Wildfire Safety Division (WSD)
Quality Control (QC) Report on GIS Data
Submitted by Bear Valley Electric Service, Inc.
(BVES) on September 9, 2020

ISSUED BY CALIFORNIA PUBLIC UTILITIES COMMISSION (CPUC)

CONTENTS

TABLES

1. BACKGROUND & INTRODUCTION

This document summarizes the Wildfire Safety Division's (WSD's) findings on completeness and quality of geographic information systems (GIS) data submitted by Bear Valley Electric Service, Inc. (BVES), as part of its first quarterly report submission due on September 9, 2020. BVES's September 9, 2020 submission was its first attempt to adhere to the Draft WSD GIS Data Reporting Requirements issued in August 2020.[1] This review document, along with an Excel document with WSD notes ("BVES Status Spreadsheet with WSD Notes.xlsx") comprise the full package of quality control (QC) review deliverables that the WSD provides to BVES regarding its September 9, 2020 GIS data submission. This review document summarizes key findings, but the Excel document provides additional supporting details of the WSD's QC review. Although this review is being delivered after the submittal of BVES's December quarterly data report, this review was substantially completed before that submission, and addresses only the September quarterly data submission. If any issues identified in this report were rectified in the December data submission, that is appreciated, but will not be reflected in this report.

As part of its QC review, the WSD identified successes and problems with submitted data. For example, appropriately submitted data are acknowledged with star icons in tables throughout Section 3. Data problems are covered by icons and comments throughout Section 3 as well as by some commentary in Section 2. For example, Section 2.4 covers related table issues. Among other issues, it identifies the major problem of the absence of the required "Initiative Asset Log" table. This table's absence is not acceptable and diminishes the value of all initiative data that were submitted.

The WSD acknowledges that there was limited time, between the August publication of Draft WSD GIS Data Reporting Requirements and the September due date for the initial quarterly data submissions, to substantively reorganize data in accordance with the new reporting standard. BVES's efforts are appreciated, but there is also room for improvement, and this report emphasizes data absences and issues discovered during QC review. Due to the ongoing quarterly reporting nature, the WSD fully expects that future data submissions will continuously improve over prior submissions until high quality, standardized data submissions become routine.

This document summarizes overall data review findings and provides detailed schema compliance assessments that break down data quality and completeness for each individual field in the data tables. Throughout this document, the term "tables" is used to refer to both attribute tables associated with feature classes and related tables that can be joined to feature classes, as needed. The terms "feature class" and "layer" are used synonymously.

In the future, the WSD will addresses utility questions and concerns expressed in the Excel status report document[2] and provide details on planned data requirement changes. The WSD will also provide a revised "WSD GIS Data Preparation & Submittal Guidance.pdf" document. Additional next steps in the WSD's GIS data acquisition efforts will involve sharing revised data requirement and geodatabase (GDB) files with electrical corporations. If an electrical corporation fails to make a good faith effort to fulfill the next GIS data submission, the WSD will factor such

---

[1] [1] The Draft WSD GIS Data Reporting Requirements are available at:
ftp://ftp.cpuc.ca.gov/WSD/GISguidance/WSD%20GIS%20Data%20Reporting%20Requirements_DRAFT_2020082 1.pdf
[2] BVES's completed version of the "WSD_DataSchema_StatusReport_20200909.xlsx" file, which the WSD provided to BVES in August 2020 to track data submission status and progress.

actions into subsequent wildfire mitigation plan (WMP) compliance reviews, and may recommend enforcement actions if such issues persist.

2. OVERALL FINDINGS

2.1 Completeness Summary

Table 1 below summarizes the overall completeness of BVES's submitted data. Of the 53 required tables in the Draft WSD GIS Data Reporting Requirements, BVES submitted 8 that contained data. BVES did not include any photo log data or photos in its submission. Additionally, as shown in Table 1, BVES did not include any initiative asset log data. Lack of initiative asset log data prevents the WSD from being able to relate assets to specific WMP initiatives and significantly limits the value of data provided in the "Initiative" data category.

In the "Completeness" column of Table 1, two percentage values are presented. The percentage on the left represents the percent complete strictly based on null values. The percentage on the right represents the percent complete based on null, "-99," and "Unknown" values. Neither percentage calculation accounts for null values in comment fields. Completeness percentages are approximate. Additional detail on the completeness breakdown methodology can be found in Section 3.1. Gray cells represent data that were not included in BVES's September 9, 2020 submission. A table providing completeness percentages for all California electrical corporations subject to these requirements is provided in Appendix A. The table presented in Appendix A provides context on how complete BVES's submission is relative to other utilities.

Table 1. Completeness of BVES 9/9/20 GIS data submission

DATA	COMPLETENESS
Asset Point	
1. Camera	
2. Connection Device	
3. Customer Meter	94.4% | 72.2%
4. Fuse	
5. Lightning Arrestor	
6. Substation	70.6% | 70.6%
7. Support Structure	59.2% | 51.8%
8. Support Structure Crossarm Detail	
9. Switchgear	
10. Transformer	
11. Transformer Detail	
12. Weather Station	67.2% | 61.1%
Asset Line	
13. Transmission Line	
14. Primary Distribution Line	
15. Secondary Distribution Line	
PSPS Event	
16. PSPS Event Log	
17. PSPS Event Line	
18. PSPS Event Polygon	
19. PSPS Event Customer Meter Point	
20. PSPS Event Damage Point	
21. PSPS Event Conductor Damage Detail	
22. PSPS Event Support Structure Damage Detail	
23. PSPS Event Other Asset Damage Detail	
24. PSPS Damage Photo Log	
Risk Event	
25. Wire Down Event	
26. Ignition	
27. Transmission Outage	

DATA	COMPLETENESS
28. Transmission VM Outage	
29. Distribution Outage	
30. Distribution VM Outage	
31. Risk Event Asset Log	
32. Risk Event Photo Log	
Initiative	
33. Vegetation Management Inspection Log	
34. Vegetation Management Inspection Point	
35. Vegetation Management Inspection Line	
36. Vegetation Management Inspection Polygon	
37. Vegetation Management Project Log	
38. Vegetation Management Project Point	
39. Vegetation Management Project Line	
40. Vegetation Management Project Polygon	
41. Asset Inspection Log	
42. Asset Inspection Point	
43. Asset Inspection Line	
44. Asset Inspection Polygon	
45. Grid Hardening Log	
46. Grid Hardening Point	
47. Grid Hardening Line	84.6% | 84.6%
48. Initiative Asset Log	
49. Initiative Photo Log	
Other Required Data	
50. Other Power Line Connection Location	
51. Critical Facility	59% | 59%
52. Red Flag Warning Day Polygon	18.5%| 18.5%
53. Administrative Area	100% | 100%
Total number of submitted tables	**8**

2.2 Quality of Entries in Excel Tracking Document

2.2.1 Reporting Accuracy
BVES's entries in the "WSD_DataSchema_StatusReport_20200909.xlsx" Excel document provided a sample for data completeness and provided explanations for data absence. The WSD appreciates the considerable effort involved with filling in the tables in this Excel document. However, there were several instances of inaccurate data reporting that the WSD does not want to see repeated in future submissions. This reporting did not adhere to the guidance[3] provided by the WSD on how to complete the spreadsheets. In the Excel status file with WSD notes ("BVES status spreadsheets with WSD Notes"), rows with major reporting concerns are highlighted in yellow. Rows with more minor concerns are highlighted in tan. In the future, the WSD will provide more specific responses to BVES's questions and concerns raised in the status spreadsheets, as part of additional guidance that addresses questions or concerns raised by all respondent electrical corporations.

BVES's data status information was generally correct, but inaccurate submission status values were an issue with the spreadsheets. Of the eight data tables provided, five (63%) had inaccurate status statements in the Excel tracking document that indicated data were provided when they were not. For example, for the tables below, some data in individual fields were incorrectly reported as being completely present (i.e. indicated by a "Yes" value under the "Data provided in latest submission?" column) when they were completely missing or only partially present. The

---

[3] Guidance on how to complete the Excel status spreadsheets can be found in Section 3 of the "WSD GIS Data Preparation & Submittal Guidance_20200821.pdf" document the WSD provided to electrical corporations in August 2020.

WSD expects these reporting inaccuracies to cease in future submissions of the Excel status files, and continued prevalence of inaccurate reporting will be factored heavily into future WSD evaluations.

- Customer Meter
- Support Structure
- Weather Station
- Grid Hardening Point
- Red Flag Warning Day Polygon

<u>2.2.2 Data Absence and Timeframe Explanations</u>
Several general explanations for data absence were repeated throughout the spreadsheets, and there were also some layer-specific explanations, but field-specific explanations were lacking. An example of a layer-specific explanation is, "BVES did not have any ignitions over the previous reporting period." The most frequently entered explanations for missing or partial data submissions were related to efforts being in-progress. Below are data availability, procurement, and timeframe statements that were commonly used by BVES:

- Availability explanations
  - "BVES is in the process of updating its GIS data to include all of its assets. The utility currently has some of this data in its asset management system, however BVES is still working on updating these files in GIS to conform with the WSD requirements."
    - This statement was re-used for various data categories with the word "assets" switched out for appropriate terminology, as applicable.
  - "BVES does not currently have this data."
  - "BVES does not own/operate any transmission lines."
- Data procurement actions
  - "BVES is working with an external consultant to update the files to meet the WSD requirements."
- Estimated delivery timeframe
  - "BVES expects to provide an update in the next quarterly filing"

BVES's responses indicate efforts to organize/provide additional data are being undertaken but do not provide substantive information beyond that. Even the delivery timeframe doesn't say if actual data will be delivered by the next filing. It just says there will be an update. These statements are vague, and more detail would be helpful, but BVES is notable for being the only smaller utility to submit GIS data and tracking spreadsheets with some real information and in accordance with the Draft WSD GIS Data Reporting Requirements, as part of its September 9, 2020 submission. More detailed responses are expected in future data status spreadsheet submissions.

2.2.3 Confidentiality Assessments
As directed in the WSD submittal guidance, throughout the data status spreadsheets, appropriate values were used to indicate the confidential nature of data. Nearly all fields had a confidentiality status, but a few fields were missing the status. For future submissions, the WSD expects confidentiality status to be included for all fields. Confidentiality status was provided for all data covered by the tracking spreadsheets, even data that BVES did not submit. All data with a confidentiality status was classified by BVES as non-confidential. BVES did not provide a confidentiality declaration, as required by General Order 66-D, Section 3.2.

2.3 Overall Schema and Requirement Adherence
Overall, for the data that were provided, BVES generally adhered to the Draft WSD GIS Data Reporting Requirements. Submitted data were provided in the geodatabase, feature classes, and tables provided by the WSD, which ensured formatting was often correct. Layers with data were also the only ones submitted, so the WSD did not receive a lot of useless empty tables that slowed review. The main issues with data submitted by BVES related to data absence. In contrast to other data submissions, formatting issues (e.g. wrong date format, not using domains, etc.) were not apparent in BVES's data.

2.4 Related Table Issues
No related tables were submitted. Regardless, a major related table problem is the absence of the required "Initiative Asset Log" table. This table enables initiative data to be linked to specific assets that are the focus of initiatives or in the proximity of initiatives, thereby enabling one to identify the specific location and attributes of an asset involved with an initiative. Because only one initiative layer was provided, and it only has one line segment in it, absence of the "Initiative Asset Log" table will play a more critical role in future submissions as more initiative data is provided. Still, even for the current submission, the table would be useful because no asset lines were submitted. Without "Initiative Asset Log" data, the value of initiative data can be significantly diminished. The "Initiative Asset Log" table must be provided in future submissions.

2.5 Submission Procedure Adherence
BVES generally adhered to submission procedures outlined by the WSD and did not have issues properly submitting its data. As described in in the Draft WSD GIS Data Reporting Requirements: "Zipped GDBs must be transmitted through the CPUC's Kiteworks secure file transfer portal available at: https://cpucftp.cpuc.ca.gov/.[4]

The WSD will provide more clarity on electronic submission guidance in the revised version of the "WSD GIS Data Preparation & Submittal Guidance.pdf" document.

2.6 Metadata
Metadata requirements are described in detail in the data preparation and submittal guidance document provided by the WSD.[5] When the WSD provided electrical corporations with customized geodatabase file templates, the WSD included prepopulated metadata. However, information covering the following items was required to be added to the metadata by each electrical corporation: data availability, data development methodology, timeframes, communication protocols, credits, use limitations, and definitions for certain fields. BVES made no metadata additions covering these items.

Field definitions are among the higher priority metadata and must be provided as applicable in future submissions. However, because of the minimal data provided for the September 9, 2020 submission, lacking field definitions was not an issue.

---

[4] Additional information regarding the CPUC's Kiteworks secure file transfer portal is available at: https://www.cpuc.ca.gov/General.aspx?id=6442459667
[5] "WSD GIS Data Preparation & Submittal Guidance_20200821.pdf" document the WSD provided to electrical corporations in August 2020.

Per page 6 of the submittal guidance[6], electrical corporations are required to provide "definitions for electrical corporation-generated field values for fields that do not have predetermined values assigned as attribute domains in the provided GDB (e.g., the 'SwitchgearType' field in the 'Switchgear' feature class)." In ArcGIS Pro, field definitions can be added under "Entity and Attribute Information" in the "Fields" section.

Defining field values is important both when there are no preset domains and when preset domains are not followed. For example, a utility might provide a "Grid Hardening Log" table and not utilize the "GHStatus" field's required attribute domain values listed below.
- Planned
- In progress
- Complete
- Cancelled

Instead, the utility might enter values like the following:
- CLSD
- CONS
- DOCC
- ESTS

With no definitions for what these apparent abbreviations mean, they provide no useful information to the WSD. However, if the preset domains were used or if definitions for abbreviations used by BVES were provided in metadata, the WSD would know what the field values mean.

Another portion of high priority absent metadata concerns the methodology for how data were pulled from original sources and cross-walked into the schema provided by the WSD. Page 7 of the data submittal guidance[7] states: "Describe the methodology for how the data were developed. This includes, at a minimum, identifying the sources (by filename) from which the data were derived and an explanation of how data were pulled from those sources. Also, describe any data field collection techniques." Knowing this information can help the WSD better understand the effort and practicality (or impracticality) involved with specific data requests.

2.7 Data Absent in 9/9/20 Submission but Present in Previous Submissions
Some requested data that were not included in BVES's September 9, 2020 GIS data submission had been previously submitted to the WSD as part of 2020 WMP data requests made in the winter and spring. Table 2 below summarizes verified[8] instances of this and only covers entirely absent tables. All entries of "Yes" in the "Previously Received in Some Form" column of Table 2 indicate some form or portion of the data (i.e., geometry or values for one or more fields) were previously submitted. Gray values indicate data from a table was not previously received.[9]

---

[6] "WSD GIS Data Preparation & Submittal Guidance_20200821.pdf" document the WSD provided to electrical corporations in August 2020.
[7] "WSD GIS Data Preparation & Submittal Guidance_20200821.pdf" document the WSD provided to electrical corporations in August 2020.
[8] Some data from winter and spring 2020 were submitted with undefined abbreviated names and no metadata. Such data could not be identified and therefore, it was not possible to verify if it matched up with data from the September 9, 2020 submission.
[9] The WSD is grateful that BVES submitted a tremendous amount of data in early 2020. However, because of the large amount of data, review for the presence of some previously submitted data was somewhat cursory. As such, a few previously submitted fields matching the latest requests may have been missed.

Because some of the absent data exist and BVES acknowledged the existence of additional data in the data status spreadsheets, the WSD expects to receive previously provided data in future submissions.

Table 2. Summary of missing data with identification of previously received data that is absent in 9/9/20 submissions

ABSENT DATA	PREVIOUSLY RECEIVED IN SOME FORM?
Asset Point	
1. Camera	
2. Connection Device	
3. Fuse	
4. Lightning Arrestor	
5. Support Structure Crossarm Detail	
6. Switchgear	Yes
7. Transformer	
8. Transformer Detail	
Asset Line	
9. Transmission Line	
10. Primary Distribution Line	Yes
11. Secondary Distribution Line	Yes
PSPS Event	
12. PSPS Event Log	
13. PSPS Event Line	
14. PSPS Event Polygon	
15. PSPS Event Customer Meter Point	
16. PSPS Event Damage Point	
17. PSPS Event Conductor Damage Detail	
18. PSPS Event Support Structure Damage Detail	
19. PSPS Event Other Asset Damage Detail	
20. PSPS Damage Photo Log	
Risk Event	
21. Wire Down Event	
22. Ignition	
23. Transmission Outage	
24. Transmission VM Outage	
25. Distribution Outage	Yes[10]
26. Distribution VM Outage	
27. Risk Event Asset Log	
28. Risk Event Photo Log	
Initiative	
29. Vegetation Management Inspection Log	
30. Vegetation Management Inspection Point	
31. Vegetation Management Inspection Line	
32. Vegetation Management Inspection Polygon	
33. Vegetation Management Project Log	
34. Vegetation Management Project Point	
35. Vegetation Management Project Line	
36. Vegetation Management Project Polygon	
37. Asset Inspection Log	
38. Asset Inspection Point	
39. Asset Inspection Line	
40. Asset Inspection Polygon	
41. Grid Hardening Log	
42. Grid Hardening Point	
43. Initiative Asset Log	
44. Initiative Photo Log	

---

[10] At least one instance of line de-energization was identified in previously submitted fault data. The faults layer did not clearly align with required outage and wire down data, but it still describes various forms of asset damage caused by vegetation, lightning, and other factors

ABSENT DATA	PREVIOUSLY RECEIVED IN SOME FORM?
Other Required Data	
45. Other Power Line Connection Location	
Total absent data tables for which some data items were previously received	**4**

2.8 Photos

BVES did not submit any photo log data or photos, but photos are a requirement and expected in future submissions. Photo submission requirements are described in guidance the WSD provided in August 2020.[11]

3. DETAILED SCHEMA COMPLIANCE ASSESSMENT

3.1 Overview and Section Organization

This section provides detailed summaries of how data submissions complied with data reporting requirements, and is broken down into subsections organized by dataset categories (e.g., "Asset Point," "PSPS Event," etc.). Each subsection has the same organization, which starts with a checklist table of all required category data. The presence or absence of an **x** in the checklist indicates submitted data or missing data.

Completeness percentages are also featured to the right of checklist entries. Completeness percentages are approximate. In determining them, nulls in comment fields were not counted toward percent incomplete because comment fields are often supposed to have null values, unless a corresponding field value is "Other – See comment" or there is another reason to provide a comment. Completeness percentages show the following:

- Left value: % complete based strictly on nulls without counting nulls in comment fields
  - o This value represents what utilities filled in. However, it includes "-99" and "Unknown" values as if they are components of complete data.
- Right value: % complete based on nulls, "-99," and "Unknown" without counting nulls in comment fields
  - o This value reflects a truer picture of data completeness. "-99" and "Unknown" both indicate immediate data absence but do not provide the data being sought. These values can indicate data are unknowable or that data were not immediately known to staff filling in the feature classes and tables but could become known with more extraction from existing data and/or new data collection efforts in the future.

Individual summaries of review findings for each feature class and table submitted follow the data category checklists. These start with a description of data table size and completeness. This description is followed by a data quality table that features review outcome icons for all fields and color coding for some fields. It includes the following icons to give the report reader a quick sense of data quality.

---

[11] Photo guidance can be found in Section 5 of "WSD GIS Data Preparation & Submittal Guidance_20200821.pdf," which the WSD provided to electrical corporations in August 2020.

Table 3. Review outcome icon definitions

Symbol	Definition
⭐	Correct values have been input where applicable, and capitalization is correct. Great job![12]
⬤	A field is slightly incomplete with 95% or more of the records containing data. Good job! Still not 100% complete, though.
◗	A field is partially incomplete with 50% to 95% of the records containing data. Good job, but there is potential for improvement.
◢	A field is mostly incomplete with 50% or fewer of the records containing data. The effort is appreciated, but improvements could be made.
❗	A field has incorrect values, incorrect capitalization, and/or or some other problem. Including data in the field is a step in the right direction, but there's room for improvement.[13]
🚫	Every value is null, "Unknown," and/or "-99." The strategy for completing this field needs improvement and possibly further discussion with the WSD.

Colors in the table below are used to indicate the priority of data issue resolution.

Table 4. Review outcome issue resolution priority colors

Color	Priority
Red	HIGH
Orange	MEDIUM
Yellow	LOW

Comments on data issues and listings of fields with no data are included below each icon/priority table summary. When no data were submitted for a feature class or table, the statement "No data" is used.

3.1 Asset Point (Feature Dataset)

3.1.1 Data Category Summary
Of the 12 "Asset Point" data layers/tables required, 4 were submitted and have an **x** in the checklist below.

Table 5. Asset Point data category completeness summary

#	Status	Name	Completeness	
1		BV_Camera_20200909		
2		BV_ConnectionDevice_20200909		
3	x	BV_CustomerMeter_20200909	94.4%	72.2%
4		BV_Fuse_20200909		
5		BV_LightingArrestor_20200909		
6	x	BV_Substation_20200909	70.6%	70.6%
7	x	BV_SupportStructure_20200909	59.2%	51.8%
8		BV_SupportStructureCrossarmDetail_20200909		
9		BV_Switchgear_20200909		
10		BV_Transformer_20200909		
11		BV_TransformerDetail_20200909		
12	x	BV_WeatherStation_20200909	67.2%	61.1%

---

[12] This icon may also be applied to empty comment fields for which no values are needed.
[13] This icon may be used in conjunction with one of the other icons to express that a field is incomplete and has another problem.

3.1.2 Camera (Feature Class)
No data.

3.1.3 Connection Device (Feature Class)
No data.

3.1.4 Customer Meter (Feature Class)
The attribute table of this feature class includes 18 fields with 23,318 rows. Based on the number of null values, this table is 94% complete, but with "-99" and "Unknown" values treated as absent data, this table is only 72% complete.

Table 6. Customer Meter data priorities and review outcomes

Field Name	Review Outcome
MeterID	★
UtilityID	★
AssetType	★
CircuitID	★
CircuitName	★
SubstationID	★
SubstationName	★
MakeandManufacturer	🚫
ModelNumber	🚫
HFTDClass	★
County	★
InstallationDate	🚫
InstallationYear	🚫
EstimatedAge	🚫
AssetLatitude	★
AssetLongitude	★

Empty value fields
- InstallationDate

Field comments
- **MakeandManufacturer**: All rows (100%) of the field have value *Unknown*.
- **ModelNumber**: All rows (100%) of the field have value *Unknown*.
- **InstallationYear**: All rows (100%) of the field have value *-99*.
- **EstimatedAge**: All rows (100%) of the field have value *Unknown*.
- **OBJECTID_1**: Need to remove this field as it is duplicate with OID.

10

3.1.5 Fuse (Feature Class)
No data.

3.1.6 Lightning Arrester (Feature Class)
No data.

3.1.7 Substation (Feature Class)
The attribute table of this feature class includes 16 fields with 17 rows. Based on the number of null values, this table is 71% complete. There are no "-99" or "Unknown" values.

Table 7. Substation data priorities and review outcomes

Field Name	Review Outcome
SubstationID	★
UtilityID	★
AssetType	★
SubstationName	★
SubstationNominalVoltagekV	★
AssociatedOperatingVoltagekV	★
SubstationRating	🚫
SubstationType	🚫
HFTDClass	★
County	★
LastInspectionDate	🚫
InstallationDate	🚫
InstallationYear	🚫
AssetLatitude	★
AssetLongitude	★

Empty value fields
- SubstationRating
- SubstationType
- LastInspectionDate
- InstallationDate
- InstallationYear

Field comments
- **OBJECTID_1**: Need to remove this field as it is duplicate with OID.

3.1.8 Support Structure (Feature Class)

The attribute table of this feature class includes 24 fields with 7,469 rows. Based on the number of null values, this table is 59% complete, but with "-99" and "Unknown" values treated as absent data, this table is only 52% complete.

Table 8. Support Structure data priorities and review outcomes

Field Name	Review Outcome
SupportStructureID	★
UtilityID	★
AssetType	★
SubstationID	⊘
HFTDClass	★
County	★
LastInspectionDate	⊘
LastMaintenanceDate	⊘
LastIntrusiveDate	⊘
InstallationDate	⊘
InstallationYear	⊘
EstimatedAge	⊘
UsefulLifespan	⊘
SupportStructureType	★
SupportStructureTypeComment	★
SupportStructureMaterial	⊘
SupportStructureMaterialComment	⊘
SupportStructureMaterialSubtype	⊘
Underbuild	⊘
ConstructionGrade	⊘
CrossarmAttached	⊘
AssetLatitude	★
AssetLongitude	★

Empty value fields
- SubstationID
- LastInspectionDate
- LastMaintenanceDate
- LastIntrusiveDate
- InstallationDate
- InstallationYear
- EstimatedAge
- UsefulLifespan
- SupportStructureTypeComment
- SupportStructureMaterial
- SupportStructureMaterialComment
- SupportStructureMaterialSubtype
- Underbuild
- ConstructionGrade
- CrossarmAttached

Field comments
- Need to remove *ObjectID*, *OBJECTID_1*, and *FID_1_1*.

3.1.9 Support Structure Crossarm Detail (Related Table)
No data.

3.1.10 Switchgear (Feature Class)
No data.

3.1.11 Transformer (Feature Class)
No data.

3.1.12 Transformer Detail (Related Table)
No data.

3.1.13 Weather Station (Feature Class)
The attribute table of this feature class includes 17 fields with 18 rows. Based on the number of null values, this table is 67% complete, but with "-99" and "Unknown" values treated as absent data, this table is only 61% complete.

Table 9. Weather Station priorities and review outcomes

Field Name	Review Outcome
StationID	⭐
UtilityID	⭐
AssetType	⭐
MakeandManufacturer	⭐
ModelNumber	🚫
HFTDClass	⭐
County	⭐
LastInspectionDate	🚫

Field Name	Review Outcome
LastMaintenanceDate	🚫
InstallationDate	🚫
InstallationYear	◖
EstimatedAge	⭐
UsefulLifespan	🚫
WeatherStationURL	⭐
AssetLatitude	⭐
AssetLongitude	⭐

Empty value fields
- LastInspectionDate
- LastMaintenanceDate
- InstallationDate
- UsefulLifespan

Field comments
- **ModelNumber**: All rows (100%) of the field have values *Unknown*.
- **InstallationYear**: 17 rows (89.5%) of the field are *NULL*.

3.2 Asset Line (Feature Dataset)

3.2.1 Data Category Summary
No data.

3.2.2 Transmission Line (Feature Class)
No data.

3.2.3 Primary Distribution Line (Feature Class)
No data.

3.2.4 Secondary Distribution Line (Feature Class)
No data.

3.3 PSPS Event (Feature Dataset)

3.3.1 Data Category Summary
No data.

3.3.2 Entity-Relationship Diagram for PSPS Events
No data.

3.3.3 PSPS Event Log (Related Table)
No data.

3.3.4 PSPS Event Line (Feature Class)
No data.

3.3.5 PSPS Event Polygon (Feature Class)
No data.

3.3.6 PSPS Event Customer Meter (Feature Class)
No data.

3.3.7 PSPS Event Asset Damage

3.3.7.2 PSPS Event Damage Point (Feature Class)
No data.

3.3.7.3 PSPS Event Conductor Damage Detail (Related Table)
No data.

3.3.7.4 PSPS Event Support Structure Damage Detail (Related Table)
No data.

3.3.7.5 PSPS Event Other Asset Damage Detail (Related Table)
No data.

3.3.7.6 PSPS Damage Photo Log (Related Table)
No data.

3.4 Risk Event (Feature Dataset)

3.4.1 Data Category Summary
No data.

3.4.2 Wire Down Event (Point Feature Class)
No data.

3.4.3 Ignition (Point Feature Class)
No data.

3.4.4 Transmission Outage (Point Feature Class)
No data.

3.4.5 Transmission VM Outage (Point Feature Class)
No data.

3.4.6 Distribution Outages (Point Feature Class)
No data.

3.4.7 Distribution VM Outage (Point Feature Class)
No data.

3.4.8 Risk Event Asset Log (Related Table)
No data.

3.4.9 Risk Event Photo Log (Related Table)
No data.

3.5 Initiative (Feature Dataset)

3.5.1 Data Category Summary
Of the 17 initiative data layers/tables required, 1 was submitted and have an **x** in the checklist below.

Table 10. Initiative data category completeness summary

#	Status	Name	Completeness	
1		BV_VegetationManagementInspectionLog_20200909		
2		BV_VegetationManagementInspectionPoint_20200909		
3		BV_VegetationManagementInspectionLine_20200909		
4		BV_VegetationManagementInspectionPolygon_20200909		
5		BV_VegetationManagementProjectLog_20200909		
6		BV_VegetationManagementProjectPoint_20200909		
7		BV_VegetationManagementProjectLine_20200909		
8		BV_VegetationManagementProjectPolygon_20200909		
9		BV_AssetInspectionLog_20200909		
10		BV_AssetInspectionPoint_20200909		
11		BV_AssetInspectionLine_20200909		
12		BV_AssetInspectionPolygon_20200909		
13		BV_GridHardeningLog_20200909		
14		BV_GridHardeningPoint_20200909		
15	x	BV_GridHardeningLine_20200909	84.6%	84.6%
16		BV_InitiativeAssetLog_20200909		
17		BV_InitiativePhotoLog_20200909		

3.5.2 Vegetation Management Inspections

3.5.2.1 Vegetation Management Inspection Log (Related Table)
No data.

3.5.2.2 Vegetation Management Inspection Point (Feature Class)
No data.

3.5.2.3 Vegetation Management Inspection Line (Feature Class)
No data.

3.5.2.4 Vegetation Management Inspection Polygon (Feature Class)
No data.

3.5.3 Vegetation Management Projects

3.5.3.1 Vegetation Management Project Log (Related Table)
No data.

3.5.3.2 Vegetation Management Project Point (Feature Class)
No data.

3.5.3.3 Vegetation Management Project Line (Feature Class)
No data.

3.5.3.4 Vegetation Management Project Polygon (Feature Class)
No data.

3.5.4 Asset Inspections

3.5.4.1 Asset Inspection Log (Related Table)
No data.

3.5.4.2 Asset Inspection Point (Feature Class)
No data.

3.5.4.3 Asset Inspection Line (Feature Class)
No data.

3.5.4.4 Asset Inspection Polygon (Feature Class)
No data.

3.5.5 Grid Hardening

3.5.5.1 Grid Hardening Log (Related Table)
No data.

3.5.5.2 Grid Hardening Point (Feature Class)
No data.

3.5.5.3 Grid Hardening Line (Feature Class)
The attribute table of this feature class includes 11 fields with 1 row. Based on the number of null values, this table is 85% complete. There are no "-99" or "Unknown" values.

Table 11.Grid Hardening Line data priorities and review outcomes

Field Name	Review Outcome
GhID	⭐
UtilityID	⭐
GhLogID	🚫
GridHardeningLocationOrAddress	⭐
HFTDClass	⭐
HFTDClassComment	⭐
City	⭐
County	⭐
District	🚫

Empty value fields
- GhLogID
- District

Field comments
- None

3.5.6 Data Related to Multiple Initiatives

3.5.6.1 Initiative Asset Log (Related Table)
No data.

3.5.6.2 Initiative Photo Log (Related Table)
No data.

3.6 Other Required Data (Feature Dataset)

3.6.1 Data Category Summary
Of the 4 initiative data layers/tables required, 3 were submitted and have an **x** in the checklist below.

Table 12. Other Required Data data category completeness summary

#	Status	Name	Completeness	
1		BV_OtherPowerLineConnectionLocation_20200909		
2	x	BV_CriticalFacility_20200909	59%	59%
3	x	BV_RedFlagWarningDayPolygon_20200909	12.1%	12.1%
4	x	BV_AdministrativeArea_20200909	100%	100%

3.6.2 Electrical Corporation Power Line-Other Power Line Connection Location (Point Feature Class)
No data.

3.6.3 Critical Facility (Point Feature Class)
The attribute table of this feature class includes 22 fields with 14 rows. However, the required schema for this data has 24 fields, which means BVES removed two. The "BackupTypeComment" and "BackupCapacity" fields were removed from BVES's submission. Based on the number of null values, whether or not "-99" and "Unknown" values are treated as absent data, this table is 59% complete.

Table 13. Critical Facility data priorities and review outcomes

Field Name	Review Outcome
FacilityID	⭐
UtilityID	⭐
FacilityName	⭐
FacilityCategory	⭐
FacilityCategoryComment	⭐
FacilityDescription	⭐

Field Name	Review Outcome
CircuitID	🚫
CircuitName	🚫
MeterID	🚫
BackupPower	🚫
BackupType	🚫
BackupTypeComment	🚫
BackupCapacity	🚫
PopulationImpact	🚫
HFTDClass	🚫
PSPSDays	★
PSPSDaysDateBasis	★
ParcelAPN	🚫
Address	★
City	★
Zip	★
Latitude	★
Longitude	★

Empty value fields
- CircuitID
- CircuitName
- MeterID
- BackupPower
- BackupType
- PopulationImpact
- HFTDClass
- ParcelAPN

Field comments
- None

3.6.4 Red Flag Warning Day (Polygon Feature Class)

The attribute table of this feature class includes 8 required fields with 29 rows. Based on the number of null values, this table is 12% complete. There are no "-99" and "Unknown" values.

Table 14. Red Flag Warning Day data priorities and review outcomes

Field Name	Review Outcome
RfwID	⭐
UtilityID	🚫
FireWeatherZoneID	🚫
FireWeatherZoneName	🚫
NumberRedFlagWarningDays	🚫
RedFlagWarningIssueDate	🚫
RedFlagWarningIssueTime	🚫
RedFlagDaysDateBasis	🚫

Empty value fields
- UtilityID
- FireWeatherZoneID
- FireWeatherZoneName
- RedFlagWarningIssueDate
- RedFlagWarningIssueTime
- NumberRedFlagWarningDays
- RedFlagDaysDateBasis

Field comments
- Only one row of the attribute table has any spatial data; this row has null values for all required fields. The other 28 records have no geometry.

3.6.5 Administrative Area (Polygon Feature Classes)

The attribute table of this feature class includes 9 fields with 1 row. Based on the number of null values, this table is 100% complete. There are no "-99" or "Unknown" values.

Table 15. Administrative Area data priorities and review outcomes

Field Name	Review Outcome
AdminID	⭐
UtilityID	⭐
AreaType	⭐
SubAreaType	⭐
SubAreaTypeComment	⭐
Name	⭐

APPENDIX A. COMPLETENESS PERCENTAGE BREAKDOWN FOR MULTIPLE UTILITIES

- PG&E = Pacific Gas and Electric
- SCE = Southern California Edison
- SDG&E = San Diego Gas and Electric
- BVES = Bear Valley Electric Service

- First % = percent complete strictly based on nulls without counting nulls in comment fields.
- Second % = percent complete based on nulls, "-99," and "Unknown" without counting nulls in comment and most description fields.

Data	Utility					
	PG&E	SCE	SDG&E	Liberty	PacifiCorp	BVES
Asset Point						
1. Camera	82.4% | 82.4%	64.7% | 58.8%	76.5% | 49.7%			
2. Connection Device		54.7% | 42.6%	68.7% | 51.5%			
3. Customer Meter		81.9% | 81.9%	68.7% | 51.5%			94.4% | 72.2%
4. Fuse	65% | 54%	72.8% | 62%	76.7% | 57.5%			
5. Lightning Arrestor			64% | 40%			
6. Substation	58% | 58%	70.5% | 64%	74.8% | 60.5%			70.6% | 70.6%
7. Support Structure		58.2% | 54%	62.5% | 50%			59.2% | 51.8%
8. Support Structure Crossarm Detail						
9. Switchgear		63.9% | 55%	72% | 59%			
10. Transformer		90% | 81.7%	83% | 83%			
11. Transformer Detail		54.3% | 52.8%	77.7% | 57.7%			
12. Weather Station	68.1% | 68.1%	47% | 41.2%	70.6% | 47%			67.2% | 61.1%
Asset Line						
13. Transmission Line		47.6% | 45.6%	56.2% | 40.6%			
14. Primary Distribution Line	28.4% | 28.4%	61.2% | 55.5%	74.8% | 61.5%			
15. Secondary Distribution Line		58% | 53.2%				
PSPS Event						
16. PSPS Event Log						
17. PSPS Event Line						
18. PSPS Event Polygon						
19. PSPS Event Customer Meter Point	100% | 100%					
20. PSPS Event Damage Point	62.6% | 62.6%					
21. PSPS Event Conductor Damage Detail						
22. PSPS Event Support Structure Damage Detail						
23. PSPS Event Other Asset Damage Detail						
24. PSPS Damage Photo Log						
Risk Event						
25. Wire Down Event	56.2% | 56.2%		80% | 80%			
26. Ignition	57.5% | 57.3%		61.1% | 60%			
27. Transmission Outage			77.8% | 77.4%			
28. Transmission VM Outage						
29. Distribution Outage	95.4% | 95.4%					
30. Distribution VM Outage			84.8% | 84.8%			
31. Risk Event Asset Log			30.5% | 30.5%			
32. Risk Event Photo Log						
Initiative						
33. Vegetation Management Inspection Log	87.7% | 87.7%	80.3% | 80.3%	81.2% | 81.2%			
34. Vegetation Management Inspection Point	68.8% | 68.8%	58.3% | 58.3%	84.9 | 84.9%			
35. Vegetation Management Inspection Line		63.6% | 63.6%				
36. Vegetation Management Inspection Polygon		70% | 70%				
37. Vegetation Management Project Log	49.9% | 49.9%	42.8% | 42.8%	48.6% | 48.6%			
38. Vegetation Management Project Point	89.8% | 89.8%	64.1% | 64.1%	89.6% | 89.6%			
39. Vegetation Management Project Line	81.8% | 81.8%					
40. Vegetation Management Project Polygon		67.7% | 67.7%				
41. Asset Inspection Log	88.1% | 88.1%	78.3% | 78.3%	80.4% | 80.4%			
42. Asset Inspection Point	88.4% | 81.2%	75.6% | 75.6%	83.2% | 83.2%			
43. Asset Inspection Line		64.6% | 64.6%	81.8% | 81.8%			
44. Asset Inspection Polygon						
45. Grid Hardening Log	70.6% | 70.6%	64.9% | 64.9%	71.2% | 71.2%			
46. Grid Hardening Point	90.6% | 82.8%	55.1% | 55.1%	86% | 86%			
47. Grid Hardening Line	90.4% | 82.5%	50.9% | 50.9%	84.4% | 84.4%			84.6% | 84.6%
48. Initiative Asset Log						
49. Initiative Photo Log						
Other Required Data						
50. Other Power Line Connection Location			82.6% | 71.8%			
51. Critical Facility	62.8% | 62.8%	62.5% | 62.5%	76.8% | 74%			59% | 59%
52. Red Flag Warning Day Polygon			90.9% | 90.9%			12.1% | 12.1%
53. Administrative Area		91.5% | 89.1%	100% | 100%			100% | 100%
Total submitted data	**21**	**28**	**32**	**0**	**0**	**8**