Model Documentation

# Model Detail

This document provides a complete overview of all element details. For simpler and more focused reports, simply copy this initial template and turn off the sections not required.

## Hydrogeology\_v.0.4

Type: Package

Status: Proposed. Version 1.0. Phase 1.0.

Package: Geology

Detail: *Created on 2011-03-15*. *Last modified on 2011-04-13*

GUID: {1D131421-002C-43be-B01F-FF2A3006A695}

**Hydrogeology\_v.0.4** - *(Package diagram)*

Created By: Janusz Michalak, Tomasz Nałęcz, Piotr Wojda *on* 2011-03-12

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {B6B5356A-7145-45b0-95BB-10271DD76B7F}



Figure: 1

### <anonymous>

Type: **Text**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_v.0.4 Keywords:

Detail: *Created on* *2007-07-19*. *Last modified on 2007-07-19*.

GUID: {F818D41D-0631-4dc4-90E8-A402588FA27D}

### Hydrogeology\_Core

Type: Package «applicationSchema»

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_v.0.4

Detail: *Created on 2011-03-05*. *Last modified on 2011-03-11*

GUID: {6DCBEC63-B54B-410a-8826-040772798F4E}

**HydrogeologyCore\_Aquifers** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-03-06

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {93BF1C87-3F82-42b9-BA34-4C1614EC531B}



Figure: 2

**HydrogeologyCore\_CodeListsAndEnumerations** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-03-09

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {A67E5173-619B-4aff-9F3F-7B535C715AF2}



Figure: 3

**HydrogeologyCore\_Features** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-03-05

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {F2073104-580C-4e54-B778-B815E52456CF}



Figure: 4

**HydrogeologyCore\_GenericAndExternalTypes** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-03-06

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {4B7F4FEA-F359-4653-AB65-52B2F6A8C94C}



Figure: 5

**HydrogeologyCore\_GeologyMain** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-03-15

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {97D27D80-89C6-47b3-B6C2-DE12F530C035}



Figure: 6

**HydrogeologyCore\_Objects** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-03-05

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {8F4C57E5-8E64-48e1-943F-60E825E9DAD5}



Figure: 7

**HydrogeologyCore\_Wells** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-03-05

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {D884CAE8-F215-48b3-8237-8024D6495476}



Figure: 8

#### ActiveWell (or AbstractionWell)

Type: **Class** Well

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core Keywords:

Detail: *Created on* *2011-03-07*. *Last modified on 2012-02-16*.

GUID: {6CC00DAA-A666-4c7d-B302-AF803FD0B3FB}

-- Definition --

A WaterWell used for the of abstraction of water from a groundwater body

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  ActiveWell (or AbstractionWell) | Public  Well |  |
| Dependency  Source -> Destination | Public  ActiveWell (or AbstractionWell) | Public  WaterUseCode |  |
| Generalization  Source -> Destination | Public  MineralWaterAbstractionWell | Public  ActiveWell (or AbstractionWell) |  |
| Association LinkForNavigation  Source -> Destination | Public  ActiveWell (or AbstractionWell) | Public  WaterAppurtenance | Invariant {if ( GroundWaterAbstractionWell.waterUse == forDrinking && WaterAppurtenance. type == well )} |
| Association  Bi-Directional | Public isProtectedBy  ActiveWell (or AbstractionWell) | Public protects  HydrogeologicalZone |  |
| Generalization  Source -> Destination | Public  ThermalWaterAbstractionWell | Public  ActiveWell (or AbstractionWell) |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **quantityOfAbstraction** CGI\_NumericRange  Public    «voidable - estimatedProperty» |  | *Default:* |
| **waterUse** WaterUseCode  Public |  | *Default:* |
| **isPartOfComplexIntake** boolean  Public    «voidable» |  | *Default:* |

#### Aqiuclude

Type: **Class** HydrogeologicalFeature

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core Keywords:

Detail: *Created on* *2011-01-28*. *Last modified on 2011-03-09*.

GUID: {33933D61-7C0D-4337-93EE-D64C551FD234}

-- Definition --

An impermeable body of rock or stratum of sediment that acts as a barrier to the flow of groundwater

(From GWML) Impermeable beds of geologic material that hinder or prevent groundwater movement.

http://www.groundwater.org/gi/gwglossary.html

- Note --

(From GWML) 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 *Hydraulic Conductivity* 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

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association  Destination -> Source | Public encloses  Aqiuclude | Public isEnclosedBy  AquiferSystem |  |
| Generalization  Source -> Destination | Public  Aqiuclude | Public  HydrogeologicalFeature |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **hasLargeHorizontalExtend** boolean  Public |  | *Default:* |
| **Tickness** CGI\_NumericRange  Public    «voidable - estimatedProperty» |  | *Default:* |
| **orderNumberFromSurface** int  Public |  | *Default:* |

#### Aquifer

Type: **Class** HydrogeologicalFeature

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core Keywords:

Detail: *Created on* *2011-01-28*. *Last modified on 2011-03-09*.

GUID: {F16A72D6-43E2-4eab-956B-1792D95EF6BA}

-- Definition --

(From GWML) 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)

-- Note --

(From GWML) 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"

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public isPartOf  Aquifer | Public isCollectionOf  AquiferSystem |  |
| Generalization  Source -> Destination | Public  ThermalWaterAquifer | Public  Aquifer |  |
| Generalization  Source -> Destination | Public  Aquifer | Public  HydrogeologicalFeature |  |
| Generalization  Source -> Destination | Public  MineralWaterAquifer | Public  Aquifer |  |
| Aggregation DescribesParametersOf  Source -> Destination | Public  AquiferDescription | Public  Aquifer |  |
| Association BaseOfDrainage (LinksForNavigation)  Source -> Destination | Public isDrained  Aquifer | Public draines  SurfaceWater |  |
| Generalization  Source -> Destination | Public  KarsticAquifer | Public  Aquifer |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **hasLargeHorizontalExtend** Boolean  Public |  | *Default:* |
| **isConfined** Boolean  Public |  | *Default:* |
| **isExploited** Boolean  Public |  | *Default:* |
| **IsMainInSystem** Boolean  Public |  | *Default:* |
| **PermeabilityCoefficient** CGI\_NumericRange  Public    «voidable - estimatedProperty» |  | *Default:* |
| **Tickness** CGI\_NumericRange  Public    «voidable - estimatedProperty» |  | *Default:* |
| **orderNumberFromSurface** int  Public |  | *Default:* |
| **vulnerabilityToPollution** CGI\_NumericRange  Public    «voidable - estimatedProperty» |  | *Default:* |

#### AquiferSystem

Type: **Class** HydrogeologicalFeature

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core Keywords:

Detail: *Created on* *2011-01-28*. *Last modified on 2011-03-09*.

GUID: {337F05A0-3C7C-4bed-8D63-3CD8D01D893E}

-- Definition --

(From GWML) Collection of aquifers composing a system of interacting components.

Aquifer System - A collection of all hydrogeological system elements, which together constitute the environment of groundwater - a " communicating vessels"  filled or can be filled with water. Attributes of Aquifer System and its components determine the feasibility of water collection, its movement, as well as the impact on its chemical state.

-- Note --

Aquifer System components and their attributes (including geometry) are the most stable over time except special cases.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association  Destination -> Source | Public encloses  Aqiuclude | Public isEnclosedBy  AquiferSystem |  |
| Aggregation  Source -> Destination | Public isPartOf  Aquifer | Public isCollectionOf  AquiferSystem |  |
| Aggregation  Source -> Destination | Public isPartOf  Aquitard | Public isCollectionOf  AquiferSystem |  |
| Aggregation belongsTo  Source -> Destination | Public  AquiferSystem | Public formedBy  HydrogeologicalSystem |  |
| Generalization ConstantInTime  Source -> Destination | Public  AquiferSystem | Public  HydrogeologicalFeature |  |
| Generalization  Source -> Destination | Public  PorousAquiferSystem | Public  AquiferSystem |  |
| Generalization  Source -> Destination | Public  CompoudAquiferSystem | Public  AquiferSystem |  |
| Generalization  Source -> Destination | Public  FracturedAquiferSystem | Public  AquiferSystem |  |
| Generalization  Source -> Destination | Public  KarsticAquiferSystem | Public  AquiferSystem |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **isLayered** Boolean  Public    «voidable» |  | *Default:* |
| **isComplex** boolean  Public    «voidable» |  | *Default:* |
| **mediaType** AquiferMediaType  Public    «voidable» |  | *Default:* |
| **aquiferType** AquiferType  Public    «voidable» |  | *Default:* |

#### Aquitard

Type: **Class** HydrogeologicalFeature

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core Keywords:

Detail: *Created on* *2011-01-28*. *Last modified on 2011-03-09*.

GUID: {4FCBF9D0-CBC9-4454-83AE-8DE1EB6D297A}

-- Definition --

(From GWML) 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.

-- Note --

(From GWML) 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"

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation DescribesParamitersOf  Source -> Destination | Public  AquiferDescription | Public  Aquitard |  |
| Aggregation  Source -> Destination | Public isPartOf  Aquitard | Public isCollectionOf  AquiferSystem |  |
| Generalization  Source -> Destination | Public  Aquitard | Public  HydrogeologicalFeature |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **hesLargeHorizontalExtend** Boolean  Public |  | *Default:* |
| **PermeabilityCoefficient** CGI\_NumericRange  Public    «voidable - estimatedProperty» |  | *Default:* |
| **Tickness** CGI\_NumericRange  Public    «voidable - estimatedProperty» |  | *Default:* |
| **orderNumberFromSurface** int  Public |  | *Default:* |

#### GroundWaterBody

Type: **Class** HydrogeologicalFeature

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core Keywords:

Detail: *Created on* *2011-01-28*. *Last modified on 2011-03-13*.

GUID: {67A1D683-550E-47bf-B05A-A2332AD009D7}

-- Definition --

(From GWML) 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.

-- Note --

GroundWaterBody may consist of smaller occurrence GroundWaterBody and consequently can form a hierarchical structure (ComplexGroundWaterBody). Part of the occurrences in the hierarchy is WFDGroundWaterBody in AM theme.

GroundWaterBody adjacent to the other GroundWaterBodys.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association neighbourhoot  Bi-Directional | Public  GroundWaterBody | Public  GroundWaterBody |  |
| Generalization VariableInTime  Source -> Destination | Public  GroundWaterBody | Public  HydrogeologicalFeature |  |
| Aggregation Aggregate  Source -> Destination | Public belongsTo  GroundWaterBody | Public contains  GroundWaterFlowSystem |  |
| Aggregation nesting  Bi-Directional | Public  GroundWaterBody | Public  GroundWaterBody |  |
| Dependency  Source -> Destination | Public  GroundWaterBody | Public  ConditionOfGrounwater |  |
| Generalization  Source -> Destination | Public  ThermallGroundWaterBody | Public  GroundWaterBody |  |
| Generalization  Source -> Destination | Public  MineralGroundWaterBody | Public  GroundWaterBody |  |
| Generalization  Source -> Destination | Public  WFD\_GroundWaterBody | Public  GroundWaterBody |  |
| Generalization  Source -> Destination | Public  KarsticGroundWaterBody | Public  GroundWaterBody |  |
| Dependency  Destination -> Source | Public  WaterType | Public  GroundWaterBody |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **mineralization** WaterType  Public    «voidable» |  | *Default:* |
| **conditionOfGroundWaterBody** ConditionOfGrounwater  Public    «voidable» |  | *Default:* |

#### GroundWaterFlowSystem

Type: **Class** HydrogeologicalFeature

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core Keywords:

Detail: *Created on* *2011-01-28*. *Last modified on 2011-03-09*.

GUID: {D09903FA-D6C4-46fc-B048-63D615045305}

-- Definition --

GroundWaterFlowSystem is created by groundwater bodies and both GroundWaterFlowSystem and GroundWaterFlowSystem change over time, and these changes are caused by external factors.

-- Note --

Variable GroundWaterFlowSystem state defines the entire state of HydrogeologicalSystem. Frequently, such factors related to HydrogeologicalSystem and highly impact on the GroundWaterFlowSystem are the different human impacts, for example, groundwater intakes, drainage systems and hydro-weirs.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization VariableInTime  Source -> Destination | Public  GroundWaterFlowSystem | Public  HydrogeologicalFeature |  |
| Aggregation Aggregate  Source -> Destination | Public belongsTo  GroundWaterBody | Public contains  GroundWaterFlowSystem |  |
| Dependency  Destination -> Source | Public  ConditionOfGrounwater | Public  GroundWaterFlowSystem |  |
| Aggregation belongsTo  Source -> Destination | Public  GroundWaterFlowSystem | Public contains  HydrogeologicalSystem |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **conditionOfFlowSystem** ConditionOfGrounwater  Public |  | *Default:* |

#### GroundWaterMonitoringStation

Type: **Class** HydrogeologicalObjectManMade

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core Keywords:

Detail: *Created on* *2011-03-07*. *Last modified on 2011-04-12*.

GUID: {F92489D6-33EA-4be1-9E70-B17B4C6DB60E}

-- Definition --

Class GroundWaterMonitoringStation realizes class Station from ISO 19156 standard in hydrogeology domain.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  GroundWaterMonitoringStation | Public  StationType |  |
| Dependency  Source -> Destination | Public  GroundWaterMonitoringStation | Public  StationLevel |  |
| Generalization  Source -> Destination | Public  GroundWaterMonitoringStation | Public  HydrogeologicalObjectManMade |  |
| Aggregation  Source -> Destination | Public  ObservationWell | Public  GroundWaterMonitoringStation |  |
| Association LinkForNavigation  Source -> Destination | Public  GroundWaterMonitoringStation | Public  MonitoringFacility | Invariant {if ( MonitoringFacility.monitoredMedium == groundWater )} |
| Generalization  Source -> Destination | Public  WFD\_GW\_MonitoringStation | Public  GroundWaterMonitoringStation |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **level** StatonLevel  Public    «voidable» |  | *Default:* |
| **type** StationType  Public    «voidable» |  | *Default:* |

#### HydrogeologicalFeature

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core Keywords:

Detail: *Created on* *2011-02-15*. *Last modified on 2011-04-13*.

GUID: {4B4A6F69-0E8D-4d7b-9533-67F4953E70D8}

-- Definition --

Top level abstract class for everything hydrogeological what is feature, but what is not hydrogeological object - what not conform definition of object.

-- Notes --

The most often, it is part of underground space delineated with physical, lithological, stratygraphic or other criterion.

This meaning is slight different then one in GWML model. Bodies of groundwater filling these spaces are hydrogeological features too.

Examples of hydrogeological features: hydrogeological unite, aquifer, aquitard, aquiclude, aquifer system, hydrogeological system, groundwater flow system and groundwater body.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association SpatialApparence  Bi-Directional | Public presents  HydrogeologicalFeatureAppearence | Public isPresented  HydrogeologicalFeature |  |
| Generalization VariableInTime  Source -> Destination | Public  GroundWaterFlowSystem | Public  HydrogeologicalFeature |  |
| Generalization VariableInTime  Source -> Destination | Public  GroundWaterBody | Public  HydrogeologicalFeature |  |
| Generalization  Source -> Destination | Public  Aquifer | Public  HydrogeologicalFeature |  |
| Generalization TheMostComplexFeature  Source -> Destination | Public  HydrogeologicalSystem | Public  HydrogeologicalFeature |  |
| Generalization  Source -> Destination | Public  WFD\_ProtectedArea | Public  HydrogeologicalFeature |  |
| Generalization  Source -> Destination | Public  Aqiuclude | Public  HydrogeologicalFeature |  |
| Generalization  Source -> Destination | Public  Aquitard | Public  HydrogeologicalFeature |  |
| Association  Bi-Directional | Public  HydrogeologicalFeature | Public  HydrogeologicalNamedPlace |  |
| Generalization ConstantInTime  Source -> Destination | Public  AquiferSystem | Public  HydrogeologicalFeature |  |
| Generalization  Source -> Destination | Public  HydrogeologicalZone | Public  HydrogeologicalFeature |  |
| Generalization  Source -> Destination | Public  ConeOfDepression | Public  HydrogeologicalFeature |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **beginLifespanObject** DateTime  Public    «lifeCycleInfo - voidable» |  | *Default:* |
| **description** PT\_FreeText  Public    «voidable» |  | *Default:* |
| **endLifespanObject** DateTime  Public    [0..1]  «lifeCycleInfo - voidable» |  | *Default:* |
| **inspireId** Identifier  Public |  | *Default:* |
| **name** PT\_FreeText  Public    «voidable» |  | *Default:* |

#### HydrogeologicalFeatureAppearence

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core Keywords:

Detail: *Created on* *2011-02-15*. *Last modified on 2011-04-12*.

GUID: {ACC15AB6-8C14-4242-83DE-08D14DF17D23}

-- Definition --

HydrogeologicalFeatureAppearence class is a geometric representation of HydrogeologicalFeature calaas. HydrogeologicalFeature instance (object) could be represented by many various instances of HydrogeologicalFeatureAppearence class.

-- Note --

Class equivalent to HydrogeologicMappedFeature in GWML model and GeologicMappedFeature in GeoSciML:

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

A physical hydrogeologic feature represented on a map."

Here, meaning of this class is wider then in GWML and similar to MappedFeature class in GeoSciML:

A MappedFeature is part of a geological interpretation.

It provides a link between a notional feature (description package) and one spatial representation of it, or part of it. (Exposures, Surface Traces and Intercepts, etc)

    \* the specific bounded occurrence, such as an outcrop or map polygon

    \* the Mapped Feature carries a geometry or shape

          o the association with a Geologic Feature (legend item) provides specification of all the other descriptors

          o the association with a Sampling Feature provides the context and dimensionality

A Mapped Feature is always associated with some sampling feature - e.g. a mapping surface, a section, a Borehole (see BoreHolesAndObservation) etc.  As noted on the diagram, if the associated sampling feature is a Borehole, then the shape associated with the MappedFeature will usually be either a point or an interval. This reconciles the 2-D ("map", section) and 1-D (borehole, traverse) viewpoints in a common abstraction."

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association SpatialApparence  Bi-Directional | Public presents  HydrogeologicalFeatureAppearence | Public isPresented  HydrogeologicalFeature |  |
| Association  Source -> Destination | Public usesDataFrom  HydrogeologicalFeatureAppearence | Public canBeApplied  MappedFeature | Invariant {if HydrogeologicalFeature is GeologicFeature} |
| Dependency  Destination -> Source | Public  TypeOfSourceForGeometry | Public  HydrogeologicalFeatureAppearence |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **geometry** GEh\_GeometryType  Public |  | *Default:* |
| **geometrySource** TypeOfSourceForGeometry  Public |  | *Default:* |
| **inspireId** Identifier  Public |  | *Default:* |
| **description** PT\_FreeText  Public    «voidable» |  | *Default:* |

#### HydrogeologicalObject

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core Keywords:

Detail: *Created on* *2011-02-15*. *Last modified on 2011-03-13*.

GUID: {D6C8AA4D-9FFB-4abd-AAE4-7575F37DA97C}

-- Definition --

An abstract class for everything that     meets the definition of     hydrogeological as well as being an     object:

An  object is an abstract entity     representing or describing a thing or     concept seen in the real world. The     object is distinguishable from other     objects, has a name and a well defined borders. (Subieta, 1999)

    Each object has four  characteristics:

         \* identity, a feature to identify it  and distinguish it from other objects;

         \* state, which is the current state of data elements;

         \* clearly definined boundary;

         \* behavior.

    Hydrogeological objects may be     natural (eg. spring) and the     manmade (eg. wells). The vast     majority of hydrogeological objects     is manmade.

    The object is not part of the     underground space extracted based     on some physical or litho-    sthratigraphic characteristics, for     example, Aquifer, Groundwater     body or Groundwater table.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  HydrogeologicalObjectNatural | Public  HydrogeologicalObject |  |
| Generalization  Source -> Destination | Public  HydrogeologicalObjectManMade | Public  HydrogeologicalObject |  |
| Association  Bi-Directional | Public  HydrogeologicalObject | Public  HydrogeologicalNamedPlace |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **inspireId** Identifier  Public |  | *Default:* |
| **geometry** GM\_Primitive  Public |  | *Default:* |
| **name** PT\_FreeText  Public    «voidable» |  | *Default:* |
| **description** PT\_FreeText  Public    «voidable» |  | *Default:* |
| **beginLifespanObject** DateTime  Public    «lifeCycleInfo - voidable» |  | *Default:* |
| **endLifespanObject** DateTime  Public    [0..1]  «lifeCycleInfo - voidable» |  | *Default:* |

#### HydrogeologicalObjectManMade

Type: **Class** HydrogeologicalObject

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core Keywords:

Detail: *Created on* *2011-02-15*. *Last modified on 2011-04-13*.

GUID: {0EB16068-3820-499e-BC7B-392F0C7EEB42}

Examples of manmade hydrogeological objects are: well, groundwater intake, groundwater monitoring station or monitoring well.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  Well | Public  HydrogeologicalObjectManMade |  |
| Generalization  Source -> Destination | Public  HydrogeologicalObjectManMade | Public  HydrogeologicalObject |  |
| Generalization  Source -> Destination | Public  GroundWaterMonitoringStation | Public  HydrogeologicalObjectManMade |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **validFrom** DateTime  Public    «lifeCycleInfo - voidable» |  | *Default:* |
| **validTo** DateTime  Public    [0..1]  «lifeCycleInfo - voidable» |  | *Default:* |

#### HydrogeologicalObjectNatural

Type: **Class** HydrogeologicalObject

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core Keywords:

Detail: *Created on* *2011-02-15*. *Last modified on 2011-03-14*.

GUID: {77D5F62C-04BE-4a4d-8BAF-557EC510D4D5}

Examples of natural hydrogeological objects are: a source, vanishing point and geyser.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  HydrogeologicalObjectNatural | Public  HydrogeologicalObject |  |
| Dependency  Source -> Destination | Public  HydrogeologicalObjectNatural | Public  WaterPersistenceValue |  |
| Association LinkForNavigation  Source -> Destination | Public  HydrogeologicalObjectNatural | Public  ProtectedSite | Invariant {if(hydrogeologicalObjectNatural is protected)} |
| Dependency  Source -> Destination | Public  HydrogeologicalObjectNatural | Public  NaturalObjectType |  |
| Generalization  Source -> Destination | Public  Spring | Public  HydrogeologicalObjectNatural |  |
| Generalization  Source -> Destination | Public  Seep | Public  HydrogeologicalObjectNatural |  |
| Generalization  Source -> Destination | Public  SwallowHole | Public  HydrogeologicalObjectNatural |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **naturalObjectType** NaturalObjectType  Public    «voidable» |  | *Default:* |
| **waterPersistance** WaterPersistanceValue  Public    «voidable - estimatedProperty» |  | *Default:* |
| **quantityOfFlow** CGI\_NumericRange  Public    «voidable - estimatedProperty» |  | *Default:* |

#### HydrogeologicalSystem

Type: **Class** HydrogeologicalFeature

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core Keywords:

Detail: *Created on* *2011-01-28*. *Last modified on 2011-03-10*.

GUID: {27504610-6C9E-4f98-8A37-DB4BC283F6B5}

-- Definition --

Part of the Earth's crust which is the environment consisting of a groundwater aquifer system (Aquifer System - invariable in time) and filled with the groundwater flow system (Groundwater Flow System - variable in time). Both these components are complex, interrelated and their components are also interrelated.

-- Note --

General hydrogeological relationships in the system:

- External Factors (External Factors, EF) influence the HydrogeologicalSystem.

- The HydrogeologicalSystem response to these factors (EF) determined by the properties of the system   (Aquifer System).

- The answer to the HydrogeologicalSystem state of EF shall be expressed by GWFS.

A detailed description of these relationships and elements that shape them contain a classes derived from classes GroundWaterFlowSystem  and AquiferSystem or are related to them.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation belongsTo  Source -> Destination | Public  GroundWaterFlowSystem | Public contains  HydrogeologicalSystem |  |
| Generalization TheMostComplexFeature  Source -> Destination | Public  HydrogeologicalSystem | Public  HydrogeologicalFeature |  |
| Aggregation belongsTo  Source -> Destination | Public  AquiferSystem | Public formedBy  HydrogeologicalSystem |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **isMain** Boolean  Public    «voidable» |  | *Default:* |

#### ObservationWell

Type: **Class** Well

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core Keywords:

Detail: *Created on* *2011-03-07*. *Last modified on 2012-02-16*.

GUID: {F1E98E5F-F9D6-43f3-ACCE-B967B37AF9AF}

-- Definition --

Class GroundWaterObservation realizes class ObservationWell from ISO 19156 standard in hydrogeology domain.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  ObservationWell | Public  Well |  |
| Aggregation  Source -> Destination | Public  ObservationWell | Public  GroundWaterMonitoringStation |  |
| Association LinkForNavigation  Source -> Destination | Public  ObservationWell | Public  MonitoringFacility | Invariant {if ( MonitoringFacility.monitoredMedium == groundWater )} |
| Dependency  Source -> Destination | Public  ObservationWell | Public  ObservationType |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **observation** ObsrevatinType  Public    [1..\*]  «voidable» |  | *Default:* |

#### WFD\_GroundWaterBody

Type: **Class** GroundWaterBody

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-04-13*.

GUID: {70EE2E18-6A47-4aea-918B-6FCB5ED1FB51}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  GrounWaterBodyDescription | Public  WFD\_GroundWaterBody |  |
| Generalization  Source -> Destination | Public  WFD\_GroundWaterBody | Public  GroundWaterBody |  |
| Association LinkForNavigation  Source -> Destination | Public  WFD\_GroundWaterBody | Public  WFDGroundWaterBody |  |
| Association LinkForNavigation  Source -> Destination | Public  WFD\_GroundWaterBody | Public  ProtectedSite | Invariant {If ProtectedSite is dependent on GroudWaterBody -> if ( GrounWaterBody.isAssociatedWithProtectedAreas == truth )} |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **EU\_GWB\_code** FeatureUniqueEUCodeType  Public | Unique Code for the Groundwater Body at EU level | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |
| **GWB\_MS\_code** FeatureUniqueCodeType  Public | Unique Code for the Groundwater Body within the Member State | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |
| **GWB\_name** PT\_FreeText  Public    «voidable» | Locally-used name of groundwater body  if known | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **isOutOf\_RBD** boolean  Public    «voidable» | Indicate whether or not  parts of the Groundwater Body are outside the RBD. Yes or No | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **isTrannsboundary** boolean  Public    «voidable» | Does the Groundwater Body cross a country border? Yes or No | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **URL** anyURI  Public    «voidable» | URL for integration of MS own internet-based information | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **centroid** GM\_Point  Public |  | *Default:* |

#### Well

Type: **Class** HydrogeologicalObjectManMade

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core Keywords:

Detail: *Created on* *2011-02-19*. *Last modified on 2012-02-16*.

GUID: {5DD7422B-248F-45a8-B462-B2244F293385}

--Definition --

(from GWML) 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

| Constraints | |
| --- | --- |
|  | inheritance restriction: geometry is applicable if Borehole is void: *(Invariant, Status is Approved*) |
|  | inheritance restriction: type of geometry is GM\_Point: *(Invariant, Status is Approved*) |

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  HydrogeologicalProfile | Public  Well |  |
| Generalization  Source -> Destination | Public  ActiveWell (or AbstractionWell) | Public  Well |  |
| Generalization  Source -> Destination | Public  ObservationWell | Public  Well |  |
| Generalization  Source -> Destination | Public  Well | Public  HydrogeologicalObjectManMade |  |
| Dependency  Source -> Destination | Public  Well | Public  WellPurposeCode |  |
| Dependency  Source -> Destination | Public  Well | Public  WellUse |  |
| Aggregation  Source -> Destination | Public isPartOf  Borehole | Public isBasedOn  Well |  |
| Dependency  Source -> Destination | Public  Well | Public  WellStatusCode |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **usage** WellUse  Public |  | *Default:* |
| **wellStatus** WellStatusCode  Public    «voidable» |  | *Default:* |
| **wellPurpose** WellPurposeCode  Public    «voidable» |  | *Default:* |
| **geometry** GM\_Point  Public    «voidable - restricted» |  | *Default:* |

#### HydrogeologyCore\_CodeListsAndEnumerations

Type: Package

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core

Detail: *Created on 2011-03-09*. *Last modified on 2011-04-11*

GUID: {63393A05-FD2F-49de-B989-E20F3CC4D597}

##### AquiferMediaType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_CodeListsAndEnumerations Keywords:

Detail: *Created on* *2011-04-11*. *Last modified on 2011-04-11*.

GUID: {38AE0070-57CF-48f6-9F41-BE2D6DDAFE10}

Imported from GWML

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **fractured**  Public    «enum» |  | *Default:* |
| **porous**  Public    «enum» |  | *Default:* |
| **karstic**  Public    «enum» |  | *Default:* |
| **compound**  Public    «enum» |  | *Default:* |

##### AquiferType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_CodeListsAndEnumerations Keywords:

Detail: *Created on* *2011-04-11*. *Last modified on 2011-04-11*.

GUID: {AD576A81-3DFC-4f6e-B1C1-6653DA4A0006}

Imported from GWML

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **confinedSubArtesian**  Public    «enum» |  | *Default:* |
| **confinedArtesian**  Public    «enum» |  | *Default:* |
| **unconfined**  Public    «enum» |  | *Default:* |

##### ConditionOfGrounwater

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_CodeListsAndEnumerations Keywords:

Detail: *Created on* *2011-03-05*. *Last modified on 2011-04-12*.

GUID: {6C2D1265-3CDE-45ee-ABEB-3B21A2829D8B}

-- Definition --

GroundWaterFlowSystem and its parts (GroundWaterBody) are variable during the state dependent on external factors, which are the most diverse human activities. Enumeration ConditonOfGroundwater determines the approximate degree of these changes.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  GroundWaterBody | Public  ConditionOfGrounwater |  |
| Dependency  Destination -> Source | Public  ConditionOfGrounwater | Public  GroundWaterFlowSystem |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **natural**  Public    «enum» |  | *Default:* |
| **lightlyModified**  Public    «enum» |  | *Default:* |
| **modified**  Public    «enum» |  | *Default:* |
| **stronglyModified**  Public    «enum» |  | *Default:* |

##### NaturalObjectType

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_CodeListsAndEnumerations Keywords:

Detail: *Created on* *2011-04-13*. *Last modified on 2011-04-13*.

GUID: {AEB6A2C6-4176-48b4-86F2-C89F361388E5}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  HydrogeologicalObjectNatural | Public  NaturalObjectType |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **spring**  Public |  | *Default:* |
| **seep**  Public |  | *Default:* |
| **swallowHole**  Public |  | *Default:* |
| **other**  Public |  | *Default:* |

##### ObservationType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_CodeListsAndEnumerations Keywords:

Detail: *Created on* *2011-03-07*. *Last modified on 2011-04-11*.

GUID: {2DDBECB1-619F-4701-BDBE-92820D75D35D}

-- Definition --

A type of an observation made on the feature of interest.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  ObservationWell | Public  ObservationType |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **diagnostics**  Public    «enum» |  | *Default:* |
| **surveillance**  Public    «enum» |  | *Default:* |
| **research**  Public    «enum» |  | *Default:* |
| **industrial**  Public    «enum» |  | *Default:* |

##### StationLevel

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_CodeListsAndEnumerations Keywords:

Detail: *Created on* *2011-03-07*. *Last modified on 2011-04-11*.

GUID: {C0339B21-8B11-4644-9A54-5174039C4B89}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  GroundWaterMonitoringStation | Public  StationLevel |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **basicNetwork**  Public    «enum» |  | *Default:* |
| **hydrologicalBenchmark**  Public    «enum» |  | *Default:* |
| **baseLine**  Public    «enum» |  | *Default:* |
| **specificNetwork**  Public    «enum» |  | *Default:* |
| **temporalNetwork**  Public    «enum» |  | *Default:* |

##### StationType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_CodeListsAndEnumerations Keywords:

Detail: *Created on* *2011-03-07*. *Last modified on 2011-04-11*.

GUID: {4EACB3C5-8011-4754-AD63-0FF50DF670FE}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  GroundWaterMonitoringStation | Public  StationType |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **quality**  Public    «enum» |  | *Default:* |
| **quantity**  Public    «enum» |  | *Default:* |

##### TypeOfSourceForGeometry

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_CodeListsAndEnumerations Keywords:

Detail: *Created on* *2011-02-19*. *Last modified on 2011-04-11*.

GUID: {AA8322E6-79A4-49db-B8B2-EDEE047F745D}

-- Definition --

Determination of the feature geometry information source or the way of geometry mark.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Destination -> Source | Public  TypeOfSourceForGeometry | Public  HydrogeologicalFeatureAppearence |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **borholeM&O** <undefined>  Public |  | *Default:* |
| **cartographicalM&O** <undefined>  Public |  | *Default:* |
| **fiat** <undefined>  Public |  | *Default:* |
| **fromMap** <undefined>  Public |  | *Default:* |
| **fuzzy** <undefined>  Public |  | *Default:* |
| **genuine** <undefined>  Public |  | *Default:* |
| **geophisicalM&O** <undefined>  Public |  | *Default:* |
| **hipotetical** <undefined>  Public |  | *Default:* |
| **hipoteticalVerifed** <undefined>  Public |  | *Default:* |
| **other**  Public |  | *Default:* |

##### WaterPersistenceValue

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_CodeListsAndEnumerations Keywords:

Detail: *Created on* *2008-09-29*. *Last modified on 2011-04-11*.

GUID: {346035A4-7320-42cc-A9B7-09729595FF03}

-- Definition --

Categories of hydrological persistence of water.

(from GWML - modified)

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | 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. |
|  | codeList = urn:x-inspire:def:codeList:INSPIRE:HydrologicalPersistenceValue. |
|  | xsdEncodingRule = iso19136\_2007\_INSPIRE\_Extensions. Values: iso19136\_2007 | iso19139\_2007 | iso19136\_2007\_INSPIRE\_Extensions  Default: iso19136\_2007\_INSPIRE\_Extensions  Description: XML Schema encoding rule to apply |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  HydrogeologicalObjectNatural | Public  WaterPersistenceValue |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **ephemeral**  Public | -- Definition --  Filled and/or flowing during and immediately after precipitation.  -- Description --  SOURCE [DFDD]. | *Default:* |
| **intermittent**  Public | -- Definition --  Filled and/or flowing for part of the year.  -- Description --  SOURCE [DFDD]. | *Default:* |
| **seasonal**  Public |  | *Default:* |
| **perennial**  Public | -- Definition --  Filled and/or flowing continuously throughout the year as its bed lies below the water table.  -- Description --  SOURCE [DFDD]. | *Default:* |

##### WaterType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_CodeListsAndEnumerations Keywords:

Detail: *Created on* *2008-12-05*. *Last modified on 2011-04-11*.

GUID: {1CF36D41-91E7-479f-AF3F-73B9619506A4}

-- Definition --

(From GWML) This enumeration class refers to the concept of salinity and its classes in water.

-- Note --

(From GWML) 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

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | 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 = . Description: URI that identifies the authority for this dictionary and its members |
|  | dictionaryIdentifier = . Description: URI that identifies this dictionary |
|  | memberIdentifierStem = . 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 |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Destination -> Source | Public  WaterType | Public  GroundWaterBody |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **ultraFreshWater**  Public | TBD | *Default:*    [sequenceNumber = 10 ] |
| **freshWater**  Public | 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. | *Default:*    [sequenceNumber = 20 ] |
| **acratopegae**  Public | 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 mineraux ou une teneur moindre que celle d'une eau minerale.  http://fr.wiktionary.org/wiki/acratop%C3%A8ge | *Default:*    [sequenceNumber = 30 ] |
| **brackishWater**  Public | 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 | *Default:*    [sequenceNumber = 40 ] |
| **saltWater**  Public | 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 | *Default:*    [sequenceNumber = 50 ] |
| **brineWater**  Public | Brine (lat. saltus) is water saturated or nearly saturated with salt (NaCl).  http://en.wikipedia.org/wiki/Brine | *Default:*    [sequenceNumber = 60 ] |

##### WaterUseCode

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_CodeListsAndEnumerations Keywords:

Detail: *Created on* *2006-01-24*. *Last modified on 2011-04-11*.

GUID: {CCC02192-582D-4e5e-AF98-022235F228D0}

-- Definition --

(from GWML) 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

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | 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 = . Description: URI that identifies the authority for this dictionary and its members |
|  | dictionaryIdentifier = . Description: URI that identifies this dictionary |
|  | memberIdentifierStem = . 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 |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  ActiveWell (or AbstractionWell) | Public  WaterUseCode |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **agriculture**  Public | 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 | *Default:* |
| **commercial**  Public | 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 | *Default:* |
| **domestic**  Public | 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 | *Default:* |
| **heatTransfert**  Public | 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 | *Default:* |
| **industrial**  Public | 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 | *Default:* |
| **irrigation**  Public | 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 | *Default:* |
| **otherUnknow**  Public | 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 | *Default:* |
| **publicRecreation**  Public | TBD | *Default:* |
| **research**  Public | TBD | *Default:* |
| **municipal**  Public | 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 | *Default:* |
| **forDrinking**  Public |  | *Default:* |

##### WellPurposeCode

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_CodeListsAndEnumerations Keywords:

Detail: *Created on* *2006-01-24*. *Last modified on 2011-04-11*.

GUID: {9B3825A0-746F-4af8-93A7-3C9BF48895DA}

-- Definition --

Code associated to define the purpose of the well.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | 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 = . Description: URI that identifies the authority for this dictionary and its members |
|  | dictionaryIdentifier = . Description: URI that identifies this dictionary |
|  | memberIdentifierStem = . 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 |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  Well | Public  WellPurposeCode |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **cathodicProtection**  Public | Other, less common types of wells include cathodic 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 | *Default:* |
| **coalELog**  Public | TBD | *Default:* |
| **core**  Public | TBD | *Default:* |
| **decontamination**  Public | TBD | *Default:* |
| **dewatering**  Public | 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 | *Default:* |
| **disposal**  Public | 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 | *Default:* |
| **flowingShot**  Public | 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 | *Default:* |
| **geotechnical**  Public | 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 | *Default:* |
| **mineral**  Public | 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 | *Default:* |
| **monitoringLevelHead**  Public | 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 | *Default:* |
| **monitoringQuality**  Public | 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 | *Default:* |
| **oil**  Public | 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 | *Default:* |
| **oilExploratory**  Public | 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 | *Default:* |
| **other**  Public | Any other usage of a well. | *Default:* |
| **recharge**  Public | 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 | *Default:* |
| **seismic**  Public | A well used to conduct seismic surveys. | *Default:* |
| **waterExploratory**  Public | A well drilled to seach for new groundwater | *Default:* |
| **waterSupply**  Public | Well used to supply water for various usage. | *Default:* |
| **withdrawal**  Public | TBD | *Default:* |
| **termal**  Public |  | *Default:* |

##### WellStatusCode

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_CodeListsAndEnumerations Keywords:

Detail: *Created on* *2006-01-24*. *Last modified on 2011-04-12*.

GUID: {6B4AD8BC-E50A-433c-942B-C03FB5DCB60E}

-- Definition --

(from GWML) Status of the well.

-- Note --

Class adapted from GWML.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | 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 = . Description: URI that identifies the authority for this dictionary and its members |
|  | dictionaryIdentifier = . Description: URI that identifies this dictionary |
|  | memberIdentifierStem = . 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 |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  Well | Public  WellStatusCode |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **abandonedDry**  Public |  | *Default:* |
| **abandonedInsufficient**  Public |  | *Default:* |
| **abandonedQuality**  Public |  | *Default:* |
| **deepened**  Public |  | *Default:* |
| **new**  Public |  | *Default:* |
| **notInUse**  Public |  | *Default:* |
| **reconditionned**  Public |  | *Default:* |
| **standby**  Public |  | *Default:* |
| **unfinished**  Public |  | *Default:* |
| **unknown**  Public |  | *Default:* |
| **abandoned**  Public |  | *Default:* |

##### WellUse

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_CodeListsAndEnumerations Keywords:

Detail: *Created on* *2007-08-03*. *Last modified on 2011-04-11*.

GUID: {6C898CC8-BC28-4d2c-BD24-76F7494D8A47}

-- Definition --

A use of well (production or pumping wells, monitoring wells, piezometers).

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | 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 = . Description: URI that identifies the authority for this dictionary and its members |
|  | dictionaryIdentifier = . Description: URI that identifies this dictionary |
|  | memberIdentifierStem = . 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 |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  Well | Public  WellUse |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **observation**  Public |  | *Default:*    [sequenceNumber = 10 ] |
| **monitoring**  Public |  | *Default:*    [sequenceNumber = 20 ] |
| **piezometry**  Public |  | *Default:*    [sequenceNumber = 30 ] |
| **domestic**  Public |  | *Default:*    [sequenceNumber = 40 ] |
| **exploitation**  Public |  | *Default:*    [sequenceNumber = 50 ] |
| **production**  Public |  | *Default:*    [sequenceNumber = 60 ] |

#### HydrogeologyCore\_GenericAndExternalTypes

Type: Package

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Core

Detail: *Created on 2011-03-09*. *Last modified on 2011-04-11*

GUID: {877435E6-EC49-430f-A4E4-4B3CEF15CF31}

##### AquiferDescription

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_GenericAndExternalTypes Keywords:

Detail: *Created on* *2007-05-30*. *Last modified on 2011-03-12*.

GUID: {35243708-6D87-4199-8783-D80019694CE3}

-- Definition --

(From GWML) Properties of the rock (forming aquifer) that is relevant to the groundwater.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = true. Description: enforce the 'by value' property pattern without xlinks |
|  | isCollection = false. Values: true | false  Default: false  Description: attribute group gml:AggregationAttributeGroup is added to the complex type of the feature type |
|  | noPropertyType = false. Values: true | false  Default: false  Description: suppress automatic creation of \*PropertyType complexType |
|  | xmlSchemaType = . Description: no type shall be generated for the class, but the given type or element referenced |
|  | xsdDerivation = true. Values: true | false  Default: true  Description: class implemented as new type + element, or by applying constraints only |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation DescribesParamitersOf  Source -> Destination | Public  AquiferDescription | Public  Aquitard |  |
| Aggregation  Source -> Destination | Public  AquiferDescription | Public  ProfileInterval |  |
| Aggregation DescribesParametersOf  Source -> Destination | Public  AquiferDescription | Public  Aquifer |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **descriptoin** PT\_FreeText  Public    «voidable» |  | *Default:* |
| **capacityCoefficient** CGI\_NumericRange  Public    «voidable - estimatedProperty» | Volumetric capacity of an aquifer to hold water. | *Default:*    [sequenceNumber = 10 ] |
| **hydraulicConductivityCoefficient** CGI\_NumericRange  Public    «voidable - estimatedProperty» | 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) | *Default:*    [sequenceNumber = 20 ] |
| **storativityCoefficient** CGI\_NumericRange  Public    «voidable - estimatedProperty» | 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 | *Default:*    [sequenceNumber = 30 ] |
| **beginLifespanObject** DateTime  Public    «lifeCycleInfo - voidable» |  | *Default:* |
| **endLifespanObject** DateTime  Public    [0..1]  «lifeCycleInfo - voidable» |  | *Default:* |

##### FeatureUniqueCodeType

Type: **Class** string

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_GenericAndExternalTypes Keywords:

Detail: *Created on* *2011-03-11*. *Last modified on 2011-04-13*.

GUID: {C26DCED7-0DE2-40c5-8934-4E65840DCD71}

Type for unique code within the Member State for the feature

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | derivation = restriction. |
|  | maxLength = 40. |
|  | minLength = 1. |
|  | whiteSpace = collapse. |

##### FeatureUniqueEUCodeType

Type: **Class** string

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_GenericAndExternalTypes Keywords:

Detail: *Created on* *2011-03-11*. *Last modified on 2011-04-13*.

GUID: {892FBC1D-4045-4062-BE92-5D025AC97A3F}

Type for EU code, allows up to 42 characters (unique code within MS prefixed with country ISO 2 character code

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | derivation = restriction. |
|  | maxLength = 42. |
|  | minLength = 3. |

##### GEh\_ComplexGeometry

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_GenericAndExternalTypes Keywords:

Detail: *Created on* *2011-02-17*. *Last modified on 2011-03-09*.

GUID: {E29D9CD1-E8F5-484d-8E39-7684234ED1AC}

-- Definition --

Description of hydrogeological feature for hydrogeological modeling needs.

-- Note --

Horizontal extend of hydrogeological feature is expressed by GM\_SurfaceBoundary.

Vertical extend diferent in diferent places is limited by floor and roof surfaces.

Surfaces are expressed in CV\_ContinousQuadrilatereaGridCoverage form.

| Constraints | |
| --- | --- |
|  | horizontal extent of floor and roof is limited to value of horizonalExtent attribute: *(Invariant, Status is Approved*) |
|  | one (floor or roof) must be present: *(Invariant, Status is Approved*) |

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  GEh\_Geometry | Public  GEh\_ComplexGeometry |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **floor** CV\_ContinuousQuadrilateralGridCoverage  Public    «voidable - featureType» |  | *Default:* |
| **horizontalExtend** GM\_SurfaceBoundary  Public |  | *Default:* |
| **roof** CV\_ContinuousQuadrilateralGridCoverage  Public    «voidable - featureType» |  | *Default:* |

##### GEh\_Geometry

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_GenericAndExternalTypes Keywords:

Detail: *Created on* *2011-02-17*. *Last modified on 2011-04-11*.

GUID: {A6037110-1372-4a78-968D-38D754C002C8}

-- Definition --

Common data union for geometry of feature.

-- Note --

In GML application it is realised by choice element.

XML Schema choice element allows only one of the elements contained in the <choice> declaration to be present within the containing element.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  GEh\_Geometry | Public  GEh\_ComplexGeometry |  |
| Dependency  Source -> Destination | Public  GEh\_GeometryType | Public  GEh\_Geometry |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **complexGeometry** GEh\_ComplexGeometry  Public |  | *Default:* |
| **simpleGeometry** GM\_Primitive  Public |  | *Default:* |

##### GEh\_GeometryType

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_GenericAndExternalTypes Keywords:

Detail: *Created on* *2011-03-06*. *Last modified on 2011-03-09*.

GUID: {2C0CFC7B-664E-4811-9DE7-F24FC9207F0D}

-- Definition --

Container for union of different types of geometriec

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  GEh\_GeometryType | Public  GEh\_Geometry |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **geometry** GEh\_Geometry  Public    «union» | geometry | *Default:* |

##### PiezometricStateOfGroundwater

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_GenericAndExternalTypes Keywords:

Detail: *Created on* *2011-04-12*. *Last modified on 2011-04-12*.

GUID: {E87F6D39-3B93-4519-B2BF-C9241B61C19F}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  StateOfGroundwater | Public  PiezometricStateOfGroundwater |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **descriptionOfPiezometricState** PT\_FreeText  Public |  | *Default:* |
| **piezometricSurfaceGrid** CV\_ContinuousQuadrilateralCoverage  Public    «featureType» |  | *Default:* |
| **piezometricSurfaceCountours** CV\_SegmentedCurveCoverage  Public    «featureType» |  | *Default:* |

##### StateOfGroundwater

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_GenericAndExternalTypes Keywords:

Detail: *Created on* *2011-04-12*. *Last modified on 2011-04-12*.

GUID: {4FB02906-2AE1-4f45-A036-CADB0FC8DB31}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  StateOfGroundwater | Public  PiezometricStateOfGroundwater |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **piezometricState** PiezometricStateOfGroundwater  Public    «union» |  | *Default:* |

##### WaterPropertyDescription

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_GenericAndExternalTypes Keywords:

Detail: *Created on* *2005-11-28*. *Last modified on 2011-03-13*.

GUID: {A86A8666-8967-4288-AA79-6318148F8EC0}

-- Definition --

(from GWML)

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.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = true. Values: true  Default: true  Description: enforce the 'by value' property pattern without xlinks |
|  | isCollection = false. Values: false  Default: false  Description: attribute group gml:AggregationAttributeGroup is added to the complex type of the feature type |
|  | noPropertyType = false. Values: true | false  Default: false  Description: suppress automatic creation of \*PropertyType complexType |
|  | xsdDerivation = true. Values: true | false  Default: true  Description: class implemented as new type + element, or by applying constraints only |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  WaterYieldDescription | Public  WaterPropertyDescription |  |
| Generalization  Source -> Destination | Public  WaterYieldDescription | Public  WaterPropertyDescription |  |
| Generalization  Source -> Destination | Public  WaterQuantityDescription | Public  WaterPropertyDescription |  |
| Generalization  Source -> Destination | Public  WaterQualityDescription | Public  WaterPropertyDescription |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **beginLifespanVersion** DateTime  Public    «lifeCycleInfo - voidable» | 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 | *Default:*    [sequenceNumber = 20 ] |
| **endLifespanVersion** DateTime  Public    [0..1]  «lifeCycleInfo - voidable» |  | *Default:* |

##### WaterQualityDescription

Type: **Class** WaterPropertyDescription

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_GenericAndExternalTypes Keywords:

Detail: *Created on* *2005-11-28*. *Last modified on 2011-03-13*.

GUID: {2DEB5464-82B1-4704-800B-6E967FF3C216}

-- Definition --

(from GWML)

A list of common properties related to water quality assessment.  Head of a substitution list that include Qualitative and Quantitative water quality properties

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = true. Values: true  Default: true  Description: enforce the 'by value' property pattern without xlinks |
|  | isCollection = false. Values: false  Default: false  Description: attribute group gml:AggregationAttributeGroup is added to the complex type of the feature type |
|  | noPropertyType = false. Values: true | false  Default: false  Description: suppress automatic creation of \*PropertyType complexType |
|  | xsdDerivation = true. Values: true | false  Default: true  Description: class implemented as new type + element, or by applying constraints only |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  WaterQualityDescription | Public  ProfileInterval |  |
| Generalization  Source -> Destination | Public  WaterQualityDescription | Public  WaterPropertyDescription |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **normComplianceResult** GEh\_ValueType  Public    «voidable» | Evaluation of the compliance of this result compared to the norm (eg, below the norm, above the norm, meeting, exceeding..) | *Default:*    [sequenceNumber = 10 ] |
| **normDocumentation** localizedString  Public    «voidable» | Identification of a norm (if any) that is should be considered to interpret the result. | *Default:*    [sequenceNumber = 20 ] |

##### WaterQuantityDescription

Type: **Class** WaterPropertyDescription

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_GenericAndExternalTypes Keywords:

Detail: *Created on* *2005-11-28*. *Last modified on 2011-03-13*.

GUID: {F42DBAB5-4493-4605-BED5-8B4D02732913}

-- Definition --

(from GWML)

A class used to describe the the quantity of water that is present in an aquifer.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = true. Values: true  Default: true  Description: enforce the 'by value' property pattern without xlinks |
|  | isCollection = false. Values: false  Default: false  Description: attribute group gml:AggregationAttributeGroup is added to the complex type of the feature type |
|  | noPropertyType = false. Values: true | false  Default: false  Description: suppress automatic creation of \*PropertyType complexType |
|  | xsdDerivation = true. Values: true | false  Default: true  Description: class implemented as new type + element, or by applying constraints only |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  WaterQuantityDescription | Public  ProfileInterval |  |
| Generalization  Source -> Destination | Public  WaterQuantityDescription | Public  WaterPropertyDescription |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **qualitativeWaterQuantity** GEh\_ValueType  Public    «voidable» | Qualitative description of the water quantity (such as 'wet' or 'dry'). Often the only information recorded in some water well records | *Default:*    [sequenceNumber = 10 ] |

##### WaterYieldDescription

Type: **Class** WaterPropertyDescription

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_GenericAndExternalTypes Keywords:

Detail: *Created on* *2008-02-05*. *Last modified on 2011-03-09*.

GUID: {D21D6A96-626B-48b2-B87F-7CA11D246FD4}

-- Definition --

(from GWML) A class used to describe the different yield parameters of an aquifer.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = true. Values: true  Default: true  Description: enforce the 'by value' property pattern without xlinks |
|  | isCollection = false. Values: false  Default: false  Description: attribute group gml:AggregationAttributeGroup is added to the complex type of the feature type |
|  | noPropertyType = false. Values: true | false  Default: false  Description: suppress automatic creation of \*PropertyType complexType |
|  | xsdDerivation = true. Values: true | false  Default: true  Description: class implemented as new type + element, or by applying constraints only |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  WaterYieldDescription | Public  ProfileInterval |  |
| Generalization  Source -> Destination | Public  WaterYieldDescription | Public  WaterPropertyDescription |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **safeYield** CGI\_NumericRange  Public    «voidable - estimatedProperty» | -- Definition --  (from GWML) With reference to either a surface- or ground-water supply, the rate of diversion or extraction for *Consumptive Use* which can be maintained indefinitely, within the limits of economic feasibility, under specified conditions of water-supply development. Also see *Perennial Yield*.  **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 *Natural Recharge*, the *Artificial* (or *Induced*) *Recharge*, and the *Incidental Recharge* without causing depletion of the groundwater reservoir. Also referred to as *Safe Yield*.  http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-y.pdf  Amount of water that can be retreived from an aquifer without jeopardising the resources but still involved some impacts (def. to be improved) | *Default:*    [sequenceNumber = 10 ] |
| **specificYield** CGI\_NumericRange  Public    «voidable - estimatedProperty» | -- Definition --  (from GWML) 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) | *Default:*    [sequenceNumber = 20 ] |
| **sustainableYield** CGI\_NumericRange  Public    «voidable - estimatedProperty» | --Definition --  (from GWML)  The groundwater extraction regime, measured over a specified planning timeframe, that allows acceptable levels of stress and protects dependent economic, social, and environmental values.  http://www.environment.gov.au/water/publications/environmental/groundwater/pubs/annex-a.pdf  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 | *Default:*    [sequenceNumber = 30 ] |

##### From\_ISO19156

Type: Package

Status: Proposed. Version 1.0. Phase 1.0.

Package: HydrogeologyCore\_GenericAndExternalTypes

Detail: *Created on 2011-03-12*. *Last modified on 2011-03-12*

GUID: {DE370832-39DE-4479-8E3A-02625546B0B4}

###### Interval

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: From\_ISO19156 Keywords:

Detail: *Created on* *2005-01-20*. *Last modified on 2011-03-12*.

GUID: {966AAC2A-1954-480f-8651-8230CEA710EB}

-- Definition --

(from ISO 19156)

An Interval is a simple curve, parameterized only by its two end-points.

| Constraints | |
| --- | --- |
|  | type(shape)=GM\_CurveSegment: *(Invariant, Status is Approved*) |

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = false. Values: true | false  Default: false  Description: enforce the 'by value' property pattern without xlinks |
|  | byValuePropertyType = false. Values: true,false  Default: false  Description: enforce the 'by value' property pattern without xl |
|  | hasXmlLang = false. Values: true | false  Default: false  Description: axml attribute xml:lang shall be generated for the type representing the class |
|  | isCollection = false. Values: true | false  Default: false  Description: attribute group gml:AggregationAttributeGroup is added to the complex type of the feature type |
|  | isCollection = false. Values: true,false  Default: false  Description: attribute group gml:AggregationAttributeGroup is a |
|  | noPropertyType = false. Values: true | false  Default: false  Description: suppress automatic creation of \*PropertyType complexType |
|  | noPropertyType = false. Values: true,false  Default: false  Description: suppress automatic creation of \*PropertyType compl |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  Interval | Public  Profile |  |

###### Measure

Type: **Class**

Status: Proposed. Version . Phase .

Package: From\_ISO19156 Keywords:

Detail: *Created on* *2008-04-10*. *Last modified on 2011-03-12*.

GUID: {CDBC49A7-ED7D-46fb-9196-C808226975F8}

-- Definition --

The result from performing the act or process of ascertaining the extent, dimensions, or quantity of some entity.

A measure is always associated to a unit of measure. Ratio measures where the two base measures are in the same units (often considered unit-less) should be associated to UnitOfMeasure (same meter/meter for map scale) so that conversions to non-unitless ratios can be accomplished (such as miles/inch).

-- Note --

(From ISO 19156 - Observations and Measurements)

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | persistence = persistent. |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **value** Number  Public | The numerical value quantifying the extent or size of some quantity, in the units specified by the associated UnitOfMeasure class. | *Default:* |

###### ObservationWell

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: From\_ISO19156 Keywords:

Detail: *Created on* *2006-07-18*. *Last modified on 2011-03-12*.

GUID: {AC6964E5-3686-41e3-BDDF-EF3BA90D0185}

-- Definition --

(from ISO 19156) Wells, boreholes, drillholes provide access within a solid medium, and are used to sample rock-units, aquifers, etc. Instruments may be inserted into the hole for in-situ observations. Specimens may be retrieved from a well for observations ex-situ. The association between specimens and wells may be indicated using the SamplingFeatureRelation class.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = false. Values: true | false  Default: false  Description: enforce the 'by value' property pattern without xlinks |
|  | byValuePropertyType = false. Values: true,false  Default: false  Description: enforce the 'by value' property pattern without xl |
|  | hasXmlLang = false. Values: true | false  Default: false  Description: axml attribute xml:lang shall be generated for the type representing the class |
|  | isCollection = false. Values: true | false  Default: false  Description: attribute group gml:AggregationAttributeGroup is added to the complex type of the feature type |
|  | isCollection = false. Values: true,false  Default: false  Description: attribute group gml:AggregationAttributeGroup is a |
|  | noPropertyType = false. Values: true | false  Default: false  Description: suppress automatic creation of \*PropertyType complexType |
|  | noPropertyType = false. Values: true,false  Default: false  Description: suppress automatic creation of \*PropertyType compl |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  Profile | Public  ObservationWell |  |

###### Profile

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: From\_ISO19156 Keywords:

Detail: *Created on* *2007-03-14*. *Last modified on 2011-03-12*.

GUID: {8658B8BD-3819-4387-BE86-AB7AA94FCC68}

-- Definition --

A profilfe is a curve along which a continuously varying property is sampled, usually at a high spatial sampling rate with an automated instrument.

-- Note --

(From ISO 19156 - Observations and Measurements)

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = false. Values: true | false  Default: false  Description: enforce the 'by value' property pattern without xlinks |
|  | byValuePropertyType = false. Values: true,false  Default: false  Description: enforce the 'by value' property pattern without xl |
|  | hasXmlLang = false. Values: true | false  Default: false  Description: axml attribute xml:lang shall be generated for the type representing the class |
|  | isCollection = false. Values: true | false  Default: false  Description: attribute group gml:AggregationAttributeGroup is added to the complex type of the feature type |
|  | isCollection = false. Values: true,false  Default: false  Description: attribute group gml:AggregationAttributeGroup is a |
|  | noPropertyType = false. Values: true | false  Default: false  Description: suppress automatic creation of \*PropertyType complexType |
|  | noPropertyType = false. Values: true,false  Default: false  Description: suppress automatic creation of \*PropertyType compl |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  Profile | Public  ObservationWell |  |
| Aggregation  Source -> Destination | Public  Interval | Public  Profile |  |

###### SF\_SamplingCurve

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: From\_ISO19156 Keywords:

Detail: *Created on* *2011-03-06*. *Last modified on 2011-03-12*.

GUID: {0ACF4E3C-6936-46b9-A241-0E5AC9434E9A}

-- Definition --

A common mode of sampling is along a curve.

The class SM\_SamplingCurve (Figure 11) is an instance of the «metaclass» GF\_FeatureType (ISO 19109), which therefore represents a feature type. SM\_SamplingCurve shall support one attribute and one association.

-- Note --

From ISO 19156 - Observations and Measurements

| Custom Properties | |
| --- | --- |
|  | isActive = False |

###### SF\_SamplingFeature

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: From\_ISO19156 Keywords:

Detail: *Created on* *2004-12-13*. *Last modified on 2011-03-13*.

GUID: {D93ED42F-BF3F-43d0-A1F3-A1BA679D2E44}

* **Role of sampling features**

Sampling features are artefacts of an observational strategy, and have no significant function outside of their role in the observation process. The physical characteristics of the features themselves are of little interest, except perhaps to the manager of a sampling campaign.

EXAMPLE A “station” is essentially an identifiable locality where a sensor system or procedure may be deployed and an observation made. In the context of the observation model, it connotes the “world in the vicinity of the station”, so the observed properties relate to the physical medium at the station, and not to any physical artefact such as a mooring, buoy, benchmark, monument, well, etc.

NOTE A transient sampling feature, such as a ships-track or flight-line, may be identified and described, but is unlikely to be revisited exactly.

A sampling feature is intended to sample some feature of interest in an application domain. However, in some cases the identity, and even the exact type, of the sampled feature may not be known when observations are made using the sampling features.

* **Classification of sampling features**

A small number of sampling patterns are common across disciplines in observational science. These provide a basis for processing and portrayal tools which are similar across domains, and depend primarily on the geometry of the sample design. Common names for sampling features include specimen, station, profile, transect, path, swath, and scene. These are classified primarily by their topological dimension. Point-located samples are defined in this Clause, extensive samples of various dimensions in Clause 9 and specimens in Clause 10.

| Constraints | |
| --- | --- |
|  | not sampledFeature->forAll(oclIsKindOf(SF\_SamplingFeature)): *(Invariant, Status is Approved*) |

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = false. Values: true,false  Default: false  Description: enforce the 'by value' property pattern without xl |
|  | 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 |
|  | isCollection = false. Values: true | false  Default: false  Description: attribute group gml:AggregationAttributeGroup is added to the complex type of the feature type |
|  | isCollection = false. Values: true,false  Default: false  Description: attribute group gml:AggregationAttributeGroup is a |
|  | noPropertyType = false. Values: true | false  Default: false  Description: suppress automatic creation of \*PropertyType complexType |
|  | noPropertyType = false. Values: true,false  Default: false  Description: suppress automatic creation of \*PropertyType compl |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **parameter** NamedValue  Public    [0..\*] | If present, the attributes *parameter:NamedValue* shall describe an arbitrary parameter associated with the SF\_SamplingFeature. This might be a parameter that qualifies the interaction with the sampled feature, or an environmental parameter associated with the sampling process. | *Default:*    [sequenceNumber = 5 ] |
| **lineage** LI\_Lineage  Public    [0..1] | If present, the attribute lineage:LI\_Lineage shall describe the history and provenance of the SF\_SamplingFeature. This might include information relating to the handling of the specimen, or details of the survey procedure of a spatial sampling feature. | *Default:*    [sequenceNumber = 2 ] |

###### Station

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: From\_ISO19156 Keywords:

Detail: *Created on* *2007-03-07*. *Last modified on 2011-03-12*.

GUID: {ADA10F18-8C87-4797-A4CE-9EE575CCCCDE}

-- Definition --

A station is an identified point location where observations are made. In many cases the station will be continuously monitored or revisted.

-- Note --

From ISO 19156 - Observations and Measurements

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = false. Values: true | false  Default: false  Description: enforce the 'by value' property pattern without xlinks |
|  | byValuePropertyType = false. Values: true,false  Default: false  Description: enforce the 'by value' property pattern without xl |
|  | hasXmlLang = false. Values: true | false  Default: false  Description: axml attribute xml:lang shall be generated for the type representing the class |
|  | isCollection = false. Values: true,false  Default: false  Description: attribute group gml:AggregationAttributeGroup is a |
|  | isCollection = false. Values: true | false  Default: false  Description: attribute group gml:AggregationAttributeGroup is added to the complex type of the feature type |
|  | noPropertyType = false. Values: true | false  Default: false  Description: suppress automatic creation of \*PropertyType complexType |
|  | noPropertyType = false. Values: true,false  Default: false  Description: suppress automatic creation of \*PropertyType compl |

### Hydrogeology\_Extensions

Type: Package

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_v.0.4

Detail: *Created on 2011-04-12*. *Last modified on 2011-04-12*

GUID: {5D7F4E2A-0E71-4997-80F6-0694215845ED}

**Hydrogeology\_Extensions** - *(Package diagram)*

Created By: Janusz Michalak *on* 2011-03-14

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {1153E480-4A05-45e1-983F-1F3D140F6C7B}



Figure: 9

#### <anonymous>

Type: **Text**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Extensions Keywords:

Detail: *Created on* *2007-07-19*. *Last modified on 2007-07-19*.

GUID: {52C58360-28AA-4fe8-9CBF-023E8F0FFBD7}

#### Hydrogeology\_AquiferSystem

Type: Package «applicationSchema»

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Extensions

Detail: *Created on 2011-04-11*. *Last modified on 2011-04-12*

GUID: {DA3B087D-7D75-42f8-BE64-ED0F283872AF}

**Hydrogeology\_AquiferSystem** - *(Logical diagram)*

Created By: Tomasz Nałęcz and Janusz Michalak *on* 2011-04-11

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {58B2551F-B645-4f2e-AA48-1C0742E0E7FB}



Figure: 10

##### CompoudAquiferSystem

Type: **Class** AquiferSystem

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_AquiferSystem Keywords:

Detail: *Created on* *2011-01-28*. *Last modified on 2011-04-13*.

GUID: {3466465C-DBEB-40ac-9F04-5B1856BF919B}

-- Definition --

The set of two or more AquiferSystem belonging to different categories. For example:

- porous and fractured,

- porous and karst

- fractured and karstic

or

- porous, fractured, and karstic.

-- Note --

Group of features Aquifer type create one connected hydrodynamicaly system.

The features the Aquifer type contains have common recharge area and elements of drainage system

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public isContained  PorousAquiferSystem | Public contains  CompoudAquiferSystem |  |
| Aggregation  Source -> Destination | Public isContained  FracturedAquiferSystem | Public contains  CompoudAquiferSystem |  |
| Generalization  Source -> Destination | Public  CompoudAquiferSystem | Public  AquiferSystem |  |
| Aggregation  Source -> Destination | Public isContained  KarsticAquiferSystem | Public contains  CompoudAquiferSystem |  |

##### FracturedAquiferSystem

Type: **Class** AquiferSystem

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_AquiferSystem Keywords:

Detail: *Created on* *2011-01-28*. *Last modified on 2011-04-13*.

GUID: {4A28C7F2-FBDA-44da-A07C-FAC450631FC3}

-- Definition --

Group of features FracturedAquifer type create one connected hydrodynamicaly system.

-- Note --

The features the FracturedAquifer type contains have common recharge area and elements of drainage system (rivers, sources and others)

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public isContained  FracturedAquiferSystem | Public contains  CompoudAquiferSystem |  |
| Generalization  Source -> Destination | Public  FracturedAquiferSystem | Public  AquiferSystem |  |
| Dependency  Source -> Destination | Public  FracturedAquiferSystem | Public  OriginOfFractures |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **genesis** OriginOfFractures  Public    [1..\*]  «voidable» |  | *Default:* |

##### KarsticAquiferSystem

Type: **Class** AquiferSystem

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_AquiferSystem Keywords:

Detail: *Created on* *2011-01-28*. *Last modified on 2011-04-13*.

GUID: {656C7058-A57B-40fa-9831-9D3E335F36BC}

-- Definition --

The group of feature KarsticAquifer types forming a hydrodynamically connected to the system.

--Note --

The features the KarsticAquifer type contains have common recharge area and elements of drainage system (rivers, sources and others)

These features can be in:

- saturated zone and are then completely filled with water.

or

- in aeration zone and are only partially filled with water.

The degree of filling with water may be seasonal, from the total fulfillment to the conditions when there is a completely lack of water.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  KarsticAquifer | Public  KarsticAquiferSystem |  |
| Aggregation  Source -> Destination | Public  SwallowHole | Public  KarsticAquiferSystem |  |
| Aggregation  Source -> Destination | Public isContained  KarsticAquiferSystem | Public contains  CompoudAquiferSystem |  |
| Dependency  Destination -> Source | Public  SoluteRockType | Public  KarsticAquiferSystem |  |
| Aggregation  Source -> Destination | Public  KarsticSpring | Public  KarsticAquiferSystem |  |
| Generalization  Source -> Destination | Public  KarsticAquiferSystem | Public  AquiferSystem |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **soluteRock** SoluteRockType  Public    [1..\*]  «voidable» |  | *Default:* |

##### OriginOfFractures

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_AquiferSystem Keywords:

Detail: *Created on* *2011-03-05*. *Last modified on 2011-04-12*.

GUID: {C92872C2-EC99-4fad-A2BD-EA58BCE48E62}

-- Definition --

Genesis of cracks forming FracturedSystem, for example:

- related to the fault zone,

- caused by weathering processes,

- other processes.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  FracturedAquiferSystem | Public  OriginOfFractures |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **zoneOfShearDisplacementStructure**  Public    «enum» |  | *Default:* |
| **zoneOfWeathering**  Public    «enum» |  | *Default:* |
| **other**  Public    «enum» |  | *Default:* |

##### PorousAquiferSystem

Type: **Class** AquiferSystem

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_AquiferSystem Keywords:

Detail: *Created on* *2011-01-28*. *Last modified on 2011-04-13*.

GUID: {E623A403-8D58-4088-9454-C435F5B3FDA4}

-- Definition --

Feature collection PorousAquifer and PorousAquitard type (often referred to HydrostratigraficSystem - GWML). Borders of PorousSystem create features of Aquiclude type and surface area. It may also consist of only one PorousAquifer.

-- Note --

Frequentally PorousSystem has a considerable horizontal range and vertical layered structure.

Group of features PorousAquifer type create one connected hydrodynamicaly system.

The features consist PorousAquifer type have common recharge area and elements of drainage system (rivers, sources and others)

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  PorousAquiferSystem | Public  AquiferSystem |  |
| Aggregation  Source -> Destination | Public isContained  PorousAquiferSystem | Public contains  CompoudAquiferSystem |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **isHydrostratigraphic** boolean  Public    «voidable» |  | *Default:* |
| **hasLargeHorizontalExtend** boolean  Public    «voidable» |  | *Default:* |

#### Hydrogeology\_DrinkingGroundWaterProtection

Type: Package «applicationSchema»

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Extensions

Detail: *Created on 2011-03-11*. *Last modified on 2011-03-12*

GUID: {5EA249A3-E105-44f8-959B-B1CC522E6E4D}

**Hydrogeology\_DrinkingGroundWaterProtection** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-03-09

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {86E63028-935C-4abc-A727-83A99132CEBF}



Figure: 11

##### ConeOfDepression

Type: **Class** HydrogeologicalFeature, HydrogeologicalZone

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_DrinkingGroundWaterProtection Keywords:

Detail: *Created on* *2007-05-31*. *Last modified on 2011-04-11*.

GUID: {D8B51A2B-AA5B-4c9d-853D-0D7FD8E40693}

-- Definition --

(from GWML) 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

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = false. Values: true | false  Default: false  Description: enforce the 'by value' property pattern without xlinks |
|  | isCollection = false. Values: true | false  Default: false  Description: attribute group gml:AggregationAttributeGroup is added to the complex type of the feature type |
|  | noPropertyType = false. Values: true | false  Default: false  Description: suppress automatic creation of \*PropertyType complexType |
|  | xsdDerivation = true. Values: true | false  Default: true  Description: class implemented as new type + element, or by applying constraints only |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  ConeOfDepression | Public  HydrogeologicalZone |  |
| Generalization  Source -> Destination | Public  ConeOfDepression | Public  HydrogeologicalFeature |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **centeredAt** GM\_Point  Public | 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 | *Default:*    [sequenceNumber = 10 ] |
| **depth** CGI\_NumericValue  Public | The depth of a cone of depression in an aquifer. | *Default:*    [sequenceNumber = 20 ] |

##### GroundWaterWellProtectionType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_DrinkingGroundWaterProtection Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-04-12*.

GUID: {BB089A28-28A5-4aa0-91B8-1704498D95A8}

-- Definition --

Types of protected areas around the groundwater intake (WFD\_register, MS\_direct,MS\_ intirect).

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  ProtectionZone | Public  GroundWaterWellProtectionType |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **MS\_indirect**  Public    «enum» |  | *Default:* |
| **MS\_direct**  Public    «enum» |  | *Default:* |
| **WFD\_register**  Public    «enum» |  | *Default:* |
| **other**  Public    «enum» |  | *Default:* |

##### HydrogeologicalZone

Type: **Class** HydrogeologicalFeature

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_DrinkingGroundWaterProtection Keywords:

Detail: *Created on* *2011-04-12*. *Last modified on 2011-04-12*.

GUID: {3A5CF07C-A9D2-4f5c-BB00-FFFB653CABE1}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  ZoneOfInfluence | Public  HydrogeologicalZone |  |
| Generalization  Source -> Destination | Public  ConeOfDepression | Public  HydrogeologicalZone |  |
| Generalization  Source -> Destination | Public  ProtectionZone | Public  HydrogeologicalZone |  |
| Generalization  Source -> Destination | Public  HydrogeologicalZone | Public  HydrogeologicalFeature |  |
| Association  Bi-Directional | Public isProtectedBy  ActiveWell (or AbstractionWell) | Public protects  HydrogeologicalZone |  |
| Generalization  Source -> Destination | Public  ZoneOfContribution | Public  HydrogeologicalZone |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **beginLifespanObject** DateTime  Public    «lifeCycleInfo - voidable» |  | *Default:* |
| **endLifespanObject** DateTime  Public    [0..1]  «lifeCycleInfo - voidable» |  | *Default:* |
| **validFrom** DateTime  Public    «voidable» |  | *Default:* |
| **validTo** DateTime  Public    [0..1]  «voidable» |  | *Default:* |

##### ProtectionZone

Type: **Class** HydrogeologicalZone

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_DrinkingGroundWaterProtection Keywords:

Detail: *Created on* *2007-07-19*. *Last modified on 2011-03-12*.

GUID: {2FA72268-9B2A-4dec-BF75-3481459BE175}

-- Definition --

(from GWML)

An area that defines a protection zone around a well.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = false. Values: true | false  Default: false  Description: enforce the 'by value' property pattern without xlinks |
|  | isCollection = false. Values: true | false  Default: false  Description: attribute group gml:AggregationAttributeGroup is added to the complex type of the feature type |
|  | noPropertyType = false. Values: true | false  Default: false  Description: suppress automatic creation of \*PropertyType complexType |
|  | xsdDerivation = true. Values: true | false  Default: true  Description: class implemented as new type + element, or by applying constraints only |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  ProtectionZone | Public  GroundWaterWellProtectionType |  |
| Generalization  Source -> Destination | Public  ProtectionZone | Public  HydrogeologicalZone |  |
| Association LinkForNavigation  Source -> Destination | Public  ProtectionZone | Public  AMArea | Invariant {if ( AMArea.amAreaType == restrictedAreaAroundDrinkingWaterSource && GroundWaterIntake.waterUsage == forDrinking)} |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **typeOfProtection** GroundWaterWellProtectionType  Public |  | *Default:* |

##### ZoneOfContribution

Type: **Class** HydrogeologicalZone

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_DrinkingGroundWaterProtection Keywords:

Detail: *Created on* *2011-03-01*. *Last modified on 2011-03-12*.

GUID: {28F5DCC9-44C7-4dfc-AEC6-6AFA38384595}

-- Definition --

(from GWML) 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)

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  ZoneOfContribution | Public  HydrogeologicalZone |  |

##### ZoneOfInfluence

Type: **Class** HydrogeologicalZone

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_DrinkingGroundWaterProtection Keywords:

Detail: *Created on* *2007-05-31*. *Last modified on 2011-03-12*.

GUID: {03082523-65DE-490a-A901-4AB68F8BB313}

-- Definition --

(from GWML)

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)

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = false. Values: true | false  Default: false  Description: enforce the 'by value' property pattern without xlinks |
|  | isCollection = false. Values: true | false  Default: false  Description: attribute group gml:AggregationAttributeGroup is added to the complex type of the feature type |
|  | noPropertyType = false. Values: true | false  Default: false  Description: suppress automatic creation of \*PropertyType complexType |
|  | xsdDerivation = true. Values: true | false  Default: true  Description: class implemented as new type + element, or by applying constraints only |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  ZoneOfInfluence | Public  HydrogeologicalZone |  |

#### Hydrogeology\_KarsticSystem

Type: Package «applicationSchema»

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Extensions

Detail: *Created on 2011-03-11*. *Last modified on 2011-03-12*

GUID: {1ACB4296-70F2-4655-B575-942998129B45}

**HydrogeologyExtension\_KarsticSystem** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-03-06

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {84AADA10-479B-48f5-BFD3-93D779931A6E}



Figure: 12

##### Cave

Type: **Class** KarsticAquifer

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_KarsticSystem Keywords:

Detail: *Created on* *2011-02-20*. *Last modified on 2011-03-15*.

GUID: {10EB0C28-B9E5-440f-BFF2-4C5140D0B108}

-- Definition --

An underground hollow with access from the ground surface or from the sea, often found in limestone areas and on rocky coastlines. (Earth Sciences / Physical Geography)

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association  Bi-Directional | Public  KarsticStream | Public  Cave |  |
| Generalization  Source -> Destination | Public  Cave | Public  KarsticAquifer |  |

##### KarsticAquifer

Type: **Class** Aquifer

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_KarsticSystem Keywords:

Detail: *Created on* *2011-02-27*. *Last modified on 2011-03-15*.

GUID: {6E650507-21E4-412d-91D6-6EEC70219A7B}

-- Definition --

A body of soluble rock that conducts water principally via enhanced (conduit or tertiary) porosity formed by the dissolution of the rock. The aquifers are commonly structured as a branching network of tributary conduits, which connect together to drain a groundwater basin and discharge to a perennial spring.

(Technical Definition of Karst Aquifer - Worthington, 2002)

-- Note --

Must produce useful quantities of water to a spring or well to qualify as an aquifer.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association  Bi-Directional | Public  KarsticAquifer | Public  KarsticSpring |  |
| Generalization  Source -> Destination | Public  KarsticChannel | Public  KarsticAquifer |  |
| Generalization  Source -> Destination | Public  KarsticAquifer | Public  Aquifer |  |
| Aggregation  Source -> Destination | Public  KarsticAquifer | Public  KarsticAquiferSystem |  |
| Generalization  Source -> Destination | Public  Cave | Public  KarsticAquifer |  |

##### KarsticChannel

Type: **Class** KarsticAquifer

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_KarsticSystem Keywords:

Detail: *Created on* *2011-02-25*. *Last modified on 2011-03-15*.

GUID: {57A2DCB0-D99F-429d-BDE5-DF23E0301BCA}

-- Definition --

The karstic channels are regarded as a separate flow system, having the volume of water *V*c with the volumetric flow rate *Q*c(*t*), mainly supplied from sinkholes.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  KarsticChannel | Public  KarsticAquifer |  |
| Association  Bi-Directional | Public  KarsticStream | Public  KarsticChannel |  |

##### KarsticGroundWaterBody

Type: **Class** GroundWaterBody

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_KarsticSystem Keywords:

Detail: *Created on* *2011-02-17*. *Last modified on 2011-03-15*.

GUID: {48174351-5940-464c-B9B5-98BCE663D411}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  KarsticGroundWaterBody | Public  GroundWaterBody |  |
| Generalization  Source -> Destination | Public  KarsticStream | Public  KarsticGroundWaterBody |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **persistance** WaterPersistenceValue  Public    «voidable - estimatedProperty» |  | *Default:* |

##### KarsticSpring

Type: **Class** Spring

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_KarsticSystem Keywords:

Detail: *Created on* *2011-02-17*. *Last modified on 2011-03-14*.

GUID: {69235633-CEBB-44fc-B3B3-79EF9AB2815E}

-- Definition --

Spring discharging karstic system

| Constraints | |
| --- | --- |
|  | if springUsageOrType == karstic: *(Invariant, Status is Approved*) |

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association LinkForNavigation  Source -> Destination | Public  KarsticSpring | Public  SpringOrSeep |  |
| Association  Bi-Directional | Public  KarsticAquifer | Public  KarsticSpring |  |
| Generalization  Source -> Destination | Public  KarsticSpring | Public  Spring |  |
| Aggregation  Source -> Destination | Public  KarsticSpring | Public  KarsticAquiferSystem |  |

##### KarsticStream

Type: **Class** KarsticGroundWaterBody

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_KarsticSystem Keywords:

Detail: *Created on* *2011-02-26*. *Last modified on 2011-03-15*.

GUID: {15397967-9F59-4dac-B055-5E66642A4596}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association  Bi-Directional | Public  KarsticStream | Public  KarsticChannel |  |
| Generalization  Source -> Destination | Public  KarsticStream | Public  KarsticGroundWaterBody |  |
| Association  Bi-Directional | Public  KarsticStream | Public  Cave |  |

##### SoluteRockType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_KarsticSystem Keywords:

Detail: *Created on* *2011-03-05*. *Last modified on 2011-04-12*.

GUID: {6FD6C368-34E5-42a6-AA77-07A17C1AD9FD}

-- Definition --

Determination of the chemical composition of rocks creating karst processes and, consequently, the nature of the voids that collect water and allow it to flow.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Destination -> Source | Public  SoluteRockType | Public  KarsticAquiferSystem |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **limstone**  Public    «enum» |  | *Default:* |
| **dolomite**  Public    «enum» |  | *Default:* |
| **gypsum**  Public    «enum» |  | *Default:* |
| **other**  Public    «enum» |  | *Default:* |

#### Hydrogeology\_MineralAndThermalWaters

Type: Package «applicationSchema»

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Extensions

Detail: *Created on 2011-03-11*. *Last modified on 2011-03-14*

GUID: {E2DE4A3E-2380-40af-AB28-77B27DD0979A}

**HydrogeologyExtensions\_MineralAndThermalWaters** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-03-10

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {183A3E82-28E9-444e-8AC3-9B607331CC24}



Figure: 13

##### Fresh-SaltClassCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_MineralAndThermalWaters Keywords:

Detail: *Created on* *2011-04-13*. *Last modified on 2011-04-13*.

GUID: {8747DCB3-B2AD-4c83-991C-1BEABE68F6D2}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  MineralWaterDescription | Public  Fresh-SaltClassCode |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **veryOligohaline**  Public    «enum» |  | *Default:* |
| **oligohaline**  Public    «enum» |  | *Default:* |
| **fresh**  Public    «enum» |  | *Default:* |
| **freshBrackish**  Public    «enum» |  | *Default:* |
| **brackish**  Public    «enum» |  | *Default:* |
| **brackishSalt**  Public    «enum» |  | *Default:* |

##### HardnessCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_MineralAndThermalWaters Keywords:

Detail: *Created on* *2011-04-13*. *Last modified on 2011-04-13*.

GUID: {746FC7F6-EFF8-4960-8BE7-93133B75EBEC}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  MineralWaterDescription | Public  HardnessCode |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **verySoft**  Public    «enum» |  | *Default:* |
| **soft**  Public    «enum» |  | *Default:* |
| **moderatelyHard**  Public    «enum» |  | *Default:* |
| **hard**  Public    «enum» |  | *Default:* |
| **veryHard**  Public    «enum» |  | *Default:* |
| **extremelyHard**  Public    «enum» |  | *Default:* |

##### MineralConcentration

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_MineralAndThermalWaters Keywords:

Detail: *Created on* *2011-04-13*. *Last modified on 2011-04-13*.

GUID: {8C4FCB63-2D4C-4e6d-BAC1-209EC4CA27DE}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  MineralWaterDescription | Public  MineralConcentration |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **veryLow**  Public    «enum» |  | *Default:* |
| **low**  Public    «enum» |  | *Default:* |
| **intermediate**  Public    «enum» |  | *Default:* |
| **high**  Public    «enum» |  | *Default:* |

##### MineralContent

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_MineralAndThermalWaters Keywords:

Detail: *Created on* *2011-04-13*. *Last modified on 2011-04-13*.

GUID: {D6D90F8E-C3F2-49d9-A3A2-848230F0A810}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  MineralWaterDescription | Public  MineralContent |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **bicarbonate**  Public    «enum» |  | *Default:* |
| **sulphate**  Public    «enum» |  | *Default:* |
| **chloride**  Public    «enum» |  | *Default:* |
| **calcium**  Public    «enum» |  | *Default:* |
| **magnesium**  Public    «enum» |  | *Default:* |
| **fluoride**  Public    «enum» |  | *Default:* |
| **iron**  Public    «enum» |  | *Default:* |
| **bivalentIron**  Public    «enum» |  | *Default:* |
| **acidCarbonDioxide**  Public    «enum» |  | *Default:* |
| **sodium**  Public    «enum» |  | *Default:* |
| **lowSodium**  Public    «enum» |  | *Default:* |

##### MineralGroundWaterBody

Type: **Class** GroundWaterBody

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_MineralAndThermalWaters Keywords:

Detail: *Created on* *2011-02-19*. *Last modified on 2011-03-12*.

GUID: {85A4B4FF-609E-48b9-B106-1D51F2B939B4}

(Definition will be added later)

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association  Bi-Directional | Public  MineralSpring | Public  MineralGroundWaterBody |  |
| Association  Bi-Directional | Public  MineralWaterAbstractionWell | Public  MineralGroundWaterBody |  |
| Dependency  Source -> Destination | Public  MineralGroundWaterBody | Public  MineralWaterDescription |  |
| Association  Bi-Directional | Public  MineralWaterAquifer | Public  MineralGroundWaterBody |  |
| Generalization  Source -> Destination | Public  MineralGroundWaterBody | Public  GroundWaterBody |  |
| Dependency  Source -> Destination | Public  MineralGroundWaterBody | Public  MineralWaterPurpose |  |
| Association LinkForNavigation  Source -> Destination | Public  MineralGroundWaterBody | Public  AMArea | Invariant {if ( AMArea.amAreaType == prospectingAndMiningPermitArea && MineralGroundWaterBody.isProspectingAndMiningPermit == truth)} |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **mineralWaterDescription** MineralWaterDescription  Public    «voidable» |  | *Default:* |
| **puropseOfMineralWater** MineralWaterPurpose  Public    «voidable» |  | *Default:* |
| **isProspectingAndMiningPermit** boolean  Public    «voidable» |  | *Default:* |

##### MineralSpring

Type: **Class** Spring

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_MineralAndThermalWaters Keywords:

Detail: *Created on* *2011-02-19*. *Last modified on 2011-03-13*.

GUID: {4F1A4FEF-06AE-4a48-BFAC-7993215327D0}

-- Definition --

Point of mineral water discharge.

| Constraints | |
| --- | --- |
|  | springUsage == mineral: *(Invariant, Status is Approved*) |

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association  Bi-Directional | Public  MineralSpring | Public  MineralGroundWaterBody |  |
| Association  Bi-Directional | Public  MineralSpring | Public  MineralWaterAquifer |  |
| Generalization  Source -> Destination | Public  MineralSpring | Public  Spring |  |

##### MineralWaterAbstractionWell

Type: **Class** ActiveWell (or AbstractionWell)

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_MineralAndThermalWaters Keywords:

Detail: *Created on* *2011-03-07*. *Last modified on 2011-03-13*.

GUID: {D10C067F-3341-49ae-B75F-7CFEAFF58E7B}

-- Definition --

A WaterWell used for the of abstraction of  mineral water from a mineral groundwater body

| Constraints | |
| --- | --- |
|  | wellPurpose == mineral: *(Invariant, Status is Approved*) |

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association  Bi-Directional | Public  MineralWaterAbstractionWell | Public  MineralGroundWaterBody |  |
| Generalization  Source -> Destination | Public  MineralWaterAbstractionWell | Public  ActiveWell (or AbstractionWell) |  |
| Association  Bi-Directional | Public  MineralWaterAbstractionWell | Public  MineralWaterAquifer |  |

##### MineralWaterAquifer

Type: **Class** Aquifer

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_MineralAndThermalWaters Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-15*.

GUID: {AD983AA8-7752-41d1-A4A8-1BEEE7447F76}

-- Definition --

An aquifer bearing groundwater containing over 1000mg/dm3 of dissolved substances of geogenic origin.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association  Bi-Directional | Public  MineralWaterAbstractionWell | Public  MineralWaterAquifer |  |
| Generalization  Source -> Destination | Public  MineralWaterAquifer | Public  Aquifer |  |
| Association  Bi-Directional | Public  MineralSpring | Public  MineralWaterAquifer |  |
| Association  Bi-Directional | Public  MineralWaterAquifer | Public  MineralGroundWaterBody |  |

##### MineralWaterDescription

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_MineralAndThermalWaters Keywords:

Detail: *Created on* *2011-04-13*. *Last modified on 2011-04-13*.

GUID: {BF327C14-CE37-407f-8F22-24DEE49D2CFC}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  MineralGroundWaterBody | Public  MineralWaterDescription |  |
| Dependency  Source -> Destination | Public  MineralWaterDescription | Public  HardnessCode |  |
| Dependency  Source -> Destination | Public  MineralWaterDescription | Public  MineralConcentration |  |
| Dependency  Source -> Destination | Public  MineralWaterDescription | Public  Fresh-SaltClassCode |  |
| Dependency  Source -> Destination | Public  MineralWaterDescription | Public  MineralContent |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **mineralConcentration** MineralConcentration  Public    [0..1]  «voidable» |  | *Default:* |
| **mineralContent** MineralContent  Public    [1..\*]  «voidable» |  | *Default:* |
| **hardnessCode** HardnessCode  Public    «voidable» |  | *Default:* |
| **fres-SaltClassCode** Fresh-SaltClassCode  Public    «voidable» |  | *Default:* |

##### MineralWaterPurpose

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_MineralAndThermalWaters Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-04-12*.

GUID: {2DA05EE3-74B0-4928-949A-48192FD9A764}

-- Definition --

The purpose for which a mineral water may be exploited.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  MineralGroundWaterBody | Public  MineralWaterPurpose |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **therapeutic**  Public |  | *Default:* |
| **bath**  Public |  | *Default:* |
| **recreation**  Public |  | *Default:* |
| **other**  Public |  | *Default:* |

##### ThermalSpring

Type: **Class** Spring

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_MineralAndThermalWaters Keywords:

Detail: *Created on* *2011-02-19*. *Last modified on 2011-03-14*.

GUID: {356BDB90-3C29-459a-9076-9F2D859960C5}

-- Definition --

Point of mineral water discharge.

| Constraints | |
| --- | --- |
|  | springUsage == termal: *(Invariant, Status is Approved*) |

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  ThermalSpring | Public  ThermalWaterPurpose |  |
| Association  Bi-Directional | Public  ThermalSpring | Public  ThermallGroundWaterBody |  |
| Association  Bi-Directional | Public  ThermalSpring | Public  ThermalWaterAquifer |  |
| Generalization  Source -> Destination | Public  ThermalSpring | Public  Spring |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **temperature** CGI\_NumericRange  Public    «voidable» |  | *Default:* |

##### ThermalWaterAbstractionWell

Type: **Class** ActiveWell (or AbstractionWell)

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_MineralAndThermalWaters Keywords:

Detail: *Created on* *2011-03-07*. *Last modified on 2011-03-14*.

GUID: {30EC0A76-53B1-4af6-9D09-AE8179E92A9B}

-- Definition --

A WaterWell used for the of abstraction of  mineral water from a mineral groundwater body

| Constraints | |
| --- | --- |
|  | wellPurpose == termal: *(Invariant, Status is Approved*) |

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  ThermalWaterAbstractionWell | Public  ThermalWaterPurpose |  |
| Association  Bi-Directional | Public  ThermalWaterAbstractionWell | Public  ThermallGroundWaterBody |  |
| Association  Bi-Directional | Public  ThermalWaterAbstractionWell | Public  ThermalWaterAquifer |  |
| Generalization  Source -> Destination | Public  ThermalWaterAbstractionWell | Public  ActiveWell (or AbstractionWell) |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **temperature** CGI\_NumericRange  Public    «voidable» |  | *Default:* |

##### ThermalWaterAquifer

Type: **Class** Aquifer

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_MineralAndThermalWaters Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-14*.

GUID: {5ADBB81F-3092-4f50-B2AA-728E16B863F4}

?????????????/

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association  Bi-Directional | Public  ThermalWaterAquifer | Public  ThermallGroundWaterBody |  |
| Generalization  Source -> Destination | Public  ThermalWaterAquifer | Public  Aquifer |  |
| Association LinkForNavigation  Source -> Destination | Public  ThermalWaterAquifer | Public  GeothermalEnergyAssessmentUnit |  |
| Association  Bi-Directional | Public  ThermalSpring | Public  ThermalWaterAquifer |  |
| Association  Bi-Directional | Public  ThermalWaterAbstractionWell | Public  ThermalWaterAquifer |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **temperature** CGI\_NumericRange  Public    «voidable - estimatedProperty» |  | *Default:* |

##### ThermalWaterPurpose

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_MineralAndThermalWaters Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-04-12*.

GUID: {4A755F30-0D2F-4840-8E9F-B2AABB1BAD84}

-- Definition --

The purpose for which thermal water may be exploited (health reasons, energy production reasons),

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  ThermalSpring | Public  ThermalWaterPurpose |  |
| Dependency  Source -> Destination | Public  ThermalWaterAbstractionWell | Public  ThermalWaterPurpose |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **healthReasons**  Public |  | *Default:* |
| **energyProduction**  Public |  | *Default:* |
| **industrial**  Public |  | *Default:* |
| **other**  Public |  | *Default:* |

##### ThermallGroundWaterBody

Type: **Class** GroundWaterBody

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_MineralAndThermalWaters Keywords:

Detail: *Created on* *2011-02-19*. *Last modified on 2011-03-14*.

GUID: {48B39B97-FA54-4489-B931-3870B19ED9D8}

(Definition will be added later)

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association  Bi-Directional | Public  ThermalWaterAquifer | Public  ThermallGroundWaterBody |  |
| Generalization  Source -> Destination | Public  ThermallGroundWaterBody | Public  GroundWaterBody |  |
| Association  Bi-Directional | Public  ThermalSpring | Public  ThermallGroundWaterBody |  |
| Association  Bi-Directional | Public  ThermalWaterAbstractionWell | Public  ThermallGroundWaterBody |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **temperature** CGI\_NumericRange  Public    «voidable - estimatedProperty» |  | *Default:* |

#### Hydrogeology\_ObjectNatural

Type: Package «applicationSchema»

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Extensions

Detail: *Created on 2011-04-11*. *Last modified on 2011-04-12*

GUID: {02AE8C74-96B2-4ac3-8A3A-74A4DD34CAB0}

**Hydrogeology\_ObjectNatural** - *(Logical diagram)*

Created By: Tomasz Nałęcz and Janusz Michalak *on* 2011-04-11

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {316B90F7-4481-4b30-9BF3-1CB140B7BE06}



Figure: 14

##### Seep

Type: **Class** HydrogeologicalObjectNatural

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_ObjectNatural Keywords:

Detail: *Created on* *2011-02-19*. *Last modified on 2011-04-11*.

GUID: {493D6C67-CB9F-4449-BA13-AD3AC53B557C}

-- Definition --

Area of groundwater discharge.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  Seep | Public  HydrogeologicalObjectNatural |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **quantityOfDischarge** CGI\_NumericRange  Public    «voidable - estimatedProperty» |  | *Default:* |

##### Spring

Type: **Class** HydrogeologicalObjectNatural

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_ObjectNatural Keywords:

Detail: *Created on* *2011-02-19*. *Last modified on 2011-04-11*.

GUID: {309BC2CA-BF56-4549-980F-0148B03D6DF2}

-- Definition --

Point of groundwater discharge.

| Constraints | |
| --- | --- |
|  | inheritance restriction: type of geometry is GM\_Point: *(Invariant, Status is Approved*) |

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  Spring | Public  SpringTypeOrUsageCode |  |
| Association LinkForNavigation  Source -> Destination | Public  Spring | Public  SpringOrSeep |  |
| Generalization  Source -> Destination | Public  Spring | Public  HydrogeologicalObjectNatural |  |
| Generalization  Source -> Destination | Public  KarsticSpring | Public  Spring |  |
| Generalization  Source -> Destination | Public  MineralSpring | Public  Spring |  |
| Generalization  Source -> Destination | Public  ThermalSpring | Public  Spring |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **quantityOfDischarge** CGI\_NumericRange  Public    «voidable - estimatedProperty» |  | *Default:* |
| **springUsageOrType** SpringTypeOrUsageCode  Public    «voidable» |  | *Default:* |

##### SpringTypeOrUsageCode

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_ObjectNatural Keywords:

Detail: *Created on* *2006-01-24*. *Last modified on 2011-04-12*.

GUID: {02CB79C6-6643-4516-8007-8268204F25FF}

Code associated to define the type or usage of the spring.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | 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 = . Description: URI that identifies the authority for this dictionary and its members |
|  | dictionaryIdentifier = . Description: URI that identifies this dictionary |
|  | memberIdentifierStem = . 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 |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  Spring | Public  SpringTypeOrUsageCode |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **mineral**  Public | 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 | *Default:* |
| **monitoringQantityOfDischarge**  Public | 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 | *Default:* |
| **monitoringQuality**  Public | 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 | *Default:* |
| **other**  Public | Any other usage of a well. | *Default:* |
| **drinkingWaterSupply**  Public | Well used to supply water for various usage. | *Default:* |
| **karstic**  Public |  | *Default:* |
| **termal**  Public |  | *Default:* |

##### SwallowHole

Type: **Class** HydrogeologicalObjectNatural

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_ObjectNatural Keywords:

Detail: *Created on* *2011-03-07*. *Last modified on 2011-04-11*.

GUID: {184AAF19-B6C6-4270-9FCA-F391E00ADB0E}

-- Definition --

Point of groundwater recharge .

-- Note --

In most cases, it recharges a karstic aquifer.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association LinkForNavigation  Source -> Destination | Public  SwallowHole | Public  VanishingPoint |  |
| Generalization  Source -> Destination | Public  SwallowHole | Public  HydrogeologicalObjectNatural |  |
| Aggregation  Source -> Destination | Public  SwallowHole | Public  KarsticAquiferSystem |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **quantityOfRecharge** CGI\_NumericRange  Public    «voidable - estimatedProperty» |  | *Default:* |

#### Hydrogeology\_Profile

Type: Package «applicationSchema»

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Extensions

Detail: *Created on 2011-04-11*. *Last modified on 2011-04-13*

GUID: {5FF64F07-B30A-4735-BA2D-BF34CF0649A4}

**Hydrogeology\_Profile** - *(Logical diagram)*

Created By: Tomasz Nałęcz and Janusz Michalak *on* 2011-04-11

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {3FC7EA83-D5C8-4c32-AED2-82920EF67527}



Figure: 15

##### AquiferDescription

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Profile Keywords:

Detail: *Created on* *2007-05-30*. *Last modified on 2011-04-11*.

GUID: {0566DBB4-0112-4a39-8A3A-06AFA75F4340}

-- Definition --

(From GWML) Properties of the rock (forming aquifer) that is relevant to the groundwater.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = true. Description: enforce the 'by value' property pattern without xlinks |
|  | isCollection = false. Values: true | false  Default: false  Description: attribute group gml:AggregationAttributeGroup is added to the complex type of the feature type |
|  | noPropertyType = false. Values: true | false  Default: false  Description: suppress automatic creation of \*PropertyType complexType |
|  | xmlSchemaType = . Description: no type shall be generated for the class, but the given type or element referenced |
|  | xsdDerivation = true. Values: true | false  Default: true  Description: class implemented as new type + element, or by applying constraints only |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **descriptoin** PT\_FreeText  Public    «voidable» |  | *Default:* |
| **capacityCoefficient** GEh\_Value  Public    «voidable - estimatedProperty» | Volumetric capacity of an aquifer to hold water. | *Default:*    [sequenceNumber = 10 ] |
| **hydraulicConductivityCoefficient** GEh\_Value  Public    «voidable - estimatedProperty» | 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) | *Default:*    [sequenceNumber = 20 ] |
| **storativityCoefficient** GEh\_Value  Public    «voidable - estimatedProperty» | 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 | *Default:*    [sequenceNumber = 30 ] |
| **beginLifespanObject** DateTime  Public    «lifeCycleInfo - voidable» |  | *Default:* |
| **endLifespanObject** DateTime  Public    [0..1]  «lifeCycleInfo - voidable» |  | *Default:* |

##### HydrogeologicalProfile

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Profile Keywords:

Detail: *Created on* *2011-02-25*. *Last modified on 2011-04-11*.

GUID: {EBE3EEB4-F159-4945-AF32-1209A4C33820}

-- Definition --

Hydrogeological profile (well log) - A record of the thickness and characteristics of the soil, rock and water-bearing formations encountered during the drilling (sinking) of a well.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  HydrogeologicalProfile | Public  Well |  |
| Aggregation  Source -> Destination | Public  ProfileInterval | Public  HydrogeologicalProfile |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **geometry** GM\_CompositeCurve  Public |  | *Default:* |

##### ProfileInterval

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Profile Keywords:

Detail: *Created on* *2011-02-25*. *Last modified on 2011-04-11*.

GUID: {CBA4FE0D-ECFE-476b-8DF8-A81BA32FAAF8}

-- Definition --

Profile interval (section) - Segment (section) of well profile described by the same or similar values of parameters.

ProfileInterval is a specialization of Interval class from ISO 19156.

-- Note --

Example of profile interval is a drilled aquifer from roof to floor.

Definition of Interval cass from ISO 19156:

An Interval is a simple curve, parameterized only by its two end-points.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  WaterQuantityDescription | Public  ProfileInterval |  |
| Aggregation  Source -> Destination | Public  WaterQualityDescription | Public  ProfileInterval |  |
| Aggregation  Source -> Destination | Public  WaterYieldDescription | Public  ProfileInterval |  |
| Aggregation  Source -> Destination | Public  AquiferDescription | Public  ProfileInterval |  |
| Aggregation  Source -> Destination | Public  ProfileInterval | Public  HydrogeologicalProfile |  |
| Dependency  Source -> Destination | Public  ProfileInterval | Public  RockMaterial |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **permeabilityCoefficient** CGI\_NumericRange  Public    «voidable» |  | *Default:* |
| **geometry** GM\_Curve  Public |  | *Default:* |
| **hydraulicHead** CGI\_NumericRange  Public    [0..1]  «voidable» | Hydraulic head or piezometric head is a specific measurement of water pressure above a geodetic datum. | *Default:* |
| **rockMaterial** RockMaterial  Public    «voidable» |  | *Default:* |

##### WaterYieldDescription

Type: **Class** WaterPropertyDescription

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_Profile Keywords:

Detail: *Created on* *2008-02-05*. *Last modified on 2011-04-11*.

GUID: {1B0AA338-9C84-4364-9AB8-3AEBC1DE050F}

-- Definition --

(from GWML) A class used to describe the different yield parameters of an aquifer.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = true. Values: true  Default: true  Description: enforce the 'by value' property pattern without xlinks |
|  | isCollection = false. Values: false  Default: false  Description: attribute group gml:AggregationAttributeGroup is added to the complex type of the feature type |
|  | noPropertyType = false. Values: true | false  Default: false  Description: suppress automatic creation of \*PropertyType complexType |
|  | xsdDerivation = true. Values: true | false  Default: true  Description: class implemented as new type + element, or by applying constraints only |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  WaterYieldDescription | Public  WaterPropertyDescription |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **safeYield** GEh\_ValueType  Public    «voidable - estimatedProperty» | -- Definition --  (from GWML) With reference to either a surface- or ground-water supply, the rate of diversion or extraction for *Consumptive Use* which can be maintained indefinitely, within the limits of economic feasibility, under specified conditions of water-supply development. Also see *Perennial Yield*.  **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 *Natural Recharge*, the *Artificial* (or *Induced*) *Recharge*, and the *Incidental Recharge* without causing depletion of the groundwater reservoir. Also referred to as *Safe Yield*.  http://water.nv.gov/WaterPlanning/dict-1/PDFs/wwords-y.pdf  Amount of water that can be retreived from an aquifer without jeopardising the resources but still involved some impacts (def. to be improved) | *Default:*    [sequenceNumber = 10 ] |
| **specificYield** GEh\_ValueType  Public    «voidable - estimatedProperty» | -- Definition --  (from GWML) 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) | *Default:*    [sequenceNumber = 20 ] |
| **sustainableYield** GEh\_ValueType  Public    «voidable - estimatedProperty» | --Definition --  (from GWML)  The groundwater extraction regime, measured over a specified planning timeframe, that allows acceptable levels of stress and protects dependent economic, social, and environmental values.  http://www.environment.gov.au/water/publications/environmental/groundwater/pubs/annex-a.pdf  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 | *Default:*    [sequenceNumber = 30 ] |

### Hydrogeology\_LinksToOtherThemes

Type: Package «applicationSchema»

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_v.0.4

Detail: *Created on 2011-04-12*. *Last modified on 2011-04-12*

GUID: {F787F713-8F92-493d-869C-1860B3C2AAA2}

**Hydrogeology: links to AM** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-03-14

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {76BD4F59-55BD-428f-AB38-723A2DDD7BB7}



Figure: 16

**Hydrogeology: links to EF** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-02-15

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {D897D2FE-AF15-48dc-B39A-53CAFB94A7CE}



Figure: 17

**Hydrogeology: links to ER** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-02-17

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {9A6C3FBE-3454-4ece-9D9E-7AC56E27E976}



Figure: 18

**Hydrogeology: links to GN** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-02-17

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {508B383F-7EE9-4766-B676-3AF3FB7586F8}



Figure: 19

**Hydrogeology: links to HY** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-02-15

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {33E497FE-A8ED-4aee-98BD-3785D5F3A800}



Figure: 20

**Hydrogeology: links to PS** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-02-15

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {974CD035-5428-4500-8D2B-2444C49E0D64}



Figure: 21

**Hydrogeology: links to US** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-03-14

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {68FA57D8-52F1-4384-BB1E-5455A6E3564D}



Figure: 22

**Hydrogeology\_LinksToOtherThemes** - *(Package diagram)*

Created By: Janusz Michalak *on* 2011-03-14

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {8E482FDB-3C76-49de-B4E1-E615A8AFA6E8}



Figure: 23

#### HydrogeologicalName

Type: **Class** GeographicalName

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_LinksToOtherThemes Keywords:

Detail: *Created on* *2011-02-22*. *Last modified on 2011-03-14*.

GUID: {0786A93F-112E-4200-B7E0-7A71CC44DC66}

(Definition will be added later)

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  HydrogeologicalName | Public  GeographicalName |  |
| Aggregation  Destination -> Source | Public  HydrogeologicalName | Public  HydrogeologicalNamesRegister |  |
| Dependency  Source -> Destination | Public  HydrogeologicalNamedPlace | Public  HydrogeologicalName |  |

#### HydrogeologicalNamedPlace

Type: **Class** NamedPlace

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_LinksToOtherThemes Keywords:

Detail: *Created on* *2008-07-08*. *Last modified on 2011-03-14*.

GUID: {71E45031-F472-4edb-B39E-3A3DBD354C54}

-- Definition --

Any real world entity referred to by one or several proper nouns.

| Constraints | |
| --- | --- |
|  | GeographicalName is restricted to HydrogeologicalName: *(Invariant, Status is Approved*) |

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = false. |
|  | isCollection = false. |
|  | noPropertyType = false. |
|  | xsdEncodingRule = iso19136\_2007\_INSPIRE\_Extensions. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  HydrogeologicalNamedPlace | Public  HydrogeologicalName |  |
| Association  Bi-Directional | Public  HydrogeologicalObject | Public  HydrogeologicalNamedPlace |  |
| Association  Bi-Directional | Public  HydrogeologicalFeature | Public  HydrogeologicalNamedPlace |  |
| Generalization  Source -> Destination | Public  HydrogeologicalNamedPlace | Public  NamedPlace |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **name** HydrogeologicalName  Public    [1..\*]  «restricted» |  | *Default:* |

#### HydrogeologicalNamesRegister

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_LinksToOtherThemes Keywords:

Detail: *Created on* *2011-03-12*. *Last modified on 2011-03-14*.

GUID: {BE35DECB-45A7-4fd6-9F4C-2E87B750624D}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Destination -> Source | Public  HydrogeologicalName | Public  HydrogeologicalNamesRegister |  |

#### From AM - Area management

Type: Package

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_LinksToOtherThemes

Detail: *Created on 2011-03-12*. *Last modified on 2011-03-14*

GUID: {EED95BE7-01E0-4dd7-88F7-9ED602B9EDED}

##### AMArea

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: From AM - Area management Keywords:

Detail: *Created on* *2010-07-12*. *Last modified on 2011-03-14*.

GUID: {8F34826C-D210-4db1-B7B5-EFEABD7A949E}

-- Name --

Management, restriction or reporting area

-- Definition --

Area managed, regulated or used for reporting at international, European, national, regional and local levels.

-- Description --

SOURCE [INSPIRE Directive]

NOTE This spatial object type covers managed areas, regulated areas and reporting units. The same area can be of several of these types.

EXAMPLE A river basin district as defined in the WFD is a managed area, a regulated area and a reporting unit.

| Constraints | |
| --- | --- |
|  | management or restriction or reporting info mandatory: *(OCL, Status is Approved*)  /\* Either the managementInformation or the restrictedActivity or the reportingInformation association role have to have a minimum multiplicity of 1. \*/  inv: managementInformation-&gt;notEmpty() or restrictedActivity-&gt;notEmpty() or reportingInformation-&gt;notEmpty() |
|  | geometry or grid cell reference mandatory: *(OCL, Status is Approved*)  /\*If the ManagementRestrictionOrReportingArea object does not consist of zones, the geometry or gridCellReference attribute must not be empty.\*/  inv: geometry-&gt;notEmpty() or gridCellReference-&gt;notEmpty() |
|  | consistency of zone geometries: *(OCL, Status is Approved*)  /\*The geometries of the zones of an management, regulation or reporting area shall not overlap.\*/ |

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  WFDGroundWaterBody | Public  AMArea |  |
| Association LinkForNavigation  Source -> Destination | Public  ProtectionZone | Public  AMArea | Invariant {if ( AMArea.amAreaType == restrictedAreaAroundDrinkingWaterSource && GroundWaterIntake.waterUsage == forDrinking)} |
| Dependency  Source -> Destination | Public  AMArea | Public  AMAreaTypeValues |  |
| Association LinkForNavigation  Source -> Destination | Public  MineralGroundWaterBody | Public  AMArea | Invariant {if ( AMArea.amAreaType == prospectingAndMiningPermitArea && MineralGroundWaterBody.isProspectingAndMiningPermit == truth)} |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **inspireID** Identifier  Public | -- Name --  INSPIRE identifier.  -- Definition --  External object identifier of the spatial object. | *Default:* |
| **geometry** GM\_Object  Public    [0..1] | -- Name --  geometry  -- Definition --  The geometry of the spatial object.  -- Description --  NOTE 1 The geometry can have any geometry type. In most cases, however, it will be either a GM\_(Multi)Surface or a GM\_(Multi)Solid  NOTE 2 The geometry of the management, restriction or reporting area has to be specified using this attribute or by providing a grid cell reference.  NOTE 3 The geometry has to be explicitly provided, even if it is derived from the geometry of another spatial object. In this case, the way the geometry was derived can be specified using the geometryOrigin attribute. | *Default:* |
| **gridCellReference** CharacterString  Public    [0..1] | -- Name --  grid cell reference  -- Definition --  Reference to a grid cell that represents the geometry of the management, regulation or reporting area.  -- Description --  NOTE The corresponding grid is specified in the system of management, regulation or reporting areas the area belongs to. | *Default:* |
| **amAreaIdentifier** CharacterString  Public    [0..1] | -- Name --  identifier of the AM area  -- Definition --  Unique thematic identifier for the management, regulation or reporting area.  -- Description --  NOTE This will typically be the identifier through which other (e.g. reporting) data will be associated with the management, regulation or reporting area. | *Default:* |
| **legalBasis** LegalAct  Public    [0..1]  «voidable» | -- Name --  legal basis  -- Definition --  The legal act, in which the management, regulation or reporting area is defined.  -- Description --  NOTE This attribute does not need to be provided if the area is defined in the legal act defining the system of management, regulation or reporting areas. | *Default:* |
| **amAreaName** GeographicalName  Public    [0..\*]  «voidable» | -- Name --  name of the management, regulation or reporting area  -- Definition --  Common name used for the management, regulation or reporting area. | *Default:* |
| **amAreaType** AMAreaTypeValues  Public    «voidable» | -- Name --  type of the management, regulation or reporting area.  -- Definition --  The type of the management, regulation or reporting area. | *Default:* |
| **geometryOrigin** GeometryOrigin  Public    [0..1]  «voidable» | -- Name --  origin of the geometry  -- Definition --  Description of the source of the geometry and the way the geometry was derived.  -- Description --  EXAMPLE 1 The geometry of a management, regulation or reporting unit can be the same as that of an administrative or statistical unit.  EXAMPLE 2 The geometry of a management, regulation or reporting unit can the derived through a buffer around the geometry of a spatial object, e.g. a school, a road or a lake. | *Default:* |

##### AMAreaTypeValues

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: From AM - Area management Keywords:

Detail: *Created on* *2010-07-16*. *Last modified on 2011-03-14*.

GUID: {953888E8-8FB3-4324-8AAD-CA8F7E97B01E}

-- Definition --

Code list describing the different types of AM areas.

-- Description --

NOTE This list is currently including the types listed in the definition of the AM theme in the INSPIRE Directive. It will be modified based once a list of AMArea types to be made available by the Member States has been elaborated.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  AMArea | Public  AMAreaTypeValues |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **dumpingSite**  Public | -- Name --  dumping site  -- Definition --  A dumping site as defined in ...  -- Description --  EXAMPLE ... | *Default:* |
| **restrictedAreaAroundDrinkingWaterSource**  Public | -- Name --  restricted area around drinking water source  -- Definition --  A restricted area around drinking water source as defined in ...  -- Description --  EXAMPLE ... | *Default:* |
| **nitrateVulnerableZone**  Public | -- Name --  nitrate-vulnerable zone  -- Definition --  A nitrate-vulnerable zone as defined in ...  -- Description --  EXAMPLE ... | *Default:* |
| **regulatedFairwayAtSeaOrLargeInlandWater**  Public | -- Name --  regulated fairway at sea or large inland water  -- Definition --  A regulated fairway at sea or large inland water as defined in ...  -- Description --  EXAMPLE ... | *Default:* |
| **areaForDumpingOfWaste**  Public | -- Name --  area for dumping of waste  -- Definition --  An area for dumping of waste as defined in ...  -- Description --  EXAMPLE ... | *Default:* |
| **noiseRestrictionZone**  Public | -- Name --  noise restriction zone  -- Definition --  A noise restriction zone as defined in ...  -- Description --  EXAMPLE ... | *Default:* |
| **prospectingAndMiningPermitArea**  Public | -- Name --  prospecting and mining permit area  -- Definition --  A dumping site as defined in ...  -- Description --  EXAMPLE ... | *Default:* |
| **riverBasinDistrict**  Public | -- Name --  river basin district  -- Definition --  A river basin district as defined in Directive 2000/60/EC (Water Framework Directive).  -- Description --  EXAMPLE ... | *Default:* |
| **reportingUnit**  Public | -- Name --  reporting unit  -- Definition --  A reporting unit as defined in the legal act defining the reporting obligation for which the unit is used.  -- Description --  EXAMPLE ... | *Default:* |
| **coastalZoneManagementArea**  Public | -- Name --  coastal zone management area  -- Definition --  A coastal zone management area as defined in ...  -- Description --  EXAMPLE ... | *Default:* |

##### WFDGroundWaterBody

Type: **Class** AMArea, WFDWaterBody

Status: Proposed. Version 1.0. Phase 1.0.

Package: From AM - Area management Keywords:

Detail: *Created on* *2008-08-10*. *Last modified on 2011-03-14*.

GUID: {9AF32C28-C9C8-403e-8791-EAD1D44ED8B2}

-- Definition --

A distinct volume of groundwater within an aquifer or aquifers.

-- Description --

SOURCE [2000/60/EC Art. 2(12)].

NOTE All WFD spatial object types are regarded as candidate spatial objects in Annex III theme 'Area management/restriction/regulation zones and reporting units' due to their primary function for reporting under Directive 2000/60/EC.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | 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. |
|  | inspireConcept = FIXME. Default: FIXME  Description: URN reference to the feature concept in the INSPIRE Feature Concept Dictionary Register |
|  | 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. |
|  | xsdEncodingRule = iso19136\_2007\_INSPIRE\_Extensions. Values: iso19136\_2007 | iso19139\_2007 | iso19136\_2007\_INSPIRE\_Extensions  Default: iso19136\_2007\_INSPIRE\_Extensions  Description: XML Schema encoding rule to apply |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association LinkForNavigation  Source -> Destination | Public  WFD\_GroundWaterBody | Public  WFDGroundWaterBody |  |
| Generalization  Source -> Destination | Public  WFDGroundWaterBody | Public  WFDWaterBody |  |
| Generalization  Source -> Destination | Public  WFDGroundWaterBody | Public  AMArea |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **geometry** GM\_Primitive  Public    «voidable» | -- Definition --  The geometry of the WFD groundwater body. | *Default:* |

#### From EF - MonitoringFacilities

Type: Package

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_LinksToOtherThemes

Detail: *Created on 2011-03-12*. *Last modified on 2011-03-12*

GUID: {6DAADE89-A2F4-4afb-89A2-F6B29CDD75A0}

##### MonitoringFacility

Type: **Class** MonitoringFeature

Status: Proposed. Version 1.0. Phase 1.0.

Package: From EF - MonitoringFacilities Keywords:

Detail: *Created on* *2010-10-11*. *Last modified on 2011-03-14*.

GUID: {580F6017-1286-490b-B9EC-CF07EC5827F5}

-- Definition --

A facility at/from which instruments are hosted or deployed to undertake environmental monitoring (insitu

or remotely sensed); either a static observation site or a moving platform.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association LinkForNavigation  Source -> Destination | Public  ObservationWell | Public  MonitoringFacility | Invariant {if ( MonitoringFacility.monitoredMedium == groundWater )} |
| Association LinkForNavigation  Source -> Destination | Public  GroundWaterMonitoringStation | Public  MonitoringFacility | Invariant {if ( MonitoringFacility.monitoredMedium == groundWater )} |
| Generalization  Source -> Destination | Public  MonitoringFacility | Public  MonitoringFeature |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **altitude** double  Public    [0..1] | -- Definition --  Vertical extent | *Default:* |
| **hierarchy** CodeList  Public    «voidable» | -- Definition --  granularity (site/station/sensor); as  hierarchies of monitoring facilities are  allowed; codelist with clear definition  of terms and constraints connected to  link *ParentFacility* | *Default:* |
| **monitoredMedium** CodeList  Public | -- Definition --  Code list on the monitored  environmental medium, granularity of  code list as common to all has to be  clarifies | *Default:* |
| **monitoringType** CodeList  Public    «voidable» | -- Definition --  Could be a codelist (as in UK EOF  model).  There it can be a computation (out of  scope for EF), a field trip, flight or  cruise, monitoring network,  programme, project... | *Default:* |
| **administrativeArea** CharacterString  Public | -- Definition --  Administrative unit | *Default:* |
| **previousIndentifier** CharacterString  Public    [0..\*] | -- Definition --  if station has vastly changed ID of old  feature | *Default:* |

##### MonitoringFeature

Type: **Class** OM\_Process

Status: Proposed. Version 1.0. Phase 1.0.

Package: From EF - MonitoringFacilities Keywords:

Detail: *Created on* *2010-09-09*. *Last modified on 2011-03-14*.

GUID: {A2219545-43A1-4caa-90EC-EED0A8CF870F}

-- Definition --

MonitoringFeature is the BaseObject for MonitoringActivities and MonitoringFacilities

-- Description --

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  MonitoringFeature | Public  OM\_Process |  |
| Generalization  Source -> Destination | Public  MonitoringFacility | Public  MonitoringFeature |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **inspireId** Identifier  Public |  | *Default:* |
| **beginLifespan** DateTime  Public    «voidable» | -- Definition --  BeginLifespan of MonitoringFeature (Temporal extent) | *Default:* |
| **endLifespan** DateTime  Public    [0..1]  «voidable» | -- Definition --  EndLifespan of MonitoringFeature (Temporal extent) | *Default:* |
| **geometry** GM\_Object  Public |  | *Default:* |
| **name** CharacterString  Public    [0..\*] | -- Definition --  Plain text denotation of facility | *Default:* |
| **keyword** CharacterString  Public    [0..\*] | -- Definition --  Reference to controlled vocabulary  (thesaurus like GEMET,...) | *Default:* |
| **comment** CharacterString  Public | -- Definition --  Plain text description of additional  information not fitting in other  attributes | *Default:* |
| **responsibleParty** CharacterString  Public | -- Definition --  Responsible party for the monitoring | *Default:* |
| **beginLifespanVersion** DateTime  Public    «voidable» |  | *Default:* |
| **endLifespanVersion** DateTime  Public    [0..1]  «voidable» |  | *Default:* |
| **legalFoundationDocument** CI\_Citation  Public    [1..\*]  «voidable» | -- Definition --  A URL or text citation referencing the legal act that created, regulates or maintain a MonitoringFeature. (taken from Protected Sites) | *Default:* |
| **process** OM\_Process  Public    [0..\*]  «voidable» | --Definition--  Processes with their corresponding Observations where this MonitoringFeature controls the Processes or is part of a Process-Chain | *Default:* |

##### OM\_Process

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: From EF - MonitoringFacilities Keywords:

Detail: *Created on* *2008-07-07*. *Last modified on 2011-03-14*.

GUID: {FF9C258F-ABFC-4bcb-AA1A-253A9D88B948}

The class OM\_Process (Figure 2) is an instance of the «metaclass» GF\_FeatureType (ISO 19109:2005), which therefore represents a feature type. OM\_Process is abstract, and has no attributes, operations or associations. It serves as the base class for observation processes. The purpose of an observation process is to generate an observation result. An instance of OM\_Process is often an instrument or sensor, but may be a human observer, a simulator, or a process or algorithm applied to more primitive results used as inputs.

NOTE ISO 19115-2:2008 provides MI\_Instrument, LE\_Processing and LE\_Algorithm, which could all be modelled as specializations of OM\_Process. OGC SensorML [10] provides a model which is suitable for many observation procedures.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = false. Values: true | false  Default: false  Description: enforce the 'by value' property pattern without xlinks |
|  | isCollection = false. Values: true | false  Default: false  Description: attribute group gml:AggregationAttributeGroup is added to the complex type of the feature type |
|  | noPropertyType = false. Values: true | false  Default: false  Description: suppress automatic creation of \*PropertyType complexType |
|  | xsdDerivation = true. Values: true | false  Default: true  Description: class implemented as new type + element, or by applying constraints only |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  MonitoringFeature | Public  OM\_Process |  |

#### From ER - Energy resources

Type: Package

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_LinksToOtherThemes

Detail: *Created on 2011-03-12*. *Last modified on 2011-03-12*

GUID: {60172B4F-E06D-4feb-A2C0-C926668C31A0}

##### EnergyResource

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: From ER - Energy resources Keywords:

Detail: *Created on* *2010-07-21*. *Last modified on 2011-03-14*.

GUID: {9DB6C75C-078B-46e5-81E5-D3DEE46225E5}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  EnergyResourceAssessmentUnit | Public  EnergyResource |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **beginLifespanVersion** DateTime  Public    «voidable» | -- Definition --  Date and time at which this version of the spatial object was inserted or changed in the spatial data set. | *Default:* |
| **endLifespanVersion** DateTime  Public    [0..1]  «voidable» | -- Definition --  Date and time at which this version of the spatial object was superseded or retired in the spatial data set. | *Default:* |
| **geometry** GM\_Object  Public | -- Definition --  Geometry associated to the energy resource deposit. This data specification does not restrict the geometry types. | *Default:* |
| **inspireID** Identifier  Public | -- Definition --  External object identifier of the spatial object.  -- Description --  NOTE An external object identifier is a unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object. The identifier is an identifier of the spatial object, not an identifier of the real-world phenomenon. | *Default:* |

##### EnergyResourceAssessmentUnit

Type: **Class** EnergyResource

Status: Proposed. Version 1.0. Phase 1.0.

Package: From ER - Energy resources Keywords:

Detail: *Created on* *2010-07-21*. *Last modified on 2011-03-14*.

GUID: {A2BFDF75-7914-4535-9922-DBF2789B8CA3}

-- Definition --

An entity which is used to study, measure or observe natural phenomena from which energy is or might be extracted.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  EnergyResourceAssessmentUnit | Public  EnergyResource |  |
| Generalization  Source -> Destination | Public  GeothermalEnergyAssessmentUnit | Public  EnergyResourceAssessmentUnit |  |

##### GeothermalEnergyAssessmentUnit

Type: **Class** EnergyResourceAssessmentUnit

Status: Proposed. Version 1.0. Phase 1.0.

Package: From ER - Energy resources Keywords:

Detail: *Created on* *2010-09-29*. *Last modified on 2011-03-14*.

GUID: {A3398DF8-A4A2-4749-9E4A-AFF87A152609}

-- Definition --

Abstract feature used as embeding structure for characteristics related to geothermal energy (geothermal gradient, heat flow).

-- Description --

Geographical regions where geology and tectonics have determined that geothermal gradient and heat flow are reaching such rates that either warmed up water in place is withdrawn, or water artificialy injected and consequently when it's warmed up withdrawn, in order to use it for power generation or direct heating.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  GeothermalEnergyAssessmentUnit | Public  EnergyResourceAssessmentUnit |  |
| Association LinkForNavigation  Source -> Destination | Public  ThermalWaterAquifer | Public  GeothermalEnergyAssessmentUnit |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **heatFlowdensity** mW/m2  Public | -- Definition --  Heat flows constantly from its sources within the Earth to the surface. Heat flow Q (W/m2) is calculated value (Q=K.?T/?Z), where K is the thermal conductivity of the rock. | *Default:* |
| **geothermalGradient** °C/km  Public | -- Definition --  The geothermal gradient is the rate of temperature change (T) with depth (Z), in the Earth. | *Default:* |

#### From GN - Gepgraphical Names

Type: Package

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_LinksToOtherThemes

Detail: *Created on 2011-03-12*. *Last modified on 2011-03-12*

GUID: {2F567C69-7B6B-4553-80D0-B953BD9D77CC}

##### GeographicalName

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: From GN - Gepgraphical Names Keywords:

Detail: *Created on* *2008-09-08*. *Last modified on 2011-03-14*.

GUID: {F03C888B-26FF-4745-ACE4-2C73315D2B57}

-- Definition --

Proper noun applied to a real world entity.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | isCollection = false. |
|  | noPropertyType = false. |
|  | xsdEncodingRule = iso19136\_2007\_INSPIRE\_Extensions. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  NamedPlace | Public  GeographicalName |  |
| Generalization  Source -> Destination | Public  HydrogeologicalName | Public  GeographicalName |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **language** CharacterString  Public    «voidable» | -- Definition --  Language of the name, given as a three letters code, in accordance with either ISO 639-3 or ISO 639-5.  -- Description --  NOTE 1More precisely, this definition refers to the language used by the community that uses the name.  NOTE 2 The code "mul" for "multilingual" should not be used in general. However it can be used in rare cases like official names composed of two names in different languages. For example, "Vitoria-Gasteiz" is such a multilingual official name in Spain.  NOTE 3 Even if this attribute is "voidable" for pragmatic reasons, it is of first importance in several use cases in the multi-language context of Europe. | *Default:* |
| **nativeness** NativenessValue  Public    «voidable» | -- Definition --  Information enabling to acknowledge if the name is the one that is/was used in the area where the spatial object is situated at the instant when the name is/was in use. | *Default:* |
| **nameStatus** NameStatusValue  Public    «voidable» | -- Definition --  Qualitative information enabling to discern which credit should be given to the name with respect to its standardisation and/or its topicality.  -- Description --  NOTE The Geographical Names application schema does not explicitly make a preference between different names (e.g. official endonyms) of a specific real world entity. The necessary information for making the preference (e.g. the linguistic status of the administrative or geographic area in question), for a certain use case, must be obtained from other data or information sources. For example, the status of the language of the name may be known through queries on the geometries of named places against the geometry of administrative units recorded in a certain source with the language statuses information. | *Default:* |
| **sourceOfName** CharacterString  Public    «voidable» | -- Definition --  Original data source from which the geographical name is taken from and integrated in the data set providing/publishing it. For some named spatial objects it might refer again to the publishing data set if no other information is available.  -- Description --  EXAMPLES Gazetteer, geographical names data set. | *Default:* |
| **pronunciation** PronunciationOfName  Public    «voidable» | -- Definition --  Proper, correct or standard (standard within the linguistic community concerned) pronunciation of the geographical name.  -- Description --  SOURCE Adapted from [UNGEGN Manual 2006]. | *Default:* |
| **spelling** SpellingOfName  Public    [1..\*] | -- Definition --  A proper way of writing the geographical name.  -- Description --  NOTE 1 Different spellings should only be used for names rendered in different scripts. .  NOTE 2 While a particular GeographicalName should only have one spelling in a given script, providing different spellings in the same script should be done through the provision of different geographical names associated with the same named place. | *Default:* |
| **grammaticalGender** GrammaticalGenderValue  Public    [0..1]  «voidable» | -- Definition --  Class of nouns reflected in the behaviour of associated words.  -- Description --  NOTE the attribute has cardinality [0..1] and is voidable, which means that:   * in case the concept of grammatical gender has no sense for a given name (i.e. the attribute is not applicable), the attribute should not be provided. * in case the concept of grammatical gender has some sense for the name but is unknown, the attribute should be provided but *void*. | *Default:* |
| **grammaticalNumber** GrammaticalNumberValue  Public    [0..1]  «voidable» | -- Definition --  Grammatical category of nouns that expresses count distinctions.  -- Description --  NOTE the attribute has cardinality [0..1] and is voidable, which means that:   * in case the concept of grammatical number has no sense for a given name (i.e. the attribute is not applicable), the attribute should not be provided. * in case the concept of grammatical number has some sense for the name but is unknown, the attribute should be provided but *void*. | *Default:* |

##### NamedPlace

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: From GN - Gepgraphical Names Keywords:

Detail: *Created on* *2008-07-08*. *Last modified on 2011-03-14*.

GUID: {85F56E0B-E08C-47db-B954-85BB7DF4DEE0}

-- Definition --

Any real world entity referred to by one or several proper nouns.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = false. |
|  | isCollection = false. |
|  | noPropertyType = false. |
|  | xsdEncodingRule = iso19136\_2007\_INSPIRE\_Extensions. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  NamedPlace | Public  GeographicalName |  |
| Generalization  Source -> Destination | Public  HydrogeologicalNamedPlace | Public  NamedPlace |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **beginLifespanVersion** DateTime  Public    «voidable» | -- Definition --  Date and time at which this version of the spatial object was inserted or changed in the spatial data set. | *Default:* |
| **endLifespanVersion** DateTime  Public    [0..1]  «voidable» | -- Definition --  Date and time at which this version of the spatial object was superseded or retired in the spatial data set. | *Default:* |
| **geometry** GM\_Object  Public | -- Definition --  Geometry associated to the named place. This data specification does not restrict the geometry types.  -- Description --  NOTE 1 The most common geometry types for a named place are a reference point (modelled as GM\_Point), a more precise geometry of the footprint (typically modelled as GM\_Curve or GM\_Surface), or a bounding box (to be modelled as a GM\_Envelope).  NOTE 2 If the geometry depicts the spatial footprint of the named place, a reference point and a bounding box could be derived from it. However, this specification does not require the explicit provision of any specific type of geometry such as bounding boxes or reference points.  NOTE 3 To avoid any misunderstanding, note that null geometry is not allowed by this specification.  NOTE 4 3D geometries are not really required for Geographical Names, but the model allows for it, so a data provider may publish it. | *Default:* |
| **inspireId** Identifier  Public | -- Definition --  External object identifier of the spatial object.  -- Description --  NOTE An external object identifier is a unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object. The identifier is an identifier of the spatial object, not an identifier of the real-world phenomenon. | *Default:* |
| **leastDetailedViewingResolution** MD\_Resolution  Public    [0..1]  «voidable» | -- Definition --  Resolution, expressed as the inverse of an indicative scale or a ground distance, above which the named place and its associated name(s) should no longer be displayed in a basic viewing service.  -- Description --  NOTE 1This information may be used to determine if the names of the named place should be displayed at a given scale of display, only in the context of basic viewing services intending to show the content of the data set containing names. Even if this information is a valuable one for mapping in general, it is only approximate; cartographic services intending to produce high quality maps should certainly rely on other criteria and techniques for selecting names for the map.  NOTE 2 Even if this attribute is "voidable" for practical reasons linked to its availability in data sources, this information may be of first importance for viewing services. There are great chances that viewing services will inefficiently manage named places having this attribute void.  EXAMPLES The following examples use the equivalentScale attribute of MD\_Resolution to express the attribute value.  - Names of important cities in Europe may be displayed at all viewing scales greater than 1/5,000,000. In this case, the value of the attribute is 5,000,000  - Names of small hamlets may only be displayed from all viewing scale greater than 1/25,000. In this case, the value of the attribute is 25,000  - Names of countries may be displayed at any small scale. In this case, this attribute is not filled.  NOTE 3 If the data set contain multiple representations of the same real world entity represented at different levels of detail, the scale ranges defined by the attributes leastDetailedViewingResolution and mostDetailedViewingResolution should not overlap, in order to avoid displaying the same names several times.  NOTE 4 The geometry of the named place should have a level of detail (i.e. resolution, granularity, precision, etc.) roughly compatible with its associated viewing scales. | *Default:* |
| **localType** LocalisedCharacterString  Public    [1..\*]  «voidable» | -- Definition --  Characterisation of the kind of entity designated by geographical name(s), as defined by the data provider, given in at least in one official language of the European Union.  -- Description --  SOURCE Adapted from [UNGEGN Manual 2007].  NOTE Local types may be defined in additional European languages, either EU official languages or other languages such as the language(s) of the geographical names provided. | *Default:* |
| **mostDetailedViewingResolution** MD\_Resolution  Public    [0..1]  «voidable» | -- Definition --  Resolution, expressed as the inverse of an indicative scale or a ground distance, below which the named place and its associated name(s) should no longer be displayed in a basic viewing service.  -- Description --  NOTE See Description of leastDetailedViewingResolution  EXAMPLES The following examples use the equivalentScale attribute of MD\_Resolution to express the attribute value.  - Names of wide areas like mountain ranges may not be displayed at all in viewing scales greater than 1/100,000. In this case, the value of the attribute is 100,000  - Names of small hamlets may be displayed at any large scale. In this case, this attribute is not filled. | *Default:* |
| **name** GeographicalName  Public    [1..\*] | -- Definition --  Name of the named place. | *Default:* |
| **relatedSpatialObject** Identifier  Public    [0..\*]  «voidable» | -- Definition --  Identifier of a spatial object representing the same entity but appearing in other themes of INSPIRE, if any.  -- Description --  NOTE If no identifier is provided with features of other INSPIRE themes, those features can of course not be referred by the NamedPlace. | *Default:* |
| **type** NamedPlaceTypeValue  Public    [1..\*]  «voidable» | -- Definition --  Characterisation of the kind of entity designated by geographical name(s).  -- Description --  SOURCE Adapted from [UNGEGN Manual 2007].  NOTE 1 This attribute should be consistent with the attribute 'relatedSpatialObject'. More precisely, if the attribute 'relatedSpatialObject' is filled in, the attribute 'type' should be filled in, and its value(s) should be consistent with the spatial data theme(s) of the related object(s).  NOTE 2 Even if this attribute may introduce some redundancy with the attribute 'relatedSpatialObject', it has to be filled in order to allow to use geographical names on their own without accessing to any other INSPIRE data set, which may be necessary in most cases. | *Default:* |

#### From HY - Hydrography

Type: Package

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_LinksToOtherThemes

Detail: *Created on 2011-03-12*. *Last modified on 2011-03-12*

GUID: {A49AEB75-D536-4006-BDC7-A5F8F99F5B4E}

##### HydroObject

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: From HY - Hydrography Keywords:

Detail: *Created on* *2009-06-17*. *Last modified on 2011-03-14*.

GUID: {9FBD995E-E94B-4b54-A026-DAC170F3CBDE}

-- Definition --

An identity base for hydrographic (including man-made) objects in the real world.

-- Description --

NOTE Derived 'views' of real-world hydrographic objects are represented through specialisations in other application schemas; all representations of the same real-world object share a common geographic name or hydrographic identifier.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | 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. |
|  | gmlMixin = true. |
|  | inspireConcept = FIXME. Default: FIXME  Description: URN reference to the feature concept in the INSPIRE Feature Concept Dictionary Register |
|  | 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. |
|  | xsdEncodingRule = iso19136\_2007\_INSPIRE\_Extensions. Values: iso19136\_2007 | iso19139\_2007 | iso19136\_2007\_INSPIRE\_Extensions  Default: iso19136\_2007\_INSPIRE\_Extensions  Description: XML Schema encoding rule to apply |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  HydroPointOfInterest | Public  HydroObject |  |
| Generalization  Source -> Destination | Public  SurfaceWater | Public  HydroObject |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **geographicalName** GeographicalName  Public    [0..\*]  «voidable» | -- Definition --  A geographical name that is used to identify a hydrographic object in the real world. It provides a 'key' for implicitly associating different representations of the object.  -- Description --  EXAMPLE A standing water in a mapping view may share the same geographical name as a WFD lake in a reporting view, implying they are both representations of the same real world object. | *Default:* |
| **hydroId** HydroIdentifier  Public    [0..\*]  «voidable» | -- Definition --  An identifier that is used to identify a hydrographic object in the real world. It provides a 'key' for implicitly associating different representations of the object.  -- Description --  NOTE 1 The identifier may be a national hydrological identification code.  NOTE 2 More than one identifier may be required, for instance a watercourse may be assigned different identifying codes under national and European schemes.  EXAMPLE A lock in a mapping view may share the same identifier as a hydro node in a network view, implying they are both representations of the same real world object. | *Default:* |

##### HydroPointOfInterest

Type: **Class** HydroObject

Status: Proposed. Version 1.0. Phase 1.0.

Package: From HY - Hydrography Keywords:

Detail: *Created on* *2008-08-12*. *Last modified on 2011-03-14*.

GUID: {3941C718-15BA-47ab-ACD6-37C3A361FC87}

-- Definition --

A natural place where water appears, disappears or changes its flow.

-- Description --

EXAMPLE Fluvial points (waterfall, cascade, rapids, breaker), spring/water hole (spring, source, geyser, thermal spring, natural fountain, well, also fumarole, artesian), sinkhole (sinkhole, drainage loss).

NOTE A hydro point of interest may create a flow constriction in the network.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | 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. |
|  | inspireConcept = FIXME. Default: FIXME  Description: URN reference to the feature concept in the INSPIRE Feature Concept Dictionary Register |
|  | 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. |
|  | xsdEncodingRule = iso19136\_2007\_INSPIRE\_Extensions. Values: iso19136\_2007 | iso19139\_2007 | iso19136\_2007\_INSPIRE\_Extensions  Default: iso19136\_2007\_INSPIRE\_Extensions  Description: XML Schema encoding rule to apply |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  SpringOrSeep | Public  HydroPointOfInterest |  |
| Generalization  Source -> Destination | Public  VanishingPoint | Public  HydroPointOfInterest |  |
| Generalization  Source -> Destination | Public  HydroPointOfInterest | Public  HydroObject |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **beginLifespanVersion** DateTime  Public    «voidable» | -- Definition --  Date and time at which this version of the spatial object was inserted or changed in the spatial data set. | *Default:* |
| **endLifespanVersion** DateTime  Public    [0..1]  «voidable» | -- Definition --  Date and time at which this version of the spatial object was superseded or retired in the spatial data set. | *Default:* |
| **geometry** GM\_Primitive  Public    «voidable» | -- Definition --  The geometry of the hydro point of interest, as a point, curve or surface. | *Default:* |
| **inspireId** Identifier  Public | -- Definition --  External object identifier of the spatial object.  -- Description --  NOTE An external object identifier is a unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object. The identifier is an identifier of the spatial object, not an identifier of the real-world phenomenon. | *Default:* |
| **levelOfDetail** MD\_Resolution  Public    [0..1] | -- Definition --  Resolution, expressed as the inverse of an indicative scale or a ground distance.  -- Description --  NOTE The object is captured at a scale of this level of detail; rules apply for portrayal and visualisation. | *Default:* |

##### SpringOrSeep

Type: **Class** HydroPointOfInterest

Status: Proposed. Version 1.0. Phase 1.0.

Package: From HY - Hydrography Keywords:

Detail: *Created on* *2008-08-12*. *Last modified on 2011-03-14*.

GUID: {FE4E8B87-0F77-47b5-B072-E5A3C0B75502}

-- Definition --

A natural outflow of water from below the ground surface.

-- Description --

NOTE 1 Corresponds to a 'source' node in a network view.

NOTE 2 Regarded as a placeholder in Annex II theme 'Geology' due to the connection with groundwater.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = false. |
|  | isCollection = false. |
|  | noPropertyType = false. |
|  | xsdEncodingRule = iso19136\_2007\_INSPIRE\_Extensions. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  SpringOrSeep | Public  HydroPointOfInterest |  |
| Association LinkForNavigation  Source -> Destination | Public  Spring | Public  SpringOrSeep |  |
| Association LinkForNavigation  Source -> Destination | Public  KarsticSpring | Public  SpringOrSeep |  |

##### SurfaceWater

Type: **Class** HydroObject

Status: Proposed. Version 1.0. Phase 1.0.

Package: From HY - Hydrography Keywords:

Detail: *Created on* *2008-06-25*. *Last modified on 2011-03-14*.

GUID: {DD111828-D9CE-492d-9367-5CE245225910}

-- Definition --

Any known inland waterway body.

-- Description --

SOURCE [Based on DFDD].

EXAMPLE Lake/pond, reservoir, river/stream, etc.

NOTE May include islands, represented as 'holes' in its geometry. Islands may be surrounded by a shore and / or land-ware boundary.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | 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. |
|  | inspireConcept = FIXME. Default: FIXME  Description: URN reference to the feature concept in the INSPIRE Feature Concept Dictionary Register |
|  | 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. |
|  | xsdEncodingRule = iso19136\_2007\_INSPIRE\_Extensions. Values: iso19136\_2007 | iso19139\_2007 | iso19136\_2007\_INSPIRE\_Extensions  Default: iso19136\_2007\_INSPIRE\_Extensions  Description: XML Schema encoding rule to apply |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  SurfaceWater | Public  HydroObject |  |
| Association BaseOfDrainage (LinksForNavigation)  Source -> Destination | Public isDrained  Aquifer | Public draines  SurfaceWater |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **beginLifespanVersion** DateTime  Public    «voidable» | -- Definition --  Date and time at which this version of the spatial object was inserted or changed in the spatial data set. | *Default:* |
| **endLifespanVersion** DateTime  Public    [0..1]  «voidable» | -- Definition --  Date and time at which this version of the spatial object was superseded or retired in the spatial data set. | *Default:* |
| **inspireId** Identifier  Public | -- Definition --  External object identifier of the spatial object.  -- Description --  NOTE An external object identifier is a unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object. The identifier is an identifier of the spatial object, not an identifier of the real-world phenomenon. | *Default:* |
| **levelOfDetail** MD\_Resolution  Public    [0..1] | -- Definition --  Resolution, expressed as the inverse of an indicative scale or a ground distance.  -- Description --  NOTE The object is captured at a scale of this level of detail; rules apply for portrayal and visualisation. | *Default:* |
| **localType** LocalisedCharacterString  Public    [0..1]  «voidable» | -- Definition --  Provides 'local' name for the type of surface water.  -- Description --  EXAMPLE Canal, channel, ditch, etc. | *Default:* |
| **origin** OriginValue  Public    «voidable» | -- Definition --  Origin of the surface water.  -- Description --  SOURCE [Based on EuroRegionalMap].  EXAMPLE Natural, man-made, etc.  NOTE 1 Natural surface waters are natural watercourses (e.g. rivers, streams) and standing waters (e.g. pools, lakes) naturally preserved and that have been canalised and / or dammed either for navigation or for preventing flood disaster.  NOTE 2 A man-made surface water is a surface water entirely created by man for drainage, storage or transportation purpose, this includes canals, ditches and reservoirs. | *Default:* |
| **persistence** HydrologicalPersistenceValue  Public    «voidable» | -- Definition --  The degree of persistence of water.  -- Description --  SOURCE [Based on DFDD]. | *Default:* |
| **tidal** Boolean  Public    «voidable» | -- Definition --  Identifies whether the surface water is affected by tidal water. | *Default:* |

##### VanishingPoint

Type: **Class** HydroPointOfInterest

Status: Proposed. Version 1.0. Phase 1.0.

Package: From HY - Hydrography Keywords:

Detail: *Created on* *2008-08-12*. *Last modified on 2011-03-14*.

GUID: {655FB31C-A3E9-4306-85E1-4C241B26452A}

-- Definition --

Location where a watercourse disappears into the terrain or vanishes due to anthropization.

-- Description --

NOTE 1 Corresponds to an 'outlet' node in a network view.

NOTE 2 Regarded as a placeholder in Annex II theme 'Geology' due to the connection with groundwater.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | byValuePropertyType = false. |
|  | isCollection = false. |
|  | noPropertyType = false. |
|  | xsdEncodingRule = iso19136\_2007\_INSPIRE\_Extensions. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  VanishingPoint | Public  HydroPointOfInterest |  |
| Association LinkForNavigation  Source -> Destination | Public  SwallowHole | Public  VanishingPoint |  |

##### WFDWaterBody

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: From HY - Hydrography Keywords:

Detail: *Created on* *2008-08-10*. *Last modified on 2011-03-14*.

GUID: {711ED7B0-F473-4f80-976A-FE5DF76FB809}

-- Definition --

Abstract class representing a WFD body of surface water or body of groundwater.

-- Description --

NOTE All WFD spatial object types are regarded as candidate spatial objects in Annex III theme 'Area management/restriction/regulation zones and reporting units' due to their primary function for reporting under Directive 2000/60/EC.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | 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. |
|  | inspireConcept = FIXME. Default: FIXME  Description: URN reference to the feature concept in the INSPIRE Feature Concept Dictionary Register |
|  | 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. |
|  | xsdEncodingRule = iso19136\_2007\_INSPIRE\_Extensions. Values: iso19136\_2007 | iso19139\_2007 | iso19136\_2007\_INSPIRE\_Extensions  Default: iso19136\_2007\_INSPIRE\_Extensions  Description: XML Schema encoding rule to apply |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  WFDGroundWaterBody | Public  WFDWaterBody |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **beginLifespanVersion** DateTime  Public    «lifeCycleInfo» | -- Definition --  Date and time at which this version of the spatial object was inserted or changed in the spatial data set. | *Default:* |
| **endLifespanVersion** DateTime  Public    [0..1]  «lifeCycleInfo» | -- Definition --  Date and time at which this version of the spatial object was superseded or retired in the spatial data set. | *Default:* |
| **inspireId** Identifier  Public | -- Definition --  External object identifier of the spatial object.  -- Description --  NOTE An external object identifier is a unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object. The identifier is an identifier of the spatial object, not an identifier of the real-world phenomenon. | *Default:* |

#### From PS - Protected Sites

Type: Package

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_LinksToOtherThemes

Detail: *Created on 2011-03-12*. *Last modified on 2011-03-12*

GUID: {FEEF0A47-F401-46b1-965B-88B37C278100}

##### Protected Sites Full

Type: Package

Status: Proposed. Version 1.0. Phase 1.0.

Package: From PS - Protected Sites

Detail: *Created on 2011-03-14*. *Last modified on 2011-03-14*

GUID: {ECFA21B2-B647-411e-8447-6AEAF824D494}

###### ProtectedSite

Type: **Class** ProtectedSite

Status: Proposed. Version 1.0. Phase 1.0.

Package: Protected Sites Full Keywords:

Detail: *Created on* *2009-08-03*. *Last modified on 2011-03-14*.

GUID: {11726C9B-5FC5-407c-B0A7-76E7AAC37BE5}

-- Definition --

An area designated or managed within a framework of international, Community and Member States' legislation to achieve specific conservation objectives.

-- Description --

Each protected site has a boundary defined through formal, legal or administrative agreements or decisions. The establishment of a protected site is normally underpinned by legislation and thus given weight in decisions about land use change and spatial planning. Each Site is normally selected as a representative example of a wider resource and selected through a formal criterion based approach. A protected site can be a contiguous extent of land/sea or a collection of discrete areas that together represent a single formal Protected Site.  This class has the attributes, constraints and associations that are part of the Full application schema.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association LinkForNavigation  Source -> Destination | Public  WFD\_GroundWaterBody | Public  ProtectedSite | Invariant {If ProtectedSite is dependent on GroudWaterBody -> if ( GrounWaterBody.isAssociatedWithProtectedAreas == truth )} |
| Association LinkForNavigation  Source -> Destination | Public  HydrogeologicalObjectNatural | Public  ProtectedSite | Invariant {if(hydrogeologicalObjectNatural is protected)} |
| Association LinkForNavigation  Source -> Destination | Public  WFD\_ProtectedArea | Public  ProtectedSite |  |
| Generalization  Source -> Destination | Public  ProtectedSite | Public  ProtectedSite |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **siteIdentifier** SiteIdentifierType  Public    [0..\*]  «voidable» | -- Definition --  The identifier for the Site using some national or international identification scheme.  -- Description --  This is distinct from the inspireID, which is a unique identifier for the record. | *Default:* |
| **activitiesAndImpacts** ActivitiesAndImpactsType  Public    [0..\*]  «voidable» | -- Definition --  Impacts resulting from human activities or natural processes that positively or negatively affect the conservation status of the protected site.  -- Description --  This information is needed to inform evaluation of conservation status of a Protected Site. This includes management activities such as grazing or cutting, land uses such as mineral extraction or transport and natural processes such as disease fluvial erosion. | *Default:* |
| **spatialResolution** MD\_Resolution  Public    [0..1]  «voidable» | -- Definition --  The spatial resolution of the protected site geometry. This may relate to a scale of capture value. | *Default:* |
| **siteDescription** LocalisedCharacterString  Public    [0..1]  «voidable» | -- Definition --  A general description of the Site and its characteristics.  -- Description --  NOTE This attribute corresponds to item 4.1 of the Natura2000 SDF. | *Default:* |
| **qualityAndImportance** LocalisedCharacterString  Public    [0..1]  «voidable» | -- Definition --  An overall indication of the quality and importance of the Site, in view of the conservation objectives of the various Directives.  -- Description --  NOTE This attribute corresponds to item 4.2 of the Natura2000 SDF. | *Default:* |
| **vulnerability** LocalisedCharacterString  Public    [0..1]  «voidable» | -- Definition --  The nature and extent of pressures on the Site from human and other influences and the fragility of habitats and ecosystems found there.  -- Description --  NOTE This attribute corresponds to item 4.3 of the Natura2000 SDF. | *Default:* |
| **ownership** LocalisedCharacterString  Public    [0..1]  «voidable» | -- Definition --  A general description of the site ownership.  -- Description --  NOTE This attribute corresponds to item 4.5 of the Natura2000 SDF.  EXAMPLES Private, State, conservation NGO. | *Default:* |
| **documentation** LocalisedCharacterString  Public    [0..1]  «voidable» | -- Definition --  References to publications and scientific data concerning the Protected Site.  -- Description --  NOTE 1 This attribute corresponds to item 4.6 of the Natura2000 SDF.  NOTE 2 Information entered should be made according to standard conventions for scientific references. Unpublished items or communications referring to the information given in the recording form should be included where ever useful. | *Default:* |
| **legalExpiryDate** DateTime  Public    [0..1]  «voidable» | -- Definition --  The date that the protected site was legally destroyed. This is the date that the real world object was destroyed, not the date that its representation in an information system was destroyed or changed. | *Default:* |
| **beginLifespanVersion** DateTime  Public    «voidable» | -- Definition --  Date and time at which this version of the spatial object was inserted or changed in the spatial data set.  -- Description --  NOTE This date is recorded to enable the generation of change only update files. | *Default:* |
| **endLifespanVersion** DateTime  Public    [0..1]  «voidable» | -- Definition --  Date and time at which this version of the spatial object was superseded or retired in the spatial data set.  -- Description --  NOTE This date is recorded primarily for those systems which "close" an entry in the spatial data set in the event of an attribute change. | *Default:* |
| **dataSource** CharacterString  Public    [0..1]  «voidable» | -- Definition --  The agency or organisation that is responsible for maintaining and providing the data about the Protected Site. This may be represented in the form of the URL or name and address of the organisation. | *Default:* |
| **officialsiteArea** Area  Public    [0..1]  «voidable» | -- Definition --  The official area of the site in hectares. This may not the same as area calculated from the geometry. | *Default:* |
| **siteLength** Length  Public    [0..1]  «voidable» | -- Definition --  The length of the site, normally used if the area is not populated. | *Default:* |
| **fundingSource** FundingSourceType  Public    [0..\*]  «voidable» | -- Definition --  The source(s) of financial support that are being used to implement the management plan on a Protected Site.  -- Description --  NOTE Funding of management on Protected Sites is critical to securing desired conservation status. The resources are supplied from a variety of sources, ranging from private land owners to European funding schemes. | *Default:* |
| **siteManagementPlan** SiteManagementPlanType  Public    [0..\*]  «voidable» | -- Definition --  The Site Management Plans that set out practical actions and measures that are needed to ensure that the features for which the site is designated are maintained. | *Default:* |
| **natura2000Respondent** CI\_ResponsibleParty  Public    [0..1]  «voidable» | -- Definition --  The person responsible for completing Natura2000 reporting on the Site.  -- Description --  NOTE This is likely to be a person from the ResponsibeAgency, but may not be. | *Default:* |
| **protectedEntity** ProtectedEntityType  Public    [0..\*]  «voidable» | -- Definition --  An entity that is protected by a designated protected site (that is, the object or reason for protection).  -- Description --  EXAMPLE Such entities may include habitats, species and geological, archaeological, cultural and other types of entities. | *Default:* |
| **presentHabitat** PresentHabitatType  Public    [0..\*]  «voidable» | -- Definition --  A habitat that exists on the Site.  -- Description --  NOTE This is distinct from the Habitats for which the Site is protected. These are represented in the protectedEntity attribute. | *Default:* |
| **timePeriod** TM\_OrdinalEra  Public    [0..1]  «voidable» | -- Definition --  For historical or archaeological Sites, the era in which the Site is thought to originate. | *Default:* |

##### Protected Sites Simple

Type: Package

Status: Proposed. Version 1.0. Phase 1.0.

Package: From PS - Protected Sites

Detail: *Created on 2011-03-14*. *Last modified on 2011-03-14*

GUID: {2A09C0E2-C646-443d-BACA-F6BDECCF19CA}

###### ProtectedSite

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Protected Sites Simple Keywords:

Detail: *Created on* *2008-06-17*. *Last modified on 2011-03-14*.

GUID: {44976208-3EF0-4f45-BE99-BB985FE62D36}

-- Definition --

An area designated or managed within a framework of international, Community and Member States' legislation to achieve specific conservation objectives.

-- Description --

Each protected site has a boundary defined through formal, legal or administrative agreements or decisions. The establishment of a protected site is normally underpinned by legislation and thus given weight in decisions about land use change and spatial planning. Each Site is normally selected as a representative example of a wider resource and selected through a formal criterion based approach. A protected site can be a contiguous extent of land/sea or a collection of discrete areas that together represent a single formal Protected Site.  This class has the attributes, constraints and associations that are part of the Simple application schema.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | 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. |
|  | inspireConcept = FIXME. Default: FIXME  Description: URN reference to the feature concept in the INSPIRE Feature Concept Dictionary Register |
|  | 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. |
|  | xsdEncodingRule = iso19136\_2007\_INSPIRE\_Extensions. Values: iso19136\_2007 | iso19139\_2007  Default: iso19136\_2007  Description: XML Schema encoding rule to apply |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  ProtectedSite | Public  ProtectedSite |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **geometry** GM\_Object  Public | -- Definition --  The geometry defining the boundary of the Protected Site.  -- Description --  The geometry may be determined by a wide range of methods, including surveying, digitisation or visual reference to natural features or cadastral boundaries and may be defined by the legal document that creates the protected area. The geometry included in a data set that uses this data model is stored as a fixed geometry by coordinates, not by reference to natural, cadastral or administrative boundaries, although it may originally have been defined from these. | *Default:* |
| **inspireID** Identifier  Public | -- Definition --  External object identifier of the protected site.  -- Description --  NOTE An external object identifier is a unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object. The identifier is an identifier of the spatial object, not an identifier of the real-world phenomenon. | *Default:* |
| **legalFoundationDate** DateTime  Public    «voidable» | -- Definition --  The date that the protected site was legally created. This is the date that the real world object was created, not the date that its representation in an information system was created.  -- Description --  NOTE In the case of Natura2000 sites, a protected site may go through several different stages (for example, proposed as SCI, confirmed as SCI, designated as SAC). A new version of the site is created for each of these different stages (because there is a change in the designation), and the new version should have the date on which the new stage was legally assigned as the legalFoundationDate (for example, when designated as a SAC, the version for the SAC would have the designation date as the legalFoundationDate). | *Default:* |
| **legalFoundationDocument** CI\_Citation  Public    «voidable» | -- Definition --  A URL or text citation referencing the legal act that created the Protected Site. | *Default:* |
| **siteDesignation** DesignationType  Public    [1..\*]  «voidable» | -- Definition --  The designation (type) of Protected Site.  -- Description --  At least one designation is required, but designations may be available using a number of different designation schemes, all of which can be accommodated in the DesignationSchemeValue codelist. | *Default:* |
| **siteName** GeographicalName  Public    [0..\*]  «voidable» | -- Definition --  The name of the Protected Site.  -- Description --  NOTE 1 Several names in different languages may be expressed.  NOTE 2 It is recommended that the language of the name (part of the GeographicalName data type) be filled where ever possible. This is an important identifying attribute of a Protected Site. | *Default:* |
| **siteProtectionClassification** ProtectionClassificationValue  Public    [1..\*]  «voidable» | -- Definition --  The classification of the protected site based on the purpose for protection.  -- Description --  The site may have more than one classification. | *Default:* |

#### From US - Utility and Governmental Services

Type: Package

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_LinksToOtherThemes

Detail: *Created on 2011-03-14*. *Last modified on 2011-03-14*

GUID: {F4C13003-3A74-4016-A8CD-48E5CA02A209}

##### UtilityNode

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: From US - Utility and Governmental Services Keywords:

Detail: *Created on* *2010-10-06*. *Last modified on 2011-03-14*.

GUID: {F30BF0E0-B870-4e6c-9835-B10B77160DCE}

-- Definition --

A point spatial object which is used for connectivity.

-- Description --

Nodes are found at both ends of the UtilityLink.

| Constraints | |
| --- | --- |
|  | All objects have inspireId: *(OCL, Status is Proposed*)  /\* All utility nodes have an external object identifier. \*/  inv:inspireId-&gt;notEmpty() |

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  WaterAppurtenance | Public  UtilityNode |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **containerId** Identifier  Public    «voidable» | -- Definition --  External container object identifier of the spatial object. | *Default:* |
| **headnig** Angle  Public    «voidable» | -- Definition --  Heading (rotation with regards to true North) value of an utility network node.  -- Description --  Nodes with heading (rotation) ressemble to vectors. For example azimuth of the directed telecommunications antenna . | *Default:* |

##### WaterAppurtenance

Type: **Class** UtilityNode

Status: Proposed. Version 1.0. Phase 1.0.

Package: From US - Utility and Governmental Services Keywords:

Detail: *Created on* *2010-10-09*. *Last modified on 2011-03-14*.

GUID: {66470B46-CCBC-4053-8C2C-03CCB1CFCA35}

-- Definition --

A node (point) appurtenance in water networks.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  WaterAppurtenance | Public  WaterAppurtenanceValue |  |
| Generalization  Source -> Destination | Public  WaterAppurtenance | Public  UtilityNode |  |
| Association LinkForNavigation  Source -> Destination | Public  ActiveWell (or AbstractionWell) | Public  WaterAppurtenance | Invariant {if ( GroundWaterAbstractionWell.waterUse == forDrinking && WaterAppurtenance. type == well )} |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **type** WaterAppurtenanceValue  Public    «voidable» | -- Definition --  Type of the water network appurtenance. | *Default:* |

##### WaterAppurtenanceValue

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: From US - Utility and Governmental Services Keywords:

Detail: *Created on* *2010-10-12*. *Last modified on 2011-03-14*.

GUID: {35D875E5-F8AD-4aa5-AE0A-8A31000C276C}

-- Definition --

Possible node (point) appurtenance values in water networks.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  WaterAppurtenance | Public  WaterAppurtenanceValue |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **anode**  Public | -- Definition --  Anode.  -- Description --  An *anode* is a feature (specifically, an electrical mechanism) that’s applied to system components for the prevention of rust, pitting, and the corrosion of metal surfaces that are in contact with water or soil. A low-voltage current is applied to the water or soil in contact with the metal, such that the  electromotive force renders the metal component cathodic. Corrosion is concentrated on the anodes instead of on the associated (and protected) water system components. This type of corrosion may occur in copper, steel, stainless steel, cast iron, and ductile iron pipes. | *Default:* |
| **clearWell**  Public | -- Definition --  Clear well.  -- Description --  A *clear well* is an enclosed tank that is associated with a treatment plant. Clear wells are used to store filtered water of sufficient capacity to prevent the need to vary the filtration rate with variations in demand. Clear wells are also used to provide chlorine contact time for disinfection. Pumps are  used to move the water from the clear well to the treatment plant or to a distribution system. | *Default:* |
| **controlValve**  Public | -- Definition --  Control valve.  -- Description --  *Control valves* represent set of valves that operate in special ways. There are three fundamental types of control valves: backflow control, air control, and altitude. | *Default:* |
| **fitting**  Public | -- Definition --  Fitting.  -- Description --  The *fitting* represents the facility found at the joint between two lines where a transition of some sort must occur. The basic connecting devices between pipes; fittings are rarely used to control the flow of water through the network. | *Default:* |
| **hydrant**  Public | -- Definition --  Hydrant.  -- Description --  A *hydrant* enables fire fighters to attach fire hoses to the distribution network. Hydrants also have secondary uses that include flushing main lines and laterals, filling tank trucks, and providing a temporary water source for construction jobs. | *Default:* |
| **junction**  Public | -- Definition --  Junction.  -- Description --  The *junction* is a water network node where two or more pipes combine, or a point where water consumption is allocated and defined as demand. | *Default:* |
| **lateralPoint**  Public | -- Definition --  Lateral point.  -- Description --  A *lateral point* represents the location of the connection between the customer and the distribution system. | *Default:* |
| **meter**  Public | -- Definition --  Meter.  -- Description --  A *meter* is a facility that is used to measure water consumption (volume). Being a facility, a meter plays the role of a junction on the active network.  NOTE Meters are also much like hydrants as they also have an associated warehouse object, namely, a WarehouseMeter. | *Default:* |
| **pump**  Public | -- Definition --  Pump.  -- Description --  A *pump* is a piece of equipment that moves, compresses, or alters the pressure of a fluid, such as water or air, being conveyed through a natural or artificial channel.  NOTE Pump types include AxialFlow, Centrifugal, Jet, Reciprocating, Rotary,  Screw, and Turbine. | *Default:* |
| **pumpStation**  Public | -- Definition --  Pump station.  -- Description --  A *pump station* is a facility for pumping water on the network to transport to another part of the network (lift pump). | *Default:* |
| **samplingStation**  Public | -- Definition --  Sampling station.  -- Description --  A *sampling station* is a facility that is used for collecting water samples. Sampling stations may be dedicated sampling devices, or they may be other devices of the system where a sample may be obtained. | *Default:* |
| **scadaSensor**  Public | -- Definition --  SCADA sensor.  -- Description --  The *SCADA sensor* is a feature that’s used to remotely measure the status of network components as part of a supervisory control and data acquisition (SCADA) system. SCADA systems provide alarms, responses, data acquisition, and control for collection and distribution systems. Operators use the SCADA system to monitor and  adjust processes and facilities. | *Default:* |
| **storageBasin**  Public | -- Definition --  Storage basin.  -- Description --  A *storage basin* represents artificially enclosed area of a river or harbor designed so that the water level remains unaffected by tidal changes. | *Default:* |
| **storageFacility**  Public | -- Definition --  Enclosed storage facility. | *Default:* |
| **surgeReliefTank**  Public | -- Definition --  Surge relief tank.  -- Description --  A *surge relief tank* is a piece of equipment used to absorb pressure increases in the water system. Surge relief tanks provide a buffer against throttling within the system by accepting water into a tank through a pressure valve. | *Default:* |
| **systemValve**  Public | -- Definition --  System valve.  -- Description --  A *system valve* is a facility that is fitted to a pipeline or orifice in which the closure member is either rotated or moved transversely or longitudinally in the waterway so as to control or stop the flow. System valves are used to regulate pressure, isolate, throttle flow, prevent backflow, and relieve  pressure.  NOTE System valve types include Gate, Plug, Ball, Cone, and Butterfly. These specific types may be classified as isolation valves. | *Default:* |
| **thrustProtection**  Public | -- Definition --  Thrust protection.  -- Description --  The *thrust protection* represents a type of line protector that’s used to prevent pipe movement. Thrust protection is commonly implemented as thrust blocks (masses of concrete material) that are placed at bends and around valve structures.  NOTE The types of thrust protection include Anchor,  Blocking, Deadman, and Kicker. | *Default:* |
| **treatmentPlant**  Public | -- Definition --  Treatment plant. | *Default:* |
| **well**  Public | -- Definition --  Production well. | *Default:* |

### Hydrogeology\_WFD\_GWB

Type: Package «applicationSchema»

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_v.0.4

Detail: *Created on 2011-03-11*. *Last modified on 2011-04-12*

GUID: {5BCFF3C9-0006-4d3f-926F-0AE2BAF221A5}

This schema was adapted from the Article 5 schema to include the status information required from the revised GWD1 Reporting sheet. The schema has also been adapted to include attributes defined in the Article 5 resubmission reporting sheet for GIS. The detail of the changes to the schema can be located in topic centre web site location http://water.eionet.europa.eu/schemas/dir????????

2 Oct 2008 YGW

Amended namespace and WFD namespace

**Hydrogeology\_WFD\_GWB** - *(Package diagram)*

Created By: Janusz Michalak *on* 2011-03-12

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {9BBFB5B6-2A96-4a44-B26A-79CCEC79D5AF}



Figure: 24

**WFD\_GWB\_LinksFromHydrogeology** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-03-12

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {AD648555-771A-47c0-B39D-F05BC7E98FB7}



Figure: 25

#### <anonymous>

Type: **Note**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_WFD\_GWB Keywords:

Detail: *Created on* *2012-06-28*. *Last modified on 2012-06-28*.

GUID: {F6FBDB74-B2A3-4c75-B772-646C8909154A}

Generated from WFD WISE XSD Schemas by reverse engendering

#### WFD\_ GWB\_Main

Type: Package «applicationSchema»

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_WFD\_GWB

Detail: *Created on 2011-03-11*. *Last modified on 2011-03-12*

GUID: {089FD6C6-A885-40de-AF45-E84F573D4512}

**WFD\_GWB\_Main** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-03-10

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {6BCEC830-F0D0-4857-9590-6A3816AB5305}



Figure: 26

##### BackgroundSubstances

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {A4072AC8-C535-47ed-96E1-C85D074D8B5B}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = choice. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  BackgroundSubstances | Public  NaturalBackgroundLevel |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **backgroundNaturalSubstancesIndicators** GWBackgoundSubstancesCode  Public | Select the natural substance(s) or indicator of pollution with a background level from the enumeration list for which threshold values have been established and for which a natural background level is required. Arsenic, Cadmium, Lead, Mercury, Ammonium, Nitrate, Chloride, Sulphate, Conductivity. | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |
| **backgroundOtherNaturalSubstances** PF\_FreeText  Public | Give the name(s) of the natural substance(s) or indicators for any other relevant pollutant for which threshold values have been established and for which a natural background level is required. | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |

##### ChemicalExemption

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {0BCB2ACB-DEA7-43d5-A6A6-509F0D35008E}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  OtherRelevantPollutantExemption | Public  ChemicalExemption |  |
| Aggregation  Source -> Destination | Public  ChemicalExemption | Public  ChemicalStatus |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **chemicalExemptionType** ObjectivesExemptionType  Public | If an exemption is applied to this Groundwater Body in terms of achievement of good chemical status select from the enumeration list which type(s) of exemption apply. More than one may apply to each Groundwater Body. Exemptions are:  Article4(4) -Technical feasibility  Article4(4) - Disproportionate cost  Article4(4) - Natural conditions  Article4(5) -Technical feasibility  Article4(5) - Disproportionate cost  Article4(6) - Natural causes  Article4(6) - Force Majeure  Article4(6) - Accidents  Article4(7) - New modification  Article4(7) - Sustainable human development | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **pollutantCausingExemption** GWPollutantsCode  Public    [0..\*]  «voidable» | CONDITIONAL. Select the pollutant(s) from the enumeration list that are covered by the exemption. | *Default:*    [maxOccurs = unbounded ]  [minOccurs = 0 ] |
| **exemptionComment** PF\_FreeText  Public    «voidable» | Further comment or explanation | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |

##### ChemicalStatus

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {D8184D9F-9804-4609-A204-1828A15F401A}

Detail required to produce the following maps:

Map 2: Achievement/exceedance of standard for nitrates (value in Annex 1 of GWD or set according to paragraph 3 of Annex 1 GWD, and according to status assessment procedure in Article 4 of GWD);

Map 3: Achievement/exceedance of standard for pesticides (combined total and individual value in Annex 1 of GWD or set according to paragraph 3 of Annex 1 GWD, and according to status assessment procedure in Article 4 of GWD);

Map 4: Achievement/exceedance of threshold values set by Member States for other pollutants (considering in this category the list of substances as contained in Part B of Annex II of GWD and more generally any other pollutants contributing to the characterisation of Groundwater Bodies as being 'at risk', and according to status assessment procedure in Article 4 of GWD).

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  ChemicalExemption | Public  ChemicalStatus |  |
| Aggregation  Source -> Destination | Public  ChemicalStatus | Public  GroundwaterBodyStatus |  |
| Aggregation  Source -> Destination | Public  NaturalBackgroundLevel | Public  ChemicalStatus |  |
| Aggregation  Source -> Destination | Public  PollutantsCausingFailure | Public  ChemicalStatus |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **chemicalStatusValue** GWStatusCode  Public | 2=good, 3=poor, U=unknown | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **commentChemicalStatusValue** PF\_FreeText  Public    «voidable» | Further comment or explanation | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **reasonsForFailure** GWChemicalFailureCode  Public    [0..\*]  «voidable» | CONDITIONAL. If the Groundwater Body is of Poor Status (3) select reasons for failure from the enumeration list. Reasons are:  a) Saline or other intrusions;  b) Exceedance of one or more quality standard or threshold value;  c) Failure to meet environmental objectives in associated surface water bodies or significant diminution of the ecological or chemical status of such bodies  d) Significant damage to terrestrial ecosystems which depend directly on the groundwater body  e) Deterioration in quality of waters for human consumption.  f) Significant impairment of human uses;  g) Significant environmental risk from pollutants across the Groundwater Body | *Default:*    [maxOccurs = unbounded ]  [minOccurs = 0 ] |

##### GWProtectedAreaDetails

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-14*.

GUID: {3ADBBA6C-A6CD-438f-ADEF-30AA2C6A82D4}

CONDITIONAL. If there are Protected Areas associated with this Water Body (PROT\_AREA\_ASSOC is "Yes") then indicate here the types of Protected Area associated with the Water Body.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  GWProtectedAreaDetails | Public  StatusProtectedAreas |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **typeOfProtectedArea** ProtectedAreaGWType  Public | Indicate the type of Protected Area as defined in the enumeration list. This should be repeated for each type of Protected Area associated with the water body. This comprises  Birds  Habitats  Nitrates  Article 7 Waters bodies used for the abstraction of drinking water  European other  National  Local | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **protectedAreaCode** FeatureUniqueEUCodeType  Public    [1..\*] | Input each previously reported Protected Area code (i.e. previously reported, before March 2010, under other directives).  For each newly reported Protected Area input a code and use PROT\_AREA  schema to provide details. | *Default:*    [maxOccurs = unbounded ]  [minOccurs = 1 ] |
| **typeOfAssociation** ProtAreaAssociationType  Public | Choose from the enumeration list the type of association (water bodies and protected areas will not always overlap 1:1.  Protected Areas may include more than water body and a water body may overlap  more than one Protected Area):  a) water body within a Protected Area,  b) water body overlapping (partly within) a Protected Area or  c) water body dynamically connected to a Protected Area e.g. river/groundwater | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **valueStatusProtectedArea** SWStatusProtAreaCode  Public    «voidable» | CONDITIONAL: In general reporting is required for all protected areas except for areas designated under nitrates Directive, if status is reported under those other directives and a link can be made with the protected area Code. Reporting is in any case required for all protected areas WFD Article 7 Protected Areas as these are not reported under any other directive.  See further explanatory text in the Schema User Guide Section 2.2.5 for reporting  the status of Article 7 and  other Protected Areas. | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **commentValueStatusProtArea** PF\_FreeText  Public    «voidable» | CONDITIONAL: For WFD Article 7 Protected Areas, indicate the reasons for failure to reach Good status and the description of the Quality Elements/determinands that fail. In case of protected areas designated under Habitats or Birds Directives provide information about the habitats or species that are causing the failure. Further guidance on what should be reported here is given in section 2.2.5 of the user guide. | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **protAreaExemptions** ObjectivesExemptionType  Public    [0..\*]  «voidable» | Report Exemptions from the enumeration list. Exemptions are  Article4(4) -Technical feasibility  Article4(4) - Disproportionate cost  Article4(4) - Natural conditions  Article4(5) -Technical feasibility  Article4(5) - Disproportionate cost  Article4(6) - Natural causes  Article4(6) - Force Majeure  Article4(6) - Accidents  Article4(7) - New modification  Article4(7) - Sustainable human development | *Default:*    [minOccurs = 0 ]  [maxOccurs = 10 ] |
| **protAreaExemptionComment** PF\_FreeText  Public    «voidable» | Further comment or explanation | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |

##### GrounWaterBodyDescription

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {1446FD3F-0B89-4d89-A1FF-563592700B13}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  HydrogeologicalCharacteristics | Public  GrounWaterBodyDescription |  |
| Aggregation  Source -> Destination | Public  GroundwaterBodyStatus | Public  GrounWaterBodyDescription |  |
| Aggregation  Source -> Destination | Public  PressuresAndImpacts | Public  GrounWaterBodyDescription |  |
| Aggregation  Source -> Destination | Public  StatusProtectedAreas | Public  GrounWaterBodyDescription |  |
| Aggregation  Source -> Destination | Public  GrounWaterBodyDescription | Public  WFD\_GroundWaterBody |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **countruCode** CountryCode  Public | Two-letter ISO country code | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |
| **EU\_RBD\_code** FeatureUniqueEUCodeType  Public | Unique EU code of the parent River Basin District. Add the two-letter ISO Country code followed by the Member State unique id | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |
| **URL** anyURI  Public    «voidable» | URL for integration of your own internet-based information | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **creationDate** dateTime  Public |  | *Default:*    [use = required ] |
| **creator** PF\_FreeText  Public |  | *Default:*    [use = required ] |
| **email** styring  Public    «voidable» |  | *Default:*    [use = optional ] |
| **description** PF\_FreeText  Public    «voidable» |  | *Default:*    [use = optional ] |
| **generatedBy** PF\_FreeText  Public    «voidable» |  | *Default:*    [use = optional ] |
| **MD\_classificationCode** DataConfidentialityClassificationCode  Public    «voidable» |  | *Default:*    [use = optional ] |

##### GroundwaterBodyStatus

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {A0E12298-49DD-4fc4-B822-AA74F360ED96}

Groundwater Quantitative and Groundwater Chemical status are to be reported

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  GroundwaterBodyStatus | Public  GrounWaterBodyDescription |  |
| Aggregation  Source -> Destination | Public  SignificantUpwardTrends | Public  GroundwaterBodyStatus |  |
| Aggregation  Source -> Destination | Public  QuantitativeStatus | Public  GroundwaterBodyStatus |  |
| Aggregation  Source -> Destination | Public  ChemicalStatus | Public  GroundwaterBodyStatus |  |
| Aggregation  Source -> Destination | Public  SignificantTrendReversal | Public  GroundwaterBodyStatus |  |

##### HydrogeologicalCharacteristics

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {FAAE2FAD-6197-4d97-B25E-0C4E4D73690B}

Provide the relevant hydrogeological aspects used to characterise the Groundwater Body.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  HydrogeologicalCharacteristics | Public  GrounWaterBodyDescription |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **isLayered** boolean  Public    «voidable» | Is the Groundwater Body layered? Y=Yes, N=No | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **area** double  Public    «voidable» | Surface area  of the Groundwater Body in km2 | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **scale** ScaleType  Public    «voidable» | Reference map scale at which the area or length of the Water Body was calculated. Express as 1:nnnnnn e.g. 1:50,000. | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **scaleExplanation** PF\_FreeText  Public    «voidable» | CONDITIONAL. Provide brief explanation of the scale used if necessary. | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **averageDepth** double  Public    «voidable» | Average depth from surface to Groundwater Body in metres. | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **averageThickness** double  Public    «voidable» | Average thickness of Groundwater Body in metres. | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **depthRange** GWDepthRangeCode  Public    «voidable» | Assignment to a depth range at the point where the main part of the Groundwater Body is situated (depth ranges: 0-20m, 20-50m, 50-200m, >200m) | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **areLinkedSurfaceWaterBodies** boolean  Public    «voidable» | Is the Groundwater Body dynamically linked to Surface Water Bodies? Y=yes, N=No | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **areLinkTerrestrialEcosystems** boolean  Public    «voidable» | Is the Groundwater Body dynamically linked to  terrestrial ecosystems? Y=yes, N=No | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **geologicalFormation** GWGeologicalFormationCode  Public    «voidable» | What is the main geological formation of the Aquifer Type? Select one from the enumeration list  Porous - highly productive,  Porous - moderately productive,  Fissured aquifers including karst - highly productive,  Fissured aquifers including karst - moderately productive,  Insignificant aquifers - local and limited groundwater | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **verticalOrientation** GWVerticalOrientationCode  Public    «voidable» | What is the vertical orientation of the Groundwater Body? Please select one from the enumeration list and refer to the "GIS guidance on reporting of groundwater bodies under WFD and GWD" for pictures of the options.  Horizontal, mainly continuous body;  Horizontal, mainly smaller, individual formations;  Declining, mainly continuous body;  Declining, mainly smaller, individual formations;  Declining and cumulative, mainly continuous body;  Declining and cumulative, mainly smaller, individual formations;  Boat form, mainly continuous body;  Smaller individual boat formed formations;  Other | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **capacity** double  Public    «voidable» | What is the volume of the aquifer in 1000m3. | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |

##### NaturalBackgroundLevel

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {BE31E62E-82BC-400d-A0A3-5AC19BA768BC}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  BackgroundSubstances | Public  NaturalBackgroundLevel |  |
| Aggregation  Source -> Destination | Public  NaturalBackgroundLevel | Public  ChemicalStatus |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **concentrationLevel** double  Public | Numeric value of the natural background level. | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **concentrationUnits** GWConcentrationUnitsCode  Public | Select the relevant units for the natural background concentrations/levels. Units are  mg/l, µg/l, ng/l and Sm-1 (the reporting unit of conductivity is milli Siemens per metre) | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |

##### OtherRelevantPollutant

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {B88C9992-B470-4f0e-984D-6B6016FFC468}

Please give the name of the pollutant or indicator of pollution. Please give CAS number of the pollutant if available and/or relevant

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  UpwardTrendPollutant | Public  OtherRelevantPollutant |  |
| Dependency  Source -> Destination | Public  TrendReversalPollutant | Public  OtherRelevantPollutant |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **otherRelevantPollutantCASNumber** ChemicalCASNumberType  Public |  | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **otherRelevantPollutantName** PF\_FreeText  Public |  | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |

##### OtherRelevantPollutantExceedance

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {723FC574-7321-49d0-B120-E8BF2186523C}

Please give the name of the other pollutant(s) or indicator(s) of pollution which is/are causing the exceedance of national standards or threshold values. Please give CAS number of the pollutant if available and/or relevant

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  PollutantsCausingFailure | Public  OtherRelevantPollutantExceedance |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **otherRelevantPollutantCASNumber** ChemicalCASNumberType  Public |  | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |
| **otherRelevantPollutantName** PF\_FreeText  Public |  | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |

##### OtherRelevantPollutantExemption

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {0DD4A8BE-1E0C-4392-896D-11635C1BB3E6}

CONDITIONAL. Input the details of the other relevant pollutants that are covered by the exemption. Please give CAS number of the pollutant if available and/or relevant

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  OtherRelevantPollutantExemption | Public  ChemicalExemption |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **otherRelevantPollutantCASNumber** ChemicalCASNumberType  Public |  | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **otherRelevantPollutantName** PF\_FreeText  Public |  | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |

##### PollutantsCausingFailure

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {D3AB650B-EC16-4605-BAE5-7C03D5F0F313}

CONDITIONAL. If the Groundwater Body is of Poor Status define each of the pollutants or indicators of pollution that have caused the Groundwater Body to fail to reach good status

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = choice. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  PollutantsCausingFailure | Public  OtherRelevantPollutantExceedance |  |
| Aggregation  Source -> Destination | Public  PollutantsCausingFailure | Public  ChemicalStatus |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **pollutantCausingFailure** GWPollutantsCode  Public | Please select the pollutant(s) or indicator(s) of pollution that is/are causing the failure of the Groundwater Body to reach good chemical status. | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |
| **otherRelevantPollutantExceedance** OtherRelevantPollutantExceedance  Public |  | *Default:* |

##### PressuresAndImpacts

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {CE8FA02D-039E-46f5-A99D-EE9DEBD07A93}

Describe the significant sources of pressures on Groundwater Bodies and a summary of the human impacts

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  PressuresAndImpacts | Public  GrounWaterBodyDescription |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **significantPresureTypes** GWPressureType  Public    [0..\*]  «voidable» | CONDITIONAL. Only required where significant pressures exist. Select the relevant and significant pressure(s) (if any) from the enumeration list. See Guidance Document No.21 'Guidance for reporting under the Water Framework Directive' for further information. | *Default:*    [maxOccurs = unbounded ]  [minOccurs = 0 ] |
| **otherPressureDescription** PF\_FreeText  Public    «voidable» | Only to be used if the Pressure Type is not in the enumeration list | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **significantImpactTypes** GWImpactTypes  Public    [0..\*]  «voidable» | CONDITIONAL. Give a review of the human impacts on Groundwater Bodies to support the determination of chemical and quantitative status according to WFD Annex 5. NOTE: 2010 data should be an update of that already reported in WISE. Select the relevant human impacts form the enumeration list. See Guidance Document No.21 'Guidance for reporting under the Water Framework Directive' for further information. | *Default:*    [maxOccurs = unbounded ]  [minOccurs = 0 ] |
| **otherImpactDescription** PF\_FreeText  Public    «voidable» | Only to be used if the Impact Type is not in the enumeration list | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |

##### QuantitativeStatus

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-14*.

GUID: {D0C9EA5C-379C-42cd-9651-759C91CA1E08}

Map 1: Quantitative status – Identification of bodies that are at “good quantitative status” and those at “poor quantitative status”

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  QuantitativeStatus | Public  GroundwaterBodyStatus |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **quantitativeStatusValue** GWStatusCode  Public | 2=good, 3=poor, U=Unknown | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **commentQuantitativeStatusValue** PF\_FreeText  Public    «voidable» | Further comment or explanation | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **reasonsForFailure** GWQuantitativeFailureCode  Public    [0..\*]  «voidable» | CONDITIONAL. If Groundwater Body is of Poor Status select reasons for failure from the enumeration list. The reason(s) for failing good quantitative status are:  a) Exceedance of available groundwater resource by long-term annual average rate of abstraction that may result in a decrease of groundwater levels;  b) Failure to achieve environmental objectives (Article 4 WFD) for associated surface waters;  c) Significant diminution of the status of surface waters;  d) Significant damage to terrestrial ecosystems directly depending on groundwater;  e) Saline or other intrusion | *Default:*    [minOccurs = 0 ]  [maxOccurs = unbounded ] |
| **goodQuantitativeStatusExemption** ObjectivesExemptionType  Public    [0..\*]  «voidable» | CONDITIONAL. If exemptions apply to the achievement of good quantitative status for this Groundwater Body, please select the reason(s)  for the exemption(s) from the enumeration list (more than one may apply to each Groundwater Body). Exemptions are:  Article4(4) -Technical feasibility  Article4(4) - Disproportionate cost  Article4(4) - Natural conditions  Article4(5) -Technical feasibility  Article4(5) - Disproportionate cost  Article4(6) - Natural causes  Article4(6) - Force Majeure  Article4(6) - Accidents  Article4(7) - New modification  Article4(7) - Sustainable human development (NOTE: This exemption is not relevant for GWB but has been left in the list for simplicity of schema construction). | *Default:*    [maxOccurs = 10 ]  [minOccurs = 0 ] |
| **goodQuantitativeStatusExemptionComment** PF\_FreeText  Public    «voidable» | Further comment or explanation | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |

##### SignificantTrendReversal

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {58A8D978-1385-449d-9B90-427D03284F47}

Map 5: Trends - Identification of: groundwater bodies in which trends have been reversed

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  TrendReversalPollutant | Public  SignificantTrendReversal |  |
| Aggregation  Source -> Destination | Public  SignificantTrendReversal | Public  GroundwaterBodyStatus |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **trendReversal** boolean  Public | Yes or No. If Yes, the pollutant/indicator of pollution that is showing a  trend reversal MUST be reported | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |
| **trendReversalComment** PF\_FreeText  Public    «voidable» | Provide extra detail if relevant | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |

##### SignificantUpwardTrends

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-14*.

GUID: {7A6A00B3-77A7-4c12-AF25-3D6304D24F38}

Map 5: Trends - Identification of Groundwater Bodies with environmentally significant and sustained upward trends in pollutant concentrations

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  SignificantUpwardTrends | Public  GroundwaterBodyStatus |  |
| Aggregation  Source -> Destination | Public  UpwardTrendPollutant | Public  SignificantUpwardTrends |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **upwardTrend** boolean  Public    «voidable» | Yes or No or Unknown. If Yes, the pollutant/indicator of pollution that is showing a significant and sustained upward trend  MUST be reported | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |
| **upwardTrendComment** PF\_FreeText  Public    «voidable» | Provide extra detail if relevant | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |

##### StatusProtectedAreas

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-14*.

GUID: {AD022BC1-BB37-4e4d-9024-6EFE7E94618B}

Data for Map 3: Status for Protected Areas (see page 13 CIS Guidance document No. 21).

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  StatusProtectedAreas | Public  GrounWaterBodyDescription |  |
| Aggregation  Source -> Destination | Public  GWProtectedAreaDetails | Public  StatusProtectedAreas |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **isAssociatedWithProtectedAreas** boolean  Public    «voidable» | This part of the schema deals with Protected Areas, in particular:  those covered by Article 7: water bodies used for the abstraction of drinking water which are not covered under any other directives.  In addition:  those Protected Areas that have NOT been reported under other directives before March 2010.  Is the Water Body associated with a Protected Area? Answer Yes/No/Unknown | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |

##### TrendReversalPollutant

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {BD3B09FF-BCA6-42b5-9932-2455F7E7543F}

CONDITIONAL. Required if TrendReversal is Yes. List the pollutant(s) or indicator(s) of pollution for which a significant trend reversal has/have been identified.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = choice. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  TrendReversalPollutant | Public  SignificantTrendReversal |  |
| Dependency  Source -> Destination | Public  TrendReversalPollutant | Public  OtherRelevantPollutant |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **pollutant** GWPollutantsCode  Public | Choose from enumeration list. The list has been derived from the Groundwater Directive 2006/118/EC with an indicative list of pesticides. | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **otherReleventPollutant** OtherReleventPollutan  Public |  | *Default:* |

##### UpwardTrendPollutant

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_ GWB\_Main Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {860B69AF-83BA-41f6-BDD3-5BE8E113713F}

CONDITIONAL. Required if UpwardTrend is Yes. Identify the pollutant(s) or indicator(s) of pollution that is/are causing the significant and sustained upward trend.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = choice. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Dependency  Source -> Destination | Public  UpwardTrendPollutant | Public  OtherRelevantPollutant |  |
| Aggregation  Source -> Destination | Public  UpwardTrendPollutant | Public  SignificantUpwardTrends |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **pollutant** GWPollutantsCode  Public | Choose from enumeration list. The list has been derived from the Groundwater Directive 2006/118/EC with an indicative list of pesticides. | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |
| **otherReleventPollutant** OtherReleventPollutant  Public |  | *Default:* |

#### WFD\_GWB\_EnumerationsAndSimpleTypes

Type: Package «applicationSchema»

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_WFD\_GWB

Detail: *Created on 2011-03-11*. *Last modified on 2011-03-15*

GUID: {F2FF2DAF-B5C5-4c73-9D28-E52133EEA8B9}

This schema defines the common types used by  WFD reporting schemas. It is a reference schema only and does not have its own instance.

History:

17 Mar 2005 YGW

Added the following

String250Type Mandatory String of up to 250 characters

DecimalType Decimal with 3 significant places

PercentageType Percentage with 3 significant decimal places

YesNoCode Yes/No Code

YesNoUnknownCode For Yes, No or Unknown/Not Applicable

CoordinateType Format Degrees Minutes, Decimal fraction of minutes (-)DDMM,MM

ScaleType Format for Scale: 1:nnnnnnnn

AltitudeTypeCode Code for Altitude types (NOT USED)

ConfidenceLevelCode Confidence Level (NOT USED)

RiskStatusCode Codes for Risk status

WaterBodyTypeCode All water body types

SurfaceWaterBodyTypeCode SurfaceWater Type

SystemTypeCode System Type

DesignationCode Designation Code

String2000Type Type to enter string of 1 to 2000 characters

ImportanceCode Importance

EcoregionCode Codes for Ecoregions as defined in Directive

CostRecoveryLevelCode Codes for cost recovery levels

ProtectedAreaCode Codes for Protected area types (NOT USED)

PollutantCategoryCode Category Codes for the Priority Substances and Annex VIII  pollutant groups. Codes 1 -12 match categories provided in AnnexVIII of the WFD

ClassificationCode Codes for data security classification - relevant ISO 19115 terms

NitrogenMethodCode Codes for methods of Nitrogen measurement

20 May 2005 YGW

Deprecated type definitions moved to end of file

CountryCodeType Deprecated

NationalInternationalType Deprecated

MSCodeType Deprecated

YesNoType Deprecated

ProtectedAreaCode Deprecated

CountryCode 2 character Country codes

NationalInternationalCode Code for national or international

Changed name WaterBodyTypeCode to WaterBodyCategoryCode

Changed name SurfaceWaterBodyTypeCode to SurfaceWaterBodyCategoryCode

Removed element PollutantCategoryCode as can be inferred from the CAS number

CoordinateType pattern changed to (-)dd.ddddd

HR added to CountryCode and MSCode Lists

23 Oct 2005 YGW

Lists amend to cater for situations where values are Not Yet Determined, or Not Applicable

ConfidenceLevelCode Added U (Unknown) and UM (yet to be measured)

NitrogenMethodCode Added OT (Other), U (Unknown)

RiskStatusCode Added 0 (Yet to be measured), 9 (Unknown)

SystemTypeCode Added NA (Not Applicable)

YesNoUnknown Added NA (not applicable)

ExceptionTypes Added to define numerical codes: -9999 (Unknown), -8888 (Yet to be measured) -7777 (not applicable)

DecimalBaseType Added base type to define non-negative decimal value

DecimalType Amended to allow numerical codes for exceptions

PercentageBaseTYpe Added base type to define percentage

PercentageType Amended to allow numerical codes for exceptions

NonNegativeIntegerType Added to allow non-negative integer with options for exceptions

11 nov 2005

Amended coordinate type to the . character in the coordinate type element because . means any character

25 Nov 2005

CoordinateType amended to allow greater flexibility

RiskStatusType Amended to include 9 - Unknown, 0 - Yet to be determined

20 Mar 2005 YGW

CountryCode removed JR (used for test purposes only)

added GR - Greece

10 Jun 2006 YGW

FlowDir amended to include U - Unknown

26 Jun 2006 YGW

EcoRegionCode added 26 Cyprus

also added 27, 28, 29 to cater for the French DOM (Guyane, Guadeloupe, Martinique, Reunion). These have yet to be decided

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Amendments to support Article 8 (Monitoring) reporting requirements

07 Jul 2006 YGW

QualityElementCode added codes for Quality Elements

WellOrSpringCode added codes to deteremine if a GW station is a well, spring or other

InvestigativeMonitoringTypeCode added codes for types of investigative monitoring

31 Aug 2006 YGW

GroundwaterElementCode Codes for groundwater element/parameter identifiers

DepthCode Codes for depths at which groundwater monitoring occurs

WellOrSpringCode Codes to identify if a GW station is a well, spring or other

SubsiteTypeCode Codes to describe the type of subsites

InternationalMonitoringNetworkCode Codes for key international monitoring networks

ProgrammeLevelCode Codes for level at which the programme is designed

ReportingLevelCode Codes to describe the reporting level

      ---------------------------------------------------------------------------------------------------------------------------------------------------

      Amendments following article 8 testing

      15/11/2006 YGW

      QualityElementCode added QE3 (missing)

      InternationalMonitoringNetworkCode added new to list

      21/01/2007 YGW

      QualityElementCode added QE2-6-3 - structure of intertidal zone

      GroundwaterElementCode added GE1-1 - groundwater level

      added GE1-2 - groundwater yield

      ------------------------------------------------------------------------------------------------------------------------------------------------

             Article 13 RBMP additions

            November 2006 JDC

            String5000Type added to support RBMP submissions

            YesNoNotApplicableCode added to support RBMP submissions

            AssociatedReferenceStructure added to support RBMP submissions

SWEcologicalStatusTypeCode added to supoort surface water body status reporting

SWChemicalStatusTypeCode added to supoort surface water body status reporting

GWStatusTypeCode added to supoort groundwater body status reporting

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             Streamlining additions

            August 2008 JDC

            CASNumberType added to support classification and status submission

            StatusOrPotentialType added to support status submission

            HeavyMetalTypeCode added to support status submission

PesticidesTypeCode added to supportstatus submission

PrioritySubstancesTypeCode added to support classification and status submission

OtherPollutantsTypeCode added to support classification and status submission

   RiverIntercalibrationTypeCode added to support classification and status submission

   LakeIntercalibrationTypeCode added to support classification and status submission

   TransitionalIntercalibrationTypeCode added to support classification and status submission

   CoastalIntercalibrationTypeCode added to support classification and status submission

            ProtectedAreaType added to support status submission

            ExemptionType added to support status submission

EQSConfidenceType added to support status submission

SWPointSourcePressureType added to support pressure and status submission

SWDiffuseSourcePressureType added to support pressure and status submission

SWAbstractionPressureType added to pressure and status submission

SWWaterFlowMorphType added to support pressure and status submission

SWOtherPressureType added to support pressure and status submission

GWPointSourcePressureType added to support pressure and status submission

GWDiffuseSourcePressureType added to support pressure and status submission

GSWAbstractionPressureType added to support pressure and status submission

GWArtificialRechargeType added to support pressure and status submission

GWIntrusionType added to support pressure and status submission

GWImpactType added to support pressure and status submission

GWClassificationType added to support classification submission

BasicMeasuresType added to support POM submission

        OtherBasicMeasuresType added to support POM submission

       HowMeasuredType added to support Classification submission

        PrioritySubstanceAndCasNumberType added to support Classification submission

        ------------------------------------------------------------------------------------------------------------------------------------------------

   Changes arising from final review by the Commission and Member States based on 30 March 2009 meeting.

            April 2009 JDC

             1. Element renaming following JRR and MS comments

            BasicMeasyresType renamed to MeasuresBasicType

                        CASNumberType renamed to ChemicalCASNumberType

            ChemicalMeasurementType renamed to ChemicalMatrixType

            ClassificationCode renamed to DataConfidentilityClassificationCode

            CoastalBilogicalQEType renamed to QECoastalBiologicalCode

            CoastalHydromorphQEType renamed to QECoastalHydromorphCode

            CoastalIntercallibrationTypeCode renamed to TypologyCoastalIntercallibrationCode

            CodeType renamed to FeatureUniqueCode

             CoordinateType renamed to GeoCoordinateType

             DecimalBaseType renamed to NumberDecimalBaseType

                DecimalCostType renamed to CostDecimalType

               DecimalType renamed to NumberDecimalType

            DepthCode renamed to MonitoringDepthCode

            EQSConfidenceType renamed to StatusConfidenceType

            EUCode Type renamed to FeatureUniqueEUCodeType

            ExceptionType renamed to NumberExceptionType

            ExemptionType renamed to ObjectivesExemptionType

            GroundwaterElementCode renamed to GECode

            GWClassificationType renamed to GWPollutantType

         GWStatusCodeType renamed to GWStatusCode

         GWClassificationType renamed to GWPollutantType

GWQuantativeFailureCode renamed to GWQuantitativeFailureCode

         HowMeasuredType renamed to MethodLoadType

         InternationalMonitoringNetworkCode    renamed to MonitoringInternationalNetworkType

         InvestigativeMonitoringTypeCode renamed to MonitoringInvestigativeCode

         LakeHydromorphQEType renamed to QELakeHydromorphCode

         LakeIntercallibrationTypeCode renamed to TypologyLakeIntercallibrationCode

         NonNegativeIntegerType renamed to NumberNonNegativeIntegerType

         NonPriorityPollutantCode renamed to ChemicalNonPrioritySubstancesCASCode

         OtherBasicMeasureType renamed to MeasureBasicOtherType

         OtherPhysioChemQEType renamed to QEPhysicoChemOtherType

         PercentageBaseType renamed to NumberPercentageBaseType

         PercentageType renamed to NumberPercentageType

         PrioritySubstancesAndCasNumberType renamed to ChemicalPrioritySubstanceType

         ProgrammeLevelCode renamed to MonitoringProgrammeLevelCode

         QualityElementCode renamed to QECode

         ProtectedAreaTypeCode now use ProtectedAreaType

         RiverHydromorphQEType renamed to QERiverHydromorphCode

         RiverIntercallibrationTypeCode renamed to TypologyRiverIntercallibrationCode

         RiverLakeBiologicalQEType renamed to QERiverLakeBiologicalCode

         RiverPhysioChemQEType renamed to QEPhysicoChemRiverType

          SubsiteTypeCode renamed to MonitoringSubsiteCode

         SurfaceWaterBodyCategoryCode renamed to SWCategoryCode

         SWStatusChemicalCode renamed to SWStatusChemicalCode

         SWBilogicalStatusTypeCode now use SWStatusEcologicalCode (no N option)

SWEcologicalStatusTypeCode renamed to SWStatusEcologicalCode

SWGeneralChemicalStatusTypeCode   renamed to SWStatusGeneralPhysicoChemicalCode

SWHydromorphStatusTypeCode renamed to SWStatusHydromorphCode

SWNonPriorityChemicallStatusType renamed to SWStatusNonPrioritySubstancelCode

          SWPressuresRequiringSupplementaryOrAdditionalMeasures    simplified to     SWPressureType

        TransitionalBiologicalQEType renamed to QETransitionalBiologicalCode

        TransitionalHydromorphQEType renamed to QETransitionalHydromorphCode

        TransitionalIntercallibrationTypeCode renamed to TypologyTransitionalIntercallibrationCode

        WellOrSpringCode renamed to GWWellOrSpringCode

2. Rationalisation of QE and GE enumeration list elelments

All QE enumeration lists have been changed to QE number plus the description e.g. QE1-1 Phytoplankton.

Ditto GE enumeration lists.

All QE elelments are now in common and include QECode, RiverQECode, LakeQECode, TransitionalQECode, CoastalQECode, QEcologicalCode, QEBiologicalRiverCode, QEBiologicalLakeCode, QEBiologicalTransitionalCode, QEBiologicalCoastalCode, QEHydrologicalRiverCode, QEHydrologicalLakeCode, QEHydrologicalTransitionalCode and QEHydrologicalCoastalCode.

A new single consolidated QE3-1ParameterType element has been added to replace the QE3-1-1MeasurementType to

QE3-1-6MeasurementType elements.

        The following QE Enumeration list elements were no longer required following restructuring; QE3-1-1MeasurementType,

        QE3-1-2MeasurementType, QE3-1-3MeasurementType, QE3-1-4MeasurementType, QE3-1-5MeasurementType,

        QE3-1-6MeasurementType, RiverPhysioChemQEType, OtherPhysioChemQEType and ChemicalMeasurementType.

3. Elements consolidated into a single enumeration list.

GWPollutantsCode - new element created as a single enumeration list of GWIndividualPesticideCode and GWAnnexIIPollutantsCode. Each item being prefixed by a hierarchy code of 1, 1.1, 1.2 etc. New level 1 entries were created.

ChemicalAllSubstancesType - new element created as a single enumeration list of HeavyMetalType, PesticidesType, PrioritySubstancesOrganicType and OtherPollutantType. Each item being prefixed by a hierarchy code of 1, 1.1, 1.2 etc. New level 1 entries were created. Also 3.3 Pentabromodiphenylether was changed to 3.3 Brominated diphenylether.

SWPressuresType - new element created as a single enumeration list of SWAbstractionPressureType, SWBiologicalExceedenceStatusTypeCode, SWBiologicalStatusTypeCode, SWDiffuseSourcePressureType, SWOtherPressureType, SWPointSourcePressureType and SWWaterFlowMorphType. A two level enumeration list was created prefixed by a hierarchy number 1, 1.1, 1.2, 1.2.1, 1.2.2 etc. New level 1 entries were created. The list was also changed to reflect the new definitions within the Reporting Sheet.

Note that

SWAbstractionPressureType is retained but renamed SWPressureAbstractionType

An element called SWPressureAggregatedType of all SW level 1 pressures has been added

GWPressuresType - new element created as a single enumeration list of GWAbstractionPressureType, GWArtificialRechargeType, GWDiffuseSourcePressureType, GWIntusionType, GWPointSourcePressureType,

A two level enumeration list was created prefixed by a hierarchy number 1, 1.1, 1.2, 1.2.1, 1.2.2 etc. New level 1 entries were created.

Note that

GWAbstractionPressureType is retained but renamed GWPressureAbstractionType

GWArtificialRechargeType is retained but renamed GWPressureRechargeType

An element called GWPressureAggregatedType of all GW level 1 pressures has been added

4. Elements removed after consolidating separate enumeration lists into one

HeavyMetalType, PesticidesType, PrioritySubstancesOrganicType and OtherPollutantType into ChemicalAllSubstancesType.

SWAbstractionPressureType, SWBiologicalExceedenceStatusTypeCode, SWBiologicalStatusTypeCode, SWDiffuseSourcePressureType, SWOtherPressureType, SWPointSourcePressureType and SWWaterFlowMorphType,

GWAbstractionPressureType, GWArtificialRechargeType, GWDiffuseSourcePressureType, GWIntusionType and GWPointSourcePressureType.

IndividualPesticideCode and AnnexIIPollutantsCode.

5. Elements whose enumeration lists have been altered

All QE enumeration lists have been changed to QE number plus the description e.g. QE1-1 Phytoplankton.

Ditto GE enumeration lists.

CountryCode - GR changed to EL for Greece.

ProtectedAreaType - UWWT, Drinking and Abstraction have been removed from the enumeration list. The item "Article 7" has been changed to "Article 7 - abstraction for drinking water"

SWPressureType changed to reflect the new requirements within the Reporting Sheet. The ful list is defined in teh annotation associated with SWPressureType. Effectively all codes have changed as they have been prefixed with a hierarchy.

ChemicalPrioritySubstanceType CAS number now prefixes substance name.

TypologyRiversIntercalibrationCodes - the following codes were removed R-E3, R-E5, R-E6, R-M3, R-N2, R-N7 and R-N9

TypologyLakesIntercalibrationCodes - the following codes were removed L-A3 and L-M1

TypologyTransitionalntercalibrationCodes - the following codes were removed TW-M5, TW-M6 and TW-M7

TypologyCoastalIntercalibrationCodes - the following codes were removed CW-M1, CW-M2, CW-M3 and CW-M4

TypologyCoastalIntercalibrationCodes - the following codes were added NEA1/26e

New elelment SWStatusProtAreaCode added. Enumeration list is as follows 1=high, 2=good, 3=failing, U=unknown

6. Elements added to common

ProtectedAreaSWType - Same as ProtectedAreaType but with UWWT removed.

ProtectedAreaGWType - The list is the same as ProtectedAreaType but with UWWT as an extra entry in the enumeration list

GWPollutantAnnexI-IIType - a subset of GWPollutantType used in GWMethods GWClassification element PolluntantOrIndicator

7. Elements added to common which had previously been described as enumeration lists in separate schemas.

CARoleCode, ChemicalCadmiumClassType, ChemicalDeOxygenatingSubstanceCode, ChemicalNutrientType, Economic2009to2015Code, EconomicWaterServiceType.GWAnnexIIPollutantsCode, GWBackgoundSubstancesCode, GWChemicalFailureCode,GWConcentrationUnitsCode, GWDepthRangeCode, QEEcologicalCode, GWGeologicalFormationCode, GWIndividualPesticideCode, GWMeasureLevelCode, GWQuantativeFailureCode, GWVerticalOrientationCode,  MeasureCostAggregationType, MeasureCostClassificationType, MeasureCoverageType,

MeasureRBDorNationalCode, MeasureSWSupplementaryType, PressureGWAbstractionPeriodType, PressureGWAbstractionUnitType,  PressureLoadUnitType, ProtAreaAssociationType, QE3-1-1MeasurementType,

QE3-1-2MeasurementType, QE3-1-3MeasurementType, QE3-1-4MeasurementType, QE3-1-5MeasurementType,

QE3-1-6MeasurementType, SWNaturalCode.

8. Elements removed from Common

AltitudeTypeCode, ConfidenceLevelCode, CostRecoveryLevelCode, CountryCodeType, DesignationCode, EcoregionCode, FlowDirCode, GWPollutantType, ImportanceCode, MSCodeType, NationalInternationalCode, NationalInternationalType, NitrogenMethodType, OptionalString1000Type, OptionalString100Type, OptionalString250Type, OptionalString500Type, OptionalString50Type, ProtectedAreaCode, ProtectedAreaTypeCode,  RiskStatusCode, SystemTypeCode, WaterBodyCategoryCode ,YesNoType.

             The following elements were created, renamed and then removed during the compilation of the streamlined schemas.

             CoastalQualityElementCode renamed to QECoastalCode

         LakeQualityElementCode renamed to QELakeCode

        RiverQualityElementCode renamed to QERiverCode           TransitionalQualityElementCode renamed to QETransitionalCode

        ------------------------------------------------------------------------------------------------------------------------------------------------

   Changes arising from outcomes of second testing perion 22-oct-2009

1. SWStatusNonPrioritySubstanceCode - Add enumeration '1' corresponding to 'High status'

   2. GWPollutantAnnexI-IIType  - Eliminate the option IndividualPesticides

   3. QE3-1ParameterType  - Add the following:

QE3-1-4 Chloride

QE3-1-4 Sulfate

QE3-1-6 N mineral

QE3-1-3 Dissolved organic carbon

4. Economic2009to2015Code  - Add the option "2009-2015"

5. GWStatusCode - changed annotation - unclassified to unknown

6. EconomicWaterServiceType - replace enumeration list with

-water supply for households

-water supply for industry

-water supply for agriculture

-wastewater collection and treatment for households

-wastewater collection and treatment for industry

-Other

##### WFD\_GWB\_EnumAndSimpleTypes\_Supplementary

Type: Package «applicationSchema»

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes

Detail: *Created on 2011-03-11*. *Last modified on 2011-03-12*

GUID: {9C67A0B0-1513-485d-BF3C-D6D858AFFC00}

**WFD\_GWB\_EnumAndSimpleTypes\_Supplementary** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-03-11

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {13D9E51F-D087-4c82-BA8F-9C26B614E359}



Figure: 27

###### ChemicalAllSubstancesType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumAndSimpleTypes\_Supplementary Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {C239555F-8AA4-424f-A5E1-078584E7EC6A}

Contains Heavy Metals, Pesticides, Priority Substances and Other Pollutants

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **1 Heavy Metals - aggregated** string  Public |  | *Default:* |
| **1.1 Cadmium** string  Public |  | *Default:* |
| **1.2 Lead** string  Public |  | *Default:* |
| **1.3 Mercury** string  Public |  | *Default:* |
| **1.4 Nickel** string  Public |  | *Default:* |
| **2 Pesticides - aggregated** string  Public |  | *Default:* |
| **2.1 Alachlor** string  Public |  | *Default:* |
| **2.2 Atrazine** string  Public |  | *Default:* |
| **2.3 Chlorpyriphos** string  Public |  | *Default:* |
| **2.4 Chlorvenfinphos** string  Public |  | *Default:* |
| **2.5 Diuron** string  Public |  | *Default:* |
| **2.6 Endosulfan** string  Public |  | *Default:* |
| **2.7 Isoproturon** string  Public |  | *Default:* |
| **2.8 Hexachlorocyclohexane** string  Public |  | *Default:* |
| **2.9 Pentachlorobenzene** string  Public |  | *Default:* |
| **2.10 Simazine** string  Public |  | *Default:* |
| **2.11 Trifluralin** string  Public |  | *Default:* |
| **3 Industrial Pollutants - aggregated** string  Public |  | *Default:* |
| **3.1 Anthracene** string  Public |  | *Default:* |
| **3.2 Benzene** string  Public |  | *Default:* |
| **3.3 Brominated diphenylether** string  Public |  | *Default:* |
| **3.4 Carbon tetrachloride** string  Public |  | *Default:* |
| **3.5 C10-13-chloroalkanes** string  Public |  | *Default:* |
| **3.6 1,2-Dichloroethane** string  Public |  | *Default:* |
| **3.7 Dichloromethane** string  Public |  | *Default:* |
| **3.8 Di(2-ethylhexyl)phthalate (DEHP)** string  Public |  | *Default:* |
| **3.9 Naphthalene** string  Public |  | *Default:* |
| **3.10 Nonylphenol** string  Public |  | *Default:* |
| **3.11 Octylphenol** string  Public |  | *Default:* |
| **3.12 Tetrachloroethylene** string  Public |  | *Default:* |
| **3.13 Trichloroethylene** string  Public |  | *Default:* |
| **3.14 Trichloromethane** string  Public |  | *Default:* |
| **4 Other pollutants - aggregated** string  Public |  | *Default:* |
| **4.1 Aldrin** string  Public |  | *Default:* |
| **4.2 Dieldrin** string  Public |  | *Default:* |
| **4.3 Endrin** string  Public |  | *Default:* |
| **4.4 Isodrin** string  Public |  | *Default:* |
| **4.5 DDT Total** string  Public |  | *Default:* |
| **4.6 para-para-DDT** string  Public |  | *Default:* |
| **4.7 Flouranthene** string  Public |  | *Default:* |
| **4.8 Hexachlorobenzene** string  Public |  | *Default:* |
| **4.9 Hexachlorobutadiene** string  Public |  | *Default:* |
| **4.10 Pentachlorophenol** string  Public |  | *Default:* |
| **4.11 Polyaromatic hydrocarbons** string  Public |  | *Default:* |
| **4.12 Benzo(a)pyrene** string  Public |  | *Default:* |
| **4.13 Benzo(b)fluoranthene** string  Public |  | *Default:* |
| **4.14 Benzo(k)fluoranthene** string  Public |  | *Default:* |
| **4.15 Benzo(g,h,i)perylene** string  Public |  | *Default:* |
| **4.16 Indeno(1,2,3-cd)pyrene** string  Public |  | *Default:* |
| **4.17 Tributyltin compounds** string  Public |  | *Default:* |
| **4.18 Trichlorobenzenes (all isomers)** string  Public |  | *Default:* |

###### ChemicalMatrixType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumAndSimpleTypes\_Supplementary Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {5FCD57F6-C918-4c48-B264-D4A1B38C679A}

Defines the types of chemical measurement methods

| Custom Properties | |
| --- | --- |
|  | isActive = False |

*Embedded Elements*

| **Element** | **Detail** | **Notes** |
| --- | --- | --- |
| Port Port1 | Version: 1.0 |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **water** string  Public |  | *Default:* |
| **settled sediment** string  Public |  | *Default:* |
| **suspended sediment** string  Public |  | *Default:* |
| **biota** string  Public |  | *Default:* |

###### EconomicWaterServiceType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumAndSimpleTypes\_Supplementary Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {43ED35C7-4886-4c63-89C4-B4E3AC09A7E6}

An enumeration list of

Water supply for households

Water supply for industry

Water supply for agriculture

Wastewater collection and treatment for households

Wastewater collection and treatment for industry

Other

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **Water supply for households** string  Public |  | *Default:* |
| **Water supply for industry** string  Public |  | *Default:* |
| **Water supply for agriculture** string  Public |  | *Default:* |
| **Wastewater collection and treatment for households** string  Public |  | *Default:* |
| **Wastewater collection and treatment for industry** string  Public |  | *Default:* |
| **Other** string  Public |  | *Default:* |

###### GWMeasureLevelCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumAndSimpleTypes\_Supplementary Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {8D930CD5-EFA5-4e1b-9FC3-555B51F63D11}

An enumeration list of Member State, International RBD, national RBD, part of RBD, Groundwater body

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **Member State** string  Public |  | *Default:* |
| **International RBD** string  Public |  | *Default:* |
| **National** string  Public |  | *Default:* |
| **RBD** string  Public |  | *Default:* |
| **Part of RBD** string  Public |  | *Default:* |
| **Groundwater body** string  Public |  | *Default:* |

###### GWPollutantAnnexI-IIType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumAndSimpleTypes\_Supplementary Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {5B0FAB4D-790D-4731-A95F-D7CD12D34703}

Defines the types of Annex I - II pollutants (of Groundwater Directive 2006/118/EEC) or indicators for Groundwater classification

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **Nitrates** string  Public |  | *Default:* |
| **Arsenic** string  Public |  | *Default:* |
| **Cadmium** string  Public |  | *Default:* |
| **Lead** string  Public |  | *Default:* |
| **Mercury** string  Public |  | *Default:* |
| **Ammonium** string  Public |  | *Default:* |
| **Chloride** string  Public |  | *Default:* |
| **Sulphate** string  Public |  | *Default:* |
| **Trichloroethylene** string  Public |  | *Default:* |
| **Tetrachloroethylene** string  Public |  | *Default:* |
| **Conductivity** string  Public |  | *Default:* |
| **TotalPesticides** string  Public |  | *Default:* |

###### GWPressureAbstractionType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumAndSimpleTypes\_Supplementary Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {BB0220B7-859B-458a-937B-CEE774379BE7}

Defines the list of GW Abstraction pressures

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **3 Abstraction** string  Public |  | *Default:* |
| **3.1 Abstraction - Agriculture** string  Public |  | *Default:* |
| **3.2 Abstraction - Public Water Supply** string  Public |  | *Default:* |
| **3.3 Abstraction - Industry (aggregated)** string  Public |  | *Default:* |
| **3.3.1 Abstraction - IPPC industries** string  Public |  | *Default:* |
| **3.3.2 Abstraction - Non-IPPC industries** string  Public |  | *Default:* |
| **3.4 Abstraction - Quarries** string  Public |  | *Default:* |
| **3.5 Abstraction - Other** string  Public |  | *Default:* |

###### GWPressureAggregatedType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumAndSimpleTypes\_Supplementary Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {33E7BE1C-6F5B-44b5-A54F-A25C3981EC1D}

Defines the list of groundwater aggregated pressures

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **1 Point Sources** string  Public |  | *Default:* |
| **2 Diffuse Sources** string  Public |  | *Default:* |
| **3 Abstraction** string  Public |  | *Default:* |
| **4 Artificial Recharge** string  Public |  | *Default:* |
| **5 Saltwater Intrusion** string  Public |  | *Default:* |
| **6 Other Pressures** string  Public |  | *Default:* |

###### GWPressureRechargeType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumAndSimpleTypes\_Supplementary Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {36B3D614-54AA-4ce5-9022-7EF2BEA7EEF4}

Defines the list of GW Recharge pressures

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **4 Artificial Recharge** string  Public |  | *Default:* |
| **4.1 Recharge - Discharges** string  Public |  | *Default:* |
| **4.2 Recharge - Returns** string  Public |  | *Default:* |
| **4.3 Recharge - Mine water rebound** string  Public |  | *Default:* |
| **4.4 Recharge - Other** string  Public |  | *Default:* |

###### PressureGWAbstractionPeriodType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumAndSimpleTypes\_Supplementary Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {D05E98E7-6390-4378-8400-01A6923564AC}

An enumeration list of yearly, winter, spring, summer, autumn

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **yearly** string  Public |  | *Default:* |
| **winter** string  Public |  | *Default:* |
| **spring** string  Public |  | *Default:* |
| **summer** string  Public |  | *Default:* |
| **autumn** string  Public |  | *Default:* |

###### PressureGWAbstractionUnitType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumAndSimpleTypes\_Supplementary Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {38B5186E-045E-46f8-BAA3-930B0B93A16C}

An enumeration list of m3, 1000m3, 1000000m3

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **m3** string  Public |  | *Default:* |
| **1000m3** string  Public |  | *Default:* |
| **1000000m3** string  Public |  | *Default:* |

##### WFD\_GWB\_EnumerationsAndSimpleTypes

Type: Package «applicationSchema»

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes

Detail: *Created on 2011-03-12*. *Last modified on 2011-04-13*

GUID: {E2870466-9DE9-433b-9877-3203F2D6FF84}

**WFD\_GWB\_EnumerationsAndSimpleTypes** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-03-10

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {731B73F8-5EA2-426b-B484-532655EC76D7}



Figure: 28

###### CountryCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {951AAF1C-49F4-46dd-A600-700AA8B7750E}

Unique 2 character ISO Code for the EU Member States

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **AT** string  Public |  | *Default:* |
| **BE** string  Public |  | *Default:* |
| **BG** string  Public |  | *Default:* |
| **CH** string  Public |  | *Default:* |
| **CZ** string  Public |  | *Default:* |
| **CY** string  Public |  | *Default:* |
| **DE** string  Public |  | *Default:* |
| **DK** string  Public |  | *Default:* |
| **EE** string  Public |  | *Default:* |
| **EL** string  Public |  | *Default:* |
| **ES** string  Public |  | *Default:* |
| **FI** string  Public |  | *Default:* |
| **FR** string  Public |  | *Default:* |
| **HR** string  Public |  | *Default:* |
| **HU** string  Public |  | *Default:* |
| **IE** string  Public |  | *Default:* |
| **IS** string  Public |  | *Default:* |
| **IT** string  Public |  | *Default:* |
| **LT** string  Public |  | *Default:* |
| **LU** string  Public |  | *Default:* |
| **LV** string  Public |  | *Default:* |
| **MT** string  Public |  | *Default:* |
| **NO** string  Public |  | *Default:* |
| **NL** string  Public |  | *Default:* |
| **PL** string  Public |  | *Default:* |
| **PT** string  Public |  | *Default:* |
| **RO** string  Public |  | *Default:* |
| **SE** string  Public |  | *Default:* |
| **SI** string  Public |  | *Default:* |
| **SK** string  Public |  | *Default:* |
| **TR** string  Public |  | *Default:* |
| **UK** string  Public |  | *Default:* |

###### DataConfidentialityClassificationCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {82FC2DE7-6FA3-46e6-B7D4-3E4CE383413C}

Codes for data security classification:

001 = Unclassified - available for general circulation

003 = Confidential - available for EC reporting only

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **001** string  Public |  | *Default:* |
| **003** string  Public |  | *Default:* |

###### GECode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {2B09C28E-CAD0-4042-8803-6270EBF1EBD5}

Codes for groundwater parameter/elements used in groundwater monitoring programmes

Groundwater level and yield GE1

Groundwater level GE1-1

Groundwater yield GE1-2

General parameters – all sub-elements below are determined (as described by Annex 5) GE2

Oxygen content GE2-1

pH Value GE2-2

Conductivity GE2-3

Nitrate GE2-4

Ammonium GE2-5

Other pollutants (e.g. other pollutants not covered above) are determined GE3

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **GE1 Groundwater level and yield** string  Public |  | *Default:* |
| **GE1-1 Groundwater level** string  Public |  | *Default:* |
| **GE1-2 Groundwater yield** string  Public |  | *Default:* |
| **GE2 General parameters** string  Public |  | *Default:* |
| **GE2-1 Oxygen content** string  Public |  | *Default:* |
| **GE2-2 pH Value** string  Public |  | *Default:* |
| **GE2-3 Conductivity** string  Public |  | *Default:* |
| **GE2-4 Nitrate** string  Public |  | *Default:* |
| **GE2-5 Ammonium** string  Public |  | *Default:* |
| **GE3 Other pollutants** string  Public |  | *Default:* |

###### GWBackgoundSubstancesCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {92EED1EA-0458-425a-BB77-4DFEA4D9AB6E}

An enumeration list of Arsenic, Cadmium, Lead, Mercury, Ammonium, Nitrate, Chloride, Sulphate, Conductivity.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **Arsenic** string  Public |  | *Default:* |
| **Cadmium** string  Public |  | *Default:* |
| **Lead** string  Public |  | *Default:* |
| **Mercury** string  Public |  | *Default:* |
| **Ammonium** string  Public |  | *Default:* |
| **Chloride** string  Public |  | *Default:* |
| **Sulphate** string  Public |  | *Default:* |
| **Conductivity** string  Public |  | *Default:* |
| **Nitrate** string  Public |  | *Default:* |

###### GWChemicalFailureCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {333AD9B4-BA28-4cb1-B429-565E456FBD1B}

An enumeration list of saline intrusions, exceedance, environmental, terrestrial, water quality, human impairment and pollutant risk

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **saline intrusions** string  Public |  | *Default:* |
| **exceedance** string  Public |  | *Default:* |
| **environmental** string  Public |  | *Default:* |
| **terrestrial** string  Public |  | *Default:* |
| **water quality** string  Public |  | *Default:* |
| **human impairment** string  Public |  | *Default:* |
| **pollutant risk** string  Public |  | *Default:* |

###### GWConcentrationUnitsCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {BB5E7E47-E273-4717-83C9-5F4C5EAD500A}

An enumeration list of mg/l, µg/l, ng/l, S m-1, µS/cm and Other

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **mg/l** string  Public |  | *Default:* |
| **µg/l** string  Public |  | *Default:* |
| **ng/l** string  Public |  | *Default:* |
| **S m-1** string  Public |  | *Default:* |
| **µS/cm** string  Public |  | *Default:* |
| **Other** string  Public |  | *Default:* |

###### GWDepthRangeCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {83E6056C-25EB-4abc-A4BD-306874057260}

Assignment to a depth range at the point where the main part of the Groundwater Body is situated (depth ranges: 0-20m, 20-50m, 50-200m, >200m)

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **0-20** string  Public |  | *Default:* |
| **20-50** string  Public |  | *Default:* |
| **50-200** string  Public |  | *Default:* |
| **200+** string  Public |  | *Default:* |

###### GWGeologicalFormationCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {6F732E7A-0121-48d3-9E3A-7665E71C64FC}

An enumeration list

Porous - highly productive ,

Porous - moderately productive,

Fissured aquifers including karst - highly productive,

Fissured aquifers including karst - moderately productive,

Insignificant aquifers - local and limited groundwater

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **Porous high** string  Public |  | *Default:* |
| **Porous moderate** string  Public |  | *Default:* |
| **Fissured high** string  Public |  | *Default:* |
| **Fissured moderate** string  Public |  | *Default:* |
| **Insignificant** string  Public |  | *Default:* |

###### GWImpactTypes

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {0B832DFF-821F-4f8f-84EE-27D1E1022F38}

Defines the types of Groundwater Impacts

Anthropogenic alterations of the level of groundwater leading to significant diminution of the ecological and qualitative status of associated surface water bodies;

Chemical composition of groundwater leading to significant diminution of the ecological and qualitative status of associated surface water bodies;

Anthropogenic alterations of the level of groundwater leading to significant damage to terrestrial ecosystems which depend directly on the GWB;

Chemical composition of groundwater leading to significant damage to terrestrial ecosystems which depend directly on the GWB;

Altered habitat in dependent surface water or terrestrial ecosystems;

Substitution of populations;

Other impacts.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **Anthropogenic Diminution** string  Public |  | *Default:* |
| **Chemical Diminution** string  Public |  | *Default:* |
| **Anthropogenic Damage** string  Public |  | *Default:* |
| **Chemical Damage** string  Public |  | *Default:* |
| **Altered Habitat** string  Public |  | *Default:* |
| **Population substitution** string  Public |  | *Default:* |
| **Other Groundwater Impact** string  Public |  | *Default:* |

###### GWPollutantsCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {AC83B971-C29B-46ea-AE46-270EC5BBA772}

An enumeration list of 1. Nitrates; 2. Pesticides - Alachlor, Atrazine, Endosulphan, Isoproturon, Hexachlorocyclohexane, Pentachlorobenzene, Simazine, Trifluralin; 3. Annex II pollutants - Arsenic, Cadmium, Lead, Mercury, Ammonium, Chloride, Sulphate, Trichloroethylene, Tetrachloroethylene, Conductivity.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **1 Nitrates** string  Public |  | *Default:* |
| **2 Pesticides** string  Public |  | *Default:* |
| **2.1 Alachlor** string  Public |  | *Default:* |
| **2.2 Atrazine** string  Public |  | *Default:* |
| **2.3 Endosulfan** string  Public |  | *Default:* |
| **2.4 Isoproturon** string  Public |  | *Default:* |
| **2.5 Hexachlorocyclohexane** string  Public |  | *Default:* |
| **2.6 Pentachlorobenzene** string  Public |  | *Default:* |
| **2.7 Simazine** string  Public |  | *Default:* |
| **2.8 Trifluralin** string  Public |  | *Default:* |
| **3 Annex II pollutant** string  Public |  | *Default:* |
| **3.1 Arsenic** string  Public |  | *Default:* |
| **3.2 Cadmium** string  Public |  | *Default:* |
| **3.3 Lead** string  Public |  | *Default:* |
| **3.4 Mercury** string  Public |  | *Default:* |
| **3.5 Ammonium** string  Public |  | *Default:* |
| **3.6 Chloride** string  Public |  | *Default:* |
| **3.7 Sulphate** string  Public |  | *Default:* |
| **3.8 Trichloroethylene** string  Public |  | *Default:* |
| **3.9 Tetrachloroethylene** string  Public |  | *Default:* |
| **3.10 Conductivity** string  Public |  | *Default:* |

###### GWPressureType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {CE0A7C84-D138-4db4-A958-0044942F7CB3}

Defines the list of groundwater pressures requiring supplementary or additional measures

POINT SOURCES

- Leakages from contaminated sites;

- Leakages from waste disposal sites (landfill and agricultural waste disposal);

- Leakages associated with oil industry infrastructure;

- Mine water discharges;

- Discharges to ground such as disposal of contaminated water to soakaways;

- Other relevant point sources.

DIFFUSE SOURCES

- Due to agricultural activities (e.g. fertilizer and pesticide use, live stock etc.);

- Due to non-sewered population;

- Urban land use;

- Other relevant diffuse sources.

ABSTRACTION OF WATER

- Abstractions for agriculture;

- Abstractions for public water supply;

Abstractions by industry including:

- IPPC industries;

- Non-IPPC industries;

- Abstractions by quarries/open cast coal sites;

- Other major abstractions.

ARTIFICAL RECHARGES

- Discharges to groundwater for artificial recharge purposes;

- Returns of groundwater to GWB from which it was abstracted (e.g. for sand and gravel washing);

- Mine water rebound;

- Other major recharges

OTHER

- Saltwater intrusion;

- Other intrusion.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **1 Point Sources** string  Public |  | *Default:* |
| **2 Diffuse Sources** string  Public |  | *Default:* |
| **3 Abstraction** string  Public |  | *Default:* |
| **4 Artificial Recharge** string  Public |  | *Default:* |
| **5 Saltwater Intrusion** string  Public |  | *Default:* |
| **6 Other Pressures** string  Public |  | *Default:* |
| **1.1 Point - Contaminated Sites** string  Public |  | *Default:* |
| **1.2 Point - Waste Disposal Sites** string  Public |  | *Default:* |
| **1.3 Point - Oil Industry** string  Public |  | *Default:* |
| **1.4 Point - Mine Waters** string  Public |  | *Default:* |
| **1.5 Point - Discharges To Ground** string  Public |  | *Default:* |
| **1.6 Point - Other** string  Public |  | *Default:* |
| **2.1 Diffuse - Agriculture** string  Public |  | *Default:* |
| **2.2 Diffuse - Non-sewered Population** string  Public |  | *Default:* |
| **2.3 Diffuse - Urban Land Use** string  Public |  | *Default:* |
| **2.4 Diffuse - Other** string  Public |  | *Default:* |
| **3.1 Abstraction - Agriculture** string  Public |  | *Default:* |
| **3.2 Abstraction - Public Water Supply** string  Public |  | *Default:* |
| **3.3 Abstraction - Industry (aggregated)** string  Public |  | *Default:* |
| **3.3.1 Abstraction - IPPC industries** string  Public |  | *Default:* |
| **3.3.2 Abstraction - Non-IPPC industries** string  Public |  | *Default:* |
| **3.4 Abstraction - Quarries** string  Public |  | *Default:* |
| **3.5 Abstraction - Other** string  Public |  | *Default:* |
| **4.1 Recharge - Discharges** string  Public |  | *Default:* |
| **4.2 Recharge - Returns** string  Public |  | *Default:* |
| **4.3 Recharge - Mine water rebound** string  Public |  | *Default:* |
| **4.4 Recharge - Other** string  Public |  | *Default:* |
| **5.1 Saltwater intrusion** string  Public |  | *Default:* |
| **5.2 Other intrusion** string  Public |  | *Default:* |

###### GWQuantitativeFailureCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {67E8D607-BCE1-4896-BA2F-081DE57EF506}

An enumeration list of exceedance, environmental, diminution, damage and intrusion.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **exceedance** string  Public |  | *Default:* |
| **environmental** string  Public |  | *Default:* |
| **diminution** string  Public |  | *Default:* |
| **damage** string  Public |  | *Default:* |
| **intrusion** string  Public |  | *Default:* |

###### GWStatusCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {243474E4-4295-4e45-85BA-02F22A27CC45}

Codes for groundwater status 2=good, 3=poor, U=unknown

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **2** string  Public |  | *Default:* |
| **3** string  Public |  | *Default:* |
| **U** string  Public |  | *Default:* |

###### GWVerticalOrientationCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {09634388-F531-44b6-A6EF-E563E8655ABC}

An enumeration list. Horizontal, mainly continuous body; Horizontal, mainly smaller, individual formations;  Declining, mainly continuous body; Declining, mainly smaller, individual formations; Declining and cumulative, mainly continuous body; Declining and cumulative, mainly smaller, individual formations; Boat form, mainly continuous body; Smaller individual boat formed formations; Other

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **Horizontal continuous** string  Public |  | *Default:* |
| **Horizontal individual** string  Public |  | *Default:* |
| **Declining, mainly continuous** string  Public |  | *Default:* |
| **Declining cumulative** string  Public |  | *Default:* |
| **Declining individual** string  Public |  | *Default:* |
| **Boat** string  Public |  | *Default:* |
| **Smaller boat** string  Public |  | *Default:* |
| **Other** string  Public |  | *Default:* |

###### GWWellOrSpringCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {5EAC7941-5056-404a-B2B7-1B5819F8BA22}

Codes for well or spring

W = Well

S  = Spring

O = Other

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **W** string  Public |  | *Default:* |
| **S** string  Public |  | *Default:* |
| **O** string  Public |  | *Default:* |

###### MonitoringDepthCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {B55C0767-C6DF-43fd-B742-1EE48A06B3ED}

Codes for depth at which monitoring occurs

U = Upper

M = Middle

L = Lower

A = Mixed

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **U** string  Public |  | *Default:* |
| **M** string  Public |  | *Default:* |
| **L** string  Public |  | *Default:* |
| **A** string  Public |  | *Default:* |

###### MonitoringInternationalNetworkType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {7AD8EAD7-C8FB-4a11-9887-5A67CAA1B1B9}

International monitoring networks

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **EIONET** string  Public |  | *Default:* |
| **Helsinki Convention(HELCOM)** string  Public |  | *Default:* |
| **Barcelona Convention/Mediterranean Action Plan(MEDPOL)** string  Public |  | *Default:* |
| **Arctic Monitoring and Assessment Programme** string  Public |  | *Default:* |
| **North East Atlantic (OSPAR)** string  Public |  | *Default:* |
| **Bucharest Convention/Black Sea Commission** string  Public |  | *Default:* |
| **Transboundary Waters Convention** string  Public |  | *Default:* |
| **International Commission for the Meuse** string  Public |  | *Default:* |
| **International Scheldt Commission** string  Public |  | *Default:* |
| **International Commission for the Elbe** string  Public |  | *Default:* |
| **International Commission for the Protection of the Danube** string  Public |  | *Default:* |
| **International Commission for the Protection of the Odra/Oder** string  Public |  | *Default:* |
| **International Commission for the Protection of the Rhine against Pollution (ICPR)** string  Public |  | *Default:* |
| **international commission for the protection of the Moselle against pollution** string  Public |  | *Default:* |

###### MonitoringSubsiteCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {CAB993AB-AE04-4ad7-866C-8AAD277C565A}

Codes to define the type of subsite: A= Area, T=Transect, M=Multipoint, N=Not Applicable/None

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **A** string  Public |  | *Default:* |
| **T** string  Public |  | *Default:* |
| **M** string  Public |  | *Default:* |
| **N** string  Public |  | *Default:* |

###### ObjectivesExemptionType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {27E8162F-BA05-4bb7-BC36-910E13675FE4}

Defines the Articles against which exemptions are made

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **Article4(4) -Technical feasibility** string  Public |  | *Default:* |
| **Article4(4) - Disproportionate cost** string  Public |  | *Default:* |
| **Article4(4) - Natural conditions** string  Public |  | *Default:* |
| **Article4(5) -Technical feasibility** string  Public |  | *Default:* |
| **Article4(5) - Disproportionate cost** string  Public |  | *Default:* |
| **Article4(6) - Natural causes** string  Public |  | *Default:* |
| **Article4(6) - Force Majeure** string  Public |  | *Default:* |
| **Article4(6) - Accidents** string  Public |  | *Default:* |
| **Article4(7) - New modification** string  Public |  | *Default:* |
| **Article4(7) - Sustainable human development** string  Public |  | *Default:* |

###### ProtAreaAssociationType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {7A4B9412-0359-42fa-9DA8-7E1CB4A29B8F}

Defines the type of protected Area Association. Options are within protected area, overlapping (partly within) and dynamically connected.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **within protected area** string  Public |  | *Default:* |
| **overlapping (partly within)** string  Public |  | *Default:* |
| **dynamically connected** string  Public |  | *Default:* |

###### ProtectedAreaGWType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {D1CA9712-DAE8-409c-94E0-6FFDFCD75ADF}

Defines Protected Areas types relevant to the classification of Protected Areas associated with Groundwater Bodies

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **Birds** string  Public |  | *Default:* |
| **Habitats** string  Public |  | *Default:* |
| **Nitrates** string  Public |  | *Default:* |
| **Article 7 Abstraction for drinking water** string  Public |  | *Default:* |
| **European other** string  Public |  | *Default:* |
| **National** string  Public |  | *Default:* |
| **Local** string  Public |  | *Default:* |

###### ProtectedAreaType

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {7911EE32-DDB6-4abd-B5D9-9697E13D7792}

Defines all Protected Area types for use in the Register of Protected Areas (Article 6)

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **Bathing** string  Public |  | *Default:* |
| **Birds** string  Public |  | *Default:* |
| **Fish** string  Public |  | *Default:* |
| **Shellfish** string  Public |  | *Default:* |
| **Habitats** string  Public |  | *Default:* |
| **Nitrates** string  Public |  | *Default:* |
| **UWWT** string  Public |  | *Default:* |
| **Article 7 Abstraction for drinking water** string  Public |  | *Default:* |
| **EuropeanOther** string  Public |  | *Default:* |
| **National** string  Public |  | *Default:* |
| **Local** string  Public |  | *Default:* |

###### ReportingLevelCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {43509E95-0927-42a1-8596-097404BF3331}

Codes for describing the reporting level: I = international RBD,  N= National part of international RBD, R = national RBD, S  = regional part or sub-unit of RBD

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **I** string  Public |  | *Default:* |
| **N** string  Public |  | *Default:* |
| **R** string  Public |  | *Default:* |
| **S** string  Public |  | *Default:* |

###### SWStatusProtAreaCode

Type: **Enumeration**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-12*.

GUID: {386C6BAA-8254-4d17-9A67-E34ADB08A367}

Codes for reporting the status of Protected Areas associated with Surface Water Bodies (see section 2.2.5 of this guide for further information):

For Article 7 drinking water and Nitrates Directive Protected Areas: 2=good, 3=failing to achieve good, U=unknown.

For Freshwater Fish and Shellfish Directive Protected Areas: 1=high, 2=good, 3=failing to achieve good, U = unknown.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **1** string  Public |  | *Default:* |
| **2** string  Public |  | *Default:* |
| **3** string  Public |  | *Default:* |
| **U** string  Public |  | *Default:* |

###### ScaleType

Type: **Class** string

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_EnumerationsAndSimpleTypes Keywords:

Detail: *Created on* *2011-03-11*. *Last modified on 2011-03-12*.

GUID: {0275D062-0BFD-4cee-AB3F-408F4F50691A}

Format for Scale: 1:nnnnnnnn

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | derivation = restriction. |
|  | pattern = 1:[0-9]{1,8}. |

#### WFD\_GWB\_Monitoring

Type: Package «applicationSchema»

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_WFD\_GWB

Detail: *Created on 2011-03-11*. *Last modified on 2011-03-12*

GUID: {47CA5BB1-3FBD-41b6-A2AD-A773ED0946F3}

**WFD\_GWB\_Monitoring** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-03-11

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {A8EC22AF-40F6-4fe3-8F7E-D94B2A79308C}



Figure: 29

##### AssociatedGroudWaterBody

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_Monitoring Keywords:

Detail: *Created on* *2011-03-11*. *Last modified on 2011-03-11*.

GUID: {1586CB10-814C-43c2-B94A-223D8C26AF0B}

Waterbodies at which this QE is measured. only required if this is representative of WB other than that identifed as the WB location

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association  Source -> Destination | Public  WFD\_GW\_MonitoringStation | Public  AssociatedGroudWaterBody |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **WFD\_GWB\_code** FeatureUniqueEUCodeType  Public    [1..\*] | Unique code of the groundwater body at EU level as reported in Article 5. | *Default:*    [minOccurs = 1 ]  [maxOccurs = unbounded ] |

##### GW\_MonitoringInternationalNetwork

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_Monitoring Keywords:

Detail: *Created on* *2011-03-11*. *Last modified on 2011-03-11*.

GUID: {6A4789A6-656A-404a-A893-C37402F10CF7}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  WFD\_GW\_MonitoringStation | Public  GW\_MonitoringInternationalNetwork |  |
| Association  Bi-Directional | Public  GW\_MonitoringInternationalNetwork | Public  WFD\_GW\_MonitoringStation |  |
| Aggregation  Source -> Destination | Public  GW\_MonitoringStationDescription | Public  GW\_MonitoringInternationalNetwork |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **name** MonitoringInternationalNetworkType  Public | Name of the international network, e.g. EIONET | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |
| **siteCode** PF\_FreeText  Public    «voidable» | Unique code for the station in this international network | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |

##### GW\_MonitoringStationDescription

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_Monitoring Keywords:

Detail: *Created on* *2011-03-11*. *Last modified on 2011-03-11*.

GUID: {5F39272C-A49E-4d93-8DCC-D285CCAB1BFC}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | memberNames = . Values: qualified | unqualified  Description: Overrides the package-level default for naming complexType definitions |
|  | mixed = false. Values: true | false  Default: false  Description: Determines whether this element may contain mixed element and character content. Refer to the W3C XML Schema recommendation |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  GW\_MonitoringStationDescription | Public  GW\_MonitoringInternationalNetwork |  |
| Aggregation  Source -> Destination | Public  GW\_MonitoringStationDescription | Public  WFD\_GW\_MonitoringStation |  |
| Aggregation  Source -> Destination | Public  GW\_MonitoringStationDescription | Public  WFD\_GW\_MonitoringStation |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **countryCode** CountryCode  Public | Unique 2 character code for the country | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **EU\_RBD\_code** FeatureUniqueEUCodeType  Public | The unique EU code of the parent river basin district | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **WFD\_RBD\_name** PF\_FreeText  Public | Name of  RBD | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |
| **reportingLevel** ReportingLevelCode  Public | Reporting level - international RBD,  National part of international RBD, national RBD, regional part or sub-unit of RBD | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **reportingLevelDescription** PF\_FreeText  Public    «voidable» | Short description of thr reporting level. | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **URL** anyURI  Public    «voidable» | URL for integration of your own internet-based information | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **creationDate** DateTime  Public |  | *Default:*    [use = required ] |
| **creator** PF\_FreeText  Public |  | *Default:*    [use = required ] |
| **email** PF\_FreeText  Public |  | *Default:*    [use = optional ] |
| **description** PF\_FreeText  Public |  | *Default:*    [use = optional ] |
| **generatedBy** PF\_FreeText  Public |  | *Default:*    [use = optional ] |
| **MD\_classificationCode** DataConfidentialityClassificationCode  Public |  | *Default:*    [use = optional ] |

##### Parameter

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_Monitoring Keywords:

Detail: *Created on* *2011-03-11*. *Last modified on 2011-03-11*.

GUID: {202A3322-C67E-4868-AE7A-CBB98E2ED2C8}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  Parameter | Public  WFD\_GW\_MonitoringStation |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **parameterCode** GECode  Public | Code or name of the groundwater element. | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |
| **measuredAs** PF\_FreeText  Public    «voidable» | How the parameter is measured at this site | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **isQuantitative** boolean  Public    «voidable» | Parameter is measured for quantitative purposes at this site | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **isChemicalSurveillance** boolean  Public    «voidable» | Parameter is measuered for chemical surveillance purposes at this site | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **isChemicalOperational** boolean  Public    «voidable» | Parameter is measured for chemical operational purposes at this site | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **subsites** MonitoringSubsiteCode  Public    «voidable» | Subsite Type: Transect, Area , Multipoint or Not Applicable/None | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **frequency** int  Public    «voidable» | Frequency at which the parameter is measured at this station at this site if varies from general programme frequency. | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **cycle** int  Public    «voidable» | Monitoring cycle for this parameter if varies from general programme frequency. Use 0 to indicate  that the parameter is only measured once | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **cycleDescription** PF\_FreeText  Public    «voidable» | If the cycle is dependant on the results of monitoring please summarise here | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **reason** PF\_FreeText  Public    «voidable» | Reason for deviation in frequency or cycle from main programme if appropriate | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |

##### WFD\_GW\_MonitoringStation

Type: **Class** GroundWaterMonitoringStation

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_Monitoring Keywords:

Detail: *Created on* *2011-03-11*. *Last modified on 2011-03-12*.

GUID: {D56258E6-F021-4e84-9148-0DE336C48D51}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  WFD\_GW\_MonitoringStation | Public  GW\_MonitoringInternationalNetwork |  |
| Association  Bi-Directional | Public  GW\_MonitoringInternationalNetwork | Public  WFD\_GW\_MonitoringStation |  |
| Aggregation  Source -> Destination | Public  GW\_MonitoringStationDescription | Public  WFD\_GW\_MonitoringStation |  |
| Aggregation  Source -> Destination | Public  Parameter | Public  WFD\_GW\_MonitoringStation |  |
| Association  Source -> Destination | Public  WFD\_GW\_MonitoringStation | Public  AssociatedGroudWaterBody |  |
| Aggregation  Source -> Destination | Public  GW\_MonitoringStationDescription | Public  WFD\_GW\_MonitoringStation |  |
| Generalization  Source -> Destination | Public  WFD\_GW\_MonitoringStation | Public  GroundWaterMonitoringStation |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **EU\_code** FeatureUniqueEUCodeType  Public | Unique Code for the monitoring station at EU level | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **MS\_code** FeatureUniqueCodeType  Public | Unique Code for the Monitoring station within the MS | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **location** GM\_Point  Public | Longitude in ETRS89 of the monitoring station | *Default:*    [minOccurs = 1 ]  [nillable = true ]  [maxOccurs = 1 ] |
| **GWB\_location** FeatureUniqueEUCodeType  Public | Unique code at EU level as reported in Article 5 of the ground water body which the monitoring station is physically located on or near. | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **name** PF\_FreeText  Public    «voidable» | Locally used name for the monitoring station | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **wellOrSpring** GWWellOrSpringCode  Public | Is the station a well or a spring or other? | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **isQuantitative** boolean  Public | Station is used for quantitative monitoring | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |
| **isChemicalSurveillance** boolean  Public | Station is used for chemical  surveillance monitoring | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |
| **isChemicalOperational** boolean  Public | Station is used for chemical operational monitoring | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **numberOfSubsites** int  Public | Number of subsites normally associated with this station. | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |
| **depth** MonitoringDepthCode  Public    «voidable» | Groundwater layer at which sampling occurs - upper, medium, lower or mixed. | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **isMonitoring** boolean  Public    «voidable» | Site is used for monitoring of groundwater status | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **isForDrinkingWater** boolean  Public    «voidable» | Site is used for drinking water abstraction | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **additionalRequirements** PF\_FreeText  Public    «voidable» | Additional requirements if the station is located in drinking water abstraction areas. | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **isForIndustrialSupply** boolean  Public    «voidable» | Site is used for industrial supply | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **isForIrrigation** boolean  Public    «voidable» | Site is used for irrigation | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **isForOtherPurposes** boolean  Public    «voidable» | Site is used for other purposes. | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **otherNetworks** PF\_FreeText  Public    «voidable» | Brief description of any other networks that this station is a part of | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **URL** anyURI  Public    «voidable» | URL for integration of your own internet-based information for this site | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |

#### WFD\_GWB\_ProtectedArea

Type: Package «applicationSchema»

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology\_WFD\_GWB

Detail: *Created on 2011-03-11*. *Last modified on 2011-03-12*

GUID: {506F8FB3-B8C9-4652-88C9-C771169765DD}

**WFD\_GWB\_ProtectedArea** - *(Logical diagram)*

Created By: Janusz Michalak *on* 2011-03-11

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {72FCCEDF-B28F-4979-8B16-5282757F096B}



Figure: 30

##### ProtectedAreaDescription

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_ProtectedArea Keywords:

Detail: *Created on* *2011-03-10*. *Last modified on 2011-03-11*.

GUID: {7FA75AE9-8994-46d9-8599-D82C0818E1B7}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  ProtectedAreaDescription | Public  WFD\_ProtectedArea |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **countruCode** CountryCode  Public | Two-letter ISO country code | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |
| **EU\_RBD\_code** FeatureUniqueEUCodeType  Public | Unique EU code of the parent River Basin District. Add the two-letter ISO Country code followed by the Member State unique id | *Default:*    [minOccurs = 1 ]  [maxOccurs = 1 ] |
| **URL** anyURI  Public    «voidable» | URL for integration of your own internet-based information | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **creationDate** dateTime  Public |  | *Default:*    [use = required ] |
| **creator** PF\_FreeText  Public |  | *Default:*    [use = required ] |
| **email** styring  Public    «voidable» |  | *Default:*    [use = optional ] |
| **description** PF\_FreeText  Public    «voidable» |  | *Default:*    [use = optional ] |
| **generatedBy** PF\_FreeText  Public    «voidable» |  | *Default:*    [use = optional ] |
| **MD\_classificationCode** DataConfidentialityClassificationCode  Public    «voidable» |  | *Default:*    [use = optional ] |

##### RegisterProtectedAreas

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_ProtectedArea Keywords:

Detail: *Created on* *2011-03-11*. *Last modified on 2011-03-12*.

GUID: {9DBA2A90-587D-42ce-920B-A7258186FE66}

A Register of Protected Areas is required under Art 6 of the WFD. Annex IV of WFD specifies which types of Protected Areas should be included in the register and what the summary of the register (which should be part of the RBMP) should include.

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Association  Bi-Directional | Public  WFD\_ProtectedArea | Public  RegisterProtectedAreas |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **legislation** PF\_FreeText  Public | Provide a list of the Community, national or local legislation under which the Protected Areas have been designated. | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **linkToLegislationReference** AssociatedReferenceStructure  Public    «voidable» | Hyperlink or reference to more detailed information or further documentation | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |

##### Size

Type: **Class**

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_ProtectedArea Keywords:

Detail: *Created on* *2011-03-11*. *Last modified on 2011-03-12*.

GUID: {8AE31564-73D6-4573-B577-DCADC7F1E31C}

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = choice. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Aggregation  Source -> Destination | Public  Size | Public  WFD\_ProtectedArea |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **area** double  Public | Area of the Protected Area in km2 (if more appropriate, length in km should be provided - see LENGTH element) | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **leng** double  Public | Length of the Protected Area in km (if more appropriate, area in km2 should be provided - see AREA element) | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |

##### WFD\_ProtectedArea

Type: **Class** HydrogeologicalFeature

Status: Proposed. Version 1.0. Phase 1.0.

Package: WFD\_GWB\_ProtectedArea Keywords:

Detail: *Created on* *2011-03-11*. *Last modified on 2011-03-14*.

GUID: {6EA2D32E-8343-4b0c-A4AF-D950676A5704}

Only to be used when adding new Protected Area details for an RBD

| Custom Properties | |
| --- | --- |
|  | isActive = False |

|  |  |
| --- | --- |
| Tagged Values | |
|  | modelGroup = sequence. |

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Generalization  Source -> Destination | Public  WFD\_ProtectedArea | Public  HydrogeologicalFeature |  |
| Association  Bi-Directional | Public  WFD\_ProtectedArea | Public  RegisterProtectedAreas |  |
| Aggregation  Source -> Destination | Public  Size | Public  WFD\_ProtectedArea |  |
| Aggregation  Source -> Destination | Public  ProtectedAreaDescription | Public  WFD\_ProtectedArea |  |
| Association LinkForNavigation  Source -> Destination | Public  WFD\_ProtectedArea | Public  ProtectedSite |  |

Attributes

| **Attribute** | **Notes** | **Constraints and tags** |
| --- | --- | --- |
| **EU\_protectedAreaCode** FeatureUniqueEUCodeType  Public | Unique code for the Protected Area at EU level. In the case of Protected Areas reported under other directives please use the same code, preceded by the two-letter ISO Country code if necessary. It is expected that the same and/or overlapping Protected Areas would have different identifying codes under the different Directives under which they are designated. | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **MS\_code** FeatureUniqueCodeType  Public | Unique code for the Protected Area within the MS | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **localName** PF\_FreeText  Public    «voidable» | Local name of the Protected Area | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |
| **centroid** GM\_Point  Public | Latitude in ETRS89 of the centroid of the Protected Area. When linear or area entities are represented as points (centroids) these should be ‘geometric’ centroids in the sense that the point should fall inside a polygon representation or for linear features be a point on the line. | *Default:*    [minOccurs = 1 ]  [nillable = true ]  [maxOccurs = 1 ] |
| **legislationReference** PF\_FreeText  Public    «voidable» | Hyperlink or reference to the  appropriate European / National / Local Legislation under which the area is protected if appropriate | *Default:*    [maxOccurs = 1 ]  [minOccurs = 0 ] |
| **protectedAreaType** ProtectedAreaType  Public | Choose the appropriate Protected Area type from the enumeration list. | *Default:*    [maxOccurs = 1 ]  [minOccurs = 1 ] |
| **URL** anyURI  Public    «voidable» | URL for integration of your own internet-based information | *Default:*    [minOccurs = 0 ]  [maxOccurs = 1 ] |

### Hydrogeology Use Case Model

Type: Package

Status: Proposed. Version . Phase 1.0.

Package: Hydrogeology\_v.0.4

Detail: *Created on 2011-03-15*. *Last modified on 2011-03-15*

GUID: {6886487E-0E77-46e9-B7E6-489CB8338EE8}

**Hydrogeological data model use cases** - *(Use Case diagram)*

Created By: Piotr Wojda *on* 2005-11-19

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {DC6BC96A-A18E-4340-A245-2FB5CC8B887A}



Figure: 31

#### <anonymous>

Type: **Note**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology Use Case Model Keywords:

Detail: *Created on* *2006-01-05*. *Last modified on 2006-01-05*.

GUID: {0BDF5489-BC08-488d-AEDD-4B6743455EF3}

Actors are the users of the system being modeled. Each Actor will have a well-defined role, and in the context of that role have useful interactions with the system.

A person may perform the role of more than one Actor, although they will only assume one role during one use case interaction.

An Actor role may be performed by a non-human system, such as another computer program.

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| NoteLink | Public  Actors | Public  <anonymous> |  |

#### Actors

Type: Package

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology Use Case Model

Detail: *Created on 2005-11-19*. *Last modified on 2011-02-25*

GUID: {8B46A6A6-1210-44df-B3CD-4A7BB4670167}

**Actors** - *(Use Case diagram)*

Created By: Piotr Wojda *on* 2005-11-19

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {EF90DC7B-E074-45ce-BD2B-04B4634403F7}



Figure: 32

##### Hydrogeologist

Type: **Actor**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Actors Keywords:

Detail: *Created on* *2005-11-19*. *Last modified on 2011-02-25*.

GUID: {F99A17F8-3CC3-49d3-8373-21B7ACA58E71}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| UseCaseLink  Source -> Destination | Public  Hydrogeologist | Public  Identify available hydrogeological data web services |  |
| UseCaseLink  Source -> Destination | Public  Hydrogeologist | Public  Access groundwater protection zones data |  |
| UseCaseLink  Source -> Destination | Public  Hydrogeologist | Public  Insert a new groundwater intake data |  |
| UseCaseLink  Source -> Destination | Public  Hydrogeologist | Public  Connect to web discovery/catalogue services |  |
| UseCaseLink  Source -> Destination | Public  Hydrogeologist | Public  Create a groundwater flow model for a new groundwater intake |  |
| UseCaseLink  Source -> Destination | Public  Hydrogeologist | Public  Access groundwater flow system and groundwater bodies data |  |
| UseCaseLink  Source -> Destination | Public  Hydrogeologist | Public  Connect a GIS application to hydrogeological data web services |  |
| UseCaseLink  Source -> Destination | Public  Hydrogeologist | Public  Access aquifer system and aquifers data |  |
| UseCaseLink  Source -> Destination | Public  Hydrogeologist | Public  Access wells and piezometers data |  |

##### Investor

Type: **Actor**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Actors Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {C9941555-CF27-4bb2-B265-3545C9CCB83C}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| UseCaseLink  Source -> Destination | Public  Investor | Public  Connect a GIS application to hydrogeological data web services |  |
| UseCaseLink  Source -> Destination | Public  Investor | Public  Access groundwater protection zones data |  |
| UseCaseLink  Source -> Destination | Public  Investor | Public  Publish an investment project localised within protection zones |  |
| UseCaseLink  Source -> Destination | Public  Investor | Public  Identify available hydrogeological data web services |  |
| UseCaseLink  Source -> Destination | Public  Investor | Public  Connect to web discovery/catalogue services |  |

##### MS-User

Type: **Actor**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Actors Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {1E8438F4-5927-4abf-BC58-DEB7AAE73F5B}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| UseCaseLink  Source -> Destination | Public  MS-User | Public  Investigate the project implementation from a hydrogeological point of view |  |
| UseCaseLink  Source -> Destination | Public  MS-User | Public  Propose a new groundwater sampling scheme |  |

#### Hydrogeological Use Cases

Type: Package

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeology Use Case Model

Detail: *Created on 2005-11-19*. *Last modified on 2011-02-23*

GUID: {4B33C825-94C7-4c77-A7AC-4E6BE2F4983B}

**A new groundwater intake study** - *(Use Case diagram)*

Created By: Piotr Wojda *on* 2005-11-19

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {AF317802-0F5E-43f5-8533-20562D2AE9BF}



Figure: 33

**Protection zones for a groundwater intake** - *(Use Case diagram)*

Created By: Piotr Wojda *on* 2011-02-23

Last Modified: 2012-06-28

Version: 1.0. *Locked:* False

GUID: {9CAC820C-DACF-4a93-ADF6-300FB82D50CF}



Figure: 34

##### Access aquifer system and aquifers data

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {0CD5B122-9654-4c3e-B22D-75DCBF5688EB}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Extend  Source -> Destination | Public  Access geological/lithological data | Public  Access aquifer system and aquifers data |  |
| UseCaseLink  Source -> Destination | Public  Hydrogeologist | Public  Access aquifer system and aquifers data |  |

##### Access existing groundwater flow models

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {301DCB93-ECE2-4f87-8C83-58B2F1516C83}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Extend  Source -> Destination | Public  Access existing groundwater flow models | Public  Access groundwater flow system and groundwater bodies data |  |

##### Access geological/lithological data

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {67D88754-D631-4221-8BB1-096084C4AE75}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Extend  Source -> Destination | Public  Access geological/lithological data | Public  Access aquifer system and aquifers data |  |

##### Access groundwater flow system and groundwater bodies data

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {276AB90B-F9D6-45a5-8C25-2DA6B7599D8D}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| UseCaseLink  Source -> Destination | Public  Hydrogeologist | Public  Access groundwater flow system and groundwater bodies data |  |
| Extend  Source -> Destination | Public  Access existing groundwater flow models | Public  Access groundwater flow system and groundwater bodies data |  |

##### Access groundwater monitoring stations network

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {003AC8E2-9834-4886-A158-3C5F2863EC8F}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Extend  Source -> Destination | Public  Access groundwater monitoring stations network | Public  Propose a new groundwater sampling scheme |  |
| Extend  Source -> Destination | Public  Access groundwater monitoring stations network | Public  Access wells and piezometers data |  |

##### Access groundwater protection zones data

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {7D3AA2C1-8FE7-4b9f-BC97-DF183D1DE7B2}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| UseCaseLink  Source -> Destination | Public  Hydrogeologist | Public  Access groundwater protection zones data |  |
| UseCaseLink  Source -> Destination | Public  Investor | Public  Access groundwater protection zones data |  |
| Extend  Source -> Destination | Public  Access protected sites data | Public  Access groundwater protection zones data |  |
| Extend  Source -> Destination | Public  Access legislation on groundwater intake protection zones | Public  Access groundwater protection zones data |  |

##### Access legislation on groundwater intake protection zones

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {331B325C-F618-42c1-9F29-689A64D460D7}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Extend  Source -> Destination | Public  Access legislation on groundwater intake protection zones | Public  Access groundwater protection zones data |  |

##### Access protected sites data

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {B07D340C-1803-43e5-8792-953858D17F3A}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Extend  Source -> Destination | Public  Access protected sites data | Public  Access groundwater protection zones data |  |

##### Access wells and piezometers data

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {A95A6783-143A-4d33-8D7A-E19DC43E9DDA}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Extend  Source -> Destination | Public  Access groundwater monitoring stations network | Public  Access wells and piezometers data |  |
| UseCaseLink  Source -> Destination | Public  Hydrogeologist | Public  Access wells and piezometers data |  |

##### Connect a GIS application to environmental data web services

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {55AB495F-E303-4374-B980-9772A523656E}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Extend  Source -> Destination | Public  Connect a GIS application to environmental data web services | Public  Connect a GIS application to hydrogeological data web services |  |

##### Connect a GIS application to hydrogeological data web services

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {DD994AC8-1FE4-4e4d-926F-B80669957D4F}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| UseCaseLink  Source -> Destination | Public  Investor | Public  Connect a GIS application to hydrogeological data web services |  |
| Extend  Source -> Destination | Public  Connect a GIS application to environmental data web services | Public  Connect a GIS application to hydrogeological data web services |  |
| UseCaseLink  Source -> Destination | Public  Hydrogeologist | Public  Connect a GIS application to hydrogeological data web services |  |

##### Connect to web discovery/catalogue services

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2005-11-19*. *Last modified on 2011-02-25*.

GUID: {A3438FFF-0B15-4c8a-8FBD-8843C9B00D3B}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| UseCaseLink  Source -> Destination | Public  Hydrogeologist | Public  Connect to web discovery/catalogue services |  |
| UseCaseLink  Source -> Destination | Public  Investor | Public  Connect to web discovery/catalogue services |  |

**Sequence diagram: Use Case1**



###### Object1

Type: **Sequence**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2006-01-05*. *Last modified on 2006-01-05*.

GUID: {C2B2CF8E-C566-4372-956B-DC13A66F5F35}

##### Create a groundwater flow model for a new groundwater intake

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {C1342D9F-885D-4574-81AC-427820E74CD6}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| UseCaseLink  Source -> Destination | Public  Hydrogeologist | Public  Create a groundwater flow model for a new groundwater intake |  |

##### Identify available hydrogeological data web services

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2005-11-20*. *Last modified on 2011-02-25*.

GUID: {058C12C7-8D2E-44e6-BB92-01CE1FB1A1E1}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| UseCaseLink  Source -> Destination | Public  Hydrogeologist | Public  Identify available hydrogeological data web services |  |
| UseCaseLink  Source -> Destination | Public  Investor | Public  Identify available hydrogeological data web services |  |
| Extend  Source -> Destination | Public  Identify environmental data web services | Public  Identify available hydrogeological data web services |  |

##### Identify environmental data web services

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {766FAE2F-B4DE-4575-BA18-F1F9FF82CBBE}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| Extend  Source -> Destination | Public  Identify environmental data web services | Public  Identify available hydrogeological data web services |  |

##### Insert a new groundwater intake data

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {958BCEF0-629D-44f6-AD4D-45F8B84D57FC}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| UseCaseLink  Source -> Destination | Public  Hydrogeologist | Public  Insert a new groundwater intake data |  |

##### Investigate the project implementation from a hydrogeological point of view

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {ED5E5A43-453B-4b0f-9E18-D66BE42DD98B}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| UseCaseLink  Source -> Destination | Public  MS-User | Public  Investigate the project implementation from a hydrogeological point of view |  |

##### Propose a new groundwater sampling scheme

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {94E6B224-8E4E-4400-B22D-2B6E073A97D5}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| UseCaseLink  Source -> Destination | Public  MS-User | Public  Propose a new groundwater sampling scheme |  |
| Extend  Source -> Destination | Public  Access groundwater monitoring stations network | Public  Propose a new groundwater sampling scheme |  |

##### Publish an investment project localised within protection zones

Type: **UseCase**

Status: Proposed. Version 1.0. Phase 1.0.

Package: Hydrogeological Use Cases Keywords:

Detail: *Created on* *2011-02-23*. *Last modified on 2011-02-25*.

GUID: {EC7F11D0-274F-4e5b-A526-810C5DEB4B7F}

*Connections*

| **Connector** | **Source** | **Target** | **Notes** |
| --- | --- | --- | --- |
| UseCaseLink  Source -> Destination | Public  Investor | Public  Publish an investment project localised within protection zones |  |