Australian Government

Geoscience Australia

APPLYING GEOSCIENCE TO AUSTRALIA'S MOST IMPORTANT CHALLENGES

Electricity Transmission Lines Database

Metadata Statement

Version 2 Last updated in 2017

eCatID: 83105

Use Constraint:

Keywords:
Transmission Lines, substations, power stations, electricity

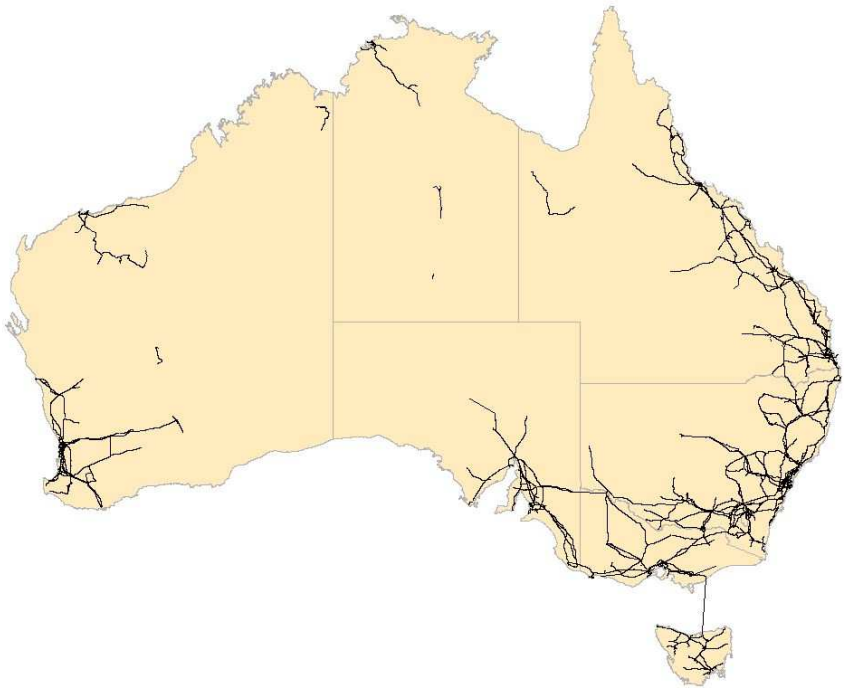
Definition:

For the purposes of this dataset, Electricity Transmission Lines are defined as: *A network of wires and insulators used to connect and transport high voltage electricity from generators to large demand customers and the lower voltage electricity distribution network.*

Abstract:

The Electricity Transmission Lines Database presents the spatial location; in line format, all known high voltage electricity transmission lines that make up the electricity transmission network within Australia.

National Map of Electricity Transmission Lines:



Lineage Statement:

The electricity transmission lines were digitized in 2011 from the library of imagery held within Geoscience Australia. Imagery used ranged from 0.15m to 2.5m resolution. The electricity transmission lines dataset was revised (Version 2) in March 2017 using Esri World Imagery.

Version 1 of the database was first released publicly on Geoscience Australia's website in April 2015 and the updated revision re-released as Version 2 in March 2017

The electricity transmission lines webservice – Version 1 was released as a subset of the Electricity Infrastructure web service in February 2016.

Source Information:

The latest information sources used to identify and attribute the electricity transmission lines were the following annually released and publicly available publications:

1. Tasmania, South Australia, Victoria, New South Wales and Queensland
   www.aemo.com.au
   - 2015 AEMO High Voltage Network - Main System Diagrams

2. Western Australia (southwest)
   Western Power's Online Network Capacity Mapping Tool
   http://www.westernpower.com.au/ldd/ncmtoverview.html
   and South West Interconnected System (SWIS)

   Western Australia (northwest)
   North West Interconnected System (NWIS)

3. Northern Territory (NT)
   http://www.utilicom.nt.gov.au/Pages/default.aspx
   - NT Government's Utilities Commission Report - 2013-14 Power System Review

The latest primary information source (refer to Lineage Statement) was supplemented with online, publicly available information from utility companies, engineering firms and government agencies.

Positional (Spatial Confidence) Accuracy:

Accuracy of the spatial data varies depending on the geographic location of the electricity transmission lines and the accuracy of the imagery used to digitize the feature.

The 'Spatial Confidence' attribute is a GIS specialist's estimation/interpretation of the location accuracy of the digitized feature without taking into account the planimetric accuracy of the imagery used during the process. Values range from 1 to 5 and are assigned based on the following criteria:

5	Feature positively identified from imagery (expert ID) and, along with reliable reference material, feature located with 100% certainty; or expert ID from imagery or reliable reference material and individual knowledge sufficient to be 100% certain of location
4	Feature positively identified from imagery (expert ID) but reference material insufficient to be 100% positive
3	Feature placed on location of full address / known coordinates but can't be positively identified from imagery; or feature placed on suspected location of facility identified from imagery, within a known, more general, location (such as a hospital grounds)
2	Feature placed on street / general facility site
1	Feature placed in the centre of district / town

Attribute Accuracy:

The accuracy of the attribute information is reliant upon the sources outlined above. Where required, Geoscience Australia staff sought clarification from online sources to validate information.

Logical Consistency:

Transmission lines are unbroken from end-point to end-point; where end-points coincide with and are snapped to the location of a substation or power station. Intersecting lines are not separated into individual line segments at the point of intersection and no duplicate features exist.

Geoscience Australia used a Validation and Testing methodology to ensure the quality and compliance of the electricity transmission lines dataset.

Testing is carried out using a mixture of computer programs and proprietary GIS packages (such as ArcGIS). Many of the tests are automated, using customised computer programs. These are supported by a detailed on-screen visual inspection of the digital data against available imagery and reference material for logical consistency and attribute accuracy.

Where feature populations are small, or the validation tests are particularly important, the full population will be tested. Where feature populations are large, or a less stringent tolerance applies, a Statistical Subset or Sample (Area) test may be used. Statistical Subset tests are a random selection of features from the whole population, whereas Sample tests assess features within a selected geographical area.

Statistically acceptable procedures are adopted for tests that require sampling. The sampling procedures adopted are based on the Australian Standard AS1199-1988: "Sampling procedures and tables for inspection by attribute". The Acceptable Quality Level (AQL) is in the range of 0% to 5% against a defined technical specification.

Completeness:

All electricity transmission lines depicted in the primary information source (refer to Lineage Statement), have been digitized.

Attribute information fields have been populated where data was available. Where there is no data available, incomplete fields are assigned a <Null> value. Attribute fields will be updated or populated during future scheduled maintenance cycles if new information or updated information is identified and publicly available.

Data Dictionary:

Note: The following data dictionary table covers the full suite of attribute fields that define the Electricity Transmission Lines Database. Attribute names that are preceded by the ^ symbol are internal fields used for maintaining the data and are not included in the Electricity Transmission Lines Database accessible via Geoscience Australia's data download website and web services.

Attribute Name	Attribute Alias	Description
OBJECTID*	Object_ID	Automatically generated system ID
SHAPE*	Shape	Geometry type (Polyline)
FEATURETYPE	Feature_Type	A singled feature type "Transmission Line" is the collective name of the different facility subtypes identified in the CLASS field
DESCRIPTION	Feature_Description	Brief description of the feature type
CLASS	Subtype_Class	The feature type subtypes: • Overhead • Underground
FID	Feature_ID	A unique alphanumeric code
NAME	Name	The name of each individual feature
OPERATIONALSTATUS	Operational_Status	A description of the feature's status: • Operational (functioning as an active transmission line) • Non-Operational (no longer operational as an active transmission line)
CAPACITYKV	Capacity_kV	Transmission voltage of the powerline - kilovolts
^PLANIMETRICACCURACY	Planimetric_Accuracy	Planimetric accuracy of the imagery used to capture or digitize the feature
STATE	State	The state where this feature is located
^ATTRIBUTESOURCE	Attribute_Source	The name of the agency/data custodian for the source of this feature's attribute information
^ATTRIBUTEDATE	Attribute_Date	Date of the source material used to capture the feature's attribute
^FEATURESOURCE	Feature_Source	The name of the agency/data custodian for the source of the material used to capture the location of this feature
^FEATUREDATE	Feature_Date	Date of the source material used to capture this feature
SPATIALCONFIDENCE	Spatial_Confidence	Confidence rating of the accuracy of the feature's spatial location (5 high – 1 low)
REVISED	Revised	The date the feature was last revised
COMMENT	Comment	A free text field for adding general comments about this feature to external users

SHAPE_Length	Shape_Length	Automatically generated length in decimal degrees

Data Maintenance:

The next revision of this database will be determined by Geoscience Australia's work program. This timeframe ranges between 1 and 5 years or by formal written agreement with Geoscience Australia.

Known Limitations of the Data:

The positional accuracy of all underground electricity transmission lines included in the database is unknown. The positions of these features were interpolated from imagery identified in the Feature Source attribute field.

Revision Dates and Descriptions:

March 2017	• Full revision of spatial product and associated metadata • Removed the word National from the title of the database • Revised Use Constraint o Logo - © Commonwealth of Australia (Geoscience Australia) 2017 • Version 2 of the spatial database was released on GA's website
February 2016	• Revised Use Constraint o Logo - © Commonwealth of Australia (Geoscience Australia) 2016 • Dataset released as a subset of the Electricity Infrastructure web service
September 2015	• Created new schema for the website and web service products • Revised Data Dictionary on page 3-4 of this document

April 2015	• Mid-cycle database reformatting with the aim of improving consistency across the Energy datasets maintained by the Infrastructure Project
	• Revised Use Constraint
	  o Logo - © Commonwealth of Australia (Geoscience Australia) 2015
	  o Creative Commons Attribution 4.0 International Licence
	• Removed Restrictions
	• Version 1 of the spatial database was released on GA's website

February 2015	• Full metadata statement update
	• Added Data Dictionary on Page 3 of this document
	• Added Definition on Page 1 of this document
	• Added eCat Number on Page 1 of this document
	• Changed contact email to GA client services
	• Added Use Constraint
	  o Logo - © Commonwealth of Australia (Geoscience Australia) 2014
	  o Creative Commons Attribution 3.0 Australia Licence

January 2014	• Spatial product and associated metadata revised o Restrictions – For Government Use Only
December 2012	• Initial electricity transmission lines spatial database and associated metadata document was created o Restrictions – For Government Use Only

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