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BOARD OF LAND AND NATURAL RESOURCES

STATE OF HAWAI'I

IN THE MATTER OF Contested Case Hearing Re Conservation District Use Application (CDUA) HA-3568 for the Thirty Meter Telescope at the Mauna Kea Science Reserve, Ka'ohe Mauka, Hāmakua, Hawai'i, TMK (3) 4-4-015:009	Case No. BLNR-CC-16-002 THE UNIVERSITY OF HAWAI'I AT HILO AND TMT INTERNATIONAL OBSERVATORY, LLC'S JOINT RESPONSE TO DEBORAH WARD'S PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, DECISION

AND ORDER, FILED MAY 29, 2017 [DOC. 657]; APPENDICES A–B; CERTIFICATE OF SERVICE

THE UNIVERSITY OF HAWAI'I AT HILO AND TMT INTERNATIONAL OBSERVATORY, LLC'S JOINT RESPONSE TO DEBORAH WARD'S PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, DECISION AND ORDER, FILED MAY 29, 2017 [DOC. 657]

Applicant UNIVERSITY OF HAWAI'I AT HILO ("**UH Hilo**") and TMT INTERNATIONAL OBSERVATORY, LLC ("**TIO**"), through their respective counsel, jointly submit this Response to Deborah Ward's *Proposed Findings of Fact, Conclusions of Law, Decision and Order*, filed May 29, 20 [Doc. 657] ("**Response**").

I. STANDARD OF REVIEW FOR REVERSAL OR MODIFICATION OF ADMINISTRATIVE FINDINGS, CONCLUSIONS, DECISIONS, OR ORDERS

To prevent judicial reversal or modification of administrative findings of fact under § 91-14(g), Hawaii Revised Statutes ("**HRS**"), the Board of Land and Natural Resources ("**BLNR**") should, upon review of the record, reverse or modify findings that are "[c]learly erroneous in view of the reliable, probative, and substantial evidence on the whole record." *In re Gray Line Hawaii Ltd.*, 93 Hawai'i 45, 53, 995 P.2d 776, 784 (2000). A finding of fact is clearly erroneous when: (1) the record lacks substantial evidence to support the finding or determination; or (2) despite substantial evidence to support the finding or determination, the BLNR is left with the definite and firm conviction that a mistake has been made. *Kienker v. Bauer*, 110 Hawai'i 97, 105 (2006).

Similarly, conclusions of law should be reversed or modified where the BLNR finds they are in violation of constitutional or statutory provisions, in excess of the statutory authority or jurisdiction of the Commission, or affected by other error of law. *Id.*

II. DISCUSSION

A. Responses to Deborah Ward ("Ward") Proposed FOF and COL

The UH Hilo and TIO object to each of the FOF and COL in Ward's *Proposed Findings of Fact, Conclusions of Law and Decision and Order* ("**Ward's Proposed FOF/COL**") to the extent that they are irrelevant, inapplicable, immaterial, mischaracterize the evidence, misstate or misrepresent the record, rely on evidence that is not credible, biased, or incomplete, and/or not supported by the evidence. UH Hilo and TIO also object to Ward's Proposed FOF/COL to the extent they assert alleged "findings" that are beyond the scope of issues set forth in Minute Order No. 19.

Appendix A contains general objections to Ward's Proposed FOF/COL, which UH Hilo and TIO hereby incorporate by reference to its response to each of Ward's FOF and COL, to the extent applicable.

In addition to the general objections in Appendix A, UH Hilo and TIO have prepared a table of specific responses and objections to Ward's proposed FOF and COL, which is attached hereto as **Appendix B**. Citations to the evidence in the record provided herein are not intended to be exhaustive or comprehensive, but demonstrate evidentiary support for the UH Hilo and TIO's responses and objections.

UH Hilo and TIO further object to Ward's Proposed FOF/COL to the extent they seek to challenge the FEIS for the TMT Project. This proceeding is not an EIS challenge; Ward's ability to make such a challenge expired long ago, and she cannot reopen the FEIS approval process through improper arguments of sufficiency under the statutes and rules governing the EIS process. This proceeding is entirely governed by the applicable constitutional law and the Conservation District rules that are genuinely at issue here.

The FOF/COL and page numbers referenced herein follow those as provided in Ward's

Proposed FOF/COL. References to the UH Hilo and TIO's Joint [Proposed] Findings of Fact, Conclusions of Law, and Decision and Order, filed on May 30, 2017 [Doc. 671] ("**UH-TIO FOF/COL**") are denoted by the prefixes "UH-TIO FOF" and "UH-TIO COL" for the numbered FOF and COL, respectively, in the jointly-submitted UH-TIO FOF/COL.

Acronyms and defined terms used herein are defined in the Index of Select Defined Terms, which was filed as part of the UH-TIO FOF/COL.

Any specific proposed finding or conclusion not specifically referred to or addressed below is deemed denied and disputed.

B. Responses to Ward's Proposed Decision and Order

Ward's proposed Decision and Order is not supported by the record. As set forth in the UH-TIO FOF/COL, substantial evidence has been adduced to show that the CDUA satisfies the eight criteria as set forth in HAR § 13-5-30(c). The record also shows that the TMT Project is consistent with the UH Hilo's and the BLNR's obligations under the public trust doctrine, *Ka Pa'akai*, and Article XI, section I and Article XII, section 7 of the Hawai'i Constitution.

Ultimately, Ward is categorically opposed to the construction of TMT regardless of whether or not the TMT Project satisfies the eight criteria. No location on the mountain, and no combination of mitigation measures, will make the TMT Project acceptable to Ward. That position is not supported by the law.

III. CONCLUSION

For the reasons set forth in the UH Hilo Pre-Hearing Statement, TIO's Pre-Hearing Statement, the UH-TIO FOF/COL, the testimony of the UH Hilo's and TIO's witnesses, the examination of the Petitioners' and Opposing Intervenor's witnesses, and in the UH Hilo's and TIO's other filings, UH Hilo and TIO respectfully request that the Hearing Officer adopt the UH-

TIO FOF/COL, and reject Ward's Proposed FOF/COL.

DATED: Honolulu, Hawai'i, June 13, 2017.

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APPENDIX A

Appendix A

General Responses to Petitioners'/Opposing Intervenors' Proposed Findings of Fact ("FOF") and Conclusions of Law ("COL")	
Citation does not support the proposition.	The citation offered by Petitioners/Opposing Intervenors does not support the proposed FOF or COL.
Estoppel/Improper Reconsideration	The proposed FOF or COL or a portion thereof is improper to the extent it is barred by estoppel or waiver, or improperly seeks reconsideration of the Hearing Officer's or the BLNR's prior ruling,
Inaccurate/False	The proposed FOF or COL or a portion thereof is inaccurate or false.
Incomplete.	The proposed FOF or COL is materially incomplete.
Irrelevant/Inapplicable.	The information in the proposed FOF or COL is irrelevant or inapplicable in this contested case proceeding. See Minute Order No. 19 [Doc. No. 281].
Lack of Jurisdiction	The proposed FOF or COL exceeds the scope of the Hearing Officer's jurisdiction and/or delegated authority
Mischaracterization.	The proposed FOF or COL mischaracterizes legal authority or the contents of the record.
Misleading. Partial quotation.	The proposed FOF or COL contains a partial quote from legal authority or a document in the record, and the incompleteness of the quotation is likely to mislead the reader.
Misleading. Presented out of context.	The proposed FOF or COL presents law or information in the record out of context and/or in a way that is likely to mislead the reader.
Misrepresentation	The proposed FOF or COL affirmatively misrepresents legal authority or the contents of the record.
Not credible.	The proposed FOF or COL is not credible based on the totality of the evidence contained in the record and/or the demonstrated biases of the witness whose testimony is cited in support of the proposed FOF or COL.

Not in dispute.	Either (1) the proposed FOF or COL is not at issue in this proceeding, or (2) standing alone, the proposed FOF or COL is not objectionable. The designation of any individual proposed FOF or COL as "not in dispute" does not and should not be construed as an admission of said FOF or COL or a concession that said FOF or COL should be incorporated into the final FOFs and COLs. It also does not and should not be construed as assent to any inferences suggested or that may be suggested by Petitioners/Opposing Intervenors from, e.g., their misleading grouping or ordering of otherwise unrelated facts.
Not in evidence.	The proposed FOF or COL asserts "facts" and/or cites documents that are not in evidence.
Unsupported/Unsubstantiated	The proposed FOF or COL is not supported by information in the record or was not substantiated by the Petitioners/Opposing Intervenors through the contested case process.

APPENDIX B

Appendix B

Summary Table of Responses to Ward's Proposed FOF/COL

FOF/ COL #	Page	FOF/COL	Response
1-2.	5	Public hearings on CDUA HA-3568 for the proposed Thirty Meter Telescope (TMT) in the Mauna Kea Conservation District, Mauna Kea Science Reserve, Ka`ohe Mauka, Hamakua, Hawai`i, TMK (3) 4-4-015:009 were held: on December 2, 2010 at the Hawaii County Council Room, 25 Aupuni Street in Hilo, on December 3, 2010, at the Natural Energy Laboratory in Kona. (Ex. A059)	Not in dispute. Irrelevant/Inapplicable. Estoppel/Improper Reconsideration. While UH-TIO do not object to general references to the first contested case hearing solely for procedural background purposes (*see* UH-TIO FOF 31-33), the BLNR's April 12, 2013 decision and order was vacated, and this matter was remanded for a new contested case hearing on the CDUA. UH-TIO FOF 34-35. The Hearing Officer denied admission of proposed exhibits arising from the prior contested case hearing because that hearing "has been disallowed by the Supreme Court." Accordingly, the record in the prior contested case hearing is not part of the record in the current proceeding. UH-TIO do not necessarily agree with the characterization of the

			record in the prior proceeding, and object to the citation to, and use of, the record in the prior contested case for substantive purposes in this proceeding.
3.	5	On February 25, 2011, the Board of Land and Natural Resources (BLNR) held a public hearing in Honolulu and voted to approved the CDUA HA-3568 for the Thirty-Meter Telescope in the Mauna Kea Conservation District, Mauna Kea Science Reserve, Ka'ohe Mauka, Hāmakua, Hawai'i. (Ex. A059)	Irrelevant/Inapplicable. Not in evidence. *See supra* UH-TIO's response to Ward's proposed FOF 1-2.
4.	5-6	On February 25, 2011 and March 7, 2011, the Office of Conservation and Coastal Lands (OCCL) received seven requests for a contested case hearing on CDUA-HA-3568, in compliance with HAR 13-1-28, from Mo'oinanea (represented by E. Kalani Flores), the Flores-Case 'Ohana, Deborah J. Ward, Paul K. Neves (as an individual and as representative of the Royal Order of Kamehameha I (ROOK)), Clarence Kūkauakahi Ching, KAHEA: The Hawaiian-Environmental Alliance (represented by Marti Townsend), and Mauna Kea Anaina Hou (represented by Kealoha Pisciotta). (Ex. A059)	Irrelevant/Inapplicable. Not in evidence. *See supra* UH-TIO's response to Ward's proposed FOF 1-2.
5.	6	On February 25, 2011, the board granted the permit with conditions, one of which was that a contested case be conducted, thus "putting the cart before the horse", as later described by the Hawaii State Supreme Court. (Ex A059)	Irrelevant/Inapplicable. Not in evidence. *See supra* UH-TIO's response to Ward's proposed FOF 1-2.
6.	6	On April 15, 2011, the BLNR Chairperson appointed Mr. Paul Aoki as the presiding officer over the contested case hearing (hereinafter Mr. Aoki is referred to as "Hearing Officer" or "HO"). (Min. Ord. 1, April 15, 2011)	Irrelevant/Inapplicable. Designation of Mr. Aoki as "Hearing Officer" or "HO" creates potential confusion with Hearing Officer Amano. Not in evidence.

			See supra UH-TIO's response to Ward's proposed FOF 1-2.
7.	6	On May 13, 2011, a pre-hearing conference was held on CDUA HA-3568 in Hilo. (Min. Ord. 1, April 15, 2011; Aoki, Tr. May 13, 2011, 4:1).	Irrelevant/Inapplicable. Not in evidence. *See supra* UH-TIO's response to Ward's proposed FOF 1-2.
8.	6	At the pre-hearing conference, the issue of the Petitioners' standing was discussed. Applicant did not object to the standing of petitioners Mauna Kea Anaina Hou, Paul K. Neves, Deborah J. Ward, Clarence Kukauakahi Ching, or KAHEA: The Hawaiian-Environmental Alliance. (Aoki, Tr. May 13, 2011, 6:17-20; Pisciotta, Tr. May 13, 2011, 43:24-46:25)	Irrelevant/Inapplicable. Not in evidence. *See supra* UH-TIO response to Ward's proposed FOF 1-2.
9.	6	On August 25, 2011, Petitioners Neves, Ching, Pisciotta, and Flores were recognized as Native Hawaiian cultural practitioners and experts in the traditional and customary practices of Native Hawaiians. (Lui Kwan, Tr. August 25, 2011, 28:4-30:6)	Irrelevant/Inapplicable. Not in evidence. Misleading. Presented out of context. *See supra* UH-TIO response to Ward's proposed FOF 1-2. Inaccurate and false. Their expertise was limited to their own individual cultural practice, and not that of others. UH-TIO object to the extent that this FOF is an improper attempt to qualify witnesses as "experts." This contested case proceeding

			was conducted with the assumption that no witnesses would be considered "experts." Instead, it was agreed that the background, education, experience, etc. of a particular witness would go to the weight of his/her testimony. *See* Tr. 10/20/16 at 52:24-53:21.
10.	6	On September 26, 2011, Flores was also recognized as expert in Native Hawaiian traditions and culture. (Flores, Tr. September 26, 2011, 4:25-6:25)	*See supra* UH-TIO's response to Ward's proposed FOF 9.
11.	6-7	The first contested case was conducted in 2011, and after seven days of testimony, the hearing closed, and the Applicant and Petitioners (combined) filed findings of fact, conclusions of law and decision and order. Each party provided the Hearing Officer with responses to the other's document, and a year later the Hearing Officer issued a decision. BLNR held a public hearing regarding the Hearing Officer's recommendation, but made the decision to (again) grant the permit outside of public scrutiny.	Irrelevant/Inapplicable. Not in evidence. *See supra* UH-TIO response to Ward's proposed FOF 1-2. As to the third sentence: Irrelevant/Inapplicable. Inaccurate/False. Unsupported/Unsubstantiated.
12.	7	The BLNR approval of the permit was vacated in 2015 by the Hawai'i Supreme Court, which remanded the case back to the BLNR for further proceedings. Mauna Kea Anaina Hou v. Bd. of Land & Nat. Res., 136 Hawai'i 376, 363 P.3d 224 (2015).	Not in dispute.
13.	7	BLNR failed to hold a new public hearing to revisit the application filed six years earlier and the Final Environmental Impact Statement accepted seven years earlier, nor was anyone in the public invited to comment, call for participation in a contested case hearing, or given the opportunity to establish standing in accordance with the Hawaii Administrative Rules.. Instead the BLNR issued an RFP for applications for the position of Hearing Officer for	Irrelevant/Inapplicable. Unsupported/Unsubstantiated. Estoppel/Improper Reconsideration. *See* Minute

		a second contested case hearing process.	Order No. 4 [Doc. 14].
14.	7	Hearing Officer Riki May Amano was appointed, and in spite of opposition from both the Applicant and the original petitioners, (Doc) the Board elected not to recuse Hearing Officer Riki May Amano.	Mischaracterization. Given UH Hilo's anticipation of numerous objections by Petitioners to the Hearing Officer's appointment, which would result in delays in the contested case hearing process (which came to fruition), UH Hilo, while noting that the Hearing Officer was eminently qualified and that the selection process was proper, reluctantly requested the BLNR to consider the appointment of another hearing officer to expedite the process. The University of Hawai'i at Hilo's Statement of Position on Petitioners' Motion for Reconsideration of Minute Order No. 4, Filed on May 6, 2016 and/or Motion to Strike Selection Process and to Disqualify Various Members and Hearing Officer, Filed May 13, 2016 [Doc. 43].
15.	7	The Hearing Officer called for a prehearing conference on Oahu, with less than the required notice, and six petitioners, not notified in a timely manner, were unable to attend. Attorney Richard Naiwiehu Wurdeman represented petitioners at the pre-hearing conference.	Irrelevant/Inapplicable. Unsupported/Unsubstantiated. Immaterial or moot. Not in evidence.

			Inaccurate / False. The Hearing Officer provided notice of the prehearing conference and conducted the conference pursuant to her authority under HAR Title 13, Chapter 1. Minute Order No. 5 [Doc. 16]. UH-TIO COL 37. Estoppel/Improper Reconsideration. At the May 16, 2016 prehearing conference, the Hearing Officer specifically asked the Petitioners' representative, Mr. Wurdeman, whether he had any objections to the prehearing conference. He answered that he had no objections. He also indicated on the record that the Petitioners were unable to attend simply because the hearing was held on Oahu, rather than the island of Hawai'i. Tr. 5/16/16 at 5:7-12. Therefore, the Petitioners, including Ward, have waived any argument as to a lack of sufficient notice.
16.	7	DOC 016/MO 5 dated May 6, 2016 set May 16, 2016, for the first 1st pre-hearing conference to be held in Honolulu at the DLNR office in the Kalanimoku Board Room located on the first floor, Makai side, of the Kalanimoku Building at 1151 Punchbowl Street, Honolulu, Hawaii. The	Not in dispute. UH-TIO note that Minute Order No. 5 is dated May 9, 2016 (not

		conference was held to establish Record for contested case hearing; set schedule regarding applications, motions, requests to intervene as a party; set hearing on interventions and 2nd pre-hearing conference for June 17, 2016 (Minute Order Nos. 7 and 8) TR V. i Titled "Prehearing Conference".	May 6, 2016).
17.	8	The first 1st pre-hearing conference was not noticed to parties in a timely manner. According to Minute Order 5, dated May 6, 2016, a pre-hearing conference was set for Monday, May 16, 2016. Notice requirements in Ch 91-9.5 (a) states: Unless otherwise provided by law, all parties shall be given written notice of hearing by registered or certified mail with return receipt requested at least 15 days before the hearing.	Irrelevant/Inapplicable. Citation does not support the proposition. The Hearing Officer provided notice of the prehearing conference and conducted the conference pursuant to her authority under HAR Title 13, Chapter 1. Minute Order No. 5 [Doc. 16]. UH-TIO COL 37. By its terms, HRS § 91-9.5 pertains to notification of a "hearing" not a prehearing conference. The Hearing Officer provided the required notice of the contested case hearing in compliance with HRS § 91-9.5. Notice of Contested Case Hearing [Doc. 276] and Amended Notice of Contested Case Hearing [Doc. 325]. Estoppel/Improper Reconsideration At the May 16, 2016 prehearing conference, the Hearing Officer specifically asked the Petitioners' representative, Mr. Wurdeman,

			whether he had any objections to the prehearing conference. He answered that he had no objections. He also indicated on the record that the petitioners were unable to attend simply because the hearing was held on Oahu, rather than the island of Hawai'i. Tr. 5/16/16 at 5:7-12. Therefore, the Petitioners have waived any argument as to a lack of sufficient notice.
18.	8	DOC 49/MO 08 Dated May 27, 2016 set a second 2nd Pre-Hearing Conference to be held on June 17, 2016 at the Hilo State Office Rooms A, B, and C. 75 Aupuni Street, Hilo, Hawaii 96720. Minute order titled "Minute Order 8: Order setting hearings on motions to intervene and 2nd pre-hearing conference; COS (3)". Tr. Vol ii	Not in dispute.
19.	8	Also, on June 17, 2016, as part of the 2nd pre-hearing conference, there was a scheduling discussion on how many witnesses the parties would be calling, establishing a date for site inspection, deadlines for pre-hearing motions, deadlines for subpoenas. TR VOL ii Titled: "Request for Admission and Motions".	Not in dispute.
20.	8	The new parties were expected to discuss or state their case on how many witnesses they would be calling for example, when they had no access to any motions filed and were not informed that they needed to come prepared with that information because they were not a party up until that point. All new parties except TIO and P.U.E.O were pro se.	Unsupported/unsubstantiated. Misleading. Presented out of context. Estoppel/Improper Reconsideration. Minute Order No. 7 provided notice that the Hearing Officer would discuss scheduling issues during the

			prehearing conference on June 17, 2016. Minute Order No. 7 [Doc. 44]. None of the Petitioners and anticipated Opposing Intervenors who were present had difficulty in estimating the number of witnesses that they anticipated calling, including Wurdeman, who represented Petitioners at that point. Tr. 06/17/16 (Scheduling Hearing) at 7:8 – 12:4. Nor did Mr. Wurdeman object when asked to estimate the number of potential witnesses to be called by the Petitioners. Inaccurate/False. The Temple of Lono was represented by Mr. Lanny Sinkin and thus did not participate *pro se*.
21.	8	Hearing Officer stated she will be filing a minute order describing the filing procedures. TR VOL iii Titled: "Request for Admission and Motions" - P 7: 4-6.	Not in dispute. UH-TIO note that the citation to "TR COL ii Titled: 'Request for Admissions and Motions'" should instead be to "TR COL ii Titled: 'Scheduling Hearing'".
22.	8	On August 5, 2016, a third 3rd pre-hearing conference was held at the YMCA building to hear motions. 300 West Lanikaula Street, Hilo, Hawaii 96720. TR VOL iv Titled "Motions Hearing".	Not in dispute.

23.	8	August 12, 2016, the fourth 4th pre-hearing conference was held at Hawaii Community College Cafeteria, 1175 Manono St, Hilo, Hawaii 96720 to argue motions. TR VOL v. Titled "Motions Hearing".	Not in dispute.
24.	8	August 29, 2016, the fifth 5th pre-hearing conference was held at Hawaii Community College Cafeteria, 1175 Manono, Hilo, Hawaii, 96720. Further Motions were heard. TR VOL vi. Titled "Motions Hearings".	Not in dispute.
25.	8	October 3, 2016 the sixth 6th pre-hearing conference was held at the Grand Naniloa Hotel, Crown Room, 93 Banyan Drive, Hilo, Hawaii 96720. TR VOL vii. Titled "Motions Hearing".	Not in dispute.
26.	9	October 17, 2016, the seventh 7th pre-hearing conference was held at the Grand Naniloa Hotel, Crown Room, 93 Banyan Drive, Hilo, Hawaii 96720. TR VOL viii. Titled "Prehearing".	Not in dispute.
27.	9	The Applicant and six petitioners were the original parties in the first contested case. a. Applicant University of Hawai`i at Hilo b. Petitioner Mauna Kea Anaina Hou and Kealoha Pisciotta c. Petitioner Kumu Hula Paul K. Neves d. Petitioner Deborah J. Ward e. Petitioner Clarence Kukauakahi Ching f. Petitioner Flores-Case Ohana g. Petitioner KAHEA: The Hawaiian-Environmental Alliance h. Intervenor Thirty Meter Telescope International Observatory LLC i. Intervenor Harry Fergerstrom j. Intervenor Mehana Kihoi k. Intervenor C. M. Kaho'okahi Kanuha l. Intervenor Joseph Kuali'i Lindsey Camara	Inaccurate/False. Maelani Lee withdrew as a party. *See* UH-TIO FOF 17. UH-TIO note that, although Stephanie-Malia Tabbada and Glen Kila were admitted as parties, neither physically appeared during the evidentiary portion of the contested case hearing which commenced on October 20, 2016 and ended on March 2, 2017. *See* UH-TIO FOF 23, 25. Proposed FOF misrepresents

		m. Intervenor J. Leina'ala Sleightholm n. Intervenor Maelani Lee o. Intervenor The Temple of Lono p. Intervenor Kalikolehua Kanaele q. Intervenor Perpetuating Unique Educational Opportunities, Inc. r. Intervenor Stephanie Malia Tabbada s. Intervenor Tiffnie Kakalia t. Intervenor Glen Kila u. Intervenor Dwight J. Vicente v. Intervenor Brannon Kamahana Kealoha w. Intervenor Cindy Freitas x. Intervenor William Freitas y. Intervenor Perpetuating Unique Educational Opportunity (P.U.E.O.)	name of intervenor TMT International Observatory, LLC. Incomplete. Although several other individuals agreed to be witnesses for the Hearing Officer, only Ms. Holi testified as a Hearing Officer's witness at the hearing, and all other Hearing Officer witnesses were subsequently dismissed. UH-TIO FOF 47, COL 25-35.
28.	10	The Applicant, University of Hawai'i at Hilo (UH-Hilo), is seeking a Conservation District Use Permit (CDUP) relative to CDUA HA-3568 on behalf of TMT Observatory Corporation ("TMT"). Ex A001 p.13, K-1 (CDUA)	Inaccurate/False. Citation does not support proposition. "TMT Observatory Corporation" will not be involved in the construction/operation of the TMT Project. Instead, TIO will occupy this role. UH Hilo is not pursuing a CDUP "on behalf" of another party, although TIO will ultimately oversee construction and operation of the Thirty-Meter Telescope Project ("**TMT Project**").

			Misleading. Presented out of context. UH-TIO object to this proposed FOF to the extent it raises issues relating to arguments regarding the validity of the CDUA because it references the TMT Corporation rather than TIO. The reference to TMT Corporation in the CDUA does not affect the validity of the CDUA. *See* UH-TIO COL 420-426.
29.	10	The Agent (signatory) for the Applicant UH-Hilo on CDUA HA-3568 is Dr. Donald Straney, Chancellor. Dr. Donald Straney is the Chancellor of UH-Hilo. UH-Hilo is a subdivision of the University of Hawaii System. (Ex A001 p1 of Item K-1, Ex. A009, 3-9)	Irrelevant/Inapplicable. Misleading. Presented out of context. *See supra* UH-TIO's response to Ward's proposed FOF 28.
30.	10	The University of Hawaii System was established as an institution of higher education. Its purpose is: "to give thorough instruction and conduct research in, and disseminate knowledge of, agriculture, mechanic arts, mathematical, physical, natural, economic, political, and social sciences, languages, literature, history, philosophy, and such other branches of advanced learning as the board of regents from time to time may prescribe and to give such military instruction as the board of regents may prescribe and that the federal government requires..." (HRS §304A-102)	Irrelevant/Inapplicable. Misleading. Presented out of context. UH-TIO object to this proposed FOF to the extent it raises issues relating to the Petitioners' and Opposing Intervenors' arguments relating to the signatory for the CDUA. *See* Petitioners' Motion to Strike Conservation District Use Application, HA-3568, dated September 2, 2010 and/or Motion for Summary Judgment,

			filed July 18, 2016 [Doc. 94]. The signatory for the CDUA was proper. *See* UH-TIO COL 416-419.
31.	10	Conservation land management is not listed as a purpose of the University system. HRS 304A-102.	*See supra* UH-TIO's response to Ward's proposed FOF 30.
32.	10	On May 27, 2011, the HO issued Minute Order 6 granting Ward standing in the 2011 contested case hearing. (Min. Ord. 6; Aoki)	Irrelevant/Inapplicable.
33.	10	Petitioner Deborah J. Ward is a recreational hiker who has been walking for 40 years on Mauna Kea to experience the trails and visit the summit of Mauna Kea, during the 1970's through to present, for recreation, wilderness experience, unfettered vistas, silence, spiritual peace, natural beauty, and cultural significance. (Ex. B.17a, page 2).	Misleading. Presented out of context. *See* UH-TIO FOF 6, 748,749.
34.	10	Ward has led hikes on Mauna Kea for groups including the Honolulu Botanic Gardens, since the 1970's, and Hawaii Community College, 4-H Youth Development Program, and (Sierra Club) High School Hikers, as a UH faculty member since the 1980's. (Exhibit B.17a , page 1)	Misleading. Presented out of context. *See* UH-TIO FOF 6, 748,749.
35.	10	Ward has experienced the cumulative impact of the destruction of habitat, widespread waste accumulation, obstruction of viewplanes, constant sound, alteration of the geology, and negative impact to the cultural practice during 40 years of recreational hiking and teaching on Mauna Kea. (Ex. B.17a, page 2)	Misleading. Presented out of context. *See* UH-TIO FOF 6, 748,749. Unsupported/Unsubstantiated. Not credible.
36.	10-11	Ms Ward states that development of six acres of industrial infrastructure with twice the County of Hawaii's allowable height limit (FEIS calls it a "new visual element on the northern plateau") on the last remaining unobstructed view plane facing Haleakala will significantly negatively affect her recreational practices. (Ex. B.17a, page 3)	Not in dispute regarding the fact that Ward made such statements. No credible evidence was presented which proved that the TMT site is the last remaining unobstructed view plane facing Haleakala. There are multiple view planes west, north, and east

			of the TMT site that afford unobstructed view planes facing Haleakala. Ex. C-18, C-19. UH-TIO object to the adoption of such statement to prove the truth of the matter asserted, because Ward's statements are irrelevant/inapplicable, unsupported/unsubstantiated and otherwise not credible.
37.	11	Ward's stated goal is to preserve and protect the natural resources from degradation. Her recreational practices and scientific interests and longstanding history in this issue are distinct from that of the general public. (Ex. A029, page 47)	Irrelevant/Inapplicable. Citation does not support proposition.
38.	11	Ward brought her concerns to this case because, as a long-time recreational user, she felt it was her citizen's responsibility to participate in hearings and meetings held to review, plan and propose appropriate management of the natural resources associated with Mauna Kea. She contributed hundreds of hours as a volunteer to this effort without monetary compensation. (Ex. B.17a, page 5)	Irrelevant/Inapplicable. Unsupported/Unsubstantiated. Not supported by the reliable, probative and substantial evidence.
39.	11	Ward demonstrated she has knowledge and information useful to the BLNR in making an informed decision regarding the protecting the Mauna Kea Conservation District. (Ex. B.17a, page 5)	Citation does not support proposition. Unsupported/Unsubstantiated. Not supported by the reliable, probative and substantial evidence.
40.	11	Ward noted that the Applicant's characterization of the TMT as a "new visual element on the northern plateau" is a significant understatement. The development of over 5 acres of industrial infrastructure for the TMT on the	Citation does not support proposition.

		last remaining unobstructed view plane facing Haleakala would significantly undermine her recreational practices. (Ex. B.17a, page 5)	Unsupported/Unsubstantiated. *See supra* UH-TIO's response to Ward's proposed FOF 36.
41.	11	Ward testified that the cumulative impact of intensified industrial land use at the summit, the destruction of habitat, widespread waste accumulation, obstruction of viewplane, constant sound, and alteration of the geology, has impacted her recreational enjoyment and spiritual practice. (1.31.17 Tr. Vol 33 p:l)	Not in dispute regarding the fact that Ward made such statements. UH-TIO object to the adoption of such statement to prove the truth of the matter asserted, because Ward's statements are unsupported/unsubstantiated and otherwise not credible. Additionally, Ward is not a native Hawaiian practitioner. *See* UH-TIO FOF 6, 748, 749.
42.	11	Ward has experienced the noise of observatory air conditioning, blowers, generators, associated vehicles and industrial activity and has found it disturbing to recreational users. (1.31.17 Tr. Vol 33 p:l)	Citation does not support proposition. *See* UH-TIO FOF 6, 748, 749. Unsupported/Unsubstantiated. Not credible.
43.	11	Ward stated that the multiple telescope domes on the summit of Mauna Kea are visual obstructions from any vantage point, and cause adverse impact to the natural beauty of Mauna Kea, which thereby undermines recreational enjoyment of the mountain. (Ex. B.17a, page 3)	Not in dispute regarding the fact that Ward made such statements. UH-TIO object to the adoption of such statement to prove the truth of the matter asserted, because Ward's statements are unsupported/unsubstantiated and otherwise not credible. *See* UH-TIO FOF 6, 748, 749.
44.	11	Ward maintains that the proposal to build the TMT on the northern plateau of	Not in dispute regarding the fact

		Mauna Kea's summit region would further degrade, despoil, and irrevocably harm her rights to a clean and healthful environment. B.17a p 2	that Ward made such statements. UH-TIO object to the adoption of such statement to prove the truth of the matter asserted, because Ward's statements are unsupported/unsubstantiated and otherwise not credible. *See* UH-TIO FOF 6, 748, 749.
45.	11-12	Ward observed first-hand actions by the University's Institute for Astronomy (IfA) and Department of Land and Natural Resources (DLNR) staff that directly violated conditions set forth in the BLNR- approved Mauna Kea Management Plan in 1996. These actions included alteration to slopes and filling of inner cinder cone of Pu`u Hau Oki, and trenching of the outer slopes, affecting high quality Wekiu bug habitat. ((Ex. B.17a, page 3))	Irrelevant/Inapplicable. Unsupported/Unsubstantiated as to legal conclusions regarding violation of the Mauna Kea Management Plan. *See* UH-TIO FOF 6, 748, 749.
46.	12	Ward has served at the request of the Office of Mauna Kea Management (OMKM) on the OMKM Environment Committee since December 2000. (Ex. B.17a, page 4)	Not in dispute.
47.	12	Ward worked with a committee of scientists working in the fields of biology, geology and environmental management, who together formulated recommendations for biological inventory and monitoring in 2002, and refined the natural resource monitoring and protection actions needed in 2005. (Ex. B.17a, page 4)	Not in dispute.
48.	12	Petitioners Mauna Kea Anaina Hou and Kealoha Pisciotta, Clarence Kauakahi Ching, Paul Neves, Deborah J Ward, and Flores Case Ohana, and KAHEA: The Environmental Alliance (hereinafter "Mauna Kea Hui Petitioners") were represented by attorney Richard Naiwieha Wurdeman from May to October 10, 2016.	Not in dispute.
49.	12	Thereafter, Mauna Kea Anaina Hou and Kealoha Pisciotta, Clarence Kauakahi Ching, Paul Neves, Deborah J Ward, and Flores Case Ohana represented themselves pro se, and KAHEA: The Environmental Alliance was represented by attorneys Yuklin Aluli and Dexter Kaiama.	Inaccurate/False. *See* UH-TIO FOF 2-8 regarding the representation of the Flores-Case 'Ohana, MKAH, Pisciotta and

			Neves.
50.	12	By motion dated April 15, 2016, Mauna Kea Hui Petitioners filed [Doc. 6] Petitioners' objections to selection process and to appointment of Hearing Officer made pursuant to Minute Order No. 1, dated March 31, 2016.	Not in dispute. UH-TIO that Mauna Kea Hui Petitioners' objection filed April 15, 2016 is Doc. 5 (not Doc. 6).
51.	12	By motion dated May 6, 2016, Mauna Kea Hui Petitioners filed [Doc. 15] Petitioners' objections regarding procurement committee and process and committee member / BLNR Board member.	Not in dispute.
52.	12-13	By motion dated May 13, 2016, Mauna Kea Hui Petitioners filed [Doc. 17] Petitioners' motion for reconsideration of Minute Order No. 4, filed on May 6, 2016 and/or motion to strike selection process and to disqualify various members and hearing officer.	Not in dispute. UH-TIO note that Mauna Kea Hui Petitioners' motion for reconsideration filed May 13, 2016 is Doc. 31 (not Doc. 17).
53.	13	By motion dated May 31, 2016, Mauna Kea Hui Petitioners filed [Doc. 52] Petitioners' submissions and positions on record; Exhibit "A."	Not in dispute.
54.	13	By motion dated June 16, 2016, Mauna Kea Hui Petitioners filed [Doc. 69] Petitioners' memorandum in opposition to Perpetuating Unique Educational Opportunities, Inc.'s motion to intervene, dated May 16 2016.	Not in dispute.
55.	13	By motion dated June 13, 2016, Mauna Kea Hui Petitioners filed [Doc. 70] Petitioners' memorandum in opposition to TMT's motion to have TMT International Observatory, LLC admitted as a party in the contested case hearing.	Not in dispute, except the motion was filed by TIO.
56.	13	By motion dated July 11, 2016, Mauna Kea Hui Petitioners filed [Doc. 81] Petitioners Mauna Kea Anaina Hou et al.'s request for continuance on submissions and next hearing date.	Not in dispute.
57.	13	By motion dated July 12, 2016, Mauna Kea Hui Petitioners filed [Doc. 83] Petitioners Mauna Kea Anaina Hou et al.'s supplement to request for continuance on submissions and next hearing date.	Not in dispute.
58.	13	By motion dated July14, 2016, Mauna Kea Hui Petitioners filed [Doc. 87] Petitioners Mauna Kea Anaina Hou et al.'s supplement to request for continuance on submissions and next hearing date.	Not in dispute. UH-TIO note that Petitioners

			Mauna Kea Anaina Hou et al.'s supplement to request for continuance on submissions on next hearing date was filed on July 12, 2016 (not July 14, 2016) and is Doc. 83 (not Doc. 87). *See* Ward's proposed FOF 57.
59.	13	By motion dated July 18, 2016, Mauna Kea Hui Petitioners filed [Doc. 94] Petitioners Mauna Kea Anaina Hou et al.'s motion to strike Conservation District Use Application, HA-3568, dated September 2, 2010, and/or motion for summary judgement.	Not in dispute.
60.	13	By motion dated July 18, 2016, Mauna Kea Hui Petitioners filed [Doc. 95] Petitioners Mauna Kea Anaina Hou et al.'s motion to disqualify BLNR's and Hearing Officer's counsel.	Not in dispute.
61.	13	By motion dated July 18, 2016 Mauna Kea Hui Petitioners filed [Doc.103] Petitioners Mauna Kea Anaina Hou et al.'s witness list.	Not in dispute.
62.	13	By motion dated July 18, 2016, Mauna Kea Hui Petitioners filed [Doc. 104] Petitioners Mauna Kea Anaina Hou et al.'s supplemental witness list.	Not in dispute.
63.	13	By motion dated July 26, 2016, Mauna Kea Hui Petitioners filed [Doc. 130] Petitioners Mauna Kea Anaina Hou et al.'s: (1) Renewal of objections to hearing officer selection process and hearing officer appointment, and (2) supplemental arguments on motion to disqualify BLNR's and Hearing Officer's counsel, filed on July 18, 2016.	Not in dispute.
64.	14	By motion dated August 1, 2016, Mauna Kea Hui Petitioners filed [Doc. 163] Mauna Kea Anaina Hou, et. al. Petitioners' initial objections to witnesses designated by other parties	Not in dispute.
65.	14	By motion dated August 1, 2016, Mauna Kea Hui Petitioners filed [Doc. 165] (email) Note for the record.	Not in dispute.
66.	14	By motion dated August 10, 2016, Mauna Kea Hui Petitioners filed [Doc. 188] Wurdeman correspondence addressed to Hearing Officer Judge (Ret.) Riki May Amano and BLNR Chair Suzanne Case re: Hearing on Petitioners' motion to disqualify BLNR's and Hearing Officer's counsel, Filed on July 18, 2016, filed on August 10, 2016.	Misrepresentation. Doc. 165 is MKAH's witness list resubmitted. UH-TIO note, however, that the

			correct citation to this document is Doc. 168.
67.	14	By motion dated August 17, 2016, Mauna Kea Hui Petitioners filed [Doc. 218] Petitioners Mauna Kea Anaina Hou, et al.'s site visit recommendations	Not in dispute.
68.	14	By motion dated August 22, 2016, Mauna Kea Hui Petitioners filed [Doc. 233] Petitioners Mauna Kea Anaina Hou, et al.'s memorandum in opposition to motion for protective order for the Honorable David Y. Ige, Suzanne Case and Stanley Reohrig, filed on August 8, 201.	Not in dispute.
69.	14	By motion dated September 8, 2016, Mauna Kea Hui Petitioners filed [Doc. 254] Petitioners Mauna Kea Anaina Hou, et al.'s request for further status conference and/or consideration of proposed scheduling.	Not in dispute.
70.	14	By motion dated September 19, 2016, Mauna Kea Hui Petitioners filed [Doc. 270] Mauna Kea Anaina Hou, et al. Petitioners' response to P.U.E.O., Inc.'s proposed minute order granting P.U.E.O., Inc.'s motion to set issues.	Not in dispute.
71.	14	By motion dated September 23, 2016, Mauna Kea Hui Petitioners filed [Doc. 282] Correspondence regarding notice of contested case hearing.	Not in dispute.
72.	14	By motion dated September 26, 2016, Mauna Kea Hui Petitioners filed [Doc. 288] Petitioner Mauna Kea Anaina Hou, et al.'s objections to site visit and Minute Order No. 18.	Not in dispute.
73.	14	By motion dated October 10, 2016, Mauna Kea Hui Petitioners filed [Doc. 340] Petitioners Mauna Kea Anaina Hou, et al.'s renewed motion to disqualify hearing officer.	Not in dispute.
74.	14	By motion dated October 10, 2016, Mauna Kea Hui Petitioners filed [Doc. 341] Notice of withdrawal of counsel.	Misrepresentation. Notice of Withdrawal was filed by Richard Wurdeman, not MKAH Petitioners.
75.	14	By motion dated October 10, 2016, Mauna Kea Hui Petitioners filed [Doc. 342] Petitioners Mauna Kea Anaina Hou and Kealoha Pisciotta, Clarence Kukauakahi Ching; Flores Case Ohana, Deborah J. Ward, Paul K. Neves, and Kahea: The Environmental Alliance list of e-mail addresses for service of process.	Not in dispute.
76.	15	By motion dated October 17, 2016, Mauna Kea Hui Petitioners filed [Doc. 383] Petitioners' Statement of Position in Response to the University's	Not in dispute.

		Statement Re Petitioners Renewed Motion to Disqualify Hearing Officer Document 369.	
77.	15	By motion dated February 28, 2017, Deborah Ward filed [Doc.483] Deborah Ward's Motion to Admit Exhibits and Written Direct Testimony Into Evidence; Memorandum in Support of Motion.	Not in dispute.
78.	15	By motion dated March 9, 2017, Deborah Ward filed [Doc. 507] Deborah Ward's first supplemental motion to admit exhibits and written direct testimony into evidence: Memorandum in support of motion.	Not in dispute.
79.	15	By motion dated March 22, 2017, Deborah Ward filed [Doc. 527] Deborah Ward's joinder to Mauna Kea Anaina Hou motion requesting time to respond to exhibit objections.	Not in dispute.
80.	15	By motion dated March 23, 2017, Deborah Ward filed [Doc.545] Deborah J. Ward joinder to Mauna Kea Anaina Hou motion requesting time to respond to exhibit objections.	Not in dispute.
81.	15	By motion dated March 23, 2017, Deborah Ward filed [Doc. 543] Deborah J Ward's motion for joinder in Temple of Lono motion to Board of Land and Natural Resources to dismiss HA-3568.	Not in dispute.
82.	15	By motion dated April 25, 2017, Deborah Ward filed [Doc. 560] Deborah J Ward joinder to Temple of Lono motion for reconsideration of Minute Order 43.	Not in dispute.
83.	15	By motion dated April 28, 2017, Deborah Ward filed [Doc. 582] Deborah J. Ward joinder to Temple of Lono emergency motion to Board to stay proceedings.	Not in dispute.
84.	15	By motion dated April 28, 2017, Deborah Ward filed [Doc. 581] Deborah J. Ward joinder to Temple of Lono motion to reconsider Minute Order 44.	Not in dispute.
85.	15	The Hearing Officer ordered Applicant and Petitioners to submit Witness Written Direct Testimony and Exhibits simultaneously on or by October 11, 2016.	Not in dispute.
86.	16	Later, the petitioners were made aware that a documents library had been set up online, where Shared Exhibits Numbers R-8 were added to the Mauna Kea Documents Library Evidentiary Hearing Submittals. At the beginning of the evidentiary hearings, there were several duplications of exhibits from the various parties.	Unsupported/Unsubstantiated. Irrelevant/inapplicable. UH-TIO note, however, that the shared documents are designated

			as record documents R-1 through R-8. Exhibits R-1 through R-8 submitted by Brannon Kamahana Kealoha were not admitted into evidence. *See* Amended Minute Order No. 44. UH-TIO have construed any citations to "R" exhibits as citations to the record documents and the corresponding "A" exhibits.
87.	16	During the hearings references were made to the duplicated documents by number, as reflected in the transcripts. No attempt was made at any time to resolve the duplication, nor was there an opportunity to compare documents or rectify discrepancies between documents and the various versions. The parties did not have the opportunity to compare the documents and collectively agree on the documents to be used.	Irrelevant/Inapplicable. Unsupported/Unsubstantiated. All exhibits were uploaded to the document library. The parties had every opportunity to inspect and compare these documents. Inaccurate / False. The individual parties had the burden of determining what exhibits to use, reviewing those exhibits in light of other exhibits as necessary, introducing those exhibits the party wished to introduce into evidence, and monitoring what exhibits were used by other parties.
88.	16	The Officer also received in to evidence the Applicant's document(s) over the Shared documents uploaded by BLNR's librarian. Consequently, at the close of the hearing, the Hearing Officer verbally expressed her intent to accept all exhibits to be judged by her on weight. Following the close of the evidentiary hearing, petitioners relied upon her assertions, made few	Irrelevant/Inapplicable. Unsupported/Unsubstantiated. Moot or otherwise resolved.

		objections, assuming that statements regarding weight would be issued in the findings of fact.	Inaccurate/False. Misrepresentation. At the close of the hearing, the Hearing Officer did not state an intent "to accept all exhibits to be judged by her on weight." At the close of evidence, the Hearing Officer instructed the parties to move their exhibits into evidence by written motion, after which the parties could file "objections, responses, replies, joinders to the motions that were made." Tr. 03/02/17 at 287:24-288:16. The Hearing Officer stated that she would then "by Minute Order, identify all exhibits that I will be receiving in evidence." Tr. 03/02/17 at 288:17-20; *see also* arguments set forth in UH Hilo's Opp to Temple's Mot. for Recon. of Minute Order No. 44 at 4-5 [Doc. 599]. Estoppel/Improper Reconsideration. *See* Temple's Mot. for Recon of Minute Order No. 44 at 4-11 [Doc. 569]; Minute Order No. 51 [Doc. 647] (rejecting various arguments that the evidence admission process

			was improper).
89.	16	However, the Applicant(s) UH/TIO offered a barrage of objections to the exhibits petitioners had relied on throughout the evidentiary hearing process. Petitioners were not extended the opportunity to respond to objections to defend our own exhibits, and Hearing Officer made her decisions on admissibility based in part, if not primarily, on the the Applicants' arguments.	*See supra* UH-TIO's response to Ward's proposed FOF 88. Mischaracterization. Misleading. Presented out of context. UH and TIO filed appropriate objections to the Petitioners' and Opposing Intervenors' exhibits. *See* University of Hawai'i at Hilo's Opposition to Motions to Admit Exhibits and Written Direct Testimony [Doc. 514] and TMT International Observatory, LLC's Memorandum in Opposition to Motions to Admit Exhibits and Written Direct Testimonies [Doc. 511]. The Hearing Officer set forth the bases for her decisions regarding the exhibits in Minute Order No. 44 [Doc. 553].
90.	16	On Mar 2, 2017 the Hearing Officer stated on March 23, "I will by Minute Order identify all exhibits that I will be receiving onto evidence". (Tr. Mar 2, 2017, Vol 44:288:1-22). After accepting objections on March 16, it wasn't until April 20, 2017, Minute order 44 was issued.	Misleading. Presented out of context. Unsupported/Unsubstantiated. UH-TIO object to this proposed FOF to the extent that it implicates any argument that Petitioners were prejudiced in his preparation of the FOF/COL. That argument has been rejected

			by the Hearing Officer. *See* Minute Order No. 50. The Hearing Officer issued Minute Order No. 44 nearly six weeks prior to the due date for the FOF/COL.
91.	16	Based on the HO representation (Tr. 3.2.17) petitioners expected that there would be a full list of accepted exhibits with which to establish Findings of Fact. Instead petitioners received multiple uncollated lists (MO 44/Doc 553), which included responses to Applicants' objections. On the last working day (May 26, 2017) prior to the filing deadline for Findings, the Hearing Officer issued a revised set of admitted exhibits. (MO 59/Doc 647, MO Amended 44/Doc 649).	*See supra* UH-TIO's response to Ward's proposed FOF 88. Misleading. Presented out of context. Unsupported/Unsubstantiated. Rather than "multiple uncollated lists," Minute Order No. 44 comprehensively organized the exhibits in tabular form, with columns for each exhibit, the objection(s) to each exhibit and the Hearing Officer's ruling. Minute Order No. 44 [Doc. 553]. Minute Order No. 51 granted in part and denied in part various motions for reconsideration of Minute Order No. 44 [Doc. 647]. As all parties had notice of the exhibits subject to the motions for reconsideration, there was no prejudice to the parties in their preparation of their FOF/COL. Amended Minute Order No. 44 [Doc. 649] merely amended

			Minute Order No. 44 to reflect the Hearing Officer's rulings on the motions for reconsideration on the exhibits.
92.	16	The Hearing Officer had countervailing positions regarding what docs should be admitted or not. For example, in some instances she required that laws that were relied on in witness testimony to entered as an exhibit, while later she denied that document's receipt into evidence.	*See supra* UH-TIO's response to Ward's proposed FOF 88. Mischaracterization. Due to numerous issues raised by the Petitioners and Opposing Intervenors, the Hearing Officer determined during the third day of the hearing that she would permit the parties to offer the exhibits at the hearing but would wait until after all of the testimony was complete before making a determination on the receipt of the exhibits into evidence. Tr. 10/25/16 at 99:12-21. Thus, it was not inconsistent for the Hearing Officer to permit the parties to offer exhibits

			during the hearing but subsequently, after due consideration of the exhibit and applicable objection(s), to exclude the exhibit from evidence.
93.	16	More importantly, Minute Order 44 (Doc 553) issued 4.20.2017 regarding documentary evidence clearly demonstrates the problem. The Order is contradictory, in that on one page several exhibits are received, while on another page the same exhibits are denied. For example, in Minute Order 44 see pages 28 and 33 to compare the decisions on exactly the same documents; on one page they are received, and and on the other, they are denied.	*See supra* UH-TIO's response to Ward's proposed FOF 88. Misleading. Presented out of context. Unsupported/Unsubstantiated. There was no prejudice to Petitioners arising from the alleged contradictory rulings on the exhibits. As noted in Minute Order No. 44 [Doc. 553] at 28 and 33, the exhibits at issue (Exs. B.38, B.39, B.40, B.41, and B.42) were duplicative of other exhibits that were admitted into evidence (*See* Exs. A-9, A-10, A-11, A-12, and A-13).
94.	17	Therefore, petitioner asserts the due process injuries are as follows: As of this date (last working day before for submission of these findings of fact), the record is incomplete because there are outstanding dispositive motions, and motions for reconsideration regarding exhibits.	*See supra* UH-TIO's response to Ward's proposed FOF 88. Incomplete. Unclear as to which "petitioner" is asserting injuries. Misleading. Presented out of context.

			Unsupported/Unsubstantiated. UH-TIO object to this proposed FOF to the extent that it implicates any argument that Petitioners were prejudiced in his preparation of the FOF/COL. The Hearing Officer issued Minute Order No. 44 nearly six weeks prior to the due date for the FOF/COL. The motions for reconsideration on the exhibits were ruled upon by May 25, 2017 (Minute Order No. 51 [Doc. 646]), and Ward does not indicate what timely-filed dispositive motions were not ruled upon by the Hearing Officer prior to the submission of the FOF/COL.
95.	17	The references from the transcript do not match the exhibits admitted by the Hearing Officer.	Unsupported/Unsubstantiated. To the extent that there are differences between the exhibits references in the transcripts and the exhibits admitted by the Hearing Officer, such differences can be clarified in the applicable FOF/COL.
96.	17	Some exhibits offered by witnesses who had already testified were later not received into evidence by the hearing officer.	*See supra* UH-TIO's response to Ward's proposed FOF 88.

			Mischaracterization. Due to numerous issues raised by the Petitioners and Opposing Intervenors, the Hearing Officer determined during the third day of the hearing that she would permit the parties to offer the exhibits at the hearing but would wait until after all of the testimony was complete before making a determination on the receipt of the exhibits into evidence. Tr. 10/25/16 at 99:12-21. Thus, it was not inconsistent for the Hearing Officer to permit the parties to offer exhibits during the hearing but subsequently, after due consideration of the exhibit and applicable objection(s), to exclude the exhibit from evidence.
97.	17	Citations to exhibits may be inconsistent throughout the record and the Findings of Fact will reflect the confusion.	*See supra* UH-TIO's response to Ward's proposed FOF 88.
98.	17	During the August 29, 2016 hearing, the petitioners articulated on the record a number of issues to be addressed in the contested case hearing. While some of these issues were address in P.U.E.O.'s proposed order, the proposed order failed to include a number of issues important in this case.	Unsupported/Unsubstantiated. Incorrect/Inaccurate. Estoppel/Improper Reconsideration. *See* Minute Order No. 19 [Doc. 281]. Irrelevant / Inapplicable. *See* UH-TIO FOF 62-67, COL 78-

			125.
99.	17	The Mauna Kea summit region is designated as part of the State of Hawaii Conservation District Resource subzone and as such, uses on the land are subject to the Conservation District rules (HAR 13-5) and permit conditions. The conservation district is administered by the State of Hawaii Department of Land and Natural Resources (DLNR) as directed by the Board of Land and Natural Resources (BLNR). Effective January 1, 1968, the BLNR leased the land (General Lease S-4191) to the University of Hawaii; the lease terminates on December 31, 2033. A001 p 1-1	Not in dispute.
100.	17	The Conservation District is comprised of areas in which natural resource conservation is a recognized concern on Mauna Kea, encompassing at least 106,000 acres (11,308 acres of UH managed lands, 3,894 acres of NAR, 52,500 Mauna Kea Forest Reserve, and 38,300 acres of the Hakalau Refuge). A010, NRMP, 1-11, 1-12.	Citation does not support proposition. Lacks evidentiary support from the record.
101.	17	Extending into a portion of the Mauna Kea Science Reserve is the Mauna Kea Ice Age Natural Area Reserve, between 10,400 and 13,200 feet elevation. The NAR designation was approved by the BLNR on November 9, 1978, a CDUA for the area was approved in 1981, and the executive order establishing the reserve was signed in that year. A012, Public Access Subplan, 2-2.	Citation does not support proposition. Lacks evidentiary support from the record.
103.	18	"Rising nearly 33,000 feet from the ocean floor, with a peak elevation of 13,796 feet, Mauna Kea is the highest point in the Pacific Basin and the highest island mountain in the world. Ex A009 CMP Appendix 4, p. 9.	Irrelevant/Inapplicable. Correct citation should be to Appendix A4.
104.	18	Mauna Kea was listed as a National Natural Landmark in 1972. One of the reasons given for placing the mountain on this register by the National Park Service is that Mauna Kea is the "Most majestic expression of shield volcanism in the Hawaiian Archipelago, if not the world." Ex A009 CMP Appendix 4, p. 9.	Irrelevant/Inapplicable. Correct citation should be to Appendix A4.
105.	18	Since 1972, Mauna Kea has been designated as a National Natural Landmark and listed in the registry of National Natural Landmarks as a result of its singular topography, morphology, and geology. Ex A003 FEIS, p. 3-106.	Irrelevant/Inapplicable.
106.	18	"Few sites posses [sic] better credentials to justify their national significance	Irrelevant/Inapplicable.

		than does Mauna Kea." Ex A003 FEIS, p. 3-106, quoting a Mauna Kea NNL program.	
107.	18	Abundant evidence of glacial striae, boulders, police and grooves shows that an ice cap covered Mauna Kea's summit during the Pleistocene era. Ex A003 FEIS Vol. 1, p. 3-106 (citing the U.S. National Park Service's description of Mauna Kea National Natural Landmark).	Irrelevant/Inapplicable. Citation does not support proposition.
108.	18	"Mauna Kea is currently estimated to be between 600,000 and 1.5 million years old and is considered by the U.S. Geological Survey (USGS) to be an active post-shield volcano. While there has been no recent volcanic activity at Mauna Kea, volcanologists believe that it "is likely to erupt again". Ex A009 CMP, p. 5-24 – 5-25	Irrelevant/Inapplicable.
109.	18	First and foremost, Mauna Kea is the exposed portion of the highest insular mountain in the United States, rising up over 30,000 feet above its submerged base in the Pacific Ocean. Second, on its slopes is found Lake Waiau, the highest lake in the United States. Third, though located in the tropics, indisputable evidence of glaciations is present above the 11,000 foot level. Lastly, possibly transcending all of these nationally significant qualities, is the fact that Mauna Kea is the most majestic expression of shield volcanism in the Hawaiian Archipelago if not in the world. Rory Westberg, Acting Regional Director, NPS Ex A004 FEIS Vol II p 4 of 531	Irrelevant/Inapplicable.
110.	18	The objectives of the NNL program are fourfold: to encourage the preservation of sites illustrating the geological and ecological character of the United States; to enhance the scientific and educational value of the sites thus preserved; to strengthen public appreciation of natural history; to foster a greater concern for the conservation of the nation's natural heritage. Laura Thielen, Chair, DLNR Ex A003FEIS Vol II p 19 of 531	Irrelevant/Inapplicable.
111.	19	. Though located in the tropic, indisputable evidence of glaciation is present above the 11,000 foot level. Lastly, possible transcending all of these nationally significant qualities is the fact that Mauna Kea is the most majestic expression of shield volcanism in the Hawaiian Archipelago if not in the world. Ex. A003 (TMT EIS Vol. II), p.3-6	Irrelevant/Inapplicable. Citation does not support proposition. U nsupported/Unsubstantiated.

112.	19	The Mauna Kea National Natural Landmark is held in trust by the State of Hawai`i, and its 83,900 acre boundary incorporates the lands within the conservation district, including the Mauna Kea Science Reserve, Ice Age Natural Area Reserve and the Mauna Kea Forest Reserve. Ex. A003(TMT EIS Vol. II), p.3-6	Citation does not support proposition. Lacks evidentiary support from the record.
113.	19	Other unique geologic features of Mauna Kea include numerous cinder cones (pu'u) that rise above lavas of the upper plateau, and evidence of glaciers that covered nearly 27-square miles of the summit region during the Pleistocene Epoch (Ice Ages) approximately 18,000 years before present." Ex A009 CMP Appendix 4, p. 9.	Irrelevant/Inapplicable. Citation does not support proposition.
114.	19	"Because of its elevation, Maunakea's summit was repeatedly glaciated during the past few hundred thousand years, and preserves the best glacial record of any oceanic volcano on Earth." Ex A003 FEIS, p. 3-105.	Irrelevant/Inapplicable.
115.	19	Hawaiian Hotspot' magmas, pushed up through the oceanic crust, began building Mauna Kea approximately 750,000 years ago. Throughout its building stages, a'a and pahoehoe lavas flowed from three main rift zones, forming a volcano resembling a warrior's shield. Towards the end of the post-shield stage eruptions became more explosive, discharging magma referred to as tephra. These eruptions created the numerous cinder cones dotted across the highest elevations of Mauna Kea. Ex A009 CMP Appendix 4, p. 9.	Irrelevant/Inapplicable. Citation should be to Appendix A4.
116.	19	"Three cinder cones (pu'u) make up the summit of Mauna Kea (Pu'u Hau'oki, Pu'u Wēkiu, Pu'u Haukea), collectively referred to as Pu'u o Kūkahau'ula, a traditional deity associated with fisherman families. There are additional cinder cones (e.g., Pu'u Keonehehe'e, Pu'u Makanaka, Pu'u Poepoe, Pu'u Poli'ahu, Māhoe, and Pu'u Waiau) below the summit." Ex A009 CMP Appendix 4, p. 9.	Citation does not support proposition.
117.	19	Mauna Kea has two series of volcanic rocks. The older Hamakua series, mostly composed of olivine basalts, forms the bulk of the mountain. The Laupahoehoe series consists of "hawaiites" and comprises a veneer that overlays the upper part of the mountain. Ex A048 2000 Master Plan, p. IV-1.	Not in dispute.
118.	20	Subglacial volcanic eruptions gave rise to lava flows that cooled quickly,	Citation does not support

		yielding a fine grained, dense black rock called obsidian, prized by Hawaiians for adzes, at a site known as Keanakako`i. Ex A048 2000 Master Plan, p. IV-2.	proposition.
119.	20	Due to glaciation during the last ice age of the Pleistocene era, ice covered approximately 27 square miles of the summit and ranged in thickness from 200-350 feet, to elevations of 10,500 feet, where ash and cinder were scraped away by glacial flow erosion. (Ex. A048, p. IV-1)	Not in dispute.
120.	20	120. . Glacial moraine and meltwater deposits of fine sediments, and glacially sculpted features of cinder cones are evidence of summit glaciation that led to the formation of Lake Waiau, one of the highest lakes in the United States. (Ex. A048, IV-2)	Citation does not support proposition that "Glacial moraine and meltwater deposits of fine sediments, and glacially sculpted features of cinder cones are evidence of summit glaciation that led to the formation of Lake Waiau[.]"
121.	20	The proposed TMT location is entirely underlain by a single lava flow. A single chemical analysis of this lava flow shows the flow to be of typical "hawaiite" composition (a type or alkali-rich basalt). Ex A003 FEIS, Vol. 1 p. 108.	Citation does not support proposition.
122.	20	"The summit of Mauna Kea (12,800 to 13,796 ft) is considered an Alpine Stone Desert. Several species of mosses and lichens, an unknown number of species of algae, some vascular plants constitute the plant community in this region. "Most of the species of plants found in the region are endemic (occurring only in Hawai'i) or indigenous (native to Hawai'i but occurring elsewhere). A few non-native plant species have also become established here, even at the summit." Ex A009 CMP, p. 5-37- 5-38.	Not in dispute.
123.	20	During the Pleistocene era, an ice cap covered approximately 27 square miles of the upper regions of Mauna Kea and "scour[ed]" the area it covered. Ex A048 2000 Master Plan, p. IV-1.	Not in dispute.
124.	20	Classic terminal, polished rock outcrops, and glacial till deposits resulted from glacial-scouring. These features, combined with snowfall and wind patterns of the summit area, "support various forms of plant and animal life." Ex A048 2000 Master Plan, p. IV-1 and IV-2.	Not in dispute.

125.	20	The landscape that exists today [on Mauna Kea] was formed by volcanic and glacial activity and is a unique environment for insects, spiders, lichens, ferns, and mosses. Rocky outcrops, loose cinder, and smooth lava flows make up habitats that combine with snowfall and wind patterns of the summit area to support various forms of plant and animal life." Ex A048 2000 MP p. IV-1.	Not in dispute.
126.	21	"The Maunakea summit area is well above the atmospheric temperature inversions that occur around 7,000-feet. Particulates and aerosols like vog (volcanic gas), smog, dust, smoke, salt particles, and water vapors generated below the inversion level are "capped" by the temperature inversion, so they do not rise above the inversion level and do not cause any interference at the summit." Ex A003 FEIS, p. 3-182.	Not in dispute.
127.	21	High winds are common at the summit, but wind velocities usually range from 10 to 30 miles per hour. Winds gust up to 100 miles per hour in the upper regions of Mauna Kea, creating an aeolian (influenced by wind) ecosystem. Ex A003 FEIS Vol. 1, p. 3-183.	Not in dispute.
128.	21	Anabatic winds occasionally penetrate the inversion layer, bringing insects and small volumes of air from lower elevations. Ex A003 FEIS Vol. 1, p. 3-183 to 3-184.	Not in dispute.
129.	21	"Wind vectors (direction and speed) across the summit area play a large role in the aeolian environment, transporting small debris including bugs from lower elevations up to the summit area. Obstructions to wind flow such as at the crests of the pu'u can redirect the wind or slow it, creating eddies or small vortexes that reduce the energy, or holding capacity, of the wind, allowing debris in the air parcel to fall out. The aeolian environment of the summit area is unique, the persistent wind forcing resident fauna to adapt (see Section 2.2.2.2)." Ex A010 CMP NRMP, p. 2.1-43.	Not in dispute.
130.	21	Winter temperatures in the upper regions of Mauna Kea range from 10-40 degrees Fahrenheit. Summer temperatures range approximately between 30 to 60 degrees. Ex A003 FEIS Vol. 1, p. 3-183.	Not in dispute.
131.	21	The 300 feet wide, approximately 10 foot deep, alpine lake, Wai'au, is "unique and revered." Ex A009 2000 Master Plan, p. IV-2.	Citation does not support proposition.
132.	21	The southern rim of Lake Wai'au is the rim of a subglacially-formed cinder	Citation does not support

		cone, Pu'u Wai'au. A003 FEIS, Vol. 1, p. 3-115.	proposition.
133.	21	Seemingly barren, desolate, and unchanging, the natural environment of the upper slopes and summit area are actually very much alive, revealing through its topography, geology, and climate an impressive history of geomorphic process and ecosystem development. Ex A009 CMP, p. 5-24.	Not in dispute.
134.	22	Although it may appear barren to the casual observer, the summit of Mauna Kea supports an interesting variety of species, many of which are found nowhere else in the world. Ex A009 CMP, p. 5-38.	Misleading. Presented out of context. There are no species of flora unique to the TMT Project site. UH-TIO FOF 466-479. There are no currently listed threatened or endangered species known to occur in the Astronomy Precinct. UH-TIO FOF 475-476.
135.	22	UH Management Areas on Mauna Kea contain two ecosystems: the Alpine Stone Desert above 12,800 feet and the Alpine Shrublands and Grasslands from roughly 9,500 feet to 12,800 feet. Ex A003 FEIS Vol. 1, S-4.	Not in dispute.
136.	22	Vegetation above 12,800 feet in the upper regions of Mauna Kea consists primarily in the lichens, moss, and ferns that have adapted to its severe climatic conditions. Ex A003 FEIS Vol. 1, p. 3-80.	Citation does not support the proposition. *See supra* UH-TIO's response to Ward's proposed FOF 134.
137.	22	An unknown number of algal species and some vascular plants of species found at lower elevations also inhabit the summit region. Ex A009 CMP, p. 5-37.	Citation does not support proposition. *See supra* UH-TIO's response to Ward's proposed FOF 134.
138.	22	Native grass species (Hawaiian bentgrass (Agrostis sanwicensis) and pili uka (Trisetum glomeratum) and fern species ('iwa'iwa (Asplenium adiatum-nigrum) and Douglas' bladderfern (Cystopteris douglasii) are found at elevations above 12,800 feet as well. Ex A009 CMP, p. 5-38.	Citation does not support the proposition. Misrepresentation. Reference states that Hawaiian bentgrass, Douglass' bladder fern, 'iwa'wa and pili uka occur in the alpine shrubland, which goes **up to (not above)**. 12,800 feet in elevation.

			See also Ex. A-3/R-3 at S-4 (stating that alpine shrublands and grasslands are located between 9,500 and 12,800 feet in elevation). *See supra* UH-TIO's response to Ward's proposed FOF 134.
139.	22	The highest density of the 21 known species of lichens in the alpine stone desert region of Mauna Kea grow on north and west faces of rocks, away from direct morning sunlight. Ex A003 FEIS Vol. 1, p. 3-61.	*See supra* UH-TIO response to Ward's proposed FOF 134.
140.	22	In 1982, 25 lichen species were found on Mauna Kea. Half of those species are endemic to Hawai'i, two of which occur only on Mauna Kea. Ex A048 2000 Master Plan, p. IV-3.	Citation does not support proposition. Unsupported/Unsubstantiated. Lacks evidentiary support from the record. Misleading. Presented out of context. None of the lichen or moss species detected at the TMT Project site are unique to Hawai'i. UH-TIO FOF 471. *See supra* UH-TIO's response to Ward's proposed FOF 134.
141.	22	Twelve species of mosses have adapted to the alpine stone desert region and tend to cluster under rock overhangs, where moisture concentrates. Two indigenous species of mosses were detected in a recent botanical survey of the proposed Northern Plateau site for the TMT. Ex A003 FEIS Vol. 1, p. 3-61.	Misleading. Partial quotation. The reference goes on to state that the two indigenous species of mosses detected at the Northern Plateau can be found elsewhere in the world. Ex. A-3/R-3 at 3-61.

			See supra UH-TIO's response to Ward's proposed FOF 134.
142.	22	Of the 25 different lichens found in 1982, half of the species were endemic to Hawaii, with two occurring only on Mauna Kea. Of the twelve mosses found in the summit area, less than a quarter were endemic. The fern Cystopteris douglasii was one of six vascular plants found at the summit, and the Mauna Kea Silversword, a sub-species unique to the mountain, was once reported in the summit region. (Ex. A048 2000 Master Plan, p.IV-2,3)	Citation does not support proposition. *See* UH-TIO FOF 466-502. Misleading. Presented out of context. None of the lichen or moss species detected at the TMT Project site are unique to Hawai'i. UH-TIO FOF 471. *See supra* UH-TIO's response to Ward's proposed FOF 134.
143.	22	Lichens at the summit of Mauna Kea are the dominant element of the vegetation even though they provide only a trace of cover in this severe essentially unvegetated landscape. It appears that the only limiting factor of lichen growth is the physical environment. Ex B. 64 Appendix D1	*See supra* UH-TIO's response to Ward's proposed FOF 134.
144.	23	Lichens in the TMT area include a macrolichen community dominated by foliose Umbilicaria decussate; where it occurs it is growing over 50% of vertical surfaces with a north to northeast aspect. Umbilicaria decussate is nearly always accompanied by Pseudephebe miniscula and Rhizocarpon geographicum and Lecidea baileyi on vertical rock faces of andesite blocks which suggests that special conditions allow growth there and not elsewhere. Ex. B.64, APP D-5,6	Citation does not support proposition. Misleading. Presented out of context. This FOF suggests that Rhizocarpon geopraphicum and Lecidea baileyi occur only at the proposed TMT site. However, there are no species of flora unique to the TMT Site. UH-TIO FOF 474. *See supra* UH-TIO's response to Ward's proposed FOF 134.

145.	23	The most common species in the Mauna Kea crustose flora are Lecanora polytropa, Lecidea baileyi and Candelariella vitellina, which are widely dispersed throughout the area. Ex B.64 APP-D5	*See supra* UH-TIO's response to Ward's proposed FOF 134.
146.	23	There are four principal environmental factors that determine the lichen and moss vegetation and species composition: substrate, moisture, temperature, and ultraviolet radiation. Ex. B.64 APP D2	*See supra* UH-TIO's response to Ward's proposed FOF 134.
147.	23	There are four principal substrate types in the summit area : a)Andesite slabs and blocks of grey rock, with few blisters, which form the large large lava flows; water drains off rapidly; b)Glaciated pahoehoe with numerous blisters where water can accumulate; lichens can accumulate c)Glacial rubble, rocks under the surface layer often have lichen growing d)Cinder and ash is too unstable to support lichen growth Ex. B.64 APP D2	Not in dispute.
148.	23	In May of 2011, Eric Hansen, witness for KAHEA, began working as the field crew leader for the Mauna Kea baseline botanical survey commissioned by the Office of Mauna Kea Management. B.10a at 1, B.10b at 3, Tr. 01/19/2017, V. 27 p 143:12-14, 144:22-25, 145: 1-3, 150: 9-15, 19-21	Misleading. Presented out of context. Although Mr. Hansen was the leader of the "field crew," Mr. Hansen was overseen by Dr. Grant Gerrish, who was the principle investigator for this study. Tr. 1/19/17 at 194:4-19, 199:4-7.
149.	23	Mr Eric Hansen was responsible for leading a field crew in conducting an intensive study of the entire Mauna Kea Science Reserve in the alpine and subalpine zones, and he helped establish vegetation survey transects.	Unsupported/Unsubstantiated. Misleading. Presented out of context. Although Mr. Hansen was the leader of the "field crew," Mr. Hansen was overseen by Dr. Grant Gerrish, who was the principle investigator for this study. Tr. 1/19/17 at 194:7-19, 199:4-7.
150.	23	Mr Hansen testified that eleven of the 67 plant species identified in the OMKM Botanic Baseline Survey (Exhibit 64) were recorded in the summit	Not in dispute.

		region. Tr. 01/19/2017, V. 27 p157:18-21	
151.	24	During the time of the 2011 baseline botanical study, fieldwork for a subcontracted lichen study of the proposed Thirty-Meter Telescope site (Area E) was also conducted by Mr. Hansen's field crew for Pacific Analytics, a subcontractor of Parson's Brinkerhoff who were contracted by UH Hilo. The lichen study (authored by Dr Cliff Smith) is included as Appendix D to the OMKM Botanical Baseline Survey (2011) of the University of Hawai`i's Managed Lands on Mauna Kea (Exhibit B.64). B.10a at 1, Tr. 01/19/2017 Vol 27:145:18-24 Vol. 27: 146: 16-25, 147: 1-6, 155: 15-18, 178: 18-21, 179: 1-6.	Not in dispute.
152		While performing the lichen study at the proposed TMT site, Mr. Hansen and his crew also documented non-lichen species in the region; these included two endemic (only found in Hawai`i) grasses, Agrostis sandwicensis and Trisetum glomeratum and two endemic ferns, Cystopteris douglasii and Asplenium trichomanes; as well as three indigenous (naturally arrived to Hawai'i on their own but found in other places) ferns, Asplenium adiantum-nigrum, Dryopteris wallichiana, and Pellaea ternifolia. B.10a at 1, Tr. 01/19/2017, V. 27 at 146: 16-25, 147: 1-6, 155: 15-18, 178: 18-21, 179: 1-6.	Misleading. Presented out of Context. Mr. Hansen did not identify any non-lichen species that are unique to the proposed TMT site. *See* UH-TIO FOF 474, 477-479.
153.	24	Currently considered a species of concern by the USFWS, the Douglas' bladderfern (Cystopteris douglasii), are known to occur in the Maunakea summit region. The Douglas' bladderfern was found throughout Area E. Ex. A005 (TMT FEIS), p. 3-65	Citation does not support proposition (cited to wrong exhibit). Misleading. Presented out of context. *See* UH-TIO FOF 476 (stating that Area E is not considered critical habitat for the Douglas' bladderfern). Additionally, the Douglas' bladderfern is widespread, occurring on all main Hawaiian

			Islands. Ex. A-3/R-3 at 3-65. Lacks evidentiary support from the record.
154.	24	Species of Concern are those species about which regulatory agencies have some concerns regarding status and threats, but for which insufficient information is available to indicate a need to list the species under the Endangered Species Act. Ex. A005, (TMT FEIS), p. 3-65	Citation does not support proposition. Misleading. Presented out of context. *See* UH-TIO FOF 476 (stating that Area E is not considered critical habitat for the Douglas' bladderfern). Additionally, the Douglas' bladderfern is widespread, occurring on all main Hawaiian Islands. Ex. A-3/R-3 at 3-65.
155.	24	Though not apparent at a distance, when examined closely, unique assemblages of botanical communities exist at the proposed TMT site (Area E). B.10a at 1, Tr. 01/19/2017, V. 27 at 147: 7-14, 151: 24-25, 152:1, 155: 10-18, 156: 4-16, 157: 9-17, 183: 7-13.	Unsupported/Unsubstantiated. Incorrect/Inaccurate. There is no evidence of "unique assemblages" at the proposed TMT site. *See*, Tr. 12/1/16 at 155:25-156:5 (Dr. Clifford Smith stating that there are no special communities located within the proposed TMT Project site). In fact, Mr. Hansen's supervisor for the 2011 baseline study, Dr. Grant Gerrish, wrote a report which Mr. Hansen admits did not recognize any plant communities or assemblages as significant. *See* UH-TIO FOF 474, 478-479.

			Not credible. Hansen, who is not a trained entomologist and admitted that he is not an expert on lichen, testified that these species of lichen can be found elsewhere on Mauna Kea and that the particular assemblages of lichens found at the TMT Project site could be found elsewhere. UH-TIO FOF 478. Hansen further testified that his superior, Dr. Gerrish, did not consider the lichen assemblage to be significant. UH-TIO FOF 479.
156.	24	During the 2011 Botanical Baseline Survey fieldwork, Mr. Hansen and his team did not find the distinct assemblage of botanical species found at Area E in other areas at the same or similar elevations of Mauna Kea. B.10a at 2, Tr. 01/19/2017, V. 27 at 147: 15-17, 194: 4-6.	*See supra* UH-TIO's response to Ward's proposed FOF 155.
157.	24	The presence of large boulders in Area E (including the site of the proposed TMT) that have small pockets where moisture (include melted snow) can collect beneath them allows for unique botanical assemblages; these pockets are shaded, protected from direct exposure to the sun and high winds which allows for lower evapotranspiration rates. B.10a at 2, Tr. 01/19/2017, V. 27 at 147: 18 -25, 151: 15-23, 152: 4-19, 155:10-18, 156: 4-16, 20-24, 170:20-25, 171:1-3, 179: 7-12.	Misleading. Presented out of context. This FOF implies that large boulders exist only in Area E. Mr. Hansen did not testify to this fact. There is no evidence that large boulders exist only in Area E. Misleading. Presented out of context. The record reflects that Hansen's overall study also included areas that extended well beyond Area E. Tr. 01/19/17 at

			191:8-15.
158.	24	The substrate in Area E which includes a pahoehoe lava flow and other pohaku that are unique from the cinder substrate of the pu`u of Mauna Kea. Tr. 01/19/2017, V. 27 at 154: 3-18, 156:25, 157:1-8, 184:3-11, 185:11-15.	Misleading. Presented out of context. The record reflects that Hansen's overall study also included areas that extended well beyond Area E. Tr. 01/19/17 at 191:8-15. Misleading. Presented out of context. The pahoehoe lava flows and other pohaku are different from the cinder substrate, but are not "unique" to Area E. *See generally* Ex. A-5/R-5, App. H at 7; Ex. A-5/R-5, App. G at 4; UH-TIO FOF 447. Lacks evidentiary support from the record.
159.	24	(Unlike the TMT project area), Cinder cones are not conducive for providing habitat for species of botanical origins. Tr. 01/19/2017, V. 27 at 180: 14-16	Misrepresentation as to the added text in parentheses. Misleading. Presented out of Context. There are no species of flora unique to the TMT Project site. Species and habitat found in the TMT Project site are not unique to that site and are found elsewhere on Mauna Kea and/or on other islands of Hawai'i. UH-TIO FOF 474. Wēkiu bugs are generally

			concentrated on the cinder cones in the summit area down to roughly 11,700 feet. There are no currently-listed threatened or endangered species known to occur in the Astronomy Precinct. Ex. A-3/R-3 at S-4. The disturbance of prime wēkiu bug habitat (Type 3) for the TMT Project would be limited to 0.2 acres. UH-TIO FOF 488; *see also* UH-TIO FOF 483-496; *infra* UH-TIO's response to Ward's proposed FOF 314.
160.	25	The only resident animal species in the summit area are arthropods. At least ten indigenous Hawaiian arthropod species are residents of this area: wēkiu bugs (Nysius wēkiuicola), lycosid wolf spiders (Lycosa sp.), two sheetweb spiders (genus Erigone), two mites (Family Aystidae and Family Eupodidae), two springtails (Family Entomobryidae), a centipede of the Lithobius species, a noctuid moth (Agrotis sp.). Ex A001 UH/TMT CDUA, p. 3-6.	Incomplete. *See* UH-TIO FOF 466-502.
161.	25	Despite their rarity, critical habitat for arthropod species is unknown or poorly defined because very little is known about their life cycle, population size, fecundity, and area distribution. (Ex. A048, p. XI-22)	Citation does not support proposition.. *See* UH-TIO FOF 466-502. Lacks evidentiary support from the record. Misleading/Presented out of context. Ex. A-48 is a document created in 2000. Since that time, many studies have been

			conducted that have increased the scientific understanding of arthropod species on Mauna Kea. *See generally*, Ex. A-5/R-5 at App. K (Arthropod and Botanical Inventory and Assessment prepared in 2009), Ex. A-16 to 22. As a member of the Mauna Kea Management Board Environment Committee (as of December 2000) (Tr. 1/31/17 at 20:23-21:3), Ward is well aware of these subsequent studies, but instead chose not to reference them in an attempt to mislead the Hearing Officer. The record reflects that the TMT Project will not be built in a critical habitat for the wēkiu bug or any species of concern. UH-TIO FOF 342. The wēkiu bug was removed as a candidate from the Federal Endangered Species Act, but in any case, OMKM has an overarching plan to restore the wēkiu bug habitat, which is currently being implemented. UH-TIO FOF 481-483. Moreover, there are no currently-listed threatened or endangered species known to occur in the Astronomy Precinct. Ex. A-3/R-

			3 at S-4.
162.	25	Little information exists about the habits of arthropod species in the summit area, except the wēkiu bug. Ex A0101CMP, p. 5-39.	*See supra* UH-TIO's response to Ward's proposed FOF 161.
163.	25	Wēkiu bugs have adapted to Mauna Kea's aeolian ecosystem; their food supply consists of insects blown from lower elevations towards the summit. Ex A-308 3-62	Citation does not support proposition. *See supra* UH-TIO's response to Ward's proposed FOF 161.
164.	25	Wekiu bugs are generally concentrated on the cinder cones in the summit area, habitats include snow patches (Type 1), tephra ridges and slopes (Type 2), loose, steep tephra slopes on the outer flanks of the cones, known as Type 3 habitat, Lava flows (Type 4) talus slopes and rock outcrops (Type 5) and compacted fine-grained material (Type 6). Ward WDT B.17a p 11	Unsupported/Unsubstantiated. Misleading. Presented out of context. Inaccurate/Incorrect. *See* UH-TIO FOF 484 (Wēkiu bugs are uncommon in Type 4 and Type 5 habitat. Type 6 habitat is unsuitable for the Wēkiu bug). The disturbance of prime wēkiu bug habitat (Type 3) for the TMT Project would be limited to 0.2 acres. UH-TIO FOF 488; *see also* UH-TIO FOF 483-496. *See supra* UH-TIO's response to Ward's proposed FOF 161.
165.	25	Dust can impact lichens, mosses, and ferns and is believed to degrade Wekiu bug habitat. Ex. A005, App. K, p. 31, A003 FEIS Vol. 1, p. 3-70.	Incomplete. *See* UH-TIO FOF 466-502. Misleading. Presented out of context. Measures are in place to mitigate the impacts of dust.

			UH-TIO FOF 309, 321, 490, 494. *See supra* UH-TIO's response to Ward's proposed FOF 161.
166.	25	It has become clear that while Wekiu bugs can range broadly over the summit when food sources and climate are favorable, the prime habitat is rims and inner craters of cinder cones. These are ice-free areas that rose above the once surrounding glacier (nunataks), as described by Englund and Porter 2006, sometimes on the flanks and base where cinder has accumulated (Eiben 2010).	Incomplete. *See* UH-TIO FOF 466-502. Unsupported/Unsubstantiated. Not in evidence. Misleading. Presented out of context. The disturbance of prime wēkiu bug habitat (Type 3) for the TMT Project would be limited to 0.2 acres. UH-TIO FOF 488; *see also* UH-TIO FOF 483-496. *See supra* UH-TIO's response to Ward's proposed FOF 161.
167.	25	Arthropod and Botanical Inventory and Assessment, by Pacific Analytics, L.L.C., Ex A-005 Appendix K FEIS Vol III	Incomplete. *See supra* UH-TIO's response to Ward's proposed FOF 161.
168.	25	Information on relationships between wind and climate variables and wēkiu bug food availability is lacking. Ex A-010 CMP NRMP, p. 2.1-44.	Citation does not support proposition. *See* UH-TIO FOF 466-502. Irrelevant/Inapplicable. This FOF has no bearing on the TMT Projects impact on wēkiu bug populations.

			Misleading. Presented out of contact. Numerous studies have been conducted on the wēkiu bug since the NRMP was published in 2009. *See* Ex. 17 at 4, A-18 at 4-5; Ex. A-22 at 7-10. *See supra* UH-TIO's response to Ward's proposed FOF 161.
169.	25	In 1982, wēkiu bugs were found in abundance above 13,450 ft and on undisturbed areas on Pu'u Wēkiu and Pu'u Ha'oki and on stable accumulations of loose cinders and tephra rocks with interstitial spaces that allowed the bugs to access moisture and shelter. Ex A-010 CMP NRMP, p. 2.2-34.	Incomplete. *See* UH-TIO FOF 466-502. Misleading. Presented out of context. The TMT Project will not significantly impact wēkiu bug populations. UH-TIO FOF 481-496. *See supra* UH-TIO's response to Ward's proposed FOF 161.
170.	26	Such hospitable environments for wēkiu bugs are found on cinder cones on the Mauna Kea summit as well as the flanks and bases of cinder cones. Ex A009 CMP, p. 5-39.	Incomplete. *See* UH-TIO FOF 466-502. Citation does not support proposition. Misleading. Presented out of contact. Numerous studies have been conducted on the wēkiu bug since the NRMP was published in 2009. *See* Ex. 17 at 4, A-18 at 4-5; Ex. A-22 at 7-10.

			See supra UH-TIO's response to Ward's proposed FOF 161.
171.	26	On an ocean island two thousand miles from the next nearest land mass, fresh water is the source of life. Protection of the aquifer is tantamount to providing the generations to come with life-giving sustenance. The summit of Mauna Kea, the highest point in the Pacific, is the apex of the aquifers that radiate from the summit.	Unsupported/Unsubstantiated. Not credible Mischaracterization. No citation is provided for this proposed FOF. The TMT Project will not harm the aquifers. *See* Tr. 12/13/16 at 112:14-113:12. Because the TMT Observatory will use a zero-discharge wastewater system, wastewater will not be released from the TMT Project so no percolation of wastewater will reach the aquifer. UH-TIO FOF 431, 805.
172.	26	The regional aquifer beneath the summit of Mauna Kea is entirely fresh water. As evidenced by most seeps and springs, shallow groundwater does exist in the mountains flanks below the summit area. Analysis of spring water shows it to be recent and identical to rainfall at the summit. at least some of the water percolates downward to ultimately discharge as a spring or seep. Ex A003 FEIS Section 3.7 Water Resources and Wastewater p 3-115, 117	Not in dispute as to statement. Misleading with respect to any conclusions implied therefrom. The reliable, probative, and credible evidence establishes that the TMT Project will cause minimal surface runoffs, and the impacts of such runoff will not be significant. *See* WDT Nance at 2; Tr. 12/13/16 at 98:5-14.

			Misleading. Presented out of context. The evidence has shown that precipitation on Mauna Kea above 9,000 is low and evaporation rates are high. The majority of water runoff at or near the TMT Project would be lost to evaporation and therefore does not become groundwater recharge. Ex. A-10, 2.1.34 – 2.1-35, 2.1-39; *see also* UH-TIO FOF 804-805.
173.	26	The Astronomy Precinct is located entirely above the Waimea Aquifer. A010 NRMP 2.1-38	Misleading. Presented out of context.
174.	26	Applicant's evidence indicates that, except for Lake Waiau, which has an impermeable layer beneath it, rainwater and snowmelt at the summit "continues its downward migration to the regional aquifer" of Hawaii Island. A003 FEIS Section 3.7 Water Resources and Wastewater p 3-115	Misleading. Presented out of context. Citation does not support the proposition. Misleading. Partial quote. The reference continues on to state that the regional aquifer beneath the summit, which is "much deeper." Misleading. Presented out of context. The reference to water continuing "its downward migration to the regional aquifer" in the FEIS refers to the situation that would occur if the

			impermeable layer under Lake Waiau did not create a perched aquifer. *See* Ex. A-3/R-3 at 3-115.
175.	26	Applicant's evidence indicates that drainage at the summit occurs through percolation of rainfall through cinder and broken rock substrates. Ex A003 FEIS Section 3.7 Water Resources and Wastewater p 3-117	Not in dispute.
176.	26	Applicant states that "In the summit region, annual precipitation ranges from approximately 20 inches at the Very Long Baseline Array (VLBA) at an altitude of 12,600 feet to approximately 15.5 inches (including snowfall) at the Subaru Observatory at an altitude of 13,575 feet. Storms, including wintertime cold-fronts, upper-level and surface low-pressure systems, tropical depressions, and hurricanes provide the majority of annual precipitation over a very short period of time." A003 FEIS Vol. 1 at 3-183	Not in dispute.
177.	27	Significant snowfall is known to occur during any month of the year, but is concentrated during January through March. A003 FEIS Vol. 1 at 3-183	Not in dispute.
178.	27	Buried ground ice in two of the summit cinder cones show that permafrost exists near the summit. A048 2000 Master Plan at IV-1	Not in dispute.
179.	27	Applicant's evidence also indicates that surface runoff at the summit does not extend below an elevation of 6,000 feet, which means that "the majority of the water ultimately ends up percolating and becoming groundwater recharge with only a small amount lost to evaporation." Ex A003 FEIS section 3.16 Cumulative Impacts p 3-219	Misleading. Presented out of context. This FOF pertains specifically to runoff from the Mauna Kea Access Road. Additionally, the evidence has shown that precipitation on Mauna Kea above 9,000 is low and evaporation rates are high. The majority of water runoff at or near the TMT Project would be lost to evaporation and therefore does not become groundwater recharge. Ex. A-10, 2.1.34 – 2.1-35, 2.1-39; *see also* UH-TIO FOF 804-805.

180.	27	The Island of Hawaii contains high water levels in the rift zones of Kilauea and Kohala Volcanoes. High water levels, possibly associated with a buried rift zone of Hualalai Volcano or fault scarps draped with lava flows, are also present along the western coast. Areas of high water levels also are found along the northern flank and eastern flanks of Mauna Kea and on the southeastern flank of Mauna Loa. These high water levels are not fully understood. (emphasis added) Exhibit B17w USGS Groundwater is Hawaii p. 3	Misleading. Presented out of context. This FOF suggests that ground water exists at high elevations on Mauna Kea. However, the Exhibit B17w references "high water levels," which is not the same as bodies of water at high elevations. Not credible. There was no expert testimony to explain how this information is relevant to the TMT Project.
181.	27	Four components of the hydrology of the Mauna Kea summit region remain unknown: 1) watershed calculations of snow-water distribution, 2) outcomes of leachate and liquid waste from septic and cesspool systems, 3) distribution and impacts of permafrost, and 4) groundwater maps of water levels, flow paths, and recharge rates. Ex A010 CMP NRMP, p. 2.1-39.	Not in dispute. Misleading with respect to any conclusions implied therefrom. The reliable, probative, and credible evidence establishes that the TMT Project will cause minimal surface runoffs, and the impacts of such runoff will not be significant. *See* WDT Nance at 2; Tr. 12/13/16 at 98:5-14.
182.	27	Applicant states that Groundwater transportation rates in the summit region of Mauna Kea are unknown, and no flow paths have been identified. It is generally believed that groundwater flows along the direction of the ground surface slope, although the presence of variable subsurface features, such as dikes and sills, with low hydraulic conductivity, likely alter groundwater flow rates and flow paths. Groundwater flow-paths are important to understanding the potential movement of leachate from underground waste water systems. Exhibit A009 CMP 5-32 (pdf p 82)	Misleading. Presented out of context. *See* UH-TIO FOF 804-805.
183.	27	Although the amount of precipitation that infiltrates into the ground is	Incomplete. *See* UH-TIO FOF

		unknown, it is generally accepted, and is reported by the NRCS (Sato et al. 1973), that surface infiltration rates in the summit region are high, and that during heavy precipitation events, water reaching the ground surface infiltrates quickly. The depth and rate of transmission of water that infiltrates is unknown and most likely varies depending on the rock type and the subsurface structure. Exhibit A009 CMP 5-32 (pdf p 82)	796-823. *See supra* UH-TIO's response to Ward's proposed FOF 179.
184.	28	Applicant states that the regional aquifer beneath the summit is what is referred to in Hawai'i as "high-level," which means that the aquifer is entirely fresh water, not fresh water floating on salt water, and geologic structures, such as a volcanic sills and dikes, isolate the water. A003 FEIS Vol I 3-115 (pdf p 203)	Incomplete. *See* UH-TIO FOF 796-823.
185.	28	The surface runoff does not extend to or below an elevation of 6,000 feet, which means that the majority of the water ultimately ends up percolating and becoming groundwater recharge with only a small amount lost to evaporation. A003 FEIS Vol I 3-219 (pdf p 307)	Misleading. Presented out of context (this portion of Ex. A-3/R-3 is in reference to the surface runoff from the Mauna Kea Access Road, not all surface runoff on Mauna Kea).
186.	28	As evidenced by modest spring and seeps, shallow groundwater does exist in the mountain's flanks below the summit area. The most prominent of these springs and seeps are the series of springs found near Pōhakuloa and Waikahalulu Gulches... This indicates that at least some of the rainfall and snow melt at the summit percolates downward to a perching layer to ultimately discharge at the ground surface as a spring or seep. A003 FEIS Vol I 3-117 (pdf p 205)	Misleading. Presented out of context. The primary watershed recharge areas for Mauna Kea occur at lower levels below the summit, not in alpine desserts. UH-TIO FOF 805. There is no reasonable prospect of the TMT Project impacting groundwater. UH-TIO FOF 804. Misleading. Partial quotation. Excerpt goes on to state: "Scientific dating tests of the spring's water indicate that it is recent, meaning that the water is not from the melting of ancient

			subsurface ice or permafrost, and analyses of the water shows it to be identical to rainfall at the summit. This indicates that at least some of the rainfall and snow melt at the summit percolates downward to a perching layer to ultimately discharge at the ground surface as a spring or seep. Hale Pohaku is located above the Onomea Aquifer system (Figure 3-30). **There are no wells in the vicinity of Hale Pohaku, because, similar to the summit area, the groundwater is at such a great depth that it is not considered economical to use it.**" (emphasis added). The reliable, probative, and credible evidence establishes that the TMT Project will cause minimal surface runoffs, and the impacts of such runoff will not be significant. *See* WDT Nance at 2; Tr. 12/13/16 at 98:5-14.
187.	28	Groundwater flowing downslope is the water source for seeps and streams found between 8,500 and 11,000 ft (2,591 and 3,353 m), near Pōhakuloa and Waikahalulu Gulches (Woodcock 1980; Arvidson 2002). Exhibit A009 CMP 5-30 (pdf p 80)	Misleading. Presented out of context. The primary watershed recharge areas for Mauna Kea occur at lower levels below the summit, not in alpine desserts.

			UH-TIO FOF 805. There is no reasonable prospect of the TMT Project impacting groundwater. UH-TIO FOF 804.
188.	28	There is evidence that the water discharging at the seeps and springs is derived from recent rainfall and snow melt across the upper slopes of Mauna Kea (Arvidson 2002; Ehlmann et al. 2005). Exhibit A009 CMP 5-30 (pdf p 80)	Misleading. Presented out of context. The primary watershed recharge areas for Mauna Kea occur at lower levels below the summit, not in alpine desserts. UH-TIO FOF 805. There is no reasonable prospect of the TMT Project impacting groundwater. UH-TIO FOF 804.
189.	28	Hydrologic conditions were strikingly different from those predicted by conventional models for ocean islands: the formation was dry down to only ~150 m where the first, thin, perched aquifer was encountered; a second, more substantial, perched aquifer was reached at only ~220 m depth that extended to ~360 m where a sequence of (remarkably thin) perching formations were recovered in the core down to about 420 m where unsaturated rocks were again encountered. Initial analysis of the core suggests that thin, clay-rich, perching formations in the shallow stratigraphic column play a much larger role in groundwater transport than has generally been recognized. (emphasis added) B.17x SAO Mauna Kea Aquifer studies on PTA p 2.	Misleading. Presented out of Context. Unsupported/Unsubstantiated. Exhibit B.17x is merely an abstract of a study conducted regarding the groundwater between the Mauna Loa and Mauna Kea volcanoes. The entire study/report is not in evidence. Misrepresentation. This study was not conducted anywhere near the summit of Mauna Kea. The abstract indicates that the drilling conducted occurred in the saddle region between Mauna Kea and Mauna Loa, starting at an elevation of 1,946 meters

			above mean sea level, which is approximately 6,384 feet. This is nowhere near the summit of Mauna Kea. Ward attempts to misrepresent this exhibit as suggesting that water can be found only 150 meters below the summit of Mauna Kea, where the TMT Project will be constructed. Misleading. Partial quotation. Ex. B17x also states that, "in the deeper interior of the volcano, compaction of the flow boundaries (the major carrier of water in the shallow stratigraphy) leads to a progressive decrease in permeability and reduction in the transport rates of recharge toward the shoreline aquifers." When asked about this portion of the study, Mr. Tom Nance testified that perching water formations in the shallow column probably did not play a larger role in groundwater transport than had been recognized in the past. Tr. 12/13/16 at 141:1-142:14.
190.	28	Aquifers formed of postshield- stage rocks have been generally regarded to have lower permeability than shield-stage lava flows, but the very young postshield rocks on the Big Island have some of the highest hydraulic	Incomplete. Misleading. Presented out of

		conductivities (tens of thousands of feet per day) reported for volcanic rocks in the Hawaiian Islands. B.17y Hawaii Volcanic Rock Aquifer Study p 3	context. Does not state that Mauna Kea is a "very young postshield rock." Not credible. There was no expert testimony to explain how this information is relevant to the TMT Project.
191.	29	Volcanic intrusives, or dikes, on Mauna Kea create compartments which are essentially permeable (sic, transcript error) so when you get recharge (or runoff) it is deposited in dike-confined compartments. That's what we call the existence of high-level groundwater, and its relative impermeability of these intruded dikes that create high level groundwater. Nance Tr.12.13.16 V16	Not in dispute.
192.	29	Mr Nance stated that an aquifer is a groundwater body defined by boundaries, high-level or basal. How they fit together on this island he couldn't say. There are more aquifers than there are regulated aquifer systems. Nance Tr.12.13.16 V16 p. 112:19-25, 113:1-2.	Mischaracterization. Misleading. Presented out of context. Misleading. Partial quotation. Testimony in response to line of questioning was as follows: Q Now, there have been a lot of claims that TMT will harm the aquifer. First, could you explain to the Judge what an aquifer is from a hydrologist's perspective? A Let me try to do that two different ways. An aquifer is a groundwater body typically defined by boundaries, defined by the type of groundwater

			occurrence of maybe high level groundwater that I just referred to, maybe basal groundwater, that's basically a lens of fresh, brackish water floating on saltwater, or it may actually even be a small little perched water body. How they fit physical on this island, I couldn't tell you, but there are many. The other way to look at that is the State Water Commission is the agency responsible for regulating low developed groundwater use has divided the island up into 24 separately identified and delineated aquifer systems. There are more actual aquifers then there are regulated aquifer systems. **Q Now, based upon your review of Mauna Kea and your knowledge of the TMT project, will the TMT project in any way harm any of these aquifers?** **A It should not at all.** 12/13/2016 at 112:14 – 113:12 (emphasis added).
193.	29	Three potable wells are tapped into high level dike-confined groundwater.	Citation does not support

		Nance Tr.12.13.16 V16 at 113:7-8.	proposition. Misleading. Partial quotation. Nance testified as to the existence of four potable wells. Tr. 12/13/16 at 113:13-22. Nance further testified that the TMT Project would not affect any of these possible water sources. Tr. 12/13/16 at 114:14-16.
194.	29	Mauna Kea kuahiwi ku ha'o i ka mālie (Mauna Kea is the astonishing mountain that stands in the calm). Ōlelo No'eau. A001 CMP	Citation does not support proposition.
195.	29	The views of Mauna Kea and the view from Mauna Kea are significant and have been for centuries. Ex A-010 CMP NRMP, p. 2.1-47.	Misrepresentation. Mischaracterization. Unsupported/Unsubstantiated. Citation does not support the proposition that the views to and from Mauna Kea are "significant." The TMT Project will not have a substantial adverse impact on the visual resources of Mauna Kea. *See* UH-TIO FOF 775-795.
196.	29	The unique topography, location and views draw many hikers to Mauna Kea to explore the few established, but unmarked trails in the summit region. A001 CDUA TMT Mgt Plan 2-5	Not in dispute.
197.	29	Residents from around the island value the changing colors of Mauna Kea throughout the day, with people from the eastern side describing the mountain's beauty at sunrise, while those on the northwestern side experience the sunsets. Ex A-302 CMP NRMP, p. 2.1-47, quoting Kepā	Not in dispute.

		Maly (1999).	
198.	29	Approximately 72 percent of the Hawai'i Island population resides in an area impacted by views of telescopes on Mauna Kea. Ex A-308 FEIS, p. 3-82.	Citation does not support proposition. UH-TIO note that the correct citation for this proposed FOF is Ex. A-3/R-3 at 3-82. Misleading. Presented out of context. Appropriate excerpt states: "Eighteen representative viewpoints within the northern portion of the island have been identified as places that are of visual significance to the three viewer groups. The viewpoints are all located in the northern portion of the island because the location of the TMT Observatory is such that it will not be visible from the southern portion . . . From approximately 43 percent of the island area a viewer is able to potentially see at least one existing observatory. According to 2000 U.S. Census data, 72 percent of the population of the Island of Hawai'i, or about 107,000 people reside within the viewshed of the existing observatories." Ex. A-3/R-3 at 3-81 – 3-82.
199.	29	Numerous recreational activities take place on Mauna Kea. Visitors come to	Not in dispute.

		Mauna Kea each year to sightsee, view the stars, tour the world-class observatories. A001 CDUA TMT Mgt Plan 2-5	
200.	30	Different categories of people that view Mauna Kea (E.G. residents, sightseers, and cultural practitioners) have differing expectations, and these differences greatly affect their perception of the observatories. A001 p 7-2	Not in dispute.
201.	30	The Applicant concedes that the visual impact of past actions on Mauna Kea, such as the 11 observatories currently located within the Astronomy Precinct, is considered substantial, significant and adverse. Ex A-308 FEIS Section 3.5 Visual and Aesthetic Resources p 3-101	Citation does not support the proposition (correct citation should be to Ex. A-3/R-3). Misleading. Presented out of context (this section of Ex. A-3/R-3 goes on to state that "[t]he **direct long-term visual impact of the TMT Observatory will be less significant.**" Ex. A-3/R-3 at 3-103). The FEIS further notes that "When the TMT Observatory is combined with the existing conditions, the cumulative visual impact of development on and near the summit of Maunakea will continue to be significant, as discussed in detail in Section 3.16.4." Ex. A-3/R-3 at 3-101. The incremental increase in cumulative visual impact due to the TMT Project will be less than significant. UH-TIO FOF 795.
202.	30	Sierra Club member Mae Mull was an ardent advocate for a Mauna Kea Master Plan for long term land use and natural resource protection. She said " The primary goals of the master plan should be permanent protection of	Not credible. Unsupported/Unsubstantiated.

		Mauna Kea's natural beauty and rare native ecosystems and to provide for public recreational use." "Big island residents, conservationists, hunters, public planners and most of Hawaii's people have special regard and respect for Maun Kea. ...To destroy the unique natural values of the mountain for the sake of astronomical observation of outer space is not progress by any measure. " "Just because other countries won't permit desecration of their mountaintops...these are not good reasons to turn our precious mountain into a playground for astronomers." (Exhibit B.17 n Mae Mull Elepaio 1974)	Mull's statement over 40 years ago does not reflect measures taken since, and should be given little weight in light of the record of this proceeding.
203.	30	Several trails traverse the Mauna Kea summit region Among these are the Mauna Kea Humu'ula Trail and the Mauna Kea Umikoa Trail. The Mauna Kea Humu'ula Trail begins near Hale Pohaku and ands near Lake Waiau. A modern trail around the western side of Puu Haukea connects the Mauna Kea Humu'ula Trail with the Mauna Kea Access Road close to the Batch Plant Staging Area. Proposed TMT-related use of the Batch Plant Staging Area will be visible to trail users during the construction period. Ex A001 CDUA p.2-4	Misleading. Partial quote. The reference goes on to state that the construction period will not entail long lasting land disturbance and is consistent with the preservation and continued use of the Batch Plant Staging Area.
204.	30	Based on the large number of shrines in the summit area it is clear that Hawaiians went to the top of the mountain with a sacred purpose in mind, but it is doubtful that large numbers were involved at any one time. The ritual landscape that exists today is almost certainly the result of journeys by a number of families and adze makers over many generations. The cluster of overlapping cinder cones that forms the "summit" of Mauna Kea, including those now called Pu`u Wekiu, Pu`u Kea, Pu`u Hau Oki and others that are not easily distinguished as discrete landforms (Porter 1979), has been designated an historic property (Site 21438) based on ethnographic information and archaeological data. Ethnographic information suggests that the "summit," as just defined, was most probably known in the past by a single name, Kūkahau`ula, that on present evidence referred to both a legendary figure and to a character in traditional histories and genealogies. The latter includes references to Kūkahau`ula as the husband of Līlīnoe and as an `aumakua (family deity) of fishermen. The place name evidence thus indicates that the "summit" was at the very least a legendary place (wahi pana Pukui and Elbert 1971, 1986). The archaeological evidence indicates	Misleading. Presented out of context. Excerpt is followed by the following: "Though no archaeological surveys were conducted prior to the construction of the summit road, which was completed in the mid-1960s, there is no indication that any archaeological sites on the "summit" were destroyed at that time, or at any time thereafter in the construction of the existing observatories. In 1998 Kepa Maly interviewed two Hawaiian men, Theodore "Teddy" Bell, who had

		that it was much more than that. While there is little archaeological evidence of human activity on the "summit" itself, the large numbers of shrines that encircle the mountain, just below indicate that the top of the mountain was the focal point of ritual practices. There is no knowledge of what these practices entailed, but it is reasonable to infer that they were centered on the worship of local mountain gods and goddesses, such as Poli`ahu and Līlīnoe, and presumably Kūkahau`ula as well. The summit is thus interpreted to have been the focal point of a major pilgrimage site or center. A122 Archaeological Survey of Mauna Kea NAR p 7-12,13	worked for Morrsion-Knudsen on the road to the summit, and Alika Lancaster, who had worked on the construction of the first observatories in the 1960s. Neither one had seen or heard of any human bones uncovered along the road, or on the summit (Maly 1999 Appendix A:123, A-232). **The most important observation to be made about the summit (Kūkahau`ula) is the meager evidence of human activity prior to the historic period.** Indeed, with the exception of Site 21209, which is comprised of two features, a small rock outline and mound on the southeast rim of Pu`u Wekiu, there are no other known sites of probable pre-Contact age on the summit." Ex. A-122 at 7-13 (emphasis added). No known traditional and customary practices are associated with the proposed 5-acre TMT Project site. The TMT Project will not have a substantial effect on shrine worship,

			pilgrimage, prayer, and offerings in the summit area. The principal areas traditionally used for these practices would not be affected by the TMT Project. *See* UH-TIO FOF 611-641. The reliable, substantial, and credible evidence demonstrates that the TMT Project will not result in any substantial adverse impact on native Hawaiian traditional and customary practices on Mauna Kea, and will not have a substantial adverse impact on any historic properties within the MKSR. Ex. A-3/R-3 at 3-37, 3-48 to 3-55; UH-TIO FOF 646-647.
205.	31	The cumulative impact of intensified industrial land use at the summit has impacted my recreational enjoyment and spiritual practice. The cumulative impact of the destruction of habitat, widespread waste accumulation, obstruction of viewplane, constant sound, alteration of the geology, and negative impact to the cultural practice of my colleagues is a source of personal grief. The summit would be silent if there was no development at all. It is not silent. The noise of observatory air conditioning, blowers, generators, associated vehicles and industrial activity is present and disturbing to recreational users who hope for the pristine silence of wilderness. B.17a Ward WDT p 2	Unsupported/Unsubstantiated. Not credible. *See* UH-TIO FOF 499, 748-49. Misrepresentation. Incomplete/Vague and Ambiguous (the FOF is written from a "first person" perspective, with Ward as the apparent source, and is an improper FOF). Not credible.

			Unsupported/Unsubstantiated. Ward is not a native Hawaiian practitioner. While Ward's interest in Mauna Kea is for recreation and hiking, she had no prior experience of hiking in the rough lava areas of the TMT Project. Ward's use of Mauna Kea for recreation purposes began when there were telescopes already existing on Mauna Kea. During the 1980s and 1990s, Ward did not witness any native Hawaiians engaging in traditional or cultural practices on Mauna Kea. UH-TIO FOF 748-749. In any case, evidence in the record supports the conclusion that at least some native Hawaiian practices are facilitated, rather than hindered, by the existence of the observatories and infrastructure on Mauna Kea. UH-TIO FOF 345. The impacts complained of by Ward are present with or without the TMT Project.
206.	31	Noise level in the vicinities of the existing observatories varied from 38 dBA to 77dBA Leq, and 40-78 dBA L10, with noise levels at or below 60 dBA Leq beyond a distance of 50 feet from HVAC exhausts. The loudest noise levels of 68 and 77 dBA Leq and 69 and 78 dBA L10, were measured at locations within 15 feet of HVAC exhaust outputs. A003 FEIS Section 3.13	Misleading. Partial quotation. Quoted excerpt is followed by the following: "The Pu'u Wekiu/Kukahuau'ula Summit and Trailhead

		Noise p 3-175, 176	measurement locations experienced measured noise levels of 47 and 49 dBA L, and 50 and 53 dBAL. Sounds from existing observatory HVAC exhaust systems were not noticeable during the summit location field measurement; despite its remote location, the summit was not completely silent. **The dominant noise source for sound levels measured at recreational use sites was due to a steady wind of 5 to 14 mph moving from the direction of the nearby observatories toward the measurement locations. Winds in this range are typical for this area and generally dominate the ambient noise levels.**" Ex. A-3/R-3 at 3-176 (emphasis added). Misleading. Presented out of context. Operation of the TMT Project will not contribute to a noticeable increase in noise levels at the identified recreational sites in the surrounding area recongized as sensitive to noise, and any noise

			impact from the project will be less than significant. UH-TIO FOF 978-983.
207.	31	Threats to Mauna Kea's air quality and sonic environment primarily revolve around the presence of humans and their levels of activity. Potential future increases in the number of people visiting, working, and recreating at the UH Management Areas may increase the levels of these impacts. Ex A-010 CMP NRMP p. 2.1-46.	Misleading. Presented out of context. Operation of the TMT Project will not contribute to a noticeable increase in noise levels at the identified recreational sites in the surrounding area recognized as sensitive to noise, and any noise impact from the project will be less than significant. UH-TIO FOF 978-986.
208.	32	The site on which the TMT is proposed is within the Mauna Kea Science Reserve (the "Science Reserve"}, which the University holds and manages pursuant to General Lease No. S-4191 (the "Master Lease"} from the BLNR. The University also holds and manages the Hale Pohaku Mid-Level Facilities under General Lease No. S-5529 and the Summit Access Road under Grant of Easement No. S-4697.	Misleading. Presented out of context. The General Lease further provides that the land is leased for a scientific complex and for activities inimical to the scientific complex. UH-TIO FOF 113-114.
209.	32	The General Lease (S-4191), dated June 21, 1968, states that the university 12.)"shall not damage, remove excavate, disfigure, deface, or destroy and object of antiquity, prehistoric ruin, or monument of historic value." Exhibit B.17f, General Lease (S-4191) p5	*See supra* UH-TIO's response to Ward's proposed FOF 208. The TMT Project will not have a significant impact on archaeological and historic resource. UH-TIO FOF 503-610. Misleading. Presented out of context. Paragraph 4 of the General Lease states that "[t]he

			land hereby leased shall be used by the Lessee as a scientific complex, including without limitation thereof an observatory, and as a scientific reserve being more specifically a buffer zone to prevent the intrusion of activities inimical to said scientific complex." Ex. B.17f at 3.
210.	32	The General Lease (S-4191) requires that 5.) "The lessee shall not sub-lease, subrent, assign or transfer any rights there under without the prior written approval of the BLNR." Exhibit B.17f, General Lease (S-4191 p 4	Irrelevant/Inapplicable. Lack of Jurisdiction. *See supra* UH-TIO's response to Ward's proposed FOF 208.
211.	32	The General Lease (S-4191) states that 2.)"The lessee shall keep the demised premises and improvements in a clean, sanitary, and orderly condition. Ex B.17f p 3	Misleading. Presented out of context. Misleading. Partial quotation. *See supra* UH-TIO's response to Ward's proposed FOF 208.
212.	32	The General Lease (S-4191) states that "improvements shall be such improvements may be abandoned in place.... removed or disposed of by the Lessee at the expiration or sooner termination of the lease, provided, that with the approval of the chariman requires that items be removed before the lease termination, or be abandoned with prior approval from the BLNR. Ex. B.17f, page 4	Misleading. Presented out of context. Misleading. Partial quotation. *See* UH-TIO's response to Ward's proposed FOF 208. TIO has committed to performing under the Decommissioning Plan. The

			TIO Sublease also requires TIO to decommission, remove its improvements, and restore the site at the end of the useful life of the proposed TMT Observatory, or in the event the General Lease between the University and BLNR is not extended or renewed. UH-TIO FOF 159, 208.
213.	32	The General Lease (S-4191) states that 1a)"No activity shall be permitted which will result in the pollution of the waters of Lake Waiau" Ex B.17f p2	Misleading. Presented out of context. Misleading. Partial quotation. *See* UH-TIO's response to Ward's proposed FOF 208. The TMT Project will not result in pollution of the waters of Lake Waiau. UH-TIO FOF 799-801.
214.	32	General Lease S-4191 from DLNR to the University for the use of the Mauna Kea Science Reserve does not confer an expectation of exclusivity onto the University. Ex B.17f p4	Misleading. Presented out of context. The General Lease allows UH Hilo to use the lease lands "as a scientific complex, including without limitation thereof an observatory, and as a scientific reserve being more specifically a buffer zone to prevent the intrusion of activities inimical to said scientific complex. Activities inimical to said scientific-complex shall

			include light and dust interference to observatory operation and certain types of electric or electronic installation on the demised lands, but shall not necessarily be limited to the foregoing." Ex. B.17f at 3. Citation does not support the proposition. Except for actual construction areas while the Project is being built (and, once it is completed, the TMT Observatory site), Petitioners, Opposing Intervenors, and everyone else will have continued access to the summit area of Mauna Kea, for religious practices and for any other permitted activity. UH-TIO FOF 679, 681, COL 363. The TMT Project will even improve access to the Northern Plateau. UH-TIO FOF 910.
215.	32	"Because living things, ecosystem processes, and cultural practices are not usually confined by administrative boundaries, it is important for the NRMP for the UH Management Areas to consider the user activities, management issues and regulations (or lack thereof) on lands adjacent to the focus area." Ex A-010 CMP NRMP, p. 1-11.	Misleading. Presented out of context. While the cited portion of the record speaks for itself, to the extent this proposed FOF is intended to support a finding and/or conclusion regarding the

			scope and/or adequacy of the Master Plan, CMP, any of the sub plans; the University's process in developing and/or implementing those plans; the University's management of Mauna Kea in general; and/or the BLNR's supervision and management of Mauna Kea, UH-TIO believe their proposed FOF are more comprehensive (and placed in the proper context), and therefore request the entry of their proposed FOF on these matters. *See, e.g.*, UH-TIO FOF 118-190.
216.	33	The 1977 Management Plan for Mauna Kea (see below) identified the scope of the Mauna Kea conservation district as from the summit down to the 6,000-foot elevation and including all lands from the summit to Saddle Road, including the Mauna Kea Forest Reserve and Game Management Area, and Kaohe Game Management Area. (Ex. B.17g, page 1)	*See supra* UH-TIO's response to Ward's proposed FOF 215.
217.	33	The Mauna Kea Ice Age Natural Area Reserve (NAR) was established in 1981 and is comprised of two parcels that abut the Mauna Kea summit region. One is 143.5 acres and a larger, triangle shaped parcel is 3,750 acres. These areas contain Lake Wai'au and the Mauna Kea Adze Quarry. Ex A-010 CMP NRMP, p. 1-12.	*See supra* UH-TIO's response to Ward's proposed FOF 215.
218.	33	The approximately 52,500 acre Mauna Kea Forest Reserve surrounds the UH managed areas and the NAR, and contains critical māmane habitat for the endangered Palila bird. Ex A-010 CMP NRMP, p. 1-12.	Irrelevant/Inapplicable. Misleading. Presented out of context. *See* UH-TIO's response to

			Ward's proposed FOF 215.
229.	33	The Hakalau Forest National Wildlife Refuge encompass 33,000 acre Hakalau forest Unit and the 5,300 acre Kona Forest Unit. Ex A-010 CMP NRMP, p. 1-12.	Irrelevant/Inapplicable. *See supra* UH-TIO's response to Ward's proposed FOF 215.
220.	33	Pōhakuloa Training Area (PTA) lands total 108,863 acres that extend up the lower slopes of Mauna Kea to an approximate altitude of 6,800 ft. PTA contains critical Palila bird habitat, fifteen federally listed threatened and endangered plants, three federally listed endangered bird species, and one federally listed bat species. Ex A-010 CMP NRMP, p. 1-12.	Irrelevant/Inapplicable. Misleading. Presented out of context. *See supra* UH-TIO's response to Ward's proposed FOF 215.
221.	33	In 1974, George Ariyoshi expressed concerns that "social pressures for more intensive use of Mauna Kea for scientific, recreational, and other purposes pose a threat to the priceless qualities of that mountain..." He wrote to Sunao Kido, then Chairman of the BLNR, directing that the agency "develop and promulgate, as expeditiously as possible, a Master Plan for all of Mauna Kea above the Saddle Road." This Master Plan was directed to include provide for Plan enforcement and amendment. Ex. B.17g DLNR, The Mauna Kea Plan (May 1977), p. 2.	Citation does not support the proposition. *See* UH-TIO FOF 123-135. Misleading. Presented out of context. The 1977 Management Plan is merely a policy guide not intended to impose rigid standards. *See* UH-TIO FOF 339.
222.	33	The plan was prepared by DLNR staff, and approved on February 11, 1977 following two public hearings. Ex. B.17g p 2-3	Misleading. Presented out of context. The 1977 Management Plan is merely a policy guide not intended to impose rigid standards. *See* UH-TIO FOF 339. Citation does not support proposition.

			Irrelevant/Inapplicable. *See supra* UH-TIO's response to Ward's proposed FOF 221.
223.	35	The Mauna Kea Plan is a policy guide on land use and management adopted by the board of Land And Natural Resources; the plan shall be reviewed annually, and any proposed amendments shall be in accordance with procedures adopted by the Board. Ex D-3 p 10 The area covered by this plan extends from the summit down to about 6,000 feet, and includes all conservation district land from the summit of Mauna Kea down to the Saddle Road. Ex. B.17g p 1	Inaccurate/False. Certain portions of quotation are incorrect. Quotation properly reads: "The area covered by this plan shall extend from the summit down to about the 6,000-foot elevation and shall include all conservation district land from the summit of Mauna kea down to the Saddle Road." Ex. B.17g at 1. Citation does not support proposition. UH-TIO note, however, that the Mauna Kea Plan is a policy guide that is not intended to impose rigid development standards. UH-TIO FOF 339. Irrelevant/Inapplicable. *See supra* UH-TIO's response to Ward's proposed FOF 221.
224	35	The objectives of the plan were to determine the capability of Mauna Kea's resources to accommodate various uses without unacceptable damage to biotic and other natural values and historic values, and the visual appearance of the mountain, and to recognize the significance of MK's summit for astronomical research and let a limitation on facilities based on need and	Inaccurate/False. Citation does not support proposition. Citation is incorrect. Ex. B.17g at 1.

		environmental concerns. Ex D-3 p 1	Irrelevant/Inapplicable. *See supra* UH-TIO's response to Ward's proposed FOF 221.
225.	35	Any use of the lands will be, however subject to regulations under County,State and Federal laws. Ex. B.17g p 5	Misleading. Partial quotation. Full quote reads: "Any use of the lands will be, however, subject to regulation under County, State, and Federal laws on Historic Sites, Natural Area Reserves, and conservation districts." Ex. B.17g at 5. *See supra* UH-TIO's response to Ward's proposed FOF 221.
226.	35	No application for any proposed facility shall have final approval without the applicant having first filed, with the board, adequate security equal to the amount of the contract to construct the telescope facilities, support facilities and to cover any other direct or indirect costs attributed to the project. Ex. B.17g p 5	Unsupported/Unsubstantiated. Misleading. Presented out of context. The Mauna Kea Plan is a policy guide that is not intended to impose rigid development standards. There is no requirement for the posting of a bond for the TMT Project before the CDUA can be approved. *See* UH-TIO FOF 339. Irrelevant/Inapplicable.
227.	35	In 1995 the BLNR and the University sought to amend the MKSRCDP to address Commercial Use and Public Access. It states "This revised public access management plan supersedes and replaces the management plan	Incomplete. Misleading. Presented out of

		approved by BLNR on Feb. 22, 1985 in CDUA HA1573. This plan differs from the plan approved in 1985 in the following manner":	context. The 1995 Management Plan (or "Revised Management Plan") was superseded by the 2009 Comprehensive Management Plan. Ex. A-9 at 2-3. Citation does not support the proposition. There is no Ex. D-10 in the record. UH-TIO note that the correct citation is Ex B.17h at i.
228.	35	Management and enforcement of public and commercial use of MK is the responsibility of DLNR except for specific rights reserved for UH.	Unsupported/Unsubstantiated. Irrelevant/Inapplicable. Misleading. Presented out of context. The 1995 Management Plan was superseded by the 2009 Comprehensive Management Plan. Ex. A-9 at 2-3. Citation does not support the proposition. There is no Ex. D-10 in the record. UH-TIO note that the correct citation is Ex B.17h at i.
229.	35	Permitted Commercial uses and management controls are incorporated in the Plan.	Incomplete. *See* UH-TIO FOF 123-158. Unsupported/Unsubstantiated.

			Irrelevant/Inapplicable. Misleading. Presented out of context. The 1995 Management Plan was superseded by the 2009 Comprehensive Management Plan. Ex. A-9 at 2-3. Citation does not support the proposition. There is no Ex. D-10 in the record. UH-TIO note that the correct citation is Ex B.17h at i.
230.	35	Some controls are eliminated and/or modified and new ones added to reflect UH's experience in the past ten years, especially since the major portions of the road have been paved. The primary criterion for controls, however, has been and continues to be public safety. Ex D-10 p (i) 1995 Management Plan	Irrelevant/Inapplicable. Citation does not support the proposition. There is no Ex. D-10 in the record. UH-TIO note that the correct citation is Ex B-H at i. Misleading. Presented out of context. The 1995 Management Plan (or "Revised Management Plan") was superseded by the 2009 Comprehensive Management Plan. Ex. A-9 at 2-3.
231.	35	The 1995 Management Plan, in turn, directly relies on the 1977 DLNR Mauna Kea Plan, the (1983) Science Reserve Complex Development Plan, and the Hale Pokaku Master Plan, for astronomy related uses. Ex. B.17h p 7 1995 Management Plan	Irrelevant/Inapplicable. Citation does not support the proposition. Citation is incorrect. Ex. B-H at i.

			Misleading. Presented out of context. The 1995 Management Plan (or "Revised Management Plan") was superseded by the 2009 Comprehensive Management Plan. Ex. A-9 at 2-3. While the cited portion of the record speaks for itself, to the extent this proposed FOF is intended to support a finding and/or conclusion regarding the scope and/or adequacy of the Master Plan, CMP, any of the sub plans; the University's process in developing and/or implementing those plans; the University's management of Mauna Kea in general; and/or the BLNR's supervision and management of Mauna Kea, UH-TIO believe their proposed FOF are more comprehensive (and placed in the proper context), and therefore request the entry of their proposed FOF on these matters. *See, e.g.*, UH-TIO FOF 118-190.
232.	36	DLNR has the authority to determine permitted public and commercial uses of the UH Management Area-subject to terms of Lease between UH and DLNR. Management and enforcement of public and commercial use of	*See supra* UH-TIO's response to Ward's proposed FOF 231.

		Mauna Kea is the responsibility of DLNR—except for specific rights reserved to UH. Ex. B.17h 1995 Management Plan P 1	
233.	36	The 1995 Revised Plan --Part III: Management and Controls on page 7, states: "Astronomy-related uses in the UH Management Area are controlled by the 1977 DLNR Mauna Kea Plan, the Hale Pohaku Master Plan, the SRCDP, and the CDUA process." Ex. B.17h p 7 1995 Management Plan	*See supra* UH-TIO's response to Ward's proposed FOF 231. Irrelevant/Inapplicable. The TMT Project will be subject to management through the BLNR-approved CMP and sub-plans. *See, e.g.*, UH-TIO FOF 359.
234.	36	The 2000 Master Plan was never adopted nor approved by the BLNR.	Misleading. Presented out of context. The Master Plan is an internal policy and planning guide for the University to promote the goal of balanced stewardship of the UH Management Area. Therefore, it was adopted by the Board of Regents and there was no requirement that it be adopted or approved by BLNR. UH-TIO FOF 123. Misleading. Partial quotation. Full quotation states: "Similar to the 1983 Master Plan, the 2000 Master Plan was not adopted nor approved by BLNR."
235.	36	In the 2000 Master Plan, the University concluded that there was a need for a single entity to manage the comprehensive plan for the Science Reserve. Ex A009 CMP P 3.8	*See supra* UH-TIO's response to Ward's proposed FOF 231; s*ee also* UH-TIO FOF 123 ("[t]he

			Master Plan is an internal policy and planning guide for the University . . .") (emphasis added).
236.	36	The objective of the 2000 Master Plan is to preserve and protect the cultural, natural, recreational and scientific resources on UH lands. Ex A048 p	Misleading. Presented out of context. The 2000 Master Plan presented many objectives, some of which provide for the development of astronomy/science on Mauna Kea. *See generally*, Ex. A-48 at II-2 to II-4; UH-TIO FOF 124. *See supra* UH-TIO's response to Ward's proposed FOF 231.
237.	36	The 2000 Master Plan calls for the management organization to be housed within the University system and funded as an ongoing program unit of the University of Hawai'i at Hilo (UH-Hilo). Ex A-009 CMP P 3.8	*See* UH-TIO's response to Ward's proposed FOF 231.
238.	36	In accordance with the 2000 Master Plan, UH-Hilo Chancellor established the OMKM on August 1, 2000. (Ex A-009 CMP P 3.8)	Misleading. Presented out of context. *See* UH-TIO FOF 125. *See supra* UH-TIO's response to Ward's proposed FOF 231.
239.	36	OMKM is the office charged with ensuring compliance with and implementation of the 2000 Master Plan. (Ex A-009 CMP P 3.8)	Misleading. Presented out of context. *See* UH-TIO FOF 125. *See supra* UH-TIO's response to Ward's proposed FOF 231.
240.	36	The 2000 Master Plan acknowledged that joint management by DLNR and the University, and layers of management requirements and recommendations outlined in historical leases, plans, permits and written or	Irrelevant/Inapplicable. Misleading. Presented out of

		verbal commitments, have created a complex and often confusing pattern of management responsibility (Group 70 International 2000). (Ex A-009 CMP P 3.9)	context. Excerpt is followed by statement that "[m]anagement actions to improve coordinated management and develop collaborative partnerships are detailed in Section 7" of the CMP. Ex. A-9 at 3-9. Misleading. Presented out of context. Management actions to improve coordinated management and develop collaborative partnerships are detailed in Ex. A-9 at 7-1 to 7-69. *See supra* UH-TIO's response to Ward's proposed FOF 231.
241.	36	The acceptance of the 2000 Master Plan by the UH Board of Regents prompted the creation of OMKM, the MKMB, and Kahu Kū Mauna. (Ex A-009 CMP P 3.9)	Misleading. Presented out of context. Excerpt subsequently states: "[t]he MKMB serves in an advisory capacity to the UH Hilo Chancellor. The MKMB has also established several advisory committees, including the MKMB Environmental Committee and the MKMB Hawaiian Cultural Committee." Ex. A-9 at 3-9. *See supra* UH-TIO response to Ward's proposed FOF 231.
242.	37	Under the 2000 Master Plan, at least some of MKSS' services are to be transferred to OMKM, but no deadline was specified and the transfer has not	Misleading. Presented out of context. The MKMB recently

		occurred. (Ex A009 CMP P 3-11)	approved the transfer of the management and oversight of MKSS to OMKM. Ex. A-9 at 3-11; *see also* Tr. 12/12/16 at 129:10-13 (Mauna Kea ranger services are under the control of OMKM). *See supra* UH-TIO's response to Ward's proposed FOF 231.
243.	37	The University's 2000 Master Plan for the UH Management Area designated approximately 525 acres (212 ha) of the leased land as an "Astronomy Precinct," where development is to be consolidated to maintain a close grouping of astronomy facilities, roads and support infrastructure (Group 70 International 2000). Ex A-009 CMP P 3-1	Misleading. Presented out of context. Excerpt continues that "[t]he remaining 10,763 acres (4,356 ha) are designated a Natural/Cultural Preservation Area in order to protect natural and cultural resources within the UH Management Area." Ex. A-9 at 3-1. *See supra* UH-TIO's response to Ward's proposed FOF 231.
244.	37	Any future development would occur within the Astronomy Precinct portion of the UH Management Areas, as delineated in the 2000 Master Plan (Group 70 International 2000). Ex A-3009 CMP P 6-8	Misleading. Presented out of context. Excerpt is preceded by: "[i]n addition to the potential construction of new observatories, other possible changes to the astronomy facilities include redevelopment of existing sites (i.e., dismantling an existing facility and replacing it with a new one on the existing footprint), upgrades to or

			expansions of existing observatories, and removal of some obsolete observatories. Changes could also involve improving utility service." Ex. A-9 at 6-8. *See supra* UH-TIO's response to Ward's proposed FOF 231.
245.	37	Any potential future observatories will be located inside the Astronomy Precinct. The goal of this process is to refine telescope siting areas defined in the 2000 Master Plan based on updated cultural and natural resource information (see Section 7.1.1 and Section 7.1.2). (Ex A-009 CMP Pg 7-57)	Citation does not support the proposition. The cited page of the CMP states in relevant part: "Using these criteria, the 2000 Master Plan updated designated telescope siting areas within the Astronomy Precinct for existing observatories, proposed redeveloped facilities, and potential new facility sites. The most probable scenarios will be to site all new proposed astronomy facilities in the area within the Astronomy Precinct identified as the north plateau." Ex. A-9 at 7-57. Misleading. Presented out of context. There are numerous siting criteria, other than consideration of updated cultural and natural resource information, defined in the 2000 Master Plan. *See, e.g.*, Ex. A-9 at 7-56.

246.	37	An approved management plan must be in place prior to the construction and operation within a resource subzone (HAR 13-5-39); a BLNR- approved comprehensive management plan must also be developed prior to construction and operation of such as facility. ExA-003 FEIS Section 3.10 p 3-142	Citation does not support proposition. While the cited portion of the record speaks for itself, to the extent this proposed FOF is intended to support a finding and/or conclusion regarding the scope and/or adequacy of the Master Plan, CMP, any of the sub plans; the University's process in developing and/or implementing those plans; the University's management of Mauna Kea in general; and/or the BLNR's supervision and management of Mauna Kea, UH-TIO believe their proposed FOF are more comprehensive (and placed in the proper context), and therefore request the entry of their proposed FOF on these matters. *See, e.g.*, UH-TIO FOF 118-190. UH-TIO further note that the CMP was approved by the BLNR on April 9, 2009 and the sub plans were all approved by the BLNR on March 25, 2010. Ex. A-3/R-3 at 3-142; *see also* UH-TIO FOF 893. Misleading. Presented out of context. Excerpt is followed by: "[a] CMP for UH's Management

			Areas on Maunakea [sic] was approved by the BLNR on April 9, 2009. The BLNR placed conditions on their approval, including the production of . . . CMP sub plans within a year or prior to submittal of a CDUP application by a project . . . UH prepared these sub plans and they were all approved by the BLNR on March 25, 2010." Ex. A-3/R-3 at 3-142 – 3-143.
247.	37	The Applicant relies on the UH CMP and its four subplans and the TMT Management Plan to fulfill the "approved management plan" requirement for its CDUP application (CDUA HA-3568) under HAR §13-5-24. The Applicant claims the proposed use is consistent with the provisions of the CMP and subplans, the approved management documents for the UH Management Areas on Mauna Kea. Ex A-001 CDUA TMT Management Plan p 3-11 Section 3 Management and Controls	Mischaracterization. The quoted excerpt states: "Astronomy facilities are an identified use in the Resource subzone (see HAR § 13-5-24(c) [R3/D1]) under an approved management plan. This means that astronomy facilities with appropriate management have been deemed to be consistent with proper management of the natural resources in that subzone. In addition to being an identified use, as discussed throughout this CDUA, both the University and the TMT Observatory Corporation are committed to managing the natural and cultural resources throughout the MKSR in a way that fulfills the objective of the Resource subzone of the

			Conservation District. The proposed TMT Project would help meet the objectives of the Resource subzone by using the excellent astronomical resources that Mauna Kea possesses to maintain the MKSR at the forefront of astronomical research while implementing and supporting overall management activities that will promote the sustained use of the natural resources in the subzone. The proposed project would be developed and operated in compliance with the Conservation District Rules and with all conditions that may be attached to the Conservation District Use Permit. The proposed use is consistent with the provisions of the CMP and subplans, the approved management documents for the UH Management Areas on Mauna Kea." Ex. A-1/R-1, Exhibit B at 3-11.
248.	37	The CMP is described as "the framework for managing multiple existing and future activities, such as astronomy, recreational and commercial activities, scientific research, and cultural and religious activities." (Ex A009)	Incomplete. Citation does not contain pin cite. Misleading. Presented out of context. The quoted excerpt states:

			"This CMP provides the framework for managing multiple existing and future activities, such as astronomy, recreational and commercial activities, scientific research, and cultural and religious activities. More importantly, the CMP provides a guide for protecting Mauna Kea's many unique cultural and natural resources. Once the CMP is adopted by the BLNR, it will also provide management guidelines and specific management recommendations to be included in BLNR's CDUPs." Ex. A-9 at 2-1; *see* UH-TIO FOF 136.
249.	37	The TMT Management Plan is a "project-specific management plan." Ex A-001 UH/TMT CDUA, p. 2-3.	Misleading. Presented out of context. The TMT Management Plan is the management plan required under HAR § 13-5-24 and complements the CMP and sub plans. UH-TIO FOF 367-371. The quoted excerpt states: "In addition to supporting the implementation of the CMP, the TMT project has also developed a project-specific management plan. The TMT Management Plan provides a general

			description of the proposal, the existing conditions on the parcel, proposed land uses on the parcel and reporting schedule; it also adopts the approach, goals, objectives and management strategies and actions of the CMP and subplans in their entirety. Specifically, the TMT Management Plan implements all relevant action items and plans of the CMP and subplans on a site-specific basis ensuring that the management actions called for in the CMP and subplans which are applicable to the TMT project are effectively and responsibly implemented. Additionally, the TMT Management Plan sets forth mitigation measures in the form of Best Management Practices and conservation methods intended to mitigate the impacts of the TMT project on Mauna Kea's varied resources. The TMT Management Plan is intended to provide site-specific information and be an extension of the CMP and subplans and together (CMP, subplans and TMT Management Plan), these documents are intended to fulfill

			the purpose of the Conservation District concerning the TMT project." Ex. A-1/R-1 at 2-3.
250.	37	The CMP is described as being in accordance with the Third Circuit Court's ruling in 2007 regarding the inadequacy of the University's management plan proposal at the time. (Ex A009)	Irrelevant/Inapplicable. Misleading. Presented out of context. Given the BLNR's approval of the CMP and sub plans (*See* UH-TIO FOF 893), which are the current, approved and operative plans, this proposed FOF is not relevant to the consideration of the CDUA. Mischaracterization. The CMP is in accordance with Judge Hara's decision; not "is described as being."
251.	38	In its 2007 decision and order, the Third Circuit Court found that the the definition of management plan in HAR 13-5-2 requires the plan to be HAR 13-5-2 "comprehensive," that is an "all-covering, all-embracing, all-inclusive" "plan for carrying out multiple land uses" for the conservation of resources on Mauna Kea. Mauna Kea Anaina Hou v. BLNR, Civ. No. 4-1-397, 7 (3rd Cir. Haw. Jan, 19, 2007))	*See supra* UH-TIO's response to Ward's proposed FOF 250.
252.	38	The Third Circuit Court also found that the "resource that needs to be conserved, protected, and preserved is the summit area of Mauna Kea," Mauna Kea Anaina Hou v. BLNR, Civ. No. 4-1-397, 7 (3rd Cir. Haw. Jan, 19, 2007)	*See supra* UH-TIO's response to Ward's proposed FOF 250.

253.	38	As identified in the first management plan for the mountain, the Mauna Kea conservation district the extends from the summit down to the 6,000-foot elevation and includes all lands from the summit to Saddle Road, including the Mauna Kea Forest Reserve and Game Management Area, and Ka`ohe Game Management Area. (Ex. B.17g, page 1)	*See supra* UH-TIO's response to Ward's proposed FOF 231.
254.	38	The CMP only applies to the "UH Management Areas" (described as "the Mauna Kea Science Reserve (Science Reserve), the mid-level support facilities at Hale Pohaku, and the Summit Access Road..."). (Ex. A009 page 2-1)	*See supra* UH-TIO's response to Ward's proposed FOF 231.
255.	38	The Third Circuit Court also found that where the 1995 management plan "was virtually silent" on the number and size of future telescopes on Mauna Kea, it did not satisfy the requirement for a comprehensive management plan. (Mauna Kea Anaina Hou v. BLNR, Civ. No. 4-1-397, 7 (3rd Cir. Haw. Jan, 19, 2007)) page 3-4)	Irrelevant/Inapplicable. The 1995 Management Plan was superseded by the 2009 Comprehensive Management Plan. Ex. A-9 at 2-3. *See supra* UH-TIO's response to Ward's proposed FOF 250.
256.	38	"Proposed new development on Mauna Kea, including the Thirty Meter Telescope (TMT)" is outside of the scope of the CMP. Ex A-009 CMP, p. 2-3.	Misleading. Presented out of context. The TMT Project is consistent with the CMP, sub plans and all other applicable plans. UH-TIO FOF 359. False/Inaccurate. The CMP is the approved management plan for any future land use. Ex. A-9 at 2-3.
257.	38	The Applicant acknowledges that "this CMP does not address development plan issues related to future observatories, including whether new observatories should be located on Mauna Kea to support the astronomy program or if observatories should have their leases extended or be	Citation does not support proposition. UH-TIO note that the correct citation for this Proposed FOF is Ex. A-9 at 7-55.

		decommissioned." (Ex. A009, page 7-54)	Misleading. Presented out of context. The Decommission Plan addresses such issues. *See* UH-TIO FOF 151-153. The TMT Project is consistent with the CMP, sub plans and all other applicable plans. UH-TIO FOF 359. Misleading. Presented out of context. Citation is incorrect. Quoted excerpt states: "this CMP does not address development plan issues related to future observatories, including whether new observatories should be located on Mauna Kea to support the astronomy program or if observatories should have their leases extended or be decommissioned. The University's official position on proposed observatory and support facility development for the period of 2000-2020 was outlined in the 2000 Master Plan (Group 70 International 2000). The role of the CMP in considering future land use is to guide the evaluation of proposed projects from the standpoint of

			potential impacts to cultural and natural resources, and to provide management actions that can be adopted by BLNR as special conditions in any CDUPs that it may issue. The Board of Land and Natural Resources shall have final approval over all land uses on conservation lands pursuant to the Conservation District Use Permitting Process." Ex. A-9 at 7-55. False/Inaccurate. The CMP is the approved management plan for any future land use. Ex. A-9 at 2-3.
258.	38	The CMP does not provide a limit on the number or size of future telescopes in the Mauna Kea Conservation District. (Ex. A009 page 7-56)	Citation does not support the proposition. *See* UH-TIO FOF 136-158. Misrepresentation. The Comprehensive Management Plan contains design guidelines, as well as siting criteria. Ex. A-9 at 7-48. *See supra* UH-TIO's response to Ward's Proposed FOF 257. The CMP further notes that the plan is to manage resources and that each "redevelopment or

			proposed new facility, including non-astronomy facilities, will undergo individual project reviews, that will include an environmental analysis pursuant to Chapter 343, HRS, and a comprehensive analysis of the potential cultural impact. Ex. A-9 at 7-55. The TMT Project is consistent with the CMP, sub plans and all other applicable plans. UH-TIO FOF 359.
259.	38	The CMP describes the need to complete, among other things: a burial treatment plan because Mauna Kea is a known burial site (A009, page 7-10) buffer zones to protect archaeological sites (A009, page 7-10, 7-56) invasives species control plan (A009, page 7-16 thru 7-18) emergency hazardous spill protocol (A009, page 7-44) permitting process for traditional and customary practices deemed appropriate (Ex A009 page 7-8 thru 7-10)	Citation does not support the proposition. *See* UH-TIO FOF 136-158. Misleading. Presented out of context. The reference sections do not set forth concrete requirements. In fact, the majority of the provisions and sections merely state "additional considerations." Burail treatment plan: A burial treatment plan was prepared for the entire MKSR and Mauna Kea Access Road Corridor, including the TMT Project site, which was approved by HIBC and SHPD. UH-TIO FOF 570; Ex. A-22 at 30; Ex. A-138, Ex. A-138a; Ex. A-139.

			Buffer zones: Management Action CR-12 requires buffer zones to "be established". Ex. A-9 at 7-10. The creation of buffer zones around known historic sites is ongoing. Ex. A-22 at 30. Kahu Ku Mauna determined that the establishment of buffer zones should be determined on a case-by-case basis instead of immediate implementation. Ex. A-17 Appendix A at 4. Invasive species: Management Action NR-2 requires the limit of damage caused by invasive species through creation of an invasive species prevention and control program. This action is ongoing, and the TMT Project will develop an invasive species prevention and control program and has policies in place to control invasive species. Ex. A-22 at 31; UH-TIO FOF 457, 490-492. An invasive species management plan was prepared and approved in 2015. Ex. A-40; Ex. A-22 at 7.

			Hazardous spill protocal: Updating and implementing an emergency response plan is ongoing. Ex. A-9 at 7-62; Ex. A-22 at 28, 36. The TMT Project will implement a Materials Storage / Waste Management Plan, including a Spill Prevention and Response Plan, and there are extensive measures planned to store and dispose of all waste. UH-TIO FOF 320, 424-428, 824-839. Traditional and customary practices: Development of plans for the exercise of culturally appropriate placement and removal of offerings, visitation of shrines and constructing new cultural resources are in progress and ongoing. Ex. A-22 at 30. The TMT Project will comply with requirements for public access and there will be no prohibitions on access to the areas outside of the TMT Observatory. UH-TIO FOF 679-682. Kahu Ku Mauna developed policies related to cultural practices, such as the

			appropriateness of construction of new cultural features, placement and removal of offerings. They were brought before MKMB at which time individuals opposed these policies. The MKMB recommended that Kahu Ku Mauna do some additional consultation. Previously, the MKMB approved guidelines for the visitation and use of ancient shrines. Ex. L-17; Ex. L-18; Ex. L-19; Ex. L-20; Tr. 12/12/16 at 19: 20 – 23:7, 60:17 – 61:9.
260.	39	The CMP does not provide a timeline for completing these tasks and provides no process for public or agency oversight consistent with Chapter 91, HRS. (Ex. A009)	Irrelevant/Inapplicable. Citation does not support proposition. Misrepresentation. *See, e.g.*, UH-TIO FOF 136. Misleading. Presented out of context. There is no requirement that such a timeline or process must be established under HRS Chapter 91. Additionally, included in the first annual report to the BLNR, was an estimated timeline for implementation of each CMP management actions. Ex. A-16, App. B.

			OMKM is required to produce an annual progress report on the management goals, objectives and actions to the BLNR. *See* Ex. A-22. The report in the record notes that major components of the plan are completed, ongoing or in progress. Ex. A-22. The BLNR is not required by law to hold a contested case hearing with respect to BLNR's review and oversight of the CMP. *See Mauna Kea Anaina Hou v. University of Hawai'i*, 126 Haw. 265 (Haw.App. 2012).
261.	39	The CMP specifically identifies the following measures as being among those Native Hawaiian rights for which access will be maintained insofar as they are consistent with other management actions: ...gathering of cultural resources.., Access for families to visit iwi kupuna..., Access to scatter ashes..., Access through trails for hunting and gathering..., Access to deposit piko..., Access for traditional...religious and spiritual observances..., Pilgrimage, offerings, and prayers, and Access to Lake Waiau to gather water for religious and spiritual purposes. Exh A-007 Staff Report Feb 25, 2011, p.11	Citation does not support the proposition. *See* UH-TIO FOF 136-158. Development of plans for the exercise of culturally appropriate placement and removal of offerings, visitation of shrines and constructing new cultural resources are in progress and ongoing. Ex. A-22 at 30. The TMT Project will comply with requirements for public access and there will be no prohibitions on access to the areas outside of the TMT Observatory. UH-TIO

			FOF 679-682. The TMT Project considers and provides efforts to mitigate any negative impacts to culture. Tr. 11/15/16 at 136:16-137:7.
262.	39	Upon approval of the CMP, the BLNR made the UH BOR responsible for implementing the CMP. In accepting that responsibility, the UH BOR delegated implementation of the CMP through normal UH governance channels to UH Hilo, OMKM, and MKMB and also assigned two members of the UH BOR to sit as ex-officio, nonvoting members on the MKMB. Ex A-003 FEIS section 3.10 Land Use Plans, Policies and Controls p 3-148	Misleading. Presented out of context. Complete excerpt states: "OMKM is charged with the day-to-day management of the MKSR. OMKM works closely with the Mauna Kea Management Board (MKMB), the Kahu Ku Mauna Council, and several advisory committees. Seven members of the community who are nominated by the UH Hilo Chancellor and approved by the UH BOR comprise the MKMB. Upon approval of the CMP, the BLNR made the UH BOR responsible for implementing the CMP. In accepting that responsibility, the UH BOR delegated implementation of the CMP through normal UH governance channels to UH Hilo, OMKM, and MKMB and also assigned two members of the UH BOR to sit as ex officio, non-voting members on the MKMB.

			MKMB guides the operations of OMKM and advises the Chancellor on activities, operations, and development. Kahu Ku Mauna - in Hawaiian, Guardians of the Mountain - is a nine-member council named by MKMB, and advises the MKMB, OMKM, and the UH Hilo Chancellor on cultural matters. Other advisory councils formed to advice the MKMB include an Environment Committee, a Hawaiian Culture Committee, a Public Safety and Conduct Committee, and a Wekiu Bug Scientific Committee." Ex. A-3/R-3 at 3-147. Citation does not support the proposition. *See* UH-TIO FOF 136-158.
263.	39	"OMKM's responsibilities are complicated by the fact that the UH Management areas are governed by two overarching documents—the Master Plan 2000, which was not approved by the Board of Land and Natural Resources, thus requiring UH to continue to comply with the rights and responsibilities outlined in the 1995 Revised Management Plan." Ex A-011 CRMP 3.2.1 OMKM Mission and Responsibilities 3-3	Misleading. Presented out of context. The 1995 Management Plan was superseded by the 2009 Comprehensive Management Plan. Ex. A-9 at 2-3; *see also* UH-TIO FOF 123. The CRMP goes on to note OMKM's management initiatives to address these issues. Ex. A-11 at 3-3 – 3-5.

			See UH-TIO FOF 123: In response to the concerns raised in an audit performed in 1998 that was critical of the University's management of the cultural and environmental resources in the MKSR, the University began preparing a new master plan for the MKSR. Ex. B.17e. On June 16, 2000, after nearly two years of work by an advisory committee and two series of public meetings, the University Board of Regents ("**BOR**") adopted the Mauna Kea Science Reserve Master Plan ("**Master Plan**"), which established management guidelines for the UH Management Area. The process reflected the Hawai'i Island community's deeply rooted concerns over the use of Mauna Kea, including respect for Hawaiian cultural beliefs and practices, protection of environmentally sensitive habitat, recreational use of the mountain, as well as astronomical research. The Master Plan is an internal policy and planning guide for the University to promote the goal

			of balanced stewardship of the UH Management Area through on-island community based management. WDT Nagata at 2; Tr. 12/8/16 at 27:6-8, 28:3-9; WDT Heen at 1; Ex. A-48 at Chapter XII. Citation does not support the proposition. *See* UH-TIO FOF 136-158.
264.	39	The University of Hawaii is an educational institution, not a land management agency. HRS 304A-102	Mischaracterization. HRS § 304A-102 is not an exhaustive list of the permitted actions the University of Hawai'i (and its various branches) may take in pursuing its stated purpose. HRS § 304A-103(2) provides in relevant part that the University shall have the general power to: "To acquire in any lawful manner any property, real, personal, or mixed, tangible or intangible, or any interest therein; to hold, maintain, use, and operate that property; and to sell, lease, or otherwise dispose of that property at such time, in such manner, and to the extent deemed necessary or appropriate to carry out its purposes[.]" Additionally, the General Lease

			authorizes UH Hilo to manage the demised lands on Mauna Kea and to develop the lands into a scientific complex. *See* Ex. B.17f at 3-4. Moreover, the BLNR Approved CMP and subplans require UH Hilo to exercise land management responsibilities. *See generally*, Exs. A-9 to A-13. Irrelevant/Inapplicable.
265.	39	The rangers who work for OMKM, but work closely with Mauna Kea Support Services, do not have the primary enforcement authority. Tr. McLaren	Irrelevant/Inapplicable. Citation does not support proposition (incomplete cite). Misleading. Presented out of context.
266.	39	At the oral arguments before the Intermediate Court of Appeals on the appeal of the BLNR's decision to deny a contested case hearing on the CMP to some of the Petitioners in the present case, counsel for the University conceded that the CMP "do[es] not take action". (See, http://www.courts.state.hi.us/courts/oral_arguments/archive/oaica30397.html, accessed on November 13, 2011 at minute 43:29)	Irrelevant/Inapplicable. Misleading. Partial quotation Misleading. Presented out of Context Not in evidence. UH-TIO note, however, that the record in the separate proceeding speaks for itself. *See* UH-TIO FOF 136-158.
267.	39	University counsel said: the "management plan itself demonstrates these are management measures that the University has been doing for quite some time	Not in evidence. UH-TIO note, however, that the record in the

		and can do." (See, http://www.courts.state.hi.us/courts/oral_arguments/archive/oaica30397.html, accessed on November 13, 2011, at minute 41:46)	separate proceeding speaks for itself. *See* UH-TIO FOF 136-158, 179-190. THE CMP SPECIFICALLY STATES the development of the CMP USED THE *KA PA'AKAI* AS A FRAMEWORK FOR THE development of the CMP, including: 1) the identification and scope of valued cultural, historical or natural resources that are found within the UH Management Areas, including the extent to which traditional and customary Native Hawaiian rights are exercised in the areas; 2) The extent to which those resources – including traditional and customary Native Hawaiian rights – will be affected or impaired by the proposed action; and 3) The feasible action, if any, to be taken by the agency to reasonably protect Native Hawaiian rights if they are found to exist. Ex. A-9 at 2-7.
268.	40	Neither the BLNR's April 9, 2009 approval of the CMP or the March 25, 2010 approval of the 4 subplans document any specific findings by the BLNR regarding the 3-part analysis required by the Court's decision in Kapa`akai. (Ex. B-41, B-42)	Irrelevant/Inapplicable. Citation does not support proposition. *See* UH-TIO FOF

			136-158. Unsupported/Unsubstantiated. Misleading. Presented out of context. The CMP and sub plans are clearly relevant and material to the BLNR's *Ka Pa'akai* analysis in connection with its consideration of the CDUA. *See* UH-TIO COL 324-354. The CMP specifically outlines the *Ka Pa'akai* framework used to develop the plan. *See* Ex. A-9 at 2-6 to 2-8.
269.	40	All of the 11,288 acres leased by the University on Mauna Kea are designated as a conservation district. (Ex. A009, page 3-1)	Not in dispute.
270.	40	"The University's 2000 Master Plan for the UH Management Area designated (approximately) 525 acres (212 ha) of the leased land as an "Astronomy Precinct," where development is to be consolidated to maintain a close grouping of astronomy facilities, roads, and support infrastructure." (Ex. A009, page 3-1 (citations omitted).	Misleading. Presented out of context. More specifically, the TMT Project is within the resource subzone of the Conservation District. UH-TIO FOF 385-395.
271.	40	In addition, the CMP directs decision-makers "to site all new proposed astronomy facilities in the area within the Astronomy Precinct identified as the north plateau." (Ex. A009 page 7-56)	Citation does not support the proposition. *See* UH-TIO FOF 136-158.
272.	40	The Legislative Auditor conducted two prior audits of the management of Mauna□Kea and the Mauna Kea Science Reserve. Our 1998 Audit of the Management of Mauna Kea and the Mauna Kea Science Reserve (Report No.	Misleading. Presented out of context. The language of the FOF comes from the "first

		98-6) found that UH's management of the science reserve was inadequate to ensure the protection of Mauna Kea's natural resources. The university had focused primarily on the development□of Mauna Kea and tied the benefits gained to its research program. Policies and action plans to ensure the protection of Mauna Kea outlined in management plans were often late and weakly implemented. New technology also required the university to change its approach to future development within the science reserve. We also found that DLNR needed to improve its protection of Mauna Kea's natural resources, particularly the conservation district permitting process and enforcement. The department's administrative requirements were frequently overlooked or not completed in a timely manner. B.17k Legislative Audit of Mauna Kea Management 2014	person" perspective and should be revised to reflect that the FOF is comprised entirely of statements made by the Legislative Auditor with respect to the 1998 audit. Additionally, the FOF suggests that these statements pertain to conditions existing as of 2014 (or as of present day). In reality, these statements are a recap of conditions that existed as of the 1998 audit. Since 1998, significant progress has been made to address the conditions identified in the 1998 audit. UH-TIO FOF 183, 188.
273.	40	In the 2005 Follow-up Audit of the Management of Mauna Kea and□the Mauna Kea Science Reserve (Report No. 05-13), we found that while UH and DLNR had made improvements in managing Mauna Kea and the science reserve, more needed to be done. The university still lacked administrative rule-making authority, exercised weak permit monitoring, and management plans for the science reserve needed to be updated to reflect current use and management and to provide increased transparency and accountability of the university. We also found that the leases, subleases, and permits were dated and that DLNR, as landowner, did not provide a mechanism to ensure compliance with lease and permit requirements. The department's divisions did not coordinate their efforts in protecting natural resources, and a management plan for the Mauna Kea Ice Age Natural Area Reserve was needed. B.17k B.17 2014 Legislative Audit of Mauna Kea Management p.15-16	Misleading. Presented out of context. The language of the FOF comes from the "first person" perspective and should be revised to reflect that the FOF is comprised entirely of statements made by the Legislative Auditor with respect to the 2005 audit. Additionally, the FOF suggests that these statements pertain to conditions existing as of 2014 (or as of present day). In reality, these statements are a recap of conditions that existed as of the 2005 audit. Additionally, the

			2014 audit recognized that UH Hilo had addressed many of the concerns raised in 2005. Ex. B.17k at 36.
274.	41	No FOF provided.	
275.	41	The Legislative Auditor found UH issued unauthorized permits to regulate and assess fees for commercial tour activities, putting Mauna Kea's resources and UH's Mauna Kea revenues at risk… In the absence of rules, the office issued unauthorized permits to regulate commercial tour operators and charge commercial tour fees. The office also lacks enforcement authority to protect the mountain's resources from the impacts of public and commercial activities, even though it is responsible for protecting those resources. B.17k 2014 Legislative Audit of Mauna Kea Management p.15-16	*See supra* UH-TIO's response to Ward's proposed FOF 273.
276.	41	Commercial tour fees, approximately $391,000 annually, are an important source of funding for the maintenance of infrastructure on Mauna Kea and the office's ongoing stewardship efforts. (Exhibit 2.3 shows a commercial tour group visiting the Mauna Kea summit.) We found, however, that UH issued temporary commercial tour permits without obtaining final approval from the Board of Regents and relied□on those permits to charge commercial tour fees. Between FY2009 and FY2013, UH assessed unauthorized tour operator fees totaling nearly□$2 million, representing between 12 and 22 percent of the office's total available funds for those years. In addition, UH continues to recognize those unauthorized permits and collect fees via informal agreements with tour operators. Such arrangements put both the mountain's resources and the office's funding at risk. B.17k 2014 Legislative Audit of Mauna Kea Management p.19	Misleading. Presented out of context. The language of the FOF comes from the "first person" perspective and should be revised to reflect that the FOF is comprised entirely of statements made by the Legislative Auditor with respect to the 2014 audit.
277.	41	The proposed site for the TMT Observatory is a roughly 5-acre area at the end of a four-wheel drive road at an elevation of 13,150 feet on the Northern Plateau of Mauna Kea. Ex A- 003 FEIS, Vol. 1 p. 2-10.	Misleading. Presented out of context. The quoted excerpt states:

			"Within Area E, the TMT Observatory will be located on a roughly 5-acre site near the end of the existing 4-wheel drive road, at an elevation of approximately 13,150 feet (Figure 2-4). This site is known as 13N in reference to its elevation and its location on the northern plateau." Ex. A-3/R-3 at 2-10.
278.	41	Roughly 6.2 acres of previously undisturbed land will be disturbed by the TMT Observatory and Access Way. Ex A- 003 FEIS Section 3.2 Cultural Resources Page 3-26	Misleading. Presented out of context. Quoted excerpt states: "Based on numerous previous studies, Area E was selected in Master Plans to be a suitable location for observatory development because, for one, it would have either a limited or no adverse impact on physical cultural resources such as archaeological and historic resources. Within Area E, the site of the TMT Observatory, known as the 13N site, was selected in part because it is the portion of Area E most disturbed by previous activity. The Access Way maximizes the use of previously disturbed areas as well. Overall, roughly 6.2 acres of previously undisturbed land

			will be disturbed by the TMT Observatory and Access Way, with slight variations depending on which Access Way Option is selected." Ex. A-3/R-3 at 3-26. Misleading. Presented out of context. The proposed TMT Project site was selected in part because it is the portion of area that is most disturbed by previous activity. The access way maximizes the use of previously disturbed areas as well. Ex. A-3/R-3 at 3-26
279.	41	There are no current developments on the Northern Plateau. Ex A-007 Staff Report Feb 25, 2011, p.7	Mischaracterization. Presented out of context. The exhibit states that there are no current developments in "the main part of the Northern Plateau." Incorrect/Inaccurate. The Smithsonian Submillimeter Array occupies part of the Northern Plateau. Ex. A-48 at IX-12. *See supra* UH-TIO's response to Ward's proposed FOF 278.
280.	41	TMT is is being proposed for an area on the North Plateau of Mauna Kea that has not hosted permanent facilities or developments. It is opening up a new area. Ex A-007 Staff Report Feb 25, 2011,p 59	Citation does not support proposition.

			Misleading. Presented out of context. The Smithsonian Submillimeter Array occupies part of the Northern Plateau. Ex. A-48 at IX-12. Mischaracterization. As described in the Master Plan, "Area E" within the Astronomy Precinct was identified as the anticipated location for the next generation large telescope. *See* UH-TIO FOF 169. *See supra* UH-TIO's response to Ward's proposed FOF 278; *see also* UH-TIO FOF 238-240.
281.	42	The TMT's footprint will be a minimum of 8.5 acres on a pristine plateau. Ex A-007 DLNR staff report Feb 25, 2011 p.K-1	Misleading. Presented out of context. The staff report notes that the observatory footprint will be approximately 4.9 acres. Ex. B.70 at 1. *See also* UH-TIO FOF 252. The staff report further notes that "Approximately ten percent of the 13N Site in Area E has been previously disturbed; approximately 1/3 of the existing Access Right of Way has been previously graded; and the Batch Plant site was initially graded as part of the road-paving project and was

			used as a staging area during the construction of several observatories." Ex. B.70 at 7. Citation does not support the proposition that the Thirty-Meter Telescope will be built on "a pristine plateau." Indeed, portions of the northern plateau have been previously disrupted. The proposed TMT Project site was selected in part because it is the portion of area that is most disturbed by previous activity. The access way maximizes the use of previously disturbed areas as well. Ex. A-3/R-3 at 3-26. Additionally, the FOF is misleading and presented out of context. The 8.5 acre (approx.) footprint includes not only the observatory dome and the Access Way, but also the support building, parking area, area disturbed by constriction. *See* Ex. A-1/R-1 at 3-5. Moreover, a 2.5 acres of the total 8.5 acre footprint has previously been disturbed. *See* UH-TIO FOF

			850.
282.	42	The total dome height will be 184 feet above finished grade, with an exterior radius of 108 feet. Ex A-007 Staff Report Feb 25, 2011, p.15	Not in dispute.
283.	42	HAR 11-200-12 states: "In Determining whether an action may have a significant effect on the environment, the agency shall consider every phase of a proposed action, the expected consequences, both primary and secondary, and the cumulative as well as the short term and long term effects of an action. In most instances, an action shall be determined to have significant impact if it: (13) Requires significant energy consumption." HRS 11-200-12 (Significance Criteria).	Not in dispute. However, this is more properly a COL.
284.	42	The TMT will have significant power requirements. Ex A-007 Staff Report Feb 25, 2011, p.45	Misleading. Presented out of context. Reference goes on to state that the TMT Project will not be a major contributor to greenhouse gases. The staff report makes it clear that BLNR considers this requirement within the context of the use of natural resources and contribution to greenhouse gases. The BLNR staff concluded that the TMT Project "will not be a major contributor of greenhouse gases in and of itself," and the staff further concluded that the TMT Project "does not extract resources, nor consume significant resources once constructed." Ex. A-7 at 45.

285.	42	The existing peak demand load documented by HELCO at the substation, including all the observatories and the Hale Pohaku facilities, is 2,230 kW, approximately less than half of the capacity of the substation. Of this current use, the Keck observatory uses approximately 350 kW of power on average. Ex A- 003 FEIS Section 3.12 Power and Communications p 3-169	Misleading. Presented out of context. The FEIS further clarifies, however, that "the average power usage at the TMT Observatory is likely to be similar to the average power usage at the Keck observatory, 350 kW, because the two facilities will be similar in size when you consider both of the Keck domes." Ex. A-3/R-3 at 3-170.
286.	42	Preliminary design electrical load estimates indicate that the TMT Observatory will operate with a "Peak Demand" of 2.4 MW. To adequately support the peak power requirement... two transformers will be upgraded at the existing HELCO substation at Hale Pohaku. Ex A- 308 FEIS Section 3.12 Power and Communications p 3-169 The HELCO transformers at Hale Pohaku need to be upgraded because the anticipated power demand from TMT and the other observatories necessitates upgrading the equipment. Sanders Tr. 8.15.11 P 86 20 -25, p 87 1-2	Misleading. Presented out of context. The FEIS further clarifies, however, that "the average power usage at the TMT Observatory is likely to be similar to the average power usage at the Keck observatory, 350 kW, because the two facilities will be similar in size when you consider both of the Keck domes." Ex. A-3/R-3 at 3-170. Not in Evidence. UH-TIO note that transcripts from the 2011 contested case proceeding are not evidence here.
287.	42	The TMT Project would result in HELCO having to upgrade the two transformers with the Hale Pohaku Substation. (Ex. A-001, CDUA, p. 1-13)	Mischaracterization. Misleading. Presented out of context. The exhibit does not

			state that the TMT Project alone necessitates the planned upgrades. The CDUA further clarifies that the "new transformers will replace the existing transfers on a one-to-one basis, and the existing fenced compound will not be expanded." Ex. A-1/R-1 at 1-13.
288.	42	The TMT Project would result in HELCO having to also upgrade the existing electrical service by replacing the existing wire conductors with new higher-capacity conductors in the underground conduits that run from the Hale Pohaku Substation to the summit area. (Ex. A-001, CDUA, p. 1-14)	*See supra* UH-TIO's response to Ward's proposed FOF 287. Misleading. Presented out of context. The CDUA further clarifies that existing underground conduits will be used and because existing pull boxes are available, no new ground disturbance will be needed for the upgrade. Ex. A-1/R-1 at 1-14. As part of the mitigation measures, existing utility pull boxes in certain locations will be camouflaged to reduce their visibility. UH-TIO FOF 909.
289.	42	DOFAW notes...Not knowing the actual alignment makes it difficult to assess the potential impacts of the project, although, the powerline will pass through the Mauna Kea Ice Age Reserve in some locations. Ex A-007 Staff Report Feb 25, 2011, p.23	Misleading. Partial quotation. This FOF omits UH Hilo's response addressing the DOFAW note. Misleading. Presented out of

			context. UH noted that the power line work would comply with DLNR and Department of Accounting and General Services standards and in accordance with the conditions in the grant of easement (including for the NAR) that was previously approved by the BLNR. Ex. A-7/R-7 at 23.
290.	43	The Department of Health Clean Water Branch (CWB) notes that the project will need to be compliant with the criteria set out in the Anti-degredation Policy (HAR ss11-54-1.1) and Designated uses (HAR ss11-54-1.1) regarding impacts on state waters. Ex A-007 Staff Report Feb 25, 2011, p.25	Misleading. Presented out of context. UH-TIO recognized that the TMT Project would be subject to other regulations as well, and TMT would comply with all federal, state and county rules and regulations. Ex. A-7/R-7 at 25.
291.	43	The building and operation of the TMT Observatory on Maunakea will require a sublease from UH, which lease this ceded land from DLNR. The sublease will be subject to approval first from the TMT board and the UH BOR followed by approval from BLNR. Ex A- 003 FEIS section 3.10 Land Use Plans, Policies and Controls p 3-159	Misleading. Partial quotation. The quoted excerpt states thereafter: "The sublease will be negotiated after the Project receives a CDUP and will be consistent with the existing Master Lease between UH and the BLNR, adopted under HRS Chapter 171." Ex. A-3/R-3 at 3-159. *See* UH-TIO FOF 208-209.
292.	43	The current UH lease expires in 2033 and the TMT Observatory will be	Not in dispute as per cite in

		required to be decommissioned and restore the site at that time, unless a new lease is obtained from the BLNR. Ex A- 003 FEIS section 3.10 Land Use Plans, Policies and Controls p 3-160	exhibit only.
293.	43	The TMT would take approximately five years to decommission. Sanders Tr. August 15, 2011, P 82: 2-5	Citation does not support the proposition. *See* UH-TIO FOF 375. Not in evidence. The record of the prior CDUA proceeding is not in evidence. UH-TIO note, however, that the record in this proceeding reflects that the TMT will take approximately 3-4 years to decommission, and decommissioning will be in compliance with the Decommissioning Plan. UH-TIO FOF 331.
294.	43	The TMT will require a sublease for use of the land on Mauna Kea leased to the University. (Sanders, Tr. August 15, 2011, 100:11-13,	Not in evidence. Misleading. Presented out of context. Not in evidence. The record of the prior CDUA proceeding is not in evidence. UH-TIO note, however, that the record in this proceeding reflects that the University executed a written sublease with TIO for a portion of the UH Management Area.

			UH-TIO FOF 208.
295.	43	The terms of the sublease to the TMT Observatory Corporation are not known, but are expected to be similar to the terms of current subleases for telescopes on Mauna Kea. (Sanders, Tr. August 15, 2011, 82:12-24, 99:24-101:4, Nagata, Tr. August 16, 2011, 211:21-25)	Not in evidence. Misleading. Presented out of context. The terms of the 2014 sublease between TIO and UH Hilo are known. *See* Ex. B.02f. Not in evidence. The record of the prior CDUA proceeding is not in evidence. UH-TIO note, however, that the evidence regarding the TIO Sublease is set forth at UH-TIO FOF 208-209, and the TIO Sublease is in evidence as Ex. B.02f. Inaccurate/False.
296.	43	Mr Hayes, project manager for the TMT EIS, stated that Overall the existing level of cumulative visual impacts from the past projects at the summit Is considered to be substantial, significant and adverse. .If the TMT is built, the TMT would add to the cumulative visual Impact that has already been substantial, significant and adverse. The TMT project would represent an additional increment. It would add to the cumulative visual impact of astronomy development? It would be an increment of impact. Tr. 10/25/16, V.3 at 155:10-25	Incomplete/Incoherent. Inaccurate/False. Misstates and misrepresents the cited testimony. Misleading. Presented out of context. *See* UH-TIO FOF 439-440.
297.	43	Asked what is the difference between increment and cumulative, Mr Hayes responded "cumulative impacts is the sum of increments". When asked if the TMT would add to the cumulative visual impact that you have already stated is substantial, Significant and adverse, he agreed that it is. Tr. 10/25/16, V.3 at 155:10-25, 156;1-6	Misleading. Partial quote. Mr. Hayes went on to state (as indicated in Ward's proposed FOF 298) "As I've said, this project will add an Increment to the cumulative impact, however,

			it will not tip any of the evaluated Impacts from a significant or from a less than Significant to a significant level." Tr. 10/25/16 at 181:1-10. Misleading. Presented out of context. *See* UH-TIO FOF 439-440.
298.	43	Mr Hayes was asked , as project manager for the EIS and a collaborator on the CDUA, Is It still your position that all of these Impacts do not add to the already significant adverse and substantial cumulative Impact in the Historic District? He answered " As I've said, this project will add an Increment to the cumulative impact, however, it will not tip any of the evaluated Impacts from a significant or from a less than Significant to a significant level. Tr. 10/25/16, V.3 at 181:1-10	Not in dispute. Misleading as to any legal conclusions drawn from the statement. The incremental increase in the cumulative visual impact due to the TMT project will be less than significant. WDT Hayes at 21-23.
299.	44	Asked of Jim Hayes: Is there anything in the proposed project that would reduce those impacts that have been already determined to be substantial to less than substantial? A: No. Tr. 10/25/16, V.3 at 215:11-19	Not in evidence (citation to statement made by cross-examiner).
300.	44	It is impossible to accurately predict the exact plant species which will invade the subalpine and alpine zones on Mauna Kea in the future, but managers must be especially aware of plant species that are adapted to dry climates, early successional habitats, high elevation climates, have wind dispersed seeds, and or that originate from the temperate zone. Ex A-010 CMP NRMP 2.2-21	Misleading. Presented out of Context While the cited portion of the record speaks for itself, to the extent this proposed FOF is intended to support a finding and/or conclusion regarding the scope and/or adequacy of the biological review, the

			development of mitigation measures, and/or to dispute a finding that the TMT Project will have no significant adverse impact on biological resources, UH-TIO believe their proposed FOF are more comprehensive (and placed in the proper context), and therefore request the entry of their proposed FOF on these matters. *See, e.g.*, UH-TIO FOF 466-502. Introduction of invasive species, will be mitigated by the TMT Project's planned implementation of various mitigation measures listed in the TMT FEIS and CDUA. UH-TIO FOF 490-491. OMKM is continually in the process of removing fireweed and other invasive species from the Hale Pōhaku area road and summit areas. UH-TIO FOF 185-187. A DLNR-approved biologist inspects all large vehicles or any sign of biological material, plant, soil, seed, and/or insects. UH-TIO FOF 146-148.

			The Maunakea Invasive Species Management Plan has a risk assessment of all of the most probable/likely invasive/invading species. A-40 at 11-28.
301.	44	There are several invasive plant species that may become established in the subalpine and alpine zone in the future, particularly if anthropogenic climate change affects rainfall regimes in the Hawaiian Islands. Ex A-010 CMP NRMP 2.2-21	Misleading. Presented out of Context. Introduction of invasive species, will be mitigated by the TMT Project's planned implementation of various mitigation measures listed in the TMT FEIS and CDUA. UH-TIO FOF 490-491. OMKM is continually in the process of removing fireweed and other invasive species from the Hale Pōhaku area road and summit areas. UH-TIO FOF 185-187. A DLNR-approved biologist inspects all large vehicles or any sign of biological material, plant, soil, seed, and/or insects. UH-TIO FOF 146-148. *See supra* UH-TIO's response to Ward's proposed FOF 300.
302.	44	Habitat alteration threatens native invertebrate communities by directly removing habitat (through development) or changing it to the extent that the invertebrates are no longer able to live there (for example, by changing host-plant abundances). Ex A-010 CMP NRMP, p. 2.2-43.	Unsupported/Unsubstantiated. Ward provides no evidence to support this statement as it relates to Mauna Kea.

			Misleading. Presented out of Context The great majority (greater than 95 percent) of the area that would be disturbed by construction of the proposed TMT Observatory and Access Way is free of wēkiu bugs. The total population of the species will not be significantly impacted by the disturbance of a small area of habitat along the TMT Access Way. UH-TIO FOF 484-502. *See supra* UH-TIO's response to Ward's proposed FOF 300.
303.	44	A threat to high elevation environments on Mauna Kea exists in invasion by new plant species that are adapted to subalpine, alpine or arid environments. These can be introduced through …accidental introduction through human activities (such as seeds stuck to vehicles or visitors' shoes). Ex A-010 CMP NRMP p. 2.2.20	Unsupported/Unsubstantiated. Ward provides no evidence to support this statement as it relates to Mauna Kea. Misleading. Presented out of Context Introduction of invasive species, will be mitigated by the TMT Project's planned implementation of various mitigation measures listed in the TMT FEIS and CDUA. For example, equipment and materials will be inspected

			for invasive species at lower elevations, below Hale Pōhaku. TIO follows the Mauna Kea Invasive Species Management Plan and has additional invasive species controls that augment OMKM's requirements. UH-TIO FOF 490-491. OMKM is continually in the process of removing fireweed and other invasive species from the Hale Pōhaku area road and summit areas. UH-TIO FOF 185-187. A DLNR-approved biologist inspects all large vehicles or any sign of biological material, plant, soil, seed, and/or insects. UH-TIO FOF 146-148. *See supra* UH-TIO's response to Ward's proposed FOF 300.
304.	44	Approximately 9% of non-native species found growing at high elevations in the Hawaiian Islands were first recorded in the past thirty years. Ex A-010 CMP NRMP 2.2.20	Unsupported/Unsubstantiated. Ward provides no evidence to support this statement as it relates to Mauna Kea. Misleading. Presented out of Context Irrelevant/Inapplicable: non-

			native species identified before the TMT Project is even built cannot be the attributed to the TMT Project. Introduction of invasive species, will be mitigated by the TMT Project's planned implementation of various mitigation measures listed in the TMT FEIS and CDUA. UH-TIO FOF 490-491. *See supra* UH-TIO's response to Ward's proposed FOF 300.
305.	44	The CMP requires (Management Action FLU-5) that an airflow analysis be performed on the design of proposed structures to assess potential impacts to aeolian ecosystems. The aeolian ecosystem is related to the wēkiu bug and the fact that its food supply consists of insects blown from lower elevations to the summit, where they come to rest and become wēkiu bug prey. Ex A003 FEIS p 3-70	Misleading. Presented out of Context. The FEIS notes that because the TMT Project is not located on a cinder cone and wēkiu bugs are not normally present in the area, this requirement is not applicable to the project. Ex. A-3/R-3 at 3-70. Misleading. Incomplete Quotation. The next sentence in the FEIS states: "Because the TMT Observatory is not located on a cinder cone and wekiu bugs are not normally present in the area, **this requirement is not applicable to the Project**." Exhibit A-3/R-3 at 3-70.
306.	45	Mr Perry White acknowledged that the dust caused by extraction and	Mischaracterization.

		movement of thousands of tons rock would have an impact on air quality. Tr. 10/1/16 Vol 1:74:22-25	Inaccurate/False Mr. White testified that the impact on air quality would be "temporary." *See* Tr. 10/20/16 at 74:22-25; *see also* UH-TIO FOF 681. Dust generated from excavation and site preparation will be mitigated by the TMT Project's planned implementation of various mitigation measures listed in the TMT FEIS and CDUA. UH-TIO FOF 490-492 494, 692. Misleading. Partial quotation. White testified that the extraction and movement of rock would *temporarily* have an impact on air quality. Tr. 10/20/16 at 74:22-25.
307.	45	Climate modeling predicts that the intensity of warming is positively related to altitude. (Ex A-010 CMP NRMP 2.2.23)	Irrelevant/Inapplicable. There is no evidence that the TMT Project contributes to climate change. *See supra* UH-TIO's response to Ward's proposed FOF 300.
308.	45	Increase in CO2 concentration may increase the competitive edge by fast growing invasive species. Ex A-010 CMP NRMP 2.2-25	Irrelevant/Inapplicable. Unsupported/Unsubstantiated. Ward provides no evidence to

			support this statement as it relates to Mauna Kea. Misleading. Presented out of Context. Introduction of invasive species, will be mitigated by the TMT Project's planned implementation of various mitigation measures listed in the TMT FEIS and CDUA. UH-TIO FOF 490-491. OMKM is continually in the process of removing fireweed and other invasive species from the Hale Pōhaku area road and summit areas. UH-TIO FOF 185-187. A DLNR-approved biologist inspects all large vehicles or any sign of biological material, plant, soil, seed, and/or insects. UH-TIO FOF 146-148. *See supra* UH-TIO's response to Ward's proposed FOF 300.
309.	45	The FEIS noted that University has failed to fully determine the significance of cumulative impact to the alpine stone desert ecosystem from activities to date. The project will add an increment to the current level of cumulative impact to all resources that have been substantially, significantly, and adversely impacted by present and future actions. (Exhibit A003 FEIS S-8-9)	Misrepresentation. The Final Environmental Impact Statement ("**FEIS**") does not state that UH Hilo "failed" to fully determine the significance of impact to the alpine stone desert ecosystems

			from activities to date. The FEIS merely states that such a determination had not yet been made. Ex. A-3/R-3 at S-8. Additionally, the FEIS does not state that all resources have been substantially and adversely impacted. For example, the FEIS states that the past cumulative impact on other resources such as water, sonic environment, and traffic has been less than significant. Ex. A-3/R-3 at S-8. Misleading. Presented out of context. The FEIS states: "the Project will add a limited increment to the current level of cumulative impact.... For those resources that have been impacted to a less than significant degree by past and present actions, the Project would not tip the balance from a less than significant level to a significant level and the less than significant level of cumulative impact would continue." Ex. A-3/R-3 at S-9; *see also* UH-TIO FOF 466-502. The displacement of roughly 6 acres of alpine stone desert lava habitat is less than significant

			because this represents less than 0.5% of this type of habitat available. UH-TIO FOF 474. Citation does not support the proposition. The TMT Project will not have a substantial adverse impact on the biological resources within the alpine stone desert ecosystem. *See* UH-TIO FOF 474-475, 484-486.
310.	45	Telescope activities on Mauna Kea have resulted in substantial, significant and adverse impacts to geologic resources, primarily due to alteration of the cinder cone morphology. Ex A-308 FEIS Section 3.6 Geology, soils, and Slope Stability p 3-111	Citation does not support proposition (incorrect cite). Misleading. Proposed FOF does not address specific impacts of TMT. Presented out of context. The quoted excerpt states: "The Project impacts will occur within the context of the current conditions at Project sites. That context includes the presence of observatories and roads in the summit region that have had direct impacts to roughly 63 acres of the cinder cones. As detailed in Section 3.16.2, the past actions on Maunakea have resulted in substantial, significant, and adverse impacts to geologic resources, primarily due to the alteration of the cinder

			cone morphology. The TMT Observatory and the Access Way will unavoidably remove any surface geologic structures present, such as lava flow morphology and glacial features in the summit region. However, such geologic features are not unique on Maunakea and are better developed at many other areas, especially on the southern summit area adjacent to the Mauna Kea Access Road in the MKSR Natural/Cultural Preserve Area and the Ice Age NAR. Nevertheless, the destruction of any surface geologic features denigrates the Mauna Kea NNL; **however, the Project will destroy less than 0.01 percent, roughly 6.2 acres** (with slight variations depending on which Access Way Option is selected), of the surface geology within the 83,900 acre Mauna Kea NNL. At most, this destruction of surface geologic features would only include roughly 0.2 acres of a cinder cone. Ex. A-3/R-3 at 3-111 – 3-112 (emphasis added). Misleading. Presented out of

			context. The FEIS notes that the potential environmental impacts will occur within the context of current conditions, which include the context of impacts upon cinder cones, and past actions that have resulted in substantial, significant, and adverse impacts to geologic resources, primarily due to the alteration of the cinder cone morphology. Ex. A-3/R-3 at 3-111.
311.	45	Mr White stated that it was doubtful that, given the terrain, it could be restored to the point that those looking at it from a distance would not recognize a big scar on the land. Tr. 10/1/16 Vol 1:81:3-7	Mischaracterization. Misrepresentation. Misleading. Presented out of Context Misleading. Partial Quotation. Mr. White's full response was: "**The decommissioning commitment upon the end of facilities used is to restore the site as nearly as possible to the way it is now.** I am not aware of any of the -- of any sites, historic sites that are on that property that would be destroyed and could not be -- so could you get it back so that you -- there was absolutely no evidence that it had ever been

			there? That's kind of doubtful, but given the nature of the terrain, it could be restored to the point I think where those looking at it from a distance would not recognize a big scar on the land. **So in that sense, I would say, yes, it is restorable.**" Tr. 10/20/16 at 80:21-81:7 (emphasis added). TIO Sublease requires TIO to restore the site at the end of the useful life of the TMT Observatory. UH-TIO FOF 208, 322-323, 331-337.
312.	45	The construction of the observatories has had a permanent impact on the biological resources in the immediate area as well as the batch plant areas, roads, and associated areas. No new lichens have become established in the area as a consequence of the construction. Ex. B-64 APP-D8	Misleading. Presented out of Context. Already-existing impacts caused by past activity cannot be attributable to the TMT Project that has yet to be built. The TMT Project will not have a significant impact on botanical resources because species and habitat of these areas are not unique to the Project site and are found elsewhere on Mauna Kea and/or on other islands of Hawai'i. UH-TIO FOF 466-474.

			See supra UH-TIO's response to Ward's proposed FOF 300.
313.	45	Lichens and moss occur predominantly on rough lava rocks or surfaces or in in small cracks and crevices. The cinder cones do not support any lichens, primarily because the substrate is too unstable to allow any colonizing lichen to become established. Ex. B-64 APP D-7	Misleading. Provided out of Context The TMT Project will not have a significant impact on botanical resources because species and habitat of these areas—including lichens—are not unique to the Project site and are found elsewhere on Mauna Kea and/or on other islands of Hawai'i. UH-TIO FOF 466-474.
314.	45	Unlike the TMT project area, Cinder cones are not conducive for providing habitat for species of botanical origins. Tr. 01/19/2017, V. 27 at 180: 14-1	Not credible. UH-TIO FOF 477-480. The TMT Project will not have a significant impact on botanical resources because species and habitat of these areas are not unique to the Project site and are found elsewhere on Mauna Kea and/or on other islands of Hawai'i. UH-TIO FOF 466-474.
315.	46	The road traffic associated with construction of each observatory is a matter of concern. Dust from vehicular traffic was considerable before the upper reaches of the summit road were paved. Ex B. 64 APP D-8 (Note the TMT access road will not be fully paved)	Misleading. Inaccurate and Incomplete Quotation Misleading. Presented out of Context. While the cited portion of the record speaks for itself, to the extent this proposed FOF is intended to support a finding

			and/or conclusion regarding the development of biological mitigation measures, and/or to dispute a finding that the TMT Project will have no significant adverse impact on biological resources, UH-TIO believe their proposed FOF are more comprehensive (and placed in the proper context), and therefore request the entry of their proposed FOF on these matters. *See, e.g.*, UH-TIO FOF 466-502. With respect to the parenthetical that the TMT Access Way will not be fully paved, UH-TIO object that this proposed FOF is misleading and presented out of context. As part of the mitigation measures, The TMT Access Way will be paved where adjacent to sensitive wēkiu bug habitats, and the paving will not have a significant adverse impact on wēkiu bug populations. UH-TIO FOF 494-495. "The paving has reduced dust formation to the point and the rocks and biota demonstrate little to no dust." Ex. B.64 at APP-D9.

			The existing roadway is required to be paved where adjacent to sensitive habitats to reduce dust-related impacts. UH TIO FOF 494.
316.	46	The long term stability of the lichen and moss communities is dependent on minimizing disturbance in the area. The colonization rate of species is extremely low. Ex. B-64 APP-D9	Misleading. Provided out of Context The TMT Project will not have a significant impact on botanical resources because species and habitat of these areas—including lichens—are not unique to the Project site and are found elsewhere on Mauna Kea and/or on other islands of Hawai'i. UH-TIO FOF 466-474. *See supra* UH-TIO's response to Ward's proposed FOF 300.
317.	46	Habitat Disturbance should be minimized - The rocks and cinder within Area E are home to lichens, mosses, and endemic arthropods, therefore disturbance should be minimized at the construction site and in the surrounding habitats. Ex. A005 (TMT FEIS, Arthropod and Botanical Inventory and Assessment), App. K, p. 31	Misleading. Presented out of Context. The TMT Project contains measures that minimize habitat disturbance. UH-TIO FOF 466-502. *See supra* UH-TIO's response to Ward's proposed FOF 300.
318.	46	Mr Eric Hansen stated that after substrate disturbance in Area E, recolonization of the highly evolved, unique lichen and moss assemblages in the area would be very slow, if possible at all. Tr. 1/19/12017, Vol	Not credible. UH-TIO FOF 474, 477-480.

		27:159:22-25, 160:1-3	Hansen testified that "From my knowledge, there is no published data to say what is the recolonization rate." Tr. 01/19/17 at 159:22-25. Further, Hansen admitted that he is not an expert on lichen. Accordingly, his opinion on the recolonization rate is speculative and not credible. UH-TIO FOF 478.
319.	46	Mr. Eric Hansen stated that a lichen community cannot be restored once the substrate in which they grow has been disturbed. Tr. 01/19/2017, V. 27 at 160: 11-13.	Mischaracterization Not credible. UH-TIO FOF 477-480. Mr. Hansen qualified this statement with the phrase, "in my experience." However, Mr. Hansen is lichenologist and lacks the requisite education and experience make a credible statement on this subject. Ex. B.10b. Hansen testified that "From my knowledge, there is no published data to say what is the recolonization rate." Tr. 01/19/17 at 159:22-25. Further, Hansen admitted that he is not an expert on lichen. Accordingly, his opinion on the recolonization rate is speculative and not credible. UH-TIO FOF 478. Contradicts Ward's proposed FOF 435 and 446 (*infra*) stating that it would take 100 years for

			flora to regenerate after disturbance.
320.	46	Hansen stated that there is no mitigation that could take place to mitigate damage to floral communities should the TMT be developed. Tr. 01/19/2017, V 27. at 163: 1-5.	Not credible. UH-TIO FOF 477-480. Hansen is not an expert on lichen and his opinion is speculative and not credible. UH-TIO FOF 478. Most, if not all, types of the vegetation found in the summit region can be found at lower elevations on Mauna Kea. There are no endangered or threatened species of flora in the TMT Project area. UH-TIO FOF 471-474.
321.	46	The stability of the lichen and moss flora at the summit of Mauna Kea revolves around three different factors; human disturbance, long-term stability and climate change.	Unsupported/unsubstantiated There is no evidence that the TMT Project contributes to climate change. The TMT Project will not have a significant impact on botanical resources because species and habitat of these areas are not unique to the Project site and are found elsewhere on Mauna Kea and/or on other islands of Hawai'i. UH-TIO FOF 466-474.

			There is a very low diversity and cover of plants in Area E and that all of the species are found at lower elevations. UH-TIO FOF 471.
322.	46	Dr. Smith disclosed that "a concise determination of some species is not possible under the time constraints of this study even though fruiting bodies may be present. Species growing in such severe habitats, particularly those growing on rocks, produce spores only during favorable conditions. The only sure way of finding good specimens would be to conduct monthly collections for at least one year." Witness C. Smith, WDT, p. 9	Irrelevant/Inapplicable. Misleading. Presented out of Context Dr. Smith, a botanist with 32 years of teaching experience, concluded that the TMT Project will not have a significant adverse impact on the flora on Mauna Kea, and the reliable, probative, substantial and credible evidence supports Dr. Smith's opinions. UH-TIO FOF 466-474. There is a very low diversity and cover of plants in Area E and that all of the species are found at lower elevations. UH-TIO FOF 471.
323.	46	Dust can impact lichens, mosses, and ferns and is believed to degrade Wekiu bug habitat. Ex. A005, (TMT FEIS), App. K, p. 31	Misleading. Partial Quotation Misleading. Presented out of Context While the cited portion of the record speaks for itself, to the extent this proposed FOF is intended to support a finding and/or conclusion regarding the

			development of biological mitigation measures, and/or to dispute a finding that the TMT Project will have no significant adverse impact on biological resources, UH-TIO believe their proposed FOF are more comprehensive (and placed in the proper context), and therefore request the entry of their proposed FOF on these matters. *See, e.g.*, UH-TIO FOF 466-502. As part of the mitigation measures, The TMT Access Way will be paved where adjacent to sensitive wēkiu bug habitats, and the paving will not have a significant adverse impact on wēkiu bug populations. UH-TIO FOF 494-497.
324.	46	Wind-blown dust that covers plants, lichens and mosses, deprives them of needed sunlight. The potential impact of excessive dust could have a moderate effect on the flora in habitats adjacent and downwind of the Access Way and TMT Observatory. Ex. A005, (TMT FEIS), p. 3-74	Citation does not support proposition (incorrect cite) UH-TIO note that the correct citation for this proposed FOF is Ex. A-3/R-3 at 3-74. Misleading. Presented out of Context Paragraph states that "However, because the lichens, mosses, and plants that will be impacted are found elsewehere . . . the overall impact to the flora will be less

			than significant." Ex. A-3/R-3 at 3-74. The FEIS concluded that "because the lichens, mosses, and plants that will be impacted [from the dust] are found elsewhere in the Mauanakea summit region and Hawai'i, the overall impact to the flora will be less than significant." Ex. A-3/R-3 at 3-74. *See also* UH-TIO FOF 494-497.
325.	47	Non-native plant species can impact native plant communities by altering the environment, by lowering the groundwater table changing fire regimes, increasing or decreasing shade, smothering plant growth. Ex A010 CMP NRMP 2.2-18	Misleading. Presented out of Context While the cited portion of the record speaks for itself, to the extent this proposed FOF is intended to support a finding and/or conclusion regarding the development of biological mitigation measures, and/or to dispute a finding that the TMT Project will have no significant adverse impact on biological resources, UH-TIO believe their proposed FOF are more comprehensive (and placed in the proper context), and therefore request the entry of their proposed FOF on these matters.

			See, e.g., UH-TIO FOF 466-502. OMKM has been involved in extensive measures regarding the removal of fireweed and other invasive species. *See* UH-TIO FOF 186. No evidence this will occur as a result of the TMT Project. Introduction of invasive species, will be mitigated by the TMT Project's planned implementation of various mitigation measures listed in the TMT FEIS and CDUA. UH-TIO FOF 490-491. OMKM is continually in the process of removing fireweed and other invasive species from the Hale Pōhaku area road and summit areas. UH-TIO FOF 185-187. A DLNR-approved biologist inspects all large vehicles or any sign of biological material, plant, soil, seed, and/or insects. UH-TIO FOF 146-148.
326.	47	Invasive plants currently found in the in the subalpine and alpine plant communities at Hale Pohaku include the non-native grasses and invasive herbs such as common mullein (Verbascum thapsus) and fireweed (Senecio madagascariensis). Ex A-010 CMP NRMP 2.2-19	Irrelevant. Unsupported/Unsubstantiated. Ward provides no evidence to

			support this statement as it relates to the TMT Project. For example, the presence of Mullein begins to taper off in higher altitudes. It is not found in the higher elevation alpine stone desert, where the TMT Project will be located. Ex. B.64 at 19. Misleading. Presented out of Context. Non-native species currently present on Mauna Kea cannot be attributable to the TMT Project that has yet to be built. Introduction of invasive species, will be mitigated by the TMT Project's planned implementation of various mitigation measures listed in the TMT FEIS and CDUA. UH-TIO FOF 490-491. OMKM is continually in the process of removing fireweed and other invasive species from the Hale Pōhaku area road and summit areas. UH-TIO FOF 185-187. A DLNR-approved biologist inspects all large vehicles or any

			sign of biological material, plant, soil, seed, and/or insects. UH-TIO FOF 146-148. *See supra* UH-TIO's response to Ward's proposed FOF 325.
327.	47	Although not recorded in plant surveys in 1979, 1985, 1990 or 1999, fireweed (Senecio madagascariensis) was found in 2007 at Hale Pohaku, the summit access road, MK Ice Age NAR, and near the summit. Ex A-010 CMP NRMP 2.2.-20	Irrelevant/Inapplicable. Misleading. Presented out of Context Non-native species currently present on Mauna Kea cannot be attributable to the TMT Project that has yet to be built. Introduction of invasive species, will be mitigated by the TMT Project's planned implementation of various mitigation measures listed in the TMT FEIS and CDUA. UH-TIO FOF 490-491. OMKM is continually in the process of removing fireweed and other invasive species from the Hale Pōhaku area road and summit areas. UH-TIO FOF 185-187. A DLNR-approved biologist inspects all large vehicles or any sign of biological material, plant,

			soil, seed, and/or insects. UH-TIO FOF 146-148. *See supra* UH-TIO's response to Ward's proposed FOF 325.
328.	47	Invasive plants are spreading up the mountain. This can be easily observed by the way many invasive plants, such as common mullein, line the roadways up the mountain. Ex A-012 CMP Mauna Kea Public Access Plan (PAP) p 2-24	Irrelevant/Inapplicable. Unsupported/Unsubstantiated. Ward provides no evidence to support this statement as it relates to the TMT Project. For example, the presence of Mullein begins to taper off in higher altitudes. It is not found in the higher elevation alpine stone desert, where the TMT Project will be located. Ex. B.64 at 19. Misleading. Presented out of Context Non-native species currently present on Mauna Kea cannot be attributable to the TMT Project that has yet to be built. Introduction of invasive species, will be mitigated by the TMT Project's planned implementation of various mitigation measures listed in the TMT FEIS and CDUA. UH-TIO FOF 490-491.

			OMKM is continually in the process of removing fireweed and other invasive species from the Hale Pōhaku area road and summit areas. UH-TIO FOF 185-187. A DLNR-approved biologist inspects all large vehicles or any sign of biological material, plant, soil, seed, and/or insects. UH-TIO FOF 146-148. *See supra* UH-TIO's response to Ward's proposed FOF 325.
329.	47	It has been estimated that since 1963, approximately 62 acres (25 hectares) of potential arthropod habitat have been lost to astronomy-related development on the summit. Ex A010 CMP, Natural Resources Management Plan, p. 2.2-43	Irrelevant/Inapplicable. Misleading. Presented out of Context While the cited portion of the record speaks for itself, to the extent this proposed FOF is intended to support a finding and/or conclusion regarding the development of biological mitigation measures, and/or to dispute a finding that the TMT Project will have no significant adverse impact on biological resources, UH-TIO believe their proposed FOF are more comprehensive (and placed in the

			proper context), and therefore request the entry of their proposed FOF on these matters. *See, e.g.*, UH-TIO FOF 466-502. The TMT Project will implement extensive mitigation measures to protect arthropods and their habitat. *See, e.g.*, UH-TIO FOF 492. No evidence the TMT Project will adverse effect arthropod population, including wēkiu bugs. UH-TIO FOF 481-502.
330.	47	The bulk of human impact has occurred on cinder cones (Types 1,2,3) near the summit of Mauna Kea, and this is where construction of existing observatories and supporting infrastructure and other human modifications have taken place Ward WDT B.17a p 11	Irrelevant/Inapplicable. Citation does not support proposition. Not Credible. While UH-TIO do not dispute that there have been impacts on cinder cones from prior telescopes, Ward is not an expert in this area and her opinions are not credible on this subject. UH-TIO FOF 499. The great majority (greater than 95 percent) of the area that would be disturbed by construction of the proposed TMT Observatory and Access Way consists of Type 4, 5, and 6 habitats. UH-TIO

			FOF 485-489.
331.	47	The TMT Observatory would displace 5.9 acres of Wēkiu bug habitat. Ex A003 FEIS, p. 3-72.	Misleading. Presented out of ContextThe FEIS further concludes that the displacement will not have a significant impact on biological resources, because species and habitat of the affected areas are not unique to the TMT Project site and are found elsewhere on Mauna Kea and in Hawai'i. Further, although approximately 5.6 acres of Type 4 wēkiu bug habitat and .3 acre of Type 5 wēkiu bug habitat will be displaced, the mix of Type 4 and 5 habitats is not considered optimal for wēkiu bugs. Ex. A-3/R-3 at 3-72. The disturbance of prime wēkiu bug habitat (Type 3) for the TMT Project would be limited to 0.2 acres. UH-TIO FOF 488-489. Nevertheless, the TMT Project is implementing extensive mitigation measures with respect to biological resources. UH-TIO FOF 466-502.
332.	47	The TMT project would impact wekiu bugs in Type 3, 4, and 5 habitats. The wekiu bugs are present on the cinder slopes of Pu'u Hau Oki, and construction of the TMT and Access Way would impact 5.9 acres of wekiu bug habitat, a 10% additional increment of impacted habitat to the cumulative impact on the natural resources. Exhibit A003 FEIS 3.4 p 3-73	Misleading. Presented out of Context. FEIS states that the habitat of the 5.9 acres is "not considered optimal for wekiu bugs; they

			may only occupy this area during extreme population explosions that push the insects into marginal habitats." Ex. A-3/R-3 at 3-72. The disturbance of prime wēkiu bug habitat (Type 3) for the TMT Project would be limited to 0.2 acres. UH-TIO FOF 488; *see also* UH-TIO FOF 483-496. *See supra* UH-TIO's response to Ward's proposed FOF 331.
333.	47	The potential impacts to the biological resources would include replacement of existing habitat with the TMT observatory and Access Way, dust generated by vehicles travelling along the unpaved Access Way, and paving a portion of the Access Way. (Exhibit R-3 FEIS 3.4 p 3-69)	Misleading. Presented out of Context. The FEIS further concludes that the displacement will not have a significant impact on biological resources, because species and habitat of the affected areas are not unique to the TMT Project site and are found elsewhere on Mauna Kea and in Hawai'i. Further, although approximately 5.6 acres of Type 4 wēkiu bug habitat and .3 acre of Type 5 wēkiu bug habitat will be displaced, the mix of Type 4 and 5 habitats is not considered optimal for wēkiu bugs. Ex. A-3/R-3 at 3-72. Nevertheless, the

			TMT Project is implementing extensive mitigation measures with respect to biological resources. UH-TIO FOF. 466-502. Further, as part of the mitigation measures, The TMT Access Way will be paved where adjacent to sensitive wēkiu bug habitats, and the paving will not have a significant adverse impact on wēkiu bug populations. UH-TIO FOF 494-495. Paving the Access Way would reduce dust, which is beneficial for wēkiu bug habitat. UH-TIO FOF 494-495. The disturbance of prime wēkiu bug habitat (Type 3) for the TMT Project would be limited to 0.2 acres. UH-TIO FOF 488; *see also* UH-TIO FOF 483-496.
334.	48	Mr Perry White stated that if the project were implemented, the habitat of endemic and unique insects would be affected. Tr. 10/1/16 Vol 1:74:22-25	Misleading. Presented out of Context. Mischaracterization. The relevant testimony is: "Q Would the project affect the habitat of endemic and unique insects or other life forms in any

			way? A I'm not aware of any endangered insects that would be affected. Q Not endangered, endemic. A Yes." Tr. 10/20/16 at 74:11-17. The relevant criteria is not whether resources would be affected "in any way," but whether there will be "substantial adverse impact." *See* UH-TIO FOF 433; HAR § 13-5-30(c)(4). Citation does not support proposition. UH-TIO note that the proper citation for this proposed FOF is Tr. 10/20/16 at 74:11-17. White further testified, however, that the TMT Project would not cause substantial adverse impact to existing natural resources within the surrounding area in compliance with criterion 4. WDT White at 7-8.
335.	48	Dr. Fred Stone conducted an entomology study for the proposed telescope development area, in 1982, that study was incorporated into the FEIS for the MKSRCDP. They made recommendations for biological inventory, habitat mitigation and monitoring which were approved in the Mauna Kea Management Plan by BLNR in 1985. Subsequently Mike Wilson, Chair of DLNR, admitted that the impacts had occurred, and that mitigation measures had not been implemented, but declined to administer penalties because	Irrelevant/Inapplicable The CDUA and FEIS address possible impacts on the wēkiu bug habitat and mitigation measures. UH-TIO FOF 466-502.

		permits had been issued for the construction activities. He also said that the CDUA permit applications by UHIfA did not include possible impact to Wēkiu bug habitat, nor mitigation measures, so there was no way for DLNR and BLNR to know about or evaluate the potential impacts. Exhibits B.17q B.17s B.17r, , B.17p, B.17t	Dr. Fred Stone's concerns/investigation related to the construction of the Subaru and Gemini telescopes over 20 years ago. The TMT Project is not related to those telescopes.
336.	48	DLNR in 1996 determined that the Gemini Northern 8-meter telescope, Japan National Large Telescope (Subaru), and the Smithsonian (SMA) had destroyed habitat beyond that disclosed in the FEIS or allowed in the approved management plan. Wekiu bug habitat on the crater and slope of Pu`u Hau Oki was severely impacted by construction of the Keck I and II telescopes which resulted in removal of approximately 35 feet of the summit ridge of Pu'u Hau Oki and side-casting the material on the crater slopes. Exhibit B.17q, B.17r, B.17s, B.17p, B.17t	Irrelevant/Inapplicable Dr. Fred Stone's concerns/investigation related to the construction of the Subaru and Gemini telescopes over 20 years ago. The TMT Project is not related to those telescopes.
337.	48	Wēkiu bug capture rates appear to be heavily influenced by climactic conditions such as presence of snow, which makes it difficult to compare capture rates across studies that were conducted during different conditions or time of year." Ex A009 CMP, p. 5-39 – 5-40.	Irrelevant/Inapplicable Misleading. Presented out of context. UH-TIO note that the correct citation for this proposed FOF is Ex. A-9 at 5-41. The CMP further notes that "However, ten years of study following the 1997-98 surveys suggest that wēkiu bugs are still abundant on Mauna Kea, and that they are able to reside in both undeveloped and developed areas of the summit." Ex. A-9 at 5-41. There is no scientific evidence that the wēkiu bug population on

			Mauna Kea has declined since 1982. *See* UH-TIO FOF 496. Nevertheless, the TMT Project is implementing extensive mitigation measures with respect to biological resources, including the wēkiu bug. UH-TIO FOF 466-502.
338.	48	The wekiu bug was listed as a candidate for the endangered species list based on two criteria; its known threats are impacting the population of the organism, and evidence of significant population decline. The Wekiu bug was listed as a candidate for Federal protection on June 13, 2002. Ex A001 CDUA Section 2.3. (Note: The CDUA has not been updated, and does not reflect regulatory changes to the wekiu status since that document was produced.)	Misleading. Presented out of Context. Irrelevant/Inapplicable Misrepresentation. There is no dispute that the U.S. Forest and Wildlife Service formally the removed wēkiu bug from the candidate endangered species list. UH-TIO FOF 481. Although the wēkiu bug was previously proposed as a candidate species for Federal listing under the Endangered Species Act. On October 26, 2011, the FWS formally removed the wēkiu bug as a candidate from the Federal Endangered Species Act stating threats to the wēkiu bug did not put the species in danger of extinction throughout all or a significant

			portion of its range. UH-TIO FOF 481. There are no currently listed threatened or endangered species known to occur in the Astronomy Precinct. UH-TIO FOF 476. There is no scientific evidence that the wēkiu bug population on Mauna Kea has declined since 1982. *See* UH-TIO FOF 496. Nevertheless, the TMT Project is implementing extensive mitigation measures with respect to biological resources, including the wēkiu bug. UH-TIO FOF 466-502
339.	48	Until recently the wekiu bug (Nysius wekiucola) was proposed as a Candidate species for Federal listing under the Endangered Species Act. The Wekiu bug (Nysius wekiucola) has garnered significant attention, through inventory, monitoring, autecology study, and public awareness, since its discovery over thirty years ago. Two of the two greatest threats to Wekiu bug identified by the scientists who have contributed to this study effort are habitat loss and predation by alien invasive ant species. Ward WDT B.17 a p 11	Misleading. Presented out of Context. Irrelevant/Inapplicable. Unsupported/Unsubstantiated Not Credible. UH-TIO FOF 499. There is no dispute that the U.S. Forest and Wildlife Service formally the removed wēkiu bug from the candidate endangered species list. UH-TIO FOF 481. Ward is not an expert in entomology. Ex.B.17a (Ward WDT). Although the wēkiu bug was previously proposed as a

			candidate species for Federal listing under the Endangered Species Act. On October 26, 2011, the FWS formally removed the wēkiu bug as a candidate from the Federal Endangered Species Act stating threats to the wēkiu bug did not put the species in danger of extinction throughout all or a significant portion of its range. UH-TIO FOF 481. There are no currently listed threatened or endangered species known to occur in the Astronomy Precinct. UH-TIO FOF 476.
340.	48	A prime example of habitat loss through development is the loss of Wekiu bug habitat on the summit through construction of telescope facilities. Wekiu bug habitat is easily altered by vehicular traffic and construction activity, as tephra cinders preferred by the bug are easily crushed into dust-sized particles. Prime habitat can be quickly degraded to compacted silt and mud by use of off-road vehicles. Wekiu bug habitat may also be altered by dust blown up from road grading and other construction activities on the summit. 2.2.2.3 Threats to Invertebrate Communities on Mauna Kea Ex 010 CMP NRMP p 2.2-43	Misleading. Presented out of Context Any potential adverse impacts on the wēkiu bug and its habitat, such as dust generated from excavation and site preparation, and wind-blown debris, will be mitigated by the TMT Project's planned implementation of various mitigation measures listed in the TMT FEIS and CDUA. UH-TIO FOF 490-492. Although approximately 5.6 acres of Type 4 wēkiu bug habitat and .3 acre of Type 5

			wēkiu bug habitat will be displaced through the TMT Project, the mix of Type 4 and 5 habitats is not considered optimal for wēkiu bugs. Ex. A-3/R-3 at 3-72. The disturbance of prime wēkiu bug habitat (Type 3) for the TMT Project would be limited to 0.2 acres. UH-TIO FOF 488; *see also* UH-TIO FOF 483-496. Nevertheless, the TMT Project is implementing extensive mitigation measures with respect to biological resources, including the wēkiu bug. UH-TIO FOF 466-502.
341.	49	Dust blown up from road grading and other construction activities on the summit can reduce surface porosity and fill pockets between cinders. This may degrade wēkiu bug habitat by inhibiting movement and by decreasing the accumulation of bugs blown up for wēkiu bug food consumption. Ex A010 CMP NRMP, p. 2.2-44.	Misleading. Presented out of context. *See supra* UH-TIO's response to Ward's proposed FOF 340.
342.	49	Wēkiu bug habitat is easily altered by vehicular traffic and construction activity, as the tephra cinders preferred by the bug are easily crushed into dust-sized particles. Ex A010 CMP NRMP, p. 2.2-44.	Paving the Access Way would reduce dust, which is beneficial for wēkiu bug habitat. UH-TIO FOF 494-495. The TMT Project will implement mitigation measures to reduce dust and wind-blown debris. UH-TIO FOF 490-492.

			See supra UH-TIO's response to Ward's proposed FOF 340.
343.	49	The southern-most roughly 700 feet of the Access Way would be located on the Pu`u Hau`Oki cinder cone. Ex A001 TMT CDUA, p. 141.	Citation does not support proposition (incorrect cite) Otherwise, not in dispute. The citation to this proposed FOF is not clear; however, UH-TIO do not dispute this proposed FOF. UH-TIO FOF 254.
344.	49	It should be noted here that the access way will alter, and destroy, known Type 3 Wēkiu bug habitat. DLNR Division of Forestry and Wildlife Administrator Paul J. Conry, CDUA Comments for the Thirty Meter Telescope wrote, November 29, 2010, Ex A007 Staff Recommendations, p. 2-6.	Citation does not support proposition (incorrect cite) The impact to wēkiu bugs resulting from construction of the TMT Access Way will be less than significant. UH-TIO FOF 489. The great majority (greater than 95 percent) of the area that would be disturbed by construction of the proposed TMT Observatory and Access Way consists of Type 4, 5, and 6 habitats. Surveys conducted in 2008 and 2009 show these to be free of wēkiu bugs. Only one percent of the area that would be disturbed consists of Type 3 habitat. UH-TIO FOF 486, 489-490. Nevertheless, the TMT Project is implementing extensive mitigation measures with respect to biological

			resources, including the wēkiu bug. UH-TIO FOF 466-502. The disturbance of prime wēkiu bug habitat (Type 3) for the TMT Project would be limited to 0.2 acres. UH-TIO FOF 488; *see also* UH-TIO FOF 483-496.
345.	49	The Arthropod and Botanical Inventory and Assessment recommends minimizing disturbance by limiting construction activities to the footprint pad and road improvements, and not side-casting cinder or other materials into adjacent habitat. Ex A005 FEIS Vol. 3, p. 942/ Appendix K, p. 31.	The TMT Project is implementing extensive mitigation measures with respect to biological resources, including the wēkiu bug. UH-TIO FOF 466-502. Construction-phase measures will be implemented to reduce impacts to sensitive habitat. UH-TIO FOF 492. TIO plans to relocate as little material from the mountain as possible. The Project will use excavated material from the grading and excavations for the building foundations and will stockpile excess material at the Batch Plant for future use in restoration. UH-TIO FOF 493.
346.	49	"The cinder [in Access Way Option #3] is considered ideal Wēkiu bug habitat… option [3]would require disturbing the cinder cone and Wēkiu bug habitat, and the road would also bisect and isolate a portion of the habitat. While Wēkiu bugs have been observed crossing existing dirt roads, none	Misleading. Presented out of Context The great majority (greater than 95 percent) of the area that would

		have ever been observed on pavement. Because this option disturbs and displaces Wēkiu bug habitat, mitigation measures similar to those proposed in the Keck Outrigger would likely have to be implemented." Ex A005 FEIS Vol. 3, Appendix K, p. 24.	be disturbed by construction of the proposed TMT Observatory and Access Way consists of Type 4, 5, and 6 habitats. Surveys conducted in 2008 and 2009 show these to be free of wēkiu bugs. Only one percent of the area that would be disturbed consists of Type 3 habitat. UH-TIO FOF 486, 489-490. Nevertheless, the TMT Project is implementing extensive mitigation measures with respect to biological resources, including the wēkiu bug. UH-TIO FOF 466-502. The disturbance of prime wēkiu bug habitat (Type 3) for the TMT Project would be limited to 0.2 acres. UH-TIO FOF 488; *see also* UH-TIO FOF 483-496.
347.	49	Option 3 is the proposed plan for the TMT Access Way. Ex A-311 TMT CDUA, p. 4-29. "Option 3, developing the existing 4-wheel drive road as the Access Way, should be avoided because it disturbs, displaces, and isolates portions of Wēkiu bug habitat. However, as redesigned the impact would be lessened. It would likely require mitigation measures similar to those suggested for the Outrigger Telescopes project, such a habitat restoration." Ex A-005 FEIS Vol. 3, Appendix K, p. 32.	*See supra* UH-TIO's response to Ward's proposed FOF 346.
348.	50	In lieu of a habitat restoration plan, the TMT Project plan is to monitor	Misleading. Presented out of

		arthropod activity in the vicinity of the portion of the Access Way that will impact Type 3 Wēkiu bug habitat. Ex A003 FEIS, p. 3-73.	Context. Misrepresentation. In addition to monitoring, the TMT Project will implement significant mitigation measures with respect to protecting the wēkiu bug habitat and other biological resources. UH-TIO FOF 466-502. "TMT will work with OMKM on the development and implementation of a habitat restoration study. Depending on the results of this study, it could be used to support the design and implementation of a Habitat Restoration Plan in the future." Ex. A-3/R-3 at 3-73; *see also* UH-TIO FOF 457, 492. Inaccurate/False. A multi-year habitat restoration plan was initiated in 2015. Ex. A-22 at 7.
349.	50	Arthropod monitoring will be performed prior to, during and for (only) two years following construction in the area of the access Way on the alpine cinder cone habitat (the flank of TCP Pu'u Hau'oki). Summary of Mitigation Measures Ex. A071 p 5	Mischaracterization as to addition of "only" to the quoted language. Misleading. Presented out of Context.

			In addition to monitoring, the TMT Project will implement significant mitigation measures with respect to protecting the Wēkiu bug habitat and other biological resources. UH-TIO FOF 466-502. Citation does not support proposition that two years is insufficient. Furthermore, TIO will develop and implement an invasive species prevention and control program. UH-TIO FOF 492, 497.
350.	50	Alien arthropods can arrive at Project sites from localities on the Island of Hawai'i where they are already established, or in crates, boxes, containers, or construction equipment that are shipped from off the Island. Ex A003 FEIS, p. 3-75.	Misleading. Presented out of Context. The TMT Project will implement an Invasive Species Prevention and Control Program, and imposes requirements on materials shipped to the site from any country and any supplier to control invasive species. In other words, despite varying standards for invasive species control in other countries, the TMT Project will impose the most stringent requirements for all shipments to the site. UH-TIO FOF 490-492

			Non-native species currently present on Mauna Kea cannot be attributable to the TMT Project that has yet to be built. Introduction of invasive species, will be mitigated by the TMT Project's planned implementation of various mitigation measures listed in the TMT FEIS and CDUA. UH-TIO FOF 490-491. The Invasive Species Prevention and Control Plan will ensure that proper measures are taken to prevent introduction of alien species. UH-TIO FOF 458. As part of the MISMP, all vehicle operators are asked to inspect their vehicles daily. A DLNR-approved biologist inspects all large vehicles or any sign of biological material, plant, soil, seed, and/or insects. UH-TIO FOF 146-148. No legal support for the proposition that the mere possibility of the introduction of invasive species bars a proposed use. If that were the law, then no land use would ever be

			permissible.
351.	50	Invasive species, including spiders (*Lepthyphantes tenuis* and *Meriola arcifera*), and beetle (*Hippodamia convergens*) that compete with arthropods including the Wēkiu bug for food and may also prey on (other) native species at the summit. Ex A010 CMP NRMP, p. 2.2-36.	*See supra* UH-TIO's response to Ward's proposed FOF 350.
352.	50	Non-indigenous arthropods may pose a threat to native species that are residents of the higher elevations of Mauna Kea through predation or as competitors for food resources. Ex A005 FEIS Vol. 3, Appendix K, p. 19.	*See supra* UH-TIO's response to Ward's proposed FOF 350.
353.	50	"It is possible that the introduction of an alien invasive species may occur in any area impacted by the construction process, and such invasion would ultimately impact the entire alpine ecosystem." DLNR Division of Forestry and Wildlife Administrator Paul J. Conry, in his CDUA Comments for the Thirty Meter Telescope wrote, on November 29, 2010, in response to 4.1.2 Natural Resource Management p. 4-13: Ex A004 FEIS Vol II	*See supra* UH-TIO's response to Ward's proposed FOF 350.
354.	50	Incremental habitat fragmentation, exacerbated by biotic challenges, puts small isolated species at further risk of extinction. Invasions of non-native weeds can further degrade an altered habitat and landscape. Predatory insects, and those feeding on the same food sources as the species at risk, can have rapid and devastating consequences. Invasive invertebrates are perhaps the greatest threat to native invertebrates in Hawaii, through competition, predation, habitat alteration, and parasitism. At the summit of Mauna Kea the greatest threat to the arthropod populations is the introduction of invasive arthropods that are adapted to alpine conditions. The potential of introduction of new invasive species to Hale Pohaku and the summit through the importation of goods from similar climates (such as astronomical equipment), construction equipment and fill, road grading equipment and gravel accidental transport on vehicles, clothing and equipment, and biological control agents. Ex A-010 NRMP 2.2, 4.2	*See supra* UH-TIO's response to Ward's proposed FOF 350.

355.	51	Several new alien predatory species that could adversely impact the Wekiu bug have been found, and Englund reported that alien ant species are the greatest potential threat in the summit area. ...Because of the predatory and social nature of ants, and because ants have caused the extinction and decline of native arthropods throughout Hawaii, both the endemic wolf spider (Lycosa sp.) and the Wekiu bug would be expected to precipitously decline if ants ever become established. (Englund Wekiu-Rep 12-9 p 29) Ex A- 005 FEIS Vol III	Citation does not support proposition. Incorrect cite and no support for the proposition that the mere possibility of the introduction of invasive species bars a proposed use. If that were the law, then no land use would ever be permissible. Misleading. Presented out of context. The only recent evidence of invasive species introduction to the UH Management Area is the identification of the fire ant near the hale constructed by persons opposing the TMT Project across from Hale Pōhaku. Camara testified that he has never seen red fire ants on the summit and acknowledged that the summit is a harsh environment not only for the fire ant, but for arthropods and other insects as well. UH-TIO FOF 501. Introduction of invasive species, will be mitigated by the TMT Project's planned implementation of various mitigation measures listed in the TMT FEIS and CDUA. UH-TIO FOF 490-491.

			As part of the MISMP, all vehicle operators are asked to inspect their vehicles daily. A DLNR-approved biologist inspects all large vehicles or any sign of biological material, plant, soil, seed, and/or insects. UH-TIO FOF 146-148. The Invasive Species Prevention and Control Plan will ensure that proper measures are taken to prevent introduction of alien species. UH-TIO FOF 458.
356.	51	Since 2005, several new predatory beetle species have been found near Lake Waiau. The lake is in close proximity to the astronomy facilities and frequented by visitors from around the world. This underscores the regular monitoring and a mechanism for rapid response. (Exhibit B.17 l Bishop Museum Englund Wekiu 21-22)	Misleading. presented out of context. The NRMP states that the pathway for introduction is unknown. Introduction of invasive species, will be mitigated by the TMT Project's planned implementation of various mitigation measures listed in the TMT FEIS and CDUA. UH-TIO FOF 490-491. As part of the MISMP, all vehicle operators are asked to inspect their vehicles daily. A DLNR-approved biologist inspects all large vehicles or any sign of biological material, plant, soil, seed, and/or insects. UH-

			TIO FOF 146-148. It is not physically possible for surface runoff from the TMT Observatory to flow to and over the Pu'u Waiau crater rim into the lake. UH-TIO FOF 799-801. The Invasive Species Prevention and Control Plan will ensure that proper measures are taken to prevent introduction of alien species. UH-TIO FOF 458.
357.	51	Threats to the hydrology of Mauna Kea include those associated with human presence and activity on the mountain and climate change. Human activities that have the potential to impact water resources quality, and to a lesser degree quantity, include any actions that add to the current wastewater volume or that change in-situ patterns of water movement. Examples are: leaking facility pipes; accidental spills of contaminants; and improperly filtered wastewater. These contributions may affect the quality of water seeped to springs along Mauna Kea's flanks, as well as the fresh water aquifers beneath the mountain. Ex A-010 CMP NRMP, p. 2.1-38.	Misleading. presented out of context. UH-TIO object to this proposed FOF to the extent that it is intended to imply that the TMT Project will have a substantial adverse impact on hydrology resources. *See* UH-TIO FOF 796-823. The NRMP states that the pathway for introduction is unknown. The reliable, probative, and credible evidence establishes that the TMT Project will cause minimal surface runoffs, and the impacts of such runoff will not be significant. *See* WDT Nance

			at 2; Tr. 12/13/16 at 98:5-14 TMT Project will not have a substantial adverse impact on the water resources and hydrology of Mauna Kea, including Lake Waiau and the groundwater underlying Mauna Kea. UH-TIO FOF 796-823. It is not physically possible for surface runoff from the TMT Observatory to flow to and over the Pu'u Waiau crater rim into the lake. UH-TIO FOF 799-801. The TMT Observatory will have a zero-discharge wastewater system. UH-TIO FOF 802. Mr. Lee testified that the waters "have always been clean," even despite the presence of the existing observatories. UH-TIO at 811.
358.	51	Risk assessment and spill response planning provides a measure of safety for human health and for the protection of the cultural and natural resources of Mauna Kea. Although the observatories have individual spill response plans, such plans are lacking for other transporters or users, such as those that might result from vehicle accidents. Ex A-010 CMP NRMP 4.2-14	Misleading. Presented out of Context Ward admitted that she was unaware of any previous spills on Mauna Kea resulting from vehicles overturning en route to the MKSR. UH-TIO FOF 835.

			The chance of a spill entering the surrounding environment is negligible. UH-TIO FOF 824-839. The TMT Project will employ mitigation measures to minimize the potential for an accidental spill while waste materials are in transit down the mountain to a proper disposal site. UH-TIO FOF 427. Implementation of a Ride-Sharing Program that will reduce the number of vehicle trips per day to the summit. UH-TIO FOF 492.
359.	51	Observatory facilities and support operations housing any potentially hazardous materials are required by law to have spill response and associated safe handling protocols in place. Situations in which a potential release might occur include discharge of liquid waste from septic tanks and cesspools, malfunction of sewage pipes, transport of sewage and hazardous materials, activities requiring the handling of potential contaminants, and vehicle use. Ex A-010 CMP NRMP 4.2-13	Misleading. Presented out of Context. This finding of fact does not pertain to specific impacts caused by TMT. The document states, following the quoted excerpt: "Threats to the natural environment due to escape and possible subsequent migration of contaminants vary depending upon the type of contaminant, release volume, and location. The fate and transport of byproducts and potentially hazardous materials used on Mauna Kea have not been

			determined, and an assessment of the potential risks following a release has not been developed. Recognizing that most of these activities are not OMKM's responsibility, natural resource management staff nonetheless must be aware of materials being stored, used, and transported, to assist them in responding to potential contaminant releases and minimizing impacts to natural and cultural resources." Ex. A-10 at 4.2.13. The TMT Project will implement measures to mitigate the risk of an accident spill to the extent logically and reasonably practicable based on best means and methods available to mitigate against such events. UH-TIO FOF 426-430. The TMT Project's storage and waste management include a Spill Prevention and Response Plan and a Materials Storage/Waste Management Plan. UH-TIO FOF 430, 829-834. In handling all hazardous

			materials, TIO will comply with existing federal and state laws. Hazardous materials will be stored in areas with secondary containment that will capture any material that may accidentally escape the primary storage unit. The TIO will utilize Environmental Protection Agency-licensed contractors to transport any hazardous waste off of Mauna Kea to be disposed of appropriately. UH-TIO FOF 828, 970.
360.	52	Threats to the natural environment due to escape and possible subsequent migration of contaminants vary depending upon the type of contaminant, release volume, and location. The fate and transport of byproducts and potentially hazardous materials used on Mauna Kea have not been determined, and an assessment of the potential risks following a release has not been developed. Ex A-010 CMP NRMP 4.2-13	*See supra* UH-TIO's response to Ward proposed FOF 359.
361.	52	Applicant states that Hydrology information gaps include the fate of leachates or liquid waste containing dissolved or suspended contaminants from septic and cesspool systems. A010 NRMP 2.1-39	Misleading. Presented out of Context. UH-TIO object to this proposed FOF to the extent that it is intended to imply that the TMT Project will have a substantial adverse impact on hydrology resources. *See* UH-TIO FOF 796-823. This is a general proposition not connected to the TMT Project by any evidence.

			The TMT Project will implement measures to mitigate the risk of an accident spill to the extent logically and reasonably practicable based on best means and methods available to mitigate against such events. UH-TIO FOF 426-430. The TMT Project's storage and waste management include a Spill Prevention and Response Plan and a Materials Storage/Waste Management Plan. UH-TIO FOF 430, 829-834.
362.	52	The two main ground-water-related problems in the State of Hawaii are contamination by organic or inorganic chemicals associated with both agricultural and non- agricultural activities, and the availability of potable fresh ground water. Both problems are ultimately related to ground-water quality. All of the main islands in the State of Hawaii have large amounts of ground water contained in volcanic-rock aquifers. However, the quality of the ground water may not be suitable for all uses. In particular, not all ground water is potable. Some of the ground water is contaminated by chemicals associated with human activities and some contains high concentrations of salts. Ex. B.17z Ground Water Atlas Hawaii HA 730-N p.1	Misleading. Presented out of Context Irrelevant/Inapplicable – this is a general statement that has not been shown to specifically apply to the TMT Project. The cited document does not specifically refer to Mauna Kea. The evidence in the record regarding hydrology and water resources is more material and credible. UH-TIO FOF 796-823. Contamination of groundwater is extremely remote and very

			unlikely from the TMT Project. UH-TIO FOF 431-432,796-823.
363.	52	Contamination of ground water by human activities can take place in several ways. In some agricultural areas, crops are irrigated with water that might contain large concentrations of dissolved minerals. If such water percolates downward, an underlying aquifer can be contaminated. In addition, fertilizers and pesticides applied to crops can move downward through the unsaturated zone to an aquifer and affect the quality of the water in the aquifer. Wastes from septic-tank systems, sewers, industry, and storm runoff also can introduce undesirable constituents into the aquifers. Ex B.17.z Ground Water Atlas Hawaii HA 730-N p.1	Misleading. Presented out of Context. Irrelevant/Inapplicable – this is a general statement that has not been shown to specifically apply to the TMT Project. The cited document does not specifically refer to Mauna Kea. The evidence in the record regarding hydrology and water resources is more material and credible. UH-TIO FOF 796-823. Contamination of groundwater is extremely remote and very unlikely from the TMT Project. UH-TIO FOF 431-432, 796-823.
364.	52	Spills of oil, sewage and hazardous chemicals have been repeatedly reported by researchers working at the summit, and they note that oil, in particular, will take a long time to biodegrade because of cold and dry conditions (Howarth 2003). Ex A-005 App K Englund	Citation does not support proposition. Irrelevant/Inapplicable – spills that occurred in the past cannot be attributable to the TMT Project that has yet to be built. The TMT Project will implement measures to mitigate the risk of an accident spill to the extent logically and reasonably practicable based on best means

			and methods available to mitigate against such events. UH-TIO FOF 426-430. The TMT Project's storage and waste management include a Spill Prevention and Response Plan and a Materials Storage/Waste Management Plan. UH-TIO FOF 430, 829-834. No mercury will be used by or at the Observatory, and no hazardous waste is anticipated to be generated at the TMT Observatory. UH-TIO FOF 824-828.
365.	52	About 0.5 gallons of hydraulic fluid spilled in the Canadian France-Hawai'i Telescope (CFHT) facilities in 1979. Ex A-009 CMP, p. 6-9.	Misleading. Presented out of Context. Irrelevant/Inapplicable – spills that occurred in the past cannot be attributable to the TMT Project that has yet to be built. The TMT Project will implement measures to mitigate the risk of an accident spill to the extent logically and reasonably practicable based on best means and methods available to mitigate against such events. UH-TIO

			FOF 426-430. The TMT Project's storage and waste management include a Spill Prevention and Response Plan and a Materials Storage/Waste Management Plan. UH-TIO FOF 430, 829-834.
366.	52	An unknown amount of diesel fuel leaked from a generator in the construction staging area in 1982. Ex A-0091 CMP, p. 6-9.	Misleading. Presented out of Context. Irrelevant/Inapplicable – spills that occurred in the past cannot be attributable to the TMT Project that has yet to be built. The TMT Project will implement measures to mitigate the risk of an accident spill to the extent logically and reasonably practicable based on best means and methods available to mitigate against such events. UH-TIO FOF 426-430. The TMT Project's storage and waste management include a Spill Prevention and Response Plan and a Materials Storage/Waste Management Plan. UH-TIO FOF 430, 829-834.

367.	53	Mercury spills occurred in the NASA IRTF (1989), CFHT facility (1990), W.M. Keck Observatory (1995), CFHT (1998) and the UH 2.2-m telescope facility (1998). Ex A-009CMP, p. 6-9 and 6-10.	Misleading. Presented out of Context. Irrelevant/Inapplicable – spills that occurred in the past cannot be attributable to the TMT Project that has yet to be built. No mercury will be used at the TMT Observatory. UH-TIO FOF 428, 824.
368.	53	Approximately 60 gallons of diesel fuel, engine and hydraulic oil were spilled onto surface cinder near the VLBA, requiring the removal of cinder, in 1995. Ex A-009 CMP, p. 6-9.	Misleading. Presented out of Context. Irrelevant/Inapplicable – spills that occurred in the past cannot be attributable to the TMT Project that has yet to be built. The TMT Project will implement measures to mitigate the risk of an accident spill to the extent logically and reasonably practicable based on best means and methods available to mitigate against such events. UH-TIO FOF 426-430. The TMT Project's storage and waste management include a Spill Prevention and Response

			Plan and a Materials Storage/Waste Management Plan. UH-TIO FOF 430, 829-834.
369.	53	In 1996, 110 gallons (two 55 gallon containers) ruptured and spilled onto cinder surrounding the Subaru telescope, requiring removal of excavated cinder. Ex A-009 CMP, p. 6-9.	Misleading. Presented out of Context. Irrelevant/Inapplicable – spills that occurred in the past cannot be attributable to the TMT Project that has yet to be built. The TMT Project will implement measures to mitigate the risk of an accident spill to the extent logically and reasonably practicable based on best means and methods available to mitigate against such events. UH-TIO FOF 426-430. The TMT Project's storage and waste management include a Spill Prevention and Response Plan and a Materials Storage/Waste Management Plan. UH-TIO FOF 430, 829-834.
370.	53	Hydraulic fluid leaked from the Caltech Submillimeter Observatory (CSO) from approximately 1990 through 2000. Ex A-009 CMP, p. 6-10.	Misleading. Presented out of Context. Irrelevant/Inapplicable – spills that occurred in the past cannot

			be attributable to the TMT Project that has yet to be built. The TMT Project will implement measures to mitigate the risk of an accident spill to the extent logically and reasonably practicable based on best means and methods available to mitigate against such events. UH-TIO FOF 426-430. The TMT Project's storage and waste management include a Spill Prevention and Response Plan and a Materials Storage/Waste Management Plan. UH-TIO FOF 430, 829-834.
371.	53	In 2003 at Hale Pōhaku, crankcase oil and hydraulic fluid leaks onto the ground requiring soil excavation and transmission oil leaked onto surface cinder, which likewise had to be excavated. Ex A-009 CMP, p. 6-10.	Misleading. Presented out of Context. Irrelevant/Inapplicable – spills that occurred in the past cannot be attributable to the TMT Project that has yet to be built. The TMT Project will implement measures to mitigate the risk of an accident spill to the extent logically and reasonably practicable based on best means and methods available to mitigate

			against such events. UH-TIO FOF 426-430. The TMT Project's storage and waste management include a Spill Prevention and Response Plan and a Materials Storage/Waste Management Plan. UH-TIO FOF 430, 829-834.
372.	53	Decaying seals on the Smithsonian Astrophysical Observatory Submillimeter Array allowed hydraulic fluid to leak in 2003. Ex A-009 CMP, p. 6-10.	Misleading. Presented out of Context. Irrelevant/Inapplicable – spills that occurred in the past cannot be attributable to the TMT Project that has yet to be built. The TMT Project will implement measures to mitigate the risk of an accident spill to the extent logically and reasonably practicable based on best means and methods available to mitigate against such events. UH-TIO FOF 426-430. The TMT Project's storage and waste management include a Spill Prevention and Response Plan and a Materials Storage/Waste Management Plan. UH-TIO FOF 43, 829-834.

373.	53	From 1998-2004, sewage overflows of several liters occurred five times at the CSO facilities. Ex A009 CMP, p. 6-10.	Misleading. Presented out of Context. Irrelevant/Inapplicable – spills that occurred in the past cannot be attributable to the TMT Project that has yet to be built. The TMT Project will implement measures to mitigate the risk of an accident spill to the extent logically and reasonably practicable based on best means and methods available to mitigate against such events. UH-TIO FOF 426-430. The TMT Project's storage and waste management include a Spill Prevention and Response Plan and a Materials Storage/Waste Management Plan. UH-TIO FOF 430, 829-834.
374.	53	Decaying seals on the Smithsonian Astrophysical Observatory Submillimeter Array allowed diesel fuel to leak in 2004. Ex A-009 CMP, p. 6-10.	Misleading. Presented out of Context. Irrelevant/Inapplicable – spills that occurred in the past cannot be attributable to the TMT Project that has yet to be built. The TMT Project will implement

			measures to mitigate the risk of an accident spill to the extent logically and reasonably practicable based on best means and methods available to mitigate against such events. UH-TIO FOF 426-430. The TMT Project's storage and waste management include a Spill Prevention and Response Plan and a Materials Storage/Waste Management Plan. UH-TIO FOF 430, 829-834.
375.	53	Twenty to thirty gallons of propylene glycol spilled at the W.M. Keck Observatory in 2004, with approximately two-thirds of that volume introduced into the outside environment. The contamination required removal of cinder. Ex A-009 CMP, p. 6-10.	Misleading. Presented out of Context. Irrelevant/Inapplicable – spills that occurred in the past cannot be attributable to the TMT Project that has yet to be built. The TMT Project will implement measures to mitigate the risk of an accident spill to the extent logically and reasonably practicable based on best means and methods available to mitigate against such events. UH-TIO FOF 426-430. The TMT Project's storage and

			waste management include a Spill Prevention and Response Plan and a Materials Storage/Waste Management Plan. UH-TIO FOF 430, 829-834.
376.	53	Telescope mirror washing entails removing mirrors from a protective girdle that contains mercury. Seven documented mercury spills have occurred in association with mirror washing. Ex A-009 CMP p. 6-8.	Citation does not support proposition. Irrelevant/Inapplicable – spills that occurred in the past cannot be attributable to the TMT Project that has yet to be built. No mercury will be used at the TMT Observatory. UH-TIO FOF 428, 824. Mirror washing wastewater is not a hazardous waste. However, the TMT Observatory has been designed to ensure that the possibility of mirror wash wastewater entering the surrounding environment will be negligible. UH-TIO FOF 826-828
377.	53	The Applicant for the TMT maintains that mirror washing wastewater is not a hazardous waste. Waste from mirror washing will be collected, removed, and transported off site for treatment and disposal. Ex A-003 FEIS Vol. 1, p. 3-129.	Not in dispute. *See also* UH-TIO FOF 824-830.
378.	54	"A two-gallon sewage spill from an incorrectly installed septic line contaminated cinder and snow in wēkiu bug habitat in the Pu'u Hauoki crater	Misleading. Presented out of Context.

		in 1998." Ex A-010 CMP NRMP p. 3-34.	Irrelevant/Inapplicable – spills that occurred in the past cannot be attributable to the TMT Project that has yet to be built. The TMT Project will implement measures to mitigate the risk of an accident spill to the extent logically and reasonably practicable based on best means and methods available to mitigate against such events. UH-TIO FOF 426-430. The TMT Project's storage and waste management include a Spill Prevention and Response Plan and a Materials Storage/Waste Management Plan. UH-TIO FOF 430, 829-834.
379.	54	Approximately 500 – 1,000 gallons of sewage overflowed from the septic tank at Hale Pōhaku and was allowed to percolate into the surrounding environment in 2008. Ex A-009 CMP, p. 6-10.	Misleading. Presented out of Context. Irrelevant/Inapplicable – spills that occurred in the past cannot be attributable to the TMT Project that has yet to be built. The TMT Project will implement measures to mitigate the risk of an accident spill to the extent

			logically and reasonably practicable based on best means and methods available to mitigate against such events. UH-TIO FOF 426-430. The TMT Project's storage and waste management include a Spill Prevention and Response Plan and a Materials Storage/Waste Management Plan. UH-TIO FOF 430, 829-834.
380.	54	In 1998, a septic tank spilled approximately 2 gallons of sewage onto the ground snow near the Subaru telescope. Ex A-009 CMP, p. 6-9.	Misleading. Presented out of Context. Irrelevant/Inapplicable. The Project will not utilize a septic system to dispose of domestic wastewater. All wastewater will be trucked off the mountain for disposal. Ex. A-3/R-3 at 3-33. Spills that occurred in the past cannot be attributable to the TMT Project that has yet to be built. The TMT Project will implement measures to mitigate the risk of an accident spill to the extent logically and reasonably practicable based on best means and methods available to mitigate

			against such events. UH-TIO FOF 426-430. The TMT Project's storage and waste management include a Spill Prevention and Response Plan and a Materials Storage/Waste Management Plan. UH-TIO FOF 430, 829-834.
381.	54	There are eight septic tanks with leach fields or disposal pits and three cesspools in the UH Managed Areas. Ex A-010 CMP NRMP, p. 3-33.	Misleading. Presented out of Context. Proposed FOF does not pertain to specific impacts of the TMT Project. The quoted document states, in relevant part: "The cesspools, septic tanks, and associated leach fields at the summit and Hale Pohaku have been designed to meet State DOH permit requirements for sanitary waste systems. With telescope facility upgrades, many of the original cesspools have been replaced with septic tanks. Currently there are eight septic tanks with leach fields or disposal pits and three cesspools (NASA 2005). Solid and liquid waste discharged into these approved systems should minimize direct discharge of solid waste in the effluent and

			into the ground and allow for physical and bio-processing." Ex. A-10 at 3-33 – 3-34. Irrelevant/Inapplicable. The Project will not utilize a septic system to dispose of domestic wastewater. All wastewater will be trucked off the mountain for disposal. Ex. A-3/R-3 at 3-33. The TMT Project will implement measures to mitigate the risk of an accident spill to the extent logically and reasonably practicable based on best means and methods available to mitigate against such events. UH-TIO FOF 426-430. The TMT Project's storage and waste management include a Spill Prevention and Response Plan and a Materials Storage/Waste Management Plan. UH-TIO FOF 430, 829-834.
382.	54	Approximately 53,990 gallons of wastewater are generated each month by existing telescopes on the summit. (Calculations based on Ex A-010 CMP NRMP, p. 3-9).	Irrelevant/Inapplicable Misleading. Presented out of Context. Proposed FOF does not pertain to specific impacts of the TMT Project.

383.	54	Large sized tank trucks have carrying capacities ranging from 5,500 to 9,000 gallons. Ex A-003 FEIS Vol 1: 3-120	Citation does not support proposition. Irrelevant/Inapplicable
384.	54	The main activities that have potential to result in a release of contaminants include vehicle travel (on and off road) and accidents; release of hazardous material and petroleum product use by observatories and support operations; sewage generation; and transport of hazardous materials and sewage off-site. Ex A-009 CMP, p. 6-14.	Misleading. Presented out of Context. The TMT Project will employ mitigation measures to minimize the potential for an accidental spill while waste materials are in transit down the mountain to a proper disposal site. UH-TIO FOF 427. Ward admitted that she was unaware of any previous spills on Mauna Kea resulting from vehicles overturning en route to the MKSR. UH-TIO FOF 835. The TMT Project will implement measures to mitigate the risk of an accident spill to the extent logically and reasonably practicable based on best means and methods available to mitigate against such events. UH-TIO FOF 426-430. The TMT Project's storage and waste management include a

			Spill Prevention and Response Plan and a Materials Storage/Waste Management Plan. UH-TIO FOF 430, 829-834. Implementation of a Ride-Sharing Program that will reduce the number of vehicle trips per day to the summit. UH-TIO FOF 492.
385.	54	Transport of contaminants through the substrate has the potential to impact the quality of both surface water and groundwater. Direct toxic impacts on flora or fauna are also possible. Ex A-009 CMP, p. 6-14.	Misleading. Presented out of Context. Unsupported/Unsubstantiated. UH-TIO object to this proposed FOF to the extent that it is intended to imply that the TMT Project will have a substantial adverse impact on hydrology or biological resources. The credible evidence shows that the TMT Project will not have a significant or adverse impact on area water resources. UH-TIO FOF 373, 427, 431-432, 796-823. Any discharge on the summit would be naturally treated and filtered through thousands of feet of the porous lavas, thereby removing any contamination in that discharge by the time it

			reaches groundwater. UH-TIO FOF 804. The overall impact of the TMT Project to flora and fauna will be less than significant. UH-TIO FOF 466-502.
386.	54	The highest probability of impact [on surface water, groundwater, and flora or fauna] is from petroleum products (e.g., fuel for vehicles and backup generators, lubricants, and cleaning fluids) and human waste. Ex A-009 CMP, p. 6-14.	Misleading. Presented out of Context. This citation does not pertain to specific impacts of the TMT Project. UH-TIO object to this proposed FOF to the extent that it is intended to imply that the TMT Project will have a substantial adverse impact on hydrology or biological resources. *See* UH-TIO FOF 466-502, 796-823. The TMT Project will implement measures to mitigate the risk of an accident spill to the extent logically and reasonably practicable based on best means and methods available to mitigate against such events. UH-TIO FOF 426-430. The TMT Project's storage and waste management include a Spill Prevention and Response Plan and a Materials

			Storage/Waste Management Plan. UH-TIO FOF 430, 829-834.
387.	54	The TMT project would require the use, handling and storage of hazardous materials at Mauna Kea including: propylene glycol, acetone, methyl ethyl ketone, at least 2,000 gallons of diesel fuel, ethylene glycol, hydraulic fluid, liquid adhesives, coating metals, acids, paints, solvents, and other cleaning chemicals. Ex A-003 CMP FEIS Vol. 1, p. 3-129.	Citation does not support proposition. Lacks evidentiary support. Misleading. Presented out of Context No support for proposition that the use, handling, and storage of hazardous materials disqualifies a project from receiving a CDUP. The TMT Project has protocols in place for the use, handling, and storage of hazardous materials. *See* UH-TIO FOF 320, 425, 430, 824-839. UH-TIO note that 3-129 of the FEIS does not specifically reference the chemicals propylene glycol, acetone, and methyl ethyl ketone, but it is not disputed in the record that the TMT Project will utilize vehicle and generator fuel, alcohols, liquid adhesives, various metals, lubricants, hydraulic fluid, glycol coolants, and small quantities of acids, paints and solvents.

			Extensive measures will be in place to manage these materials, and the chance of a spill entering the surrounding environment is negligible. *See* UH-TIO FOF 824-839.
388.	55	The TMT Observatory and a portion of the access road would create two acres of impervious surfaces that would cause runoff. Runoff would percolate into permeable natural ground. Nance Tr.12.13.16 V16 p.98	Misleading. Presented out of Context. Misleading. Partial quotation. Mr. Nance testified that the TMT Observatory and a portion of the access road would create less than two acres of impervious surfaces. Tr. 12/13/16 at 98:5-14. Relevant testimony was as follows: "The TMT Observatory and a portion of the access road would create less than two acres of impervious surfaces that would cause runoff to occur during precipitation events. This runoff, because of the location of the observatory on the north flank and below the summit, the runoff would start downhill to the north. **It's very likely it wouldn't traverse very far before being lost to percolation into the permeable natural ground, and**

			otherwise wouldn't be an issue." Tr. 12/13/16 at 98:5-14 (emphasis added). The reliable, probative, and credible evidence establishes that the TMT Project will cause minimal surface runoffs, and the impacts of such runoff will not be significant. *See* WDT Nance at 2; Tr. 12/13/16 at 98:5-14 Contamination of groundwater is extremely remote and very unlikely from the TMT Project. UH-TIO FOF 431-432, 796-823. It is not physically possible for surface runoff from the TMT Observatory to flow to and over the Pu'u Waiau crater rim into the lake. UH-TIO FOF 799-801. The TMT Observatory will have a zero-discharge wastewater system. UH-TIO FOF 802. Any discharge on the summit would be naturally treated and filtered through thousands of feet of the porous lavas, thereby removing any contamination in that discharge by the time it

			reaches groundwater. UH-TIO FOF 804.
389.	55	TMT facilities will be designed to maximize groundwater recharge to the extent possible. Site grading and landscaping will be designed to direct stormwater to pervious areas so that it may percolate into the ground and thus into the aquifer. Ex A001 CDUA 6-1	Citation does not support proposition (incorrect cite) Misleading. Presented out of Context UH-TIO object to this proposed FOF to the extent that it is intended to imply that the TMT Project will have a substantial adverse impact on hydrology resources. *See* UH-TIO FOF 796-823. Contamination of groundwater is extremely remote and very unlikely from the TMT Project. UH-TIO FOF 431-432, 796-823. It is not physically possible for surface runoff from the TMT Observatory to flow to and over the Pu'u Waiau crater rim into the lake. UH-TIO FOF 799-801. The TMT Observatory will have a zero-discharge wastewater system. UH-TIO FOF 802. Any discharge on the summit would be naturally treated

			and filtered through thousands of feet of the porous lavas, thereby removing any contamination in that discharge by the time it reaches groundwater. UH-TIO FOF 804. It is extremely unlikely that any spill would be large enough to have any impact on the drinking water for Hawai'i County. The main threats to Mauna Kea's aquifer occur at lower elevations in areas of heavier population and use. *See* UH-TIO FOF 805, 796-823.
390.	55	The TMT Project's design features will include the use of stormwater dry wells and grading to maximize groundwater recharge The release of fuel or chemicals, including mirror washing wastewater, from an accidental spill could degrade surface and groundwater resources. A003 FEIS Vol I 3-121 (pdf p 209)	Misrepresentation. Citation does not support proposition. Unsupported/Unsubstantiated. UH-TIO object to this proposed FOF to the extent that it is intended to imply that the TMT Project will have a substantial adverse impact on hydrology resources. *See* UH-TIO FOF 796-823. Contamination of groundwater is extremely remote and very

			unlikely from the TMT Project. UH-TIO FOF 431-432, 796-823. It is not physically possible for surface runoff from the TMT Observatory to flow to and over the Pu'u Waiau crater rim into the lake. UH-TIO FOF 799-801. The TMT Observatory will have a zero-discharge wastewater system. UH-TIO FOF 802. Any discharge on the summit would be naturally treated and filtered through thousands of feet of the porous lavas, thereby removing any contamination in that discharge by the time it reaches groundwater. UH-TIO FOF 804. It is extremely unlikely that any spill would be large enough to have any impact on the drinking water for Hawai'i County. The main threats to Mauna Kea's aquifer occur at lower elevations in areas of heavier population and use. *See* UH-TIO FOF 805, 796-823.
391.	55	Exhibit A071, page 8 Summary of TMT Mitigation Measures says that the project will use storm-water dry wells and grading to maximize groundwater	Misleading. Presented out of context. UH-TIO object to this

		recharge. Mr Nance stated that the runoff would percolate downward, but he didn't know if it would be confined. Nance Tr.12.13.16 V16 p. 145	proposed FOF to the extent that it is intended to imply that the TMT Project will have a substantial adverse impact on hydrology resources. *See* UH-TIO FOF 796-823. Exhibit A-71 contains other mitigation measures to prevent spills of wastewater and hazardous waste. *See* Ex. A-71 at 8-9. Contamination of groundwater is extremely remote and very unlikely from the TMT Project. UH-TIO FOF 431-432, 796-823. Any discharge on the summit would be naturally treated and filtered through thousands of feet of the porous lavas, thereby removing any contamination in that discharge by the time it reaches groundwater. UH-TIO FOF 804.
392.	55	Runoff would move downward through the unsaturated lava, traversing vertically downward to underlying groundwater. We don't know the distance because we don't know exactly where the groundwater is. Nance Tr.12.13.16 V16 p.99-100	Misrepresentation. Misleading. Presented out of context.

			Mr. Nance's statement was that "it would traverse thousands of feet downward before it over reached the underlying groundwater , maybe 6, 7000 feet." Contamination of groundwater is extremely remote and very unlikely from the TMT Project. UH-TIO FOF 431-432, 796-823. Any discharge on the summit would be naturally treated and filtered through thousands of feet of the porous lavas, thereby removing any contamination in that discharge by the time it reaches groundwater. UH-TIO FOF 804. It is extremely unlikely that any spill would be large enough to have any impact on the drinking water for Hawai'i County. The main threats to Mauna Kea's aquifer occur at lower elevations in areas of heavier population and use. *See* UH-TIO FOF 805, 796-823.
393.	55	The runoff from the TMT site will go downslope to the North, following topography, on the northern flank of Mauna Kea. Nance Tr.12.13.16 V16 p. 110	Misleading. Presented out of context. UH-TIO object to this proposed FOF to the extent that it

			is intended to imply that the TMT Project will have a substantial adverse impact on hydrology resources. *See* UH-TIO FOF 796-823. Contamination of groundwater is extremely remote and very unlikely from the TMT Project. UH-TIO FOF 431-432, 796-823. Any discharge on the summit would be naturally treated and filtered through thousands of feet of the porous lavas, thereby removing any contamination in that discharge by the time it reaches groundwater. UH-TIO FOF 804.
394.	55	TMT project managers anticipate the generation of approximately 120 cubic feet of trash per week. Ex A-003 FEIS Vol.1, p. 3-129.	Misleading. Presented out of context. UH-TIO object to this proposed FOF to the extent that it is intended to imply that the TMT Project will have a substantial adverse impact on hydrology resources. *See* UH-TIO FOF 796-823. Document states in relevant part: "Trash and other solid waste

			generated as part of the activities associated with the TMT at both the TMT Observatory and at Hale Pohaku will result in a minor increase in the generation and disposal of solid waste from Maunakea. It is anticipated that the TMT will generate trash at a rate similar to that of the Keck observatory, approximately 120 cubic feet per week. Solid waste and trash generated by the daily operation will be primarily composed of waste paper, spent containers, and limited amounts of food waste. Like the existing observatories, in compliance with the existing regulations, the Project's waste or leftover material will be recycled and reused to the extent possible. Scrap metal, plastic, and glass will be collected for recycling, and the remaining solid waste rubbish will be removed and trucked off the mountain for disposal in a landfill. Between pickups, rubbish will be stored indoors in lidded trash containers. Cans, plastic, and glass bottles, paper and cardboard, and scrap metal will

			be collected in separate containers and transported to Headquarters for reuse or recycling. Wastes such as used oil and glycol, will be removed to also be recycled by licensed contractors. No solid waste will be disposed of at the summit." Ex. A-3/R-3 at 3-129.
395.	55	UH estimates 2,080 gallons per day will be used by the (480 gpd) TMT Observatory and the Headquarters. (1,600 gpd). Ex A-003 FEIS Vol. 1, p. 3-120.	Misleading. Presented out of context. UH-TIO note that this FOF refers to potable water, and the use is less than significant. Ex. A-3/R-3 at 3-120. Document states in relevant part: "The Project will slightly increase the amount of freshwater used island-wide due to water use by employees at the various Project facilities. Assuming a maximum daily use of 20 gallons a day per person at the work place, the following daily uses of potable water are estimated 480 gallons at the TMT Observatory, possibly 200 gallons at the potential TMT Mid-Level Facility, and 1,600 gallons at the Headquarters. This **represents less than 0.01**

			percent of the current island-wide daily potable water pumpage, and 0.0001 percent, of the estimated sustainable use of freshwater from the island's aquifers. Also, in compliance with the existing requirements, **water efficient fixtures will be installed and water efficient practices implemented** to reduce the demand on freshwater resources. Therefore, **this impact will be less than significant."** Ex. A-3/R-3 at 3-120 (emphasis added).
396.	55	To transport 14,600 gallons of water generated by the TMT Observatory down the mountain each month would require a tanker truck to use the Access Way at least 1-2 times each month. Ex A-003 FEIS Vol 1: 3-120	Citation does not support proposition. Unsupported/Unsubstantiated. Misleading. Presented out of context. Proper measures will be taken to ensure the safe transport of materials off-site, thereby minimizing potential spills. UH-TIO FOF 427.
397.	55	Mr. Gary Sanders, TMT project manager, was asked about the protocol for addressing a leak in the underground 5,000 gallon chemical storage tank. He stated, "It depends on where the leak is. We might have to excavate. We might have to go to the location and then we'd have to remove the material. Tr. 01/3/2017, V. 20 at 77, 6-9.	Misleading. Presented out of context. Dr. Sanders also testified that the process from detection of the leak to remedying the leak would be done as quickly as possible,

			depending upon the weather and the nature of the leak. Tr. 01/04/17 at 85:5 – 86:21. A Spill Prevention and Response Plan will be implemented to address any chemical leaks. Ex. A-1/R-1 at 3-218; UH-TIO FOF 320-430.
398.	56	Mr Sanders stated, "It depends upon the nature of the leak, butpresumably immediate action to pump out the contents of the tank and then to do whatever had to be done to repair. And if the ground was impacted in any way, to remove the affected material." Depending on the weather and the nature of the leak, such clean-up would require days. Tr. 01/4/2017, V. 21 at 84-85: 25, 1-4, 86: 20-21.	Misleading. Presented out of context. Dr. Sanders also testified that the process from detection of the leak to remedying the leak would be done as quickly as possible, depending upon the weather and the nature of the leak. Tr. 01/04/17 at 85:5 – 86:21.
399.	56	When asked about the disposal of hazardous wastes from mirror stripping, Mr. Sanders stated, "And all of the effluent from the stripping and coating process will be collected and stored in a 5,000-gallon double wall with leak detection equipment, underground storage tank and all of that effluent will be treated as if it is hazardous waste, zero discharge and it will be removed periodically. Perhaps once a week or once every two weeks by a trucking company that's licensed and permitted to do hazardous waste removal and properly transport and dispose of the materials." Tr. 01/3/2017, V. 20 at 75-76: 25, 1-9.	Not in dispute.
400.	56	Mr. Sanders explained the process for stripping and recoating the mirrors. When askedwhat kind of chemicals would be used to strip the mirrors, Mr. Sanders replied,"Common chemicals, they're caustic chemicals, some acid and bases. None of which are hazardous chemicals although they do dissolve the coatings, and this is a well-established process." Tr.01/3/2017, V. 20 at 75: 21-24.	Not in dispute.

401.	56	Mr. Sanders states, "It's my understanding that they are not classified as hazardous waste." Tr. 01/3/2017, V. 20 at 97: 11-12.	Incomplete. UH-TIO does not dispute that this was Mr. Sanders's testimony.
402.	56	Sanders continues, "But we are not paying attention to that, we are treating all it [sic] as if it were hazardous waste and handling it as if it was hazardous waste and disposing of it as if it was hazardous waste." Tr. 01/3/2017, V. 20 at 97: 14-17.	Not in dispute.
403.	56	When asked if there is currently a facility on Hawai'i Island that could reprocess that kind of effluent collected from the silver recovering of the plates, Mr. Sanders replied, "I don't know the answer." Tr. 01/3/2017, V. 20 at 231: 4-10.	Irrelevant/Inapplicable. Misleading. Partial quotation. Dr. Sanders testified that the mirror washing effluent would be removed from the underground storage tank "by a contractor who's licensed, you know, by the EPA or whatever other authorities are needed to properly process it, but I don't know how that processing is done." Tr. 01/03/17 at 231:10-15. Dr. Sanders further clarified that the work would be done by a "properly licensed contractor". Tr. 01/03/17 at 231:24-25.
404.	56	Locally generated contributors to air pollution above the inversion level include vehicle exhaust, chemical fumes from construction and maintenance activities, and fugitive dust from various sources, including vehicles traveling on unpaved surfaces and road grading and construction or other activities conducted on unpaved areas. Rapid dispersion of pollutants is aided by strong winds. (Ex A-003 FEIS, p. 3-182)	Misleading. Presented out of context. FOF fails to demonstrate how this relates to the TMT Project. The FEIS goes onto conclude that "the impact of the Project on air quality and the climate will be less than significant." Ex. A-3/R-3 at 3-185.

			Misleading. Partial quotation. Quoted language is preceded by the following statement: "Air quality monitoring has been performed at the Mauna Loa Observatory at an elevation of approximately 11, 140 feet since its construction in 1956. This monitoring station provides data most representative of the conditions at Maunakea. The data gathered at this station indicate that the air quality at the Mauna Loa Observatory is excellent and in attainment status with State and National Ambient Air Quality Standards (NAAQS). Given the similarities between the two locations (Maunakea and Maunaloa), **it has been inferred that the overall air quality at Maunakea is excellent as well.**" Ex. A-3/R-3 at 3-182 (emphasis added). Incomplete. *See* UH-TIO FOF 433-464.
405.	57	Threats to Mauna Kea's air quality and sonic environment primarily revolve around the presence of humans and their levels of activity. Potential future increases in the number of people visiting, working, and recreating at the UH Management Areas may increase the levels of these impacts. Ex A-010 CMP	Misleading. Misleading. Presented out of context. *See* UH-TIO FOF 978 – 983. This Proposed FOF does not address

		NRMP p. 2.1-46	specific impacts of the TMT Project. The FEIS states that "the impact of the Project on air quality and the climate will be less than significant." Ex. A-3/R-3 at 3-185. The noise impacts from the TMT Project will be less than significant. UH-TIO FOF 978-983; Ex. A-3/R-3 at 3-201 to 203. Incomplete. *See* UH-TIO FOF 433-464.
406.	57	The TMT Observatory will be visible from locations within the summit region, primarily the northern plateau and northern ridge of Kukahau'ula. A001 CDUA 7-9	Misleading. Partial quote. Ex. A-1/R-1 states that "Although the TMT Observatory will not be visible from the summit of Mauna Kea (#16) or from Lake Waiau (#17) as shown on Figure 7.1, it will be visible from other locations within the summit region, primarily the northern plateau and the northern ridge of Kūkaha'ula" where existing telescopes are located. At 7-9. Ex. A-1/R-1 goes on to state that "The TMT Observatory will also be hidden from Pu'u Līlīnoe and Lake Waiau,

			culturally important areas from which a number of the existing observatories are visible. However, the TMT Observatory will be visible within the northern portion of the summit region, including the northwestern portion of Kūkahau'ula, referred to as Pu'u Hau'oki, Pu'u Pōhaku, and Pu'u Poli'ahu. Many of the existing observatories are also visible from these areas." At 7-11. *See also*, UH-TIO FOF 306, 586, 771, 780, 781, 900-905. The CDUA is more accurately noted in Ward's proposed FOF 407.
407.	57	The TMT Observatory will add a new visual element to a relatively undeveloped portion of the summit region. That element will be visible from viewpoints along the northern ridge of Kukahu'ula and from roadways within the northern portion of the summit region. A001 CDUA 7-11 TMT Mgt Plan 2-5	Misleading. Presented out of context. UH-TIO object to this proposed FOF to the extent that it is intended to imply that the TMT Project will have a substantial adverse impact on visual resources. *See* UH-TIO FOF 775-795. Ex. A-1/R-1 states that "Although the TMT Observatory will not be visible from the summit of Mauna Kea (#16) or from Lake Waiau (#17) as shown

			on Figure 7.1, it will be visible from other locations within the summit region, primarily the northern plateau and the northern ridge of Kūkaha'ula" where existing telescopes are located. At 7-9. Ex. A-1/R-1 goes on to state that "The TMT Observatory will also be hidden from Pu'u Līlīnoe and Lake Waiau, culturally important areas from which a number of the existing observatories are visible. However, the TMT Observatory will be visible within the northern portion of the summit region, including the northwestern portion of Kūkahau'ula, referred to as Pu'u Hau'oki, Pu'u Pōhaku, and Pu'u Poli'ahu. Many of the existing observatories are also visible from these areas." At 7-11. *See also*, UH-TIO FOF 306, 586, 771, 780, 781, 900-905.
408.	57	The DLNR feels that the visual impacts have been downplayed in the analysis. The analysis does not seem to account for the visual impact of the project on the individuals that move within and between impacted viewplanes, impact on visitors, and more importantly, the impact of viewing a new very large observatory from the perspective within the summit area. Laura Thielen, Chair, DLNR Ex A-004 FEIS Vol II p 21 of 531	Misleading. Presented out of context. These comments were made with regards to the Draft Environmental Impact Statement (during the comment period). The Department of Land and Natural Resources' concerns regarding visual impacts were

			specifically addressed in the FEIS, as noted in Ex. A-4/R-4 at 21 of 531. Among other revisions, the FEIS included a new visualization and discussed other viewplanes. The FEIS noted that the TMT Observatory would not block or substantially obstruct the identified views and viewplanes and its impact is considered less than significant. Ex. A-004 at 21 of 531.
409.	57	The TMT would intrude upon the currently unobstructed view of Haleakala Mountain as well as the primary view of the setting sun from the mountain. It will also obstruct viewplanes used for traditional and cultural spiritual and religious Native Hawaiian practice. The Northern Plateau is one of the last un-hindered open space areas with views down to the sea, along the coasts, and across the island chain. The TMT would neither preserve nor improve upon Mauna Kea's natural beauty; the eighteen-story building would be twice the highest allowable structure in Hawaii County, and would forever change the wilderness experience in the summit region. B.17a Ward WDT p 15	Not credible (D.Ward not a cultural practitioner). Unsupported/Unsubstantiated. *See* UH-TIO FOF 704, 775-795, 868-913. Assumes facts not in evidence as it was not established by any evidence that such view planes were part of any bundle of rights traditionally and culturally exercised. UH-TIO's FOF regarding visual and aesthetic resources is more credible and supported by the record. UH-TIO FOF 775-795.
410.	57	Development of six acres of industrial infrastructure with twice the County of	Incomplete/Vague and

		Hawaii's allowable height limit (FEIS calls it a "new visual element on the northern plateau") on the last remaining unobstructed view plane facing Haleakala will significantly negatively affect my recreational practices. The view of Mauna Kea's summit, from my vantage point at my residence, from the beach at Hilo bay, from my hiking trails on Mauna Loa, all are fettered by the presence of multiple domes on the skyline; it is almost impossible to find a location on the island of Hawaii where one cannot see a telescope in one's view of Mauna Kea. I believe I am not alone in finding these visual obstructions a significant annoyance and an adverse impact. B.17a Ward WDT p 3	Ambiguous (the FOF is written from a "first person" perspective, with Ward as the apparent source, and is an improper FOF). Misleading. Presented out of context. Ward is not a cultural practitioner and her practices are not protected under the Hawai'i Constitution. Additionally, Ward's hiking practices do not occur at the proposed TMT Project site. *See* UH-TIO FOF 748. Unsupported/Unsubstantiated as to Ward's "belief" that she is not alone in her opinion. *See supra* UH-TIO's response to Ward's proposed FOF 410.
411.	58	Applicant does not define "noise sensitive areas." Ex A-003 FEIS Section 3.13 Noise p 3-179	Inaccurate/False. The FEIS provides various descriptions of "noise sensitive" locations, areas, and sites. *See, e.g.*, Ex. A-3/R-3 at 3-173 (identifying noise sensitive sites near the TMT Project), 3-175 (identifying Kūkahau'ula as a noise sensitive location), 3-179 (describing all noise sensitive areas located in the summit region); *see also*,

			UH-TIO FOF 980. The noise impact from the TMT Project will be less than significant. UH-TIO FOF 978-983.
412.	58	Applicant does not conduct an analysis the cultural impacts of noise levels and offers no analysis of noise from culturally significant places like Pu`u Poliahu. FEIS Section 3.13 Noise p 3-179	Inaccurate/False. Misrepresentation. The TMT Project operations are not expected to cause a significant noise impact, and although no mitigation measures (beyond compliance with applicable regulations are required), mitigation measures will be employed. The finding of less than significant impact to noise sensitive areas addresses the cultural impact. Ex. A-3/R-3 at 3-179-180; UH-TIO FOF 978-983.
413.	58	The Applicant concedes that significant noise would result from construction activities such as excavation, trenching, grading, pouring of foundations, and erection of structures. FEIS Section 3.15 Construction and Decommissioning p 3-202	Misrepresentation. Misleading. Presented out of Context. UH did not concede that "significant" noise would result. Noise impacts from construction will be mitigated through compliance with conditions in Noise Permits and the Noise Variance. Construction noise at

			the TMT Observatory site is likely to be inaudible from a relatively short distance from the source due to the existing background noise associated with the strong wind conditions at the summit. Ex. A-3/R-3 at 3-203.
414.	58	Construction of the proposed project would violate noise regulations, such that a noise variance would be required under HAR 11-46-8 for construction of the TMT Observatory. FEIS Section 3.15 Construction and Decommissioning p 3-202	Misleading. Misrepresentation. The EIS states that proper steps will be taken to ensure that construction complies with all applicable noise regulations. *See* Ex. A-3/R-3 at 3-203. A noise variance would be obtained in connection with noise permits so that construction noise will comply with the variance and permits, and the TMT Project will comply with all variance and permit conditions. Ex. A-3/R-3 at 3-203.
415.	58	The Applicant acknowledges the proposed project would generate construction-related noise in the 80-100 dBA range at 50 feet for front-end loaders, backhoes, tractors, scrapers, graders, pavers, trucks, concrete mixers, concrete pumps, cranes, compressors, pneumatic wrenches, jack hammers, and rock drills. Short periods of blasting may also be necessary to dig foundations for the TMT Observatory. FEIS Section 3.15 Construction and Decommissioning p 3-202	Misleading. Presented out of context. UH-TIO clarified that no explosives or blasting will be done to construct the TMT Project. *See* UH-TIO FOF 283. The sound does not project very far under most conditions. UH-TIO FOF 978.

			The noise impacts from the TMT Project will be less than significant. Construction noise at the TMT Observatory site is likely to be inaudible from a relatively short distance from the source due to the existing background noise associated with the strong wind conditions at the summit. UH-TIO FOF 978-983; Ex. A-3/R-3 at 3-201 to 203.
416.	58	Noise level in the vicinities of the existing observatories varied from 38 dBA to 77dBA Leq, and 40-78 dBA L10, with noise levels at or below 60 dBA Leq beyond a distance of 50 feet from HVAC exhausts. The loudest noise levels of 68 and 77 dBA Leq and 69 and 78 dBA L10, were measured at locations within 15 feet of HVAC exhaust outputs. Ex A-003 FEIS Section 3.13 Noise p 3-175, 176	Misleading. Presented out of context. The noise generated by the TMT Observatory will be minimal. UH-TIO FOF 978-986. The sound does not project very far under most conditions. UH-TIO FOF 978. The noise impacts from the TMT Project will be less than significant. UH-TIO FOF 978-983; Ex. A-3/R-3 at 3-201 to 203. Misleading. Partial quotation. The quoted portion is followed by this statement: "The Pu'u Wekiu/Kukahau'ula Summit and Trailhead

			measurement locations experienced measured noise levels of 47 and 49 dBA Leq, and 50 and 53 dBA L10. Sounds from existing observatory HVAC exhaust systems were not noticeable during the summit location field measurement; despite its remote location, the summit was not completely silent. **The dominant noise source for sound levels measured at recreational use sites was due to a steady wind of 5 to 14 mph moving from the direction of the nearby observatories toward the measurement locations. Winds in this range are typical for this area and generally dominate the ambient noise levels."** Ex. A-3/R-3 at 3-176 (emphasis added).
417.	58	At the public hearing, OCCL Staff acknowledged that telescope activities do interfere with the quiet enjoyment of the mountain and thus added a condition to the TMT CDUA requiring that 4 days be set aside for reduced activities at the TMT. The OCCL staff said: "Shut the lights down a bit; shut the process down so that on certain days Native Hawaiians can have even more solitude." (Ex. BLNR Minutes, page 8)	Citation does not support proposition (incomplete citation). This citation to the record is unclear.. UH-TIO do not dispute, however, that, as a mitigation measure, TMT Observatory operations will be minimized for up to four days per year to accommodate cultural activities

			on culturally sensitive days of the year. UH-TIO FOF 686; Ex. A-3/R-3, at S-12. Misleading. Presented out of context. The noise generated by the TMT Observatory will be minimal. UH-TIO FOF 978-986.
418.	59	The Applicant contends that because impacts are already substantial, adverse and significant, adding more to that impact is not going to change those impacts, while simultaneously claiming their proposed mitigation measures will offset and reduce the negative impacts to less than significant.	Mischaracterization of applicant's legal position. Incomplete. *See* UH-TIO FOF 343.
419.	59	One of the most efficient ways of preserving a sensitive ecosystem is to limit future development in the area. (emphasis added) An additional measure of protection for sensitive habitats can be achieved by prohibiting development of any currently undeveloped pu'u (or portion thereof) at the summit. Ex A-010 CMP NRMP	Citation does not support proposition (no pincite). Lacks evidentiary support.
420.	59	All future developments in the Science Reserve and at Hale Pohaku should include mitigation plans for preventing or repairing damage to sensitive habitats caused by construction and development activities. Any habitat that will be permanently removed should be replaced on at least a one-to-one basis, through either creation of new habitat, restoration of degraded existing habitat, or by permanent protection of similar unique habitats. Mitigation projects on the summit should focus on protection of Wekiu bug habitat from alien species introduction and predation. Ex A-010 CMP NRMP	Citation does not support proposition (no pincite). Lacks evidentiary support.
421.	59	Instead, the Applicant proposes several other mitigation measures, including: paint, reduced size, furniture, and money. A071 p 1-11	Incomplete. Misleading. Presented out of context. The mitigation measures presented in this FOF are a few of many mitigation measures that will be employed

			by UH and TIO. *See, e.g.*, Exhibit B to Exhibit A-1 (CDUA) at 4-1 to 4-44; Ex. A-71; Ex. A-3/R-3 at S-12 to S-19.
422.	59	The CDUA outlines three project-level mitigations for the known visual impacts of the proposed TMT observatory; (1) The location of the TMT project is the primary impact avoidance measure, as it is north of and below the summit.; (2) The design of the observatory also mitigates the visual impact. The dome has been designed to fit very tightly around the telescope, and the telescope has been designed to be much shorter than usual. (3) Also, the coating of the dome will be a reflective aluminum- like coating, which during the day reflects the sky and reduces the visibility of the structure. Ex. A001 (CDUA), p. 2-17, 7-13	Misleading. Presented out of context. The mitigation measures presented in this FOF are a few of many mitigation measures that will be employed by UH and TIO. *See, e.g.*, Exhibit B to Exhibit A-1 (CDUA) at 4-1 to 4-44; Ex. A-71; Ex. A-3/R-3 at S-12 to S-19.
423.	59	Figure 1-3: Mauna Kea Summit Region: Existing Facilities, Features, & Future Development Areas in the CDUA shows that the location of TMT north of and below the summit is due to the fact there is no available room on the summit within the designated Astronomy Precinct due to the existing observatories. This is not a mitigation measure for eliminating the visual impact of the TMT observatory. Ex. A0011(CDUA), p. 1-4, 7-13	Citation does not support proposition. Inaccurate/False. The TMT Project could have been constructed at the summit. The northern plateau was chosen for a variety of reasons. *See* UH-TIO FOF 169, 306, 307.
424.	60	Use of ceded lands for $1 a year or nominal consideration", "[s]ubleases between the University and the observatories", "[p]roposed new development on Mauna Kea, including the Thirty Meter Telescope (TMT) and Pan Starrs", "[c]ommunity benefit package with increased educational benefits", and "[g]uaranteed employment opportunities for Native Hawaiians and the people on the Island of Hawai'i" are "Issues and Concerns Beyond the Scope of the CMP" that "policy makers are urged to consider in their broader decision making related to Mauna Kea." Ex A-009 CMP, p. 2-3.	Not in dispute as to statement in CMP. Misleading as to any legal conclusions implied therefrom.
425.	60	The Mauna Kea Lands Fund special fund is established under section 2170 of Chapter 304A, HRS. (HRS §304A-2170)	Not in dispute.
426.	60	Per Chapter 304A, the University is authorized to: "give thorough instruction	Not in dispute.

		and conduct research in, and disseminate knowledge of, agriculture, mechanic arts, mathematical, physical, natural, economic, political, and social sciences, languages, literature, history, philosophy, and such other branches of advanced learning as the board of regents from time to time may prescribe and to give such military instruction as the board of regents may prescribe and that the federal government requires..." (HRS §304A-102)	
427.	60	Section 2170 of Chapter 304A, HRS, states in relevant part: "(b) The proceeds of the special fund shall be used for: (1) Managing the Mauna Kea lands, including maintenance, administrative expenses, salaries and benefits of employees, contractor services, supplies, security, equipment, janitorial services, insurance, utilities, and other operational expenses"	Misleading. Partial quotation. HRS § 304A-2170 also provides that the funds may be used for the enforcement of administrative rules related to Mauna Kea.
428.	60	"Managing the Mauna Kea lands" fails to mention the protection, preservation, or conservation of natural and cultural resources as a purpose of the special fund. (HRS §340A-2170(b)(1))	Irrelevant/Inapplicable. Misleading. Presented out of context. Misleading. Partial quotation. HRS § 304A-2170 also provides that the funds may be used for the enforcement of administrative rules related to Mauna Kea. Administrative rules are a tool that is used to manage and protect resources on Mauna Kea.
429.	60	Mauna Kea Lands Fund does not provide for the management of conservation district resources. (HRS §304A-2170(b)(1))	*See supra* UH-TIO's response to Ward's to FOF 428.
430.	60	The Applicant did not present evidence to show that depositing an unknown quantity of money into the Mauna Kea Land Fund will ensure protection, preservation, and conservation of resources in the Mauna Kea conservation district.	Unsupported/Unsubstantiated. Argumentative.
431.	60	The Applicant and DLNR staff discuss both decommissioning of the TMT site, as well as decommissioning of other telescopes as methods for mitigating the significant, substantial, adverse impact of the TMT proposal.	Citation does not support proposition. Otherwise, FOF not in dispute.

		Ex. A-311, p. 2-7	
432.	61	DLNR staff contends that a lack of staff and funding prevents them from carrying out management actions. This is because BLNR violated its fiduciary duties under Section 5(f) of the Hawaii Admission Act and its statutory duty under HRS § 171-33(5) by disposing of the Section 5(b) lands on Mauna Kea without a proper appraisal and at less than their independently appraised fair-market value. DLNR, by not collecting payment of lease rents at fair-market value, places an unacceptable burden on Hawaii taxpayers, who must subsidize international astronomy. Ward WDT B.17a	Unsupported/Unsubstantiated. Not credible. Irrelevant/Inapplicable. Lack of Jurisdiction. Argumentative.
433.	61	OCCL Staff Report for the TMT CDUA states that a. "Environmental protection costs money. Protecting historic and cultural resources costs money. Education costs money. Maintaining public access and ensuring public safety costs money. Routine infrastructure maintenance costs money. Stopping TMT, and fighting all development will not restore the mountain to a pre-contact condition. The existing roads, electric lines, and facilities will not disappear. Rather, as funds dry up, active and strong management will become difficult, maintenance and renovations will slow, infrastructure will crumble—and the very cultural and environmental resources that Sierra Club et al purport to protect will suffer." Ex A007 p 62	Citation does not support proposition. Misleading. Partial quotation. The quoted excerpt is preceded by the following sentence: "The fundamental flaw that Sierra Club et al. make is not recognizing that strong management - which they fought for - requires significant investment." Ex. A-7/R-7 at 60 (italics in original).
434.	61	The statement in the CDUA that potential impacts to cultural, archaeological, and historical resources (omitting biological and natural) would cease upon decommissioning (to the extent practicable) is illogical. No decommissioning project will restore the cultural and natural landscape that has been altered. The impact is irrevocable. Ex B.17a Ward WDT	Unsupported/Unsubstantiated. Not credible. Argumentative.
435.	61	It was disclosed by Mr Hansen during cross-examination that it would take 100 years for flora to regenerate after the proposed excavation & disturbance at TMT site. (Hansen, Tr. Tr. 1/19/12017)	Citation does not support proposition. Lacks evidentiary support.
436.	61	Mr Eric Hansen stated that after substrate disturbance in Area E,	Unsupported/Unsubstantiated.

		recolonization of the highly evolved, unique lichen and moss assemblages in the area would be very slow, if possible at all. Tr. 1/19/12017, Vol 27:159:22-25, 160:1-3	Not credible. Inaccurate/False. There are no unique species or assemblages of species at the TMT Project site. *See* UH-TIO FOF 474, 477-479.
437.	61	The University claims there will be fewer telescopes when the lease expires, but the CMP decommissioning plan leaves specifics regarding the extent of site restoration undefined. As a result, the costs and risks associated with decommissioning are difficult to gauge. Ex. A013	Citation does not support proposition. Unsupported/Unsubstantiated. Misleading. Presented out of context. The starting point for determining the level to restore a site begins with full restoration. UH-TIO FOF 336; Ex A-13 at 26.
438.	62	The TMT project satisfies the regulatory definition of "significant effect" because it proposes to construct a new 18-story, 5-acres industrial structure on undeveloped land. The foreseeable significant harm of the proposal include significant viewplanes interrupted, open space lost, the historic district degraded, traditional and customary practices violated, and increased risk to groundwater resources.	Unsupported/Unsubstantiated.
439.	62	HRS 343-2 defines "Significant effect" to mean "the sum of effects on the quality of the environment, including actions that irrevocably commit a natural resource, curtail the range of beneficial uses of the environment, are contrary to the State's environmental policies or long-term environmental goals as established by law, or adversely affect the economic welfare, social welfare, or cultural practices of the community and State."	Irrelevant/Inapplicable. The time for a challenge to the FEIS under Chapter 343 has passed. *See* UH-TIO COL 385.
440.	62	The development of observatories within the Astronomy Precinct substantially altered the appearance of the summit, and the presence of these observatories continues to affect the performance of religious and cultural	Citation does not support proposition.

		practices. Ex. A-003, (TMT FEIS Section 3.16 Cumulative Impacts), p.3-225	Mischaracterization.
441.	62	From a cumulative perspective, the impact of past and present actions on cultural, archaeological, and historic resources is substantial, significant, and adverse; the impacts would continue to be substantial, significant and adverse with the consideration of the Project and other reasonably foreseeable future actions. (Emphasis added) Ex. A-003, TMT FEIS, p. S-8	Misleading. Partial quotation. Quoted section of the document states thereafter: "In general, the Project will add a limited increment to the current level of cumulative impact. Therefore, those resources that have been substantially, significantly, and adversely impacted by past and present actions would continue to have a substantial, significant, and adverse impact with the addition of the Project. For those resources that have been impacted to a less than significant degree by past and present actions, the Project would not tip the balance from a less than significant level to a significant level and the less than significant level of cumulative impact would continue." Ex. A-3/R-3 at S-9.
442.	62	From cumulative perspective, the impact of past and present actions on the traditional and customary practices of Native Hawaiians has been substantial, significant and adverse; the impacts would continue to be substantial, significant, and adverse with the consideration of the Project	Unsupported/Unsubstantiated. Misleading. Presented out of context. The TMT Project would not result in a substantial, significant, and adverse impact to traditional and customary practices. *See* UH-TIO FOF

			433-839, COL 177-217.
443.	62	Project specific impacts would have a significant effect on the natural, cultural, archaeological, and historic resources. FOF # 291-405	Citation does not support proposition. Unsupported/Unsubstantiated. Not credible. Incorrect/Inaccurate. *See* UH-TIO FOF 433-839, COL 177-217; Ex. A-3/R-3 at S-9 to S-19.
444.	62	Project specific impacts would have a significant effect on the continued practice of traditional and customary Native Hawaiian practices.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 611-774, COL 177-217.
445.	63	The Applicant concedes that the project would add a new visual element to the summit area of Mauna Kea, where the visual impact of past actions on Mauna Kea, such as the 11 observatories currently located within the Astronomy Precinct, is already considered substantial, significant and adverse. Ex A-003 FEIS Section 3.5 Visual and Aesthetic Resources p 3-101, FOF #201	Misleading. Presented out of context. Although the TMT Observatory would add a new visual element, the project's visual impact will be less than significant under HAR § 11-200-12. UH-TIO FOF 777. Misleading. Partial quotation. Quoted portion is preceded by the following statement: "The Project's visual impact is perceived by some to be significant; however, in the context of the existing observatories and the fact that the TMT Observatory will not block

			or substantially obstruct the identified views and viewplanes of the mountain, which is the applicable significance criteria in §11-200-12 of the HAR, the Project's visual impact will be less than significant." Ex. A-3/R-3 at 3-101.
446.	63	The Applicant concedes that construction of the TMT would destroy natural wildlife habitat that would need 100 years to recover. FOF#303-310	Unsupported/Unsubstantiated. Citation does not support proposition. Not credible.
447.	63	Because the proposal includes increased industrial activity over known aquifers, the TMT project would increase the likely damage to water resources on Mauna Kea. (FoF #372-381, 385-387	Unsupported/Unsubstantiated. Not credible. Inaccurate/False. *See* UH-TIO FOF 796-823, COL 177-217. False/Inaccurate. *See* Ex. A-3/R-3 at 3-122 ("The mitigation measure will further reduce the level of impact to water resources, which is considered less than significant without any mitigation"); *see also*, UH-TIO FOF 373.
448.	63	The existing potential risk to water resources on Mauna Kea is significant. FoF #345	Unsupported/Unsubstantiated. Citation does not support proposition.

			Inaccurate/False. *See* Ex. A-3/R-3 at S-8 (stating that the existing cumulative impact to water resources on Mauna Kea is less than significant). False/Inaccurate. *See* Ex. A-3/R-3 at 3-122 ("The mitigation measure will further reduce the level of impact to water resources, which is considered less than significant without any mitigation"); *see also*, UH-TIO FOF 373.
449.	63	Given the high permeability of the cinder on Mauna Kea and the existence of five aquifer under the summit area, the project specific and cumulative impact of telescope activity on water resources is significant, substantial, and adverse, and poses a risk to public health FoF 374-378	*See supra* UH-TIO's response to Ward's proposed FOF 447. Inaccurate/False. *See* UH-TIO FOF 796-823.
450.	63	Based on the findings of fact above, the TMT may have a significant effect on water resources, rare, native species, and air quality.	Citation does not support proposition. Unsupported/Unsubstantiated. Not credible. Incorrect/Inaccurate. *See* UH-TIO FOF 433-839.
451.	63	Overall the existing level of cumulative visual impacts from the past projects at the summit Is considered to be substantial, significant and adverse. .If the TMT is built, the TMT would add tthe cumulative visual Impact that has already been substantial, significant and adverse.	Unsupported/Unsubstantiated. Inaccurate/False. *See* Ex. A-3/R-3 at 3-101 ("in the context of the existing observatories and the

			fact that the TMT Observatory will not block or substantially obstruct the identified views and viewplanes of the mountain, which is the applicable significance criteria in §11-200-12 of the HAR, the Project's visual impact will be less than significant").
452.	63	The TMT project would represent an additional increment. It would add to the cumulative visual impact of astronomy development? It would be an increment of impact. Tr. 10/25/16, V.3 at 155:10-25	Misleading. Presented out of context. Although the TMT Observatory would add a new visual element, the project's visual impact will be less than significant under HAR § 11-200-12. UH-TIO FOF 777. Misleading. Presented out of context. *See* WDT Hayes at 19 ("The standard industry practice for conduct a visual impact analysis is to consider the context of the proposed land use. In other words, the impact of the proposed Project must be assessed in the context of the Mauna Kea Astronomy Precinct. The Astronomy Precinct is not a bare mountaintop with no telescope structures. Rather, there are 11 other observatories in the Astronomy Precinct. The TMT Observatory will not substantially obstruct or block

			existing views of Maunakea from around the island of Hawai'i. The TMT Observatory will be visible from only about 14 percent of the island area. The new area where the TMT Observatory will be visible and where currently none of the existing observatories can be seen is approximately only 1.2 percent of the area of the island. Furthermore, the TMT Observatory will be visible to only about 15.4 percent of the population, and the great majority of those residents already can see one or more observatories from their residences. Therefore, **while the TMT Observatory will be a new visual element among the existing observatories, it does not substantially alter the current overall visual impact of the Astronomy Precinct area"** (emphasis added).
453.	63	Asked what is the difference between increment and cumulative, Mr Hayes responded "cumulative impacts is the sum of increments". When asked if the TMT would add to the cumulative visual impact that you have already stated is substantial, Significant and adverse, he agreed that it is. Tr. 10/25/16, V.3 at 155:10-25, 156;1-6	Citation does not support proposition. Mischaracterization. This COL implies that Mr. Hayes stated that the TMT Project would result in a substantial, significant, and

			adverse impact to the visual resources on Mauna Kea. However, Mr. Hayes testified that the TMT Project would merely add an increment to the cumulative impact, but would not "tip any of the evaluated impacts from a significant -- or from a less than significant to a significant level." Tr. 10/25/16 at 181:6-10.
454.	64	Mr Hayes was asked , as project manager for the EIS and a collaborator on the CDUA, Is It still your position that all of these Impacts do not add to the already significant adverse and substantial cumulative Impac tIn the Historic District? He answered " As I've said, this project will add an Increment to the cumulative impact, however, it will not tip any of the evaluated Impacts from a significant or from a less than Significant to a significant level. Tr. 10/25/16, V.3 at 181:1-10	Misleading. Partial quotation. The complete question and testimony are as follows: Q As project manager for the EIS and a collaborator on the CDUA, is it still your position that all of these impacts do not add to the already significant adverse and substantial cumulative impact in the Historic District? A As I've said, this project will add an increment to the cumulative impact, however, it will not tip any of the evaluated impacts from a significant -- or from a less than significant to a significant level. Tr. 10/25/16 at 181:1-10.
455.	64	Hawaii Administrative Rules 11-200-12(b) says "In determining whether an action may have a significant effect on the environment, the agency shall	Irrelevant/Inapplicable. Title 11, Chapter 200 of the Hawai'i

		consider every phase of a proposed action, the expected consequences, both primary and secondary, and the cumulative as well as the short-term and long-term effects of the action. In most instances, an action shall be determined to have a significant effect on the environment if it:	Administrative Rules pertains to environmental impact statements. The time for objecting to the FEIS in this matter has long passed.
456.	64	HAR 11-200-2 defines "Cumulative impact" to mean "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."	Irrelevant/Inapplicable. Title 11, Chapter 200 of the Hawai'i Administrative Rules pertains to environmental impact statements. The time for objecting to the FEIS in this matter has long passed.
457.	64	Based on HAR 11-200, the analysis to determine whether a project would have a significant effect is not based on a threshold, but on the extent accumulated impacts.	Citation does not support proposition. Mischaracterization.
458.	65	Based on the findings of fact above, however, the foreseeable impacts of the TMT proposal are both individually and cumulatively significant.	Unsupported/Unsubstantiated. Inaccurate/False. Incomplete (the COL does not specify the nature of the alleged impacts, nor whether such impacts are adverse or positive). Misleading. Presented out of context. Although the TMT Observatory would add a new visual element, the project's visual impact will be less than significant under HAR § 11-200-12. UH-TIO FOF 777.
459.	65	The mitigation measures offered do not directly address threats to water resources, cultural practices, obstructed viewplanes, among the many	Unsupported/Unsubstantiated. *See* UH-TIO FOF 433-839, COL

		significant impacts identified in these findings of fact.	177-217. Assumes facts not in evidence.
460.	65	The Applicant and Project entity propose a wide range of mitigation measures to reduce the admitted significant effects of the TMT project. These mitigation measures, however, fail to reduce the significant effects of the specific project, as well as the cumulative impact of telescope activity on Mauna Kea, to a level that is less than significant.	Inaccurate/False. Misrepresentation re: "the admitted significant effects of the TMT project." Unsupported/Unsubstantiated. *See* UH-TIO FOF 433-839, COL 177-217. Assumes facts not in evidence.
461.	65	The Applicant has the burden of proof in demonstrating that the significant effects of the proposed project are mitigated to a level that is less than significant.	Unsupported/Unsubstantiated. Mischaracterization. HAR § 13-1-35(k) states that "The party initiating the proceeding and, in the case of proceeding on alleged violations of law, the department, shall have the burden of proof, including the burden of producing evidence as well as the burden of persuasion. The quantum of proof shall be a preponderance of the evidence." Similarly, HAR § 13-5-30(c) provides that "[t]he applicant shall have the burden of demonstrating that a proposed land use is consistent with." There is no rule that imposes a specific burden of proof on the

			applicant to demonstrate that the effects of a proposed project are mitigated to a level less than significant.
462.	65	HAR § 11-200-17 (M) provides that: A. "The draft EIS shall consider mitigation measures proposed to avoid, minimize, rectify, or reduce impact, including provision for compensation for losses of cultural, community, historical, archaeological, fish and wildlife resources, including the acquisition of land, waters, and interests therein. **Description of any mitigation measures included in the action plan to reduce significant, unavoidable, adverse impacts to insignificant levels, and the basis for considering these levels acceptable shall be included**. Where a particular mitigation measure has been chosen from among several alternatives, the measures shall be discussed and reasons given for the choice made. Included, where possible and appropriate, should be **specific reference to the timing of each step proposed to be taken in the mitigation process, what performance bonds, if any, may be posted, and what other provisions are proposed to assure that the mitigation measures will in fact be taken."**	Irrelevant/Inapplicable. Title 11, Chapter 200 of the Hawai'i Administrative Rules pertains to environmental impact statements. The time for objecting to the FEIS in this matter has long passed.
463.	65	In federal law, 40 CFR § 1508.20, "mitigation" is defined as "(a) Avoiding the impact altogether by not taking a certain action or parts of an action. (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation. (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment. (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.	Irrelevant/Inapplicable.

		(e) Compensating for the impact by replacing or providing substitute resources or environments"	
464.	66	To be relevant mitigation must be focused on the restoration of the adverse impact caused by the project. There must be a direct nexus between the harm caused by the proposed project and the mitigation effort promised. See, Morimoto v. Bd. of Land & Natural Res., 107 Haw. 296 (2005)	Citation does not support proposition. Misrepresentation. The *Morimoto* case does not state any requirement that there be a direct nexus between the harm caused by the proposed project and the mitigation effort promised.
465.	66	In addition, there must be an assurance that compensation offered will result in minimizing the impacts caused by the project. See, Morimoto v. Bd. of Land & Natural Res., 107 Haw. 296 (2005) (finding U.S. government was capable of creating new, more preferable palila habitat, where the project proposed to destroy less preferable habitat; the requirement was legally enforceable).	Citation does not support proposition. Misrepresentation. The *Morimoto* case does not state any requirement that the applicant provide assurances regarding minimization of the impacts caused by the proposed project.
466.	66	Applicant UH-Hilo is legally responsible for all obligations and/or liabilities resulting from a finally approved CDUP. TMT is not a legal party or participant to this CDUA process. Because the record provides no evidence of an Operational Agreement or any type of legal document between the Applicant and TMT, there is no mechanism for BLNR to require the TMT Corporation comply with permit terms and conditions.	Misleading. Presented out of context. The TIO Sublease requires TIO to comply with the permit. Ex. B.02f at 3: The construction and operation of the Subleased Premises shall be conducted in strict compliance with the terms and conditions of Conservation District Use Permit HA-3568 approved by the Lessor on April 12, 2013 (the "TMT CDUP"), including performance of all mitigation conditions set

			forth therein, and any amended or subsequent Conservation District Use Permit.
467.	66	"No application for any proposed facility shall have final approval without the applicant having first filed, with the Board, adequate security equal to the amount of the contract to construct the telescope facilities, support facilities and to cover any other direct or indirect costs attributed to the project. ..." The 1977 Mauna Kea Plan - II (C)	Unsupported/Unsubstantiated. The 1977 Management Plan is merely a policy guide not intended to impose rigid standards. *See* UH-TIO FOF 339. Irrelevant/Inapplicable.
468.	66	The CDUA does not include any indication that "adequate security equal to the amount of the contract to construct the telescope facilities" has been filed.	Unsupported/Unsubstantiated. The 1977 Management Plan is merely a policy guide not intended to impose rigid standards. *See* UH-TIO FOF 339. Irrelevant/Inapplicable.
469.	66	The findings of fact in this case do not demonstrate that the Applicant has satisfy the requirements for mitigation of significant effects.	Unsupported/Unsubstantiated. Mischaracterization. There is no specific requirement that the applicant mitigate impacts. Mitigation efforts are a factor that should be considered in determining the merits of the CDUA. *See Morimoto v. Board of Land and Natural Resources*, 107 Hawai'i 296, 302-304 (2005). As such, there is no specific mitigation "requirement" to "satisfy," as Ward appears to

			assert.
470.	67	The Applicant and DLNR staff cite the "Comprehensive Management Plan" as one of the main reasons the significant impacts of the TMT will be mitigated to a level that is less than significant. The conclusion of the Applicant and staff is not supported by the record.	Unsupported/Unsubstantiated.
471.	67	Before the Intermediate Court of Appeals, the Applicant described the CMP as a plan that does "not take action" and is no different from the previous activities the University has undertaken on the UH managed lands.	Irrelevant/Inapplicable. Not in evidence. *See supra* UH-TIO's response to Ward's proposed FOF 266.
472.	67	As the Findings of Fact above demonstrate, the CMP is incomplete. It identifies hundreds of "needs" without any enforceable timelines or benchmarks to ensure those identified needs are met.	Unsupported/Unsubstantiated. Not credible. Inaccurate/False. Misleading. Presented out of context. The subsequent implementation of the CMP is monitored/evidenced by the annual reports to the BLNR. *See* Exs. A-15 to A-22.
473.	67	The CMP is concerned with only a limited subset of the overall conservation district of Mauna Kea and fails to provide limitations on the number and size of future telescope projects.	Unsupported/Unsubstantiated. Not credible.
474.	67	The CMP does not provide a strong management framework that ensures the significant impacts of the TMT and all existing telescope activity are reduced to a level that is less than significant.	Unsupported/Unsubstantiated Not credible. Inaccurate/False.
475.	67	The Applicant concedes that the visual and cultural impacts of the TMT are	Misleading. Presented out of

		significant, substantial, and adverse.	context. UH-TIO concede that certain impacts from past astronomy facilities have been significant, substantial, and adverse. However, "[t]he direct long-term visual impact of the TMT Observatory will be less significant." Ex. A-3/R-3 at 3-103. Additionally, the TMT Project will not result in significant, substantial and adverse impacts to cultural resources or practices. *See* UH-TIO FOF 503-774, COL 177-217.
476.	67	Applicant demonstrated that the proposed TMT could have been larger if the dome-to-aperture ratio of current telescopes was followed. Ex. A-001, p. 1-8)	Not in dispute.
477.	67	The conclusion that the TMT project could have been bigger does not demonstrate that the admitted significant impacts of the project would be reduced to a level that is less than significant.	Unsupported/Unsubstantiated. Misrepresentation. UH-TIO have not admitted that there are any significant impacts that will result from the TMT Project. In fact, there will be no such significant impacts. *See* UH-TIO FOF 433-839, COL 177-217. Misleading. Presented out of context. The reduction to the size of the observatory is one of many mitigation efforts that collectively reduce the impact of the project. *See generally*, Ex.

			A-71.
478.	67	The Applicant proposes to paint the TMT silver to reduce the visual impact of the project. Ex. A-054, p. 33-40	Not in dispute. However, UH-TIO note that the TMT Observatory will not be painted "silver" but will have an "aluminum-like" coating. *See* Ex. C-3.
479.	68	The findings of fact demonstrate that painting the project silver will likely cause a "lighthouse effect" for makai-to-mauka views of the mountain and serious obstacle to open space views from the summit, regardless of its color.	Unsupported/Unsubstantiated. There is no FOF that refers to the silver paint or the fact that it will cause a lighthouse effect. Not credible. UH-TIO note that the TMT Observatory will not be painted "silver" but will have an "aluminum-like" coating. *See* Ex. C-3.
480.	68	The Applicant concedes that the visual and cultural impacts of the TMT are significant, and the finding of facts above demonstrate that significant impact is substantial and adverse.	Unsupported/Unsubstantiated. There is no FOF supporting the proposition that UH-TIO concede that the cultural impacts of TMT are significant. Misrepresentation. UH-TIO concede that the impacts from past astronomy facilities have been significant, substantial, and adverse. However, "[t]he direct long-term visual impact of the TMT Observatory will be less significant." Ex. A-3/R-3 at 3-

			103. Inaccurate/False. There will be no significant/substantial adverse impacts to visual and cultural resources. *See* UH-TIO FOF 611-795, COL 177-217.
481.	68	The Applicant offers no evidence that painting the structure silver will reduce those significant, substantial, and adverse impacts to a level that is less than significant.	Misleading. Presented out of context. The painting/camouflaging of the TMT Observatory is one of many mitigation efforts that collectively reduce the impact of the project. *See generally*, Ex. A-71; *see also* Ex. A-3/R-3 at 3-89 to 3-103. Inaccurate/False. Incomplete/Ambiguous. COL does not specify what type of "impacts" are being referenced. UH-TIO note that the TMT Observatory will not be painted "silver" but will have an "aluminum-like" coating. *See* Ex. C-3.
482.	68	Applicant asserts that sublease rental payments will be deposited in the Mauna Kea Land Funds special fund and used for management of Mauna Kea's natural and cultural resources.	Incomplete. *See* UH-TIO FOF 463.
483.	68	The sublease rent amount has not been negotiated, thus it is unknown how much money would be deposited into the fund.	Unsupported/Unsubstantiated.

			Not credible. Inaccurate/False. *See* UH-TIO FOF 208.
484.	68	The Mauna Kea Lands Fund special fund is established under section 2170 of Chapter 304A, HRS. (HRS §304A-2170)	Inaccurate/False. HRS § 304A-2170 states in relevant part that "[t]here is established the Mauna Kea lands management special fund, into which shall be deposited . . . All net rents from leases, licenses, and permits, including fees and charges for the use of land and facilities within the Mauna Kea lands."
485.	68	Per Chapter 304A, the University is authorized to: "give thorough instruction and conduct research in, and disseminate knowledge of, agriculture, mechanic arts, mathematical, physical, natural, economic, political, and social sciences, languages, literature, history, philosophy, and such other branches of advanced learning as the board of regents from time to time may prescribe and to give such military instruction as the board of regents may prescribe and that the federal government requires..." (HRS §304A-102)	Not in dispute.
486.	68	Section 2170 of Chapter 304A, HRS, states in relevant part: (b) The proceeds of the special fund shall be used for: (1) Managing the Mauna Kea lands . . .	Misleading. Partial quotation. HRS § 304A-2170 also provides that the funds may be used for the enforcement of administrative rules related to Mauna Kea.
487.	68	"Managing the Mauna Kea lands" fails to mention the protection, preservation, or conservation of natural and cultural resources as a purpose of the special fund. (HRS §340A-2170(b)(1))	Irrelevant/Inapplicable. Misleading. Partial quotation. HRS § 304A-2170 also provides that the funds may be used for the enforcement of administrative rules related to Mauna Kea.

			Administrative rules are a tool that is used to manage and protect resources on Mauna Kea.
488.	69	The Applicant did not present evidence to show that depositing an unknown quantity of money into the Mauna Kea Land Fund will ensure protection, preservation, and conservation of resources in the Mauna Kea conservation district.	Irrelevant/Inapplicable. Unsupported/Unsubstantiated. Misleading. Presented out of context. The fund is one of many tools that will be used to ensure protection, preservation, and conservation of resources on Mauna Kea.
489.	69	Because the Mauna Kea Lands Fund does not provide for the management of conservation district resources, depositing money into this fund does not satisfy the requirements for direct and enforceable mitigation of the existing and anticipated significant, substantial, and adverse impact of telescope activity on Mauna Kea.	Inaccurate/False. There is no mitigation "requirement." Additionally, there is no requirement that mitigation be "direct and enforceable." *See supra* UH-TIO's response to Ward's proposed COL 469.
490.	69	Therefore, as the findings of fact demonstrate, the record does not support the Applicant's conclusion that money by itself will reduce the significant impact to a level that is less than significant.	*See supra* UH-TIO's response to Ward's proposed COL 488.
491.	69	The Applicant offers to renaturalize the dirt road leading up Pu`u Poliahu and monitor the Wekiu population for a set period of years. Ex. A-001	Not in dispute.
492.	69	Pu'u Poliahu is not within the scope of the CDUA before the BLNR. Thus mitigation actions related to Pu`u Poliahu are "off-site" mitigations and do not directly address the impact caused by the proposed project.	Unsupported/Unsubstantiated. Ward has provided no authority supporting the proposition that off-site mitigation measures cannot be considered. Indeed, off-site mitigation measures are widely accepted in the context of environmental reviews. *See, e.g.*,

			City of Carmel-By-The-Sea v. U.S. Dept. of Transp., 123 F.3d 1142, 1154 (9th Cir. 1997) (affirming off-site mitigation proposals contained in an FEIS). UH-TIO note the inconsistencies in Ward's arguments. Ward argues that the TMT Project's impact to the entire Mauna Kea Summit Region Historic District must be considered with regards to the CDUA (*see* Ward's proposed COL 604-608), while at the same time arguing that "off site" mitigation measures undertaken within said historic district cannot be considered. Ward cannot have it both ways.
493.	69	Erasing a dirt road is not commensurate with structure of an 18-story, 5-acre industrial building on an undeveloped plateau.	Incomplete/Vague and Ambiguous. Unsupported/Unsubstantiated.
494.	69	Monitoring Wekiu populations is not a mitigation measure because it does nothing to offset or compensate for the Wekiu habitat that would be lost if the TMT were built.	Unsupported/Unsubstantiated. Misleading. Presented out of context. Monitoring populations is one of many actions that will be taken to protect the Wēkiu bug. The TMT Project will not result in any significant adverse impact to Wēkiu bug populations on Mauna Kea. *See* UH-TIO

			FOF 481-496.
495.	69	"Mitigation plans to monitor conditions and develop data in the future are insufficient. Oregon Natural Desert Assoc. v. Singleton, 47 F. Supp. 2d 1182, 1194 (D. Or. 1998).	Incomplete (unclear as to the implication of the quote). Citation does not support proposition. The cited case does not contain a passage stating that "Mitigation plans to monitor conditions and develop data in the future are insufficient." Irrelevant/Inapplicable. This citation is to case law from another jurisdiction that has its own distinct set of statutes, rules, and case law.
496.	69	The University asserts that the TMT Observatory Corporation will commit a $1 million annually to various workforce development and public education efforts.	Not in dispute. UH-TIO note that it is TIO, not TMT Observatory Corporation, that will commit this funding.
497.	70	The Applicant provides no rule or statute authorizing the BLNR to consider such payments in lieu of strict compliance with the Department's permitting requirements, statutory mandates, and constitutional obligations.	Irrelevant/Inapplicable. Misleading. Presented out of context. Misrepresentation. UH-TIO are not arguing that the $1 million dollar contribution authorizes the BLNR to stray from complying with its duties/obligations.
498.	70	Donation of funds for community benefit purposes is outside the scope of the CDUA at issue in this hearing and goes beyond the scope of the BLNR's authority to manage and protect natural and cultural resources. Thus, these donations do not factor into the decision whether this permit application	Inaccurate/False. The donation of funds is directly relevant to "Criteria 8" as provided under HAR § 13-5-30(c)(8), regarding

		should be granted.	public health, safety, and welfare. *See* UH-TIO FOF 937-938, COL 286-289.
499.	70	Decommissioning of a telescope – either a current telescope or of the TMT should it be built – is not within the scope of the CDUA at issue in this hearing.	Inaccurate/False. Unsupported/Unsubstantiated. Decommissioning is relevant with regards to mitigation of overall impacts.
500.	70	The possibility that a telescope may be decommissioned in the future – without facts about the extent and method of that decommissioning or the permit vehicle to ensure it happens – is pure speculation that cannot serve as a basis for the BLNR's decision on the contents of CDUA-HA-3568.	Inaccurate/False. Decommissioning is relevant with regards to mitigation of overall impacts. Unsupported/Unsubstantiated. There is substantial evidence regarding TIO's and UH Hilo's commitment to the decommissioning process, as well as the binding nature of the decommissioning requirement. *See, e.g.*, UH-TIO FOF 140, 151-166, 208, 331-337.
501.	70	The University asserts that it "envisions" less telescopes on Mauna Kea in the future. Indeed, by the terms of General Lease S-4191, there would be no telescopes on Mauna Kea by 2033.	Unsupported/Unsubstantiated.
502.	70	As outlined below, the TMT project cannot satisfy the eight criteria requirements for issuing a CDUP under HAR 13-5-30. The TMT is not consistent with the purpose of the conservation district, the resource subzone, or requirements of the CZMP. Moreover, it is an acknowledged and unmitigated source of substantial adverse impact that is not compatible with, nor improves upon the wide-open space of the northern plateau. The TMT would further subdivide the conservation district for the purpose of	Inaccurate/False. Unsupported/Unsubstantiated. Not credible. Contrary to Haw. S. Ct. ruling in *Kilakila 'O Haleakala. See* UH-

		intensifying land use. Lastly, it poses a further risk to the public's health and welfare. For these reasons, the BLNR cannot permission to build the TMT in the conservation district of Mauna Kea.	TIO COL 116-121.
503.	70	HAR 13-5-24 states "Identified land uses in the resource subzone. Y. R-3 Astronomy Facilities Z. (D-1) Astronomy facilities under an approved management plan."	Not in dispute.
504.	71	HAR 13-5-2 "Management plan means a comprehensive plan for carrying out multiple land uses."	Not in dispute.
505.	71	Mauna Kea Anaina Hou, et al. v. BLNR, et al, Civ. No. 4-1-397, (3rd Cir. Haw. Jan, 19, 2007)) states: AA. "...the 1995 Plan did not provide for the scope and coverage for development of the astronomy facilities on Mauna Kea, as did the 1985 Plan. It is also apparent by review of its contents that the 1995 management plan would not support the CDUA for the project since the 1995 management plan was virtually silent on the matter of future development of astronomy related facilities on Mauna Kea."	Irrelevant/Inapplicable. The 1995 Management Plan was superseded by the 2009 Comprehensive Management Plan. Ex. A-9 at 2-3.
506.	71	The findings of fact above demonstrate that the UH CMP fails to satisfy the requirements for a comprehensive management plan.	Unsupported/Unsubstantiated. Not credible.
507.	71	The UH CMP concerns only "UH Managed Areas," not the entire conservation district of Mauna Kea, which stretches from approximately the 6,000-foot elevation to the summit.	Misleading. Presented out of context.
508.	71	The Third Circuit Court held that the resource to be protected by the comprehensive management plan is the summit of Mauna Kea.	Unsupported/Unsubstantiated.
509.	71	We now know that the 1977 Management Plan for Mauna Kea (written by DLNR staff) identified the scope of the Mauna Kea conservation district as from the summit down to the 6,000-foot elevation and including all lands from the summit to Saddle Road, including the Mauna Kea Forest Reserve	Irrelevant/Inapplicable.

		and Game Management Area, and Kaohe Game Management Area. (Ex. B.17g, page 1)	
510.	71	Indeed, the admitted confusing and complex management work outlined in the CMP would be better served by bringing all management of Mauna Kea under one comprehensive document developed by DLNR and implemented by DLNR.	Irrelevant/Inapplicable. Speculation.
511.	71	The question of future telescope development, and especially the issue of the TMT proposal, were deemed by the authors of the UH CMP as outside the scope of the document. This is to say that the UH CMP is literally silent on the matter of future development of astronomy related facilities on Mauna Kea.	Unsupported/Unsubstantiated. Misleading. Presented out of context.
512.	71	While the UH CMP addresses general questions of location for possible future development, it provides no limit on the number or size of future telescopes. As such, it would be possible under the UH CMP for every inch of the Astronomy Precinct to developed with astronomy related facilities. This is to say, the UH CMP does not protect the resources of the Mauna Kea conservation district from the obvious substantial adverse impact of such an outcome.	Unsupported/Unsubstantiated. Inaccurate/False. Unfounded Speculation.
513.	72	The Applicant admitted before the Intermediate Court of Appeals that the UH CMP does "not take action."	Irrelevant/Inapplicable. Not in evidence. *See supra* UH-TIO's response to Ward's proposed FOF 266.
514.	72	The findings of fact above indicate that the UH CMP does not set out any timelines, thresholds, or triggers to ensure that any of the 103 management activities outlined in it will actually happen. This is to say, there is no mechanism for ensuring the UH CMP is ever more than an "unimplemented plan."	Unsupported/Unsubstantiated. Misrepresentation. Mischaracterization. The BLNR has repeatedly exercised its authority and control by approving the CMP,

			sub-plans, and the University's project review and approval process. UH-TIO FOF 179-190. BLNR can require compliance with the CMP and associated sub-plans as a condition of the CDUP. *See* UH-TIO Recommended Decision and Order on p. 220, subpart (8).
515.	72	Without enforceable requirements that actually ensure the protection of Mauna Kea's resources, the UH CMP is not the "strong management framework" the Applicant asserts will remedy the longstanding substantial adverse impact of telescope activities on the resources of Mauna Kea.	Unsupported/Unsubstantiated. Misrepresentation Mischaracterization BLNR can require compliance with the CMP and associated sub-plans as a condition of the CDUP. *See* UH-TIO Recommended Decision and Order on p. 220, subpart (8).
516.	72	"HAR 13-5-30 Permits, generally"	Incomplete.
517.	73	HAR 13-5-30(c)(1) states: conservation districts are formed "for the purpose of conserving, protecting and preserving the important natural resources of the State through appropriate management to promote their long-term sustainability and the public health, safety, and welfare." See also, HRS §205-2(e).	Inaccurate citation. Misleading. Partial quotation. Full text reads: "The purpose of this chapter 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.
518.	73	The Applicant proposes that an 18-story, five-acre industrial structure in a currently undisturbed natural area.	Misleading. Presented out of context. Mischaracterization of the record.
519.	73	The Applicant interprets the purpose of the conservation district as being "appropriate management" and contends that the "strong management framework" of the UH CMP satisfies this permit criteria.	Unsupported/Unsubstantiated. Mischaracterization of the record. Inaccurate/False.
520.	73	The above findings of fact fail to support the conclusion that the UH CMP is a "strong management framework."	Unsupported/Unsubstantiated. Not credible.
521.	73	In addition, even if the UH CMP did provide strong management, that alone does not satisfy this permit requirement. As written, HAR 13-5-30(c)(1) requires that the proposed land use be consistent with "conserving, protecting, and preserving … important natural resources." The TMT project would destroy many of those resources to the point of jeopardizing federal designations, e.g. National Natural Landmark. Such significant impacts as these would require the Applicant to engage in extensive mitigation measures to correct for the harms caused by the proposed project. Thus, the proposed land use is not consistent with the purpose the of the conservation district.	Unsupported/Unsubstantiated. Not credible. Misrepresents the language of HAR § 13-5-30(c)(1). The "consistency" requirement provides only that the proposed land use be consistent with the **purpose** of the conservation district. HAR § 13-5-30(c)(1). The CDUA satisfies this requirement. *See* UH-TIO FOF 350-384, COL 128-142. This

			criteria does not speak to "conserving, protecting, and preserving … important natural resources."
522.	74	Because the TMT cannot meet this first criterion, this CDUA cannot be approved.	*See supra* UH-TIO's response to Ward's proposed COL 521.
523.	74	According to HAR 13-5-13(a), "[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." Id. (emphasis added).	Not in dispute.
524.	74	HAR 13-5-2 defines "natural resource" to mean "resources such as plants, aquatic life and wildlife, cultural, historic, and archeological sites, and minerals."	Not in dispute.
525.	74	HAR 13-5-2 also defines "Scenic area" to mean "areas possessing natural, scenic, or wildland qualities."	Not in dispute.
526.	74	HAR 13-5-24 identifies "astronomy facilities under an approved management plan" as one of the allowable uses in the Resource Subzone.	Not in dispute.
527.	74	For an identified use to be permitted, it must demonstrate that it is consistent with the sustained use of the natural resources of the area.	Unsupported/Unsubstantiated. There is no such requirement under HAR § 13-5-30.
528.	74	The Applicant fails to meet this burden. The findings of fact above demonstrate that the proposed project would have a substantial adverse effect on the natural resources of Mauna Kea as a whole and the northern plateau specifically.	*See supra* UH-TIO's response to Ward's proposed COL 527. Inaccurate/False. UH-TIO have presented substantial credible evidence that the TMT Project would not have a substantial adverse impact on the resources of Mauna Kea. *See* UH-TIO FOF 466-839, COL 177-217.
529.	74	The mitigation measures offered by the Applicant fail to demonstrate that the direct and undisputed harms of the proposed project will be reduced to a level that is less than significant. The Applicant fails to satisfy criterion two and	Misrepresentation. Criterion two does not specifically pertain to mitigation. Instead, Criterion

		thus CDUA-HA-3568 cannot be granted.	two requires that the proposed land use be consistent with the objectives of the subzone of the land on which the use will occur. UH Hilo has satisfied Criterion two. *See* FOF 385-416, COL 143-164.
530.	75	The TMT proposal must comply with the provisions of the CZM program as outlined in HRS 205A.	Misleading. The TMT Project will not be within a special management area. HRS Chapter 205A is not applicable to the TMT Project. *See* UH-TIO FOF 417-421, COL 168-169.
531.	75	HRS 205A-1 Definitions. "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."	Not in dispute.
532.	75	The TMT is proposed for Mauna Kea on the Island of Hawaii, and thus is within "all lands of the State."	Mischaracterization. The TMT Project will not be within a special management area. *See* UH-TIO FOF 417-421, COL 168-169. Additionally, Mauna Kea is clearly outside of the "Coastal zone management area," which extends seaward from the shoreline.
533.	75	The proposed TMT is not consistent with two objectives of the CZM Program.	Inaccurate/False. The TMT Project is not subject to the requirements of HRS Chapter 205A. Nonetheless, the TMT Project is consistent with the purpose and objectives of the chapter and satisfies Criterion

			Three under HAR § 13-5-30(c)(3). *See* UH-TIO FOF 417-432, COL 165-176.
534.	75	HRS 205A-2 Coastal zone management program; objectives and policies. (b) Objectives. 1. (2) Historic resources; (A) Protect, preserve, and, where desirable, restore those natural and manmade 2. historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.	Not in dispute.
535.	75	The above findings of fact demonstrate the significant risk telescope activity, including the proposed TMT, poses to the integrity of the historic district of Mauna Kea. The Applicant has offered no evidence that the proposed mitigation measures will reduce the known significant effect of telescope activity on the historic resources of Mauna Kea to a level that is less than significant.	*See supra* UH-TIO's response to Ward's proposed COL 533.
536.	75	Because the proposed TMT would contribute to the existing "significant, substantial, and adverse" impacts of telescopes on Mauna Kea, CDUA-HA-3568 does not comply with HAR 13-5-30(c)(3) and therefore cannot be granted.	*See supra* UH-TIO's response to Ward's proposed COL 533.
537.	76	HRS 205A-2 Coastal zone management program; objectives and policies. (b) Objectives. (1) Scenic and open space resources; (A) Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.	Incomplete.
538.	76	The record is replete with evidence of the significant effect the proposed TMT would have on the scenic open spaces and important viewplanes of the northern plateau on Mauna Kea. The Applicant's Visual Impact Analysis Report concedes that the visual impact of the proposed project would be significant, although it is criticized because it "downplays" the visual impacts of the project and misidentifies important viewplanes affected by the	Unsupported/Unsubstantiated. Not credible. *See* UH-TIO FOF 775-795 COL, 177-217.

		proposed project (e.g. Pu`ukohala Heiau).	
539.	76	Because the proposed TMT would contribute to the existing "significant, substantial, and adverse" impacts of telescopes on Mauna Kea, CDUA-HA-3568 does not comply with HAR 13-5-30(c)(3) and therefore cannot be granted.	*See supra* UH-TIO's response to Ward's proposed COL 533. Misleading. Presented out of context. HAR § 13-5-30(c)(3) is one of the eight criteria upon which a CDUA is evaluated.
540.	76	HAR 13-5-39(c)(4) states: xiii. "The proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area, community or region."	Incorrect citation.
541.	76	The Applicant asserts that because the TMT project would have only an incremental impact, it is not substantial and therefore meets criteria four.	Incomplete/Vague and Ambiguous. COL does not identify what type of impact is being referenced (*i.e.*, water, natural resources, cultural resources, etc.).
542.	76	As outlined, supra, this is a misstatement of the standard for assessing significant effect.	Incomplete/Incoherent. Unsupported/Unsubstantiated.
543.	76	The findings of fact are replete with evidence – and the Applicant concedes – that the TMT project would contribute to the existing substantial adverse impacts suffered on Mauna Kea.	Incomplete/Vague and Ambiguous. COL does not identify what type of impact is being referenced (*i.e.*, water, natural resources, cultural resources, etc.). Unsupported/Unsubstantiated. Assumes facts not in evidence or facts that are not reliable,

			substantial and probative.
544.	76	The visual impacts of the proposed TMT will be substantial and adverse.	Inaccurate/False. There will be no significant/substantial adverse impacts to visual and cultural resources. *See* UH-TIO FOF 775-795, COL 177-217.
545.	76	The geological impacts of the proposed TMT will be substantial and adverse, and will jeopardize the listing of Mauna Kea as a National Natural Landmark.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 433-839, COL 177-217.
546.	77	The risks of groundwater contamination may be substantial and adverse, but have not been adequately assessed.	Inaccurate/False. *See* UH-TIO FOF 796-823, COL 177-217.
547.	77	The Petitioners demonstrated that the Applicant has underestimated the level of significant effect likely to be caused by the construction of the TMT project.	Unsupported/Unsubstantiated. Not credible.
548.	77	The impact to the continuing and constitutionally protected traditional and customary practices of Native Hawaiians would be severe.	Incomplete. Unsupported/Unsubstantiated. *See* UH-TIO FOF 611-774, COL 177-217.
549.	77	The record demonstrates that: BB. the entire conservation district of Mauna Kea is a known sacred landscape with viewplanes associated with navigation and many ancient trails (FOF #103) CC. the historic properties in the Mauna Kea Science Reserve are "are of importance to Native Hawaiians because they possess traditional cultural significance derived from associated cultural practice and beliefs," (FOF #103) DD. the traditional and customary and religious practices include the collection of water, depositing piko, burial ceremonies, and religious observances. (FOF #104)	Unsupported/Unsubstantiated. Not credible. *See* UH-TIO FOF 503-774, COL 177-217. These practices have not been proven to be within the bundle of rights protected by Article XII, Section 7 of the Hawai'i State Constitution.

		EE. these ancient practices continue today and have evolved into contemporary practices (FOF #104) FF. the construction of ahu, releasing of cremated remains, and other contemporary cultural practices evolved from ancient practices and **considered reasonable practices**. (FOF #105, #106) GG.these practices are of the class of practices protected by Article XII, sec. 7 of the Constitution and the related caselaw. (FOF #107).	
550.	77	Further injury to these practices is not allowed under the law.	Incomplete/Vague and Ambiguous as to "not allowed under the law." Unsupported/Unsubstantiated.
551.	77	The Applicant has not demonstrated that the mitigation measures proposed for the project would bring the existing wide range of significant effects from telescope activity on Mauna Kea down to a level that is less than significant.	Incomplete/Vague and Ambiguous as to the "wide range of significant effects." Inaccurate/False. Unsupported/Unsubstantiated. *See* UH-TIO FOF 433-839, COL 177-217.
552.	77	The proposed project will have a substantial adverse impact on existing natural resources within the surrounding area, community or region. These impacts will not be mitigated to a level that is less than significant. Thus, the Applicant has failed to meet its burden on the criterion, and the CDUA-HA-3568 cannot be granted.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 466-502, COL 177-217.
553.	78	HAR 13-5-30(c)(5) states: **i.** "The proposed land use, including buildings, structures and facilities, shall be compatible with the locality and	Mischaracterization of UH Hilo's assertions.

		surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels." The Applicant asserts both that: B. the TMT project would be removed from Pu`u Kukahau`ula and thus not significantly affect traditional and customary practices or the historic significance of that area, and C. the TMT project is close to Pu`u Kukauhau`ula, where the majority of telescope construction has occurred and thus is consistent with the surrounding environment.	Unsupported/Unsubstantiated. Misleading. Presented out of context. This is one of the eight criteria upon which a CDUA is evaluated.
554.	78	Both cannot be true.	Incomplete/Incoherent.
555.	78	The undisputed conclusion that telescope activity on Mauna Kea has a "significant, substantial, and adverse" impact on the resources of the conservation district is an indication that the built structures on Mauna Kea were not consistent with the surrounding environment to begin with.	Incomplete/Vague and Ambiguous as to what impacts are being referred to. Unsupported/Unsubstantiated. *See* UH-TIO FOF 433-839, COL 177-217.
556.	78	The proposed location for the TMT project is the northern plateau of Mauna Kea and is designated for the purposes of the CDUA process as "Area E."	Not in dispute.
557.	78	The above findings of fact demonstrate that Area E and the environment immediately surrounding it is undeveloped land.	Unsupported/Unsubstantiated. Inaccurate/False. Misrepresentation. There are already 11

			observatories on Mauna Kea within the Astronomy Precinct. There are also small foundations remaining on the TMT Project site from astronomical testing that took place in 1964. Multiple roads and utility lines lead up to the summit area. UH-TIO FOF 238-240. Witnesses for the Petitioners and Opposing Intervenors, ***including Ward herself,*** admitted that the summit area is already substantially developed for astronomy use. UH-TIO FOF 859-866, 985, COL 344.
558.	78	The findings of fact also demonstrated that viewplanes from the north ridge of the summit and from Pu`u Poliahu that include Area E currently have no built structures or man-made interference.	Unsupported/Unsubstantiated. Inaccurate/False.
559.	78	The Applicant has not demonstrated that the TMT is consistent with the surrounding environment of Area E and thus this criterion is not satisfied and the CDUA-HA-3568 cannot be granted.	Vague/Ambiguous. This COL appears to refer to Criterion 5, as set forth in HAR § 13-5-30(c)(5). UH Hilo has satisfied this criterion. *See* UH-TIO FOF 840-867, COL 218-226.
560.	79	The proposed TMT would not be compatible with the wide open and natural space that is the northern plateau of Mauna Kea. The proposed project is ½ mile from the existing roads and infrastructure, on the alpine desert ecosystem comprised of lichens, mosses and grasses, not on the cinder cones of the summit ridge. FOF #158, 159	Unsupported/Unsubstantiated. *See supra* UH-TIO's response to Ward's proposed COL 559.
561.	79	It is the conservation district (and the historic district) that is the locality to be considered, not the existing telescopes (many of which were retroactively	Citation does not support proposition.

		permitted after construction). UH/TMT contends that the TMT project - comprised of more than 12.5 acres (4.9.ac. for the observatory, 3.6 ac. for the access way, 4 ac. for the batch plant staging area, and a utilities corridor (that intrudes into the Natural Area Reserve) - and 400 foot corridor along Mauna Kea access road) must be assessed in the context of existing buildings (i.e. other observatories), otherwise the HAR §13-5-30(c)(5) criterion would be senseless because nothing could ever be built in a Conservation District. (Exhibit R-1 CDUA, p. 18.)	Unsupported/Unsubstantiated. *See* UH-TIO FOF 433-839, COL 177-217.
562.	79	UH/TMT's interpretation ignores HAR §13-5-30(b), which establishes at the outset that generally, "[l]and uses shall not be undertaken in the conservation district" and further, if they are to occur, land uses must be evaluated to ensure that no adverse and significant impacts occur. Id.	False/Inaccurate. Unsupported/Unsubstantiated. Misleading. Partial quotation. HAR § 13-5-30(b) provides that "**unless provided in this chapter** [*i.e.*, through conservation district use permits], land uses shall not be undertaken in the conservation district." (Emphasis added).
563.	79	HAR 13-5-30(c)(6) states:	Incomplete.
564.	79	"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"	Misleading. Presented out of context. This is one of the eight criteria upon which a CDUA is evaluated.
565.	79	The TMT would intrude upon the currently unobstructed view of Haleakala Mountain as well as the primary view of the setting sun from the mountain. It will also obstruct viewplanes used for traditional and cultural spiritual and religious Native Hawaiian practice. The Northern Plateau is one of the last un-hindered open space areas with views down to the sea, along the coasts, and across the island chain. The TMT would neither preserve nor improve upon Mauna Kea's natural beauty; the eighteen-story building would be twice the highest allowable structure in Hawaii County, and would forever change the wilderness experience in the summit region.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 704, 782, 785, 787, 788, 904; *see supra* UH-TIO's response to Ward's proposed FOF 36.
566.	79	No COL provided.	

567.	80	The above findings of fact demonstrate that the proposed TMT does not improve upon or preserve the open space and natural beauty of Mauna Kea.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 868-913, COL 227-256.
568.	80	The staff recommendation rationalizes the approval of the TMT project on the expectation of payment, bemoaning that "management costs money." (Ex. A007 Staff Report).	Misleading. Presented out of context. The Office of Conservation and Coastal Lands undertook a detailed review of the CDUA and took into account many factors in issuing its recommendation. *See* UH-TIO FOF 340-343.
569.	80	The Applicant and staff cite no statute or regulation that authorizes the BLNR to circumvent this requirement in exchange for money.	Mischaracterization of the record. UH-TIO have not asserted that this is in fact the case, and is not asking the BLNR to circumvent regulations in exchange for money.
570.	80	The payment of market-based lease rent, as required by HRS 171-17 and -18, is separate and secondary to compliance with the threshold requirements for issuing the CDUP. Indeed, if that were not the case, the Applicant could always offer to pay some amount of money to satisfy any permit requirement that is otherwise violated by the nature of the proposed land use.	Irrelevant/Inapplicable. Incomplete/Incoherent.
571.	80	Moreover, there is no evidence in the record to demonstrate the amount of money the TMT Observatory Corporation will pay.	Irrelevant/Inapplicable. Unsupported/Unsubstantiated. *See* UH-TIO FOF 208. UH-TIO also note that TIO, not TMT Observatory Corporation, would be the sublessee for the TMT Project.
572.	80	The Applicant also failed to demonstrated that whatever amount the TMT project proponents would pay in rent is sufficient to provide for the	Irrelevant/Inapplicable.

		management actions needed to mitigate the substantial adverse impact of the TMT project.	Unsupported/Unsubstantiated. Inaccurate/False. Not credible. *See* UH-TIO FOF 208, 215, 261, 278, 463.
573.	80	The Applicant failed to demonstrate that it has the expertise and ability to meet the management needs of the resources on Mauna Kea now, much less after the TMT would be built.	Irrelevant/Inapplicable. Unsupported/Unsubstantiated.
574.	80	HAR 13-5-30(c)(7) states that "subdivision of land will not be utilized to increase the intensity of land uses in the conservation district."	Misleading. Presented out of context. This is one of the eight criteria upon which a CDUA is evaluated.
575.	80	HAR 13-5-30(c)(7) states that "subdivision of land will not be utilized to increase the intensity of land uses in the conservation district."	Misleading. Presented out of context. This is one of the eight criteria upon which a CDUA is evaluated.
576.	80	HAR 13-5-2 defines "subdivision" to mean "a division of a parcel of land into more than one parcel."	Not in dispute.
577.	81	Webster's Merriam Dictionary defines "division" as something that "divides, separates or marks off," as in a "border." http://www.merriam-webster.com/thesaurus/division.	Irrelevant/Inapplicable. Incomplete. The definitions contained in the administrative rules sufficiently define a "subdivision." As such, dictionary definitions are inapplicable.
578.	81	Based on the findings of fact outlined above, the University has subdivided its leased parcel in several ways for the purpose of intensifying land uses in the conservation district of Mauna Kea.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 914-936, COL 257-272.
579.	81	UH subleases intensified land use by increasing the burden of vehicles, visitors, and long-term personnel that will use access roads, sewage,	Unsupported/Unsubstantiated. *See* UH-TIO FOF 914-936, COL

		electricity, utilities, and base-level and mid-level facilities.	257-272.
580.	81	Land use in the Mauna Kea Science Reserve has the hallmarks of a subdivision: facilities and improvements cost sharing, planned development, and defined, independent property interests.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 914-936, COL 257-272.
581.	81	The TMT CDUA erroneously concluded that the "proposed TMT project does not involve the subdivision of land." (Exhibit R-1 CDUA, 2-28). The TMT sublease would further parcel the original (single) lot leased to UH in 1968 (Exhibit B.17 f Lease No. S-4191). The General Lease allows for "an observatory", but DLNR and the University have conveniently ignored that, opting instead to intensify land use in violation of HAR §13-5-30(c)(7) ("subdivision of land will not be utilized to increase the intensity of land uses in the conservation district"). Because the proposed TMT CDUA is premised on a subdivision of land that will intensity land use, the BLNR cannot approve it without abusing its discretion.	False/Inaccurate. Unsupported/Unsubstantiated. *See* UH-TIO FOF 914-936, COL 257-272.
582.	81	No COL provided.	
583.	81	The findings of fact above demonstrate that the University divided its 11,088-acre lease into two parts: the Astronomy Precinct and a Natural/Cultural Preservation Area.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 914-936, COL 257-272.
584.	81	The findings of fact also demonstrate that the University divided the smaller Astronomy Precinct from the remainder of its leased lands to ensure that future "telescope development was limited to the Astronomy Precinct."	Unsupported/Unsubstantiated. *See* UH-TIO FOF 914-936, COL 257-272.
585.	81	This is a division of a parcel into two or more parcels for the purpose of intensifying land uses in the conservation district, which is specifically prohibited by HAR 13-5-30(c)(7).	Unsupported/Unsubstantiated. *See* UH-TIO FOF 914-936, COL 257-272.
586.	81	The undisputed fact that currently the cumulative impact of past, present, and reasonably foreseeable telescope activity is considered significant, substantial, and adverse further supports this conclusion of law.	UH-TIO do not dispute that there have been significant and adverse impacts to certain resources on Mauna Kea in the **past**. However, the TMT Project will not result in such significant, substantial, and adverse impacts. *See* UH-TIO FOF 433-839, COL 177-217.

587.	82	Issuance of CDUA-HA-3568 would further the improper subdivision and intensified land use in the Mauna Kea conservation district, which is not allowed by the administrative rules.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 914-936, COL 257-272.
588.	82	The above findings of fact demonstrate that while the terms of a sublease to the TMT are not in the record, a sublease would be required by the University and the telescope operator.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 914-936, COL 257-272.
589.	82	The above findings of fact demonstrate that a sublease to the TMT would be similar to past subleases issued for telescope facilities on Mauna Kea.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 914-936, COL 257-272.
590.	82	Based on the above findings of fact, past subleases for telescope facilities granted telescope operators such exclusive use of land so at to effect a division of the University's parcel of land into more than one parcel. That the sublease would not be necessary without the construction of a land use in the conservation district, demonstrates that the division of the parcel is for the purpose of intensifying land use in the conservation district.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 914-936, COL 257-272.
591.	82	Approving the TMT CDUA would result in a division of land to intensify land uses in the conservation district, which is prohibited by HAR 13-5-30(c)(7).	Unsupported/Unsubstantiated. *See* UH-TIO FOF 914-936, COL 257-272.
592.	82	HAR 13-5-30(c)(8) states: JJ. "The proposed land use will not be materially detrimental to the public health, safety, and welfare."	Misleading. Presented out of context. This is one of the eight criteria upon which a CDUA is evaluated.
593.	82	The findings of fact above – and the record as a whole – is replete with evidence that the desecration of Mauna Kea is a source of immense pain for many people, especially Native Hawaiians.	Unsupported/Unsubstantiated. Not credible. *See* UH-TIO 937-1000, FOF COL 273-293.
594.	82	These facts have been known to the University at least since 2005 and the publication of Kepa Maly's Oral History of Mauna Kea.	Unsupported/Unsubstantiated. Not credible. *See* UH-TIO FOF 937-1000, COL 273-293.
595.	83	The Applicant offered no evidence to demonstrate that the pain suffered by some Native Hawaiians from the desecration of Mauna Kea does not undermine the health and well-being of Native Hawaiians.	Unsupported/Unsubstantiated. Not credible. *See* UH-TIO FOF 937-1000, COL 273-293.
596.	83	The Petitioners presented evidence, not refuted by the Applicant, that the pain some Native Hawaiians suffer due to the desecration of Mauna Kea	Unsupported/Unsubstantiated. Not credible. *See* UH-TIO FOF

		could be connected to the poor public health standards of Native Hawaiians.	937-1000, COL 273-293.
597.	83	Moreover, the Applicant failed to refute concerns for the contamination of groundwater sources.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 796-823, COL 177-217.
598.	83	The findings of fact above demonstrate that Mauna Kea is a place of water. It is undisputed that the summit of Mauna Kea is above 5 aquifers for the Island of Hawaii.	Unsupported/Unsubstantiated. Mischaracterization. Misleading. Presented out of context. There will be no substantial, significant, and adverse impact to water resources on Mauna Kea as a result of the TMT Project. *See* UH-TIO FOF 796-823, COL 177-217.
599.	83	It is also undisputed that telescope activity on Mauna Kea has resulted in the release of hazardous chemicals into the environment.	Unsupported/Unsubstantiated. Irrelevant/Inapplicable (as to past occurrences not related to the TMT Project). Mischaracterization. Misleading. Presented out of context.
600.	83	The overall cumulative impact of telescope activity on Mauna Kea is acknowledged as being "significant, substantial, and adverse."	Mischaracterization. **Past** telescope activities has resulted in a significant and adverse impact to certain resources on Mauna Kea. The TMT Project will not result in a significant, substantial, and adverse impact to

			any resources on Mauna Kea. *See* UH-TIO FOF 433-839, COL 177-217.
601.	83	The cumulative impacts to the traditional and cultural properties and associated traditional and customary Native Hawaiian practices resulting from the storage, use, and release of the large quantities hazardous materials has not been assessed.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 503-610, COL 177-217.
602.	83	Based on the abovementioned facts regarding the traditional and customary practices, the use of the sacred waters, snow and ice from Lake Waiau and summit region, and the University's failure to assess the significant impacts to those resources and practices from hazardous waste spills, human waste leech fields, and construction related contamination, the Applicant cannot its burden to show that the land use "will not be materially detrimental to public health, safety and welfare.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 503-774, COL177-217.
603.	83	Because the Applicant cannot prove that the proposed TMT project would not be materially detrimental to the public health, safety, and welfare, this criterion is not satisfied and CDUA-HA-3568 cannot be granted.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 937-1000, COL 273-293.
604.	83	The CDUA was incomplete by failing to assess the TMT Project impacts upon the several hundred historic properties identified as contributing factors to the Mauna Kea Summit Region Historic District. (Ex. A-001, CDUA)	Citation does not support proposition. Unsupported/Unsubstantiated. Not credible. *See* UH-TIO FOF 503-610, COL 177-217.
605.	84	The CDUA was incomplete by failing to disclose the visual impacts of the TMT Project upon the several hundred historic properties and cultural resources on the northern plateau in the MKSR. (Ex. A-001, CDUA)	Citation does not support proposition. Unsupported/Unsubstantiated. Not credible. *See* UH-TIO FOF 775-795 COL, 177-217.
606.	84	The CDUA was incomplete by failing to assess how the TMT Project would impact upon the integrity of the Mauna Kea Science Reserve as a TCP. (Ex.	Citation does not support proposition.

		A-001, CDUA)	Unsupported/Unsubstantiated. Not credible. *See* UH-TIO FOF 503-610, COL 177-217.
607.	84	The CDUA was incomplete by failing to assess how the TMT Project would impact upon the integrity of the Historic District. (Ex. A-001, CDUA)	Citation does not support proposition. Unsupported/Unsubstantiated. Not credible. *See* UH-TIO FOF 503-610, COL 177-217.
608.	84	The CDUA was incomplete by failing to assess how the TMT Project would impact upon the integrity of the Mauna Kea Science Reserve as a TCP. (Ex. A-001, CDUA) The CDUA was incomplete by failing to assess how the TMT Project would impact upon the eligibility of a TCP nomination. (Ex. A-001, CDUA)	Citation does not support proposition. Unsupported/Unsubstantiated. Not credible. *See* UH-TIO FOF 503-610, COL 177-217.
609.	84	In the CDUA, the Applicant downplayed the impact of the TMT Project upon historic properties by omitting all references to SIHP Site Nos. 16169 and 21447 that are shown on Figure 4.1 even though they are identified in Figure 5.1 of the FAIS-AP and in other archaeological reports. (Ex. A-001, CDUA, p. 4-2; Ex. A-055, FAIS-AP, p. 5-5) The CDUA was incomplete by failing to disclose the impacts upon SIHP Site Nos. 16169 and 21447 that are shown on Figure 4.1 within the Mauna Kea Astronomy Precinct and within the vicinity of the TMT Project area. (Ex. A-001, CDUA, p. 4-2) In the CDUA, the Applicant downplayed the impact of the TMT Project upon	Citation does not support proposition. Unsupported/Unsubstantiated. Not credible. *See* UH-TIO FOF 503-610, COL 177-217.

		historic properties by intentionally removing the SIHP Site Nos. (16178, 16179, 16181, 16182, 21205) from Figure 4.1 even though they are identified in Figure 5.1 of the FAIS-AP and in other archaeological reports. (Ex. A-001, CDUA, p. 4-2; Ex. A-055, FAIS-AP, p. 5-5) In the CDUA, the Applicant downplayed the impact of the TMT Project upon cultural resources ("find spots") in the MKSR by intentionally eliminating all references from the CDUA and removing their site locations from Figure 4.1 even though they are identified in Figure 5.1 of the FAIS-AP and in other archaeological reports. (Ex. A-001, CDUA, p. 4-2; Ex. A-055, FAIS-AP, p. 3-12, 5-5) The CDUA was incomplete by failing to disclose the impacts upon the several hundred cultural resources ("find spots") in the MKSR. (Ex. A-001, CDUA; Ex. A-055, FAIS-AP, p. 3-12;) The CDUA was incomplete by failing to disclose the impacts upon cultural resources ("find spots") Nos. 1997.07, 2005.03, 2005.05, 2005.06, 2005.07, 2005.08, & 2005.09 that are within the Mauna Kea Astronomy Precinct and within the vicinity of the TMT Project area. (Ex. A-001, CDUA; Ex. A-28, FAIS-AP, p. 5-5, 5-20)	
610.	85	The CDUA was incomplete by failing to assess how the TMT Project would impact upon the eligibility of a National Register of Historic Places nomination. (Ex. A-311, CDUA) In lieu of a habitat restoration plan, the TMT Project plan is to monitor arthropod activity in the vicinity of the portion of the Access Way that will impact Type 3 Wēkiu bug habitat. Ex A-003 FEIS, p. 3-73.	Citation does not support proposition. Unsupported/Unsubstantiated. Not credible. *See* UH-TIO FOF 503-610, COL 177-217.

611.	85	Based on the findings of fact above, the TMT CDUA cannot be issued because it is also inadequate and incomplete.	Unsupported/Unsubstantiated.
612.	85	Mauna Kea is a known burial ground. State law requires burial treatment plans for proposals occurring in known burial grounds. Yet, there is no burial treatment plan for the summit area of the Mauna Kea conservation district.	Inaccurate/False. *See* UH-TIO FOF 570, 605; Ex. A-138, A-138A, A-139.
613.	85	Mauna Kea is a burial ground of our highest born and most sacred ancestors.	Unsupported/Unsubstantiated.
614.	85	Archaeologist [McCoy] noted the …no shrines have been identified on top of cinder cones in the Mauna Kea Science Reserve…believing that these high and remote places were reserved for the burying of the dead." (Brackets added) Ex. A048, App. N, p. 23	Mischaracterization. There is no evidence of burials at the TMT site. *See* UH-TIO FOF 545, 564, 628, 674.
615.	85	Numerous burials and possible burials have been identified in the Mauna Kea conservation district.	Unsupported/Unsubstantiated. Mischaracterization. There is no evidence of burials at the TMT site. *See* UH-TIO FOF 545, 564, 628, 674.
616.	85	Chapter 6E, HRS, states "it shall be the public policy of this State to provide leadership in preserving, restoring, and maintaining historic and cultural property, to ensure the administration of such historic and cultural property in a spirit of stewardship and trusteeship for future generations, and to conduct activities, plans, and programs in a manner consistent with the preservation and enhancement of historic and cultural property."	Not in dispute.
617.	85	HRS 6E-2 defines: "Burial site" means any specific unmarked location where prehistoric or historic human skeletal remains and their associated burial goods are interred, and its immediate surrounding archaeological context, deemed a unique class of historic property and not otherwise included in section 6E-41.	Not in dispute.

		"Historic preservation" means the research, protection, restoration, rehabilitation, and interpretation of buildings, structures, objects, districts, areas, and sites, including underwater sites and burial sites, significant to the history, architecture, archaeology, or culture of this State, its communities, or the nation. "Historic property" means any building, structure, object, district, area, or site, including heiau and underwater site, which is over fifty years old. "Mitigation plan" means a plan, approved by the department, for the care and disposition of historic properties, aviation artifacts, and burial sites or the contents thereof, that includes monitoring, protection, restoration, and interpretation plans.	
618.	86	HRS 6E requires where known burials exist a burial treatment plan must be approved by the island burial council.	Not in dispute.
619.	86	In 1999, the Mauna Kea Summit Region Historic District (MKSRHD), which encompasses the adze quarry and many other significant sites in a vast cultural landscape, was determined eligible for listing on the National Register. (Ex. A055, FAIS-AP, p. 1-1).	Not in dispute.
620.	86	The Mauna Kea Summit Region Historic District is significant under all four National Register criteria, and criterion "e" of the Hawaii Administrative Rules, Chapter §13-275-6. The district is significant under criterion "a" because of the presence of the Mauna Kea.	Inaccurate/False. Misrepresentation. The district is significant under criterion A because of the Mauna Kea Adze Quarry Complex. *See* UH-TIO FOF 529.
621.	86	There are 29 historic properties with a total of 48 features recorded in the MKSR that are interpreted as Burials or Possible Burials.	Unsupported/Unsubstantiated.
622.	86	HAR 13-284-2 Definitions. "Adverse effects" means any alteration to the characteristics of a historic property." "Detailed mitigation plan" means "the specific plan for mitigation, including	Misleading. Presented out of context.

		but not limited to, a preservation plan, an archaeological data recovery plan, an ethnographic data recovery plan, a historic data recovery plan, a burial treatment plan, and an architectural recordation plan. The detailed mitigation plan serves as a scope of work for mitigation." "Mitigation" means "the measures taken to minimize impacts to significant historic properties. Mitigation may take different forms, including, but not limited to, preservation, archaeological data recovery, reburial, ethnographic documentation, historic data recovery, and architectural recordation." "Mitigation commitment" means "the commitment to the form or forms of mitigation to be undertaken for each significant historic property."	
623.	86	HAR 13-284-7 Determining effects to significant historic properties. (b) Effects include, but are not limited to, partial or total destruction or alteration of the historic property, detrimental alteration of the properties' surrounding environment, detrimental visual, spatial, noise or atmospheric impingement, increasing access with the chances of resulting damage and neglect resulting in deterioration or destruction. These effects are potentially harmful.	Misleading. Presented out of context.
624.	87	Based on the above findings of fact regarding the lack of a burial treatment plan for the known burial that is all of Mauna Kea, the University cannot meet their burden under HAR §13-5-30(4) or under HAR 13-5-30(c)(8), or compliance with Chapter 6E of the State Historic Preservation Act.	Inaccurate/False. Burial treatment plans have been adopted and approved by SHPD. *See* UH-TIO FOF 570, 605; Exs. A-138, A-138A, A-139; *see also,* UH-TIO FOF 433-839, COL 177-217.
625.	87	The record is replete with confirmation of the long-standing traditional and customary practices on Mauna Kea. The BLNR has an obligation to protect reasonable traditional and customary practices. The TMT proposal is not consistent with this obligation and thus cannot be granted.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 466-774, COL 177-217.

626.	87	Article 12, Section 7. "The State reaffirms and shall protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by ahupua'a tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778, subject to the right of the State to regulate such rights."	Not in dispute.
627.	87	In Public Access Shoreline Hawai`i v. Hawaii County Planning Commission, 79 Hawai`i 425, 903 P.2nd 1246 (1995), (hereafter "PASH"), the Hawai`i Supreme Court stated: i. The State's power to regulate the exercise of customarily and traditionally exercised Hawaiian Rights, necessarily allows the State to permit development that interferes with such rights in certain circumstances… Nevertheless, the State is **obligated** to protect the reasonable exercise of customary and traditionally exercised rights of Hawaiians to the extent feasible.	Not in dispute.
628.	87	In Ka pa`akai O Ka `Aina v. Land Use Commission (hereafter "Ka Pa`akai v. LUC"), 94 Hawai`i 31, 47, 7 P.3d 1068, 1068 (2000) the Hawai`i Supreme Courts states: ii. To preserve and protect traditional and customary native Hawaiian rights, the Board examines the following factors:	Not in dispute.
629.	87	The identity and scope of cultural, historical, and natural resources in the application area, including the extent to which traditional and customary native rights are to have been exercised in the application area;	Not in dispute.
630.	88	The extent to which those resources, including traditional and customary native Hawaiian rights, will be affected or impaired by the proposed action; and	Not in dispute.
631.	88	The feasible action, if any to be taken to reasonably protect native Hawaiian rights if they are found to exist.	Misleading. Presented out of context. This quote is with

		**Ka Pa`akai v. LUC** further states: i. Equally important, the Land Use Commission ("LUC") made no specific findings or conclusions regarding the effects on or the impairment of any Article XII, section 7 [Hawai`i State Constitution] uses, or the feasibility of the protection for those rules. Instead, as mentioned, the LUC delegated unqualified authority to Ka`upulehu development ("KD") ...This wholesale delegation of responsibility for the preservation and protection of native Hawaiian rights to KD, a private entity, however, was improper and misses the point...	regards to the specific factual scenario underlying the *Ka Pa'akai* case.
632.	88	Chapters 205A-2 and 15, and 183C, HRS, obligate the BLNR to "to conserve, protect, and preserve the important natural resources of the State" that are designated as conservation districts. HRS 183C-1.	Misleading. Partial quotation. The full quote is as follows: "[i]t is therefore, the intent of the legislature 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.**" (Emphasis added).
633.	88	The Applicant the University of Hawai`i at Hilo (UH), is seeking a conservation district use permit (CDUP) relative to CDUA HA-3568, on behalf of TMT Observatory Corporation ("TMT"). Ex. A-001, p.13, K-1 (CDUA)	Inaccurate/False. Citation does not support proposition. "TMT Observatory Corporation" will not be involved in the construction/operation of the TMT Project. Instead, TIO will occupy this role. UH Hilo is not pursuing a

			CDUP "on behalf" of another party, although TIO will ultimately oversee construction and operation of the Thirty-Meter Telescope Project ("**TMT Project**"). Misleading. Presented out of context. UH-TIO object to this proposed FOF to the extent it raises issues relating to arguments regarding the validity of the CDUA because it references the TMT Corporation rather than TIO. The reference to TMT Corporation in the CDUA does not affect the validity of the CDUA. *See* UH-TIO COL 420-426.
634.	88	Upon approval of the UH Comprehensive Management Plan (UH CMP) the BLNR made the University Board of Regents (UH BOR) Responsible for implementing the CMP, in accepting that responsibility the UH BOR delegated implementation of the CMP through normal UH governance channels to UHH, OMKM, MKMB, and also assigned two members of the UH BOR to sit as ex-officio, non-voting members on the MKMB. Ex. A-003, p.3-128	Citation does not support the proposition.
635.	88	There is no dispute the University of Hawai`i, is the only Applicant named on the Conservation District Use Application for the proposed TMT Telescopes Project.	Misleading. Presented out of context. Unsupported/Unsubstantiated.
636.	88	There is no dispute the TMT Corporation is in fact not named as the "applicant" on the CDUA-HA-3568.	Misleading. Presented out of context. Additionally, as previously noted, "TMT Corporation" will not be involved in the construction or operation of the TMT Project. Otherwise not in dispute.

637.	88	The record of the BLNR's decision to approve the UH CMP and CDUA-HA-3568 did not include specific findings of fact as to three elements of the Ka Pa`akai due process analysis. (Ex. B-41, B-42). Indeed, the Applicant's admitted lack of process for addressing claims of traditional and customary Native Hawaiian practitioners harmed by decisions made ostensibly in compliance with the UH CMP indicates that the appropriate due process analysis required by Ka Pa`akai has not been met in this case. Thus, approval of CDUA-HA-3568 would further the inappropriate "wholesale delegation" BLNR's legal obligations, in violation of the constitutional due process rights of Native Hawaiian practitioners.	Unsupported/Unsubstantiated. Misleading. Presented out of context. The CMP specifically outlines the *Ka Pa'akai* framework used to develop the plan. *See* Ex. A-9 at 2-6 to 2-8. This proceeding is being conducted pursuant to the rules and regulations of BLNR; and BLNR will make its *Ka Pa'akai* findings based upon the entire record of this case. BLNR has not delegated this responsibility
638.	89	As the findings of fact show, the record is replete with confirmation that the Native Hawaiian petitioners in this case engage in constitutionally protected traditional and customary practices.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 611-774, COL 177-217; *see also* UH-TIO COL 86-87, 100-109, 327-335. The evidentiary record is wholly lacking in reliable probative and substantial evidence that practices of Petitioners are constitutionally protected.
639.	89	The findings of fact above demonstrated that:	Incomplete.
640.	89	the entire conservation district of Mauna Kea is a known sacred landscape with viewplanes associated with navigation and many ancient trails (FOF #103)	Citation does not support proposition. Unsupported/Unsubstantiated.
641.	89	the historic properties in the Mauna Kea Science Reserve are "are of importance to Native Hawaiians because they possess traditional cultural significance derived from associated cultural practice and beliefs," (FOF	Citation does not support proposition.

		#103)	Unsupported/Unsubstantiated.
642.	89	the traditional and customary and religious practices include the collection of water, depositing piko, burial ceremonies, and religious observances.	Unsupported/Unsubstantiated.
643.	89	these ancient practices continue today and have evolved into contemporary practices ; the construction of ahu, releasing of cremated remains, and other contemporary cultural practices evolved from ancient practices and considered reasonable practices. (FOF #105, #106)	Citation does not support proposition. Unsupported/Unsubstantiated.
644.	89	these practices are of the class of practices protected by Article XII, sec. 7 of the Constitution and the related caselaw.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 611-774, COL 177-217; *see also* UH-TIO COL 86-87, 100-109, 327-335. *See supra* UH-TIO's response to Ward's proposed COL 638.
645.	89	These findings of fact demonstrate that the current practices of some of the Petitioners were previously identified as NHTCP (thus meeting both the Constitutional requirements and court requirement (PASH and State v. Hanapi)) and have been known to the University for more than a decade.	Unsupported/Unsubstantiated. *See* UH-TIO FOF 611-774, COL 177-217; *see supra* UH-TIO's response to Ward's proposed COL 638.
646.	89	Article 11, Section 1. "For the benefit of present and future generations, the State and its political subdivisions shall conserve and protect Hawaii'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.	Misleading. Presented out of context. The Public trust doctrine has never been extend beyond the context of water resources. UH-TIO FOF 1007, COL 295-323..
647.	89	Article 12, Section 4. "The lands granted to the State of Hawaii by Section 5(b) of the Admission Act and pursuant to Article XVI, Section 7, of the State Constitution, excluding therefrom lands defined as "available lands" by Section 203 of the Hawaiian Homes Commission Act, 1920, as amended, shall be held by the State as a public trust for native Hawaiians and the general public."	Misleading. Presented out of context. The Public trust doctrine has never been extend beyond the context of water resources. UH-TIO FOF 1007, COL 295-323.

648	90	In Re Water Use Permit Applications, 94 Hawai`i 97, 9 P.3d 409 (2000) ("the Waiahole Ditch Case"), the Hawai`i Supreme Court recognized that public trust doctrine was "a fundamental principle of constitutional law in Hawai`i." Haw. Const., Art.XI, section 1, P.133, 9 P.3d at 444.	Misleading. Presented out of context. The Public trust doctrine has never been extend beyond the context of water resources. UH-TIO FOF 1007, COL 295-323.
649.	90	The duties imposed by the public trust doctrine in this case are not supplanted or made superfluous by HRS Chapter 183C or the regulations promulgated there under. "Mere compliance by [agencies] with their legislative authority is not sufficient to determine if their actions comport with the requirements of the public trust doctrine. The public trust doctrine at all times forms the outer boundaries of permissible government action with respect to public trust resources." Id. at 132, 9 P.3d at 445 (citing to Kootenai Envtl. Alliance v. Panhandle Yacht Club, Inc., 105 Idaho 622, 671 P.2d 1085, 1095 (Idaho 1983)). Thus, BLNR, like the Commission on Water Resource Management in the Waiahole Ditch Case, has an "affirmative duty" to take the public trust into account in permitting the use of public lands located in the conservation district and "to protect the public trust uses whenever feasible."	With regards to the quotations of the "Waiahole Ditch Case": Not in dispute. With regards to legal conclusions/application of the Waiahole Ditch Case: Incorrect/False. *See* UH-TIO COL 295-323.
650.	90	There is no dispute that Mauna Kea is a "public natural resource" of the class protected under Article XI, section 1 of Hawaii's Constitution. See, Waiahole Ditch Case at 133, 9 P.3d at 444 Mauna Kea is part of the "ceded lands trust," lands ceded by the federal government back to the State of Hawai`i by Section 5(b) of the Admission Act and pursuant to Article XVI, Section 7, of the Hawai`i Constitution. These lands are held by the State as "a public trust for native Hawaiians and the general public." Haw. Const., Art. XII, sec. 4. Mauna Kea has also been designated a National Natural Landmark because of its unique geological and biological features. It is eligible for listing in the National Register of Historic Places as a traditional cultural property. There is no doubt that it is a public natural resource of invaluable worth to the public and Native Hawaiians.	Citation does not support proposition. Misleading. Presented out of context. Incorrect/False. *See* UH-TIO COL 295-323.
651.	90	Therefore, BLNR must independently uphold the Constitutional mandate that it "shall conserve and protect Hawaii's natural beauty and all natural	Incorrect/False. *See* UH-TIO COL 295-323.

		resources…in a manner consistent with their conservation." Haw. Const., Art. XI, sec. 1.	
652.	90	The Native Hawaiians and the general public are the two named beneficiaries of the public trust established in the Hawaii Admissions Act. Section 5(f), of the Act, includes support programs "for the betterment of the conditions of native Hawaiians." As both public and Native Hawaiian beneficiaries of this trust, Petitioners have a right to judicial review of actions of the trustee that result in waste of or deprivation of income from the assets. As beneficiaries of this trust, they have a right to reasonable revenues from the lease of public lands subject to the provisions of the trust.	Incorrect/False. Mischaracterization of law. Citation does not support proposition.
653.	91	Section 171-17 and -18, HRS, require the DLNR to assess and collect fair market lease rent, to be deposited in the Public Trust Land Fund.	Irrelevant/Inapplicable. Lack of Jurisdiction.
654.	91	HRS 171-17 (a) The appraisal of public lands for sale or lease at public auction for the determination of the upset price may be performed by an employee of the board of land and natural resources qualified to appraise lands, or by one but not more than three disinterested appraisers whose services shall be contracted for by the board; provided that the upset price or upset rental shall be determined by disinterested appraisal whenever prudent management so dictates. No such lands shall be sold or leased for a sum less than the value fixed by appraisal; provided that for any sale or lease at public auction, the board may establish the upset sale or rental price at less than the appraisal value set by an employee of the board and the land may be sold or leased at that price. The board shall be reimbursed by the purchaser or lessee for the cost of any appraisal required to be made by a disinterested appraiser or appraisers contracted for by the board. (a) Have the appraisal of public lands for sale or lease at public auction for the determination of the upset price may be performed by an employee of the board of land and natural resources qualified to appraise lands, or by one but not more than three disinterested appraisers whose services shall be contracted for by the board.	Irrelevant/Inapplicable. Lack of Jurisdiction.
655.	91	HRS 171-18. All funds derived from the sale or lease or other disposition of public lands shall be appropriated by the laws of the State; provided that all proceeds and income from the sale, lease, or other disposition of lands ceded	Irrelevant/Inapplicable. Lack of Jurisdiction.

		to the United States by the Republic of Hawaii under the joint resolution of annexation, approved July 7, 1898 (30 Stat. 750), or acquired in exchange for lands so ceded, and returned to the State of Hawaii by virtue of section 5(b) of the Act of March 18, 1959 (73 Stat. 6), and all proceeds and income from the sale, lease or other disposition of lands retained by the United States under sections 5(c) and 5(d) of the Act and later conveyed to the State under section 5(e) shall be held as a public trust for the support of the public schools and other public educational institutions, for the betterment of the conditions of native Hawaiians as defined in the Hawaiian Homes Commission Act, 1920, as amended, for the development of farm and home ownership on as widespread a basis as possible, for the making of public improvements, and for the provision of lands for public use.	
656.	91	There are at least 13 leases for telescope structures on the public lands of Mauna Kea. These sub-leases are made between the State, UH and foreign and non-state governments and corporations that have no such protection under the relevant sections of the Admissions Act, including Section 5(f) of the Act.	Irrelevant/Inapplicable. Lack of Jurisdiction.
657.	91	The leases are signed by a representative of DLNR, a representative of the University, and representatives of the telescope owners/operators. Ex. B-7.	Irrelevant/Inapplicable.
658.	92	The annual lease rent paid by of the existing telescope owners/operators is either $1 or less. Exhibit Subleases	Irrelevant/Inapplicable. Misleading. Presented out of Context Under the TIO Sublease, TIO agreed to pay rent on a graduated schedule that will eventually be approximately $1 million per year in about eight to ten years. *See* UH-TIO FOF 208, 215, 261, 278, 463.
659.	92	While the University may benefit from the use of public trust lands for educational purposes under Section 5(f) of the Hawai`i Admissions Act,	Irrelevant/Inapplicable.

		however, the law does not provide private corporations and foreign countries that same privilege.	Lack of Jurisdiction. Unsupported/Unsubstantiated. Misleading. Presented out of context. *See* UH-TIO COL 305-310.
660.	92	The University may not extend their public trust lands privilege to non-state and foreign government and or corporations.	Irrelevant/Inapplicable. Lack of Jurisdiction. Unsupported/Unsubstantiated. Misleading. Presented out of context. *See* UH-TIO COL 305-310.
661.	92	As is evidenced in the sub-lease agreements the University is not assessing and collecting fair market lease rent and depositing it into the Public Trust Lands Fund for public purposes pursuant to HRS 171.	Irrelevant/Inapplicable. Lack of Jurisdiction. Misrepresentation.
662.	92	As is evidenced in the sub-lease agreements the DLNR is not assessing and collecting fair market lease rent and depositing it into the Public Trust Lands Fund for public purposes pursuant to HRS 171.	Irrelevant/Inapplicable. Lack of Jurisdiction. Misrepresentation.
663.	92	It is undisputed that fair market lease rent has not been collected by DLNR for the use of the public lands of Mauna Kea for astronomy related activities, commercial tours, and other revenue generating uses.	Irrelevant/Inapplicable. Lack of Jurisdiction. Under the TIO Sublease, TIO agreed to pay rent on a graduated schedule that will eventually be

			approximately $1 million per year in about eight to ten years. *See* UH-TIO FOF 208, 215, 261, 278, 463.
664.	92	BLNR is required to assess and collect fair market lease rent to be deposited into the Public Trust Lands Fund to be used for specified public uses, regardless of the fact that the University under HRS 304, may also charge users rent.	Irrelevant/Inapplicable. Lack of Jurisdiction. Under the TIO Sublease, TIO agreed to pay rent on a graduated schedule that will eventually be approximately $1 million per year in about eight to ten years. *See* UH-TIO FOF 208, 215, 261, 278, 463.
665.	92	DLNR's 1977 management plan for the Mauna Kea Conservation District required that no application shall have final approval without the applicant having first filed with the board adequate security equal to the amount of the contract to construct the telescope facilities, support facilities and to cover any direct or indirect costs attributed to the project.	Misleading. Presented out of context. The 1977 Management Plan is merely a policy guide not intended to impose rigid standards. *See* UH-TIO FOF 339. Irrelevant/Inapplicable.
666.	92	Although the TMT Observatory Corporation has alluded to pay an un-specified amount of "substantial rent," the University is actually the Applicant on this CDUA, and the UHH has not provided at security deposit.	Misleading. Presented out of context. The 1977 Management Plan is merely a policy guide not intended to impose rigid standards. *See* UH-TIO FOF 339. Citation does not support proposition. Ward provides no legal authority that would require

			UH Hilo to pay a "security deposit."
667.	92	Moreover HRS 171, requires all lease rent for the use of public trust lands to be based on the fair market value. This means rent is not based on what the Applicant or the TMT Corporation is willing to pay.	Irrelevant/Inapplicable. Lack of Jurisdiction. Unsupported/Unsubstantiated. Not Credible. Under the TIO Sublease, TIO agreed to pay rent on a graduated schedule that will eventually be approximately $1 million per year in about eight to ten years. *See* UH-TIO FOF 208, 215, 261, 278, 463. Ward offers no evidence that the agreed upon rent is less than fair market value.
668.	93	Neither the CMP nor the CDUA ensure that either the general public or Native Hawaiian beneficiaries receives their constitutionally guaranteed portion of all money generated from the use of former crown and government lands of which Mauna Kea is a part as is provide under the law (HRS 171).	Irrelevant/Inapplicable. Lack of Jurisdiction. Under the TIO Sublease, TIO agreed to pay rent on a graduated schedule that will eventually be approximately $1 million per year in about eight to ten years. *See* UH-TIO FOF 208, 215, 261, 278, 463. By statute, 20 percent of the rent would go to OHA.

			See HRS § 10-13.5.
669.	93	The BLNR, has a fiduciary duty to protect the interests of its beneficiaries.	Irrelevant/Inapplicable. Lack of Jurisdiction as to HRS 171.

BOARD OF LAND AND NATURAL RESOURCES

STATE OF HAWAI'I

IN THE MATTER OF Contested Case Hearing Re Conservation District Use Application (CDUA) HA-3568 for the Thirty Meter Telescope at the Mauna Kea Science Reserve, Ka'ohe Mauka, Hāmakua, Hawai'i, TMK (3) 4-4-015:009	Case No. BLNR-CC-16-002 CERTIFICATE OF SERVICE

CERTIFICATE OF SERVICE

The undersigned certifies that the above-referenced document was served upon the following parties by email unless indicated otherwise:

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