Alberta
Agriculture
and Forestry

Spatial Data Directives

Data Formats, Business Rules and Topology Rules for CCP/SAP Submissions

Version 7.0b
November 2020

Forest Stewardship and Trade Branch

Updates

Spatial Data Directives– Data Formats, Business Rules and Topology Rules for CCP/SAP Submissions was created in April 2019 as supplemental information for a series of Forestry Division Directives, known collectively as the Spatial Data Directives. Subsequent revisions to the document are summarized below:

Date	Type of Revision	Version No.	Sections Revised
September 2020	Minor	7.0b	Added Appendix 1 – Audit Process

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Classification: Public

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1. Data

The Spatial Data Directives specification lays out the requirements for delivery of spatial data to support various forest management needs. The specification provides the details on the datasets required and the format of these data.

1.1 Templates

To ensure that data is consistent for all submissions, a set of template FGDBs have been created and are available for download from the portal. There are templates for both Final Harvest Blocks and Silvicultural Activities. For each data type, two templates are provided, one for UTM Zone 11 and UTM Zone 12.

1.2 Submissions

Data must be submitted through the [Spatial Data Directives Submission Portal](#).

Spatial data must be submitted as an Esri® polygon feature class using the specified template. The feature class must be delivered as a single **file geodatabase (FGDB).** Data must be delivered as a zip file archive containing only data related to the type of data being delivered (CCP or SAP). The name of the zip file is to follow a format as detailed in the Section 1.4. The zip file must conform to the validation rules laid out in Section 2.1.

Metadata is collected as part of the submission process.

1.3 Projection and Datum

Spatial data must be delivered using the NAD83 Canadian National Transformation version 2 (NTv2) datum in one of the following acceptable projected coordinate systems consistent with the geographic location of the features captured:
- UTM Zone 11 (WKID 26911) or
- UTM Zone 12 (WKID 26912)

1.4 File Naming Conventions

File names must include:
1. Stakeholder code
2. Data submission type code
3. Submission date.

The standard codes for Stakeholder Names are those used in the *Alberta Regeneration Information System Industry Operations Manual* Appendix D – Stakeholder Codes.

Standard submission types and codes are listed in Table 1 below.

Table 1: Standard data types and codes

Data Type	Data Type Code (*DDD*)	FGDB Feature Class/Table Name	Type
Final Harvest Area	CCP	FINAL_HARV_AREA	Polygon
Silvicultural Activities	SAP	SILV_ACTIVITIES	Polygon

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1.4.1 File Geodatabase Naming Conventions

FGDB name(s) are formatted *SSSS_DDD_yyyymmdd*

1. *SSSS* is stakeholder code,
2. *DDD* is data type code,
3. *yyyymmdd* is the submission date in the format year, month and day.

Example for Final Harvest Areas:

ALPC_CCP_20170515.gdb
FINAL_HARV_AREA

1.4.2 Resubmission File Naming Convention

Data delivered as a re-submission must **not** re-use/recycle the original submission name. File names must be constructed using the current date of submission as like any other submission. Reference to the original data submission file being replaced with the newest submission should be indicated in the notes section of the submission interface.

2. Final Harvest Areas

Submission Type: CCP

Feature Class Name: FINAL_HARV_AREA

Description: Capture of harvested areas on the landscape

Policy: Refer to [AF, Forestry Policy, 2015, No.3](#) for standards, specifications, submissions, enforcement/compliance, contact information and authorities

Geometry: Polygon

File Naming Convention: SSSS_CCP_yyyymmdd.gdb

Table 2 - Final Harvest Area Schema

Field Name	Type	Allowable Values	Value Description	Validation	Definition
OBJECTID	Object ID	System Defined		Mandatory	A system-managed value that uniquely identifies a record or feature.
Shape	Geometry	System Defined		Mandatory	Identifies feature geometry type.
DISP_HOLDR	Text (4)	Refer to ARIS Industry Operations Manual – Appendix D Table 1.	ARIS stakeholder code (SSSS placeholder in File Naming Convention)	Mandatory	Uniquely identifies the company or organization responsible for the reforestation of the harvest area.
DISP_NUM	Text (10)	Any text	Disposition Number	Mandatory	Identifies the Primary Disposition number to which the authority to harvest is attached.
OPEN_NUM	Text (11)	Any text	ARIS Opening Number	Mandatory	Describes opening number unique to harvested area.
HARV_CODE	Text (1)	H	Harvested	Mandatory	Describes the category of disturbance relative to the harvested area.
		A	Anthropogenic		
SKID_CLEARANCE_DATE	Date	YYYY-MM-DD	Skid Clearance Date	Mandatory	Describes the date when timber skidding was completed in the opening.
Shape_Length	Double	System Defined		Mandatory	Feature perimeter length.
Shape_Area	Double	System Defined		Mandatory	Feature area.

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2.1.   Zip File Validation Rules

A Final Harvest Area spatial data submission must be delivered using the provided Esri® FGDB polygon feature class template contained in a zipped file geodatabase.

The following checks will be used to validate zip files submitted for FINAL_HARV_AREA submissions:

1. Zip file must not be empty.

2. Zip file must not be password protected/encrypted.

3. Zip file contains only a CCP SDD file geodatabase with the appropriate naming convention applied.

4. Zip file must not contain more than one file geodatabase.

2.2.   Schema Validation Rules

1. File geodatabase must contain a feature class named FINAL_HARV_AREA and the table named VERSION_INFO used to indicate the SDD version of the data.

2. The submission contains no other tables or features classes other than indicated above.

3. Using the template outlined by the schema table above and identified in the VERSION_INFO table delivered, the FINAL_HARV_AREA feature class submission must match the template for:
   - All required fields provided
   - No additional fields
   - Matching field definitions
   - Projected coordinate system UTM Zone 11 or UTM Zone 12
   - Geometry shape is polygon.

2.3.   Business Validation Rules

1. A complete Final Harvest Areas (CCP) submission contains harvested areas typically harvested within a single timber year under one ARIS stakeholder operator:
   - Timber year is defined as the period of time between May 1st and April 30th of the following calendar year. For example, harvest activity occurring Jan 12, 2018 will fall under the 2017 timber year with a reforestation clock start date of May 1, 2018.
   - FINAL_HARV_AREA submission deadline occurs every May 15th two years after the harvested area's reforestation clock start date. For example, harvested area skid cleared in 2016/17 timber year with a reforestation clock start date of May 1, 2017 will be due May 15, 2019.

2. All feature attributes submitted must align with information reported to the ARIS database based on the assigned Opening Number.

3. Anthropogenic disturbances that occur within a harvested area shall only be captured if the disturbance occurred *after* harvesting resulting in a deviation from the Net Harvested Hectares:
   - The harvested area's opening number must be assigned to the anthropogenic feature to facilitate accurate Net Harvested Hectares reporting in ARIS.
   - [HARV_CODE] must be designated as "A" for anthropogenic feature.
   - If an anthropogenic disturbance existed prior to harvesting, the disturbance shall not be captured. For instance, if the existing anthropogenic feature is contained completely within the harvest polygon then it would be represented as a hole.
   - Anthropogenic disturbance and harvest polygons must not overlap one another and must share coincident boundaries where adjacent.

4. New submissions containing opening numbers that have already been submitted will replace pre-existing features regardless of acceptance status and will undergo a new audit review. In other words, if the same opening is submitted twice, the new one will override the previous one and be re-evaluated even if the first one passed validation.

5. The ARIS opening number assigned must have its corresponding point within one of the component polygons representing the harvest area:

   • Refer to ARIS Manual - Appendix A for documentation regarding opening number placement. Access to ARIS Sharepoint site under a GoA account is required. Contact your organization's ARIS representative for details.

   • Provincial ARIS point grid with opening numbers available at ftp://ftp.gov.ab.ca/env/gda/ARIS_grid

   Exception: Final Harvest Areas which have no available opening number to be assigned may be assigned the nearest available opening grid number location outside the boundary of the harvested area.

2.4. Geometry and Topology Validation Rules

1. Feature geometry must be polygon.

2. Duplicate features that exist within the individual submission will not be accepted.

3. Submissions with harvested areas overlapping with other harvested areas will not be accepted.

4. Submissions with poor quality edge-ties resulting in slivers or gaps between adjacent harvested areas will not be accepted.

5. Single-part features with the same opening number and harvest code attribute shall be dissolved into a single multi-part polygon feature.

6. Spatial data must be submitted in the provided Esri® FGDB polygon feature class template contained in a zipped file geodatabase.

7. Spatial data must be delivered using the NAD83 Canadian National Transformation version 2 (NTv2) datum in one of the following acceptable projected coordinate systems consistent with the geographic location of the features captured:
   • UTM Zone 11 (WKID 26911) or
   • UTM Zone 12 (WKID 26912).

2.5. Attribute Table Validation Rules

1. The following fields cannot be Null or Blank:
   • DISP_HOLDR
   • DISP_NUM
   • OPEN_NUM
   • HARV_CODE
   • SKID_CLEARANCE_DATE.

2. DISP_HOLDR value must be in uppercase format.

3. DISP_HOLDR value must be identical for all records within a single data submission. In other words, multiple disposition holders cannot be submitted in the same submission.

4. DISP_NUM value must be in uppercase format.

5. OPEN_NUM field must exist in ARIS.

6. HARV_CODE value must be a valid coded domain value as provided through the template.

7. SKID_CLEARANCE_DATE must be between May 1, 1999 and today's date.

8. Shape_Area must have a value equal to or greater than 1000.

9. All data must be consistent with that found in ARIS based on the opening number.

3. Silvicultural Activities

Submission Type: SAP

Feature Class Name: SILV_ACTIVITIES

Description: Capture spatially explicit information on certain silvicultural activities on the landscape.

Policy: Refer to AF, Forestry Policy, 2015, No. 4 for standards, specifications, submissions, enforcement/compliance, contact information and authorities.

Geometry: Polygon

File Naming Convention: SSSS_SAP_yyyymmdd.gdb

Table 3 - Silvicultural Activities Schema

Field Name	Type	Allowable Values	Value Description	Validation	Definition
OBJECTID	Object ID	System Defined		Mandatory	Unique identifier for feature.
Shape	Geometry	System Defined		Mandatory	Identifies feature geometry type.
DISP_HOLDR	Text (4)	Refer to ARIS Industry Operations Manual – Appendix D Table 1.	ARIS stakeholder code (SSSS placeholder in File Naming Convention)	Mandatory	Identifies unique ARIS four letter stakeholder code.
DISP_NUM	Text (15)	Any text	Disposition Number	Mandatory	Disposition number to which reforestation responsibility is attached.
OPEN_NUM	Text (11)	Any text	ARIS Opening Number	Mandatory	Describes opening number unique to harvested area.
TREAT_DATE	Date	YYYY-MM-DD	Date of treatment or activity	Mandatory	Occurrence of treatment or activity.
TREAT_TYPE	Text (4)	CHEM	Chemical herbicide treatment	Mandatory	Describes the categories of silvicultural activities reported.
		GENE	Genetically improved seed or clone deployment activity (may or may not be specific to NSR retreatment)		
		PLNT	Non-genetically improved planting activity for NSR retreatment		

Field Name	Type	Allowable Values	Value Description	Validation	Definition
CHEM_CODE	Text (4)	CHAD	Chemical Aerial Broadcast	Mandatory if TREAT_TYPE = CHEM	Describes codes identifying treatment methods for chemical herbicide activities.
		CHAP	Chemical Aerial Accuflow		
		CHHD	Chemical Aerial Highlight		
		CHHP	Chemical Aerial Highlight (Accuflow/TVB)		
		PREP	Chemical Site Preparation		
GEN_CLASS_ CODE	Text (6)	AIC9	Improved Orchard	Mandatory if TREAT_TYPE = GENE	Describes genetic class codes from stream 2 materials. Refer to Alberta Forest Genetic Resource Management and Conservation Standards Volume 1: Stream 1 and Stream 2 - Appendix 6
		AIC11	Seedlot with Ne<18 (registration restricted)		
		AIC12	Hybrid Orchard		
		BIC9	Selected population		
		BIC10	Tested population		
		BIC11	Lot with NE<18 (registration restricted)		
		BIC12	Amplified family		
		BIC13	Hybrids		
		BIC14	Non-local material		
GEN_SEEDLOT1	Text (30)	Any text	Seed Lot Number	Mandatory if TREAT_TYPE = GENE	Describes genetic seed lot used in silvicultural activity.
GEN_SEEDLOT2	Text (30)	Any text	Additional Seed Lot Number	Mandatory if number of genetic seed lots used per feature > 1	Describes second additional genetic seed lot used in silvicultural activity.
GEN_SEEDLOT3	Text (30)	Any text	Additional Seed Lot Number	Mandatory if number of genetic seed lots used per feature > 2	Describes third additional genetic seed lot used in silvicultural activity.
Shape_Length	Double	System Defined		Mandatory	Feature perimeter length.
Shape_Area	Double	System Defined		Mandatory	Feature area.

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3.1. Zip File Validation Rules

A Silvicultural Activities spatial data submission must be delivered using the provided Esri® FGDB polygon feature class template contained in a zipped file geodatabase.

The following checks will be used to validate zip files submitted for SILV_ACTIVITES submissions:

1. Zip file must not be empty.

2. Zip file must not be password protected/encrypted.

3. Zip file contains only a SAP SDD file geodatabase with the appropriate naming convention applied.

4. Zip file must not contain more than one file geodatabase.

3.2. Schema Validation Rules

1. File geodatabase must contain a feature class named SILV_ACTIVITIES and the table named VERSION_INFO used to indicate the SDD version of the data.

2. The submission contains no other tables or features classes other than indicated above.

3. Using the template outlined by the schema table above and identified in the VERSION_INFO table delivered, the SILV_ACTIVITIES feature class submission must match the template for:
   - All required fields provided
   - No additional fields
   - Matching field definitions
   - Projected coordinate system UTM Zone 11 or UTM Zone 12
   - Geometry shape is polygon.

3.3. Spatial Validation Rules

The following checks will be used to validate spatial data for SILV_ACTIVITES submissions:

1. Spatial data must be delivered using the NAD83 Canadian National Transformation version 2 (NTv2) datum in one of the following acceptable projected coordinate systems consistent with the geographic location of the features captured:
   - UTM Zone 11 (WKID 26911) or
   - UTM Zone 12 (WKID 26912).

2. Multi-part polygons are acceptable.

3. Aerial herbicide applications (CHEM_CODE = CHAP, CHAD, CHHD, or CHHP) must be provided as buffered flight lines (see Figure 1) and may extend beyond a harvest area boundary.
   - Excursions (off-target applications/drifting) and unauthorized herbicide release events (spills/leaks) must be reported associated with the opening number of the nearest harvest area
   - Original source flight line data must be buffered by the width of the boom used to apply aerial herbicide to create polygons
   - Aerial herbicide treatments will be merged together when the opening number, treatment date and chemical code are the identical to reduce the number of records.

4. Features delineated must explicitly capture where the silvicultural activity occurred.
   - E.g. Partial treatments of harvested area must be precisely captured (see Figure 2).

5. Duplicate features that exist within the individual submission will not be accepted. A duplicate feature is defined where two polygons are spatially identical and the TREAT_TYPE and

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TREAT_DATE is the same for both of them.

6. A polygon with one Opening Number cannot overlap another polygon with a different Opening Number. The only exception to this rule is of the TREAT_TYPE is CHEM in which case overlaps between features with a different Opening Number are acceptable.

3.4. Attribute Validation Rules

The following checks will be used to validate attribute data for SILV_ACTIVITES submissions:

1. All activities submitted must align with records reported to ARIS based on the assigned Opening Number.

2. The following fields may not be left as null or blank:
   - DISP_HOLDR
   - DISP_NUM
   - OPEN_NUM
   - TREAT_DATE
   - TREAT_TYPE.

3. If TREAT_TYPE = 'PLNT' then NSR_RETREAT must = Y, otherwise NSR_RETREAT must be N.

4. If TREAT_TYPE = 'GENE' then GEN_CLASS_CODE and GEN_SEEDLOT1 fields must not be null or blank.
   - If more than one genetic seedlot is used in the same treatment then populate GEN_SEEDLOT2 and/or GEN_SEEDLOT3 fields where necessary.

5. GEN_SEEDLOT1, GEN_SEEDLOT2, and GEN_SEEDLOT3 must be populated in sequential order.
   - For example, GEN_SEEDLOT2 may not be attributed unless GEN_SEEDLOT1 contains a value.

6. If GEN_SEEDLOT1 is attributed, CHEM_CODE field must be blank or null and TREAT_TYPE field cannot equal 'CHEM'.

7. DISP_HOLDR field must contain the same value for each feature submitted within a single spatial data submission.
   - One ARIS stakeholder per submission.

8. TREAT_DATE must be must be between May 1, 1991 and today's date.

9. If TREAT_TYPE is CHEM or PLNT then the following fields must be Null or blank:
   - GEN_CLASS_CODE
   - GEN_SEEDLOT1
   - GEN_SEEDLOT2
   - GENSEEDLOT3.

10. If TREAT_TYPE is CHEM then CHEM_CODE must be populated with a valid value.

11. If TREAT_TYPE is GENE or PLNT then CHEM_CODE must be Null or Blank.
12. OPEN_NUM value must match an opening number value present in ARIS.

13. All data must be consistent with that found in ARIS based on the opening number.

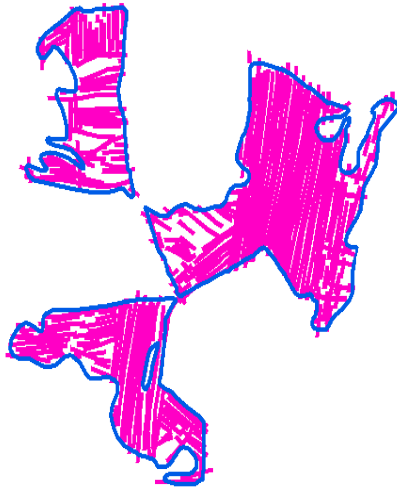**Figure 1: Example of Aerial Herbicide Application vs. Harvest Area Boundary**

Figure 2: Explicit Spatial Capture of Silvicultural Activity

4. Definitions

Harvest Year/Timber Year – Operational period May 1st to April 30th. For example, if an area was harvested on January 25, 2017, the harvest year is 2016.

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Appendix 1 – Audit Process

1. General

If the submitted data package meets the basic requirements for the zipfile it will be uploaded to the portal. The data package is then filtered through a basic Quality Control process that will immediately evaluate the content and structure of your data. If your data passes this step, it will be assigned to an auditor for further visual review and evaluation. An email will be sent to the data provider confirming that the data submission has successfully completed the submission audit. If the submission fails, an email will be sent to the data provider with a report detailing errors found. You will also be able to download a QC data package containing an FGDB with features classes and tables detailing spatial and attribute errors encountered. This will aid in locating and fixing errors.

In addition to the initial content and structure validation, geomatics and business audits will be performed on your submission. These are basically visual reviews to ensure the data meets the requirements of the SDD specifications. You can track the progress of your submission through the portal as it moves through these stages.

At any point in the audit process, disposition holders may be asked to provide the imagery that was used to capture the harvest area or ancillary data to support silvicultural activities.

2. Submission Audit

Zipfile Validation
- Cannot be password enabled
- Must contain a valid SDD FGDB named according to SDD standards
- Only one SDD FGDB can be contained in the zipfile

Schema Tests:
- Required Table not found in source
- Required Field not found in source
- Invalid Table (Feature Class) found in source.
- Invalid Field found in source
- Invalid Coordinate System
- Invalid field type and/or length
- Invalid Feature Type geometry type
- Invalid or missing domain code
- Invalid or missing domain values
- Invalid or Missing Version

Attribute Tests:
- Attribute Null Test
- Attribute Range Test
- Attribute Domain (Restricted) Test
- Number of Characters Test
- Case Test
- Same Value Test
- Sequential Test
- Regex Test

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Conditional Attribute Tests:
- Valid Value
- Null or Blank
- Hard-Coded Value
- Test Negated

Spatial Tests:
- Overlaps
- Duplicate features

3. Geomatics Audit
- Alignment with ARIS
- Anthropogenic disturbance
- Slivers and gaps
- Coordinate system
- Skid clearance date

4. Business Audit
Satellite imagery used to verify:
- Completeness of the information
- Relative positioning of the disturbance boundaries

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