



**National Hydro Network
Product Distribution Formats**

Edition 1.0.3

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RELEASES HISTORY

Date	Version	Description
2007-06-01	1.0	Initial version
2008-04-15	1.0.1	Correction and update of section 4.3. Addition of « Named Feature » feature to KML format in sections 4.5 and 5.3. These modifications apply to all NHN-CL1 and NHN-CL2 data produced to this date.
2010-02-01	1.0.2	Addition of the “File Geodatabase” (FGDB) format to the National Hydro Network (NHN) product distribution formats and modification of sections 3, 4 and 5 accordingly.
2010-05-17	1.0.3	Addition of the PDF format (image maps) to the National Hydro Network (NHN) product distribution formats and modification of sections 1, 3, 4 and 5 accordingly.

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1 OVERVIEW

Geospatial data from the National Hydro Network (NHN) product are available in three distribution formats: FGDB (File Geodatabase, ESRI™), GML (Geography Markup Language) in ASCII, and Shape (ESRI™). A subset of NHN data is also available in KMZ (compressed version of KML (Keyhole Markup Language)) and image maps are available in PDF (Portable Document Format). This document completes the “National Hydro Network, Data Product Specifications, Distribution Profile” document. It specifically describes the naming of data and metadata files and provides feature names as well as attribute names and data types for those identified in the “National Hydro Network, Feature Catalogue, Distribution Profile” for each distribution format. The “National Hydro Network, Feature Catalogue, Distribution Profile” describes in detail the NHN data feature attributes and domains of possible values.

2 PRODUCT IDENTIFICATION

Name:	National Hydro Network
Version:	1.0
Date:	2007-10-01
Standards:	NHN Standard (conceptual description): <i>National Hydro Network, Canada, Level 1, Product Specifications, Edition 1.0, 2004-08;</i> NHN Standard (conceptual description): <i>National Hydro Network, Canada, Level 1, Data Model, Edition 1.0, 2004-08;</i> NHN Product (data description): <i>National Hydro Network, Data Product Specifications, Distribution Profile, Edition 1.0, 2007-06-01</i>
Feature catalogues:	NHN Standard (conceptual description): <i>National Hydro Network, Canada, Level 1, Linear Referencing System (LRS), Data Catalogue, Edition 1.0, 2004-08;</i> NHN Product (data description): <i>National Hydro Network, Feature Catalogue, Distribution Profile, Edition 1.0.1, 2008-06-01.</i>

3 DISTRIBUTION FORMATS IDENTIFICATION

3.1 FGDB (File GeoDatabase)

Name:	File GeoDatabase (FGDB) (ESRI™)
Version:	Unknown (Outside the public domain)
Date:	2008 (This format was launched with ArcGIS (ESRI™) version 9.2 software.)
Specifications:	Not applicable (Outside the public domain)

3.2 GML (Geography Markup Language)

Name: GML
Version: 2.1.2
Date: 2002-09-17
Specifications: Geography Markup Language – GML – 2.1.2, OpenGIS®Implementation Specifications, OGC Document Number 02-069
http://portal.opengeospatial.org/files/?artifact_id=11339

3.3 Shape

Name: Shape (ESRI™)
Version: 01
Date: July 1998
Specifications: ESRI Shapefile Technical Description, an ESRI White paper - July 1998
(<http://www.esri.com/library/whitepapers/pdfs/shapefile.pdf>)

3.4 KML (Keyhole Markup Language)

Name: KMZ
Version: 2.0
Date: Unknown
Specifications: http://www.keyhole.com/kml/kml_doc.html

3.5 PDF (Portable Document Format)

Name : PDF
Version : 1.7
Date : 2008
Specifications : http://www.adobe.com/devnet/pdf/pdf_reference.html

4 DISTRIBUTION FILES IDENTIFICATION

4.1 FGDB file names

Features of the NHN data product distributed through the File Geodatabase (FGDB) format are grouped per dataset (or NHN Work Unit) inside a directory that bears the “.gdb” extension. The name of the FGDB directory is described as follows:

NHN_<identifier>_<edition>_<version>.gdb

- NHN = National Hydro Network;
- <identifier> = NHN Work Unit identifier (NHN dataset);
- <edition> = Dataset edition number;
- <version> = Dataset version number;
- .gdb = File name extension.

Example:

NHN_05UB000_2_0.gdb (05UB000 NHN dataset, edition 2, version 0 in FGDB format).

It should be noted that the FGDB directory mentioned above usually contains several files, some of which having the following file extensions, namely: .atx, .spx, .freelist, .gdbtable, .gdbindexes, .gdbtblx (e.g. a0000000a.gdbindexes, a0000003a.N_1_Desc_0.atx).

NB In order to facilitate the use of NHN data in FGDB (.gdb) format, an ArcMap project (".mxd", ESRI™), specifically designed for NHN data in FGDB format, was developed. A user guide explaining how to use this ArcMap project with NHN data in FGDB format has also been produced. This ArcMap project as well as the accompanying user guide are available and can be downloaded from the NHN data section of the GeoBase portal (www.GeoBase.ca), directly under the "Use" section (<http://www.geobase.ca/geobase/en/data/nhn/utilisation.html>).

4.2 GML file names

Features of the NHN data product distributed in GML format are grouped into dataset (or NHN Work Unit) files. The name of the GML file is described as follows:

nhn_<identifier>_<edition>_<version>.gml

- nhn = National Hydro Network;
- <identifier> = NHN Work Unit identifier (NHN dataset);
- <edition> = Dataset edition number;
- <version> = Dataset version number;
- .gml = File name extension.

Example:

nhn_05UB000_1_0.gml (05UB000 NHN dataset, edition 1, version 0 in GML format).

A XML schema (XSD file) is also provided with GML data. This file defines, in a structured manner, the type of content, syntax and semantic of GML (and XML) documents. The name of this file is "nhn_<identifier>_<edition>_<version>.xsd" (e.g. nhn_05UB000_1_0.xsd) and is referenced by each GML file.

4.3 Shape file names

Features of the NHN data product distributed in Shape format are grouped according to their geometric representation (point, line, area). The name of the Shape files is described as follows:

NHN_<identifier>_<edition>_<version>_<package code>_<class name>_<geometry code>.shp

- NHN = National Hydro Network;
- <identifier> = NHN Work Unit identifier (NHN dataset);
- <edition> = Dataset edition number;
- <version> = Dataset version number;
- < package code > = NHN package code written in uppercase. Possible codes are: HE, HD, HN, TO where:
 - HE = Hydro Events package;
 - HD = Hydrographic package;
 - HN = Hydro Network package;
 - TO = Toponymy package.
- <class name> = NHN feature class name, written in uppercase, as shown in brackets in the “Attributes specific to NHN features” table of the Shape format further in this document;
- <geometry code> = Code indicating the geometric representation of the NHN feature. Possible values are: 0 (point), 1 (line), 2 (area). This code applies only to features having a geometric representation. Features without a geometric representation, such as Events, are provided without this code.;
- .shp = Extension of the main geometry file name.

In Shape format, there are also three other file types which usually complete the main geometry file of a NHN feature:

- an attribute file (.dbf for dBASE® file);
- a spatial index file (.shx) containing an offset (relative position) for each record of the main geometry file;
- a projection file (.prj) holding information about the reference system used and the cartographic projection parameters.

Examples:

- | | |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| NHN_05UB000_1_0_HD_ISLAND_2.shp | (Island feature from the Hydrographic package with an area-type geometry for NHN dataset 05UB000, edition 1, version 0 in Shape format); |
| NHN_05UB000_1_0_HN_BANK_1.shp | (Bank feature from the Hydro Network package with a line-type geometry for NHN dataset 05UB000, edition 1, version 0 in Shape format). |

4.4 KMZ and KML file names

The KMZ (compressed version of KML) and KML (Keyhole Markup Language) formats are not considered as official formats for the NHN product, because they do not allow the transfer of all NHN features. Thus, only a subset of NHN data is encoded in KMZ and KML, specifically to be used and visualized within the *Google Earth* software environment.

Features of the NHN data product distributed in KMZ format are grouped into dataset (or NHN Work Unit) files. The name of the KMZ file is described as follows:

nhn_rhn_<identifier>_<subdivision>_kml_<language code>.kmz

- nhn_rhn = NHN product acronym in both official languages;

- <identifier> = NHN Work Unit identifier (NHN dataset);
- <subdivision> = Subdivision of the original dataset. Possible codes are: nw, ne, sw, se where :
 - nw = north-western part of the dataset;
 - ne = north-eastern part of the dataset;
 - sw = south-western part of the dataset;
 - se = south-eastern part of the dataset.

Note: This part of the filename is present only when a large NHN dataset had to be divided into four smaller KMZ files in order to reduce processing time in the Google Earth software.
- kml = Keyhole Markup Language format;
- <language code> = Language in which the data is provided (en (English), fr (French));
- .kmz = File name extension (compressed version of KML (Keyhole Markup Language)).

Example:

nhn_rhn_05UB000_kml_en.kmz (05UB000 NHN dataset, in English and KMZ format).

Whereas the name of the KML file contained in the KMZ file is described as follows:

NHN_<identifier>_<edition>_<version>_<subdivision>.kml

- NHN = National Hydro Network;
- <identifier> = NHN Work Unit identifier (NHN dataset);
- <edition> = Dataset edition number;
- <version> = Dataset version number;
- <subdivision> = Subdivision of the original dataset. Possible codes are: nw, ne, sw, se where :
 - nw = north-western part of the dataset;
 - ne = north-eastern part of the dataset;
 - sw = south-western part of the dataset;
 - se = south-eastern part of the dataset.

Note: This part of the filename is present only when a large NHN dataset had to be divided into four smaller KML files in order to reduce processing time in the Google Earth software.
- .kml = File name extension (KML (Keyhole Markup Language) format).

Example:

NHN_05UB000_1_0.kml (05UB000 NHN dataset, edition 1, version 1, in English KML format).

4.5 PDF file names

The PDF (Portable Document Format) format for the distribution of image maps is not considered as official format for the NHN product, because it do not allow the transfer of all NHN features. Thus, only a subset of NHN data is represented in this format to view and to print image maps.

The name of the PDF file is described as follows:

nhn_rhn_<identifier>_<language code>.pdf

- nhn_rhn = NHN product acronym in both official languages;
- <identifier> = NHN Work Unit identifier (NHN dataset);
- <language code> = Language in which the data is provided (en (English), fr (French));
- .pdf = File name extension.

Example:

nhn_rhn_05UB000_en.pdf (05UB000 NHN dataset, in English and PDF format).

4.6 Metadata files

Four metadata files are distributed with each NHN dataset in FGDB, GML or SHAPE format. Two are delivered in FGDC/XML format (in English and in French) and two others in FGDC/HTML format. The name of the NHN metadata files is described as follows:

nhn_rhn_<identifier>_<edition>_<version>_fgdc_<language code>.<format>

- nhn_rhn = NHN product acronym in both official languages;
- <identifier> = NHN Work Unit identifier (NHN dataset);
- <edition> = Dataset edition number;
- <version> = Dataset version number;
- fgdc = Metadata file format according to CSDGM standard of the Federal Geographic Data Committee (FGDC);
- <language code> = Metadata ISO language code written in lowercase: en (English), fr (French);
- <format> = File name extension (.xml or .html).

Examples:

nhn_rhn_05UB000_1_0_fgdc_en.xml (English metadata file for NHN dataset 05UB000, edition 1, version 0 in FGDC/XML format)

nhn_rhn_05UB000_1_0_fgdc_fr.html (French metadata file for NHN dataset 05UB000, edition 1, version 0 in FGDC/HTML format)

4.7 List of distribution file names and feature class names

In the following table, type is expressed as:

- P = point;
- L = line;
- A = area.

Feature catalogue Feature name	FGDB – Feature name	GML – Feature name	Shape – File name	KML – Feature name	Type
Flow Property Event	NHN_HE_FLOWPROPLN_6	NHN_HE_FLOWPROPLN_6	HE_FLOWPROPLN		N/A
Manmade Line Event	NHN_HE_MANMADELN_6	NHN_HE_MANMADELN_6	HE_MANMADELN		N/A
Manmade Point Event	NHN_HE_MANMADEPT_6	NHN_HE_MANMADEPT_6	HE_MANMADEPT		N/A
Obstacle Line Event	NHN_HE_OBSTACLELN_6	NHN_HE_OBSTACLELN_6	HE_OBSTACLELN		N/A
Obstacle Point Event	NHN_HE_OBSTACLEPT_6	NHN_HE_OBSTACLEPT_6	HE_OBSTACLEPT		N/A
Island	NHN_HD_ISLAND_2	NHN_HD_ISLAND_2	HD_ISLAND_2	HD_ISLAND_2	A
Manmade Hydrographic Entity	NHN_HD_MANMADE_0	NHN_HD_MANMADE_0	HD_MANMADE_0	HD_MANMADE_0	P
	NHN_HD_MANMADE_1	NHN_HD_MANMADE_1	HD_MANMADE_1	HD_MANMADE_1	L
	NHN_HD_MANMADE_2	NHN_HD_MANMADE_2	HD_MANMADE_2	HD_MANMADE_2	A
Hydrographic Obstacle Entity	NHN_HD_OBSTACLE_0	NHN_HD_OBSTACLE_0	HD_OBSTACLE_0	HD_OBSTACLE_0	P
	NHN_HD_OBSTACLE_1	NHN_HD_OBSTACLE_1	HD_OBSTACLE_1	HD_OBSTACLE_1	L
	NHN_HD_OBSTACLE_2	NHN_HD_OBSTACLE_2	HD_OBSTACLE_2	HD_OBSTACLE_2	A
Single Line Watercourse	NHN_HD_SLWATER_1	NHN_HD_SLWATER_1	HD_SLWATER_1		L
Waterbody	NHN_HD_WATERBODY_2	NHN_HD_WATERBODY_2	HD_WATERBODY_2	HD_WATERBODY_2	A
Bank	NHN_HN_BANK_1	NHN_HN_BANK_1	HN_BANK_1		L
Delimiter	NHN_HN_DELIMITER_1	NHN_HN_DELIMITER_1	HN_DELIMITER_1		L
Hydro Junction	NHN_HN_HYDROJUNCT_0	NHN_HN_HYDROJUNCT_0	HN_HYDROJUNCT_0		P
Littoral	NHN_HN_LITTORAL_1	NHN_HN_LITTORAL_1	HN_LITTORAL_1	HN_LITTORAL_1	L
Network Linear Flow	NHN_HN_NLFLOW_1	NHN_HN_NLFLOW_1	HN_NLFLOW_1	HN_NLFLOW_1	L
Named Feature	NHN_TO_NAMEDFEA_0	NHN_TO_NAMEDFEA_0	TO_NAMEDFEA_0	TO_NAMEDFEA_0	P
	NHN_TO_NAMEDFEA_1	NHN_TO_NAMEDFEA_1	TO_NAMEDFEA_1		L
	NHN_TO_NAMEDFEA_2	NHN_TO_NAMEDFEA_2	TO_NAMEDFEA_2		A
NHN Work Unit Limit	NHN_WORKUNIT_LIMIT_2	NHN_WORKUNIT_LIMIT_2	WORKUNIT_LIMIT_2	WORKUNIT_LIMIT_2	A
Network Analysis (ArcGIS Geometric Network) ***	NHN_HN_PrimaryDirectedNLFlow_1				L

*** **NB** A Group Layer that is not part of the NHN Feature Catalogue appears at the bottom of the table above, namely the "Network Analysis (ArcGIS Geometric Network)". This group is specific to the FGDB format and contains only one data layer, that is the "NHN_HN_PrimaryDirectedNLFlow_1". This additional data layer has been added to the NHN FGDB format to allow a quicker and easier exploitation of NHN network data under the form of an ArcGIS Geometric Network. For more information about this please refer to the NHN User Guide Series, in particular the User Guide

explaining how to use the ArcMap project with NHN data in FGDB format. This ArcMap project as well as the accompanying user guide are available and can be downloaded from the NHN data section of the GeoBase portal (www.GeoBase.ca), directly under the "Use" section (<http://www.geobase.ca/geobase/en/data/nhn/utilisation.html>).

5 ATTRIBUTES IDENTIFICATION

The attributes common to all NHN features are identified in the first table under each format. Attributes specific to each feature are presented in the second table.

In the following tables, data type is expressed as:

- Int = integer;
- Real = real number;
- C(c) = character (c = number of characters);
- N(n,d) = number (n = total number of digits, d = number of decimals).

5.1 FGDB format

5.1.1 Attributes common to all NHN features

Feature catalogue Attribute name	File Geodatabase Attribute name	FGDB Data type
Acquisition Technique	acquisitionTechnique	Int
Completely Cover	completelyCover	Int
Dataset Name	datasetName	C(50)
Planimetric Accuracy	planimetricAccuracy	Int
Provider	provider	Int
Validity Date	validityDate	C(8)

5.1.2 Attributes specific to NHN features

Feature catalogue Feature name	Feature catalogue Attribute name	File Geodatabase Attribute name	FGDB Data type
Bank	From Junction	fromJunction	C(32)
	Island NID	islandNid	C(32)
	Isolated	isolated	Int
	NID	nid	C(32)
	Permanency	permanency	Int
	Shoreline Water Level	shorelineWaterLevel	Int
	To Junction	toJunction	C(32)
	Waterbody NID	waterbodyNid	C(32)
	Water Definition	waterDefinition	Int
waterDefinitionText		C(100)	

Feature catalogue Feature name	Feature catalogue Attribute name	File Geodatabase Attribute name	FGDB Data type
Delimiter	Delimiter Type	delimiterType	Int
	From Junction	fromJunction	C(32)
	Island 1 NID	islandNid1	C(32)
	Island 2 NID	islandNid2	C(32)
	NID	nid	C(32)
	To Junction	toJunction	C(32)
	Waterbody 1 NID	waterbodyNid1	C(32)
	Waterbody 2 NID	waterbodyNid2	C(32)
Flow Property Event	From Point Position	from	Real
	Network Linear Element Class Name	networkLinearElementClassName	C(100)
	Network Linear Element NID	networkLinearElementNid	C(32)
	NID	nid	C(32)
	To Point Position	to	Real
	Water Definition	waterDefinition	Int
waterDefinitionText		C(100)	
Hydrographic Obstacle Entity	Geographical Name Database	geographicalNameDB	C(100)
	ID Date	idDate	C(8)
	Name Date	nameDate	C(8)
	Name ID 1	nameId1	C(32)
	Name ID 2	nameId2	C(32)
	Name 1	name1	C(100)
	Name 2	name2	C(100)
	NID	nid	C(32)
Obstacle Type		obstacleType	Int
	obstacleTypeText	C(100)	
Hydro Junction	Junction Type	junctionType	Int
	NID	nid	C(32)
Island	Coastal Island	coastalIsland	Int
	Geographical Name Database	geographicalNameDB	C(100)
	ID Date	idDate	C(8)
	Name Date	nameDate	C(8)
	Name ID 1	nameId1	C(32)
	Name ID 2	nameId2	C(32)
	Name 1	name1	C(100)
	Name 2	name2	C(100)
	NID	nid	C(32)
Sand Island	sandIsland	Int	
Littoral	From Junction	fromJunction	C(32)
	Island NID	islandNid	C(32)
	NID	nid	C(32)

Feature catalogue Feature name	Feature catalogue Attribute name	File Geodatabase Attribute name	FGDB Data type
	Shoreline Water Level	shorelineWaterLevel	Int
	To Junction	toJunction	C(32)
Manmade Hydrographic Entity	Geographical Name Database	geographicalNameDB	C(100)
	ID Date	idDate	C(8)
	Manmade Status	manmadeStatus	Int
	Manmade Type	manmadeType	Int
		manmadeTypeText	C(100)
	Name Date	nameDate	C(8)
	Name ID 1	nameId1	C(32)
	Name ID 2	nameId2	C(32)
	Name 1	name1	C(100)
	Name 2	name2	C(100)
NID	nid	C(32)	
Manmade Line Event	From Point Position	from	Real
	Hydrographic Entity Class Name	hydrographicEntityClassName	C(100)
	Manmade Hydrographic Entity NID	manmadeHydrographicEntityNid	C(32)
	Manmade Status	manmadeStatus	Int
	Manmade Type	manmadeType	Int
		manmadeTypeText	C(100)
	Network Linear Element Class Name	networkLinearElementClassName	C(100)
	Network Linear Element NID	networkLinearElementNid	C(32)
	NID	nid	C(32)
To Point Position	to	Real	
Manmade Point Event	From Point Position	from	Real
	Hydrographic Entity Class Name	hydrographicEntityClassName	C(100)
	Manmade Hydrographic Entity NID	manmadeHydrographicEntityNid	C(32)
	Manmade Status	manmadeStatus	Int
	Manmade Type	manmadeType	Int
		manmadeTypeText	C(100)
	Network Linear Element Class Name	networkLinearElementClassName	C(100)
	Network Linear Element NID	networkLinearElementNid	C(32)
NID	nid	C(32)	
Named Feature	Entity Type	entityType	Int
	Geographical Name Database	geographicalNameDB	C(100)
	ID Date	idDate	C(8)
	Name	name	C(100)
	Name Date	nameDate	C(8)
	Name ID	nameId	C(32)
	NID	nid	C(32)
	Related NID	relatedNid	C(32)

Feature catalogue Feature name	Feature catalogue Attribute name	File Geodatabase Attribute name	FGDB Data type
Network Linear Flow	Flow Direction	flowDirection	Int
	From Junction	fromJunction	C(32)
	Geographical Name Database	geographicalNameDB	C(100)
	ID Date	idDate	C(8)
	Isolated	isolated	Int
	Level Priority	levelPriority	Int
	Name Date	nameDate	C(8)
	Name ID 1	nameId1	C(32)
	Name ID 2	nameId2	C(32)
	Name 1	name1	C(100)
	Name 2	name2	C(100)
	Network Flow Type	networkFlowType	Int
	NID	nid	C(32)
	To Junction	toJunction	C(32)
Obstacle Line Event	From Point Position	from	Real
	Hydrographic Entity Class Name	hydrographicEntityClassName	C(100)
	Network Linear Element Class Name	networkLinearElementClassName	C(100)
	Network Linear Element NID	networkLinearElementNid	C(32)
	NID	nid	C(32)
	Obstacle Hydrographic Entity NID	obstacleHydrographicEntityNid	C(32)
	Obstacle Type	obstacleType	Int
		obstacleTypeText	C(100)
To Point Position	to	Real	
Obstacle Point Event	From Point Position	from	Real
	Hydrographic Entity Class Name	hydrographicEntityClassName	C(100)
	Network Linear Element Class Name	networkLinearElementClassName	C(100)
	Network Linear Element NID	networkLinearElementNid	C(32)
	NID	nid	C(32)
	Obstacle Hydrographic Entity NID	obstacleHydrographicEntityNid	C(32)
	Obstacle Type	obstacleType	Int
		obstacleTypeText	C(100)
Primary Directed Network Linear Flow (Geometric Network)	Flow Direction	flowDirection	Int
	From Junction	fromJunction	C(32)
	Geographical Name Database	geographicalNameDB	C(100)
	ID Date	idDate	C(8)
	Isolated	isolated	Int
	Level Priority	levelPriority	Int
	Name Date	nameDate	C(8)
	Name ID 1	nameId1	C(32)
	Name ID 2	nameId2	C(32)

Feature catalogue Feature name	Feature catalogue Attribute name	File Geodatabase Attribute name	FGDB Data type
	Name 1	name1	C(100)
	Name 2	name2	C(100)
	Network Flow Type	networkFlowType	Int
	NID	nid	C(32)
	To Junction	toJunction	C(32)
Single Line Watercourse	Geographical Name Database	geographicalNameDB	C(100)
	ID Date	idDate	C(8)
	Isolated	isolated	Int
	Name Date	nameDate	C(8)
	Name ID 1	nameId1	C(32)
	Name ID 2	nameId2	C(32)
	Name 1	name1	C(100)
	Name 2	name2	C(100)
	NID	nid	C(32)
	Permanency	permanency	Int
	Water Definition	waterDefinition	Int
waterDefinitionText		C(100)	
Waterbody	Geographical Name Database	geographicalNameDB	C(100)
	ID Date	idDate	C(8)
	Isolated	isolated	Int
	Lake ID 1	lakeId1	C(32)
	Lake ID 2	lakeId2	C(32)
	Lake Name 1	lakeName1	C(100)
	Lake Name 2	lakeName2	C(100)
	Name Date	nameDate	C(8)
	NID	nid	C(32)
	River ID 1	riverId1	C(32)
	River ID 2	riverId2	C(32)
	River Name 1	riverName1	C(100)
	River Name 2	riverName2	C(100)
	Permanency	permanency	Int
	Water Definition	waterDefinition	Int
		waterDefinitionText	C(100)

5.1.3 Attributes specific to non-NHN features

Feature catalogue Feature name	Feature catalogue Attribute name	File Geodatabase Attribute name	FGDB Data type
NHN Work Unit Limit	Dataset Name	datasetName	C(50)
	Edition	edition	C(2)

Feature catalogue Feature name	Feature catalogue Attribute name	File Geodatabase Attribute name	FGDB Data type
	Province Code 1	provinceCode1	C(100)
	Province Code 2	provinceCode2	C(100)
	Province Code 3	provinceCode3	C(100)
	Province Code 4	provinceCode4	C(100)
	Validity Date	validityDate	C(8)
	Version	version	C(2)

5.2 GML format

5.2.1 Attributes common to all NHN features

Feature catalogue Attribute name	GML Attribute name	GML Data type
Acquisition Technique	acquisitionTechnique	Int
Completely Cover	completelyCover	Int
Dataset Name	datasetName	C(50)
Planimetric Accuracy	planimetricAccuracy	Int
Provider	provider	Int
Validity Date	validityDate	C(8)

5.2.2 Attributes specific to NHN features

Feature catalogue Feature name	Feature catalogue Attribute name	GML Attribute name	GML Data type
Bank	From Junction	fromJunction	C(32)
	Island NID	islandNid	C(32)
	Isolated	isolated	Int
	NID	nid	C(32)
	Permanency	permanency	Int
	Shoreline Water Level	shorelineWaterLevel	Int
	To Junction	toJunction	C(32)
	Waterbody NID	waterbodyNid	C(32)
	Water Definition	waterDefinition	Int
waterDefinitionText		C(100)	
Delimiter	Delimiter Type	delimiterType	Int
	From Junction	fromJunction	C(32)
	Island 1 NID	islandNid1	C(32)
	Island 2 NID	islandNid2	C(32)
	NID	nid	C(32)
	To Junction	toJunction	C(32)

Feature catalogue Feature name	Feature catalogue Attribute name	GML Attribute name	GML Data type
	Waterbody 1 NID	waterbodyNid1	C(32)
	Waterbody 2 NID	waterbodyNid2	C(32)
Flow Property Event	From Point Position	from	Real
	Network Linear Element Class Name	networkLinearElementClassName	C(100)
	Network Linear Element NID	networkLinearElementNid	C(32)
	NID	nid	C(32)
	To Point Position	to	Real
	Water Definition	waterDefinition	Int
		waterDefinitionText	C(100)
Hydrographic Obstacle Entity	Geographical Name Database	geographicalNameDB	C(100)
	ID Date	idDate	C(8)
	Name Date	nameDate	C(8)
	Name ID 1	nameId1	C(32)
	Name ID 2	nameId2	C(32)
	Name 1	name1	C(100)
	Name 2	name2	C(100)
	NID	nid	C(32)
	Obstacle Type	obstacleType	Int
		obstacleTypeText	C(100)
Hydro Junction	Junction Type	junctionType	Int
	NID	nid	C(32)
Island	Coastal Island	coastalIsland	Int
	Geographical Name Database	geographicalNameDB	C(100)
	ID Date	idDate	C(8)
	Name Date	nameDate	C(8)
	Name ID 1	nameId1	C(32)
	Name ID 2	nameId2	C(32)
	Name 1	name1	C(100)
	Name 2	name2	C(100)
	NID	nid	C(32)
	Sand Island	sandIsland	Int
Littoral	From Junction	fromJunction	C(32)
	Island NID	islandNid	C(32)
	NID	nid	C(32)
	Shoreline Water Level	shorelineWaterLevel	Int
	To Junction	toJunction	C(32)
Manmade Hydrographic Entity	Geographical Name Database	geographicalNameDB	C(100)
	ID Date	idDate	C(8)
	Manmade Status	manmadeStatus	Int
	Manmade Type	manmadeType	Int

Feature catalogue Feature name	Feature catalogue Attribute name	GML Attribute name	GML Data type
		manmadeTypeText	C(100)
	Name Date	nameDate	C(8)
	Name ID 1	nameId1	C(32)
	Name ID 2	nameId2	C(32)
	Name 1	name1	C(100)
	Name 2	name2	C(100)
	NID	nid	C(32)
Manmade Line Event	From Point Position	from	Real
	Hydrographic Entity Class Name	hydrographicEntityClassName	C(100)
	Manmade Hydrographic Entity NID	manmadeHydrographicEntityNid	C(32)
	Manmade Status	manmadeStatus	Int
		manmadeType	Int
	Manmade Type	manmadeTypeText	C(100)
		Network Linear Element Class Name	networkLinearElementClassName
	Network Linear Element NID	networkLinearElementNid	C(32)
NID	nid	C(32)	
To Point Position	to	Real	
Manmade Point Event	From Point Position	from	Real
	Hydrographic Entity Class Name	hydrographicEntityClassName	C(100)
	Manmade Hydrographic Entity NID	manmadeHydrographicEntityNid	C(32)
	Manmade Status	manmadeStatus	Int
		manmadeType	Int
	Manmade Type	manmadeTypeText	C(100)
		Network Linear Element Class Name	networkLinearElementClassName
	Network Linear Element NID	networkLinearElementNid	C(32)
NID	nid	C(32)	
Named Feature	Entity Type	entityType	Int
	Geographical Name Database	geographicalNameDB	C(100)
	ID Date	idDate	C(8)
	Name	name	C(100)
	Name Date	nameDate	C(8)
	Name ID	nameId	C(32)
	NID	nid	C(32)
	Related NID	relatedNid	C(32)
Network Linear Flow	Flow Direction	flowDirection	Int
	From Junction	fromJunction	C(32)
	Geographical Name Database	geographicalNameDB	C(100)
	ID Date	idDate	C(8)
	Isolated	isolated	Int
	Level Priority	levelPriority	Int

Feature catalogue Feature name	Feature catalogue Attribute name	GML Attribute name	GML Data type
	Name Date	nameDate	C(8)
	Name ID 1	nameId1	C(32)
	Name ID 2	nameId2	C(32)
	Name 1	name1	C(100)
	Name 2	name2	C(100)
	Network Flow Type	networkFlowType	Int
	NID	nid	C(32)
	To Junction	toJunction	C(32)
Obstacle Line Event	From Point Position	from	Real
	Hydrographic Entity Class Name	hydrographicEntityClassName	C(100)
	Network Linear Element Class Name	networkLinearElementClassName	C(100)
	Network Linear Element NID	networkLinearElementNid	C(32)
	NID	nid	C(32)
	Obstacle Hydrographic Entity NID	obstacleHydrographicEntityNid	C(32)
	Obstacle Type	obstacleType	Int
		obstacleTypeText	C(100)
To Point Position	to	Real	
Obstacle Point Event	From Point Position	from	Real
	Hydrographic Entity Class Name	hydrographicEntityClassName	C(100)
	Network Linear Element Class Name	networkLinearElementClassName	C(100)
	Network Linear Element NID	networkLinearElementNid	C(32)
	NID	nid	C(32)
	Obstacle Hydrographic Entity NID	obstacleHydrographicEntityNid	C(32)
	Obstacle Type	obstacleType	Int
		obstacleTypeText	C(100)
Single Line Watercourse	Geographical Name Database	geographicalNameDB	C(100)
	ID Date	idDate	C(8)
	Isolated	isolated	Int
	Name Date	nameDate	C(8)
	Name ID 1	nameId1	C(32)
	Name ID 2	nameId2	C(32)
	Name 1	name1	C(100)
	Name 2	name2	C(100)
	NID	nid	C(32)
	Permanency	permanency	Int
	Water Definition	waterDefinition	Int
		waterDefinitionText	C(100)
Waterbody	Geographical Name Database	geographicalNameDB	C(100)
	ID Date	idDate	C(8)
	Isolated	isolated	Int

Feature catalogue Feature name	Feature catalogue Attribute name	GML Attribute name	GML Data type
	Lake ID 1	lakeId1	C(32)
	Lake ID 2	lakeId2	C(32)
	Lake Name 1	lakeName1	C(100)
	Lake Name 2	lakeName2	C(100)
	Name Date	nameDate	C(8)
	NID	nid	C(32)
	River ID 1	riverId1	C(32)
	River ID 2	riverId2	C(32)
	River Name 1	riverName1	C(100)
	River Name 2	riverName2	C(100)
	Permanency	permanency	Int
	Water Definition	waterDefinition	Int
		waterDefinitionText	C(100)

5.2.3 Attributes specific to non-NHN features

Feature catalogue Feature name	Feature catalogue Attribute name	GML Attribute name	GML Data type
NHN Work Unit Limit	Dataset Name	datasetName	C(50)
	Edition	edition	C(2)
	Province Code 1	provinceCode1	C(100)
	Province Code 2	provinceCode2	C(100)
	Province Code 3	provinceCode3	C(100)
	Province Code 4	provinceCode4	C(100)
	Validity Date	validityDate	C(8)
	Version	version	C(2)

5.3 Shape format

5.3.1 Attributes common to all NHN Features

Feature catalogue Attribute name	Shape Attribute name	Shape Data type
Acquisition Technique	ACQTECH	N(2,0)
Completely Cover	METACOVER	N(2,0)
Dataset Name	DATASETNAM	C(50)
Planimetric Accuracy	ACCURACY	N(2,0)
Provider	PROVIDER	N(2,0)
Validity Date	VALDATE	C(8)

5.3.2 Attributes specific to NHN features

Feature catalogue Feature name	Feature catalogue Attribute name	Shape Attribute name	Shape Data type
Bank (BANK)	From Junction	FROM_JUNCT	C(32)
	Island NID	ISLANDNID	C(32)
	Isolated	ISOLATED	N(2,0)
	NID	NID	C(32)
	Permanency	PERMANENCY	N(2,0)
	Shoreline Water Level	WATERLEVEL	N(2,0)
	To Junction	TO_JUNCT	C(32)
	Waterbody NID	WATBODNID	C(32)
	Water Definition	DEFINITION	N(3,0)
TYPE_TEXT		C(100)	
Delimiter (DELIMITER)	Delimiter Type	TYPE	N(4,0)
	From Junction	FROM_JUNCT	C(32)
	Island 1 NID	ISLANDNID1	C(32)
	Island 2 NID	ISLANDNID2	C(32)
	NID	NID	C(32)
	To Junction	TO_JUNCT	C(32)
	Waterbody 1 NID	WATBODNID1	C(32)
	Waterbody 2 NID	WATBODNID2	C(32)
Flow Property Event (FLOWPROPLN)	From Point Position	FROM	N(3,3)
	Network Linear Element Class Name	NETWORKNAM	C(100)
	Network Linear Element NID	NETWORKNID	C(32)
	NID	NID	C(32)
	To Point Position	TO	N(3,3)
	Water Definition	DEFINITION	N(3,0)
TYPE_TEXT		C(100)	
Hydrographic Obstacle Entity (OBSTACLE)	Geographical Name Database	GEONAMEDB	C(100)
	ID Date	IDDATE	C(8)
	Name Date	NAMEDATE	C(8)
	Name ID 1	NAMEID_1	C(32)
	Name ID 2	NAMEID_2	C(32)
	Name 1	NAME_1	C(100)
	Name 2	NAME_2	C(100)
	NID	NID	C(32)
	Obstacle Type	TYPE	N(4,0)
TYPE_TEXT		C(100)	
Hydro Junction (HYDROJUNCT)	Junction Type	TYPE	N(4,0)
	NID	NID	C(32)
Island (ISLAND)	Coastal Island	COASTAL	N(2,0)
	Geographical Name Database	GEONAMEDB	C(100)

Feature catalogue Feature name	Feature catalogue Attribute name	Shape Attribute name	Shape Data type
	ID Date	IDDATE	C(8)
	Name Date	NAMEDATE	C(8)
	Name ID 1	NAMEID_1	C(32)
	Name ID 2	NAMEID_2	C(32)
	Name 1	NAME_1	C(100)
	Name 2	NAME_2	C(100)
	NID	NID	C(32)
	Sand Island	SAND	N(2,0)
Littoral (LITTORAL)	From Junction	FROM_JUNCT	C(32)
	Island NID	ISLANDNID	C(32)
	NID	NID	C(32)
	Shoreline Water Level	WATERLEVEL	N(2,0)
	To Junction	TO_JUNCT	C(32)
Manmade Hydrographic Entity (MANMADE)	Geographical Name Database	GEONAMEDB	C(100)
	ID Date	IDDATE	C(8)
	Manmade Status	STATUS	N(2,0)
	Manmade Type	TYPE	N(4,0)
		TYPE_TEXT	C(100)
	Name Date	NAMEDATE	C(8)
	Name ID 1	NAMEID_1	C(32)
	Name ID 2	NAMEID_2	C(32)
	Name 1	NAME_1	C(100)
	Name 2	NAME_2	C(100)
NID	NID	C(32)	
Manmade Line Event (MANMADELN)	From Point Position	FROM	N(3,3)
	Hydrographic Entity Class Name	HYDRONAME	C(100)
	Manmade Hydrographic Entity NID	HYDRONID	C(32)
	Manmade Status	STATUS	N(2,0)
	Manmade Type	TYPE	N(4,0)
		TYPE_TEXT	C(100)
	Network Linear Element Class Name	NETWORKNAM	C(100)
	Network Linear Element NID	NETWORKNID	C(32)
	NID	NID	C(32)
	To Point Position	TO	N(3,3)
Manmade Point Event (MANMADEPT)	From Point Position	FROM	N(3,3)
	Hydrographic Entity Class Name	HYDRONAME	C(100)
	Manmade Hydrographic Entity NID	HYDRONID	C(32)
	Manmade Status	STATUS	N(2,0)
	Manmade Type	TYPE	N(4,0)
		TYPE_TEXT	C(100)

Feature catalogue Feature name	Feature catalogue Attribute name	Shape Attribute name	Shape Data type
	Network Linear Element Class Name	NETWORKNAM	C(100)
	Network Linear Element NID	NETWORKNID	C(32)
	NID	NID	C(32)
Named Feature (NAMEDFEA)	Entity Type	TYPE	N(4,0)
	Geographical Name Database	GEONAMEDB	C(100)
	ID Date	IDDATE	C(8)
	Name	NAME	C(100)
	Name Date	NAMEDATE	C(8)
	Name ID	NAMEID	C(32)
	NID	NID	C(32)
	Related NID	RELATEDNID	C(32)
Network Linear Flow (NLFLOW)	Flow Direction	DIRECTION	N(2,0)
	From Junction	FROM_JUNCT	C(32)
	Geographical Name Database	GEONAMEDB	C(100)
	ID Date	IDDATE	C(8)
	Isolated	ISOLATED	N(2,0)
	Level Priority	PRIORITY	N(2,0)
	Name Date	NAMEDATE	C(8)
	Name ID 1	NAMEID_1	C(32)
	Name ID 2	NAMEID_2	C(32)
	Name 1	NAME_1	C(100)
	Name 2	NAME_2	C(100)
	Network Flow Type	TYPE	N(4,0)
	NID	NID	C(32)
	To Junction	TO_JUNCT	C(32)
Obstacle Line Event (OBSTACLELN)	From Point Position	FROM	N(3,3)
	Hydrographic Entity Class Name	HYDRONAME	C(100)
	Network Linear Element Class Name	NETWORKNAM	C(100)
	Network Linear Element NID	NETWORKNID	C(32)
	NID	NID	C(32)
	Obstacle Hydrographic Entity NID	HYDRONID	C(32)
	Obstacle Type	TYPE	N(4,0)
		TYPE_TEXT	C(100)
	To Point Position	TO	N(3,3)
Obstacle Point Event (OBSTACLEPT)	From Point Position	FROM	N(3,3)
	Hydrographic Entity Class Name	HYDRONAME	C(100)
	Network Linear Element Class Name	NETWORKNAM	C(100)
	Network Linear Element NID	NETWORKNID	C(32)
	NID	NID	C(32)
	Obstacle Hydrographic Entity NID	HYDRONID	C(32)

Feature catalogue Feature name	Feature catalogue Attribute name	Shape Attribute name	Shape Data type
	Obstacle Type	TYPE	N(4,0)
		TYPE_TEXT	C(100)
Single Line Watercourse (SLWATER)	Geographical Name Database	GEONAMEDB	C(100)
	ID Date	IDDATE	C(8)
	Isolated	ISOLATED	N(2,0)
	Name Date	NAMEDATE	C(8)
	Name ID 1	NAMEID_1	C(32)
	Name ID 2	NAMEID_2	C(32)
	Name 1	NAME_1	C(100)
	Name 2	NAME_2	C(100)
	NID	NID	C(32)
	Permanency	PERMANENCY	N(2,0)
	Water Definition	DEFINITION	N(3,0)
TYPE_TEXT		C(100)	
Waterbody (WATERBODY)	Geographical Name Database	GEONAMEDB	C(100)
	ID Date	IDDATE	C(8)
	Isolated	ISOLATED	N(2,0)
	Lake ID 1	LAKEID_1	C(32)
	Lake ID 2	LAKEID_2	C(32)
	Lake Name 1	LAKENAME_1	C(100)
	Lake Name 2	LAKENAME_2	C(100)
	Name Date	NAMEDATE	C(8)
	NID	NID	C(32)
	Permanency	PERMANENCY	N(2,0)
	River ID 1	RIVID_1	C(32)
	River ID 2	RIVID_2	C(32)
	River Name 1	RIVNAME_1	C(100)
	River Name 2	RIVNAME_2	C(100)
	Water Definition	DEFINITION	N(3,0)
		TYPE_TEXT	C(100)

5.3.3 Attributes specific to non-NHN features

Feature catalogue Feature name	Feature catalogue Attribute name	Shape Attribute name	Shape Data type
NHN Work Unit Limit (WORKUNIT_LIMIT)	Dataset Name	DATASETNAM	C(50)
	Edition	EDITION	C(2)
	Province Code 1	PROVCD_1	C(100)
	Province Code 2	PROVCD_2	C(100)
	Province Code 3	PROVCD_3	C(100)

Feature catalogue Feature name	Feature catalogue Attribute name	Shape Attribute name	Shape Data type
	Province Code 4	PROVCD_4	C(100)
	Validity Date	VALIDDATE	C(8)
	Version	VERSION	C(2)

5.4 KML format

5.4.1 Attributes common to all NHN features

Feature catalogue Attribute name	KML Attribute name	KML Data type
Dataset Name	datasetName	C(50)
Planimetric Accuracy	planimetricAccuracy	Int
Provider	provider	C(100)
Validity Date	validityDate	C(8)

5.4.2 Attributes specific to NHN features

Feature catalogue Feature name	Feature catalogue Attribute name	KML Attribute name	KML Data type
Hydrographic Obstacle Entity	Name 1	name1	C(100)
	NID	nid	C(32)
	Obstacle Type	obstacleType	C(100)
Island	Name 1	name1	C(100)
	NID	nid	C(32)
Littoral	NID	nid	C(32)
Manmade Hydrographic Entity	Manmade Type	manmadeType	C(100)
	Name 1	name1	C(100)
	NID	nid	C(32)
Named Feature	Name	name (provided as KML name)	C(100)
	NID	nid	C(32)
Network Linear Flow	Name 1	name1	C(100)
	Network Flow Type	networkFlowType	C(100)
	NID	nid	C(32)
Waterbody	Lake Name 1	lakeName1	C(100)
	NID	nid	C(32)
	Permanency	permanency	C(100)
	River Name 1	riverName1	C(100)
	Water Definition	waterDefinition	C(100)

5.5 PDF Format

Not applicable (image maps)