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COMMENTS OF THE GREEN POWER INSTITUTE ON THE 2021 WILDFIRE MITIGATION PLANS OF THE SMJUS

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The Green Power Institute, the renewable energy program of the Pacific Institute for Studies in Development, Environment, and Security (GPI), provides these *Comments of the Green Power Institute on the 2021 Wildfire Mitigation Plans of the SMJUs*. GPI's opening comments address the 2021 WMP Updates of the Small and Multi-Jurisdictional Utilities (SMJUs). We did not review or prepare comments on the Independent Transmission Operators' (ITOs) 2021 WMP Updates given the very small size of their uniquely built systems, which include substantial undergrounding or underwater transmission lines. We also did not review or comment on the SMJU quarter-four reports on account of the length of IOU 2021 WMP Updates, which limited our review time for the SMJU filings. We further focus on those aspects of the SMJU plans that address distribution system wildfire risk. It is well known that the distribution system presents the largest wildfire risk by the numbers, including but not limited to the total number of risk events and ignitions. This is a simple result of the fact that the distribution system has the most poles, assets, and conductor miles in close proximity to vegetation and ratepayers.

Like the 2021 WMP Updates of the IOUs, the SMJUs in their 2021 WMP updates are overhauling their risk modeling methods, although at a slower pace. The results of the overhauls are leading to a major lag in risk assessment and mapping tools while SMJUs move forward with wildfire mitigation program implementation. While their slower pace is expected, it also presents an opportunity to closely monitor and guide their risk modeling efforts in order to facilitate the development of robust predictive tools despite their inherently limited risk-event datasets.

Our comments address the following topics:

- Liberty should provide Tables 1- 12 in an excel format in future quarterly reports and annual updates.

- Many of PacifiCorp's Mitigation descriptions in Section 7.3 are missing detailed information required in the WMP.
- Risk Modeling: SMJU's ability to model probability of ignition and other risk drivers is limited by available data. SMJU wildfire risk should not be underestimated due to their small territories and few risk driver/ignition events.
- Risk Modeling: All SMJU wildfire risk models should be vetted and the results provided in the WMP and annual updates.
- Risk Modeling: Liberty risk modeling review and recommendations.
- Risk Modeling: PacifiCorp risk modeling review and recommendations.
- Risk Modeling: PacifiCorp relies on remote sensing and sensors to determine fuel conditions.
- Risk Modeling: BVES risk modeling review and recommendations.
- Asset Management and Inspections: Liberty should explain the change in Level 1 findings from detailed inspections and justify the decision to not perform HFTD patrol inspections.
- Asset Management and Inspections: BVES utilizes the most inspections and should justify cumulative versus diminishing returns.
- Grid Hardening: G.O. 95 pole loading infractions are not adequately addressed.
- Grid Hardening: Liberty completed many fuse replacements in low wildfire risk rated zones.
- Grid Hardening: Liberty should explain how many wildfire risk events it anticipates the green jacket insulator program will eliminate.
- Grid Hardening: SMJUs continue to rely on CC as a wildfire and PSPS mitigation tool despite a lack of definitive evidence regarding its efficacy or ability to reduce wildfire and PSPS risk.
- Grid Hardening: BVES should work with SCE to determine if the import line supplying BVES is likely to undergo a PSPS.
- Grid Hardening: BVES egress route hardening program does not include a focus on wildfire risk reduction.

- Vegetation Management: PacifiCorp's pre-fire season and 1-year vegetation management plans are focused on inspections and evaluations.
- Vegetation Management: Liberty's vegetation management program to achieve clearances is vague.
- Vegetation Management: PacifiCorp has sidelined their LiDAR inspection program on account of many false positives.
- Vegetation management: SMJUs do not describe any VM residue end-use pathways.

Liberty should provide Tables 1- 12 in an excel format in future quarterly reports and annual updates.

GPI was unable to locate an excel workbook for Liberty's Quarter 4/ 2021 WMP Update data Tables 1- 12, WSD Attachment 2.3 (Liberty 2021 WMP Update p.166 -180). Data Tables 1-12 that were appended to Liberty's 2021 WMP Update were unusable, either for direct evaluation or for transfer to excel. Table conversion to PDF format resulted in most data entries having no column or row headers and rendered large segments of the tables uninterpretable. It is also impossible to determine which table each page corresponds to. Based on the pages provided it also appears that not all of the required data tables and data are provided. Table 1-12 are clearly present in Liberty's Q4 report but are not supplied in excel format. Liberty should provide their WMP performance metrics Tables 1-12 in excel format with each quarter report and the annual Update. The excel format should also be available for download on their website along with the .pdf version and WMP reports.

Many of PacifiCorp's Mitigation descriptions in Section 7.3 are missing detailed information required in the WMP.

Mitigations in section 7.3 of the WMP are required to provide the following information:

1. ***Risk to be mitigated*** */ problem to be addressed*
2. ***Initiative selection*** *("why" engage in activity) – include reference to a risk informed analysis on empirical (or projected) impact of initiative in comparison to alternatives*

3. ***Region prioritization*** *("where" to engage activity) – include reference to a risk informed analysis in allocation of initiative (e.g., veg clearance is done for trees tagged as "high-risk")*
4. ***Progress on initiative*** *(amount spent, regions covered) and plans for next year*
5. ***Future improvements to initiative***

PacifiCorp should ensure that future WMP annual and 3-year updates include all requested information in sufficient detail.

Risk Modeling: SMJU's ability to model probability of ignition and other risk drivers is limited by available data. SMJU wildfire risk should not be underestimated due to their small territories and few risk driver/ignition events.

GPI is particularly concerned about the ability of SMJUs to adequately model and address probability of ignition risk for specific risk drivers within their territories due to their very limited risk-driver datasets. As we have addressed in past comments on the SMJU WMPs, the SMJU's intrinsically have smaller outage and ignition datasets given their smaller territory sizes in comparison to the IOUs. A direct probability of ignition comparison between the SMJUs and IOUs is also difficult-to-impossible to perform since the SMJU datasets are smaller and therefore limited in terms of their statistical robustness. For example, it is statistically impossible to compare the IOUs' wildfire risk with BVES given their small territory which recorded only 258 distribution outage events, and no annual ignitions since 2015. This does not necessarily imply that BVES and the other SMJUs have a lower probability of ignition or overall lower wildfire risk than the IOUs on a per circuit mile or area basis. Rather their probability of ignition could very well be on par with the IOUs, even though it is more difficult to assess given the stochastic nature of wildfire risk and the overall low frequency of outages and ignitions. SMJU wildfire risk models and plans must be reviewed with this adjusted, data-limited frame of reference in mind.

Some of Liberty and PacifiCorp's data limitations are also due to past practices. For example, Liberty explains:

> Recent risk analysis performed by Liberty includes utilizing a machine learning approach to model its wildfire risk. Initial data inputs include detailed historic outage records dating

> back to 2015 pulled from the company's outage management system (OMS). Since the OMS was fully integrated in 2017, data integrity and quality can only be reasonably analyzed for 2017-2020 (Liberty 2021 WMP Update, p. 26).

Comments made by the SMJUs during the March 23, 2021, workshop also indicated that past outage data collection was driven by a focus on repairs and service restoration rather than for understanding wildfire risk and risk drivers (See also Liberty 2021 WMP Update p. 29-30). Our understanding based on these comments is that until relatively recent years, SMJU data collection methods led to recording many outages as having "unknown", or simply unlisted, drivers.

Based on the 2021 WMP Update narratives it appears that the SMJUs are moving towards more robust and auditable risk-driver and outage-event reporting formats that utilize computer-based platforms to record and store data in place of traditional paper forms. However, distribution outage data for PacifiCorp still includes over 129 and 85 "other-distribution" and "unknown-distribution" outage events in 2020, or 19 and 12 percent of the total 2020 distribution outage events. Of the total distribution outage events recoded since 2015, 22 percent and 13 percent are categorized as "other-distribution" and "unknown-distribution." Based on these data it appears that PacifiCorp is still unable to determine the risk event that caused a substantial proportion of their outages, and/or they have numerous or major risk drivers that are not included in the WSD risk driver categorization schema. Liberty reports 52 distribution "other" risk events in 2020 alone. Comments from Liberty suggest that pre-2017 data cannot be validated. PacifiCorp and Liberty should explain the main risk drivers that underlie "other-distribution" outages. PacifiCorp should explain the measures they are taking to determine the risk drivers underlying otherwise "unknown-distribution" outage events.

Past data gaps are inescapable, although their proportion of the overall dataset will shrink as the new data collection systems are implemented and additional years' worth of data are added over time. The fact remains that any past data gaps will continue to affect the SMJUs' ability to evaluate probability of ignition, specific risk drivers, and overall

wildfire risk based on risk driver outage data within their territory for the next few years. This is especially the case if substantial risk driver data gaps persist in the near-term.

The SMJU's probability of ignition and risk-driver-specific risk modeling efforts are especially limited based on the combined effects of few stochastic risk driver events occurring in their relatively small territories (i.e. low *n* for outages and ignitions) and past data gaps. This is particularly concerning since these data are foundational to understanding, targeting, and efficiently mitigating ignition potential and overall wildfire risk. When asked to expand on this particular challenge in the March 23, 2021, workshop, each SMJU acknowledged this issue and provided options they were exploring in order to overcome their data shortage. Options included data sharing with the IOUs, data sharing with other SMJUs, and evaluating data from other non-California territories within the company jurisdiction (i.e. PacifiCorp). However, none of the SMJUs described any data sharing plans or collaborations within their 2021 WMP Updates.

GPI recommends that the SMJUs explain how they are addressing their outage and ignition-risk-driver data shortage issue in the next annual update. They should also provide a summary of how the data limitations have limited their ability to accurately model probability of ignition and overall wildfire risk, and how they intend to overcome these hurdles. All SMJUs should also provide a summary of risk model vetting and validation outcomes, including ability to predict past outage and or ignition events.

Based on the SMJUs' 2021 WMP Updates there are few indications that they are leveraging any IOU datasets in order to model risk or mitigation potential. Since the SMJUs share substantial borders with the IOU's (e.g. BVES is encircled by SCE), there would seem to be numerous opportunities to leverage existing IOU datasets, including probability of ignition risk driver assessments, that are relevant to the SMJU territories in terms of tree species, fauna, climate, weather patterns, and other regional characteristics. For example, raw data on tree species and associated outage occurrence from a neighboring IOU may inform SMJU vegetation probability-of-ignition models. While we understand that each utility adopts somewhat different grid design and topology methods, there are also presumably opportunities to learn from IOU's equipment-based probability

of ignition risk based on the fundamentals of standard grid assets and asset failure modes. Alternatively, a small SMJU like BVES may benefit from contracting out aspects of its risk modeling to SCE, which encircles its entire territory. Regardless, GPI strongly recommends that SMJUs develop pathways to supplement their limited risk driver datasets and reduce or eliminate the need to "reinvent the wheel" by preforming independent risk-based analyses (e.g. risk tree species) by leveraging IOU data and results.

We address individual SMJU risk models in comments below.

Risk Modeling: All SMJU wildfire risk models should be vetted and the results provided in the WMP and annual updates.

SMJUs indicate that they vet and validate their wildfire risk models, yet none provide the outcomes of their modeling test efforts. GPI recommends that all SMJUs provide a more detailed summary of how they vetted and validated their models, including the outcomes and predictive capabilities of any model tests with real data.

Some model assessment can be performed based on WMP narratives. However, the narratives are high-level summaries of complex methods and algorithms with numerous underlying assumptions and can only be evaluated at a corresponding high-level based on the relatively limited information provided. GPI therefore recommends requiring an Independent Evaluation of SMJU wildfire risk models since they are foundational to deploying targeted mitigation activities that achieve efficient and rapid risk buydown. The IE may be part of the IE teams defined by the WSD, or a separate entity. Flawed risk models could result in large amounts of ratepayer dollars going towards inefficient and/or ineffective wildfire risk mitigations that fail to decrease wildfire risk.

Risk Modeling: Liberty risk modeling review and recommendations.

Liberty's updated risk modeling most closely reflects the IOU risk modeling methodologies, including the use of Machine Learning (ML) to develop a granular probability-of-ignition risk model based on outage data (Liberty 2021 WMP Update, p.

26). Liberty also performs wildfire consequence modeling via Reax match drop analyses. The resultant wildfire risk model is defined as probability-of-ignition times consequence and includes both circuit and polygon granularity. Liberty has generalized plans to develop a PSPS model in 2021, although methods were not defined. Liberty's combined probability-of-ignition and wildfire consequence model appears to be the most quantitative model employed by the SMJUs. It is important to note that the integrity and completeness of the underlying dataset is in question for 2015-2016 and cannot be vetted.

GPI recommends collecting additional information regarding model testing methods and outcomes. SCE currently uses the most robust method by randomly selecting data to use as a testing dataset from the entire available dataset. Liberty should clarify if and how it preformed ML model testing and the results of the model test, including the occurrence of false negatives. An Independent Evaluator (IE) should also review the model and assess what, if any, predictive limitations may result from training an ML model on Liberty's limited risk driver dataset (e.g. outages and ignitions) in order predict a stochastic, low-frequency event (i.e. probability of ignition).

Risk Modeling: PacifiCorp risk modeling review and recommendations.

PacifiCorp relies on forced outage events and ignition events as a proxy for modeling ignition risk. Their distribution outage and ignition event data totals 4611 and 58 events, respectively, from 2015 to 2020. As previously discussed, PacifiCorp distribution outage data likely has substantial gaps based on "unknown" and "other" outage risk driver categories upwards of 13 percent and 22 percent of total outages, respectively, since 2015.

Similar to other Utilities it appears that PacifiCorp overhauled their risk modeling circa 2020 to generate their Localized Risk Assessment Model (LRAM). The LRAM seems to combine some probability of ignition and consequence modeling to determine overall risk. PacifiCorp states:

> The first step in this process was to leverage prior risk modeling for application at the module level. The core logic in the existing risk modeling, as expressed by fire threat tier designation, remains sound. Modeling general ignition probability and historic fire

> weather fire spread probability, together and including population density to approximate impact, is the best and primary method to assess general wildfire risk, and this approach serves to establish risk to utility assets, irrelevant of the ignition cause. Accordingly, PacifiCorp used the Integrated Utility Threat Index (iUTI) to determine the relative risk score of each individual module. Modules with varying iUTI scores are being assessed based on a weighted average proportionate to the portion of the module with any particular iUTI score [PacifiCorp 2021 WMP Update, p. 56].

Prior modeling summaries imply that PacifiCorp used both forced outage events and actual ignitions in determining wildfire risk. The assessment of "general wildfire risk" that is "irrelevant of the ignition cause" may be a point of concern for PacifiCorp's more granular model and their ability to deploy mitigations to address the most pressing risk drivers.

Based on a review of the nested data elements, the LRAM includes a nested "vegetation outage rate" assessment that includes "historic outage records and circuit information." An example provided in the Update describes how the model can be used to target vegetation management based on tree cover and historic data. It is not, however, readily apparent whether or how outage data based on equipment failure is integrated into the risk model. The Utility Fault Rate Ignition Risk model utilizes outage data with a focus on the relationship between outage and ignitions. Other equipment risk related sub-models appear to focus on short circuit events and arc energy risk and use CYME as the primary or sole data input. The "Utility Fire" sub-model purpose is "To review and compare utility caused fire details and locations, to determine what causes and risks contribute to utility equipment ignition [PacifiCorp 2021 WMP Update, p. 70]." The Method is focused on combining data elements "to create a recoded dataset of utility caused fires" though the application and results section state that the model is focused on determining Equipment risk:

> Implement wildfire mitigation strategy in areas where at risk equipment exists. The information can be used to determine any trends which may occur when analyzed with additional fire risk influencers. This data will help to determine where addition system and equipment risk exist to drive facility locations upgrades and placements for protective equipment [PacifiCorp 2021 WMP Update, p. 71].

Based on the Utility Fire sub-model description it is not entirely clear whether the model is intended to evaluate Equipment probability of ignition or full-blown fire occurrence and consequence, and for which risk drivers. The Utility Fire sub-model data inputs and focus on "fires" do not parallel the "vegetation outage rate" sub-model.

PacifiCorp's equipment caused distribution outages comprise 41 percent of the total outages and 50 percent of total ignitions since 2015. GPI recommends that PacifiCorp clarify if and how is it utilizing equipment caused distribution outage data in the LRAM, and whether the LRAM can guide granular Grid and System Hardening efforts needed to reduce equipment-outages and ignitions on the distribution system. They should also clarify whether the LRAM model can inform pro-active equipment replacement (e.g. aging or high risk assets) prior to failure.

PacifiCorp includes an "LRAM Validation" Section that focuses on "stress testing" model weightings. Relative weightings appear to be based on a relative assessment of model outcomes based three areas chosen by SMEs with a range of fire risk relevant characteristics. This method seems to constitute a manual "cluster analysis" with a subjective determination of what the risk model outcome should be based on each location's characteristics. PacifiCorp states that only the Probabilistic Arc Energy sub-model weight was reduced. Subjective, relative weightings were also used in the "Contemporary Fire Weather Risk" model for weather variables versus fire components [PacifiCorp 2021 WMP Update, p. 63]. In Section 7.3.1 Risk Assessment and mapping, PacifiCorp states:

> PacifiCorp designed the LRAM, in its enabling function, to be broadly extended throughout its electrical network. With regard to prioritization and validation of its model, it utilized a Tier 3 area, Tier 2 are subject to PSPS due to local climatology and a Non-Tier area (PacifiCorp 2021 WMP Update, p. 123).

This suggest that the LRAM model may not be functional for Tier 2 areas, or at a minimum its accuracy in Tier 2 is not validated. These model vetting and validation activities do not constitute objective or comprehensive model vetting methods and may introduce substantial subjectivity and/or inaccuracies to modeled risk outcomes. GPI

recommends that an IE vet and validate PacifiCorp's LRAM model including its ability to predict/align with historic ignition and wildfire occurrences and assess probability of ignition risk for equipment risk drivers. PacifiCorp should also explain when they will complete model validation on HFTD Tier 2 areas and provide the results of both Tier 3 and Tier 2 validation work.

PacifiCorp also states that higher risk rankings do not always result in mitigation prioritization:

> Because of certain design goals, access limitations, and other factors not specifically calculated, a higher composite score does not necessarily mean that the module will always receive priority over a module with a lower risk score. For example, it would often not make sense to prioritize a module for certain types of mitigation in one year if the same module was scheduled for conversion to covered conductor in the following year.

While this is a relatively common statement in all utility plans, PacifiCorp and other utilities should explain what interim actions are implemented prior to more involved mitigations such as CC installation. For many SMJUs their system hardening and high-risk asset replacement (e.g. tree attachments and fuse replacements) plans are anticipated to take years to complete. During this time the risk in these regions will remain high. PacifiCorp and the SMJUs should describe if they will take interim measures to reduce wildfire risk in high-risk areas not slated for near-term mitigations. For example, performing or prioritizing increased patrol inspections and/or detailed inspections in high wildfire risk ranked circuits that are not scheduled for mitigations in 2021 – 22.

Risk Modeling: PacifiCorp relies on remote sensing and sensors to determine fuel conditions.

PacifiCorp relies on remote sensing and sensors to determine fuel conditions (PacifiCorp 2021 WMP Update, p. 26). All other SMJU and IOUs use a combination of fuel sampling and sensor/remote sensing data to determine fuel moisture. For example, Liberty has a weekly fuel moisture sampling program (Liberty 2021 WMP Update, p. 27). PacifiCorp should explain if and why it does not require a fuel sampling program to calibrate and validate sensor information and inform fire probability and consequence modeling. They

should also explain how they can implement a fuel moisture sampling effort, collaborate with a nearby Utility or other partner already performing the work, and/or leverage existing regionally relevant data.

Risk Modeling: BVES risk modeling review and recommendations.

BVES plans to overhaul their wildfire risk modeling methodology in 2021 by hiring a consultant to develop a more sophisticated ignition and wildfire risk model. They anticipate this new model will be completed in 2022. Details regarding model type or approach are not provided. GPI generally supports BVES's plan to overhaul their probability-of-ignition and wildfire risk model. The current model, which is referred to as the Risk-Based Decision-Making model (RBDM), is very vaguely defined, and limited in its evaluation of ignition probability and wildfire consequence. BVES also does not currently have a risk map of ignition probability and wildfire consequence.

BVES does not have a quantitative wildfire consequence model (e.g. match drop) as part of its risk assessment and the consequence evaluation that is in place is vague at best. BVES consequence metrics include "Worst Reasonable Case" and a tiered consequence rubric, both listed as an input to the existing RBDM. The "Worst Reasonable Case" seems to be a subjective process in which a "risk team" determines what the "Worst Reasonable Case" and most likely outcome of a given scenario would entail according to BVES's six impact categories. This is extremely vague and does not provide any meaningful information such as who the "risk team" includes, how they are determining "Worst Reasonable Case," or how they are defining "reasonable" (BVES 2021 WMP Update, p. 38). "Top Tier Events" appear to include qualitative consideration for "risk driver and consequential outcome." A "Tier 1 Consequence" is defined as:

- Has the potential to impact many processes;
- Could affect more than four risk categories;
- Risk velocity (speed on onset; the speed with which a risk manifests itself) is high; or
- Could affect corporate level policies or goals and/or have effects across multiple parts of the company. [BVES 2021 WMP Update, p. 38.]

This definition is extremely vague and does not include any threshold values that allow for appropriate, consistent, or measurable applications (e.g. if a fatality or injury occurs). For example, bench marking based on "Many processes" is vague and not adequately defined. The degree to which a fire would need to "affect" risk categories and why it must "affect" four categories is not clear or justified. A fire that affects BVES's "safety" risk category at a level 6 "severe" (single fatality) would in and of itself be considered an unacceptable wildfire consequence based on WSD/WSAB established objectives. Notably Tier 2 and 3 do not include any refence to affecting risk categories or risk category thresholds. A risk velocity of "high" is not quantitatively defined. It is also not clear what is meant by the final qualifier regarding "affecting" corporate policies or goals since the WMP itself is effectively requiring and leading to long-term changes in corporate policies and goals in order to prevent utility ignited wildfires, not react to them.

The RBDM also does not appear to have any quantitative probability-of-ignition models. It appears that BVES is incorporating risk events and risk drivers in the RBMD component titled "Identify Hazards/Threats (Triggers)." However, there are no details regarding what data (e.g. outage data) are used in this process or how they are using it. "Risk Identification" includes "Gather an initial list of risk events in a brainstorming session [BVES 2021 WMP Update, p. 43]." Risk Analysis methods include an initial undefined ranking of "selected risk events" as "high, medium, or low?" impacts, followed by "select risk events for full analysis". BVES also indicates that they "examine outliers" although how they determine outliers or what they do once they designate events as "outliers" is not clear and may fail to address the WSAB recommendation to scrutinize and plan for "black swan" events.

The Total Risk Score is derived from a "formula to create a score between 0 and 1,000,000,000 [BVES 2021 WMP Update, p. 42]," but the formula is not provided. The Fire Safety Circuit Model, which guides mitigation activities to reduce ignition potential, does not appear to include any fuel moisture, fuel load, or weather/wind considerations and is reliant on property identifying "worst performing circuits". Wildfire Risk Score Group risk scoring criteria for the Fire Safety Circuit Matrix, provided in Supporting

Tables 4.5.1-5 and 4.5.1-6, are not quantitatively justified and therefore their ability to properly assign risk is unknown. BVES' entire existing wildfire risk model, the RBDM, is plagued by vague and subjective methods that cannot be vetted based on the information provided. These and many other aspects of BVES's RBDM method are vague, do not appear to be data driven, and provide no insight into how BVES actually arrives at a wildfire risk score, or the assumptions made in this process.

As previously stated, granular wildfire risk modeling is foundational to rapid and efficient risk buydown. Without a more quantitative, data-driven, and transparent wildfire risk model it is not clear whether BVES is optimally deploying wildfire mitigation initiatives. Being the smallest SMJU, BVES also has risk driver data limitations that presents challenges to their modeling efforts. Since 2015 they have recorded 258 outages and 0 ignitions. Given these challenges and the current RBDM, GPI agrees that BVES's wildfire risk model needs a complete overhaul, and that external, expert support is needed.

BVES does not provide any indication regarding the methods they will explore for developing a new RBDM. GPI strongly recommends that the WSD and a qualified IE follow BVES's quantitative wildfire risk modeling effort in order to guide and vet the process over the course of its development. Given that BVES is encompassed by SCE, GPI recommends that BVES explore opportunities to leverage SCE's existing models, datasets, and/or data collection capabilities. BVES may even benefit from contracting SCE services to provide risk modeling datasets (e.g. high-risk tree data), modeling capabilities (e.g. contract SCE to perform a match drop analysis across BVES territory), and/or fill in data collection gaps (e.g. a small expansion of SCEs existing LiDAR or UAV programs to supply BVES datasets versus BVEs establishing entire programs). BVES's plan to develop an entirely new wildfire risk modeling suggests this is an opportune moment to consider collaborations with, or contract services from SCE.

BVES plans to develop multiple risk models and maps to 50 percent completion in 2021 and 100 percent completion by 2022, including:

- A summarized risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment.
- Climate-driven risk map and modelling based on various relevant weather scenarios.
- Ignition probability mapping showing the probability of ignition along the electric lines and equipment.
- Initiative mapping and estimation of wildfire and PSPS risk-reduction impact.
- Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment [BVES 2021 WMP Update, Table 5.3-1].

GPI is concerned by the proposed timeline. The WMP proceeding and method development has been underway since 2018. BVES is already behind in terms of their ability to model wildfire risk in their territory. This means the mitigation work being completed now may not be deployed in optimal locations. Lessons learned from PG&E are relevant to BVES, where PG&E's data-driven risk modeling overhaul led to drastic changes to their wildfire risk maps and resulted in substantial risk buydown inefficiencies and delays due to mitigation rollout in sub-optimal locations. While BVES is much smaller than PG&E it is equally important to efficiently deploy limited resources in order to reduce BVES's wildfire risk.

GPI recommends that BVES explore the ability to complete probability of ignition and wildfire consequence models in 2021 versus spreading their efforts across all proposed models. Models such as the climate-driven risk map and the estimation of wildfire and PSPS risk-reduction impact can be completed after foundational wildfire risk mapping is complete. Forecasted climate-driven risk is a longer-term assessment that is not required for immediate and near-term (1-3 year planning horizon) mitigation deployment and risk buydown. Estimation of wildfire and PSPS risk-reduction impact must occur subsequent to first determining wildfire and PSPS risk. GPI recommends delaying these models in order to focus on and establish complete, foundation wildfire risk models in 2021.

Asset Management and Inspections: Liberty should explain the change in Level 1 findings from detailed inspections and justify the decision to not perform HFTD patrol inspections.

Liberty saw a large increase in HFTD distribution Level 1 detailed inspection findings in 2020, from a peak of only 0.007 per mile (3 over 392 miles in 2017) between 2015 to 2019, to 0.057 per mile (56 over 981 miles) in 2020. The uptick in 2020 detailed inspection finding on a per mile basis relative to prior years suggests possible methodological deficits in identifying findings via detailed inspections, the only general distribution inspections Liberty is performing in HFTD. It also appears that Liberty increased the number of miles inspected via detailed inspections relative to previous years and the minimum required (i.e. GO standard) once per five-year inspection cycle. Liberty plans to perform detailed inspections of vegetation in HFTD once every three years per circuit. They plan to supplement this with annual LiDAR inspections on their entire overhead system beginning in 2021 (Liberty 2021 WMP Update, p. 112).

Vegetation patrol inspections specifically target dead and dying tree removal, not conductor clearances. Other Utilities perform annual HFTD patrol inspections prior to the fire season that include vegetation encroachment and asset assessment. Liberty "…performs annual patrol inspections in urban areas and patrol inspections every two years in rural areas (Liberty 2021 WMP Update, p. 101)." Their general patrol inspection plan does not appear to target HFTD areas at all based on the data in the performant metrics Table 1, which shows 0 HFTD distribution miles patrolled. Overall, Liberty performs the least amount of distribution system inspections in their HFTD compared to other SMJUs, including prior to fire season. Notably, Liberty also does not have a QA/QC program for inspections and will not develop one until 2022 (Liberty 2021 WMP Update, p. 102-3).

Liberty should provide the following information on their inspection programs:

- Explain why such a drastic increase in HFTD distribution system Level 1 findings occurred in 2020. For example, whether it was due to changes in inspection method, personnel training, inspection location, or other factors.

- Justify their decision to only perform detailed inspections in HFTD and not general patrol inspections.
- Describe what inspections are being conducted in the HFTD in advance of the wildfire season (i.e. by June 1 and September 1) to mitigate any new vegetation encroachment or utility asset issues that arise following detailed inspection and that could increase wildfire risk.
- Provide data to show that inspection gaps due to 3 or 5-year cycles do not lead to substantial increased circuit wildfire risk during interim inspection years.
- Provide data to demonstrate the efficacy of using annual LiDAR vegetation inspections to identify vegetation infractions as an interim inspection and compliment to 3-year detailed vegetation inspection cycles. These data are needed to determine whether Liberty is performing adequate HFTD distribution vegetation inspections and vegetation risk mitigation. If their methods are adequate, it may help guide the adoption of more efficient inspection methods for other SMJUs.

GPI also notes that there appear to be substantial differences in how utilities define patrol inspections and what they inspect, whether assets, vegetation clearances, and/or dead and dying trees. It may be prudent to clarify and establish the definitions of various patrol inspections to improve cross comparison of utility HFTD distribution system inspection programs and data table interpretation.

Asset Management and Inspections: BVES utilizes the most inspections and should justify cumulative versus diminishing returns.

BVES plans to implement four inspection approaches that generally address VM and/or asset condition: (1) two annual patrols of the entire overhead system; (2) detailed inspections on a standard 5-year cycle; (3) annual LiDAR inspections; and (4) sub-transmission and distribution UAV inspection.

BVES does not explain whether these inspections are staggered to evaluate VM and asset conditions throughout the year or the wildfire season. They do not explain how often it will perform UAV inspections. They also do not explain the number of conditions that are identified and remedied via LiDAR and UAV inspections. Assuming these two inspections are included in "other" inspections in Table 1, they resulted in no HFTD Level 1 findings in 2020. It is not possible to determine the contributions of LiDAR and UAV inspections to HFTD Level 2 or 3 findings (n = 39, n = 303) in 2020 based on "other

inspection" data in Table 1 since this category presumably includes intrusive pole, substation and other inspections. Duplicate annual patrol inspections appear to result in Level 1 and Level 2 findings on par with detailed inspections completed in 2020, though on a per mile basis detailed inspections are much more efficient at locating deficiencies.

GPI strongly recommends a thorough assessment of BVES's general VM and asset inspection methods to ensure they are in fact complimentary and not redundant. BVES should justify, with data, why it requires so many of what it terms "complimentary" inspections (e.g. BVES 2021 WMP Update, p. 122). They must show that these inspections have aggregative value, rather than diminishing returns, that justifies cost and resource allocation. For example, if the second complete OH patrol inspection resulted in only one additional Level 1 finding would it be more efficient and effective to divert resources to perform detailed inspections on say a 3-year cycle. Or, if UAV and LiDAR are unable to identify Level 1 findings, should these be performed on a less frequent basis (e.g. every 2 years) and replaced with additional annual detailed inspections. BVES should also clarify when it plans to provide proposed data on UAV program success (BVES 2021 WMP Update, p. 124).

In their 2021 WMP Update, BVES refers to a "Bi-Annual LiDAR Survey (detects Level 1 and 2 vegetation and facilities discrepancies and other discrepancies that may lead to safety issues; also detects if previously noted discrepancies are being properly cleared) (BVES 2021 WMP Update, p. 47)." They later state that they plan to implement an annual LiDAR inspection. BVES should clarify if it preforms an annual or bi-annual LiDAR survey.

Grid Hardening: G.O. 95 pole loading infractions are not adequately addressed.

BVES's Pole Loading Assessment and Remediation Plan notes that pole loading is a standard and ongoing program defined based on GO 95 and 195 standards with heavy loading requirements at high elevations. Yet BVES's 2020 pole loading assessments on 2,703 poles resulted in 43 percent (1,155 poles) failing the inspection criteria. In contrast, Liberty identified 400 poles in HFTD Tier 2 areas, and only 3 percent of total system

poles required replacement based on GO 95 conditions after inspecting all 22,400 poles in their territory. Liberty completed pole replacements in HFTD Tier 3 areas in 2020.

BVES should explain why such a large proportion of poles are failing long-standing GO load design standards, particularly assuming that they are aware that the poles were installed under less rigorous and outdated standards and present a substantial wildfire risk. BVES is also coordinating the pole loading assessment and remediation program with CC installations. Their Pole Loading Assessment and Remediation Plan is slated for completion in 2026 based on Table 5.3-2 [BVES 2021 WMP Update Plan, p. 68] or 2027 based on Table 7.1-1 [BVES 2021 WMP Update Plan, p. 89]. Given the vast number of poles that do not meet GO standards in BVES's territory it may be necessary to reevaluate whether waiting for packaged wildfire mitigations is prudent. Particularly given unknowns regarding CC capabilities and the extent of CC coverage needed to substantially reduce wildfire risk.

PacifiCorp states that it:

> …does not have a specific asset management and inspections wildfire mitigation program focused on pole loading assessment to determine safety factor of in-service assets. Instead, PacifiCorp uses engineering standards and compatible units for various scenarios and grades with inherent safety factors to ensure that the strength of the pole installed is sufficient for the intended use with the applicable safety factors [PacifiCorp 2021 WMP Update, p. 152].

Despite this they plan to replace over half the poles (1,632 of 3,005) that will be addressed through the pole replacement/reinforcement program (Activity 7.3.3.6), with most (88 percent) replaced in 2023. PacifiCorp should provide data on its pole loading assessments regarding the percent of inspected poles that are failing inspections based on GO loading standards.

Grid Hardening: Liberty completed many fuse replacements in low wildfire risk rated zones.

Liberty provides a plot of fuse replacement locations (Liberty 2021 WMP Update, p. 92). Liberty should explain why they performed substantial fuse replacements in the lowest

fire risk polygon, near South Lake Tahoe, versus in Moderate to Very High fire risk zones. They should also clarify their plans going forward since their plan to prioritize fuse replacement in high and very high Reax risk zones is not substantiated by past fuse replacement prioritization and the figure provided.

Grid Hardening: Liberty should explain how many wildfire risk events it anticipates the green jacket insulator program will eliminate.

Liberty plans to deploy a Green Jacket Insulator program to mitigate ignition risk from animal or debris contact with substation equipment (Liberty 2021 WMP Update, p. 94). A portion of the benefits are stated to include increasing system reliability. Liberty should provide data to justify the ability of the green jacket insulator program to predominantly reduce wildfire risk versus as a reliability application. The data provided in the standard tables do not provide the information that is required to evaluate the number of substation related outage or ignition occurrences by risk driver that the green jacket insulator program could prevent.

Grid Hardening: SMJUs also continue to rely on CC as a wildfire and PSPS mitigation tool despite a lack of definitive evidence regarding its efficacy or ability to reduce wildfire and PSPS risk.

The SMJUs are following suit after the IOUs, and largely adopting widespread CC installation as a primary mitigation strategy. It is not yet clear the extent to which CC coverage is needed to substantially reduce wildfire risk and especially PSPS need. In response to Action Liberty-8, Liberty states:

> External research was not heavily used beyond referencing covered conductor fault prevention research, which seemed to agree with Liberty's expectations and the results from the other IOUs' effectiveness scoring for the mitigation. Liberty remains hopeful, as some of these newer wildfire prevention technologies are used, more data and research can be incorporated into its later generation wildfire risk models [Liberty 2021 WMP Update, p. 45].

PacifiCorp states:

> …we lack the history that is ideal for increased confidence in post-installation outage experience to fully demonstrate how effective our wildfire mitigation covered conductor installations are expected to be. While these results strongly suggest 90% reduction in outages, or risk events, there simply has not been enough time to declare without a doubt the efficacy of the strategy. However, there are two positive signs in the analysis of our reliability focused samples, as well as additional reliability focused projects not included in the sample.
>
> As the company can add more projects, time, and operating experience it expects to improve these estimates, however, in conclusion, the company's analysis gauges the effectiveness of covered conductor/spacer cable to yield approximately 90% reduction in faults [PacifiCorp 2021 WMP Update, p. 86].

BVES states:

> Based on pilot programs, BVES has reevaluated its structure design in the context of wildfire risk and decided to replace bare conductors with covered conductors on all sub-transmission lines (34.5 kV) and to replace all bare 4 kV distribution wire in high-risk areas within the service area with covered wire (BVES 2021 WMP Update, p. 114).

It is likely that BVES has the least CC data given its small territory and concomitantly limited planned CC installations. Yet they somehow determine that they should install CC and/or wire wrap along all sub-transmission lines irrespective of wildfire risk (BVES 2021 WMP Update, p. 114, 115). They do not provide adequate justification regarding why this is needed or the impact it is anticipated to have on reducing wildfire risk and risk events. BVES should justify this decision with data and clarify how many circuit miles of sub-transmission CC it plans to deploy. All IOUs and SMJU's have now deployed CC, suggesting an opportunity to collaborate and leverage a collective CC dataset that could answer outstanding questions regarding the ability of CC to reduce wildfire risk related to a range of risk drivers.

GPI reiterates that the value of CC for mitigating the need to declare PSPS events remains unknown. While all IOUs and SMJUs appear to tout is as a PSPS mitigation method there has yet to be a Utility that has altered a PSPS threshold on account of CC installations. The ability for CC to reduce PSPS based on intrinsic operating capabilities, coverage and

optimal locations for PSPS mitigation has yet to be determined by the IOUs. Yet, PacifiCorp states:

> In review of its prior plans the company was criticized for appearing to adopt covered conductor as its lone strategy for limiting the probability of PSPS in the future. While the implementation of covered conductor is considered a key component in the reduction of PSPS probability, PacifiCorp has adopted many complementary elements to limit the probability or need for a PSPS event, evident by many components of the thorough rationale for assessing PSPS and fire risk described below [PacifiCorp 2021 WMP Update, p. 36].

and

> PacifiCorp's covered conductor installation program seeks to retrofit existing distribution and local transmission lines in the highest risk locations and PSPS zones with more resilient technology such as covered conductor and spacer cable [PacifiCorp 2021 WMP Update, p. 130].

and

> …initial [covered conductor installation] efforts [are] focused on engineering and program start-up and a general prioritization on PSPS designated areas to reduce risk and work toward eliminating the need for PSPS events [PacifiCorp 2021 WMP Update, p. 131].

Covered conductor may allow an increase in Operating/PSPS thresholds once it is thoroughly evaluated for this purpose. Although is not a new requirement for the WMP, a thorough evaluation of the ability for CC to reduce wildfire risk and enable grid operations during currently defined PSPS conditions has yet to be completed. We understand this is due in part to limited SMJU CC datasets. GPI recommends immediate and ongoing *collaborative* efforts are needed from the SMJUs and IOUs to leverage aggregated CC data and better understand the benefits of CC to wildfire and PSPS risk, including its intrinsic capabilities, necessary deployment coverage and optimal locations.

Grid Hardening: BVES should work with SCE to determine if the import line supplying BVES is likely to undergo a PSPS.

BVES notes that they receive imported generation from SCE supply lines. They plan to mitigate potential SCE PSPS event impacts by installing a 4 MW, 4-hour energy storage

facility (BVES 2021 WMP Updae, p. 109). GPI generally supports widespread DER installations to support distribution grid needs and reliability both locally and at the system level. It would, however, be prudent for BVES, the smallest SMJU, to open dialogue with SCE regarding the likelihood of a PSPS impacting that particular line. GPI also recommends additional exploration regarding how both SCE and BVES could reduce the risk of PSPS on that particular line, given its importance to BVES customer load. The likelihood of PSPS in BVES due to SCE enacted PSPS should also inform BVES's PSPS customer impact mitigation planning.

Grid Hardening: BVES egress route hardening program does not include a focus on wildfire risk reduction.

BVES will conduct an evacuation route hardening pilot project (in 2021) and implement an evacuation hardening program (2-yar plan). GPI generally supports the development of this plan since one of the benefits of smaller Utility territories should include a closer connection between the community and holistic community planning, in this case electric sector design that considers wildfire/emergency egress routes. However, BVES states:

> The primary objective of this pilot program is not to reduce the risk of ignition resulting in a wildfire. Rather, the pilot program is to develop tools and approach to add resiliency and safety during an evacuation due to a wildfire (BVES 2021 WMP Update, p. 112).

This same logic is included for the larger evacuation route hardening program. These guiding principles for proposed egress route hardening are flawed. It is equally important that wildfires do not originate at and emanate from BVES's egress routes. Preventing a wildfire from occurring along an egress route is one element of egress route safety. Therefore, BVES's egress route hardening projects and program should include the objective to reduce wildfire risk along the egress route.

Vegetation Management: PacifiCorp's pre-fire season and 1-year vegetation management plans are focused on inspections and evaluations.

The timing of annual wildfire mitigation activities is important to ensure wildfire risk reduction during the fire season, which extends from around May through December and

peaks around July-October. The WMP therefore requires Utilities to describe their mitigation activities planned by June 1 and September 1. PacifiCorp's WMP activities by June 1 are predominantly inspection focused, suggesting annual mitigation activities are not carried out until after fire season has begun. Vegetation management and inspection activities in particular include visual inspection in HFTD Tier 3 and a pilot for electronic data collection. By September 1 their VM and Inspection program become data focused, including reviewing "…2021 fire season operating protocols…" and plans to "leverage data analytics to evaluate the impact of alarm based high impedance fault detection observed through the 2021 fire season (PacifiCorp, 2021 WMP Update, p. 116)." Plans for their VM and Inspection program "Before the next Annual WMP Update" appear to be focused on evaluations of programs and pilots and strategy update and review.

While PacifiCorp states that their distribution VM work cycles vary based on HFTD designation, with HFTD VM work conducted annually (PacifiCorp 2021 WMP Update, p. 156), it is not apparent when the actual VM work occurs. VM Patrol inspections make up 83 percent of annual HFTD Distribution line inspections, according to Table 1. For their "Patrol inspection of vegetation around distribution electric lines and equipment" (Activity 7.3.5.11) they state that "Correction work is subsequently conducted based on those inspection results" and "In conjunction with such annual patrols, vegetation management annually completes correction work based on the patrol results (PacifiCorp 2021 WMP Update, p. 165)." In contrast, their "detailed inspections of vegetation around distribution electric lines and equipment" (Activity 7.3.5.2) appear to include the mitigation work at the time of the inspection.

PacifiCorp should clarify: (1) Whether annual "Vegetation Management to achieve clearance around electric lines and equipment" (Activity 7.3.5.20) is completed at the same time as patrol inspections; (2) How long after patrol inspections is VM clearance work performed; and (3) How much of the total annual HFTD VM clearance/removal work is performed by June 1, by September 1, and by the next WMP annual update.

Vegetation Management: Liberty's vegetation management program to achieve clearances is vague.

Liberty provides very little detail on their vegetation management program to achieve clearances around conductors and equipment. They do not specify when the work takes place, including whether clearance work is done prior to fire season on HFTD circuits. In response to "region prioritization" Liberty only states: "Liberty implements this inspection and clearing strategy through its system (Liberty 2021 WMP Update, p. 119)." This statement is vague. They have no planned improvements.

Liberty should explain their vegetation clearance work in detail, including how long it takes to remedy vegetation clearance infractions from the time they are identified, how they define an infraction (e.g. less than 4 feet, or grater radial clearance from distribution lines), whether they prioritize work in HFTD zones, and if HFTD work is prioritized to occur prior to fire season (e.g. by June 1 and September 1).

The combined lack of detail and prioritization for performing vegetation management work on HFTD distribution lines, relatively few HFTD distribution vegetation inspections, and data showing vegetation contact as one of their leading causes of HFTD distribution outages is concerning. GPI recommends performing a detailed audit of Liberty's HFTD distribution vegetation management inspection and clearance work plan to ensure they are adequately addressing vegetation-related risk drivers in HFTD prior to fire season.

Vegetation Management: PacifiCorp has sidelined their LiDAR inspection program on account of many false positives.

PacifiCorp conducted a LiDAR Vegetation Inspection Pilot Program. This pilot appears to have had three one-year phases starting in 2019 through 2021. In their results and discussion section they indicate analytical challenges:

> Using LiDAR for vegetation inspection has not yet proved to be a viable mitigation initiative. PacifiCorp has conducted a pilot and demonstrations from three different vendors, but all of these have had mixed results. PacifiCorp observed a high degree of false positives compared to field review of clearance violations. When clearance violations

> from different vendors were compared for the same locations, there were substantially different results. Attempts to use LiDAR data for individual tree identifications also produced many false positives [PacifiCorp 2021 WMP Update, p. 44].

Both BVES and Liberty have fully adopted LiDAR vegetation inspection in their wildfire mitigation plans. BVES: "conducts one LIDAR sweep per year to evaluate the effectiveness of clearance efforts and identify potential wildfire hazards (BVES 2021 WMP Update, p. 120)." Liberty completed a LiDAR pilot program in 2020 with success, stating:

> In October 2020, Liberty piloted the use of LiDAR to perform inspections of vegetation conditions relative to overhead electric lines. The success of this pilot program led to the commitment of a substantial investment into an annual LiDAR program for measuring vegetation clearance distances system wide. The annual system-wide LiDAR inspections will commence in 2021 and will specifically target vegetation clearance compliance (Liberty 2021 WMP Update, p. 75).

The IOUs are also using LiDAR for VM inspections. There are at least a few possible explanations for the discrepancy between PacifiCorp and the other utilities that should be explored to better understand the LiDAR program at each utility: (1) It is possible that other Utility LiDAR programs also have many false positives but the utilities have decided that the positive findings outweigh the occurrence of false positives, and/or are simply not reporting these shortfalls and are moving forward with the program and in the process of refining it; (2) PacifiCorp's data processing methodology could be less refined compared to other utilities and could benefit from collaborations with utilities with more successful LiDAR vegetation inspection programs; and/or (3) The characteristics of vegetation in PacifiCorp's territory are distinct in a way that reduces the efficacy of LiDAR as a VM assessment. Regardless of the cause, the discrepancy that PacifiCorp's LiDAR program poses compared to other utilities success stories indicates that the effectiveness and fiscal efficiency of all utility LiDAR programs should be explored in more detail, including the use of LiDAR to identify tree species and evaluate vegetation clearances.

Vegetation management: SMJUs do not describe any VM residue end-use pathways.

During the SMJU 2021 WMP Update workshop the WSD and GPI queried the SMJUs on how they were managing fuel load and vegetation residue removal. In their responses in the workshop, all SMJUs described value-added end-use pathways used by their contractors. This including instances of contractors sending vegetation residues to biomass generation facilities and community firewood and wood-chip programs. PacifiCorp described a successful biomass generation end-use that was cost-neutral after considering transportation costs. Yet none of the SMJUs included any of these efforts in their 2021 WMP Updates. Rather, the SMJUs largely pass this responsibility off to VM contractors.

GPI reiterates that value-added end-use pathways for vegetation management residues equates to net-neutral or reduced impact "disposal" of the residues. Furthermore, it is the responsibility of the Utility to develop value-added or net-neutral pathways for VM residues since they are responsible for producing them. It is also the responsibility of the WSD and wildfire mitigation planning effort to establish this expectation in order to mitigate the wildfire consequence, environmental, and cost impacts of aggressive VM activities, and ultimately improve wildfire mitigation sustainability – a tenet of California utility wildfire mitigation efforts.

It is clear from both SMJU and IOU comments during the workshops that some vegetation management residue programs and pathways are taking shape to utilize, and ultimately "dispose" of, the tons of vegetation slash and material being produced annually by aggressive vegetation management efforts. However, the lack of formal reporting requirements for these activities and the way they are integrated into other maturity model capabilities and benchmarks means they are largely overlooked and not formally reported on in the WMPs. That is, the design of the maturity model survey and WMPs reporting requirements will systematically prevent any productive data or information collection on this aspect of wildfire mitigation activities. Without information on VM reside end-use or disposal pathways, it is impossible to assess their viability, sustainability, net benefits (including wildfire consequence reduction, environmental, and cost benefits), or lack

thereof. The lack of reporting requirements and information also renders it impossible to establish baseline expectations and define best practices.

Liberty is the only Utility to provide a summary of the tons of biomass removed. Liberty is a relatively small Utility with limited resources. Their ability to provide this information is a testament to the ability for all utilities to provide data on biomass removed. It is not a far reach to also request data collection and reporting on where the removed biomass is taken, either for disposal or productive end uses. For example, the tons of biomass delivered to a biomass facility must be quantified in order to provide payment. As another example, it is possible to estimate and report on the amount of biomass left in place and made available for community firewood programs.

California has an opportunity to improve Utility vegetation management sustainability. Delaying vegetation management residue accountability and impact reduction could lead to an ongoing build-up of dead and dry fuels in the already fire prone forests and communities, fail to partially recover costs of VM work that could reduce ratepayer impacts, or miss opportunities to reduce the environmental impacts of aggressive VM activities. GPI strongly recommends holding utilities responsible for their VM residue disposal via WMP narrative and data reporting requirements. This information can inform baseline expectations and best practices for sustainable VM residue disposal.

Liberty Table detailing tons of biomass removed (Liberty 2021 WMP Update, p. 110)

	Line Miles Treated	Acres Treated	Trees Removed	Landowner Participation	Tons of Biomass Removed
2020 Actual	3.4	8.5	404	55	376.4
2021 Projected					2,100

Conclusions

The 2021 WMP Updates of the SMJUs in many ways more closely resemble new WMPs than updates. The utilities are clearly still in the developmental stage of planning and carrying out wildfire mitigation plans and measures, indicating an ongoing need for strong

WSD oversite of the process. The GPI performed detailed analysis of key parts of the WMPs and report our findings herein.

The GPI urges the Commission to adopt our analyses and recommendations.

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Respectfully Submitted,

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