

Overview

Classes by Stereotype

All Classes

Packages

- GWML
- GWML/Analyses
- GWML/AquiferTesting
- GWML/Categorisation
- GWML/HydrogeologicFeature
- GWML/HydrogeologicProperties
- GWML/HydrogeologicUnit
- GWML/Physiography
- GWML/Relations
- GWML/WaterBody
- GWML/WaterQualityMeasurement
- GWML/WaterQuantity
- GWML/WellConstruction
- GWML/WellProtection
- GWML/WellsAndObservations
- GWML/xToSort

GML Application Schema <API Specification/>	
Overview Package Class Help	
GML Application Schema - Package Overview	
Package Name	Package Description
GWML	<p>Root package for GWML v 1.1</p> <p>GWML (GroundWater Markup Language) an application schema that specifies a set of feature-types and supporting structures for information used in the groundwater domain.</p> <p>GWML is factored into a set of sub-packages.</p>
GWML/Analyses	Set of classes that represents a variable quality measurement of water
GWML/AquiferTesting	The aquiferTesting package groups all test (mainly pump test) and other artefacts of measuring properties of the aquifer or the well
GWML/Categorisation	The GWML Categorisation package is used to define classification of hydrogeologic units mostly for local planning purposes.
GWML/HydrogeologicFeature	The GWML HydrogeologicFeature package contains a class used to describe a feature of the hydrogeology domain.
GWML/HydrogeologicProperties	The GWML HydrogeologicProperties package contains a set of classes used to describe the property of the groundwater and the material that constitute the support of an aquifer.
GWML/HydrogeologicUnit	The GWML HydrogeologicUnit package contains a set of classes used to describe the various properties of hydrogeologic units.
GWML/Physiography	The GWML Physiography package contains a set of classes used to relate the groundwater to features of the ground (watershed and hydrologicUnit)
GWML/Relations	The GWML Relations package contains a set of classes used to manage the relation between two objects.
GWML/WaterBody	The GWML WaterBody package contains a set of classes used to describe the properties of a water body, either from the ground, underground or atmospheric.
GWML/WaterQualityMeasurement	The GWML WaterQualityMeasurement package contains a set of classes used to describe the quality of the groundwater.
GWML/WaterQuantity	The GWML WaterQuantity package contains a set of classes used to describe the quantity of the groundwater in aquifers.
GWML/WellConstruction	<p>The GWML WellConstruction package contains a set of classes used to describe the construction of water well.</p> <p>Specifically, this package can be used to obtain the following information.</p> <ul style="list-style-type: none">-Overall well dimension-Construction method-Type and composition of all materials used-Dimensions, design features and location of each significant component (including the well pump)
GWML/WellProtection	The GWML WellProtection package contains classes required to describe the protection domain of a well.
GWML/WellsAndObservations	All the concepts related to tools and apparatus for groundwater assessments, well tests and aquifer tests. Includes wells, pumps and other devices. Includes concepts related samples and sampling procedures
GWML/xToSort	package of things that are identified in the domain but don't quite fit in any of the other packages

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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Classes by Stereotype

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- [Aquiclude](#) <<FeatureType>>
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- [AquiferSystem](#) <<FeatureType>>
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- [ConfinedAquifer](#) <<FeatureType>>
- [ConstructionComponent](#) <<FeatureType>>
- [DependentObservationCalculation](#) <<FeatureType>>
- [Device](#) <<FeatureType>>
- [DeviceInstallation](#) <<FeatureType>>
- [DiffuseFlow](#) <<FeatureType>>
- [Drawdown](#) <<FeatureType>>
- [DynamicWaterLevel](#) <<FeatureType>>
- [Filtration](#) <<FeatureType>>
- [FiltrationComponent](#) <<FeatureType>>
- [GeologicReservoir](#) <<FeatureType>>
- [GroundwaterBody](#) <<FeatureType>>
- [GroundwaterDivide](#) <<FeatureType>>
- [GroundwaterTesting](#) <<FeatureType>>
- [GuideLine](#) <<FeatureType>>
- [HydraulicBoundary](#) <<FeatureType>>
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- [HydrogeologicMappedFeature](#) <<FeatureType>>
- [HydrogeologicUnit](#) <<FeatureType>>
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<<Enumeration>> Classes

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[WaterFlowProcess](#) <<Enumeration>>
[WaterLevelTypes](#) <<Enumeration>>

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[WellStatusCode](#) <<CodeList>>
[WellUse](#) <<CodeList>>

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

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- [ConstructionComponent](#) <<FeatureType>>
- [DependentObservationCalculation](#) <<FeatureType>>
- [Device](#) <<FeatureType>>
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- [DiffuseFlow](#) <<FeatureType>>
- [Drawdown](#) <<FeatureType>>
- [DynamicWaterLevel](#) <<FeatureType>>
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- [FiltrationComponent](#) <<FeatureType>>
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- [GroundwaterBody](#) <<FeatureType>>
- [GroundwaterDivide](#) <<FeatureType>>
- [GroundwaterTesting](#) <<FeatureType>>
- [GuideLine](#) <<FeatureType>>
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- [RechargeArea](#) <<FeatureType>>
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- [TransitReservoir](#) <<FeatureType>>
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- [WaterBudget](#) <<FeatureType>>
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- [WaterSpecimen](#) <<FeatureType>>
- [WaterWell](#) <<FeatureType>>
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- [WellConstruction](#) <<FeatureType>>
- [WellField](#) <<FeatureType>>
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- [ZoneOfContribution](#) <<FeatureType>>
- [ZoneOfInfluence](#) <<FeatureType>>

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- [HydrogeologicDescription](#) <<Type>>
- [LocationRelation](#) <<Type>>
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- [WaterCompositionDescription](#) <<DataType>>
- [WaterPropertyDescription](#) <<DataType>>
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- [DiffuseFlow](#)
- [DissolvedComponent](#)
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- [GroundwaterBody](#)
- [GroundwaterDivide](#)
- [GroundwaterTestCode](#)
- [*GroundwaterTesting*](#)
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- [HydraulicBoundary](#)
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- [HydroGeologicalFramework](#)
- [HydroStratigraphicUnit](#)
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- [HydrogeologicDescription](#)
- [*HydrogeologicFeature*](#)
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- [HydrologicUnit](#)
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- [WaterType](#)
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- [WaterWell](#)
- [WaterYieldDescription](#)
- [WellBoreholeDetails](#)
- [WellCasing](#)
- [WellCasingComponent](#)
- [WellConstruction](#)
- [WellField](#)
- [WellPumpInstallation](#)
- [WellPurposeCode](#)
- [WellStatusCode](#)
- [WellUse](#)
- [WellWaterDescription](#)
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[GWML](#)

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Classes by Stereotype

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[ConfinedAquiferType](#) <<Enumeration>>

[GWML/Physiography](#)

Classes by Stereotype

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Classes by Stereotype

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Classes by Stereotype

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Classes by Stereotype

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- [WaterLevelTypes](#) <<Enumeration>>

Classes by Stereotype

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<<Enumeration>> Classes

[DrillingFluidCode](#) <<Enumeration>>

Classes by Stereotype

<<FeatureType>> Classes

[ConeOfDepression](#) <<FeatureType>>

[ProtectionZone](#) <<FeatureType>>

[ZoneOfContribution](#) <<FeatureType>>

[ZoneOfInfluence](#) <<FeatureType>>

Classes by Stereotype

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Classes

- [Device](#) <<FeatureType>>
- [DeviceInstallation](#) <<FeatureType>>
- [Drawdown](#) <<FeatureType>>
- [MonitoringStation](#) <<FeatureType>>
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Classes

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Classes

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- [WellUse](#) <<CodeList>>

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[HydroGeologicalFramework](#) <<FeatureType>>

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[ProtectionArea](#) <<FeatureType>>

[RechargeArea](#) <<FeatureType>>

<<DataType>> Classes

[SpatialRelationship](#) <<DataType>>

<<enumeration>> Classes

[SpatialRelation](#) <<enumeration>>

GML Application Schema<API Specification/>

OverviewPackageClassHelp

Help

About this documentation

This documentation is an auto-generated set of linked HTML pages that provide an overview of a domain-specific [GML Application Schema](#) model.

Detailed information about GML Application Schema development is beyond the scope of this help page, however the following section on the ISO/TC 211 Profile of UML (sourced from [here](#)) is provided to assist the reader in interpreting the behaviour of certain model Classes.

ISO/TC 211 Profile of UML

UML is the canonical notation used in the ISO 19100 series of standards for Geographic Information developed by ISO/TC 211. However, UML provides a rich palette, and even within class-diagrams the UML elements may be combined in a variety of ways to represent similar functions. In order to restrict the variability, a strict "profile" of UML is used. This is defined primarily in ISO 19103, with some contextual clarification in ISO 19109, 19118 and 19136.

The key constraints for our purposes are:

1. a rolename is required on every navigable association end
2. the default cardinality for a navigable association end or attribute is [1]
3. standard stereotypes are used for packages and classes, according to the following table (adapted from ISO 19136/GML 3.2 Annex E)

The first set of stereotypes corresponds primarily the set described in Table E.1 of ISO 19136:2007 (GML 3.2.1), and are suitable for a domain model that is ready for direct conversion to XML as a GML Application Schema.

Stereotype name	Scope	Use	XML Implementation
<<ApplicationSchema>> / <<applicationSchema>>	Package	Complete application schema	An XML Schema in a single XML namespace
<<FeatureType>> / <<featureType>>	Class	Feature-type	XML element whose XML Schema-type is derived from gml:AbstractFeatureType
<<Type>> / <<type>>	Class	Referenceable objects other than features	XML element whose XML Schema-type is derived from gml:AbstractGMLType
<<DataType>> / <<dataType>>	Class	Structured data type	XML element with a complex content model; does not have identity and must appear inline
<<Union>> / <<union>>	Class	Arbitrary set of alternative classes	Choice group whose members are GML Objects or Features, or objects corresponding to DataTypes
<<CodeList>> / <<codeList>>	Class	Extensible enumeration	Union of an enumeration of string values and a pattern
<<Enumeration>> / <<enumeration>>	Class	Fixed enumeration	Enumeration of string values

Some additional stereotypes have been found useful in domain modelling. These are packaged as a separate "UML Profile" for use in the [HollowWorld](#) environment.

Stereotype name	Scope	Use	XML Implementation
<<Leaf>> / <<leaf>>	Package	Convenient group of elements within an application schema	Single XML Schema document
<<PrimitiveType>> / <<primitiveType>>	Class	Structured data type	Class which has a "canonical" pre-defined XML encoding
<<property>>	attribute, associationRole	Property	Local element (a) having a simple type (b) containing a complex type, or (c) using the GML in-line or by-reference pattern
<<multipleInheritance>>	Generalization	Multiple Inheritance	To accommodate tagged values required for XML Schema implementation

List of known documentation limitations

- Properties (i.e. attributes and associations) that are inherited from externally governed classes are not shown in class details
- Local Subclasses: (as listed on Class Details pages) include only the direct descendants of the class. (i.e. deeper levels of generalization are not listed)
- Class Details page only indicates extends for a single parent. (i.e. multiple inheritance is not yet supported)
- Documentation of nested <<Application Schema>> packages is not yet supported. Currently the rule suite expects a parent <<Application Schema>> with child <<Leaf>> packages

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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Package **GWML**

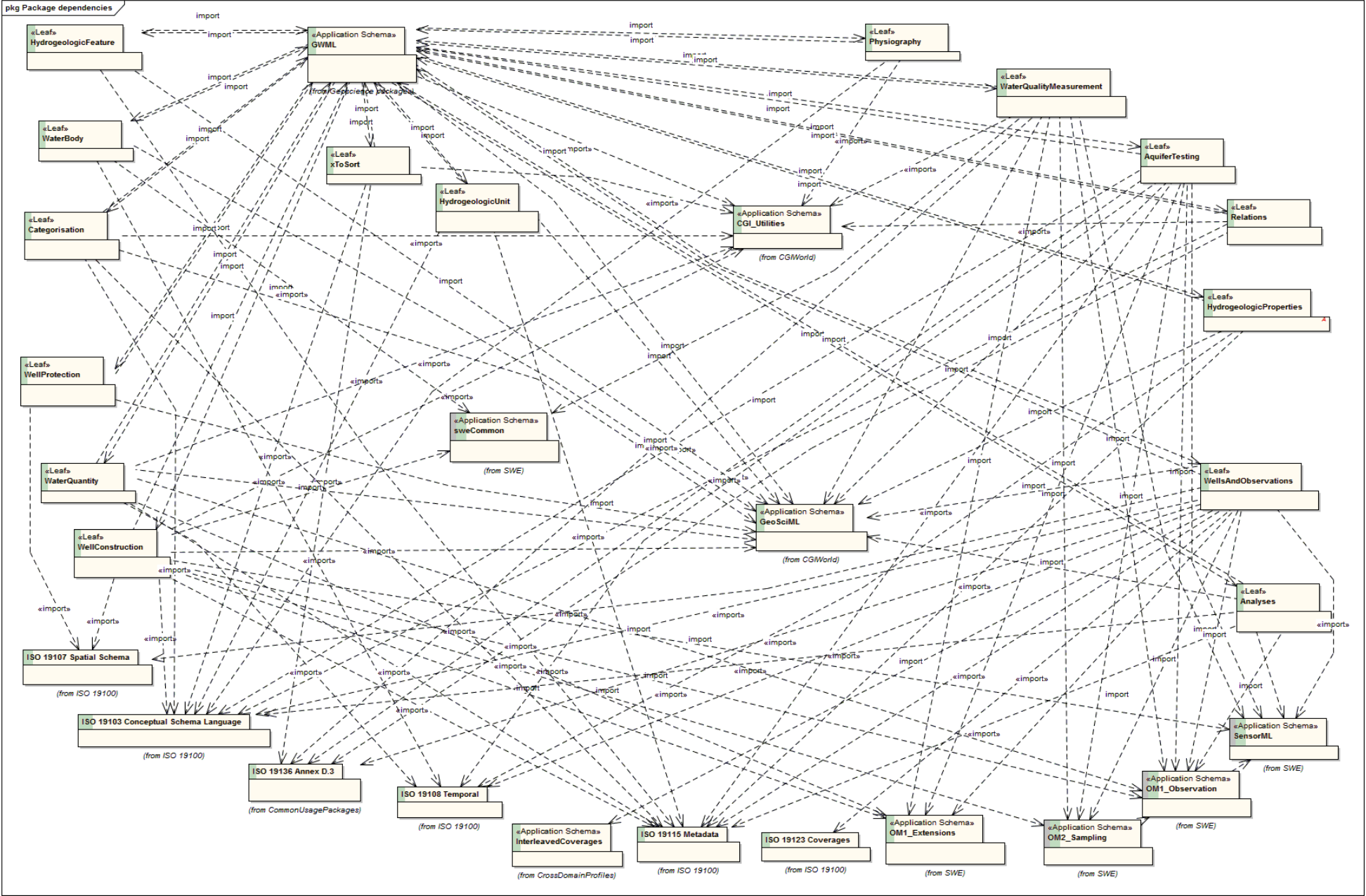
Root package for GWML v 1.1

GWML (GroundWater Markup Language) an application schema that specifies a set of feature-types and supporting structures for information used in the groundwater domain.

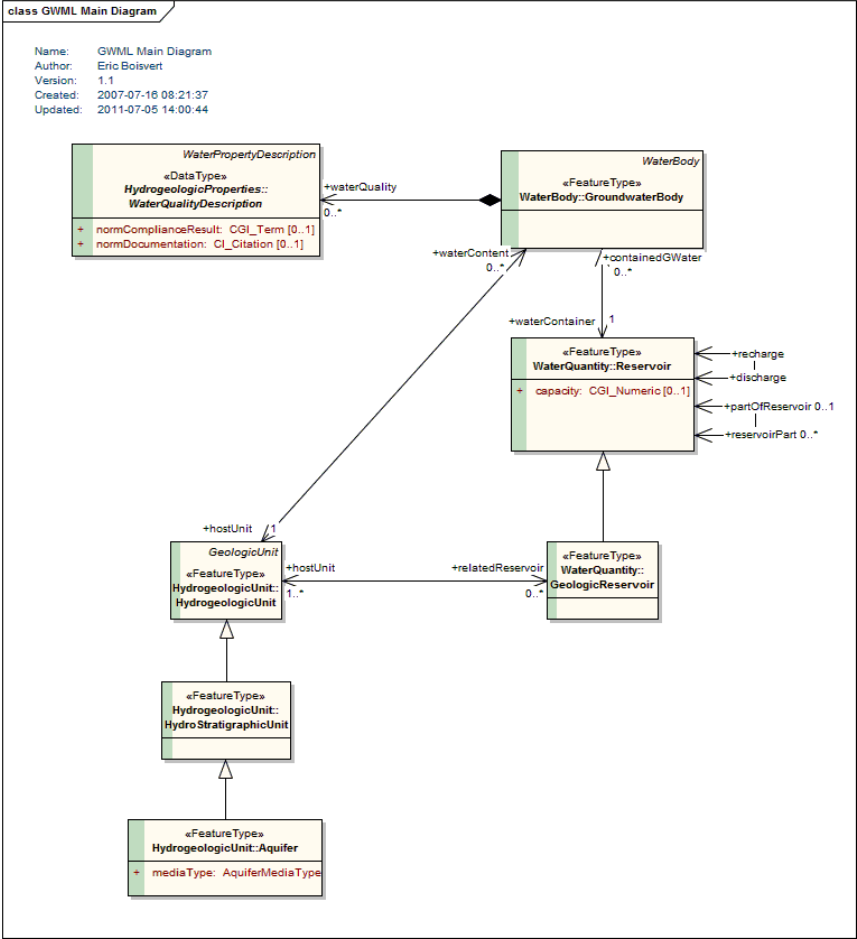
GWML is factored into a set of sub-packages.

Tagged Values		
Tag	Value	Notes
gmlProfileSchema	#NOTES#Description: URL of the schema location of a GML profile (optional)	Description: URL of the schema location of a GML profile (optional)
owner	Eric Boisvert	Description: Party responsible for maintenance of this package
targetNamespace	http://www.nrcan.gc.ca/xml/gwml/1	Default: FIXME Description: Target XML namespace of the application schema
version	1.0	Default: FIXME Description: Current version of the application schema
xmlns	gwml	Default: FIXME Description: Namespace prefix to be used as short form of the target namespace
xsdDocument	gwml.xsd	Default: FIXME Description: Name of an XML Schema document to create representing the content of this package
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

UML Diagram: Package dependencies



UML Diagram: GWML Main Diagram



For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML

Application Schema

<API Specification/>

Overview

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Package GWML/Analyses

Set of classes that represents a variable quality measurement of water

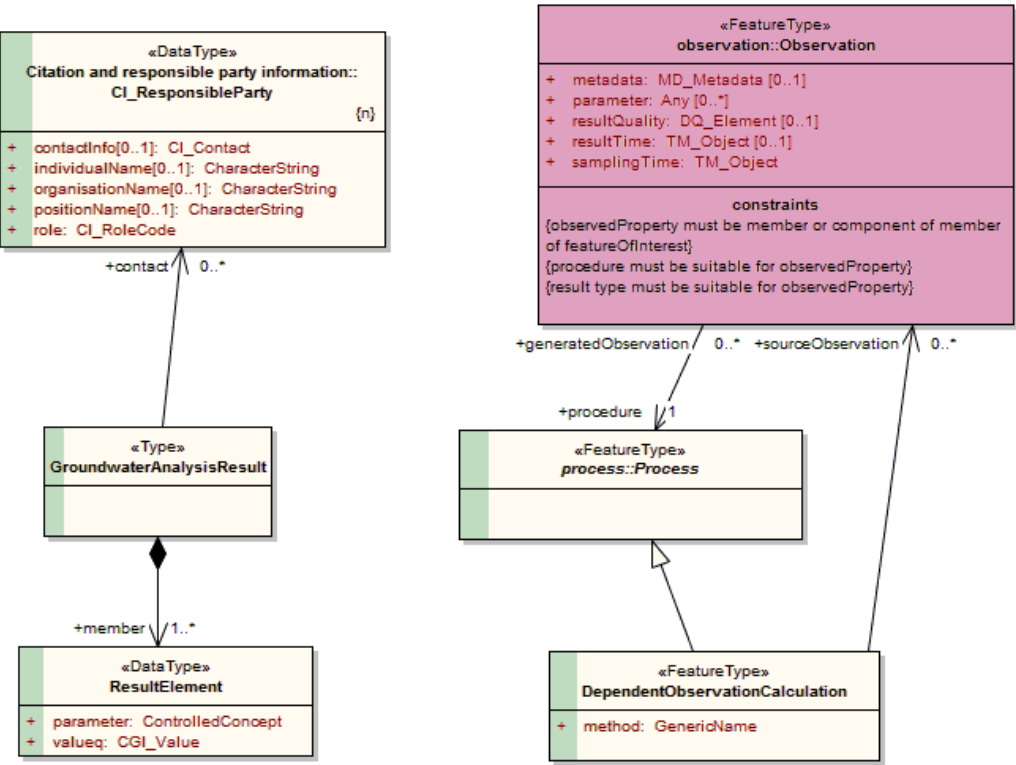
Class Summary	
<<FeatureType>> Classes	
DependentObservationCalculation	Calculation that depend from another set of observation
<<FeatureType>>	
<<Type>> Classes	
GroundwaterAnalysisResult <<Type>>	Report a collection of values related to groundwater quality (quantitative and qualitative).
<<DataType>> Classes	
ResultElement <<DataType>>	This class is used to represent one element of the results of a groundwater analysis.

Tagged Values		
Tag	Value	Notes
xsdDocument	Analysis.xsd	Description: Name of an XML Schema document to create representing the content of this package
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

UML Diagram: Analysis

class Analysis

Name: Analysis
Author: Eric Boisvert
Version: 1.1
Created: 2008-02-08 09:43:05
Updated: 2011-07-04 13:25:41



For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

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Package GWML/AquiferTesting

The aquiferTesting package groups all test (mainly pump test) and other artefacts of measuring properties of the aquifer or the well

Class Summary	
<<FeatureType>> Classes	
GroundwaterTesting <<FeatureType>>	This abstracted class is used to represent the result of a groundwater test.
PackerTesting <<FeatureType>>	<p>Packer tests consist of isolating specific sections (usually 10 ft) of a bedrock borehole with inflatable packers (bladders) so that water-quality samples can be collected and aquifer tests can be conducted. A series of such tests allows definition of the vertical distribution of water quality (usually contaminants) and hydraulic conductivity (pathways for water and contaminant movement) in an aquifer. Monitoring water levels in nearby wells while pumping packed intervals can identify permeable intervals within the aquifer. Information from the packer tests can be used to properly site the future location of monitoring wells.</p> <p>http://il.water.usgs.gov/pubs/ofr01-50_chapter4_8.pdf</p> <p>packer test (Lugeon test) Test for measuring the permeability of ground in sections of boreholes. An inflatable tube ('packer') is lowered down a borehole and expanded so that the sections above and below are isolated. Alternatively, two packers may be used to isolate a certain section. Water is pumped into the section under investigation and leakage can be measured. The rate at which water is absorbed per metre length of hole is measured in units of lugeon, named after the French geologist Maurice Lugeon (1870?1953). One lugeon is approximately equal to 1.0 * 10&minus;5 cm/s permeability.</p> <p>AILSA ALLABY and MICHAEL ALLABY. "packer test." A Dictionary of Earth Sciences. 1999. Retrieved December 17, 2008 from Encyclopedia.com: http://www.encyclopedia.com/doc/1O13-packertest.html</p>
PumpTesting <<FeatureType>>	<p>An aquifer test (or a pumping test) is conducted to evaluate an aquifer by "stimulating" the aquifer through constant pumping, and observing the aquifer's "response" (drawdown) in observation wells. Aquifer testing is a common tool that hydrogeologists use to characterize a system of aquifers, aquitards and flow system boundaries.</p> <p>http://en.wikipedia.org/wiki/Aquifer_test</p>
SlugTesting <<FeatureType>>	<p>A slug test is a particular type of aquifer test where water is quickly added or removed from a groundwater well, and the change in hydraulic head is monitored through time, to determine the near-well aquifer characteristics. It is a method used by hydrogeologists and civil engineers to determine the transmissivity and storativity of the material the well is completed in.</p> <p>http://en.wikipedia.org/wiki/Slug_test</p>
TracingTest <<FeatureType>>	<p>Tracer tests are used to "trace" the path of flowing water. Tracer tests are conducted in pipelines, lakes, rivers and groundwater. The tracer chemical must be dissolved in water at concentrations that do not significantly change the aqueous density. Tracer chemicals must behave conservatively --&gt; meaning no mass is lost through reaction or partitioning into differing phases (vapor, solids). Thus, the only solute transport processes affecting a conservative tracer are advection and dispersion. Advection is the movement of the solute (dissolved tracer) due to groundwater flowing and moving. The mean pore-water velocity (calculated from Darcy's Law) is used to predict advection. As the pore-water velocities within the groundwater are not uniform (variability around the mean velocity), some solute will move slower than the mean velocity and other solute will move faster than the mean velocity. The resulting dispersion of the solute causes a broadening of the solute plume and a decrease in the concentration. The ambient or background level of tracer chemical in the receiving waters must be low.</p> <p>http://www.geology.sdsu.edu/classes/geol552/tracertestdesign.htm</p> <p>Test that involves injecting a tracer and detecting its diffusion into another site.</p>
<<DataType>> Classes	
ProcessContextRelation <<DataType>>	Specific relation between sampling features where the sampling features form a network in a process to generate observations for a target sampling feature. The common example is a well network where measures are taken at several wells to estimate a property at a target well or for another target feature (ie, an aquifer)
<<CodeList>> Classes	
GroundwaterTestCode <<CodeList>>	This enumeration lists various groundwater test topics that can be applied to an aquifer.

Tagged Values		
Tag	Value	Notes
xsdDocument	AquiferTesting.xsd	Description: Name of an XML Schema document to create representing the content of this package
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

UML Diagram: Aquifer Testing Procedure

Name: Aquifer Testing Procedure
Author: Eric Boisvert
Version: 1.1
Created: 2006-01-24 14:50:38
Updated: 2011-07-04 13:25:41

GML Application Schema<API Specification/>

OverviewPackageClassHelp

Package GWML/Categorisation

The GWML Categorisation package is used to define classification of hydrogeologic units mostly for local planning purposes.

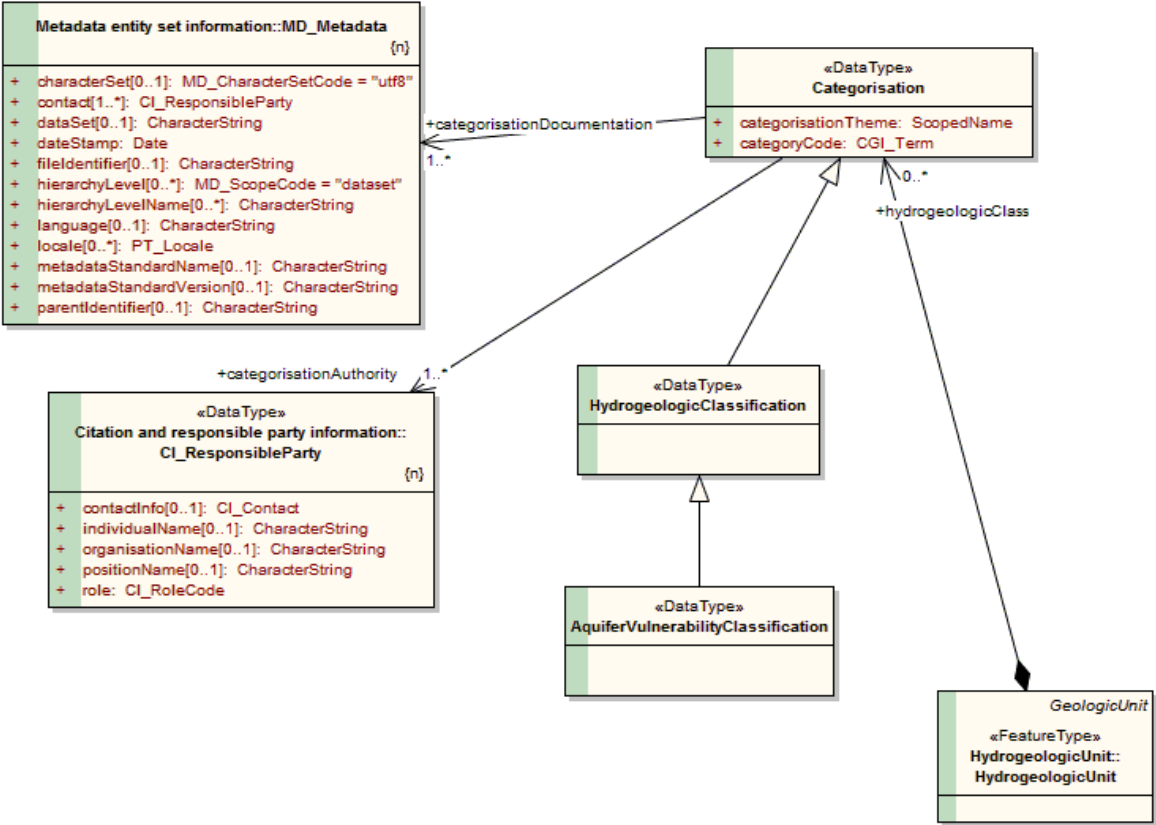
Class Summary	
<<DataType>> Classes	
AquiferVulnerabilityClassification <<DataType>>	<p>Two concepts have been introduced that can affect groundwater quality. The land-use activities that take place at the surface can affect groundwater quality, and the physical or geologic characteristics of the vadose zone and aquifer can provide protection from infiltrating contaminants.</p> <p>Land-use activities and aquifer sensitivity are absolute terms that can be easily defined through observation and physical investigation. They are combined to define a relative term that is used to qualify the real risk to a given aquifer: vulnerability.</p> <p>http://www.waterencyclopedia.com/Oc-Po/Pollution-of-Groundwater-Vulnerability.html</p>
Categorisation <<DataType>>	<p>Custom classification applied to a hydrogeologic Unit. This classification is usually based on local concerns, such as vulnerability, water availability or other classes related to water usage and protection. Many agencied designed those classification to guide decision making (land planning, constructions, agriculture) and hence the same unit can be classified in many classification simultaneously.</p>
HydrogeologicClassification <<DataType>>	<p>A class used to specify a classification based on characteristic hydrology and geological settings.</p> <p>Derived from http://www.esf.edu/rwls/research/Fen/Fenglossaty.pdf - Hydrologic Classification System</p>

Tagged Values		
Tag	Value	Notes
xsdDocument	Categorisation.xsd	Description: Name of an XML Schema document to create representing the content of this package
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

UML Diagram: Categorisation

class Categorisation

Name: Categorisation
Author: Eric Boisvert
Version: 1.1
Created: 2007-12-16 14:36:35
Updated: 2011-07-04 13:25:41



For more information about GML Application Schema development refer to:
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For more general information about GML refer to:
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GML Application Schema<API Specification/>

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Package GWML/HydrogeologicFeature

The GWML HydrogeologicFeature package contains a class used to describe a feature of the hydrogeology domain.

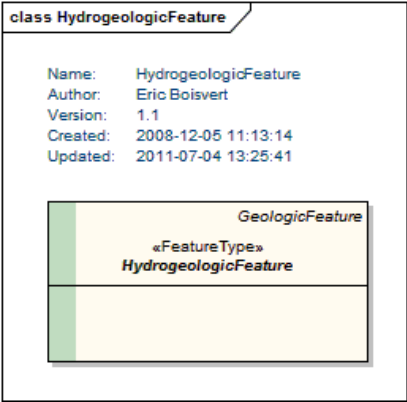
Class Summary

<<FeatureType>> Classes	
HydrogeologicFeature	An abstract feature of the hydrogeology domain which is not a hydrogeologic unit
<<FeatureType>>	

Tagged Values

Tag	Value	Notes
xsdDocument	HydrogeologicFeature.xsd	Description: Name of an XML Schema document to create representing the content of this package
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

UML Diagram: HydrogeologicFeature



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For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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Package GWML/HydrogeologicProperties

The GWML HydrogeologicProperties package contains a set of classes used to describe the property of the groundwater and the material that constitute the support of an aquifer.

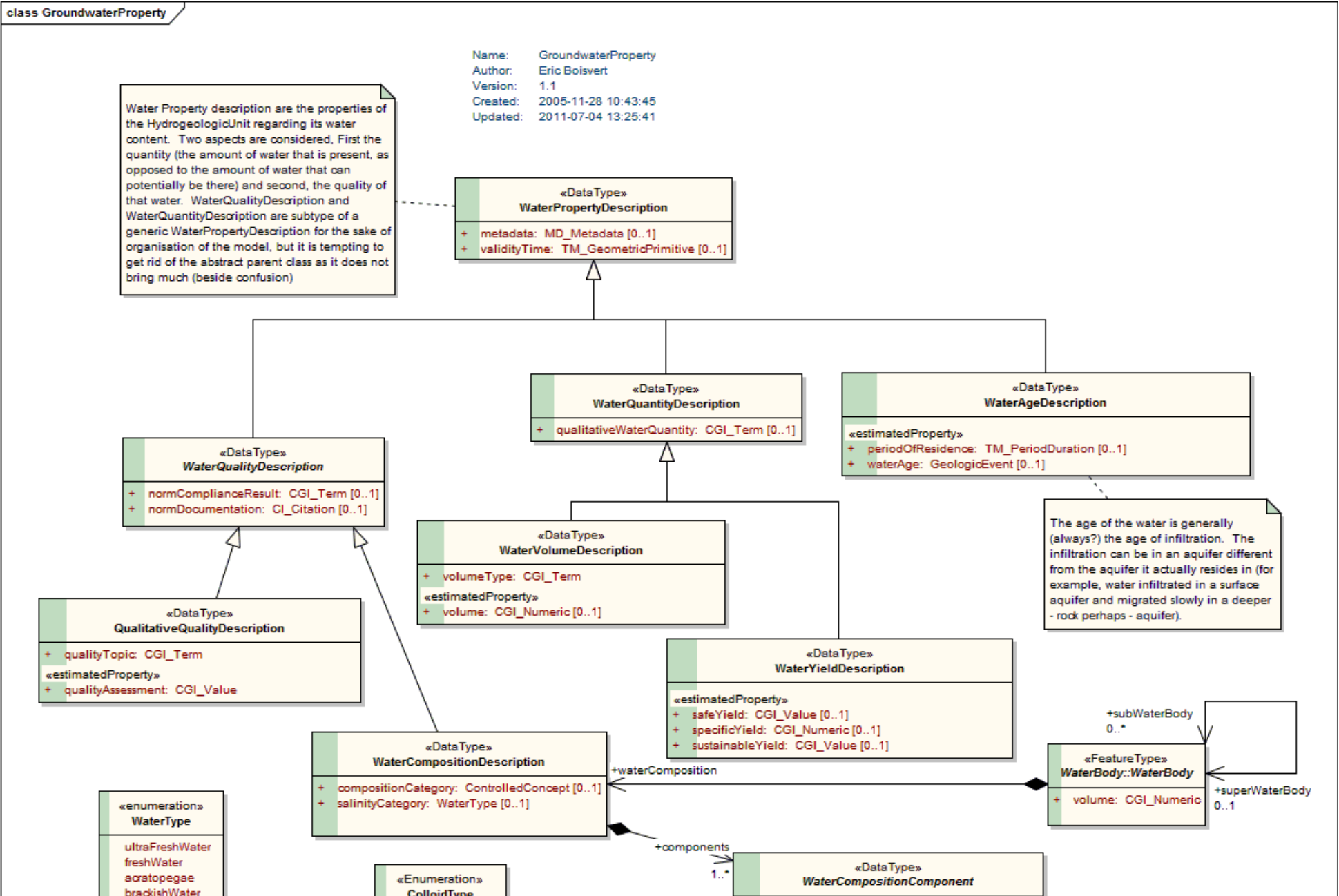
Class Summary	
<<Type>> Classes	
HydrogeologicDescription <<Type>>	Properties of the rock that is relevant to the groundwater
Salinity <<Type>>	<p>Salinity is a very special kind of dissolved component and is often an important aspect of groundwater studies because of it's many impacts.</p> <p>The salinity can come from various sources; sea water instrusion (actual or ancien), dissolution of host rock or dissolution of salt during recharge (eg, water circulating through evaporates)</p>
Salt <<Type>>	<p>A salt, in chemistry, is defined as the product formed from the neutralisation reaction of acids and bases. Salts are ionic compounds composed of cations (positively charged ions) and anions (negative ions) so that the product is electrically neutral (without a net charge). These component ions can be inorganic such as chloride (Cl&minus;), as well as organic such as acetate (CH3COO&minus;) and monoatomic ions such as fluoride (F&minus;), as well as polyatomic ions such as sulfate (SO42&minus;).</p> <p>There are several varieties of salts. Salts that produce hydroxide ions when dissolved in water are basic salts and salts that produce hydronium ions in water are acid salts. Neutral salts are those that are neither acid nor basic salts. Zwitterions contain an anionic center and a cationic center in the same molecule but are not considered to be salts. Examples include amino acids, many metabolites, peptides and proteins. http://en.wikipedia.org/wiki/Salt_(chemistry)</p>
<<DataType>> Classes	
BiologicComponent <<DataType>>	Type of biologic component present in the groudwater (bacteria, virus, etc).
ColloidalComponent <<DataType>>	<p>This class refers to a physical component that hava the proerties of a colloid.</p> <p>A colloid is a type of mechanical mixture where one substance is dispersed evenly throughout another. Because of this dispersal, some colloids have the appearance of solutions. A colloidal system consists of two separate phases: a dispersed phase (or internal phase) and a continuous phase (or dispersion medium). A colloidal system may be solid, liquid, or gaseous. derived from http://en.wikipedia.org/wiki/Colloid</p> <p>Of, pertaining to, or consisting of a colloid. http://en.wiktionary.org/wiki/colloidal</p>
DissolvedComponent <<DataType>>	<p>That has been disintegrated in a solvent http://en.wiktionary.org/wiki/dissolved</p> <p>This class refers to a chemical component dissoved in groundwater.</p>
GeologicProperty <<DataType>>	The geologic property of an aquifer.
PhysicalProperty <<DataType>>	A generic class used to describe various physical properties.
Porosity <<DataType>>	Used in geology, hydrogeology, soil science, and building science, the porosity of a porous medium (such as rock or sediment) describes the fraction of void space in the material, where the void may contain, for example, air or water. http://en.wikipedia.org/wiki/Porosity
QualitativeQualityDescription	A normative quality description is an assesment based upon some guideline edited by a gouvernement or a quality standard. It can include things such as "odor" or "color".

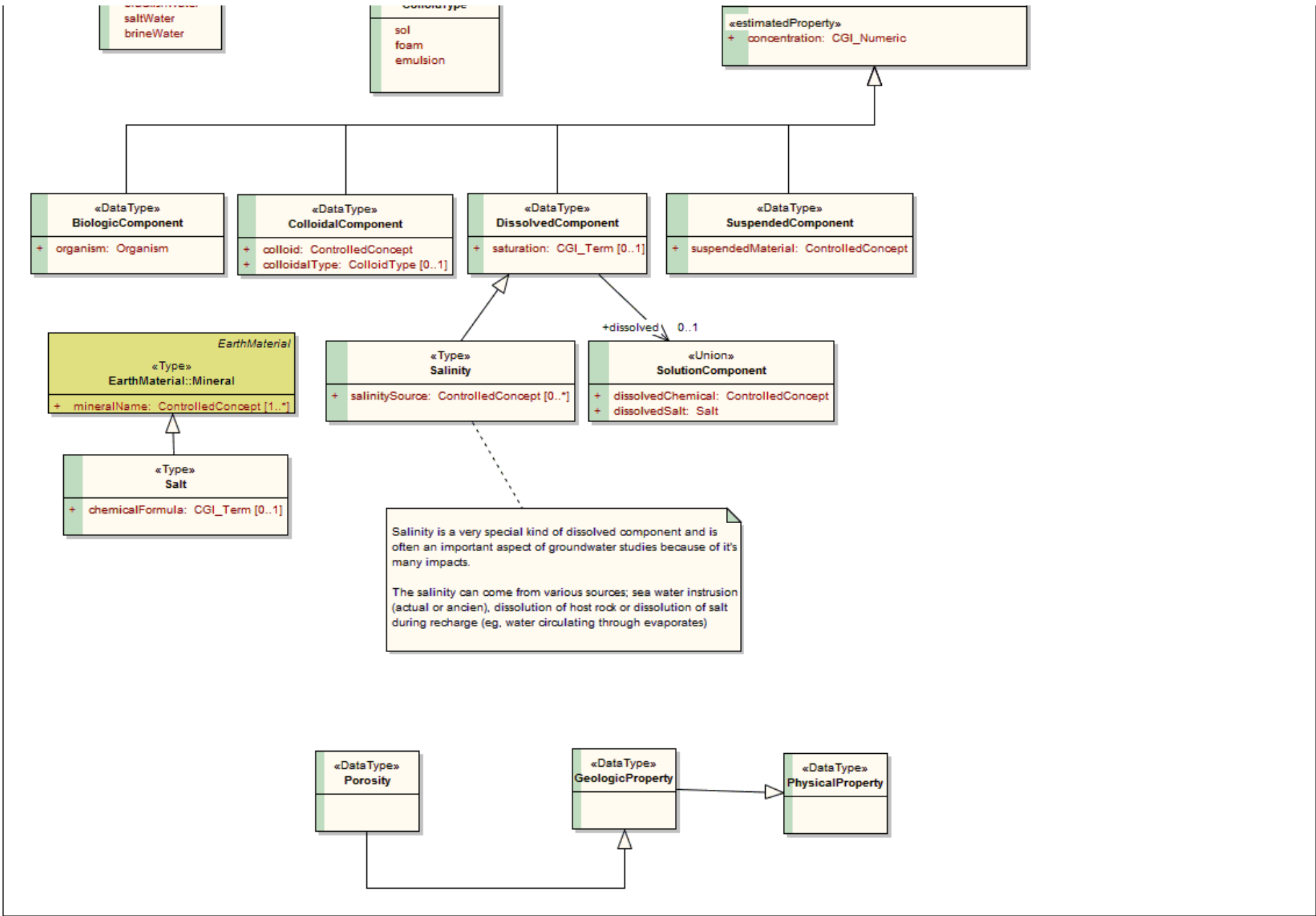
<<DataType>>	
SuspendedComponent <<DataType>>	<p>In chemistry, a suspension is a homogeneous fluid containing solid particles that are sufficiently large for sedimentation. Usually they must be larger than 1 micrometre.[1] The internal phase (solid) is dispersed throughout the external phase (fluid) through mechanical agitation, with the use of certain excipients or suspending agents. Unlike colloids, suspensions will eventually settle. An example of a suspension would be sand in water. The suspended particles are visible under a microscope and will settle over time if left undisturbed. This distinguishes a suspension from a colloid in which the suspended particles are smaller and do not settle.[2] In a solution, the dissolved substance does not exist as a solid and the two are homogeneously mixed.</p> <p>http://en.wikipedia.org/wiki/Suspension_(chemistry)</p> <p>This class is used to described a suspended material in groundwater.</p>
WaterAgeDescription <<DataType>>	<p>The age of the water is generally (always?) the age of infiltration. The infiltration can be in an aquifer different from the aquifer it actually resides in (for example, water infiltrated in a surface aquifer and migrated slowly in a deeper - rock perhaps - aquifer).</p>
WaterCompositionComponent <<DataType>>	<p>An abstract class that is used to describe a component that can be present in groundwater</p>
WaterCompositionDescription <<DataType>>	<p>An abstract class used to describe the composition of water.</p>
WaterPropertyDescription <<DataType>>	<p>Water Property description are the properties of the HydrogeologicUnit regarding its water content. Two aspects are considered, First the quantity (the amount of water that is present, as opposed to the amount of water that can potentially be there) and second, the quality of that water.</p>
WaterQualityDescription <<DataType>>	<p>A list of common properties related to water quality assessment. Head of a substitution list that include Qualitative and Quantitative water quality properties</p>
WaterQuantityDescription <<DataType>>	<p>A class used to describe the the quantity of water that is present in an aquifer.</p>
WaterVolumeDescription <<DataType>>	<p>A class used to describe the volume of water present in an aquifer.</p>
WaterYieldDescription <<DataType>>	<p>A class used to describe the different yield parameters of an aquifer.</p>
<<Union>> Classes	
SolutionComponent <<Union>>	<p>In chemistry, a solution is a homogeneous mixture composed of two or more substances. In such a mixture, a solute is dissolved in another substance, known as a solvent. A common example is a solid, such as salt or sugar, dissolved in water, a liquid. Gases may dissolve in liquids, for example, carbon dioxide or oxygen in water. Liquids may dissolve in other liquids.</p> <p>http://en.wikipedia.org/wiki/Solution</p> <p>This class is used to describe a dissolved component in groundwater.</p>
<<Enumeration>> Classes	
ColloidType <<Enumeration>>	<p>A colloid is a type of mechanical mixture where one substance is dispersed evenly throughout another. Because of this dispersal, some colloids have the appearance of solutions. A colloidal system consists of two separate phases: a dispersed phase (or internal phase) and a continuous phase (or dispersion medium). A colloidal system may be solid, liquid, or gaseous.</p> <p>http://en.wikipedia.org/wiki/Colloid</p>
<<enumeration>> Classes	
WaterType <<enumeration>>	<p>This enumeration class refers to the concept of salinity and its classes in water.</p> <p>Salinity is the saltiness or dissolved salt content of a body of water. http://en.wikipedia.org/wiki/Salinity</p> <p>Generally, the concentration of mineral salts dissolved in water. Salinity may be expressed in terms of a concentration or as electrical conductivity. When describing salinity influenced by seawater, salinity often refers to the concentration of chlorides in the water. See also total dissolved solids. http://www.groundwater.water.ca.gov/groundwater_basics/gwb_glossary/index.cfm#ss</p>

Tagged Values		
Tag	Value	Notes

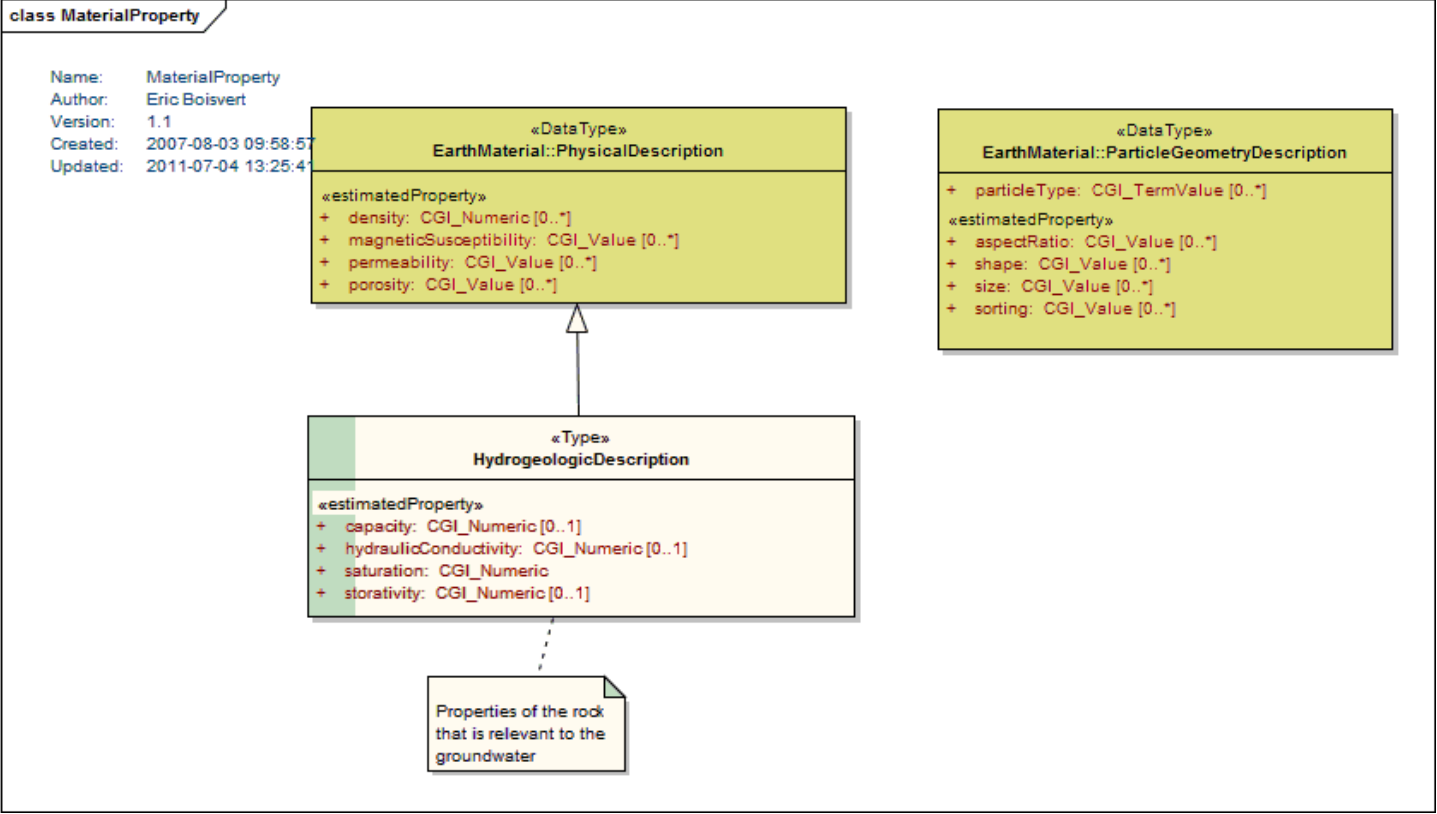
xsdDocument	HydrogeologicProperties.xsd	Description: Name of an XML Schema document to create representing the content of this package
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

UML Diagram: GroundwaterProperty





UML Diagram: MaterialProperty





Overview

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Package GWML/HydrogeologicUnit

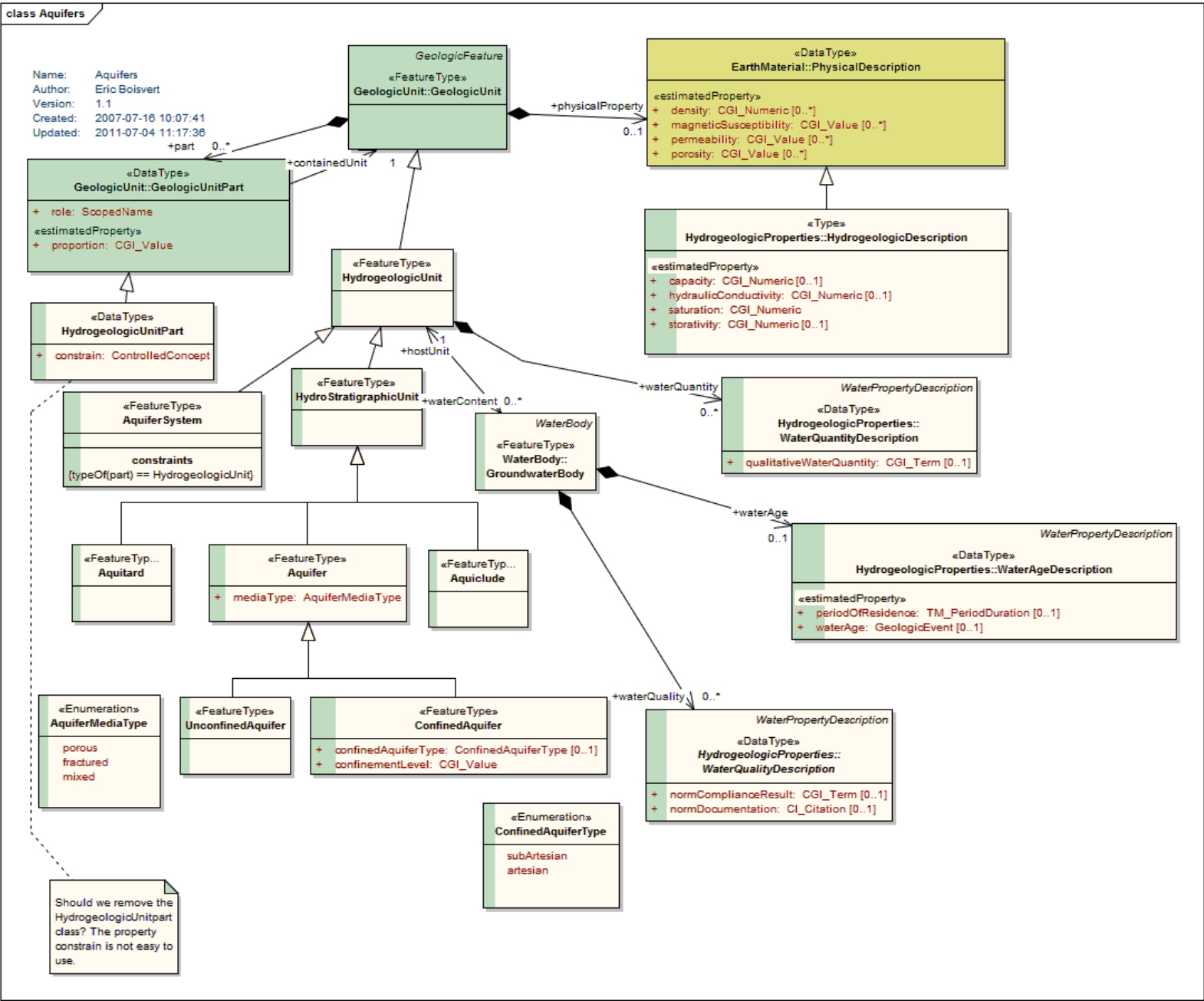
The GWML HydrogeologicUnit package contains a set of classes used to describe the various properties of hydrogeologic units.

Class Summary	
<<FeatureType>> Classes	
Aquiclude <<FeatureType>>	<p>Impermeable beds of geologic material that hinder or prevent groundwater movement. http://www.groundwater.org/gi/gwglossary.html</p> <p>A formation which, although porous and capable of absorbing water slowly, will not transmit water fast enough to furnish an appreciable supply for a well or spring. Aquicludes are characterized by very low values of "leakage" (the ratio of vertical <i>Hydraulic Conductivity </i>to thickness), so that they transmit only minor inter-aquifer flow and also have very low rates of yield from compressible storage. Therefore, they constitute boundaries of aquifer flow systems. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-a.pdf</p>
Aquifer <<FeatureType>>	<p>A formation, group of formations, or part of a formation that contains sufficient saturated, permeable material to yield significant quantities of water to wells and springs. (USGS)</p> <p>An underground geological formation able to store and yield water. http://www.groundwater.org/gi/gwglossary.html</p> <p>An aquifer is an underground layer of water-bearing permeable rock or unconsolidated materials (gravel, sand, silt, or clay) from which groundwater can be usefully extracted using a water well. http://en.wikipedia.org/wiki/Aquifer</p>
AquiferSystem <<FeatureType>>	<p>Collection of hydrogeological units composing a system of interacting components. By virtue of being a GeologicUnit, it derives from it the 'part' property</p>
Aquitard <<FeatureType>>	<p>A saturated, but poorly permeable bed that impedes ground-water movement and does not yield water freely to wells, but which may transmit appreciable water to or from adjacent aquifers and, where sufficiently thick, may constitute an important ground-water storage unit. Aquitards are characterized by values of leakance that may range from relatively low to relatively high. Areally extensive aquitards of relatively low leakance may function regionally as boundaries of aquifer flow systems. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-a.pdf</p>
ConfinedAquifer <<FeatureType>>	<p>Aquifer confined under an impermeable layer.</p> <p>Confined aquifers have the water table above their upper boundary (an aquitard or aquiclude), and are typically found below unconfined aquifers. The term "perched" refers to ground water accumulating above a low-permeability unit or strata, such as a clay layer. This term is generally used to refer to a small local area of ground water that occurs at an elevation higher than a regionally-extensive aquifer. The difference between perched and unconfined aquifers is their size (perched is smaller). http://en.wikipedia.org/wiki/Confined_aquifer#Confined_versus_unconfined</p> <p>(1) An aquifer containing water between two relatively impermeable boundaries. The water level in a well tapping a confined aquifer stands above the top of the confined aquifer and can be higher or lower than the water table that may be present in the material above it. In some cases the water level can rise above the ground surface, yielding a flowing well. (2) An aquifer or water-bearing subsurface stratum which is bounded above and below by formations of impermeable or relatively impermeable material; a water-bearing formation whose upper boundary is a layer which does not transmit water readily. (3) An aquifer in which ground water is under pressure significantly greater than atmospheric and its upper limit is the bottom of a bed of distinctly lower hydraulic conductivity than that of the aquifer itself. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-c.pdf</p>
HydroStratigraphicUnit <<FeatureType>>	<p>Formation, or part of a formation, or a group of formation in which there are similar hydrologic characteristics that allow for grouping into aquifers and associated confininf layers (Domenico & Schwartz, 1997)</p> <p>Hydrostratigraphic units were originally defined by Maxey (1964) as bodies of rock with considerable lateral extent that act as a reasonably distinct hydrologic system. It is clear from Maxey's definition that hydrostratigraphic units were to be hydraulically continuous, mappable, and scale-independent entities. Mappability, in this case, means the subsurface geology can be subdivided according to permeability (Seaber, 1988). Thus, a single hydrostratigraphic unit may include a formation, part of a formation, or a group of formations.</p> <p>-Maxey, G. B., 1964, Hydrostratigraphic units: Journal of Hydrology, v. 2, p. 124-129.</p>
HydrogeologicUnit <<FeatureType>>	<p>Means any soil of rock unit or zone which by virtue of its porosity or permeability, or lack thereof, has a distinct influence on the storage or movement of groundwater. (EPA)</p> <p>Any soil or rock unit or zone that because of its hydraulic properties has a distinct influence on the storage or movement of ground water. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-h.pdf</p>
UnconfinedAquifer <<FeatureType>>	<p>An aquifer containing water that is not under pressure; the water level in a well is the same as the water table outside the well. An unconfined aquifer made up of loose material, such as sand or gravel, that has not undergone lithification (settling). In an unconfined aquifer the upper boundary is the top of the <i>Zone of Saturation </i>(water table). http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-u.pdf</p>
<<DataType>> Classes	
HydrogeologicUnitPart <<DataType>>	<p>Describe the relationship between this hydrogeologic unit and geologic units that host, contrains or bound it.</p>
<<Enumeration>> Classes	
AquiferMediaType <<Enumeration>>	<p>Aquifers are generally classified as porous or fractured (or mixed in a cased of fractured porous media)</p>
ConfinedAquiferType <<Enumeration>>	<p>Exist where the groundwater is bounded between layers of impermeable substances like clay or dense rock. When tapped by a well, water in confined aquifers is forced up, sometimes above the soil surface. This is how a flowing artesian well is formed. http://www.groundwater.org/gi/gwglossary.html#C</p>

Tagged Values

Tag	Value	Notes
xsdDocument	HydrogeologicUnit.xsd	Description: Name of an XML Schema document to create representing the content of this package
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

UML Diagram: Aquifers



For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

OverviewPackageClassHelp

Package **GWML/Physiography**

The GWML Physiography package contains a set of classes used to relate the groundwater to features of the ground (watershed and hydrologicUnit)

Class Summary

<<FeatureType>> Classes	
HydrologicUnit <<FeatureType>>	<p>The Hydrologic Unit system is a standardized watershed classification system developed by USGS in the mid 1970s. Hydrologic units are watershed boundaries organized in a nested hierarchy by size. http://nwis.waterdata.usgs.gov/tutorial/huc_def.html</p> <p>The drainage basin concept is expanded upon in hierarchical systems of hydrologic units. In the United States, an effort is being made to delineate hydrologic units in a six level hierarchy covering the entire country and adhering to a standard called the "Federal Standard for Delineation of Hydrologic Unit Boundaries". The six nested levels of hydrologic unit regions are named, from largest to smallest, regions, subregions, basins, subbasins, watersheds, and subwatersheds. The system defines 21 hydrologic unit (HU) regions in the United States, 222 HU subregions, 352 HU basins, and 2,149 HU subbasins. The delineation of 5th level watersheds and 6th level subwatersheds is not complete, but estimates predict about 22,000 watersheds and 160,000 subwatersheds in the United States. http://en.wikipedia.org/wiki/Region#Hydrologic_Units</p>
WaterShed <<FeatureType>>	<p>A drainage basin is an extent of land where water from rain or snow melt drains downhill into a body of water, such as a river, lake, reservoir, estuary, wetland, sea or ocean. The drainage basin includes both the streams and rivers that convey the water as well as the land surfaces from which water drains into those channels, and is separated from adjacent basins by a drainage divide.[1]</p> <p>The drainage basin acts like a funnel, collecting all the water within the area covered by the basin and channelling it into a waterway. Each drainage basin is separated topographically from adjacent basins by a geographical barrier such as a ridge, hill or mountain, which is known as a water divide.</p> <p>Other terms that are used to describe a drainage basin are catchment, catchment area, catchment basin, drainage area, river basin, water basin and watershed.[2] In the technical sense, a watershed refers to a divide that separates one drainage area from another drainage area.[3] However, in the United States and Canada, the term is often used to mean a drainage basin or catchment area itself. Watersheds drain into other watersheds in a hierarchical form, larger ones breaking into smaller ones or sub-watersheds with the topography determining where the water flows. http://en.wikipedia.org/wiki/Drainage_basin</p>

Tagged Values

Tag	Value	Notes
xsdDocument	Physiography.xsd	Description: Name of an XML Schema document to create representing the content of this package
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

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For more general information about GML refer to:
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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Package GWML/Relations

The GWML Relations package contains a set of classes used to manage the relation between two objects.

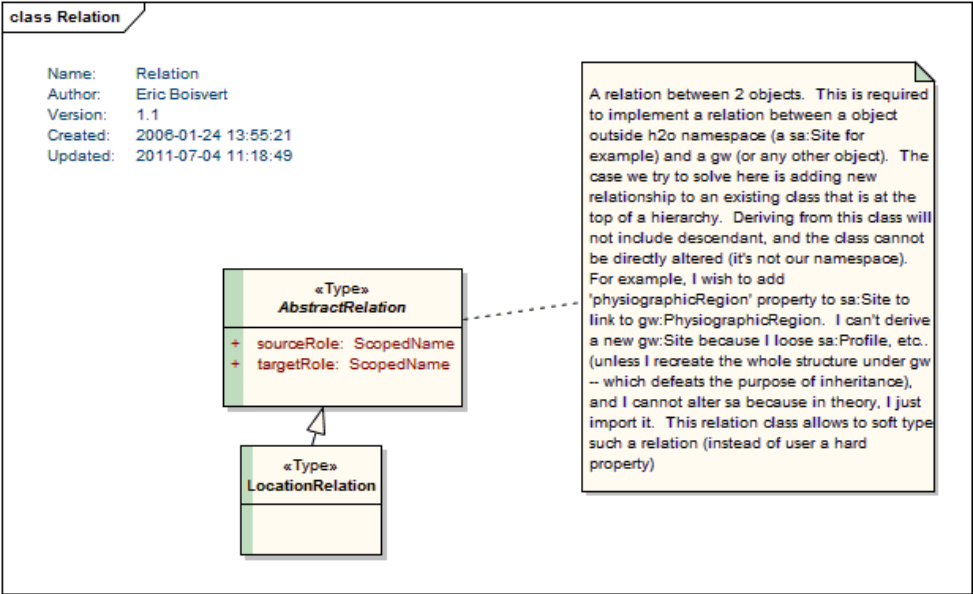
Class Summary

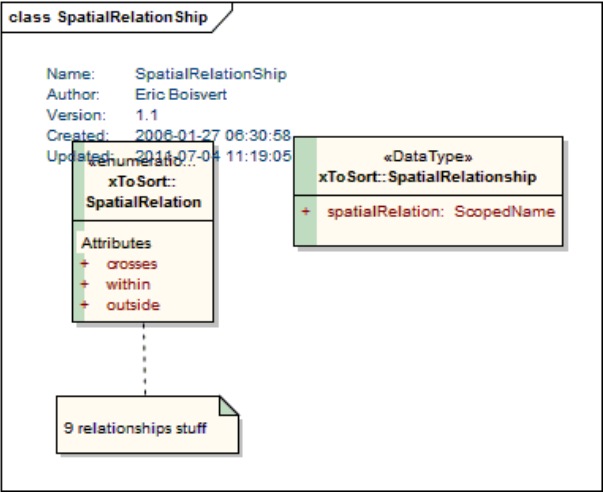
<<Type>> Classes	
AbstractRelation <<Type>>	A relation between 2 objects. This is required to implement a relation between a object outside h2o namespace (a gsml:Site for example) and a h2o (or any other object). The case we try to solve here is adding new relationship to an existing class that is at the top of a hierarchy. Deriving from this class will not include descendant, and the class cannot be directly altered (it's not our namespace). For example, I wish to add 'physiographicRegion' property to gsml:Site to link to h2o:PhysiographicRegion. I can't derive a new h2o:Site because I loose gsml:Profile, etc.. (unless I recreate the whole structure under h2o -- which defeats the purpose of inheritance), and I cannot alter gsml because in theory, I just import it. This relation class allows to soft type such a relation (instead of user a hard property)
LocationRelation <<Type>>	Establish a relation based on the location of the source. This should be otherwise calculated by some spatial operation, but it's now always possible

Tagged Values

Tag	Value	Notes
xsdDocument	Relations.xsd	Description: Name of an XML Schema document to create representing the content of this package
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

UML Diagram: Relation





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OverviewPackageClassHelp

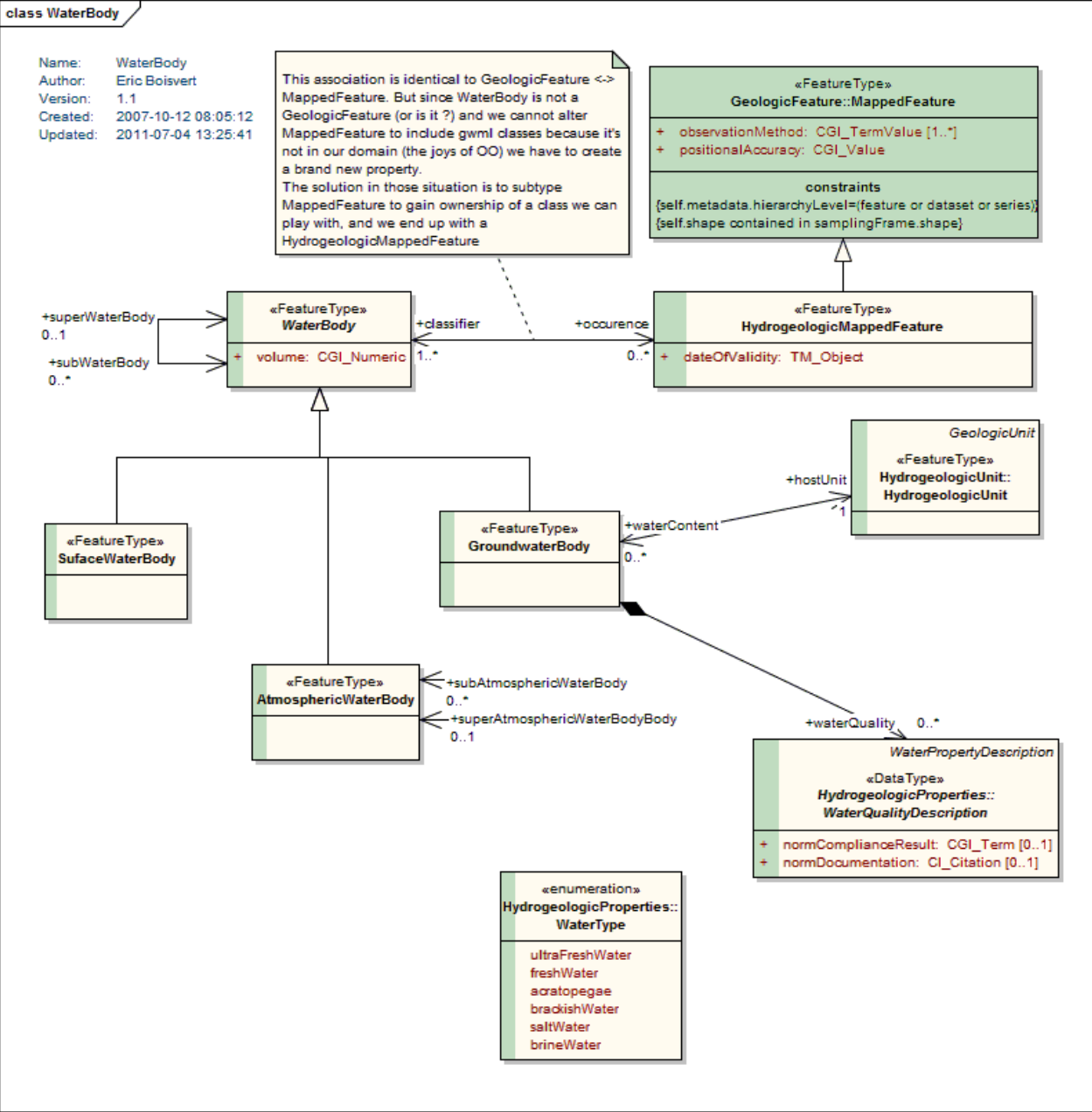
Package GWML/WaterBody

The GWML WaterBody package contains a set of classes used to describe the properties of a water body, either from the ground, underground or atmospheric.

Class Summary	
<<FeatureType>> Classes	
AtmosphericWaterBody <<FeatureType>>	Quatity of water, in gaseous, liquid or solid phase, present in the atmosphere.
GroundwaterBody <<FeatureType>>	A distinct volume of groundwater within an aquifer or aquifers (Vogt, 2002). The equivalent in the European Water Framework Directive (2000/60/CE, 2000) is "Body of groundwater" defined exactly in the same way.
HydrogeologicMappedFeature <<FeatureType>>	Mapped feature more oriented on spatial temporal (although geometries could handle this). A physical hydrogeologic feature represented on a map.
SufaceWaterBody <<FeatureType>>	Water collecting on the ground or in a stream, river, lake, wetland, or ocean is called surface water, as opposed to groundwater or atmospheric water. http://en.wikipedia.org/wiki/Surface_water The water from all sources that occurs on the Earth's surface either as diffused water or as water in natural channels, artificial channels, or other surface water bodies. http://ohioline.osu.edu/aex-fact/0460.html (This should be detailed by the surface water working group.)
WaterBody <<FeatureType>>	A mass or a volume of water, constrained geographically and/or structurally. An ocean is a water body, as a the water within an aquifer. This class is a distinction between water as a material and water as a feature The concept of water body is also present in Vogt (2002) [Vogt, J., 2002. Guidance Document on Implementing the GIS Elements of the Water Framework Directive] as an European directive. In the latter case, the european concept is more administrative than scientific. The spatio-temporal representation of this body (it's geometry at time T is represented by a MappedFeature)

Tagged Values		
Tag	Value	Notes
xsdDocument	WaterBody.xsd	Description: Name of an XML Schema document to create representing the content of this package
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

UML Diagram: WaterBody



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GML Application Schema
<API Specification/>

OverviewPackageClassHelp

Package GWML/WaterQualityMeasurement

The GWML WaterQualityMeasurement package contains a set of classes used to describe the quality of the groundwater.

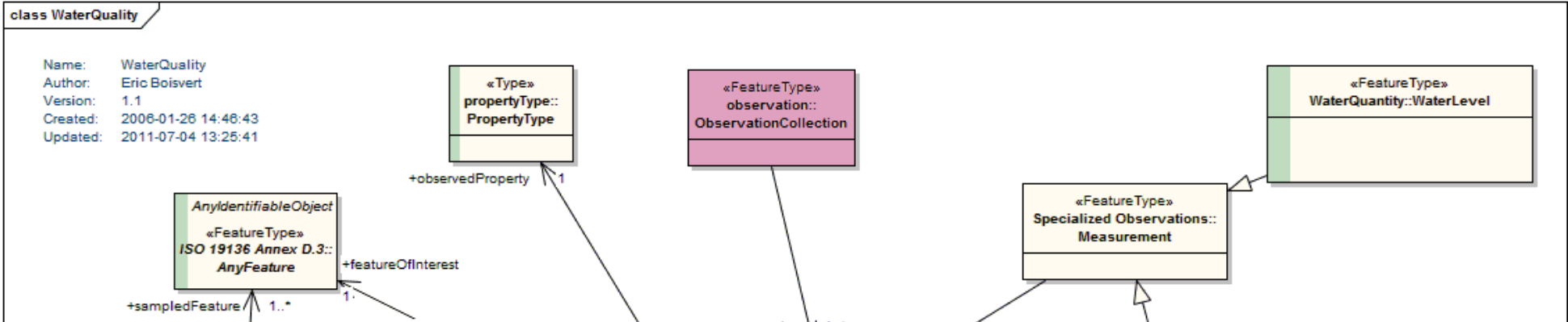
Class Summary

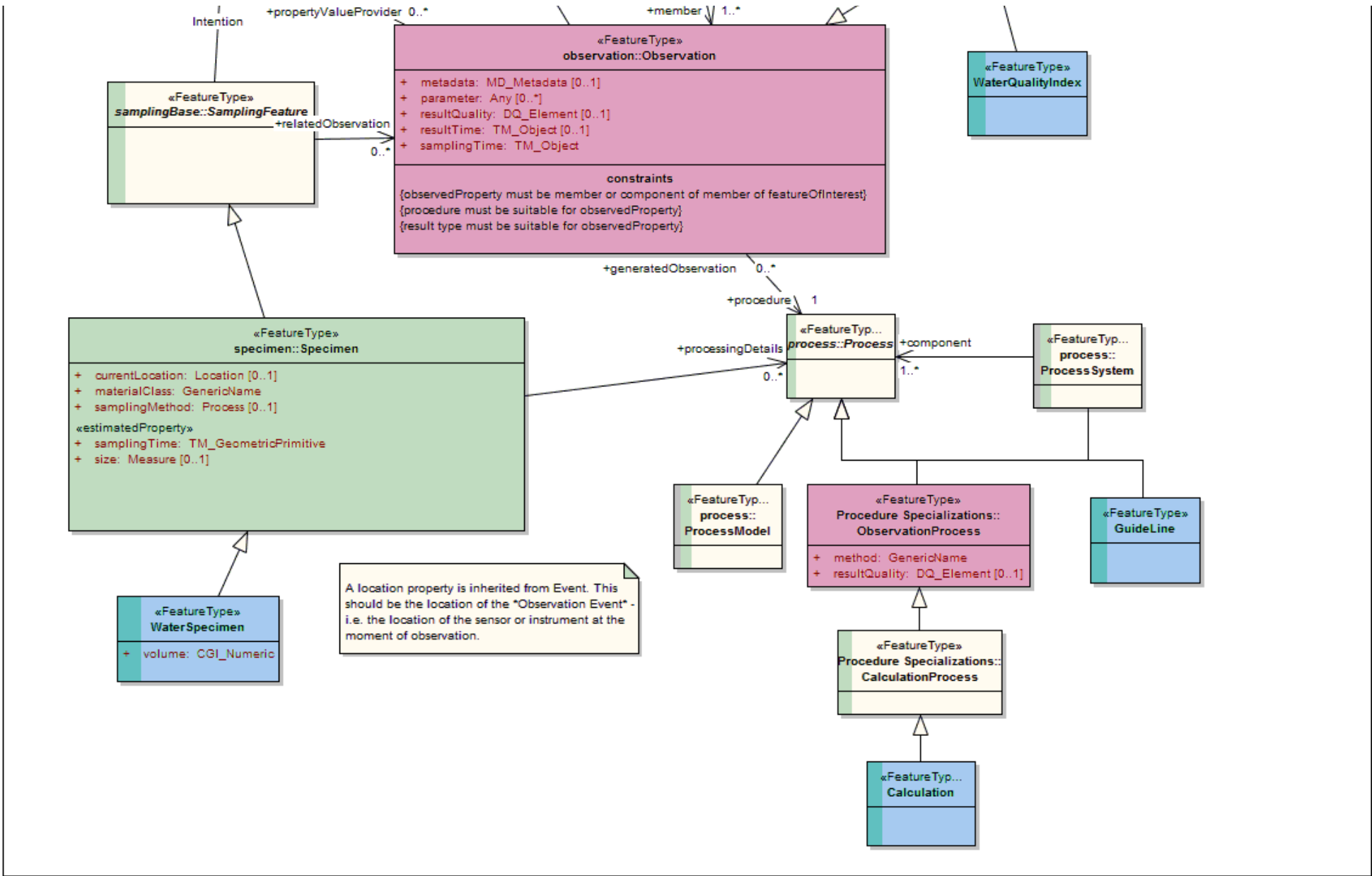
<<FeatureType>> Classes	
Calculation <<FeatureType>>	Water Quality procedure (from Environment Canada)
GuideLine <<FeatureType>>	Prescribed methodology
WaterQualityIndex <<FeatureType>>	Classification of water quality through an index. This class is a subclass a measurement class.
WaterSpecimen <<FeatureType>>	<p>This class is a sub-class of a specimen class, which is defined as follows "A Specimen is some physical material sampled from a specified location, typically associated with a Site, such as a Station, a location or interval within a Section, or a location or extent from a DescriptionExtent".</p> <p>It adds a specific property for a waterSpecimen (volume).</p>

Tagged Values

Tag	Value	Notes
xsdDocument	WaterQualityMeasurement.xsd	Description: Name of an XML Schema document to create representing the content of this package
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

UML Diagram: WaterQuality





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OverviewPackageClassHelp



Package GWML/WaterQuantity

The GWML WaterQuantity package contains a set of classes used to describe the quantity of the groundwater in aquifers.

Class Summary	
<<FeatureType>> Classes	
AtmosphericReservoir	The atmosphericReservoir class is a subclass of the reservoir class.
<<FeatureType>>	There is always water in the atmosphere. Clouds are, of course, the most visible manifestation of atmospheric water, but even clear air contains water?water in particles that are too small to be seen. One estimate of the volume of water in the atmosphere at any one time is about 3,100 cubic miles (mi3) or 12,900 cubic kilometers (km3). That may sound like a lot, but it is only about 0.001 percent of the total Earth's water volume of about 332,500,000 mi3 (1,385,000,000 km3), as shown in the table below. If all of the water in the atmosphere rained down at once, it would only cover the ground to a depth of 2.5 centimeters, about 1 inch. http://ga.water.usgs.gov/edu/watercycleatmosphere.html
BiologicReservoir <<FeatureType>>	Quantity of water contained in the living organisms. Refer mostly to vegetal cover which participates in one important process : evapotranspiration
ConduitFlow <<FeatureType>>	Groundwater movement down-gradient along fractures, faults, joints, bedding planes and solution openings resulting in "flashiness" -- a rapid response to recharge, turbulence, and highly variable chemistry, temperature and flow rates (http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)
DiffuseFlow <<FeatureType>>	Groundwater movement down-gradient through interconnected fractures, faults, joints and bedding planes, resulting in less turbulent flow, less dramatic response to recharge events, and more uniform chemistry than observed in conduit flow. (http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)
DynamicWaterLevel <<FeatureType>>	This class is a subclass of waterLevel and it is used to specify the elevation of a dynamic water level.
GeologicReservoir <<FeatureType>>	Reservoir related to the presence of water in hydrogeologic units.
PorousFlow <<FeatureType>>	Groundwater movement down-gradient through the pore space of aquifer host rocks, such as uncemented or poorly-cemented sandstones. (http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)
RadialFlow <<FeatureType>>	The flow of water in an aquifer toward a well. (http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)
Reservoir <<FeatureType>>	<p>A reservoir is, most broadly, a place or hollow vessel where fluid is kept in reserve, for later use. http://en.wikipedia.org/wiki/Reservoir</p> <p>(1) A pond, lake, or basin, either natural or artificial, for the storage, regulation, and control of water. (2) An artificially created lake in which water is collected and stored for future use. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-r.pdf</p>
StaticWaterLevel <<FeatureType>>	This class is a subclass of waterLevel and it is used to specify the elevation of a static water level.
SurfaceReservoir <<FeatureType>>	A surface reservoir refers to an artificial lake, used to store water for various uses. http://en.wikipedia.org/wiki/Reservoir_(water)
TransitReservoir <<FeatureType>>	a special reservoir to represent water drawn from (or injected to) a specific reservoir but where to destination is unspecified. For example, to represent the total amount of water drawn from an aquifer over a year.
UtilityReservoir <<FeatureType>>	Reservoir related to water usage by human/agriculture. ie. Water pumped from a aquifer to a city water system has this reservoir as a target (because we don't know yet where this water will end up), although we know it will eventually return to the other reservoirs
WaterBudget <<FeatureType>>	<p>An accounting of the inflow, outflow, and storage changes of water in a hydrologic unit. http://www.usgs.gov/science/science.php?term=1297&type=theme</p> <p>The role of lakes within the global hydrologic cycle has been described earlier. Lakes depend for their very existence upon a balance between their many sources of water and the losses that they experience. This so-called water budget of lakes is important enough to have warranted considerable study throughout the world, with each lake or lake system possessing its own hydrologic idiosyncrasies. Aside from being of scientific interest, water-budget studies serve to reveal the dependence of each lake on particular hydrologic factors, thus enabling better management practices. These may include restrictions on water utilization during drought conditions, dike construction and evacuations prior to flooding, control of water levels to ensure efficient power production, and major decisions associated with diversions of watercourses in order to enhance water-quantity- and water-quality-management activities. www.britannica.com/EBchecked/topic/636988/water-budget</p>
WaterFlow <<FeatureType>>	Movement of subsurface water in the saturated zone from areas of recharge to areas of discharge. http://www.usgs.gov/science/science.php?term=514
WaterFlowDirection <<FeatureType>>	Measurement of the direction of the water flow, at a specific location.
WaterLevel <<FeatureType>>	Measurement of the elevation of water in an aquifer.
<<Enumeration>> Classes	
WaterFlowProcess <<Enumeration>>	This enumeration class is used to describe the various process of ground water flow.

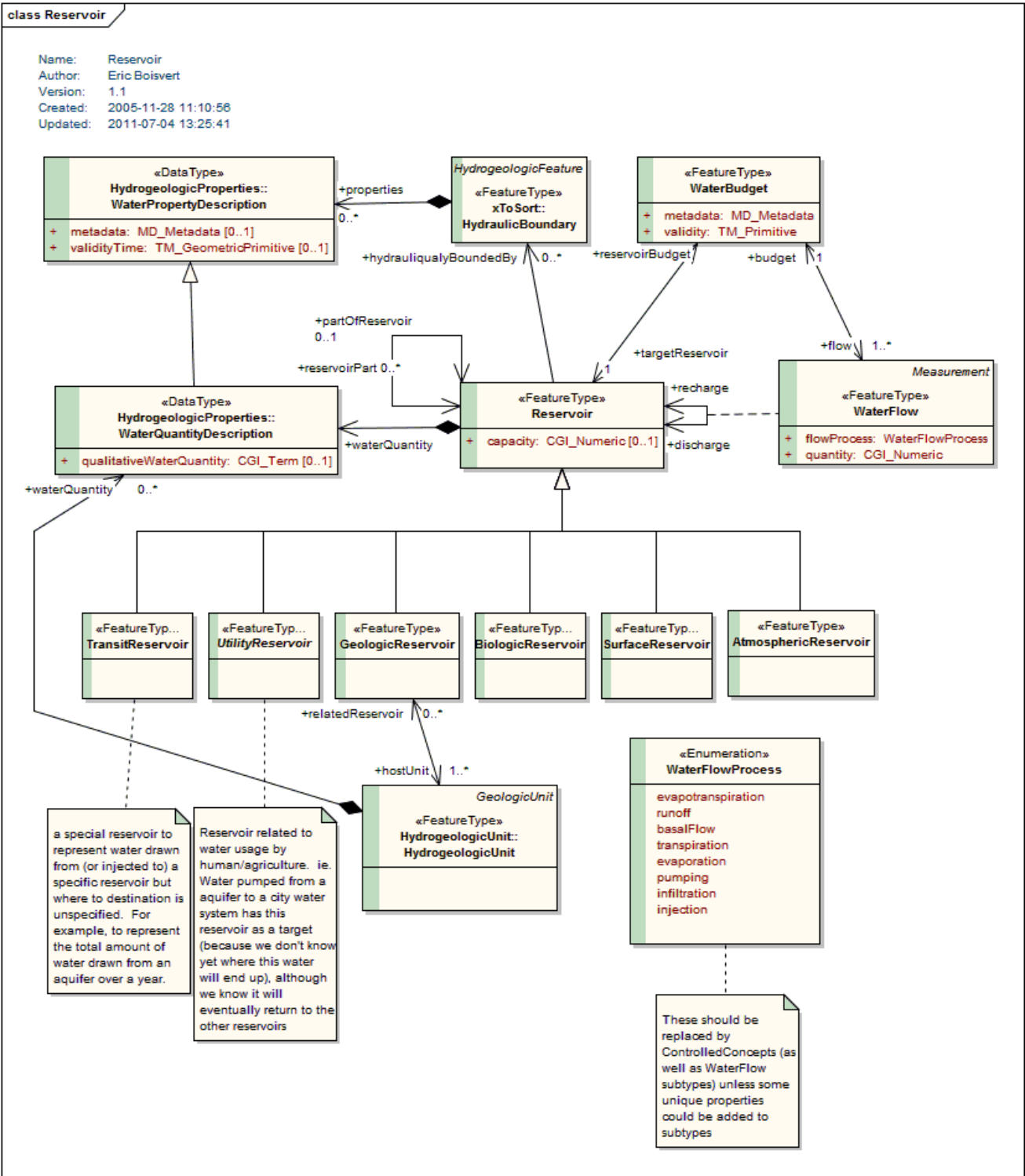
[WaterLevelTypes](#)
<<Enumeration>>

Type of water level in an aquifer

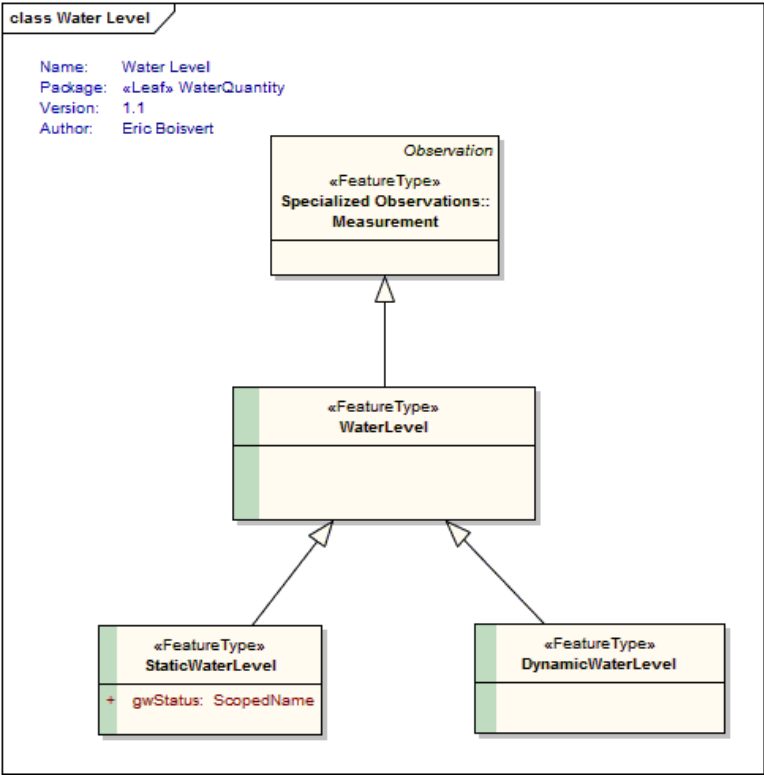
Tagged Values

Tag	Value	Notes
xsdDocument	WaterQuantity.xsd	Description: Name of an XML Schema document to create representing the content of this package
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

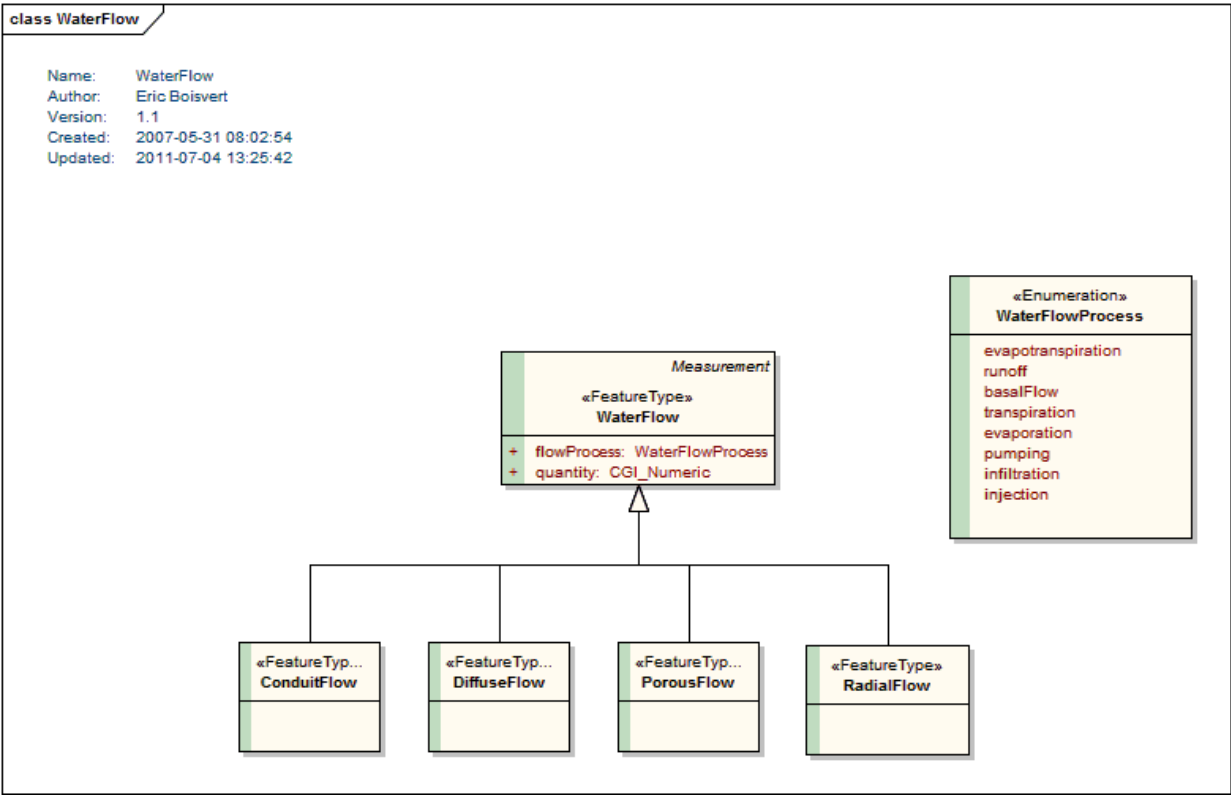
UML Diagram: Reservoir



UML Diagram: Water Level



UML Diagram: WaterFlow



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Overview

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Package GWML/WellConstruction

The GWML WellConstruction package contains a set of classes used to describe the construction of water well.

Specifically, this package can be used to obtain the following information.

- Overall well dimension
- Construction method
- Type and composition of all materials used
- Dimensions, design features and location of each significant component (including the well pump)

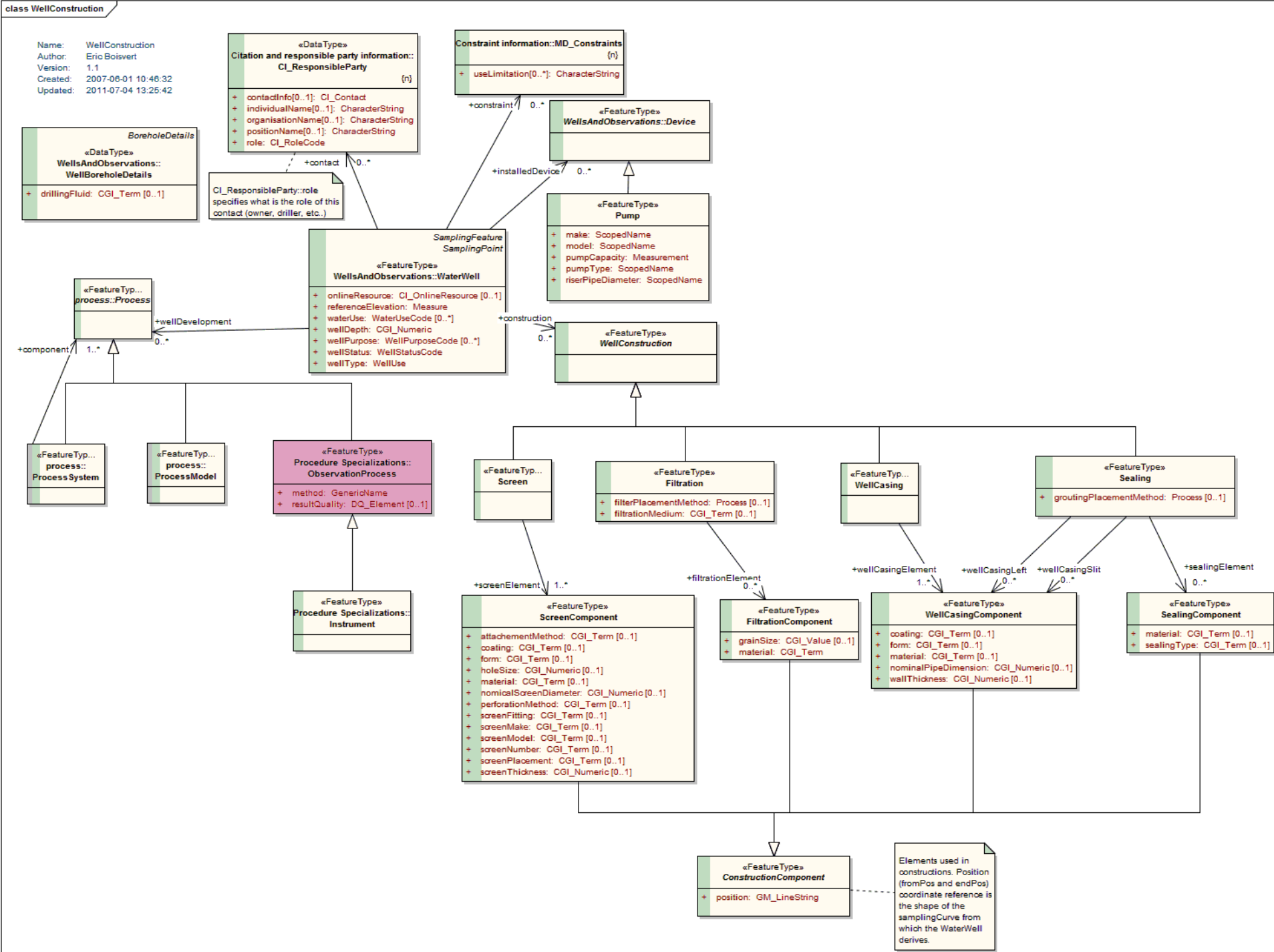
Class Summary

<<FeatureType>> Classes	
ConstructionComponent <<FeatureType>>	Elements used in constructions. Position (fromPos and endPos) coordinate reference is the shape of the samplingCurve from which the WaterWell derives.
Filtration <<FeatureType>>	
FiltrationComponent <<FeatureType>>	Type of material used to filter the water.
Pump <<FeatureType>>	<p>Good reference on water pumps http://www.popularmechanics.com/home_improvement/how_it_works/1275136.html?page=1&pc=y</p> <p>A water well pump is a pump that is used in extracting water from a water well. There are many makes of pumps, the foremost being Franklin Electric (American), and Pedrollo (Italian).</p> <p>They include different kinds of pumps, yet most of them are submersible pumps:</p> <ul style="list-style-type: none">* manual pumpless/hand pump wells requiring a human operator* mechanical or rotary pump requiring mechanical parts to pump water* solar water pumps* DC Submersible Well Pump* Pumps driven by air as used by the Amish.* Pumps driven by air as used in the Australian outback. <p>http://en.wikipedia.org/wiki/Water_well_pump</p>
Screen <<FeatureType>>	<p>General information related to water well and screens.</p> <p>At the bottom of wells, based on formation, a screening device, filter pack, slotted casing, or open bore hole is left to allow the flow of water into the well. Constructed screens are typically used in unconsolidated formations (sands, gravels, etc.), allowing water and a percentage of the formation to pass through the screen. Allowing some material to pass through creates a large area filter out of the rest of the formation, as the amount of material present to pass into the well slowly decreases and is removed from the well. Rock wells are typically cased with a PVC liner/casing and screen or slotted casing at the bottom, this is mostly present just to keep rocks from entering the pump assembly. Some wells utilize a 'filter pack' method, where an undersized screen or slotted casing is placed inside the well and a filter medium is packed around the screen, between the screen and the borehole or casing. This allows the water to be filtered of unwanted materials before entering the well and pumping zone.</p> <p>http://en.wikipedia.org/wiki/Water_well</p>
ScreenComponent <<FeatureType>>	Class used to details the various components of the water pump screen.
Sealing <<FeatureType>>	<p>WELL SEAL: a device used to cover the top of a well casing pipe and thereby seal the top of the well casing to prevent the entry of surface runoff. A well seal differs from a well cap in that a seal has a gasket and a cap does not. A well seal should include a screened vent pipe that passes through the gasket to allow pressure equilibration. A screen is necessary to reduce contaminant entry. The vent should be high enough not to be flooded.</p> <p>http://www.purdue.edu/envirosoft/well/src/construc4.htm</p>
SealingComponent <<FeatureType>>	Description of the sealing used in the construction of a water well.
WellCasing <<FeatureType>>	Casing, as in borehole, but scoped to Well structures build in (or hosted) a borehole. We had to support a specific well casing (from xhtml/GeoSciML boreholes) because 1) Borehole spec did not provide such concept so far and 2) Wells are not necessary hosted in a borehole (and might have some casing).
WellCasingComponent <<FeatureType>>	A single part of a well casing
WellConstruction <<FeatureType>>	Construction components, use to describe how the well was built. This information are important when assessing result of pump tests.
<<Enumeration>> Classes	
DrillingFluidCode <<Enumeration>>	Type of fluid used in the drilling process.

Tagged Values

Tag	Value	Notes
xsdDocument	WellConstruction.xsd	Description: Name of an XML Schema document to create representing the content of this package
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

UML Diagram: WellConstruction



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Package GWML/WellProtection

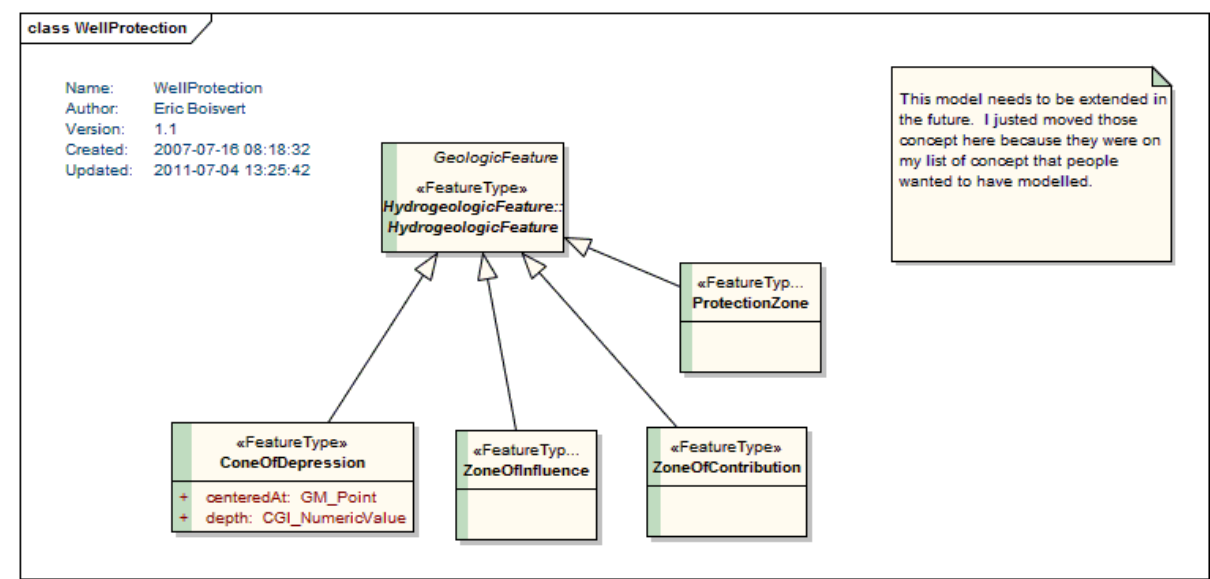
The GWML WellProtection package contains classes required to describe the protection domain of a well.

Class Summary	
<<FeatureType>> Classes	
ConeOfDepression <<FeatureType>>	<p>A cone of depression occurs in an aquifer when ground water is pumped from a well. In an unconfined (water table) aquifer, this is an actual depression of the water levels. In confined (artesian) aquifers, the cone of depression is a reduction in the pressure head surrounding the pumped well (please see earlier articles for discussion of head). http://en.wikipedia.org/wiki/Cone_of_depression</p> <p>A depression in the groundwater table or potentiometric surface that has the shape of an inverted cone and develops around a well from which water is being withdrawn. Its trace (perimeter) on the land surface defines the zone of influence of a well. Also called pumping cone and cone of drawdown. (http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)</p> <p>he zone around a well in an unconfined aquifer that is normally saturated, but becomes unsaturated as a well is pumped, leaving an area where the water table dips down to form a cone shape. The shape of the cone is influenced by porosity and the water yield or pumping rate of the well. The land surface overlying the cone of depression is referred to as the area of influence. http://www.groundwater.org/gi/gwglossary.html#C</p>
ProtectionZone <<FeatureType>>	<p>An area that defines a protection zone around a well.</p>
ZoneOfContribution <<FeatureType>>	<p>The area surrounding a pumping well, spring, or tunnel that encompasses all areas and features that supply groundwater to the well spring, or tunnel. (http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)</p>
ZoneOfInfluence <<FeatureType>>	<p>The area of influence, or cone of depression formed when pumping a well or well field. (http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)</p>

Tagged Values

Tag	Value	Notes
xsdDocument	WellProtection.xsd	Description: Name of an XML Schema document to create representing the content of this package
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

UML Diagram: WellProtection



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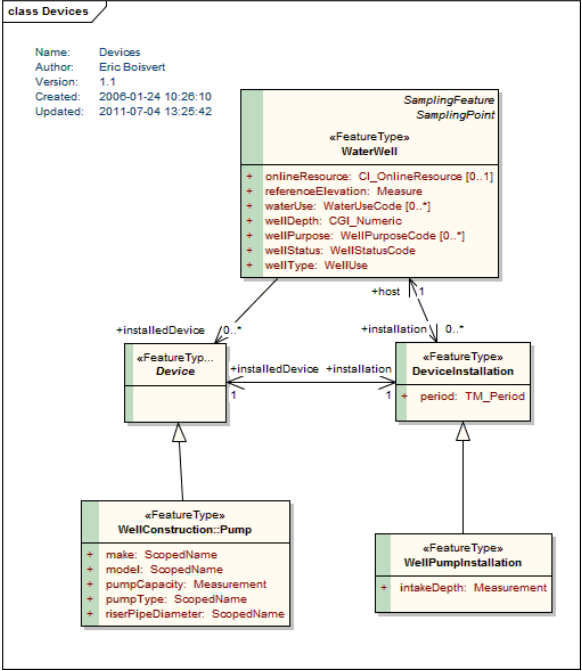
Package GWML/WellsAndObservations

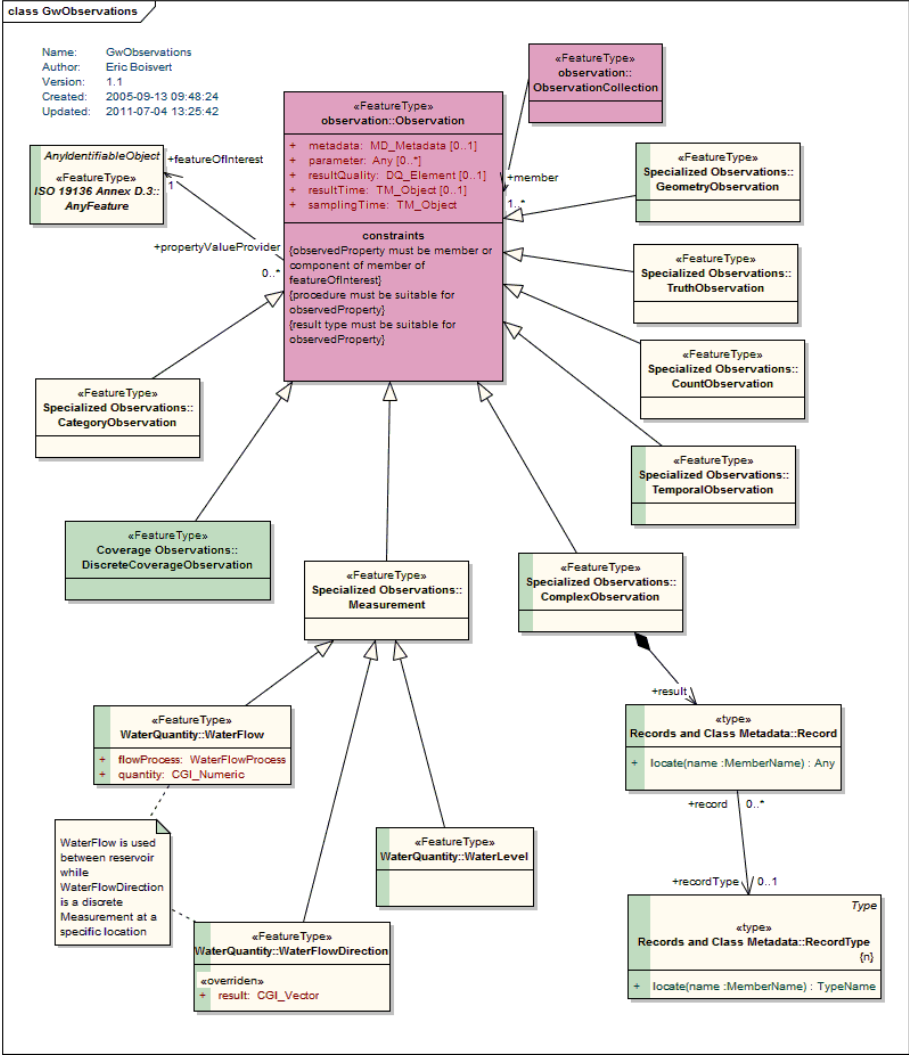
All the concepts related to tools and apparatus for groundwater assessments, well tests and aquifer tests. Includes wells, pumps and other devices. Includes concepts related samples and sampling procedures

Class Summary	
<<FeatureType>> Classes	
Device <<FeatureType>>	An apparatus that serve some purpose, like a pump or a meter.
DeviceInstallation <<FeatureType>>	Installation of a device to a water well.
Drawdown <<FeatureType>>	The vertical distance groundwater elevation is lowered, or the amount head is reduced, due to the removal of groundwater. Also the decline in potentiometric surface caused by the withdrawal of water from a hydrogeologic unit. The distance between the static water level and the surface of the cone of depression. A lowering of the water table of an unconfined aquifer or the potentiometric surface of a confined aquifer caused by pumping of groundwater from wells. (http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)
MonitoringStation <<FeatureType>>	A site where a sampling is taken for monitoring various properties.
WaterWell <<FeatureType>>	An excavation where the intended use is for location, acquisition, development, or artificial recharge of ground water. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-w.pdf A water well is an excavation or structure created in the ground ? by digging, driving, boring or drilling to access water in underground aquifers. http://en.wikipedia.org/wiki/Water_well
WellField <<FeatureType>>	(1) One or more wells producing water from a subsurface source. (2) A tract of land which contains a number of wells for supplying a large municipality or irrigation district. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-w.pdf
WellPumpInstallation <<FeatureType>>	Installation of a pump to a water well.
<<DataType>> Classes	
WellBoreholeDetails <<DataType>>	This class is used to details specific characteristics of well boreholes.
WellWaterDescription <<DataType>>	
<<CodeList>> Classes	
WaterUseCode <<CodeList>>	The use of water may be classified by specific types according to distinctive uses. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-w.pdf
WellPurposeCode <<CodeList>>	Code associated to define the purpose of the well.
WellStatusCode <<CodeList>>	Status of the well.
WellUse <<CodeList>>	

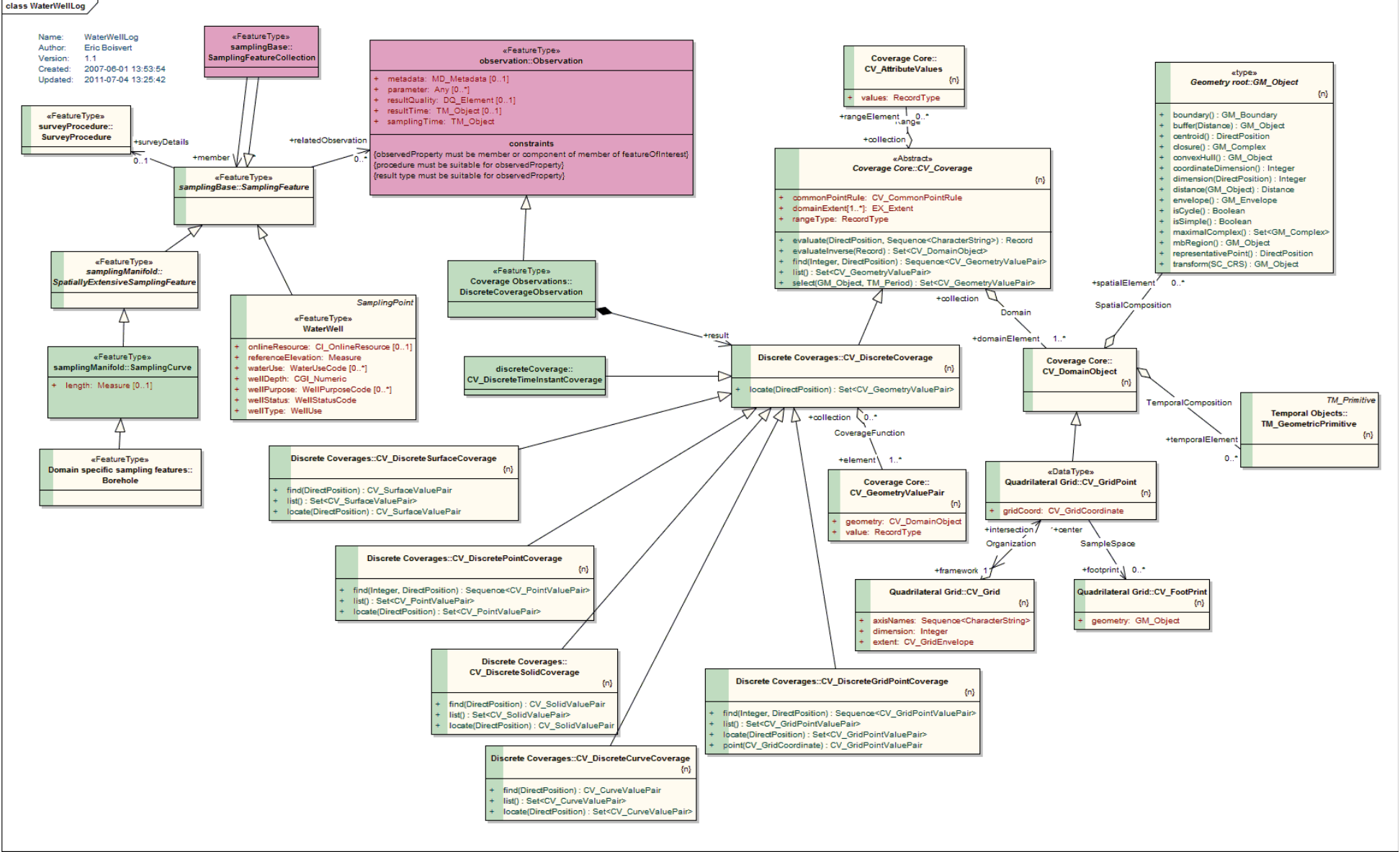
Tagged Values		
Tag	Value	Notes
xsdDocument	WellsAndObservations.xsd	Description: Name of an XML Schema document to create representing the content of this package
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

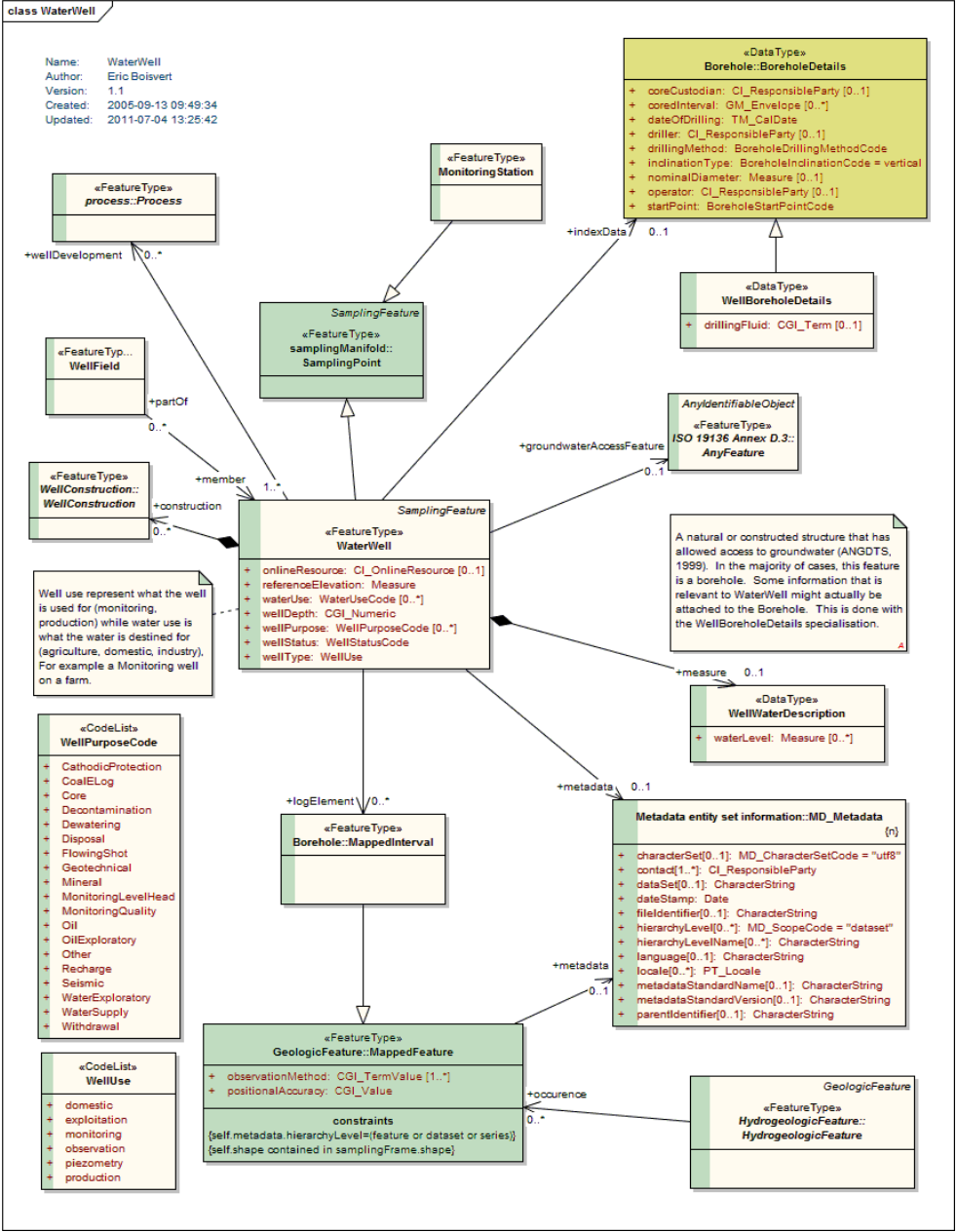
UML Diagram: Devices





UML Diagram: WaterWellLog





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Overview

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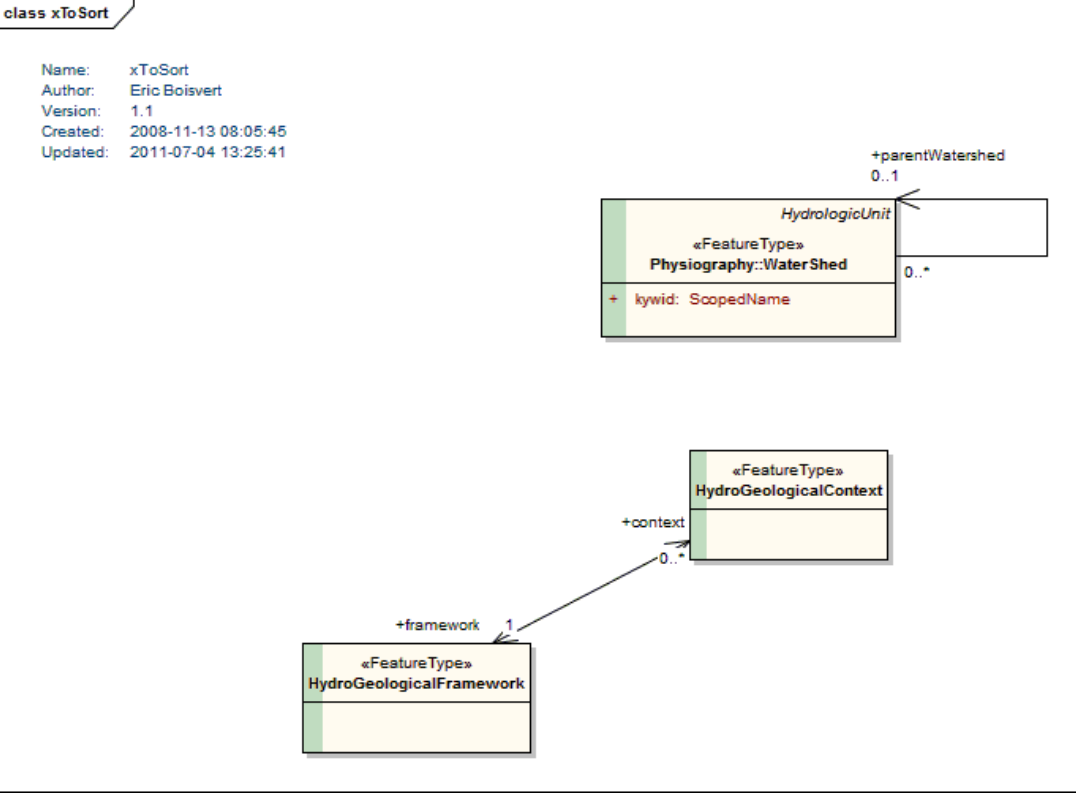
Package GWML/xToSort

package of things that are identified in the domain but don't quite fit in any of the other packages

Class Summary	
<<FeatureType>> Classes	
GroundwaterDivide <<FeatureType>>	The boundary between two adjacent groundwater basins, which is represented by a high point in the water table. http://www.groundwater.org/gi/gwglossary.html#D A Limit between two groundwater "watersheds", somewhat like a water divide
HydraulicBoundary <<FeatureType>>	A hydrologic feature that prevents the flow of groundwater. Examples include groundwater divides or low permeability material that impedes groundwater flow. (http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)
HydroGeologicalContext <<FeatureType>>	General information about the hydrogeologic units, the regional geology, soils, etc that is part of a framework.
HydroGeologicalFramework <<FeatureType>>	A collection of hydrogeological units which forms a hydrogeological context.
PiezometricSurface <<FeatureType>>	Also : Potentionetric Surface A surface that represents the level to which water will rise in tightly cased wells. If the head varies significantly with depth in the aquifer, then there may be more than one potentiometric surface. The water table is a particular potentiometric surface for an unconfined aquifer. (http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)
ProtectionArea <<FeatureType>>	The surface and subsurface area surrounding a water well or wellfield through which contaminants are reasonably likely to move toward and reach such water well or well field.(http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)
RechargeArea <<FeatureType>>	Area in which water reaches the groundwater reservoir by surface infiltration. An area in which there is a downward component of hydraulic head in the aquifer. (http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)
<<DataType>> Classes	
SpatialRelationship <<DataType>>	This class is used to identify the spatial relationship between two or more objects.
<<enumeration>> Classes	
SpatialRelation <<enumeration>>	9-Intersection as a Model for Topological Relations. See http://www.spatial.maine.edu/~max/9intReport.pdf for a complete reference on this topic.

Tagged Values		
Tag	Value	Notes
xsdDocument	xToSort.xsd	Description: Name of an XML Schema document to create representing the content of this package
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

UML Diagram: xToSort



GML Application Schema<API Specification>

OverviewPackageClassHelp



Class <<FeatureType>> Aquiclude (extends [HydroStratigraphicUnit](#))

Impermeable beds of geologic material that hinder or prevent groundwater movement.
<http://www.groundwater.org/gi/gwglossary.html>

A formation which, although porous and capable of absorbing water slowly, will not transmit water fast enough to furnish an appreciable supply for a well or spring. Aquicludes are characterized by very low values of "leakage" (the ratio of vertical <i>Hydraulic Conductivity</i> to thickness), so that they transmit only minor inter-aquifer flow and also have very low rates of yield from compressible storage. Therefore, they constitute boundaries of aquifer flow systems.
<http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-a.pdf>

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes				
relatedReservoir	GeologicReservoir	0..*	HydrogeologicUnit					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>120</td></tr></table>				Tag	Value	sequenceNumber	120
	Tag	Value						
sequenceNumber	120							
waterContent	GroundwaterBody	0..*	HydrogeologicUnit					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>125</td></tr></table>				Tag	Value	sequenceNumber	125
	Tag	Value						
sequenceNumber	125							
waterQuantity	WaterQuantityDescription	0..*	HydrogeologicUnit					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>140</td></tr></table>				Tag	Value	sequenceNumber	140
	Tag	Value						
sequenceNumber	140							
hydrogeologicClass	Categorisation	0..*	HydrogeologicUnit					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>170</td></tr></table>				Tag	Value	sequenceNumber	170
	Tag	Value						
sequenceNumber	170							

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="Aquiclude"
substitutionGroup="gwml:HydroStratigraphicUnit" type="gwml:AquicludeType">
  <xs:annotation>
    <xs:documentation>Impermeable beds of geologic material that hinder or prevent groundwater movement.
http://www.groundwater.org/gi/gwglossary.html
A formation which, although porous and capable of absorbing water slowly, will not transmit water fast
enough to furnish an appreciable supply for a well or spring. Aquicludes are characterized by very low
values of "leakage" (the ratio of vertical &lt;i>Hydraulic Conductivity &lt;/i>to thickness), so that
they transmit only minor inter-aquifer flow and also have very low rates of yield from compressible
storage. Therefore, they constitute boundaries of aquifer flow systems.
http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-a.pdf</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AquicludeType">
  <xs:complexContent>
    <xs:extension base="gwml:HydroStratigraphicUnitType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AquicludePropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:Aquiclude"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> **Aquifer** (extends [HydroStratigraphicUnit](#))

A formation, group of formations, or part of a formation that contains sufficient saturated, permeable material to yield significant quantities of water to wells and springs. (USGS)

An underground geological formation able to store and yield water.
<http://www.groundwater.org/gi/gwglossary.html>

An aquifer is an underground layer of water-bearing permeable rock or unconsolidated materials (gravel, sand, silt, or clay) from which groundwater can be usefully extracted using a water well.
<http://en.wikipedia.org/wiki/Aquifer>

Local Subclasses: [ConfinedAquifer](#) [UnconfinedAquifer](#)

Attributes

Name	Type	Bounds	From Class	Notes				
mediaType	AquiferMediaType	1..1	Aquifer	Property used to specify the medium of an aquifer.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes				
relatedReservoir	GeologicReservoir	0..*	HydrogeologicUnit					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>120</td></tr></table>				Tag	Value	sequenceNumber	120
	Tag	Value						
sequenceNumber	120							
waterContent	GroundwaterBody	0..*	HydrogeologicUnit					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>125</td></tr></table>				Tag	Value	sequenceNumber	125
	Tag	Value						
sequenceNumber	125							
waterQuantity	WaterQuantityDescription	0..*	HydrogeologicUnit					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>140</td></tr></table>				Tag	Value	sequenceNumber	140
	Tag	Value						
sequenceNumber	140							
hydrogeologicClass	Categorisation	0..*	HydrogeologicUnit					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>170</td></tr></table>				Tag	Value	sequenceNumber	170
	Tag	Value						
sequenceNumber	170							

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Suppress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="Aquifer"
substitutionGroup="gwml:HydroStratigraphicUnit" type="gwml:AquiferType">
  <xs:annotation>
    <xs:documentation>A formation, group of formations, or part of a formation that contains sufficient
saturated, permeable material to yield significant quantities of water to wells and springs. (USGS)

An underground geological formation able to store and yield water.
http://www.groundwater.org/gi/gwglossary.html

An aquifer is an underground layer of water-bearing permeable rock or unconsolidated materials (gravel,
sand, silt, or clay) from which groundwater can be usefully extracted using a water well.
http://en.wikipedia.org/wiki/Aquifer</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AquiferType">
  <xs:complexContent>
    <xs:extension base="gwml:HydroStratigraphicUnitType">
      <xs:sequence>
        <xs:element name="mediaType" type="gwml:AquiferMediaTypeType">
          <xs:annotation>
            <xs:documentation>Property used to specify the medium of an
aquifer.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AquiferPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:Aquifer"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> **AquiferSystem** (extends [HydrogeologicUnit](#))

Collection of hydrogeological units composing a system of interacting components. By virtue of being a GeologicUnit, it derives from it the 'part' property

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
relatedReservoir	GeologicReservoir	0..*	HydrogeologicUnit	
	Association tagged values			
	Tag	Value		
	sequenceNumber	120		
waterContent	GroundwaterBody	0..*	HydrogeologicUnit	
	Association tagged values			
	Tag	Value		
	sequenceNumber	125		
waterQuantity	WaterQuantityDescription	0..*	HydrogeologicUnit	
	Association tagged values			
	Tag	Value		
	sequenceNumber	140		
hydrogeologicClass	Categorisation	0..*	HydrogeologicUnit	
	Association tagged values			
	Tag	Value		
	sequenceNumber	170		

Constraints

Constraint	Type	Status	Weight
typeOf(part) == HydrogeologicUnit	Invariant	Approved	0,00

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false

		Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AquiferSystem"
substitutionGroup="gwml:HydrogeologicUnit" type="gwml:AquiferSystemType">
  <xs:annotation>
    <xs:documentation>Collection of hydrogeological units composing a system of interacting components.
By virtue of being a GeologicUnit, it derives from it the 'part' property</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AquiferSystemType">
  <xs:complexContent>
    <xs:extension base="gwml:HydrogeologicUnitType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AquiferSystemPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:AquiferSystem"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)
For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp



Class <<FeatureType>> **Aquitard** (extends [HydroStratigraphicUnit](#))

A saturated, but poorly permeable bed that impedes ground-water movement and does not yield water freely to wells, but which may transmit appreciable water to or from adjacent aquifers and, where sufficiently thick, may constitute an important ground-water storage unit. Aquitards are characterized by values of leakance that may range from relatively low to relatively high. Areally extensive aquitards of relatively low leakance may function regionally as boundaries of aquifer flow systems.
<http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-a.pdf>

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes			
relatedReservoir	GeologicReservoir	0..*	HydrogeologicUnit				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>120</td></tr></table>				Tag	Value	sequenceNumber
Tag	Value						
sequenceNumber	120						
waterContent	GroundwaterBody	0..*	HydrogeologicUnit				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>125</td></tr></table>				Tag	Value	sequenceNumber
Tag	Value						
sequenceNumber	125						
waterQuantity	WaterQuantityDescription	0..*	HydrogeologicUnit				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>140</td></tr></table>				Tag	Value	sequenceNumber
Tag	Value						
sequenceNumber	140						
hydrogeologicClass	Categorisation	0..*	HydrogeologicUnit				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>170</td></tr></table>				Tag	Value	sequenceNumber
Tag	Value						
sequenceNumber	170						

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

--	--	--

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="Aquitard"
substitutionGroup="gwml:HydroStratigraphicUnit" type="gwml:AquitardType">
  <xs:annotation>
    <xs:documentation>A saturated, but poorly permeable bed that impedes ground-water movement and does
not yield water freely to wells, but which may transmit appreciable water to or from adjacent aquifers and,
where sufficiently thick, may constitute an important ground-water storage unit. Aquitards are
characterized by values of leakance that may range from relatively low to relatively high. Areally
extensive aquitards of relatively low leakance may function
regionally as boundaries of aquifer flow systems.
http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-a.pdf</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AquitardType">
  <xs:complexContent>
    <xs:extension base="gwml:HydroStratigraphicUnitType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AquitardPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:Aquitard"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

OverviewPackageClassHelp

Class <<FeatureType>> AtmosphericReservoir (extends [Reservoir](#))

The atmosphericReservoir class is a subclass of the reservoir class.

There is always water in the atmosphere. Clouds are, of course, the most visible manifestation of atmospheric water, but even clear air contains water?water in particles that are too small to be seen. One estimate of the volume of water in the atmosphere at any one time is about 3,100 cubic miles (mi3) or 12,900 cubic kilometers (km3). That may sound like a lot, but it is only about 0.001 percent of the total Earth's water volume of about 332,500,000 mi3 (1,385,000,000 km3), as shown in the table below. If all of the water in the atmosphere rained down at once, it would only cover the ground to a depth of 2.5 centimeters, about 1 inch.
<http://ga.water.usgs.gov/edu/watercycleatmosphere.html>

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
capacity	CGI_Numeric	0..1	Reservoir	Capacity of a reservoir to contain water, expressed as a numeric value and the unit of measurment.
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		10	

Outbound Associations

Name	Type	Multiplicity	From Class	Notes				
reservoirBudget	WaterBudget	1	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>130</td></tr></table>				Tag	Value	sequenceNumber	130
	Tag	Value						
sequenceNumber	130							
hydrauliquallyBoundedBy	HydraulicBoundary	0..*	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>140</td></tr></table>				Tag	Value	sequenceNumber	140
	Tag	Value						
sequenceNumber	140							
containedWater	GroundwaterBody	0..*	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>141</td></tr></table>				Tag	Value	sequenceNumber	141
	Tag	Value						
sequenceNumber	141							
waterQuantity	WaterQuantityDescription	1	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>160</td></tr></table>				Tag	Value	sequenceNumber	160
	Tag	Value						
sequenceNumber	160							

partOfReservoir	Reservoir	0..1	Reservoir	
	Association tagged values			
	Tag	Value		
	sequenceNumber	170		
recharge	Reservoir	1	Reservoir	
	Association tagged values			
	Tag	Value		
	sequenceNumber	190		
containedWater	AtmosphericWaterBody	0..*	Reservoir	
	Association tagged values			
	Tag	Value		
	sequenceNumber	195		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AtmosphericReservoir"
substitutionGroup="gwml:Reservoir" type="gwml:AtmosphericReservoirType">
  <xs:annotation>
    <xs:documentation>The atmosphericReservoir class is a subclass of the reservoir class.

There is always water in the atmosphere. Clouds are, of course, the most visible manifestation of
atmospheric water, but even clear air contains water?water in particles that are too small to be seen. One
estimate of the volume of water in the atmosphere at any one time is about 3,100 cubic miles (mi3) or
12,900 cubic kilometers (km3). That may sound like a lot, but it is only about 0.001 percent of the total
Earth's water volume of about 332,500,000 mi3 (1,385,000,000 km3), as shown in the table below. If all of
the water in the atmosphere rained down at once, it would only cover the ground to a depth of 2.5
centimeters, about 1 inch.
http://ga.water.usgs.gov/edu/watercycleatmosphere.html</xs:documentation>
  </xs:annotation>
</xs:element>
```

```
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AtmosphericReservoirType">
  <xs:complexContent>
    <xs:extension base="gwm1:ReservoirType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AtmosphericReservoirPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwm1:AtmosphericReservoir"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> AtmosphericWaterBody (extends WaterBody)

Quaity of water, in gaseous, liquid or solid phase, present in the atmosphere.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
volume	CGI_Numeric	1..1	WaterBody	Volume of water present in a water body.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes				
waterComposition	WaterCompositionDescription	1	WaterBody					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>110</td></tr></table>				Tag	Value	sequenceNumber	110
	Tag	Value						
sequenceNumber	110							
occurrence	HydrogeologicMappedFeature	0..*	WaterBody					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>145</td></tr></table>				Tag	Value	sequenceNumber	145
	Tag	Value						
sequenceNumber	145							
subWaterBody	WaterBody	0..*	WaterBody					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>155</td></tr></table>				Tag	Value	sequenceNumber	155
	Tag	Value						
sequenceNumber	155							
subAtmosphericWaterBody	AtmosphericWaterBody	0..*	AtmosphericWaterBody					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>160</td></tr></table>				Tag	Value	sequenceNumber	160
	Tag	Value						
sequenceNumber	160							
waterContainer	Reservoir	1	AtmosphericWaterBody					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>200</td></tr></table>				Tag	Value	sequenceNumber	200
	Tag	Value						
sequenceNumber	200							

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AtmosphericWaterBody"
type="gwml:AtmosphericWaterBodyType" substitutionGroup="gwml:WaterBody">
  <xs:annotation>
    <xs:documentation>Quantity of water, in gaseous, liquid or solid phase, present in the
atmosphere.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AtmosphericWaterBodyType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterBodyType">
      <xs:sequence>
        <xs:element name="superAtmosphericWaterBodyBody"
type="gwml:AtmosphericWaterBodyPropertyType" minOccurs="0" maxOccurs="1"/>
        <xs:element name="subAtmosphericWaterBody" type="gwml:AtmosphericWaterBodyPropertyType"
minOccurs="0" maxOccurs="unbounded"/>
        <xs:element name="waterContainer" type="gwml:ReservoirPropertyType"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AtmosphericWaterBodyPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:AtmosphericWaterBody"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> BiologicReservoir (extends Reservoir)

Quantity of water contained in the living organisms. Refer mostly to vegetal cover which participates in one important process : evapotranspiration

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
capacity	CGI_Numeric	0..1	Reservoir	Capacity of a reservoir to contain water, expressed as a numeric value and the unit of measurment.
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		10	

Outbound Associations

Name	Type	Multiplicity	From Class	Notes				
reservoirBudget	WaterBudget	1	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>130</td></tr></table>				Tag	Value	sequenceNumber	130
	Tag	Value						
sequenceNumber	130							
hydrauliqualyBoundedBy	HydraulicBoundary	0..*	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>140</td></tr></table>				Tag	Value	sequenceNumber	140
	Tag	Value						
sequenceNumber	140							
containedWater	GroundwaterBody	0..*	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>141</td></tr></table>				Tag	Value	sequenceNumber	141
	Tag	Value						
sequenceNumber	141							
waterQuantity	WaterQuantityDescription	1	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>160</td></tr></table>				Tag	Value	sequenceNumber	160
	Tag	Value						
sequenceNumber	160							
partOfReservoir	Reservoir	0..1	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>170</td></tr></table>				Tag	Value	sequenceNumber	170
	Tag	Value						
sequenceNumber	170							

recharge	Reservoir	1	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>190</td></tr></table>				Tag	Value	sequenceNumber	190
	Tag	Value						
sequenceNumber	190							
containedWater	AtmosphericWaterBody	0..*	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>195</td></tr></table>				Tag	Value	sequenceNumber	195
	Tag	Value						
sequenceNumber	195							

Constraints

Constraint	Type	Status	Weight
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Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="BiologicReservoir"
substitutionGroup="gwml:Reservoir" type="gwml:BiologicReservoirType">
  <xs:annotation>
    <xs:documentation>Quantity of water contained in the living organisms. <font
color="#0000ff">Refer mostly to vegetal cover which participates in one important process :
evapotranspiration</font></xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="BiologicReservoirType">
  <xs:complexContent>
    <xs:extension base="gwml:ReservoirType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="BiologicReservoirPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:BiologicReservoir"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> Calculation (extends CalculationProcess)

Water Quality procedure (from Environment Canada)

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="Calculation"
substitutionGroup="omx:CalculationProcess" type="gwml:CalculationType">
  <xs:annotation>
    <xs:documentation>Water Quality procedure (from Environment Canada)</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="CalculationType">
  <xs:complexContent>
    <xs:extension base="omx:CalculationProcessType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="CalculationPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:Calculation"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```


For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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Overview

Package

Class

Help

Class <<FeatureType>> ConduitFlow (extends [WaterFlow](#))

Groundwater movement down-gradient along fractures, faults, joints, bedding planes and solution openings resulting in "flashiness" -- a rapid response to recharge, turbulence, and highly variable chemistry, temperature and flow rates (<http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html>)

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
flowProcess	WaterFlowProcess	1..1	WaterFlow	Identification of a particular process in the groundwater cycle
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		10	
quantity	CGI_Numeric	1..1	WaterFlow	Quantity of water transferred during a particular water flow process.
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		20	

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
budget	WaterBudget	1	WaterFlow	
	Association tagged values			
	Tag		Value	
	sequenceNumber		110	

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.

xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ConduitFlow"
substitutionGroup="gwml:WaterFlow" type="gwml:ConduitFlowType">
  <xs:annotation>
    <xs:documentation>Groundwater movement down-gradient along fractures, faults, joints, bedding planes
and solution openings resulting in "flashiness" -- a rapid response to recharge, turbulence, and highly
variable chemistry, temperature and flow rates
(http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ConduitFlowType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterFlowType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ConduitFlowPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:ConduitFlow"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> ConeOfDepression (extends [HydrogeologicFeature](#))

A cone of depression occurs in an aquifer when ground water is pumped from a well. In an unconfined (water table) aquifer, this is an actual depression of the water levels. In confined (artesian) aquifers, the cone of depression is a reduction in the pressure head surrounding the pumped well (please see earlier articles for discussion of head).
http://en.wikipedia.org/wiki/Cone_of_depression

A depression in the groundwater table or potentiometric surface that has the shape of an inverted cone and develops around a well from which water is being withdrawn. Its trace (perimeter) on the land surface defines the zone of influence of a well. Also called pumping cone and cone of drawdown. (<http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html>)

he zone around a well in an unconfined aquifer that is normally saturated, but becomes unsaturated as a well is pumped, leaving an area where the water table dips down to form a cone shape. The shape of the cone is influenced by porosity and the water yield or pumping rate of the well. The land surface overlying the cone of depression is referred to as the area of influence.
<http://www.groundwater.org/gi/gwglossary.html#C>

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
centeredAt	GM_Point	1..1	ConeOfDepression	The planimetric localization of the center of the cone of depression.				
				The planimetric shape of a cone of depression os not necessarily circular. This discussion details size and shape characteristic of a cone of depression.				
				The size and shape (slope) of the cone of depression depends on many factors. The pumping rate in the well will affect the size of the cone. Also, the type of aquifer material, such as whether the aquifer is gravel, sand, silt, fractured rocks, karst, etc., also will affect how far the cone extends. The amount of water in storage and the thickness of the aquifer also will determine the size and shape of the cone of depression. As a well is pumped, the cone of depression will extend out and will continue to expand in a radial fashion until a point of equilibrium occurs. This usually is when the amount of water released from storage equals the rate of pumping. This also can occur when recharge to the aquifer equals the amount of water being pumped. We typically think of a cone of depression as being a circular feature surrounding the pumped well. However, aquifer characteristics can affect the shape of the cone of depression. For example, if there is a steep ground-water gradient in the area of pumpage, the cone will tend to be shorter in the upgradient direction and elongated in the downgradient direction. This is because the water is already flowing towards the well from the upgradient direction, so the cone of depression doesn't need to extend as far out to obtain water, whereas the water is flowing away from the well in the downgradient direction, so the cone of depression needs to reach further to obtain water.				
				http://en.wikipedia.org/wiki/Cone_of_depression				
<div><div>Attribute tagged values</div><table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table></div>					Tag	Value	sequenceNumber	10
Tag	Value							
sequenceNumber	10							
depth	CGI_NumericValue	1..1	ConeOfDepression	The depth of a cone of depression in an aquifer.				
				<div><div>Attribute tagged values</div><table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table></div>	Tag	Value	sequenceNumber	20
Tag	Value							
sequenceNumber	20							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
occurrence	MappedFeature	0..*	HydrogeologicFeature	
	Association tagged values			
	Tag	Value		

	sequenceNumber	140
--	----------------	-----

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ConeOfDepression"
substitutionGroup="gwml:HydrogeologicFeature" type="gwml:ConeOfDepressionType">
  <xs:annotation>
    <xs:documentation>A cone of depression occurs in an aquifer when ground water is pumped from a well.
In an unconfined (water table) aquifer, this is an actual depression of the water levels. In confined
(artesian) aquifers, the cone of depression is a reduction in the pressure head surrounding the pumped well
(please see earlier articles for discussion of head).
http://en.wikipedia.org/wiki/Cone_of_depression

A depression in the groundwater table or potentiometric surface that has the shape of an inverted cone and
develops around a well from which water is being withdrawn. Its trace (perimeter) on the land surface
defines the zone of influence of a well. Also called pumping cone and cone of drawdown.
(http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)

he zone around a well in an unconfined aquifer that is normally saturated, but becomes unsaturated as a well
is pumped, leaving an area where the water table dips down to form a cone shape. The shape of the cone is
influenced by porosity and the water yield or pumping rate of the well. The land surface overlying the
cone of depression is referred to as the area of influence.
http://www.groundwater.org/gi/gwglossary.html#C</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ConeOfDepressionType">
  <xs:complexContent>
    <xs:extension base="gwml:HydrogeologicFeatureType">
      <xs:sequence>
        <xs:element name="centeredAt" type="gml:PointPropertyType">
          <xs:annotation>
            <xs:documentation>The planimetric localization of the center of the cone of
depression.

The planimetric shape of a cone of depression os not necessarily circular. This discussion details size and
shape characteristic of a cone of depression.

The size and shape (slope) of the cone of depression depends on many factors. The pumping rate in the well
will affect the size of the cone. Also, the type of aquifer material, such as whether the aquifer is gravel,
sand, silt, fractured rocks, karst, etc., also will affect how far the cone extends. The amount of water in
storage and the thickness of the aquifer also will determine the size and shape of the cone of depression.
As a well is pumped, the cone of depression will extend out and will continue to expand in a radial fashion
until a point of equilibrium occurs. This usually is when the amount of water released from storage equals
the rate of pumping. This also can occur when recharge to the aquifer equals the amount of water being
pumped. We typically think of a cone of depression as being a circular feature surrounding the pumped well.
However, aquifer characteristics can affect the shape of the cone of depression. For example, if there is a
```

steep ground-water gradient in the area of pumpage, the cone will tend to be shorter in the upgradient direction and elongated in the downgradient direction. This is because the water is already flowing towards the well from the upgradient direction, so the cone of depression doesn't need to extend as far out to obtain water, whereas the water is flowing away from the well in the downgradient direction, so the cone of depression needs to reach further to obtain water.

```
http://en.wikipedia.org/wiki/Cone_of_depression</xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="depth" type="gsml:CGI_NumericValuePropertyType">
  <xs:annotation>
    <xs:documentation>The depth of a cone of depression in an aquifer.</xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ConeOfDepressionPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:ConeOfDepression"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

OverviewPackageClassHelp

Class <<FeatureType>> ConfinedAquifer (extends [Aquifer](#))

Aquifer confined under an impermeable layer.

Confined aquifers have the water table above their upper boundary (an aquitard or aquiclude), and are typically found below unconfined aquifers. The term "perched" refers to ground water accumulating above a low-permeability unit or strata, such as a clay layer. This term is generally used to refer to a small local area of ground water that occurs at an elevation higher than a regionally-extensive aquifer. The difference between perched and unconfined aquifers is their size (perched is smaller).
http://en.wikipedia.org/wiki/Confined_aquifer#Confined_versus_unconfined

(1) An aquifer containing water between two relatively impermeable boundaries. The water level in a well tapping a confined aquifer stands above the top of the confined aquifer and can be higher or lower than the water table that may be present in the material above it. In some cases the water level can rise above the ground surface, yielding a flowing well. (2) An aquifer or water-bearing subsurface stratum which is bounded above and below by formations of impermeable or relatively impermeable material; a water-bearing formation whose upper boundary is a layer which does not transmit water readily. (3) An aquifer in which ground water is under pressure significantly greater than atmospheric and its upper limit is the bottom of a bed of distinctly lower hydraulic conductivity than that of the aquifer itself.
<http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-c.pdf>

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
mediaType	AquiferMediaType	1..1	Aquifer	Property used to specify the medium of an aquifer.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
confinedAquiferType	ConfinedAquiferType	0..1	ConfinedAquifer	This property refers to the type of confined aquifer.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
confinementLevel	CGI_Value	1..1	ConfinedAquifer	Level of confinement. This should cover for the 'semi-confined aquifer any maybe some numerical expression (50% confinement).
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	20		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
relatedReservoir	GeologicReservoir	0..*	HydrogeologicUnit	
	Association tagged values			
	Tag	Value		
	sequenceNumber	120		

waterContent	GroundwaterBody	0..*	HydrogeologicUnit	
	Association tagged values			
	Tag	Value		
	sequenceNumber	125		
waterQuantity	WaterQuantityDescription	0..*	HydrogeologicUnit	
	Association tagged values			
	Tag	Value		
	sequenceNumber	140		
hydrogeologicClass	Categorisation	0..*	HydrogeologicUnit	
	Association tagged values			
	Tag	Value		
	sequenceNumber	170		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ConfinedAquifer"
substitutionGroup="gwml:Aquifer" type="gwml:ConfinedAquiferType">
  <xs:annotation>
    <xs:documentation>Aquifer confined under an impermeable layer.
```

Confined aquifers have the water table above their upper boundary (an aquitard or aquiclude), and are typically found below unconfined aquifers. The term "perched" refers to ground water accumulating above a low-permeability unit or strata, such as a clay layer. This term is generally used to refer to a small local area of ground water that occurs at an elevation higher than a regionally-extensive aquifer. The difference between perched and unconfined aquifers is their size (perched is smaller).
http://en.wikipedia.org/wiki/Confined_aquifer#Confined_versus_unconfined

(1) An aquifer containing water between two relatively impermeable boundaries. The water level in a well tapping a confined aquifer stands above the top of the confined aquifer and can be higher or lower than the water table that may be present in the material above it. In some cases the water level can rise above the ground surface, yielding a flowing well. (2) An aquifer or water-bearing subsurface stratum which is


```
bounded above and below by formations of impermeable or relatively impermeable material; a water-bearing
formation whose upper boundary is a layer which does not transmit water readily. (3) An aquifer in which
ground water is under pressure significantly greater than atmospheric and its upper limit is the bottom of
a bed of distinctly lower hydraulic conductivity than that of the aquifer itself.
http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-c.pdf</xs:documentation>
</xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ConfinedAquiferType">
  <xs:complexContent>
    <xs:extension base="gwml:AquiferType">
      <xs:sequence>
        <xs:element maxOccurs="1" minOccurs="0" name="confinedAquiferType"
type="gwml:ConfinedAquiferTypeType">
          <xs:annotation>
            <xs:documentation>This property refers to the type of confined
aquifer.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="confinementLevel" type="gsml:CGI_ValuePropertyType">
          <xs:annotation>
            <xs:documentation>Level of confinement. This should cover for the 'semi-confined
aquifer any maybe some numerical expression (50% confirnment).</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ConfinedAquiferPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:ConfinedAquifer"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp



Class <<FeatureType>> ConstructionComponent

Elements used in constructions. Position (fromPos and endPos) coordinate reference is the shape of the samplingCurve from which the WaterWell derives.

Local Subclasses: [FiltrationComponent](#) [ScreenComponent](#) [SealingComponent](#) [WellCasingComponent](#)

Attributes

Name	Type	Bounds	From Class	Notes
position	GM_LineString	1..1	ConstructionComponent	This attribute is used to reference the shape of the samplingCurve from which the WaterWell derives.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ConstructionComponent"
type="gwm1:ConstructionComponentType" abstract="true" substitutionGroup="gml:_Feature">
  <xs:annotation>
    <xs:documentation>Elements used in constructions. Position (fromPos and endPos) coordinate reference
is the shape of the samplingCurve from which the WaterWell derives.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ConstructionComponentType"
```

```
abstract="true">
  <xs:complexContent>
    <xs:extension base="gml:AbstractFeatureType">
      <xs:sequence>
        <xs:element name="position">
          <xs:annotation>
            <xs:documentation>This attribute is used to reference the shape of the samplingCurve
from which the WaterWell derives.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ConstructionComponentPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:ConstructionComponent"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> DependentObservationCalculation (extends Process)

Calculation that depend from another set of observation

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
method	GenericName	1..1	DependentObservationCalculation					
	<div><div>Attribute tagged values</div><table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table></div>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
sourceObservation	Observation	0..*	DependentObservationCalculation	
	Association tagged values			
	Tag	Value		
sequenceNumber	120			

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DependentObservationCalculation"
substitutionGroup="sml:_Process" type="gwm1:DependentObservationCalculationType">
  <xs:annotation>
    <xs:documentation>Calculation that depend from another set of observation</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DependentObservationCalculationType">
  <xs:complexContent>
    <xs:extension base="sml:AbstractProcessType">
      <xs:sequence>
        <xs:element name="method" type="gml:CodeType"/>
        <xs:element maxOccurs="unbounded" minOccurs="0" name="sourceObservation"
type="om:ObservationPropertyType"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema"
name="DependentObservationCalculationPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwm1:DependentObservationCalculation"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
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OverviewPackageClassHelp



Class <<FeatureType>> Device

An apparatus that serve some purpose, like a pump or a meter.

Local Subclasses: [Pump](#)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes				
installation	DeviceInstallation	1	Device					
	Association tagged values							
	<table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>160</td></tr></table>		Tag	Value	sequenceNumber	160		
	Tag	Value						
sequenceNumber	160							

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="Device" type="gwml:DeviceType" abstract="true" substitutionGroup="gml:_Feature">
  <xs:annotation>
    <xs:documentation>An apparatus that serve some purpose, like a pump or a meter.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DeviceType" abstract="true">
  <xs:complexContent>
    <xs:extension base="gml:AbstractFeatureType">
      <xs:sequence>
```

```
        <xs:element name="installation" type="gwml:DeviceInstallationPropertyType"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DevicePropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:Device"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
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For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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Class <<FeatureType>> DeviceInstallation

Installation of a device to a water well.

Local Subclasses: [WellPumpInstallation](#)

Attributes

Name	Type	Bounds	From Class	Notes				
period	TM_Period	1..1	DeviceInstallation	Period for which the device has been installed.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes			
host	WaterWell	1	DeviceInstallation				
	Association tagged values						
	<table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>120</td></tr></table>	Tag	Value	sequenceNumber	120		
Tag	Value						
sequenceNumber	120						
installedDevice	Device	1	DeviceInstallation				
	Association tagged values						
	<table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>150</td></tr></table>	Tag	Value	sequenceNumber	150		
Tag	Value						
sequenceNumber	150						

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only

xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply
-----------------	---------------	--

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DeviceInstallation"
type="gwml:DeviceInstallationType" substitutionGroup="gml:_Feature">
  <xs:annotation>
    <xs:documentation>Installation of a device to a water well.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DeviceInstallationType">
  <xs:complexContent>
    <xs:extension base="gml:AbstractFeatureType">
      <xs:sequence>
        <xs:element name="period" type="gml:TimePeriodPropertyType">
          <xs:annotation>
            <xs:documentation>Period for which the device has been installed.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="host" type="gwml:WaterWellPropertyType"/>
        <xs:element name="installedDevice" type="gwml:DevicePropertyType"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DeviceInstallationPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:DeviceInstallation"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
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GML Application Schema<API Specification/>

Overview

Package

Class

Help

Class <<FeatureType>> DiffuseFlow (extends [WaterFlow](#))

Groundwater movement down-gradient through interconnected fractures, faults, joints and bedding planes, resulting in less turbulent flow, less dramatic response to recharge events, and more uniform chemistry than observed in conduit flow.
(<http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html>)

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
flowProcess	WaterFlowProcess	1..1	WaterFlow	Identification of a particular process in the groundwater cycle
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		10	
quantity	CGI_Numeric	1..1	WaterFlow	Quantity of water transferred during a particular water flow process.
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		20	

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
budget	WaterBudget	1	WaterFlow	
	Association tagged values			
	Tag		Value	
	sequenceNumber		110	

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.

xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DiffuseFlow"
substitutionGroup="gwml:WaterFlow" type="gwml:DiffuseFlowType">
  <xs:annotation>
    <xs:documentation>Groundwater movement down-gradient through interconnected fractures, faults,
joints and bedding planes, resulting in less turbulent flow, less dramatic response to recharge events, and
more uniform chemistry than observed in conduit flow.
(http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DiffuseFlowType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterFlowType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DiffuseFlowPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:DiffuseFlow"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> Drawdown

The vertical distance groundwater elevation is lowered, or the amount head is reduced, due to the removal of groundwater. Also the decline in potentiometric surface caused by the withdrawal of water from a hydrogeologic unit. The distance between the static water level and the surface of the cone of depression. A lowering of the water table of an unconfined aquifer or the potentiometric surface of a confined aquifer caused by pumping of groundwater from wells.(<http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html>)

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="Drawdown" type="gwml:DrawdownType"
substitutionGroup="gml:_Feature">
  <xs:annotation>
    <xs:documentation>The vertical distance groundwater elevation is lowered, or the amount head is
reduced, due to the removal of groundwater. Also the decline in potentiometric surface caused by the
withdrawal of water from a hydrogeologic unit. The distance between the static water level and the surface
of the cone of depression. A lowering of the water table of an unconfined aquifer or the potentiometric
surface of a confined aquifer caused by pumping of groundwater from
wells.(http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DrawdownType">
  <xs:complexContent>
    <xs:extension base="gml:AbstractFeatureType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DrawdownPropertyType">
```

```
<xs:sequence minOccurs="0">
  <xs:element ref="gwml:Drawdown" />
</xs:sequence>
<xs:attributeGroup ref="gml:AssociationAttributeGroup" />
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema
<API Specification>

OverviewPackageClassHelp



Class <<FeatureType>> **DynamicWaterLevel** (extends [WaterLevel](#))

This class is a subclass of waterLevel and it is used to specify the elevation of a dynamic water level.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DynamicWaterLevel"
substitutionGroup="gwml:WaterLevel" type="gwml:DynamicWaterLevelType">
  <xs:annotation>
    <xs:documentation>This class is a subclass of waterLevel and it is used to specify the elevation of
a dynamic water level.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DynamicWaterLevelType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterLevelType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DynamicWaterLevelPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:DynamicWaterLevel"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> Filtration (extends WellConstruction)

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
filterPlacementMethod	Process	0..1	Filtration	Process defining the filter placement method. Can be tremie or pour down. Groundwater Data Management Guidelines, Environment Canada, Dec. 1991
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		10	
filtrationMedium	CGI_Term	0..1	Filtration	Type of filtration mechanism used in the filtration device. Terms can be Natural, Filter pack or Formation stabilizer. Groundwater Data Management Guidelines, Environment Canada, Dec. 1991
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		20	

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
filtrationElement	FiltrationComponent	0..*	Filtration	0..* instead of 1, because one might have filtrationMedium without any FiltrationComponent
	Association tagged values			
	Tag		Value	
	sequenceNumber		110	

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false

		Description: Suppress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="Filtration" type="gwml:FiltrationType"
substitutionGroup="gwml:WellConstruction"/>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="FiltrationType">
  <xs:complexContent>
    <xs:extension base="gwml:WellConstructionType">
      <xs:sequence>
        <xs:element name="filterPlacementMethod" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Process defining the filter placement method. Can be tremie or pour
down.
Groundwater Data Management Guidelines, Environment Canada, Dec. 1991</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="filtrationMedium" type="gsml:CGI_TermPropertyType" minOccurs="0"
maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Type of filtration mechanism used in the filtration device. Terms
can be Natural, Filter pack or Formation stabilizer.
Groundwater Data Management Guidelines, Environment Canada, Dec. 1991</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="filtrationElement" type="gwml:FiltrationComponentPropertyType"
minOccurs="0" maxOccurs="unbounded">
          <xs:annotation>
            <xs:documentation>0..* instead of 1, because one might have filtrationMedium without
any FiltrationComponent</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="FiltrationPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:Filtration"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> **FiltrationComponent** (extends [ConstructionComponent](#))

Type of material used to filter the water.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes	
position	GM_LineString	1..1	ConstructionComponent	This attribute is used to reference the shape of the samplingCurve from which the WaterWell derives.	
				Attribute tagged values	
				<table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>	
Tag	Value				
sequenceNumber	10				
grainSize	CGI_Value	0..1	FiltrationComponent	Size of the particles of the filtration material.	
				Attribute tagged values	
				<table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>	
Tag	Value				
sequenceNumber	10				
material	CGI_Term	1..1	FiltrationComponent	Identification of the material used in the filtration device. Gravel, pit run, silica sand, washed sand, crushed rock, artificial (unspecified) unknown, other Groundwater Data Management Guidelines, Environment Canada, Dec. 1991	
				Attribute tagged values	
				<table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>	
Tag	Value				
sequenceNumber	20				

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.

xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="FiltrationComponent"
type="gwml:FiltrationComponentType" substitutionGroup="gwml:ConstructionComponent">
  <xs:annotation>
    <xs:documentation>Type of material used to filter the water.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="FiltrationComponentType">
  <xs:complexContent>
    <xs:extension base="gwml:ConstructionComponentType">
      <xs:sequence>
        <xs:element name="grainSize" type="gsml:CGI_ValuePropertyType" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Size of the particles of the filtration
material.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="material" type="gsml:CGI_TermPropertyType">
          <xs:annotation>
            <xs:documentation>Identification of the material used in the filtration device.
Gravel, pit run, silica sand, washed sand, crushed rock, artificial (unspecified) unknown, other
Groundwater Data Management Guidelines, Environment Canada, Dec. 1991</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="FiltrationComponentPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:FiltrationComponent" />
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup" />
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> **GeologicReservoir** (extends [Reservoir](#))

Reservoir related to the presence of water in hydrogeologic units.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
capacity	CGI_Numeric	0..1	Reservoir	Capacity of a reservoir to contain water, expressed as a numeric value and the unit of measurment.
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		10	

Outbound Associations

Name	Type	Multiplicity	From Class	Notes				
reservoirBudget	WaterBudget	1	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>130</td></tr></table>				Tag	Value	sequenceNumber	130
	Tag	Value						
sequenceNumber	130							
hydrauliqualyBoundedBy	HydraulicBoundary	0..*	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>140</td></tr></table>				Tag	Value	sequenceNumber	140
	Tag	Value						
sequenceNumber	140							
containedWater	GroundwaterBody	0..*	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>141</td></tr></table>				Tag	Value	sequenceNumber	141
	Tag	Value						
sequenceNumber	141							
waterQuantity	WaterQuantityDescription	1	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>160</td></tr></table>				Tag	Value	sequenceNumber	160
	Tag	Value						
sequenceNumber	160							
partOfReservoir	Reservoir	0..1	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>170</td></tr></table>				Tag	Value	sequenceNumber	170
	Tag	Value						
sequenceNumber	170							

recharge	Reservoir	1	Reservoir	
	Association tagged values			
	Tag	Value		
	sequenceNumber	190		
containedWater	AtmosphericWaterBody	0..*	Reservoir	
	Association tagged values			
	Tag	Value		
	sequenceNumber	195		
hostUnit	HydrogeologicUnit	1..*	GeologicReservoir	
	Association tagged values			
	Tag	Value		
	sequenceNumber	130		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GeologicReservoir"
substitutionGroup="gwml:Reservoir" type="gwml:GeologicReservoirType">
  <xs:annotation>
    <xs:documentation>Reservoir related to the presence of water in hydrogeologic
units.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GeologicReservoirType">
  <xs:complexContent>
    <xs:extension base="gwml:ReservoirType">
      <xs:sequence>
        <xs:element maxOccurs="unbounded" minOccurs="1" name="hostUnit"
type="gwml:HydrogeologicUnitPropertyType" />
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

```
        </xs:sequence>
      </xs:extension>
    </xs:complexContent>
  </xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GeologicReservoirPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:GeologicReservoir"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> GroundwaterBody (extends WaterBody)

A distinct volume of groundwater within an aquifer or aquifers (Vogt, 2002). The equivalent in the European Water Framework Directive (2000/60/CE, 2000) is "Body of groundwater" defined exactly in the same way.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
volume	CGI_Numeric	1..1	WaterBody	Volume of water present in a water body.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes			
waterComposition	WaterCompositionDescription	1	WaterBody				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>110</td></tr></table>				Tag	Value	sequenceNumber
Tag	Value						
sequenceNumber	110						
occurence	HydrogeologicMappedFeature	0..*	WaterBody				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>145</td></tr></table>				Tag	Value	sequenceNumber
Tag	Value						
sequenceNumber	145						
subWaterBody	WaterBody	0..*	WaterBody				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>155</td></tr></table>				Tag	Value	sequenceNumber
Tag	Value						
sequenceNumber	155						
waterAge	WaterAgeDescription	0..1	GroundwaterBody				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>127</td></tr></table>				Tag	Value	sequenceNumber
Tag	Value						
sequenceNumber	127						
hostUnit	HydrogeologicUnit	1	GroundwaterBody				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>130</td></tr></table>				Tag	Value	sequenceNumber
Tag	Value						
sequenceNumber	130						

waterQuality	WaterQualityDescription	0..*	GroundwaterBody					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>140</td></tr></table>				Tag	Value	sequenceNumber	140
	Tag	Value						
sequenceNumber	140							
waterContainer	Reservoir	1	GroundwaterBody					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>142</td></tr></table>				Tag	Value	sequenceNumber	142
	Tag	Value						
sequenceNumber	142							

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GroundwaterBody"
type="gwml:GroundwaterBodyType" substitutionGroup="gwml:WaterBody">
  <xs:annotation>
    <xs:documentation>A distinct volume of groundwater within an aquifer or aquifers (Vogt, 2002). The
equivalent in the European Water Framework Directive (2000/60/CE, 2000) is "Body of groundwater" defined
exactly in the same way.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GroundwaterBodyType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterBodyType">
      <xs:sequence>
        <xs:element name="waterAge" type="gwml:WaterAgeDescriptionPropertyType" minOccurs="0"
maxOccurs="1"/>
        <xs:element name="hostUnit" type="gwml:HydrogeologicUnitPropertyType"/>
        <xs:element name="waterQuality" type="gwml:WaterQualityDescriptionPropertyType"
minOccurs="0" maxOccurs="unbounded"/>
        <xs:element name="waterContainer" type="gwml:ReservoirPropertyType"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```



```
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GroundwaterBodyPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:GroundwaterBody"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

Overview

Package

Class

Help

Class <<FeatureType>> GroundwaterDivide

The boundary between two adjacent groundwater basins, which is represented by a high point in the water table.
<http://www.groundwater.org/gi/gwglossary.html#D>

A Limit between two groundwater "watersheds", somewhat like a water divide

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Suppress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GroundwaterDivide"
substitutionGroup="gml:_Feature" type="gwml:GroundwaterDivideType">
  <xs:annotation>
    <xs:documentation>The boundary between two adjacent groundwater basins, which is represented by a
high point in the water table.
http://www.groundwater.org/gi/gwglossary.html#D
A Limit between two groundwater "watersheds", somewhat like a water divide</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GroundwaterDivideType">
  <xs:complexContent>
    <xs:extension base="gml:AbstractFeatureType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GroundwaterDividePropertyType">
  <xs:sequence minOccurs="0">
```

```
<xs:element ref="gwml:GroundwaterDivide"/>
</xs:sequence>
<xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

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For more general information about GML refer to:
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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> GroundwaterTesting (extends ObservationProcess)

This abstracted class is used to represent the result of a groundwater test.

Local Subclasses: [PumpTesting](#) [TracingTest](#)

Attributes

Name	Type	Bounds	From Class	Notes
groundwaterTestType	GroundwaterTestCode	1..1	GroundwaterTesting	Code used to refer to a particular hydraulic test, defined in the hydraulicTestCode enumeration.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
rawResult	Any	0..*	GroundwaterTesting	Pointer to a file where the raw results are (image, file, raw data). Raw, uninterpreted data that is used to produce a result for the Observation
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	20		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
report	CI_Citation	0..*	GroundwaterTesting	
	Association tagged values			
	Tag	Value		
	sequenceNumber	110		
contact	CI_ResponsibleParty	0..*	GroundwaterTesting	
	Association tagged values			
	Tag	Value		
	sequenceNumber	120		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007)

		encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GroundwaterTesting"
type="gwml:GroundwaterTestingType" abstract="true" substitutionGroup="omx:ObservationProcess">
  <xs:annotation>
    <xs:documentation>This abstracted class is used to represent the result of a groundwater
test.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GroundwaterTestingType" abstract="true">
  <xs:complexContent>
    <xs:extension base="omx:ObservationProcessType">
      <xs:sequence>
        <xs:element name="groundwaterTestType" type="gml:CodeType">
          <xs:annotation>
            <xs:appinfo>
              <gml:defaultCodeSpace
xmlns:gml="http://www.opengis.net/gml">#NOTES</gml:defaultCodeSpace>
            </xs:appinfo>
            <xs:documentation>Code used to refer to a particular hydraulic test, defined in the
hydraulicTestCode enumeration.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="rawResult" type="gml:AssociationType" minOccurs="0" maxOccurs="unbounded">
          <xs:annotation>
            <xs:documentation>Pointer to a file where the raw results are (image, file, raw
data). Raw, uninterpreted data that is used to produce a result for the Observation</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="report" type="gmd:CI_Citation_PropertyType" minOccurs="0"
maxOccurs="unbounded"/>
        <xs:element name="contact" type="gmd:CI_ResponsibleParty_PropertyType" minOccurs="0"
maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GroundwaterTestingPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:GroundwaterTesting"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

OverviewPackageClassHelp



Class <<FeatureType>> GuideLine (extends Process)

Prescribed methodology

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GuideLine" substitutionGroup="sml:_Process" type="gwml:GuideLineType">
  <xs:annotation>
    <xs:documentation>Prescribed methodology</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GuideLineType">
  <xs:complexContent>
    <xs:extension base="sml:AbstractProcessType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GuideLinePropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:GuideLine"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
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GML Application Schema<API Specification/>

Overview

Package

Class

Help

Class <<FeatureType>> HydraulicBoundary (extends [HydrogeologicFeature](#))

A hydrologic feature that prevents the flow of groundwater. Examples include groundwater divides or low permeability material that impedes groundwater flow. (<http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html>)

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes			
occurrence	MappedFeature	0..*	HydrogeologicFeature				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>140</td></tr></table>		Tag	Value	sequenceNumber	140	
Tag	Value						
sequenceNumber	140						
properties	WaterPropertyDescription	0..*	HydraulicBoundary				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>170</td></tr></table>		Tag	Value	sequenceNumber	170	
Tag	Value						
sequenceNumber	170						

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Suppress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details


```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydraulicBoundary"
substitutionGroup="gwml:HydrogeologicFeature" type="gwml:HydraulicBoundaryType">
  <xs:annotation>
    <xs:documentation>A hydrologic feature that prevents the flow of groundwater. Examples include
groundwater divides or low permeability material that impedes groundwater flow.
(http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydraulicBoundaryType">
  <xs:complexContent>
    <xs:extension base="gwml:HydrogeologicFeatureType">
      <xs:sequence>
        <xs:element maxOccurs="unbounded" minOccurs="0" name="properties"
type="gwml:WaterPropertyDescriptionPropertyType"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydraulicBoundaryPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:HydraulicBoundary"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema
<API Specification>

OverviewPackageClassHelp



Class <<FeatureType>> HydroGeologicalContext

General information about the hydrogeologic units, the regional geology, soils, etc that is part of a framework.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes			
framework	HydroGeologicalFramework	1	HydroGeologicalContext				
	<div><div>Association tagged values</div><table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>140</td></tr></table></div>				Tag	Value	sequenceNumber
Tag	Value						
sequenceNumber	140						

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydroGeologicalContext"
substitutionGroup="gml:_Feature" type="gwml:HydroGeologicalContextType">
  <xs:annotation>
    <xs:documentation>General information about the hydrogeologic units, the regional geology, soils,
etc that is part of a framework.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydroGeologicalContextType">
  <xs:complexContent>
    <xs:extension base="gml:AbstractFeatureType">
```

```

        <xs:sequence>
          <xs:element name="framework" type="gwml:HydroGeologicalFrameworkPropertyType"/>
        </xs:sequence>
      </xs:extension>
    </xs:complexContent>
  </xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydroGeologicalContextPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:HydroGeologicalContext"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>

```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp



Class <<FeatureType>> HydroGeologicalFramework

A collection of hydrogeological units which forms a hydrogeological context.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes			
context	HydroGeologicalContext	0..*	HydroGeologicalFramework				
	<div><div>Association tagged values</div><table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>130</td></tr></table></div>				Tag	Value	sequenceNumber
Tag	Value						
sequenceNumber	130						

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydroGeologicalFramework"
substitutionGroup="gml:_Feature" type="gwml:HydroGeologicalFrameworkType">
  <xs:annotation>
    <xs:documentation>A collection of hydrogeological units which forms a hydrogeological
context.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydroGeologicalFrameworkType">
  <xs:complexContent>
    <xs:extension base="gml:AbstractFeatureType">
```

```

    <xs:sequence>
      <xs:element maxOccurs="unbounded" minOccurs="0" name="context"
type="gwm1:HydroGeologicalContextPropertyType" />
    </xs:sequence>
  </xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydroGeologicalFrameworkPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwm1:HydroGeologicalFramework" />
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup" />
</xs:complexType>

```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> **HydroStratigraphicUnit** (extends [HydrogeologicUnit](#))

Formation, or part of a formation, or a group of formation in which there are similar hydrologic characteristics that allow for grouping into aquifers and associated confininf layers (Domenico & Schwartz, 1997)

Hydrostratigraphic units were originally defined by Maxey (1964) as bodies of rock with considerable lateral extent that act as a reasonably distinct hydrologic system. It is clear from Maxey's definition that hydrostratigraphic units were to be hydraulically continuous, mappable, and scale-independent entities. Mappability, in this case, means the subsurface geology can be subdivided according to permeability (Seaber, 1988). Thus, a single hydrostratigraphic unit may include a formation, part of a formation, or a group of formations.

-Maxey, G. B., 1964, Hydrostratigraphic units: Journal of Hydrology, v. 2, p. 124-129.

Local Subclasses: [Aquiclude](#) [Aquifer](#) [Aquitard](#)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes			
relatedReservoir	GeologicReservoir	0..*	HydrogeologicUnit				
	Association tagged values						
	<table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>120</td></tr></table>	Tag	Value	sequenceNumber	120		
Tag	Value						
sequenceNumber	120						
waterContent	GroundwaterBody	0..*	HydrogeologicUnit				
	Association tagged values						
	<table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>125</td></tr></table>	Tag	Value	sequenceNumber	125		
Tag	Value						
sequenceNumber	125						
waterQuantity	WaterQuantityDescription	0..*	HydrogeologicUnit				
	Association tagged values						
	<table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>140</td></tr></table>	Tag	Value	sequenceNumber	140		
Tag	Value						
sequenceNumber	140						
hydrogeologicClass	Categorisation	0..*	HydrogeologicUnit				
	Association tagged values						
	<table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>170</td></tr></table>	Tag	Value	sequenceNumber	170		
Tag	Value						
sequenceNumber	170						

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydroStratigraphicUnit"
substitutionGroup="gwml:HydrogeologicUnit" type="gwml:HydroStratigraphicUnitType">
  <xs:annotation>
    <xs:documentation>Formation, or part of a formation, or a group of formation in which there are
similar hydrologic characteristics that allow for grouping into aquifers and associated confininf layers
(Domenico &amp;amp; Schwartz, 1997)
</xs:documentation>
</xs:annotation>
</xs:element>

Hydrostratigraphic units were originally defined by Maxey (1964) as bodies of rock with considerable lateral
extent that act as a reasonably distinct hydrologic system. It is clear from Maxey's definition that
hydrostratigraphic units were to be hydraulically continuous, mappable, and scale-independent entities.
Mappability, in this case, means the subsurface geology can be subdivided according to permeability
(Seaber, 1988). Thus, a single hydrostratigraphic unit may include a formation, part of a formation, or a
group of formations.

-Maxey, G. B., 1964, Hydrostratigraphic units: Journal of Hydrology, v. 2, p. 124-129.</xs:documentation>
</xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydroStratigraphicUnitType">
  <xs:complexContent>
    <xs:extension base="gwml:HydrogeologicUnitType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydroStratigraphicUnitPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:HydroStratigraphicUnit"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp



Class <<FeatureType>> HydrogeologicFeature (extends GeologicFeature)

An abstract feature of the hydrogeology domain which is not a hydrogeologic unit

Local Subclasses: [ConeOfDepression](#) [HydraulicBoundary](#) [ProtectionZone](#) [ZoneOfContribution](#) [ZoneOfInfluence](#)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
occurence	MappedFeature	0..*	HydrogeologicFeature	
	Association tagged values			
	Tag	Value		
	sequenceNumber	140		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" abstract="true" name="HydrogeologicFeature"
substitutionGroup="gsml:GeologicFeature" type="gwml:HydrogeologicFeatureType">
  <xs:annotation>
    <xs:documentation>An abstract feature of the hydrogeology domain which is not a hydrogeologic
unit</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" abstract="true" name="HydrogeologicFeatureType">
  <xs:complexContent>
    <xs:extension base="gsml:GeologicFeatureType">
```



```

        <xs:sequence>
          <xs:element maxOccurs="unbounded" minOccurs="0" name="occurence"
type="gsm1:MappedFeaturePropertyType"/>
        </xs:sequence>
      </xs:extension>
    </xs:complexContent>
  </xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrogeologicFeaturePropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:HydrogeologicFeature"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>

```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

OverviewPackageClassHelp



Class <<FeatureType>> HydrogeologicMappedFeature (extends MappedFeature)

Mapped feature more oriented on spatial temporal (although geometries could handle this).

A physical hydrogeologic feature represented on a map.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
dateOfValidity	TM_Object	1..1	HydrogeologicMappedFeature	MappedFeature in hydrogeology are quite variable over time. This property defines over what time period this geometry actually make sense.
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		10	

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
classifier	WaterBody	1..*	HydrogeologicMappedFeature	
	Association tagged values			
	Tag	Value		
	sequenceNumber	150		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrogeologicMappedFeature"
type="gwml:HydrogeologicMappedFeatureType" substitutionGroup="gsml:MappedFeature">
  <xs:annotation>
    <xs:documentation>Mapped feature more oriented on spatial temporal (although geometries could handle
this).
A physical hydrogeologic feature represented on a map.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrogeologicMappedFeatureType">
  <xs:complexContent>
    <xs:extension base="gsml:MappedFeatureType">
      <xs:sequence>
        <xs:element name="dateOfValidity">
          <xs:annotation>
            <xs:documentation>MappedFeature in hydrogeology are quite variable over time. This
property defines over what time period this geometry actually make sense.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="classifier" type="gwml:WaterBodyPropertyType" minOccurs="1"
maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrogeologicMappedFeaturePropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:HydrogeologicMappedFeature"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> HydrogeologicUnit (extends GeologicUnit)

Means any soil of rock unit or zone which by virtue of its porosity or permeability, or lack thereof, has a distinct influence on the storage or movement of groundwater. (EPA)

Any soil or rock unit or zone that because of its hydraulic properties has a distinct influence on the storage or movement of ground water.
http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-h.pdf

Local Subclasses: [AquiferSystem](#) [HydroStratigraphicUnit](#)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes				
relatedReservoir	GeologicReservoir	0..*	HydrogeologicUnit					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>120</td></tr></table>				Tag	Value	sequenceNumber	120
	Tag	Value						
sequenceNumber	120							
waterContent	GroundwaterBody	0..*	HydrogeologicUnit					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>125</td></tr></table>				Tag	Value	sequenceNumber	125
	Tag	Value						
sequenceNumber	125							
waterQuantity	WaterQuantityDescription	0..*	HydrogeologicUnit					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>140</td></tr></table>				Tag	Value	sequenceNumber	140
	Tag	Value						
sequenceNumber	140							
hydrogeologicClass	Categorisation	0..*	HydrogeologicUnit					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>170</td></tr></table>				Tag	Value	sequenceNumber	170
	Tag	Value						
sequenceNumber	170							

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

--	--	--

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrogeologicUnit"
substitutionGroup="gsml:GeologicUnit" type="gwml:HydrogeologicUnitType">
  <xs:annotation>
    <xs:documentation>Means any soil of rock unit or zone which by virtue of its porosity or
permeability, or lack thereof, has a distinct influence on the storage or movement of groundwater. (EPA)

Any soil or rock unit or zone that because of its hydraulic properties has a distinct influence on the
storage or movement of ground water.
http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-h.pdf</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrogeologicUnitType">
  <xs:complexContent>
    <xs:extension base="gsml:GeologicUnitType">
      <xs:sequence>
        <xs:element maxOccurs="unbounded" minOccurs="0" name="relatedReservoir"
type="gwml:GeologicReservoirPropertyType"/>
        <xs:element maxOccurs="unbounded" minOccurs="0" name="waterContent"
type="gwml:GroundwaterBodyPropertyType"/>
        <xs:element maxOccurs="unbounded" minOccurs="0" name="waterQuantity"
type="gwml:WaterQuantityDescriptionPropertyType"/>
        <xs:element maxOccurs="unbounded" minOccurs="0" name="hydrogeologicClass"
type="gwml:CategorisationPropertyType"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrogeologicUnitPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:HydrogeologicUnit"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

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OverviewPackageClassHelp



Class <<FeatureType>> HydrologicUnit

The Hydrologic Unit system is a standardized watershed classification system developed by USGS in the mid 1970s. Hydrologic units are watershed boundaries organized in a nested hierarchy by size.
http://nwis.waterdata.usgs.gov/tutorial/huc_def.html

The drainage basin concept is expanded upon in hierarchical systems of hydrologic units. In the United States, an effort is being made to delineate hydrologic units in a six level hierarchy covering the entire country and adhering to a standard called the "Federal Standard for Delineation of Hydrologic Unit Boundaries". The six nested levels of hydrologic unit regions are named, from largest to smallest, regions, subregions, basins, subbasins, watersheds, and subwatersheds. The system defines 21 hydrologic unit (HU) regions in the United States, 222 HU subregions, 352 HU basins, and 2,149 HU subbasins. The delineation of 5th level watersheds and 6th level subwatersheds is not complete, but estimates predict about 22,000 watersheds and 160,000 subwatersheds in the United States.
http://en.wikipedia.org/wiki/Region#Hydrologic_Units

Local Subclasses: [WaterShed](#)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrologicUnit"
substitutionGroup="gml:_Feature" type="gwml:HydrologicUnitType">
  <xs:annotation>
    <xs:documentation>The Hydrologic Unit system is a standardized watershed classification system
developed by USGS in the mid 1970s. Hydrologic units are watershed boundaries organized in a nested
hierarchy by size.
http://nwis.waterdata.usgs.gov/tutorial/huc_def.html

The drainage basin concept is expanded upon in hierarchical systems of hydrologic units. In the United
```

```
States, an effort is being made to delineate hydrologic units in a six level hierarchy covering the entire country and adhering to a standard called the "Federal Standard for Delineation of Hydrologic Unit Boundaries". The six nested levels of hydrologic unit regions are named, from largest to smallest, regions, subregions, basins, subbasins, watersheds, and subwatersheds. The system defines 21 hydrologic unit (HU) regions in the United States, 222 HU subregions, 352 HU basins, and 2,149 HU subbasins. The delineation of 5th level watersheds and 6th level subwatersheds is not complete, but estimates predict about 22,000 watersheds and 160,000 subwatersheds in the United States.
http://en.wikipedia.org/wiki/Region#Hydrologic_Units</xs:documentation>
</xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrologicUnitType">
  <xs:complexContent>
    <xs:extension base="gml:AbstractFeatureType" />
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrologicUnitPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:HydrologicUnit" />
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup" />
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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Class <<FeatureType>> MonitoringStation (extends SamplingPoint)

A site where a sampling is taken for monitoring various properties.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="MonitoringStation"
type="gwm1:MonitoringStationType" substitutionGroup="sa:SamplingPoint">
  <xs:annotation>
    <xs:documentation>A site where a sampling is taken for monitoring various
properties.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="MonitoringStationType">
  <xs:complexContent>
    <xs:extension base="sa:SamplingPointType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="MonitoringStationPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwm1:MonitoringStation"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```


For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> PackerTesting (extends PumpTesting)

Packer tests consist of isolating specific sections (usually 10 ft) of a bedrock borehole with inflatable packers (bladders) so that water-quality samples can be collected and aquifer tests can be conducted. A series of such tests allows definition of the vertical distribution of water quality (usually contaminants) and hydraulic conductivity (pathways for water and contaminant movement) in an aquifer. Monitoring water levels in nearby wells while pumping packed intervals can identify permeable intervals within the aquifer. Information from the packer tests can be used to properly site the future location of monitoring wells.
http://il.water.usgs.gov/pubs/ofr01-50_chapter4_8.pdf

packer test (Lugeon test) Test for measuring the permeability of ground in sections of boreholes. An inflatable tube ('packer') is lowered down a borehole and expanded so that the sections above and below are isolated. Alternatively, two packers may be used to isolate a certain section. Water is pumped into the section under investigation and leakage can be measured. The rate at which water is absorbed per metre length of hole is measured in units of lugeon, named after the French geologist Maurice Lugeon (1870?1953). One lugeon is approximately equal to 1.0 * 10−5 cm/s permeability.
AILSА ALLABY and MICHAEL ALLABY. "packer test." A Dictionary of Earth Sciences. 1999. Retrieved December 17, 2008 from Encyclopedia.com: http://www.encyclopedia.com/doc/1O13-packertest.html

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
groundwaterTestType	GroundwaterTestCode	1..1	GroundwaterTesting	Code used to refer to a particular hydraulic test, defined in the hydraulicTestCode enumeration.
	<i>Attribute tagged values</i>			
	Tag	Value		
	sequenceNumber	10		
rawResult	Any	0..*	GroundwaterTesting	Pointer to a file where the raw results are (image, file, raw data). Raw, uninterpreted data that is used to produce a result for the Observation
	<i>Attribute tagged values</i>			
	Tag	Value		
	sequenceNumber	20		
duration	TM_PeriodDuration	1..1	PumpTesting	Duration on which the pump testing is performed.
	<i>Attribute tagged values</i>			
	Tag	Value		
	sequenceNumber	10		
rate	Measurement	1..1	PumpTesting	Rate at which the water is pumped during the pumping test.
	<i>Attribute tagged values</i>			
	Tag	Value		
	sequenceNumber	20		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
report	CI_Citation	0..*	GroundwaterTesting	

	Association tagged values			
	Tag	Value		
	sequenceNumber	110		

contact	CI_ResponsibleParty	0..*	GroundwaterTesting	
	Association tagged values			
	Tag	Value		
	sequenceNumber	120		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PackerTesting" type="gwml:PackerTestingType"
substitutionGroup="gwml:PumpTesting">
  <xs:annotation>
    <xs:documentation>Packer tests consist of isolating specific sections (usually 10 ft) of a bedrock
borehole with inflatable packers (bladders) so that water-quality samples can be collected and aquifer
tests can be conducted. A series of such tests allows definition of the vertical distribution of water
quality (usually contaminants) and hydraulic conductivity (pathways for water and contaminant movement) in
an aquifer. Monitoring water levels in nearby wells while pumping packed intervals can identify permeable
intervals within the aquifer. Information from the packer tests can be used to properly site the future
location of monitoring wells.
http://il.water.usgs.gov/pubs/ofr01-50_chapter4_8.pdf

packer test (Lugeon test) Test for measuring the permeability of ground in sections of boreholes. An
inflatable tube ('packer') is lowered down a borehole and expanded so that the sections above and below are
isolated. Alternatively, two packers may be used to isolate a certain section. Water is pumped into the
section under investigation and leakage can be measured. The rate at which water is absorbed per metre
length of hole is measured in units of lugeon, named after the French geologist Maurice Lugeon (1870?1953).
One lugeon is approximately equal to 1.0 * 10&minus;5 cm/s permeability.
AILSA ALLABY and MICHAEL ALLABY. "packer test." A Dictionary of Earth Sciences. 1999. Retrieved December
17, 2008 from Encyclopedia.com: http://www.encyclopedia.com/doc/1013-packertest.html</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PackerTestingType">
  <xs:complexContent>
    <xs:extension base="gwml:PumpTestingType"/>
  </xs:complexContent>
</xs:complexType>
```

```
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PackerTestingPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:PackerTesting"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp



Class <<FeatureType>> PiezometricSurface

Also : Potentionetric Surface
A surface that represents the level to which water will rise in tightly cased wells. If the head varies significantly with depth in the aquifer, then there may be more than one potentiometric surface. The water table is a particular potentiometric surface for an unconfined aquifer.
(<http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html>)

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PiezometricSurface"
substitutionGroup="gml:_Feature" type="gwml:PiezometricSurfaceType">
  <xs:annotation>
    <xs:documentation>Also : Potentionetric Surface
A surface that represents the level to which water will rise in tightly cased wells. If the head varies
significantly with depth in the aquifer, then there may be more than one potentiometric surface. The water
table is a particular potentiometric surface for an unconfined aquifer.
(http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PiezometricSurfaceType">
  <xs:complexContent>
    <xs:extension base="gml:AbstractFeatureType"/>
  </xs:complexContent>
</xs:complexType>
```

```
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PiezometricSurfacePropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:PiezometricSurface"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

Overview

Package

Class

Help

Class <<FeatureType>> PorousFlow (extends [WaterFlow](#))

Groundwater movement down-gradient through the pore space of aquifer host rocks, such as uncemented or poorly-cemented sandstones. (<http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html>)

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
flowProcess	WaterFlowProcess	1..1	WaterFlow	Identification of a particular process in the groundwater cycle				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							
quantity	CGI_Numeric	1..1	WaterFlow	Quantity of water transferred during a particular water flow process.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>			Tag	Value	sequenceNumber	20	
	Tag	Value						
sequenceNumber	20							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
budget	WaterBudget	1	WaterFlow	
	Association tagged values			
	Tag	Value		
	sequenceNumber	110		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false

		Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PorousFlow" substitutionGroup="gwml:WaterFlow" type="gwml:PorousFlowType">
  <xs:annotation>
    <xs:documentation>Groundwater movement down-gradient through the pore space of aquifer host rocks, such as uncemented or poorly-cemented sandstones. (http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PorousFlowType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterFlowType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PorousFlowPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:PorousFlow"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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Class <<FeatureType>> ProtectionArea

The surface and subsurface area surrounding a water well or wellfield through which contaminants are reasonably likely to move toward and reach such water well or well field.(<http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html>)

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ProtectionArea"
substitutionGroup="gml:_Feature" type="gwml:ProtectionAreaType">
  <xs:annotation>
    <xs:documentation>The surface and subsurface area surrounding a water well or wellfield through
which contaminants are reasonably likely to move toward and reach such water well or well
field.(http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ProtectionAreaType">
  <xs:complexContent>
    <xs:extension base="gml:AbstractFeatureType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ProtectionAreaPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:ProtectionArea"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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Overview

Package

Class

Help

Class <<FeatureType>> ProtectionZone (extends [HydrogeologicFeature](#))

An area that defines a protection zone around a well.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
occurence	MappedFeature	0..*	HydrogeologicFeature	
	Association tagged values			
	Tag	Value		
	sequenceNumber	140		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ProtectionZone"
substitutionGroup="gwml:HydrogeologicFeature" type="gwml:ProtectionZoneType">
  <xs:annotation>
    <xs:documentation>An area that defines a protection zone around a well.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ProtectionZoneType">
  <xs:complexContent>
    <xs:extension base="gwml:HydrogeologicFeatureType"/>
  </xs:complexContent>
</xs:complexType>
```

```
</xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ProtectionZonePropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:ProtectionZone"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

OverviewPackageClassHelp

Class <<FeatureType>> Pump (extends Device)

Good reference on water pumps
http://www.popularmechanics.com/home_improvement/how_it_works/1275136.html?page=1& c=y

A water well pump is a pump that is used in extracting water from a water well. There are many makes of pumps, the foremost being Franklin Electric (American), and Pedrollo (Italian).

They include different kinds of pumps, yet most of them are submersible pumps:

- * manual pumpless/hand pump wells requiring a human operator
- * mechanical or rotary pump requiring mechanical parts to pump water
- * solar water pumps
- * DC Submersible Well Pump
- * Pumps driven by air as used by the Amish
- * Pumps driven by air as used in the Australian outback.

http://en.wikipedia.org/wiki/Water_well_pump

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
make	ScopedName	1..1	Pump	Brand of the pump
Attribute tagged values				
Tag		Value		
sequenceNumber		10		
model	ScopedName	1..1	Pump	Model of the pump
Attribute tagged values				
Tag		Value		
sequenceNumber		20		
pumpCapacity	Measurement	1..1	Pump	Capacity of the pump, expressed as a measurement type (value and UOM)
Attribute tagged values				
Tag		Value		
sequenceNumber		30		
pumpType	ScopedName	1..1	Pump	Identification of the type of pump
Attribute tagged values				
Tag		Value		
sequenceNumber		40		
riserPipeDiameter	ScopedName	1..1	Pump	Identification of the diameter of a riser pipe used in a water pump
Attribute tagged values				
Tag		Value		
sequenceNumber		50		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes			
installation	DeviceInstallation	1	Device				
	Association tagged values						
	<table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>160</td></tr></table>				Tag	Value	sequenceNumber
Tag	Value						
sequenceNumber	160						

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Suppress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="Pump" type="gwml:PumpType"
substitutionGroup="gwml:Device">
  <xs:annotation>
    <xs:documentation>Good reference on water pumps
http://www.popularmechanics.com/home_improvement/how_it_works/1275136.html?page=1&amp;amp;c=y

A water well pump is a pump that is used in extracting water from a water well. There are many makes of
pumps, the foremost being Franklin Electric (American), and Pedrollo (Italian).

They include different kinds of pumps, yet most of them are submersible pumps:

    * manual pumpless/hand pump wells requiring a human operator
    * mechanical or rotary pump requiring mechanical parts to pump water
    * solar water pumps
    * DC Submersible Well Pump
    * Pumps driven by air as used by the Amish
    * Pumps driven by air as used in the Australian outback.
http://en.wikipedia.org/wiki/Water_well_pump</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PumpType">
  <xs:complexContent>
    <xs:extension base="gwml:DeviceType">
      <xs:sequence>
        <xs:element name="make" type="gml:CodeType">
          <xs:annotation>
            <xs:documentation>Brand of the pump</xs:documentation>
          </xs:annotation>
```

```

        </xs:element>
        <xs:element name="model" type="gml:CodeType">
          <xs:annotation>
            <xs:documentation>Model of the pump</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="pumpCapacity" type="om:ObservationPropertyType">
          <xs:annotation>
            <xs:documentation>Capacity of the pump, expressed as a measurement type (value and
UOM)</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="pumpType" type="gml:CodeType">
          <xs:annotation>
            <xs:documentation>Identification of the type of pump</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="riserPipeDiameter" type="gml:CodeType">
          <xs:annotation>
            <xs:documentation>Identification of the diameter of a riser pipe used in a water
pump</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PumpPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:Pump"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>

```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> PumpTesting (extends GroundwaterTesting)

An aquifer test (or a pumping test) is conducted to evaluate an aquifer by "stimulating" the aquifer through constant pumping, and observing the aquifer's "response" (drawdown) in observation wells. Aquifer testing is a common tool that hydrogeologists use to characterize a system of aquifers, aquitards and flow system boundaries.
http://en.wikipedia.org/wiki/Aquifer_test

Local Subclasses: [PackerTesting](#) [SlugTesting](#)

Attributes

Name	Type	Bounds	From Class	Notes
groundwaterTestType	GroundwaterTestCode	1..1	GroundwaterTesting	Code used to refer to a particular hydraulic test, defined in the hydraulicTestCode enumeration.
	<i>Attribute tagged values</i>			
	Tag	Value		
	sequenceNumber	10		
rawResult	Any	0..*	GroundwaterTesting	Pointer to a file where the raw results are (image, file, raw data). Raw, uninterpreted data that is used to produce a result for the Observation
	<i>Attribute tagged values</i>			
	Tag	Value		
	sequenceNumber	20		
duration	TM_PeriodDuration	1..1	PumpTesting	Duration on which the pump testing is performed.
	<i>Attribute tagged values</i>			
	Tag	Value		
	sequenceNumber	10		
rate	Measurement	1..1	PumpTesting	Rate at which the water is pumped during the pumping test.
	<i>Attribute tagged values</i>			
	Tag	Value		
	sequenceNumber	20		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
report	CI_Citation	0..*	GroundwaterTesting	
	Association tagged values			
	Tag	Value		
	sequenceNumber	110		
contact	CI_ResponsibleParty	0..*	GroundwaterTesting	

Association tagged values	
Tag	Value
sequenceNumber	120

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PumpTesting" type="gwml:PumpTestingType"
substitutionGroup="gwml:GroundwaterTesting">
  <xs:annotation>
    <xs:documentation>An aquifer test (or a pumping test) is conducted to evaluate an aquifer by
"stimulating" the aquifer through constant pumping, and observing the aquifer's "response" (drawdown) in
observation wells. Aquifer testing is a common tool that hydrogeologists use to characterize a system of
aquifers, aquitards and flow system boundaries.
http://en.wikipedia.org/wiki/Aquifer_test</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PumpTestingType">
  <xs:complexContent>
    <xs:extension base="gwml:GroundwaterTestingType">
      <xs:sequence>
        <xs:element name="duration" type="duration">
          <xs:annotation>
            <xs:documentation>Duration on which the pump testing is performed.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="rate" type="om:ObservationPropertyType">
          <xs:annotation>
            <xs:documentation>Rate at which the water is pumped during the pumping
test.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PumpTestingPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:PumpTesting"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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Class <<FeatureType>> RadialFlow (extends WaterFlow)

The flow of water in an aquifer toward a well.
(<http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html>)

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
flowProcess	WaterFlowProcess	1..1	WaterFlow	Identification of a particular process in the groundwater cycle
	<i>Attribute tagged values</i>			
	Tag	Value		
	sequenceNumber	10		
quantity	CGI_Numeric	1..1	WaterFlow	Quantity of water transferred during a particular water flow process.
	<i>Attribute tagged values</i>			
	Tag	Value		
	sequenceNumber	20		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
budget	WaterBudget	1	WaterFlow	
	Association tagged values			
	Tag	Value		
	sequenceNumber	110		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false

		Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="RadialFlow" substitutionGroup="gwml:WaterFlow" type="gwml:RadialFlowType">
  <xs:annotation>
    <xs:documentation>The flow of water in an aquifer toward a well.
(http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="RadialFlowType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterFlowType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="RadialFlowPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:RadialFlow"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> RechargeArea

Area in which water reaches the groundwater reservoir by surface infiltration. An area in which there is a downward component of hydraulic head in the aquifer.
(<http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html>)

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="RechargeArea" substitutionGroup="gml:_Feature" type="gwml:RechargeAreaType">
  <xs:annotation>
    <xs:documentation>Area in which water reaches the groundwater reservoir by surface infiltration. An area in which there is a downward component of hydraulic head in the aquifer.
    (http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="RechargeAreaType">
  <xs:complexContent>
    <xs:extension base="gml:AbstractFeatureType" />
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="RechargeAreaPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:RechargeArea"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup" />
</xs:complexType>
```

</xs:complexType>

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

OverviewPackageClassHelp

Class <<FeatureType>> Reservoir

A reservoir is, most broadly, a place or hollow vessel where fluid is kept in reserve, for later use.
<http://en.wikipedia.org/wiki/Reservoir>

(1) A pond, lake, or basin, either natural or artificial, for the storage, regulation, and control of water. (2) An artificially created lake in which water is collected and stored for future use.
<http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-r.pdf>

Local Subclasses: [AtmosphericReservoir](#) [BiologicReservoir](#) [GeologicReservoir](#) [SurfaceReservoir](#) [TransitReservoir](#) [UtilityReservoir](#)

Attributes

Name	Type	Bounds	From Class	Notes
capacity	CGI_Numeric	0..1	Reservoir	Capacity of a reservoir to contain water, expressed as a numeric value and the unit of measurment.
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		10	

Outbound Associations

Name	Type	Multiplicity	From Class	Notes				
reservoirBudget	WaterBudget	1	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>130</td></tr></table>				Tag	Value	sequenceNumber	130
	Tag	Value						
sequenceNumber	130							
hydrauliqualyBoundedBy	HydraulicBoundary	0..*	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>140</td></tr></table>				Tag	Value	sequenceNumber	140
	Tag	Value						
sequenceNumber	140							
containedWater	GroundwaterBody	0..*	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>141</td></tr></table>				Tag	Value	sequenceNumber	141
	Tag	Value						
sequenceNumber	141							
waterQuantity	WaterQuantityDescription	1	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>160</td></tr></table>				Tag	Value	sequenceNumber	160
	Tag	Value						
sequenceNumber	160							

partOfReservoir	Reservoir	0..1	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>170</td></tr></table>				Tag	Value	sequenceNumber	170
	Tag	Value						
sequenceNumber	170							
recharge	Reservoir	1	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>190</td></tr></table>				Tag	Value	sequenceNumber	190
	Tag	Value						
sequenceNumber	190							
containedWater	AtmosphericWaterBody	0..*	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>195</td></tr></table>				Tag	Value	sequenceNumber	195
	Tag	Value						
sequenceNumber	195							

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="Reservoir" substitutionGroup="gml:_Feature" type="gml:ReservoirType">
  <xs:annotation>
    <xs:documentation>A reservoir is, most broadly, a place or hollow vessel where fluid is kept in reserve, for later use.
    http://en.wikipedia.org/wiki/Reservoir

    (1) A pond, lake, or basin, either natural or artificial, for the storage, regulation, and control of water.
    (2) An artificially created lake in which water is collected and stored for future use.
    http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-r.pdf</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ReservoirType">
  <xs:complexContent>
    <xs:extension base="gml:AbstractFeatureType">
```



```
<xs:sequence>
  <xs:element maxOccurs="1" minOccurs="0" name="capacity" type="gsml:CGI_NumericPropertyType">
    <xs:annotation>
      <xs:documentation>Capacity of a reservoir to contain water, expressed as a numeric
value and the unit of measurment.</xs:documentation>
    </xs:annotation>
  </xs:element>
  <xs:element name="reservoirBudget" type="gwml:WaterBudgetPropertyType"/>
  <xs:element maxOccurs="unbounded" minOccurs="0" name="hydrauliqualyBoundedBy"
type="gwml:HydraulicBoundaryPropertyType"/>
  <xs:element maxOccurs="unbounded" minOccurs="0" name="containedGWater"
type="gwml:GroundwaterBodyPropertyType"/>
  <xs:element maxOccurs="unbounded" minOccurs="0" name="reservoirPart"
type="gwml:ReservoirPropertyType"/>
  <xs:element name="waterQuantity" type="gwml:WaterQuantityDescriptionPropertyType"/>
  <xs:element maxOccurs="1" minOccurs="0" name="partOfReservoir"
type="gwml:ReservoirPropertyType"/>
  <xs:element name="discharge" type="gwml:ReservoirPropertyType"/>
  <xs:element name="recharge" type="gwml:ReservoirPropertyType"/>
  <xs:element maxOccurs="unbounded" minOccurs="0" name="containedAWater"
type="gwml:AtmosphericWaterBodyPropertyType"/>
</xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ReservoirPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:Reservoir"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp



Class <<FeatureType>> Screen (extends [WellConstruction](#))

General information related to water well and screens.

At the bottom of wells, based on formation, a screening device, filter pack, slotted casing, or open bore hole is left to allow the flow of water into the well. Constructed screens are typically used in unconsolidated formations (sands, gravels, etc.), allowing water and a percentage of the formation to pass through the screen. Allowing some material to pass through creates a large area filter out of the rest of the formation, as the amount of material present to pass into the well slowly decreases and is removed from the well. Rock wells are typically cased with a PVC liner/casing and screen or slotted casing at the bottom, this is mostly present just to keep rocks from entering the pump assembly. Some wells utilize a 'filter pack' method, where an undersized screen or slotted casing is placed inside the well and a filter medium is packed around the screen, between the screen and the borehole or casing. This allows the water to be filtered of unwanted materials before entering the well and pumping zone.
http://en.wikipedia.org/wiki/Water_well

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes			
screenElement	ScreenComponent	1..*	Screen				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>110</td></tr></table>		Tag	Value	sequenceNumber	110	
Tag	Value						
sequenceNumber	110						

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="Screen" type="gwml:ScreenType"
substitutionGroup="gwml:WellConstruction">
  <xs:annotation>
    <xs:documentation>General information related to water well and screens.

At the bottom of wells, based on formation, a screening device, filter pack, slotted casing, or open bore
hole is left to allow the flow of water into the well. Constructed screens are typically used in
unconsolidated formations (sands, gravels, etc.), allowing water and a percentage of the formation to pass
through the screen. Allowing some material to pass through creates a large area filter out of the rest of
the formation, as the amount of material present to pass into the well slowly decreases and is removed from
the well. Rock wells are typically cased with a PVC liner/casing and screen or slotted casing at the
bottom, this is mostly present just to keep rocks from entering the pump assembly. Some wells utilize a
'filter pack' method, where an undersized screen or slotted casing is placed inside the well and a filter
medium is packed around the screen, between the screen and the borehole or casing. This allows the water to
be filtered of unwanted materials before entering the well and pumping zone.
http://en.wikipedia.org/wiki/Water_well</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ScreenType">
  <xs:complexContent>
    <xs:extension base="gwml:WellConstructionType">
      <xs:sequence>
        <xs:element name="screenElement" type="gwml:ScreenComponentPropertyType" minOccurs="1"
maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ScreenPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:Screen"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> ScreenComponent (extends [ConstructionComponent](#))

Class used to details the various components of the water pump screen.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
position	GM_LineString	1..1	ConstructionComponent	This attribute is used to reference the shape of the samplingCurve from which the WaterWell derives.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
attachementMethod	CGI_Term	0..1	ScreenComponent	Identification of screen attachement method. Can be telescoped, on casing, on riser pipe, neoprene (K) packer, Lead packer, other, unknown. Groundwater Data Management Guidelines, Environment Canada, Dec. 1991
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
coating	CGI_Term	0..1	ScreenComponent	Identification of the thin outer layer applied to the screen. Can be galvanized, stainless, copper bearing, low carbon, black, porous. Groundwater Data Management Guidelines, Environment Canada, Dec. 1991
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	20		
form	CGI_Term	0..1	ScreenComponent	Form of the screen. Can be slotted casing, perforated casing, bridge slot casing, wire wrap or continuous slot, wire mesh, shutter or louvered, well point, tube, unknown, other. Groundwater Data Management Guidelines, Environment Canada, Dec. 1991
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	30		
holeSize	CGI_Numeric	0..1	ScreenComponent	Size of the slots or perforations of the screen.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	40		
material	CGI_Term	0..1	ScreenComponent	Identification of the material with which the screen is made. Can be metal, steel, iron, copper, brass, bronze, everdur, Armco metal, veriperm, stone, plastic, PVC, ABS, Fibreglass. Groundwater Data Management Guidelines, Environment Canada, Dec. 1991
	Attribute tagged values			
	Tag	Value		

	sequenceNumber		50	
nominalScreenDiameter	CGI_Numeric	0..1	ScreenComponent	Value of the nominal screen diameter (thickness of the screen rim).
	Attribute tagged values			
	Tag	Value		
	sequenceNumber		60	
perforationMethod	CGI_Term	0..1	ScreenComponent	Information on how the slots were performed. Can be drill, grinder, axe / chisel, machine, saw, torch, other, unknown.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber		70	
screenFitting	CGI_Term	0..1	ScreenComponent	Identification of the screen fitting (from the bottom). Can be bail, open, plug, tail pipe, washdown, unknown. Groundwater Data Management Guidelines, Environment Canada, Dec. 1991
	Attribute tagged values			
	Tag	Value		
	sequenceNumber		74	
screenMake	CGI_Term	0..1	ScreenComponent	Make of the screen.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber		78	
screenModel	CGI_Term	0..1	ScreenComponent	Model of the screen
	Attribute tagged values			
	Tag	Value		
	sequenceNumber		80	
screenNumber	CGI_Term	0..1	ScreenComponent	Screen number corresponds to hole size and is given in 0.001 inch. The value is expressed as an alphanumeric code. Groundwater Data Management Guidelines, Environment Canada, Dec. 1991
	Attribute tagged values			
	Tag	Value		
	sequenceNumber		84	
screenPlacement	CGI_Term	0..1	ScreenComponent	Value of thescreen placement method. Can be bail down, pull back, jetted, washed down, unknown. Groundwater Data Management Guidelines, Environment Canada, Dec. 1991
	Attribute tagged values			
	Tag	Value		
	sequenceNumber		88	
screenThickness	CGI_Numeric	0..1	ScreenComponent	Thickness of the screen walls.

	Attribute tagged values	
	Tag	Value
	sequenceNumber	90

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Suppress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ScreenComponent"
type="gwm1:ScreenComponentType" substitutionGroup="gwm1:ConstructionComponent">
  <xs:annotation>
    <xs:documentation>Class used to details the various components of the water pump
screen.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ScreenComponentType">
  <xs:complexContent>
    <xs:extension base="gwm1:ConstructionComponentType">
      <xs:sequence>
        <xs:element name="attachementMethod" type="gsml:CGI_TermPropertyType" minOccurs="0"
maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Identification of screen attachement method. Can be telescoped, on
casing, on riser pipe, neoprene (K) packer, Lead packer, other, unknown.
Groundwater Data Management Guidelines, Environment Canada, Dec. 1991</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="coating" type="gsml:CGI_TermPropertyType" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Identification of the thin outer layer applied to the screen. Can
be galvanized, stainless, copper bearing, low carbon, black, porous.
Groundwater Data Management Guidelines, Environment Canada, Dec. 1991</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="form" type="gsml:CGI_TermPropertyType" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Form of the screen. Can be slotted casing, perforated casing,
bridge slot casing, wire wrap or continuous slot, wire mesh, shutter or louvered, well point, tube,
unknown, other.
```

```

Groundwater Data Management Guidelines, Environment Canada, Dec. 1991</xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="holeSize" type="gsml:CGI_NumericPropertyType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Size of the slots or perforations of the screen.</xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="material" type="gsml:CGI_TermPropertyType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Identification of the material with which the screen is made. Can
be metal, steel, iron, copper, brass, bronze, everdur, Armco metal, veriperm, stone, plastic, PVC, ABS,
Fibreglass.
Groundwater Data Management Guidelines, Environment Canada, Dec. 1991</xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="nominalScreenDiameter" type="gsml:CGI_NumericPropertyType" minOccurs="0"
maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Value of the nominal screen diameter (thickness of the screen
rim).</xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="perforationMethod" type="gsml:CGI_TermPropertyType" minOccurs="0"
maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Information on how the slots were performed. Can be drill,
grinder, axe / chisel, machine, saw, torch, other, unknown.</xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="screenFitting" type="gsml:CGI_TermPropertyType" minOccurs="0"
maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Identification of the screen fitting (from the bottom). Can be
bail, open, plug, tail pipe, washdown, unknown.
Groundwater Data Management Guidelines, Environment Canada, Dec. 1991</xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="screenMake" type="gsml:CGI_TermPropertyType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Make of the screen.</xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="screenModel" type="gsml:CGI_TermPropertyType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Model of the screen</xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="screenNumber" type="gsml:CGI_TermPropertyType" minOccurs="0"
maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Screen number corresponds to hole size and is given in 0.001 inch.
The value is expressed as an alphanumeric code.
Groundwater Data Management Guidelines, Environment Canada, Dec. 1991</xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="screenPlacement" type="gsml:CGI_TermPropertyType" minOccurs="0"
maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Value of thescreen placement method. Can be bail down, pull back,
jetted, washed down, unknown.
Groundwater Data Management Guidelines, Environment Canada, Dec. 1991</xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="screenThickness" type="gsml:CGI_NumericPropertyType" minOccurs="0"
maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Thickness of the screen walls.</xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ScreenComponentPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:ScreenComponent"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>

```

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

OverviewPackageClassHelp



Class <<FeatureType>> Sealing (extends [WellConstruction](#))

WELL SEAL: a device used to cover the top of a well casing pipe and thereby seal the top of the well casing to prevent the entry of surface runoff. A well seal differs from a well cap in that a seal has a gasket and a cap does not. A well seal should include a screened vent pipe that passes through the gasket to allow pressure equilibration. A screen is necessary to reduce contaminant entry. The vent should be high enough not to be flooded.
<http://www.purdue.edu/envirosoft/well/src/construc4.htm>

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
groutingPlacementMethod	Process	0..1	Sealing	Refers to the grout placement method on a water well.
				Grout : Injection of liquid cement or chemicals into the ground where they set thus impeding or preventing water flow by reducing permeability and improving the strength of rocks by filling pores and fractures. Primary injection holes are spaced at regular intervals with infilling of secondary holes where necessary. The type of grout and its viscosity depends on rock type because of varying size of pores and fractures and hydraulic resistance. The migration of grout is controlled by permeability. AILSA ALLABY and MICHAEL ALLABY. "grouting." A Dictionary of Earth Sciences. 1999. Retrieved December 23, 2008 from Encyclopedia.com: http://www.encyclopedia.com/doc/1O13-grouting.html
				<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>
Tag	Value			
sequenceNumber	10			

Outbound Associations

Name	Type	Multiplicity	From Class	Notes				
sealingElement	SealingComponent	0..*	Sealing					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>120</td></tr></table>				Tag	Value	sequenceNumber	120
	Tag	Value						
sequenceNumber	120							
wellCasingLeft	WellCasingComponent	0..*	Sealing	casing left after plugging				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>140</td></tr></table>				Tag	Value	sequenceNumber	140
	Tag	Value						
sequenceNumber	140							
wellCasingSlit	WellCasingComponent	0..*	Sealing					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>150</td></tr></table>				Tag	Value	sequenceNumber	150
	Tag	Value						
sequenceNumber	150							

Constraints

--	--	--	--

Constraint	Type	Status	Weight
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Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="Sealing" type="gwml:SealingType"
substitutionGroup="gwml:WellConstruction">
  <xs:annotation>
    <xs:documentation>WELL SEAL: a device used to cover the top of a well casing pipe and thereby seal
the top of the well casing to prevent the entry of surface runoff. A well seal differs from a well cap in
that a seal has a gasket and a cap does not. A well seal should include a screened vent pipe that passes
through the gasket to allow pressure equilibration. A screen is necessary to reduce contaminant entry. The
vent should be high enough not to be flooded.
http://www.purdue.edu/envirosoft/well/src/construc4.htm</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SealingType">
  <xs:complexContent>
    <xs:extension base="gwml:WellConstructionType">
      <xs:sequence>
        <xs:element name="groutingPlacementMethod" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Refers to the grout placement method on a water well.

Grout : Injection of liquid cement or chemicals into the ground where they set thus impeding or preventing
water flow by reducing permeability and improving the strength of rocks by filling pores and fractures.
Primary injection holes are spaced at regular intervals with infilling of secondary holes where necessary.
The type of grout and its viscosity depends on rock type because of varying size of pores and fractures and
hydraulic resistance. The migration of grout is controlled by permeability.
AILSA ALLABY and MICHAEL ALLABY. "grouting." A Dictionary of Earth Sciences. 1999. Retrieved December 23,
2008 from Encyclopedia.com: http://www.encyclopedia.com/doc/1013-grouting.html</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="sealingElement" type="gwml:SealingComponentPropertyType" minOccurs="0"
maxOccurs="unbounded"/>
        <xs:element name="wellCasingLeft" type="gwml:WellCasingComponentPropertyType" minOccurs="0"
maxOccurs="unbounded">
          <xs:annotation>
            <xs:documentation>casing left after plugging</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="wellCasingSlit" type="gwml:WellCasingComponentPropertyType" minOccurs="0"
maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SealingPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:Sealing"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> SealingComponent (extends [ConstructionComponent](#))

Description of the sealing used in the construction of a water well.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
position	GM_LineString	1..1	ConstructionComponent	This attribute is used to reference the shape of the samplingCurve from which the WaterWell derives.
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		10	
material	CGI_Term	0..1	SealingComponent	Material used in the sealing component of a water well. Can be formation packer, welded ring, shale trap, drive shoe, driven casing, other. Groundwater Data Management Guidelines, Environment Canada, Dec. 1991
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		10	
sealingType	CGI_Term	0..1	SealingComponent	Describe the type of sealing. Can be annular sealing, plugging
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		20	

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
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Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.

xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SealingComponent"
type="gwml:SealingComponentType" substitutionGroup="gwml:ConstructionComponent">
  <xs:annotation>
    <xs:documentation>Description of the sealing used in the construction of a water
well.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SealingComponentType">
  <xs:complexContent>
    <xs:extension base="gwml:ConstructionComponentType">
      <xs:sequence>
        <xs:element name="material" type="gsml:CGI_TermPropertyType" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Material used in the sealing component of a water well. Can be
formation packer, welded ring, shale trap, drive shoe, driven casing, other.
Groundwater Data Management Guidelines, Environment Canada, Dec. 1991</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="sealingType" type="gsml:CGI_TermPropertyType" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Describe the type of sealing. Can be annular sealing,
plugging</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SealingComponentPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:SealingComponent"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

Overview

Package

Class

Help

Class <<FeatureType>> slugTesting (extends PumpTesting)

A slug test is a particular type of aquifer test where water is quickly added or removed from a groundwater well, and the change in hydraulic head is monitored through time, to determine the near-well aquifer characteristics. It is a method used by hydrogeologists and civil engineers to determine the transmissivity and storativity of the material the well is completed in.
http://en.wikipedia.org/wiki/Slug_test

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
groundwaterTestType	GroundwaterTestCode	1..1	GroundwaterTesting	Code used to refer to a particular hydraulic test, defined in the hydraulicTestCode enumeration.
	<i>Attribute tagged values</i>			
	Tag	Value		
	sequenceNumber	10		
rawResult	Any	0..*	GroundwaterTesting	Pointer to a file where the raw results are (image, file, raw data). Raw, uninterpreted data that is used to produce a result for the Observation
	<i>Attribute tagged values</i>			
	Tag	Value		
	sequenceNumber	20		
duration	TM_PeriodDuration	1..1	PumpTesting	Duration on which the pump testing is performed.
	<i>Attribute tagged values</i>			
	Tag	Value		
	sequenceNumber	10		
rate	Measurement	1..1	PumpTesting	Rate at which the water is pumped during the pumping test.
	<i>Attribute tagged values</i>			
	Tag	Value		
	sequenceNumber	20		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
report	CI_Citation	0..*	GroundwaterTesting	
	Association tagged values			
	Tag	Value		
	sequenceNumber	110		
contact	CI_ResponsibleParty	0..*	GroundwaterTesting	

Association tagged values		
Tag	Value	
sequenceNumber	120	

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SlugTesting" type="gwml:SlugTestingType"
substitutionGroup="gwml:PumpTesting">
  <xs:annotation>
    <xs:documentation>A slug test is a particular type of aquifer test where water is quickly added or
removed from a groundwater well, and the change in hydraulic head is monitored through time, to determine
the near-well aquifer characteristics. It is a method used by hydrogeologists and civil engineers to
determine the transmissivity and storativity of the material the well is completed in.
http://en.wikipedia.org/wiki/Slug_test</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SlugTestingType">
  <xs:complexContent>
    <xs:extension base="gwml:PumpTestingType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SlugTestingPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:SlugTesting"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> StaticWaterLevel (extends [WaterLevel](#))

This class is a subclass of waterLevel and it is used to specify the elevation of a static water level.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
gwStatus	ScopedName	1..1	StaticWaterLevel	This property is used to specify if the groundwater is already pumped or not (a new waterwell).
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="StaticWaterLevel"
substitutionGroup="gwml:WaterLevel" type="gwml:StaticWaterLevelType">
  <xs:annotation>
    <xs:documentation>This class is a subclass of waterLevel and it is used to specify the elevation of
a static water level.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="StaticWaterLevelType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterLevelType">
```



```

    <xs:sequence>
      <xs:element name="gwStatus" type="gml:CodeType">
        <xs:annotation>
          <xs:documentation>This property is used to specify if the groundwater is already
pumped or not (a new waterwell).</xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="StaticWaterLevelPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:StaticWaterLevel"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>

```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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Class <<FeatureType>> SurfaceWaterBody (extends WaterBody)

Water collecting on the ground or in a stream, river, lake, wetland, or ocean is called surface water, as opposed to groundwater or atmospheric water.
http://en.wikipedia.org/wiki/Surface_water

The water from all sources that occurs on the Earth's surface either as diffused water or as water in natural channels, artificial channels, or other surface water bodies.
http://ohioline.osu.edu/aex-fact/0460.html

(This should be detailed by the surface water working group.)

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
volume	CGI_Numeric	1..1	WaterBody	Volume of water present in a water body.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes				
waterComposition	WaterCompositionDescription	1	WaterBody					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>110</td></tr></table>				Tag	Value	sequenceNumber	110
	Tag	Value						
sequenceNumber	110							
occurence	HydrogeologicMappedFeature	0..*	WaterBody					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>145</td></tr></table>				Tag	Value	sequenceNumber	145
	Tag	Value						
sequenceNumber	145							
subWaterBody	WaterBody	0..*	WaterBody					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>155</td></tr></table>				Tag	Value	sequenceNumber	155
	Tag	Value						
sequenceNumber	155							

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SufaceWaterBody"
type="gwml:SufaceWaterBodyType" substitutionGroup="gwml:WaterBody">
  <xs:annotation>
    <xs:documentation>Water collecting on the ground or in a stream, river, lake, wetland, or ocean is
called surface water, as opposed to groundwater or atmospheric water.
http://en.wikipedia.org/wiki/Surface_water

The water from all sources that occurs on the Earth's surface either as diffused water or as water in
natural channels, artificial channels, or other surface water bodies.
http://ohioline.osu.edu/aex-fact/0460.html

(This should be detailed by the surface water working group.)</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SufaceWaterBodyType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterBodyType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SufaceWaterBodyPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:SufaceWaterBody"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> SurfaceReservoir (extends [Reservoir](#))

A surface reservoir refers to an artificial lake, used to store water for various uses.
[http://en.wikipedia.org/wiki/Reservoir_\(water\)](http://en.wikipedia.org/wiki/Reservoir_(water))

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
capacity	CGI_Numeric	0..1	Reservoir	Capacity of a reservoir to contain water, expressed as a numeric value and the unit of measurment.
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		10	

Outbound Associations

Name	Type	Multiplicity	From Class	Notes				
reservoirBudget	WaterBudget	1	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>130</td></tr></table>				Tag	Value	sequenceNumber	130
	Tag	Value						
	sequenceNumber	130						
hydrauliqualyBoundedBy	HydraulicBoundary	0..*	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>140</td></tr></table>				Tag	Value	sequenceNumber	140
	Tag	Value						
	sequenceNumber	140						
containedWater	GroundwaterBody	0..*	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>141</td></tr></table>				Tag	Value	sequenceNumber	141
	Tag	Value						
	sequenceNumber	141						
waterQuantity	WaterQuantityDescription	1	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>160</td></tr></table>				Tag	Value	sequenceNumber	160
	Tag	Value						
	sequenceNumber	160						
partOfReservoir	Reservoir	0..1	Reservoir					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>170</td></tr></table>				Tag	Value	sequenceNumber	170
	Tag	Value						
	sequenceNumber	170						

recharge	Reservoir	1	Reservoir				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>190</td></tr></table>				Tag	Value	sequenceNumber
Tag	Value						
sequenceNumber	190						
containedWater	AtmosphericWaterBody	0..*	Reservoir				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>195</td></tr></table>				Tag	Value	sequenceNumber
Tag	Value						
sequenceNumber	195						

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SurfaceReservoir"
substitutionGroup="gwml:Reservoir" type="gwml:SurfaceReservoirType">
  <xs:annotation>
    <xs:documentation>A surface reservoir refers to an artificial lake, used to store water for various
uses.
http://en.wikipedia.org/wiki/Reservoir_(water)</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SurfaceReservoirType">
  <xs:complexContent>
    <xs:extension base="gwml:ReservoirType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SurfaceReservoirPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:SurfaceReservoir"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> TracingTest (extends [GroundwaterTesting](#))

Tracer tests are used to "trace" the path of flowing water. Tracer tests are conducted in pipelines, lakes, rivers and groundwater. The tracer chemical must be dissolved in water at concentrations that do not significantly change the aqueous density. Tracer chemicals must behave conservatively --> meaning no mass is lost through reaction or partitioning into differing phases (vapor, solids). Thus, the only solute transport processes affecting a conservative tracer are advection and dispersion. Advection is the movement of the solute (dissolved tracer) due to groundwater flowing and moving. The mean pore-water velocity (calculated from Darcy's Law) is used to predict advection. As the pore-water velocities within the groundwater are not uniform (variability around the mean velocity), some solute will move slower than the mean velocity and other solute will move faster than the mean velocity. The resulting dispersion of the solute causes a broadening of the solute plume and a decrease in the concentration. The ambient or background level of tracer chemical in the receiving waters must be low.
<http://www.geology.sdsu.edu/classes/geol552/tracertestdesign.htm>

Test that involves injecting a tracer and detecting its diffusion into another site.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
groundwaterTestType	GroundwaterTestCode	1..1	GroundwaterTesting	Code used to refer to a particular hydraulic test, defined in the hydraulicTestCode enumeration.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
rawResult	Any	0..*	GroundwaterTesting	Pointer to a file where the raw results are (image, file, raw data). Raw, uninterpreted data that is used to produce a result for the Observation
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	20		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
report	CI_Citation	0..*	GroundwaterTesting	
	Association tagged values			
	Tag	Value		
	sequenceNumber	110		
contact	CI_ResponsibleParty	0..*	GroundwaterTesting	
	Association tagged values			
	Tag	Value		
	sequenceNumber	120		

Constraints

Constraint	Type	Status	Weight
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Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Suppress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="TracingTest" type="gwml:TracingTestType"
substitutionGroup="gwml:GroundwaterTesting">
  <xs:annotation>
    <xs:documentation>Tracer tests are used to "trace" the path of flowing water. Tracer tests are
conducted in pipelines, lakes, rivers and groundwater. The tracer chemical must be dissolved in water at
concentrations that do not significantly change the aqueous density. Tracer chemicals must behave
conservatively --&gt; meaning no mass is lost through reaction or partitioning into differing phases
(vapor, solids). Thus, the only solute transport processes affecting a conservative tracer are advection
and dispersion. Advection is the movement of the solute (dissolved tracer) due to groundwater flowing and
moving. The mean pore-water velocity (calculated from Darcy's Law) is used to predict advection. As the
pore-water velocities within the groundwater are not uniform (variability around the mean velocity), some
solute will move slower than the mean velocity and other solute will move faster than the mean velocity.
The resulting dispersion of the solute causes a broadening of the solute plume and a decrease in the
concentration. The ambient or background level of tracer chemical in the receiving waters must be low.
http://www.geology.sdsu.edu/classes/geol552/tracertestdesign.htm

Test that involves injecting a tracer and detecting its diffusion into another site.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="TracingTestType">
  <xs:complexContent>
    <xs:extension base="gwml:GroundwaterTestingType" />
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="TracingTestPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:TracingTest" />
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup" />
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> TransitReservoir (extends Reservoir)

a special reservoir to represent water drawn from (or injected to) a specific reservoir but where to destination is unspecified. For example, to represent the total amount of water drawn from an aquifer over a year.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
capacity	CGI_Numeric	0..1	Reservoir	Capacity of a reservoir to contain water, expressed as a numeric value and the unit of measurment.
Attribute tagged values				
Tag		Value		
sequenceNumber		10		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
reservoirBudget	WaterBudget	1	Reservoir	
Association tagged values				
Tag		Value		
sequenceNumber		130		
hydrauliqualyBoundedBy	HydraulicBoundary	0..*	Reservoir	
Association tagged values				
Tag		Value		
sequenceNumber		140		
containedWater	GroundwaterBody	0..*	Reservoir	
Association tagged values				
Tag		Value		
sequenceNumber		141		
waterQuantity	WaterQuantityDescription	1	Reservoir	
Association tagged values				
Tag		Value		
sequenceNumber		160		
partOfReservoir	Reservoir	0..1	Reservoir	
Association tagged values				
Tag		Value		
sequenceNumber		170		

recharge	Reservoir	1	Reservoir	
	Association tagged values			
	Tag	Value		
	sequenceNumber	190		
containedWater	AtmosphericWaterBody	0..*	Reservoir	
	Association tagged values			
	Tag	Value		
	sequenceNumber	195		

Constraints

Constraint	Type	Status	Weight
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Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="TransitReservoir"
substitutionGroup="gwml:Reservoir" type="gwml:TransitReservoirType">
  <xs:annotation>
    <xs:documentation>a special reservoir to represent water drawn from (or injected to) a specific
reservoir but where to destination is unspecified. For example, to represent the total amount of water
drawn from an aquifer over a year.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="TransitReservoirType">
  <xs:complexContent>
    <xs:extension base="gwml:ReservoirType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="TransitReservoirPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:TransitReservoir"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

Overview

Package

Class

Help

Class <<FeatureType>> UnconfinedAquifer (extends [Aquifer](#))

An aquifer containing water that is not under pressure; the water level in a well is the same as the water table outside the well. An unconfined aquifer made up of loose material, such as sand or gravel, that has not undergone lithification (settling). In an unconfined aquifer the upper boundary is the top of the <i>Zone of Saturation </i>(water table).
<http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-u.pdf>

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
mediaType	AquiferMediaType	1..1	Aquifer	Property used to specify the medium of an aquifer.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes				
relatedReservoir	GeologicReservoir	0..*	HydrogeologicUnit					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>120</td></tr></table>				Tag	Value	sequenceNumber	120
	Tag	Value						
sequenceNumber	120							
waterContent	GroundwaterBody	0..*	HydrogeologicUnit					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>125</td></tr></table>				Tag	Value	sequenceNumber	125
	Tag	Value						
sequenceNumber	125							
waterQuantity	WaterQuantityDescription	0..*	HydrogeologicUnit					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>140</td></tr></table>				Tag	Value	sequenceNumber	140
	Tag	Value						
sequenceNumber	140							
hydrogeologicClass	Categorisation	0..*	HydrogeologicUnit					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>170</td></tr></table>				Tag	Value	sequenceNumber	170
	Tag	Value						
sequenceNumber	170							

Constraints

Constraint	Type	Status	Weight
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Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="UnconfinedAquifer"
substitutionGroup="gwml:Aquifer" type="gwml:UnconfinedAquiferType">
  <xs:annotation>
    <xs:documentation>An aquifer containing water that is not under pressure; the water level in a well
is the same as the water table outside the well. An unconfined aquifer made up of loose material, such as
sand or gravel, that has not undergone lithification (settling). In an unconfined aquifer the upper
boundary is the top of the <i>Zone of Saturation</i>(water table).
http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-u.pdf</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="UnconfinedAquiferType">
  <xs:complexContent>
    <xs:extension base="gwml:AquiferType" />
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="UnconfinedAquiferPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:UnconfinedAquifer" />
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup" />
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> UtilityReservoir (extends Reservoir)

Reservoir related to water usage by human/agriculture. ie. Water pumped from a aquifer to a city water system has this reservoir as a target (because we don't know yet where this water will end up), although we know it will eventually return to the other reservoirs

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
capacity	CGI_Numeric	0..1	Reservoir	Capacity of a reservoir to contain water, expressed as a numeric value and the unit of measurment.
Attribute tagged values				
Tag		Value		
sequenceNumber		10		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
reservoirBudget	WaterBudget	1	Reservoir	
Association tagged values				
Tag		Value		
sequenceNumber		130		
hydrauliqualyBoundedBy	HydraulicBoundary	0..*	Reservoir	
Association tagged values				
Tag		Value		
sequenceNumber		140		
containedWater	GroundwaterBody	0..*	Reservoir	
Association tagged values				
Tag		Value		
sequenceNumber		141		
waterQuantity	WaterQuantityDescription	1	Reservoir	
Association tagged values				
Tag		Value		
sequenceNumber		160		
partOfReservoir	Reservoir	0..1	Reservoir	
Association tagged values				
Tag		Value		
sequenceNumber		170		

recharge	Reservoir	1	Reservoir				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>190</td></tr></table>			Tag	Value	sequenceNumber	190
	Tag	Value					
sequenceNumber	190						
containedWater	AtmosphericWaterBody	0..*	Reservoir				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>195</td></tr></table>			Tag	Value	sequenceNumber	195
	Tag	Value					
sequenceNumber	195						

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" abstract="true" name="UtilityReservoir"
substitutionGroup="gwml:Reservoir" type="gwml:UtilityReservoirType">
  <xs:annotation>
    <xs:documentation>Reservoir related to water usage by human/agriculture. ie. Water pumped from a
aquifer to a city water system has this reservoir as a target (because we don't know yet where this water
will end up), although we know it will eventually return to the other reservoirs</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" abstract="true" name="UtilityReservoirType">
  <xs:complexContent>
    <xs:extension base="gwml:ReservoirType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="UtilityReservoirPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:UtilityReservoir"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> WaterBody

A mass or a volume of water, constrained geographically and/or structurally. An ocean is a water body, as a the water within an aquifer. This class is a distinction between water as a material and water as a feature

The concept of water body is also present in Vogt (2002) [Vogt, J., 2002. Guidance Document on Implementing the GIS Elements of the Water Framework Directive] as an European directive. In the latter case, the european concept is more administrative than scientific.

The spatio-temporal representation of this body (it's geometry at time T is represented by a MappedFeature)

Local Subclasses: [AtmosphericWaterBody](#) [GroundwaterBody](#) [SurfaceWaterBody](#)

Attributes

Name	Type	Bounds	From Class	Notes				
volume	CGI_Numeric	1..1	WaterBody	Volume of water present in a water body.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes				
waterComposition	WaterCompositionDescription	1	WaterBody					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>110</td></tr></table>				Tag	Value	sequenceNumber	110
	Tag	Value						
sequenceNumber	110							
occurence	HydrogeologicMappedFeature	0..*	WaterBody					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>145</td></tr></table>				Tag	Value	sequenceNumber	145
	Tag	Value						
sequenceNumber	145							
subWaterBody	WaterBody	0..*	WaterBody					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>155</td></tr></table>				Tag	Value	sequenceNumber	155
	Tag	Value						
sequenceNumber	155							

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Suppress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterBody" type="gwml:WaterBodyType"
abstract="true" substitutionGroup="gml:_Feature">
  <xs:annotation>
    <xs:documentation>A mass or a volume of water, constrained geographically and/or structurally. An
ocean is a water body, as a the water within an aquifer. This class is a distinction between water as a
material and water as a feature
    </xs:documentation>
  </xs:annotation>
</xs:element>

The concept of water body is also present in Vogt (2002) [Vogt, J., 2002. Guidance Document on Implementing
the GIS Elements of the Water Framework Directive] as an European directive. In the latter case, the
european concept is more administrative than scientific.

The spatio-temporal representation of this body (it's geometry at time T is represented by a
MappedFeature)</xs:documentation>
</xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterBodyType" abstract="true">
  <xs:complexContent>
    <xs:extension base="gml:AbstractFeatureType">
      <xs:sequence>
        <xs:element name="volume" type="gsml:CGI_NumericPropertyType">
          <xs:annotation>
            <xs:documentation>Volume of water present in a water body.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="waterComposition" type="gwml:WaterCompositionDescriptionPropertyType"/>
        <xs:element name="superWaterBody" type="gwml:WaterBodyPropertyType" minOccurs="0"
maxOccurs="1"/>
        <xs:element name="occurence" type="gwml:HydrogeologicMappedFeaturePropertyType"
minOccurs="0" maxOccurs="unbounded"/>
        <xs:element name="subWaterBody" type="gwml:WaterBodyPropertyType" minOccurs="0"
maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterBodyPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:WaterBody"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> WaterBudget

An accounting of the inflow, outflow, and storage changes of water in a hydrologic unit.
<http://www.usgs.gov/science/science.php?term=1297&type=theme>

The role of lakes within the global hydrologic cycle has been described earlier. Lakes depend for their very existence upon a balance between their many sources of water and the losses that they experience. This so-called water budget of lakes is important enough to have warranted considerable study throughout the world, with each lake or lake system possessing its own hydrologic idiosyncrasies. Aside from being of scientific interest, water-budget studies serve to reveal the dependence of each lake on particular hydrologic factors, thus enabling better management practices. These may include restrictions on water utilization during drought conditions, dike construction and evacuations prior to flooding, control of water levels to ensure efficient power production, and major decisions associated with diversions of watercourses in order to enhance water-quantity- and water-quality-management activities.
www.britannica.com/EBchecked/topic/636988/water-budget

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
metadata	MD_Metadata	1..1	WaterBudget	Metadata associated to a water budget.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
validity	TM_Primitive	1..1	WaterBudget	Validity of this budget
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	20		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
flow	WaterFlow	1..*	WaterBudget	
	Association tagged values			
	Tag	Value		
	sequenceNumber	120		
targetReservoir	Reservoir	1	WaterBudget	
	Association tagged values			
	Tag	Value		
	sequenceNumber	140		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Suppress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterBudget" substitutionGroup="gml:_Feature" type="gwml:WaterBudgetType">
  <xs:annotation>
    <xs:documentation>An accounting of the inflow, outflow, and storage changes of water in a hydrologic unit.
    http://www.usgs.gov/science/science.php?term=1297&amp;amp;type=theme

    The role of lakes within the global hydrologic cycle has been described earlier. Lakes depend for their very existence upon a balance between their many sources of water and the losses that they experience. This so-called water budget of lakes is important enough to have warranted considerable study throughout the world, with each lake or lake system possessing its own hydrologic idiosyncrasies. Aside from being of scientific interest, water-budget studies serve to reveal the dependence of each lake on particular hydrologic factors, thus enabling better management practices. These may include restrictions on water utilization during drought conditions, dike construction and evacuations prior to flooding, control of water levels to ensure efficient power production, and major decisions associated with diversions of watercourses in order to enhance water-quantity- and water-quality-management activities.
    www.britannica.com/EBchecked/topic/636988/water-budget</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterBudgetType">
  <xs:complexContent>
    <xs:extension base="gml:AbstractFeatureType">
      <xs:sequence>
        <xs:element name="metadata" type="gmd:MD_Metadata_PropertyType">
          <xs:annotation>
            <xs:documentation>Metadata associated to a water budget.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="validity" type="gml:TimePrimitivePropertyType">
          <xs:annotation>
            <xs:documentation>Validity of this budget</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element maxOccurs="unbounded" minOccurs="1" name="flow" type="gwml:WaterFlowPropertyType"/>
        <xs:element name="targetReservoir" type="gwml:ReservoirPropertyType"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterBudgetPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:WaterBudget"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to: [UML models of GML Application Schemas](#)

For more general information about GML refer to:

[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> WaterFlow (extends Measurement)

Movement of subsurface water in the saturated zone from areas of recharge to areas of discharge.
http://www.usgs.gov/science/science.php?term=514

Local Subclasses: [ConduitFlow](#) [DiffuseFlow](#) [PorousFlow](#) [RadialFlow](#)

Attributes

Name	Type	Bounds	From Class	Notes
flowProcess	WaterFlowProcess	1..1	WaterFlow	Identification of a particular process in the groundwater cycle
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
quantity	CGI_Numeric	1..1	WaterFlow	Quantity of water transferred during a particular water flow process.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	20		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
budget	WaterBudget	1	WaterFlow	
	Association tagged values			
	Tag	Value		
	sequenceNumber	110		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false

		Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterFlow" substitutionGroup="omx:Measurement" type="gwml:WaterFlowType">
  <xs:annotation>
    <xs:documentation>Movement of subsurface water in the saturated zone from areas of recharge to areas of discharge.
http://www.usgs.gov/science/science.php?term=514</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterFlowType">
  <xs:complexContent>
    <xs:extension base="om:ObservationType">
      <xs:sequence>
        <xs:element name="flowProcess" type="gwml:WaterFlowProcessType">
          <xs:annotation>
            <xs:documentation>Identification of a particular process in the groundwater cycle</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="quantity" type="gsml:CGI_NumericPropertyType">
          <xs:annotation>
            <xs:documentation>Quantity of water transferred during a particular water flow process.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="budget" type="gwml:WaterBudgetPropertyType"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterFlowPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:WaterFlow"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> WaterFlowDirection (extends Measurement)

Measurement of the direction of the water flow, at a specific location.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes			
result	CGI_Vector	1..1	WaterFlowDirection	A direction of the water flow, expressed as a CGI_Vector with a direction and a magnitude.			
	Attribute tagged values						
	<table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10
Tag	Value						
sequenceNumber	10						

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterFlowDirection"
substitutionGroup="omx:Measurement" type="gwml:WaterFlowDirectionType">
  <xs:annotation>
    <xs:documentation>Measurement of the direction of the water flow, at a specific
location.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterFlowDirectionType">
  <xs:complexContent>
    <xs:extension base="om:ObservationType">
```



```
<xs:sequence>
  <xs:element name="result" type="gsml:CGI_VectorPropertyType">
    <xs:annotation>
      <xs:documentation>A direction of the water flow, expressed as a CGI_Vector with a
direction and a magnitude.</xs:documentation>
    </xs:annotation>
  </xs:element>
</xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterFlowDirectionPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:WaterFlowDirection"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
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Overview

Package

Class

Help

Class <<FeatureType>> WaterLevel (extends Measurement)

Measurement of the elevation of water in an aquifer.

Local Subclasses: [DynamicWaterLevel](#) [StaticWaterLevel](#)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterLevel"
substitutionGroup="omx:Measurement" type="gwml:WaterLevelType">
  <xs:annotation>
    <xs:documentation>Measurement of the elevation of water in an aquifer.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterLevelType">
  <xs:complexContent>
    <xs:extension base="om:ObservationType" />
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterLevelPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:WaterLevel"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

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OverviewPackageClassHelp



Class <<FeatureType>> WaterQualityIndex (extends Measurement)

Classification of water quality through an index. This class is a subclass a measurement class.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterQualityIndex"
substitutionGroup="omx:Measurement" type="gwml:WaterQualityIndexType">
  <xs:annotation>
    <xs:documentation>Classification of water quality through an index. This class is a subclass a
measurement class.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterQualityIndexType">
  <xs:complexContent>
    <xs:extension base="om:ObservationType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterQualityIndexPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:WaterQualityIndex"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> WaterShed (extends [HydrologicUnit](#))

A drainage basin is an extent of land where water from rain or snow melt drains downhill into a body of water, such as a river, lake, reservoir, estuary, wetland, sea or ocean. The drainage basin includes both the streams and rivers that convey the water as well as the land surfaces from which water drains into those channels, and is separated from adjacent basins by a drainage divide.[1]

The drainage basin acts like a funnel, collecting all the water within the area covered by the basin and channelling it into a waterway. Each drainage basin is separated topographically from adjacent basins by a geographical barrier such as a ridge, hill or mountain, which is known as a water divide.

Other terms that are used to describe a drainage basin are catchment, catchment area, catchment basin, drainage area, river basin, water basin and watershed.[2] In the technical sense, a watershed refers to a divide that separates one drainage area from another drainage area.[3] However, in the United States and Canada, the term is often used to mean a drainage basin or catchment area itself. Watersheds drain into other watersheds in a hierarchical form, larger ones breaking into smaller ones or sub-watersheds with the topography determining where the water flows.
http://en.wikipedia.org/wiki/Drainage_basin

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
kywid	ScopedName	1..1	WaterShed	Identification number related to a watershed. The ID number is provided by Environment Canada.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes				
parentWatershed	WaterShed	0..1	WaterShed					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>170</td></tr></table>				Tag	Value	sequenceNumber	170
	Tag	Value						
	sequenceNumber	170						

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false

		Description: Suppress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterShed"
substitutionGroup="gwml:HydrologicUnit" type="gwml:WaterShedType">
  <xs:annotation>
    <xs:documentation>A drainage basin is an extent of land where water from rain or snow melt drains
downhill into a body of water, such as a river, lake, reservoir, estuary, wetland, sea or ocean. The
drainage basin includes both the streams and rivers that convey the water as well as the land surfaces from
which water drains into those channels, and is separated from adjacent basins by a drainage divide.[1]

The drainage basin acts like a funnel, collecting all the water within the area covered by the basin and
channelling it into a waterway. Each drainage basin is separated topographically from adjacent basins by a
geographical barrier such as a ridge, hill or mountain, which is known as a water divide.

Other terms that are used to describe a drainage basin are catchment, catchment area, catchment basin,
drainage area, river basin, water basin and watershed.[2] In the technical sense, a watershed refers to a
divide that separates one drainage area from another drainage area.[3] However, in the United States and
Canada, the term is often used to mean a drainage basin or catchment area itself. Watersheds drain into
other watersheds in a hierarchical form, larger ones breaking into smaller ones or sub-watersheds with the
topography determining where the water flows.
http://en.wikipedia.org/wiki/Drainage_basin</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterShedType">
  <xs:complexContent>
    <xs:extension base="gwml:HydrologicUnitType">
      <xs:sequence>
        <xs:element name="kywid" type="gml:CodeType">
          <xs:annotation>
            <xs:documentation>Identification number related to a watershed. The ID number is
provided by Environment Canada.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element maxOccurs="1" minOccurs="0" name="parentWatershed"
type="gwml:WaterShedPropertyType"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterShedPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:WaterShed"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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OverviewPackageClassHelp



Class <<FeatureType>> WaterSpecimen (extends Specimen)

This class is a sub-class of a specimen class, which is defined as follows "A Specimen is some physical material sampled from a specified location, typically associated with a Site, such as a Station, a location or interval within a Section, or a location or extent from a DescriptionExtent".

It adds a specific property for a waterSpecimen (volume).

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes			
volume	CGI_Numeric	1..1	WaterSpecimen	Volume of the water specimen, expressed as a CGI_Numeric value (value + unit of measure).			
	Attribute tagged values						
	<table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10
Tag	Value						
sequenceNumber	10						

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterSpecimen" substitutionGroup="sa:Specimen" type="gwm1:WaterSpecimenType">
  <xs:annotation>
    <xs:documentation>This class is a sub-class of a specimen class, which is defined as follows "A Specimen is some physical material sampled from a specified location, typically associated with a Site, such as a Station, a location or interval within a Section, or a location or extent from a
```


DescriptionExtent".

```
It adds a specific property for a waterSpecimen (volume).</xs:documentation>
</xs:annotation>
</xs:element>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterSpecimenType">
  <xs:complexContent>
    <xs:extension base="sa:SpecimenType">
      <xs:sequence>
        <xs:element name="volume" type="gsml:CGI_NumericPropertyType">
          <xs:annotation>
            <xs:documentation>Volume of the water specimen, expressed as a CGI_Numeric value
(value + unit of measure).</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterSpecimenPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:WaterSpecimen"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

OverviewPackageClassHelp

Class <<FeatureType>> WaterWell (extends SamplingPoint)

An excavation where the intended use is for location, acquisition, development, or artificial recharge of ground water.
http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-w.pdf

A water well is an excavation or structure created in the ground ? by digging, driving, boring or drilling to access water in underground aquifers.
http://en.wikipedia.org/wiki/Water_well

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
referenceElevation	Measure	1..1	WaterWell	Elevation from which other elevation are calculated (such as Water Level)				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							
waterUse	WaterUseCode	0..*	WaterWell	The use of water may be classified by specific types according to distinctive uses. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-w.pdf Can be agriculture, commercial, domestic, heat transfer, industrial, irrigation, municipal, other, unknown, public recreation, research. Groundwater Data Management Guidelines, Environment Canada, Dec. 1991				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>			Tag	Value	sequenceNumber	20	
	Tag	Value						
sequenceNumber	20							
wellDepth	CGI_Numeric	1..1	WaterWell	Depth of the well				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>30</td></tr></table>			Tag	Value	sequenceNumber	30	
	Tag	Value						
sequenceNumber	30							
wellPurpose	WellPurposeCode	0..*	WaterWell	Purpose of the well. Can be cathodic protection, coalELog, core, decontamination, Dewatering, Disposal, FlowingShot, Geotechnical, Mineral, MonitoringlevelHead, MonitoringQuality, Oil, OilExploratory, Recharge, Seismic, WaterExploratory, WaterSupply, Other. Groundwater Data Management Guidelines, Environment Canada, Dec. 1991				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>40</td></tr></table>			Tag	Value	sequenceNumber	40	
	Tag	Value						
sequenceNumber	40							
wellStatus	WellStatusCode	1..1	WaterWell	Status of the well, Can be new, unfinished, reconditioned, deepened, not in use, standby, unknown, abandoned dry, abandoned insufficient, abandoned quality. Groundwater Data Management Guidelines, Environment Canada, Dec. 1991				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>50</td></tr></table>			Tag	Value	sequenceNumber	50	
	Tag	Value						
sequenceNumber	50							

wellType	WellUse	1..1	WaterWell	Type of wells, related to the way they are build, eg: Dug Well, Drilled Well..
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	60		
onlineResource	CI_OnlineResource	0..1	WaterWell	Reference to an external online representation (URI, web page, URN)
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	70		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes				
constraint	MD_Constraints	0..*	WaterWell					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>110</td></tr></table>				Tag	Value	sequenceNumber	110
	Tag	Value						
sequenceNumber	110							
measure	WellWaterDescription	0..1	WaterWell					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>112</td></tr></table>				Tag	Value	sequenceNumber	112
	Tag	Value						
sequenceNumber	112							
contact	CI_ResponsibleParty	0..*	WaterWell					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>118</td></tr></table>				Tag	Value	sequenceNumber	118
	Tag	Value						
sequenceNumber	118							
logElement	MappedInterval	0..*	WaterWell					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>120</td></tr></table>				Tag	Value	sequenceNumber	120
	Tag	Value						
sequenceNumber	120							
installedDevice	Device	0..*	WaterWell					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>123</td></tr></table>				Tag	Value	sequenceNumber	123
	Tag	Value						
sequenceNumber	123							
wellDevelopment	Process	0..*	WaterWell					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr></table>				Tag	Value		
	Tag	Value						

	sequenceNumber	127		
installation	DeviceInstallation	0..*	WaterWell	
	Association tagged values			
	Tag	Value		
	sequenceNumber	130		
construction	WellConstruction	0..*	WaterWell	
	Association tagged values			
	Tag	Value		
	sequenceNumber	135		
indexData	BoreholeDetails	0..1	WaterWell	
	Association tagged values			
	Tag	Value		
	sequenceNumber	150		
metadata	MD_Metadata	0..1	WaterWell	
	Association tagged values			
	Tag	Value		
	sequenceNumber	170		
groundwaterAccessFeature	AnyFeature	0..1	WaterWell	
	Association tagged values			
	Tag	Value		
	sequenceNumber	180		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only

xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply
-----------------	---------------	--

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterWell" type="gwm1:WaterWellType"
substitutionGroup="sa:SamplingPoint">
  <xs:annotation>
    <xs:documentation>An excavation where the intended use is for location, acquisition, development, or
artificial recharge of ground water.
http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-w.pdf
A water well is an excavation or structure created in the ground ? by digging, driving, boring or drilling
to access water in underground aquifers.
http://en.wikipedia.org/wiki/Water_well</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterWellType">
  <xs:complexContent>
    <xs:extension base="sa:SamplingPointType">
      <xs:sequence>
        <xs:element name="referenceElevation" type="gml:MeasureType">
          <xs:annotation>
            <xs:documentation>Elevation from which other elevation are calculated (such as Water
Level)</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="waterUse" type="gml:CodeType" minOccurs="0" maxOccurs="unbounded">
          <xs:annotation>
            <xs:appinfo>
              <gml:defaultCodeSpace
xmlns:gml="http://www.opengis.net/gml">#NOTES</gml:defaultCodeSpace>
            </xs:appinfo>
            <xs:documentation>The use of water may be classified by specific types according to
distinctive uses.
http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-w.pdf
Can be agriculture, commercial, domestic, heat transfer, industrial, irrigation, municipal, other, unknown,
public recreation, research.
Groundwater Data Management Guidelines, Environment Canada, Dec. 1991</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="wellDepth" type="gsm1:CGI_NumericPropertyType">
          <xs:annotation>
            <xs:documentation>Depth of the well</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="wellPurpose" type="gml:CodeType" minOccurs="0" maxOccurs="unbounded">
          <xs:annotation>
            <xs:appinfo>
              <gml:defaultCodeSpace
xmlns:gml="http://www.opengis.net/gml">#NOTES</gml:defaultCodeSpace>
            </xs:appinfo>
            <xs:documentation>Purpose of the well. Can be cathodic protection, coalELog, core,
decontamination, Dewatering, Disposal, FlowingShot, Geotechnical, Mineral, MonitoringlevelHead,
MonitoringQuality, Oil, OilExploratory, Recharge, Seismic, WaterExploratory, WaterSupply, Other.
Groundwater Data Management Guidelines, Environment Canada, Dec. 1991</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="wellStatus" type="gml:CodeType">
          <xs:annotation>
            <xs:appinfo>
              <gml:defaultCodeSpace
xmlns:gml="http://www.opengis.net/gml">#NOTES</gml:defaultCodeSpace>
            </xs:appinfo>
            <xs:documentation>Status of the well, Can be new, unfinished, reconditioned,
deepened, not in use, standby, unknown, abandoned dry, abandoned insufficient, abandoned quality.
Groundwater Data Management Guidelines, Environment Canada, Dec. 1991</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="wellType" type="gml:CodeType">
          <xs:annotation>
            <xs:appinfo>
              <gml:defaultCodeSpace
xmlns:gml="http://www.opengis.net/gml">#NOTES</gml:defaultCodeSpace>
            </xs:appinfo>
            <xs:documentation>Type of wells, related to the way they are build, eg: Dug Well,
Drilled Well..</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="onlineResource" type="gmd:CI_OnlineResource_PropertyType" minOccurs="0"
maxOccurs="1">
```

```

        <xs:annotation>
          <xs:documentation>Reference to an external online representation (URI, web page,
URN)</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="constraint" type="gmd:MD_Constraints_PropertyType" minOccurs="0"
maxOccurs="unbounded"/>
      <xs:element name="measure" type="gwml:WellWaterDescriptionPropertyType" minOccurs="0"
maxOccurs="1"/>
      <xs:element name="contact" type="gmd:CI_ResponsibleParty_PropertyType" minOccurs="0"
maxOccurs="unbounded"/>
      <xs:element name="logElement" minOccurs="0" maxOccurs="unbounded"/>
      <xs:element name="installedDevice" type="gwml:DevicePropertyType" minOccurs="0"
maxOccurs="unbounded"/>
      <xs:element name="wellDevelopment" minOccurs="0" maxOccurs="unbounded"/>
      <xs:element name="installation" type="gwml:DeviceInstallationPropertyType" minOccurs="0"
maxOccurs="unbounded"/>
      <xs:element name="construction" type="gwml:WellConstructionPropertyType" minOccurs="0"
maxOccurs="unbounded"/>
      <xs:element name="indexData" type="gsml:BoreholeDetailsPropertyType" minOccurs="0"
maxOccurs="1"/>
      <xs:element name="metadata" type="gmd:MD_Metadata_PropertyType" minOccurs="0"
maxOccurs="1"/>
      <xs:element name="groundwaterAccessFeature" minOccurs="0" maxOccurs="1"/>
    </xs:sequence>
  </xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterWellPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:WaterWell"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>

```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> WellCasing (extends WellConstruction)

Casing, as in borehole, but scoped to Well structures build in (or hosted) a borehole. We had to support a specific well casing (from xmm1/GeoSciML boreholes) because 1) Borehole spec did not provide such concept so far and 2) Wells are not necessary hosted in a borehole (and might have some casing).

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
wellCasingElement	WellCasingComponent	1..*	WellCasing	
	Association tagged values			
	Tag	Value		
sequenceNumber	120			

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellCasing" type="gwml:WellCasingType" substitutionGroup="gwml:WellConstruction">
  <xs:annotation>
    <xs:documentation>Casing, as in borehole, but scoped to Well structures build in (or hosted) a borehole. We had to support a specific well casing (from xmm1/GeoSciML boreholes) because 1) Borehole spec did not provide such concept so far and 2) Wells are not necessary hosted in a borehole (and might have some casing).</xs:documentation>
  </xs:annotation>
```

```
</xs:element>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellCasingType">
  <xs:complexContent>
    <xs:extension base="gwml:WellConstructionType">
      <xs:sequence>
        <xs:element name="wellCasingElement" type="gwml:WellCasingComponentPropertyType"
minOccurs="1" maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellCasingPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:WellCasing"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

Overview

Package

Class

Help

Class <<FeatureType>> WellCasingComponent (extends [ConstructionComponent](#))

A single part of a well casing

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
position	GM_LineString	1..1	ConstructionComponent	This attribute is used to reference the shape of the samplingCurve from which the WaterWell derives.
coating	CGI_Term	0..1	WellCasingComponent	Coating applied to the casing. Can be galvanized, stainless, mild, low carbon, copper bearing, black, porous. Groundwater Data Management Guidelines, Environment Canada, Dec. 1991
form	CGI_Term	0..1	WellCasingComponent	Form of material used in the casing. Can be curbing, cribbing, corrugated, culvert, hose, pipe - casing - tubing. Groundwater Data Management Guidelines, Environment Canada, Dec. 1991
material	CGI_Term	0..1	WellCasingComponent	Material in which the casing is made. Can be metal, steel, iron, concrte, wood, brick, plastic, teflon, PVC, ABS, Fibreglass, asbestos cement, unknow, other. Groundwater Data Management Guidelines, Environment Canada, Dec. 1991
nominalPipeDimension	CGI_Numeric	0..1	WellCasingComponent	Value of the pipe dimension of the casing.
wallThickness	CGI_Numeric	0..1	WellCasingComponent	Value of the thickness of the wass of the casing.

--

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellCasingComponent"
type="gwml:WellCasingComponentType" substitutionGroup="gwml:ConstructionComponent">
  <xs:annotation>
    <xs:documentation>A single part of a well casing</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellCasingComponentType">
  <xs:complexContent>
    <xs:extension base="gwml:ConstructionComponentType">
      <xs:sequence>
        <xs:element name="coating" type="gsml:CGI_TermPropertyType" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Coating applied to the casing. Can be galvanized, stainless, mild,
low carbon, copper bearing, black, porous.
Groundwater Data Management Guidelines, Environment Canada, Dec. 1991</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="form" type="gsml:CGI_TermPropertyType" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Form of material used in the casing. Can be curbing, cribbing,
corrugated, culvert, hose, pipe - casing - tubing.
Groundwater Data Management Guidelines, Environment Canada, Dec. 1991</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="material" type="gsml:CGI_TermPropertyType" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Material in which the casing is made. Can be metal, steel, iron,
concrte, wood, brick, plastic, teflon, PVC, ABS, Fibreglass, asbestos cement, unknow, other.
Groundwater Data Management Guidelines, Environment Canada, Dec. 1991</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="nominalPipeDimension" type="gsml:CGI_NumericPropertyType" minOccurs="0"
maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Value of the pipe dimension of the casing.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="wallThickness" type="gsml:CGI_NumericPropertyType" minOccurs="0"
```

```
maxOccurs="1">
    <xs:annotation>
      <xs:documentation>Value of the thickness of the wass of the
casing.</xs:documentation>
    </xs:annotation>
  </xs:element>
</xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellCasingComponentPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:WellCasingComponent" />
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup" />
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema
<API Specification/>

OverviewPackageClassHelp



Class <<FeatureType>> *WellConstruction*

Construction components, use to describe how the well was built. This information are important when assessing result of pump tests.

Local Subclasses: [Filtration](#) [Screen](#) [Sealing](#) [WellCasing](#)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true Description: enforce the 'by value' property pattern without xlinks
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellConstruction"
type="gwml:WellConstructionType" abstract="true" substitutionGroup="gml:_Feature">
  <xs:annotation>
    <xs:documentation>Construction components, use to describe how the well was built. This information
are important when assessing result of pump tests.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellConstructionType" abstract="true">
  <xs:complexContent>
    <xs:extension base="gml:AbstractFeatureType" />
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellConstructionPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:WellConstruction" />
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup" />
</xs:complexType>
```

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[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> WellField

(1) One or more wells producing water from a subsurface source. (2) A tract of land which contains a number of wells for supplying a large municipality or irrigation district.
<http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-w.pdf>

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
member	WaterWell	1..*	WellField	
	Association tagged values			
	Tag	Value		
sequenceNumber	180			

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellField" type="gwml:WellFieldType"
substitutionGroup="gml:_Feature">
  <xs:annotation>
    <xs:documentation>(1) One or more wells producing water from a subsurface source. (2) A tract of
land which contains a number of wells for supplying a large municipality or irrigation district.
http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-w.pdf</xs:documentation>
  </xs:annotation>
</xs:element>
```

```
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellFieldType">
  <xs:complexContent>
    <xs:extension base="gml:AbstractFeatureType">
      <xs:sequence>
        <xs:element name="member" type="gwml:WaterWellPropertyType" minOccurs="1"
maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellFieldPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:WellField"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

Overview

Package

Class

Help

Class <<FeatureType>> WellPumpInstallation (extends DeviceInstallation)

Installation of a pump to a water well.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
period	TM_Period	1..1	DeviceInstallation	Period for which the device has been installed.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							
intakeDepth	Measurement	1..1	WellPumpInstallation	Depth of the intake of the well, expressed as a value and UOM.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes				
host	WaterWell	1	DeviceInstallation					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>120</td></tr></table>				Tag	Value	sequenceNumber	120
	Tag	Value						
sequenceNumber	120							
installedDevice	Device	1	DeviceInstallation					
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>150</td></tr></table>				Tag	Value	sequenceNumber	150
	Tag	Value						
sequenceNumber	150							

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.

isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellPumpInstallation"
type="gwml:WellPumpInstallationType" substitutionGroup="gwml:DeviceInstallation">
  <xs:annotation>
    <xs:documentation>Installation of a pump to a water well.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellPumpInstallationType">
  <xs:complexContent>
    <xs:extension base="gwml:DeviceInstallationType">
      <xs:sequence>
        <xs:element name="intakeDepth" type="om:ObservationPropertyType">
          <xs:annotation>
            <xs:documentation>Depth of the intake of the well, expressed as a value and
UOM.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellPumpInstallationPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:WellPumpInstallation"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> ZoneOfContribution (extends HydrogeologicFeature)

The area surrounding a pumping well, spring, or tunnel that encompasses all areas and features that supply groundwater to the well spring, or tunnel. (http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
occurrence	MappedFeature	0..*	HydrogeologicFeature	
	Association tagged values			
	Tag	Value		
	sequenceNumber	140		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ZoneOfContribution"
substitutionGroup="gwml:HydrogeologicFeature" type="gwml:ZoneOfContributionType">
  <xs:annotation>
    <xs:documentation>The area surrounding a pumping well, spring, or tunnel that encompasses all areas
and features that supply groundwater to the well spring, or tunnel.
(http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ZoneOfContributionType">
```

```
<xs:complexContent>
  <xs:extension base="gwml:HydrogeologicFeatureType"/>
</xs:complexContent>
</xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ZoneOfContributionPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:ZoneOfContribution"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<FeatureType>> ZoneOfInfluence (extends [HydrogeologicFeature](#))

The area of influence, or cone of depression formed when pumping a well or well field.
(<http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html>)

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
occurence	MappedFeature	0..*	HydrogeologicFeature	
	Association tagged values			
	Tag	Value		
	sequenceNumber	140		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the feature type as a feature collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ZoneOfInfluence"
substitutionGroup="gwml:HydrogeologicFeature" type="gwml:ZoneOfInfluenceType">
  <xs:annotation>
    <xs:documentation>The area of influence, or cone of depression formed when pumping a well or well
field. (http://www.wrds.uwyo.edu/wrds/deq/whp/whpgloss.html)</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ZoneOfInfluenceType">
  <xs:complexContent>
```

```

    <xs:extension base="gwml:HydrogeologicFeatureType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ZoneOfInfluencePropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:ZoneOfInfluence"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>

```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

OverviewPackageClassHelp

Class <<Type>> AbstractRelation

A relation between 2 objects. This is required to implement a relation between a object outside h2o namespace (a gsml:Site for example) and a h2o (or any other object). The case we try to solve here is adding new relationship to an existing class that is at the top of a hierarchy. Deriving from this class will not include descendant, and the class cannot be directly altered (it's not our namespace). For example, I wish to add 'physiographicRegion' property to gsml:Site to link to h2o:PhysiographicRegion. I can't derive a new h2o:Site because I loose gsml:Profile, etc.. (unless I recreate the whole structure under h2o -- which defeats the purpose of inheritance), and I cannot alter gsml because in theory, I just import it. This relation class allows to soft type such a relation (instead of user a hard property)

Local Subclasses: [LocationRelation](#)

Attributes

Name	Type	Bounds	From Class	Notes				
sourceRole	ScopedName	1..1	AbstractRelation	The role of the source				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
	sequenceNumber	10						
targetRole	ScopedName	1..1	AbstractRelation	all target should have the same role				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>			Tag	Value	sequenceNumber	20	
	Tag	Value						
	sequenceNumber	20						

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xmlSchemaType	#NOTES#Description: If the type has a canonical XML Schema encoding the XML Schema typename corresponding to the data type shall be given as the value (applies to ISO 19136:2007 encoding rule)	Description: If the type has a canonical XML Schema encoding the XML Schema typename corresponding to the data type shall be given as the value (applies to ISO 19136:2007 encoding rule)

xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" abstract="true" name="AbstractRelation"
substitutionGroup="gml:_GML" type="gwml:AbstractRelationType">
  <xs:annotation>
    <xs:documentation>A relation between 2 objects. This is required to implement a relation between a
object outside h2o namespace (a gsml:Site for example) and a h2o (or any other object). The case we try to
solve here is adding new relationship to an existing class that is at the top of a hierarchy. Deriving
from this class will not include descendant, and the class cannot be directly altered (it's not our
namespace). For example, I wish to add 'physiographicRegion' property to gsml:Site to link to
h2o:PhysiographicRegion. I can't derive a new h2o:Site because I loose gsml:Profile, etc.. (unless I
recreate the whole structure under h2o -- which defeats the purpose of inheritance), and I cannot alter
gsml because in theory, I just import it. This relation class allows to soft type such a relation (instead
of user a hard property)</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" abstract="true" name="AbstractRelationType">
  <xs:complexContent>
    <xs:extension base="gml:AbstractGMLType">
      <xs:sequence>
        <xs:element name="sourceRole" type="gml:CodeType">
          <xs:annotation>
            <xs:documentation>The role of the source</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="targetRole" type="gml:CodeType">
          <xs:annotation>
            <xs:documentation>all target should have the same role</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AbstractRelationPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:AbstractRelation"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<Type>> GroundwaterAnalysisResult

Report a collection of values related to groundwater quality (quantitative and qualitative).

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
member	ResultElement	1..*	GroundwaterAnalysisResult	
	Association tagged values			
	Tag	Value		
	sequenceNumber	126		
contact	CI_ResponsibleParty	0..*	GroundwaterAnalysisResult	
	Association tagged values			
	Tag	Value		
	sequenceNumber	129		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xmlSchemaType	#NOTES#Description: If the type has a canonical XML Schema encoding the XML Schema typename corresponding to the data type shall be given as the value (applies to ISO 19136:2007 encoding rule)	Description: If the type has a canonical XML Schema encoding the XML Schema typename corresponding to the data type shall be given as the value (applies to ISO 19136:2007 encoding rule)
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007

	Description: XML Schema encoding rule to apply
--	--

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GroundwaterAnalysisResult"
substitutionGroup="gml:_GML" type="gwml:GroundwaterAnalysisResultType">
  <xs:annotation>
    <xs:documentation>Report a collection of values related to groundwater quality (quantitative and
qualitative).</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GroundwaterAnalysisResultType">
  <xs:complexContent>
    <xs:extension base="gml:AbstractGMLType">
      <xs:sequence>
        <xs:element maxOccurs="unbounded" minOccurs="1" name="member"
type="gwml:ResultElementPropertyType"/>
        <xs:element maxOccurs="unbounded" minOccurs="0" name="contact"
type="gmd:CI_ResponsibleParty_PropertyType"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GroundwaterAnalysisResultPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:GroundwaterAnalysisResult"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<Type>> HydrogeologicDescription (extends PhysicalDescription)

Properties of the rock that is relevant to the groundwater

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
capacity	CGI_Numeric	0..1	HydrogeologicDescription	Volumetric capacity of an aquifer to hold water.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							
hydraulicConductivity	CGI_Numeric	0..1	HydrogeologicDescription	Hydraulic conductivity can be measured by applying Darcy's law on the material. Such experiments can be conducted by creating a hydraulic gradient between two points, and measuring the flow rate (Oosterbaan and Nijland[1]). (Wikipedia)				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>			Tag	Value	sequenceNumber	20	
	Tag	Value						
sequenceNumber	20							
saturation	CGI_Numeric	1..1	HydrogeologicDescription	This property displays the saturation of water in a given material.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>25</td></tr></table>			Tag	Value	sequenceNumber	25	
	Tag	Value						
sequenceNumber	25							
storativity	CGI_Numeric	0..1	HydrogeologicDescription	Storativity is the volume of water released from storage per unit decline in hydraulic head in the aquifer, per unit area of the aquifer. http://en.wikipedia.org/wiki/Specific_storage				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>30</td></tr></table>			Tag	Value	sequenceNumber	30	
	Tag	Value						
sequenceNumber	30							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: false

		Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xmlSchemaType	#NOTES#Description: If the type has a canonical XML Schema encoding the XML Schema typename corresponding to the data type shall be given as the value (applies to ISO 19136:2007 encoding rule)	Description: If the type has a canonical XML Schema encoding the XML Schema typename corresponding to the data type shall be given as the value (applies to ISO 19136:2007 encoding rule)
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrogeologicDescription"
substitutionGroup="gsml:PhysicalDescription" type="gwml:HydrogeologicDescriptionType">
  <xs:annotation>
    <xs:documentation>Properties of the rock that is relevant to the groundwater</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrogeologicDescriptionType">
  <xs:complexContent>
    <xs:extension base="gsml:PhysicalDescriptionType">
      <xs:sequence>
        <xs:element maxOccurs="1" minOccurs="0" name="capacity" type="gsml:CGI_NumericPropertyType">
          <xs:annotation>
            <xs:documentation>Volumetric capacity of an aquifer to hold water.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element maxOccurs="1" minOccurs="0" name="hydraulicConductivity"
type="gsml:CGI_NumericPropertyType">
          <xs:annotation>
            <xs:documentation>Hydraulic conductivity can be measured by applying Darcy's law on
the material. Such experiments can be conducted by creating a hydraulic gradient between two points, and
measuring the flow rate (Oosterbaan and Nijland[1]). (Wikipedia)</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="saturation" type="gsml:CGI_NumericPropertyType">
          <xs:annotation>
            <xs:documentation>This property displays the saturation of water in a given
material.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element maxOccurs="1" minOccurs="0" name="storativity"
type="gsml:CGI_NumericPropertyType">
          <xs:annotation>
            <xs:documentation>Storativity is the volume of water released from storage per unit
decline in hydraulic head in the aquifer, per unit area of the aquifer.
http://en.wikipedia.org/wiki/Specific_storage</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrogeologicDescriptionPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:HydrogeologicDescription"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

OverviewPackageClassHelp



Class <<Type>> LocationRelation (extends AbstractRelation)

Establish a relation based on the location of the source. This should be otherwise calculated by some spatial operation, but it's now always possible

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
sourceRole	ScopedName	1..1	AbstractRelation	The role of the source
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		10	
targetRole	ScopedName	1..1	AbstractRelation	all target should have the same role
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		20	

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xmlSchemaType	#NOTES#Description: If the type has a canonical XML Schema encoding the XML Schema typename corresponding to the data type shall be given as the value (applies to ISO 19136:2007 encoding rule)	Description: If the type has a canonical XML Schema encoding the XML Schema typename corresponding to the data type shall be given as the value (applies to ISO 19136:2007 encoding rule)
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions

		Default: iso19136_2007 Description: XML Schema encoding rule to apply
--	--	--

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="LocationRelation"
substitutionGroup="gwml:AbstractRelation" type="gwml:LocationRelationType">
  <xs:annotation>
    <xs:documentation>Establish a relation based on the location of the source. This should be
otherwise calculated by some spatial operation, but it's now always possible</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="LocationRelationType">
  <xs:complexContent>
    <xs:extension base="gwml:AbstractRelationType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="LocationRelationPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:LocationRelation"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<Type>> **Salinity** (extends [DissolvedComponent](#))

Salinity is a very special kind of dissolved component and is often an important aspect of groundwater studies because of it's many impacts.

The salinity can come from various sources; sea water intrusion (actual or ancien), dissolution of host rock or dissolution of salt during recharge (eg, water circulating through evaporates)

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
concentration	CGI_Numeric	1..1	WaterCompositionComponent	In chemistry, concentration is the measure of how much of a given substance there is mixed with another substance. This can apply to any sort of chemical mixture, but most frequently the concept is limited to homogeneous solutions, where it refers to the amount of solute in a substance. http://en.wikipedia.org/wiki/Concentration				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							
saturation	CGI_Term	0..1	DissolvedComponent	This attribute refers the the saturation of a dissolved component into ground water. The domain values are "pure, unsaturated, saturated, sursaturated". In physical chemistry, saturation is the point at which a solution of a substance can dissolve no more of that substance and additional amounts of it will appear as a precipitate. This point of maximum concentration, the saturation point, depends on the temperature of the liquid as well as the chemical nature of the substances involved. http://en.wikipedia.org/wiki/Saturation_(chemistry)				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							
salinitySource	ControlledConcept	0..*	Salinity	The salinity can come from various sources; sea water intrusion (actual or ancien), dissolution of host rock or dissolution of salt during recharge (eg, water circulating through evaporates)				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes			
dissolved	SolutionComponent	0..1	DissolvedComponent				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>120</td></tr></table>		Tag	Value	sequenceNumber	120	
Tag	Value						
sequenceNumber	120						

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the type as an object collection.
noPropertyType	false	Values: false Default: false Description: Suppress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xmlSchemaType	#NOTES#Description: If the type has a canonical XML Schema encoding the XML Schema typename corresponding to the data type shall be given as the value (applies to ISO 19136:2007 encoding rule)	Description: If the type has a canonical XML Schema encoding the XML Schema typename corresponding to the data type shall be given as the value (applies to ISO 19136:2007 encoding rule)
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="Salinity"
substitutionGroup="gwm1:DissolvedComponent" type="gwm1:SalinityType">
  <xs:annotation>
    <xs:documentation>Salinity is a very special kind of dissolved component and is often an important
aspect of groundwater studies because of it's many impacts.

The salinity can come from various sources; sea water instrusion (actual or ancien), dissolution of host
rock or dissolution of salt during recharge (eg, water circulating through evaporates)</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SalinityType">
  <xs:complexContent>
    <xs:extension base="gwm1:DissolvedComponentType">
      <xs:sequence>
        <xs:element maxOccurs="unbounded" minOccurs="0" name="salinitySource"
type="gsml:ControlledConceptPropertyType">
          <xs:annotation>
            <xs:documentation>The salinity can come from various sources; sea water instrusion
(actual or ancien), dissolution of host rock or dissolution of salt during recharge (eg, water circulating
through evaporates)</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SalinityPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwm1:Salinity"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[URL models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<Type>> Salt (extends Mineral)

A salt, in chemistry, is defined as the product formed from the neutralisation reaction of acids and bases. Salts are ionic compounds composed of cations (positively charged ions) and anions (negative ions) so that the product is electrically neutral (without a net charge). These component ions can be inorganic such as chloride (Cl−), as well as organic such as acetate (CH3COO−) and monoatomic ions such as fluoride (F−), as well as polyatomic ions such as sulfate (SO42−).

There are several varieties of salts. Salts that produce hydroxide ions when dissolved in water are basic salts and salts that produce hydronium ions in water are acid salts. Neutral salts are those that are neither acid nor basic salts. Zwitterions contain an anionic center and a cationic center in the same molecule but are not considered to be salts. Examples include amino acids, many metabolites, peptides and proteins.
[http://en.wikipedia.org/wiki/Salt_\(chemistry\)](http://en.wikipedia.org/wiki/Salt_(chemistry))

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes			
chemicalFormula	CGI_Term	0..1	Salt	A chemical formula is a way of expressing information about the atoms that constitute a particular chemical compound, and how the relationship between those atoms changes in chemical reactions. http://en.wikipedia.org/wiki/Chemical_formula			
	Attribute tagged values						
	<table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10
Tag	Value						
sequenceNumber	10						

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: false Default: false Description: Create a property type that requires that the instance is encoded inline (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
isCollection	false	Values: true false Default: false Description: Identifies the type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline or by-reference encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xmlSchemaType	#NOTES#Description: If the type has a canonical XML Schema encoding the XML Schema typename corresponding to the data type shall be given as the value (applies to ISO 19136:2007 encoding rule)	Description: If the type has a canonical XML Schema encoding the XML Schema typename corresponding to the data type shall be given as the value (applies to ISO 19136:2007 encoding rule)
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only

xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply
-----------------	---------------	--

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="Salt" substitutionGroup="gsml:Mineral"
type="gwml:SaltType">
  <xs:annotation>
    <xs:documentation>A salt, in chemistry, is defined as the product formed from the neutralisation
reaction of acids and bases. Salts are ionic compounds composed of cations (positively charged ions) and
anions (negative ions) so that the product is electrically neutral (without a net charge). These component
ions can be inorganic such as chloride (Cl&#amp;minus;), as well as organic such as acetate
(CH3COO&#amp;minus;) and monoatomic ions such as fluoride (F&#amp;minus;), as well as polyatomic ions such as
sulfate (SO42&#amp;minus;).

There are several varieties of salts. Salts that produce hydroxide ions when dissolved in water are basic
salts and salts that produce hydronium ions in water are acid salts. Neutral salts are those that are
neither acid nor basic salts. Zwitterions contain an anionic center and a cationic center in the same
molecule but are not considered to be salts. Examples include amino acids, many metabolites, peptides and
proteins.
http://en.wikipedia.org/wiki/Salt_(chemistry)</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SaltType">
  <xs:complexContent>
    <xs:extension base="gsml:MineralType">
      <xs:sequence>
        <xs:element maxOccurs="1" minOccurs="0" name="chemicalFormula"
type="gsml:CGI_TermPropertyType">
          <xs:annotation>
            <xs:documentation>A chemical formula is a way of expressing information about the
atoms that constitute a particular chemical compound, and how the relationship between those atoms changes
in chemical reactions.
http://en.wikipedia.org/wiki/Chemical_formula</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SaltPropertyType">
  <xs:sequence minOccurs="0">
    <xs:element ref="gwml:Salt"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<DataType>> AquiferVulnerabilityClassification (extends HydrogeologicClassification)

Two concepts have been introduced that can affect groundwater quality. The land-use activities that take place at the surface can affect groundwater quality, and the physical or geologic characteristics of the vadose zone and aquifer can provide protection from infiltrating contaminants.

Land-use activities and aquifer sensitivity are absolute terms that can be easily defined through observation and physical investigation. They are combined to define a relative term that is used to qualify the real risk to a given aquifer: vulnerability.

http://www.waterencyclopedia.com/Oc-Po/Pollution-of-Groundwater-Vulnerability.html

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
categorisationTheme	ScopedName	1..1	Categorisation	A theme on which a categorisation is applied.
	<i>Attribute tagged values</i>			
	Tag	Value		
	sequenceNumber	10		
categoryCode	CGI_Term	1..1	Categorisation	A code associated to a category.
	<i>Attribute tagged values</i>			
	Tag	Value		
	sequenceNumber	20		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
categorisationDocumentation	MD_Metadata	1..*	Categorisation	
	Association tagged values			
	Tag	Value		
	sequenceNumber	130		
categorisationAuthority	CI_ResponsibleParty	1..*	Categorisation	
	Association tagged values			
	Tag	Value		
	sequenceNumber	140		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true Description: enforce the 'by value' property pattern without xlinks
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Suppress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AquiferVulnerabilityClassification"
substitutionGroup="gwml:HydrogeologicClassification" type="gwml:AquiferVulnerabilityClassificationType">
  <xs:annotation>
    <xs:documentation>Two concepts have been introduced that can affect groundwater quality. The land-
use activities that take place at the surface can affect groundwater quality, and the physical or geologic
characteristics of the vadose zone and aquifer can provide protection from infiltrating contaminants.

Land-use activities and aquifer sensitivity are absolute terms that can be easily defined through
observation and physical investigation. They are combined to define a relative term that is used to qualify
the real risk to a given aquifer: vulnerability.

http://www.waterencyclopedia.com/Oc-Po/Pollution-of-Groundwater-Vulnerability.html</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AquiferVulnerabilityClassificationType">
  <xs:complexContent>
    <xs:extension base="gwml:HydrogeologicClassificationType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema"
name="AquiferVulnerabilityClassificationPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:AquiferVulnerabilityClassification"/>
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

OverviewPackageClassHelp



Class <<DataType>> **BiologicComponent** (extends [WaterCompositionComponent](#))

Type of biologic component present in the groudwater (bacteria, virus, etc).

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes					
concentration	CGI_Numeric	1..1	WaterCompositionComponent	In chemistry, concentration is the measure of how much of a given substance there is mixed with another substance. This can apply to any sort of chemical mixture, but most frequently the concept is limited to homogeneous solutions, where it refers to the amount of solute in a substance. http://en.wikipedia.org/wiki/Concentration					
				<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>		Tag	Value	sequenceNumber	10
				Tag	Value				
				sequenceNumber	10				
organism	Organism	1..1	BiologicComponent	In biology, an organism is a living thing (such as animal, plant, fungus, or micro-organism). http://en.wikipedia.org/wiki/Organisms					
				<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>		Tag	Value	sequenceNumber	10
				Tag	Value				
				sequenceNumber	10				

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Description: enforce the 'by value' property pattern without xlink
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="BiologicComponent"
substitutionGroup="gwml:WaterCompositionComponent" type="gwml:BiologicComponentType">
  <xs:annotation>
    <xs:documentation>Type of biologic component present in the groudwater (bacteria, virus,
etc).</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="BiologicComponentType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterCompositionComponentType">
      <xs:sequence>
        <xs:element name="organism" type="gsml:OrganismPropertyType">
          <xs:annotation>
            <xs:documentation>In biology, an organism is a living thing (such as animal, plant,
fungus, or micro-organism).
http://en.wikipedia.org/wiki/Organisms</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="BiologicComponentPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:BiologicComponent"/>
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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Class <<DataType>> Categorisation

Custom classification applied to a hydrogeologic Unit. This classification is usually based on local concerns, such as vulnerability, water availability or other classes related to water usage and protection. Many agencied designed those classification to guide decision making (land planning, constructions, agriculture) and hence the same unit can be classified in many classification simultaneously.

Local Subclasses: [HydrogeologicClassification](#)

Attributes

Name	Type	Bounds	From Class	Notes				
categorisationTheme	ScopedName	1..1	Categorisation	A theme on which a categorisation is applied.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							
categoryCode	CGI_Term	1..1	Categorisation	A code associated to a category.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>			Tag	Value	sequenceNumber	20	
	Tag	Value						
sequenceNumber	20							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
categorisationDocumentation	MD_Metadata	1..*	Categorisation	
	Association tagged values			
	Tag	Value		
sequenceNumber	130			
categorisationAuthority	CI_ResponsibleParty	1..*	Categorisation	
	Association tagged values			
	Tag	Value		
sequenceNumber	140			

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true

		Description: enforce the 'by value' property pattern without xlink
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Suppress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="Categorisation"
type="gwml:CategorisationType">
  <xs:annotation>
    <xs:documentation>Custom classification applied to a hydrogeologic Unit. This classification is
usually based on local concerns, such as vulnerability, water availability or other classes related to water
usage and protection. Many agencies designed those classification to guide decision making (land planning,
constructions, agriculture) and hence the same unit can be classified in many classification
simultaneously.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="CategorisationType">
  <xs:sequence>
    <xs:element name="categorisationTheme" type="gml:CodeType">
      <xs:annotation>
        <xs:documentation>A theme on which a categorisation is applied.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="categoryCode" type="gsml:CGI_TermPropertyType">
      <xs:annotation>
        <xs:documentation>A code associated to a category.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="unbounded" minOccurs="1" name="categorisationDocumentation"
type="gmd:MD_Metadata_PropertyType"/>
    <xs:element maxOccurs="unbounded" minOccurs="1" name="categorisationAuthority"
type="gmd:CI_ResponsibleParty_PropertyType"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="CategorisationPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:Categorisation"/>
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
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Class <<DataType>> **ColloidalComponent** (extends [WaterCompositionComponent](#))

This class refers to a physical component that hava the proerties of a colloid.

A colloid is a type of mechanical mixture where one substance is dispersed evenly throughout another. Because of this dispersal, some colloids have the appearance of solutions. A colloidal system consists of two separate phases: a dispersed phase (or internal phase) and a continuous phase (or dispersion medium). A colloidal system may be solid, liquid, or gaseous.
derived from <http://en.wikipedia.org/wiki/Colloid>

Of, pertaining to, or consisting of a colloid.
<http://en.wiktionary.org/wiki/colloidal>

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
concentration	CGI_Numeric	1..1	WaterCompositionComponent	In chemistry, concentration is the measure of how much of a given substance there is mixed with another substance. This can apply to any sort of chemical mixture, but most frequently the concept is limited to homogeneous solutions, where it refers to the amount of solute in a substance. http://en.wikipedia.org/wiki/Concentration				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							
colloid	ControlledConcept	1..1	ColloidalComponent	A colloid is a type of mechanical mixture where one substance is dispersed evenly throughout another. This attribute may be used to name a colloid.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							
colloidalType	ColloidType	0..1	ColloidalComponent	A type of colloid, either sol, foam or emulsion.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>			Tag	Value	sequenceNumber	20	
	Tag	Value						
sequenceNumber	20							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Description: enforce the 'by value' property pattern without xlinks

isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ColloidalComponent"
substitutionGroup="gwml:WaterCompositionComponent" type="gwml:ColloidalComponentType">
  <xs:annotation>
    <xs:documentation>This class refers to a physical component that hava the proerties of a colloid.

A colloid is a type of mechanical mixture where one substance is dispersed evenly throughout another.
Because of this dispersal, some colloids have the appearance of solutions. A colloidal system consists of
two separate phases: a dispersed phase (or internal phase) and a continuous phase (or dispersion medium). A
colloidal system may be solid, liquid, or gaseous.
derived from http://en.wikipedia.org/wiki/Colloid

Of, pertaining to, or consisting of a colloid.
http://en.wiktionary.org/wiki/colloidal</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ColloidalComponentType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterCompositionComponentType">
      <xs:sequence>
        <xs:element name="colloid" type="gsml:ControlledConceptPropertyType">
          <xs:annotation>
            <xs:documentation>A colloid is a type of mechanical mixture where one substance is
dispersed evenly throughout another. This attribute may be used to name a colloid.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element maxOccurs="1" minOccurs="0" name="colloidalType" type="gwml:ColloidTypeType">
          <xs:annotation>
            <xs:documentation>A type of colloid, either sol, foam or emulsion.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ColloidalComponentPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:ColloidalComponent"/>
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)
For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<DataType>> **DissolvedComponent** (extends [WaterCompositionComponent](#))

That has been disintegrated in a solvent
<http://en.wiktionary.org/wiki/dissolved>

This class refers to a chemical component dissolved in groundwater.

Local Subclasses: [Salinity](#)

Attributes

Name	Type	Bounds	From Class	Notes
concentration	CGI_Numeric	1..1	WaterCompositionComponent	In chemistry, concentration is the measure of how much of a given substance there is mixed with another substance. This can apply to any sort of chemical mixture, but most frequently the concept is limited to homogeneous solutions, where it refers to the amount of solute in a substance. http://en.wikipedia.org/wiki/Concentration
				<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>
Tag	Value			
sequenceNumber	10			
saturation	CGI_Term	0..1	DissolvedComponent	This attribute refers the the saturation of a dissolved component into ground water. The domain values are "pure, unsaturated, saturated, sursaturated". In physical chemistry, saturation is the point at which a solution of a substance can dissolve no more of that substance and additional amounts of it will appear as a precipitate. This point of maximum concentration, the saturation point, depends on the temperature of the liquid as well as the chemical nature of the substances involved. http://en.wikipedia.org/wiki/Saturation_(chemistry)
				<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>
Tag	Value			
sequenceNumber	10			

Outbound Associations

Name	Type	Multiplicity	From Class	Notes			
dissolved	SolutionComponent	0..1	DissolvedComponent				
	<div>Association tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>120</td></tr></table>		Tag	Value	sequenceNumber	120	
Tag	Value						
sequenceNumber	120						

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Description: enforce the 'by value' property pattern without xlinks

isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DissolvedComponent"
substitutionGroup="gwml:WaterCompositionComponent" type="gwml:DissolvedComponentType">
  <xs:annotation>
    <xs:documentation>That has been disintegrated in a solvent
http://en.wiktionary.org/wiki/dissolved

This class refers to a chemical component dissovod in groundwater.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DissolvedComponentType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterCompositionComponentType">
      <xs:sequence>
        <xs:element maxOccurs="1" minOccurs="0" name="saturation" type="gsml:CGI_TermPropertyType">
          <xs:annotation>
            <xs:documentation>This attribute refers the the saturation of a dissolved component
into ground water. The domain values are "pure, unsaturated, saturated, sursaturated".

In physical chemistry, saturation is the point at which a solution of a substance can dissolve no more of
that substance and additional amounts of it will appear as a precipitate. This point of maximum
concentration, the saturation point, depends on the temperature of the liquid as well as the chemical
nature of the substances involved.
http://en.wikipedia.org/wiki/Saturation_(chemistry)</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element maxOccurs="1" minOccurs="0" name="dissolved"
type="gwml:SolutionComponentPropertyType"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DissolvedComponentPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:DissolvedComponent"/>
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

OverviewPackageClassHelp



Class <<DataType>> **GeologicProperty** (extends [PhysicalProperty](#))

The geologic property of an aquifer.

Local Subclasses: [Porosity](#)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true Description: enforce the 'by value' property pattern without xlinks
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GeologicProperty"
substitutionGroup="gwml:PhysicalProperty" type="gwml:GeologicPropertyType">
  <xs:annotation>
    <xs:documentation>The geologic property of an aquifer.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GeologicPropertyType">
  <xs:complexContent>
    <xs:extension base="gwml:PhysicalPropertyType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="GeologicPropertyPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:GeologicProperty"/>
  </xs:sequence>
</xs:complexType>
```

[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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OverviewPackageClassHelp



Class <<DataType>> **HydrogeologicClassification** (extends [Categorisation](#))

A class used to specify a classification based on characteristic hydrology and geological settings.

Derived from <http://www.esf.edu/rwls/research/Fen/Fenglossaty.pdf> - Hydrologic Classification System

Local Subclasses: [AquiferVulnerabilityClassification](#)

Attributes

Name	Type	Bounds	From Class	Notes
categorisationTheme	ScopedName	1..1	Categorisation	A theme on which a categorisation is applied.
	<i>Attribute tagged values</i>			
	Tag	Value		
	sequenceNumber	10		
categoryCode	CGI_Term	1..1	Categorisation	A code associated to a category.
	<i>Attribute tagged values</i>			
	Tag	Value		
	sequenceNumber	20		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
categorisationDocumentation	MD_Metadata	1..*	Categorisation	
	Association tagged values			
	Tag	Value		
	sequenceNumber	130		
categorisationAuthority	CI_ResponsibleParty	1..*	Categorisation	
	Association tagged values			
	Tag	Value		
	sequenceNumber	140		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true

		Description: enforce the 'by value' property pattern without xlink
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrogeologicClassification"
substitutionGroup="gwml:Classification" type="gwml:HydrogeologicClassificationType">
  <xs:annotation>
    <xs:documentation>A class used to specify a classification based on characteristic hydrology and
geological settings.
Derived from http://www.esf.edu/rwls/research/Fen/Fenglossaty.pdf - Hydrologic Classification
System</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrogeologicClassificationType">
  <xs:complexContent>
    <xs:extension base="gwml:ClassificationType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrogeologicClassificationPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:HydrogeologicClassification"/>
  </xs:sequence>
</xs:complexType>
```

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[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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OverviewPackageClassHelp



Class <<DataType>> HydrogeologicUnitPart (extends GeologicUnitPart)

Describe the relationship between this hydrogeologic unit and geologic units that host, constrains or bound it.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
constrain	ControlledConcept	1..1	HydrogeologicUnitPart	
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true Description: enforce the 'by value' property pattern without xlink
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrogeologicUnitPart"
substitutionGroup="gsml:GeologicUnitPart" type="gwml:HydrogeologicUnitPartType">
  <xs:annotation>
    <xs:documentation>Describe the relationship between this hydrogeologic unit and geologic units that
host, constrains or bound it.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrogeologicUnitPartType">
  <xs:complexContent>
    <xs:extension base="gsml:GeologicUnitPartType">
      <xs:sequence>
```

```
        <xs:element name="constrain" type="gsml:ControlledConceptPropertyType"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="HydrogeologicUnitPartPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:HydrogeologicUnitPart"/>
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

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OverviewPackageClassHelp



Class <<DataType>> PhysicalProperty

A generic class used to describe various physical properties.

Local Subclasses: [GeologicProperty](#)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true Description: enforce the 'by value' property pattern without xlinks
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PhysicalProperty"
type="gwm1:PhysicalPropertyType">
  <xs:annotation>
    <xs:documentation>A generic class used to describe various physical properties.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PhysicalPropertyType"/>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PhysicalPropertyPropertyType">
  <xs:sequence>
    <xs:element ref="gwm1:PhysicalProperty"/>
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)
For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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OverviewPackageClassHelp

Class <<DataType>> Porosity (extends [GeologicProperty](#))

Used in geology, hydrogeology, soil science, and building science, the porosity of a porous medium (such as rock or sediment) describes the fraction of void space in the material, where the void may contain, for example, air or water.
<http://en.wikipedia.org/wiki/Porosity>

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true Description: enforce the 'by value' property pattern without xlinks
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Suppress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="Porosity"
substitutionGroup="gwml:GeologicProperty" type="gwml:PorosityType">
  <xs:annotation>
    <xs:documentation>Used in geology, hydrogeology, soil science, and building science, the porosity of
a porous medium (such as rock or sediment) describes the fraction of void space in the material, where the
void may contain, for example, air or water.
http://en.wikipedia.org/wiki/Porosity</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PorosityType">
  <xs:complexContent>
    <xs:extension base="gwml:GeologicPropertyType"/>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="PorosityPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:Porosity"/>
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema
<API Specification/>

OverviewPackageClassHelp



Class <<DataType>> ProcessContextRelation (extends SamplingFeatureRelation)

Specific relation between sampling features where the sampling features form a network in a process to generate observations for a target sampling feature. The common example is a well network where measures are taken at several wells to estimate a property at a target well or for another target feature (ie, an aquifer)

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
------	------	--------	------------	-------

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
relatedProcess	Process	0..1	ProcessContextRelation	
	Association tagged values			
	Tag	Value		
	sequenceNumber	110		

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true Description: enforce the 'by value' property pattern without xlinks
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ProcessContextRelation"
type="gwm1:ProcessContextRelationType" substitutionGroup="sa:SamplingFeatureRelation">
  <xs:annotation>
    <xs:documentation>Specific relation between sampling features where the sampling features form a
network in a process to generate observations for a target sampling feature. The common example is a well
network where measures are taken at several wells to estimate a property at a target well or for another
target feature (ie, an aquifer)</xs:documentation>
  </xs:annotation>
</xs:element>
```



```
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ProcessContextRelationType">
  <xs:complexContent>
    <xs:extension base="sa:SamplingFeatureRelationType">
      <xs:sequence>
        <xs:element name="relatedProcess" minOccurs="0" maxOccurs="1"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ProcessContextRelationPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:ProcessContextRelation"/>
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

Overview

Package

Class

Help

Class <<DataType>> QualitativeQualityDescription (extends [WaterQualityDescription](#))

A normative quality description is an assesment based upon some guideline edited by a gouvernement or a quality standard. It can include things such as "odor" or "color".

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
metadata	MD_Metadata	0..1	WaterPropertyDescription	Metadata used to describe the water properties.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							
validityTime	TM_GeometricPrimitive	0..1	WaterPropertyDescription	Time instant or period at which this value has any validity. NOTE: the time at which this observation was made is carried by O&M				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>			Tag	Value	sequenceNumber	20	
	Tag	Value						
sequenceNumber	20							
normComplianceResult	CGI_Term	0..1	WaterQualityDescription	Evaluation of the compliance of this result compared to the norm (eg, below the norm, above the norm, meeting, exceeding..)				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							
normDocumentation	CI_Citation	0..1	WaterQualityDescription	Identification of a norm (if any) that is should be considered to interpret the result.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>			Tag	Value	sequenceNumber	20	
	Tag	Value						
sequenceNumber	20							
qualityTopic	CGI_Term	1..1	QualitativeQualityDescription	What is being measured (ie, hardness, suspended material, odor or color)				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							
qualityAssessment	CGI_Value	1..1	QualitativeQualityDescription	Qualitative assesment of the water, using a normative quality descriptor.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>			Tag	Value	sequenceNumber	20	
	Tag	Value						
sequenceNumber	20							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true Description: enforce the 'by value' property pattern without xlink
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="QualitativeQualityDescription"
substitutionGroup="gwml:WaterQualityDescription" type="gwml:QualitativeQualityDescriptionType">
  <xs:annotation>
    <xs:documentation>A normative quality description is an assesment based upon some guideline edited
by a gouvernement or a quality standard. It can include things such as "odor" or "color".</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="QualitativeQualityDescriptionType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterQualityDescriptionType">
      <xs:sequence>
        <xs:element name="qualityTopic" type="gsml:CGI_TermPropertyType">
          <xs:annotation>
            <xs:documentation>What is being measured (ie, hardness, suspended material, odor or
color)</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="qualityAssessment" type="gsml:CGI_ValuePropertyType">
          <xs:annotation>
            <xs:documentation>Qualitative assesment of the water, using a normative quality
descriptor.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema"
name="QualitativeQualityDescriptionPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:QualitativeQualityDescription"/>
  </xs:sequence>
</xs:complexType>
```

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<DataType>> ResultElement

This class is used to represent one element of the results of a groundwater analysis.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
parameter	ControlledConcept	1..1	ResultElement	This property is used to define the types of the elements of the results if a groundwater analysis.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
	sequenceNumber	10						
valueq	CGI_Value	1..1	ResultElement	This parameter is used to represent the values of the various parameters of the results of a groundwater analysis.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>			Tag	Value	sequenceNumber	20	
	Tag	Value						
	sequenceNumber	20						

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true Description: enforce the 'by value' property pattern without xlinks
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ResultElement" type="gwml:ResultElementType">
  <xs:annotation>
    <xs:documentation>This class is used to represent one element of the results of a groundwater
analysis.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ResultElementType">
  <xs:sequence>
    <xs:element name="parameter" type="gsml:ControlledConceptPropertyType">
      <xs:annotation>
        <xs:documentation>This property is used to define the types of the elements of the results
if a groundwater analysis.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="valueq" type="gsml:CGI_ValuePropertyType">
      <xs:annotation>
        <xs:documentation>This parameter is used to represent the values of the various parameters
of the results of a groundwater analysis.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ResultElementPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:ResultElement"/>
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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Class <<DataType>> **SpatialRelationship**

This class is used to identify the spatial relationship between two or more objects.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
spatialRelation	ScopedName	1..1	SpatialRelationship	This property is used to express explicitly the spatial relationship between two or more objects.
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		10	

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true Description: enforce the 'by value' property pattern without xlink
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SpatialRelationship"
type="gwm1:SpatialRelationshipType">
  <xs:annotation>
    <xs:documentation>This class is used to identify the spatial relationship between two or more
objects.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SpatialRelationshipType">
  <xs:sequence>
    <xs:element name="spatialRelation" type="gml:CodeType">
      <xs:annotation>
```

```

        <xs:documentation>This property is used to express explicitly the spatial relationship
between two or more objects.</xs:documentation>
    </xs:annotation>
    </xs:element>
</xs:sequence>
</xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SpatialRelationshipPropertyType">
    <xs:sequence>
        <xs:element ref="gwm1:SpatialRelationship"/>
    </xs:sequence>
</xs:complexType>

```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp



Class <<DataType>> SuspendedComponent (extends [WaterCompositionComponent](#))

In chemistry, a suspension is a homogeneous fluid containing solid particles that are sufficiently large for sedimentation. Usually they must be larger than 1 micrometre.[1] The internal phase (solid) is dispersed throughout the external phase (fluid) through mechanical agitation, with the use of certain excipients or suspending agents. Unlike colloids, suspensions will eventually settle. An example of a suspension would be sand in water. The suspended particles are visible under a microscope and will settle over time if left undisturbed. This distinguishes a suspension from a colloid in which the suspended particles are smaller and do not settle.[2] In a solution, the dissolved substance does not exist as a solid and the two are homogeneously mixed.
[http://en.wikipedia.org/wiki/Suspension_\(chemistry\)](http://en.wikipedia.org/wiki/Suspension_(chemistry))

This class is used to described a suspended material in groundwater.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes	
concentration	CGI_Numeric	1..1	WaterCompositionComponent	In chemistry, concentration is the measure of how much of a given substance there is mixed with another substance. This can apply to any sort of chemical mixture, but most frequently the concept is limited to homogeneous solutions, where it refers to the amount of solute in a substance. http://en.wikipedia.org/wiki/Concentration	
		Attribute tagged values			
		Tag	Value		
		sequenceNumber	10		
suspendedMaterial	ControlledConcept	1..1	SuspendedComponent	Name of the suspension material in groundwater.	
		Attribute tagged values			
		Tag	Value		
		sequenceNumber	10		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Description: enforce the 'by value' property pattern without xlinks
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true

		Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SuspendedComponent"
substitutionGroup="gwml:WaterCompositionComponent" type="gwml:SuspendedComponentType">
  <xs:annotation>
    <xs:documentation>In chemistry, a suspension is a homogeneous fluid containing solid particles that
are sufficiently large for sedimentation. Usually they must be larger than 1 micrometre.[1] The internal
phase (solid) is dispersed throughout the external phase (fluid) through mechanical agitation, with the use
of certain excipients or suspending agents. Unlike colloids, suspensions will eventually settle. An example
of a suspension would be sand in water. The suspended particles are visible under a microscope and will
settle over time if left undisturbed. This distinguishes a suspension from a colloid in which the suspended
particles are smaller and do not settle.[2] In a solution, the dissolved substance does not exist as a
solid and the two are homogeneously mixed.
http://en.wikipedia.org/wiki/Suspension_(chemistry)
This class is used to described a suspended material in groundwater.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SuspendedComponentType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterCompositionComponentType">
      <xs:sequence>
        <xs:element name="suspendedMaterial" type="gsml:ControlledConceptPropertyType">
          <xs:annotation>
            <xs:documentation>Name of the suspension material in groundwater.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SuspendedComponentPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:SuspendedComponent" />
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<DataType>> WaterAgeDescription (extends [WaterPropertyDescription](#))

The age of the water is generally (always?) the age of infiltration. The infiltration can be in an aquifer different from the aquifer it actually resides in (for example, water infiltrated in a surface aquifer and migrated slowly in a deeper - rock perhaps - aquifer).

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
metadata	MD_Metadata	0..1	WaterPropertyDescription	Metadata used to describe the water properties.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
	sequenceNumber	10						
validityTime	TM_GeometricPrimitive	0..1	WaterPropertyDescription	Time instant or period at which this value has any validity. NOTE: the time at which this observation was made is carried by O&M				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>			Tag	Value	sequenceNumber	20	
	Tag	Value						
	sequenceNumber	20						
periodOfResidence	TM_PeriodDuration	0..1	WaterAgeDescription	The time period in which a unit of water resides in an aquifer.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
	sequenceNumber	10						
waterAge	GeologicEvent	0..1	WaterAgeDescription	The age of the water, expressed as a geologicEvent. Refer to http://www.geosciml.org/documentation/geosciml/2.0_rc3/GeoSciML/GeologicAge/GeologicEvent.html for a complete description of a geologicEvent.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>			Tag	Value	sequenceNumber	20	
	Tag	Value						
	sequenceNumber	20						

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true Description: enforce the 'by value' property pattern without xlinks
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false

		Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterAgeDescription"
substitutionGroup="gwml:WaterPropertyDescription" type="gwml:WaterAgeDescriptionType">
  <xs:annotation>
    <xs:documentation>The age of the water is generally (always?) the age of infiltration. The infiltration can
be in an aquifer different from the aquifer it actually resides in (for example, water infiltrated in a surface
aquifer and migrated slowly in a deeper - rock perhaps - aquifer).</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterAgeDescriptionType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterPropertyDescriptionType">
      <xs:sequence>
        <xs:element maxOccurs="1" minOccurs="0" name="periodOfResidence" type="duration">
          <xs:annotation>
            <xs:documentation>The time period in which a unit of water resides in an
aquifer.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element maxOccurs="1" minOccurs="0" name="waterAge" type="gsml:GeologicEventPropertyType">
          <xs:annotation>
            <xs:documentation>The age of the water, expressed as a geologicEvent. Refer to
http://www.geosciml.org/documentation/geosciml/2.0_rc3/GeoSciML/GeologicAge/GeologicEvent.html for a complete
description of a geologicEvent.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterAgeDescriptionPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:WaterAgeDescription"/>
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema
<API Specification>

OverviewPackageClassHelp

Class <<DataType>> **WaterCompositionComponent**

An abstract class that is used to describe a component that can be present in groundwater

Local Subclasses: [BiologicComponent](#) [ColloidalComponent](#) [DissolvedComponent](#) [SuspendedComponent](#)

Attributes

Name	Type	Bounds	From Class	Notes				
concentration	CGI_Numeric	1..1	WaterCompositionComponent	In chemistry, concentration is the measure of how much of a given substance there is mixed with another substance. This can apply to any sort of chemical mixture, but most frequently the concept is limited to homogeneous solutions, where it refers to the amount of solute in a substance. http://en.wikipedia.org/wiki/Concentration				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Description: enforce the 'by value' property pattern without xlink
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" abstract="true" name="WaterCompositionComponent" type="gwml:WaterCompositionComponentType">
  <xs:annotation>
    <xs:documentation>An abstract class that is used to describe a component that can be present in groundwater</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" abstract="true" name="WaterCompositionComponentType">
```

```
<xs:sequence>
  <xs:element name="concentration" type="gsml:CGI_NumericPropertyType">
    <xs:annotation>
      <xs:documentation>In chemistry, concentration is the measure of how much of a given
substance there is mixed with another substance. This can apply to any sort of chemical mixture, but most
frequently the concept is limited to homogeneous solutions, where it refers to the amount of solute in a
substance.
http://en.wikipedia.org/wiki/Concentration</xs:documentation>
    </xs:annotation>
  </xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterCompositionComponentPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:WaterCompositionComponent" />
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<DataType>> WaterCompositionDescription (extends [WaterQualityDescription](#))

An abstract class used to describe the composition of water.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
metadata	MD_Metadata	0..1	WaterPropertyDescription	Metadata used to describe the water properties.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
validityTime	TM_GeometricPrimitive	0..1	WaterPropertyDescription	Time instant or period at which this value has any validity. NOTE: the time at which this observation was made is carried by O&M
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	20		
normComplianceResult	CGI_Term	0..1	WaterQualityDescription	Evaluation of the compliance of this result compared to the norm (eg, below the norm, above the norm, meeting, exceeding..)
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
normDocumentation	CI_Citation	0..1	WaterQualityDescription	Identification of a norm (if any) that is should be considered to interpret the result.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	20		
compositionCategory	ControlledConcept	0..1	WaterCompositionDescription	Describe what kind of concentration is represented, such as "Natural quality", "suitability for irrigation", etc..
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
salinityCategory	WaterType	0..1	WaterCompositionDescription	This property refers to the type of salinity that is present in the water.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	30		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes			
components	WaterCompositionComponent	1..*	WaterCompositionDescription				
	<div><div>Association tagged values</div><table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>120</td></tr></table></div>		Tag	Value	sequenceNumber	120	
Tag	Value						
sequenceNumber	120						

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true Description: enforce the 'by value' property pattern without xlink
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterCompositionDescription"
substitutionGroup="gwml:WaterQualityDescription" type="gwml:WaterCompositionDescriptionType">
  <xs:annotation>
    <xs:documentation>An abstract class used to describe the composition of water.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterCompositionDescriptionType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterQualityDescriptionType">
      <xs:sequence>
        <xs:element maxOccurs="1" minOccurs="0" name="compositionCategory"
type="gsml:ControlledConceptPropertyType">
          <xs:annotation>
            <xs:documentation>Describe what kind of concentration is represented, such as
"Natural quality", "suitability for irrigation", etc..</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element maxOccurs="1" minOccurs="0" name="salinityCategory" type="gwml:WaterTypeType">
          <xs:annotation>
            <xs:documentation>This property refers to the type of salinity that is present in the
water.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element maxOccurs="unbounded" minOccurs="1" name="components"
type="gwml:WaterCompositionComponentPropertyType"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```



```
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterCompositionDescriptionPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:WaterCompositionDescription"/>
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

OverviewPackageClassHelp



Class <<DataType>> WaterPropertyDescription

Water Property description are the properties of the HydrogeologicUnit regarding its water content. Two aspects are considered, First the quantity (the amount of water that is present, as opposed to the amount of water that can potentially be there) and second, the quality of that water.

Local Subclasses: [WaterAgeDescription](#) [WaterQualityDescription](#) [WaterQuantityDescription](#)

Attributes

Name	Type	Bounds	From Class	Notes
metadata	MD_Metadata	0..1	WaterPropertyDescription	Metadata used to describe the water properties.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
validityTime	TM_GeometricPrimitive	0..1	WaterPropertyDescription	Time instant or period at which this value has any validity. NOTE: the time at which this observation was made is carried by O&M
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	20		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true Description: enforce the 'by value' property pattern without xlinks
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterPropertyDescription"
type="gwml:WaterPropertyDescriptionType">
  <xs:annotation>
    <xs:documentation>Water Property description are the properties of the HydrogeologicUnit regarding
its water content. Two aspects are considered, First the quantity (the amount of water that is present, as
opposed to the amount of water that can potentially be there) and second, the quality of that
water.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterPropertyDescriptionType">
  <xs:sequence>
    <xs:element maxOccurs="1" minOccurs="0" name="metadata" type="gmd:MD_Metadata_PropertyType">
      <xs:annotation>
        <xs:documentation>Metadata used to describe the water properties.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="validityTime" type="gml:TimePrimitivePropertyType">
      <xs:annotation>
        <xs:documentation>Time instant or period at which this value has any validity. NOTE: the
time at which this observation was made is carried by O&amp;M</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterPropertyDescriptionPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:WaterPropertyDescription"/>
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

Overview

Package

Class

Help

Class <<DataType>> **WaterQualityDescription** (extends [WaterPropertyDescription](#))

A list of common properties related to water quality assessment. Head of a substitution list that include Qualitative and Quantitative water quality properties

Local Subclasses: [QualitativeQualityDescription](#) [WaterCompositionDescription](#)

Attributes

Name	Type	Bounds	From Class	Notes
metadata	MD_Metadata	0..1	WaterPropertyDescription	Metadata used to describe the water properties.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
validityTime	TM_GeometricPrimitive	0..1	WaterPropertyDescription	Time instant or period at which this value has any validity. NOTE: the time at which this observation was made is carried by O&M
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	20		
normComplianceResult	CGI_Term	0..1	WaterQualityDescription	Evaluation of the compliance of this result compared to the norm (eg, below the norm, above the norm, meeting, exceeding..)
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
normDocumentation	CI_Citation	0..1	WaterQualityDescription	Identification of a norm (if any) that is should be considered to interpret the result.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	20		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true

		Default: true Description: enforce the 'by value' property pattern without xlink
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" abstract="true" name="WaterQualityDescription"
substitutionGroup="gwml:WaterPropertyDescription" type="gwml:WaterQualityDescriptionType">
  <xs:annotation>
    <xs:documentation>A list of common properties related to water quality assessment. Head of a
substitution list that include Qualitative and Quantitative water quality properties</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" abstract="true"
name="WaterQualityDescriptionType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterPropertyDescriptionType">
      <xs:sequence>
        <xs:element maxOccurs="1" minOccurs="0" name="normComplianceResult"
type="gsml:CGI_TermPropertyType">
          <xs:annotation>
            <xs:documentation>Evaluation of the compliance of this result compared to the norm
(eg, below the norm, above the norm, meeting, exceeding..)</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element maxOccurs="1" minOccurs="0" name="normDocumentation"
type="gmd:CI_Citation_PropertyType">
          <xs:annotation>
            <xs:documentation>Identification of a norm (if any) that is should be considered to
interpret the result.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterQualityDescriptionPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:WaterQualityDescription"/>
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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Class <<DataType>> **WaterQuantityDescription** (extends [WaterPropertyDescription](#))

A class used to describe the the quantity of water that is present in an aquifer.

Local Subclasses: [WaterVolumeDescription](#) [WaterYieldDescription](#)

Attributes

Name	Type	Bounds	From Class	Notes
metadata	MD_Metadata	0..1	WaterPropertyDescription	Metadata used to describe the water properties.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
	validityTime	TM_GeometricPrimitive	0..1	WaterPropertyDescription
Attribute tagged values				
Tag		Value		
sequenceNumber		20		
qualitativeWaterQuantity		CGI_Term	0..1	WaterQuantityDescription
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true Description: enforce the 'by value' property pattern without xlinks
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true

		Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterQuantityDescription"
substitutionGroup="gwml:WaterPropertyDescription" type="gwml:WaterQuantityDescriptionType">
  <xs:annotation>
    <xs:documentation>A class used to describe the the quantity of water that is present in an
aquifer.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterQuantityDescriptionType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterPropertyDescriptionType">
      <xs:sequence>
        <xs:element maxOccurs="1" minOccurs="0" name="qualitativeWaterQuantity"
type="gsml:CGI_TermPropertyType">
          <xs:annotation>
            <xs:documentation>Qualitative description of the water quantity (such as 'wet' or
'dry'). Often the only information recorded in some water well records</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterQuantityDescriptionPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:WaterQuantityDescription"/>
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<DataType>> WaterVolumeDescription (extends [WaterQuantityDescription](#))

A class used to describe the volume of water present in an aquifer.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
metadata	MD_Metadata	0..1	WaterPropertyDescription	Metadata used to describe the water properties.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
validityTime	TM_GeometricPrimitive	0..1	WaterPropertyDescription	Time instant or period at which this value has any validity. NOTE: the time at which this observation was made is carried by O&M
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	20		
qualitativeWaterQuantity	CGI_Term	0..1	WaterQuantityDescription	Qualitative description of the water quantity (such as 'wet' or 'dry'). Often the only information recorded in some water well records
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
volumeType	CGI_Term	1..1	WaterVolumeDescription	Describes the type of volume that we are referring to eg: dynamicVolume, specificVolume, theoricVolume, gwStorage (static)
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
volume	CGI_Numeric	0..1	WaterVolumeDescription	Total volume of water in an aquifer.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	20		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

--	--	--	--

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true Description: enforce the 'by value' property pattern without xlinks
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Suppress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterVolumeDescription"
substitutionGroup="gwml:WaterQuantityDescription" type="gwml:WaterVolumeDescriptionType">
  <xs:annotation>
    <xs:documentation>A class used to describe the volume of water present in an
aquifer.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterVolumeDescriptionType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterQuantityDescriptionType">
      <xs:sequence>
        <xs:element name="volumeType" type="gsml:CGI_TermPropertyType">
          <xs:annotation>
            <xs:documentation>Describes the type of volume that we are referring to eg:
dynamicVolume, specificVolume, theoricVolume, gwStorage (static)</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element maxOccurs="1" minOccurs="0" name="volume" type="gsml:CGI_NumericPropertyType">
          <xs:annotation>
            <xs:documentation>Total volume of water in an aquifer.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterVolumeDescriptionPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:WaterVolumeDescription"/>
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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Class <<DataType>> WaterYieldDescription (extends WaterQuantityDescription)

A class used to describe the different yield parameters of an aquifer.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
metadata	MD_Metadata	0..1	WaterPropertyDescription	Metadata used to describe the water properties.
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
validityTime	TM_GeometricPrimitive	0..1	WaterPropertyDescription	Time instant or period at which this value has any validity. NOTE: the time at which this observation was made is carried by O&M
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	20		
qualitativeWaterQuantity	CGI_Term	0..1	WaterQuantityDescription	Qualitative description of the water quantity (such as 'wet' or 'dry'). Often the only information recorded in some water well records
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
safeYield	CGI_Value	0..1	WaterYieldDescription	With reference to either a surface- or ground-water supply, the rate of diversion or extraction for <i>Consumptive Use </i>which can be maintained indefinitely, within the limits of economic feasibility, under specified conditions of water-supply development. Also see <i>Perennial Yield</i>. Yield, Perennial ? The amount of usable water of a ground-water reservoir that can be economically withdrawn and consumed each year for an indefinite period of time. It cannot exceed the sum of the <i>Natural Recharge</i>, the <i>Artificial </i>(or <i>Induced</i>) <i>Recharge</i>, and the <i>Incidental Recharge </i>without causing depletion of the groundwater reservoir. Also referred to as <i>Safe Yield</i>. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-y.pdf
				Amount of water that can be retrieved from an aquifer without jeopardising the resources but still involved some impacts (def. to be improved)
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
specificYield	CGI_Numeric	0..1	WaterYieldDescription	Specific yield, also known as the drainable porosity, is a ratio, less than or equal to the effective porosity, indicating the volumetric fraction of the bulk aquifer volume that a given aquifer will yield when all the water is allowed to drain out of it under the forces of gravity (http://en.wikipedia.org/wiki/Specific_storage)
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	20		
sustainableYield	CGI_Value	0..1	WaterYieldDescription	<i>The groundwater extraction regime, measured over a specified planning timeframe, that allows acceptable levels of stress and protects dependent economic, social, and environmental values.</i><i>http://www.environment.gov.au/water/publications/environmental/groundwater/pubs/annex-a.pdf</i>
				The sustainable yield of natural capital is the ecological yield that can be extracted without reducing the base of capital itself, i.e. the surplus required to maintain nature's services at the same or increasing level over time

	Attribute tagged values	
	Tag	Value
	sequenceNumber	30

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true Description: enforce the 'by value' property pattern without xlinkns
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Suppress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterYieldDescription"
substitutionGroup="gwml:WaterQuantityDescription" type="gwml:WaterYieldDescriptionType">
  <xs:annotation>
    <xs:documentation>A class used to describe the different yield parameters of an aquifer.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterYieldDescriptionType">
  <xs:complexContent>
    <xs:extension base="gwml:WaterQuantityDescriptionType">
      <xs:sequence>
        <xs:element maxOccurs="1" minOccurs="0" name="safeYield" type="gsml:CGI_ValuePropertyType">
          <xs:annotation>
            <xs:documentation>With reference to either a surface- or ground-water supply, the rate of
diversion or extraction for <i>Consumptive Use</i> which can be maintained indefinitely, within the limits of
economic feasibility, under specified conditions of water-supply development. Also see <i>Perennial
Yield</i>.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element maxOccurs="1" minOccurs="0" name="specificYield" type="gsml:CGI_NumericPropertyType">
          <xs:annotation>
            <xs:documentation>Specific yield, also known as the drainable porosity, is a ratio, less than or
equal to the effective porosity, indicating the volumetric fraction of the bulk aquifer volume that a given aquifer will
yield when all the water is allowed to drain out of it under the forces of gravity
(http://en.wikipedia.org/wiki/Specific_storage)</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element maxOccurs="1" minOccurs="0" name="sustainableYield" type="gsml:CGI_ValuePropertyType">
          <xs:annotation>
            <xs:documentation><i></i><i>The groundwater extraction regime, measured over a specified
planning timeframe, that allows acceptable levels of stress and protects dependent economic, social, and environmental
values.</i></i><i></i>http://www.environment.gov.au/water/publications/environmental/groundwater/pubs/annex-
a.pdf<i></i></i></xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

```
The sustainable yield of natural capital is the ecological yield that can be extracted without reducing the base of
capital itself, i.e. the surplus required to maintain nature's services at the same or increasing level over
time</xs:documentation>
    </xs:annotation>
  </xs:element>
</xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterYieldDescriptionPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:WaterYieldDescription"/>
  </xs:sequence>
</xs:complexType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<DataType>> WellBoreholeDetails (extends BoreholeDetails)

This class is used to details specific characteristics of well boreholes.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
drillingFluid	CGI_Term	0..1	WellBoreholeDetails	Identification of the drilling fluid used for the well borehole.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
	sequenceNumber	10						

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	true	Values: true Default: true Description: enforce the 'by value' property pattern without xlink
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdDerivation	true	Values: true false Default: true Description: class implemented as new type + element, or by applying constraints only
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellBoreholeDetails" type="gwm1:WellBoreholeDetailsType" substitutionGroup="gsml:BoreholeDetails">
  <xs:annotation>
    <xs:documentation>This class is used to details specific characteristics of well boreholes.</xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellBoreholeDetailsType">
  <xs:complexContent>
    <xs:extension base="gsml:BoreholeDetailsType">
      <xs:sequence>
```

```

        <xs:element name="drillingFluid" type="gsml:CGI_TermPropertyType" minOccurs="0"
maxOccurs="1">
            <xs:annotation>
                <xs:documentation>Identification of the drilling fluid used for the well
borehole.</xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellBoreholeDetailsPropertyType">
    <xs:sequence>
        <xs:element ref="gwml:WellBoreholeDetails"/>
    </xs:sequence>
</xs:complexType>

```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<DataType>> WellWaterDescription

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
waterLevel	Measure	0..*	WellWaterDescription	
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
isCollection	false	Values: true false Default: false Description: Identifies the data type as an object collection.
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:element xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellWaterDescription" type="gwml:WellWaterDescriptionType"/>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellWaterDescriptionType">
  <xs:sequence>
    <xs:element name="waterLevel" type="gml:MeasureType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WellWaterDescriptionPropertyType">
  <xs:sequence>
    <xs:element ref="gwml:WellWaterDescription"/>
  </xs:sequence>
</xs:complexType>
```

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

OverviewPackageClassHelp



Class <<Union>> SolutionComponent

In chemistry, a solution is a homogeneous mixture composed of two or more substances. In such a mixture, a solute is dissolved in another substance, known as a solvent. A common example is a solid, such as salt or sugar, dissolved in water, a liquid. Gases may dissolve in liquids, for example, carbon dioxide or oxygen in water. Liquids may dissolve in other liquids.
<http://en.wikipedia.org/wiki/Solution>

This class is used to describe a dissolved component in groundwater.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
dissolvedChemical	ControlledConcept	1..1	SolutionComponent	Name of a dissolved chemical component in groundwater that is not a salt.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							
dissolvedSalt	Salt	1..1	SolutionComponent	Name of a salt component dissolved in groundwater.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>			Tag	Value	sequenceNumber	20	
	Tag	Value						
sequenceNumber	20							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
byValuePropertyType	false	Values: true false Default: false Description: enforce the 'by value' property pattern without xlinks
hasXmlLang	false	Values: true false Default: false Description: axml attribute xml:lang shall be generated for the type representing the class
noPropertyType	false	Values: false Default: false Description: Surpress creation of a standard property type that supports inline encoding (applies to ISO 19136:2007 encoding rule). Always set to false in INSPIRE.
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```

<xs:group xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SolutionComponent">
  <xs:annotation>
    <xs:documentation>In chemistry, a solution is a homogeneous mixture composed of two or more
substances. In such a mixture, a solute is dissolved in another substance, known as a solvent. A common
example is a solid, such as salt or sugar, dissolved in water, a liquid. Gases may dissolve in liquids, for
example, carbon dioxide or oxygen in water. Liquids may dissolve in other liquids.
http://en.wikipedia.org/wiki/Solution
This class is used to describe a dissolved component in groundwater.</xs:documentation>
  </xs:annotation>
  <xs:choice>
    <xs:element ref="gsml:ControlledConcept">
      <xs:annotation>
        <xs:documentation>Name of a dissolved chemical component in groundwater that is not a
salt.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element ref="gwml:Salt">
      <xs:annotation>
        <xs:documentation>Name of a salt component dissolved in groundwater.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:choice>
</xs:group>

<xs:simpleType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SolutionComponentUnionSemantics">
  <xs:restriction base="string">
    <xs:enumeration value="dissolvedChemical"/>
    <xs:enumeration value="dissolvedSalt"/>
  </xs:restriction>
</xs:simpleType>

<xs:complexType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SolutionComponentPropertyType">
  <xs:sequence minOccurs="0">
    <xs:group ref="gwml:SolutionComponent"/>
  </xs:sequence>
  <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
  <xs:attribute name="unionSemantics" type="gwml:SolutionComponentUnionSemantics"/>
</xs:complexType>

```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification>

OverviewPackageClassHelp



Class <<Enumeration>> AquiferMediaType

Aquifers are generally classified as porous or fractured (or mixed in a cased of fractured porous media)

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
porous		1..1	AquiferMediaType	Porous media are those aquifers consisting of aggregates of individual particles such as sand or gravel. The groundwater occurs in and moves through the openings between the individual grains. Porous media where the grains are not connected to each other are considered unconsolidated. If the grains are cemented together, such aquifers are called consolidated. Sandstones are examples of consolidated porous http://www.ec.gc.ca/water/en/nature/grdwtr/e_move.htm				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							
fractured		1..1	AquiferMediaType	Fractured aquifers are rocks in which the groundwater moves through cracks, joints or fractures in otherwise solid rock. Examples of fractured aquifers include granite and basalt. Limestones are often fractured aquifers, but here the cracks and fractures may be enlarged by solution, forming large channels or even caverns. Limestone terrain where solution has been very active is termed karst. Porous media such as sandstone may become so highly cemented or recrystallized that all of the original space is filled. In this case, the rock is no longer a porous medium. However, if it contains cracks it can still act as a fractured aquifer. http://www.ec.gc.ca/water/en/nature/grdwtr/e_move.htm				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>			Tag	Value	sequenceNumber	20	
	Tag	Value						
sequenceNumber	20							
mixed		1..1	AquiferMediaType	A combination of a porous and fractured aquifer.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>30</td></tr></table>			Tag	Value	sequenceNumber	30	
	Tag	Value						
sequenceNumber	30							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:simpleType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="AquiferMediaTypeType">
  <xs:restriction base="string">
    <xs:enumeration value="porous">
      <xs:annotation>
        <xs:documentation>Porous media are those aquifers consisting of aggregates of individual
particles such as sand or gravel. The groundwater occurs in and moves through the openings between the
individual grains. Porous media where the grains are not connected to each other are considered
unconsolidated. If the grains are cemented together, such aquifers are called consolidated. Sandstones are
examples of consolidated porous http://www.ec.gc.ca/water/en/nature/grdwtr/e_move.htm</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="fractured">
      <xs:annotation>
        <xs:documentation>Fractured aquifers are rocks in which the groundwater moves through
cracks, joints or fractures in otherwise solid rock. Examples of fractured aquifers include granite and
basalt. Limestones are often fractured aquifers, but here the cracks and fractures may be enlarged by
solution, forming large channels or even caverns. Limestone terrain where solution has been very active is
termed karst. Porous media such as sandstone may become so highly cemented or recrystallized that all of
the original space is filled. In this case, the rock is no longer a porous medium. However, if it contains
cracks it can still act as a fractured aquifer.
http://www.ec.gc.ca/water/en/nature/grdwtr/e_move.htm</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="mixed">
      <xs:annotation>
        <xs:documentation>A combination of a porous and fractured aquifer.</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>
</xs:simpleType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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GML Application Schema<API Specification/>

OverviewPackageClassHelp

Class <<Enumeration>> ColloidType

A colloid is a type of mechanical mixture where one substance is dispersed evenly throughout another. Because of this dispersal, some colloids have the appearance of solutions. A colloidal system consists of two separate phases: a dispersed phase (or internal phase) and a continuous phase (or dispersion medium). A colloidal system may be solid, liquid, or gaseous.
<http://en.wikipedia.org/wiki/Colloid>

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
sol		1..1	ColloidType	A sol is a colloidal suspension of solid particles (1-500 nanometres in size) in a liquid. Examples include blood, pigmented ink, and paint. http://en.wikipedia.org/wiki/Sol_(colloid)				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>				Tag	Value	sequenceNumber	10
	Tag	Value						
sequenceNumber	10							
foam		1..1	ColloidType	The most general definition of foam is a substance that is formed by trapping many gas bubbles in a liquid or solid. http://en.wikipedia.org/wiki/Foam				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>				Tag	Value	sequenceNumber	20
	Tag	Value						
sequenceNumber	20							
emulsion		1..1	ColloidType	An 'emulsion' [IPA]: [1]) is a mixture of two immiscible (unblendable) liquids. One liquid (the dispersed phase) is dispersed in the other (the continuous phase). http://en.wikipedia.org/wiki/Emulsion				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>30</td></tr></table>				Tag	Value	sequenceNumber	30
	Tag	Value						
sequenceNumber	30							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:simpleType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ColloidTypeType">
  <xs:restriction base="string">
    <xs:enumeration value="sol">
      <xs:annotation>
        <xs:documentation>A sol is a colloidal suspension of solid particles (1-500 nanometres in
size) in a liquid. Examples include blood, pigmented ink, and paint.
http://en.wikipedia.org/wiki/Sol_(colloid)</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="foam">
      <xs:annotation>
        <xs:documentation>The most general definition of foam is a substance that is formed by
trapping many gas bubbles in a liquid or solid.
http://en.wikipedia.org/wiki/Foam</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="emulsion">
      <xs:annotation>
        <xs:documentation>An 'emulsion' [IPA]: [1]) is a mixture of two immiscible (unblendable)
liquids. One liquid (the dispersed phase) is dispersed in the other (the continuous phase).
http://en.wikipedia.org/wiki/Emulsion</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>
</xs:simpleType>
```

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For more general information about GML refer to:
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GML Application Schema<API Specification>

OverviewPackageClassHelp



Class <<Enumeration>> ConfinedAquiferType

Exist where the groundwater is bounded between layers of impermeable substances like clay or dense rock. When tapped by a well, water in confined aquifers is forced up, sometimes above the soil surface. This is how a flowing artesian well is formed.
<http://www.groundwater.org/gi/gwglossary.html#C>

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
subArtesian		1..1	ConfinedAquiferType	Water rising naturally in a well to a height appreciably above that of the surrounding water table but not flowing out of the well. http://www.thefreedictionary.com/subartesian
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		10	
artesian		1..1	ConfinedAquiferType	An artesian aquifer is a confined aquifer containing groundwater that will flow upwards through a well without the need for pumping. Water may even spurt out of the ground if the natural pressure is high enough. http://en.wikipedia.org/wiki/Artesian_aquifer
	Attribute tagged values			
	Tag		Value	
	sequenceNumber		20	

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:simpleType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="ConfinedAquiferTypeType">
  <xs:restriction base="string">
    <xs:enumeration value="subArtesian">
      <xs:annotation>
        <xs:documentation>Water rising naturally in a well to a height appreciably above that of the
surrounding water table but not flowing out of the well.
http://www.thefreedictionary.com/subartesian</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>
</xs:simpleType>
```

```

    <xs:enumeration value="artesian">
      <xs:annotation>
        <xs:documentation>An artesian aquifer is a confined aquifer containing groundwater that will
flow upwards through a well without the need for pumping. Water may even spurt out of the ground if the
natural pressure is high enough.
http://en.wikipedia.org/wiki/Artesian_aquifer</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>
</xs:simpleType>

```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
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OverviewPackageClassHelp

Class <<Enumeration>> DrillingFluidCode

Type of fluid used in the drilling process.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
AirBased		1..1	DrillingFluidCode	Dry air, mist, foam, stiff foam, others
WaterBased		1..1	DrillingFluidCode	Clean water, water and clay, water and polymers, water clay and polymers, others

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:simpleType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="DrillingFluidCodeType">
  <xs:restriction base="string">
    <xs:enumeration value="AirBased">
      <xs:annotation>
        <xs:documentation>Dry air, mist, foam, stiff foam, others</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="WaterBased">
      <xs:annotation>
        <xs:documentation>Clean water, water and clay, water and polymers, water clay and polymers,
others</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>
</xs:simpleType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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Class <<Enumeration>> WaterFlowProcess

This enumeration class is used to describe the various process of ground water flow.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
evapotranspiration		1..1	WaterFlowProcess	Evapotranspiration (ET) is a term used to describe the sum of evaporation and plant transpiration from the earth's land surface to atmosphere. Evaporation accounts for the movement of water to the air from sources such as the soil, canopy interception, and waterbodies. [...] In areas that are not irrigated, actual evapotranspiration is usually no greater than precipitation, with some buffer in time depending on the soil's ability to hold water. It will usually be less because some water will be lost due to percolation or surface runoff. An exception is areas with high water tables, where capillary action can cause water from the groundwater to rise through the soil matrix to the surface. If potential evapotranspiration is greater than actual precipitation, then soil will dry out, unless irrigation is used. http://en.wikipedia.org/wiki/Evapotranspiration				
				Evapotranspiration: The loss water from the soil through both evaporation and transpiration from plants. http://www.groundwater.org/gi/gwglossary.html#E				
				<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>	Tag	Value	sequenceNumber	10
Tag	Value							
sequenceNumber	10							
runoff		1..1	WaterFlowProcess	That portion of precipitation or irrigation on an area which does not infiltrate, but instead is discharged from the area. http://en.wiktionary.org/wiki/runoff?rdfrom=Runoff				
				Surface runoff is a term used to describe when soil is infiltrated to full capacity and excess water, from rain, snowmelt, or other sources flows over the land. This is a major component of the water cycle.[1][2] Runoff that occurs on surfaces before reaching a channel is also called a nonpoint source. If a nonpoint source contains man-made contaminants, the runoff is called nonpoint source pollution. A land area which produces runoff draining to common point is called a watershed. When runoff flows along the ground, it can pick up soil contaminants such as petroleum, pesticides (in particular herbicides and insecticides), or fertilizers that become discharge or nonpoint source pollution.[3]Increased runoff reduces groundwater recharge, thus lowering the water table and making droughts worse, especially for farmers and others who depend on water wells. http://en.wikipedia.org/wiki/Surface_runoff				
				<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>	Tag	Value	sequenceNumber	20
Tag	Value							
sequenceNumber	20							
basalFlow		1..1	WaterFlowProcess	Baseflow is the portion of streamflow that comes from groundwater and not runoff. It is assumed that 50% of the water that percolates down to shallow ground water contributes to baseflow. http://en.wikipedia.org/wiki/Baseflow				
				Baseflow: Streamflow coming from groundwater seepage into a stream or river. Groundwater flows underground until the water table intersects the land surface and the flowing water becomes surface water in the form of springs, streams/ivers, lakes and wetlands. Baseflow is the continual contribution of groundwater to rivers and is an important source of flow between rainstorms. http://www.groundwater.org/gi/gwglossary.html#B				
				<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>30</td></tr></table>	Tag	Value	sequenceNumber	30
Tag	Value							
sequenceNumber	30							
transpiration		1..1	WaterFlowProcess	Transpiration is the process by which moisture is carried through plants from roots to small pores on the underside of leaves, where it changes to vapor and is released to the atmosphere. [...] In many places, the top layer of the soil where plant roots are located is above the water table and thus is often wet to some extent, but is not totally saturated, as is soil below the water table. The soil above the water table gets wet when it rains as water infiltrates into it from the surface. But, it will dry out without additional precipitation. Since the water table is usually below the depth of the plant roots, the plants are dependent on water supplied by precipitation. As this diagram shows, in places where the water table is near the land surface, such as next to lakes and oceans, plant roots can penetrate into the saturated zone below the water table, allowing the plants to transpire water directly from the ground-water system. Here, transpiration of ground water commonly results in a drawdown of the water table much like the effect of a pumped well (cone of depression). http://ga.water.usgs.gov/edu/watercycletranspiration.html				
				Transpiration: The process by which water absorbed by plants (usually through the roots) is evaporated into the atmosphere from the plant surface (principally from the leaves). http://www.groundwater.org/gi/gwglossary.html#E				
				<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>40</td></tr></table>	Tag	Value	sequenceNumber	40
Tag	Value							
sequenceNumber	40							
evaporation		1..1	WaterFlowProcess	Evaporation: The conversion of a liquid (water) into a vapor (a gaseous state) usually through the application of heat energy during the hydrologic cycle; the opposite of condensation. http://www.groundwater.org/gi/gwglossary.html#E				
				Evaporation is the process by which water changes from a liquid to a gas or vapor. Evaporation is the primary pathway that water moves from the liquid state back into the water cycle as atmospheric water vapor. Studies have shown that the oceans, seas, lakes, and rivers provide nearly 90 percent of the moisture in the atmosphere via evaporation, with the remaining 10 percent being contributed by plant transpiration. http://ga.water.usgs.gov/edu/watercycleevaporation.html				
				<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>50</td></tr></table>	Tag	Value	sequenceNumber	50
Tag	Value							
sequenceNumber	50							
pumping		1..1	WaterFlowProcess	To raise (as water) with a pump b; to draw fluid from with a pump. http://www.merriam-webster.com/dictionary/pumping				
				<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>60</td></tr></table>	Tag	Value	sequenceNumber	60
				Tag	Value			
sequenceNumber	60							
infiltration		1..1	WaterFlowProcess	infiltration : The flow of water downward from the land surface into and through the upper soil layers. http://www.groundwater.water.ca.gov/groundwater_basics/gwb_glossary/index.cfm#ii				

				Anywhere in the world, a portion of the water that falls as rain and snow infiltrates into the subsurface soil and rock. How much infiltrates depends greatly on a number of factors. Infiltration of precipitation falling on the ice cap of Greenland might be very small, whereas, as this picture of a stream disappearing into a cave in southern Georgia, USA shows, a stream can act as a direct funnel right into ground water! Some water that infiltrates will remain in the shallow soil layer, where it will gradually move vertically and horizontally through the soil and subsurface material. Eventually, it might enter a stream by seepage into the stream bank. Some of the water may infiltrate deeper, recharging ground-water aquifers. If the aquifers are porous enough to allow water to move freely through it, people can drill wells into the aquifer and use the water for their purposes. Water may travel long distances or remain in ground-water storage for long periods before returning to the surface or seeping into other water bodies, such as streams and the oceans. http://ga.water.usgs.gov/edu/watercycleinfiltration.html
Attribute tagged values				
Tag		Value		
sequenceNumber		70		
injection	1..1	WaterFlowProcess	In some areas of the world, vast amounts of treated or treatable water are being injected and stored beneath the earth's surface to preserve current water resources, plan for future droughts, protect water resources, recharge wellfields, and/or store water for use at a later time to sustain development. [?] These storage programs involve the pumping, or injection, of water supplies into aquifer formations that store the water. http://books.google.ca/books?id=_X3Xg4nj-GMC&dq=groundwater+injection&printsec=frontcover&source=bl&ots=bvumm7JuA2&sig=5mVscJdae3OCcSJ3xIhsEI3FXvo&hl=fr&sa=X&oi=book_result&resnum=2&ct=result#PPA5,M1 Injection well: A well constructed for the purpose of injecting treated water, often wastewater, directly into the ground. Water is generally forced (pumped) into the well for dispersal or storage into a designated aquifer. Injection wells are generally drilled into aquifers that are not used as a drinking water source, unused aquifers, or below freshwater levels. http://www.groundwater.org/gi/gwglossary.html#I	
Attribute tagged values				
Tag		Value		
sequenceNumber		80		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
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Tagged values

Tag	Value	Notes
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:simpleType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterFlowProcessType">
  <xs:restriction base="string">
    <xs:enumeration value="evapotranspiration">
      <xs:annotation>
        <xs:documentation>Evapotranspiration (ET) is a term used to describe the sum of evaporation and plant transpiration from the earth's land surface to atmosphere. Evaporation accounts for the movement of water to the air from sources such as the soil, canopy interception, and waterbodies. [...] In areas that are not irrigated, actual evapotranspiration is usually no greater than precipitation, with some buffer in time depending on the soil's ability to hold water. It will usually be less because some water will be lost due to percolation or surface runoff. An exception is areas with high water tables, where capillary action can cause water from the groundwater to rise through the soil matrix to the surface. If potential evapotranspiration is greater than actual precipitation, then soil will dry out, unless irrigation is used.
http://en.wikipedia.org/wiki/Evapotranspiration
Evapotranspiration: The loss water from the soil through both evaporation and transpiration from plants.
http://www.groundwater.org/gi/gwglossary.html#E</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="runoff">
      <xs:annotation>
        <xs:documentation>That portion of precipitation or irrigation on an area which does not infiltrate, but instead is discharged from the area.
http://en.wiktionary.org/wiki/runoff?rdfrom=Runoff
Surface runoff is a term used to describe when soil is infiltrated to full capacity and excess water, from rain, snowmelt, or other sources flows over the land. This is a major component of the water cycle.[1][2] Runoff that occurs on surfaces before reaching a channel is also called a nonpoint source. If a nonpoint source contains man-made contaminants, the runoff is called nonpoint source pollution. A land area which produces runoff draining to common point is called a watershed. When runoff flows along the ground, it can pick up soil contaminants such as petroleum, pesticides (in particular herbicides and insecticides), or fertilizers that become discharge or nonpoint source pollution.[3]Increased runoff reduces groundwater recharge, thus lowering the water table and making droughts worse, especially for farmers and others who depend on water wells.
http://en.wikipedia.org/wiki/Surface_runoff</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="basalFlow">
      <xs:annotation>
        <xs:documentation>Baseflow is the portion of streamflow that comes from groundwater and not runoff. It is assumed that 50% of the water that percolates down to shallow ground water contributes to baseflow.
http://en.wikipedia.org/wiki/Baseflow
Baseflow: Streamflow coming from groundwater seepage into a stream or river. Groundwater flows underground until the water table intersects the land surface and the flowing water becomes surface water in the form of springs, streams/rivers, lakes and wetlands. Baseflow is the continual contribution of groundwater to rivers and is an important source of flow between rainstorms.
http://www.groundwater.org/gi/gwglossary.html#B</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="transpiration">
      <xs:annotation>
        <xs:documentation>Transpiration is the process by which moisture is carried through plants from roots to small pores on the underside of leaves, where it changes to vapor and is released to the atmosphere. [ ... ] In many places, the top layer of the soil where plant roots are located is above the water table and thus is often wet to some extent, but is not totally saturated, as is soil below the water table. The soil above the water table gets wet when it rains as water infiltrates into it from the surface, But, it will dry out without additional precipitation. Since the water table is usually below the depth of the plant roots, the plants are dependent on water supplied by precipitation. As this diagram shows, in places where the water table is near the land surface, such as next to lakes and oceans, plant roots can penetrate into the saturated zone below the water table, allowing the plants to transpire water directly from the ground-water system. Here, transpiration of ground water commonly results in a drawdown of the water table much like the effect of a pumped well (cone of depression).
http://ga.water.usgs.gov/edu/watercycletranspiration.html
Transpiration: The process by which water absorbed by plants (usually through the roots) is evaporated into the atmosphere from the plant surface (principally from the leaves).
http://www.groundwater.org/gi/gwglossary.html#T</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>
</xs:simpleType>
```

```
<xs:enumeration value="evaporation">
  <xs:annotation>
    <xs:documentation>Evaporation: The conversion of a liquid (water) into a vapor (a gaseous state) usually through the application of heat energy during the hydrologic cycle; the opposite of condensation.
http://www.groundwater.org/gi/gwglossary.html#E
  </xs:annotation>
</xs:enumeration>
Evaporation is the process by which water changes from a liquid to a gas or vapor. Evaporation is the primary pathway that water moves from the liquid state back into the water cycle as atmospheric water vapor. Studies have shown that the oceans, seas, lakes, and rivers provide nearly 90 percent of the moisture in the atmosphere via evaporation, with the remaining 10 percent being contributed by plant transpiration.
http://ga.water.usgs.gov/edu/watercycleevaporation.html</xs:documentation>
</xs:annotation>
<xs:enumeration value="pumping">
  <xs:annotation>
    <xs:documentation>To raise (as water) with a pump b: to draw fluid from with a pump.
http://www.merriam-webster.com/dictionary/pumping</xs:documentation>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="infiltration">
  <xs:annotation>
    <xs:documentation>nfiltration : The flow of water downward from the land surface into and through the upper soil layers.
http://www.groundwater.water.ca.gov/groundwater_basics/gwb_glossary/index.cfm#ii
  </xs:annotation>
</xs:enumeration>
Anywhere in the world, a portion of the water that falls as rain and snow infiltrates into the subsurface soil and rock. How much infiltrates depends greatly on a number of factors. Infiltration of precipitation falling on the ice cap of Greenland might be very small, whereas, as this picture of a stream disappearing into a cave in southern Georgia, USA shows, a stream can act as a direct funnel right into ground water!
Some water that infiltrates will remain in the shallow soil layer, where it will gradually move vertically and horizontally through the soil and subsurface material. Eventually, it might enter a stream by seepage into the stream bank. Some of the water may infiltrate deeper, recharging ground-water aquifers. If the aquifers are porous enough to allow water to move freely through it, people can drill wells into the aquifer and use the water for their purposes. Water may travel long distances or remain in ground-water storage for long periods before returning to the surface or seeping into other water bodies, such as streams and the oceans.
http://ga.water.usgs.gov/edu/watercycleinfiltration.html</xs:documentation>
</xs:annotation>
</xs:enumeration>
<xs:enumeration value="injection">
  <xs:annotation>
    <xs:documentation>In some areas of the world, vast amounts of treated or treatable water are being injected and stored beneath the earth's surface to preserve current water resources, plan for future droughts, protect water resources, recharge wellfields, and/or store water for use at a later time to sustain development. [ ? ] These storage programs involve the pumping, or injection, of water supplies into aquifer formations that store the water.
http://books.google.ca/books?id=_X3Xg4nj-GMC&amp;amp;dq=groundwater+injection&amp;amp;printsec=frontcover&amp;amp;source=bl&amp;amp;ots=bvumm7JuA2&amp;amp;sig=5mVscJdae30CcSj3xIhsEl3FXvo&amp;amp;hl=fr&amp;amp;sa=X&amp;amp;oi=book_result&amp;amp;resnum=2&amp;amp;ct=result#PPA5,M1
  </xs:annotation>
</xs:enumeration>
Injection well: A well constructed for the purpose of injecting treated water, often wastewater, directly into the ground. Water is generally forced (pumped) into the well for dispersal or storage into a designated aquifer. Injection wells are generally drilled into aquifers that are not used as a drinking water source, unused aquifers, or below freshwater levels.
http://www.groundwater.org/gi/gwglossary.html#I</xs:documentation>
</xs:annotation>
</xs:enumeration>
</xs:restriction>
</xs:simpleType>
```

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OverviewPackageClassHelp



Class <<Enumeration>> WaterLevelTypes

Type of water level in an aquifer

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
dynamic		1..1	WaterLevelTypes	Dynamic water level, fluctuating water level in an aquifer.
static		1..1	WaterLevelTypes	Static water level, water level at a constant elevation

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:simpleType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterLevelTypesType">
  <xs:restriction base="string">
    <xs:enumeration value="dynamic">
      <xs:annotation>
        <xs:documentation>Dynamic water level, fluctuating water level in an
aquifer.</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="static">
      <xs:annotation>
        <xs:documentation>Static water level, water level at a constant elevation</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>
</xs:simpleType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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Class <<CodeList>> GroundwaterTestCode

This enumeration lists various groundwater test topics that can be applied to an aquifer.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
groundwaterYield		1..1	GroundwaterTestCode	Test conducted to assess the yield of an aquifer				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>			Tag	Value	sequenceNumber	10	
	Tag	Value						
sequenceNumber	10							
pumpingRate		1..1	GroundwaterTestCode	Test conducted to evaluate an aquifer by "stimulating" the aquifer through constant pumping, and observing the aquifer's "response" (drawdown) in observation wells. http://en.wikipedia.org/wiki/Aquifer_test				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>			Tag	Value	sequenceNumber	20	
	Tag	Value						
sequenceNumber	20							
groundwaterAvailability		1..1	GroundwaterTestCode	Test conducted to asses the availability of groundwater in an aquifer. This test assesses if a certain volume of water pumped from an aquifer is available.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>30</td></tr></table>			Tag	Value	sequenceNumber	30	
	Tag	Value						
sequenceNumber	30							
groundwaterFlow		1..1	GroundwaterTestCode	Assessment of direction and speed of groundwater flow. Normally done using either flowmeter or tracers.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>40</td></tr></table>			Tag	Value	sequenceNumber	40	
	Tag	Value						
sequenceNumber	40							

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
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Tagged values

Tag	Value	Notes
asDictionary	true	Values: true

		Default: true Description: Encode code list as externally managed dictionary (applies to ISO 19136:2007 encoding rule). Always true in INSPIRE.
codeSpace	#NOTES#Description: URI that identifies the authority for this dictionary and its members	Description: URI that identifies the authority for this dictionary and its members
dictionaryIdentifier	#NOTES#Description: URI that identifies this dictionary	Description: URI that identifies this dictionary
memberIdentifierStem	#NOTES#Description: URI stem used for dictionary members	Description: URI stem used for dictionary members
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

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OverviewPackageClassHelp

Class <<CodeList>> WaterUseCode

The use of water may be classified by specific types according to distinctive uses.
<http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-w.pdf>

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
Commercial		1..1	WaterUseCode	Commercial Water Use (Withdrawals). Water for motels, hotels, restaurants, office buildings, and other commercial facilities and institutions, both civilian and military. The water may be obtained from a public supply or may be self supplied. The terms "water use" and "water withdrawals" are equivalent, but not the same as "Consumptive Use" as they do not account for return flows. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-c.pdf
Agriculture		1..1	WaterUseCode	Agricultural Use. The use of any tract of land for the production of animal or vegetable life; uses include, but are not limited to, the pasturing, grazing, and watering of livestock and the cropping, cultivation, and harvesting of plants. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-a.pdf
Domestic		1..1	WaterUseCode	Domestic Water Use (Withdrawals). Water used normally for residential purposes, including household use, personal hygiene, drinking, washing clothes and dishes, flushing toilets, watering of domestic animals, and outside uses such as car washing, swimming pools, and for lawns, gardens, trees and shrubs. The water may be obtained from a public supply or may be self supplied. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-d.pdf
HeatTransfert		1..1	WaterUseCode	Water used as an agent to facilitate heat trasfer. Heat Transfer Agent. A liquid or gas that functions in a Heat Exchanger to facilitate the movement of heat from one location to another. For example, the engine coolant in an automobile serves to transfer heat from the engine block to the atmosphere. likewise, water facilitates the movement of heat from the reactor core to the outside of a nuclear reactor. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-h.pdf
Industrial		1..1	WaterUseCode	Industrial Water Use (Withdrawals) ? Industrial water use includes water used for processing activities, washing, and cooling. Major water-using manufacturing industries include food processing, textile and apparel products, lumber, furniture and wood products, paper production, printing and publishing, chemicals, petroleum, rubber products, stone, clay, glass and concrete products, primary and fabricated metal industries, industrial and commercial equipment and electrical, electronic and measuring equipment and transportation equipment. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-i.pdf
Irrigation		1..1	WaterUseCode	Irrigation Water Use (Withdrawals). Artificial application of water on lands to assist in the growing of crops and pastures or to maintain vegetative growth on recreational lands, such as parks and golf courses. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-i.pdf
Municipal		1..1	WaterUseCode	M&I (Municipal and Industrial) Water Withdrawals (Use). Water supplied for municipal and industrial uses provided through a municipal distribution system. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-m.pdf Public Water Use. Water supplied from a Public Water Supply System (PWSS) and used for such purposes as fire fighting, street washing, and municipal parks, golf courses, and swimming pools. Public water use also includes system water losses (water lost to leakage) and brine water discharged from desalination facilities. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-p.pdf
OtherUnknow		1..1	WaterUseCode	Other Water Use. Water used for such purposes as heating, cooling, irrigation (public-supplied only), lake augmentation, and other nonspecific uses. http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-o.pdf
PublicRecreation		1..1	WaterUseCode	TBD
Research		1..1	WaterUseCode	TBD

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
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Tagged values

Tag	Value	Notes
asDictionary	true	Values: true Default: true Description: Encode code list as externally managed dictionary (applies to ISO 19136:2007 encoding rule). Always true in INSPIRE.
codeSpace	#NOTES#Description: URI that identifies the authority for this dictionary and its members	Description: URI that identifies the authority for this dictionary and its members
dictionaryIdentifier	#NOTES#Description: URI that identifies this dictionary	Description: URI that identifies this dictionary
memberIdentifierStem	#NOTES#Description: URI stem used for dictionary members	Description: URI stem used for dictionary members
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

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OverviewPackageClassHelp



Class <<CodeList>> WellPurposeCode

Code associated to define the purpose of the well.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
CoalELog		1..1	WellPurposeCode	TBD
Oil		1..1	WellPurposeCode	An oil well is a term for any perforation through the Earth's surface designed to find and release both petroleum oil and gas hydrocarbons. http://en.wikipedia.org/wiki/Oil_well
Core		1..1	WellPurposeCode	TBD
Decontamination		1..1	WellPurposeCode	TBD
Dewatering		1..1	WellPurposeCode	ewatering is the removal of water from solid material or soil by wet classification, centrifugation, filtration, or similar solid-liquid separation processes. Removing or draining water from a riverbed, construction site, caisson, or mine shaft, by pumping or evaporation. This is often done during the site development phase of a major construction project due to a high water table. Usually involves the use of "dewatering" pumps. Methods of dewatering include; Wellpoint, Deep Well and Eductor systems. http://en.wikipedia.org/wiki/Dewatering
Disposal		1..1	WellPurposeCode	A well, often a depleted oil or gas well, into which waste fluids can be injected for safe disposal. Disposal wells typically are subject to regulatory requirements to avoid the contamination of freshwater aquifers. http://www.glossary.oilfield.slb.com/Display.cfm?Term=disposal%20well
FlowingShot		1..1	WellPurposeCode	A flowing shot hole is a drilled (seismic) hole that has entered an underground water source that has sufficient pressure to cause the hole to "overflow". http://www.etsurvey.com/water/h20main.htm
Geotechnical		1..1	WellPurposeCode	A geotechnical well is defined as a hole drilled for the exclusive purpose of collecting geotechnical data, including soil samples, vapour samples, and water samples obtained through bailing, driven sampler or other similar methods. http://www.adwr.state.az.us/dwr/Content/Find_by_Category/Laws_and_Rules/files/SPS/Well%20Construction/Well%20Construction%20and%20Licensing%20-%20WL7.pdf
Mineral		1..1	WellPurposeCode	A non-E&P well drilled for the purpose of locating and/or extracting a mineral from the subsurface, usually through the injection and/or extraction of mineral-bearing fluids. http://posc.org/technical/reference/POSC_well_purpose.html Mineral test hole- any hole in excess of one hundred (100) feet drilled during the exploration for minerals but shall exclude auger drilling in surficial or otherwise unconsolidated material, drilling in conjunction with mining or quarrying operations, and drill holes for the exploration of oil and/or gas, water, structural foundations, and seismic surveys. http://www.tennessee.gov/sos/rules/0950/0950-01-01.pdf
MonitoringLevelHead		1..1	WellPurposeCode	Monitoring well: A non-pumping well, generally of small diameter, that is used to measure the elevation of a water table or water quality. A piezometer, which is open only at the top and bottom of its casing, is one type of monitoring well. http://www.groundwater.org/gi/gwglossary.html#M monitoring wells or piezometers, are often smaller diameter wells used to Monitor the hydraulic head or sample the groundwater for chemical constituents. Piezometers are monitoring wells completed over a very short section of aquifer. Monitoring wells can also be completed at multiple levels, allowing discrete samples or measurements to be made at different vertical elevations at the same map location. http://en.wikipedia.org/wiki/Monitoring_well
MonitoringQuality		1..1	WellPurposeCode	Most monitoring wells constructed today are used to assess the nature and distribution of pollutants and contaminants in groundwater; The nature and distribution of naturally occurring chemical constituents; Subsurface hydrologic conditions; and, hydraulic properties of strata as they relate to pollutant and contaminant movement.

				http://www.dpla.water.ca.gov/sd/groundwater/california_well_standards/mws/mws_history.html
OilExploratory		1..1	WellPurposeCode	A exploratory well drilled in an unproved area to test for a new field, a new pay, a deeper reservoir, or a shallower reservoir. Also known as an exploration well. http://posc.org/technical/reference/POSC_well_purpose.html Exploratory Well: A well drilled with a high degree of risk to: A) search for a new reservoir of oil or gas, also known as a Wildcat, B) extend the parameters of an existing field known as a Step Out, C) to prove another zone within an already producing field. http://www.vastenergy.com/definitions.htm
Other		1..1	WellPurposeCode	Any other usage of a well.
Recharge		1..1	WellPurposeCode	a- Aquifer Recharge Wells (5R21) Used to recharge depleted aquifers and may inject fluids from a variety of sources such as lakes, streams, domestic wastewater treatment plants, other aquifers, etc. b- Saline Water Intrusion Barrier Wells (5B22) Used to inject water into fresh water aquifers to prevent intrusion of salt water into fresh water aquifers. Used in highly populated areas. c- Subsidence Control Wells (5S23) Used to inject fluids into a non-oil or gas-producing zone to reduce or eliminate subsidence associated with overdraft of fresh water and not used for the purpose of oil or natural gas production. a, b, c - http://www.epa.gov/Region2/water/compliance/wellclasstypetable_inventoryc_form.pdf
Seismic		1..1	WellPurposeCode	A well used to conduct seismic surveys.
WaterExploratory		1..1	WellPurposeCode	A well drilled to seach for new groundwater
WaterSupply		1..1	WellPurposeCode	Well used to supply water for various usage.
Withdrawal		1..1	WellPurposeCode	TBD
CatholicProtection		1..1	WellPurposeCode	Other, less common types of wells include catholic protection wells. Cathodic protection wells, sometimes called 'deep groundbeds,' house devices to minimize electrolytic corrosion of metallic pipelines, tanks, and other facilities in contact with the ground. http://www.dpla.water.ca.gov/sd/groundwater/california_well_standards/cpws/cpws_introduction.html

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
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Constraints

Constraint	Type	Status	Weight
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Tagged values

Tag	Value	Notes
asDictionary	true	Values: true Default: true Description: Encode code list as externally managed dictionary (applies to ISO 19136:2007 encoding rule). Always true in INSPIRE.
codeSpace	#NOTES#Description: URI that identifies the authority for this dictionary and its members	Description: URI that identifies the authority for this dictionary and its members
dictionaryIdentifier	#NOTES#Description: URI that identifies this dictionary	Description: URI that identifies this dictionary
memberIdentifierStem	#NOTES#Description: URI stem used for dictionary members	Description: URI stem used for dictionary members
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions

		Default: iso19136_2007 Description: XML Schema encoding rule to apply
--	--	--

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OverviewPackageClassHelp



Class <<CodeList>> WellStatusCode

Status of the well.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
AbandonedDry		1..1	WellStatusCode	
Abandoned		1..1	WellStatusCode	
AbandonedInsufficient		1..1	WellStatusCode	
AbandonedQuality		1..1	WellStatusCode	
Deepened		1..1	WellStatusCode	
New		1..1	WellStatusCode	
NotInUse		1..1	WellStatusCode	
Reconditionned		1..1	WellStatusCode	
Standby		1..1	WellStatusCode	
Unfinished		1..1	WellStatusCode	
Unknown		1..1	WellStatusCode	

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
asDictionary	true	Values: true Default: true Description: Encode code list as externally managed dictionary (applies to ISO 19136:2007 encoding rule). Always true in INSPIRE.
codeSpace	#NOTES#Description: URI that identifies the authority for this dictionary and its members	Description: URI that identifies the authority for this dictionary and its members
dictionaryIdentifier	#NOTES#Description: URI that identifies this dictionary	Description: URI that identifies this dictionary
memberIdentifierStem	#NOTES#Description: URI stem used for dictionary members	Description: URI stem used for dictionary members
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

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OverviewPackageClassHelp

Class <<CodeList>> WellUse

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
observation		1..1	WellUse	
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
monitoring		1..1	WellUse	
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	20		
piezometry		1..1	WellUse	
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	30		
domestic		1..1	WellUse	
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	40		
exploitation		1..1	WellUse	
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	50		
production		1..1	WellUse	
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	60		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
asDictionary	true	Values: true Default: true Description: Encode code list as externally managed dictionary (applies to ISO 19136:2007 encoding rule). Always true in INSPIRE.
codeSpace	#NOTES#Description: URI that identifies the authority for this dictionary and its members	Description: URI that identifies the authority for this dictionary and its members
dictionaryIdentifier	#NOTES#Description: URI that identifies this dictionary	Description: URI that identifies this dictionary
memberIdentifierStem	#NOTES#Description: URI stem used for dictionary members	Description: URI stem used for dictionary members
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

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OverviewPackageClassHelp



Class <<enumeration>> SpatialRelation

9-Intersection as a Model for Topological Relations. See <http://www.spatial.maine.edu/~max/9intReport.pdf> for a complete reference on this topic.

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes
crosses		1..1	SpatialRelation	
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	10		
within		1..1	SpatialRelation	
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	20		
outside		1..1	SpatialRelation	
	Attribute tagged values			
	Tag	Value		
	sequenceNumber	30		

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:simpleType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="SpatialRelationType">
  <xs:restriction base="string">
    <xs:enumeration value="crosses"/>
    <xs:enumeration value="within"/>
    <xs:enumeration value="outside"/>
  </xs:restriction>
</xs:simpleType>
```

```
</xs:restriction>  
</xs:simpleType>
```

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OverviewPackageClassHelp

Class <<enumeration>> WaterType

This enumeration class refers to the concept of salinity and its classes in water.

Salinity is the saltiness or dissolved salt content of a body of water. <http://en.wikipedia.org/wiki/Salinity>

Generally, the concentration of mineral salts dissolved in water. Salinity may be expressed in terms of a concentration or as electrical conductivity. When describing salinity influenced by seawater, salinity often refers to the concentration of chlorides in the water. See also total dissolved solids. http://www.groundwater.water.ca.gov/groundwater_basics/gwb_glossary/index.cfm#ss

Local Subclasses: (none)

Attributes

Name	Type	Bounds	From Class	Notes				
ultraFreshWater		1..1	WaterType	TBD				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>10</td></tr></table>				Tag	Value	sequenceNumber	10
	Tag	Value						
	sequenceNumber	10						
freshWater		1..1	WaterType	A- Freshwater is a word that refers to bodies of water such as ponds, lakes, rivers and streams containing low concentrations of dissolved salts and other total dissolved solids. In other words, the term excludes seawater and brackish water. Freshwater can also be the output of desalinated seawater. http://en.wikipedia.org/wiki/Freshwater Fresh water: Water with less than 0.5 parts per thousand dissolved salts.				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>20</td></tr></table>				Tag	Value	sequenceNumber	20
	Tag	Value						
	sequenceNumber	20						
acratopegae		1..1	WaterType	From Ancient Greek akratos ("pure, unmixed") and PEGE ("source, fountain). Water with low mineral content or less than mineral water. Translated from : Du grec ancien akratos (" pur, sans melange ") et pege (" source, fontaine "). Qui a, en parlant d'une eau, une faible teneur en sels minéraux ou une teneur moindre que celle d'une eau minerale. http://fr.wiktionary.org/wiki/acratop%C3%A8ge				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>30</td></tr></table>				Tag	Value	sequenceNumber	30
	Tag	Value						
	sequenceNumber	30						
brackishWater		1..1	WaterType	Brackish water (less commonly brack water) is water that has more salinity than fresh water, but not as much as seawater. It may result from mixing of seawater with fresh water, as in estuaries, or it may occur in brackish fossil aquifers. The word comes from the Middle Dutch root "brak," meaning "salten" or "salty" http://en.wikipedia.org/wiki/Brackish				
	<div>Attribute tagged values</div> <table><tr><th>Tag</th><th>Value</th></tr><tr><td>sequenceNumber</td><td>40</td></tr></table>				Tag	Value	sequenceNumber	40
	Tag	Value						
	sequenceNumber	40						
saltWater		1..1	WaterType	Saline water is a general term for water that contains a significant concentration of dissolved salts (NaCl). The concentration is usually expressed in parts per million (ppm) of salt. The salinity concentration level used by United States Geological Survey classifies saline water in three categories. Slightly saline water contains around 1,000 to 3,000 ppm. Moderately saline water contains roughly 3,000 to 10,000 ppm. Highly saline water has around 10,000 to 35,000 ppm of salt. Seawater has a salinity of roughly 35,000 ppm, equivalent to				

			35 g/L. Technically, brackish water contains between 0.5 to 30 grams of salt per litre?more often expressed as 0.5 to 30 parts per thousand (ppt). Thus, brackish covers a range of salinity regimes and is not considered a precisely defined condition. http://en.wikipedia.org/wiki/Saline_water								
	<table><tr><td colspan="2">Attribute tagged values</td><td></td></tr><tr><td>Tag</td><td>Value</td><td></td></tr><tr><td>sequenceNumber</td><td>50</td><td></td></tr></table>			Attribute tagged values			Tag	Value		sequenceNumber	50
Attribute tagged values											
Tag	Value										
sequenceNumber	50										

brineWater		1..1	WaterType	Brine (lat. saltus) is water saturated or nearly saturated with salt (NaCl). http://en.wikipedia.org/wiki/Brine								
	<table><tr><td colspan="2">Attribute tagged values</td><td></td></tr><tr><td>Tag</td><td>Value</td><td></td></tr><tr><td>sequenceNumber</td><td>60</td><td></td></tr></table>				Attribute tagged values			Tag	Value		sequenceNumber	60
Attribute tagged values												
Tag	Value											
sequenceNumber	60											

Outbound Associations

Name	Type	Multiplicity	From Class	Notes
------	------	--------------	------------	-------

Constraints

Constraint	Type	Status	Weight
------------	------	--------	--------

Tagged values

Tag	Value	Notes
asDictionary	true	Values: true Default: true Description: Encode code list as externally managed dictionary (applies to ISO 19136:2007 encoding rule). Always true in INSPIRE.
codeSpace	#NOTES#Description: URI that identifies the authority for this dictionary and its members	Description: URI that identifies the authority for this dictionary and its members
dictionaryIdentifier	#NOTES#Description: URI that identifies this dictionary	Description: URI that identifies this dictionary
memberIdentifierStem	#NOTES#Description: URI stem used for dictionary members	Description: URI stem used for dictionary members
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply
xsdEncodingRule	iso19136_2007	Values: iso19136_2007 iso19139_2007 iso19136_2007_INSPIRE_Extensions Default: iso19136_2007 Description: XML Schema encoding rule to apply

GML-conformant XML Implementation Details

```
<xs:simpleType xmlns:xs="http://www.w3.org/2001/XMLSchema" name="WaterTypeType">
  <xs:restriction base="string">
    <xs:enumeration value="ultraFreshWater">
      <xs:annotation>
        <xs:documentation>TBD</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="freshWater">
      <xs:annotation>
        <xs:documentation>A- Freshwater is a word that refers to bodies of water such as ponds, lakes, rivers and streams containing low concentrations of dissolved salts and other total dissolved solids. In other words, the term excludes seawater and brackish water. Freshwater can also be the output of desalinated seawater.
http://en.wikipedia.org/wiki/Freshwater
```

```
Fresh water: Water with less than 0.5 parts per thousand dissolved salts.</xs:documentation>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="acratopegae">
  <xs:annotation>
    <xs:documentation>From Ancient Greek akratos ( "pure, unmixed") and PEGE ( "source,
fountain). Water with low mineral content or less than mineral water.

Translated from :
Du grec ancien akratos (" pur, sans melange ") et pege (" source, fontaine "). Qui a, en parlant d'une eau,
une faible teneur en sels minéraux ou une teneur moindre que celle d'une eau minérale.
http://fr.wiktionary.org/wiki/acratop%C3%A8ge</xs:documentation>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="brackishWater">
  <xs:annotation>
    <xs:documentation>Brackish water (less commonly brack water) is water that has more salinity
than fresh water, but not as much as seawater. It may result from mixing of seawater with fresh water, as
in estuaries, or it may occur in brackish fossil aquifers. The word comes from the Middle Dutch root
"brak," meaning "salten" or "salty"
http://en.wikipedia.org/wiki/Brackish</xs:documentation>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="saltWater">
  <xs:annotation>
    <xs:documentation>Saline water is a general term for water that contains a significant
concentration of dissolved salts (NaCl). The concentration is usually expressed in parts per million (ppm)
of salt. The salinity concentration level used by United States Geological Survey classifies saline water
in three categories. Slightly saline water contains around 1,000 to 3,000 ppm. Moderately saline water
contains roughly 3,000 to 10,000 ppm. Highly saline water has around 10,000 to 35,000 ppm of salt. Seawater
has a salinity of roughly 35,000 ppm, equivalent to 35 g/L. Technically, brackish water contains between
0.5 to 30 grams of salt per litre?more often expressed as 0.5 to 30 parts per thousand (ppt). Thus,
brackish covers a range of salinity regimes and is not considered a precisely defined condition.
http://en.wikipedia.org/wiki/Saline_water</xs:documentation>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="brineWater">
  <xs:annotation>
    <xs:documentation>Brine (lat. saltus) is water saturated or nearly saturated with salt
(NaCl).
http://en.wikipedia.org/wiki/Brine</xs:documentation>
  </xs:annotation>
</xs:enumeration>
</xs:restriction>
</xs:simpleType>
```

For more information about GML Application Schema development refer to:
[UML models of GML Application Schemas](#)

For more general information about GML refer to:
[GML - the Geography Markup Language](#)

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