Product data description

Vicmap™ Elevation statewide contours & relief

www.delwp.vic.gov.au

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Version 2.0 June 2017

Applies to data model 3.4 Octover 2015

AS/NZS ISO 19131:2008 compliant

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# Document history

|  |  |  |  |
| --- | --- | --- | --- |
| Version | Date | Author | Note |
| 1.0 | January 2003 | J Green | New template  Split vector statewide contours from raster digital elevation model |
| 1.0 | February 2003 | A White | Checked by Custodial Officer |
| 1.1 | August 2003 | J Green | Added Data Model Version 2 reference |
| 1.2 | August 2005 | M O’Brien | Added Data Model Version 2.2 reference |
| 1.3 | November 2015 | D Blain | Added Data Model 3.4, and reformatted to Vicmap Product Description\_TEMPLATE v4.docx, update ground service point and ground type point sections |
| 2.0 | June 2017 | J LeLievre  D Blain | Updated to new product description template. |

This document has been formatted and structured in compliance with AS/NZS ISO 19131:2008 Geographic Information – Data product specifications.

# Publication Approval

Before this is approved - compliant metadata must be completed in MetaShare.

|  |  |  |  |
| --- | --- | --- | --- |
| Title: | Vicmap Data Services Manager | Title: | Foundation Data Portfolio Manager |
| Signature: |  | Signature: |  |
| **Date:** |  | **Date:** |  |

|  |  |
| --- | --- |
| Title: | Vicmap Foundation Data Team Leader |
| Signature: |  |
| **Date:** |  |

An approved printed copy must be maintained in an appropriate DELWP TRIM file.

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# Overview

## Vicmap™

Vicmap™ is the foundation that underlies most spatial information in Victoria. This portfolio of spatial related authoritative data products, made up from individual datasets, is developed and managed by the Department of Environment, Land, Water & Planning. The information provides the foundation to Victoria’s primary mapping and spatial information systems, and is used for building business information and systems.

Vicmap is a registered trademark of the Victorian Government and is synonymous with authoritative statewide mapping since 1975.

The Vicmap portfolio includes:

|  |  |
| --- | --- |
| Vicmap Address  Vicmap Admin  Vicmap Crown Land Tenure  Vicmap Elevation  Vicmap Features of Interest  Vicmap Hydro  Vicmap Imagery | Vicmap Lite  Vicmap Planning  Vicmap Position  Vicmap Property  Vicmap Topographic Mapping  Vicmap Transport  Vicmap Vegetation |

Vicmap data is supported by a collection of Reference Tables, Vicmap Reference Tables. A reference table may list the full name, description and other attributes associated with a feature code or identifier.

Further information can be found at <https://www2.delwp.vic.gov.au/maps>

## Data product specification title

Vicmap™ Elevation statewide contours & relief

## Responsible party

Department of Environment, Land, Water and Planning

PO Box 527, Melbourne VIC 3001 Australia

[vicmap.help@delwp.vic.gov.au](mailto:vicmap.help@delwp.vic.gov.au)

## Terms and definitions

For the purpose of this document, the following terms and definitions apply.

|  |  |
| --- | --- |
| **Term** | **Definition** |
| ANZLIC ID | A unique identifier enabling metadata records to be discovered and differentiated within a structured data library. |
| Attribute | A characteristic of a feature that may occur as a type or an instance. |
| Custodian | An organisation responsible for ensuring the accuracy, currency, distribution of their data and the terms and conditions of access and use. |
| Data type | Specification of a value domain with operations allowed on values in this domain  Refer to AS/NZS ISO 19103 |
| Dataset | Identifiable collection of data. Maybe as small as a single feature or feature attribute contained within a larger dataset. A hardcopy map maybe considered a dataset.  Refer to AS/NZS ISO 19115 |
| Domain | A well-defined set both necessary and sufficient, as everything that satisfies the definition in the set and everything that does not satisfy the definition is necessarily outside the set.  Refer to ISO/TS 19103 |
| the Department | Meaning the Department of Environment, Land, Water & Planning (DELWP). |
| Entity | A unit of data that can be classified and have stated relationship with other entities. |
| Feature | An abstraction of real-world phenomena. A feature may occur as a type or an instance. Feature type or instance shall be used when only one is meant.  The feature structure of the feature based data model can be summarised as:  feature instance = [spatial object + attribute object] |
| Metadata | Metadata is ‘data about data’ and provides a synopsis about the data lineage, accuracy and details about access permissions.  Refer to ISO 19115 Geographic information ― Metadata |
| Persistent Feature Identifier (PFI) | The unique code provide at creation of the feature which remains until the feature is retired. |
| Product | Dataset or dataset series that conforms to a data product specification. |
| Quality | Totality of characteristics of a product that bear on its ability to satisfy stated and implied needs. Refer to:  ISO 19113 Geographic information ― Quality principles  ISO 19114 Geographic information ― Quality evaluation procedures |
| the State | Victoria. |
| Unique Feature identifier (UFI) | Each feature is uniquely identified and renewed with each change. |

## Acronyms

For the purpose of this document, the following acronyms may apply.

|  |  |
| --- | --- |
| **Acronym** | **Definition** |
| DELWP | Department of Environment, Land, Water & Planning |
| DEM | Digital Elevation Model |
| DTM | Digital Terrain Model |
| GNSS | Global Navigation Satellite Systems |
| ICSM | Intergovernmental Committee on Surveying & Mapping |
| LGA | Local Government Area |
| LUV | Land Use Victoria |
| NES | Notification for Editing Service |
| SDM | Spatial DataMart |
| VGDD | Victorian Government Data Directory |

## Informal description of the data product

Vicmap Elevation assists with terrain analysis and land assessment by providing contour and relief data. This product is able users and can be combined with other data to enable more efficient and effective planning of landscape sensitivity, catchment modelling and habitat suitability.

The Vicmap Elevation is comprised the following:

* **Statewide 10- 20m contours & relief:** represents Victoria’s elevations in the form of contours, spot heights and surface features including cliffs, embankments and rock outcrops.
* **Digital Terrain Model (DTM):** represents Victoria’s terrain surface at 20m & 10m grid resolution and are hydrologically enforced.
* **Multi-resolution:** Compilation of project data, both DEMs and contours, at various resolutions covering the major flood plains across Victoria & Greater Melbourne and environs.
* **Topographical coastal 1m DEM & 0.5 contours:** high resolution representation of Victoria’s natural relief features along the coast.

Vicmap Elevation data is sourced from authoritative Custodians via the *LUV Custodianship Program.* Datasets may be supplemented and/or verified with information supplied by:

* Federal, State & Local Government
  + DELWP (Forests, Fire Management, Geographic Names & Land Registry)
* Government agencies & authorities
  + Parks Victoria
  + VicRoads
* Emergency & Essential Services
  + Country Fire Authority
* Asset Information Management
* Melbourne Water
* Licensed surveyors
* Water authorities
* Melway

This product description focuses on the statewide contours 10-20m & relief dataset series of Vicmap Elevation, which is freely available to users and incorporated into the Vicmap Topographic Mapping products.

Product updates are made available weekly through the Vicmap maintenance lifecycle. Vicmap elevation is mature product and does not incur many changes.

# Specification scope

### Level

Dataset.

### Extent & coverage

Vicmap Elevation covers the State of Victoria.

Cross border data for select Vicmap Products is provided to DELWP under an arrangement with New South Wales and South Australia with coverage extending up to 100 kilometres into New South Wales and an 1 x 1:100,000 tile into South Australia. Selected Vicmap Elevation data is maintained over the border. Refer to the metadata record for each dataset for detail.

# Data product identification

### Title

Vicmap Elevation statewide contours & relief

### Alternative title

VMELEV

Vicmap Elevation

Vicmap Elevation 10-20m

### Abstract

Vicmap Elevation statewide contours & relief provides an accurate representation of natural relief features across Victoria, at a capture scale of 1:25,000. It is used in a variety of applications, particularly in emergency services, natural resource management, planning and development, and map publication.

Below are the key characteristics of the Vicmap Elevation statewide contours & relief product:

* Main data captured in the *Accelerated Mapping Program* between 1975-1994 at 1:25,000 statewide. The data was later scanned, vectorised, verified and spatially referenced with the creation of the data model in 2000.
* Data is topologically structured (vertical topology) and hydrologically structured by 2008.
* Seamless coverage across Victoria and cross boarder data included in 2008.
* Conforms to national data models (ie. ICSM), and
* Adapted to relevant standards and outputs of Working Groups under the auspices of ICSM, ANZLIC and other industry organisations, such as:
  + ISO 19100 series, and
  + ICSM Guidelines for incremental update (Ref. Policy and Guidelines for Incremental Update – ICSM Harmonisation Working Group, October 2000).

Where Standards have been found to be deficient to the Department’s requirements (example, attribute field size insufficient) suitable modifications have been made.

### Topic category

Elevation.

# Data content and structure

### Data content

Vicmap Elevation statewide contours & relief contains the following feature based vector datasets:

|  |  |  |  |
| --- | --- | --- | --- |
| **ANZLIC ID** | **Dataset name** | **Description** | **Feature type** |
| ANZVI0803002499 | VICMAP\_ELEVATION | *\*Parent metadata record* | N/A |
| ANZVI0803002504 | EL\_CONTOUR | Contours | Line |
| ANZVI0803002893 | EL\_GRND\_TYPE\_AREA\_POLYGON | Rock outcrop, sand, surface area void | Polygon |
| ANZVI0803002502 | EL\_GRND\_SURFACE\_POINT | Mountain, point, rock outcrop | Point |
| ANZVI0803002500 | EL\_MORPHOLOGY\_LINE | Cliff, sand dune, cutting, embankment, levee | Line |
| ANZVI0803002501 | EL\_MORPHOLOGY\_POINT | Sinkhole, cave | Point |

Table1: Datasets that comprise Vicmap Elevation statewide contours & relief.

*\*Parent metadata record for VMELEV. Parent metadata records act as a cover note for a product that contains a dataset series for search, discovery & delivery purposes. Refer to the data model in Appendix A.*

All data contains attribution (not all tables are populated) which is feature descriptive and provides specific information about each feature. Each feature contains information from different classes of common attribution.

|  |  |
| --- | --- |
| **Attribute class** | **Description** |
| Spatial Feature | Description of a spatial feature within the dataset including feature ID, date stamping and type |
| Feature Quality | Defines accuracy and other quality information pertaining to this spatial feature |
| Capture Method | The method used to capture this data |
| Data Source | The source of the data in this dataset |
| Layer | The layer to which the features belong |
| Theme | The Theme to which the features belong |
| Named Feature | The list of all names of features used within Victoria, with linkages to the official Place Names Register maintained by Land Victoria |
| Feature Type | The holding of all the different feature types that are applicable and their relationship to the original Vicmap IGDS Data Dictionary |

Table 2: Vicmap Elevation statewide contours & relief attributes

### Data models

See Appendix A.

The Vicmap Elevation contours & relief product data model is published on the Department’s website <https://www2.delwp.vic.gov.au/maps/maps-and-spatial-data>.

### Data dictionary

See Appendix B.

### Data structure

Vicmap Elevation statewide contours & relief uses a feature-based data model, which was constructed with the following objectives:

* The data model should conform as far as possible to the national (ICSM) topographic data model. In addition, some specific requirements were identified by the Department, with respect to the handling of cartographic text, unformed polygon based features, and temporal and status management.
* Text strings are optionally linked to a feature instance they are associated with, where:
* Multiple text strings may be linked to one feature;
* Text strings associated with a particular entity will be stored in an associated text layer; and,
* Text strings format is a single place point plus rotation angle.
* Temporal Data Management:All data is to have temporal attributes for the management of different versions of the database. These attributes include date stamps such as Created, Retired and Extracted for Edit (data management tool only).
* Feature identification is managed through the use of two identifier attributes, the Persistent Feature identifier (PFI) and the Unique Feature Identifier (UFI).
* A Persistent Feature Identifier (PFI) is generated once for each feature at the point of creation and remains constant until a feature it is spatially changed or retired. A PFI is unique cannot be reused within a dataset. However, you may have the same PFI number in different datasets but does not relate to the same feature entity.
* The Unique Feature Identifier (UFI) is generated for each feature at the point of creation and changes with each modification or version. This allows users to track the changes made to a feature over time. A UFI is unique across all Vicmap products.

All key features are tagged with the following attributes to enable an audit trail to be maintained and to facilitate incremental updating.

|  |  |  |
| --- | --- | --- |
| **Attribute** | **Format** | **Description** |
| create\_date\_pfi | dd-mmm-yyyy hh:mm:ss | The date/time stamped against each feature when it is originally created and remains with the feature through all editing actions to attributes or modification of feature spatial representation |
| retire\_date\_pfi\* | dd-mmm-yyyy hh:mm:ss | The date/time stamped against each feature when it is retired as a result of merge, split or deletion actions. |
| create\_date\_ufi | dd-mmm-yyyy hh:mm:ss | The date/time stamped against each feature when it is created. |
| retire\_date\_ufi\* | dd-mmm-yyyy hh:mm:ss | The date/time stamped against each feature when it is retired due to physical change, attribute change or deletion. |

Table 3: Attributes associated with the creation, modification and retiring of Vicmap data.

*\*are non-published fields for internal use only.*

* A version of a dataset can be extracted for a range of dates if required for legal or exceptional circumstances
* Datasets between products are topologically structured (vertical topology). Eg. Many road centre lines also form administrative boundaries or are coincident with other features; for example dam wall.
* All features are tagged with a pointer (**feature\_quality\_id**) to the feature quality table with the following attributes to determine currency:
  + The source mapping scale indirectly provides an estimate of the horizontal positional accuracy

|  |  |  |
| --- | --- | --- |
| **Attribute** | **Format** | **Description** |
| feat\_reli\_date | dd-mmm-yyyy hh:mm:ss | The date of source information for new or modified spatial feature. |
| attr\_reli\_date | dd-mmm-yyyy hh:mm:ss | The date of source information for new or modified aspatial object attributes of the feature. |

Table 4: Feature currency attributes, non-published data.

Refer to Appendix C for more information about the data tables within the Vicmap Elevation statewide contours & relief product.

Cross border data is not subject to the same data structures or accuracy as the content within Victoria. This is due to the differences in the data models between the States.

# Reference systems

Vicmap Address is mapped to the Geocentric Datum of Australia (GDA) and the Australian Height Datum (AHD). Data is held in geographic latitude and longitude computed in terms of the GDA at 01 January 1994 (GDA94).

The temporal reference system for Vicmap is the Gregorian calendar.

# Data quality

## Accuracy

The spatial accuracy of data within a Vicmap product is where possible better than 1:25,000 and retains vertical alignment with other Vicmap datasets. Accuracy of each dataset is individually noted in the metadata.

The following procedures are undertaken as normal update/maintenance routines, to ensure conformity of the data to specification:

* Customised menus for data editing which provide on the fly logical consistency attribute checking as data is edited
* Automated data QA processes to validate topological integrity, completeness and logical consistency
* Automated data loading routines, reflecting business rules for data population, to ensure data accuracy
* Independent review of data upon loading including aspatial attributes, spatial extents and successful data load
* Validation of accepted types according to approved reference tables
* Validation of entity PFI/UFI tags for uniqueness.

*Resolution of coordinates*

Co-ordinates of all spatial objects will be quoted to the nearest 0.001 metres.

Approximately 5% of all maintenance advice notices processed are separately audited by the Department to confirm accuracy, completeness and correctness in the capture process.

### Spatial accuracy

The positional accuracy of spatial data is a statistical estimate of the degree to which planimetric coordinates and elevations of features agree with their real-world values.

The minimum planimetric accuracy attainable will be the sum of errors from three sources:

* The positional accuracy of source material
* Errors due to the conversion process, and
* Errors due to the manipulation process.

It is expressed as the standard deviation of the horizontal position of the feature, that is +/-17.5 metres for scanned 1:25,000 scale topographic data. It is generally estimated that 90% of well defines features are within 0.7mm at 1:25,000 map scale of their true position.

Cartographic generalisation of features to facilitate presentation has been employed based on a hierarchy of topological data. Line string-vector specifications stipulate maximum distance between two points (0.25mm) and thinning of arcs applied according to the degree of curvature of the line strings. For three successive points, if the mid-point is less than 0.10mm off-line it should be discarded. Points diverging greater than 0.10mm are stored.

General rules associated with data capture were applied to determine whether features were to be drawn to scale to form polygons or were to be symbolised as a point.

### Attribute accuracy and reliability

The allowable error in attribute accuracy ranges between a 1% (new data additions) to 5% (pre-maintenance contract data). For this product, attribute accuracy is a measure of the degree to which the features and attribute values of spatial objects agree with the information on the source material.

### Spatial data integrity

Vicmap data will comply with the following rules for spatial data integrity.

* All linear features within the same layer will be broken by a node at intersections, or at the point where an attribute of the feature changes. A node will exist at these intersection points.
* The spatial data will have no overshoots, undershoots, broken lines, pseudo nodes or other artefacts of the data capture process. Artefacts such as spikes and deviations of a linear feature from its expected position will be removed from the data to the extent that they will not be visible when the data is plotted or displayed at half its nominal scale ie 1:12,500 for 1:25,000 data.
* There will be no coincident polygons, lines (whole or in part) or points of the same feature type in the data (also frequently known as double digitising). Differing features may be coincident, as may be the case where a dam wall also forms part of a dam polygon, (in these cases, the common data repeats for each feature type, and is appropriately tagged and supplied as part of each feature type).

*Point Density Reduction:* Data point reduction filters linear spatial objects so that the locational information is conveyed in Vicmap by the minimum number of points while still retaining the smooth shape of the source data. The following specifications have been adopted:

* The length of a line segment will be equal to, or greater than 2.5 metres.
* The length of a line segment will not be greater than 10,000 metres.

## Completeness

These figures are reasonable estimates of completeness for features within Victoria. They are anecdotal, sometimes supported by limited feature and/or attribute comparisons with other datasets. They have not been confirmed through statistical methodologies and/or large scale field trials.

|  |  |
| --- | --- |
| **Dataset** | **Completeness** |
| Grnd\_type (line) | 85% |
| Grnd\_type (point) | 80% |
| Morphology\_line (line) | 75% |
| Morphology\_point (point) | 10% |

Table 5: Vicmap Elevation statewide contours & relief completeness

## Logical Consistency

The allowable error in logical consistency ranges between 1% (new data additions) to 5% (sourced data). Logical consistency is a measure of the degree to which data complies with the technical specification. The test procedures are a mixture of software scripts and on-screen, visual checks.

# Data capture

Vicmap relies heavily on the agreements and MoU’s signed with authoritative Custodians, through the *LUV Custodianship Program*, for its data.

The Department may also use imagery to improve the completeness of a dataset in absence of an authoritative Custodian.

Examples of Custodians and/or those that may supplement or verified data are listed below:

* Federal, State and Local Government
* Government agencies and authorities (e.g. Parks Victoria, Melbourne Water, VicRoads)
* Registrar of Geographic Names – Department of Environment, Land, Water, and Planning
* Crown Land Management – Department of Environment, Land, Water, and Planning
* Fire Management - Department of Environment, Land, Water, and Planning
* Emergency & Essential Services, and
* Utility companies.

Cross border data is maintained to a limited extent into New South Wales and South Australia to assist primarily emergency and essential service activities. A cross boarder agreement between the State Government departments manages the relationship and distribution of this data. Data is updated on an annual basis subject to funding being available. The data made available to DELWP is subject to the maintenance regime of the relevant jurisdiction and their respective quality, accuracy and completeness specifications.

## Production methods

* Vicmap Elevation statewide contours & relief was created as part of the State’s *Accelerated mapping program* in the 1970’s with the aim of producing hardcopy series mapping across Victoria.
* Preliminary compilation was at 1:10,000 scale and produced 1:10,000 base maps in town and urban areas and 1:25,000 topographic maps in rural areas.
* State coverage was attained by 1994.
* Graphical detail was compiled photogrammetrically from 1:40,000 scale aerial photography and plotted onto stable base film or digitally captured and converted to design file format.
* 1st Stage Data Capture 1985-94. Mandatory data (Hydrography, Relief, Roads) was first captured using raster scanning of negative separations and vectorising, together with some direct digitising from source material ( compilation plots, mapping artwork).
* Originally mapbase data was stored as individual 1:25,000 single or double mapsheet tiles.
* 2nd Stage Data Capture 1994-97. Capture of the balance of data features covering text, infrastructure, vegetation, spot heights and contour values was carried out by scanning or hand digitising from compilations, negative separations and printed map source material.
* Features were attributed using AS2482 feature coding and symbol style. The data was only “spaghetti” data in that it had no topological structure or attribution with the exception of AS2482 code and contours and spot heights, which were, tagged with respective height values.
* To make the data spatially enabled with full attribution, topology and unique identification, a data model was developed in 2000 to create a feature-based seamless dataset series across Victoria. This was stored to national (ICSM) data model standards.
* Data was topologically structured (vertical topology) and hydrologically structured for the State by 2008. 2008 also saw the inclusion of cross border data.
* Vicmap Elevation is now a topographic theme product of Vicmap. The data has undergone some quality assurance to verify accuracy and content.

# Data maintenance

Vicmap products can change under one of the following three terms:

* *Vicmap maintenance -* The incorporation of new data to an existing dataset via an M1, spatial change requests or scheduled Custodial supply. No changes are made to the data or object model, therefore does not require change management processes. Additions can be seen in the weekly Vicmap update.
* *Vicmap improvements –* changes to a dataset that may see existing data over a large area replaced and/or may require the data model changed. Vicmap Improvement must be managed through the Vicmap Change Management Forum and are typically carried out as part of a project requiring additional funding. and may reinvolve a new Custodial data requiring change management.

DELWP obtains updates to data from authoritative Custodians at various intervals based on the agreed Custodianship arrangements (i.e. quarterly, yearly and ad hoc). Updates are incorporated into Vicmap daily and made available weekly: noting that Vicmap data is never deleted, only retired and archived for legal purposes. Data is date stamped to reflect the last time the record was verified.

Reported errors or omissions are verified with the authoritative source before a change is made. Most notifications regarding anomalies are received via the Notification for Editing Service (NES) and once verified will be incorporated into Vicmap. Feedback from users and stakeholders, including emergency services dispatch providers, ensures that the highest standards are maintained.

Approximately 5% of all maintenance advice notices processed are separately audited by DELWP to confirm accuracy, completeness and correctness in the capture process.

Vicmap data undergoes the following standard procedures to ensure conformity of the products specification:

* Customised menus for data editing which provide on the fly logical consistency attribute checking as data is edited
* Automated data quality assurance processes to validate topological integrity, completeness and logical consistency
* Automated data loading routines, reflecting business rules for data population, to ensure data accuracy
* Independent review of data upon loading including aspatial attributes, spatial extents and successful data load
* Validation of accepted types according to approved reference tables (Appendix D), and
* Validation of entity PFI/UFI tags for uniqueness.

Data made available to Vicmap under Cross Border agreements is subject to the maintenance regime of the relevant jurisdiction and is not subject to the same maintenance regime of the Vicmap datasets. Cross border data made available in Vicmap is not updated regularly.

# Data product delivery

## Access & licensing

Vicmap Admin is freely available through the Victorian Government Data Directory (VGDD) at [www.data.vic.gov.au](http://www.data.vic.gov.au) under a Creative Commons Attribution 3.0 Australia license.

The Victorian Government Data Directory also provides details such as:

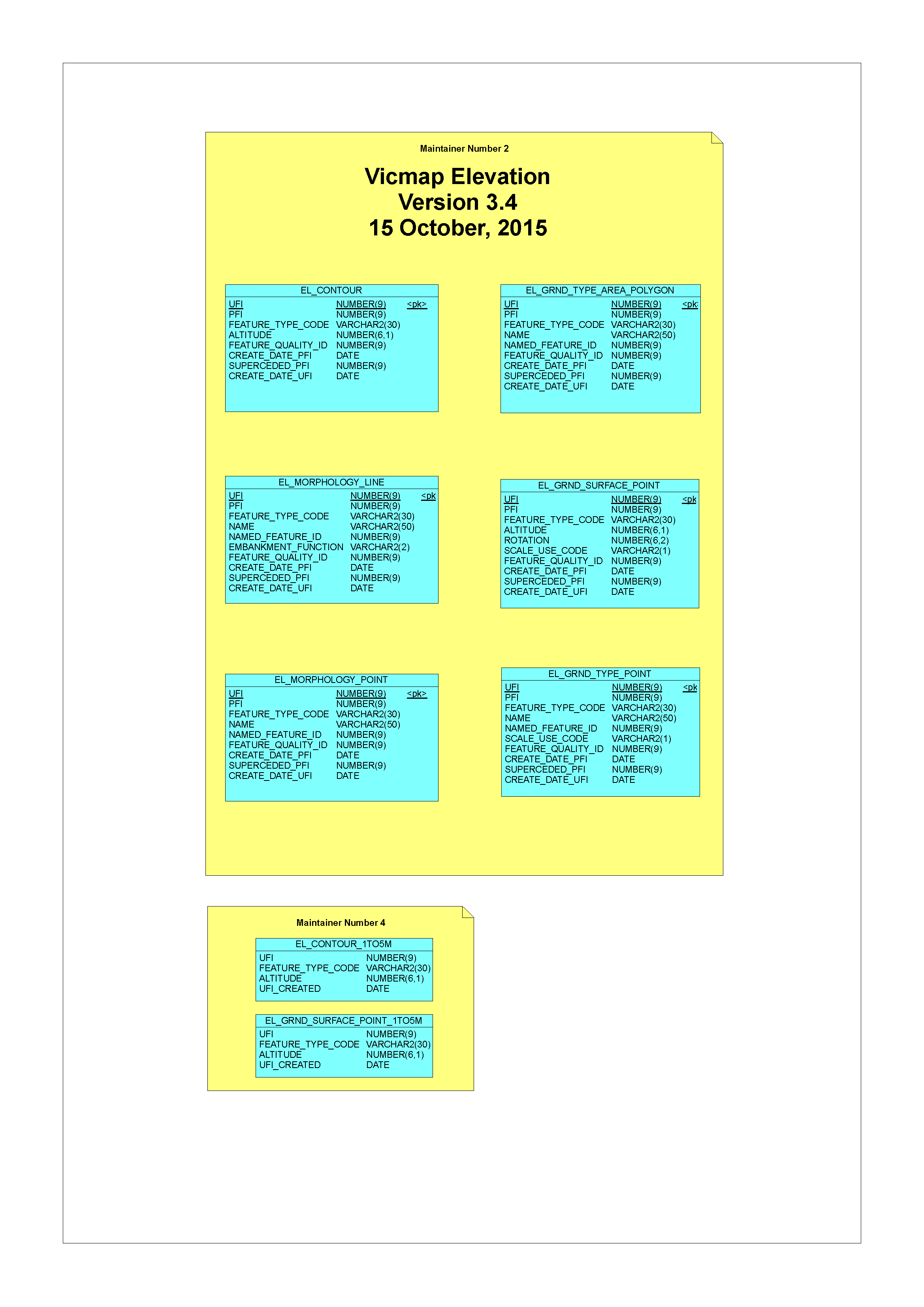
* Timetable for release
* Usage and availability restrictions
* License restrictions and conditions
* Access constraints
* Exclusion of liability
* Supply and media formats
* Projections.

Vicmap is also available through a network of Data Service Providers listed at: <https://www2.delwp.vic.gov.au/maps/spatial-data/spatial-data-retailers>

# Metadata

The metadata, abstract, and preview for the datasets within Vicmap products can be viewed at Spatial DataMart (SDM) located at <http://services.land.vic.gov.au/SpatialDatamart/> by searching for the ANZLIC ID.

# Appendix A: Data & object models

Vicmap data models can be located at [www2.delwp.vic.gov.au/maps/maps-and-spatial-data](https://www2.delwp.vic.gov.au/maps/maps-and-spatial-data)

# Appendix B: Data dictionary

| **Name** | **Definition** | **Data Type** | **Key** | **Mandatory** | **Unique** |
| --- | --- | --- | --- | --- | --- |
| PFI | Vicmap unique identifier for a feature over time (common to all versions of a single feature) | number | yes | yes |  |
| UFI | VICMAP Digital unique identifier for a feature | Number | yes | yes | yes |
| feature\_type\_code | feature code to identify feature type | Character |  | yes |  |
| named\_feature\_id | Feature Name Identifier for the feature | number |  |  |  |
| feature\_quality\_id | Identifier for the feature quality record | number |  | yes |  |
| Create\_date\_pfi | Date the PFI originally created | date |  | yes |  |
| Superceded\_pfi | PFI of feature before merge or split operation | number |  |  |  |
| create\_date\_ufi | Date the ufi was created on | date |  | yes |  |

## Accuracy attributes

Attributes below defines the accuracy and other quality information pertaining to this spatial feature

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Definition** | **Data Type** | **Code List** | **Key** | **Mandatory** |
| id | Identifier for the feature quality record | number |  | yes | yes |
| feat\_reli\_date | reliability date for spatial features | date |  |  | yes |
| attr\_reli\_date | reliability date attribute | date |  |  | yes |
| plan\_accuracy | plan accuracy | real |  |  | yes |
| elevation\_accuracy | elevation accuracy | real |  |  | yes |
| data\_sour\_code | source code | number |  |  | yes |
| scale | Vicmap data scale indicating position accuracy | number |  |  | yes |
| create\_date | date the record was created | date |  |  | yes |

## Data Source Code

The lookup table for data Custodian.

|  |  |
| --- | --- |
| **Source** | **Source Description** |
| 1 | MMBW |
| 10 | MELWAYS/UBD |
| 20 | VICROADS |
| 21 | VICROADS - DESIGN |
| 30 | DELWP |
| 31 | DELWP - TOPOGRAPHIC |
| 32 | DELWP - PROPERTY |
| 40 | LOCAL GOVERNMENT AUTHORITIES |
| 50 | EMERGENCY SERVICES/BEST |
| 60 | WATER AUTHORITIES |
| 70 | FIELD DATA CAPTURE |
| 80 | SATELLITE IMAGERY |
| 81 | AERIAL PHOTOGRAPHY |
| 90 | NSW – LAND INFORMATION CENTRE |
| 999 | UNKNOWN |

## Derivation of Planimetric Accuracy

The proposed derivation of planimetric accuracy is based on the SDRN ( State Digital Road Network)specification absolute accuracy definitions (Refer SDRN Technical Specification version 5.0).

Standard deviations proposed to be adopted as detailed below:-

| **scale** | **source** | **theoretical plan\_acc** | **Formula Used** | **adopted plan\_acc** |
| --- | --- | --- | --- | --- |
| 40 | 1, 32 (cadas) | 0 | scale\*0.00063 | 0.5 |
| 480 | 1, 32 | 0.3 |  | 0.5 |
| 500 | 1, 32 | 0.3 |  | 0.5 |
| 1000 | 1, 32 | 0.6 |  | 1 |
| 2500 | 1, 32 | 1.6 |  | 2 |
| 5000 | 1, 32 | 3.2 |  | 4 |
| 7500 | 1, 32 | 4.7 |  | 5 |
| 10000 | 1, 32 | 6.3 |  | 10 |
| 20000 | 1, 32 | 12.6 |  | 15 |
| 25000 | 1, 32 | 15.8 |  | 20 |
| 50000 | 1, 32 | 31.5 |  | 35 |
| 40 | 31 (topo) | 0 | scale \* 0.00033 | 0.5 |
| 480 | 31 | 0.2 |  | 0.5 |
| 500 | 31 | 0.2 |  | 0.5 |
| 1000 | 31 | 0.3 |  | 0.5 |
| 2500 | 31 | 0.8 |  | 2 |
| 5000 | 31 | 1.7 |  | 3 |
| 7500 | 31 | 2.5 |  | 4 |
| 10000 | 31 | 3.3 |  | 6 |
| 20000 | 31 | 6.6 |  | 11 |
| 25000 | 31 | 8.3 |  | 14 |
| 50000 | 31 | 16.5 |  | 28 |
|  | All other sources | scale \* 0.00033 |  | Round up to appropriate whole metre |
| 9999999 |  | 9999 |  | 9999 |
|  |  |  |  |  |

Class: data\_source

**Definition:** The source of the data in this dataset

**Features**: Aspatial

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Definition** | **Data Type** | **Code List** | **Key** | **Mandatory** |
| code | Source code | number |  | yes | yes |
| name | Data source name | character |  |  | yes |
| description | Source description | character |  |  | no |

## Data Source Class Attributes

Class: Layer

**Definition**: The layer to which the features belong

**Features**: Aspatial

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Definition** | **Data Type** | **Code List** | **Key** | **Mandatory** |
| Code | Layer code | number |  | yes | yes |
| Name | Layer name | character |  |  | yes |
| Description | Layer description | character |  |  | no |
| theme\_code | Theme code | character |  |  | yes |

Data Layer Class Attributes

Class: Theme

**Definition**: The Theme to which the features belong

**Features**: Aspatial

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Definition** | **Data Type** | **Code List** | **Key** | **Mandatory** |
| Code | Theme code | number |  | yes | yes |
| Name | Theme name | character |  |  | yes |
| Description | Theme description | character |  |  | no |

Data Theme Class Attributes

Class: named\_feature

**Definition**: The list of all names of features used within Victoria, with linkages to the official Place Names Register maintained by Land Victoria.

**Features**: Aspatial

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Definition** | **Data Type** | **Code List** | **Key** | **Mandatory** |
| Id | Unique name id within Vicmap Digital (Roads & Topographic) | number |  | yes | yes |
| Name | Name | character |  |  | yes |
| Place\_name\_pid | Foreign key to Victorian Place Names Register | number |  |  | yes |
| create\_date | Date the record was created on | date |  |  | yes |

Named Feature Class Attributes

Class: alternate\_name

**Definition**: The list of alternative names applicable to features. Names may or may not occur in the Place Names Register.

**Features:** Aspatial

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Definition** | **Data Type** | **Code List** | **Key** | **Mandatory** |
| id | Unique name id for features with a unique combination of primary and alternate names | number |  | yes | yes |
| name | Name | character |  |  | yes |
| create\_date | Date the record was created on | date |  |  | yes |

Alternate Name Class Attributes

# Appendix C: Data tables

CONTOURS (LINE)

Summary information

|  |  |
| --- | --- |
| Description | An artificial line joining points of equal altitude on the earth's surface. |
| Entity | Contour |
| Included terms |  |
| Entity Type | Spatial |
| ICSM Conformance | New entity |

TABLE: EL\_CONTOUR

TABLE DESCRIPTION:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **COLUMN NAME** | **DATA TYPE** | **FIELD SIZE** | **NULL** | **COLUMN DESCRIPTION** |
| PFI | NUMBER | (20,0 ) | Y | Persistent Feature Identifier |
| UFI | NUMBER | (20,0 ) | Y | Unique Feature Identifier |
| FEATURE\_TYPE\_CODE | VARCHAR2 | 30 | Y | Feature Code |
| ALTITUDE | NUMBER | (6,1 ) | Y | Height above sea level [Australian Height Datum] |
| FEATURE\_QUALITY\_ID | NUMBER | (9,0 ) | Y | Identifier for the feature quality record |
| CREATE\_DATE\_PFI | DATE | 7 | Y | Date of original Creation of Feature |
| SUPERCEDED\_PFI | NUMBER | (20,0 ) | Y | PFI of feature prior to merge or split operation |
| CREATE\_DATE\_UFI | DATE | 7 | Y | Date of Creation of Feature |

FEATURE CODES RANGES:

| **Feature\_Type\_Code** | **Description** |
| --- | --- |
|  |  |
| contour | Contour |
| contour | Contour (Intermediate) |
| contour\_dep | Contour (Dep.Intermediate) |
| contour\_dep\_index | Contour (Dep.Index) |
| contour\_index | Index Contour |

LOOK UP TABLE CODELISTS APPLICABLE: NONE

GROUND SURFACE POINT (POINT)

Summary information

|  |  |
| --- | --- |
| Description | Ground Surface Point |
| Entity | Spot height |
| Included terms | Spot heights, photogrammetric control points |
| Entity Type | Spatial |
| ICSM Conformance | Unknown |

TABLE: EL\_GROUND\_SURFACE\_POINT

TABLE DESCRIPTION:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **COLUMN NAME** | **DATA TYPE** | **FIELD SIZE** | **NULL** | **COLUMN DESCRIPTION** |
| PFI | NUMBER | (20,0 ) | Y | Persistent Feature Identifier |
| UFI | NUMBER | (20,0 ) | Y | Unique Feature Identifier |
| FEATURE\_TYPE\_CODE | VARCHAR2 | 30 | Y | Feature Code |
| ALTITUDE | NUMBER | (6,1 ) | Y | Height above sea level [Australian Height Datum] |
| ROTATION | NUMBER | (7,2 ) | Y | Rotation angle [in degrees] of symbol for cartographic placement |
| FEATURE\_QUALITY\_ID | NUMBER | (9,0 ) | Y | Identifier for the feature quality record |
| CREATE\_DATE\_PFI | DATE | 7 | Y | Date of original Creation of Feature |
| SUPERCEDED\_PFI | NUMBER | (20,0 ) | Y | PFI of feature prior to merge or split operation |
| CREATE\_DATE\_UFI | DATE | 7 | Y | Date of Creation of Feature |
| SCALE\_USE\_CODE | VARCHAR2 | 1 | Y | Code to indicate the type of scale use |

FEATURE CODES RANGES:

| **Feature\_Type\_Code** | **Description** |
| --- | --- |
| photogrammetric\_control\_point | Tie points and Pass points |
| spot\_height | Spot Heights |
|  |  |

LOOK UP TABLE CODELISTS APPLICABLE: NONE

GROUND TYPE (POLYGON)

Summary information

|  |  |
| --- | --- |
| Description | Formed Ground Surface Area |
| Entity | Rock outcrop, Sand, Surface Area Void |
| Included terms | Rocky outcrop, sand area |
| Entity Type | Spatial |
| ICSM Conformance | Unknown |

TABLE: EL\_GRND\_TYPE\_AREA\_POLYGON

TABLE DESCRIPTION:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **COLUMN NAME** | **DATA TYPE** | **FIELD SIZE** | **NULL** | **COLUMN DESCRIPTION** |
| PFI | NUMBER | (20,0 ) | Y | Persistent Feature Identifier |
| UFI | NUMBER | (20,0 ) | Y | Unique Feature Identifier |
| FEATURE\_TYPE\_CODE | VARCHAR2 | 30 | Y | Feature Code |
| NAME | VARCHAR2 | 50 | Y | name of a feature |
| NAMED\_FEATURE\_ID | NUMBER | (9,0 ) | Y | Unique identifier for feature name |
| FEATURE\_QUALITY\_ID | NUMBER | (9,0 ) | Y | Identifier for the feature quality record |
| CREATE\_DATE\_PFI | DATE | 7 | Y | Date of original Creation of Feature |
| SUPERCEDED\_PFI | NUMBER | (20,0 ) | Y | PFI of feature prior to merge or split operation |
| CREATE\_DATE\_UFI | DATE | 7 | Y | Date of Creation of Feature |

FEATURE CODES RANGES:

| **Feature\_Type\_Code** | **Description** |
| --- | --- |
| rock\_outcrop | Rocky Outcrop |
| sand | Sand Area |
| surface\_area\_void | Surface Area Void |
|  |  |

LOOK UP TABLE CODELISTS APPLICABLE: NONE

GROUND TYPE (POINT)

Summary information

|  |  |
| --- | --- |
| Description | Unformed Ground Surface Point |
| Entity | Mountain |
| Included terms | Mountain |
| Entity Type | Spatial |
| ICSM Conformance | Unknown |

|  |  |
| --- | --- |
| Description | Unformed Ground Surface Point |
| Entity | Point |
| Included terms |  |
| Entity Type | Spatial |
| ICSM Conformance | Unknown |

|  |  |
| --- | --- |
| Description | Unformed Ground Surface Point |
| Entity | Rock outcrop |
| Included terms | Rocky outcrop |
| Entity Type | Spatial |
| ICSM Conformance | Unknown |

TABLE: EL\_GRND\_TYPE\_POINT

TABLE DESCRIPTION:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **COLUMN NAME** | **DATA TYPE** | **FIELD SIZE** | **NULL** | **COLUMN DESCRIPTION** |
| PFI | NUMBER | (20,0 ) | Y | Persistent Feature Identifier |
| UFI | NUMBER | (20,0 ) | Y | Unique Feature Identifier |
| FEATURE\_TYPE\_CODE | VARCHAR2 | 30 | Y | Feature Code |
| NAME | VARCHAR2 | 50 | Y | name of a feature |
| NAMED\_FEATURE\_ID | NUMBER | (9,0 ) | Y | Unique identifier for feature name |
| FEATURE\_QUALITY\_ID | NUMBER | (9,0 ) | Y | Identifier for the feature quality record |
| CREATE\_DATE\_PFI | DATE | 7 | Y | Date of original Creation of Feature |
| SUPERCEDED\_PFI | NUMBER | (20,0 ) | Y | PFI of feature prior to merge or split operation |
| CREATE\_DATE\_UFI | DATE | 7 | Y | Date of Creation of Feature |
| SCALE\_USE\_CODE | VARCHAR2 | 1 | Y | Code to indicate the type of scale use |

FEATURE CODES RANGES:

| **Feature\_Type\_Code** | **Description** |
| --- | --- |
| Mountain |  |
| Point |  |
| rock\_outcrop | Point rock visible above ground |
|  |  |

LOOK UP TABLE CODELISTS APPLICABLE:

SCALE USE CODE

|  |  |  |
| --- | --- | --- |
| **SCALE\_USE\_CODE** | **MAXIMUM\_SCALE** | **MINIMUM\_SCALE** |
| 1 | 5,000,000 | 3,000,000 |
| 2 | 3,000,000 | 2,000,000 |
| 3 | 2,000,000 | 1,000,000 |
| 4 | 1,000,000 | 500,000 |
| 5 | 500,000 | 250,000 |
| 6 | 250,000 | 100,000 |
| 7 | 100,000 | 50,000 |
| 8 | 50,000 | 25,000 |
| 9 | 25,000 | 10,000 |

MORPHOLOGY LINE (LINE)

Summary information

|  |  |
| --- | --- |
| Description | A high, steep or overhanging face of rock. |
| Entity | Cliff |
| Included terms | Bluff, Escarpment, Precipice, Scarp |
| Entity Type | Spatial |
| ICSM Conformance | Conforms |

|  |  |
| --- | --- |
| Description | An open excavation to provide passage for a road, railway, canal, drain, etc. |
| Entity | Cutting |
| Included terms | Cut |
| Entity Type | Spatial |
| ICSM Conformance | Conforms |

|  |  |
| --- | --- |
| Description | An artificial bank of earth and/or stone built above the natural surface. |
| Entity | Embankment |
| Included terms | Causeway (N),Dyke, Levee |
| Entity Type | Spatial |
| ICSM Conformance | Conforms |

|  |  |
| --- | --- |
| Description | Mounds of loose sand usually crescent shaped transverse to the prevailing winds. |
| Entity | Sand dune |
| Included terms | Sand, sand dunes |
| Entity Type | Spatial |
| ICSM Conformance | Conforms |

TABLE: EL\_MORPHOLOGY\_LINE

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **COLUMN NAME** | **DATA TYPE** | **FIELD SIZE** | **NULL** | **COLUMN DESCRIPTION** |
| PFI | NUMBER | (20,0 ) | Y | Persistent Feature Identifier |
| UFI | NUMBER | (20,0 ) | Y | Unique Feature Identifier |
| FEATURE\_TYPE\_CODE | VARCHAR2 | 30 | Y | Feature Code |
| NAME | VARCHAR2 | 50 | Y | name of a feature |
| NAMED\_FEATURE\_ID | NUMBER | (9,0 ) | Y | Unique identifier for feature name |
| EMBANKMENT\_FUNCTION | VARCHAR2 | 1 | Y | Function of use of embankment |
| FEATURE\_QUALITY\_ID | NUMBER | (9,0 ) | Y | Identifier for the feature quality record |
| CREATE\_DATE\_PFI | DATE | 7 | Y | Date of original Creation of Feature |
| SUPERCEDED\_PFI | NUMBER | (20,0 ) | Y | PFI of feature prior to merge or split operation |
| CREATE\_DATE\_UFI | DATE | 7 | Y | Date of Creation of Feature |

FEATURE CODES RANGES:

| **Feature\_Type\_Code** | **Description** |
| --- | --- |
| cliff | Cliff |
| cutting\_both | Cutting (Both Sides) |
| cutting\_one | Cutting (One Side) |
| embankment\_both | Embankment (Both Sides) |
| embankment\_one | Embankment (One Side) |
| levee | Levee Bank |
| sand\_dune | Sand Dunes |

LOOK UP TABLE CODELISTS APPLICABLE:

Embankment function

|  |  |
| --- | --- |
| **Code** | **Description** |
| 1 | Flood Control Embankment |
| 2 | Road or Rail Embankment |

MORPHOLOGY POINT (POINT)

Summary information

|  |  |
| --- | --- |
| Description | A hole or funnel shaped cavity made in the earth by the action of water on the soil, rock or underlying strata. |
| Entity | Sinkhole |
| Included terms | doline |
| Entity Type | Spatial |
| ICSM Conformance | Conforms |

|  |  |
| --- | --- |
| Description | A naturally formed, subterranean open area, chamber or rock shelter. (N) |
| Entity | Cave |
| Included terms | Cavern, Grotto, Overhang (N) |
| Entity Type | Spatial |
| ICSM Conformance | Conforms |

TABLE: EL\_MORPHOLOGY\_POINT

TABLE DESCRIPTION:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| COLUMN NAME | DATA TYPE | FIELD SIZE | NULL | COLUMN DESCRIPTION |
| PFI | NUMBER | (20,0 ) | Y | Persistent Feature Identifier |
| UFI | NUMBER | (20,0 ) | Y | Unique Feature Identifier |
| FEATURE\_TYPE\_CODE | VARCHAR2 | 30 | Y | Feature Code |
| NAME | VARCHAR2 | 50 | Y | name of a feature |
| NAMED\_FEATURE\_ID | NUMBER | (9,0 ) | Y | Unique identifier for feature name |
| FEATURE\_QUALITY\_ID | NUMBER | (9,0 ) | Y | Identifier for the feature quality record |
| CREATE\_DATE\_PFI | DATE | 7 | Y | Date of original Creation of Feature |
| SUPERCEDED\_PFI | NUMBER | (20,0 ) | Y | PFI of feature prior to merge or split operation |
| CREATE\_DATE\_UFI | DATE | 7 | Y | Date of Creation of Feature |

FEATURE CODES RANGES:

| Feature\_Type\_Code | Description |
| --- | --- |
| sinkhole | Sinkhole |
| cave | Cave |

LOOK UP TABLE CODELISTS APPLICABLE: NONE

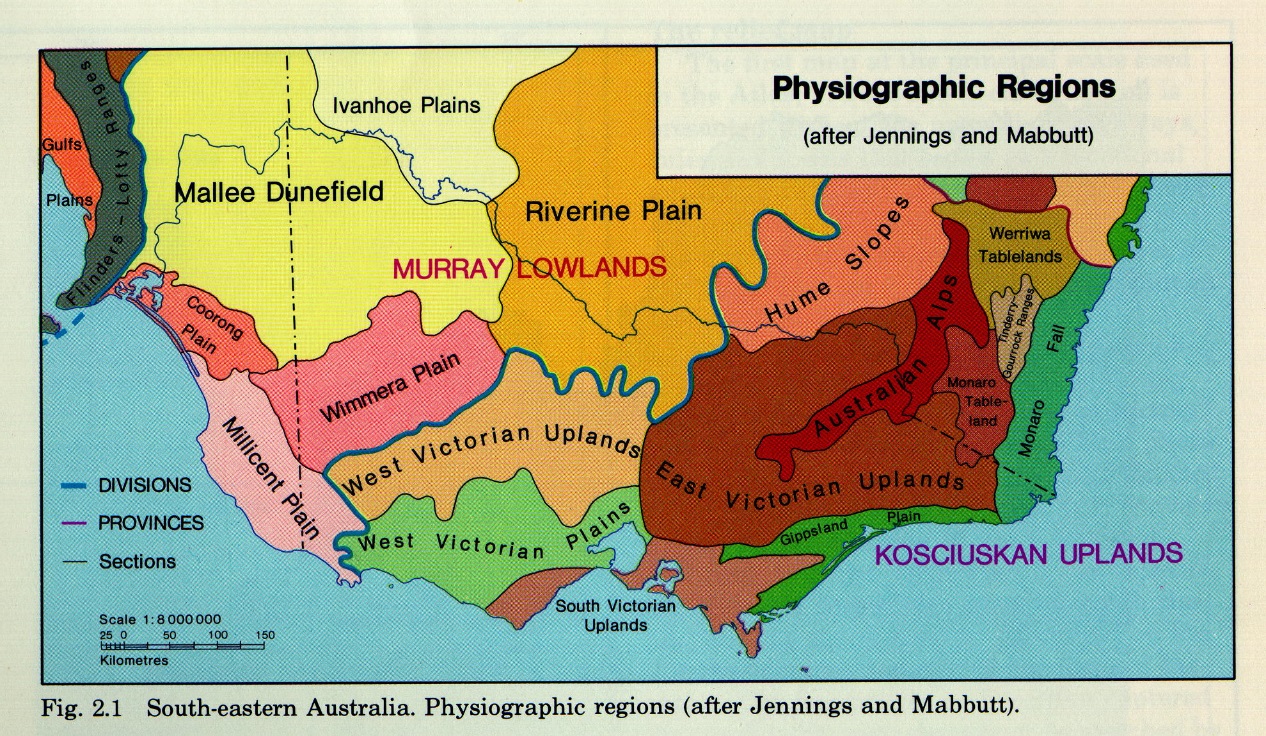
# Appendix E general information

## Terrain types in Victoria

The great range of landscape types in Victoria, as summarised in the table & figure given below, ensures not only a variety of environments for plants and animals, but also a pattern of potential opportunities and constraints for a variety of human activities.

|  |  |
| --- | --- |
| **Name** | **Description** |
| Australian Alpine Region | Dissected high uplands, glaciated locally with widespread preglacial features. |
| Eastern Victorian Uplands | Dissected high plateaux on various resistant rocks. |
| West Victorian Uplands | Moderately high plateaux and strike ridges. |
| South Victorian Uplands | Low fault blocks, mainly of tilted and dissected sandstone, granite hills and islands. |
| Monaro Tableland | Undulating upland plains with tabular basalt relief and granite tors. |
| Monaro Fall | Deeply dissected, steeply sloping plateau margin in metamorphic rocks and granite. |
| Hume Slopes | Tableland stepping down westwards and breaking into detached hills. |
| Gippsland Plain | Terraced plains with sands and gravels. |
| West Victorian Plains | Plains mainly on basalt lavas with many volcanic forms and lakes, partly on weak sedimentary rocks. |
| Riverine Plain | Alluvial plain. |
| Wimmera Plain | Aeolian and alluvial sandplain; minor low sandstone ridges. |
| Mallee Dunefield | Fixed W-E calcareous longitudinal dunes. |
| Millicent Plain | Parallel dune limestone ridges with intervening swamps, closed karst depressions and young volcanoes in the southeast. |
| Ivanhoe Plains | Plains with low W-E stabilised longitudinal dunes and sand-plain, small pans with lunettes, minor sandstone ridges, floodplains. |

Physiographic regions (Jennings and Mabbutt, 1977)



South-eastern Australia, Physiographic regions (after Jennings and Mabbutt, 1977).

# Appendix F reference tables

Reference tables used in the production and maintenance the product.

VMREFTAB.EL\_EMBANKMENT\_FUNCTION

VMREFTAB.SCALE\_USE

Table 14 – add\_access\_type

|  |  |
| --- | --- |
| Code | Description |
| L | An address that is accessed from a road |
| W | An address that is accessed from a water way |
| I | An address that is located on an island that cannot be accessed from the mainland by road. |

delwp.vic.gov.au