Electric Substations

Identification Information:

Citation:

Citation Information:

Publication Date: 20160307

Title: Substations

Geospatial Data Presentation Form: Vector Digital Data Set (Point)

Larger Work Citation:

Citation Information:

Title: Foundation Energy Data

Geospatial Data Presentation Form: GIS Data Project/Collection

Online Linkage: https://hifld-dhs-gii.opendata.arcgis.com

Description:

Abstract: This layer represents Substations. Substations are facilities and equipment that switch, transform, or regulate electric voltage. The Substations feature class includes taps, a location where power on a transmission line is tapped by another transmission line. **** Geographical coverage includes the Continental United States and a portion of British Columbia and Alberta.

Purpose: This feature class is for the Homeland Infrastructure Foundation Level Database (HIFLD) (https://gii.dhs.gov/HIFLD) as well as the Energy modelling and simulation community.

Supplemental Information: If you are using this dataset as a shapefile, please be aware that it was converted from a Geodatabase. As a result, this shapefile may have attribution and metadata errors resulting from the conversion process. The following are known issues: null values may have been changed to 0s (zeros) or to blank values, numbers (including latitude and longitude) may have been rounded up or down, there may be issues with Unicode character strings, and time cannot be stored in a date field. Field names may have been truncated to no longer than 10 characters or completely changed, lengthy string attributes may have been truncated to 254 characters, and attribute columns may have been deleted. Shapefiles do not support coded domains and subtypes therefore the original file geodatabase attribution and metadata information for coded domains and subtypes could be incorrect or missing in the shapefile version. Please visit the following ESRI website for more information: caution-http://pro.arcgis.com/en/pro-app/tool-reference/appendices/geoprocessing-considerations-for-Shapefile-output.htm

Time Period of Content:

Time Period Information:

Range of Dates/Times:

Beginning Date: 20131210

Ending Date: 20150930

Currentness Reference: observed

Status:

Progress: Complete

Maintenance and Update Frequency: Continually

Spatial Domain:

Bounding Coordinates:

West Bounding Coordinate: -130.329151

East Bounding Coordinate: -67.003329

North Bounding Coordinate: 58.724233

South Bounding Coordinate: 24.555565

Keywords:
Theme:
Theme Keyword Thesaurus: None
Theme Keyword: transformers
Theme Keyword: substations
Theme Keyword: homeland defense
Theme Keyword: voltage
Theme Keyword: address
Theme Keyword: transmission
Theme Keyword: electricity
Theme Keyword: energy infrastructure
Theme Keyword: kilovolts
Theme Keyword: emergency response
Theme Keyword: homeland security
Theme Keyword: power
Theme:
Theme Keyword Thesaurus: ISO 19115 Topic Categories
Theme Keyword: structure
Place:
Place Keyword Thesaurus: None
Place Keyword: Continental United States
Place Keyword: CAN
Place Keyword: Canada
Place Keyword: USA
Place Keyword: Alberta
Place Keyword: British Columbia
Access Constraints: None (Public Domain Information)
Use Constraints: None (Public Use). Users are advised to read the data set's metadata thoroughly to understand appropriate use and data limitations.
Point of Contact:
Contact Information:
Contact Organization Primary:
Contact Organization: Oak Ridge National Laboratory
Contact Address:
Address Type: mailing and physical
Address: One Bethel Valley Rd, MS-6017
City: Oak Ridge
State or Province: TN
Postal Code: 37831
Country: US
Contact Voice Telephone: 865-241-3976
Contact Facsimile Telephone: 865-241-6261
Data Set Credit: Oak Ridge National Laboratory (ORNL) Geographic Information Science and Technology (GIST) Group, Los Alamos National Laboratory (LANL), Idaho National Laboratory (INL), National Geospatial-Intelligence Agency (NGA) Homeland Security Infrastructure Program (HSIP) Team
Native Data Set Environment: Microsoft Windows 7 Version 6.1 (Build 7601) Service Pack 1; Esri ArcGIS 10.1.1.3143
Data Quality Information:
Attribute Value Accuracy Information:
Attribute Accuracy Report: No formal attribute accuracy test was conducted. Data from the authoritative sources (as identified in other sections of this metadata) is

assumed to be correct and accurate. See also "Overview Description" in the "Entities and Attributes" metadata section.

Logical Consistency Report: Data were extracted from sources (identified in the SOURCE field) and other open source websites to populate the attribute fields; NOT AVAILABLE values (for string and date data types) and Null values (for numeric data types) denote missing data that was not present in the source data. During quality control, attributes were checked to ensure that they fell within the expected ranges or had expected/valid values. Text attribute values were checked for spelling and usage consistency. No topology tests were conducted. All records were verified to occur within the spatial domain of the feature class.

Completeness Report: Data is complete given available sources.

Positional Accuracy:

Horizontal Positional Accuracy:

Horizontal Positional Accuracy Report: None; all efforts are made to place the geographic representation of the facility on-entity using the best available imagery from a wide variety of sources. Users should read and understand the METHOD metadata as well as the Processing Steps.

Vertical Positional Accuracy:

Vertical Positional Accuracy Report: None; dataset contains no vertical data.

Lineage:

Source Information:

Source Citation:

Citation Information:

Title: see SOURCE field

Geospatial Data Presentation Form: Other

Publication Information:

Publisher: see SOURCE field

Type of Source Media: None

Source Citation Abbreviation: see SOURCE field

Process Step:

Process Description:

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Authoritative data sources are identified through open source research.
That data is then acquired and transformed into a usable data format.
The properly formatted data then goes through preprocessing steps that
includes a georeferencing or spatial adjustment operation to give
spatial context to the data. In the absence of authoritative sources,
feature geometry is created based on interpretation of the best
available imagery. The data goes through further refinement using
remote sensing techniques. After preprocessing, records go through a
review process in an effort to meet the goal of placing each feature on
a facility based on-entity location based on interpretation of the best
available imagery and open source information. The DATE field indicates
the date in which the review step took place.
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Spatial Data Organization Information:

Direct Spatial Reference Method: Vector

Entity and Attribute Information:

Detailed Description:

Entity Type:

Entity Type Label: Substations

Entity Type Definition: Attribute fields were populated using sources identified in the SOURCE field for the period covered in the Time Period metadata and other open source data. NOT AVAILABLE values (for string and date data types) and Null values (for numeric data types) denote missing data that was not present in the source data. However, the missing data may be present in other sources not yet discovered

and used in the creation and/or maintenance of this dataset. These records may be populated with valid information in future update cycles.

Entity Type Definition Source: Originator defined

Attribute:

Attribute Label: MAX_VOLTAGE

Attribute Definition: Maximum voltage of all Transmission Lines that feed into the substation

Attribute Definition Source: Originator defined

Attribute Domain Values:

Range Domain:

Range Domain Minimum: 0

Range Domain Maximum: 1000

Attribute Units of Measure: Kilovolt (kV)

Attribute:

Attribute Label: LINES

Attribute Definition: Number of transmission lines that are linked to the substation.

Attribute Definition Source: Originator defined

Attribute Domain Values:

Range Domain:

Range Domain Minimum: 0

Range Domain Maximum: 28

Attribute:

Attribute Label: ZIPCODE

Attribute Definition: Zip Code (5 digit); Postal Code (Canada; 6-digit).

Attribute Definition Source: The responsible organization as identified in the SOURCE field.

Attribute Domain Values:

Codeset Domain:

Codeset Name: Postal Codes

Codeset Source: Canada Postal (https://www.canadapost.ca)

Attribute Domain Values:

Codeset Domain:

Codeset Name: US Postal Zip Codes

Codeset Source: United States Postal Service (https://www.usps.com)

Attribute:

Attribute Label: STATE

Attribute Definition: State abbreviation; Province abbreviation (Canada)

Attribute Definition Source: The responsible organization as identified in the SOURCE field.

Attribute Domain Values:

Codeset Domain:

Codeset Name: Two-Letter Province Abbreviation

Codeset Source: Canada Postal (https://www.canadapost.ca)

Attribute Domain Values:

Codeset Domain:

Codeset Name: Two–Letter State and Possession Abbreviations

Codeset Source: United States Postal Service (https://www.usps.com)

Attribute:

Attribute Label: NOTES

Attribute Definition: Any supplemental notes about the substation.

Attribute Definition Source: Originator defined

Attribute:

Attribute Label: SOURCE
Attribute Definition: Original source used to identify geospatial location and/or attribution for the feature. Frequently used sources include ESRI's World Imagery Service.
Attribute Definition Source: Originator defined
Attribute:
Attribute Label: DATE
Attribute Definition: Date when geospatial location and/or attribution were last validated for the feature.
Attribute Definition Source: Originator defined
Attribute Domain Values:
Range Domain:
Range Domain Minimum: 0
Range Domain Maximum: 0
Attribute:
Attribute Label: LATITUDE
Attribute Definition: The angular distance north or south from the equator on the earth's surface.
Attribute Definition Source: Originator defined
Attribute Domain Values:
Range Domain:
Range Domain Minimum: 24.555565
Range Domain Maximum: 58.724233
Attribute Units of Measure: Decimal Degrees
Attribute:
Attribute Label: MIN_VOLTAGE
Attribute Definition: Minimum voltage of all Transmission Lines that feed into the substation
Attribute Definition Source: Originator defined
Attribute Domain Values:
Range Domain:
Range Domain Minimum: 0
Range Domain Maximum: 500
Attribute Units of Measure: Kilovolt (kV)
Attribute:
Attribute Label: OBJECTID
Attribute Definition: Internal feature number.
Attribute Definition Source: Esri
Attribute Domain Values:
Unrepresentable Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute Label: COUNTRY
Attribute Definition: Country Code (3 character).
Attribute Definition Source: Originator defined
Attribute Domain Values:
Codeset Domain:
Codeset Name: Geopolitical Entities, Names, and Codes (GENC) Standard
Codeset Source: National System for Geospatial Intelligence (NSG) Standards Registry (https://nsgreg.nga.mil/genc/discovery)
Attribute:
Attribute Label: NAME
Attribute Definition: Feature name.

Attribute Definition Source: The responsible organization as identified in the SOURCE field.
Attribute Domain Values:
Enumerated Domain:
Enumerated Domain Value: TAP
Enumerated Domain Value Definition: Location where power on a transmission line is tapped by another transmission line.
Enumerated Domain Value Definition Source: Originator defined
Attribute:
Attribute Label: LONGITUDE
Attribute Definition: The angular distance east or west from the prime meridian on the earth's surface.
Attribute Definition Source: Originator defined
Attribute Domain Values:
Range Domain:
Range Domain Minimum: -130.329151
Range Domain Maximum: -67.003329
Attribute Units of Measure: Decimal Degrees
Attribute:
Attribute Label: CITY
Attribute Definition: City name.
Attribute Definition Source: The responsible organization as identified in the SOURCE field.
Attribute:
Attribute Label: Shape
Attribute Definition: Feature geometry.
Attribute Definition Source: Esri
Attribute Domain Values:
Unrepresentable Domain: Coordinates defining the features.
Attribute:
Attribute Label: METHOD
Attribute Definition: Methodology used to validate geospatial location and/or attribution for the feature.
Attribute Definition Source: Originator defined
Attribute Domain Values:
Enumerated Domain:
Enumerated Domain Value: IMAGERY
Enumerated Domain Value Definition: The best available imagery used to determine the location.
Enumerated Domain Value Definition Source: Originator defined
Enumerated Domain:
Enumerated Domain Value: OTHER
Enumerated Domain Value Definition: Open source information used to determine the location.
Enumerated Domain Value Definition Source: Originator defined
Enumerated Domain:
Enumerated Domain Value: IMAGERY AND OTHER
Enumerated Domain Value Definition: Imagery and supplemental open source information used to determine the location.
Enumerated Domain Value Definition Source: Originator defined
Enumerated Domain:
Enumerated Domain Value: UNVERIFIED

Enumerated Domain Value Definition: Feature could not be located or the feature has not yet been validated.

Enumerated Domain Value Definition Source: Originator defined

Overview Description:

Entity and Attribute Overview:

```
The entity and attribute information provided here describes the
tabular data associated with the data set. Please review the detailed
descriptions that are provided (the individual attribute descriptions)
for information on the values that appear as fields/table entries of
the data set. Please see the "Processing Steps" section for further
methodology. Some features within this dataset were collected using
image processing. NOT AVAILABLE values (for string and date data types)
and Null values (for numeric data types) denote missing data that was
not present in the source data. However, the missing data may be
present in other sources not yet discovered and used in the creation
and/or maintenance of this dataset. These records may be populated with
valid information in future update cycles.
```

Entity and Attribute Detail Citation: Oak Ridge National Laboratory

Distribution Information:

Distributor:

Contact Information:

Contact Organization Primary:

Contact Organization: HIFLD Subcommittee

Contact Electronic Mail Address: hifld@hq.dhs.gov

Distribution Liability: Distributor assumes no liability for misuse of data.

Standard Order Process:

Digital Form:

Digital Transfer Information:

Format Name: Vector Digital Data Set (Point)

Fees: None. No fees are applicable for obtaining the data set.

Metadata Reference Information:

Metadata Date: 20160302

Metadata Contact:

Contact Information:

Contact Organization Primary:

Contact Organization: Oak Ridge National Laboratory

Contact Address:

Address Type: mailing and physical

Address: One Bethel Valley Rd, MS-6017

City: Oak Ridge

State or Province: TN

Postal Code: 37831

Country: US

Contact Voice Telephone: 865-241-3976

Contact Facsimile Telephone: 865-241-6261

Metadata Standard Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata Standard Version: FGDC-STD-001-1998

Metadata Time Convention: local time