PACIFIC GAS AND ELECTRIC COMPANY
Wildfire Mitigations Plans Discovery 2026-2028
Data Response

PG&E Data Request No.:	OEIS_004-Q003
PG&E File Name:	WMP-Discovery2026-2028_DR_OEIS_004-Q003
Request Date:	April 18, 2025
Requester DR No.:	OEIS-P-WMP-2025-PG&E-004
Requesting Party:	Office of Energy Infrastructure Safety
Requester:	Nathan Poon
Date Sent:	April 29, 2025

SUBJECT: REGARDING THE WILDFIRE CONSEQUENCE MODEL

QUESTION 003

a. On pages 18-22 of PG&E's Wildfire Consequence Model V4 document, PG&E provides an example of the suppression model applied to the Dixie Fire.

   i. Provide an expanded version of the example to show the calculation of the number of structures in Table 11 (p. 22). This includes providing the data on Existing Structures, live fuel moisture (LFM), and wind speed (WS), as noted on page 20, which are not reported in the example.

   ii. How did PG&E select the 300 m height for wind speed (p. 20)? What impact does that have on the statistical performance of the model?

   iii. On page 14 of the Wildfire Consequence Model V4 document, Table 4 lists the dry wind conditions criteria. Are these sampled at a weather station height, at 300 m above surface (like the consequence model wind speeds), or some other reference height?

b. On page 26 of PG&E's Wildfire Consequence Model V4 document, PG&E presents the equation for calculating the fractional fatalities based on AFN and WS fatalities.

   i. What are the units of the AFN value?

   ii. How does this correspond to the AFN deciles shown in Figure 13 and Table 13 (p. 26)?

c. On page 36 of the Wildfire Consequence Model V4 document, Table 20 provides example consequence training data. Provide this table as an Excel spreadsheet with one row per historical fire used in consequence training. Provide the following columns in addition to the columns shown in Table 20:

   (1) TDI level

   (2) AFN decile level

   (3) Wind speed in mph at 300 m

   (4) Live fuel moisture

   (5) Daily average wind speed for Dry Wind Conditions (if this is different from wind speed in mph at 300 m)

(6) 10-hr dry fuel moisture

(7) Relative humidity

(8) FPI-R

(9) Flame Length

(10) Rate of Spread

(11) Whether the fire is within the HFRA

(12) Whether the fire was used for training or validation

d. In PG&E's response to Energy Safety's Data Request 1 Question 25, PG&E states that "the overall WF Consequence model v4 with egress and suppression incorporated was validated against historical fire outcomes."

i. Provide a list of all fires used to validate WFC v4.

ii. Provide a detailed description of the validation PG&E performed, and include the results of the validation for each historical fire outcome evaluated.

ANSWER 003

a.

i. The calculations in the 4.1.3.2 and 4.1.3.3 sections of documentation were included as an illustrative example not drawn from the modeling performed for the v4 release. A worksheet named "Dixie example" in "*WMP-Discovery2026-2028_DR_OEIS_004-Q003Atch01.xlsx*" reproduces the calculations for the equivalent of Table 11, starting with model coefficients and covariate values for the Dixie Fire, but based on coefficients aligned with the released v4 model. The model only requires the known count of structures burned under actual conditions, not existing structures, because other values are computed as a ratio relative to the actual values.

ii. Modeling wind in weather models, like the one used to create the historical gridded weather data available at PG&E, requires accounting for air flows in 3 dimensions. Wind is particularly impacted by the boundary layer at ground level and various obstructions like topographical features, buildings, trees, etc. In PG&E's weather model (which is a standard model in the meteorological community), wind is modeled at various heights above the ground, with values at 10m influenced by surface roughness and topographic obstructions and values at 300m typically capturing more "free flow" conditions. In other words, there is much more spatial/local variability in the data closer to the surface due to surface characteristics. The higher altitude winds are also (very generally speaking) the drivers of wind gusts at the ground level. When considering the conditions that would correlate with the expected outcome of a hypothetical wildfire, we opted to use speeds at 300m to avoid overly local influences at the point of origin that may not be representative of the prevailing conditions in the surrounding area. We did not perform a formal sensitivity analysis on other potential covariates in the same role.

iii. The Dry Wind criteria are based on 10m wind speed. Dry Wind is predictive of outcomes due to its role in drying fuels (as well as propelling fires) and humidity is modeled at 2m above the ground, so the 10m wind speed is closer to the fuels and the humidity values.

b.

i. AFN is the fraction of the population (from 0.0 to 1.0) with "access and functional needs."

ii. The table below summarizes the relationship between AFN fractions and the decile cuts. Please see "*WMP-Discovery2026-2028_DR_OEIS_004-Q003Atch01.xlsx*" at the sheet titled "AFN Deciles."

AFN decile number	decile lower bound	decile upper bound	decile average value
1	14.7%	24.7%	21.1%
2	24.7%	29.2%	27.3%
3	29.2%	31.3%	30.4%
4	31.3%	32.5%	32.1%
5	32.5%	34.0%	33.2%
6	34.0%	36.1%	35.1%
7	36.1%	39.0%	37.3%
8	39.0%	44.8%	41.4%
9	44.8%	52.2%	48.2%
10	52.2%	74.9%	59.0%

c.

i. The requested data is provided in the "Fire data" sheet of "*WMP-Discovery2026-2028_DR_OEIS_004-Q003Atch01.xlsx*". Note that requested columns for 10-hr dry fuel moisture and relative humidity were not available in the source data used in the consequence modeling (as they are not direct inputs into the modeling based on that data). The acreage field uses CAL FIRE data when available and VIIRS estimates otherwise. Also, all fires were used for modeling and validation, so no label is needed for those.

d.

i. The validation was performed on the full set of consequence predictions drawing on all fires found in the "Fire data" sheet of "*WMP-Discovery2026-2028_DR_OEIS_004-Q003Atch01.xlsx*".

ii. The validation started with checks that intended calculations were correct, that data sets did not contain duplicates of fires or erroneous data, that VIIRS fire detections from space were properly matched with CAL FIRE tracked outcome data, that the VIIRS ignition locations (estimated from space) were close to known points of origin.

The primary test of fidelity with historical outcomes was the ROC-like figures presented in Figure 5 of the v4 consequence model documentation, which provides the results of historical fire validation. Those figures rank order historical fires by the consequence at their point of origin (consequence values are not specific to the days those fire occurred on) and then calculate and plot the cumulative sum of relevant fire outcomes, including the cumulative counts of fires that burned greater than 300 acres, destroyed structures, and caused fatalities. Those figures and related discussion are based on all fires in the data set with non-zero CAL FIRE values for each of those tabulated consequence metrics. The steepness of the curves confirms that the model is discriminating between locations with low and high historical fire outcomes well.

The validation of the egress and suppression modeling was done by mapping, looking at rank order shifts, and looking at rank-ordered consequence buy-down curves, all of which are provided and discussed in section 4.4 of the v4 consequence document.