DGIWG 262

Multinational Geospatial Co-production Program Urban Vector Data (MUVD) Metadata Specification

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Abstract:	Metadata specification for MGCP Urban Vector Data Product. It is defined as a profile of DGIWG Metadata Foundation 2.0.
Copyright:	

CONTENTS

List of Figures

List of Tables

i. Executive Summary

This document defines a metadata profile of the DGIWG Metadata Foundation (DMF) to be used for the Multinational Geospatial Co-production Program (MGCP) Urban Vector Data (MUVD) Urban and Subregion datasets.

This work has been achieved in cooperation between the DGIWG Metadata panel and the MGCP Urban Group.

ii. Contributing participants

Nation	Parent organization
France (Lead Nation)	Institut National de l'information géographique et forestière(IGN)
Czech Republic	Military Geographic and Hydrometeorologic Office (MGHM)
United Kingdom	UK StratCom JGI
Denmark	Danish Geospatial Agency (SDFE)

iii. Document points of contact

This work has been achieved in strong cooperation with MGCP Urban Group.

All questions regarding this document shall be directed to the secretariat@dgiwg.org.

NOTE: All personal information will be removed when an internal document is made public. This includes names and personal e-mail accounts.

iv. Revision history

Date	Version	Comments	Authors
2020-01-15	0.1	First draft	DGIWG (ML)
2020-09-21	0.8	Pre-final draft	DGIWG (ML) based on feedback from MUVD
2020-11-02	1.0alpha	Final draft sent to MUVD for feedback	DGIWG P3
2021-03-15	1.0draft	Final draft sent for ballot	DGIWG P3 + MUVD contributors
2021-07-19	1.0.0 FD1	Final editorial review	TCDGIWG, SDGIWG
2021-11-29	1.0.0 FD2	Comment resolution after ballot	DGIWG P3 + MUVD contributors

v. Future work

This work defines some metadata elements that are extensions of the DMF 2.0. Those elements will be integrated into the DMF at the next revision.

1 Introduction

Interoperability of metadata is a key factor of the success of data exchange between nations. To enhance this capability, metadata associated with MGCP Urban Vector Data (MUVD) will be based on the DGIWG Metadata Foundation (DMF), DGIWG 114, v. 2.0. This will allow better interoperability of the co-production program with the DGIWG nations, an efficient exchange of MUVD datasets between the MGCP member Nations and enhance interoperability within NATO and the FMN capability developments.

This document defines the MUVD profile of DMF including elements from the following DMF classes: DMF Core, DMF/Common, DMF/Data, DMF/Data+ and DMF/Specific. There are some additional extensions and constraints to fulfil MUVD program needs. Some elements had to be added to DMF and they will be considered for future DMF versions. Those elements are defined in Annex A.

Within the MUVD production process, factors like data source, extraction process, available features or resolution may result in data being extracted using a different set of parameters within different geographic regions of a dataset, the metadata for each area within a dataset sharing common parameters (known as the Urban dataset) will be organized into Subregions. Similar to the MGCP 'Cell', each MUVD Urban dataset will contain one or more subregions, depending upon how the dataset is extracted. The metadata for a subregion describes the data produced using a common set of extraction criteria, originating from a common source, etc. In accordance with the MUVD production specifications, each Subregion within an Urban dataset will not extend beyond the extent of the containing Urban dataset.

This document defines a metadata structure and content for both the Urban dataset and the Subregion level. The feature level metadata is not addressed in this document; those metadata elements are part of the feature model.

2 Scope

This standard will define the specifications of a metadata profile for MGCP Urban Vector data (MUVD) based on the DGIWG Metadata Foundation (DMF), version 2.0 (DGIWG-114 v. 2).

The MUVD metadata specification requirements defined in this document include:

- a minimum set of metadata at the Urban dataset level.
- a minimum set of metadata at the Subregional level within an Urban dataset.

3 Conformance

The MUVD metadata profile is based on DGIWG 114 v. 2.0 (DMF 2.0) and respects the rules for profiling DMF. Based on DMF 2.0, the MUVD metadata profile is designed for both the first generation of ISO metadata standards [SO 19115:2003 and associates] and for the second generation [ISO 19115-1:2014 and associates]. Only the second generation of ISO standards should be used for MUVD co-production.

The unique resource identifier (URI) of this profile is:

http://www.dgiwg.org/std/dmf/profile/muvd/1.0

4 Normative References

The following documents contain provisions that, through reference in this text, constitute provisions of this specification.

4.1 International Standards:

(1) DGIWG 114 v. 2.0, DGIWG Metadata Foundation (DMF 2.0)

(2) IETF RFC 2396, Uniform Resource Identifiers (URI): Generic Syntax

(3) IETF RFC 3629, UTF-8, a transformation format of ISO/CEI 10646:2020

(4) ISO 10646-1:2000, Information technology - Universal Multiple-Octet Coded Character Set (UCS) - Part 1: Architecture and Basic Multilingual Plane

(5) ISO/TS 19104:2008, Geographic information - Terminology

(6) ISO 19110:2005, Geographic information - Methodology for feature cataloguing

(7) ISO 19115:2003, Geographic information – Metadata

(8) ISO 19115-1:2014, Geographic information - Metadata - Part 1: Fundamentals[1]

(9) ISO 19115-3:2016, Geographic information - Metadata - XML schema implementation of metadata fundamentals

(10) ISO/TS 19139:2007, Geographic information - Metadata - XML schema implementation (Technical Specification)

[1] Revision of ISO 19115:2003

(11) ISO 3166-1:2006/Cor 1:2007, Codes for the representation of names of countries and their subdivisions - Part 1: Country codes

(12) ISO 639-2:1998, Codes for the representation of names of languages -- Part 2: Alpha-3 code

(13) ISO 8601:2000, Data elements and interchange formats - Information interchange - Representation of dates and times

(14) ISO/IEC 9834-8:2014, Information technology - Open Systems Interconnection - Procedures for the operation of OSI Registration Authorities: Generation and registration of Universally Unique Identifiers (UUIDs) and their use as ASN.1 Object Identifier components

(15) MGCP MOU, Multinational Geospatial Co-production Program Memorandum of Understanding

4.2 National Standards:

(1) NGA.STND.0036, National Geospatial-Intelligence Agency - Standardization document - 0036, World Geodetic System 1984, 7 July 2014

5 Terminology

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

5.1 Terms and Definitions

catalogue

Collection of items or an electronic or paper document that contains information about the collection of items. [ISO 10303-227:2005, definition 3.3.10]

urban dataset

Unit of exchange of MUVD
NOTE: A dataset will always contain at least one subregion.

data type

Specification of a value domain with operations allowed on values in this domain. [ISO 19103:2015]

EXAMPLE: Integer, Real, Boolean, String, Date, and GM_Point.
Note 1 to entry: Data types include primitive predefined types and user definable types.

dataset

Identifiable collection of data. [ISO 19115-1:2014]

dataset series

Collection of datasets sharing common characteristics. [ISO 19115-1:2014]

metadata

Information about a resource. [ISO 19115-1:2014]

metadata element

Discrete unit of metadata. [ISO 19115:2003]

NOTE 1 to entry: Metadata elements are unique within a metadata class.
NOTE 2 to entry: Equivalent to an attribute and/or an association in UML terminology.
NOTE 3 to entry: Class attributes and relationships are referred to collectively as metadata elements.

profile

Set of one or more base standards or subsets of base standards, and, where applicable, the identification of chosen clauses, classes, options and parameters of those base standards, that are necessary for accomplishing a particular function. [ISO 19106:2004]

resource

Identifiable asset or means that fulfils a requirement. [ISO 19115-1:2014]

EXAMPLE Dataset, dataset series, service, document, initiative, software, person or organization.

service

Distinct part of the functionality that is provided by an entity through interfaces. [adapted from ISO/IEC TR 14252:1996]

subregion

Collection of geospatial data for a specific area within a dataset where the geospatial data conforms to a common, specific acquisition requirement.

tile

Spatial subset of geographic data. [ISO 19115:2003]

user view

Collection of elements organized from the perspective of a producer or consumer of the data.

5.2 Abbreviated terms

AAFIF	Automated Airfield Facilities Information File
ASN.1	Abstract Syntax Notation One
CRS	Coordinate Reference System
DGIF	Defence Geospatial Information Framework
DGIWG	Defence Geospatial Information Working Group
DMF	DGIWG Metadata Foundation

DVOF	Digital Vertical Obstruction File
EPSG	European Petroleum Survey Group
ESRI	Environmental Systems Research Institute, Inc.
FC	Feature Catalogue
GAIT	Geospatial Analysis Integrity Tool
GML	Geography Markup Language
HRVD	High Resolution Vector Data
IEC	International Electronic Commission
IETF	Internet Engineering Task Force
IGW	International Geospatial Warehouse
ISO	International Organisation for Standardisation
MGCP	Multinational Geospatial Co-production Program
MUVD	MGCP Urban Vector Data
MOU	Memorandum of Understanding
NGA	National Geospatial-Intelligence Agency
OSI	Open Systems Interconnection
RFC	Requests for Comments
TR	Technical Report
TRD	Technical Reference Documentation
UML	Unified Modelling Language
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
UTC	Coordinated Universal Time
UTRD	Urban Technical Reference Documentation
UUID	Universally Unique Identifier
WGS	World Geodetic System
XML	Extensible Markup Language

6 MUVD Urban dataset and Subregion metadata

6.1 MUVD metadata content description

This clause describes the MUVD Urban dataset and Subregion metadata requirements for metadata users, i.e. the producers and the consumers of the data. Those requirements are expressed through user views. A user view is a simple collection of metadata elements expressed from the perspective of a user.

Each element of a user view has:

- The **DMF** metadata element name;
- A **Description** statement including an underlined title;
- A **Mapping** to the corresponding former MGCP metadata element where relevant;
- A **Type/Value** statement defining the element data type (from DMF data types and specific types defined in 2.3), and possibly restricting the domain of values. If complex types or codelists are unchanged compared to what is in DMF, please refer to [DMF 2.0]. Fixed values are expressed in bold.
- A **Cardinality** statement composed of a number of occurrences (typically 1 indicates that one and only one occurrence is expected so that the element is mandatory) or a range expressing a minimum and maximum number of occurrences. The format of a range of occurrences is ***n..m*** (or ***n*** where n=m) where:
  - n is a positive integer representing the minimum number of occurrences or 0 indicating that the element is optional;
  - m is a positive integer representing the maximum number of occurrence or * indicating that the maximum is unbounded.

  If the cardinality is different from the cardinality of DMF, the string is bolded.

Each row of the tables (except the first one) corresponds to a metadata element. Elements automatically populated will be entered on the grey rows.

The Urban dataset and Subregion metadata elements are defined respectively in Sections 6.4 and 6.5.

6.2 Standard implementation of the MUVD

DMF 2.0 is the basis for the Urban dataset and Subregion metadata implementation and it provides both, [ISO 19115:2003] (old generation) and [ISO 19115-1:2014] (new generation) encodings. MUVD metadata will only use the new generation of standards. All metadata supplied by the MUVD producer (both the mandatory and any additional elements beyond those identified in this clause) will remain a part of the MUVD dataset and will be available to data consumers in the MUVD Metadata XML instance file.

6.3 MUVD specific data types

Most simple types used in this specification are defined in DMF 2.0. Some specific types are listed below.

6.3.1 Urban dataset Identifier

Identifier for an MUVD Urban dataset (referred to as UDSID in this document). The format of an Urban dataset Identifier is:

MUVD_<Name>_<Alpha3>_<E/W><Longitude><N/S><Latitude>_E<Edition>

Where:

- <Name> is the name of the main city of the urban area when applicable. The name will be derived from the ISO-compliant UN/LOCODE website or the NGA GEOnet Names Server (GNS) as a secondary/alternative name source. However, the producing nation may deviate from these sources when logical.

NOTE: Some urban datasets may not be collected in urban areas; in such cases the name of a prominent feature (or other name) may be used in place of a city name. The producing nation may determine the most logical name to be used.

- <Alpha3> is the three letter code of the main country as defined in [ISO 3166-1:2006/Cor 1:2007].
- <E/W> is **E** or **W** respectively for Urban datasets east or west to Greenwich;
- <Longitude> is a 5-digit number expressing the whole positive longitude of the western edge of the Urban dataset. It is expressed DDDMM (WGS84) where DDD represents the Degrees and MM the Minutes;
- <N/S> is **N** or **S** respectively for Urban datasets in the Northern or Southern hemisphere;
- <Latitude> is a 4-digit number expressing the whole positive latitude of the southern edge of the Urban dataset. It is expressed DDMM (WGS84) where DD represents the Degrees and MM the Minutes.
- <Edition> is the edition number. It should be equal to RSED field.

Example: MUVD_Nairobi_KEN_E03649N0117_E1

6.3.2 Subregion Identifier

<UDSID> followed by underscore and a 2-digit number uniquely identifying the subregion within the Urban dataset:

<UDSID>_<subregionNumber>

(e.g., MUVD_Nairobi_KEN_E03649N0117_E1_01 as the first subregion). The number of subregions within an Urban dataset cannot exceed 99.

6.4 Urban dataset Metadata

The Urban dataset Metadata describes the urban dataset data. An urban dataset is composed of one or more subregions, each of which contains the geospatial data that make up the urban dataset in one or more data file. Each of the subregions has metadata further describing the geospatial data in the subregion. The Urban dataset Metadata can be used for discovery of data and the subregion metadata can be used for determination of suitability of use of the data.

In conformance with [ISO 19115-1:2014], the Metadata Entity Set Information (6.4.1) provides information about the Urban dataset Metadata. The Urban dataset Metadata additionally contains information about the urban dataset identification information (6.4.2), sources used in producing the urban dataset content (6.4.3), lineage (6.4.4), validation (6.4.5) and the coordinate reference system (6.4.6). This information is not specific to the subregion metadata, but is intended to provide a high-level overview of the urban dataset.

The following tables (detailed on Sections 6.4.1through 6.4.6) provide instructions on how to create Urban dataset Metadata elements.

Table 1 - Urban dataset Metadata Entity Set Elements

Table 2 - Urban dataset Identification Elements

Table 3 – Urban dataset Content Section

Table 4 - Urban dataset Lineage Elements

Table 5 - Urban dataset Validation Elements

Table 6 - Urban dataset Coordinate Reference System Elements

6.4.1 Urban dataset Metadata Entity Set Section

The Urban dataset Metadata Entity Set Section describes the metadata elements used to describe the Urban dataset Metadata. It is the *metadata* about the Urban dataset Metadata. The Urban dataset Metadata Entity Set Section elements are listed in Table 1 below.

Table 1 - Urban dataset Metadata Entity Set Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
MDDLOC.language	*Metadata language* Fixed to **eng**. See Annex B-1.1	CMLANG	Language Codelist **eng**	1
MDDLOC.encoding	*Metadata encoding* Fixed to **utf8**. See Annex B-1.2	CMCHAR	Character set Codelist **utf8**	1
Identification.RSTYPN	*Resource type* Fixed to **Urban dataset**	CMSPLN	String **Urban dataset**	1
MDRPTY	*Metadata responsible party* The metadata point of contact is identical to the data point of contact if and only if this instance of the pointOfContact metadata element can be an internal reference (e.g., href="#urban datasetMetadataPoc") to the corresponding instance of the contact metadata element. (see sub-elements below)			1
MDRPTY.party.orgName	*Organization Name of the Party* Limited to the Participant Agency *Note: For a complete update of the urban dataset, the metadata information has to be negotiated between the Producing Participant and the Updating Participant. Refer to Annex G-2.*	CMPOCA	String limited to Participant Agency	1
MDRPTY.party.country	*Party Country* Limited to the Participant Nation *Note: For a complete update of the urban dataset, the metadata information has to be negotiated between the Producing Participant and the Updating Participant. Refer to Annex G-3.*	CMPOCC	String limited to Participant Nation Codelist	**1**

Table 1 - Urban dataset Metadata Entity Set Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
MDRPTY.role	*Role of the Party* Role Codelist Limited to **originator** or **processor**		Role Codelist (Limited to **originator** or **processor**)	1
MDDATE	*Metadata Date Stamp* The date which specifies when the metadata record was created or updated. *Note: For MUVD, this element is not expected to record the date of creation of the metadata file, but rather the date of initiation of the metadata capture.* *Note2: The Urban dataset Metadata date stamp must be equal to or earlier than the Urban dataset edition date and the Validation Date Stamp, as follows:* *MDDATE <= RSDATE('revision') <= measureDate*	CMDATE	Date Format is conformant to [ISO 8601:2000]: YYYY-MM-DD	1
MDSTD	*Metadata standard* (see sub-elements below)			1
MDSTD.title	*Metadata Standard title* Fixed to **urn:dgiwg:metadata:dmf:2.0:profile:muvd'**	CMSTDN	String	1
MDSTD.version	*Metadata Standard version* Fixed to '**1.0'**	CMSTDV	String	1
MDSID	*Metadata Set Identifier* URI of the dataset to which the metadata applies. The value is expected to be: https://igw.mgcp.ws/<UDSID> where <UDSID> is the value of the UDSID element. Refer to Section 6.3.1.	CURI	URI	1
MDSCST	*Metadata security constraint* This element provides a means to express a set of security constraints applicable to the metadata. (see sub-elements below)			**1**

Table 1 - Urban dataset Metadata Entity Set Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
MDSCST.level	*Metadata Classification Level* Fixed to **unclassified**. See Annex B-1.3	CMSEC	Security Classification Level Codelist **unclassified**	1
MDSCST.handling	*Metadata Handling Description* Security handling restrictions of the Urban dataset Metadata. The value is either **Limited Distribution (LIMDIS)** or **Unrestricted** or **Not for Public Release**.	CMSHND	String **Limited Distribution (LIMDIS)** or **Unrestricted** or **Not for Public Release**	**1**

6.4.2 Urban dataset Identification Section

The Urban dataset Identification Section contains the identifier for the urban dataset dataset, the urban dataset producer, geographic extent of the urban dataset, and any copyright or licensing restrictions on the urban dataset dataset. The Urban dataset Identification Elements are listed in Table 2 below.

Table 2 - Urban dataset Identification Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSID.identifier	*Resource identifier* Identifies the urban dataset this metadata describes. See Urban dataset Identifier (UDSID) defined at Section 6.3.1.	CELLID	CharacterString (UDSID)	1
RSDATE.date with RSDATE.type = 'creation'	*Resource date (creation)* Creation date of the urban dataset, e.g. the latest extraction date from source for the original production or update. NOTE: If creation of a dataset spans multiple days, months or years, use the latest date of extraction. The Urban dataset creation date must be equal to or earlier than the Urban dataset edition date and the Validation Date Stamp *RSDATE('creation') <= RSDATE('revision') <= measureDate*	CCDATE	Date Format is conformant to [ISO 8601:2000]: YYYY-MM-DD	1

Table 2 - Urban dataset Identification Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSDATE.date with RSDATE.type = 'revision'	*Resource date (revision)* Date of the edition of update. NOTE: Urban dataset edition date should be equal to or later than the Urban dataset creation date and the Urban dataset Metadata date stamp and equal to or earlier than the Validation Date Stamp *RSDATE('creation') <= RSDATE('revision') <= measureDate*	CEDDAT	Date Format is conformant to [ISO 8601:2000]: YYYY-MM-DD	0..1
RSED	Resource edition number Edition number of the urban dataset. The first version of a completed urban dataset shall always be "**1**".		Integer	1
RSSERI	*Name of Resource Series* Name of the series to which the dataset belongs. Fixed to **MUVD**	CSERES	String **MUVD**	1
RSABSTR	*Resource abstract* Brief narrative summary of the content of the urban dataset dataset, typically: **Urban dataset covering <Name> (<Alpha3>) between <W> and <E> longitudes and <S> and <N> latitudes.** where: – <Name> is name of the urban area – <Alpha3> is the 3 letters code of the country as defined in [ISO 3166-1:2006/Cor 1:2007]; – <S> is the southern whole latitude of the urban dataset; – <N> is the northern whole latitude of the urban dataset. – <W> is the western whole latitude of the urban dataset; – <E> is the eastern whole latitude of the urban dataset. the latitude and longitude values should be expressed to two decimals	CDESCR	String	1

Table 2 - Urban dataset Identification Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSTYPE	*Resource type* Fixed to **dataset**		Resource Type Code	1
RSRPTY	*Resource responsible party* (see sub-elements below)			1..*
RSRPTY.party.orgName	*Organization Name of the Party* Limited to Participant Agency Name of the agency with production responsibility for the urban dataset. The MUVD Participant Agencies are listed in a register and in Annex G-2. For a complete update of the cell, the metadata information has to be negotiated between the Producing Participant and the Updating Participant.	CORIGA	String limited to Participant Agency	1
RSRPTY.party.country	*Party Country* Limited to Participant Nation Name of the country with production responsibility for the urban dataset. The MUVD Participant Nations are listed in Annex G-3. For a complete update of the cell, the metadata information has to be negotiated between the Producing Participant and the Updating Participant.	CORIGC	String limited to Participant Nation	**1**
RSRPTY.role	*Role of the Party* The Producing Participant is the **originator**; the Updating Participant is the **processor**		Role Codelist (Limited to **originator** or **processor**)	1
RSDFMT	*Resource distribution format* (see sub-elements below)			1
RSDFMT.citation.title	*Format title* Fixed to **Shapefile**	CFFMTN	String **Shapefile**	1
RSDFMT.citation.version	*Format version* Fixed to **July 1998**	CFFMTV	String **July 1998**	1

Table 2 - Urban dataset Identification Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSDFMT.citation.specification Note: This element is not included in DMF 2.0, it is part of the MUVD profile	*Format specification* Fixed to **ESRI Shapefile Technical Description - An ESRI White Paper**	CFFMTS	String Fixed to **ESRI Shapefile Technical Description - An ESRI White Paper**	1
RSSCST	*Resource security constraint* (see sub-elements below)			1
RSSCST.level	*Security Classification Level* Fixed to **unclassified**	CSECCL	Security Classification Level Codelist **unclassified**	1
RSSCST.handling	*Handling Description* The value is either **Limited Distribution (LIMDIS)** or **Unrestricted** or **Not for Public Release.** When multiple subregions, use the use the most stringent handling restrictionof the subregions.	CSHNDI	String **Limited Distribution (LIMDIS)** or **Unrestricted** or **Not for Public Release**	1
RSLCST.statement	*Resource legal statement (copyright)* Text of copyright restrictions imposed on urban dataset data Participants do not have to claim copyright. If no copyright is asserted, participant should state the following in the metadata: "**No copyright or restriction of rights of use is asserted by originator of this information**." For a complete update of the urban dataset, the metadata information has to be negotiated between the Producing Participant and the Updating Participant.	CCPYRT	String	1
RSDLOC	*Resource default locale* (see sub-elements below)			1
RSDLOC.language	*Resource language* Fixed to **eng**	CDLANG	Language Codelist **eng**	1

Table 2 - Urban dataset Identification Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSDLOC.encoding	*Resource encoding* Fixed to **utf8**	CDCHAR	Character set Codelist **utf8**	1
RSEXT	*Resource extent* This element describes the extent of the resource. A bounding box and one or several bounding polygon(s) have to be provided. (see below). In the standard case, there is one bounding box and one bounding polygons. This polygon can be equal to the bounding box. In cases where data is more granular, the bounding box describes the overall area and several polygons are used to describe the different sub-areas where the data is (polygons might be in different subregions). (see sub-elements below)			1
RSEXT.boundingBox	*Bounding Box* This metadata element expresses the spatial extent as a bounding box. It includes the North/South and East West corners as WGS84 latitude and longitude to two decimals.	CEXTNT	Bounding Box	1
RSEXT.boundingPolygon	*Bounding polygon* This metadata element expresses the spatial extent as a polygon. The polygons will have 3….n coordinate pairs exactly matching the extent of the dataset without regard to number of decimals.		Polygon	1..*
RSEXT.verticalExtent.minZ	*Vertical extent (Minimum Z value)* This Element shall be present if and only if the Coordinate Reference System is 3D (See 6.4.6). It expresses the minimum value of the urban dataset data coordinates relative to Coordinate Reference System third axis. The value is expressed in meters.	CMINZ	Float	0..1

Table 2 - Urban dataset Identification Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSEXT.verticalExtent.maxZ	*Vertical extent (Maximum Z value)* This Element shall be present if and only if the Coordinate Reference System is 3D (See 6.4.6). It expresses the maximum value of the urban dataset data coordinates relative to Coordinate Reference System third axis. The value is expressed in meters.	CMAXZ	Float	0..1
VGEOM.objectCount where VGEOM.objectType = 'point'	*Count of the geometric point objects* This element shall contain the total count of point primitives in the urban dataset.	CPONTC	Integer	**1**
VGEOM.objectCount where VGEOM.objectType = 'curve'	*Count of the geometric curve objects* This element shall contain the total count of curve primitives in the urban dataset.	CLINEC	Integer	**1**
VGEOM.objectCount where VGEOM.objectType = 'surface'	*Count of the geometric surface objects* This element shall contain the total count of surface primitives in the urban dataset.	CAREAC	Integer	**1**
RSREM	*Resource Remark* Supplemental information regarding the dataset.	CCMNT	String	0..1

6.4.3 Urban dataset Content Section

The Urban dataset Content Section provides a reference to the feature catalogue used in producing the features contained within the Urban dataset. The section also lists the feature types that are present in the Urban dataset. These Urban dataset Content Elements are listed in Table 3 below.

Table 3 – Urban dataset Content Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
FCDESC	*Feature catalogue description* (see subelements below)			**1**
FCDESC.citation.title	*Feature catalogue title* **MUVD Feature Catalogue**	SFCATR	Anchor	1

Table 3 – Urban dataset Content Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
	The value is associated to a reference (URL) to the effective location of the feature catalogue.		**MUVD Feature Catalogue**	
FCDESC.citation.date	*Feature catalogue publication date* Creation date of the feature catalogue used in production of the data for the dataset	SFCDTD	Date Format is conformant to [ISO 8601:2000]: YYYY-MM-DD	1
FCDESC.fcInclusion	*Inclusion of the Feature Catalogue* Indication of whether or not the feature catalogue is included within the files. **False** if and only if the urban dataset feature catalogue is the **MUVD Feature Catalogue**	SFCINC	Boolean	1
FCDESC. featureTypesWithInfo **Note: This element is not included in DMF 2.0 and is part of the MUVD profile**	*Realised Feature Types with their count* Each occurrence of this element contains the name of a feature type (e.g. “Bridge (Curve)”) having at least one instance: – conforming to the feature type definition from the dataset feature catalogue; – fully or partially included within the dataset extent. This occurrence is associated with the number of occurrence of feature instances for this feature type See two sub-elements below			**1..***
FCDESC. featureTypesWithInfo.featureTypeName	*Name of the feature type* the name of a feature type (e.g. “Bridge (Curve)”)	SFTYPE	String	1
FCDESC. featureTypesWithInfo.featureInstanceCount	*Feature Instance Count* number of occurrence of feature instances for this feature type		Integer	**1**

6.4.4 Urban dataset Lineage Section

The Urban dataset Lineage Section provides general information about urban dataset production, including the dates of the oldest and newest primary sources used in producing the urban dataset data geometry. The Urban dataset Lineage Elements are listed in Table 4 below.

Table 4 - Urban dataset Lineage Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSLING	*Urban dataset Lineage* General statement about the lineage of the urban dataset. This element is intended to provide very general information about the overall production processes and sources used to produce the urban dataset.	CLSTAT	String	0..1
RSSRC.date where RSSRC.title= '**Oldest source'**	*Date of oldest source* Date of the creation of the oldest primary source data used for the urban dataset data.	COLDSD	Date Format is conformant to [ISO 8601:2000]: YYYY-MM-DD	1
RSSRC.date where RSSRC.title= '**Newest source'**	*Date of newest source* Date of the creation of the most recent primary source data used for the urban dataset data.	CNEWSD	Date Format is conformant to [ISO 8601:2000]: YYYY-MM-DD	1

6.4.5 Urban dataset Validation Section

The Urban dataset validation section provides a history of the validation process within a dataset. The Urban dataset Validation elements are listed in Table 5 below.

Table 5 - Urban dataset Validation Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSUQR	*Resource Unspecified Quality Report* This report describes the validation towards the specification. (see sub-elements below)			**1**
RSUQR.qualityElement	*Quality Element type* This is the type of quality element evaluated that should be used in ISO implementation. Fixed to **DQ_ConceptualConsistency**		String Fixed to **DQ_ConceptualConsistency**	1

Table 5 - Urban dataset Validation Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSUQR.measureName	*Validation Process Name* Name of the process or software program used for validating the data. Values are limited to the Validation Tool Codelist at Annex G-1, except for new tools that are not included in the list.	SVNAME	String See Validation Tool Codelist	1
RSUQR.description	*Validation Process Version* Version of the process or software program used for validating the data. Enter the version number only, e.g., "27" for GAIT 27.	SVVERS	String	1
RSUQR.measureDate **Note: This element is not included in DMF 2.0 and is part of the MUVD profile**	*Validation Date Stamp* Date/time at which the validation was performed. If available, use the Report Date (UTC) found in the Report provided by the validation tool.	SVDATE	Date or Date Time Format is conformant to [ISO 8601:2000]: YYYY-MM-DD or YYYY-MM-DDThh:mm:ssZ	1
RSUQR.cnfResult.specification.title	*Specification Name* Name of the specification against which the data was validated against (Technical Reference Documentation identification). The format is MUVD Technical Reference Documentation (UTRDXvX.Y, where X pertains to the release and vX.Y represents the version and subversion number. For UTRD1v1.0, enter the value **MUVD Technical Reference Documentation (UTRD1v1.0)**. The dataset should only be validated against one subversion of the specification. List only the UTRD, not the individual documents.	SVSPCN	String **MUVD Technical Reference Documentation (UTRDXvX.Y)**	1

Table 5 - Urban dataset Validation Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSUQR.cnfResult.specification.date	*Specification Date* Date of the specification against which the subregion data was validated (UTRD publication date). Use the publication date of the UTRD version entered in title (RSUQR.cnfResult.specification.title).. It is acceptable to enter zeros for the time portion. For example, the value 2019-07-05T00:00:00Z would be acceptable.	SVSPCD	Date Time Format is conformant to [ISO 8601:2000]: YYYY-MM-DD or YYYY-MM-DDThh:mm:ssZ	1
RSUQR.cnfResult.explanation	*Validation Statement* Explanation of the conformance result including any discrepancies found. If the dataset is found to be conformant, the value "**dataset conformant to specification**" shall be used when it is conformant.	SVSTMT	String Fixed to **dataset conformant to specification,** when conformance is true, free string in other cases	1
RSUQR.cnfResult.conformance	*Data Valid Flag* Indicates that the subregion data is conformant to the specification (i.e., MUVD UTRD1v1.0) (TRUE) or found to be non-conformant in one or more areas (FALSE).	SVVALD	Boolean	1

6.4.6 Urban dataset Coordinate Reference System Section

The Urban dataset Coordinate Reference System Section provides general information about the urban dataset coordinate reference system in which the Urban dataset coordinates are expressed. The Urban dataset Coordinate Reference System Elements are listed in Table 6.

Table 6 - Urban dataset Coordinate Reference System Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSRSYS	*Coordinate Reference System* Implemented as an Anchor See sub-elements of RSRSYS below. More details concerning reference system can be found in Annex E.			1

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSRSYS.reference	*Reference to a CRS register* This element should point through an URI to a Geodetic Code register (**EPSG**)		String	1
RSRSYS.value	*CRS label* fixed to: – **WGS 84 2D-Geographic East-North** when the coordinates are 2D; – **WGS 84 3D-Geographic East-North** when they are 3D.	CCRSID	String	1

6.5 Subregion Metadata

The Subregion Metadata describes a subregion within an urban dataset. A subregion defines a geographic extent within an urban dataset where the features were produced using a common set of extraction criteria. The minimum homogenous collection (i.e. density and feature catalogue) is defined in each subregion instance and subregion extent. **Error! Reference source not found.** describes reasons that can justify the creation of subregions.

Each urban dataset will contain one or more subregions. Subregions shall not overlap. Each subregion within an urban dataset will not extend beyond the extent of the containing urban dataset. In addition to the information set of the subregion (6.5.1), the metadata for a subregion contains the identification of the subregion (6.5.2), information about the feature content of the subregion (**Error! Reference source not found.**), data quality (6.5.3) and source data information (6.5.4).

Table 7 - Creating Subregions

Reason	Requirement	Description
Source Material	Optional	Optionally, a subregion may be created to highlight an area where: – No imagery is available due to cloud cover or transmission gaps (note that an alternative to creating a subregion is to collect a Void Collection Area (ZD020)). – Imagery with different ground resolution. – Imagery with different capture dates. – Ancillary source material e.g. City Map, used for capturing the feature geometry
Accuracy	Optional	Optionally, a subregion may be created to highlight an area where accuracy varies from program aim.

The following tables (on Sections 6.5.1 through 6.5.4) list and provide instructions on how to create the elements of the Subregion metadata.

Table 8 - Subregion Metadata Entity Set Elements

Table 9 - Subregion Identification Elements

Table 10 - Subregion Quality Measure Elements

Table 11 - Subregion Lineage Elements

Table 12 - Subregion Source Elements

6.5.1 Subregion Metadata Entity Set Information

The Subregion Metadata Entity Set Information is used to describe the subregion metadata. It is the *metadata* about the Subregion Metadata that differs from that of Urban dataset Metadata Entity Set Section described in 6.4.1 which describes the Urban dataset. The Subregion Metadata Entity Set Elements are listed in Table 8 below.

Table 8 - Subregion Metadata Entity Set Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
MDDLOC	*Metadata locale* (see subelements below)			1
MDDLOC.language	*Metadata language* Fixed to **eng** refer to Annex B-1.1	SMLANG	Language Codelist **eng**	1
MDDLOC.encoding	*Metadata encoding* Fixed to **utf8** refer to Annex B-1.2	SMCHAR	Character set Codelist **utf8**	1
Identification.RSTYPN	*Resource type name* Fixed to **Subregion**	SMSPLN	String **Subregion**	1
MDRPTY	*Metadata responsible party* The metadata point of contact is identical to the data point of contact if and only if this instance of the point of contact metadata element can be an internal reference (e.g., href="#urban datasetMetadataPoc") to the corresponding instance of the contact metadata element.			1..*
MDRPTY.party.orgName	*Organization Name of the Party* Limited to the Participant Agency Codelist *Note: For a complete update of the urban dataset, the metadata information has to be negotiated between the Producing Participant and the Updating Participant. Refer to Annex G-2.*		String limited to Participant Agency	1

Table 8 - Subregion Metadata Entity Set Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
MDRPTY.party.country	*Party Country* Limited to the Participant Nation *Note: For a complete update of the urban dataset, the metadata information has to be negotiated between the Producing Participant and the Updating Participant. Refer to Annex G-3.*		String limited to Participant Nation	**1**
MDRPTY.role	*Role of the Party* Role Codelist Limited to **originator** or **processor**		Role Codelist (Limited to **originator** or **processor**)	1
MDDATE	*Metadata date stamp* The date which specifies when the metadata record was created or updated. *Note: For MUVD, this element is not expected to record the date of creation of the metadata file, but rather the date of initiation of the metadata capture.* *Note2: The Urban dataset Metadata date stamp must be equal to or earlier than the Urban dataset edition date and the Validation Date Stamp, as follows:* *MDDATE <= RSDATE('revision') <= measureDate*	SMDATE	Date Format is conformant to [ISO 8601:2000]: YYYY-MM-DD	1
MDSTD	*Metadata standard* (see sub-elements below)			1
MDSTD.title	*Metadata standard title* Fixed to **'urn:dgiwg:metadata:dmf:2.0:profile:muvd'**	SMSTDN	String	1
MDSTD.version	*Metadata standard version* Fixed to **1.0**	SMSTDV	String	1

Table 8 - Subregion Metadata Entity Set Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
MDSID	*Metadata Set Identifier* URI of the dataset to which the metadata applies. The value is expected to be: https://igw.mgcp.ws/<UDSID> followed by 2-digit number uniquely identifying the subregion within the Urban dataset where <UDSID> is the value of the UDSID element. Refer to section 6.3.2.	SURI	URI	1

6.5.2 Subregion Identification Section

The Subregion Identification Section contains the identifier for the subregion, the geographic extent of the subregion, and copyright or licensing restrictions placed on the data within the subregion. The Subregion Identification Elements are listed in Table 9 below.

Table 9 - Subregion Identification Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSID.identifier	*Resource identifier* Identifier of the subregion this metadata describes. Format is <identifier of the urban dataset> followed by 2-digit number uniquely identifying the subregion within the urban dataset (e.g., MUVD_Nairobi_KEN_E03649N0117 **_E1_01** for the first subregion). The number of subregions within an urban dataset shall not exceed 99.	SUBRID	Subregion Id	1

Table 9 - Subregion Identification Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSDATE.date with RSDATE.type = 'creation'	*Resource date (creation)* Creation date (or extraction date from source) of the subregion. The definition of the urban dataset subregions is usually achieved before producing the urban dataset data. But, the need for new subregions may occur during the data production, and possibly when revising the data.	SCDATE	Date Format is conformant to [ISO 8601:2000]: YYYY-MM-DD	1
RSDATE.date with RSDATE.type = 'revision'	*Resource date (revision)* Date of the current version of the subregion.	SEDDAT	Date Format is conformant to [ISO 8601:2000]: YYYY-MM-DD	1
RSUSE	Subregion Unicode Font Unicode font used during collection and for viewing diacritics. Unicode font should be preceded by 'Subregion unicode font: '	SUFONT	String	0..1
RSABSTR	Subregion description Brief narrative summary of the specific characteristics of the data contained within the subregion extent, particularly the specifics of the geographic area corresponding to the subregion extent. – If the urban dataset contains a single subregion, the default value is **Single subregion**. – If the urban dataset contains multiple subregions, the value is SubregionNN, where NN is a consecutive number. For example Subregion01, Subregion02. – If the subregion is representing a void collection area, the default value is **"Void subregion"**	SDESCR	String	1
RSTYPE	*Resource type* Fixed to **tile**		Resource Type Codelist Fixed to **tile**	1

Table 9 - Subregion Identification Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSSRES	*Subregion scale* Scale to which the features in the subregion were collected (i.e., 5000). Mandatory if data is present, but not used if a Void collection subregion.	SSCALE	Integer	0..1
RSEXT.boundingPolygon	*Subregion coverage (extent)* Extent of the subregion dataset which can be composed of multiple surfaces, each possibly having interior patches; coordinates are provided using WGS84.	SEXTNT	Polygon	1
RSRPTY	*Resource responsible party* (see sub-elements below)			**1..***
RSRPTY.party.orgName	*Organization Name of the Party* Name of the agency with production responsibility for the subregion. The MUVD Participant Agencies are listed in Annex G-2.	SORIGA	String limited to Participant Agency	1
RSRPTY.party.country	*Party Country* Name of the country with production responsibility for the subregion. The MUVD Participant Nations are listed in Annex G-3.	SORIGC	String limited to Participant Nation	1
RSRPTY.role	*Role of the Party* The Producing Participant is the **originator**; the Updating Participant is the **processor.**		Role Codelist (Limited to **originator** or **processor**)	1
RSLCST.statement	*Resource legal statement (copyright)* Text of copyright restrictions imposed on subregion dataset data. Participants do not have to claim copyright. If no copyright is asserted, participants should state the following in the metadata: "**No copyright or restriction of rights of use is asserted by originator of this information.**"	SCPYRT	String	0..1

Table 9 - Subregion Identification Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSSCST.note	*Security note* A description of any commercial (or similar) restriction on the distribution of information regarding the feature or data set. Values limited to: **Limited Distribution. For Official Use Only by MGCP members.** or **Not for public release.** or, when Unrestricted: **Unrestricted. For Public Release.**	STIERN	String **Limited Distribution. For Official Use Only by MGCP members.** or **Unrestricted. For Public Release.** or **Not for public release**	0..1
RSREM	*Type of Update* Identifies when the urban dataset has been updated. The value for a complete update should be **Complete Update**. The value "**Not applicable**" is not used in this context. Instead, the element is omitted during initial production.	STYPEU	String	0..1

The subregion extent (SEXTNT) will typically be provided as a single exterior boundary and no interior patches. Rather than using multiple surfaces to represent a non-contiguous subregion coverage, it is recommended to consider using multiple subregions. The interior patches of the extent can be used to identify void areas within the subregion; however, to identify void areas is recommended to use the void feature type, thus avoiding to add the complexity of interior patches.

6.5.3 Subregion Quality Measure Section

The Subregion Quality Measure Section defines the absolute accuracy of the features extracted in the subregion. The Subregion Quality Measure Elements are listed in Table 10 below.

Table 10 - Subregion Quality Measure Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSUQR	*Resource Unspecified Quality Report* This measure describes the quality result for horizontal accuracy. (see sub-elements below)			1

Table 10 - Subregion Quality Measure Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSUQR.qualityElement	*Quality Element type* This is the type of quality element evaluated that should be used in ISO implementation. Fixed to **DQ_AbsoluteExternalPositionalAccuracy**		Quality element Codelist **Fixed to DQ_AbsoluteExternalPositionalAccuracy**	1
RSUQR.method	*Description of the Evaluation Method* Identifies the method used in determining the maximum horizontal (circular) error of the features in the subregion. Limited to values of the Codelist Accuracy Evaluation Method.	SACEMT	Accuracy Evaluation Method Codelist	1
RSUQR.QuantitativeResult	*Quantitative result* Maximum horizontal (circular) error of the features related to the subregion. The value is expressed in metres.	SACEVL	Float	1
RSUQR	*Resource Unspecified Quality Report* This measure describes the quality result for vertical error. This block is optional (see sub-elements below)			0..1
RSUQR.qualityElement	*Quality Element type* This is the type of quality element evaluated that should be used in ISO implementation. Fixed to **DQ_AbsoluteExternalPositionalAccuracy**		Quality element Codelist **Fixed to DQ_AbsoluteExternalPositionalAccuracy**	1
RSUQR.method	*Description of the Evaluation Method* Identifies the method used in determining the maximum vertical (linear) error of the features in the subregion. Limited to values of the Codelist Accuracy Evaluation Method.	SALEMT	Accuracy Evaluation Method Codelist	1
RSUQR.QuantitativeResult	*Quantitative result* Maximum vertical (linear) error of the features related to the subregion. The value is expressed in metres.	SALEVL	Float	1

6.5.4 Subregion Lineage Section

The Subregion Lineage Section provides general information about the lineage of the features extracted within the subregion and a more detailed description of their source data. The source data are more or less detailed depending on the releasability of the available information. It can be limited to the oldest and newest source of each source type, or include information about individual sources of a given type (e.g. the description of the GEOnet Names database used) or consist of all individual sources. The Subregion Lineage Elements are listed in Tables 11 and 12 below.

Table 11 - Subregion Lineage Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSLING	*Subregion Lineage* This element is intended to provide very general information about the overall production processes and sources used to produce the part of the urban dataset data related to the subregion.	SLSTAT	String	0..1
RSSRC	*Source* (see sub-elements below)			1..*
RSSRC.citation.title	*Source entry title* Identifies the source or source type used in the production of the dataset If one source of a given type: – Character string identifying the source dataset (e.g., Very High Resolution Commercial Monoscopic Imagery) If multiple sources* of a given type: – Literal string constructed from **Newest <Type of Source>** for the newest source of a given type (e.g., Newest Very High Resolution Commercial Monoscopic Imagery); – Literal string constructed from **Oldest <Type of source>** for the oldest source of a given type (e.g., Oldest Very High Resolution Commercial Monoscopic Imagery).	SSCRTIn	String managed in Source Type if Source Type exists	1

Table 11 - Subregion Lineage Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSSRC.citation.date	*Creation date of the source entry* Date of the creation of the individual source corresponding to the source entry title, possibly the Oldest/Newest individual source of a given source type. Date.type is fixed to “Creation”.	SSRCDTn	Date Format is conformant to [ISO 8601:2000]: YYYY-MM-DD	1
RSSRC.description	*Type of source* Limited to the Source Type codelist. Values are listed in Annex G-4.	SSRCTYn	String managed in Source Type	**1**
RSSRC.citation.identifier	*Source identifier* Identifier of the source, (e.g., veryHighResCommMonoImage).	SSRCIDn	String	0..1
RSSRC.equivalentScale	*Source (equivalent) scale* Scale of the source. The value is equal to 10000 times the ground resolution for a source image. The element is omitted for non-scaled sources such as AAFIF, DVOF, and GeoNames. It is mandatory for scaled sources.	SSRCSCn	Integer	0..1
RSSRC.extent.boundingPolygon	*Source extent* Extent of the source entry. This extent can be composed of multiple surfaces, each possibly having interior patches; coordinates are provided using WGS84. The different sources generally overlap and may not be strictly included within the subregion extent.	SSRCEXn		0..1

Table 12 - Subregion Source Elements

DMF Identifier	MUVD requirement	Former MGCP Identifier	Type/ Format	MUVD Card
RSSRC	*Vertical source* Mandatory if a source with elevation data has been used. *(see sub-elements below)*			0..1
RSSRC.citation.title	*Vertical Source Category Title* Identifies the vertical source category used in the production of the dataset.	SSVRTI	String	1

RSSRC.citation.date	*Creation Date of the Vertical Source Category* Date of the creation of the individual source corresponding to the vertical source category title. If the title is noElevations, then the date is fixed to the subregion creation date (RSDATE).	SSVCDT	Date	1
RSSRC.description	*Type of Vertical Source Category* Type of source entry. Limited to the codelist Vertical Source Type Identifiers. Values are listed in Annex G-5.	SSVCTY	String Limited to the codelist Vertical Source Type Category	0..1
RSSRC.dcitation.identifier	*Vertical Source identifier* Identifier of the vertical source category.	SSVCID	String	0..1
RSSRC.extent	*Vertical Source Category extent* Extent of the source entry. This extent can be composed of multiple surfaces, each possibly having interior patches; coordinates are provided using WGS84. The different sources generally overlap and may not be strictly included within the subregion extent.	SSVCEX	Extent	0..1

In addition, this section is used to capture the oldest and newest dates for each of the sources used in production of the urban dataset dataset. This case requires two instantiations of the source information (**Source entry title** to **Source extent**). For example, Table 13 provides an example of the resulting content for the elements if the source for the subregion dataset production is Very High Resolution Commercial Monoscopic Imagery.

Table 13 - Example Subregion Lineage Section Content (informative)

Identifier	Value
RSLING	Initial collection using imagery, AAFIF, DVOF, and GeoNames.
RSSRC[0].citation.title	**Newest Very High Resolution Commercial Monoscopic Imagery**
RSSRC[0].citation.date	**2012-01-01**
RSSRC[0].description	**Very High Resolution Commercial Monoscopic Imagery**
RSSRC[0].citation.identifier	veryHighResCommMonoImage
RSSRC[0].equivalentScale	10000
RSSRC[0].extent	-73 18 -73 19 -72 19 -72 18 -73 18
RSSRC[1].citation.title	**Oldest Very High Resolution Commercial Monoscopic Imagery**
RSSRC[1].citation.date	**2010-01-01**
RSSRC[1].description	**Very High Resolution Commercial Monoscopic Imagery**
RSSRC[1].citation.identifier	veryHighResCommMonoImage
RSSRC[1].equivalentScale	10000
RSSRC[1].extent	-73 18 -73 19 -72 19 -72 18 -73 18
RSSRC[2].citation.title	**Interpolated DTED1 data**
RSSRC[2].citation.date	**2012-03-21**

RSSRC[2].description	**DTED data**
RSSRC[2].citation.identifier	**Dted1**
RSSRC[2].extent	-73 18 -73 19 -72 19 -72 18 -73 18

To understand the heritage of the features it is important to identify the sources used in the production of the Urban dataset. In this case, the primary source used for production of the geometry of the features in the subregion shall be identified. This includes identification of the imagery used or other sources used to populate the geometry of the features. In addition, If features attributes are populated with ancillary sources (e.g. AAFIF, DVOF, or GeoNames) these shall be documented in the subregion lineage section.

When citing AAFIF, DVOF, or GeoNames as an ancillary source, populate the Subregion Lineage Source Date (RSSRC.citation.date) using the following elements:

- AAFIF: INFO_CURRENCY element (truncated to INFO_CURRE)
- DVOF: SOURCEDT element
- GeoNames: Download date from database

Annex A
MUVD Metadata Profile of DMF 2.0 (Informative)

Annex A-1 Profile definition

Annex A-1.1. Introduction

This part is intended to define the MUVD DMF profile. This profile is based on DMF 2.0 and respects rules for profiling DMF.

Annex A-1.2. Identification

This profile constitutes implementation of DMF for MUVD. It includes elements from the following metadata classes: DMF/Core, DMF/Common, DMF/Data, DMF/Data+, and DMF/Specific.
The Uniform Resource Identifier (URI) of this profile is:

http://www.dgiwg.org/std/dmf/profile/muvd/1.0

Annex A-1.3. Usage

This profile is defined both for the 1st generation of ISO standards [ISO 19115:2003 and associates] and for the 2nd generation [ISO 19115-1:2014 and associates]. However, only the 2nd generation of ISO standards should be used for MUVD co-production.

Annex A-2 Conceptual definition

Annex A-2.1. MUVD Urban dataset and Subregion

Figure 2 is a UML class diagram illustrating the relationships between urban dataset (MUVD_Urban dataset), subregion (MUVD_Subregion), data (MX_DataFile), metadata (MD_Metadata) and the catalogues (CT_Catalogue) accompanying the urban dataset.

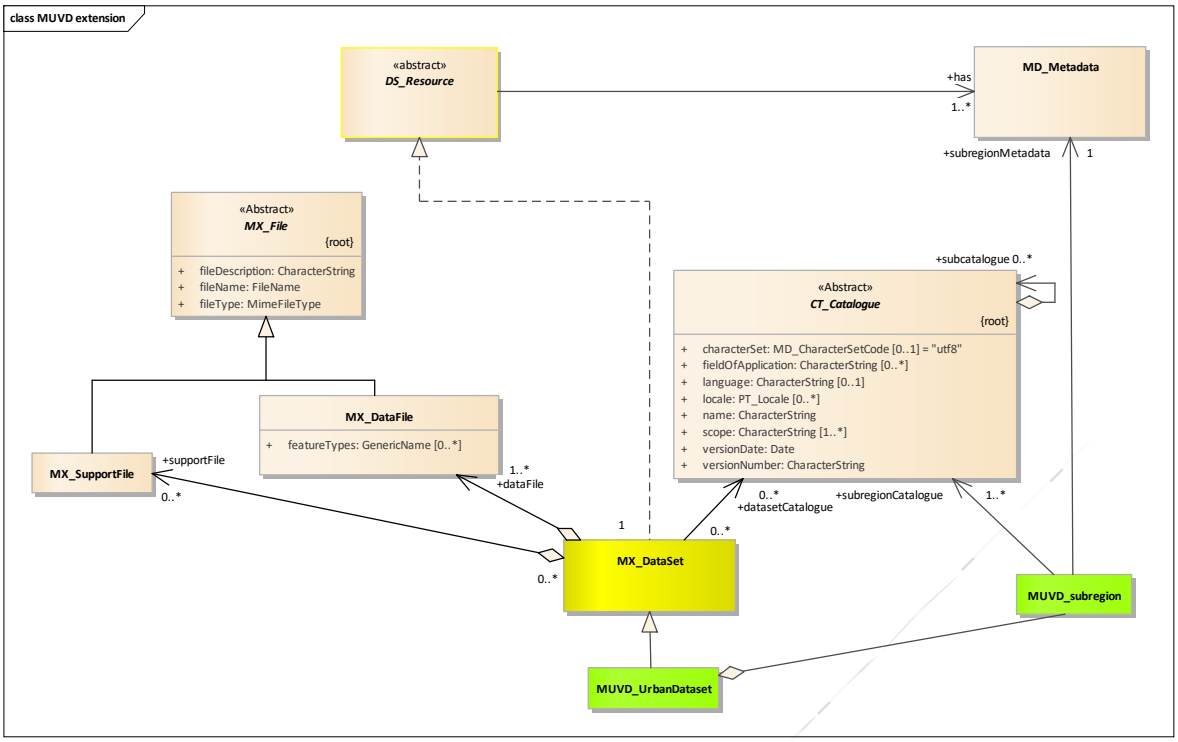

Figure 1 - MUVD Urban dataset and Subregion metadata

Each urban dataset is composed of one or more subregions. Both the urban dataset and each subregion are described by each one instance of metadata (**MD_Metadata**). The dataset data is stored in a set of data files with file descriptions (**MX_DataFile**) attached to the urban dataset.

Both the urban dataset and each subregion reference a feature catalogue, a codelist catalogue (**CT_CodelistCatalogue** in Figure 2), a catalogue of Units of Measure (**CT_UomCatalogue** in Figure 2), and a catalogue of coordinate reference systems (**CT_CrsCatalogue** in Figure 2).

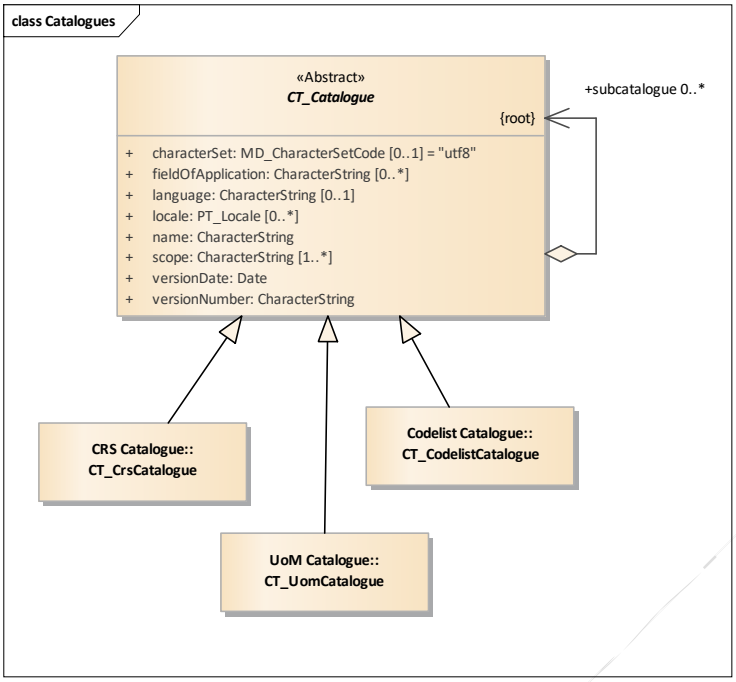

Figure 2 - ISO Catalogues

Annex B
Profile Specific Codelists (Normative)

Annex B-1 Overview

The clauses below contain the values allowed for certain metadata elements in this profile. In order to be conformant with this profile, the specified metadata elements shall only contain values as specified in this clause. As needed, these subclauses will be updated to reflect additional allowable values.

Annex B-1.1. Language

The following table defines the Languages to be used in the MUVD Urban datasets and metadata. The codes proposed conform to ISO 639-2:1998 and are compliant with DMF 2.0.

Value	Name	Description
eng	English	When the language country is not defined, the dictionary to be used as a reference for this language is the "Shorter Oxford English Dictionary - Edition 2"

Annex B-1.2. Character set

The following table defines the Character sets to be used in the MUVD Urban datasets and metadata. The codes proposed conform to DMF.

Value	Name	Description
utf8	utf8	UTF-8 is a character encoding defined in ISO 10646-1 Annex D and also described in IETF RFC 3629

Annex B-1.3. Security Classification Level

The following table defines the Security Classification Levels allowed for the MUVD Urban datasets and metadata. The code defined conforms to DMF.

Value	Name	Description
unclassified	Unclassified	This marking is applied to information which meets the marking criteria for the least stringent security classification

Annex C
Profile extensions (Normative)

Annex C-1 Unspecified Quality Report Extension

The properties of an Unspecified Quality Report with MUVD extension are listed below. Elements that are part of the extension are outlined in a thicker borderline.

Identifier	Title / Description	Value Domain	Card
qualityElement [DMF/Common]	Quality Element This is the type of quality element evaluated. The appropriate value depends on the quality criteria concerned by the quality measure.	Quality element Codelist Default is *DQ_ConceptualConsistency*	1
measureName [DMF/Common]	Measure Name This is the name of the measure applied.	Free Text	0..1
measureDescription [DMF/Common]	Measure Description This is the description of the measure applied.	Free Text	0..1
measureDate [DMF/MUVDProfile]	**Measure Date** **This is the date on which a data quality measure was applied**	DateTime	**0..1**
method [DMF/Common]	Description of the Evaluation Method Details about the method used for performing the evaluation.	Free Text	0..1
cnfResult [DMF/Common]	Conformance Result The result of the evaluation is reported as a conformance statement.	Conformance Result	0..1
qtyResult [DMF/Common]	Quantitative Result The result of the evaluation is reported as quantitative.	Quantitative Result	0..1
descResult [DMF/Common]	Descriptive Result The result of the evaluation is reported as descriptive information.	String, Free Text or Anchor	0..1
covResult [DMF/Data+]	Coverage Result The result of the quality evaluation is provided as a coverage.	Coverage Result	0..1

Annex C-1.1. Implementation using the first generation of metadata standards:

+ scope[1]:DQ_Scope

+ level[1]:MD_ScopeCode	RSTYPE - Default is dataset
+ levelDescription[0..1]:MD_ScopeDescription	When RSTYPE is not equal to dataset
+ other[1]:CharacterString	RSTYPN
+ extent[0]:EX Extent	*Not used*
+ report[0..*]:DQ_Element	RSUQR (for each) (when set)
+ nameOfMeasure[0..1]:CharacterString	measureName
+ measureDescription[0..1]:CharacterString	measureDescription
+ dateTime[0..1]:DateTime	**measureDate**
+ evaluationMethodDescription[0..1]:CharacterString	method
+ result[0..1]:DQ_ConformanceResult	cnfResult (when set) - See Conformance Result and Note 4
+ result[0..1]:DQ_QuantitativeResult	When descResult is set - See Descriptive Result *(not used in MUVD)*
+ result[0..1]:DQ_QuantitativeResult	qtyResult (when set) - See Quantitative Result
+ result[0..1]:QE_CoverageResult	covResult (when set) - See Coverage Result *(not used in MUVD)*

Annex C-1.2. Implementation using the second generation of metadata standards

+ scope[1]:MD_Scope	
+ level[1]:MD_ScopeCode	RSTYPE
+ levelDescription[0..1]:MD_ScopeDescription	When RSTYPE is not equal to dataset
+ other[1]:CharacterString	RSTYPN
+ extent[0]:EX_Extent	*Not used*
+ report[0..*]:DQ_Element	RSUQR (for each) (when set)
+ measure[1]:DQ MeasureReference	
+ nameOfMeasure[1]:CharacterString	measureName
+ measureDescription[0..1]:CharacterString	measureDescription
+ evaluationMethod[0..1]:DQ_EvaluationMethod	
+ evaluationMethodDescription[0..1]:CharacterString	method
+ dateTime[0..*]: DateTime	**measureDate**
+ result[0..*]:DQ_ConformanceResult	cnfResult (when set) - See Conformance ResultConformance Result
+ result[0..*]:DQ_DescriptiveResult	When descResult is set - See Descriptive Result *(not used in MUVD)*
+ result[0..*]:DQ_QuantitativeResult	qtyResult (when set) - See Quantitative Result
+ result[0..*]:QE_CoverageResult	covResultcovResult (when set) - See Coverage ResultCoverage and *(not used in MUVD)*

Annex C-2 Format extension

The properties of the Format with MUVD extension are listed below. Elements that are part of the extension are outlined in a thicker borderline.

Identifier	Title / Description	Value Domain	Card
citation [DMF/Core]	Format Citation This is the name and version of the format.	Citation	1
specification [DMF/MUVDprofile]	**Format Specification** **This is the reference to the specification of the format.**	**Free Text**	**0..1**

decompression [DMF/Data]	File Decompression Technique These are the recommended algorithms or processes that can be applied to read or expand resources to which compression techniques have been applied..	Free Text	0..1

Annex C-2.1. Implementation using the first generation of ISO standards:

Each Format is implemented through a single instance of gmd:MD_Format or one of its subclasses.

Its property instances are described below:

+ name[1]:CharacterString	citation.title
+ version[1]:CharacterString	citation.version
+ specification[1]:CharacterString	**specification**
+ fileDecompressionTechnique[0..1]:CharacterString	decompression

Annex C-2.2. Implementation using the second generation of ISO standards:

Each Format is implemented through a single instance of mrd:MD_Format or one of its subclasses.

Its property instances are described below:

+ formatSpecificationCitation[1]:CI Citation	
+ title[1]:CharacterString	citation.title
+ alternateTitle[1]:CharacterString	**specification**
+ edition[1]:CharacterString	citation.version
+ fileDecompressionTechnique[0..1]:CharacterString	decompression

Annex C-3 Feature catalog extension

The properties of the Feature catalog description with MUVD extension are listed below. Elements that are part of the extension are outlined in a thicker borderline.

Identifier	Title / Description	Value Domain	Card
citation [DMF/Data]	Feature Catalogue Citation Citation of the feature catalogue. The referenceDate is mandatory.	Citation	1..*
language [DMF/Data]	Feature Catalogue Language Language used in the feature catalogues.	Language Codelist	0..*
isoCompliance [DMF/Data]	ISO Compliance of the Feature Catalogue Indication of whether or not the cited feature catalogue complies with ISO 19110.	Boolean Default is **false**	1
fcInclusion [DMF/Data]	Inclusion of the Feature Catalogues Indication of whether or not the cited feature catalogues are included.	Boolean Default is **false**	1
featureTypes [DMF/Data]	Realised Feature Type Feature Type from feature catalogues occurring in the data.	String	0..*

featureTypesWithInfo [DMF/MUVDprofile]	**Feature Type with instance count** **Feature Type from feature catalogues occurring in the data with the number of occurrence that they have.** **This element can only be used if featureTypes is not used.**	**FeatureTypeInfo**	**0..***

With FeatureTypeInfo datatype defined as:

Identifier	Title / Description	Value Domain	Card
featureTypeName [DMF/MUVDprofile]	**Feature Type name** **Feature Type from feature catalogues occurring in the data.**	**String**	**1**
featureInstanceCount [DMF/MUVDprofile]	**Feature instance count** **Feature Type from feature catalogues occurring in the data with the number of occurrence that they have.**	**Integer**	**0..1**

Annex C-3.1. Implementation using the first generation of ISO standards:

This element does not natively exist in the old generation of standards. It is implemented as a quality result.

Its property instances are described below:

+ scope[0..1]:DQ_Scope	
+gmd:level [1]:MX_ScopeCode	**"feature"**
+levelDescription[1]:MD_ScopeDescription	
+gmd:features[1]: gco:ObjectReference_PropertyType	
@xlink:href	**feature**
+ report[0..*]:DQ_Element	**featureTypesWithInfo (for each) (when set)**
+ nameOfMeasure[0..1]:CharacterString	**Fixed to "Feature type count"**
+ measureDescription[0..1]:CharacterString	**featureTypeName**
+ result[0..1]:DQ_QuantitativeResult	**featureInstanceCount**

Annex C-3.2. Implementation using the second generation of ISO standards:

Each feature catalog information is implemented through a single instance of mrd:MD_FeatureCatalogDescription or one of its subclasses.

Its property instances are described below:

+ contentInfo[0..1]:MD_FeatureCatalogueDescription	FCDESC (when set)
+ complianceCode[1]:Boolean	isoCompliance - Default is false
+ locale[0..*]:PT_Locale	For each language
+ language[1]:LanguageCode	language
+ includedWithDataset[1]:Boolean	fcInclusion - Default is false
+ featureTypes[0..*]:MD_FeatureTypeInfo	For each featureTypes
+ featureTypeName[1]:GenericName	featureTypes **if featureTypesWithInfo is not set, featureTypesWithInfo.featureTypeName if featureTypesWithInfo is set**

+ featureInstanceCount[0..1]:Integer	**featureTypesWithInfo .featureInstanceCount**
+ featureCatalogueCitation[1..*]:CI_Citation	citation (for each) - See Citation

Annex D
Content of the urban dataset archive metadata file

The Urban dataset, Subregion metadata and related resources are all contained in the <UDSID>.XML file of the <UDSID>.ZIP archive. The content of this <UDSID>.XML file is presented as a hierarchical set of labels corresponding to the properties of the ISO 19115-1:2014 classes involved in the description of an urban dataset and its subregions.

The mapping between MUVD metadata elements and ISO XML elements can be found in Section 6.3 of DGIWG 114 v. 2 (DMF). Mappings specific to the MUVD extension can be found in Annex C of this document.

Annex E
CRS Identification in MUVD Metadata (Normative)

Annex E-1 Introduction

The geospatial data provided through the MUVD is required to conform to the WGS-84 coordinate reference system (CRS). Within the MUVD metadata, the CRS is identified using the RSRSYS (Resource Reference System Identifier) element. MUVD permits to use two specifications for the WGS-84 CRS. The specifications are for either 2-dimensional or 3-dimensional data content. The identifiers for the reference systems permitted to be specified in the MUVD metadata are listed in Table

Table 14 - Allowed MUVD Coordinate Reference Systems

Dimensions	Name	href
2-D (longitude, latitude)	WGS 84 2D-Geographic East-North	mgcp/crs/mgcp_gmxCrs.xml#WGS84E_2D
3-D (longitude, latitude, haehag)	WGS 84 3D-Geographic East-North	mgcp/crs/mgcp_gmxCrs.xml#WGS84G_3D

For 2-D and 3-D data, the geographic position is expressed as decimal degrees of longitude and latitude. In addition, the 3-D data includes a third axis for height above the WGS-84 ellipsoid Earth Gravity Model 2008 (EGM 2008) geoid in metres.

Annex E-2 CRS Identification

Within the metadata, the coordinate reference system is identified (referenceSystemIdentifier) using the “Anchor” tag within the “code” tag. In Table 12 the string in the **Name** column is used as the content of the <gmx:Anchor> tag. The string in the **href** column is used as the content of the *xlink:href* attribute of the <gmx:Anchor> tag. The link provides the path to the CRS definition in the MUVD CRS catalogue. Figures 3 and 4 provide examples of the identifier instances for both 2-D and 3-D CRS specification.

```
<!-- WGS-84 2-D CRS Identification -->
<gmd:referenceSystemIdentifier>
  <gmd:RS_Identifier>
    <gmd:code>
      <gmx:Anchor  xlink:href=" http://www.opengis.net/def/crs/EPSG/0/
CRS84">WGS 84 2D-Geographic East-North</gmx:Anchor>
    </gmd:code>
  </gmd:RS_Identifier>
</gmd:referenceSystemIdentifier>

<!-- WGS-84 3-D CRS Identification -->
<gmd:referenceSystemIdentifier>
  <gmd:RS_Identifier>
    <gmd:code>
      <gmx:Anchor                                              xlink:href="
http://www.opengis.net/def/crs/EPSG/0/CRS84_3D">WGS  84  3D-Geographic
East-North</gmx:Anchor>
    </gmd:code>
  </gmd:RS_Identifier>
</gmd:referenceSystemIdentifier>
```

Figure 3 - Example CRS Identification Instances using former encoding (ISO 19115:2003)

```
<!-- WGS-84 2-D CRS Identification -->
  <mdb:referenceSystemInfo>
    <mrs:MD_ReferenceSystem>
      <mrs:referenceSystemIdentifier>
        <mcc:MD_Identifier>
          <gmx:Anchor                                          xlink:href="
http://www.opengis.net/def/crs/EPSG/0/  CRS84">WGS   84   2D-Geographic
East-North</gmx:Anchor>
        </mcc:MD_Identifier>
      </mrs:referenceSystemIdentifier>
    </mrs:MD_ReferenceSystem>
  </mdb:referenceSystemInfo>
```

Figure 4 - Example CRS Identification Instances using new encoding (ISO 19115-1:2014)

CRS definition

The geodetic datum is the **World Geodetic System 1984 (WGS 84)** as defined by NGA.STND.0036_1.0.0_WGS84:

- Ellipsoid: **WGS 84**
- Ellipsoid semi-major axis (a): **6378137** metres;
- Ellipsoid inverse flattening (1/f): **298.257223563**
- Prime Meridian: **Greenwich**

– Epoch: **1984**

WGS 84 (G1762) is the sixth update to the realization of the WGS 84 Reference Frame. The previous realizations were designated WGS 84 (G1674) [5], WGS 84 (G1150) [4], WGS 84 (G873), WGS 84 (G730) and WGS 84. The “G” indicates that GPS measurements were used to obtain the coordinates. The number following the “G” indicates the GPS week number during which the coordinates were approved for implementation by NGA. The original TRANSIT realization of WGS 84 has no such designation. When the coordinates are 2D, they are expressed in the **WGS 84 2D-Geographic East-North** coordinate reference system based on the WGS 84 datum and a coordinate system defined by the following two axes:

– The first axis corresponds to the longitudes expressed in decimal degrees. It is East-oriented;

– The second axis corresponds to the latitudes which are expressed in decimal degrees. It is North-oriented.

When the coordinates are 3D, they are expressed in the **WGS 84 3D-Geographic East-North** coordinate reference system based on the WGS 84 datum and a coordinate system defined by the following three axes:

– The first axis corresponds to the longitudes expressed in decimal degrees. It is East-oriented.

– The second axis corresponds to the latitudes which are expressed in decimal degrees. It is North-oriented.

– The third axis corresponds to the heights over the **World Geodetic System 1984 (WGS 84)** ellipsoid. They are expressed in metres.

These coordinate reference systems are based on the same reference document (NGA.STND.0036) as the European Petroleum Survey Group (EPSG) coordinate reference systems **4326** and **4979,** but they do not have the same axis order. The order of the axis determines the order of the coordinates. In the EPSG system, the first coordinate corresponds to the latitudes and the second corresponds to the longitudes. Use of those EPSG identifiers (e.g., when using coordinate transformation services) instead of the MUVD identifiers is possible, but requires that the two first coordinates of each position be reversed.

Annex F
Using Codelists in MUVD Metadata Implementation (Informative)

This section provides guidance regarding the use of codelists in the MUVD metadata XML instance documents.

Codelists are used to provide a consistent encoding of information with a clearly defined domain of desired values. The elements in the metadata and codelists they use are listed in Table 155. The metadata XML element is paired with its' codelist instantiation. The **Spec. Ref.** column indicates where codelist is documented, either in the MUVD metadata profile specification or in the relevant ISO specification.

Table 15 - XML Elements Using Codelists in the MUVD Metadata XML Document

Codelist name	XML Codelist	Spec. Ref.
Date Type Codelist	CI_DateTypeCode	19115 B.5.2
Role Codelist	CI_RoleCode	19115 B.5.5
Character Set Codelist	MD_CharacterSetCode	19115 B.5.10 MUVD Annex B-1.2
Classification Level Codelist	MD_ClassificationCode	19115 B.5.11 MUVD Annex B-1.3
Geometric Object Type Codelist	MD_GeometricObjectTypeCode	19115 B.5.15
Restriction Codelist	MD_RestrictionCode	19115 B.5.24
Resource Type Codelist	MD_ScopeCode	19115 B.5.25
Spatial Representation Type Codelist	MD_SpatialRepresentationTypeCode	19115 B.5.26
AccuracyEvaluationMethod	Implemented as a CharacterString, codelist stored in a register	MUVD 0
LanguageCode	MD_Language code, restructed to *eng*.	MUVD Annex B-1.1
ParticipantAgency	Implemented as a CharacterString, codelist stored in a register	MUVD Annex G-2
ParticipantNation	Implemented as a CharacterString, codelist stored in a register	MUVD Annex G-3
SourceTypeId	Implemented as a CharacterString, codelist stored in a register	MUVD Annex G-4
VerticalSourceTypeId	Implemented as a CharacterString, codelist stored in a register	MUVD Annex G-5

Annex G
Codelists to be stored in a register (Informative)

To facilitate the maintenance of this metadata specification, this document does not maintain codelists that are subject to frequent changes. These will be stored in an external register. These are mentioned here with their initial values for information purposes.

Annex G-1 Validation Tool Codelists

This list contains codes for the tools that can be used to validate the dataset against the specification.

Value	Name
GAIT	Geospatial Analysis Integrity Tool
QAC	Quality Assurance Capacity
FME	FME workbench

Annex G-2 Participant Agency

Participation in the MUVD is limited to the signatories of the MGCP MOU. This results in a finite list of Participant Agencies representing the Participant Nations. In the list below, the Participant Nation is provided for reference; a separate list of country codes is used to represent the Participant Nations in the metadata. This set of codes is used to document the Participant Agencies, i.e. the agencies responsible for the production of the metadata and the dataset.

Value	Name	Participant Nation
AGO	Australian Geospatial-Intelligence Organisation	Australia
BELGS	Belgian Defense Geographic Service	Belgium
DSG	Brazilian Army Geographic Service	Brazil
MCE	Mapping and Charting Establishment	Canada
MoD_HRV	Ministry of Defence of the Republic of Croatia	Croatia
GSCAF	Geographic Service of the Czech Armed Forces	Czech Republic
DALO	The Danish Defence Acquisition and Logistics Organization	Denmark
MGG	Military Geographic Group	Estonia
TOPK	Topographic Service of Finnish Defence Forces	Finland
EMA_BGHOM	Etat-Major des Armées / Bureau Géographie, Hydrographie, Océanographie et Météorologie	France
BGIC	Bundeswehr Geoinformation Centre	Germany
HMGS	Hellenic Military Geographical Service	Greece
GEOS_HDF	Geoinformation Service of the Hungarian Defence Forces	Hungary
DGS-II_DIV	Defence General Staff	Italy
DGI_DIH	Directorate for Geospatial Intelligence, Defense Intelligence Headquarters	Japan
KDIA	Korean Defense Intelligence Agency	Korea
LGIA	Latvian Geospatial Information Agency	Latvia
MMC	Military Mapping Center of Lithuanian National Defence Forces	Lithuania
TSM	Topographic Service of Moldova	Moldova

Value	Name	Participant Nation
DGA	Defence Geographic Agency	Netherlands
GNZ	GEOINT New Zealand	New Zealand
NORAF	Norwegian Armed Forces	Norway
SGeoW	Szefostwo Geografii Wojskowej	Poland
CIGEOE	Centro de Informação Geoespacial do Exército	Portugal
DGIA	Defence Geospatial Information Agency	Romania
TOPU	Topografický ústav	Slovakia
DGI	Directorate Geospatial Information	South Africa
UCC	Cartographic Coordination Unit	Spain
SWAF	Swedish Armed Forces	Sweden
GCM	General Command of Mapping	Turkey
DGC_NCGI	Defence Geographic Centre, National Centre for Geospatial Intelligence	United Kingdom
NGA	National Geospatial-Intelligence Agency	United States

Annex G-3 Participant Nation

Participation in the MUVD is limited to the signatories of the MGCP MOU. This following list contains the [ISO 3166-1:2006/Cor 1:2007] alpha-3 country codes of the Participant Nations.

Value	Name
AUS	Australia
BEL	Belgium
BRA	Brazil
CAN	Canada
HRV	Croatia
CZE	Czech Republic
DNK	Denmark
EST	Estonia
FIN	Finland
FRA	France
DEU	Germany
GRC	Greece
HUN	Hungary
ITA	Italy
JPN	Japan
KOR	Korea
LVA	Latvia
LTU	Lithuania
MDA	Moldova
NLD	Netherlands
NZL	New Zealand
NOR	Norway
POL	Poland
PRT	Portugal
ROU	Romania
SVK	Slovakia
ZAF	South Africa
ESP	Spain
SWE	Sweden
TUR	Turkey

Value	Name
GBR	United Kingdom
USA	United States

Annex G-4 Source Type

The following values are used to document the type of sources in creating a feature. This codelist is aligned with the enumerated values for the SRT (Source Type) attribute of DGIF (MUVD baseline). The "ShortName" column is used to populate the Source Identifier (RSSRC.citation.identifier); the "Name" column is used to populate the Source Entry Title (RSSRC.citation.title) and Type of Source (RSSRC.citation.description) in the subregion metadata. The "Scale" column is used to populate the Source (Equivalent) Scale (RSSRC.equivalentScale); use an integer value (with no commas) that falls within the listed range.

ShortName	Name	Definition	Code	Scale
ngaArcDigRasterGraphic	ADRG	NGA Arc Digitized Raster Graphic.	1	<=5,000,000
ngaAutoAirFacInfoFile	AAFIF	NGA Automated Aeronautical Facilities Information File.	2	<Blank>
ngaChartUpdateManual	CHUM	NGA Chart Update Manual (CHUM).	3	<Blank>
ngaCityGraphic	City Graphic	NGA City Graphic.	4	2,500 to 25,000
ngaCombatChart	Combat Chart	NGA Combat Chart data.	5	25,000 or 50,000
ngaCompressedAdrg	CADRG	NGA Compressed Arc Digitized Raster Graphic.	6	<=5,000,000
ngaControlledImageBase1	CIB1	NGA Controlled Imagery Base 1 metre data.	7	10,000
ngaControlledImageBase5	CIB5	NGA Controlled Imagery Base 5 metre data.	8	50,000
ngaDigitalNauticalChart	DNC	NGA Digital Nautical Chart.	10	50,000 to 500,000
ngaDigitalPrintFile	DPF	NGA Digital Print File.	11	Various
ngaDigitalTopoData1	DTOP 1	NGA Digital Topographic Data Level 1.	16	50,000 or 100,000
ngaDigitalTopoData2	DTOP 2	NGA Digital Topographic Data Level 2.	17	50,000 or 100,000
ngaDigitalTopoData3	DTOP 3	NGA Digital Topographic Data Level 3.	18	50,000 or 100,000
ngaDigitalTopoData4	DTOP 4	NGA Digital Topographic Data Level 4.	19	50,000 or 100,000
ngaDigitalTopoData5	DTOP 5	NGA Digital Topographic Data Level 5.	20	50,000 or 100,000
ngaDigitalVertObstruction	DVOF	NGA Digital Vertical Obstruction File.	21	<Blank>
ngaFoundationFeatureData	FFD	NGA Foundation Feature Data.	22	50,000 to 250,000
ngaGeoLandCover	Land Cover	NGA GeoCover or LandCover.	24	<Blank>
ngaGeoNames	GeoNames	NGA GeoNames.	25	<Blank>

ShortName	Name	Definition	Code	Scale
gpsBasedElementCollect	GPS	GPS-based element-collected open source data.	26	Various
ngaImageCityMap	ICM	NGA Image City Map (ICM).	27	Various
usNtmImagery	NTM Imagery	Imagery from (US) National Technical Means (NTM).	29	Various
imageryUnspecified	Imagery	Imagery of unspecified type and resolution.	30	<Blank>
ngaInterimTerrainData	ITD	NGA Interim Terrain Data.	31	50,000 to 250,000
ngaInterimVectorData	IVD	NGA Interim Vector Data.	32	<Blank>
ngaInternationalBoundary	International Boundaries	NGA International Boundaries database.	33	<Blank>
ngaJointOperatGraphic	JOG	NGA Joint Operational Graphic.	34	250,000
ngaLittoralWarfareData	LWD	NGA Littoral Warfare Data.	36	5,000 to 50,000
mapChartOrGeodeticData	MC&G	Mapping, charting and/or geodetic data.	37	Various
ngaMissionSpecificData1	MSD 1	NGA Mission Specific Data Level 1.	38	Various
ngaMissionSpecificData2	MSD 2	NGA Mission Specific Data Level 2.	39	Various
ngaMissionSpecificData3	MSD 3	NGA Mission Specific Data Level 3.	40	Various
ngaMissionSpecificData4	MSD 4	NGA Mission Specific Data Level 4.	41	Various
ngaMissionSpecificData5	MSD 5	NGA Mission Specific Data Level 5.	42	Various
usModernizedIntegratedDB	MIDB	(US) Modernized Integrated Data Base.	43	<Blank>
nativeData	Native Data	Native data source.	44	Various
nativeMap	Native Map	Native map source.	45	Various
ngaMedicalFacilities	Medical Facilities	NGA GIS medical facilities database.	46	Various
ngaNominalAttTopoEvalMap	NATE	NGA Nominally Attributed Topographic Evaluation map.	47	50,000
ngaPlanningGraphic	Planning Graphic	NGA Planning Graphic.	48	Various
usShuttleRadarTopoMission	SRTM	(US) Shuttle Radar Topographic Mission.	50	Various
siteMap	Site Map	Site map (for example: at a nuclear facility).	51	Various
unitedNationsData	UN Data	United Nations data.	59	Various
ngaUrbanVectorMap	UVMap	NGA Urban Vector Map.	60	Various
ngaVectorInterimTerrain	VITD	NGA Vector Interim Terrain Data.	61	50,000
ngaVectorMap0	VMap 0	NGA Vector Map Level 0.	62	1,000,000
ngaVectorMap1	VMap 1	NGA Vector Map Level 1.	63	250,000
ngaVectorMap2	VMap 2	NGA Vector Map Level 2.	64	50,000
ngaWorldVectorShorePlus	WVS Plus	NGA World Vector Shoreline Plus.	65	250,000 to 120,000,000
spotHrgDtm	SPOT HRG Digital	SPOT 5 High Resolution Geometric (HRG) Digital Terrain	85	25,000 to 50,000

ShortName	Name	Definition	Code	Scale
	Terrain Model	Model (DTM) of unspecified resolution.		
vectorData	Vector Data	Vector data of unspecified scale.	92	<Blank>
vectorData25k	1:25k Vector Data	1:25,000 scale vector data.	93	25,000
vectorData50k	1:50k Vector Data	1:50,000 scale vector data.	94	50,000
vectorData100k	1:100k Vector Data	1:100,000 scale vector data.	95	100,000
veryHighResCommMonoImage	Very High Resolution Commercial Monoscopic Imagery	Commercial monoscopic imagery with a resolution equal or better than 1 metre.	110	<=10,000
veryHighResCommStereoImage	Very High Resolution Commercial Stereoscopic Imagery	Commercial stereoscopic imagery with a resolution equal or better than 1 metre.	111	<=10,000
highResCommMonoImage	High Resolution Commercial Monoscopic Imagery	Commercial monoscopic imagery with a resolution more than 1 metre up to 5 metre.	112	10,001 to 50,000
highResCommStereoImage	High Resolution Commercial Stereoscopic Imagery	Commercial stereoscopic imagery with a resolution more than 1 metre up to 5 metre.	113	10,001 to 50,000
mediumResCommMonoImage	Medium Resolution Commercial Monoscopic Imagery	Commercial monoscopic imagery with a resolution lower than 5 metre.	114	50,001 to 150,000
mediumResCommStereoImage	Medium Resolution Commercial Stereoscopic Imagery	Commercial stereoscopic imagery with a resolution lower than 5 metre.	115	50,001 to 150,000
lowResCommMonoImage	Low Resolution Commercial Monoscopic Imagery	Commercial monoscopic imagery with a resolution lower than 15 metre.	116	>150,000
lowResCommStereoImage	Low Resolution Commercial Stereoscopic Imagery	Commercial stereoscopic imagery with a resolution lower than 15 metre.	117	>150,000
mapOneToTwentyFiveK	Map 1:25k	1:25,000 scale topographic or thematic map.	118	25,000
mapOneToFiftyK	Map 1:50k	1:50,000 scale topographic or thematic map.	119	50,000

ShortName	Name	Definition	Code	Scale
mapOneToHundredK	Map 1:100k	1:100,000 scale topographic or thematic map.	120	100,000
routingData	Routing Data	Routing data for navigation on roads. (For example, distributed by NAVTEQ or Teleatlas.)	121	Various
MULT	Multiple	The attribute has more than one known value.	996	<Blank>
N_P	Unpopulated	The attribute value exists, but due to policy considerations it cannot be given.	997	<Blank>
other	Other	The attribute value is known, but is not currently a valid member of the attribute range. (The actual value may have been previously, or may become in the future, a valid member of the attribute range.)	999	Various
noInformation	No information	The attribute value is unknown.	-99999999	<Blank>

Annex G-5 Vertical Source Type Category

The following values are used to document how the Z coordinate value for a feature was determined. Codes values are aligned with the enumerated values for the VSC (Vertical Source Category) attribute.

ShortName	Name	Definition	Code
interpolatedDted1	DTED 1	Determined by interpolation of DTED Level 1 (3 arc second) data.	1
interpolatedDted2	DTED 2	Determined by interpolation of DTED Level 2 (1 arc second) data.	2
noElevations	No Elevations	No elevation values are present; the data set is two-dimensional.	3
reflectiveSurface	Reflective Surface	Determined from analysis of reflective surface data (for example: first return LiDAR or IFSAR).	4
stereoscopicImagery	Stereoscopic Imagery	Determined by analysis of stereoscopic imagery.	5
tinData	TIN Data	Determined by interpolation of Triangulated Irregular Network (TIN) data.	6
other	Other	The attribute value is known, but is not currently a valid member of the attribute range. (The actual value may have been previously, or may become in the future, a valid member of the attribute range.)	999
noInformation	No information	The attribute value is unknown.	-9999999

Annex G-6 Accuracy Evaluation Method

The following list of values is used to document Accuracy Evaluation Methods used in determining the documented positional accuracy of the data. These codes are aligned with the enumerated values for the AHM (Absolute Horizontal Accuracy Evaluation Method) and AVM (Absolute Vertical Accuracy Evaluation Method) attributes.

Short Name	Name	Definition	Code
geodeticSurveyAdequate	Geodetic Survey Adequate	Geodetic survey control - adequate sample.	1
geodeticSurveySmall	Geodetic Survey Small	Geodetic survey control - small sample.	2
photogrammGdasAdequate	Photogrammetric GDAS Adequate	Photogrammetric control (GDAS II) - adequate sample.	4
photogrammGdasSmall	Photogrammetric GDAS Small	Photogrammetric control (GDAS II) - small sample.	5
productSpecification	Product Specification	Product specification accuracy value - assumed adequate sample.	15
evaluationDeferred	Evaluation Deferred	Evaluation deferred (no measurement).	21
notApplicable	Not Applicable	There is no possible value in the attribute range that would be applicable. (May occur when the attribute is not applicable to the feature type (for example: the Airfield Type attribute of a Settlement feature type).)	998
noInformation	No information	The attribute value is unknown.	-9999999