Minnesota Geospatial Advisory Council

PLSS Point Data Standard

Version 1.0

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Table of Contents

About the GAC

The mission of the Minnesota Geospatial Advisory Council (GAC) is to act as a coordinating body for the Minnesota geospatial community. The GAC is authorized by legislation passed in 2009 and reauthorized in 2014 Minnesota Statutes (16E.30, subd. 8). It represents a cross-section of organizations that include city, county, regional, state, federal and tribal governments as well as education, business and nonprofit sectors.

As part of this mission, the GAC works with the Minnesota geospatial community to define and adopt standards needed by the community. GAC standards are developed and proposed by geospatial community subject matter experts. The GAC's Standards Committee administers a process to ensure community-wide public review and input for any proposed standards.

The GAC does not mandate or enforce standards. It offers the standards as a resource to the community. Organizations may choose to adopt the standards and require their use internally.

Introduction

The Public Land Survey System (PLSS) established corners which form the framework for many geospatial datasets. In Minnesota, the responsibility for maintaining the PLSS is placed on county surveyors and their private sector counterparts. MN Statutes 381.12 provides the requirements for PLSS corner certification. There is no statute which governs standards for coordinate determination and maintenance of the related geospatial data.

Purpose of this Standard

The purpose of this standard is to provide a single, commonly accepted set of attribute specifications (field name, type, length, and order) for transferring and aggregating Public Land Survey System (PLSS) point data in Minnesota. It may also be used for other cadastral point data, such as local control points. It is intended to be used when data is being transferred between organizations. Use of the standard will improve the ability to share data resources by reducing incompatibilities when acquiring, processing and disseminating PLSS point data.

The points and associated data contained within this standard are to be a summarization of the most current corner certificate on file for the associated PLSS point. They are not to be considered authoritative data for the location of the PLSS point. The monument in the ground and associated corner certificates are the authoritative data for the PLSS corner.

Applicability

Data producers may have unique methods, definitions, and criteria for capture and storage of PLSS point data that satisfy their own business requirements. This standard seeks to establish attribute specifications for data exchange purposes. It does not attempt to define internal data capture or storage specifications for data producers, though some may find benefit in storing data in this format. Organizations within Minnesota are encouraged to adopt this standard for purposes of data exchange.

Sources of this Standard

In response to a need to share data across jurisdictional boundaries, a precursor to this standard was developed and implemented by the Arrowhead Geospatial Collaborative in Northeastern Minnesota. This group included St. Louis County, Itasca County and the Superior National Forest.

This group also participated in a pilot project where the US Bureau of Land Management (BLM) integrated the compiled local data into a comprehensive dataset which can be found at this website (https://gbp-blm-egis.hub.arcgis.com/). This data will be used by the US Forest Service to update their land ownership layers, and in turn these layers should now better align with other jurisdictional land ownership layers.

The Parcel and Land Records Committee (PLRC) of the GAC is tasked with facilitating the GAC's "Updated & Aligned Boundary Data" priority. The committee concluded that standardized PLSS point data will facilitate this priority. In short, if PLSS Point Data is standardized and PLSS points are certified and located across the state then the data authorities can be confident in adjusting associated data to these points. The PLRC worked to modify the Arrowhead Standard to meet the needs of other regions of Minnesota.

The Cadastral Data Content Standard for the National Spatial Data Infrastructure (CadNSDI) was reviewed prior to the development of this standard. These standards were determined to be overburdensome in some areas and did not include some of the specific needs of Minnesota PLSS data maintainers. The CadNSDI standard was used as a basis for many fields, and the proposed standard was modified to meet the needs of Minnesota. A relationship between the CadNSDI and the proposed PLSS Point Standard is maintained via the BLM_PNT_ID field. This way, the local data can be harvested by the BLM and vertically integrated.

Compliance Notes

Organizations in Minnesota are encouraged to adopt and comply with this standard for purposes of data exchange. A PLSS points dataset that fully complies with this standard will consist of geospatial points with all attribute fields specified in this standard. It will also comply with the inclusion and domain specifications of this standard. Some data producing organizations that choose to comply with this standard do not collect all data included in the standard. Such organizations may choose to work toward full compliance over time. It is understood that each data producing organization will make compliance decisions based on their own business needs.

Inclusion

Inclusion is a term used to explain the requirement for a field to be populated in a dataset to comply with the standard. Three types of inclusion are possible: Mandatory, Conditional and Optional.

Mandatory

Field must be populated for each record to be fully compliant with the standard. Null values are not allowed.

Example: Local Point Identifier is a Mandatory field in this standard. If Point ID values are missing, the dataset does not comply with the standard.

Conditional

Field must be populated with a non-null value for each record that is applicable to the feature or for which a specified condition exists.

Example: Corner Status is a conditional field in this standard. A point which is certified will have a status from the associated domain. A point which has not been certified will not have a known value in this field.

Optional

Field is not required to be populated.

Mixed Case

Like other GAC standards, all field values in this standard will use a mixed case format. Some end users may want an all-caps format for a specific purpose. Data may be converted to all caps by end users if desired. It is more difficult to automatically convert all caps back to mixed case.

Abbreviations

All field values in this standard must be spelled out unless specifically defined otherwise in the field description. This is done to remove ambiguity and better align with other existing standards.

Domains

Several domain tables accompany this standard in a spreadsheet available at this link. To comply with this standard, a cadastral points dataset must use the codes from specified domains but does not need to include the domain tables with the data. If a local value exists that is not included in a domain (e.g., a monument type), it may be submitted to the MN Geospatial Advisory Council, Standards Committee to be included in the domain. Domains will be updated on a periodic basis, as needed. The date of the most recent change to each domain table is included in the spreadsheet.

Data Element Details

Appendix A: MN GAC PLSS Point Data Standard Schema

Appendix A is a spreadsheet available at this link showing the schema for this standard. It includes all data elements in the standard, with field name, type, width and other important information about each data element.

Note: The points and associated data contained within this standard are to be a summarization of the most current corner certificate on file for the associated PLSS point.

1. General Elements

1.1 Local Point Identifier

Database Name	LOC_PNT_ID		
Data Type	Text	Inclusion	Mandatory
Width	36	Domain	
Examples	1, 1000, 16987		
Description	This is to be a unique point identifier used by the local data owner. This ID will only be unique to the local data owner and not necessarily unique statewide.		

1.2 BLM Designation

Database Name	BLM_DESIG		
Data Type	Text	Inclusion	Mandatory
Width	22	Domain	
Examples	MN040540N0190W0_240500		
Description	BLM designation of corner. This is the BLM's unique identifier for the point constructed of PLSS information. See example and also the standard CadNSDI content.		

1.3 Corner Category

Database Name	COR_CAT		
Data Type	Text	Inclusion	Mandatory
Width	30	Domain	CornerCat
Examples	PLSS Corner, Ground Control, Local Non PLSS Corner		
Description	Generalized category for corner type.		

1.4 Corner Type

Database Name	COR_TYPE		
Data Type	Text	Inclusion	Mandatory
Width	60	Domain	CornerType
Examples	Section Corner, 1/4 Section Corner, Angle Point, Judicial Landmark		
Description	Describes the use for the corner.		

1.5 Corner Status

Database Name	COR_STATUS		
Data Type	Text	Inclusion	Conditional
Width	20	Domain	CornerStatus
Examples	Existent, Obliterated, Lost, Undetermined		
Description	Status describes whether corner is existent, obliterated or lost using the technical definitions from the Manual of Surveying Instructions. If no corner certificate exists, this data element may be null.		

1.6 Corner Alias Name

Database Name	COR_ALIAS		
Data Type	Text	Inclusion	Mandatory
Width	40	Domain	
Examples	NW 02-56-17, MC#12-65-02		
Description	Name of the corner based on local conventions. Names will vary based on county. Data stewards are encouraged to standardize a local convention.		

1.7 Additional Alias Name

Database Name	ALIAS_ADD		
Data Type	Text	Inclusion	Optional
Width	22	Domain	
Examples	WCMC#12-65-02		
Description	Supplemental corner name based on local conventions. Names will vary based on county. Data stewards are encouraged to standardize a local convention.		

1.8 Corner Note

Database Name	COR_NOTE		
Data Type	Text	Inclusion	Optional
Width	255	Domain	
Examples	Witness Corner to Meander Corner (MC#42), When using this Corner, See "Report of Survey" Document no. 571758 for additional information.		
Description	Additional notes regarding corner position or record status.		

1.9 Surveyor Category

Database Name	SURV_CAT		
Data Type	Text	Inclusion	Optional
Width	30	Domain	SurveyorCategory
Examples	Private, Government, Other		
Description	Generalized category of surveyor's employer.		

1.10 Surveyor Identification

Database Name	SURV_ID		
Data Type	Text	Inclusion	Mandatory
Width	255	Domain	A list is available here.
Examples	[Jill Johnson, 78256], [John Doe, 65789], [Bobby Plumb, 96874]		
Description	Surveyor name and Professional Land Surveyor Identification Number per the State of Minnesota. A list is available here. This is the surveyor that made the final determination on the corner. If multiple signatories exist, add a note in the corner notes field.		

1.11 Surveyor Agency

Database Name	SURV_AGNCY		
Data Type	Text	Inclusion	Optional
Width	255	Domain	
Examples	Koochiching County Bolton & Menk, Inc., State of Minnesota DOT		
Description	Employer of Surveyor. Your data will be most useful if you develop a local domain so that a particular employer is spelled the same way every time.		

1.12 Field Book Name

Database Name	FB_NAME		
Data Type	Text	Inclusion	Optional
Width	20	Domain	
Examples	255, B-65, Corner ties 57-12		
Description	Survey Field Book name or number.		

1.13 Field Book Page Number

Database Name	FB_PAGE_NO		
Data Type	Text	Inclusion	Optional
Width	20	Domain	
Examples	15, 255A, 16-25		
Description	Survey Field Book page number.		

1.14 Project Name

Database Name	PROJ_NAME		
Data Type	Text	Inclusion	Optional
Width	255	Domain	
Examples	35698, Highway 252, Silver Creek Twp		
Description	Primary Project or Survey Number representing the work action which included the location of the point.		

1.15 Project Notes

Database Name	PROJ_NOTES		
Data Type	Text	Inclusion	Optional
Width	255	Domain	
Examples	Under contract with the State of Minnesota PLSS Monument Grant program.		
Description	Additional project information.		

1.16 Filing Date

Database Name	FILE_DATE		
Data Type	Date	Inclusion	Optional
Width		Domain	
Examples			
Description	Date Certificate was recorded in the County Recorder’s office or filed in the County Surveyor’s Office.		

2. Coordinate Elements

The purpose of this section is to capture the located coordinates of the corner. Most corner certificates in Minnesota list coordinates using local county coordinate systems, but some list latitude and longitude. The conditional inclusion shown for these data elements means that one or the other must be included to comply with this standard. Including both is optional.

2.1 Northing

Database Name	LOC_Y		
Data Type	Real	Inclusion	Conditional
Width	Double	Domain	
Examples	4658860.04		
Description	Located northing of the point in the local coordinate system specified in 2.5 Coordinate System.		

2.2 Easting

Database Name	LOC_X		
Data Type	Real	Inclusion	Conditional
Width	Double	Domain	
Examples	3788352.16		
Description	Located easting of the point in the local coordinate system specified in 2.5 Coordinate System.		

2.3 Elevation

Database Name	LOC_Z		
Data Type	Real	Inclusion	Optional
Width	Double	Domain	
Examples	1156.32		
Description	Orthometric height of the point using the same units as defined for the Northing and Easting.		

2.4 Coordinate Units

Database Name	LOC_UNITS		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	HorizontalUnits
Examples	U.S. Survey Feet		
Description	Indicates units used in the local coordinate system specified in 2.5 Coordinate System		

2.5 Coordinate System

Database Name	LOC_COORD		
Data Type	Text	Inclusion	Conditional
Width	255	Domain	
Examples	Ramsey, St. Louis County Transverse Mercator Coordinate System 96		
Description	Local planar coordinate system zone designation per the MnDOT Map Projections and Parameters definitions. https://www.dot.state.mn.us/surveying/toolstech/mapproj.html		

2.6 Observation Date

Database Name	OBS_DATE		
Data Type	Date	Inclusion	Mandatory
Width		Domain	
Examples			
Description	Date of the last verifiable and documented visit to the monument in which coordinates were determined.		

2.7 Collection Method

Database Name	METHOD		
Data Type	Text	Inclusion	Mandatory
Width	40	Domain	HorizontalMethod
Examples	Geodetic GPS Survey, Calculation, Unknown		
Description	The methodology or system used to determine the coordinate value.		

2.8 Longitude

Database Name	LONG_X		
Data Type	Text	Inclusion	Conditional
Width	15	Domain	
Examples	92 30 36.1549		
Description	Located longitude, format D M S.SSSS, do not include west designation.		

2.9 Latitude

Database Name	LAT_Y		
Data Type	Text	Inclusion	Conditional
Width	15	Domain	
Examples	47 32 45.7029		
Description	Located latitude, format D M S.SSSS, do not include north designation.		

2.10 Horizontal Datum

Database Name	H_DATUM		
Data Type	Text	Inclusion	Mandatory
Width	30	Domain	HorizontalDatum
Examples	NAD83, IGLD 1955		
Description	Horizontal Datum for the point as referenced to an establish ellipsoid model.		

2.11 Vertical Datum

Database Name	V_DATUM		
Data Type	Text	Inclusion	Optional
Width	30	Domain	VerticalGeopotentialDatum
Examples	NAVD88, Mean Low Water		
Description	Vertical Datum for the orthometric height.		

2.12 Horizontal Accuracy

Database Name	H_ACC		
Data Type	Text	Inclusion	Mandatory
Width	30	Domain	AccuracyLevel
Examples	5 Centimeter +-, 2-Meter +-, Unknown		
Description	Estimated horizontal accuracy of reported position.		

2.13 Vertical Accuracy

Database Name	V_ACC		
Data Type	Text	Inclusion	Optional
Width	30	Domain	AccuracyLevel
Examples	10 Centimeter +-, Unknown		
Description	Estimated vertical accuracy of reported position.		

3. PLSS Elements

It is up to each organization to determine a local referencing convention for which township, range, section they want to use to denote a corner. Different counties may use different conventions. It is desirable to be consistent within a county.

Note: If a corner certificate uses a different referencing convention for the corner than is used by the county, it is expected that these PLSS elements will use the county convention.

3.1 Township

Database Name	TWP		
Data Type	Integer	Inclusion	Optional
Width	Short	Domain	Township
Examples	56, 132		
Description	PLSS Township Number.		

3.2 Township Direction

Database Name	TWP_DIR		
Data Type	Text	Inclusion	Optional
Width	10	Domain	TownshipDir
Examples	North, South		
Description	PLSS Township Direction.		

3.3 Range

Database Name	RANGE		
Data Type	Integer	Inclusion	Optional
Width	Short	Domain	Range
Examples	9, 43		
Description	PLSS Range.		

3.4 Meridian

Database Name	MRDN		
Data Type	Integer	Inclusion	Optional
Width	Short	Domain	PrincipalMeridian
Examples	4, 5		
Description	PLSS Meridian.		

3.5 Meridian Direction

Database Name	MRDN_DIR		
Data Type	Integer	Inclusion	Optional
Width	Short	Domain	RangeDirection
Examples	1		
Description	Direction from PLSS Meridian.		

3.6 Section

Database Name	SECTION		
Data Type	Integer	Inclusion	Optional
Width	Short	Domain	Section
Examples	6, 35		
Description	PLSS Section.		

4. Monument Elements

4.1 Monument Status

Database Name	MON_STATUS		
Data Type	Text	**Inclusion**	Optional
Width	20	**Domain**	MonumentStatus
Examples	Found, Set, Calculated		
Description	Indicates whether a monument was found, set, etc.		

4.2 Monument Photo

Database Name	MON_PHOTO		
Data Type	Text	**Inclusion**	Optional
Width	1000	**Domain**	
Examples			
Description	Link to photo of monument. Can be a hardcoded hyperlink or a reference to a file.		

4.3 Context Photo

Database Name	CNTX_PHOTO		
Data Type	Text	**Inclusion**	Optional
Width	1000	**Domain**	
Examples			
Description	Context photo. Can be a hardcoded hyperlink or a reference to a file.		

4.4 Monument Type

Database Name	MON_TYPE		
Data Type	Text	**Inclusion**	Mandatory
Width	50	**Domain**	MonumentType
Examples	Iron Pipe, Sandstone, Calculated		
Description	Physical description of the type of monument and material it is made of.		

4.5 Cap Type

Database Name	CAP_TYPE		
Data Type	Text	**Inclusion**	Optional
Width	30	**Domain**	MonumentCap
Examples	Aluminum, Plumber		
Description	Material/style of monument cap.		

4.6 Monument Diameter

Database Name	MON_DIAM		
Data Type	Real	**Inclusion**	Optional
Width	Double	**Domain**	MonumentDiameter
Examples	0.5, 4		
Description	Exterior diameter of monument in decimal inches. Note any inconsistencies or clarifications in the Monument Notes field.		

4.7 Cap Diameter

Database Name	CAP_DIAM		
Data Type	Real	**Inclusion**	Optional
Width	Double	**Domain**	MonumentDiameter
Examples	0.5, 4		
Description	Exterior diameter of cap in decimal inches. Note any inconsistencies or clarifications in the Monument Notes field.		

4.8 Monument Length

Database Name	MON_LENGTH		
Data Type	Real	**Inclusion**	Optional
Width	Double	**Domain**	MonumentLength
Examples	5.5, 8		
Description	Length of monument in decimal feet.		

4.9 Monument Notes

Database Name	MON_NOTES		
Data Type	Text	**Inclusion**	Optional
Width	255	**Domain**	
Examples	Found 4”x4”x24” granite monument 3’ below road surface with a 0.625” rebar on the south side of stone monument. Placed a cast iron monument at the road surface.		
Description	Note field for other pertinent info regarding the monument, e.g., depth, height, relation to centerline.		

5. Reference Elements

5.1 Reference File Name

Database Name	REF_FILE		
Data Type	Text	**Inclusion**	Optional
Width	255	**Domain**	
Examples	01253649, 6312C25.tif		
Description	The name of a scanned. filed or recorded reference document.		

5.2 Certificate URL

Database Name	REF_URL		
Data Type	Text	**Inclusion**	Optional
Width	1000	**Domain**	
Examples			
Description	Hyperlink to corner certificate document.		

5.3 Related Record

Database Name	REL_REC		
Data Type	Text	**Inclusion**	Optional
Width	100	**Domain**	RelatedRecord
Examples	Corner Certificate with known geodetic coordinates		
Description	Description of type of record that may be related to a point. Used to differentiate record quality.		

5.4 Data Authority

Database Name	DATA_AUTH		
Data Type	Text	**Inclusion**	Mandatory
Width	255	**Domain**	CountyName
Examples	Itasca, Douglas		
Description	Identification of primary county data authority.		

Appendix A: MN GAC PLSS Point Data Standard Schema

Appendix A is a spreadsheet available at this link showing the schema for this standard. It includes all the data elements in the standard, with field name, type, width and other important information about each data element.

Appendix B: MN GAC Standards Domains

Appendix B is a spreadsheet available at this link showing all the domain tables used in Minnesota Geospatial Advisory Council standards. It includes a tab showing when each domain table was last updated.

Appendix C: MN GAC Standard Lookup Tables

Appendix C is a spreadsheet available at this link showing all the lookup tables used in Minnesota Geospatial Advisory Council standards. It includes a tab showing when each table was last updated.