Land and Water Boards of the Mackenzie Valley

Geospatial Data Submission Standards

Mackenzie Valley Land and Water Board
Gwich'in Land and Water Board
Sahtu Land and Water Board
Wek'èezhìi Land and Water Board

July 9, 2021

Revision History Table		
Date	**Section**	**Revision**
July 9, 2021	General	• Updated terminology • Typographic and administrative updates • No changes to requirements
	Definitions and Acronyms	• Addition of some standard definitions for consistency with other Board guidance documents • Updated final plan and GIS definitions
	1. Introduction	• Restructured and revised for consistency with other Board guidance documents • Revised and clarified purposes in section 1.1 • Included additional legislative references in section 1.2 • Updated document history in Section 1.3 • Moved information on when geospatial data is required from section 1.4 to new section 2 • Added section 1.5 on Monitoring and Performance Measurement of these Standards
	2. When is Geospatial Data Required?	• New section
	3. Activities to Include in Geospatial Data	• New section incorporating relevant information from other sections • Moved project activities table to this section • Revised project activities table to be generally applicable, rather than specific to project category
	Sections 4-7	• Re-organized into separate sections for each type of geospatial data • Removed Application Form section and incorporated this information into other sections to improve flow and reduce repetition • Revised to align with new Application Forms
	4. Geographic Coordinates	• Moved Application Form example from Appendices into this section
	5. Map Sheet Number	• New section to account for removal of Application Form section • Revised to explain what NTS Map Sheet Number is
	6. Maps	• Restructured for better flow • Included project boundary for scope • Removed potentially sensitive data from the base map features table • Moved project activities table to section 3 • Expanded on coordinate system information
	7. GIS Data	• Included information on sensitive data such as TEK/TK and archaeological sites in section 7.1 • Clarified data format in section 7.2 • Included examples of attribute data in section 7.5
	Appendices	• Removed Application Form examples and incorporated into main body • Removed examples of project activities from map submission example and incorporated into section 3
		• Development of the Guideline (Section 1.3) • Application of the Guideline (Section 1.4)

November 23, 2016	New sections	• Geographic Coordinates (Section 2) • Application Form (Section 3) • Map Submission (Section 4) • Copyright (Section 5.1) • Attribute Data (Section 5.5) • Appendix A- GIS Standard Checklist • Appendix B- Application Form Example • Appendix C- Map Submission Example • Appendix D- GIS data Example

Table of Contents

Definitions and Acronyms

TERM	DEFINITION
AEMP	Aquatic Effects Monitoring Program
applicant	A person who has filed an application with the Board.
application	Any application for or in relation to a land use permit or water licence submitted in accordance with the *Mackenzie Valley Resource Management Act* (MVRMA), the *Waters Act*, or their regulations, and includes a request for a Board ruling, a plan approval, or any step required to advance a Board proceeding.
ArcMap for Desktop	ArcMap is an ESRI software use to create maps and conduct spatial queries.
attribute data	Geographic description of the features in form of tabular data.
Boards	The Land and Water Boards of the Mackenzie Valley, as mandated by the MVRMA. • Part 3 of the MVRMA establishes regional land and water boards with the power to regulate the use of land and water, and the deposit of waste, including the issuance of land use permits and water licences, so as to provide for the conservation, development, and utilization of land and water resources in a manner that will ensure the optimum benefit to the residents of the management area and of the Mackenzie Valley and to all Canadians. • Part 4 of the MVRMA establishes the Mackenzie Valley Land and Water Board (MVLWB). Regional Land and Water Boards have been established in the Gwich'in, Sahtu, and Wek'èezhìi management areas and now form Regional Panels of the MVLWB.
coordinate system	A coordinate reference system (CRS) that defines the map projection.
coordinates	A set of horizontal axis (x) and vertical axis (y) values that defines a location.
datum	A model that measures locations relative to centre of the earth.
dBase table (dbf)	A file format that stores the attribute data.
degrees, minutes, seconds (DMS)	A unit used for describing latitude and longitude coordinates (1 degree = 60 minutes; 1 minute = 60 seconds).
digital elevation model (DEM)	Raster data model that shows terrain relief.
ESRI	A company that supplies geographic information system software (e.g., ArcMap for Desktop).
EPSG code	Codes developed by European Petroleum Survey Group (EPSG) that identify coordinate systems.
Extensible Markup Language (XML)	A stand-alone file format for sharing metadata.
FGDC	Federal Geographic Data Committee (FGDC)
final plan	A document containing the information outlined in section 29 of the Mackenzie Valley Land Use Regulations, which must be submitted to the Board by a permittee within 60 days of the completion of a land use operation or the expiration of a land use permit.
Geographic Information System (GIS)	A framework for gathering, managing, and analyzing data.
georeferenced	A raster image associated with a coordinate system.
geospatial data	Information about a location and shapes of geographic features.
GeoTIFF	Raster image in TIFF files that contains spatial reference information.
GLWB	Gwich'in Land and Water Board
graticule labels	Labels along a data frame that show the longitude and latitude.

land use permit (permit)	An authorization required for an activity set out in sections 4 and 5 of the Mackenzie Valley Land Use Regulations, or a land use permit (Type C) required by Tłı̨chǫ law for use of Tłı̨chǫ lands, or by a Délı̨nę law for use of Délı̨nę lands, respectively, for which a Type A or B land use permit is not required.
latitude	Parallel lines running east to west on the earth.
longitude	Meridian lines that intersect the equator and pass through the North and South Poles.
map projection	Transformation of coordinates on spherical earth to a flat and planar map.
map sheet number	The index on the grid of the National Topographic System (NTS).
metadata	Information about GIS data that describes its content, source, projection, scale, etc.
MVLWB	Mackenzie Valley Land and Water Board
MVFAWR	Mackenzie Valley Federal Areas Waters Regulations
MVRMA	Mackenzie Valley Resource Management Act
MVLUR	Mackenzie Valley Land Use Regulations (MVLUR)
North American Datum (NAD)	NAD 83 is based on Geodetic Reference System 1980 ellipsoid with its measurement obtained from terrestrial and satellite data. NAD 83 is gradually replacing NAD 27, which was used in the United States during the twentieth century.
project	Any activity that requires a water licence or land use permit.
raster data	Grid of cells/pixels-based data (e.g., aerial photographs, satellite imageries, scanned maps, etc.).
shapefile	A format to store location, shape, and attribute data of geographic features.
SNP	Surveillance Network Program
tabular data	Descriptive information that is stored in rows and columns in a database and can be linked to spatial data.
Tagged Image File Format (TIFF)	A file format that stores raster images.
topography	Features of the land surfaces (e.g., elevations, and position of natural and constructed features).
toponymy	Study of place names (toponyms).
Traditional (environmental) Knowledge (TEK/TK)	A cumulative, collective body of knowledge, experience, and values built up by a group of people through generations of living in close contact with nature. Builds upon the historic experiences of a people and adapts to social, economic, environmental, spiritual, and political change.[1]
vector data	Data using point, lines, and polygons to represent features.
water licence (licence)	An authorization required as per Columns III and IV of Schedules D to H of the Waters Regulations (for non-federal areas) and Columns III and IV of Schedules IV to VIII of the Mackenzie Valley Federal Areas Waters Regulations (for federal areas).
WLWB	Wek'èezhìi Land and Water Board

[1] Individual organizations may have specific practices and protocols in place guiding use of traditional (environmental) knowledge.

1.0 Introduction

The Land and Water Boards (the Boards) of the Mackenzie Valley regulate the use of water and deposit of waste through the issuance of water licences (licences) in accordance with the *Waters Act* and Waters Regulations, and the *Mackenzie Valley Resource Management Act* (MVRMA) and Mackenzie Valley Federal Areas Waters Regulations (MVFAWR). The Boards regulate the use of land through the issuance of land use permits (permits) in accordance with the MVRMA and the Mackenzie Valley Land Use Regulations (MVLUR).

1.1 Purpose

Geospatial data such as geographic coordinates, maps, and Geographic Information System (GIS) data are essential to several elements of the regulatory process, including confirming eligibility such as mineral claims and leases, identifying transboundary applications and impacts, assessing cumulative impacts, and conducting preliminary screenings.

These Standards outline:

- When geospatial data are required;
- What is required in the geographic information section of the application form for permits and licences;
- What to include in map submissions; and
- What the expected format is for geospatial data.

The purpose of these Standards is to promote:

- Efficiency – Clarify the geospatial data submissions requirements for applicants by providing clear instructions and expectations;
- Certainty – Ensure applicants understand the required information, level of effort, and time frames associated with geospatial data submissions;
- Consistency – Ensure expectations and Board practices are consistent throughout the Mackenzie Valley; and
- Transparency – Ensure that all parties involved in the application process have enough information to participate in a meaningful way.

The Acts and Regulations are the authority in any case where there is a conflict or inconsistency between these Standards and the legislation.[2] Additionally, links to various other relevant references are provided in these Standards to assist readers; however, these references may be subject to revisions following the publication of these Standards. Applicants and other readers should always ensure they are using the most recent versions of any references (e.g., legislation, guidelines, policies, land use plans, etc.).

[2] The *Waters Act* and MVRMA, and the Water Regulations and MVFAWR, respectively.

1.2 Authority

Sections 65, 102, and 106 of the MVRMA grant the Board the authority to develop and implement guidelines.

1.3 How These Standards Were Developed

On March 1, 2012, the Boards initially released the *Standards for Geographic Information Systems (GIS) Submissions*, which was updated as the *Guidelines for Geographic Information Systems (GIS) Submission Standard* on November 23, 2016, following a public review. In 2021, these Standards were updated to reflect current Board practices and guidance documents, such as the *Guide to the Water Licensing Process* and the *Guide to Land Use Permitting Process.* These updated Standards were renamed as the *Geospatial Data Submission Standards* to better reflect the content and were released on July 9, 2021.

1.4 Application of These Standards

These Standards apply to any geospatial data submitted to the following Boards:

- Mackenzie Valley Land and Water Board (MVLWB)
- Gwich'in Land and Water Board (GLWB)
- Sahtu Land and Water Board (SLWB)
- Wek'èezhìi Land and Water Board (WLWB)

1.5 Monitoring and Performance Measurement of These Standards

Mechanisms will be required to monitor and measure performance and to evaluate the effectiveness of these Standards. In accordance with the principles of a management systems approach (e.g., plan-do-check-act), the Boards will develop a performance measurement framework. These Standards will be reviewed and amended as necessary within that framework. The framework will also describe how affected parties, industry, and government will be involved in the review process.

2.0 When is Geospatial Data Required?

The Boards may request geospatial data at any stage for any submission associated with an application, licence, or permit. For example, maps are required with any permit or licence application, and are often required in management plans and reports required under licence and permit conditions. If there any changes to proposed activities during a proceeding, the Board may require resubmission of maps to accurately reflect the approved activities. The Board may also direct an applicant to submit GIS data if it is deemed necessary to assess the proposed activities.

In an application package for a licence or a permit, the geospatial data that the Boards require **depends on the size, scale, and nature of the project being proposed**.[3] Typically, a type A licence application has more extensive information requirements than a type B licence application. Geographic coordinates and

[3] See the Apply for Permit/Licence webpage on any of the Boards' websites (www.glwb.com/www.mvlwb.com/www.slwb.com/www.wlwb.ca/) to access the Boards' Application Forms.

maps are typically required for all projects, while GIS data may also be required for larger projects. Regardless, the Board may request more geospatial data for any submission to complete a preliminary screening determination for the project, and/or to set the term and conditions for the licence or permit. This information is also applicable to amendment and renewal applications.

Table 1 sets out typical geospatial data requirements for commonly required submissions. Geospatial data requirements may be specified in other Board guidance documents, including but not limited to the *Guide to the Water Licensing Process, Guide to Land Use Permitting Process,* and *Guidelines for Aquatic Effects Monitoring Program*, etc.[4] Applicants should refer to the Board's guidelines for specific geospatial data requirements. **Because the geospatial data required can vary based on the project details, please contact Board staff prior to submitting documents if it is unclear whether geospatial data is required for a specific submission.[5]**

Table 1: Typical Geospatial Data Requirements for Board Submissions

● Required ○ Required if Applicable □ Encouraged	Geospatial Data		
	Geographic Coordinates	**Maps**	**GIS Data**
Permit and Licence Applications	●	●	○
Spill Contingency Plan	○	●	○
Waste Management Plan	○	●	○
Closure and Reclamation Plan	○	●	○
Management and Monitoring Plans or Programs (e.g., Aquatic Effects Monitoring Programs (AEMP), construction plans, monitoring plans, operations and maintenance manuals, etc.)	○	●	○
Reports (e.g., Annual Reports, Surveillance Network Program Reports, AEMP Annual Reports, etc.)	●	●	□
Final Plans	●	●	●

More information about the Boards' expectations for each type of geospatial data is provided in sections 5 to 7.

3.0 Activities to Include in Geospatial Data

The geospatial data provided should reflect the activities and operations described in the application, management plan, monitoring program, or report submitted to the Board. Maps submitted should also include all proposed project activities and structures. At a minimum, project activities and structures listed under paragraphs 19(3)(b) and 29(1)(b) of the MVLUR should be included. See Table 2 for a more extensive, but not exhaustive list of project activities and structures that should be included.

[4] All Board guidance documents referenced in these Standards can be accessed on the Policies and Guidelines webpage on any of the Boards' websites (www.glwb.com/www.mvlwb.com/www.slwb.com/www.wlwb.ca/).
[5] Contact information for Board staff can be accessed on the Contact Us webpage on any of the Boards' websites.

Table 2: Examples of Project Activities

Project Activities and Structures	
General	drill locations, camps, winter roads, lines, trails, airstrips, access roads, rights-of-way, fuel storage facilities, wells, staging areas, quarries, etc.
Water Use	water sources (e.g., lakes, rivers, streams, aquifers, etc.); water supply facilities, groundwater wells, etc.
Waste Disposal	sumps, discharge locations, hydrocarbon-contaminated soil treatment facilities, sewage disposal facilities, solid waste disposal facilities, tailings containment facilities, waste rock storage facilities, wastewater treatment facilities, etc.
Watercourse Crossing and Training	bridges, pipelines, barge landing, culverts, or flood control structures, watercourse diversion structures, etc.
Water Management	dams, dykes, collection ponds, etc.
Monitoring Locations	SNP stations, AEMP stations, etc.

4.0 Geographic Coordinates

Where required, any geographic coordinates submitted should be in the format of degrees (D), minutes (M), seconds (S) or decimal degrees as shown in Table 3. For example, the Application Forms require the maximum and minimum latitude and longitude geographic coordinates of the project boundary, as shown in the example in Table 4.

Table 3: Format of Geographic Coordinates

Format	Degrees, minutes, seconds [a] (DMS)	Decimal degrees [b] (D)
Example	128°38’20.773”W, 66°15’28.522”N	-128.639104˚, 66.257923˚
Longitude, Latitude [c]	DDD˚MM’SS.SS” W, DDD˚MM’SS.SS”N	-/+D.DDDD˚ , -/+D.DDDD˚
Unit symbols [d]	D (˚), M (’), S (”)	D (˚)
Direction (West, North)	W, N	-, +

[a] The seconds in DMS must be to a precision of at least two decimal places.

[b] The decimal degrees must be to a precision of at least four decimal places .

[c] Coordinates should be consistently in either DMS or decimal degrees; **other coordinate systems are not accepted.**

[d] If using DMS, indicate the degrees (˚), minutes (’), seconds (”) by specifying their unit symbol.

Table 4: Example of Project Boundary Coordinates and Map Sheet Number

Minimum latitude:	64˚35’8.3140”	Maximum latitude:	65˚15’3.32”
Minimum longitude:	-125˚40’16.96”	Maximum longitude:	-126˚50’14.511”

NTS Map Sheet No.:	96C, 96 D, 96E, 96F

5.0 Map Sheet Number

The National Topographic System (NTS) map sheet number is formed by a number and a letter (e.g., 106P). The NTS map sheet number is required on the Application Forms as shown in the example in Table 4

above. To determine the map sheet number for the project location, there is a map available on the Board's website.[6]

6.0 Maps

When maps are required, both overview and detailed maps should be included. See Appendix B for examples. This section details the elements and features that should be included in a map.

6.1 Map Elements

All maps should include elements such as a map title, north arrow, map scale (scale text and/or scale bar), latitude/longitude graticules labels, data source, map projection, date of the map, author of the map, and disclaimers (if any). See Figure 1 in Appendix B for example.

6.2 Map Scale

The overview map (see Appendix B, Figure 1) should be scaled at 1:250,000 or less (e.g., 1:500,000) to show the location of the project area. In an application package, the overview map should clearly demonstrate the maximum proposed project boundary. Detailed maps (see Appendix B, Figure 2) should be scaled at 1:50,000 or more (e.g., 1:5,000) to show more localized proposed project activities. Multiple detailed maps may be required if the project extends across a large geographic area.

6.3 Base Map Features

In addition to the project activities listed in section 3, maps should also include base map features such as vegetation, waterbodies, place names, and administrative boundaries to provide context. See Table 5 for a more extensive, but not exhaustive list of features that should be included.

Table 5: Base Map Features

Base Map Features	
Rights	mineral claims, mineral leases, etc.
Hydrography	lakes, rivers, streams, watersheds (sub-basins and major basins), etc.
Vegetation	wooded area, wetlands, etc.
Administrative boundaries	landowners, land managers, land claim regions, land withdrawal areas, NWT Protected Areas Strategy, etc.
Toponymy	place names, water features names, boundary names, etc.
Sensitive species and features	rare or maybe-at-risk plants, hot and warm springs, mineral licks, Karst topography, eskers, ice patches, etc.

6.4 Map Projection

All maps and GIS data should be spatially referenced to Geographic Coordinate System North American 1983 and must be in one of the following projections:

[6] See the Maps webpage on any of the Boards' websites to access the Base Maps.

- Universal Transverse Mercator (UTM) Zone 8N, 9N, 10N, 11N, or 12N
- NAD 1983 Northwest Territories Lambert
  WKID: 3580 Authority: EPSG
  Projection: Lambert Conformal Conic
  False Easting: 0.0
  False Northing: 0.0
  Central Meridian: -112.0
  Standard Parallel 1: 62.0
  Standard Parallel 2: 70.0
  Latitude of Origin: 0.0
  Linear Unit: Metre (1.0)

7.0 GIS Data

All applicable project activities described in section 3 should be included in the dataset as individual files (see Appendix C). For example, project activities such as access road and camp location should not be combined in the same shapefile. Base map features such as topography or administrative boundaries are generally not required to be submitted as GIS data.

7.1 Copyright and Sensitive Information

Submitted geospatial data are posted on the Boards' public registry. For GIS data under database release agreement (e.g., sensitive datasets), applicants should follow the conditions of the agreement when sharing data (e.g., acquire written consent to share data). For non-transferable GIS data, please provide the source of the database such as citation and contact information. Other sensitive data, such as locations of archaeological sites or traditional (environmental) knowledge, should not be included in submissions.

7.2 Data Format

GIS data must be submitted in a format compatible with the latest version of ArcMap Desktop. The Boards will accept the following formats:

- Vector Data:
  - Points, polylines, or polygons
  - Shapefiles with main file (.shp), index file (.shx), and dBase table (.dbf) (see section 7.5) are required. Submission of other files such as Coordinate system file (.prj) are encouraged.
  - **AutoCAD drawings (.dwg) are not acceptable.** External footprint is sufficient. Internal structure is not required.
  - ESRI's shapefile (.shp) spatial data format standards are outlined in the ESRI White Paper: ESRI Shapefile Technical Description.

- Raster Data:
  - Images: satellite imagery, aerial photography, digital elevation models (DEMs).
  - Tagged Image File Format (TIFF) GeoTIFF (.tif, .tiff, and .tff).

- Ortho-corrected and georeferenced.

Submit different features as individual files and use a .zip file to consolidate multiple feature files for a single submission.

Please contact Board Staff if planning to use other file formats.

7.3 Projection

Acceptable projections are specified in section 7.4.

7.4 Metadata

Metadata is the information that describes the GIS dataset. The datasets must include basic metadata in the format and standard of Extensible Markup Language (XML). Applicants can use one of the Federal Geographic Data Committee (FGDC) approved metadata standards to fill out the ESRI metadata stylesheet. The documentation must include, at a minimum, the following:

- Applicant name;
- Project/data set description;
- Scale of data set compilation (e.g., 1:20,000);
- Datum and projection of data set compilation;
- Citation information (e.g., originator);
- Date of creation and any updates;
- Data source (e.g., GPS, air photo, etc.) with resolution;
- Data quality and accuracy;
- Agency and person responsible for the data set and contact information;
- Restrictions and limitations; and
- List of attributes, descriptions of the attributes, and acronyms.

See Appendix C for examples.

7.5 Attribute Data

The dBase table (.dbf) is commonly created along with a shapefile. The dBase table should consist of attribute fields used to describe each entity in each dataset. Acronyms in the attribute table should be identified in the metadata (.xml). The attributes can vary depending on the type of project. The level of details in the attribute table should reflect the submission to the Board. For example, if water source GIS data is submitted to the Board, the attribute data should include the name of the water source, the type of watercourse (e.g., river, stream, lakes), capacity, proposed water use, purpose of water use, etc. In addition to the default fields such as Object ID and Shape (point, polyline, polygon), the attribute table should include other fields, if applicable, such as:

- Name/Site ID (e.g., well site ID);
- Type of operation (e.g., camp, access road, etc.);

- Status (e.g., active, suspended, inactive, etc.);
- Date/season (e.g., sampling date);
- Area/length/width/depth (e.g., airstrip dimension);
- Capacity/volume (e.g., campsite capacity); and/or
- Note (for other description).

See Appendix C for examples.

Appendix A – GIS Standard Checklist

Applicants should use the following checklist to ensure that the minimum requirements have been incorporated into their application or submission.

Application Form

☐ Maximum and minimum coordinates (project area) (see section 3)

☐ Coordinates of project activities

☐ 1:250,000 NTS map sheet number

Geographic Coordinates (Section 3)

☐ Coordinate units in degrees (˚), minutes (’), seconds (”) or decimal degrees (˚)

Map Submission (Section 6)

☐ Regional map: 1: 250,000 or less

☐ Detail map(s): 1: 5,000 or more

☐ Topographic and operational features (including temporary facilities)

☐ Map elements: title, north arrow, graticule labels, scale, and data source

☐ Map projection: NAD83/NWT Lambert or NAD83 UTM Zone # (indicate zone number)

GIS Data (Section 7)

☐ Data format: compatible with latest ArcMap Desktop

☐ Vector: .shp, .shx, .dbf

☐ Raster: .GeoTIFF

☐ Different features illustrated as individual files and combine all files in a single .ZIP file

☐ Projection: NAD83 / NWT Lambert or NAD83 UTM Zone # (indicate zone number)

☐ Metadata (.xml)

☐ Attribute data (.dbf)

Appendix B – Map Submission Examples

Map Submission Example

Map elements:
1. Map Title
2. Legend
3. North Arrow
4. Scale bar/text, regional map scaled at less than 1:250,000
5. Date of creation, contact information etc.
6. Graticules labels

7. Data source,
8. Coordinate system information (zone number clearly indicated in the NAD83 UTM projection).

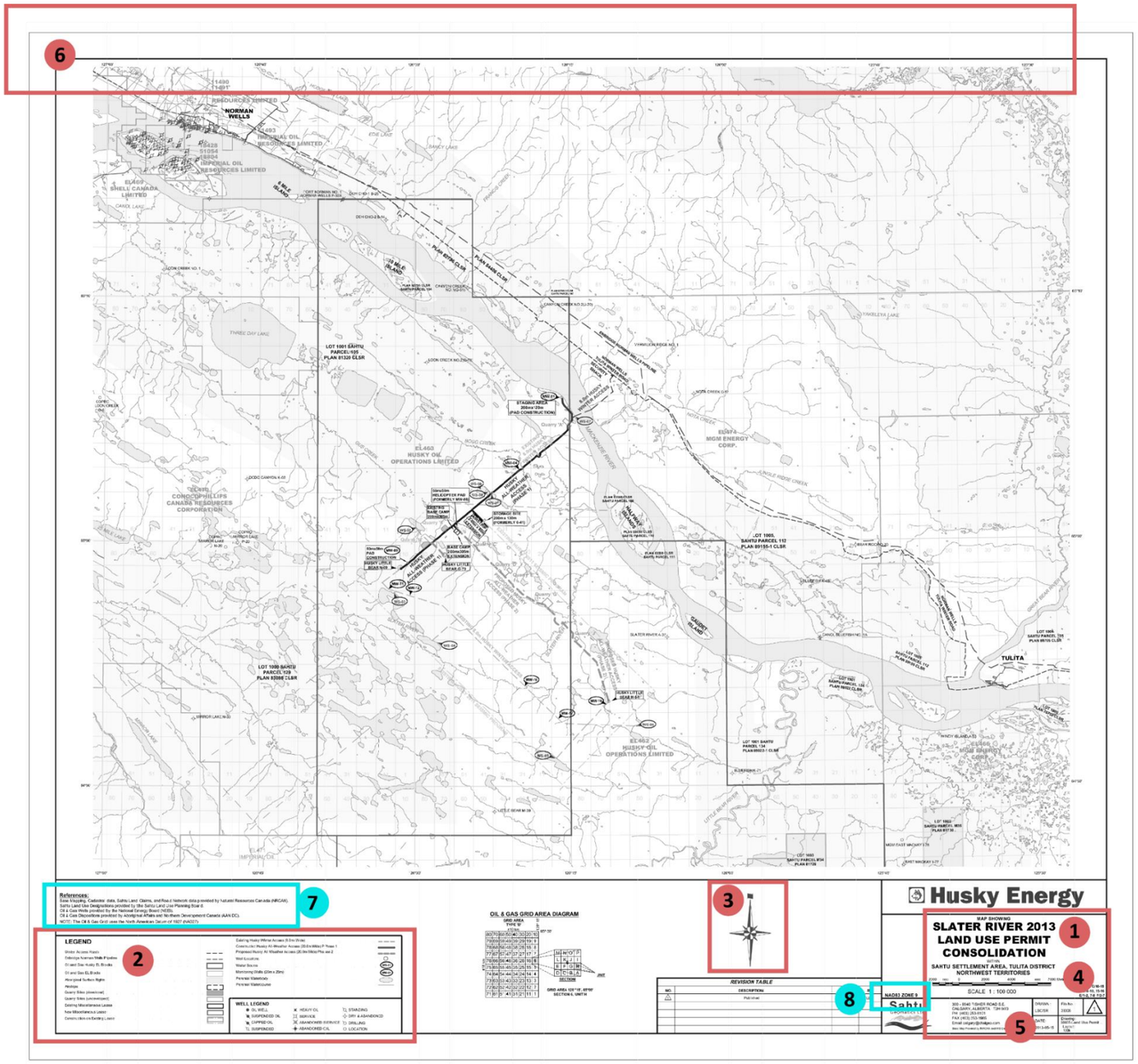


Figure 1: Overview Map

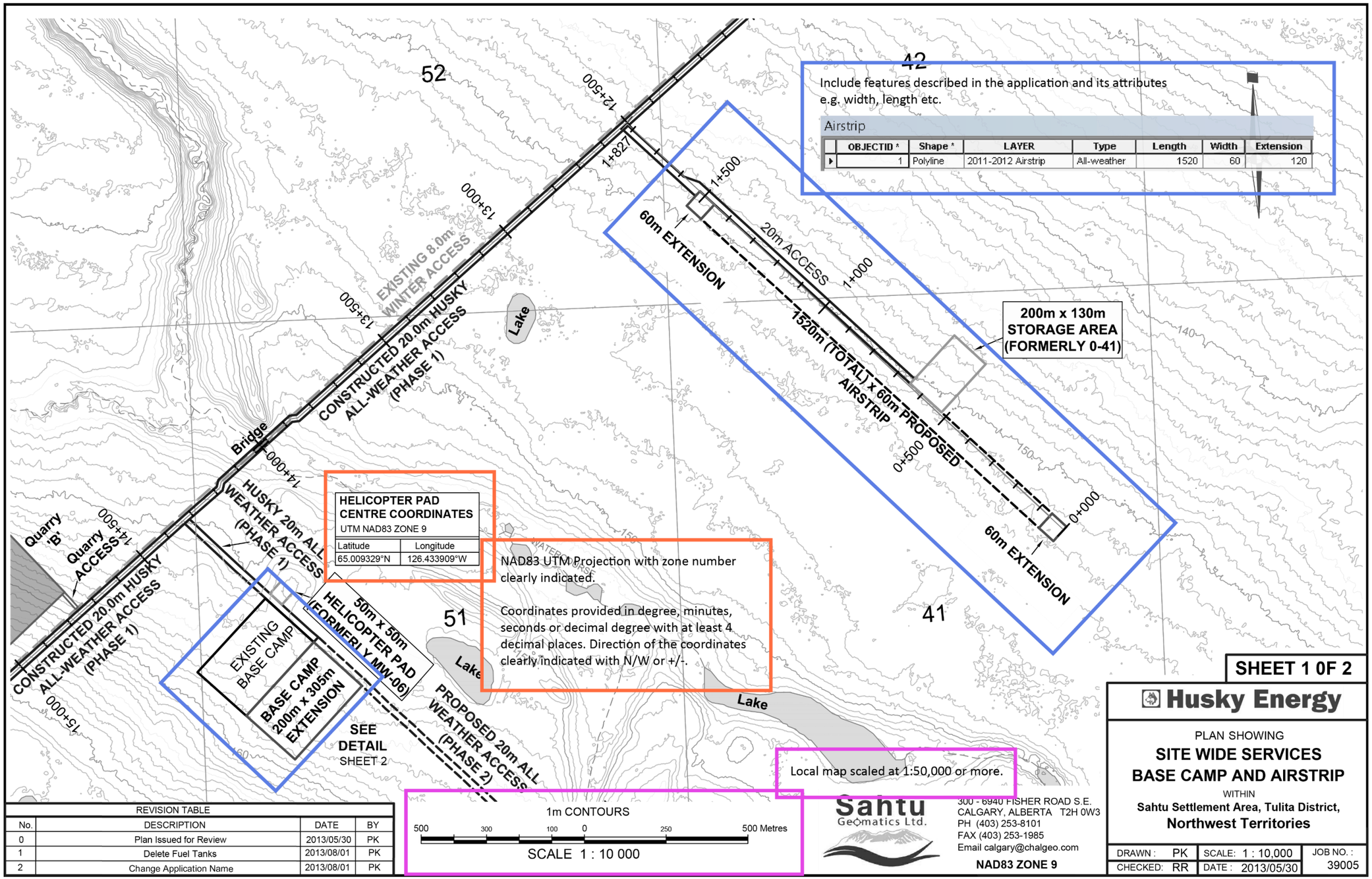


Figure 2: Detailed Map

Appendix C – GIS Data Examples

Data Format Example (Section 7.2)

- Vector data is accepted in shapefiles (.shp, .shx, & .dbf), but not in CAD drawing (.dwg) format as shown in Figure 3
- Organize different features into individual shapefiles, and compile multiple shapefiles into a single .ZIP file.

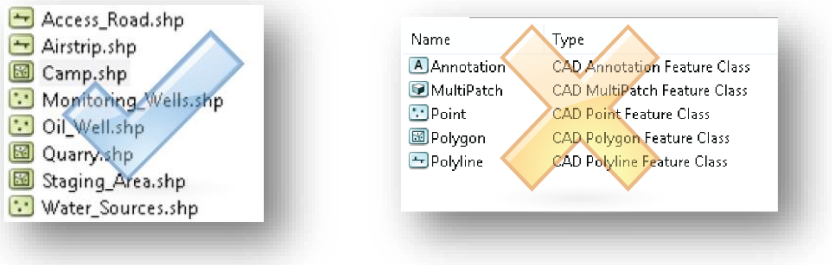


Figure 3: Examples of Shapefiles of Different Features that Should be Submitted Individually

Metadata Example (Section 7.4)

- A list of attributes and corresponding descriptions should be included in the metadata (.xml file) as shown in Figure 4.

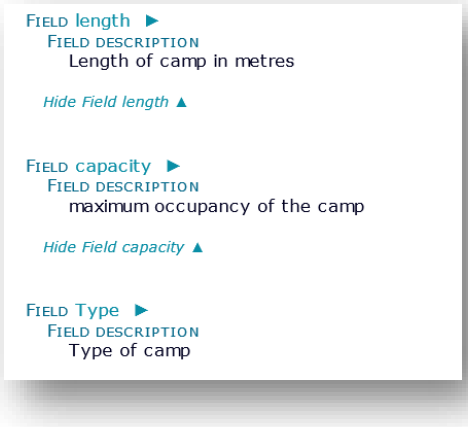


Figure 4: Example of a Metadata File

Attribute Table Example (Section 7.5)

- External footprints of operational features should be reflected in maps as shown in Figure 1; maps or CAD data for internal structural details are not required.
- Feature properties such as dimension, coordinates, maximum occupancy, type of camp, etc. (as described in the application) should be reflected in the attribute table (dBase table) of the GIS data as shown in Figure 5.

4.1 Camp/Storage Sites

4.1.1 Site Expansion

The current camp/storage site has dimensions of 200m by 305m and encompasses an area of 6.1ha. To accommodate anticipated storage requirements and a 400 person camp, an additional 6.1ha will be required. A 200 x 305m area will be cleared and padded adjacent to the current camp/storage site along the southeast boundary (refer to Pre-disturbance Assessment report and photos in **Appendix 1-C**) using the same construction methods employed and described in the LUP application for S12F-007. These include:

- Clearing of trees and shrubbery using mechanical mulchers or low ground pressure crawler tractors (dozers), however, any merchantable timber will be harvested and be made available to the communities;
- Placement of geo-textile over the material;
- Placement of a minimum of 1m fill over the geo-textile; and,
- Compacting and levelling the site to promote drainage.

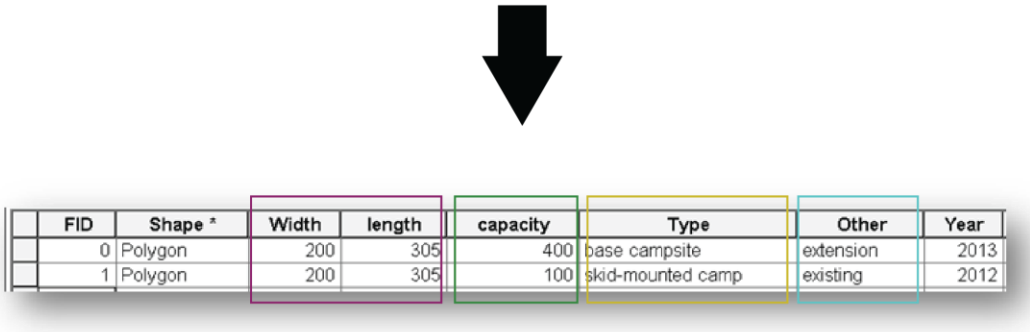
Approximately 82,500m^3 of fill will be required which will be obtained from Quarry "B" and/or Quarry "M" and/or another approved Quarry.

Table 4-1: Base Campsite Location

Location Name	Coordinates (NAD83 Zone 9)			
	Latitude	Longitude	Northing (m)	Easting (m)
Base Campsite	65.007681°N	126.435543°W	7211569	620875

4.1.2 Camp

The camp that is currently located on the base camp/storage site is configured as a 103-person skid-mounted camp; however Husky will not exceed the maximum occupancy of 100-persons as authorized under LUP S12F-007 and WL S11L3-002. Husky proposes to install a second camp with an estimated occupancy of 226 persons after which the current camp will be demobilized. However to accommodate future project needs, this application is requesting a maximum occupancy of 400 persons. This gives Husky the flexibility to add additional accommodation if project activities warrant. The new camp will be sited on pilings at the camp/storage site expansion and adjacent to the current camp (see Site Sketch in **Appendix 2**). The camp will be equipped with portable water treatment and waste water treatment plants appropriately sized to handle camp requirements. A 25m tall communications tower will be erected to provide improved communications for the camp. A pole-mounted antenna may be installed as a temporary measure prior to and during the tower installation.



	FID	Shape *	Width	length	capacity	Type	Other	Year
	0	Polygon	200	305	400	base campsite	extension	2013
	1	Polygon	200	305	100	skid-mounted camp	existing	2012

Figure 5: Example of Application Project Description Reflected in the Attribute Table