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**NORTH AMERICAN PROFILE OF ISO 19115:2003 —
GEOGRAPHIC INFORMATION — METADATA
(NAP — METADATA)**

CETTE NORME NATIONALE DU CANADA EST DISPONIBLE EN VERSIONS
FRANÇAISE ET ANGLAISE.

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**NORTH AMERICAN PROFILE OF ISO 19115:2003 — GEOGRAPHIC INFORMATION —
METADATA (NAP — METADATA)****PREFACE**

This National Standard of Canada — North American Profile of ISO 19115:2003 — Geographic Information — Metadata (NAP — Metadata) and its sister profile the American National Standard — North American Profile of ISO 19115:2003 — Geographic Information — Metadata, is the first publication of this content-identical document. This Profile is a subset of the ISO 19115 — Geographic Information — Metadata, Edition 1, complying with ISO 19106 — Geographic Information — Profiles. The goal of this Profile is to provide a mechanism for organizations producing geographic information to describe datasets in detail. The Profile helps users to better understand geographic metadata, the assumptions and limitations of geographic information, and facilitates the search for proper information to fit users' needs. The North American Profile of ISO 19115:2003 — Geographic Information — Metadata was prepared to meet the specific geographic needs of data producers and users in the Canada and U.S.

This standard was developed by the Committee of Geomatics of the Canadian General Standards Board and Technical Committee INCITS (InterNational Committee for Information Technology Standards) L1 of Accredited Standards Committee INCITS under agreement between both technical committees beginning in September 2005 and continuing to adoption in 2009.

The Profile has eight clauses and six annexes. It also includes a Bibliography, which contains a list of informative references. Clause 1 sets the scope of the Profile. Clause 2 identifies the normative references. Clause 3 provides terms and definitions. Clause 4 provides information to use the Profile. Clause 5 describes the metadata content and its structure. Clause 6 give the details on the handling cultural and linguistic adaptability. Clause 7 gives details on code lists. Clause 8 provides the details on extending the profile. Annex A, Metadata Schemas, provides normative diagrams describing metadata element of this profile in the Unified Modeling Language (UML). These diagrams are based on those of ISO 19115:2003 — Geographic information — Metadata. They provide "views," which are portions of the complete model, that defines a metadata section (UML package) of related entities, elements, data types, and code lists. Annex B, Data Types, a normative annex, provides definitions for the 26 data types used in the Profile. Annex C, Conformance Causes, a normative annex, provides the tests, for metadata instance documents, for consideration of conformance with the Profile. Annex D, List of NAP — Metadata Code Lists, an informative annex, lists the code lists and enumerations that are referred by metadata elements. Annex E, Metadata Implementation, an informative annex, provides an overview and some examples of how to encode the metadata elements listed in this Profile. Annex F, Transformation from/to NAP — Metadata, an informative annex, provides information on the three major metadata standards that were the foundations for the Canada and U.S. implementations prior to the North American Profile.

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NORTH AMERICAN PROFILE OF ISO 19115:2003 — GEOGRAPHIC INFORMATION —
METADATA (NAP — METADATA)

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**NORTH AMERICAN PROFILE OF ISO19115:2003 — GEOGRAPHIC INFORMATION —
METADATA (NAP — METADATA)****INTRODUCTION**

Digital geographic information has been captured and used for more than three decades in different disciplines: natural resources, transportation, disaster, security, economy, land management, etc. Many organizations have contributed to this immense collection of geographic information, which is more and more available on the Internet through Web services. Geographic metadata provides a mechanism for organizations producing geographic information to describe datasets in detail. Users at different levels can access geographic metadata to better understand the assumptions and limitations of the information and facilitate the search for proper information to fit their needs.

Standards for geographic metadata provide a common framework for documenting geographic information in terms of terminology, definition, and structure. In 1995, the Canadian General Standard Board published the Directory Information Describing Geo-referenced Datasets which introduced a standardized metadata content for the description of geographic datasets. In 1998, the Federal Geographic Data Committee introduced the Content Standard for Digital Geospatial Metadata which specifies a set of metadata elements and its structure for the representation of geographic datasets. More recently ISO 19115:2003 — Geographic information — Metadata, an international standard that sets the basis for the description of geographic data, has been released. This international standard provides a common framework for producing and exchanging geographic metadata between nations.

In this context, the United States of America and Canada have agreed to revise their respective metadata standards and develop a common profile of ISO 19115:2003 — Geographic information — Metadata. North American Profile of ISO 19115:2003 — Geographic information — Metadata (NAP — Metadata) will enhance interoperability of geographic information metadata in North America.

Major uses of geographic metadata are:

- to maintain an organization's internal inventory of geographic information;
- to improve the organization and management of geographic information metadata;
- to provide information about an organization's geographic data holdings within geographic data catalogues, clearinghouses, and brokerages, geographic information discovery portals; and
- to provide information needed to process and interpret data to be received through a transfer from an external source.

The information included in the standard supports the following use:

- discovery — data needed to identify and locate the sets of geographic data that exist for a geographic location;
- access — data needed to acquire an identified set of geographic data;
- fitness for use — data needed to determine if a set of geographic data meets the user's need and to support the user in applying the geographic information appropriately; and
- transfer — data needed to obtain a copy of a set of geographic data.

The North American Profile of ISO 19115:2003 — Geographic information — Metadata is organized as follows:

- a) Scope (clause 1);
- b) Normative references (clause 2);

- c) Terms and definitions (clause 3);
- d) Notation, symbols and abbreviated terms (clause 4);
- e) Metadata content (clause 5);
- f) Cultural and linguistic adaptability (clause 6);
- g) Code lists (clause 7)
- h) Extending the profile (clause 8).

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**NORTH AMERICAN PROFILE OF ISO19115:2003 - GEOGRAPHIC INFORMATION
– METADATA (NAP – METADATA)****1 Scope**

The North American Profile of ISO 19115:2003 Geographic information – Metadata is intended to identify geospatial metadata that are needed for North American organizations to describe their geospatial data, including dataset and dataset series, and related Web services. It is based on ISO 19115:2003 Geographic information – Metadata and ISO 19106:2004 Geographic information – Profiles. It also includes service metadata from ISO 19119:2005 Geographic information – Services and implementation perspectives from ISO/TS 19139:2007 Geographic information – Metadata – XML schema implementation. As outlined in ISO 19106:2004 Geographic Information – Profiles, it satisfies conformance Class 1 since it defines a pure subset of ISO 19115:2003 Geographic information – Metadata and ISO 19119:2005 Geographic information – Services. Retained metadata elements have been selected to enhance discovery of geographic information within North America and to minimize authorized duplications. The extension of code lists is also intended to support to geographic information discovery. Annex A provides the adjustments made to the ISO 19115:2003 Geographic information – Metadata and ISO 19119:2005 Geographic information – Services UML models.

This profile intends to be an inclusive document addressing ISO 19115:2003 Geographic information – Metadata and the accepted modifications. It is presented in a manner to support the consistent capture and use of geospatial metadata. As such, it includes best practices to guide data providers in capturing geospatial metadata. To that end, it supports interoperability of geospatial information as it provides a common framework for the description and representation of metadata. In addition, this profile provides a mechanism to support cultural and linguistic adaptability by enabling representation of free text in multiple languages and by introducing a metadata register describing metadata in multiple languages (e.g. English and French) compliant to ISO 19135:2005 Geographic information – Procedures for item registration.

Note: Parts of ISO 19110:2005 Geographic information – Methodology for feature cataloguing and ISO/FDIS19111rev. Geographic information – Spatial referencing by coordinates are covered as needed.

2 Normative References

- ISO 639-2:1998, Codes for the representation of names of languages - Part 2: alpha-3 code
- ISO 3166-1:2006, Codes for the representation of names of countries and their subdivisions - Part 1: Country codes
- ISO 4217:2008, Codes for the representation of currencies and funds
- ISO/TS 19103:2005, Geographic information - Conceptual schema language
- ISO 19106:2004, Geographic information – Profiles
- ISO 19107:2003, Geographic Information – Spatial schema
- ISO 19108:2002, Geographic Information – Temporal schema
- ISO 19109:2005, Geographic Information – Rules for application schema
- ISO 19110:2005, Geographic Information – Methodology for feature cataloguing
- ISO 19111:2007, Geographic information – Spatial referencing by coordinates
- ISO 19113:2002, Geographic Information – Quality principles
- ISO 19114:2003, Geographic Information – Quality evaluation procedures
- ISO 19115:2003, Geographic information – Metadata
- ISO 19115:2003/Cor.1:2006, Geographic information – Metadata, Technical corrigendum 1
- ISO 19118:2005, Geographic information – Encoding
- ISO 19119:2005, Geographic information – Services
- ISO 19119:2005/ Amd 1:2008, Extensions of the service metadata model
- ISO/TS 19127:2005 Geographic information – Geodetic codes and parameters
- ISO 19133:2005, Geographic Information – Location-based services – Tracking and navigation
- ISO 19135:2005, Geographic information – Procedures for item registration
- ISO 19136:2007, Geographic information – Geography Markup Language
- ISO/TS 19139:2007, Geographic information – Metadata - XML schema implementation
- OGC 05-008, OpenGIS® Web Services Common Specification

3 Terms and Definitions

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

3.1

aggregate dataset

a dataset which is comprised of two or more component datasets

Note: An aggregate dataset may inherit one or more characteristics.

3.2

application profile

identification of clauses, classes, subsets, options, and **parameters** from base standards that are necessary for accomplishing a particular function

3.3

application schema

conceptual schema for data required by one or more applications

[ISO 19101]

3.4

attribute

named property of an entity

[ISO/IEC2382]

3.5

class

description of a set of objects that share the same **attributes**, **operations**, **methods**, relationships, and semantics

[ISO/TS 19103]

3.6

client

software component that can invoke an **operation** from a **server**

[ISO 19128]

3.7

conceptual model

model that defines concepts of a universe of discourse

[ISO 19101]

3.8

conceptual schema

formal description of a **conceptual model**

[ISO 19101]

3.9

data

reinterpretable representation of information in a formalized manner suitable for communication, interpretation, or processing

[ISO/IEC 2382-1:1993]

3.10

dataset

identifiable collection of data

[ISO 19115]

3.11

dataset series

collection of **datasets** sharing the same product specification

[ISO 19115]

3.12

dimension

variable required to represent a position in the space. For example, two variables – x and y – are needed to locate a point on a plane (e.g. a building on a City map)

3.13

feature

abstraction of real world phenomena

[ISO 19101]

3.14

feature type

abstraction of the whole collection of real world phenomena that are classified into one concept

3.15

geographic data

data with implicit or explicit reference to a location relative to the Earth

[ISO 19109]

NOTE Geographic information is also used as a term for information concerning phenomena implicitly or explicitly associated with a location relative to the Earth.

3.16

geographic dataset

dataset with features depicted with implicit or explicit reference to a location relative to the Earth

3.17

geographic information

information concerning phenomena implicitly or explicitly associated with a location relative to the Earth

[ISO 19101]

3.18

identifier

linguistically independent sequence of characters capable of uniquely and permanently identifying that with which it is associated

[ISO 19135]

3.19

instantiable/non-instantiable

capable /or not to represent (an abstraction) by the creation of a concrete instance or to create the ability to create an instance

[adapted from ISO 19133]

3.20

interface

named set of **operations** that characterize the behaviour of an entity

[ISO 19119]

3.21

metaclass

a **class** whose instances are **classes**

3.22

metadata component

a constituent part of a **metadata main item** or a **metadata subitem**. It can specialize or aggregate another **metadata component**

3.23

metadata element

a discrete unit of metadata

[ISO 19115]

3.24

metadata entity

a set of **metadata elements** describing the same aspect of data

[ISO 19115]

Note: It consists of a set of attributes which describes an aspect of a resource [NAP - Metadata clarification of ISO 19115].

3.25

metadata main item

metadata element which is of primary interest in the context

3.26

metadata subitem

a subordinate of a **metadata main item**

3.27

metadata schema

conceptual schema describing metadata

[ISO 19101]

3.28

metadata section

subset of metadata that defines a collection of related metadata entities and elements

[ISO 19115]

3.29

method

implementation of an **operation**

3.30

multiplicity

specification of the range of allowable cardinalities that a set may assume

3.31

namespace

unique identifier of a set of names so that there is no ambiguity when objects having different origins but the same names are mixed together. In XML, a namespace is identified by a URI reference

3.32

operation

specification of a transformation or query that an object may be called to execute

[ISO 19119]

3.33

parameter

variable used to express a value in an operation **request** or **response**

3.34

portrayal

presentation of information to humans

[ISO 19117]

3.35

portrayal catalogue

collection of all defined **portrayals**

[ISO 19117]

3.36

register

set of files containing **identifiers** assigned to items with descriptions of the associated items

[ISO 19135]

3.37

request

invocation of an **operation** by a **client**

[ISO 19128]

3.38

resource

asset or means that fulfills a requirement

Example dataset, service, document, person, organization, etc.

[ISO 19115]

3.39

response

result of an **operation** returned from a **server** to a **client**

[ISO 19132]

3.40

schema

formal description of a model

[ISO 19101]

3.41

server

a particular instance of a **service**

[ISO 19128]

3.42

service

distinct part of the functionality that is provided by an entity through **interfaces**

[ISO 19119]

Withdrawn/Retirée

4 Using this profile

4.1 Introduction

Clause 5 constitutes the substance of this profile since it depicts the content of a metadata file that fulfils the profile. The content is presented using diagrams and tables.

Diagrams are meant to be overviews of the content of this profile. They do not convey all of the details included in the tables, but are useful to support the understanding of the content and the structure of the Profile. The notation that is used in diagrams is documented in the notation clause below (clause 4.2).

Tables constitute the normative part of the Profile; they describe the detailed content. Each metadata item has these attributes: a specific clause number, a name or role name, an indicator of multiplicity, an indicator of the type of data in which the item is expressed (see below), a description, and a statement of best practices relevant for metadata capture, as illustrated below:

Clause No.	Name/RoleName	Multiplicity	Type	Description	Best Practices
5.2.1	fileIdentifier	M	free text (CharacterString)	A unique phrase or string which uniquely identifies the metadata file.	Each metadata record shall have a unique identifier, such as a universal unique identifier (UUID), to distinguish it from other resources.

To distinguish among the levels of clauses presented in the tables, rows containing third level clauses are shaded in light grey whereas of fourth level clauses are not shaded. This help to distinguish between attributes and classes, which serve as datatypes for attributes or components.

The **Clause Number** is a unique and persistent reference number assigned to each element or class described in the tables.

Name/RoleName

- **Attribute names** begin with a lowercase letter (e.g. fileIdentifier). Typically, an attribute is of basic type as documented in annex B, e.g. the metadata attribute fileIdentifier is of the type free text (or CharacterString). But in some cases, it refers to a metadata class, e.g. the metadata *contact* attribute refers to the CI_ResponsibleParty class.
- **Component names** begin with a capital letter (e.g. Identification Information) and always refer to a metadata class, e.g. the metadata Identification Information component refers to the metadata classes identified as MD_DataIdentification and SV_ServiceIdentification. Consequently, an attribute of a given name (e.g. citation) may refer to a class of a same name (e.g. Citation) but capitalized differently. In the content clause, a component is usually introduced in a third level clause.

Multiplicity indicates both whether a clause is mandatory or not, and the number of occurrences allowed. The table below lists the notation that may occur in this field, along with its meaning.

Notation	Meaning	Number of Occurrences
O	Optional, Maximum 1	0..1
M	Mandatory, Maximum 1	1
C	Conditional, Maximum 1	0..1 but could be mandatory (1..1) under certain conditions
O,Repeatable	Optional, Repeatable	0..N
M,Repeatable	Mandatory, Repeatable	1..N
C,Repeatable	Conditional, Repeatable	0..N but could be mandatory (1..N) under certain conditions

The **Type** element may contain one of several subtypes of information:

- When the clause identifies an item of metadata, this attribute designates one of the data types identified in normative Annex B; some common types are CharacterString, Date, Boolean, Integer, etc.
- When the clause identifies an item of metadata for which a coded domain is defined, the name of the NAP – Metadata code list is presented. NAP – Metadata code lists do not contain entries for "Other" or "Miscellaneous," and do not allow use of free text. NAP – Metadata users should understand that code lists are extendable; specific communities may use other values as long as they are documented in a register accessible on Internet. The ISO/TS 19139 XML encoding used with the NAP – Metadata profile provides the mechanism to refer to a specific register available for user communities (see clause 7).
- When the clause identifies a metadata component, the name of the abstract class is presented, as well as the clause in which that class is implemented in the following manner:

Only instantiable classes are described in table (dictionary) clauses; i.e. abstract classes are not described in the tables. Rather, they are represented in the diagrams, with references to the clauses which describe the instantiable classes of which they consist. A reference example may be considered: section 5.3 Identification information (MD_Identification) is an abstract class and, as such, is reported either via 5.3.1 Data Identification (MD_DataIdentification) or 5.3.2 Service Identification (MD_ServiceIdentification) – depending on the method to make the resource available. The relevant tables describe element 5.3.1.1 (and following) and 5.3.2.1 (and following), which are the instantiable elements which make up these classes.

The **Description** element contains a brief narrative definition or explanation of the clause.

The **Best Practices** element includes information which is intended as commentary of possible use to implementers and users of NAP – Metadata. It is not intended to be exhaustive but provides additional information to ensure a standardized use of metadata items.

4.2 Notation

Diagrams of this profile are intended to be overviews of the content that support the readability of the standard. However, users must always refer to associated tables to get details of each metadata element. Figure 1 shows how diagrams are presented.

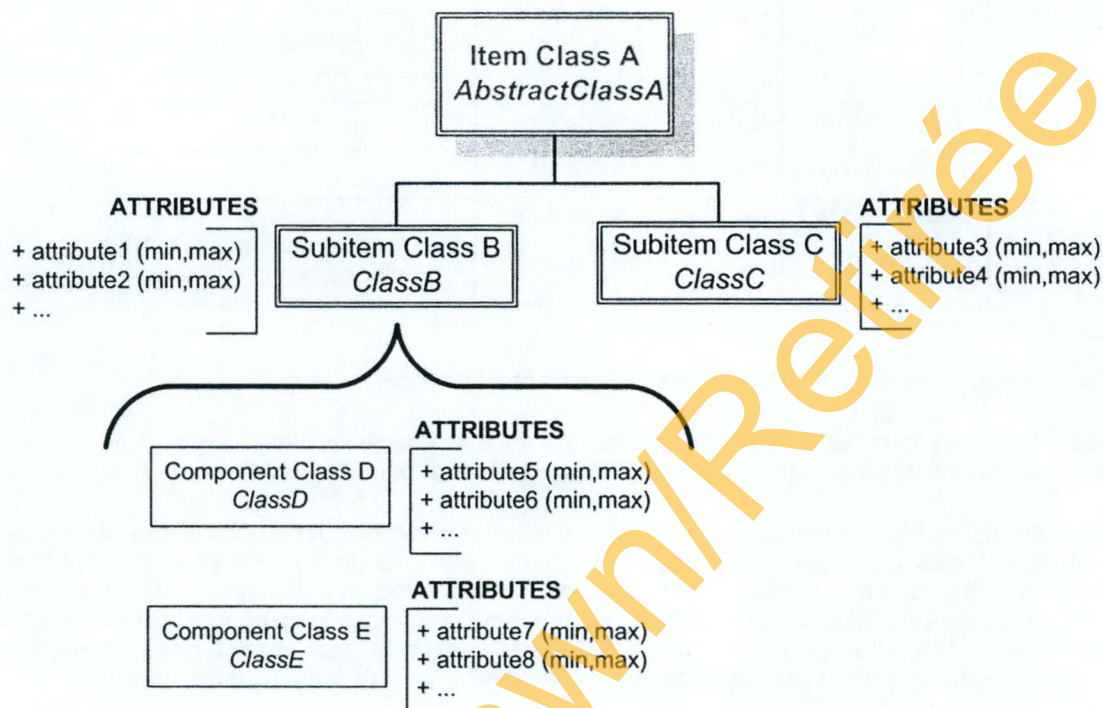
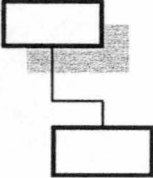


Figure 1: Presentation of diagrams

Diagrams are directly convertible to the formal UML notation used in the referenced ISO documents. The notation used in the diagrams is described as follows:

<div> Metadata Item Name <i>Type Name</i> </div>	<p>An instantiable metadata main item class and its type. It is used for root and main metadata items in diagrams.</p> <p>Note: In UML, this could refer to a root aggregate class or superclass.</p>
<div> Metadata Item Name <i>Abstract Type Name</i> </div>	<p>A non-instantiable metadata main item class and its abstract type. It is used for root and main metadata items in diagrams.</p> <p>Note: In UML, this could refer to a root aggregate class or superclass.</p>
<div> Metadata Subitem Name <i>Type Name</i> </div>	<p>An instantiable metadata subitem class and its type.</p> <p>Note: In UML, this refers to a subclass.</p>

<div> <div>Metadata Subitem Name</div> <div>Abstract Type Name</div> </div>	<p>A non-instantiable metadata subitem class and its abstract type.</p> <p>Note: In UML, this refers to an abstract subclass.</p>
<div> <div>Metadata Component Name (min, max)</div> <div>Type Name</div> </div>	<p>An instantiable metadata component class, its multiplicity (optional), and its type. A metadata component class is a component of a metadata item (main and sub) class. It can specialize or aggregate another metadata component class.</p> <p>Note: In UML, this refers to a class and its role to another class.</p>
<div> <div>Metadata Component Name (min, max)</div> <div>Abstract Type Name</div> </div>	<p>A non-instantiable metadata component class, its multiplicity (optional), and its type. A metadata component class is a component of a metadata item (main and sub) class. It can specialize or aggregate another metadata component class.</p> <p>Note: In UML, this refers to an abstract class and its role to another class.</p>
<div> <div>ATTRIBUTES</div> <div> <div>+ attribute1 (min, max)</div> <div>+ attribute2 (min, max)</div> <div>+ attribute3 (min, max)</div> <div>+ ...</div> </div> </div>	<p>List of attributes of a metadata item class or metadata component class. It includes the multiplicity of each attribute.</p> <p>Note: In UML, this refers to an attribute with its multiplicity.</p>
	<p>Inclusion of metadata components.</p> <p>Note: In UML, this refers to an aggregation relationship.</p>
	<p>A metadata item class inheritance relationship.</p> <p>Note: In UML, this refers to generalisation or inheritance relationship.</p>
	<p>An and/or operator specifying that either one or a combination of items or components can be used.</p> <p>Note: In UML, this refers to an overlapping constraint in a generalization relationship.</p>
<div>(min, max)</div>	<p>Multiplicity of a metadata component class or attribute. It specifies the minimum and maximum number of occurrences that can be used:</p> <ul style="list-style-type: none"> (O) Optional, maximum 1 (M) Mandatory, maximum 1 (C) Conditional, maximum 1 (O, *) Optional, Repeatable (M, *) Mandatory, Repeatable (C, *) Conditional, Repeatable <p>Mandatory: obligation to provide the information. Conditional: obligation to provide the information subject to a predefined rule. Optional: freedom to provide or not the information.</p>

	Note: In UML, this refers to multiplicity.
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Additionally, best practices document the structure and format of some free text fields when they include multiple information. The notation used is as follow:

Field Element:	Description:
<aValue>	A value of the type specified within the angle brackets. For example, "fra" is an acceptable value for <ISO 639-2/T three letter language code>.
<;>	A character specified within the angle brackets typically used to separate values. <;> stands for a semicolon separator.
<blank space>	A blank space character as specified within the angle brackets.
{ }	A content part of the free text field that is optional. It may include values, separators, or blank spaces.

4.3 Symbols and Abbreviated Terms

BP	Best Practice
CI_	Citation
DC	Dublin Core
DCMI	Dublin Core Metadata Initiative
DQ_	Data Quality
DS_	Dataset
FGDC	Federal Geographic Data Committee
EX_	Extent
GF_	Geographic Feature
GML	Geography Markup Language
GM_	Geometry
HTTP	HyperText Transfer Protocol
ISO	International Organization for Standardization
LI_	Lineage
MD_	Metadata
NAP – Metadata	North American Profile of ISO 19115:2003 Geographic information – Metadata
OGC	Open Geospatial Consortium Inc.

PT_	Plain Text
RS_	Reference System
SC_	Spatial Coordinate
SV_	Service
TM_	Time
UML	Unified Modeling Language
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
UTF-8	Unicode Transformation Format-8
XML	Extensible Markup Language
XSD	XML Schema Definition
XSL	Extensible Stylesheet Language
XSLT	XSL Transformation
WMS	Web Map Service

5 Metadata Content

5.1 Introduction

This clause presents the metadata elements of NAP – Metadata. It begins with the description of the overall metadata record information, which is the root of a metadata description, and is followed by the various attributes and components that are included in it. Either attributes or components are described by simple types (e.g. integer, free text, etc.) or types composed of other attributes and components. The designation of metadata elements is according to ISO 19115:2003 Geographic information – Metadata and ISO 19119:2005 Geographic information – Services.

Annex A provides the UML representation of the metadata elements of this profile including the adjustments made to ISO 19115:2003 Geographic information – Metadata and ISO 19119:2005 Geographic information – Services.

Clause 6, Cultural and Linguistic Adaptability, introduces the authoritative repository (clause 6.3) used to host the metadata items used within the NAP Metadata Profile. This register supports not only each item used within this document, but also provides code list values referenced within this document, this in the various languages supported by the register.

5.2 Metadata Record Information

This section consists in the root of the metadata description. It provides information on the metadata record (5.2.1 – 5.2.9, 5.2.11, 5.2.13, and 5.2.15) and on related resources (5.2.10, 5.2.12, 5.2.14, 5.2.16 – 5.2.21), i.e. datasets and/or services. Attributes and components are presented here briefly and later fully described beginning in 5.3.

Type: MD_Metadata

Description: Information which describes the metadata and the components to describe the resource.

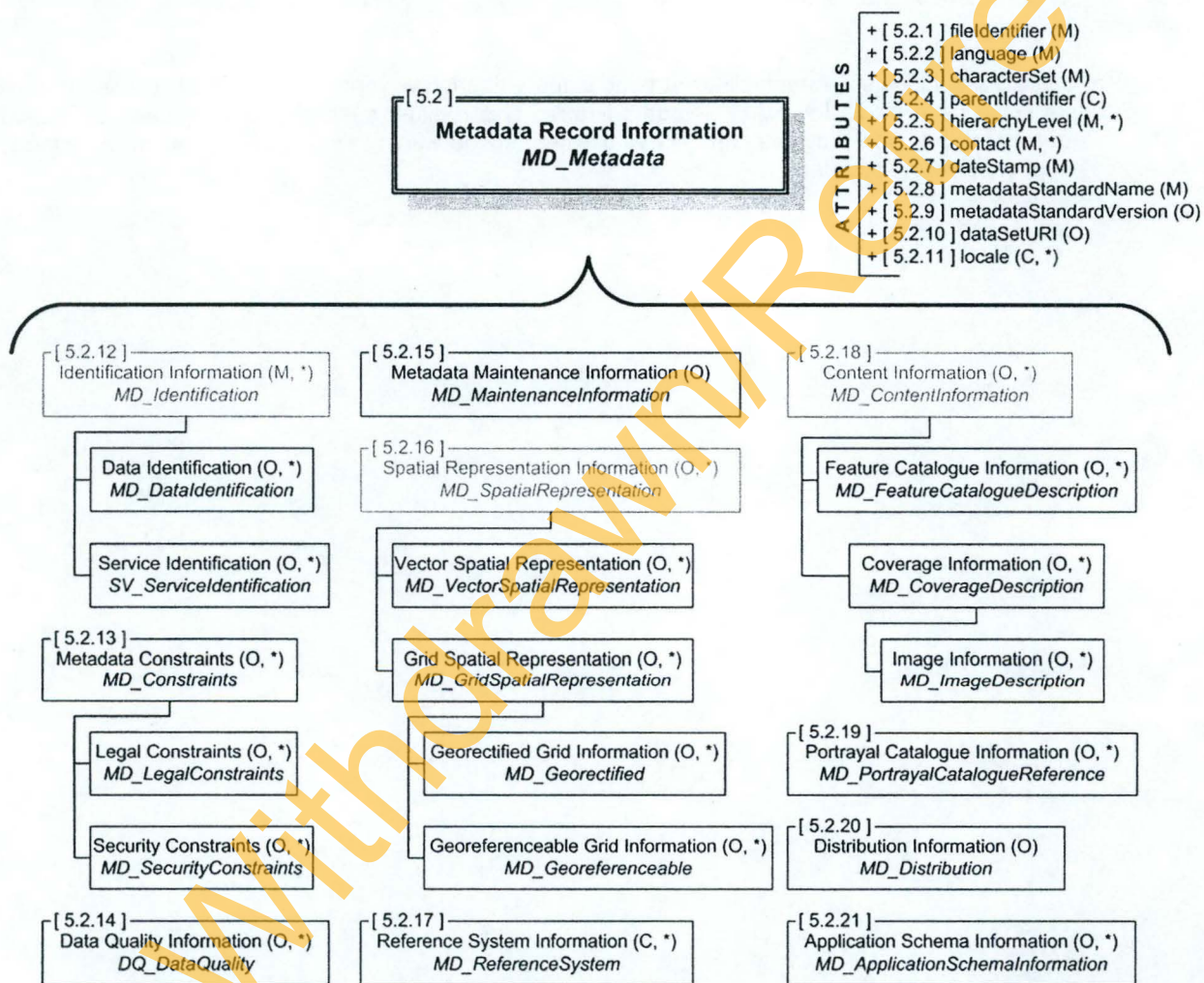


Figure 2: Metadata record information

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.2.1	fileIdentifier	M	free text (CharacterString)	A unique phrase or string which uniquely identifies the metadata file.	Each metadata record shall have a unique identifier, such as a universal unique identifier (UUID), to distinguish it from other resources.
5.2.2	language	M	free text (CharacterString)	Language of the metadata composed of an ISO 639-2/T three letter language code and an ISO 3166-1 three letter country code.	<p>The language code and country code are documented in the following manner: <ISO 639-2/T three letter language code><;><blank space><ISO 3166-1 three letter country code></p> <p>Language code is given in lowercase. Country code is given in uppercase. e.g. fra; CAN</p> <p>This attribute constitutes the primary language of free text attributes. When more than one language is used in the metadata, then the attribute <i>locale</i> (5.2.11) is mandatory. See also clause 6.2.</p> <p>Note: see http://www.loc.gov/standards/ISO_639-2/php/English_list.php for ISO 639-2/T language codes; see http://userpage.chemie.fu-berlin.de/diverse/doc/ISO_3166.html for ISO 3166-1 country codes.</p>
5.2.3	characterSet	M	CodeList napMD_CharacterSetCode	Character coding standard in the metadata.	The character set for the metadata representation is restricted to "utf8," as used for ISO/TS 19139:2007 compliant XML encoding.
5.2.4	parentIdentifier	C	free text (CharacterString)	The unique name of the file or associated fileIdentifier, related in higher hierarchy to the file.	<i>parentIdentifier</i> is documented when the hierarchy of a higher level exists. If there is more than one parent see <i>Aggregation Information</i> (5.3.1.19).

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.2.5	hierarchyLevel	M,Repeatable	CodeList napMD_ScopeCode	Level to which the metadata applies.	<p>Default repeatability is 1. If hierarchy is unknown, default value is "dataset."</p> <p>Select <i>hierarchyLevel</i> from napMD_ScopeCode.</p> <p>The parent record of a resource will most commonly be a <i>Series</i> (5.21) sharing many of the characteristics of that record such as theme, source, date, resolution, methodology, or distributor. When a parent record exists, it is not necessary to repeat all elements for each child record.</p> <p>If a record is associated with more than one parent it is recommended that the respective parents be assigned distinct hierarchy levels or defined as <i>Aggregation Information</i> (5.3.1.19).</p>
5.2.6	contact	M,Repeatable	CI_ResponsibleParty (see 5.16)	The party responsible for the metadata content.	The organization directly responsible for metadata maintenance is preferred. Contact information (5.16.4 <i>contactInfo</i>) shall be provided.
5.2.7	dateStamp	M	Date (see B.4)	Metadata creation date.	Date of metadata creation; if modified, the last metadata update.
5.2.8	metadataStandardName	M	free text (CharacterString)	Name of the metadata standard/profile used.	Default value to "North American Profile of ISO 19115:2003 – Geographic information – Metadata."
5.2.9	metadataStandardVersion	O	free text (CharacterString)	Version of the metadata standard/profile used.	Default value NAP – Metadata version used.
5.2.10	dataSetURI	O	free text (CharacterString)	Uniform Resource Identifier for the dataset along with its on line function code.	<i>dataSetURI</i> is meant for metadata data files that document only one dataset. For more complex situations, the dataset URI should be documented through <i>citation</i> (5.3.1.1) in <i>Data</i>

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
					<p><i>Identification</i> (5.3.1).</p> <p>The <i>dataSetURI</i> is documented in two parts in the following manner:</p> <p><Uniform Resource Identifier><;><blank space><onLineFunctionCode></p> <p>The on line function code is optional. Select <i>onLineFunctionCode</i> from <i>napCI_OnLineFunctionCode</i>.</p> <p>e.g.;</p> <p>http://lioapp.lrc.gov.on.ca/edwin/EDWINCGI.exe?IHID=771&AgencyID=1&Theme=All_Themes;download</p>
5.2.11	locale	C,Repeatable	PT_Locale (see 6.2)	Other languages used in metadata free text description.	Mandatory when more than one language is used in free text descriptions. The character encoding (6.2) shall be set to "utf8."
5.2.12	Identification Information	M,Repeatable	MD_DataIdentification (see 5.3.1) and/or SV_ServiceIdentification (see 5.3.2)	Basic information about the dataset.	MD_Identification is an abstract class; <i>Identification Information</i> can only be represented via <i>MD_DataIdentification</i> and/or <i>SV_ServiceIdentification</i> .
5.2.13	Metadata Constraint Information	O,Repeatable	MD_Constraints (see 5.4.1) and/or MD_LegalConstraints (see 5.4.2) and/or MD_SecurityConstraints (see 5.4.3)	Describes the use, legal, and security constraints on the use of the metadata.	Multiple constraints can be reported for the metadata as needed.
5.2.14	Data Quality Information	O,Repeatable	DQ_DataQuality (see 5.5)	Data quality information for the resource.	
5.2.15	Metadata Maintenance Information	O	MD_MaintenanceInformation (see 5.6)	Information about metadata update.	
5.2.16	Spatial Representation Information	O,Repeatable	MD_GridSpatialRepresentation (see 5.7.1) and/or	Digital representation of vector and/or grid objects	MD_SpatialRepresentation is an abstract class. <i>Spatial Representation Information</i> can be

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
			MD_VectorSpatialRepresentation (see 5.7.2) and/or MD_Georectified (see 5.7.3) and/or MD_Georeferenceable (see 5.7.4)	in the dataset.	instantiated only via MD_GridSpatialRepresentation and/or MD_VectorSpatialRepresentation and/or MD_Georectified and/or MD_Georeferenceable.
5.2.17	Reference System Information	C,Repeatable	MD_ReferenceSystem (see 5.8)	Description of the spatial and/or temporal reference systems used in the dataset.	Conditional, if <i>spatialRepresentationType</i> (5.3.1.7) in <i>Data Identification</i> (5.3.1) is "vector," "grid" or "tin." Multiple instances of <i>Reference System Information</i> are authorized to describe the coordinate systems being used for coordinate representation (horizontal, vertical and/or temporal).
5.2.18	Content Information	O,Repeatable	MD_FeatureCatalogueDescription (see 5.9.1) and/or {MD_CoverageDescription (see 5.9.2) or MD_ImageDescription (see 5.9.3)}	Characteristics describing the feature catalogue, the coverage, and the image data.	MD_ContentInformation is an abstract class. Content information can only be instantiated via MD_FeatureCatalogueDescription and/or MD_CoverageDescription or MD_ImageDescription.
5.2.19	Portrayal Catalogue Information	O,Repeatable	MD_PortrayalCatalogueReference (see 5.10)	Information about the catalogue describing symbols and rules to depict a resource.	
5.2.20	Distribution Information	O	MD_Distribution (see 5.11)	Information about acquiring the dataset.	
5.2.21	Application Schema Information	O,Repeatable	MD_ApplicationSchemaInformation (see 5.12)	Information about the conceptual schema of the dataset.	

5.3 Identification Information (M,Repeatable)

Identification information is provided either via data identification or service identification depending on the method to make the resource available. Data identification uniquely identifies a data resource whereas service identification identifies a Web service that operates on a data resource. Note that metadata details in data identification (5.3.1) need not be repeated when a dataset is also provided as a service described in service identification (5.3.2) which references that dataset.

5.3.1 Data Identification (O,Repeatable)

Type: MD_DataIdentification

Description: Information which describes a dataset.

BP: *Data Identification* is required if *Service Identification* (5.3.2) is not provided.

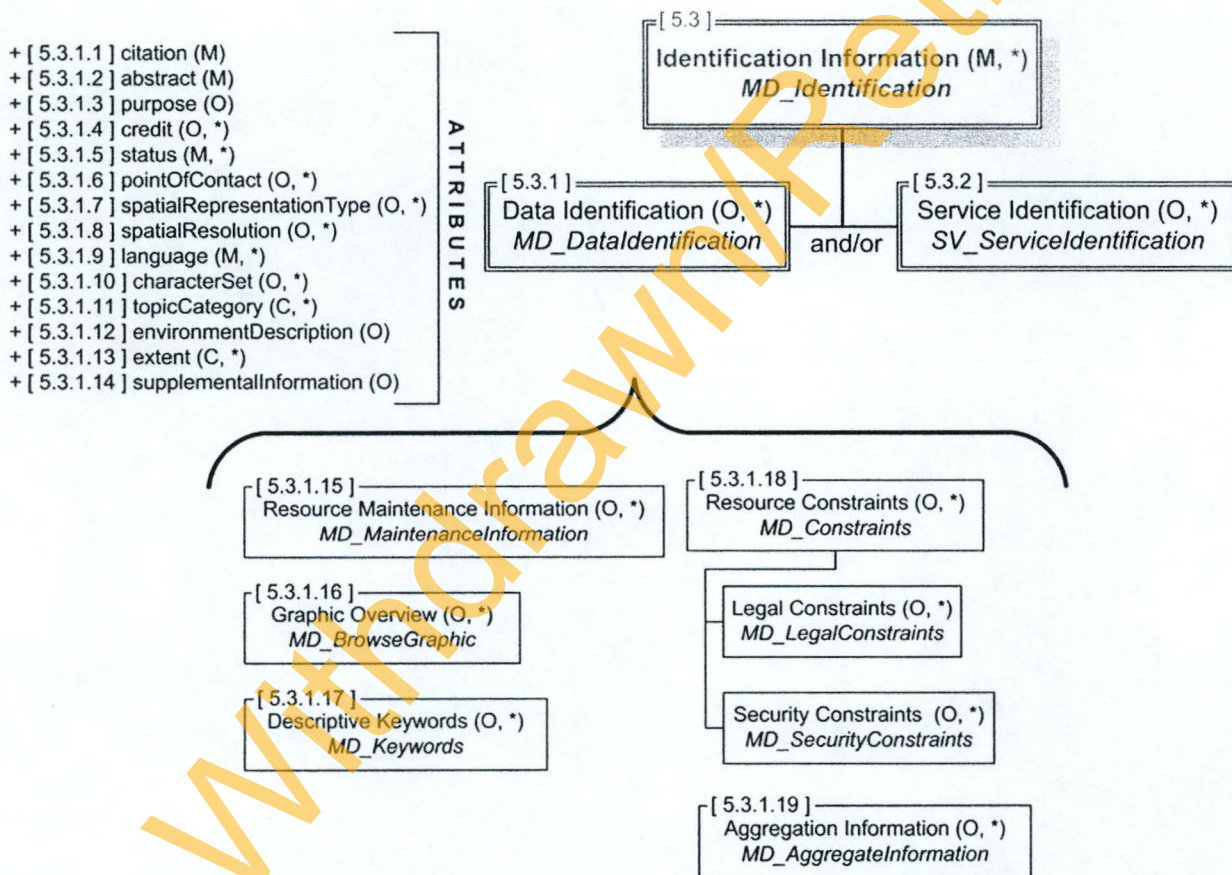


Figure 3: Data identification

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.3.1.1	citation	M	CI_Citation (see 5.14)	Citation for the dataset.	<p>The attribute <i>identifier</i> (5.14.6) in <i>Citation</i> (5.14) shall be reported in the context of data identification.</p> <p>The attribute <i>citedResponsibleParty</i> (5.14.7) in <i>Citation</i> (5.14) shall be reported at least once.</p> <p>Contact information (5.16.4 <i>contactInfo</i>) for the cited responsible party shall also be provided (e.g. at least the distributor could be identified). All metadata content elements remain valid as of the date identified in <i>dateStamp</i> (5.2.7); for example, contact information.</p> <p>The date of the resource reported in the citation (i.e. 5.14.3 <i>date</i>) corresponds to the resource's last update version according to its update frequency (5.6.1 <i>maintenanceAndUpdateFrequency</i>) and the date of next update (5.6.2 <i>dateOfNextUpdate</i>) of its previous version.</p>
5.3.1.2	abstract	M	free text (CharacterString)	Brief narrative summary of the dataset's contents.	Abstract narrative should include information on general content, thematic features (e.g., geology; climatology; etc.), and features; dataset application: GIS, CAD, image, database; geographic coverage: county/city name; time period of content: begin and end date or single date; and special data characteristics or limitations.
5.3.1.3	purpose	O	free text (CharacterString)	Summary of the intentions for which the dataset was	Purpose includes objectives for creating the dataset and what the dataset is to

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
				developed.	support.
5.3.1.4	credit	O,Repeatable	free text (CharacterString)	Recognition of those who contributed to the dataset.	
5.3.1.5	status	M,Repeatable	CodeList napMD_ProgressCode	The development phase of the dataset.	Select <i>status</i> from napMD_ProgressCode.
5.3.1.6	pointOfContact	O,Repeatable	CI_ResponsibleParty (see 5.16)	Identification and means to contact people/organizations associated with the dataset.	Contacts other than those cited under <i>citation</i> (5.3.1.1). Contact information (5.16.4 <i>contactInfo</i>) shall be provided.
5.3.1.7	spatialRepresentationType	O,Repeatable	CodeList napMD_SpatialRepresentationTypeCode	Object(s) used to represent the geographic information.	Select <i>spatialRepresentationType</i> from napMD_SpatialRepresentationTypeCode.
5.3.1.8	spatialResolution	O,Repeatable	MD_Resolution (see 5.3.3)	The level of detail of the dataset expressed as equivalent scale or ground distance.	
5.3.1.9	language	M,Repeatable	free text (CharacterString)	Languages of the dataset using standard ISO three letter codes.	Three letter language code followed by an optional three letter country code: <ISO 639-2/T three letter language code>{<;><blank space><ISO 3166-1 three letter country code>} Language code is given in lowercase. Country code is given in uppercase. e.g. eng fra; CAN This attribute constitutes the default language of the dataset. Note:

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
					see http://www.loc.gov/standards/ISO_639-2/php/English_list.php for ISO 639-2/T language codes; see http://userpage.chemie.fu-berlin.de/diverse/doc/ISO_3166.html for ISO 3166-1 country codes.
5.3.1.10	characterSet	O,Repeatable	CodeList napMD_CharacterSetCode	Character coding standard in the dataset.	The default value of the character set for the resource representation is "utf8." The character set should be reported for any resource that uses characters for its representation. Resources such as image and video for instance might not make use of character set. When dataset includes North American aboriginal languages, the character set will not usually be "utf8."
5.3.1.11	topicCategory	C,Repeatable	CodeList napMD_TopicCategoryCode	The main theme(s) of the dataset.	Select <i>topicCategory</i> from napMD_TopicCategoryCode. A <i>topicCategory</i> code shall be provided when <i>hierarchyLevel</i> (5.2.5) is set to "dataset."
5.3.1.12	environmentDescription	O	free text (CharacterString)		Describes the dataset's processing environment. Includes information such as software, computer operating system, filename, and dataset size.
5.3.1.13	extent	C,Repeatable	EX_Extent (see 5.13)	Describes the spatial (horizontal and/or vertical) and the temporal coverage in the resource.	Either <i>Geographic Bounding Box</i> (5.13.3) or <i>Geographic Description</i> (5.13.4) is required when <i>hierarchyLevel</i> (5.2.5) is set to "dataset."
5.3.1.14	supplementalInformation	O	free text (CharacterString)	Other descriptive	

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
				information about the dataset.	
5.3.1.15	Resource Maintenance Information	O,Repeatable	MD_MaintenanceInformation (see 5.6)	Describes the frequency, scope, and responsible party for updating the dataset.	
5.3.1.16	Graphic Overview	O,Repeatable	MD_BrowseGraphic (see 5.3.5)	The name of, description of, and file type of an illustration of the dataset.	
5.3.1.17	Descriptive Keywords	O,Repeatable	MD_Keywords (see 5.3.6)	Commonly used words or phrases which describe the dataset. Optionally, the keyword type and a citation for the authoritative or registered resource of the keywords are also provided.	
5.3.1.18	Resource Constraints	O,Repeatable	MD_Constraints (see 5.4.1) and/or MD_LegalConstraints (see 5.4.2) and/or MD_SecurityConstraints (see 5.4.3)	The limitations or constraints on the use of or access to the resource.	
5.3.1.19	Aggregation Information	O,Repeatable	MD_AggregateInformation (see 5.3.7)	The citation for the aggregate dataset or the name of the aggregate dataset, the type of aggregate dataset, and optionally the activity which produced the dataset.	Either the attribute <i>aggregateDataSetName</i> (5.3.7.1) or <i>aggregateDataSetIdentifier</i> (5.3.7.2) shall be reported.

5.3.2 Service Identification (O,Repeatable)

Type: SV_ServiceIdentification

Description: Service metadata describes the operation and address of an electronic geographic information delivery system.

BP: Service Identification is required if Data Identification (5.3.1) is not provided.

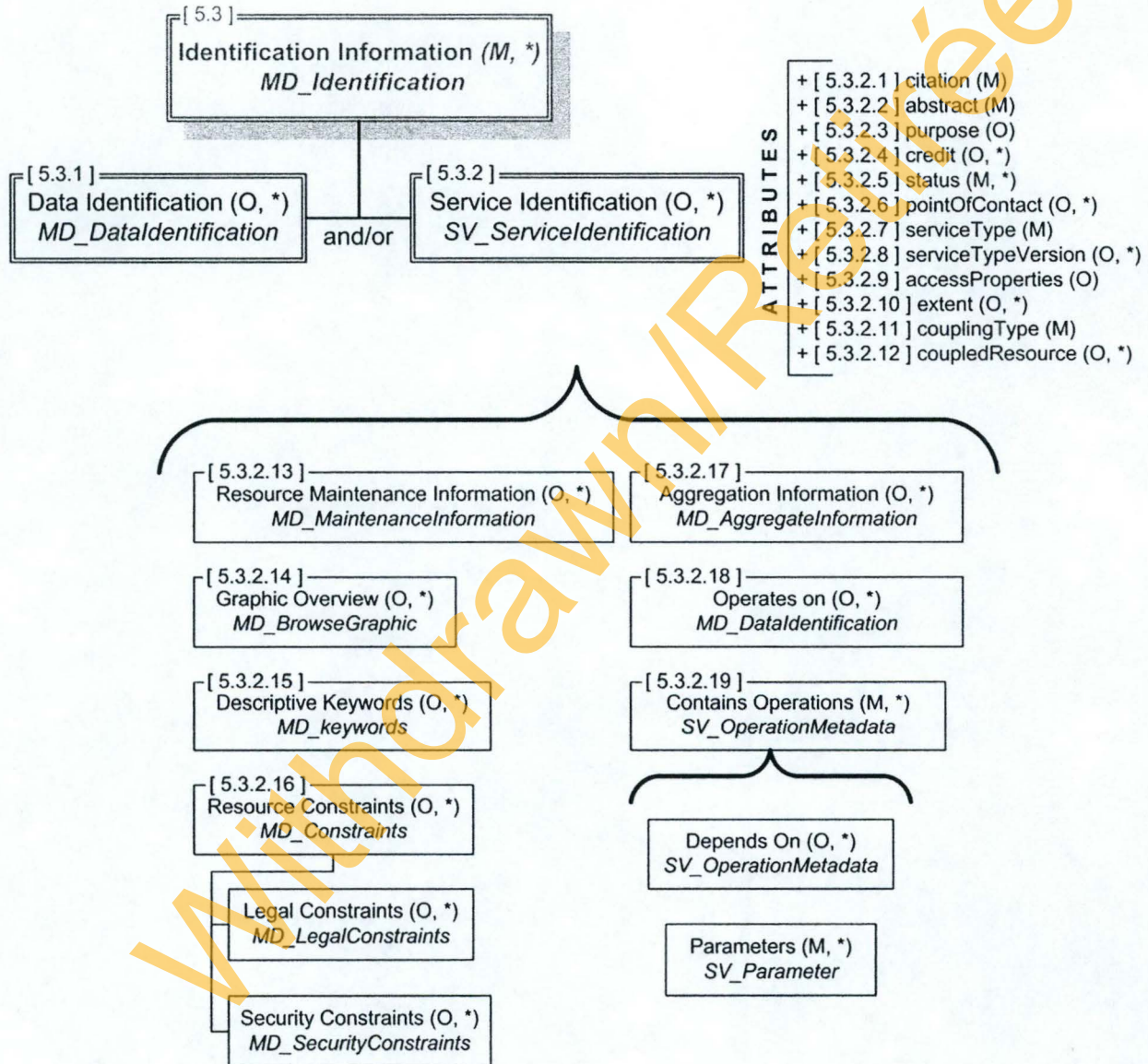


Figure 4: Service identification

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.3.2.1	citation	M	CI_Citation (see 5.14)	Citation for the service including, but not limited to title, date, edition, identifier, and responsible party.	The attribute <i>identifier</i> (5.14.6) in <i>Citation</i> (5.14) shall be reported in the context of service identification. The attribute <i>citedResponsibleParty</i> (5.14.7) in <i>Citation</i> (5.14) shall be reported at least once. Contact information (5.16.4 <i>contactInfo</i>) of the cited responsible party shall be provided.
5.3.2.2	abstract	M	free text (CharacterString)	Brief narrative summary of the service contents.	Abstract narrative should include information on general content and features; dataset application: GIS, CAD, image, database; geographic coverage: county/city name; time period of content: begin and end date or single date; and special data characteristics or limitations. Note: Many applications limit preliminary display to the first 150-200 characters of this field so critical distinguishing characteristics should be listed first.
5.3.2.3	purpose	O	free text (CharacterString)	Summary of the intentions for which the service was developed.	Purpose includes objectives for creating the service and what the service supports.
5.3.2.4	credit	O,Repeatable	free text (CharacterString)	Recognition of those who contributed to the service.	
5.3.2.5	status	M,Repeatable	CodeList napMD_ProgressCode	The development phase of the service.	Select <i>status</i> from napMD_ProgressCode. When <i>status</i> is set to "onGoing," <i>Resource Maintenance Information</i> (5.3.2.13) shall be provided with either the attribute <i>dateOfNextUpdate</i> (5.6.2) or the attribute <i>userDefinedMaintenanceFrequency</i> (5.6.3).

5.3.2.6	pointOfContact	O,Repeatable	CI_ResponsibleParty (see 5.16)	Identification and means to contact people/organizations associated with the service.	Contacts other than those cited under <i>citation</i> (5.3.2.1). Contact information (5.16.4 <i>contactInfo</i>) shall be provided.
5.3.2.7	serviceType	M	GenericName (see B.8)	The service type name from a service registry.	The registry namespace may be "OGC" and the service type name may be "Catalogue."
5.3.2.8	serviceTypeVersion	O,Repeatable	free text (CharacterString)	The version of the service type.	If the registry namespace is "OGC" and the service type name is "Catalogue" (as provided in 5.3.2.7), then the version can be "1.1."
5.3.2.9	accessProperties	O	MD_StandardOrderProcess (see 5.11.4)	Information on the availability of the service which includes attributes from Standard Order Process including: fees, available date and time, ordering instructions, turnaround.	
5.3.2.10	extent	O,Repeatable	EX_Extent (see 5.13)	Describes the spatial (horizontal and/or vertical) and temporal coverage in the service.	
5.3.2.11	couplingType	M	CodeList napSV_CouplingType	Qualitative information on the tightness with which the service and the associated data are coupled.	Select <i>couplingType</i> from napSV_CouplingType.
5.3.2.12	coupledResource	O,Repeatable	SV_CoupledResource (see 5.3.8)	Further description of the coupling between the service and the data when they are tightly coupled.	
5.3.2.13	Resource Maintenance	O,Repeatable	MD_MaintenanceInformation (see	Describes the frequency,	When <i>status</i> (5.3.2.5) is set to "onGoing," either

	Information		5.6)	scope, and responsible party for updating the service.	the attribute <i>dateOfNextUpdate</i> (5.6.2) or <i>userDefinedMaintenanceFrequency</i> (5.6.3) in <i>Maintenance Information</i> (5.6) must be provided.
5.3.2.14	Graphic Overview	O,Repeatable	MD_BrowseGraphic (see 5.3.5)	The name of, description of, and file type of an illustration of a data resource provided from the service.	
5.3.2.15	Descriptive Keywords	O,Repeatable	MD_Keywords (see 5.3.6)	Commonly used words or phrases which describe the service. Optionally, the keyword type and a citation for the authoritative or registered resource of the keywords are provided.	
5.3.2.16	Resource Constraints	O,Repeatable	MD_Constraints (see 5.4.4) and/or MD_LegalConstraints (see 5.4.2) and/or MD_SecurityConstraints (see 5.4.3)	The limitations or constraints on the use of or access to the service.	
5.3.2.17	Aggregation Information	O,Repeatable	MD_AggregateInformation (see 5.3.7)	The citation for the aggregate service or the name of the aggregate service, the type of aggregate service, and optionally the activity which produced the service.	
5.3.2.18	Operates On	O,Repeatable	MD_DataIdentification (see 5.3.1)	Information describing datasets on which the service operates.	
5.3.2.19	Contains Operations	M,Repeatable	SV_OperationMetadata (see 5.3.9)	Operations performed by the service.	

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Withdrawn/Retirée

5.3.3 Spatial Resolution

Type: MD_Resolution

Description: The level of detail in a dataset expressed as equivalent scale or ground distance.

BP: One and only one of the following must be entered: *equivalentScale*, or *distance* as appropriate.

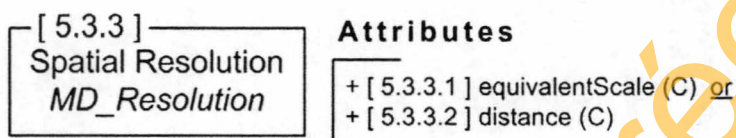


Figure 5: Spatial resolution

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.3.3.1	equivalentScale	C	MD_RepresentativeFraction (see 5.3.4)	Detail expressed as the numerical scale of a comparable hardcopy map or chart.	<i>equivalentScale</i> is entered if and only if <i>distance</i> (5.3.3.2) is not provided.
5.3.3.2	distance	C	Distance (see B.7)	Ground sample distance.	<i>distance</i> is entered if and only if <i>equivalentScale</i> (5.3.3.1) is not provided.

Withdrawn/Retired

5.3.4 Representative Fraction

Type: MD_RepresentativeFraction

Description: The scale of a map or other cartographic object expressed as a fraction or ratio which relates unit distance on the map or other cartographic object to distance, measured in the same units, on the ground.

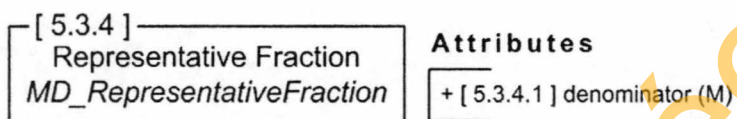


Figure 6: Representative fraction

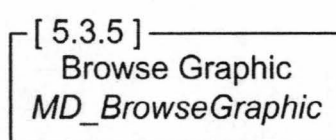
Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.3.4.1	denominator	M	Integer (see B.13)	The number below the line in a proper fraction that the numerator is equal to 1.	Value is greater than 0.

Withdrawn/Revised

5.3.5 Browse Graphic

Type: MD_BrowseGraphic

Description: The name, description, and file type of an illustration of the resource.



Attributes

- + [5.3.5.1] fileName (M)
- + [5.3.5.2] fileDescription (O)
- + [5.3.5.3] fileType (O)

Figure 7: Browse graphic

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.3.5.1	fileName	M	free text (CharacterString)	Name of the graphic file provided to illustrate the resource.	The attribute <i>fileName</i> shall include path or URL to access the graphic file and the file type extension, e.g. "aGraphicFile.png." If the file type is not well known then it should be described within the attribute <i>fileType</i> (5.3.5.3). The file type should be a graphic file type (see CodeList napMD_FileFormatCode).
5.3.5.2	fileDescription	O	free text (CharacterString)	Text description of the graphic file's content.	
5.3.5.3	fileType	O	free text (CharacterString)	Description of the graphic file format.	<i>fileType</i> should be provided especially when the file type included as the extension of the file name is not well known more specifically when the file type extension is not included in CodeList napMD_FileFormatCode. When the file type requires a non common viewer, also provide instructions on acquiring that viewer.

5.3.6 Keywords

Type: MD_Keywords

Description: Commonly used words or phrases which describe the resource. Optionally, the keyword type and a citation for the authoritative or registered resource of the keywords are also provided.

BP: It is highly recommended that keywords from an authoritative source be used instead of using user defined keywords. Communities should make available on the Web specific thesauri of keywords developed for use with this profile.

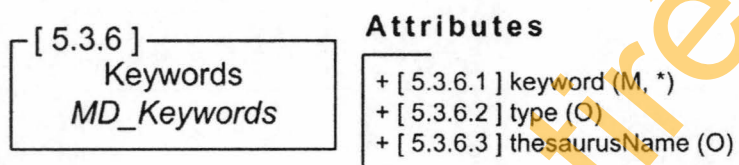


Figure 8: Keywords

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.3.6.1	keyword	M,Repeatable	free text (CharacterString)	Commonly used words or phrases which describe the resource.	
5.3.6.2	type	O	CodeList napMD_KeywordTypeCode	Term or type used to group keywords: discipline, place, stratum, temporal, or theme.	Select type from napMD_KeywordTypeCode.
5.3.6.3	thesaurusName	O	CI_Citation (see 5.14)	The name of a registered authoritative keyword resource.	<p>Strongly recommend to provide contact information (5.16.4 <i>contactInfo</i>).</p> <p>Recommend to provide the language used in the thesaurus in the attribute <i>otherCitationDetails</i> (5.14.10) in <i>Citation</i> (5.14) in the following manner:</p> <pre><citationDetailsType = "language"><;><blank space><ISO 639-2/T three letter language code><;><blank space><ISO 3166-1 three letter country code></pre> <p>Language code is given in lowercase. Country code is given in uppercase. e.g. language; fra; CAN</p>

5.3.7 Aggregation Information

Type: MD_AggregateInformation

Description: The citation for or name of an aggregate dataset, the type of aggregate dataset, and optionally the activity which produced the dataset.

BP: Either the attribute *aggregateDataSetName* or *aggregateDataSetIdentifier* shall be reported.

For best practice as to when to use aggregation information, hierarchy level, and series see sample in Annex E.

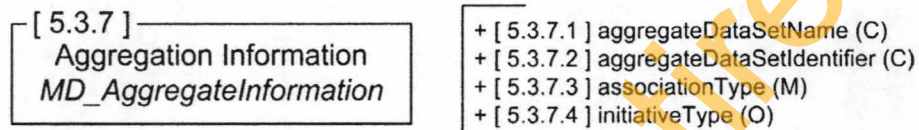


Figure 9: Aggregation information

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.3.7.1	aggregateDataSetName	C	CI_Citation (see 5.14)	Citation information for the aggregate resource or initiative.	Strongly recommend to provide contact information (5.16.4 <i>contactInfo</i>) under cited responsible party (5.14.7 <i>citedResponsibleParty</i>). <i>aggregateDataSetName</i> must be entered if <i>aggregateDataSetIdentifier</i> (5.3.7.2) is not provided.
5.3.7.2	aggregateDataSetIdentifier	C	MD_Identifier (see 5.22)	Identification of the aggregate dataset.	<i>aggregateDataSetIdentifier</i> must be entered if <i>aggregateDataSetName</i> (5.3.7.1) is not provided.
5.3.7.3	associationType	M	CodeList napDS_AssociationTypeCode	Association type of the aggregate dataset.	Select <i>associationType</i> from napDS_AssociationTypeCode. In order to allow navigation from aggregate datasets to datasets that contribute parts to the aggregate dataset, the association type code <i>isComposedOf</i> has been introduced. However, this approach is not encouraged since every time a dataset is derived from the aggregate dataset, it implies an update of the aggregate dataset metadata mentioning that the aggregate dataset is composed of this new derived dataset.
5.3.7.4	initiativeType	O	CodeList napDS_InitiativeTypeCode	Type of initiative for which the dataset was developed.	Select <i>initiativeType</i> from napDS_InitiativeTypeCode.

5.3.8 Coupled Resource

Type: SV_CoupledResource

Description: Information describing the linkage between a service operation and a tightly coupled dataset.

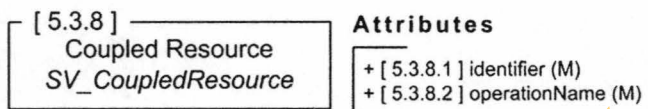


Figure 10: Coupled resource

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.3.8.1	identifier	M	free text (CharacterString)	The dataset name or identifier of the associated dataset.	
5.3.8.2	operationName	M	free text (CharacterString)	Designation of the operation.	

Withdrawn/Retired

5.3.9 Operation Metadata

Type: SV_OperationMetadata

Description: Description of one's service operation. Together, attributes and components provide the signature of the operation (i.e. the method).

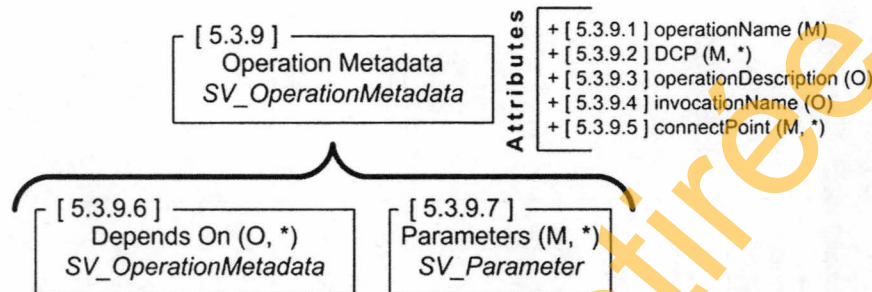


Figure 11: Operation metadata

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.3.9.1	operationName	M	free text (CharacterString)	An identifier that uniquely designates the operation.	
5.3.9.2	DCP	M,Repeatable	Codelist nap_DCPList	Distributed Computing Platforms that have been used to implement the operation such as XML, CORBA, JAVA, COM, SQL, and/or WebServices.	Select <i>DCP</i> from nap_DCPList.
5.3.9.3	operationDescription	O	free text (CharacterString)	Description of the purpose of the operation and results obtained from the operation.	
5.3.9.4	invocationName	O	free text (CharacterString)	The name used to invoke the operation on all Distributed Computing Platforms.	
5.3.9.5	connectPoint	M,Repeatable	CI_OnlineResource (see 5.20)	Reference to access the service interface.	
5.3.9.6	Depends On	O,Repeatable	SV_OperationMetadata (see 5.3.9)	The list of operations required prior to invoking the service; Structured as a list for capturing alternate or parallel predecessor paths.	
5.3.9.7	Parameters	M	Sequence<SV_Parameter> (see 5.3.10)	Values required for the interface invocation.	

5.3.10 Parameter

Type: SV_Parameter

Description: Information describing parameters of an operation.

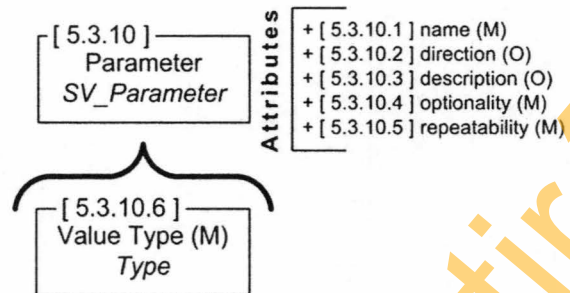


Figure 12: Parameter

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.3.10.1	name	M	MemberName (see B.15)	The name that the service uses for the parameter.	
5.3.10.2	direction	O	Enumeration napSV_ParameterDirection	Indication if the parameter serves as input, output, or both.	
5.3.10.3	description	O	free text (CharacterString)	Explanation of the purpose and function of the parameter.	
5.3.10.4	optionality	M	free text (CharacterString)	Indicates the necessity of the parameter.	The default value is "Mandatory."
5.3.10.5	repeatability	M	Boolean (see B.2)	Indication if one or more values for the parameter may be provided.	"0" / "false" means <i>not repeatable</i> ; "1" / "true" means <i>repeatable</i> .
5.3.10.6	Value Type	M	Type (see B.23)	The class used for the value type.	

5.4 Constraint Information (O,Repeatable)

Constraints are reported through metadata constraint information and/or legal constraints and/or security constraints.

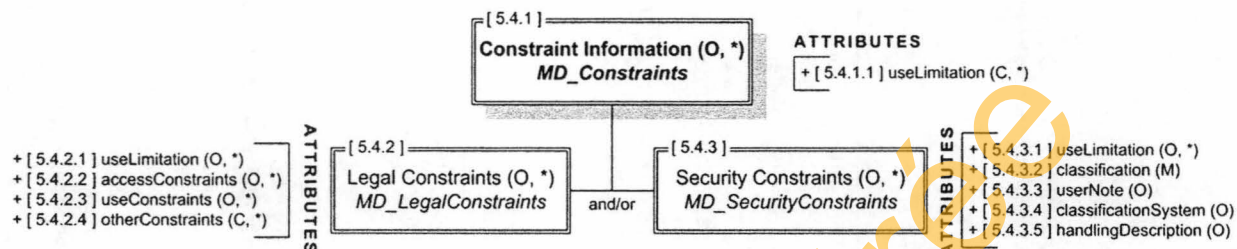


Figure 13: Constraint information

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.4.1	Constraint Information	O,Repeatable	MD_Constraints	The limitations, restrictions, or statements on the resource fitness for use.	
5.4.1.1	useLimitation	C,Repeatable	free text (CharacterString)	Statement on the fitness for use or limitations on the use of the resource or metadata.	The attribute <i>useLimitation</i> is mandatory unless <i>Legal Constraints</i> (5.4.2) or <i>Security Constraints</i> (5.4.3) is provided.
5.4.2	Legal Constraints	O,Repeatable	MD_LegalConstraints	The legal restrictions or prerequisites to using the resource or accessing the metadata.	Legal constraints should be repeated for multiple legal access constraints such as those associated with privacy, sensitivity, and statutory.
5.4.2.1	useLimitation	O,Repeatable	free text (CharacterString)	Statement on the fitness of use or limitations on the use of the resource or metadata.	
5.4.2.2	accessConstraints	O,Repeatable	CodeList napMD_RestrictionCode	Limitations on access to the resource or metadata to protect privacy, intellectual property, or any special limitations.	Select <i>accessConstraints</i> from napMD_RestrictionCode.
5.4.2.3	useConstraints	O,Repeatable	CodeList napMD_RestrictionCode	Restrictions or limitations or warnings to protect privacy, intellectual property, or other special restrictions on the resource or the metadata.	Select <i>useConstraints</i> from napMD_RestrictionCode.
5.4.2.4	otherConstraints	C,Repeatable	free text (CharacterString)	Other restrictions or legal prerequisites for accessing the resource or metadata.	<i>otherConstraints</i> shall be provided if <i>accessConstraints</i> (5.4.2.2) or <i>useConstraints</i> (5.4.2.3) is set to "otherRestrictions." For an

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
					example: "Data only to be used for the purposes for which they were collected."
5.4.3	Security Constraints	O,Repeatable	MD_SecurityConstraints	Restrictions applied to the resource or metadata to protect security concerns.	
5.4.3.1	useLimitation	O,Repeatable	free text (CharacterString)	Statement on the fitness of use or limitations on the use of the resource or metadata.	
5.4.3.2	classification	M	CodeList napMD_ClassificationCode	Name of the handling restrictions on the resource or the metadata.	Select <i>classification</i> from napMD_classificationCode.
5.4.3.3	userNote	O	free text (CharacterString)	An explanation of the classification level applied to the resource or metadata.	
5.4.3.4	classificationSystem	O	free text (CharacterString)	Name of the security classification system.	
5.4.3.5	handlingDescription	O	free text (CharacterString)	Additional information regarding security restrictions on handling the resource or metadata.	<i>handlingDescription</i> can serve as a place to state that the data had been reviewed and had been approved for release.

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Withdrawn/Retirée

5.5 Data Quality Information (O,Repeatable)

This section describes attributes and components that provide information about data quality.

Type: DQ_DataQuality

Description: Information on the quality of the data that is specified by a data quality scope.

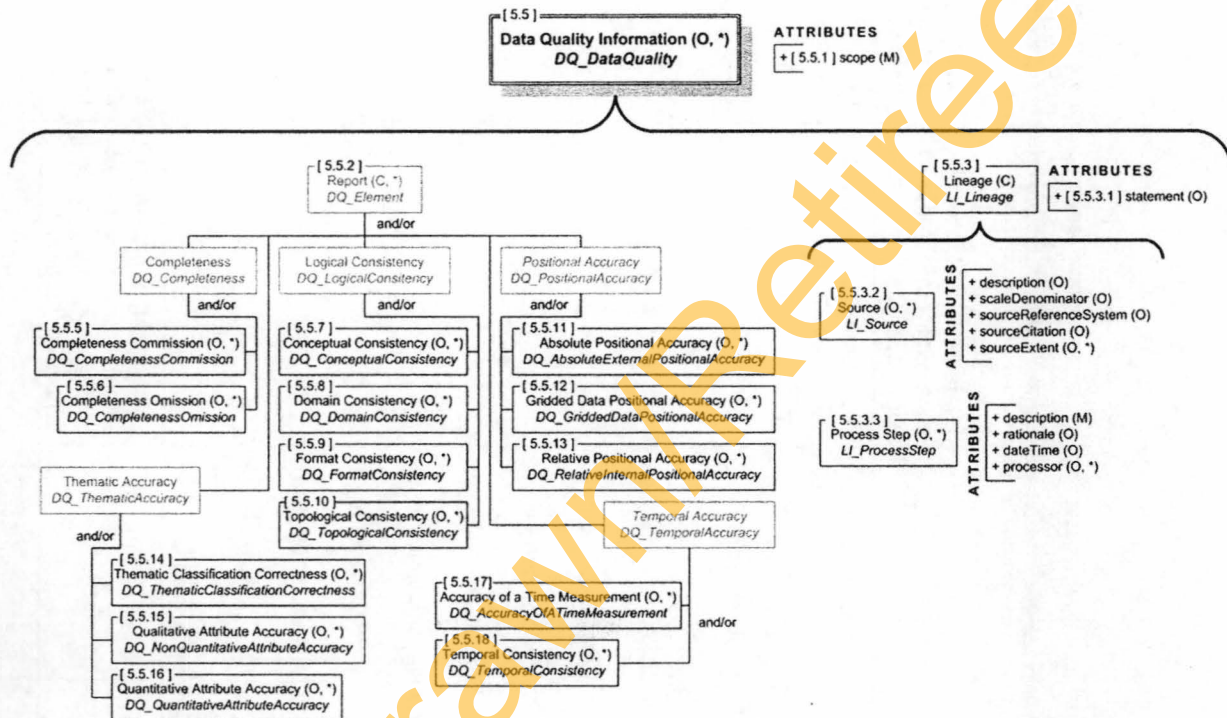


Figure 14: Data quality information

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.5.1	scope	M	DQ_Scope (see 5.5.4)	The extent of characteristics for which data quality information is reported.	When the attribute <i>level</i> (5.5.4.1) of <i>scope</i> (5.5.4) is set to "dataset," <i>Report</i> (5.5.2) or <i>Lineage</i> (5.5.3) is mandatory. Both of them may be reported.
5.5.2	Report	C, Repeatable	DQ_CompletenessCommission (see 5.5.5) and/or DQ_CompletenessOmission (see 5.5.6) and/or DQ_ConceptualConsistency (see 5.5.7) and/or DQ_DomainConsistency (see 5.5.8) and/or DQ_FormatConsistency (see 5.5.9) and/or DQ_TopologicalConsistency (see 5.5.10) and/or DQ_AbsoluteExternalPositionalAccuracy (see 5.5.11) and/or DQ_GriddedDataPositionalAccuracy (see 5.5.12) and/or DQ_RelativeInternalPositionalAccuracy (see 5.5.13) and/or DQ_ThematicClassificationCorrectness (see 5.5.14) and/or DQ_NonQuantitativeAttributeAccuracy (see 5.5.15) and/or DQ_QuantitativeAttributeAccuracy (see 5.5.16) and/or DQ_AccuracyOfATimeMeasurement (see 5.5.17) and/or DQ_TemporalConsistency (see 5.5.18)	A statement of the quality of the resource specified by the scope.	<i>Report</i> (5.5.2) shall be provided when <i>Lineage</i> (5.5.3) is not reported.
5.5.3	Lineage	C	LI_Lineage	Information or lack of information on the events and source data used to construct the dataset	<i>Lineage</i> (5.5.3) shall be provided when <i>Report</i> (5.5.2) is not reported. At least, one of the attributes of <i>Lineage</i> – <i>statement</i> , <i>source</i> , or <i>processStep</i> – shall be provided; more

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
				within the specified scope.	than one may be reported. The attribute <i>statement</i> (5.5.3.1) shall be provided when (1) the attributes <i>source</i> (5.5.3.2) and <i>processStep</i> (5.5.3.3) are not provided and (2) the attribute <i>level</i> (5.5.4.1) of the <i>scope</i> (5.5.4) of <i>Data Quality Information</i> (5.5) is set to "dataset" or "series."
5.5.3.1	statement	O	free text (CharacterString)	General explanation of the data producer's knowledge of the dataset lineage.	
5.5.3.2	Source	O,Repeatable	LI_Source (see 5.5.22)	Information on the sources used in the development of the dataset.	<i>source</i> is provided when <i>statement</i> (5.5.3.1) or <i>processStep</i> (5.5.3.3) is not reported.
5.5.3.3	Process Step	O,Repeatable	LI_ProcessStep (see 5.5.23)	The events in the development of the dataset.	

5.5.4 Scope (M)

Type: DQ_Scope

Description: The extent of characteristics for which data quality information is reported.

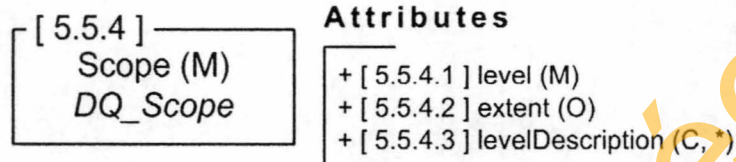


Figure 15: Scope

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.5.4.1	level	M	CodeList napMD_ScopeCode	The data or application level for which data quality is described.	Select <i>level</i> from napMD_ScopeCode.
5.5.4.2	extent	O	EX_Extent (see 5.13)	The spatial (horizontal and/or vertical) and the temporal delineation of the resource.	
5.5.4.3	levelDescription	C,Repeatable	MD_ScopeDescription (see 5.5.19)	Description of the level of the dataset.	When <i>level</i> is not "dataset" or "series" then <i>levelDescription</i> must be entered.

5.5.5 Completeness Commission (O,Repeatable)

Type: DQ_CompletenessCommission

Description: Notification of excess data present in the dataset beyond the extent defined in Scope.

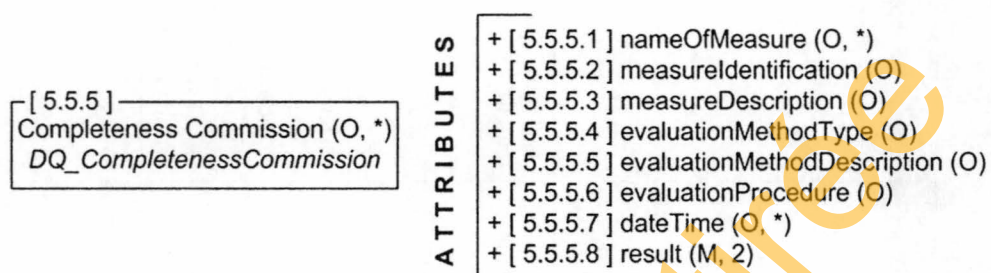


Figure 16: Completeness commission

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.5.5.1	nameOfMeasure	O,Repeatable	free text (CharacterString)	Name of the test applied to the data to assure data quality.	
5.5.5.2	measureIdentification	O	MD_Identifier (see 5.22)	Code which identifies a registered standard data quality procedure.	
5.5.5.3	measureDescription	O	free text (CharacterString)	Description of the measure applied to the dataset to assure quality.	
5.5.5.4	evaluationMethodType	O	CodeList napDQ_EvaluationMethodTypeCode	Method type used to evaluate data quality in the dataset.	Select <i>evaluationMethodType</i> from napDQ_EvaluationMethodTypeCode.
5.5.5.5	evaluationMethodDescription	O	free text (CharacterString)	Description of the evaluation method applied to the dataset.	
5.5.5.6	evaluationProcedure	O	CI_Citation (see 5.14)	Citation for the evaluation procedure.	Strongly recommend to provide contact information (5.16.4 <i>contactInfo</i>) under cited responsible party (5.14.7 <i>citedResponsibleParty</i>).
5.5.5.7	dateTime	O,Repeatable	DateTime (see B.5)	Date and time at which the test was completed.	DateTime cannot support the description of duration; only single time is allowed.
5.5.5.8	result	M,2	DQ_QuantitativeResult (see 5.5.20) and/or DQ_ConformanceResult (see 5.5.21)	Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.	

5.5.6 Completeness Omission (O,Repeatable)

Type: DQ_CompletenessOmission

Description: Notification of data absent from the dataset as defined by Scope.

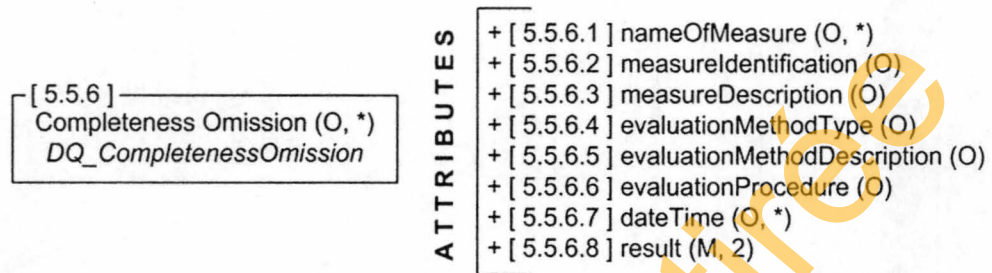


Figure 17: Completeness omission

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.5.6.1	nameOfMeasure	O,Repeatable	free text (CharacterString)	Name of the test applied to the data to assure data quality.	
5.5.6.2	measureIdentification	O	MD_Identifier (see 5.22)	Code which identifies a registered standard data quality procedure.	
5.5.6.3	measureDescription	O	free text (CharacterString)	Description of the measure applied to the dataset to assure quality.	
5.5.6.4	evaluationMethodType	O	CodeList napDQ_EvaluationMethodTypeCode	Method type used to evaluate data quality in the dataset.	Select <i>evaluationMethodType</i> from <i>napDQ_EvaluationMethodTypeCode</i> .
5.5.6.5	evaluationMethodDescription	O	free text (CharacterString)	Description of the evaluation method applied to the dataset.	
5.5.6.6	evaluationProcedure	O	CI_Citation (see 5.14)	Citation for the evaluation procedure.	Strongly recommend to provide contact information (5.16.4 <i>contactInfo</i>) under cited responsible party (5.14.7 <i>citedResponsibleParty</i>).
5.5.6.7	dateTime	O,Repeatable	DateTime (see B.5)	Date and time at which the test was completed.	DateTime cannot support the description of duration; only single time is allowed.
5.5.6.8	result	M,2	DQ_QuantitativeResult (see 5.5.20) and/or DQ_ConformanceResult (see 5.5.21)	Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.	

5.5.7 Conceptual Consistency (O,Repeatable)

Type: DQ_ConceptualConsistency

Description: The level to which the dataset adheres to the conceptual schema. For example, conceptual consistency might describe to which level the resource complies with the data structure and attributing of the conceptual schema – i.e. feature types, features attributes, relationships between features, etc.

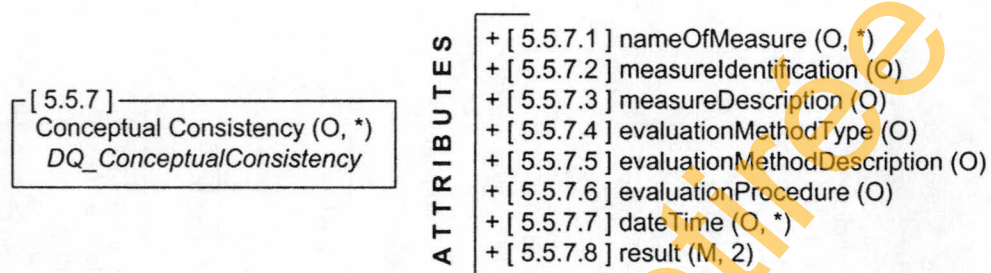


Figure 18: Conceptual consistency

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.5.7.1	nameOfMeasure	O,Repeatable	free text (CharacterString)	Name of the test applied to the data to assure data quality.	
5.5.7.2	measureIdentification	O	MD_Identifier (see 5.22)	Code which identifies a registered standard data quality procedure.	
5.5.7.3	measureDescription	O	free text (CharacterString)	Description of the measure applied to the dataset to assure quality.	
5.5.7.4	evaluationMethodType	O	CodeList napDQ_EvaluationMethodTypeCode	Method type used to evaluate data quality in the dataset.	Select <i>evaluationMethodType</i> from napDQ_EvaluationMethodTypeCode.
5.5.7.5	evaluationMethodDescription	O	free text (CharacterString)	Description of the evaluation method applied to the dataset.	
5.5.7.6	evaluationProcedure	O	CI_Citation (see 5.14)	Citation for the evaluation procedure.	Strongly recommend to provide contact information (5.16.4 <i>contactInfo</i>) under cited responsible party (5.14.7 <i>citedResponsibleParty</i>).
5.5.7.7	dateTime	O,Repeatable	DateTime (see B.5)	Date and time at which the test was completed.	DateTime cannot support the description of duration; only single time is allowed.
5.5.7.8	result	M,2	DQ_QuantitativeResult (see 5.5.20) and/or DQ_ConformanceResult (see 5.5.21)	Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.	

5.5.8 Domain Consistency (O,Repeatable)

Type: DQ_DomainConsistency

Description: The adherence of resource attribute values to conceptual schema specified values.

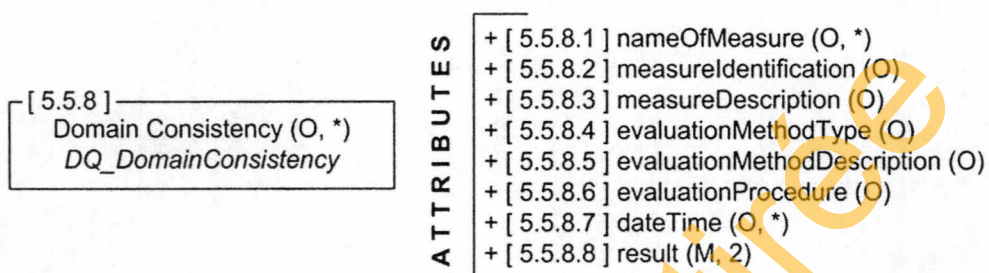


Figure 19: Domain consistency

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.5.8.1	nameOfMeasure	O,Repeatable	free text (CharacterString)	Name of the test applied to the data to assure data quality.	
5.5.8.2	measureIdentification	O	MD_Identifier (see 5.22)	Code which identifies a registered standard data quality procedure.	
5.5.8.3	measureDescription	O	free text (CharacterString)	Description of the measure applied to the dataset to assure quality.	
5.5.8.4	evaluationMethodType	O	CodeList napDQ_EvaluationMethodTypeCode	Method type used to evaluate data quality in the dataset.	Select <i>evaluationMethodType</i> from napDQ_EvaluationMethodTypeCode.
5.5.8.5	evaluationMethodDescription	O	free text (CharacterString)	Description of the evaluation method applied to the dataset.	
5.5.8.6	evaluationProcedure	O	CI_Citation (see 5.14)	Citation for the evaluation procedure.	Strongly recommend to provide contact information (5.16.4 <i>contactInfo</i>) under cited responsible party (5.14.7 <i>citedResponsibleParty</i>).
5.5.8.7	dateTime	O,Repeatable	DateTime (see B.5)	Date and time at which the test was completed.	DateTime cannot support the description of duration; only single time is allowed.
5.5.8.8	result	M,2	DQ_QuantitativeResult (see 5.5.20) and/or DQ_ConformanceResult (see 5.5.21)	Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.	

5.5.16 Quantitative Attribute Accuracy (O,Repeatable)

Type: DQ_QuantitativeAttributeAccuracy

Description: Degree to which quantitative attributes reflect the stated requirements.

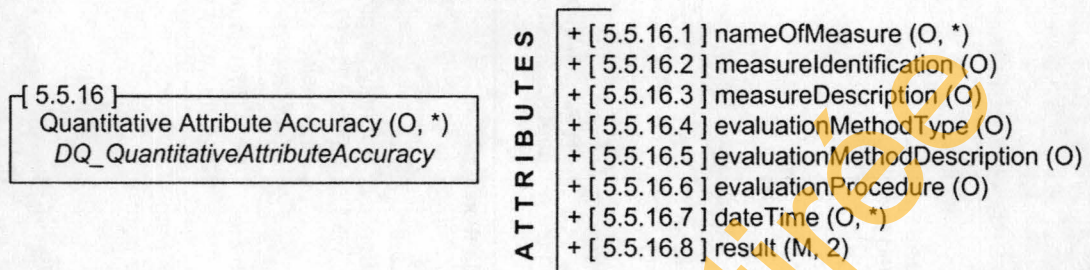


Figure 27: Quantitative attribute accuracy

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.5.16.1	nameOfMeasure	O,Repeatable	free text (CharacterString)	Name of the test applied to the data to assure data quality.	
5.5.16.2	measureIdentification	O	MD_Identifier (see 5.22)	Code which identifies a registered standard data quality procedure.	
5.5.16.3	measureDescription	O	free text (CharacterString)	Description of the measure applied to the dataset to assure quality.	
5.5.16.4	evaluationMethodType	O	CodeList napDQ_EvaluationMethodTypeCode	Method type used to evaluate data quality in the dataset.	Select <i>evaluationMethodType</i> from napDQ_EvaluationMethodTypeCode.
5.5.16.5	evaluationMethodDescription	O	free text (CharacterString)	Description of the evaluation method applied to the dataset.	
5.5.16.6	evaluationProcedure	O	CI_Citation (see 5.14)	Citation for the evaluation procedure.	Strongly recommend to provide contact information (5.16.4 <i>contactInfo</i>) under cited responsible party (5.14.7 <i>citedResponsibleParty</i>).
5.5.16.7	dateTime	O,Repeatable	DateTime (see B.5)	Date and time at which the test was completed.	DateTime cannot support the description of duration; only single time is allowed.
5.5.16.8	result	M,2	DQ_QuantitativeResult (see 5.5.20) and/or DQ_ConformanceResult (see 5.5.21)	Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.	

5.5.17 Accuracy of a Time Measurement (O,Repeatable)

Type: DQ_AccuracyOfATimeMeasurement

Description: Report on the accuracy or error in time measurement.

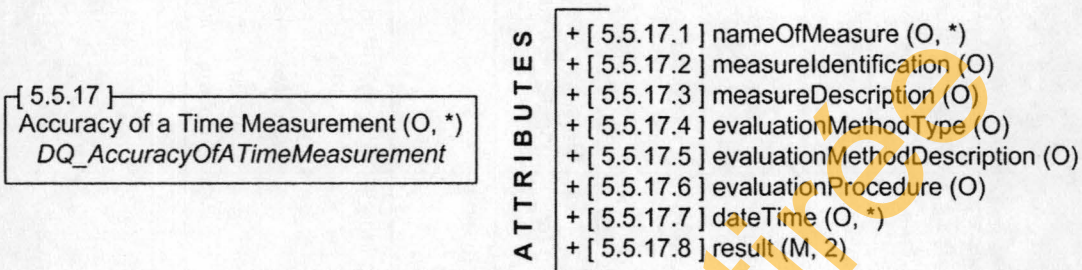


Figure 28: Accuracy of a time measurement

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.5.17.1	nameOfMeasure	O,Repeatable	free text (CharacterString)	Name of the test applied to the data to assure data quality.	
5.5.17.2	measureIdentification	O	MD_Identifier (see 5.22)	Code which identifies a registered standard data quality procedure.	
5.5.17.3	measureDescription	O	free text (CharacterString)	Description of the measure applied to the dataset to assure quality.	
5.5.17.4	evaluationMethodType	O	CodeList napDQ_EvaluationMethodTypeCode	Method type used to evaluate data quality in the dataset.	Select <i>evaluationMethodType</i> from napDQ_EvaluationMethodTypeCode.
5.5.17.5	evaluationMethodDescription	O	free text (CharacterString)	Description of the evaluation method applied to the dataset.	
5.5.17.6	evaluationProcedure	O	CI_Citation (see 5.14)	Citation for the evaluation procedure.	Strongly recommend to provide contact information (5.16.4 <i>contactInfo</i>) under cited responsible party (5.14.7 <i>citedResponsibleParty</i>).
5.5.17.7	dateTime	O,Repeatable	DateTime (see B.5)	Date and time at which the test was completed.	DateTime cannot support the description of duration; only single time is allowed.
5.5.17.8	result	M,2	DQ_QuantitativeResult (see 5.5.20) and/or DQ_ConformanceResult (see 5.5.21)	Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.	

5.5.18 Temporal Consistency (O,Repeatable)

Type: DQ_TemporalConsistency

Description: The correctness of reported ordered events or sequences.

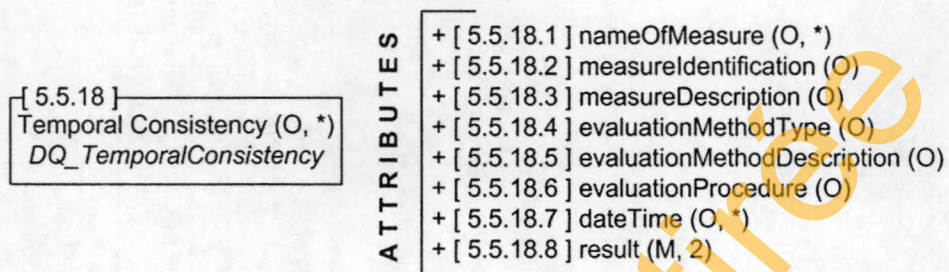


Figure 29: Temporal consistency

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.5.18.1	nameOfMeasure	O,Repeatable	free text (CharacterString)	Name of the test applied to the data to assure data quality.	
5.5.18.2	measureIdentification	O	MD_Identifier (see 5.22)	Code which identifies a registered standard data quality procedure.	
5.5.18.3	measureDescription	O	free text (CharacterString)	Description of the measure applied to the dataset to assure quality.	
5.5.18.4	evaluationMethodType	O	CodeList napDQ_EvaluationMethodTypeCode	Method type used to evaluate data quality in the dataset.	Select <i>evaluationMethodType</i> from napDQ_EvaluationMethodTypeCode.
5.5.18.5	evaluationMethodDescription	O	free text (CharacterString)	Description of the evaluation method applied to the dataset.	
5.5.18.6	evaluationProcedure	O	CI_Citation (see 5.14)	Citation for the evaluation procedure.	Strongly recommend to provide contact information (5.16.4 <i>contactInfo</i>) under cited responsible party (5.14.7 <i>citedResponsibleParty</i>).
5.5.18.7	dateTime	O,Repeatable	DateTime (see B.5)	Date and time at which the test was completed.	DateTime cannot support the description of duration; only single time is allowed.
5.5.18.8	result	M,2	DQ_QuantitativeResult (see 5.5.20) and/or DQ_ConformanceResult (see 5.5.21)	Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.	

5.5.19 Scope Description

Type: MD_ScopeDescription

Description: Description of the class of information covered by the information.

BP: One and only one of the following must be entered: *attributes*, *features*, *featureInstances*, *attributeInstances*, *dataset*, or *other* as appropriate.

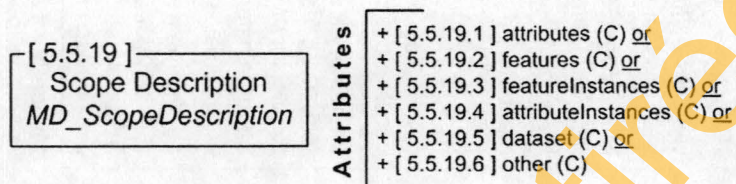


Figure 30: Scope description

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.5.19.1	attributes	C	Set<GF_AttributeType> (see B.9)	Set of attribute types specifying the range and extent of the scope.	Mandatory if <i>features</i> (5.5.19.2), <i>featureInstances</i> (5.5.19.3), <i>attributeInstances</i> (5.5.19.4), <i>dataset</i> (5.5.19.5), or <i>other</i> (5.5.19.6) are not documented.
5.5.19.2	features	C	Set<GF_FeatureType> (see B.10)	Set of feature types specifying the range and extent of the scope.	Mandatory if <i>attributes</i> (5.5.19.1), <i>featureInstances</i> (5.5.19.3), <i>attributeInstances</i> (5.5.19.4), <i>dataset</i> (5.5.19.5), or <i>other</i> (5.5.19.6) are not documented.
5.5.19.3	featureInstances	C	Set<GF_FeatureType> (see B.10)	Set of feature instances specifying the range and extent of the scope.	Mandatory if <i>attributes</i> (5.5.19.1), <i>features</i> (5.5.19.2), <i>attributeInstances</i> (5.5.19.4), <i>dataset</i> (5.5.19.5), or <i>other</i> (5.5.19.6) are not documented. <i>featureInstances</i> should refer to a set of occurrences of feature types.
5.5.19.4	attributeInstances	C	Set<GF_AttributeType> (see B.9)	Set of attribute instances specifying the range and extent of the scope.	Mandatory if <i>attributes</i> (5.5.19.1), <i>features</i> (5.5.19.2), <i>featureInstances</i> (5.5.19.3), <i>dataset</i> (5.5.19.5), or <i>other</i> (5.5.19.6) are documented. <i>attributeInstances</i> should refer to a set of occurrences of attribute types.
5.5.19.5	dataset	C	free text (CharacterString)	Dataset identifier specifying the range and extent of the scope.	Mandatory if <i>attributes</i> (5.5.19.1), <i>features</i> (5.5.19.2), <i>featureInstances</i> (5.5.19.3), <i>attributeInstances</i> (5.5.19.4), or <i>other</i> (5.5.19.6) are not documented.
5.5.19.6	other	C	free text (CharacterString)	Information specifying the range and extent of the scope that is not covered under attributes, features, featureInstances, attributeInstances, and dataset.	Mandatory if <i>attributes</i> (5.5.19.1), <i>features</i> (5.5.19.2), <i>featureInstances</i> (5.5.19.3), <i>attributeInstances</i> (5.5.19.4), or <i>dataset</i> (5.5.19.5) are not documented.

5.5.20 Quantitative Result (O,Repeatable)

Type: DQ_QuantitativeResult

Description: Information on the value(s) resulting from applying a data quality measure.

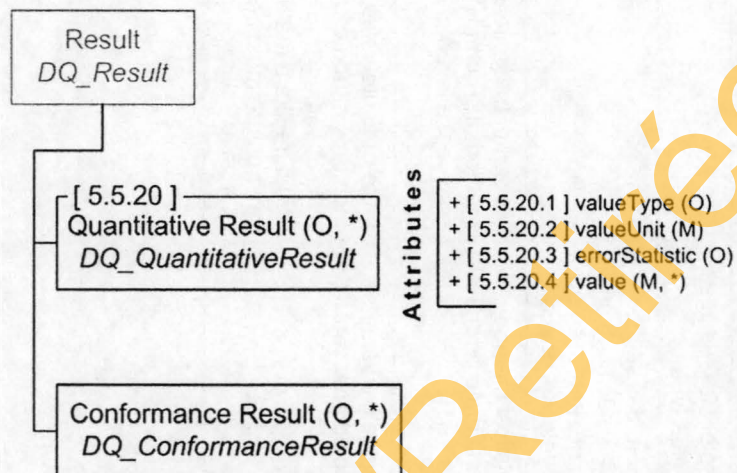


Figure 31: Quantitative result

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.5.20.1	valueType	O	RecordType (see B.18)	The class or classes used for the value type(s).	
5.5.20.2	valueUnit	M	UnitOfMeasure (see B.24)	Any system devised to quantify a value such as length, time, angle, area, volume, velocity, or scale.	
5.5.20.3	errorStatistic	O	free text (CharacterString)	The statistical method used to estimate error in the value.	As part of the description of the statistical method, the confidence interval (e.g. 95% confidence level) of an accuracy value should be specified.
5.5.20.4	value	M,Repeatable	Record (see B.17)	The quantitative value(s) for the object measured.	If the attribute <i>valueType</i> (5.5.20.1) is not used then, this attribute will consist of a single value or a list of values. If this attribute follows a complex structure like a matrix, as in a covariance matrix, its structure must be described in <i>valueType</i> (5.5.20.1).

5.5.21 Conformance Result (O,Repeatable)

Type: DQ_ConformanceResult

Description: Information which describes the outcome from evaluating the value(s) against a set of acceptable quality levels.

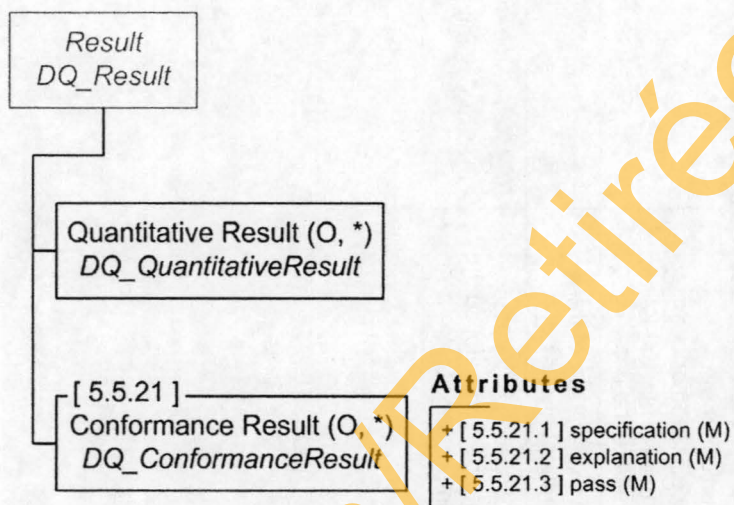


Figure 32: Conformance result

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.5.21.1	specification	M	CI_Citation (see 5.14)	Citation for the specification or user requirement used to evaluate the data.	
5.5.21.2	explanation	M	free text (CharacterString)	An explanation of the conformance result.	
5.5.21.3	pass	M	Boolean (see B.2)	Notification of whether the data passed or failed the conformance test.	"0" / "false" means <i>failed</i> ; "1" / "true" means <i>passed</i> .

5.5.22 Source

Type: LI_Source

Description: Information about the source data used in creating the data within the specified Scope.

BP: Either the attribute *description* or the pair of attributes – *sourceCitation* and *sourceExtent* – shall be provided.

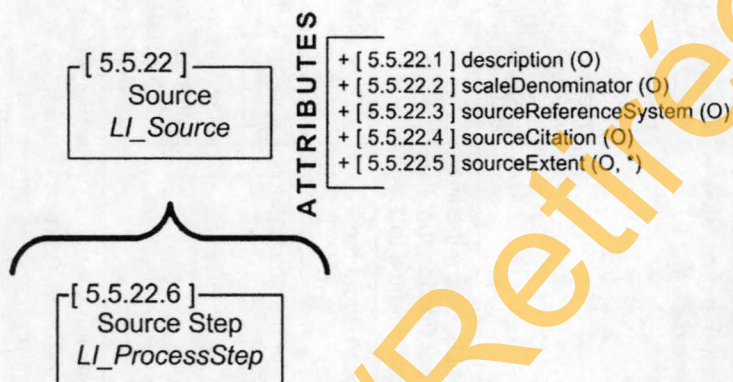


Figure 33: Source

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.5.22.1	description	O	free text (CharacterString)	Statement that describes the source data.	<i>description</i> is mandatory if <i>sourceCitation</i> (5.5.22.4) and <i>sourceExtent</i> (5.5.22.5) are not provided. The attribute <i>description</i> includes the source medium name code (CodeList napMD_MediumNameCode) followed by <>blank space> and a free text description, e.g. "dvd; source satellite image."
5.5.22.2	scaleDenominator	O	MD_RepresentativeFraction (see 5.3.4)	The number below the line in a proper fraction that the numerator is equal to 1.	
5.5.22.3	sourceReferenceSystem	O	MD_ReferenceSystem (see 5.8)	Information about the reference system.	
5.5.22.4	sourceCitation	O	CI_Citation (see 5.14)	Citation for the sources for the dataset.	<i>sourceCitation</i> is mandatory if <i>description</i> (5.5.22.1) is not provided. Strongly recommend to provide contact information (5.16.4 <i>contactInfo</i>) under cited responsible party (5.14.7 <i>citedResponsibleParty</i>).
5.5.22.5	sourceExtent	O,Repeatable	EX_Extent (see 5.13)	Describes the spatial (horizontal and/or vertical) and the temporal coverage in the dataset.	<i>sourceExtent</i> is mandatory if <i>description</i> (5.5.22.1) is not provided.
5.5.22.6	Source Step	O,Repeatable	LI_ProcessStep (see 5.5.23)	Information about an event related to the creation process for the source data.	

5.5.23 Process Step

Type: LI_ProcessStep

Description: The events in the development of the dataset.

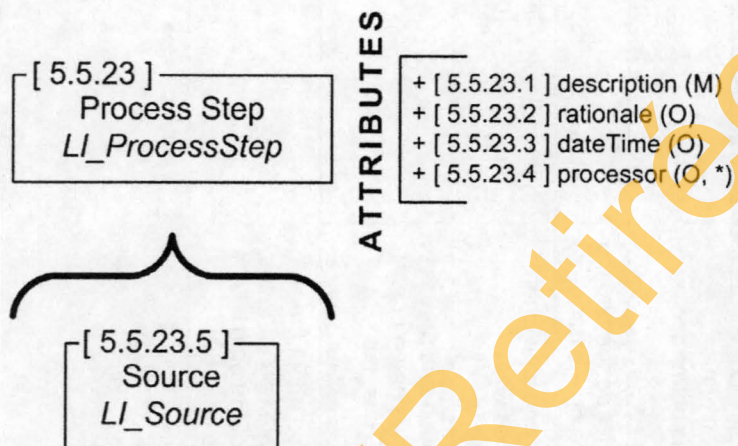


Figure 34: Process step

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.5.23.1	description	M	free text (CharacterString)	Description of the processes performed on the data.	
5.5.23.2	rationale	O	free text (CharacterString)	Purpose for performing the processes on the data.	
5.5.23.3	dateTime ¹	O	DateTime (see B.5)	The date and time when the process was completed.	Only single time is allowed.
5.5.23.4	processor	O,Repeatable	CI_ResponsibleParty (see 5.16)	Identification and means to contact the person or party that performed the process.	
5.5.23.5	Source	O,Repeatable	LI_Source (see 5.5.22)	Information about the source data related to the creation of the data within the scope	

¹ *dateTime* cannot support the description of duration.

5.6 Maintenance Information

This section provides information about how the resources or metadata records are updated.

Multiplicity is optional (O) when used for metadata maintenance information (5.2.15) but optional and repeatable (O,Repeatable) when used for resource maintenance information (5.3.1.15 or 5.3.2.13).

Type: MD_MaintenanceInformation

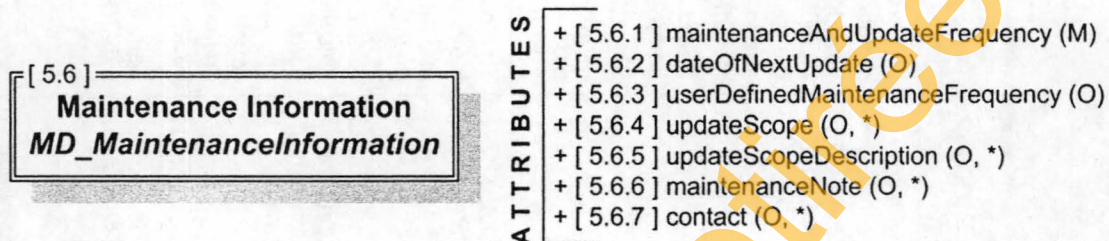


Figure 35: Maintenance information

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.6.1	maintenanceAndUpdateFrequency	M	CodeList napMD_MaintenanceFrequencyCode	Frequency of changes and additions made to the resource after the initial completion.	For example, <i>maintenanceAndUpdateFrequency</i> could be used to update automatically <i>dateOfNextUpdate</i> (5.6.2) using the <i>date</i> of the resource (5.14.3) under <i>citation</i> (5.3.1.1) and the metadata date stamp (5.2.7) of the metadata record information (5.2). Select <i>maintenanceAndUpdateFrequency</i> from <i>napMD_MaintenanceFrequencyCode</i> . Select <i>asNeeded</i> from <i>napMD_MaintenanceFrequencyCode</i> when a <i>userDefinedMaintenanceFrequency</i> (5.6.3) is defined.
5.6.2	dateOfNextUpdate	O	Date (see B.4)	The scheduled revision date for the resource.	This could be calculated using the <i>date</i> of the resource (5.14.3) under <i>citation</i> (5.3.1.1) and the <i>maintenanceAndUpdateFrequencyCode</i> (5.6.1).
5.6.3	userDefinedMaintenanceFrequency	O	TM_PeriodDuration (see B.21)	The maintenance period other than those defined.	This value defines a maintenance frequency period that is not predefined in <i>napMD_MaintenanceFrequencyCode</i> . It consists in the maximum time between updates. This means that the time period between updates could be shorter.
5.6.4	updateScope	O,Repeatable	CodeList napMD_ScopeCode	Scope of data to which maintenance is applied.	Select <i>updateCode</i> from <i>napMD_ScopeCode</i> .
5.6.5	updateScopeDescription	O,Repeatable	MD_ScopeDescription (see 5.5.19)	Additional information about the range or extent	

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
				of the resource.	
5.6.6	maintenanceNote	O,Repeatable	free text (CharacterString)	Information regarding specific requirements for maintaining the resource.	
5.6.7	contact	O,Repeatable	CI_ResponsibleParty (see 5.16)	Identification of and means of communicating with, person and organization with responsibility for maintaining the resource.	Contact information (5.16.4 contactInfo) shall be provided.

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Withdrawn/Retirée

5.7 Spatial Representation Information (O,Repeatable)

This section describes attributes and components that provide information about spatial representation information.

Type: MD_GridSpatialRepresentation (see 5.7.1) and/or MD_VectorSpatialRepresentation (see 5.7.2) and/or MD_Georectified (see 5.7.3) and/or MD_Georeferenceable (see 5.7.4)

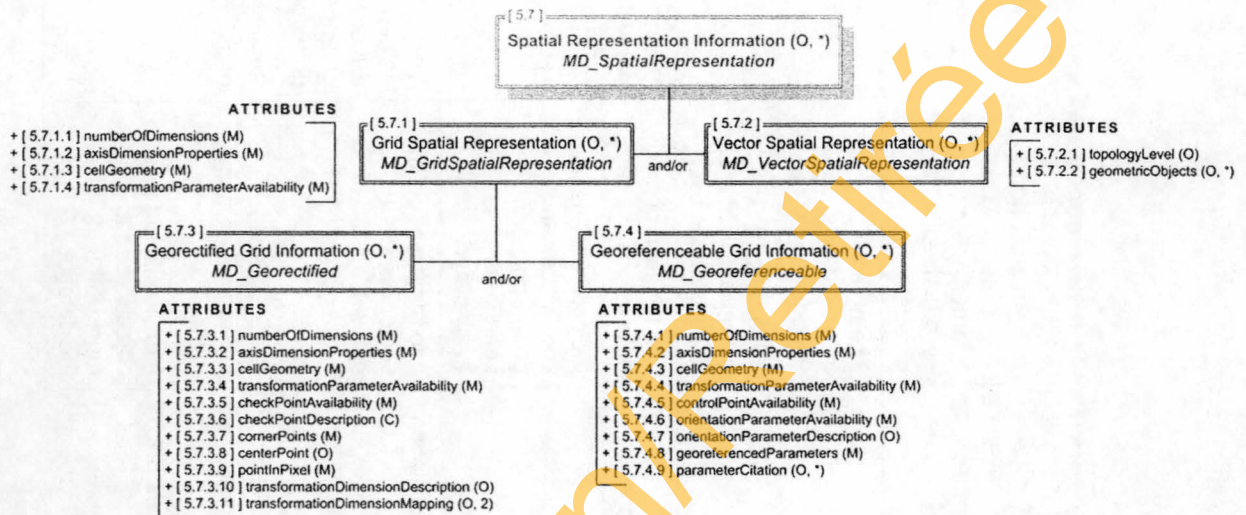


Figure 36: Spatial representation information

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.7.1	Grid Spatial Representation	(O,Repeatable)	MD_GridSpatialRepresentation	Information on the grid system used in the dataset.	<i>Grid Spatial Representation</i> is required if dataset objects are gridded.
5.7.1.1	numberOfDimensions	M	Integer (see B.13)	The number of independent spatio-temporal axes.	
5.7.1.2	axisDimensionProperties	M	Sequence<MD_Dimension> (see 5.7.5)	Information on the dimension name, size, and resolution used.	
5.7.1.3	cellGeometry	M	CodeList napMD_CellGeometryCode	Identification of grid data as point or cell.	Select <i>cellGeometry</i> from napMD_CellGeometryCode.
5.7.1.4	transformationParameterAvailability	M	Boolean (see B.2)	Indication of image coordinates and geographic or map coordinates availability.	"0" / "false" means <i>no</i> ; "1" / "true" means <i>yes</i> .
5.7.2	Vector Spatial Representation	(O,Repeatable)	MD_VectorSpatialRepresentation	Information about the vector objects in the dataset.	<i>Vector Spatial Representation</i> is required if point or vector objects exist in the dataset. Either <i>topologyLevel</i> (5.7.2.1) or <i>geometricObjects</i> (5.7.2.2) shall be provided, or both.
5.7.2.1	topologyLevel	O	CodeList napMD_TopologyLevelCode	Code to identify topology level in the dataset.	Select <i>topologyLevel</i> from napMD_TopologyLevelCode.
5.7.2.2	geometricObjects	O,Repeatable	MD_GeometricObjects (see 5.7.6)	Identification of the objects used to represent features in the dataset.	

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.7.3	Georectified Grid Information	(O,Repeatable)	MD_Georectified	Information on the grid used to georectify the data.	
5.7.3.1	numberOfDimensions	M	Integer (see B.13)	Number of independent spatio-temporal axes.	
5.7.3.2	axisDimensionProperties	M	Sequence<MD_Dimension> (see 5.7.5)	Information on the dimension name, size, and resolution used.	
5.7.3.3	cellGeometry	M	CodeList napMD_CellGeometryCode	Identification of grid data as point or cell.	Select <i>cellGeometry</i> from napMD_CellGeometryCode.
5.7.3.4	transformationParameterAvailability	M	Boolean (see B.2)	Indication of image coordinates and geographic or map coordinates availability.	"0" / "false" means <i>no</i> ; "1" / "true" means <i>yes</i> .
5.7.3.5	checkPointAvailability	M	Boolean (see B.2)	Indication of availability of geographic position points in order to test the accuracy of the georeferenced grid data.	"0" / "false" means <i>no</i> ; "1" / "true" means <i>yes</i> .
5.7.3.6	checkPointDescription	C	free text (CharacterString)	Description of geographic position points used to test the accuracy of the georeferenced grid data.	Mandatory if <i>checkPointAvailability</i> (5.7.3.5) is set to "1" / "true" (yes).

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.7.3.7	cornerPoints	M	Sequence<GM_Point> (see B.12)	Location in coordinate system defined by Spatial Reference System and grid coordinates of the cells at opposite ends of the grid coverage along two diagonals in the grid spatial dimension.	At a minimum, two corner points shall be provided along one diagonal. When providing more than two corner points, they shall be in the clockwise order.
5.7.3.8	centerPoint	O	GM_Point (see B.12)	Earth location, represented as a point, in the coordinate system defined by the Spatial Reference System and the grid coordinate of the cell halfway between opposite ends of the grid.	
5.7.3.9	pointInPixel	M	CodeList napMD_PixelOrientationCode	Point in a pixel corresponding to the Earth location of the pixel.	Select <i>pointInPixel</i> from napMD_PixelOrientationCode.
5.7.3.10	transformationDimensionDescription	O	free text (CharacterString)	General description of the transformation.	
5.7.3.11	transformationDimensionMapping	O,2	free text (CharacterString)	Information about which grid axes are spatial axes.	
5.7.4	Georeferenceable Grid Information	(O,Repeatable)	MD_Georeferenceable	Information on georeferencing the	

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
				dataset.	
5.7.4.1	numberOfDimensions	M	Integer (see B.13)	Number of independent spatio-temporal axes.	
5.7.4.2	axisDimensionProperties	M	Sequence<MD_Dimension> (see 5.7.5)	Information on the dimension name, size, and resolution used.	
5.7.4.3	cellGeometry	M	CodeList napMD_CellGeometryCode	Identification of grid data as point or cell.	Select <i>cellGeometry</i> from napMD_CellGeometryCode.
5.7.4.4	transformationParameterAvailability	M	Boolean (see B.2)	Indication of image coordinates and geographic or map coordinates availability.	"0" / "false" means <i>no</i> ; "1" / "true" means <i>yes</i> .
5.7.4.5	controlPointAvailability	M	Boolean (see B.2)	Indication of control point existence.	"0" / "false" means <i>no</i> ; "1" / "true" means <i>yes</i> .
5.7.4.6	orientationParameterAvailability	M	Boolean (see B.2)	Indication of orientation parameters availability.	"0" / "false" means <i>no</i> ; "1" / "true" means <i>yes</i> .
5.7.4.7	orientationParameterDescription	O	free text (CharacterString)	Description of parameters used to describe sensor orientation.	
5.7.4.8	georeferencedParameters	M	Record (see B.17)	Terms which support grid data georeferencing.	
5.7.4.9	parameterCitation	O,Repeatable	CI_Citation (see 5.14)	Citation for the parameter reference.	Strongly recommend to provide contact information (5.16.4 <i>contactInfo</i>) under

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
					cited responsible party (5.14.7 <i>citedResponsibleParty</i>).

5.7.5 Dimension

Type: MD_Dimension

Description: Information on the dimension name, size, and resolution used.

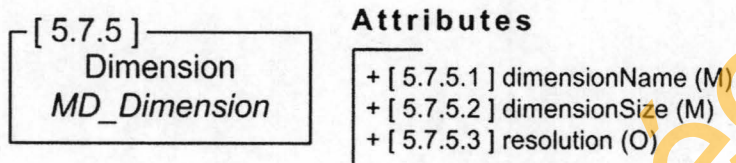


Figure 37: Dimension

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.7.5.1	dimensionName	M	CodeList napMD_DimensionNameTypeCode	Axis name.	Select <i>dimensionName</i> from napMD_DimensionNameTypeCode.
5.7.5.2	dimensionSize	M	Integer (see B.13)	Number of elements along the axes.	
5.7.5.3	resolution	O	Measure (see B.14)	Degree of detail in the grid dataset.	

5.7.6 Geometric Objects

Type: MD_GeometricObjects

Description: Identification of the object type and number of objects in the dataset.

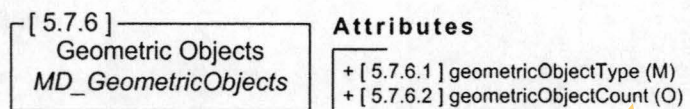


Figure 38: Geometric objects

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.7.6.1	geometricObjectType	M	CodeList napMD_GeometricObjectTypeCode	Name of point or vector objects to locate zero, one, two or three dimensional locations in the dataset.	Select <i>geometricObjectType</i> from napMD_GeometricObjectTypeCode.
5.7.6.2	geometricObjectCount	O	Integer (see B.13)	Total number of point or vector objects in the dataset.	Value greater than "0."

5.8 Reference System Information (C,Repeatable)

This section describes attributes that provide information about reference system information.

Type: MD_ReferenceSystem

Description: Identification of the spatial and temporal reference systems used.

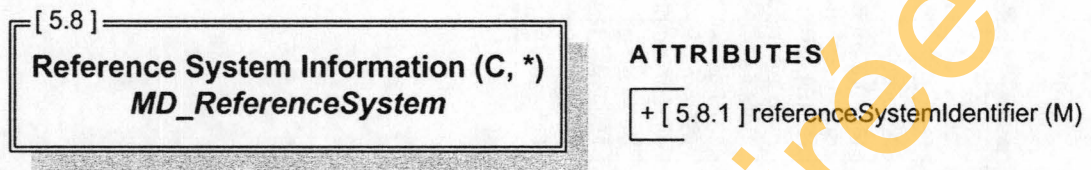


Figure 39: Reference system information

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.8.1	referenceSystemIdentifier	M	RS_Identifier (see 5.8.2)	Identifier of the Reference System.	<p>A coordinate reference system (CRS) should be taken from a publicly available register or document. If a coordinate reference system (CRS) is not available from a publicly available register or document and as such has no identifier or well known name, then that CRS shall be described according to <i>ISO 19111</i> and <i>ISO/TS 19127</i>. An identifier or well known name with an authority is then defined and referenced here.</p> <p>Note: A CRS identifier should be taken from a register such as EPSG Geodetic Parameter Dataset (http://www.epsg.org/).</p>

5.8.2 Reference System Identifier

Type: RS_Identifier

Description: Identifier of the Reference System.

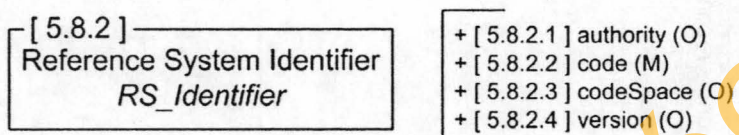


Figure 40: Reference system identifier

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.8.2.1	authority	O	CI_Citation (see 5.14)	The party responsible for maintenance of the reference system code space, e.g. "International Association of Oil and Gas Producers (OGP)."	Strongly recommend to provide contact information (5.16.4 <i>contactInfo</i>) under cited responsible party (5.14.7 <i>citedResponsibleParty</i>).
5.8.2.2	code	M	free text (CharacterString)	The alphanumeric value identifying the reference system, e.g. "EPSG:4269."	
5.8.2.3	codeSpace	O	free text (CharacterString)	Identifier/namespace of the system in which the code is valid, e.g. " http://www.epsg.org/databases/epsg-v6_13.zip ."	
5.8.2.4	version	O	free text (CharacterString)	The cited reference system version, e.g. "6.13."	

5.9 Content Information (O,Repeatable)

This section describes attributes and components that provide information about content information.

Type: MD_FeatureCatalogueDescription and/or MD_CoverageDescription and/or MD_Image

Description: Describes the dataset content.

BP: Although features are normally listed in a Feature Catalogue, it is necessary to list them in 5.9.1.4 as the catalogue may not be easily accessible.

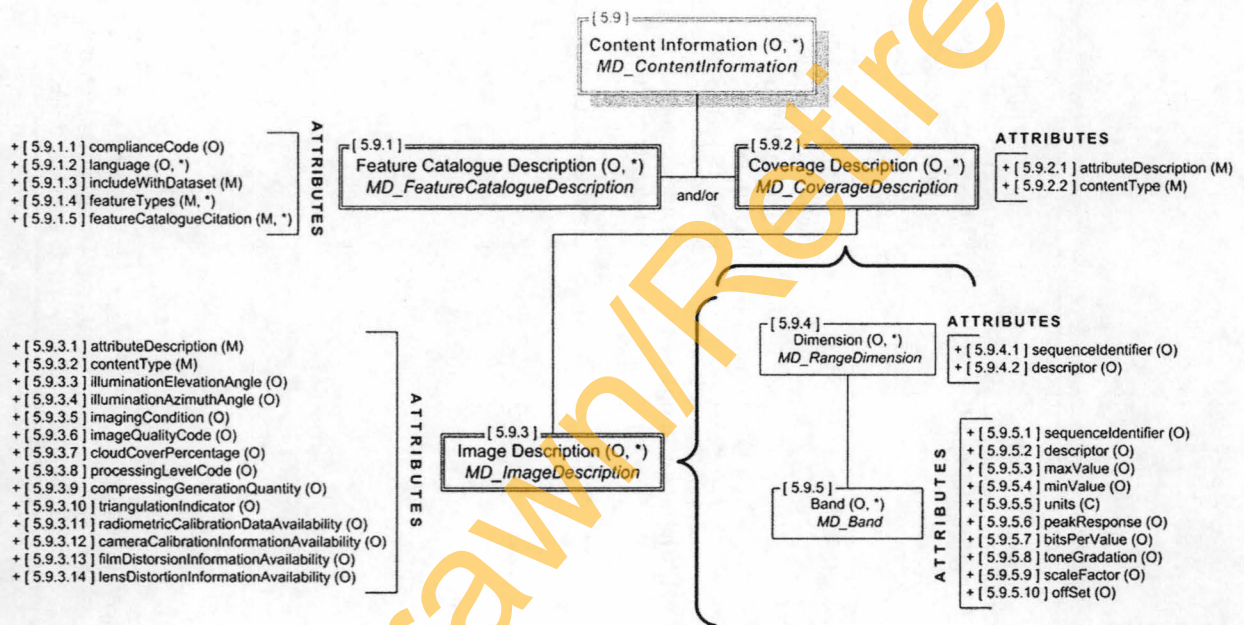


Figure 41: Content information

The following subitems with their attributes and components provide information about content.

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.9.1	Feature Catalogue Description	O,Repeatable	MD_FeatureCatalogueDescription	Identification of the feature catalogue or the conceptual schema.	
5.9.1.1	complianceCode	O	Boolean (see B.2)	Indication of whether the cited feature catalogue complies with ISO 19110.	"0" / "false" means <i>not compliant</i> ; "1" / "true" means <i>compliant</i> .
5.9.1.2	language	O,Repeatable	free text (CharacterString)	Language and character coding standards of the feature catalogue.	Three letter language code, a three letter country code, and character coding code: <ISO 639-2/T three letter language code><;><blank space><ISO 3166-1 three letter country code><;><blank space><character set code> e.g. fra; CAN; utf8 Note: see http://www.loc.gov/standards/ISO 639-2/php/English_list.php for ISO 639-2/T language codes; see http://userpage.chemie.fu-berlin.de/diverse/doc/ISO 3166.html for ISO 3166-1 country codes; see CodeList napMD_CharacterSetCode for character set codes.
5.9.1.3	includedWithDataset	M	Boolean (see B.2)	Is the feature catalogue included with the dataset?	"0" / "false" means <i>not included</i> ; "1" / "true" means <i>included</i> .

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.9.1.4	featureTypes	M,Repeatable	GenericName (see B.8)	Feature type identifier and/or generic name of feature as listed in the feature catalogue.	
5.9.1.5	featureCatalogueCitation	M,Repeatable	CI_Citation (see 5.14)	Citation to reference the feature catalogue.	Strongly recommend to provide contact information (5.16.4 <i>contactInfo</i>) under cited responsible party (5.14.7 <i>citedResponsibleParty</i>). Strongly recommend that the citation provides a link to the feature catalogue, which may be included in and/or be external to the metadata document. The link is provided by the attribute <i>onlineResource</i> (5.17.3) under <i>contactInfo</i> (5.16.4), which is itself under <i>citedResponsibleParty</i> (5.14.7).
5.9.2	Coverage Description	O,Repeatable	MD_CoverageDescription	Information about the content of grid data cells.	
5.9.2.1	attributeDescription	M	RecordType (see B.18)	Description of the attribute corresponding to the cell measurement.	
5.9.2.2	contentType	M	CodeList napMD_CoverageContentTypeCode	Information represented by the cell.	Select <i>contentType</i> from napMD_CoverageContentTypeCode.
5.9.2.3	Dimension	O,Repeatable	MD_RangeDimension (see 5.9.4)	Information on the	

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
			and/or MD_Band (see 5.9.5)	dimensions of the cell measurement value.	
5.9.3	Image Description	O,Repeatable	MD_ImageDescription	Information about image characteristics	
5.9.3.1	attributeDescription	M	RecordType (see B.18)	Description of the cell measurement.	
5.9.3.2	contentType	M	CodeList napMD_CoverageContentTypeCode	Information represented by the cell.	Select <i>contentType</i> from napMD_CoverageContentTypeCode.
5.9.3.3	illuminationElevationAngle	O	Real (see B.16)	Illumination elevation measured in degrees clockwise from the target plane at intersection of the optical line of sight with the Earth's surface.	Value domain is [-90, 90]. For scanned images, refer to the center pixel of the image.
5.9.3.4	illuminationAzimuthAngle	O	Real (see B.16)	Illumination azimuth measured in degrees clockwise from true north at the time the image is taken.	Value domain is [0, 360]. Reference the center pixel of the image for scanned images.
5.9.3.5	imagingCondition	O	CodeList napMD_ImagingConditionCode	Conditions affecting the image.	Select <i>imagingCondition</i> from napMD_ImagingConditionCode.

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.9.3.6	imagingQualityCode	O	MD_Identifier (see 5.22)	Specifies the image quality.	
5.9.3.7	cloudCoverPercentage	O	Real (see B.16)	Percentage of dataset area obscured by clouds.	Value domain is [0.0, 100.0].
5.9.3.8	processingLevelCode	O	MD_Identifier (see 5.22)	Identification of the image processing level.	
5.9.3.9	compressionGenerationQuantity	O	Integer (see B.13)	The number of compression cycles performed on the image.	
5.9.3.10	triangulationIndicator	O	Boolean (see B.2)	Indication if triangulation was performed on the image.	"0" / "false" means <i>no</i> ; "1" / "true" means <i>yes</i> .
5.9.3.11	radiometricCalibrationDataAvailability	O	Boolean (see B.2)	Indication if radiometric calibration information to generate radiometrically calibrated standard data product is available.	"0" / "false" means <i>no</i> ; "1" / "true" means <i>yes</i> .
5.9.3.12	cameraCalibrationInformationAvailability	O	Boolean (see B.2)	Indication of camera calibration constants availability.	"0" / "false" means <i>no</i> ; "1" / "true" means <i>yes</i> .

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.9.3.13	filmDistortionInformationAvailability	O	Boolean (see B.2)	Indication of Calibration Reseau information availability.	"0" / "false" means <i>no</i> ; "1" / "true" means <i>yes</i> .
5.9.3.14	lensDistortionInformationAvailability	O	Boolean (see B.2)	Indication of lens aberration correction information availability.	"0" / "false" means <i>no</i> ; "1" / "true" means <i>yes</i> .
5.9.3.15	Dimension	O,Repeatable	MD_RangeDimension (see 5.9.4) and/or MD_Band (see 5.9.5)	Information on the dimensions of the cell measurement value.	
5.9.4	Dimension	O,Repeatable	MD_RangeDimension	Information on the dimensions of the cell measurement value.	Either <i>sequenceIdentifier</i> or <i>descriptor</i> shall be provided, or both.
5.9.4.1	sequenceIdentifier	O	MemberName (see B.15)	Sensor band wavelengths.	
5.9.4.2	descriptor	O	free text (CharacterString)	Description of cell value range.	
5.9.5	Band	O,Repeatable	MD_Band	Range of wavelengths in the electromagnetic spectrum.	Either <i>sequenceIdentifier</i> or <i>descriptor</i> shall be provided, or both.
5.9.5.1	sequenceIdentifier	O	MemberName (see B.15)	Sensor band wavelengths.	
5.9.5.2	descriptor	O	free text (CharacterString)	Description of cell value range.	

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.9.5.3	maxValue	O	Real (see B.16)	Longest wavelength the sensor is capable of collecting within the designated band.	
5.9.5.4	minValue	O	Real (see B.16)	Shortest wavelength the sensor is capable of collecting within the designated band.	
5.9.5.5	units	C	UomLength (see B.25)	Sensor wavelength units.	Mandatory if <i>maxValue</i> (5.9.5.3) or <i>minValue</i> (5.9.5.4) is reported.
5.9.5.6	peakResponse	O	Real (see B.16)	Highest wavelength response.	
5.9.5.7	bitsPerValue	O	Integer (see B.13)	Maximum number of significant bits in the uncompressed representation for the value in each band of each pixel.	
5.9.5.8	toneGradation	O	Integer (see B.13)	Number of discrete numerical values in the grid data.	
5.9.5.9	scaleFactor	O	Real (see B.16)	Scale factor applied to each cell value.	

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.9.5.10	offset	0	Real (see B.16)	The physical value corresponding to a cell value of zero.	

5.10 Portrayal Catalogue Information (O,Repeatable)

This section describes attributes that provide information about portrayal catalogue information.

Note: A portrayal catalogue is a collection of defined symbols used to depict, to humans, features on a map.

Type: MD_PortrayalCatalogueReference

Description: Information used to identify and locate the portrayal catalogue.

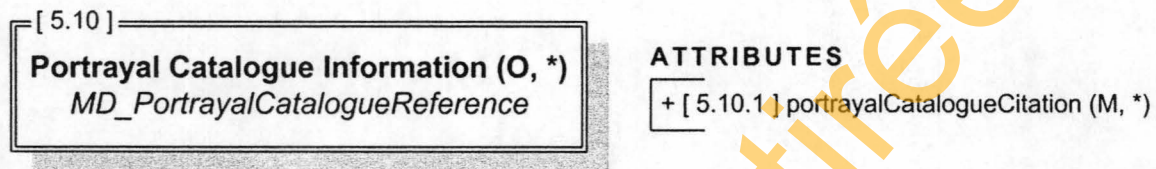


Figure 42: Portrayal catalogue information

The following attribute provides information about portrayal catalogue.

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.10.1	portrayalCatalogueCitation	M,Repeatable	CI_Citation (see 5.14)	Bibliographic citation for the portrayal catalogue.	Strongly recommend to provide contact information (5.16.4 <i>contactInfo</i>) under cited responsible party (5.14.7 <i>citedResponsibleParty</i>).

5.11 Distribution Information (O)

This section describes attributes and components that provide information about distribution information.

Type: MD_Distribution

Description: Information about the dataset distributor and options to obtain the dataset.

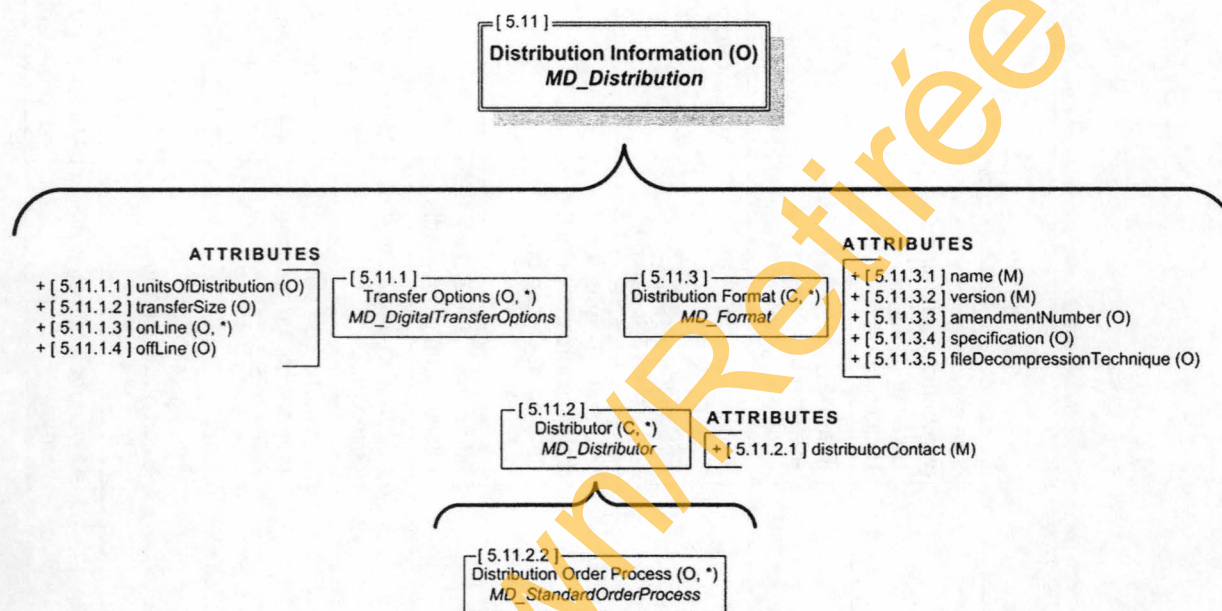


Figure 43: Distribution information

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.11.1	Transfer Options	O,Repeatable	MD_DigitalTransferOptions	The means and media by which the data/dataset is obtained from the distributor.	
5.11.1.1	unitsOfDistribution	O	free text (CharacterString)	Tiles, layers, geographic areas, etc. in which the data is available.	
5.11.1.2	transferSize	O	Real (see B.16)	Estimated size of the transfer unit in the specified format, expressed in megabytes.	Value greater than "0.0." <i>transferSize</i> refers to the maximum value.
5.11.1.3	onLine	O,Repeatable	CI_OnlineResource (see 5.20)	Information about the online sources where the data/dataset may be obtained.	
5.11.1.4	offLine	O	MD_Medium (see 5.11.8)	Information about the offline distribution media.	
5.11.2	Distributor	C,Repeatable	MD_Distributor	Information about the data distributor.	Mandatory if <i>Distribution Format</i> (5.11.3) information is not provided.
5.11.2.1	distributorContact	M	CI_ResponsibleParty (see 5.16)	Information on party responsible for dataset distribution.	If the distributor name or position name is not known then organization name is required. Contact information (5.16.4 <i>contactInfo</i>) shall be provided.
5.11.2.2	Distribution Order Process	O,Repeatable	MD_StandardOrderProcess (see 5.11.4)	The process to follow when obtaining the dataset.	
5.11.3	Distribution Format	C,Repeatable	MD_Format	Description of distribution format.	Mandatory if <i>Distributor</i> (5.11.2) information is not provided.

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.11.3.1	name	M	free text (CharacterString)	Name of the data transfer format.	
5.11.3.2	version	M	free text (CharacterString)	Version of the format (date, number, etc).	
5.11.3.3	amendmentNumber	O	free text (CharacterString)	Format version amendment number.	
5.11.3.4	specification	O	free text (CharacterString)	The subset name, profile, or product specification of the format.	
5.11.3.5	fileDecompressionTechnique	O	free text (CharacterString)	Description of recommended processes or algorithms to apply to the compressed resource.	

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Withdrawn/Retirée

5.11.4 Standard Order Process

Type: MD_StandardOrderProcess

Description: The process in which the resource is obtained or received and other related instructions or fee information.

BP: At least one of *fees*, *plannedAvailableDateTime*, *orderingInstructions* or *turnaround* shall be provided.

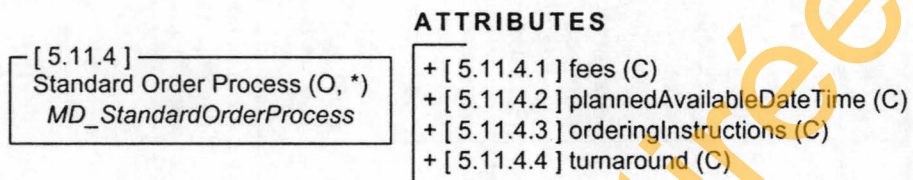


Figure 44: Standard order process

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.11.4.1	fees	C	free text (CharacterString)	Fees and terms for obtaining the data/dataset.	Include at the end an monetary units alphabetic code as specified in ISO 4217 (see http://www.iso.org/iso/en/prods-services/popstds/currencycodeslist.html) e.g. 300.00USD 299.99CAD <i>fees</i> is mandatory when <i>plannedAvailableDateTime</i> (5.11.4.2), <i>orderingInstructions</i> (5.11.4.3), and <i>turnaround</i> (5.11.4.4) are not provided.
5.11.4.2	plannedAvailableDateTime	C	DateTime (see B.5)	Date and time the resource will be available.	<i>plannedAvailableDateTime</i> is mandatory when <i>fees</i> (5.11.4.1), <i>orderingInstructions</i> (5.11.4.3), and <i>turnaround</i> (5.11.4.4) are not provided.
5.11.4.3	orderingInstructions	C	free text (CharacterString)	General instructions, terms, and services provided by the data distributor.	<i>orderingInstructions</i> is mandatory when <i>fees</i> (5.11.4.1), <i>plannedAvailableDateTime</i> (5.11.4.2), and <i>turnaround</i> (5.11.4.4) are not provided.
5.11.4.4	turnaround	C	free text (CharacterString)	Typical time required for filling a data request.	<i>turnaround</i> is mandatory when <i>fees</i> (5.11.4.1), <i>plannedAvailableDateTime</i> (5.11.4.2), and <i>orderingInstructions</i> (5.11.4.3) are not provided.

5.11.5 Medium

Type: MD_Medium

Description: Information on the name, density, density units, volumes, medium format, and medium note used to describe the transfer of data to a medium.

BP: At least one of *name*, *density*, *volumes*, *mediumFormat* or *mediumNote* shall be provided. *DensityUnits* is mandatory if *density* is provided.

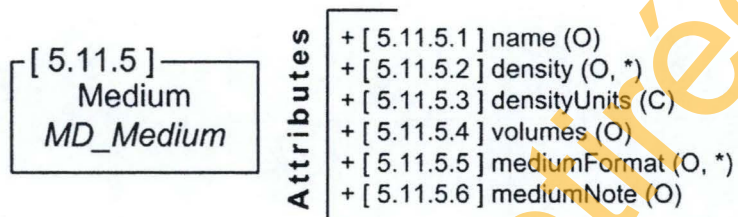


Figure 45: Medium

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.11.5.1	name	O	CodeList napMD_MediumNameCode	Medium name code.	Select medium <i>name</i> from napMD_MediumNameCode.
5.11.5.2	density	O,Repeatable	Real (see B.16)	The recording density on the specified media.	Value greater than "0.0."
5.11.5.3	densityUnits	C	free text (CharacterString)	The recording density units.	<i>densityUnits</i> is mandatory when <i>density</i> (5.11.5.2) is recorded.
5.11.5.4	volumes	O	Integer (see B.13)	Identification of the number of recorded items on the media.	Value greater than "0."
5.11.5.5	mediumFormat	O,Repeatable	CodeList napMD_MediumFormatCode	Method used to write to the medium.	Select <i>mediumFormat</i> from napMD_MediumFormatCode.
5.11.5.6	mediumNote	O	free text (CharacterString)	Description of limitations or requirements for using the medium.	

5.12 Application Schema Information (O,Repeatable)

This section describes attributes that provide information about application schema information.

Type: MD_ApplicationSchemaInformation

Description: Information about the application schema used to develop the dataset.

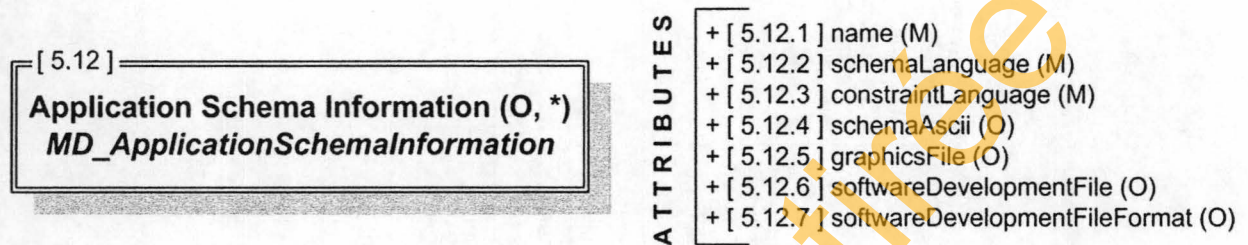


Figure 46: Application schema information

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.12.1.1	name	M	CI_Citation (see 5.14)	Citation for the application schema.	Strongly recommend to provide contact information (5.16.4 <i>contactInfo</i>) under cited responsible party (5.14.7 <i>citedResponsibleParty</i>).
5.12.1.2	schemaLanguage	M	free text (CharacterString)	identification of the schema language.	
5.12.1.3	constraintLanguage	M	free text (CharacterString)	Identification of the formal language used to describe constraints in the application schema.	
5.12.1.4	schemaAscii	O	free text (CharacterString)	Full application schema given as an ASCII file.	
5.12.1.5	graphicsFile	O	Binary (see B.1)	Full application schema given as a graphics file.	
5.12.1.6	softwareDevelopmentFile	O	Binary (see B.1)	Full application schema given as a software development file.	
5.12.1.7	softwareDevelopmentFileFormat	O	free text (CharacterString)	Software dependent format used for the application schema software dependent file.	

5.13 Extent Information

This section describes attributes and components that provide information about extent.

Type: EX_Extent

Description: Describes the spatial (horizontal and/or vertical) and the temporal coverage in the dataset.

BP: At least, one of *description*, *Geographic Element*, *Temporal Element* or *Vertical Element* shall be reported.

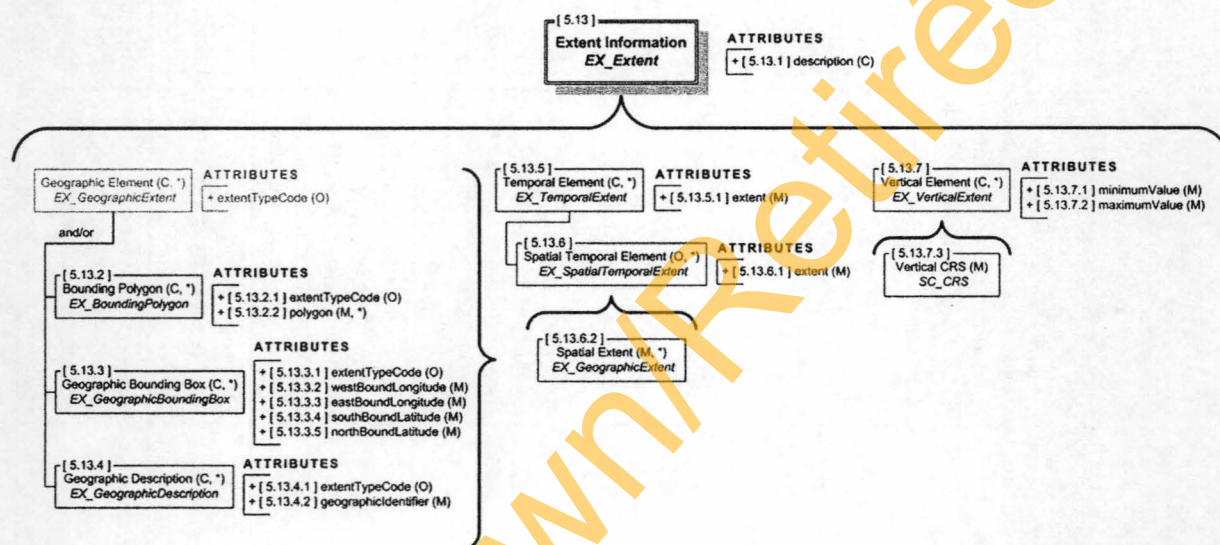


Figure 47: Extent information

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.13.1	description	C	free text (CharacterString)	Text which describes the spatial and temporal extent of the dataset.	When referring to a named location, time period or elevation, this can be also listed as a keyword (5.3.1.17, 5.3.2.15 and 5.3.6). The attribute <i>type</i> (5.3.6.2) will be set with the respective value of "place", "temporal", or "stratum". For descriptions that include temporal values <i>Spatial Temporal Element</i> (5.13.6) should be used instead of this <i>description</i> element. <i>description</i> is mandatory when <i>Bounding Polygon</i> (5.13.2), <i>Geographic Bounding Box</i> (5.13.3), <i>Geographic Description</i> (5.13.4), <i>Temporal Element</i> (5.13.5), or <i>Vertical Element</i> (5.13.7) are not provided.
5.13.2	Bounding Polygon	C,Repeatable	EX_BoundingPolygon	An element which describes inclusions or exclusions in a resource. The enclosed boundary of the dataset expressed in x-y coordinates.	<i>Bounding Polygon</i> is mandatory when <i>description</i> (5.13.1), <i>Geographic Bounding Box</i> (5.13.3), <i>Geographic Description</i> (5.13.4), <i>Temporal Element</i> (5.13.5), or <i>Vertical Element</i> (5.13.7) are not provided.
5.13.2.1	extentTypeCode	O	Boolean (see B.2)	Indication of the bounding polygon including or excluding areas or when the dataset includes areas where data does not exist.	"0" / "false" means <i>exclusion</i> ; "1" / "true" means <i>inclusion</i> .
5.13.2.2	polygon	M,Repeatable	GM_Object (see B.11)	Bounding polygon represented by coordinate pairs.	Latitude domain is [-90, 90] in decimal degrees, Longitude domain is [-180, 180] in decimal degrees.
5.13.3	Geographic Bounding Box	C,Repeatable	EX_GeographicBoundingBox	An element which describes inclusions or exclusions in a resource. It consists of an	This is only an approximation and specifying the coordinate reference systems is not needed. <i>Geographic Bounding Box</i> is mandatory when <i>description</i> (5.13.1), <i>Bounding Polygon</i> (5.13.2),

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
				approximation on the horizontal extent of the data represented by a rectangle-like shape.	<i>Geographic Description</i> (5.13.4), <i>Temporal Element</i> (5.13.5), or <i>Vertical Element</i> (5.13.7) are not provided.
5.13.3.1	extentTypeCode	O	Boolean (see B.2)	Indication of the bounding box including or excluding areas or when the dataset includes areas where data does not exist.	"0" / "false" means <i>exclusion</i> ; "1" / "true" means <i>inclusion</i> .
5.13.3.2	westBoundLongitude	M	Decimal (see B.6)	Western most coordinate of the dataset extent.	West bound domain is [-180, 180] in decimal degrees.
5.13.3.3	eastBoundLongitude	M	Decimal (see B.6)	Eastern most coordinate of the dataset extent.	East bound domain is [-180, 180] in decimal degrees.
5.13.3.4	southBoundLatitude	M	Decimal (see B.6)	Southern most coordinate of the dataset extent.	South bound domain is [-90, 90] in decimal degrees.
5.13.3.5	northBoundLatitude	M	Decimal (see B.6)	Northern most coordinate of the dataset extent.	North bound domain is [-90, 90] in decimal degrees.
5.13.4	Geographic Description	C,Repeatable	EX_GeographicDescription	An element which describes inclusions or exclusions in a resource. The geographic extent is described by an identifier.	<i>Geographic Description</i> is mandatory when <i>description</i> (5.13.1), <i>Bounding Polygon</i> (5.13.2), <i>Geographic Bounding Box</i> (5.13.3), <i>Temporal Element</i> (5.13.5), or <i>Vertical Element</i> (5.13.7) are not provided.
5.13.4.1	extentTypeCode	O	Boolean (see B.2)	Indication of the bounding box including or excluding areas or when the dataset includes areas where data does not exist.	"0" / "false" means <i>exclusion</i> ; "1" / "true" means <i>inclusion</i> .
5.13.4.2	geographicIdentifier	M	MD_Identifier (see 5.22)	Information which identifies the geographic area	

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
				through the use of a unique name established and maintained by an authority.	
5.13.5	Temporal Element	C,Repeatable	EX_TemporalExtent	The time period related to the dataset content.	A temporal element could be used to describe either the time period covered by the content of the dataset (e.g. during the Jurassic) or the date and time when the data has been collected (e.g. the date on which the geological study was completed). If both are needed, then two temporal extents should be provided. The use of multiple temporal extents should be explained in the attribute <i>description</i> of the extent (5.13.1). <i>Temporal Element</i> is mandatory when <i>description</i> (5.13.1), <i>Bounding Polygon</i> (5.13.2), <i>Geographic Bounding Box</i> (5.13.3), <i>Geographic Description</i> (5.13.4), or <i>Vertical Element</i> (5.13.7) are not provided.
5.13.5.1	extent	M	TM_Primitive (see B.22)	The period of the dataset content.	Even if TM_Primitive allows the description of an instant, a time period is expected here.
5.13.6	Spatial Temporal Element	O,Repeatable	EX_TemporalExtent	Dataset extent in respect to date and/or time and spatial boundaries.	A spatial temporal element can be used as a substitute to a temporal element.
5.13.6.1	extent	M	TM_Primitive (see B.22)	The period of the dataset content.	
5.13.6.2	Spatial Extent	M,Repeatable	EX_BoundingPolygon (see 5.13.2) and/or EX_GeographicBoundingBox (see 5.13.3) and/or EX_GeographicDescription (see	The description of dataset spatial extent in respect to temporal extent.	

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
			5.13.4)		
5.13.7	Vertical Element	C,Repeatable	EX_VericalExtent	The elements which express the minimum and maximum of the vertical extent of the dataset.	<i>Vertical Element</i> is mandatory when <i>description</i> (5.13.1), <i>Bounding Polygon</i> (5.13.2), <i>Geographic Bounding Box</i> (5.13.3), <i>Geographic Description</i> (5.13.4), or <i>Temporal Element</i> (5.13.5) are not provided.
5.13.7.1	minimumValue	M	Real (see B.16)	Lowest vertical extent in the dataset.	
5.13.7.2	maximumValue	M	Real (see B.16)	Highest vertical extent in the dataset.	
5.13.7.3	Vertical CRS	M	SC_CRS (see B.19)	Information about the coordinate system used as the reference system for measuring vertical extent.	

5.14 Citation

This section describes attributes that provide information about citation.

Type: CI_Citation

Description: Information to reference the resource.

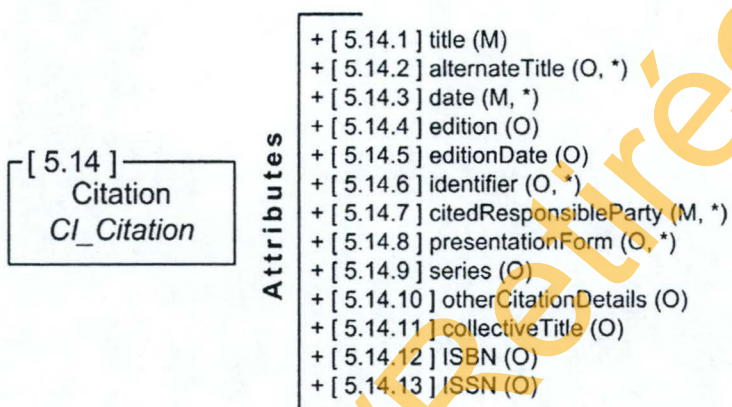


Figure 48: Citation

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.14.1	title	M	free text (CharacterString)	Name by which the cited resource is known.	
5.14.2	alternateTitle	O,Repeatable	free text (CharacterString)	Short name or other language name by which the cited information is known, e.g. "DCW" as an alternative title for "Digital Chart of the World."	
5.14.3	date	M,Repeatable	CI_Date (see 5.15)	Reference date for the cited resource; reference date and event used to describe it.	Whenever possible, include both creation date and revision date.
5.14.4	edition	O	free text (CharacterString)	Version of the cited resource.	
5.14.5	editionDate	O	Date (see B.4)	Date of the edition.	
5.14.6	identifier	O,Repeatable	MD_Identifier (see 5.22)	A unique value that identifies an object in a given namespace.	In MD_Identifier, the namespace is stored in the attribute <i>authority</i> (5.22.1) and the ID is stored in the attribute <i>code</i> (5.22.2). For example, the 1:50 000 map sheet of Sherbrooke in Canada is identified by the code "21E05" under the authority of "National Topographic System."
5.14.7	citedResponsibleParty	M,Repeatable	CI_ResponsibleParty (see 5.16)	Identification of the contact for the resource.	
5.14.8	presentationForm	O,Repeatable	CodeList napCI_PresentationFormCode	The form in which the resource is available.	Select <i>presentationForm</i> from napCI_PresentationFormCode.
5.14.9	series	O	CI_Series (see 5.21)	Information about the series or collection of which the resource is a	

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
				part.	
5.14.10	otherCitationDetails	O	free text (CharacterString)	Other information to complete a citation.	Separate each citation detail as following: <citationDetail_1><;><blank space><citationDetail_2>...
5.14.11	collectiveTitle	O	free text (CharacterString)	Information about the combined resource of which the dataset is a part. The description may include information on other volumes which are also available.	
5.14.12	ISBN	O	free text (CharacterString)	The international standard book number (ISBN) assigned by an ISBN authority to a publication such as a book, a pamphlet, an educational kit, a microform, a CD-ROM or another digital or electronic publication.	
5.14.13	ISSN	O	free text (CharacterString)	The international standard serial number (ISSN) assigned by an ISSN authority to a serial publication, such as a periodical, a newspaper, an annual, a journal or a monographic series.	

5.15 Date

This section describes attributes that provide information about a citation date.

Type: CI_Date

Description: The date in which the event or action occurred.

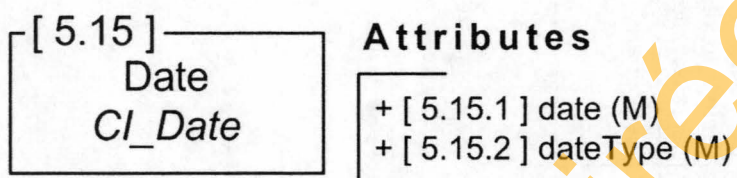


Figure 49: Date

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.15.1	date	M	Date (see B.4)	The date in which the event or action occurred.	Date is represented minimally as a four digit representation for year-YYYY.
5.15.2	dateType	M	CodeList napCI_DateTypeCode	Identification of the event used for the temporal aspect in the resource.	Select <i>dateType</i> from napCI_DateTypeCode.

Withdrawn/Revised

5.16 Responsible Party

This section describes attributes that provide information about the responsible party.

Type: CI_ResponsibleParty

Description: The identification of a responsible for the resource and the party's role in the resource.

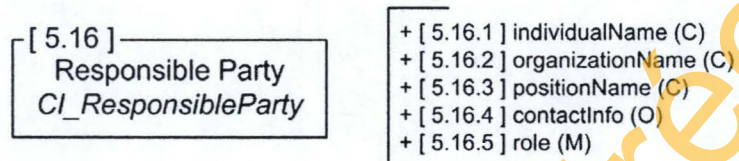


Figure 50: Responsible party

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.16.1	individualName	C	free text (CharacterString)	The name of the individual responsible for a reported action in the resource.	<i>individualName</i> shall be provided if <i>organizationName</i> (5.16.2) and/or <i>positionName</i> (5.16.3) are not provided. Wherever possible, avoid the use of personal names as they change more frequently than position name or organization and because their presence in a database or metadata record may make that record private as defined by various federal regulations.
5.16.2	organizationName	C	free text (CharacterString)	Name of the responsible organization.	<i>organizationName</i> shall be provided if <i>individualName</i> (5.16.1) and/or <i>positionName</i> (5.16.3) are not provided. <i>organizationName</i> is preferred.
5.16.3	positionName	C	free text (CharacterString)	Position of the responsible person.	<i>positionName</i> shall be provided if <i>individualName</i> (5.16.1) and/or <i>organizationName</i> (5.16.2) are not provided.
5.16.4	contactInfo	O	CI_Contact (see 5.17)	Information required enabling contact with the responsible person and/or organization.	
5.16.5	role	M	CodeList napCI_RoleCode	Function performed by the responsible party.	Select <i>role</i> from napCI_RoleCode.

5.17 Contact

This section describes attributes that provide information about contact.

Type: CI_Contact

Description: Information which assists one to contact an individual or organization.

BP: One of *phone*, *address*, or *onlineResource* shall be provided.

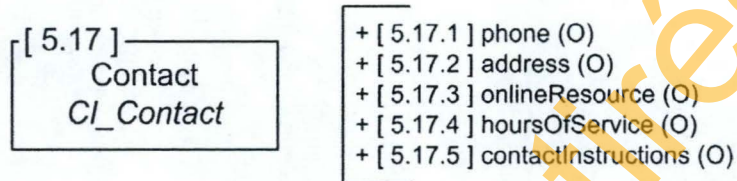


Figure 51: Contact

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.17.1	phone	O	CI_Telephone (see 5.18)	Telephone numbers to contact the organization or individual.	
5.17.2	address	O	CI_Address (see 5.19)	Physical and email address to contact the organization or individual.	
5.17.3	onlineResource	O	CI_OnlineResource (see 5.20)	Information about Internet hosted resources: availability; URL; protocol used; resource name; resource description, and resource function.	
5.17.4	hoursOfService	O	free text (CharacterString)	Time period (including time zone) when individuals can contact the organization or individual.	<p>According to the ISO 8601 representation of time-intervals by start and end time, hours of service is composed of a start and an end time in the form of:</p> <p><startTime></><endTime></p> <p>The start and end time representation conforms to ISO 8601 extended format. In this format, hours are depicted by two digits <hh> ranging from "00" to "24", minutes by two digits <mm> ranging from "00" to "59", and seconds by two digits <ss> ranging from "00" to "60." The basic format for local time is as follows:</p> <ul style="list-style-type: none"> a) hour, minute, and second: <hh><:><mm><:><ss> (e.g. 13:30:00); b) hour and minute: <hh><:><mm> (e.g. 13:30); c) hour: <hh> (e.g. 13).

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
					<p>The character "Z" could be added at the end of the time representation if it needs to designate time in Coordinated Universal Time (UTC), e.g. 13:30Z. However if it needs to show the difference between local time and UTC, one the following could be added at the end of the time representation:</p> <p>a) local time ahead of or equal to UTC: <+><hh><:><mm> (e.g. 13:30+05:00);</p> <p>b) local time behind of or equal to UTC: <-><hh><:><mm> (e.g. 13:30-05:00).</p>
5.17.5	contactInstructions	0	free text (CharacterString)	Supplemental instructions on how or when to contact the individual or organization.	

5.18 Telephone

This section describes attributes that provide information about telephone number.

Type: CI_Telephone

Description: Information on the telephone numbers used to contact the responsible individual or organization.

BP: *voice* or *facsimile* is required.

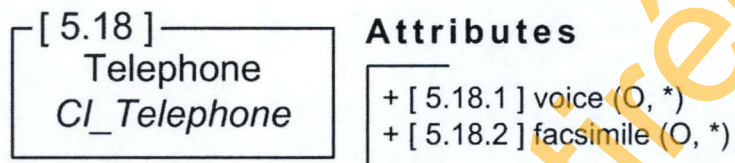


Figure 52: Telephone

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.18.1	voice	O,Repeatable	free text (CharacterString)	Telephone number of an organization or individual.	<p>The structure of the phone number is:</p> <pre><phoneType><;><blank space> <countryCode><blank space> <(><areaCode><)><localNumber></pre> <p>The <i>phoneType</i> values are either "voice" or "TDD/TTY."</p> <p>e.g. voice; 1 (819) 5645600</p>
5.18.2	facsimile	O,Repeatable	free text (CharacterString)	Facsimile telephone number of an organization or individual.	<p>The structure of the facsimile number is:</p> <pre><countryCode><blank space> <(><areaCode><)><localNumber></pre> <p>e.g. 1 (819) 5645698</p>

5.19 Address

This section describes attributes that provide information about address.

Type: CI_Address

Description: Place and email addresses at which the organization or individual may be contacted.

BP: At least one of the attributes below shall be provided.

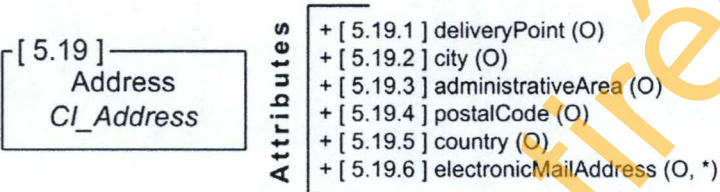


Figure 53: Address

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.19.1	deliveryPoint	O	free text (CharacterString)	Address line for the location.	<p>The delivery point is described according to one of the following:</p> <p>a) <addressType><;><blank space><street number><;><blank space><street name><;><blank space><floor ID><;><blank space><room/suite ID></p> <p>b) <addressType><;><blank space><box number><;><blank space><post office name></p> <p>The <i>addressType</i> is either "postal" or "physical." For the case b), it shall be "postal."</p> <p>Information not available or not applicable is left blank.</p> <p>For example, "physical; 2144; King West; ; 010" consists of a physical address of 2144 King West street with no floor information, and a room/suite ID of 010.</p>
5.19.2	city	O	free text (CharacterString)	City of the address.	
5.19.3	administrativeArea	O	free text (CharacterString)	State or province of the address.	<p>Lists of states and provinces are available at:</p> <p>a) United States: United States Post Service web page at http://www.usps.com/ncsc/lookups/usps_abbreviations.htm</p> <p>b) Canada: Post Canada – Canadian Addressing Guide at http://www.canadapost.ca/common/tools/pg/manual/PGaddress-e.asp</p>
5.19.4	postalCode	O	free text (CharacterString)	Administrative spatial code which assists mail and parcel delivery.	<p>The postal code format should follow the standard structure of the country. For instance, the format in the U.S. is:</p> <p><NNNNN><-><NNNN></p> <p>The format in Canada is:</p>

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
					<ANA><blank space><NAN> ² .
5.19.5	country	O	free text (CharacterString)	Country of the address.	The country name shall be taken from the ISO 3166 code list available at http://www.iso.org/iso/en/prods-services/ISO 3166ma/02iso-3166-code-lists/index.html . The full country name must be entered, not the code.
5.19.6	electronicMailAddresses	O, Repeatable	free text (CharacterString)	The electronic mailbox address of the responsible organization or individual.	

² N stands for a numeric character and A, for an alpha uppercase character.

5.20 Online Resource

This section describes attributes that provide information about an online resource.

Type: CI_OnlineResource

Description: Information on the Internet available resource.

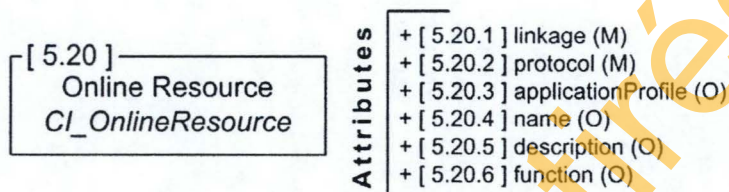


Figure 54: Online resource

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.20.1	linkage	M	URL (see B.26)	Internet location (address) for on-line access which uses a Uniform Resource Locator address or similar addressing scheme such as www.isotc211.org or ftp.isotc211.org .	
5.20.2	protocol	M	free text (CharacterString)	The connection protocol to be used such as http, ftp, etc.	The protocol should be taken from an official controlled list such as the Official Internet Protocol Standards published on the Web at http://www.rfc-editor.org/rfcxx00.html or the Internet Assigned Numbers Authority (IANA) at http://www.iana.org/numbers.html .
5.20.3	applicationProfile	O	free text (CharacterString)	Name of an application profile that can be used with the online resource.	<i>applicationProfile</i> refers to the name of an application to access the resource as identified by <i>linkage</i> (5.20.1) and <i>protocol</i> (5.20.2).
5.20.4	name	O	free text (CharacterString)	Name of the resource sought or the utility that provides it.	
5.20.5	description	O	free text (CharacterString)	Description of the utility that provides the resource sought.	
5.20.6	function	O	CodeList napCI_OnlineFunctionCode	Code for function performed by the online resource.	Select <i>function</i> from napCI_OnlineFunctionCode.

5.21 Series

This section describes attributes that provide information about series.

Type: CI_Series

Description: Information about a Series publication or dataset aggregation.

BP: For reference to a parent record, use clause 5.2.4. For clarification on the use of hierarchy levels, refer to Appendix D.

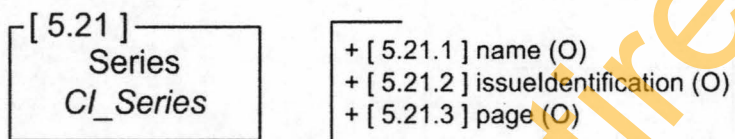


Figure 55: Series

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.21.1	name	O	free text (CharacterString)	Name of the publication series or aggregate dataset of which the referenced dataset is a part.	<i>name</i> shall be provided if <i>issueldentification</i> (5.21.2) is not provided.
5.21.2	issueldentification	O	free text (CharacterString)	Identification of the series' issue information.	<i>issueldentification</i> shall be provided if <i>name</i> (5.21.1) is not provided.
5.21.3	page	O	free text (CharacterString)	Identification of the articles' page number(s).	

5.22 Identifier

This section describes attributes that provide information about identification.

Type: MD_Identifier

Description: Information about the unique identification of an object.

BP: The namespace is stored in the attribute *authority* and the ID is stored in the attribute *code*. For example, the 1:50 000 map sheet of Sherbrooke in Canada is identified by the code "21E05" under the authority of "National Topographic System."

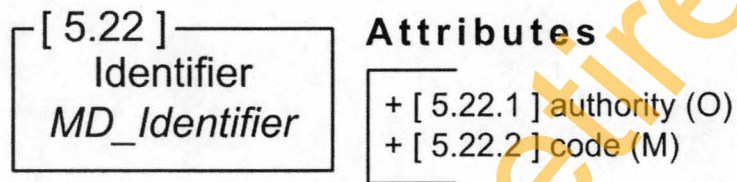


Figure 56: Identifier

Clause No	Name/ RoleName	Multiplicity	Type	Description	Best Practices
5.22.1	authority	O	CI_Citation (see 5.14)	Recognized responsible party or organization for a reference.	
5.22.2	code	M	free text (CharacterString)	The alphanumeric value that identifies a resource.	

Withdrawn/Retired

6 Cultural and Linguistic Adaptability

NAP – Metadata supports cultural and linguistic adaptability. It means that metadata is reported according to identified languages to serve cultures, application areas, professions, etc. Accordingly, three mechanisms are recognized in this profile:

- 1) Metadata language and CharacterSet;
- 2) Locale and free text attributes; and
- 3) Metadata element and code list register.

In this profile, there are four possibilities to identify languages and character sets:

- 1) the attributes *language* (see 5.2.2) and *characterSet* (see 5.2.3) in metadata record information;
- 2) the attribute *locale* (see 5.2.11) in metadata record information;
- 3) the attributes *language* (see 5.3.1.9) and *characterSet* (see 5.3.1.10) in data identification; and
- 4) the attribute *language* in feature catalogue description (see 5.9.1.2).

6.1 Metadata language and CharacterSet

Metadata elements are primarily reported in a specific language and an encoding character set that are identified in the attributes *language* (see 5.2.2) and *CharacterSet* (see 5.2.3) respectively, both at the metadata root level – i.e. Metadata Record Information (MD_Metadata). In this profile, the language identification is composed of a language identifier agreeing with ISO 639-2/T three letter terminology code and a country identifier agreeing with ISO 3166-1 three letter code separated by a semicolon (";") and a blank space character. The language code is in lowercase whereas the country code is in uppercase (e.g. "fra; CAN"). Any free text metadata element reported in that language uses the CharacterString data type as defined in ISO/TS 19103:2005.

6.2 Locale and free text attributes

Metadata may need to be reported in various languages. This is the case in Canada, which has two official languages. For this purpose, this profile allows the representation of free text metadata in other languages. As such, the primary language used for metadata description is identified with the attributes *language* (see 5.2.2) and *characterSet* (see 5.2.3) respectively of the Metadata Record Information and any additional languages are identified in the attribute *locale* (see 5.2.11) of the Metadata Record Information. The attribute *locale* is documented in conformity with the PT_Locale type as defined in ISO 19139:2007 and depicted in Figure 57.

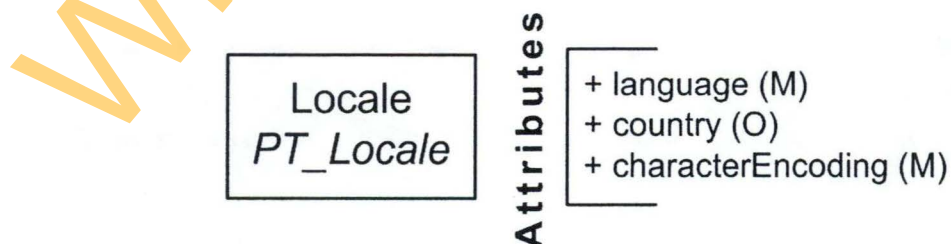


Figure 57: Locale

Here, the attribute *language* is provided according to ISO 639-2/T three letter terminology codes in lowercase. The attribute *country* is provided according to ISO 3166-1 three letter codes in uppercase.

A free text metadata can be reported within any declared languages. It must use either a LocalizedCharacterString or a PT_FreeText both subtypes of CharacterString as defined in ISO 19139:2007 (Figure 58). A Localized Character String is a free text description that refers to one language (Figure 59) declared in the attribute *locale* of the metadata record information whereas PT_FreeText is a free text description in one or multiple languages declared in the attribute *locale* of the metadata record information (i.e. it aggregates at least one Localized Character String).

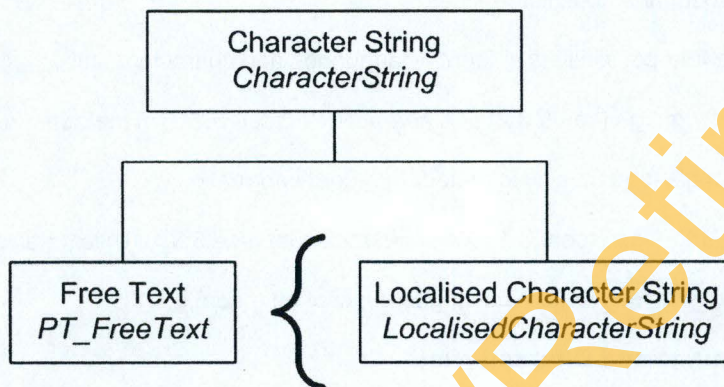


Figure 58: CharacterString, LocalisedCharacterString, and FreeText

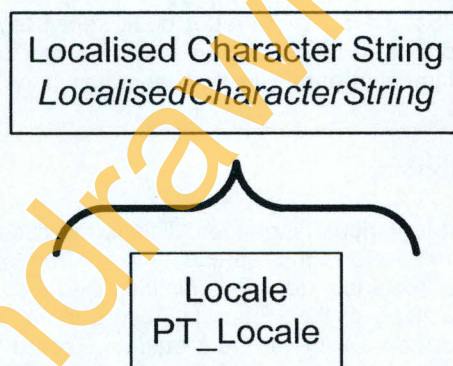


Figure 59: LocalisedCharacterString

Therefore, CharacterString, LocalizedCharacterString, or PT_FreeText can be used to report free text metadata attributes.

Consequently, the following rules apply when using CharacterString, LocalisedCharacterString, and PT_FreeText:

- 1) CharacterString shall be used when
 - a free text metadata attribute is reported in the primary metadata language and character set (attribute *language* and *characterSet* of MD_Metadata); or

- a free text metadata attribute is reported without reference to any language but according to the primary character set (attribute *characterSet* of MD_Metadata) Typically, this is the case for proper nouns, which are essentially identifiers for people, things, events, etc.;
- 2) LocalisedCharacterString shall be used when a free text metadata attribute is reported in one and only one of the additional metadata languages and character sets (attribute *locale* of MD_Metadata);
 - 3) PT_FreeText shall be used when a free text metadata element is reported in more than one language and character set identified as primary and additional languages.

Note: By default, all metadata entities will be in the same language, although individual text strings may be made available in other languages as described in 3), above. Note that some words in Canadian English differ from their equivalent in American English, such as center vs. centre, color vs. colour, or organisation vs. organization. Applications designed to discover all appropriate metadata records should take into account these differences by using a thesaurus or list of recognized variants.

This profile strongly recommends encoding multilingual free text elements following ISO 19139:2007 that bundles all the information within a PT_FreeText_PropertyType as shown in the snippet below describing an *abstract* metadata element (see 5.3.1.2):

```
<locale>
  <PT_Locale id="locale_fr">
    <languageCode>
      <LanguageCode codeList="./Codelist/ML_gmxCodelists.xml#
      LanguageCode" codeListValue="fra">
        Français
      </LanguageCode>
    </languageCode>
    <country>
      <Country codeList="./Codelist/ML_gmxCodelists.xml#Country"
      codeListValue="FR">
        FR
      </Country>
    </country>
    <characterEncoding>
      <MD_CharacterSetCode codeList="./Codelist/ML_gmxCodelists.xml#
      MD_CharacterSetCode" codeListValue="utf8">
        UTF 8
      </MD_CharacterSetCode>
    </characterEncoding>
  </PT_Locale>
</locale>
<abstract xsi:type="gmd:PT_FreeText_PropertyType">
  <gco:CharacterString>my abstract description</gco:CharacterString>
  <PT_FreeText>
    <textGroup>
      <LocalisedCharacterString locale="locale_fr">
        description de mon résumé
      </LocalisedCharacterString>
    </textGroup>
  </PT_FreeText>
</abstract>
```

6.3 NAP – Metadata register

Among other challenges, NAP – Metadata provides a solution to cultural and linguistic adaptability by introducing a multilingual register, i.e. *NAP – Metadata Register*. The NAP – Metadata Register identifies and provides the definition of metadata main items, metadata subitems, components, attributes, code lists, and coded values that are part of this profile in the languages that are required for North America. NAP –

Metadata Register supports English and French and may be extended as needed to support other languages, such as Spanish, Portuguese, and native North American languages, including support for additional alphabets needed for some native North American languages. However, code lists and their values that are referred in this clause may evolve and as such are not detailed in this document. By managing those in a register found at <http://www.fgdc.gov/nap/metadata/register> or <http://www.geoconnections.org/nap/metadata/register>, it will not affect this profile. The NAP – Metadata Register is ISO 19135:2005 compliant.

The following apply to the NAP – Metadata register:

- name: North American Profile of ISO 19115:2003 Metadata Register
- Uniform resource identifier (URI): <http://www.fgdc.gov/nap/metadata/register>
<http://www.geoconnections.org/nap/metadata/register>
- Operating language: English

7 Code Lists

ISO 19115:2003 and the NAP – Metadata use code lists to standardized textual metadata elements. A code list is an open enumeration of values which permits extending or adding codes as needed. NAP – Metadata uses ISO 19115:2003 code lists, extends some of them, and develops new ones to standardize some free text metadata elements. Annex D provides a list of the NAP – Metadata code lists. In order to distinguish NAP – Metadata code lists to ISO 19115:2003 code lists and avoid confusion, all NAP – Metadata code lists are prefixed with "nap", i.e. "napCI_", "napDQ_", "napDS_" and "napMD_". Figure 60 shows one example of an extended code list with codes shown in bold type, napCI_DateTypeCode, and one example of a new code list for a text data type, napMD_FileFormatCode.

«CodeList» napCI_DateTypeCode	«CodeList» napMD_FileFormatCode
<ul style="list-style-type: none"> + creation + publication + revision + notAvailable + inForce + adopted + deprecated + superseded 	<ul style="list-style-type: none"> + bil + bmp + bsq + bzip2 + cdr + cgm + cover + csv + dbf + dgn + doc + dwg + dxf + ...

Figure 60: Examples of NAP – Metadata code list

Any ISO 19115 based code list will be identified in an ISO 19139 compliant XML document using the corresponding ISO 19139 element name with a reference to the appropriate NAP – Metadata register code list in the attribute *codeList*. For example, the description of the value *deprecated* from the *napCI_DateTypeCode* code list is as follows:

```
<gmd:CI_DateTypeCode codeList="http://www.geoconnections.org/nap/metadata/register/napMetadataRegister.xml#IC_87" codeListValue="RI_372">deprecated</gmd:CI_DateTypeCode>
```

where:

CI_DateTypeCode:
ISO 19139 element name for a value of the code list *CI_DateTypeCode*

http://www.geoconnections.org/nap/metadata/register/napMetadataRegister.xml#IC_87:
unique identifier for the code list *napCI_DateTypeCode*

RI_372:
unique identifier for the value *deprecated*

When using a NAP – Metadata specific code list, the instance document must reference its XML type definition by derivation from *CharacterString*. For instance, it would be as following for *napMD_FileFormatCode* code list:

```
<xs:complexType name="napMD_FileFormatCode_PropertyType">
  <xs:complexContent>
    <xs:extension base="gco:CharacterString_PropertyType">
      <xs:attribute name="codeList" type="xs:anyURI" use="required"/>
      <xs:attribute name="codeSpace" type="xs:anyURI" use="optional"/>
      <xs:attribute name="codeListValue" type="xs:anyURI" use="required"/>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Then, a *CharacterString* metadata item can use that type through an explicit assertion with the attribute *xsi:type* to represent its content with reference to the appropriate code list and code list value, example:

```
...
<MD_BrowseGraphic>
  <fileType xsi:type="napm:napMD_FileFormatCode_PropertyType"
    codeList="http://www.geoconnections.org/nap/metadata/register/napMetadataRegister.xml#IC_115" codeListValue="RI_699" >
    <gco:CharacterString>dx</gco:CharacterString>
  </fileType>
</MD_BrowseGraphic>
...
```

NAP – Metadata code lists shall be used to claim compliance with this profile.

It is not the intention of this document to list all code lists and coded values that are needed for NAP – Metadata. The code lists and coded values are managed as part of and made available from the NAP – Metadata Register that is introduced in Clause 6.3. As such, code lists and coded values are available in the various languages handled by the register.

8 Extending the Profile

User communities may find it valuable to create extensions to this profile. While the specific extensions in any profile will not be compatible with the standard, the core and reused elements from this profile, and from the ISO 19115 standard from which this profile is derived, will remain interoperable.

However before developing NAP – Metadata extensions, the following notices are given:

- Before developing any extension to this profile, it is important to recognize that these extensions will not be interoperable outside of the specific community for which they will be developed;

- Therefore before initiating any extension development, a complete and careful study of the "Metadata Content" section of this profile along with the NAP-Metadata Register should be conducted in order to identify appropriate ways and coded values to document metadata. Extensions might not be required if existing metadata items and coded values meet the requirements;
- The review of any available formal NAP – Metadata extensions should also be considered before developing others as they might fulfill the needs and be reused.

Although NAP – Metadata does not provide explicit instructions for its extension process, it is still possible to extend this profile. To that end, the Metadata extension methodology from Annex F of *ISO 19115:2003, Geographic information – Metadata* along with *ISO 19106:2004, Geographic Information – Profiles* should be followed.

Withdrawn/Retirée

Bibliography

- ISO 639-2:1998, Codes for the representation of names of languages – Part 2: alpha-3 code
- ISO 3166-1:2006, Codes for the representation of names of countries and their subdivisions – Part 1: Country codes
- ISO 4217:2008, Codes for the representation of currencies and funds
- ISO/19101:2005, Geographic information – Reference model
- ISO/TS 19103:2005, Geographic information – Conceptual schema language
- ISO 19106:2004, Geographic Information – Profiles
- ISO 19111:2007, Geographic information – Spatial referencing by coordinates
- ISO 19115:2003, Geographic information – Metadata
- ISO 19115:2006, Geographic information – Metadata, Technical corrigendum 1
- ISO 19118:2005, Geographic information – Encoding
- ISO 19119:2005, Geographic information – Services
- ISO 19119:2005/Amd 1:2008, Extensions of the service metadata model
- ISO/TS 19127:2005, Geographic information – Geodetic codes and parameters
- ISO/TS 19128:2005, Geographic information – Web map server interface
- ISO/19132:2007, Geographic information – Location Based Services - Reference model
- ISO 19135:2005, Geographic information – Procedures for item registration
- ISO 19136:2007, Geographic information – Geography markup language
- ISO/TS 19139:2007, Geographic information – Metadata - XML schema implementation
- OGC 05-008-2005, OpenGIS® Web Services Common Specification

Annex A

Metadata Schemas

(normative)

A.1 NAP – Metadata UML diagram differences from ISO 19115 UML diagrams

This annex provides normative diagrams describing metadata elements of this profile in the Unified Modelling Language (UML). These diagrams are based on those of ISO 19115:2003 Geographic information – Metadata. They provide "views," which are portions of the complete model, that defines a metadata section (UML package) of related entities, elements, data types, and code lists. Throughout the following models, entities may have mandatory and/or optional elements and associations. In some cases, optional entities may have mandatory elements; those elements become mandatory only if the optional element is used. Throughout the diagrams, classes and relationships shown in light grey indicate that are not used in this profile and notes in light grey entitled "NAP – Metadata changes" highlight changes from ISO 19115:2003 Geographic information – Metadata to NAP – Metadata. Conditions that are introduced in these notes make use of the Object Constraint Language (OCL).

The UML notations used in this profile are described in the Figure 61.

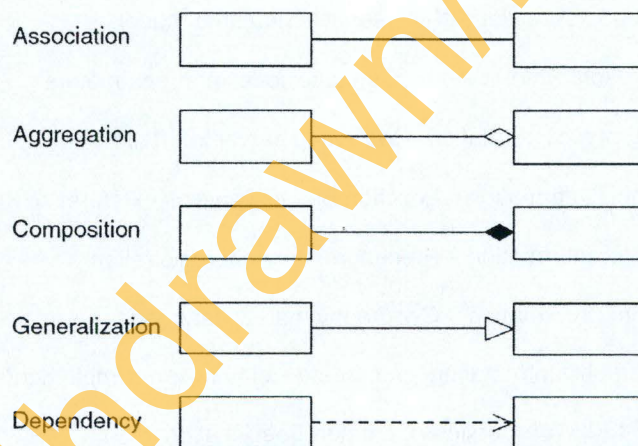


Figure 61: UML notation

An association describes a relationship between two or more classes. Three types of association are possible: association, aggregation and composition. A simple association represents a general relationship between two classes; aggregation, and composition association consist of soft and strong part-whole relationships respectively between two classes. An association is typically bi-directional but can specify a specific direction with an arrow end. A navigable association supplies a "role name" that is appropriate for the role of the target object in relation to the source object. Accordingly, a bi-directional association has a role name at both ends. The representation of role name and multiplicity is illustrated in Figure 62.

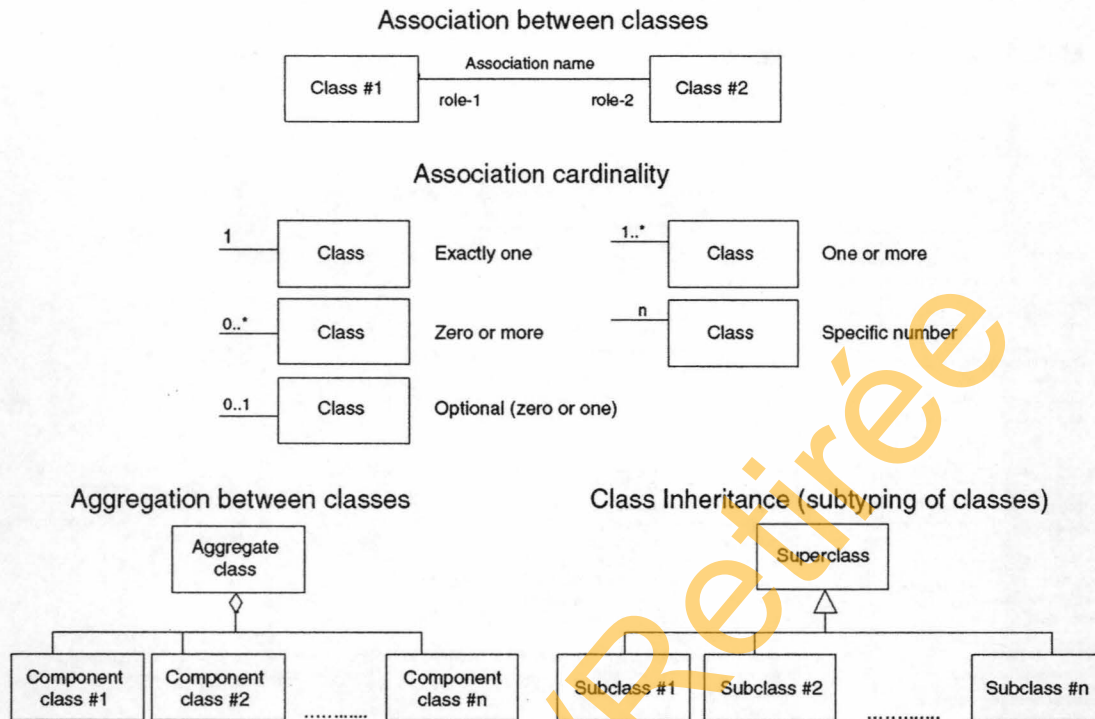


Figure 62: Role and cardinality

A generalization is a superclass/subclass relationship. The subclasses are specializations of the superclass and as such inherit the properties and roles of the superclass.

A dependency represents the relationship between a supplier and a client class. The supplier typically provides services, such as:

- access supplier's value (constant or variable);
- client invocation of supplier's operations;
- client operations that return objects of the supplier.

The following stereotypes are used in the UML diagrams presented here after:

<<Type>>: A domain of objects together with the operations applicable to the objects, without defining the physical implementation of those objects. It may have attributes and associations but no method. It serves as reference class for structural polymorphism.

<<Enumeration>>: A strict list of named values, used as the range of a particular attribute type. It is typically used when the values of the list are completely known.

<<DataType>>: A descriptor of a set of values that lack identity and whose operations do not have side effects. Datatypes include primitive pre-defined types and user-definable types. Pre-defined types include numbers, string, and time. User-definable types include enumerations.

<<CodeList>>: An open and flexible enumeration expressing a long list of potential values. It is typically used when only likely values of the list are known.

A.2 Metadata Package UML Diagrams

A.2.1 Metadata Record Information

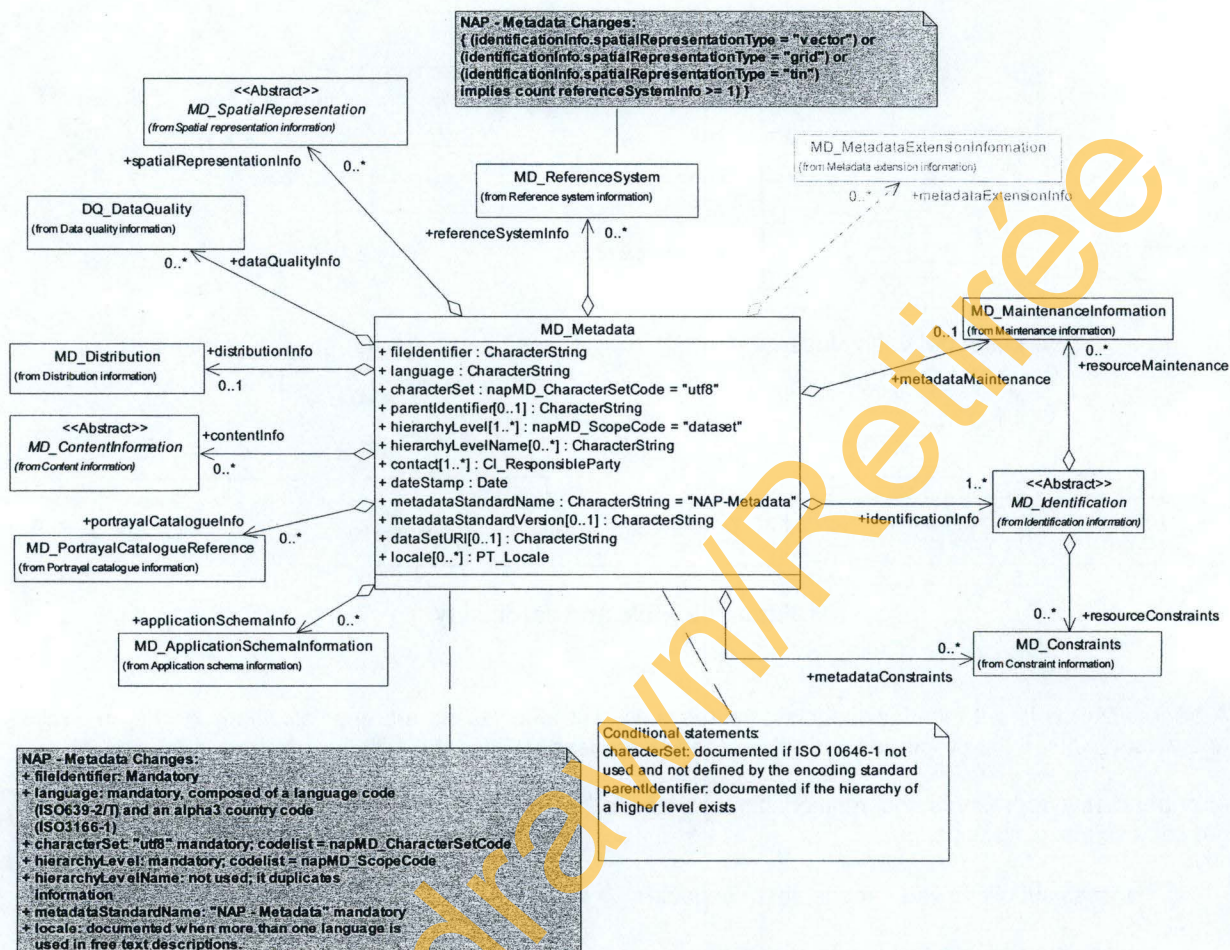


Figure 63: Metadata record information

A.2.2 Identification Information

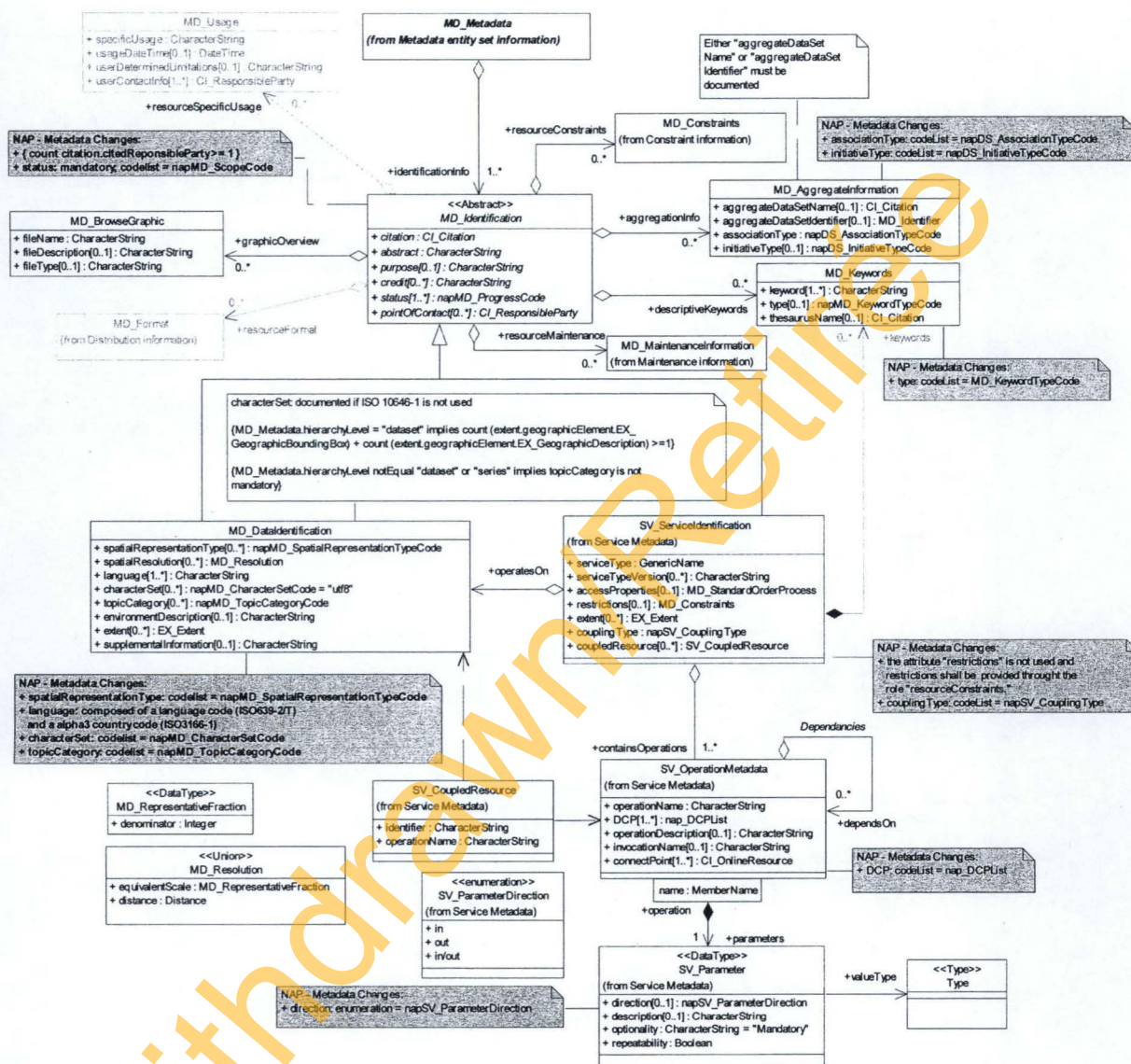


Figure 64: Identification information

A.2.3 Data Identification Information

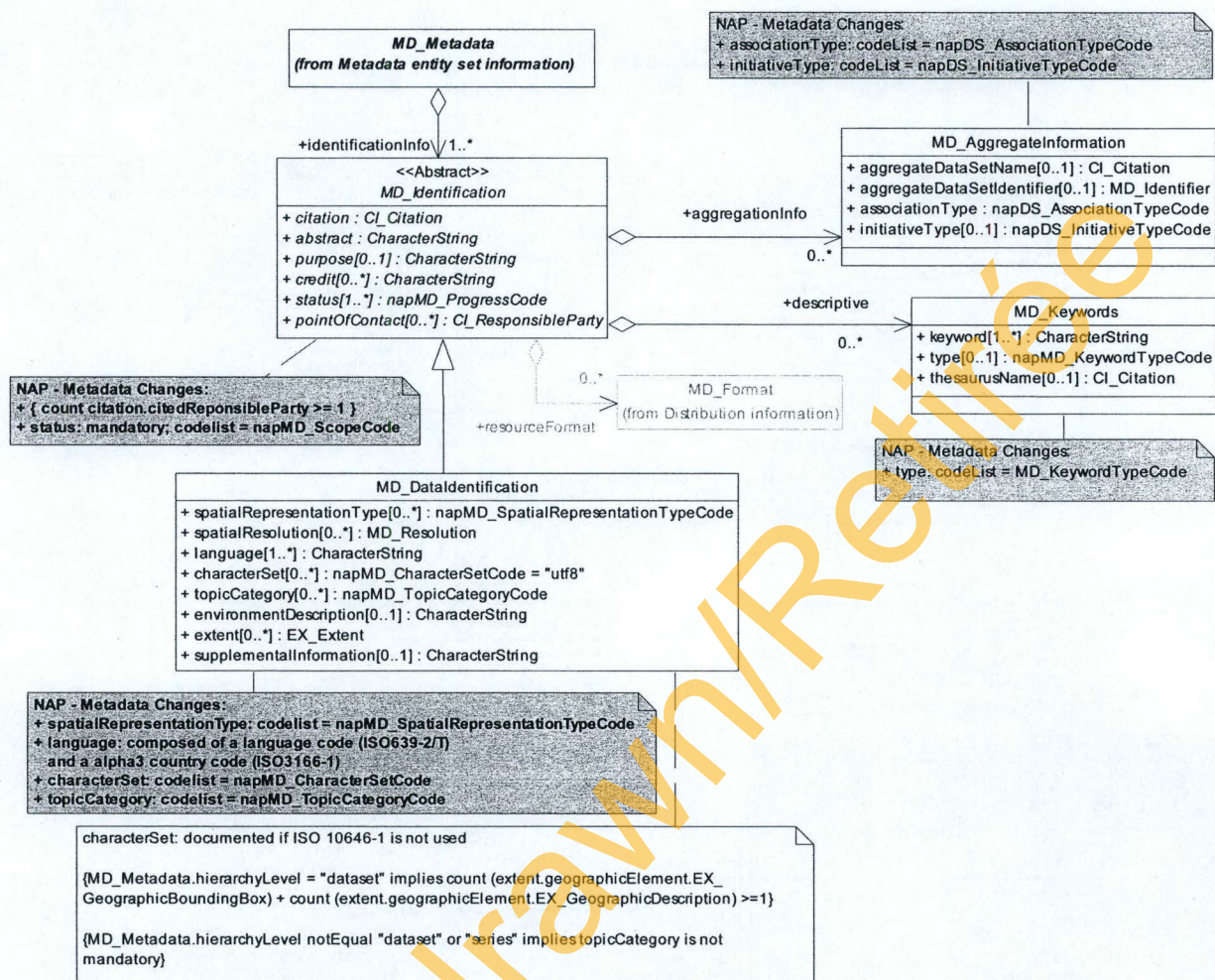


Figure 65: Data identification information

CAN/CGSB-171.100-2009



Figure 66: Service identification information

A.2.5 Constraint Information

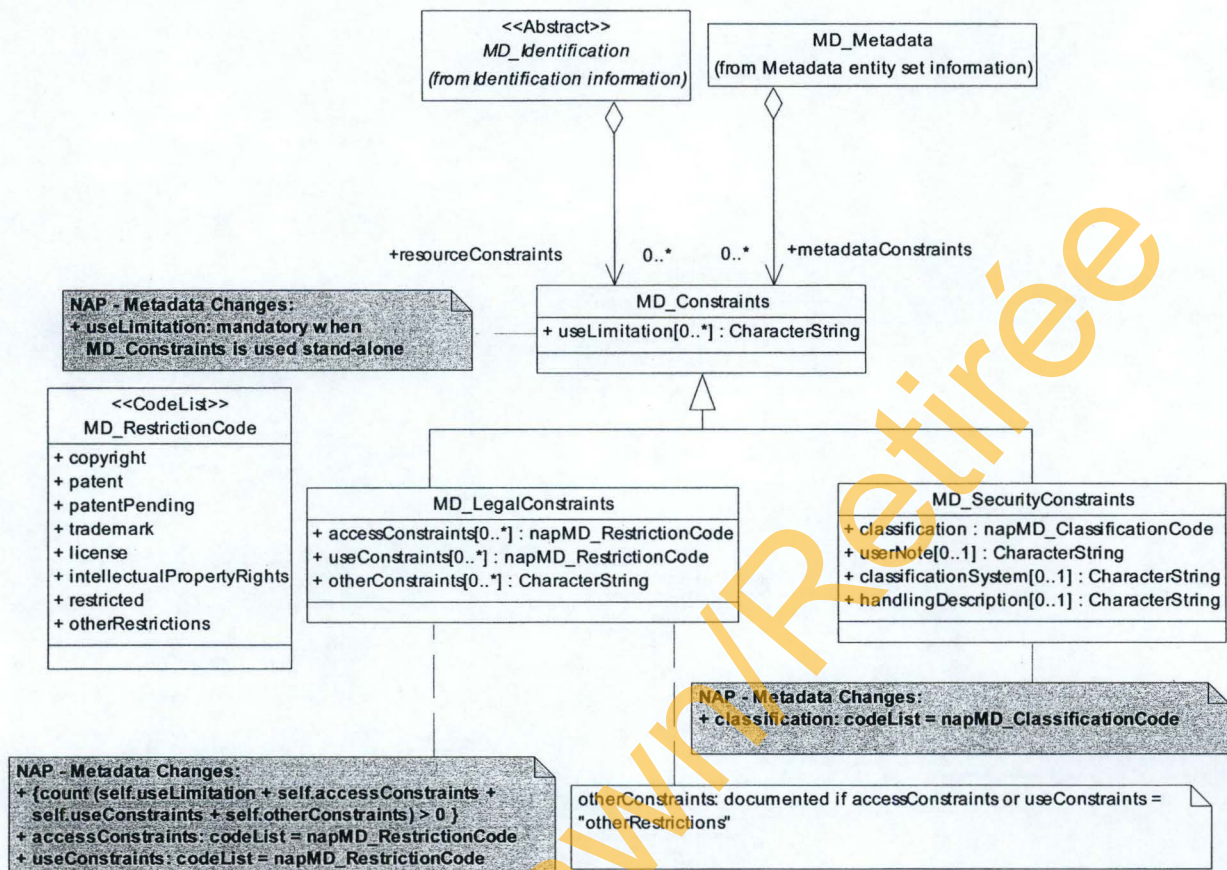


Figure 67: Constraint information

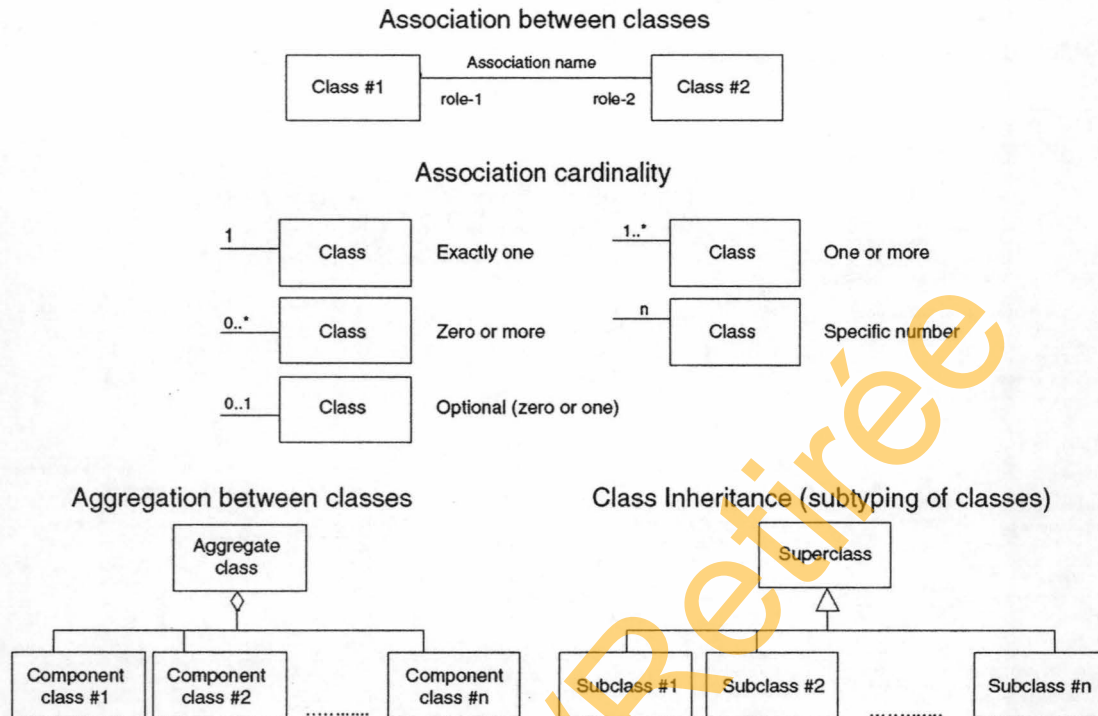


Figure 62: Role and cardinality

A generalization is a superclass/subclass relationship. The subclasses are specializations of the superclass and as such inherit the properties and roles of the superclass.

A dependency represents the relationship between a supplier and a client class. The supplier typically provides services, such as:

- access supplier's value (constant or variable);
- client invocation of supplier's operations;
- client operations that return objects of the supplier.

The following stereotypes are used in the UML diagrams presented here after:

<<Type>>: A domain of objects together with the operations applicable to the objects, without defining the physical implementation of those objects. It may have attributes and associations but no method. It serves as reference class for structural polymorphism.

<<Enumeration>>: A strict list of named values, used as the range of a particular attribute type. It is typically used when the values of the list are completely known.

<<DataType>>: A descriptor of a set of values that lack identity and whose operations do not have side effects. Datatypes include primitive pre-defined types and user-definable types. Pre-defined types include numbers, string, and time. User-definable types include enumerations.

<<CodeList>>: An open and flexible enumeration expressing a long list of potential values. It is typically used when only likely values of the list are known.

A.2.1 Metadata Record Information

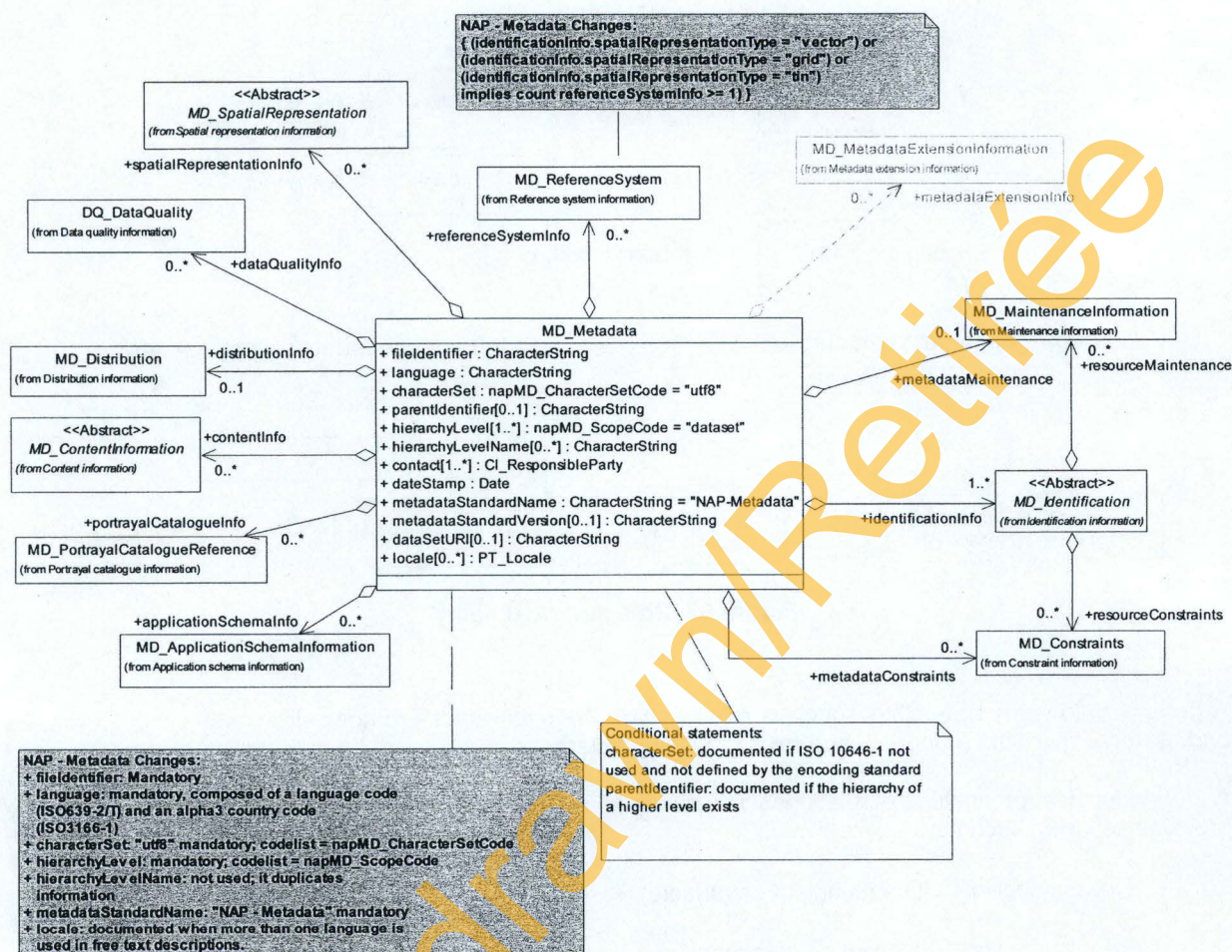


Figure 63: Metadata record information

A.2.2 Identification Information

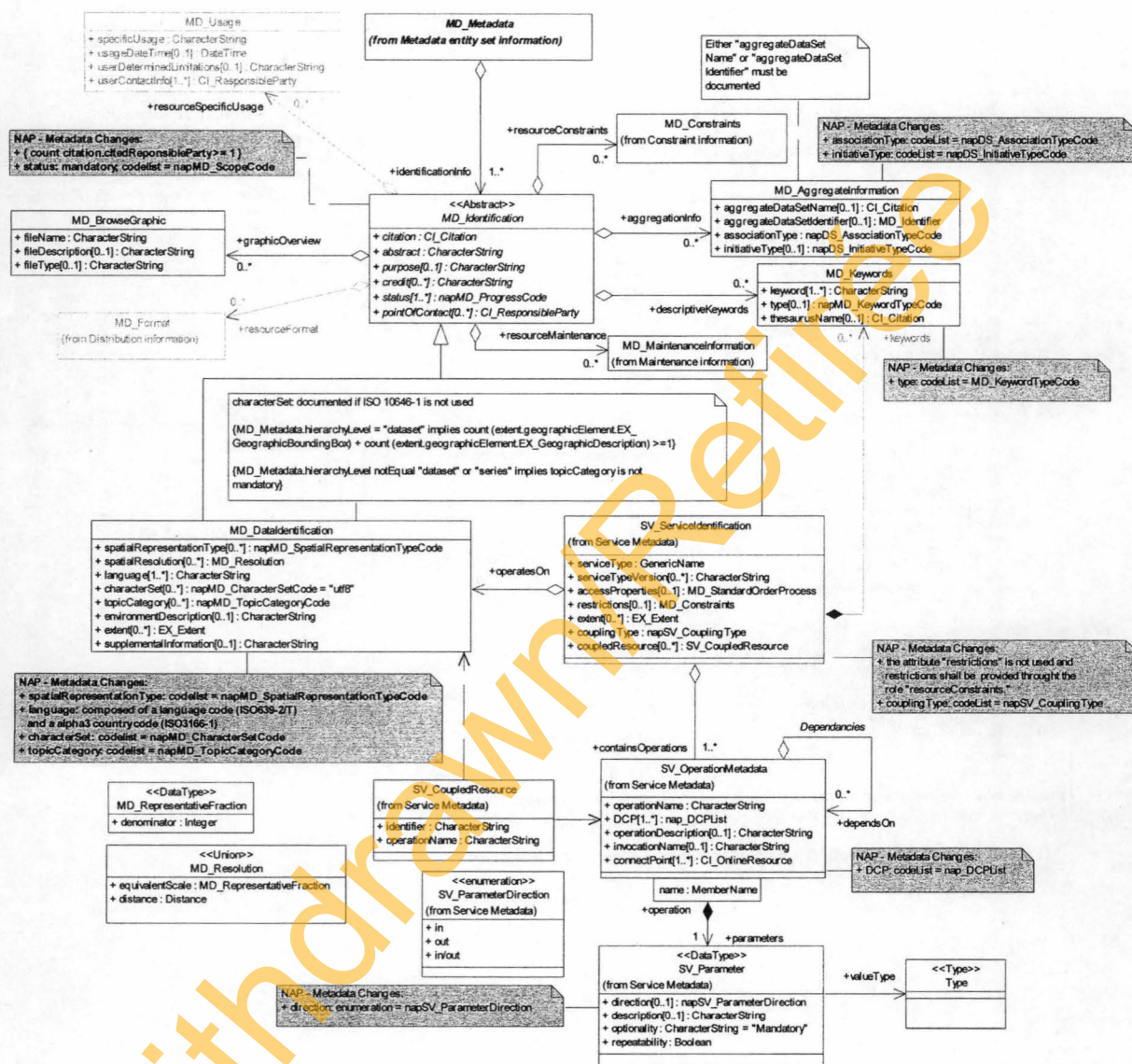


Figure 64: Identification information

A.2.3 Data Identification Information

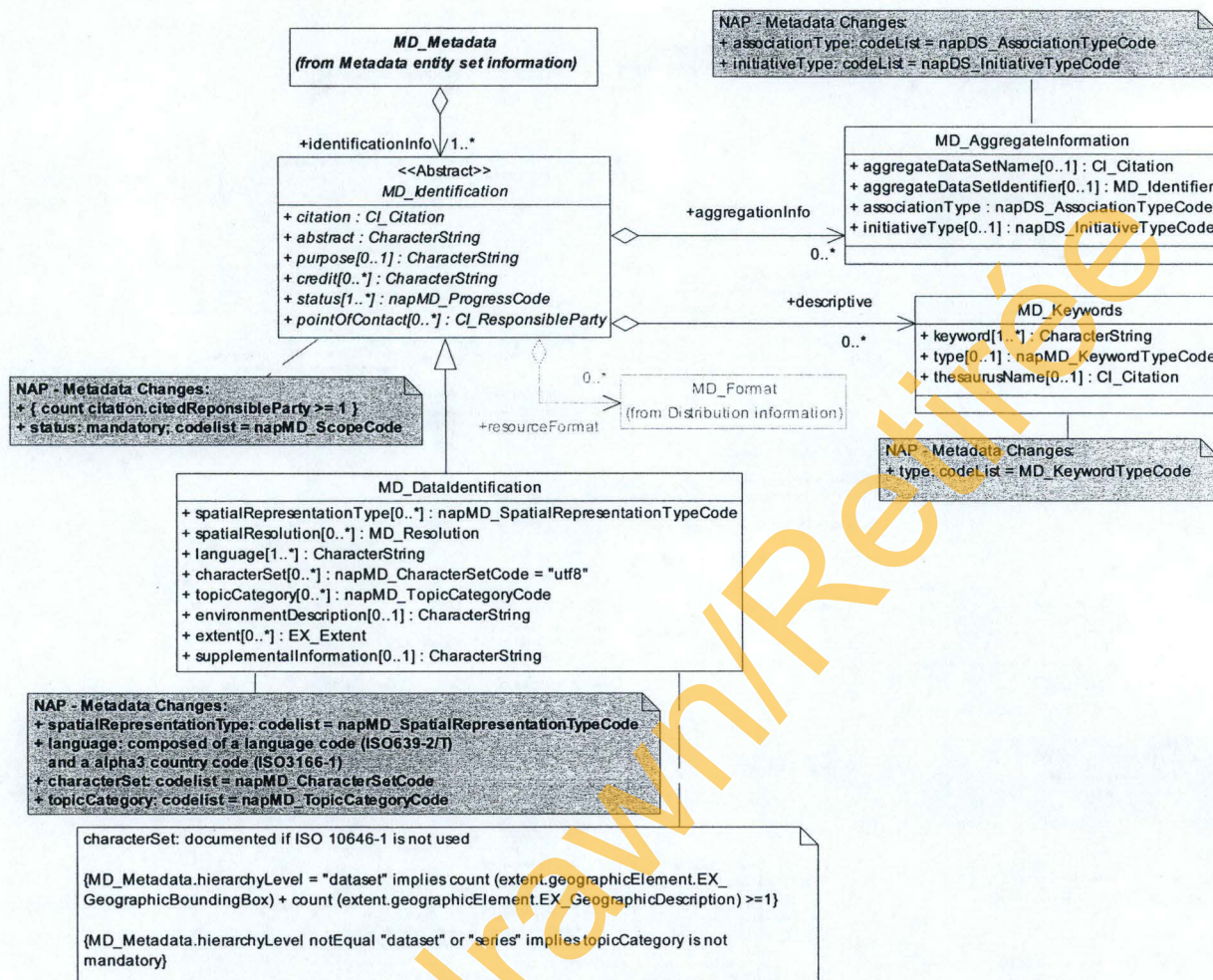


Figure 65: Data identification information

CAN/CGSB-171.100-2009



A.2.5 Constraint Information

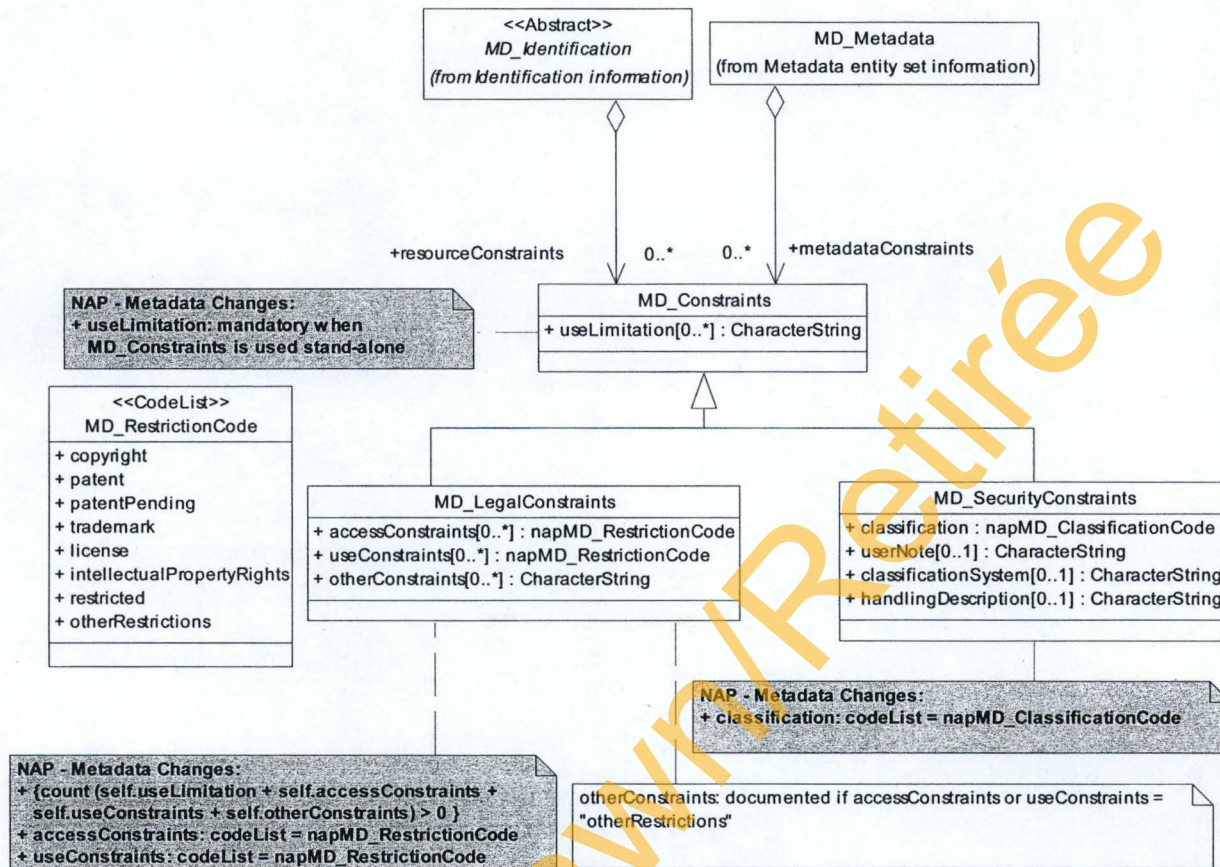


Figure 67: Constraint information

A.2.6 Legal Constraint Information

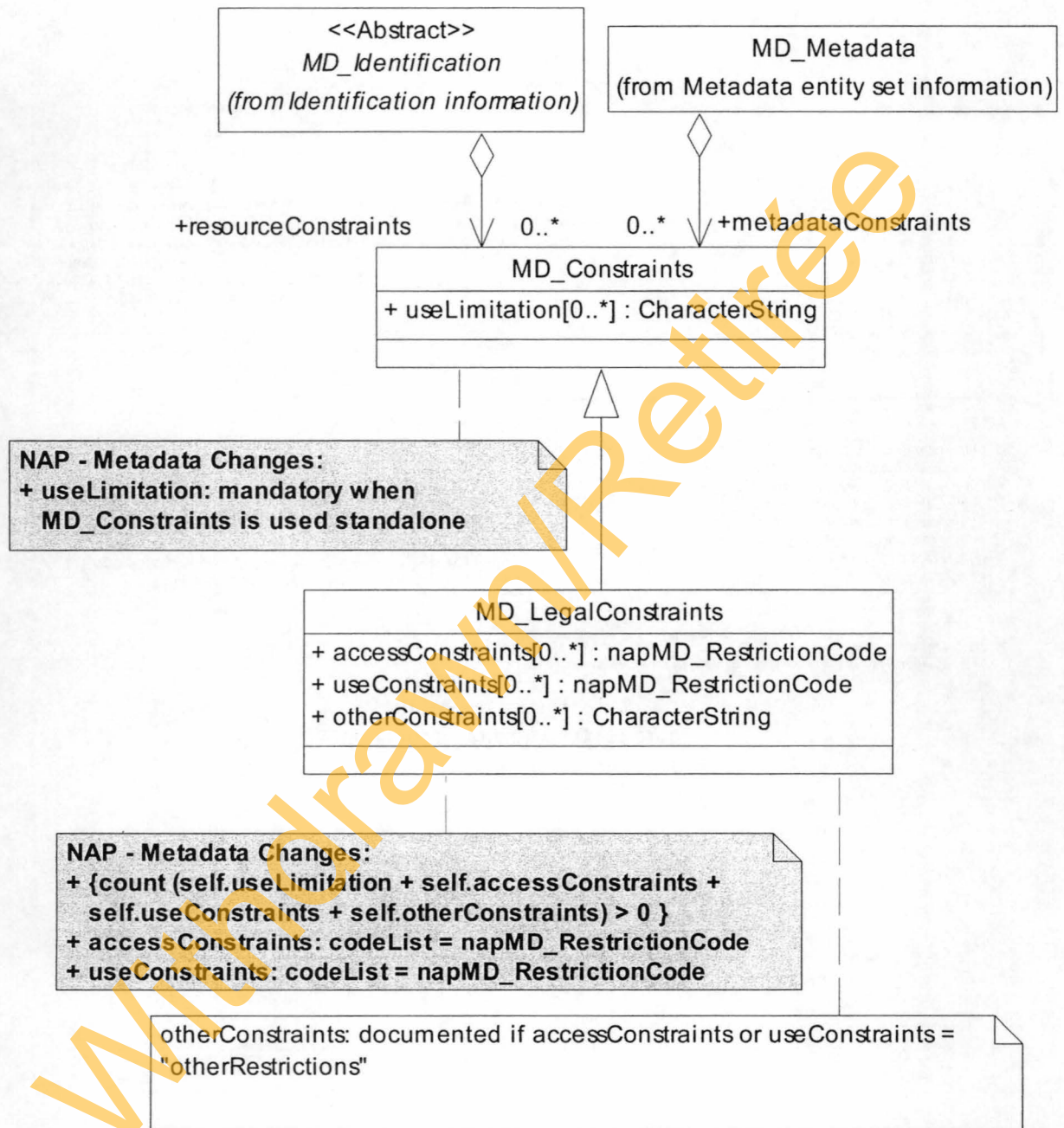


Figure 68: Legal constraint information

A.2.7 Data Quality Information

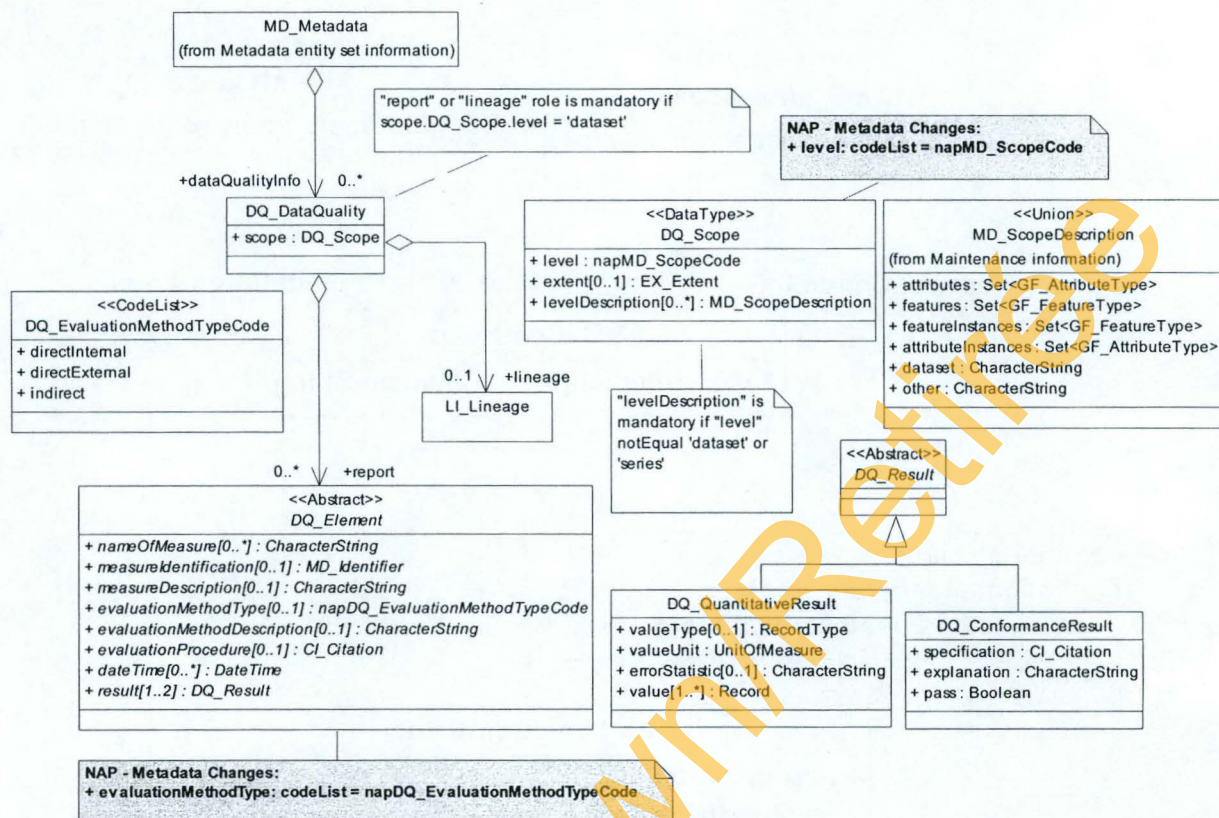


Figure 69: Data quality information

A.2.8 Lineage Information

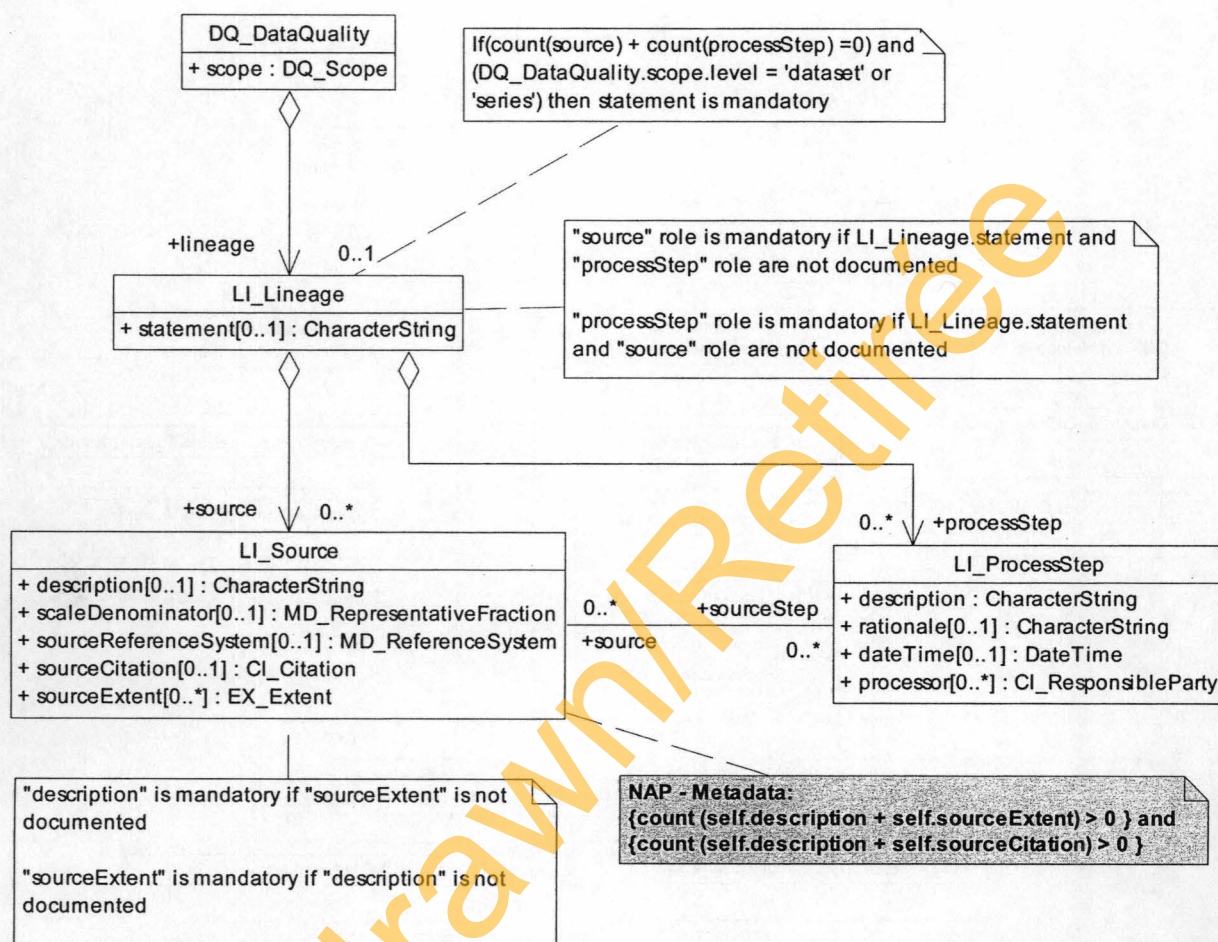


Figure 70: Lineage information

A.2.9 Data Quality Classes and Subclasses

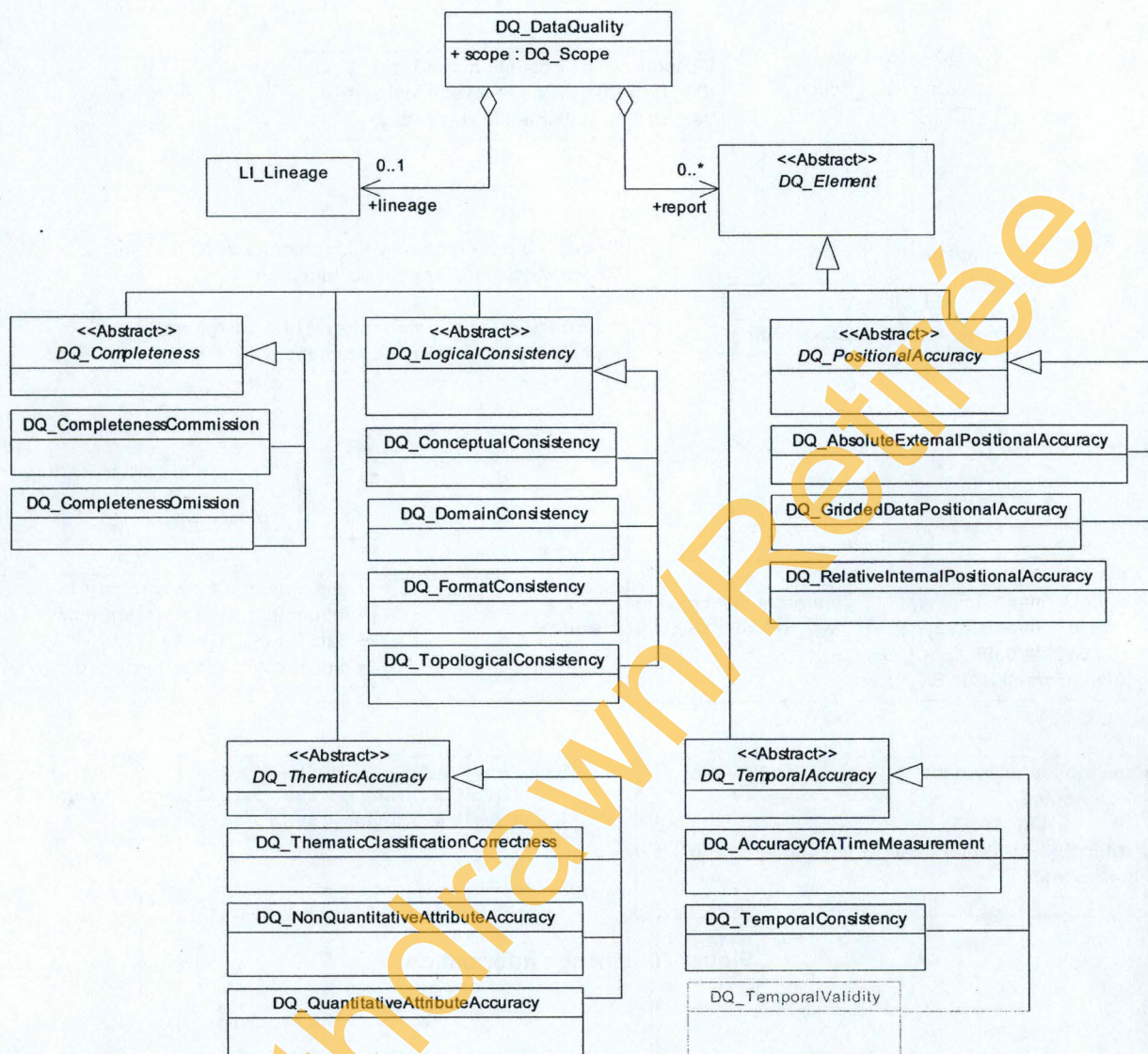


Figure 71: Data quality classes and subclasses

A.2.10 Maintenance Information

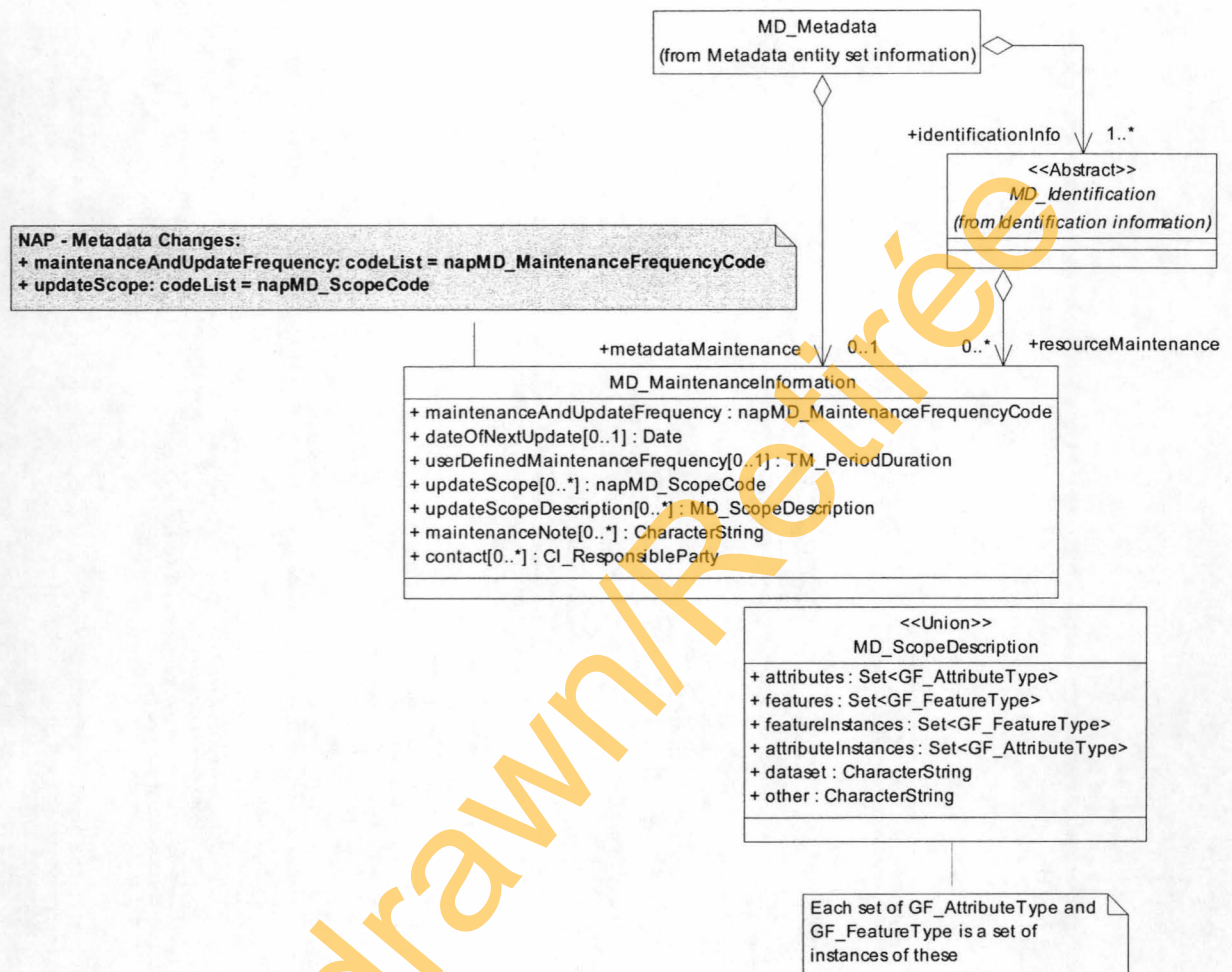


Figure 72: Maintenance information

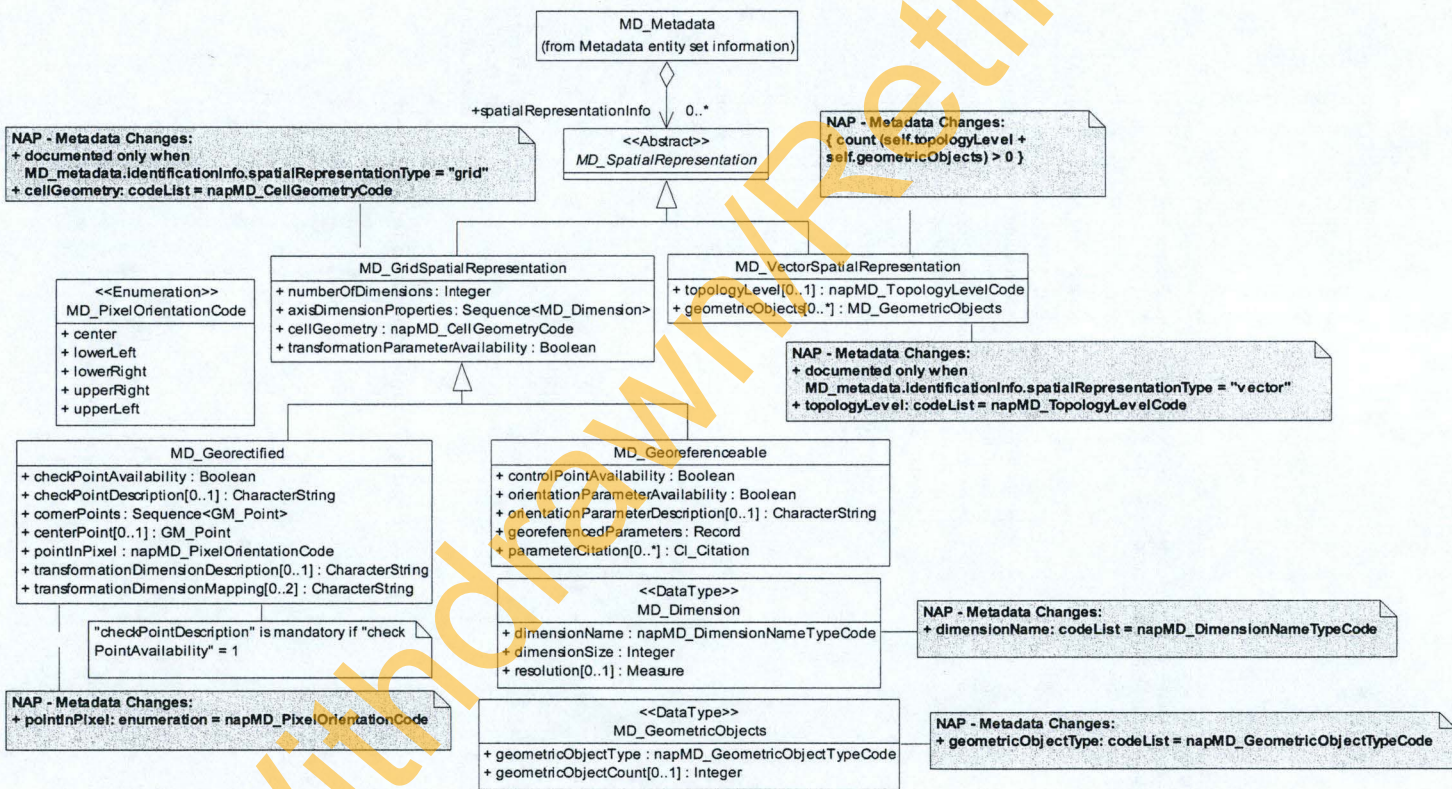


Figure 73: Spatial representation information

A.2.12 Reference System Information

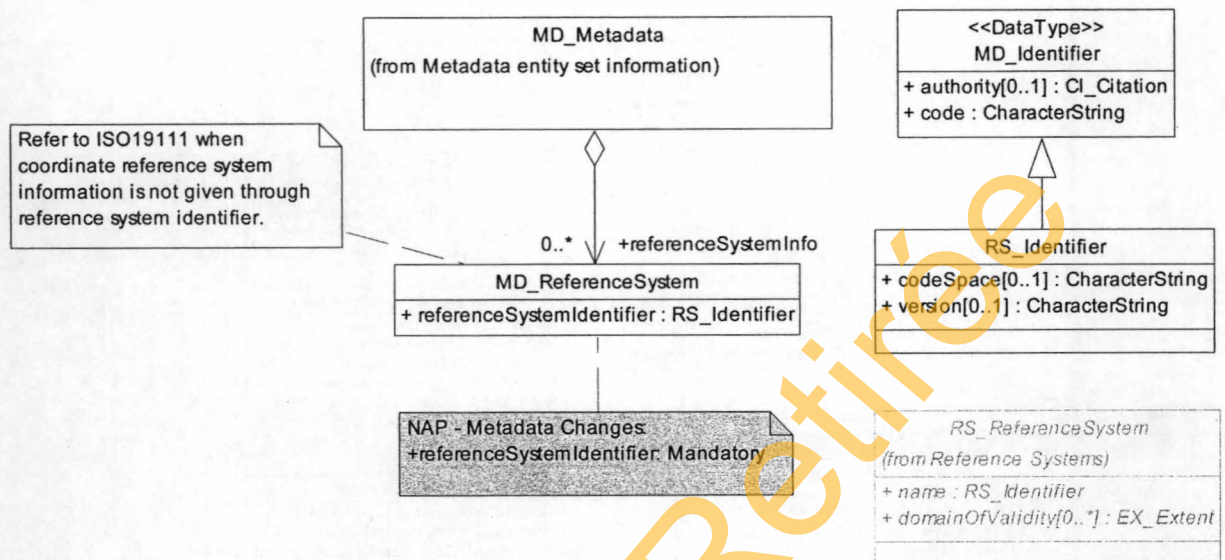


Figure 74: Reference system information

A.2.13 Content Information

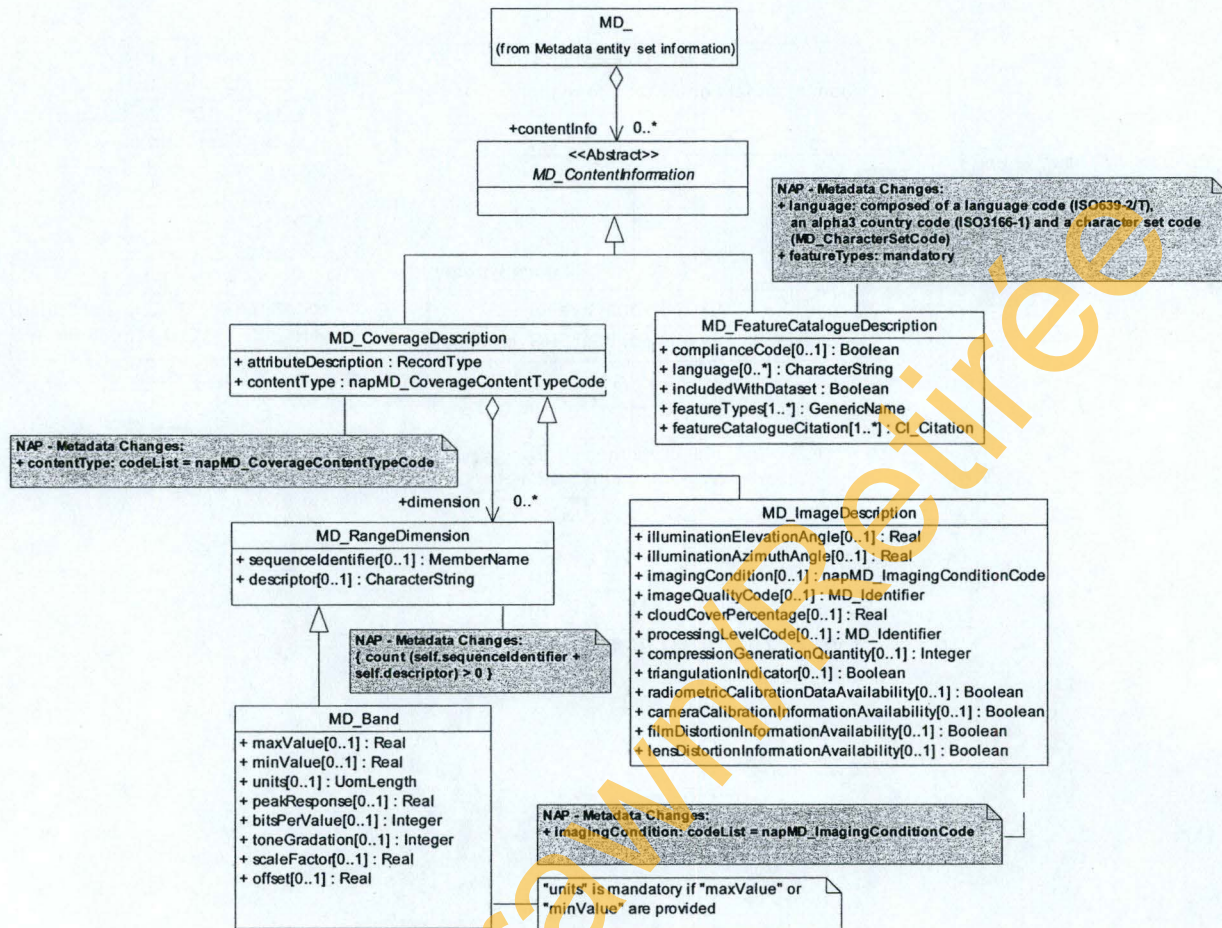


Figure 75: Content information

A.2.14 Portrayal Catalogue Information

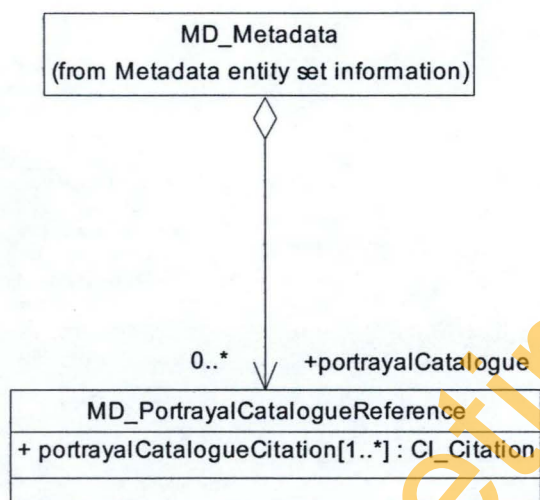


Figure 76: Portrayal catalogue information

A.2.15 Distribution Information

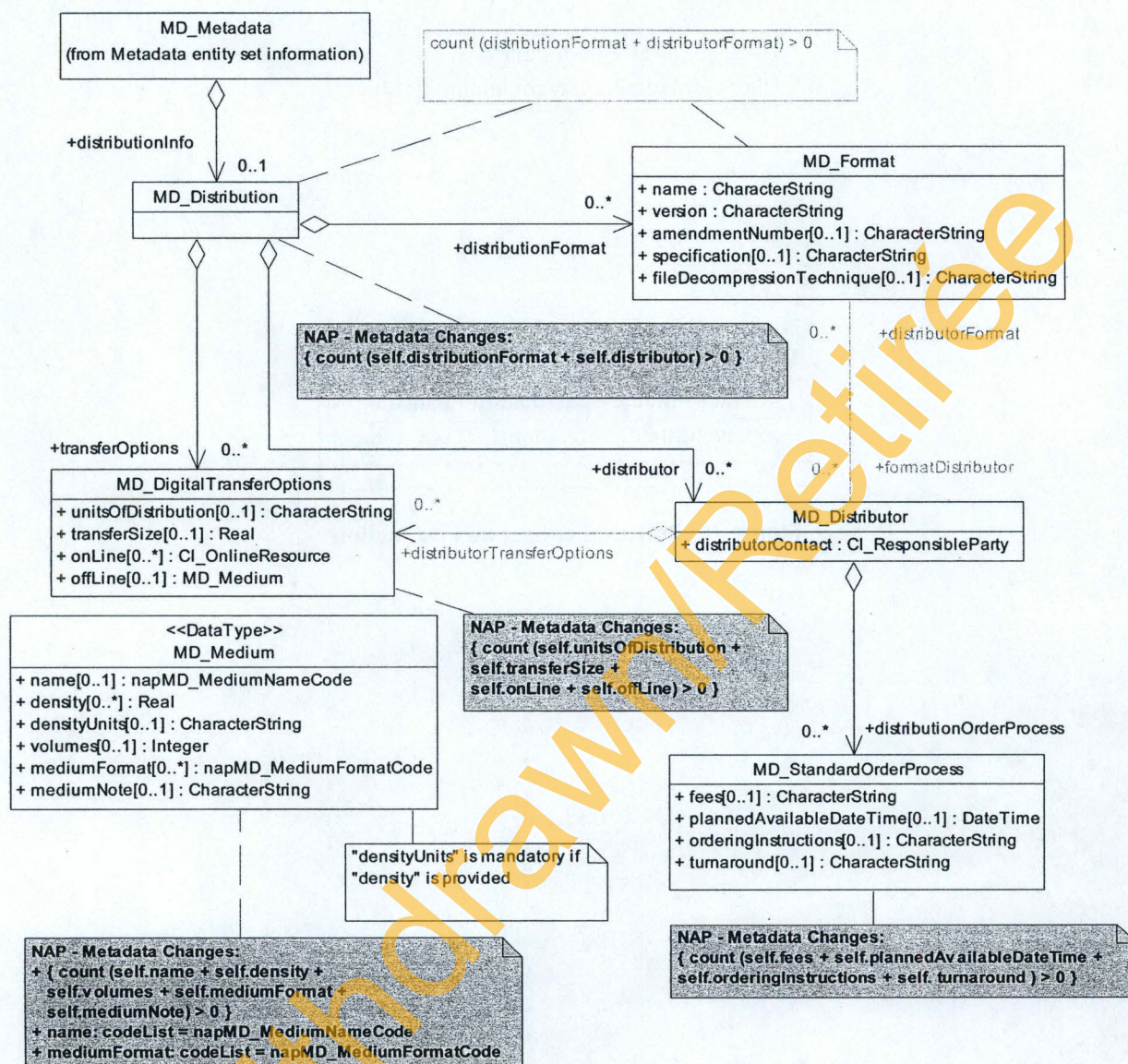


Figure 77: Distribution information

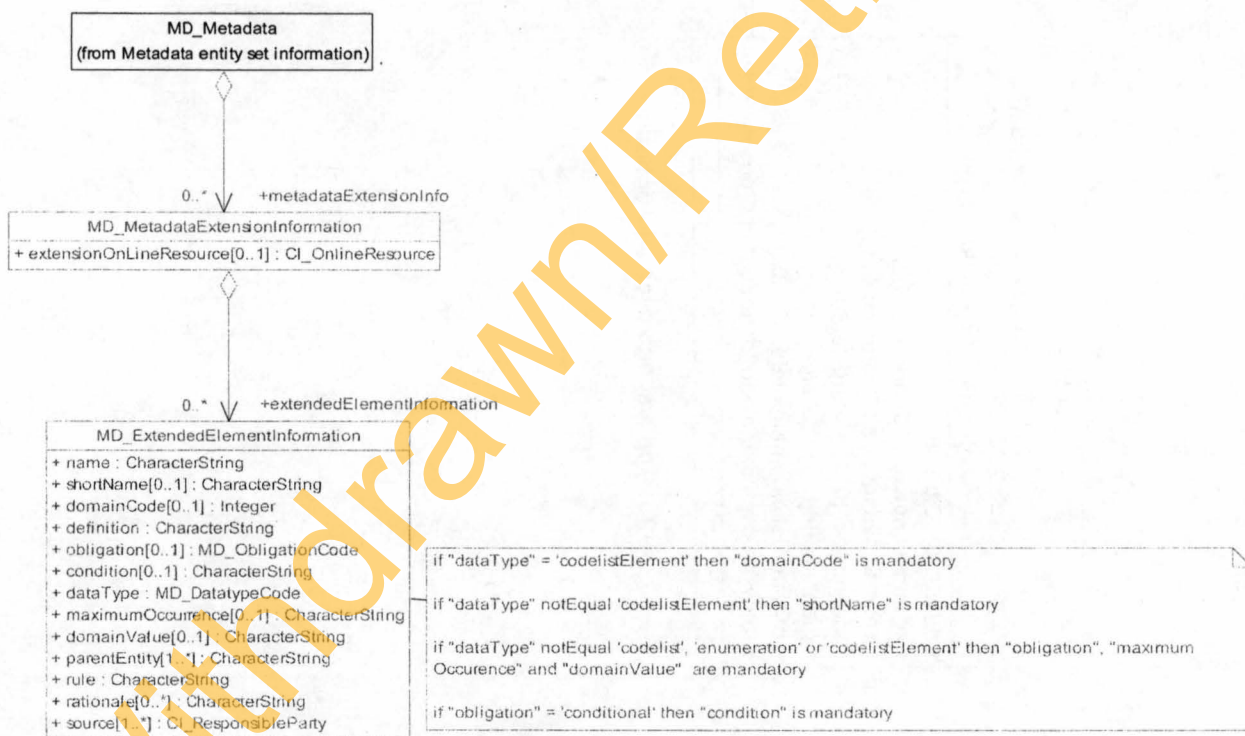


Figure 78: Metadata extension information

A.2.17 Application Schema Information

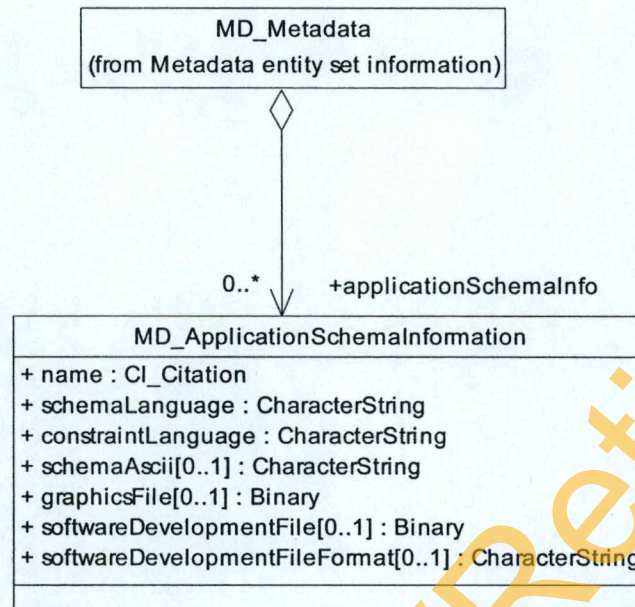


Figure 79: Application schema information

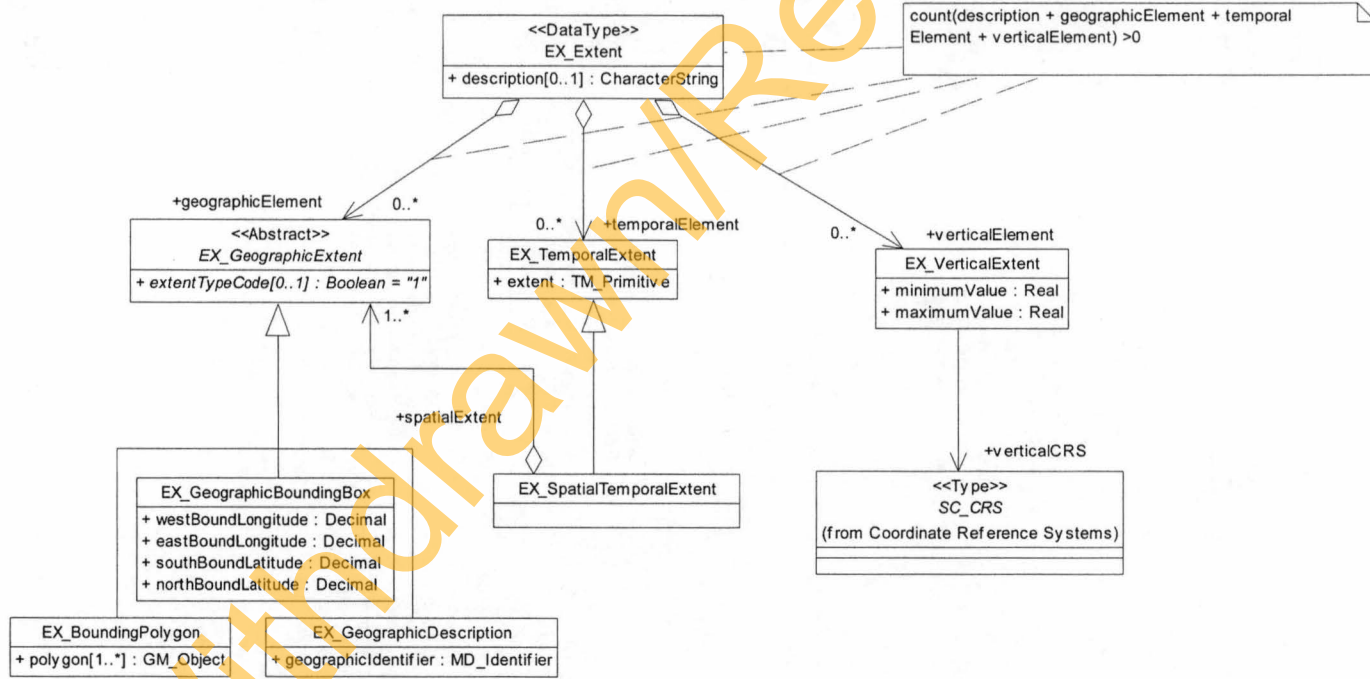


Figure 80: Extent Information

A.2.19 Citation and Responsible Party Information

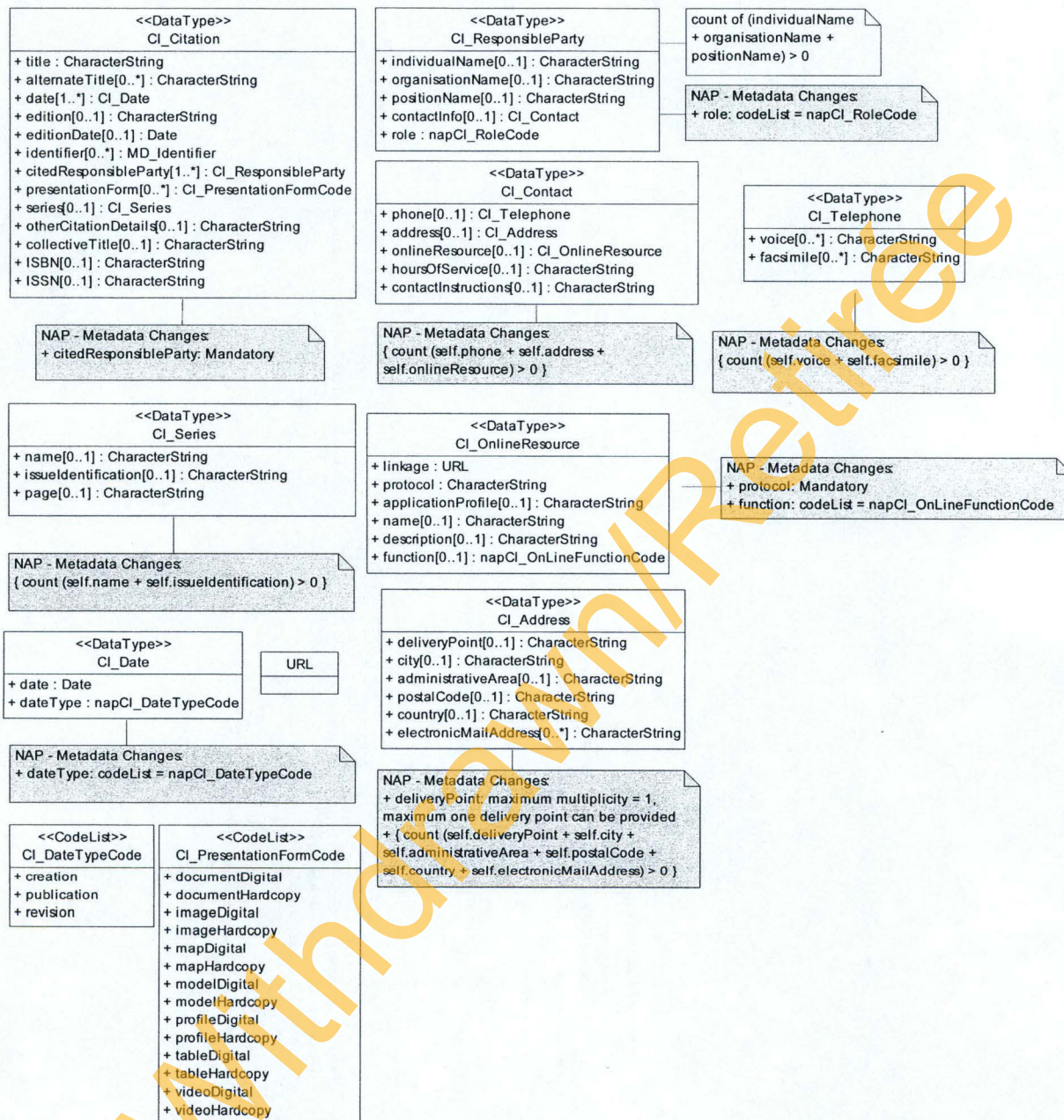


Figure 81: Citation and responsible party information

Annex B

Data Types

(normative)

B.1 Binary

Any binary data (e.g. image, sound) encoded as a sequence of bits.

(see *ISO/TS 19133:2005, Geographic information – Location based services – Tracking and navigation*, clause 10.2.3).

B.2 Boolean

Truth value representing true or false. True can be represented by {true, 1} and false by {false, 0}

(see *ISO/TS 19103:2005, Geographic information - Conceptual schema language*, clause 6.5.2.11).

B.3 CharacterString

An arbitrary-length sequence of characters, including accents and special characters, from the identified character set.

B.4 Date

Date gives values for the representation of:

1. year, e.g. 2006
2. year and month, e.g. 2006-10
3. year, month, and day e.g. 2006-10-01

Date representation in this profile is consistent with the types `xs:date`, `xs:gYearMonth`, `xs:gYear` as defined in *W3C XML Schema Definition Language (XSD) 1.1 Part 2: Datatypes* (<http://www.w3.org/TR/xmlschema11-2/>) and used in *ISO/TS 19139:2007, Geographic information – Metadata – XML schema implementation*.

(see *ISO/TS 19103:2005, Geographic information - Conceptual schema language*, clause 6.5.2.8, and *ISO/TS 19139:2007, Geographic information – Metadata – XML schema implementation*, clause 8.5.8.4.7)

B.5 DateTime

Date gives values for the representation of year, month, day, and time of the day in terms of hours, minutes, and seconds, with an optional time zone. Example 2006-10-01T12:00:00-05:00 corresponds to noon on October 1st, 2006, Eastern Standard Time in the U.S.

DateTime representation in this profile is consistent with the type `xs:dateTime` as defined in *W3C XML Schema Definition Language (XSD) 1.1 Part 2: Datatypes* (<http://www.w3.org/TR/xmlschema11-2/>) and used in *ISO/TS 19139:2007, Geographic information – Metadata – XML schema implementation*.

(see *ISO/TS 19103:2005, Geographic information - Conceptual schema language*, clause 6.5.2.8, and *ISO/TS 19139:2007, Geographic information – Metadata – XML schema implementation*, clause 8.5.8.4.7)

B.6 Decimal

A number that represents an exact value, e.g. 2.5, 5.25, 12.125

(see ISO/TS 19103:2005, *Geographic information - Conceptual schema language*, clause 6.5.2.4).

B.7 Distance

A measure of length between two points. A distance is made of a value and a unit of measure (uom), e.g. centimeter, meter, kilometer, inch, foot, mile, etc.

(see ISO/TS 19103:2005, *Geographic information - Conceptual schema language*, clause 6.5.7.7).

B.8 GenericName

An abstract class for the representation of a name in a namespace. A `GenericName` can be either a `LocalName` or a `ScopedName`. As defined in ISO 19139:2007, the representation of generic names follows the following XML schema:

```
<xs:element name="featureTypes" type="gco:GenericName_PropertyType" minOccurs="0"
maxOccurs="unbounded"/>

<xs:element name="AbstractGenericName" type="gml:CodeType" abstract="true"/>
<xs:complexType name="GenericName_PropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gco:AbstractGenericName"/>
  </xs:sequence>
  <xs:attribute ref="gco:nilReason"/>
</xs:complexType>

<xs:element name="LocalName" type="gml:CodeType"
substitutionGroup="gco:AbstractGenericName"/>
<xs:element name="ScopedName" type="gml:CodeType"
substitutionGroup="gco:AbstractGenericName"/>
```

An instance corresponding to a `featureTypes` element might appear in the document as follows:

```
<featureTypes>
  <LocalName codeSpace = "http://www....">building</LocalName>
</featureTypes>
```

(see ISO/TS 19103:2005, *Geographic information - Conceptual schema language*, clause 6.5.6.3).

B.9 GF_AttributeType

ISO 19109:2005, *Geographic information – Rules for application schema metaclass* used for the representation of an attribute of a class of features, e.g. "numberOfLane," and "buildingUsage."

(see ISO 19109:2005, *Geographic information – Rules for application schema*, clause 7.3.6).

B.10 GF_FeatureType

ISO 19109:2005, *Geographic information – Rules for application schema metaclass* used for the representation of a class of features, e.g. "road," "river," and "building."

(see ISO 19109:2005, *Geographic information – Rules for application schema*, clause 7.3.4).

B.11 GM_Object

ISO 19107:2003, Geographic information – Spatial schema abstract classes standing for any geometric objects (e.g. GM_Point, GM_Curve, GM_Surface) for the representation of the geometry of objects.

(see ISO 19107:2003, *Geographic information – Spatial schema*, clause 6.2.2).

B.12 GM_Point

ISO 19107:2003, Geographic information – Spatial schema data type for the representation of a single point.

(see ISO 19107:2003, *Geographic information – Spatial schema*, clause 6.3.11).

B.13 Integer

A signed number with no fractional part, e.g.: -12, 125, 12000963.

(see ISO/TS 19103:2005, *Geographic information - Conceptual schema language*, clause 6.5.2.3).

B.14 Measure

A value resulting from the process to evaluate an amount or a quantity expressed in a unit of measure. A measure is made of a value and a unit of measure.

(see ISO/TS 19103:2005, *Geographic information - Conceptual schema language*, clause 6.5.7.2).

B.15 MemberName

A name that references an attribute in a record, a RecordType, an attribute, an operation, or an association role.

(see ISO/TS 19103:2005, *Geographic information - Conceptual schema language*, clause 6.5.6.7).

B.16 Real

A signed floating point number composed of a mantissa and an optional exponent, e.g. -2E5, 364.236E8, 15.32e-3, 24, -0, 0.

(see ISO/TS 19103:2005, *Geographic information - Conceptual schema language*, clause 6.5.2.5).

B.17 Record

A structure of logically related elements.

(see ISO/TS 19103:2005, *Geographic information - Conceptual schema language*, clause 6.5.5).

B.18 RecordType

A specification of the content and structure of a Record.

(see ISO/TS 19103:2005, *Geographic information - Conceptual schema language*, clause 6.5.5).

B.19 SC_CRS

A coordinate reference system documented according to *ISO/19111:2007, Geographic information – Spatial referencing by coordinates*.

B.20 Sequence

A sequence is an ordered collection of elements. An element may be repeated as appropriate. List is a synonym of sequence.

B.21 TM_PeriodDuration

Time spans by an object or an event. A TM_PeriodDuration of 5 years, 1 month, 6 days, 12 hours, and 35 minutes is represented by P5Y1M6DT12H35M. Any subset of this representation is allowed as long as one unit is represented, e.g. a period duration of minus 80 days is represented as P80D.

(see *ISO 19108:2003, Geographic information – Temporal schema*, clause 5.2.3.7).

B.22 TM_Primitive

TM_Primitive is an abstract data type for temporal geometric primitives (TM_Instant and TM_Period) and temporal topological primitives (TM_Node and TM_Edge).

(see *ISO 19108:2003, Geographic information – Temporal schema*, clause 5.2.2).

B.23 Type

Any valid data type in a namespace. A Type is represented by a TypeName type that references either a recordType or an object type in some schema. The value is stored in the attribute "aName," example in XML compliant with the extension of ISO/TS 19139 XML schema for service metadata:

```
<srv:valueType>
  <gco:TypeName>
    <gco:aName>decimal</gco:aName>
  </gco:TypeName>
</featureTypes>
```

(see *ISO/TS 19103:2005, Geographic information - Conceptual schema language*, clause 6.5.6.6, and extension of *ISO/TS 19139:2007, Geographic information – Metadata – XML schema implementation for service metadata* at http://eden.ign.fr/xsd/csw_profile/20061016/20061016/view).

B.24 UnitOfMeasure

A quantity adopted as a standard unit of measure, e.g. metre, degree, kilogram.

(see *ISO/TS 19103:2005, Geographic information - Conceptual schema language*, clause 6.5.7.3).

B.25 UomLength

Reference quantities to express the value of a length, e.g. metre

(see *ISO/TS 19103:2005, Geographic information - Conceptual schema language*, clause 6.5.7.8).

B.26 URL

A uniform resource locator, e.g. www.fgdc.gov/nap/metadata

Annex C

Conformance Clauses

(normative)

C.1 Conformance Requirements

Metadata instance documents implementing this standard shall be considered in conformance if they comply with the rules stated in Clause 5, Clause 6, Annex A, and Annex B and meet the following tests:

C.1.1 Completeness

All metadata instance documents must contain all mandatory and conditional (if conditions apply) metadata elements defined in this document.

C.1.2 Semantics

All metadata instance documents implementing this standard must use the metadata elements provided in this standard for the purposes for which they were defined.

C.1.3 Schema

All metadata instance documents implementing this standard must contain metadata organized as specified in this standard.

C.1.4 Maximum Occurrences

All metadata instance documents implementing this standard must contain not more than the specified number of occurrences of metadata component classes or attributes.

C.1.5 Data Types

All metadata instance documents implementing this standard must use data types as specified in this standard and in the manner specified.

C.1.6 Codelists

All metadata instance documents implementing this standard must use codelists as defined in this standard or extensions of these codelists, which are listed and documented within the NAP – Metadata Register.

C.2 User Defined Extension Metadata Conformance

C.2.1 Exclusiveness

User defined metadata elements must not duplicate elements defined in this standard.

C.2.2 Structure

User defined metadata elements must be integrated correctly and must not disrupt the schema defined in this standard.

C.2.3 Extended Codelists

User extended codelists must include the original codes in the same order with the new codes appended to the end of the list.

Withdrawn/Retirée

Annex D

List of NAP – Metadata Code Lists

(informative)

This annex lists the code list and enumeration that are referred by metadata elements. The coded values are not enumerated here as they may change in time to reflect the specific needs of the North American geographic information community. They are maintained in the NAP – Metadata register (<http://www.fgdc.gov/nap/metadata/register> and <http://www.geoconnections.org/nap/metadata/register>) introduced in clause 6.3. However, the code lists are listed in Table 1

Table 1: Lists of code lists

Code list name	Code list definition
<u>napCI DateTypeCode</u>	identification of when a given event occurred, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_87 http://geoconnections.org/nap/metadata/register/codelists.html#IC_87
<u>napCI OnLineFunctionCode</u>	function performed by the resource, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_88 http://geoconnections.org/nap/metadata/register/codelists.html#IC_88
<u>napCI PresentationFormCode</u>	mode in which the data are represented, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_89 http://geoconnections.org/nap/metadata/register/codelists.html#IC_89
<u>napCI RoleCode</u>	function performed by the responsible party, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_90 http://geoconnections.org/nap/metadata/register/codelists.html#IC_90
<u>napDQ EvaluationMethodTypeCode</u>	type of method for evaluating an identified data quality measure, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_91 http://geoconnections.org/nap/metadata/register/codelists.html#IC_91
<u>napDS AssociationTypeCode</u>	justification for the correlation of two datasets, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_92 http://geoconnections.org/nap/metadata/register/codelists.html#IC_92
<u>napDS InitiativeTypeCode</u>	type of aggregation activity in which datasets are related, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_93 http://geoconnections.org/nap/metadata/register/codelists.html#IC_93
<u>napMD CellGeometryCode</u>	code indicating whether grid data is point, area, or volume, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_94 http://geoconnections.org/nap/metadata/register/codelists.html#IC_94
<u>napMD CharacterSetCode</u>	name of the character coding standard used for the resource, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_95 http://geoconnections.org/nap/metadata/register/codelists.html#IC_95

<u>napMD ClassificationCode</u>	name of the handling restrictions of the dataset, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_96 http://geoconnections.org/nap/metadata/register/codelists.html#IC_96
<u>napMD CoverageContentTypeCode</u>	specific type of information represented in the cell, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_97 http://geoconnections.org/nap/metadata/register/codelists.html#IC_97
<u>napMD DimensionNameTypeCode</u>	name of the dimension, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_98 http://geoconnections.org/nap/metadata/register/codelists.html#IC_98
<u>napMD GeometricObjectTypeCode</u>	name of point or vector objects used to locate zero-, one-, two- or three- dimensional spatial locations in the dataset, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_99 http://geoconnections.org/nap/metadata/register/codelists.html#IC_99
<u>napMD ImagingConditionCode</u>	code which indicates conditions which may affect the image, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_100 http://geoconnections.org/nap/metadata/register/codelists.html#IC_100
<u>napMD KeywordTypeCode</u>	methods used to group similar keywords, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_101 http://geoconnections.org/nap/metadata/register/codelists.html#IC_101
<u>napMD MaintenanceFrequencyCode</u>	frequency with which modifications and deletions are made to the data after it is first produced, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_102 http://geoconnections.org/nap/metadata/register/codelists.html#IC_102
<u>napMD MediumFormatCode</u>	method used to write to the medium, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_103 http://geoconnections.org/nap/metadata/register/codelists.html#IC_103
<u>napMD MediumNameCode</u>	name of the medium, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_104 http://geoconnections.org/nap/metadata/register/codelists.html#IC_104
<u>napMD PixelOrientationCode</u>	point in a pixel corresponding to the Earth location of the pixel, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_105 http://geoconnections.org/nap/metadata/register/codelists.html#IC_105
<u>napMD ProgressCode</u>	status of the dataset or progress of a review, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_106 http://geoconnections.org/nap/metadata/register/codelists.html#IC_106
<u>napMD RestrictionCode</u>	limitation(s) placed upon the access or use of the data, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_107 http://geoconnections.org/nap/metadata/register/codelists.html#IC_107
<u>napMD ScopeCode</u>	class of information to which the referencing entity applies, as listed at: http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_108 http://geoconnections.org/nap/metadata/register/codelists.html#IC_108
<u>napMD SpatialRepresentationType</u>	method used to represent geographic information in the dataset, as

<u>Code</u>	<p>listed at:</p> <p>http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_109</p> <p>http://geoconnections.org/nap/metadata/register/codelists.html#IC_109</p>
<u>napMD_TopicCategoryCode</u>	<p>high-level geographic data thematic classification to assist in the grouping and search of available geographic data sets, as listed at:</p> <p>http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_110</p> <p>http://geoconnections.org/nap/metadata/register/codelists.html#IC_110</p>
<u>napMD_TopologyLevelCode</u>	<p>degree of complexity of the spatial relationships, as listed at:</p> <p>http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_111</p> <p>http://geoconnections.org/nap/metadata/register/codelists.html#IC_111</p>
<u>nap_DCPList</u>	<p>type of distributed computing platform or environment, as listed at:</p> <p>http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_112</p> <p>http://geoconnections.org/nap/metadata/register/codelists.html#IC_112</p>
<u>napSV_ParameterDirection</u>	<p>class of information to which the referencing entity applies, as listed at:</p> <p>http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_113</p> <p>http://geoconnections.org/nap/metadata/register/codelists.html#IC_113</p>
<u>napSV_CouplingType</u>	<p>class of information to which the referencing entity applies, as listed at:</p> <p>http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_114</p> <p>http://geoconnections.org/nap/metadata/register/codelists.html#IC_114</p>
<u>napMD_FileFormatCode</u>	<p>code identifying a file format, as listed at:</p> <p>http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_115</p> <p>http://geoconnections.org/nap/metadata/register/codelists.html#IC_115</p>
<u>ISO 639-2_LanguageNameCodes</u>	<p>ISO standard codes for the representation of names of languages as listed at:</p> <p>http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_116</p> <p>http://geoconnections.org/nap/metadata/register/codelists.html#IC_116</p> <p>http://www.loc.gov/standards/ISO_639-2/php/English_list.php</p>
<u>ISO 3166-1_CountryNameCodes</u>	<p>ISO standard country name codes as listed at:</p> <p>http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_117</p> <p>http://geoconnections.org/nap/metadata/register/codelists.html#IC_117</p> <p>http://userpage.chemie.fu-berlin.de/diverse/doc/ISO_3166.html (see 6.1)</p>
<u>ISO 4217_CurrencyNamesAndCode Elements</u>	<p>ISO standard currency codes as listed at:</p> <p>http://www.fgdc.gov/nap/metadata/register/codelists.html#IC_118</p> <p>http://geoconnections.org/nap/metadata/register/codelists.html#IC_118</p> <p>http://www.iso.org/iso/en/prods-services/popstds/currencycodeslist.html</p>

Annex E

Metadata Implementation

(informative)

E.1 Background

NAP – Metadata outlines the format to be used for definitions, data types, and relationships among geographic metadata elements. In order to use these elements to create, modify, discover, evaluate, present, and/or access the metadata records of which they form a part and the related spatial data they describe, it is necessary to manage the elements in software implementations and to provide for the exchange of metadata between such data management systems. This, in turn, requires that the metadata elements be encoded in a clear and consistent manner.

This Annex provides an overview and some examples of how to encode the metadata elements listed in this Standard. It specifically covers the creation of metadata records for single datasets, services, and aggregations of information objects. The examples provided are in Canadian English. However, users may also create records in American English or Canadian French when implementing NAP – Metadata. The resource described by the Metadata record may be available in any language.

The examples in Clause E.5 are provided in XML format with element values in clear text and role names from Clause 5 of this profile embedded in the XML tags. Best practices and the use of optional elements are described as Comments before and after each such usage

E.2 Metadata Records for Single Datasets

Datasets are the most common type of resource for which Metadata Records are created. The example in Clause E.5.3 includes a Metadata entity for a dataset entitled "Nesting Site – North Bay District." The same dataset also is used as an example of a component dataset associated with a Metadata entity for a Series dataset (see E.5.2). In this case, the Ontario Ministry of Natural Resources (OMNR) has a data class entitled "Nesting Site – Province of Ontario" for all of Ontario that is maintained by 26 different, geographically discrete, district offices. Since the period of maintenance, the contact, and the geographic coverage for each district is unique, a discrete, dataset-level metadata entity was created for each District in addition to the Series-level metadata record for the entire Province. For an explanation of the use of Hierarchy, see Clause E.4.

E.3 Metadata Records for Services

Discrete metadata entities can exist to describe a service alone, an information object alone, a service that is tightly coupled to one or more information objects, or an information object that is tightly coupled to one or more services. The example provided in Clause E.5.2 describes an OGC-compliant Web Map Service (WMS) as part of the metadata entity for the information object called "Nesting Site – Province of Ontario." It is recommended that additional metadata entities exist for other information objects made available through the same service. It is also recommended that an additional metadata entity exist for the service, listing each of the information objects available through that service.

E.4 Information Object Aggregations

Information objects are often aggregated. NAP – Metadata distinguishes between two broad categories of aggregations: those where the component information objects share one or more characteristics, referred to as Series; and, those where the component information objects do not share characteristics, referred to as an aggregate of resources (see 5.3.1.19 and 5.3.2.17).

E.4.1 Collection metadata (optional)

A dataset collection is a group of datasets that have been assembled to meet a common objective. Examples of dataset collection metadata entries that do not inherit characteristics may include:

- A group of metadata entities each describing objects collected by an individual, as understood by the archival term "fonds";
- A group of datasets or services used by a single application or a single map;
- A group of otherwise unrelated datasets held or maintained by the same individual or organization;
- A group of satellite images, or printed maps, that cover roughly the same geographic area produced by different processes or processors;
- A group representing all metadata entities found in a single repository;
- A group of metadata entities found in one or more repositories that fulfill a specific search criterion.

The creation of a "dataset collection" metadata level is an optional feature that allows users to refer to a single object for convenience. When there are no shared characteristics among the component information objects, the metadata entity definition of this type of metadata will not be adequate for an assessment of those component information objects.

E.4.2 Series metadata (optional)

Series metadata incorporates the concept of hierarchy levels. The basic principle behind distinguishing among levels of Metadata is that a lower level, sometimes referred to as the child, inherits the characteristics of an upper level, often referred to as the parent. A child metadata entity can have many parents. In order to avoid repeating the same description for all levels, only those characteristics that are different are added to the child records. For example, if the distributor of the data remains the same, this need not be carried down the structure. In order to clarify this concept, the following example follows the life cycle of an example set of geographic data.

A series is a group of information objects that share one or more characteristics such as subject matter, geographic area, time period, spatial representation, methodology, custodian or distributor. Examples of series metadata entries may include:

- A group of aerial photographs captured during a single flight with one camera and film type;
- A group of vector datasets depicting the same features for multiple administrative areas;
- A group of the same thematic dataset in the same geographic area for multiple years;
- A group of raster map data captured from the same paper map source.

A Series can, itself, be part of another Series. For example, a Series of Series might include:

- A series of groups of aerial photographs captured at regular intervals (eg annually);
- A series of groups of single-feature vector datasets for multiple areas in the same jurisdiction;
- A series of thematic groupings (eg transportation) of datasets in the same geographic area.

The creation of a "series" metadata level is an optional feature that allows users to consult higher-level characteristics for data search. The definition of this type of metadata may be adequate for the initial

characterization of available spatial data, but may not be adequate for detailed assessment of data quality of specific datasets. See example in Clause E.5.2.

E.4.3 Dataset metadata

For the purposes of this profile, a dataset should be a consistent spatial data product instance that can be generated or made available by a spatial data distributor. A dataset may be a member of a data series, as defined in the previous sub clause. A dataset may be composed of a set of identified feature types and instances, and attribute types and instances as described in the following four sub clauses. On a demand basis, metadata from series and dataset information will be merged to present the user with a view of the metadata at the dataset level of abstraction. Metadata for which no hierarchy is listed are interpreted to be "dataset" metadata, by default. See example in Clause E.5.3.

E.4.4 Feature type metadata (optional)

Constructs known as features are grouped with common characteristics. Spatial data services may elect to support feature type-level metadata where it is available and make such metadata available for query or retrieval. Feature Type-level metadata, together with feature instance attribute type and attribute instance level metadata, will be grouped into datasets, as defined in the previous sub clause. See example in Clause E.5.4.

E.4.5 Feature instance metadata (optional)

Feature instances are spatial constructs (features) that have a direct correspondence with a real world object. Spatial data services may elect to support feature instance-level metadata where it is available and make such metadata available for query or retrieval. Feature Instance-level metadata, together with feature type, attribute type, and attribute instance-level metadata, will be grouped into datasets. Examples of feature instance metadata entries may include:

A specific Great Blue Heron Nest site.

E.4.6 Attribute type metadata (optional)

Attribute types are the digital parameters that describe a common aspect of grouped spatial primitives (0-, 1-, 2-, and 3-dimensional geometric objects). Spatial data services may elect to support attribute type-level metadata where it is available and make such metadata available for query or retrieval. Attribute type-level metadata, together with feature type-, feature instance-, and attribute instance-level metadata, will be grouped into datasets. An example of an attribute type metadata entry may include:

Height above ground (of a Great Blue Heron Nest).

E.4.7 Attribute instance metadata (optional)

Attribute instances are the digital parameters that describe an aspect of a feature instance. Spatial data services may elect to support attribute instance-level metadata where it is available and make such metadata available for query or retrieval. Attribute instance-level metadata, together with feature type-, feature instance-, and attribute type-level metadata, will be grouped into datasets. An example of an attribute instance metadata entry may include:

Height above ground of a specific Great Blue Heron Nest.

E.5 Example

E.5.1 Example Metadata Hierarchy

Metadata can describe any object of interest, termed a resource, to help find it, use it, or determine its suitability to fulfill a certain purpose. The most common type of resource for which geospatial metadata records are created is the Dataset. Datasets usually include one or more Feature types. Each Feature type is defined through the use of attributes. Often attributes are limited to a specific list of valid values.

This hierarchy of metadata can be graphically represented as shown in Figure 82.

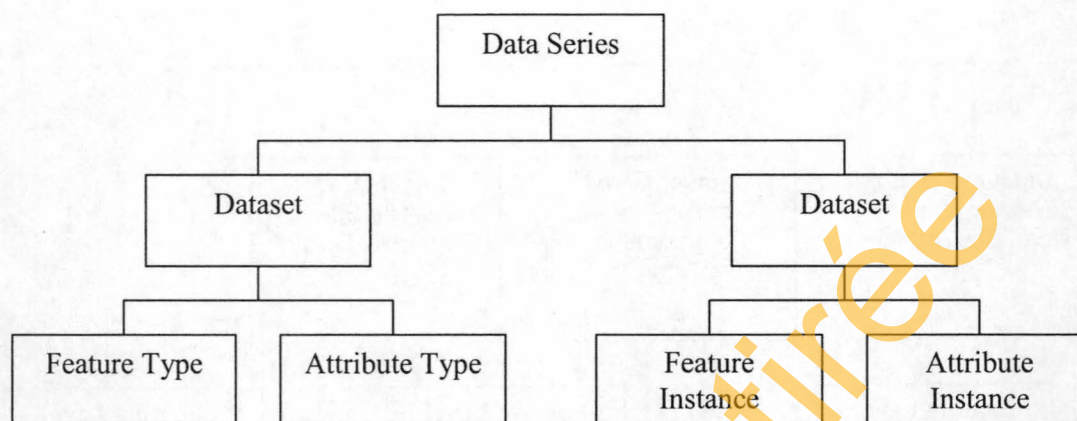


Figure 82: Metadata hierarchy

Datasets can be part of a parent series or collection of datasets. A series or collection of datasets can, in turn, be part of another parent series or collection. NAP – Metadata permits the creation of metadata records for features, datasets, series and series of series.

The following hierarchy chart (Figure 83) illustrates the logical implementation of a dataset series level, dataset level and feature level metadata record utilizing a hierarchy approach. It is not intended to demonstrate any particular expertise in the subject area, or to recommend a particular information architecture or data model. In this example the data custodian has created a series of datasets representing all bird nesting sites in Ontario, Canada. This is a single, physical database. Each dataset in the series contains all nesting sites for a specific geographic area. Each dataset is maintained locally and then posted to the primary database. The feature types in each dataset are the specific types of nests found in that geographic area. The feature attributes apply to each specific type of nest. Metadata records were created for the series, for each dataset, and for each feature type in each dataset.

The example below illustrates how the three hierarchical metadata records inherit values from one another:

- Dataset Series Level (E.5.2 – Nesting Site - Province of Ontario)
- Dataset Level (E.5.3 – Nesting Site – North Bay District)
- Feature Level (E.5.4 – Nesting Site – North Bay District - Great Blue Heron Nesting Site/Colony)

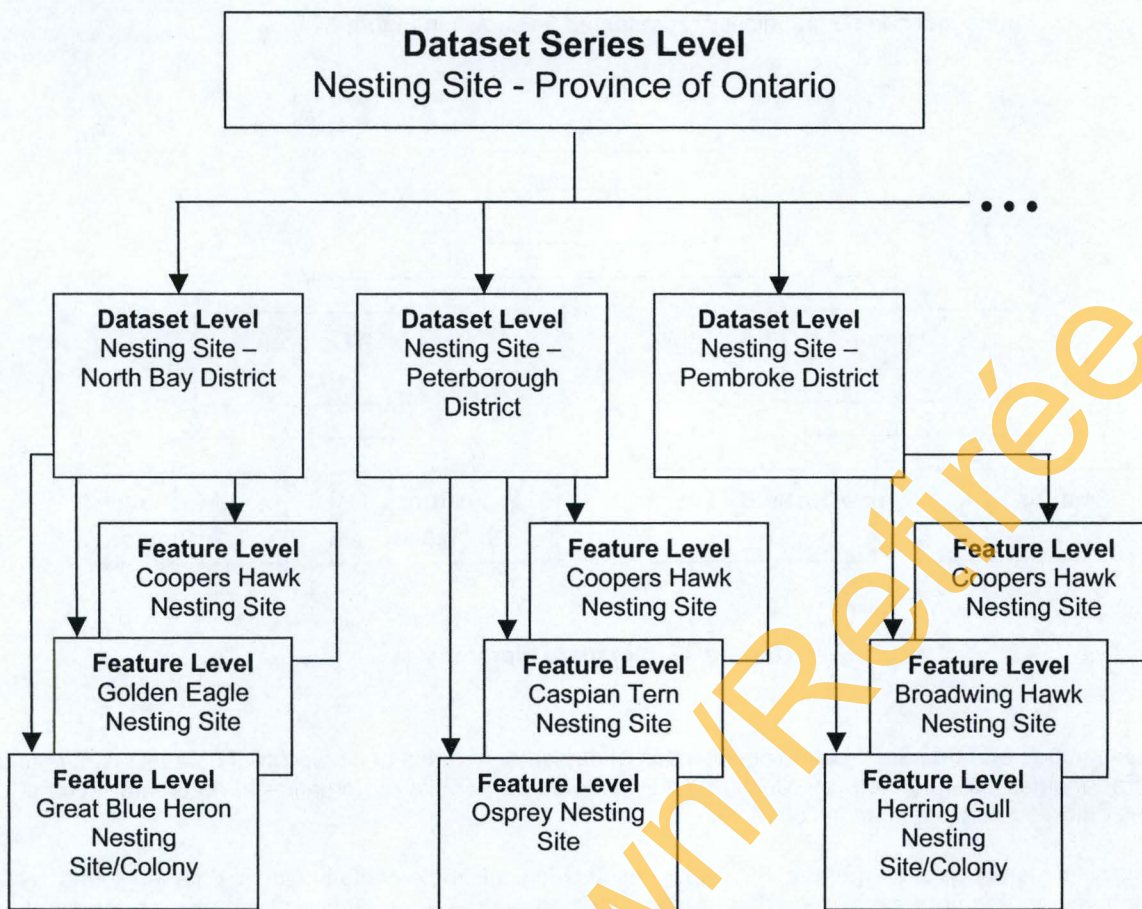


Figure 83: Logical implementation of a dataset series level, dataset level and feature level metadata record

E.5.2 Dataset Series Metadata – Nesting Site – Province of Ontario

```
<?xml version="1.0" encoding="UTF-8"?>
<gmd:MD_Metadata xmlns="http://www.isotc211.org/schemas/2005/gmd"
  xmlns:gmd="http://www.isotc211.org/schemas/2005/gmd"
  xmlns:napm="http://www.geoconnections.org/nap/metadata/Tools/napXsd/napm"
  xmlns:gco="http://www.isotc211.org/schemas/2005/gco"
  xmlns:gts="http://www.isotc211.org/schemas/2005/gts"
  xmlns:gss="http://www.isotc211.org/schemas/2005/gss"
  xmlns:gsr="http://www.isotc211.org/schemas/2005/gsr"
  xmlns:xlink="http://www.w3.org/1999/xlink"
  xmlns:srv="http://www.isotc211.org/schemas/2005/srv"
  xmlns:gml="http://www.opengis.net/gml"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.isotc211.org/schemas/2005/gmd ../gmd/gmd.xsd"
  http://www.isotc211.org/schemas/2005/srv ../srv/srv.xsd
  http://www.geoconnections.org/nap/metadata/Tools/napXsd/napm ../napm/napm.xsd">
  <gmd:fileIdentifier>
    <gco:CharacterString>40ffba40-e192-4cbd-9fdc-89bd664e136b</gco:CharacterString>
  </gmd:fileIdentifier>
  <gmd:language>
    <gco:CharacterString>eng; CAN</gco:CharacterString>
  </gmd:language>
  <gmd:characterSet>
    <gmd:MD_CharacterSetCode codeList="http://www.geoconnections.org/nap/metadata/register/
      napMetadataRegister.xml#IC_95" codeListValue="RI_458">utf8</gmd:MD_CharacterSetCode>
  </gmd:characterSet>
  <gmd:hierarchyLevel>
    <gmd:MD_ScopeCode codeList="http://www.geoconnections.org/nap/metadata/register/
      napMetadataRegister.xml#IC_108" codeListValue="RI_622">dataset</gmd:MD_ScopeCode>
  </gmd:hierarchyLevel>
  <gmd:contact>
    <gmd:CI_ResponsibleParty>
      <gmd:organisationName>
        <gco:CharacterString>Ontario Ministry of Natural Resources</gco:CharacterString>
      </gmd:organisationName>
      <gmd:positionName>
        <gco:CharacterString>Land Information Ontario - Support</gco:CharacterString>
      </gmd:positionName>
      <gmd:contactInfo>
        <gmd:CI_Contact>
          <gmd:phone>
            <gmd:CI_Telephone>
              <gmd:voice>
                <gco:CharacterString>voice; 1 (705) 7551878</gco:CharacterString>
              </gmd:voice>
              <gmd:facsimile>
                <gco:CharacterString>1 (705) 7551677</gco:CharacterString>
              </gmd:facsimile>
            </gmd:CI_Telephone>
          </gmd:phone>
          <gmd:address>
            <gmd:CI_Address>
              <gmd:deliveryPoint>
                <gco:CharacterString>physical; 300; Water Street; </gco:CharacterString>
              </gmd:deliveryPoint>
              <gmd:city>
                <gco:CharacterString>Peterborough</gco:CharacterString>
              </gmd:city>
            </gmd:CI_Address>
          </gmd:address>
        </gmd:CI_Contact>
      </gmd:contactInfo>
    </gmd:CI_ResponsibleParty>
  </gmd:contact>

```



```

    <gmd:administrativeArea>
      <gco:CharacterString>Ontario</gco:CharacterString>
    </gmd:administrativeArea>
    <gmd:postalCode>
      <gco:CharacterString>K9J 8M5</gco:CharacterString>
    </gmd:postalCode>
    <gmd:country>
      <gco:CharacterString>Canada</gco:CharacterString>
    </gmd:country>
    <gmd:electronicMailAddress>
      <gco:CharacterString>lio@ontario.ca</gco:CharacterString>
    </gmd:electronicMailAddress>
    </gmd:CI_Address>
  </gmd:address>
</gmd:CI_Contact>
</gmd:contactInfo>
<gmd:role>
  <gmd:CI_RoleCode codeList="http://www.geoconnections.org/nap/metadata/register/napMetadataRegister.xml#IC_90" codeListValue="RI_414">pointOfContact</gmd:CI_RoleCode>
</gmd:role>
</gmd:CI_ResponsibleParty>
</gmd:contact>
<gmd:dateStamp>
  <gco:Date>2006-06-30</gco:Date>
</gmd:dateStamp>
<gmd:metadataStandardName>
  <gco:CharacterString> North American Profile of ISO 19115:2003 –
  Geographic information – Metadata </gco:CharacterString>
</gmd:metadataStandardName>
<gmd:metadataStandardVersion>
  <gco:CharacterString>1.2.1</gco:CharacterString>
</gmd:metadataStandardVersion>
<gmd:dataSetURI>
  <gco:CharacterString>http://lioapp.lrc.gov.on.ca/edwin/EDWINCGI.exe?IHID=260&AgencyID=1&
  Theme=All_Themes; download</gco:CharacterString>
</gmd:dataSetURI>
<gmd:locale>
  <gmd:PT_Locale id="locale_eng_CAN">
    <gmd:languageCode>
      <gmd:LanguageCode codeList="http://www.geoconnections.org/nap/metadata/register/napMetadataRegister.xml#IC_116" codeListValue="eng">English</gmd:LanguageCode>
    </gmd:languageCode>
    <gmd:country>
      <gmd:Country codeList="http://www.geoconnections.org/nap/metadata/register/napMetadataRegister.xml#IC_117" codeListValue="CAN">Canada</gmd:Country>
    </gmd:country>
    <gmd:characterEncoding>
      <gmd:MD_CharacterSetCode codeList="http://www.geoconnections.org/nap/metadata/register/napMetadataRegister.xml#IC_95" codeListValue="RI_458">utf8</gmd:MD_CharacterSetCode>
    </gmd:characterEncoding>
  </gmd:PT_Locale>
</gmd:locale>
<gmd:locale>
  <gmd:PT_Locale id="locale_fra_CAN">
    <gmd:languageCode>
      <gmd:LanguageCode codeList="http://www.geoconnections.org/nap/metadata/register/napMetadataRegister.xml#IC_116" codeListValue="fra">Français</gmd:LanguageCode>
    </gmd:languageCode>
    <gmd:country>

```



```
<gmd:Country codeList="http://www.geoconnections.org/nap/metadata/register/
napMetadataRegister.xml#IC_117" codeListValue="CAN">Canada</gmd:Country>
</gmd:country>
<gmd:characterEncoding>
<gmd:MD_CharacterSetCode codeList="http://www.geoconnections.org/nap/metadata/register/
napMetadataRegister.xml#IC_95" codeListValue="RI_458">utf8</gmd:MD_CharacterSetCode>
</gmd:characterEncoding>
</gmd:PT_Locale>
</gmd:locale>
<gmd:spatialRepresentationInfo>
<gmd:MD_VectorSpatialRepresentation>
<gmd:topologyLevel>
<gmd:MD_TopologyLevelCode codeList="http://www.geoconnections.org/nap/metadata/register/
napMetadataRegister.xml#IC_111" codeListValue="RI_662">geometryOnly</gmd:MD_TopologyLevelCode>
</gmd:topologyLevel>
<gmd:geometricObjects>
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<gmd:geometricObjectType>
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<gmd:geometricObjectCount>
<gco:Integer>6308</gco:Integer>
</gmd:geometricObjectCount>
</gmd:MD_GeometricObjects>
</gmd:geometricObjects>
</gmd:MD_VectorSpatialRepresentation>
</gmd:spatialRepresentationInfo>
<gmd:referenceSystemInfo>
<gmd:MD_ReferenceSystem>
<gmd:referenceSystemIdentifier>
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  Endangered Species Act 2003. For more information, see Selected Wildlife and Habitat Features - Inventory
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habitats de la faune de plusieurs espèces en Ontario tels que les aires d'alimentation, les aires de
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    <gco:LocalName>1133 Louisiana Tern Nesting Site (expired)</gco:LocalName>
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    <gco:LocalName>1196 Prairie Warbler Nesting Site (expired)</gco:LocalName>
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</gmd:featureTypes>
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</gmd:featureTypes>
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  <gmd:CI_Citation>
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    </gmd:edition>
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      <gco:Date>2003-05-22</gco:Date>
    </gmd:editionDate>
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        </gmd:organisationName>
        <gmd:positionName>
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        </gmd:positionName>
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```



```

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  <gco:CharacterString>1 (705) 7551677</gco:CharacterString>
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</gmd:phone>
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    </gmd:country>
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  </gmd:CI_OnlineResource>
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</gmd:role>
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              </gmd:facsimile>
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```



```

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      <gmd:electronicMailAddress>
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</gmd:contactInfo>
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</gmd:role>
</gmd:CI_ResponsibleParty>
</gmd:distributorContact>
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      <gmd:MD_Medium>
        <gmd:name>
          <gmd:MD_MediumNameCode codeList="http://www.geoconnections.org/nap/metadata/register/
          napMetadataRegister.xml#IC_104" codeListValue="RI_554">cdRom</gmd:MD_MediumNameCode>
        </gmd:name>
      </gmd:MD_Medium>
    </gmd:offLine>
  </gmd:MD_DigitalTransferOptions>
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    <gmd:offLine>
      <gmd:MD_Medium>
        <gmd:name>
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```



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    </gmd:level>
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  <gmd:LI_Lineage>
    <gmd:statement>
      <gco:CharacterString>Data is collected and maintained by Ontario Ministry of Natural Resources (OMNR)
        Districts using the Natural Resources Values Information System (NRVIS).</gco:CharacterString>
    </gmd:statement>
    <gmd:processStep>
      <gmd:LI_ProcessStep>
        <gmd:description>
          <gco:CharacterString>Investigation by OMNR staff biologists via GPS and remote GIS devices both on the
            ground and by helicopter.</gco:CharacterString>
        </gmd:description>
        <gmd:rationale>
          <gco:CharacterString>Periodic update</gco:CharacterString>
        </gmd:rationale>
        <gmd:dateTime>
          <gco:DateTime>2006-04-15T00:00:00</gco:DateTime>
        </gmd:dateTime>
      </gmd:LI_ProcessStep>
    </gmd:processStep>
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      <gmd:LI_Source>
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            via GPS</gco:CharacterString>
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      </gmd:LI_Source>
    </gmd:source>
    <gmd:source>
      <gmd:LI_Source>
        <gmd:description>
          <gco:CharacterString>hardcopyTracedPaper; direct collection by Ontario Ministry of Natural Resources
            (OMNR) biologists via observations
          </gco:CharacterString>
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      </gmd:LI_Source>
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      <gmd:LI_Source>
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    </gmd:maintenanceAndUpdateFrequency>
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  </gmd:MD_MaintenanceInformation>
</gmd:metadataMaintenance>

```

```

</gmd:dateOfNextUpdate>
<gmd:updateScope>
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</gmd:updateScope>
<gmd:updateScopeDescription>
  <gmd:MD_ScopeDescription>
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    </gmd:other>
  </gmd:MD_ScopeDescription>
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    <gmd:positionName>
      <gco:CharacterString>Land Information Ontario Support</gco:CharacterString>
    </gmd:positionName>
    <gmd:contactInfo>
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          <gmd:CI_Telephone>
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            </gmd:voice>
            <gmd:facsimile>
              <gco:CharacterString>1 (705) 7551677</gco:CharacterString>
            </gmd:facsimile>
          </gmd:CI_Telephone>
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```



```
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</gmd:contact>
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</gmd:metadataMaintenance>
</gmd:MD_Metadata>
```

Withdrawn/Retirée

E.5.3 Dataset Metadata – Nesting Site – OMNR North Bay District

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  xmlns:gmd="http://www.isotc211.org/schemas/2005/gmd"
  xmlns:napm="http://www.geoconnections.org/nap/metadata/Tools/napXsd/napm"
  xmlns:gco="http://www.isotc211.org/schemas/2005/gco"
  xmlns:gts="http://www.isotc211.org/schemas/2005/gts"
  xmlns:gss="http://www.isotc211.org/schemas/2005/gss"
  xmlns:gsr="http://www.isotc211.org/schemas/2005/gsr"
  xmlns:xlink="http://www.w3.org/1999/xlink"
  xmlns:srv="http://www.isotc211.org/schemas/2005/srv"
  xmlns:gml="http://www.opengis.net/gml"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.isotc211.org/schemas/2005/gmd ../gmd/gmd.xsd
http://www.isotc211.org/schemas/2005/srv ../srv/srv.xsd
http://www.geoconnections.org/nap/metadata/Tools/napXsd/napm ../napm/napm.xsd">
  <gmd:fileIdentifier>
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  </gmd:fileIdentifier>
  <gmd:language>
    <gco:CharacterString>eng; CAN</gco:CharacterString>
  </gmd:language>
  <gmd:characterSet>
    <gmd:MD_CharacterSetCode codeList="http://www.geoconnections.org/nap/metadata/register/
napMetadataRegister.xml#IC_95" codeListValue="RI_458">utf8</gmd:MD_CharacterSetCode>
  </gmd:characterSet>
  <gmd:parentIdentifier>
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  </gmd:parentIdentifier>
  <gmd:hierarchyLevel>
    <gmd:MD_ScopeCode codeList="http://www.geoconnections.org/nap/metadata/register/
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                <gco:CharacterString>1 (705) 4755550</gco:CharacterString>
              </gmd:facsimile>
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              </gmd:deliveryPoint>
```



```

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</gmd:role>
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</gmd:contact>
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  – Geographic information – Metadata </gco:CharacterString>
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  </gmd:languageCode>
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```



```

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</gmd:country>
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</gmd:locale>
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  <gmd:MD_VectorSpatialRepresentation>
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        </gmd:codeSpace>
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    </gmd:referenceSystemIdentifier>
  </gmd:MD_ReferenceSystem>
</gmd:referenceSystemInfo>
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  <gmd:MD_DataIdentification>
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            Bay</LocalisedCharacterString>
          </textGroup>
        </PT_FreeText>
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either prepared for download, and notice sent to requestor, or packaged and distributed offline.

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```

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```



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            </gmd:voice>
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              <gco:CharacterString>1 (705) 4755550</gco:CharacterString>
            </gmd:facsimile>
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```

E.5.4 Feature Level Metadata – OMNR North Bay District – Great Blue Heron Nesting Site/Colony

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  xmlns:gco="http://www.isotc211.org/schemas/2005/gco"
  xmlns:gts="http://www.isotc211.org/schemas/2005/gts"
  xmlns:gss="http://www.isotc211.org/schemas/2005/gss"
  xmlns:gsr="http://www.isotc211.org/schemas/2005/gsr"
  xmlns:xlink="http://www.w3.org/1999/xlink"
  xmlns:srv="http://www.isotc211.org/schemas/2005/srv"
  xmlns:gml="http://www.opengis.net/gml"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.isotc211.org/schemas/2005/gmd ../gmd/gmd.xsd"
  http://www.isotc211.org/schemas/2005/srv ../srv/srv.xsd
  http://www.geoconnections.org/nap/metadata/Tools/napXsd/napm ../napm/napm.xsd">
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```

```

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```



```

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    nids, qui est associé avec un grand héron dans l'aire géographique définie par le district de North Bay du
    ministère des Richesses naturelles de l'Ontario. Cet ensemble d'objets est un d'une série d'objets à l'intérieur
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        </gmd:name>
      </gmd:MD_Medium>
    </gmd:offLine>
  </gmd:MD_DigitalTransferOptions>
</gmd:transferOptions>
</gmd:MD_Distribution>
</gmd:distributionInfo>
<gmd:dataQualityInfo>
  <gmd:DQ_DataQuality>
    <gmd:scope>
      <gmd:DQ_Scope>
        <gmd:level>
          <gmd:MD_ScopeCode codeList="http://www.geoconnections.org/nap/metadata/register/napMetadataRegister.xml#IC_108" codeListValue="RI_623">series</gmd:MD_ScopeCode>
        </gmd:level>
      </gmd:DQ_Scope>
    </gmd:scope>
    <gmd:lineage>
      <gmd:LI_Lineage>
        <gmd:statement>
          <gco:CharacterString>Data is collected and maintained by Ontario Ministry of Natural Resources (OMNR) Districts using the Natural Resources Values Information System (NRVIS).</gco:CharacterString>
        </gmd:statement>
        <gmd:processStep>
          <gmd:LI_ProcessStep>
            <gmd:description>
              <gco:CharacterString>Investigation by OMNR staff biologists via GPS and remote GIS devices both on the ground and by helicopter.</gco:CharacterString>
            </gmd:description>
            <gmd:rationale>
              <gco:CharacterString>Periodic update</gco:CharacterString>
            </gmd:rationale>
            <gmd:dateTime>
              <gco:DateTime>2006-04-15T00:00:00</gco:DateTime>
            </gmd:dateTime>
          </gmd:LI_ProcessStep>
        </gmd:processStep>
      </gmd:LI_Lineage>
    </gmd:lineage>
  </gmd:DQ_DataQuality>
</gmd:dataQualityInfo>

```



```

<gmd:source>
  <gmd:LI_Source>
    <gmd:description>
      <gco:CharacterString>online; direct collection by Ontario Ministry of Natural Resources (OMNR) biologists
      via GPS</gco:CharacterString>
    </gmd:description>
  </gmd:LI_Source>
</gmd:source>
<gmd:source>
  <gmd:LI_Source>
    <gmd:description>
      <gco:CharacterString>hardcopyTracedPaper; direct collection by Ontario Ministry of Natural Resources
      (OMNR) biologists via observations
    </gco:CharacterString>
  </gmd:description>
</gmd:LI_Source>
</gmd:source>
<gmd:source>
  <gmd:LI_Source>
    <gmd:description>
      <gco:CharacterString>online; vintage Ontario Base Maps (circa 1972-1985)
    </gco:CharacterString>
  </gmd:description>
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</gmd:source>
</gmd:LI_Lineage>
</gmd:lineage>
</gmd:DQ_DataQuality>
</gmd:dataQualityInfo>
<gmd:metadataMaintenance>
  <gmd:MD_MaintenanceInformation>
    <gmd:maintenanceAndUpdateFrequency>
      <gmd:MD_MaintenanceFrequencyCode codeList="http://www.geoconnections.org/nap/metadata/register/
      napMetadataRegister.xml#IC_102" codeListValue="RI_539">annually</gmd:MD_MaintenanceFrequencyCode>
    </gmd:maintenanceAndUpdateFrequency>
    <gmd:dateOfNextUpdate>
      <gco:Date>2008-02-15</gco:Date>
    </gmd:dateOfNextUpdate>
    <gmd:updateScope>
      <gmd:MD_ScopeCode codeList="http://www.geoconnections.org/nap/metadata/register/
      napMetadataRegister.xml#IC_108" codeListValue="RI_626">feature</gmd:MD_ScopeCode>
    </gmd:updateScope>
    <gmd:updateScopeDescription>
      <gmd:MD_ScopeDescription>
        <gmd:other>
          <gco:CharacterString>Update activity checks for changes to any aspect of the Features in the dataset and
          adds, modifies, or deletes elements in the Metadata record accordingly.</gco:CharacterString>
        </gmd:other>
      </gmd:MD_ScopeDescription>
    </gmd:updateScopeDescription>
    <gmd:contact>
      <gmd:CI_ResponsibleParty>
        <gmd:organisationName>
          <gco:CharacterString>Ontario Ministry of Natural Resources</gco:CharacterString>
        </gmd:organisationName>
        <gmd:positionName>
          <gco:CharacterString>North Bay District Biologist</gco:CharacterString>
        </gmd:positionName>
        <gmd:contactInfo>
          <gmd:CI_Contact>

```

```

<gmd:phone>
  <gmd:CI_Telephone>
    <gmd:voice>
      <gco:CharacterString>voice; 1 (705) 4755550</gco:CharacterString>
    </gmd:voice>
    <gmd:facsimile>
      <gco:CharacterString>1 (705) 4755550</gco:CharacterString>
    </gmd:facsimile>
  </gmd:CI_Telephone>
</gmd:phone>
<gmd:address>
  <gmd:CI_Address>
    <gmd:deliveryPoint>
      <gco:CharacterString>physical; 3301; Trout Lake Road; ;</gco:CharacterString>
    </gmd:deliveryPoint>
    <gmd:city>
      <gco:CharacterString>North Bay</gco:CharacterString>
    </gmd:city>
    <gmd:administrativeArea>
      <gco:CharacterString>Ontario</gco:CharacterString>
    </gmd:administrativeArea>
    <gmd:postalCode>
      <gco:CharacterString>P1A 4L7</gco:CharacterString>
    </gmd:postalCode>
    <gmd:country>
      <gco:CharacterString>Canada</gco:CharacterString>
    </gmd:country>
    <gmd:electronicMailAddress>
      <gco:CharacterString>lio@ontario.ca</gco:CharacterString>
    </gmd:electronicMailAddress>
  </gmd:CI_Address>
</gmd:address>
</gmd:CI_Contact>
</gmd:contactInfo>
<gmd:role>
  <gmd:CI_RoleCode codeList="http://www.geoconnections.org/nap/metadata/register/
napMetadataRegister.xml#IC_90" codeListValue="RI_409">custodian</gmd:CI_RoleCode>
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</gmd:CI_ResponsibleParty>
</gmd:contact>
</gmd:MD_MaintenanceInformation>
</gmd:metadataMaintenance>
</gmd:MD_Metadata>

```


Annex F

Transformation from/to NAP – Metadata

(informative)

F.1 Dublin core

The standard Dublin Core Metadata Element Set (ANSI/NISO Z39.85 – 2001, ISSN 1041-5653) defines fifteen metadata elements for resource description in a cross-disciplinary information management. To achieve interoperability between NAP – Metadata and the Dublin Core Metadata Element Set a mapping with ISO 19115:2003 is published at:

- <http://www.fgdc.gov/nap/metadata/transformation>,
- <http://www.geoconnections.org/nap/metadata/transformation>.

F.2 FGDC

The issue of transformation of "Content Standard for Digital Geospatial Metadata (revised June 1998)" compliant metadata to NAP – Metadata compliant metadata is highly recognized. However, it is not in the scope of this profile to describe the metadata transformation from one to the other and conversely. But, available documentation and tools such as crosswalk and XSLT between the two metadata standards and more are published on the NAP – Metadata Web page:

- <http://www.fgdc.gov/nap/metadata/transformation>,
- <http://www.geoconnections.org/nap/metadata/transformation>.

F.3 Directory Information Describing Digital Geo-Referenced Data Sets (CAN/CGSB 171.3-95)

The standard for geospatial metadata *Directory Information Describing Digital Geo-Referenced Data Sets (CAN/CGSB 171.3-95)* defined the requirements for geospatial metadata in Canada. To support the transformation of metadata complying with this standard to NAP – Metadata, available documentation and tools are published on the NAP – Metadata Web page:

- <http://www.fgdc.gov/nap/metadata/transformation>,
- <http://www.geoconnections.org/nap/metadata/transformation>.