

# LPIS Quality Assurance Framework

Based on IES/H04/2016/21688

## ANNEX X

### Technical guidance on **Implementation eXtra Information for Testing (TG IXIT)** **LPIS model test suite, version 2.0** **July 2016**

The IXIT is called for by ISO 19105(2000), however, this standard does not provide templates or structures.

#### **1. Release notes (changes/updates from version 5.3)**

1.1 This is an original version. There is no earlier guidance document on the IXIT.

##### **1.2 June 2016 version:**

- Two new features were added:
  1. Determination method of the eligible hectares available for the payment process
  2. Status of implementation of the Geospatial aid application
- The delivery was extended with choice of tools and deadlines for upload in the annual assessment cycle
- Point 3.4: Full name of the abbreviation LCML has been given in the footnote.
- Point G.17.b: word "reduced" changed to "modified"

## **2. Introduction**

- 2.1 The Implementation eXtra Information for Testing is a statement containing all of the information related to the implementation under test (IUT) and its corresponding system under test (SUT) which will enable the testing laboratory to run an appropriate test suite against that IUT. An IXIT typically provides the details on the organization and storage of concepts in the SUT as well as on the means of access to and modification of the SUT.
- An implementation is defined as the realization of a specification, in the context of the ISO geographic information standards, and of LPIS QA in particular, this involves the specifications of the geographic dataset of reference parcels
  - A system Under Test (SUT) relates the computer hardware, software and communication network required to support the implementation. This IXIT doesn't investigate the SUT.

## **3. IXIT Data scope**

- 3.1 For the creation and upkeep of an LPIS, several important choices about data sources and stakeholder roles have been made. These choices have a profound impact on the priorities, the structure, the operational strengths and potential weaknesses of the operational system.
- 3.2 ISO standards on geographical information would usually attribute this type of information to the LINEAGE component of metadata, but since the LPIS QA requires a correct and complete understanding of these choices, a structured way for documentation is required. Furthermore the method for the conformance testing under LPIS QA is verification testing which implies rigorous proofs of correctness to demonstrate conclusively and exhaustively any stated conformance of an implementation.
- 3.3 This annex X or TG IXIT provides the structured way to find and report the required lineage metadata.
- 3.4 There are two other LPIS QA information components that describe choices and lineage regarding the IUT but that are not in scope of the TG IXIT.
- The eligibility profile which provides an LCML<sup>1</sup>-compatible catalogue of the land cover classes deemed eligible by the LPIS custodian. The eligibility profile methodology and format are described in Annex III of the TG ETS.
  - MTS 2.0 involves other implementation and source dataset metadata, which is sufficiently structured by the INSPIRE implementing rules on metadata and the relevant data specifications. This metadata is part of the core TG MTS, but outside the scope of the Implementation Conformance Statement (ICS).

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<sup>1</sup> Land Cover Meta Language (ISO 19144-2)

## **4. IXIT Data structure**

- 4.1 The IXIT probes into **eight** implementation option that any LPIS custodian must have made at a certain point to address the choices or options offered by the Regulations. As a result, the outcome of IXIT is simple a set of **8** qualifiers (nouns or adjectives).
- 4.2 The **eight** choices relate to:
- **A** - The author/actor of the primary boundary of the reference parcel. The primary boundary or perimeter represents the spatial extent of land corresponding to the reference parcel identifier. The outcome defines the reference parcel type; note that a “basic property unit” (BPU) has been introduce to be in line with the INSPIRE glossary.
  - **B** - The process that lead to the delineation of the borders of the agricultural land to be used as maximum eligible area.
  - **C** - The way the eligible landscape feature, if applicable, have been adjudicated to the reference parcel.
  - **D** - The processing of the spatial themes above to assemble a maximum eligible area for each individual reference parcel perimeter.
  - **E** - The application of pro rata reduction of permanent grasslands (PG) with scattered ineligible features.
  - **F** - The validation and documentation of the required positional accuracy requirements.
  - **G** – How does the SUT determine the amount of eligible hectares per RP that are actually available for direct area payment application.
  - **H** – The status of implementation of the geospatial aid application.
- 4.3 The method to find the correct choices made is by answering the polychotomy questionnaire in the next chapter; for each of the **eight** topics, one and only one answer should emerge.
- 4.4 Although we do not expect that not all combination of answers can actually occur, e.g. a “CP” type reference parcel perimeter is unlikely not come with “freehand” drawn borders, no business rules have yet been implemented. Each of the **eight** qualifiers operates in full independence.
- 4.5 In the questionnaire,
- extracts from the regulation are “*quoted in italic*”
  - answers for the topic are “**quoted bold underline**”
  - referrals to subsequent questions are indicated as → qn

## **5. IXIT data capture – the polychotomy questionnaire**

### **A Authoring the reference parcel PERIMETER**

- q1.** The initial/primary graphical data (polygon boundaries) for the perimeter that identifies a “*unit of land representing agricultural area*” and allows “*unique and unambiguous localisation*” are delivered by:
- a/ external registers or maps → q2
  - b/ internal IACS procedures → q3
- q2.** The data supplier of the graphical data for perimeter and RP ID is
- a/ cadastral institution (or other entrusted body), land registry, land court, or any other property register → q4
  - b/ mapping agency, cartographic institute or mapmaker “**TB**” - topographical block
- q3.** The delineation of these units is made by
- a/ the LPIS-custodian, the PA or their contractor “**PB**” - physical block
  - b/ the farmer or applicant: → q5
- q4.** What does the polygon, used as reference parcel, represent?
- a/ the unit of land that was historically entered in the register: “**CP**” - cadastral parcel
  - b/ the current extend of land tenure, i.e. adjacent CPs merged by right holder: “**BPU**” - basic property unit
- q5.** What the farmer or applicant delineates is:
- a/ each individual crop group: “**AP**” – agricultural parcel
  - b/ all clusters of adjacent agricultural parcels in his holding: “**FB**” – farmer’s block

### **B Mapping the BORDERS of agricultural land**

- q6.** The optional/secondary/implied graphical data (polygon boundaries) that represent the physical borders used to “*measure the agricultural land*” that “*as a principle, is stable in time*” are derived from.
- a/ a systematic land cover mapping project, covering all the agricultural land of the territory → q7
  - b/ a delineation process during IACS applications with or without preregistration → q8
- q7.** The land cover mapping project is set-up by
- a/ the LPIS-custodian or the PA in isolation: “**dedicated**”
  - b/ in collaboration with a third party institution (e.g. mapping agency, environmental agency,..): “**shared**”
- q8.** The delineation process by the applicant is
- a/ based on delineation from standalone aerial/VHR imagery (even if overlaps with other applications are enforced): “**freehand**”
  - b/ based on aerial/VHR imagery in combination with and constrained by other GIS data: “**constrained**”

**C. Integrating eligible area from GAEC LANDSCAPE FEATURES**

- q9.** If applicable, how was the eligible area from “*landscape features subject to the requirements and standards listed in Annex II to Regulation (EU) No 1306/2013 which form part of the total area*”, established?
- a/ as a part of A. and B. above, i.e. embedded inside the perimeter of a reference parcel of agricultural land: “**inclusive**”
  - b/ as a separate spatial feature with individual identification and polygon, i.e. adjacent to the perimeter of a reference parcel of agricultural land: “**complementary**”

**D. ASSEMBLING the reference parcel for IACS crosschecks**

- q10.** To “determine” “for each reference parcel” “a maximum eligible area for the purpose of the support schemes listed in Annex I to Regulation”, the following spatial operations were performed
- a/ none (assumed possible only in production block systems): “**raw**”
  - b/ a straightforward (unmodified, unfiltered) spatial intersection between only perimeter and border polygons: “**straightforward**”
  - c/ a sub selection only of perimeter data (merger of units) followed by a spatial intersection with border polygons → q11
  - d/ manipulation (queries and or spatial operations) of perimeter data followed by a spatial intersection with border polygons: “**adjusted**”
  - e/ a more complex sequence of spatial operations, involving other spatial themes and combinations than a singular intersection of perimeter and border. → q13
- q11.** This sub-selection of perimeter data represents:
- a/ ignoring only particular topographical elements or landscape feature types present in source but irrelevant for IACS: “**extracted**”
  - b/ ignoring only perimeter segments that have the same applicant on both sides → q12
  - c/ made by any other condition: “**amalgamated**”
- q12.** Retrieve your RP-type from A above and
- a/ If “BPU”, “**default**”
  - b/ for all other RP-types: “**personalized**”
- q13.** What is impact of the additional spatial themes used?
- a/ it allows to combine another reference parcel authors than the one identified as primary, and allows to obtain operate with smaller units of land: “**hybrid**”
  - b/ It allows subdividing the initial reference parcel perimeter into smaller units based on physical subdivision: “**sub-parcelled**”
  - c/ Neither a/ or b/ (e.g. is achieves some particular properties, it accommodates a legacy situation): “**complicated**”

## **ANNEX X: MTS 2.0 – TG IXIT (July 2016)**

### **E. Establishing the PRO RATA reference area values for permanent grassland**

**q14.** Regarding “*permanent grassland with scattered ineligible features*”, and their “*pro-rata system to determine the eligible area within the reference parcel*”:

- a/ pro rata is not implemented and so not a single case occurs; for all PG the area is directly derived from a polygon geometry of the delineated grassland: “**geometric**”
- b/ pro rata is implemented and at least one reference parcel with PG was subject to area reduction → q15

**q15.** The pro-rata reduction of eligible area of reference is calculated

- a/ based on the delineation of a specific PG land cover class: for all applicable PG occurrences, the delineated polygon area is reduced by a pre-assessed pro-rata reduction factor: “**systematic**”
- b/ in at least one case that area reduction is based on a reference parcel specific assessment of the area of the ineligible features to be deduced: “**sporadic**”

### **F. VALIDATING the source data**

**q16.** All spatial data identified above (source imagery, perimeter polygons, border polygons and possibly third themes) are demonstrated, by a documented report of external tests, to “*operate on the basis of a national coordinate reference system*” on a level that is “*at least equivalent to that of cartography at a scale of 1:5 000*”.

- a/ If there are testing reports: “**validated**”
- b/ If there are no testing reports: “**non-validated**”

### **G. Immediate AVAILABILITY for payment**

17. With the agricultural area and eligible hectares inside the reference parcel perimeter measured, how does the SUT “*specify the maximum eligible area per reference parcel*” of the current year in the “*pre-established forms based on the areas determined in the previous year*”?

- a/ That area value is identical to the value determined by the inventory or the physical observations of the agricultural land: “**landCover**”
- b/ The area value determined by the physical inventory has been further **modified** on the basis of internal or external restrictions: “**landUse**”

### **H. GSAA uptake**

18. To what extent are farmers known to “*submit the aid application and/or payment claim using the geo-spatial aid application form*” i.e. “*through a GIS-based interface*”?

- a/ less than 25%: “**< 25%**”
- b/ at least 25%: “**≥ 25%**”
- c/ at least 75%: “**≥ 75%**”
- d/ (as good as) all applications: “**= 100%**”

## 6. Data Delivery

- 6.1 The **eight** qualifiers (nouns or adjectives) should be recorded in the appropriate element of the Ixit.xsd.

Qualifier	Topic	Ixit.xsd - entry
<b>A</b>	Author / RP-type	perimeterAuthorRPType
<b>B</b>	Land cover borders	landCoverBorders
<b>C</b>	Landscape features	landscapeFeatures
<b>D</b>	RP assembly	rPAssembly
<b>E</b>	Pro-rata PG	prorataPG
<b>F</b>	Validation	validation
<b>G</b>	Availability	availability
<b>H</b>	Geospatial aid application	gSAA

- 6.2 The schema descriptor can be downloaded from the LPIS schema registry: <https://lpis.jrc.ec.europa.eu/Ixit/index.htm>. The compiled xml files will have to be uploaded as the MTS package on the LPIS QA portal
- 6.3 A filled in example is available at <http://lpis.jrc.ec.europa.eu/registry/examples/>
- 6.4 Alternatively, for 2016, the outcome can be documented in the MTS log file (Annex XI), where a separate IXIT tab has been included to accommodate the IUT values for each qualifier. The resulting values in the worksheet tab will have to be manually copied into the MTS database via an editing application provided by the LPIS QA portal.
- 6.5 The TG IXIT delivery is linked to the MTS reporting package.
- 6.6 After the initial complete MTS upload for 2016, new complete MTS packages shall only be uploaded if and when the SUT was subject to a system redesign or to a substantial system upgrade. **Any substantial redesign or upgrade will inevitably impact on the TG IXIT data results.**