

*ISO 19131 Qu'Appelle Valley Lakes
system – Topography and Imagery 2008
– Data Product Specifications*

Revision: A

Data product specifications: Qu'Appelle Valley Lakes system – Topography and Imagery 2008

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Data Product Specifications: Qu'Appelle Valley Lakes system – Topography and Imagery 2008

1. Overview

1.1. Informal description

The 'Qu'Appelle Valley Lakes system – Topography and Imagery' series consists of topographic and imagery data for lakes within the Qu'Appelle River Valley in central Saskatchewan. This data was collected in the fall of 2008 and consists of contour lines, shorelines, spot heights, tile index, and imagery.

1.2. Data product specification - metadata

This section provides metadata about the creation of this data product specification

Data product specification – title:	Qu'Appelle Valley Lakes system – Topography and Imagery 2008
Data product specification - reference date:	2013-06-24
Data product specification - responsible party:	Agriculture and Agri-Food Canada
Data product specification – language:	English, French
Data product specification - topic category:	Elevation

1.3. Terms and definitions

- Feature attribute
characteristic of a feature
- Class
description of a set of objects that share the same attributes, operations, methods, relationships, and semantics [UML Semantics]
NOTE: A class does not always have an associated geometry (e.g. the metadata class).
- Feature
abstraction of real world phenomena
- Object
entity with a well-defined boundary and identity that encapsulates state and behaviour [UML Semantics]
NOTE: An object is an instance of a class.
- Package
grouping of a set of classes, relationships, and even other packages with a view to organizing the model into more abstract structures

1.4. Abbreviations

AAFC Agriculture and Agri-Food Canada

2. SPECIFICATION SCOPE

This data specification has only one scope, the general scope.

NOTE: The term 'specification scope' originates from the International Standard ISO19131. 'Specification scope' does not express the purpose for the creation of a data specification or the potential use of data, but identifies partitions of the data specification where specific requirements apply.

3. DATA PRODUCT IDENTIFICATION

3.1. Data series identification

Title	Qu'Appelle Valley Lakes system – Topography and Imagery 2008
Alternate Title	
Abstract	The ' Qu'Appelle Valley Lakes system – Topography and Imagery' series consists of topographic and imagery data for lakes within the Qu'Appelle River Valley in central Saskatchewan. This data was collected in the fall of 2008 and consists of contour lines, shorelines, spot heights, tile index, and imagery
Purpose	The topographic contours and imagery will be used, in conjunction with existing digital cadastral boundaries, to assess land holding and to acquire additional land control (easement, land purchase) necessary for project licensing.
Topic Category	Elevation
Spatial Representation Type	Vector
Spatial Resolution	
Geographic Description	Qu'Appelle Valley Lakes system, Saskatchewan, Canada Geographic Extent: North: 51 South 50 East: -102 West: -104.5
Supplemental Information	Canada owns and operates five dams on the Qu'Appelle River system in Saskatchewan. Three of these dams have been a part of Specific Claim dispute with First Nations along the Qu'Appelle Valley for many years. Negotiations of these Specific Claims, led by INAC, are nearing a successful resolution. With the resolution of these Specific Claims, there is an opportunity for Canada to transfer the ownership of these dams to the Province of Saskatchewan. One of the terms of such a transfer is that the projects must be able to be licensed in accordance with regulatory provisions set out by the Saskatchewan Watershed Authority (the Regulator). To achieve this license, Canada must be able to demonstrate adequate land control of the reservoir margin area in accordance with specifications established by the Regulator.
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Thesaurus Date: February 1, 2000 Keywords: Remote sensing, Topography, Hydrography, Watersheds, Aerial photography
Scope identification	series

3.2. Data product identification

3.2.1. Qu'Appelle Valley Lakes system - Contour Lines 2008

Title	Qu'Appelle Valley Lakes system - Contour Lines 2008 (ELV_SK_QUAPPELLE_CONTOUR)
Alternate Title	
Abstract	Contour Lines for the Pasqua, Crooked, Echo, and Round Lakes within the Qu'Appelle Valley river system in Saskatchewan
Purpose	AAFC acquired high resolution imagery and digital topographic contours for the Qu'Appelle Valley Lakes (Pasqua, Echo, Crooked and Round) area. The high resolution topographic contours will be used for the purpose of confirmation of the existing land control adjacent to the lake and the location of private lands relative to the operating level of each lake.
Topic Category	Elevation
Spatial Representation Type	Vector
Spatial Resolution	3500
Geographic Description	Qu'Appelle River Valley, Central Saskatchewan
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data Licence : http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Thesaurus Date: February 1, 2000 Keywords: Topography, Hydrography, Watersheds
Scope identification	Dataset
Feature Attribute Names	Elevation, Lake Name

3.2.2. Qu'Appelle Valley Lakes system – Shoreline 2008

Title	Qu'Appelle Valley Lakes system – Shoreline 2008(ELV_SK_QUAPPELLE_SHORELINE)
Alternate Title	
Abstract	Shorelines for the Pasqua, Crooked, Echo, and Round Lakes within the Qu'Appelle Valley River system in Saskatchewan
Purpose	AAFC acquired high resolution imagery and digital topographic contours for the Qu'Appelle Valley Lakes (Pasqua, Echo, Crooked and Round) area. The high resolution topographic contours will be used for the purpose of confirmation of the existing land control adjacent to the lake and the location of private lands relative to the operating level of each lake.
Topic Category	Elevation
Spatial Representation Type	Vector
Spatial Resolution	3500
Geographic Description	Qu'Appelle River Valley, Central Saskatchewan

Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data Licence : http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Thesaurus Date: February 1, 2000 Keywords: Topography, Hydrography, Watersheds
Scope identification	Dataset
Feature Attribute Names	Elevation, Lake Name, Operation Date

3.2.3. Qu'Appelle Valley Lakes system – Spot Height Points 2008

Title	Qu'Appelle Valley Lakes system – Spot Height Points 2008 (ELV_SK_QUAPPELLE_SPOT_HGHT_PT)
Alternate Title	
Abstract	Spot Height Points for the Pasqua, Crooked, Echo, and Round Lakes area within the Qu'Appelle Valley River system in Saskatchewan
Purpose	AAFC acquired high resolution imagery and digital topographic contours for the Qu'Appelle Valley Lakes (Pasqua, Echo, Crooked and Round) area. The high resolution topographic contours will be used for the purpose of confirmation of the existing land control adjacent to the lake and the location of private lands relative to the operating level of each lake.
Topic Category	Elevation
Spatial Representation Type	Vector
Spatial Resolution	3500
Geographic Description	Qu'Appelle River Valley, Central Saskatchewan
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data Licence : http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Thesaurus Date: February 1, 2000 Keywords: Topography, Hydrography, Watersheds
Scope identification	Dataset
Feature Attribute Names	Elevation, Lake Name

3.2.4. Qu'Appelle Valley Lakes system – Flight Line 2008

Title	Qu'Appelle Valley Lakes system – Flight Line 2008 (ELV_SK_QUAPPELLE_TILE_INDEX)
Alternate Title	
Abstract	Flight lines for the Pasqua, Crooked, Echo, and Round Lakes area within the Qu'Appelle Valley River system in Saskatchewan
Purpose	AAFC acquired high resolution imagery and digital topographic contours for the Qu'Appelle Valley Lakes (Pasqua, Echo, Crooked and Round) area. The high resolution topographic contours will be used for the purpose of confirmation of the existing land control adjacent to the lake and the location of private lands relative to the operating level of each lake.

Topic Category	Elevation
Spatial Representation Type	Vector
Spatial Resolution	3500
Geographic Description	Qu'Appelle River Valley, Central Saskatchewan
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data Licence : http://www.data.gc.ca .
Keywords	Thesaurus: Government of Canada Core Subject Thesaurus Date: February 1, 2000 Keywords: Topography, Hydrography, Watersheds
Scope identification	Dataset
Feature Attribute Names	Elevation, Lake Name

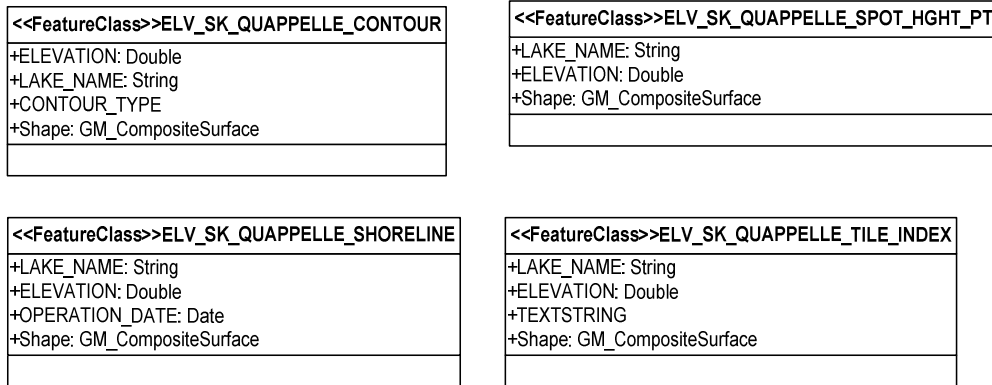
3.2.5. Qu'Appelle Valley Lakes system – Imagery

Title	Qu'Appelle Valley Lakes system – Imagery 2008
Alternate Title	
Abstract	50 cm Aerial photography for the Pasqua, Crooked, Echo, and Round Lakes within the Qu'Appelle Valley River system in Saskatchewan
Purpose	AAFC acquired high resolution imagery and digital topographic contours for the Qu'Appelle Valley Lakes (Pasqua, Echo, Crooked and Round) area. The high resolution topographic contours will be used for the purpose of confirmation of the existing land control adjacent to the lake and the location of private lands relative to the operating level of each lake.
Topic Category	Imagery/Base Maps/Earth Cover
Spatial Representation Type	Grid
Spatial Resolution	50 cm
Geographic Description	Qu'Appelle River Valley, Central Saskatchewan
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data Licence : http://www.data.gc.ca .
Keywords	Thesaurus: Government of Canada Core Subject Thesaurus Date: February 1, 2000 Keywords: Remote sensing, Topography, Hydrography, Watersheds, Aerial photography
Scope identification	Dataset
Feature Attribute Names	

4. DATA CONTENT AND STRUCTURE

4.1. Feature-based application schema

Figure 4.1.1 – Qu’Appelle Valley Lakes system UML Class Diagram



4.2. Feature catalogue – Qu’Appelle Valley Lakes system 2008 - Feature Catalogue

Title	Qu’Appelle Valley Lakes system 2008 - Feature Catalogue
Scope	Topography
Version Number	1.0
Version Date	2013-06-04
Producer	Agriculture and Agri-Food Canada, Government of Canada

System-generated attributes (for example, OBJECTID, Shape, Shape Length and Area) are not defined in the feature catalog.

4.2.1. Feature attributes

4.2.1.1. Elevation

Name	ELEVATION (ELEVATION)
Definition	The vertical distance of a point or object above or below a reference surface or datum. Elevations were recorded every 100m along roads while travelling between the control locations.
Aliases	
Producer	Agriculture and Agri-Food Canada, Government of Canada
Value Data Type	Real
Value Domain Type	0 (not enumerated)

4.2.1.2. Lake Name

Name	LAKE NAME (LAKE_NAME)										
Definition	Lake Name										
Aliases											
Producer	Agriculture and Agri-Food Canada, Government of Canada										
Value Data Type	Character										
Value Domain Type	1 (enumerated)										
	Feature Attribute Value										
	<table border="1"> <thead> <tr> <th>Label</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>ROUND</td> <td>Lake Name</td> </tr> <tr> <td>ECHO</td> <td>Lake Name</td> </tr> <tr> <td>CROOKED</td> <td>Lake Name</td> </tr> <tr> <td>PASQUA</td> <td>Lake Name</td> </tr> </tbody> </table>	Label	Definition	ROUND	Lake Name	ECHO	Lake Name	CROOKED	Lake Name	PASQUA	Lake Name
Label	Definition										
ROUND	Lake Name										
ECHO	Lake Name										
CROOKED	Lake Name										
PASQUA	Lake Name										

4.2.1.3. Text String

Name	TEXT STRING (TEXTSTRING)
Definition	Text for Cartographic use only
Aliases	
Producer	Agriculture and Agri-Food Canada, Government of Canada
Value Data Type	Character
Value Domain Type	0 (not enumerated)

4.2.1.4. Operation Date

Name	Operation Date (OPERATION_DATE)
Definition	Operation Date
Aliases	
Producer	Agriculture and Agri-Food Canada, Government of Canada
Value Data Type	Time
Value Domain Type	0 (not enumerated)

4.2.1.5. Contour Type

Name	Contour Type (CONTOUR_TYPE)	
Definition	Type of Contour, Used for cartographic purposes.	
Aliases		
Producer	Agriculture and Agri-Food Canada, Government of Canada	
Value Data Type	Time	
Value Domain Type	1 (enumerated)	
	Feature Attribute Value	
	Label	Definition
	Index Contour	A contour line on a topographic map that is labeled as to elevation; used as a reference
	Intermediate	A contour line which is drawn between index contour lines and shown as a thinner line

5. REFERENCE SYSTEMS

5.1. Spatial reference system

Horizontal coordinate reference system: WGS 84

Map projection: Web Mercator Auxiliary Sphere; EPSG: 3857; Version 8.1.4

Horizontal coordinate reference system: NAD83(CSRS)

Map projection: UTM 13N

5.2. Temporal reference system

Gregorian calendar

6. DATA QUALITY

6.1. Completeness

6.1.1. COMPLETENESS OMISSION

Photogrammetrically compiled, stereo-model, format datasets was merged into a single, seamless file for data structuring and integrity editing. The merged DEM datasets was software processed to verify and validate the structure and integrity of the digital information. This software performed the following quality assurance procedures to ensure that: - breakline features do not intersect - gaps in

elements are within specified tolerances - continuity and connectivity exists between linear planimetric features - adjoining features having identical boundaries were closed - all polygonal features are properly closed - all planimetric and DEM features have been assigned the correct attributes - extraneous or duplicated data has been removed - shoreline water features have a constant elevation - Linear water features do not reverse flow direction.

6.2. Logical consistency

DEM Stereo-compilation Digital stereo-compilation of DEM datasets was performed on a DATEM Summit and/or a Cardinal Systems VR2 fully analytical photogrammetric stereoplottter interfaced to MicroStation V8 CAD software. For maximum accuracy a rigorous stereo-model orientation process was employed using the stereo-model orientation parameters, (E, N, Elev, θ , ϕ , ω) and the PAT-B format plate coordinates as derived from the aerial triangulation adjustment. LDT photogrammetrically compiled planimetric features and DEM, including all digital vector information necessary to adequately depict the terrain in manually controlled point to point mode using softcopy, analytical stereoplotters. Automatic stream digitizing and autocorrelation techniques were not used. A regular grid array was compiled perpendicular to the direction of flight and observed in one direction only to avoid scan line and image vignetting errors. Linear and polygonal features forming junctions within a stereo-model, crossing stereo-model boundaries or tying to hypsographic data from adjoining sheets were "noded" three dimensionally (3D) within the MicroStation CAD environment. Two distinct levels of DEM data were created.

(i) DEM For Contour Generation - The DEM datasets to be used for 0.25m contour generation consisted of:

1) Breakline Data - Topographic features compiled as breaklines including all hydrographic features Select planimetric features e.g. edge of road, retaining walls Exclusion areas (obscured areas) compiled at ground level

2) Mass Points Regular grid of points at a 10m interval Random points at all terrain highs and lows Point densification around buildings and obscured areas etc.

(ii) DEM For Orthophoto Generation - The DEM datasets to be used for digital orthophoto generation consisted of:

1) Breakline Data Major topographic features compiled as breaklines including the edge of all hydrographic features and the centreline of all access features.

2) Mass Points Regular grid of points at a 20m interval Random points at all terrain highs and lows All features delineating terrain low points (streams and rivers in valleys) were digitized in the "upslope" direction to prevent floating of the machine measuring mark.

Conversely all features delineating terrain high point (ridge lines) were digitized in the "down slope" direction to prevent digging of the measuring mark. Breaklines compiled to delineate the top and bottom of true vertical surfaces such as cliffs were offset in the "down slope" direction to prevent conflicts during subsequent surface modeling and orthophoto procedures.

6.3. Positional accuracy

6.4. Temporal accuracy

6.5. Thematic accuracy

6.6. Lineage statement

Lineage Statement	Contour Dataset Generation For the required areas contours at 0.25m intervals were generated from the DEM using Intergraph Siteworks contour interpolation software. To ensure continuity between datasets, input to the contour interpolation process for each site was in the form of seamless files, including a 40m boundary overlap, containing the vector features and the DEM dataset. Every fifth contour was coded as an "index" contour. Symbolized spot height locations with text were placed at all significant high and low positions within the area and at locations where information additional to the contours is necessary to determine ground elevation. Edited DEM and contour datasets will be translated from DGN to ESRI Shapefile Ver 9.x format utilizing Safe Software FME translation software. To ensure no data was lost or corrupted during the translation process both the original DGN and the translated ESRI Shapefile format datasets were loaded to ESRI ArcGIS Ver 9.x software and interactively compared. All datasets originated from Land data Technologies Inc.
Scope	<i>Series</i>

7. DATA CAPTURE

8. DATA MAINTENANCE

9. PORTRAYAL

Not applicable.

10. DATA PRODUCT DELIVERY

File Geodatabase

format name: Esri Geodatabase (File-based)

format version: 10.1

specification: A collection of various types of GIS datasets held in a file system folder. (<http://arcgis.com>)

languages: eng

character set: utf8

TIF

format name: Tag Interleaved File:

version: 6.0

specification: GeoTIFF is format extension for storing georeference and geocoding information in a TIFF 6.0 compliant raster file by tying a raster image to a known model space or map projection.

languages: eng

character set: utf8

11. METADATA

The metadata requirements follow the Government of Canada's Treasury Board Standard on Geospatial Data (ISO 19115).