

**Standards for Terrestrial Ecosystem Mapping (TEM)
Digital Data Capture in British Columbia,**

Version 3.0 (2000)

Errata No. 1.0

Prepared by
Ministry of Sustainable Resource Management
Resource Information Branch
for the
Resource Information Standards Committee

March 2004

Introduction:

As many of you are aware the provincial government, specifically the Resource Information Branch, MSRM, is no longer responsible for the Quality Assurance (QA) of project deliverables associated with Terrestrial Ecosystem Mapping (TEM). Provincial responsibilities with respect to project deliverables are to determine if, upon delivery, the final project data is in compliance with the provincial standards and can be loaded into the provincial data warehouse. Under this new QA process, the Quality Assurance of TEM deliverables is to be completed by third party QA contractors. It is now the responsibility of the client to ensure all data is in compliance with the current RISC standard(s). It is also now the responsibility of the client to deliver all final TEM products to the province, including all relevant Quality Assurance and, if applicable, Accuracy Assessment (AA) documentation.

To facilitate this process, section 6.0 of the *Standard for Terrestrial Ecosystem Mapping (TEM) Digital Data Capture in British Columbia, Version 3.0* (2000) (the TEM technical standard) has been amended. These amendments should replace any earlier versions of Section 6. The information included in this document provides revised naming conventions for digital TEM project deliverables and a new location for delivery of final TEM products. All future TEM project deliverables must adhere to the standards for data submission provided in this document.

Summary:

The following is a summary of the main changes in Section 6.0 – Deliverables, of the TEM technical standard:

1. A project identification number <BAPID> must be requested from the province at the onset of the project. When requesting the BAPID you will be required to supply basic information about the project. The BAPID should be used in naming all files and in all correspondence.
2. File format and naming requirements have changed slightly.
3. All project deliverables must be delivered to the province's ftp site.
4. The province can no longer accept files in hardcopy or on CD's excepted as noted in 5.
5. Air photos and plot cards should be delivered to MSRM.
6. There is a new requirement for interim deliverables. These include Biogeoclimatic linework and approval of new map units.
7. QC, QA and AA reports will be submitted as part of the final deliverables.
8. Map legends will now be delivered in pdf format and include all lines and symbology. Plot files are no longer required.
9. Graphics and other inserts should not be linked to the report or expanded legend file as separate documents.

Any questions or comments can be directed to the TEM data custodian at: eco_mail@Victoria1.gov.bc.ca. Recommendations for changes to this standard and/or other related standards should be directed to the same location.

6. Deliverables

6.1. Location

The province can no longer accept data in any other submission format including hardcopy or data submitted on CDs, except as noted below for air photos and plot cards. The final submission of seamless data and all associated files must be made in one data transfer, not in individual sections.

The files must be zipped into one project file and delivered to the Ministry of Sustainable Resource Management ftp site at <ftp://ftp.env.gov.bc.ca/pub/incoming/tem>. Anonymous login will be used to access the ftp site. The file should be named:

tem_<BAPID>.zip

The Business Area Project IDentification number <BAPID> must be requested from the MSRM at the onset of the project. When submitting a request for BAPID the following information should be included in the body of the email:

- Business Area: (i.e. PEM, TEM, WHR, etc)
- Project Name:
- FIA Contract no.:
- MSRM Region:
- Scale of Mapping:
- Location: (i.e. mapsheets, landscape units, etc):
- Client:
- Mapping Consultant:
- Start date:
- If wildlife habitat assessment will be included (please apply for WHR BAPID according to the WHR data submission standards.)

BAPID requests should be sent to: eco_mail@Victoria1.gov.bc.ca.

The province should also be notified at this address whenever final data is posted to the ftp site. The subject line of the email should include the line “Request for BAPID” or “<BAPID> final deliverables”.

6.2. Format required for project deliverables

To ensure all TEM deliverables are submitted correctly, users must adhere to the requirements outlined in this and all other sections of the *Standard for Terrestrial Ecosystem Mapping (TEM) Digital Data Capture in British Columbia*, (RIC, 2000)(the TEM Technical Standard).

Sections 6.3 through 6.4 provide the list of MINIMUM deliverables and file naming conventions that must be submitted to the province at completion of the TEM project. File names must be in

lower case and not contain any spaces. Word documents must be converted into PDF format and Excel documents must be converted into CSV format.

Users should always refer to the project contract, referenced materials, the TEM Technical Standard and all other necessary documentation to guarantee all required deliverables are submitted.

6.3. Interim Deliverables

In order to accommodate a more mechanized method of data delivery and project sign off, the following products should be provided to the province prior to submission of the final products. These files will allow improved updating of the mapcodes list and the production of project-specific validation routines which will be required to verify completed TEM projects.

6.3.1 Biogeoclimatic (BGC) and Ecosection Linework

All proposed BGC linework must be submitted to and approved by the applicable Ministry of Forests regional ecologist prior to the production and submission of final ecosystem mapping. In areas of the province where reconnaissance or field level reliability large scale BGC mapping is already available through the Ministry of Forests, mapping should be completed using existing lines. For more information on localized BGC mapping please see the following website: <http://www.for.gov.bc.ca/hre/becweb/subsite-map/largescale-01.htm>. Note, if significant changes to Ecosection lines are anticipated then the proposed linework should be submitted to the Ministry of Sustainable Resource Management for approval.

See the TEM Standard, Section 6 Mapping and Field Survey Procedures for further explanation of the BGC/Ecosection mapping procedures.

6.3.2 New units (i.e. map codes)

New map unit list: All proposed new map units, including the original supporting plot data, must be submitted to and approved by the regional ecologist for the study area prior to the submission of the final deliverables. Once approved, the list of new units, including proposed unit name and definition, should be submitted to MSRM. The provincial list of site series and map codes, will then be updated, to include these new units, allowing users to validate final submissions.

See the TEM Standard, Section 3.2.1 Unclassified site units for further explanation of the map unit approval procedures.

6.4 Final Deliverables

6.4.1 Required spatial databases:

The completed spatial data file must include the entire project boundary, ecosystem and terrain features along with the required spatial attributes identified in Section 3.

Two ARC/INFO single precision export files are required deliverables:

1. ECP coverage containing the TEM polygon information

The file name should be: tem_<BAPID>_<thematic content> - i.e. tem_4146_ecp.e00

2. ECI coverage containing the sample points (plot locations)

The file name should be: tem_<BAPID><thematic content> - i.e. tem_4146_eci.e00

All spatial files should be accompanied by meta data. Provincial standards for Arc files can be found at <http://srmwww.gov.bc.ca/gis/arcmetadata.html>. If the ecosystem digital map is stored in a format other than ARC/INFO, it is the responsibility of the client to ensure the data is converted into the standard format. Export files must be created with the 'NONE' compression option (produces readable ASCII).

6.4.2 Spatial Requirements

Projects captured from stereo pairs using mono-restitution or other methodologies will include reports and materials necessary for quality control and assurance as listed below.

1. The **original** typed document photos and update photos with control marked as per these specifications.
2. A digital file containing control points in ASCII (CSV) format. This control point file shall contain point numbers, X, Y, Z coordinates (to three decimal places).
3. All original source materials provided by the Ministry, including TRIM prints and diapositives, along with TRIM digital control.
4. Mono-restitution set up (digital) reports for each model.

Table 6-1 – Spatial deliverables requirements

Each model must clearly provide the following information	
1) Project Name	
	Geographic Location
	Model name
	Operator
	Tablet resolution
	Focal length
	Photo Scale
2) Orientation Results	
	Photo positioning: Omega, Phi, Kappa
	Fiducial digitizing confidence: must meet or exceed 98 % (0.2)

3) Control Residuals Report	
	All output to be in meters to 3 decimal places
	Mean residual
	Maximum residual
	For each control point (minimum of 6):
	The X,Y,Z of the control point
	The residual in X
	The residual in Y
	The residual in Z

NOTE: Control transfers from TRIM must follow contract procedures. All stereo models will be setup on a stereo plotter that has met TRIM calibrations, issued by Geographic Data BC that are current. A copy of certification of the equipment may be requested by the province as deliverable during quality assurance.

6.4.3 Non-spatial attribute databases:

The first three databases listed below are mandatory deliverables. The user-defined database is optional depending on project specifications.

1. TEM Project database (project.csv): This database includes the project meta-data and must contain all mandatory fields indicated in Table 2-1 of the TEM Technical Standards.

The file name should be: tem_<BAPID>_<thematic content> - i.e. tem_4146_mta.csv

2. TEM Polygon database (polygon.csv): This database contains ecosystem and terrain attributes and must contain all mandatory fields indicated in Table 2-1 of the TEM Technical Standards.

The file name should be: tem_<BAPID>_<thematic content> – i.e. tem_4146_ecp.csv

3. TEM Field data: Full plots and GIFs must be submitted as VENUS files. Visual and air call checks may be submitted through the Graviti form within VENUS, or as a csv file. Minimum data collection requirements are indicated in Section 6.3.3 of the TEM Standard.

The file names should be: tem_<BAPID>_<thematic content> - i.e. tem_4146_eci.mdb

tem_<BAPID>_<thematic content> – i.e. tem_4146_eci.csv

4. TEM User Defined database (userdefined.csv): This database defines project specific attributes and is required if user defined attributes are applied.
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The file name should be: tem_<BAPID>_<thematic content> - i.e. tem_4146_usr.csv

See the TEM Technical Standard and TEM Data Capture and Validation Tool (TEM DC) for further explanation of how to record user defined codes and attributes.

6.4.4 Digital Plot Files & Check Plots

Digital plot files and hard copy check plots are no longer required by the province but may be specified as a deliverable by the client.

6.4.5 Map Legend

The map legend is required in PDF format. Users should see section 5.0 of the *Standard for Terrestrial Ecosystem Mapping in British Columbia* (RIC, 1998) for further explanation and examples of what should be included in a TEM Map Legend. These files should include all lines and symbols used on the map.

The file name should be: tem_<BAPID>_<thematic content> - i.e. tem_4146_ml.pdf

This file format replaces what is described in Table 2-2 of the TEM Technical Standards.

6.4.6 Expanded Legend and Final Report

The Expanded Legend and/or Final Report should contain a description of the study area (e.g. biophysical information, disturbance history, BGC summary, etc.), project objectives, methodologies, limitations of the mapping, a description of all map entities, results and discussion. The report should also include a digital data capture methodology report that describes how the spatial data was captured from the source. All appendices and references must be included.

These documents should be submitted as Portable Document Files (.pdf). All figures and photos should be embedded and saved within the document. **Graphics and other inserts should not be linked to the report or expanded legend file as separate documents.**

The file name(s) should be:

tem_<BAPID>_<thematic content> - i.e. tem_4146_rpt.pdf

tem_<BAPID>_<thematic content> - i.e. tem_4146_el.pdf

This file format replaces what is described in Table 2-2 of the TEM Technical Standards.

6.4.7 Plot Cards & Air Photos:

Original or copies of plot cards and typed air photos must be delivered to:

Resource Information Branch, Ministry of Sustainable Resource Management

Mailing Address:

PO Box 9358 Stn Prov Govt,
Victoria, BC V8W 9R7

Courier Address:

4th Fl., 395 Waterfront Crescent,
Victoria, BC V8T 5K7

6.4.8 Quality Assurance (QA) and Accuracy Assessment (AA) Reporting

Reports must be submitted as Portable Document Files (.pdf) indicating that all steps in the mapping and the final data have undergone complete quality assurance review. QA/AA review may be performed by a qualified third party or may be managed by having the mapping contractor sign the reports assuring the quality of the deliverables. Consult the most current version of the TEM QA guidelines for further explanation of the QA review procedures. Consult the “Protocol for Accuracy Assessment of Ecosystem Maps” for further explanation of the AA review procedures.

The file(s) name should be:

tem_<BAPID>_<thematic content> - i.e. tem_4145_qa01.pdf for any QA documentation; and

tem_<BAPID>_<thematic content> - i.e. tem_4145_aa01.pdf for any AA documentation.

If more than one QA/AA report is delivered each should be named sequentially, i.e.: tem_4145_qa02.pdf and tem_4145_qa03.pdf.

The practitioner must retain a copy of their work after the project has been signed off for the period of time indicated by their professional association legislation or for any period of time indicated in relevant legal documentation.

6.5 Data Acceptance/Project Sign-off

All final deliverables must conform to the standards discussed in this document and must pass all data verification rules.

If any TEM product does not meet to the required standard, an error report will be generated by the Ministry of Sustainable Resource Management and the delivered package (I.e. all submitted files) will be returned to the client. The client must have any identified problems rectified and resubmit the deliverables to the Ministry. Projects will not be accepted until the Ministry has received all final project deliverables, including any applicable quality assurance and/or accuracy assessment reports.