



Data Dictionary  
Certification Testing Rules  
1.4.1

October 2015

Version: 1.4.1

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# Data Dictionary Certification Testing Rules v1.4.1

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Date of Last Update: October 16, 2015

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# 1.0 Introduction

This document contains the RETS Data Dictionary Compliance requirements an applicant's Data Dictionary implementation would need to satisfy before receiving RESO Certification.

This document should be read by any organization who want:

- To create Data Dictionary compliant implementation.
- To have a detailed understanding of the certification process.

Processing a Data Dictionary Certification request is a four step internal process that begins with an application submitted through <http://reso.org/certification>. The steps and compliance tests are described throughout this document.

The Data Dictionary certification is a server certification. We are certifying that the server can deliver Data Dictionary structured information.

**NOTE:** We are NOT certifying that Update functionality works without data loss due to mismatched data transfer types. See the DataType and Interpretation section for more information.

## 1.1 Glossary

## 1.2 RESO Certification Flow (Summary)

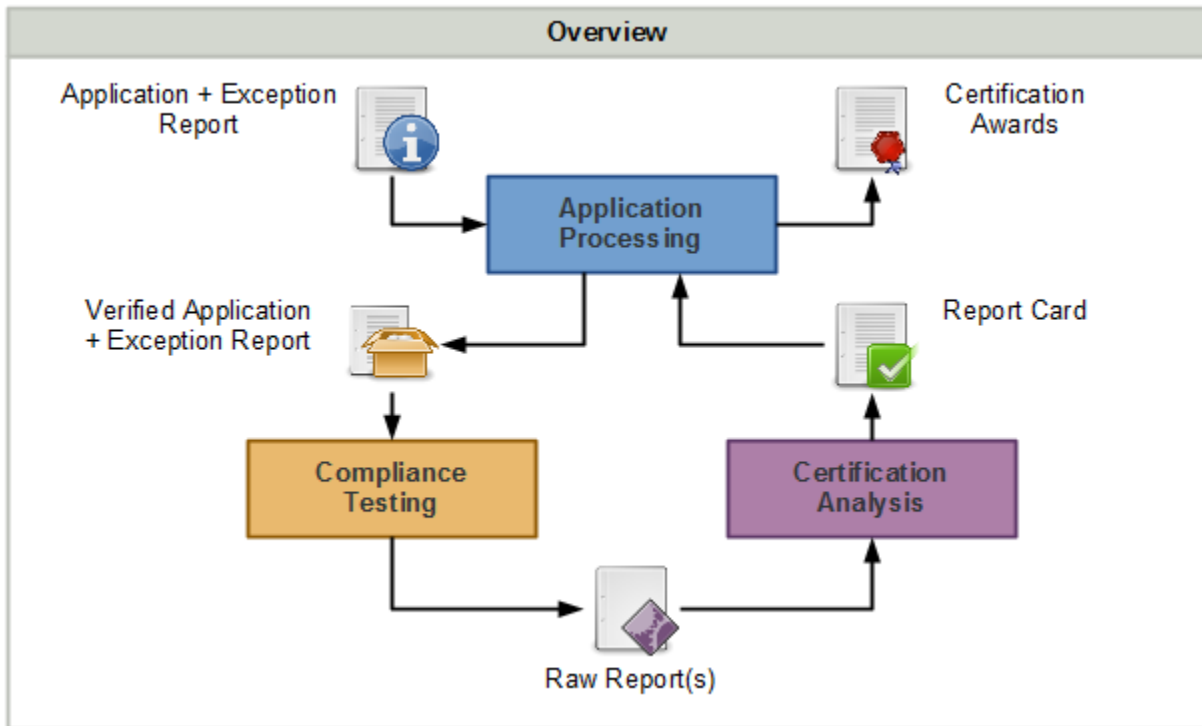
## 1.3 Supplemental Application Information

## 1.4 Impact of Future Data Dictionary Changes to these Testing Rules

## 1.1 Glossary

A glossary for common terms for Data Dictionary Certification processes is [available here](#).

## 1.2 RESO Certification Flow (Summary)



RESO Group	Action	Output
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<b>Application Processing (Pre-Certification)</b>	Accept and Verify Applicant's ' <b>Certification Application</b> ' and ' <b>Supplemental Application Information</b> ' via <a href="http://reso.org/certification">reso.org/certification</a>	Prepare for Compliance Testing. Pass application and ' <b>Supplemental Application Information</b> ' to Compliance Department.
<b>Compliance Testing</b>	Test applicant's metadata against well-defined Compliance Rules as set forth by the DD Compliance Workgroup.	Testing results formatted in ' <b>Raw Report</b> ' package. Pass ' <b>Raw Report</b> ' to Certification Department.
<b>Certification Analysis</b>	Analyze ' <b>Raw Report</b> ' to determine if applicant qualifies for a certificate. Create a ' <b>Report Card</b> ' with findings.	Pass analysis results and ' <b>Report Card</b> ' back to Application Processing.
<b>Application Processing (Post-Certification)</b>	Act on Certification Department recommendation	Notify applicant of Certificate Pass/Fail. Send notification and ' <b>Report Card</b> ' back to Applicant.

Application Processing (Pre-Certification)

### 1.3 Supplemental Application Information

The Supplemental Application Information (SAI) will assist RESO with the Data Dictionary evaluations. It will contain information that may not be easily transmitted through the on-line application form.

Supplemental application information MUST be delivered by the MLS (or source provider) with its application. This supplemental information may provide information required by the RESO Compliance department to perform the evaluation tests.

**NOTE:** The exact format will be determined by the RESO Compliance Staff. Links to the SAI will be added when available.

It is recommended that the SAI information be made available to the MLS data consumers (public) to help in data mapping efforts.

### 1.4 Impact of Future Data Dictionary Changes to these Testing Rules

Changes in future versions of the RESO Data Dictionary may impact the certification testing results of the rules in this document. The results of the impacted rules will be modified:

- To help ease the transition to a newer Data Dictionary version; and
- To allow decisions of the Data Dictionary workgroup to be impact certification more quickly.

Generally, the updated test result will go up or down in severity toward the newer standard. No changes to future versions of the Data Dictionary will invalidate current certifications.

If the documented test result is a(n)...	And a new rule or definition makes the same test a(n)...	Then the new result would be a(n)...
ERROR	WARNING	WARNING
ERROR	NOTICE or COMPLIANT	NOTICE
WARNING	ERROR	No Change <sup>1</sup>
WARNING	NOTICE or COMPLIANT	NOTICE
NOTICE	ERROR or WARNING	WARNING
NOTICE	COMPLIANT	No Change <sup>2</sup>
COMPLIANT	ERROR or WARNING	WARNING
COMPLIANT	NOTICE	No Change <sup>2</sup>

**NOTE 1:** Changing a WARNING into an ERROR could retroactively disqualify those who have already been certified.

**NOTE 2:** Since a NOTICE does not have to be fixed within a time-frame, this change has no practical impact on current certification. No change is made to simplify the potential list of changes.

## 2.0 Data Dictionary Compliance Rules

This section contains the rules that RESO will use in the Compliance testing. The specific set of rules that need must be passed for a "Certification" are discussed in [Section 3](#).

### 2.1 Certified Transport Requirement

### 2.2 RETS 1.x Field-Level Compliance

### 2.3: RETS 1.x Field Compliance Notices and Compliance Warnings

## 2.1 Certified Transport Requirement

**REQ-DD141-TRANS-1:** The Data Dictionary is independent of transport methods (i.e. RETS 1x, RETS Web API, etc.).

**NOTE:** Each of the following sections contains transport specific rules when a Data Dictionary is implemented. While the Data Dictionary may be implemented within any transport, the compliance rules **MAY** vary based on transport.

## 2.2 RETS 1.x Field-Level Compliance

Data Dictionary compliance will be determined by comparing host's RETS 1.x Metadata fields with those defined by the Data Dictionary. Each of the host's mapped fields **MUST** follow all applicable rules in this and following sub-sections to be considered compliant.

**REQ-DD141R1X-FLC-1:** Tested field attributes **MUST** be found COMPLIANT for the entire field to be COMPLIANT.<sup>1</sup>

A field's compliance is determined by comparing multiple field attributes with the corresponding Data Dictionary attributes. Each tested attribute will receive one of the following results: ERROR, WARNING, NOTICE, or COMPLIANT (listed in descending order of severity). The field status will be the most severe label found within the attribute test results.<sup>2</sup>

**NOTE 1:** Only the attribute tests required for the field type will be performed as not all attribute tests apply to every field.

**NOTE 2:** A field may have 1 ERROR, 2 WARNING, and 2 COMPLIANT attributes. This field would be an ERROR. A different field may have 1 NOTICE and 4 COMPLIANT attributes. This field would be a NOTICE.

**REQ-DD141R1X-FLC-2:** All fields that could be mapped to the Data Dictionary **SHOULD** be mapped.<sup>3</sup>

**NOTE 3:** All fields without a mapping will be reviewed. Any field discovered that has a match with the Data Dictionary AND has an ERROR **MAY** disqualify the applicant from receiving a certification.

### 2.2.1 Metadata: StandardName

### 2.2.2 Metadata: Data Type and Interpretations

### 2.2.3 Metadata: Precision

### 2.2.4 Metadata: Suggested MaximumLength

### 2.2.5 Metadata: Enumerations

### 2.2.6 Metadata: Data Formatting

## 2.2.1 Metadata: StandardName

**REQ-DD141R1X-SN-1:** Any applicant metadata field identified as a Core Field **MUST** use a StandardName from the Data Dictionary. Any identifiable core field with an incorrect or misspelled StandardName will be an **ERROR**. Any identifiable non-core field will be a **WARNING**.

**NOTE 1:** Data Dictionary StandardName values are case-sensitive. For example, "ListingID" does not match "ListingId". Difference in case will result in an ERROR.

**NOTE 2:** Certification testers will attempt to identify fields that should be mapped. This may not be possible if the applicant's SystemName is undecipherable. A good-faith effort to provide complete and correct mappings is expected from all applicants.

**REQ-DD141R1X-SN-2:** Applicant metadata fields without a Data Dictionary match SHOULD have an empty StandardName. Non-Data Dictionary applicant fields with a StandardName will be given a **NOTICE**.

**NOTE 3:** While using these "extra" non-Data Dictionary StandardNames does not negatively affect certification, the practice is discouraged. These are given a **NOTICE** so that those using the metadata will be forewarned that these are not accepted Data Dictionary StandardNames.

**REQ-DD141R1X-SN-3:** Any applicant metadata field using StandardName that matches the Data Dictionary Repeating Field name pattern **MAY** have the definition field in the same resource class. The repeating portion of the StandardName **MAY** be found as an enumeration. Though recommended, It is **NOT REQUIRED** to have the field that defines the repeating field content in the system's metadata. These StandardNames will still be **COMPLIANT** even with the missing definitions.

**Example 2:** "RoomLibraryArea" and "RoomBedroom1Area" both match the Room[type]Area pattern. The "RoomType" enumerated field **MAY** be present to define "Library" and "Bedroom 1" as enumerations for the repeating StandardName.

Special considerations will be made when comparing the applicant's field names and definitions with those found in the Data Dictionary.

- Fields with SIMILAR definitions and MATCHING StandardNames are **COMPLIANT**.
- Fields with SIMILAR definitions and DIFFERENT StandardNames are **NOT** compliant. In this situation, the StandardName **MUST** be changed to match the Data Dictionary to be compliant. Only the StandardName needs to be changed for compliance.
- Fields with DIFFERENT definitions and MATCHING StandardNames are allowed but **MUST** be listed in the Supplemental Application Information.

**Example 1:** An applicant's "Subdivision" field has a different definition than the Data Dictionary.

- Fields with DIFFERENT definitions and DIFFERENT StandardNames are ignored.

## 2.2.2 Metadata: Data Type and Interpretations

The Data Dictionary provides a "Simple Data Type" for each field. The corresponding field within the applicant's metadata **MUST** be a **logical** match. The exact **physical** representation may vary. The following examples highlight the difference between logic and physical matches.

**NOTE:** Multiple tables in the following subsections are provided to give the reader an easier to read visual interpretation.

**EXAMPLE 1:** Data Dictionary Boolean requires a **logical** true/false indication. (A third "no answer" or empty indication is allowed, but not required.) Booleans may be represented **physically** with 1/0, Y/N, Yes/No, T/F, True/False, or similar. A specific enumeration to represent a non-response, like "None" OR "N/A," is allowed in lookups. This non-response enumeration is the same as leaving a number or character boolean field empty.

**EXAMPLE 2:** Data Dictionary "Number (Whole)" **MAY** be any DataType that represents a whole number: Int, Long, Small, or Tiny. It **MAY NOT** be a Decimal.

**NOTE:** The RETS 1.8 Specification requires each field within the metadata to have attributes describing the data stored. Two of these attributes are "**DataType**" and "**Interpretation**". These two attributes will be used to determine if the metadata field is logically consistent with the Data Dictionary.

**DataType** uses one of the following values: Boolean, Character, Date, DateTime, Time, Tiny, Small, Int, Long, and Decimal.

**Interpretation** uses one of the following values: Number, Currency, Lookup, LookupMulti, and URI

More information about Metadata **DataType** and **Interpretation** may be found in Table 11-15 of Section 11.3.2 in the RETS 1.8 Specification.

**REQ-DD141R1X-DTI-1:** The applicant Metadata DataType field **MUST** match **logically** to the Data Dictionary DataType. It is recommended that the field **physically** match one of the DataType values as defined in the previous table. Other DataTypes and Interpretations will be evaluated on an as needed basis.

**REQ-DD141R1X-DTI-2:** Logical allowances of data types **MUST NOT** contradict the requirements of the utilized RETS specification where the Data Dictionary is implemented. For conflicts, the utilized RETS 1.x specification must be followed.

**EXAMPLE 3:** Date and DateTime fields must be formatted as required in the utilized RETS specification. It is not sufficient for a Character field to contain date or datetime data.

**REQ-DD141R1X-DTI-3:** Any DataType transformation that would result in data loss when data moves from a HOST to a CLIENT is **NOT** compliant.

**EXAMPLE 4:** A Host has a multi-select enumeration and the Client is expecting a single-select.

### 2.2.2.1 RETS 1.x Metadata DataType and Interpretation Values (Table)

### 2.2.2.2 RETS 1.x Compliance Errors for Metadata (Table)

### 2.2.2.3 RETS 1.x Compliance Notices and Warnings for Metadata (Table)

### 2.2.2.1 RETS 1.x Metadata DataType and Interpretation Values (Table)

The Data Dictionary provides a "Simple Data Type" for each field defined. This value dictates what is an acceptable value within the applicant's metadata DataType and Interpretation fields.

**NOTE:** The RETS 1.8 Specification requires each field within the metadata to have attributes describing the data stored. Two of these attributes are "**DataType**" and "**Interpretation**". These two attributes will be used to determine if the metadata field is logically consistent with the Data Dictionary.

**DataType** uses one of the following values: Boolean, Character, Date, DateTime, Time, Tiny, Small, Int, Long, and Decimal.

**Interpretation** uses one of the following values: Number, Currency, Lookup, LookupMulti, and URI

More information about Metadata **DataType** and **Interpretation** may be found in Table 11-15 of Section 11.3.2 in the RETS 1.8 Specification.

The Data Dictionary Simple DataType is transport independent. The following chart provides acceptable translations between the single Data Dictionary value and the two RETS 1.x values: DataType and Interpretation.

Following these recommendations will allow the field to be certified without qualification. Where needed, the "Preferred" DataType and Interpretation has been identified. "Acceptable" alternative are also provided.

Requirement ID	DD Simple DataType	Acceptable Metadata DataType(s)	Acceptable Metadata Interpretation(s)
REQ-DD141R1X-DTC-1	Boolean <sup>1</sup>	<b>Preferred:</b> Boolean <b>Acceptable:</b> Int, Long, Small, Tiny, Character	<b>Preferred:</b> Empty Interpretation or Number <b>Acceptable:</b> Lookup
REQ-DD141R1X-DTC-2	Date	Date	Empty Interpretation Expected
REQ-DD141R1X-DTC-3	Number (Whole) <sup>2</sup>	Int, Long, Small, Tiny	<b>Preferred:</b> Number <b>Acceptable:</b> Empty Interpretation
REQ-DD141R1X-DTC-4	Number (Decimal)	Decimal	<b>Preferred:</b> Number, Currency <b>Acceptable:</b> Empty Interpretation
REQ-DD141R1X-DTC-5	String <sup>3</sup>	Int, Long, Small, Tiny, Character, Decimal	<b>Preferred:</b> Empty Interpretation <b>Acceptable:</b> Number, Currency, Lookup
REQ-DD141R1X-DTC-6	StringList, Single <sup>4</sup>	Int, Long, Small, Tiny, Character, Boolean <sup>5</sup>	Lookup
REQ-DD141R1X-DTC-7	StringList, Multi <sup>4</sup>	Int, Long, Small, Tiny, Character	LookupMulti
REQ-DD141R1X-DTC-8	Timestamp	DateTime	Empty Interpretation Expected

**NOTE 1:** It is preferred that applicant's Boolean fields have a "Boolean" DataType and an empty or "Number" Interpretation. Since Boolean fields may be represented by many different fields or lookups, the other DataTypes and Interpretations are listed. However, an empty Interpretation is not allowed unless the DataType is Boolean. A character data type with an empty interpretation would be a "String-to-Boolean" mapping. A number data type with an empty interpretation would be a "Number-to-Boolean" mapping. These mappings are an **ERROR** (REQ-DD140R1X-DTE1).

**NOTE 2:** Any RETS 1.x DataType that represents a whole number is allowed.

**NOTE 3:** Any Number-to-String mapping is allowed (Whole and Decimal Numbers). Any Single-Select Lookup-to-String mapping is allowed.

**NOTE 4:** Lookup and LookupMulti fields may be represented in many different ways. These are the most common DataTypes for lookups. Other DataTypes for lookups will be evaluated on a case-by-case basis.

**NOTE 5:** Boolean-to-Lookup Single is allowed **ONLY** when the enumeration list is "Open" or "Open (to be locked)". This mapping for Locked enumerations is **NOT** allowed.

### 2.2.2.2 RETS 1.x Compliance Errors for Metadata (Table)

**Compliance Error:** An "error" is issued for any portion of the Data Dictionary's implementation (field, enumerations, etc.) that does not conform to the requirements. These error disqualify the applicant from certification.

**NOTE:** Only those "Errors" from DataType mappings are included here. This is **NOT** an extensive list of errors. Only those that apply specifically to Data Type.

#### Compliance Errors



Requirement ID	DD Simple Data Type	Compliance Errors DataTypes(s)	Compliance Error Interpretation(s)
REQ-DD141R1X-DTE-1	Boolean	Int, Long, Small, Tiny, Character, Date, Timestamp, Decimal	None ("String-to-Boolean", "Number-to-Boolean", or "Date/Timestamp-to-Boolean" Mapping Errors) An Interpretation is required for Non-Boolean data types.
REQ-DD141R1X-DTE-2	Date <sup>1</sup>	Int, Long, Small, Tiny, Character, Timestamp	None
REQ-DD141R1X-DTE-3	Number <sup>2</sup>	(Any DataType used as a Lookup)	Lookup (Any Lookup-to-Number OR LookupMulti-to-Number Mapping)
REQ-DD141R1X-DTE-4	Number (Whole)	Character, Decimal, Date, Timestamp	None ("Character-to-Whole" Mapping Error) None ("Decimal-to-Whole" Mapping Error) See <b>REQ-DD141R1X-P-4</b> None ("Date-to-Whole" or "Timestamp-to-Whole" Mapping Error)
REQ-DD141R1X-DTE-5	StringList, Multi	Int, Long, Small, Tiny, Character	None (This is the "String-to-LookupMulti" or "Number-to-LookupMulti" Error). The Interpretation cannot be "None" or empty for "StringList, Multi"
REQ-DD141R1X-DTE-6	StringList, Multi <sup>3</sup>	Boolean	None
REQ-DD141R1X-DTE-7	StringList, Single <sup>3</sup>	Boolean	None
REQ-DD141R1X-DTE-8	StringList, Single	Int, Long, Small, Tiny, Character	None (This is the "String-to-Lookup" or "Number-to-Lookup" Error) The Interpretation cannot be "None" or empty for "StringList, Single"
REQ-DD141R1X-DTE-9	StringList, Single <sup>4</sup>	(Any DataType used as a Lookup)	LookupMulti (This is the "Multi-to-Single Lookup" Error)
REQ-DD141R1X-DTE-10	Timestamp <sup>1</sup>	Int, Long, Small, Tiny, Character, Date	None
REQ-DD141R1X-DTE-11	(Any Non-Number/String) <sup>5</sup>	Decimal	Any ("Decimal-to-Non-Number/String" Mapping Error) excluding "Decimal-to-String" mappings, which are compliant.

**NOTE 1:** Any transformation of a Date and Timestamp into the other is an error. Some Data Dictionary fields have a Date and Timestamp variant: OnMarketDate v. OnMarketTimestamp or OffMarketDate v. OffMarketTimestamp. Please map to the correct version to avoid receiving a compliance error.

**NOTE 2:** Any lookup to be translated into a number field will be an error. The exception is when every lookup value is a pure number, without any additional symbols. If this is the case, the mapping will be given a WARNING. To receive the warning instead of the error, this field and its lookups must be clearly stated in the Supplemental Application Information. LookupMulti-to-Number CAN NOT receive a WARNING because multiple values concatenated together cannot be a number.

For example: A lookup representing the number of bedrooms could have the values "1", "2", "3", "4", and "5+". This would be an ERROR because of the "5+" lookup value. To receive a warning, the last value would need to be changed to "5" AND documented in the Supplemental Application Information.

**NOTE 3:** Due to the potential ambiguity of how a Boolean is translated, all of these mappings are considered errors. This applies to "Locked" enumerations lists. Boolean-to-Lookup, Single is allowed when the enumeration list is "Open" or "Open (to be locked)"

**NOTE 4:** For Data Dictionary "StringList, Single" fields, the applicant Metadata Interpretation field **SHOULD** be "Lookup". If the applicant Metadata has a "LookupMulti" Interpretation, that creates a "Multi-to-Single" data mapping, this field will NOT be considered compliant.

**NOTE 5:** Per "REQ-DD140R1X-DTC-5" the Decimal-to-String mapping is compliant.

### 2.2.2.3 RETS 1.x Compliance Notices and Warnings for Metadata (Table)

**Compliance Notice:** A "notice" is issued for any portion of the Data Dictionary's implementation (field, enumerations, etc.) that does not conform to the requirements but does **NOT** disqualify the applicant from certification.

**Compliance Warnings:** A "warning" is the same as a compliance notice with the additional requirement that it is fixed within a specific time frame. Future certification MAY be denied if a "warning" is not fixed in the required time.

#### Compliance Notices

The direction the data "flows" is important when translating data fields between different DataTypes. The direction of all of the mappings are from the applicant's metadata (Host's implementation) into the Data Dictionary (Client's expectations). There are some DataType mappings where

reversing the direction would result in a loss of data. The DataType transformations that only work going into the Data Dictionary will be marked with a "Compliance Notice."

Also, a "Compliance Notice" MAY be issued for any portion of the Data Dictionary's implementation (field, enumerations, etc.) that does not conform to this or other requirements, but does NOT disqualify the applicant from certification.

Any DataType transformation that could result in a loss of data from the applicant's metadata into the Data Dictionary will not be "Compliant."<sup>1</sup>

Requirement ID	DD Simple Data Type	Compliance Notice DataTypes(s)	Compliance Notice Interpretation(s)
REQ-DD141R1X-DTN-1	String	Int, Long, Small, Tiny, Decimal <sup>2</sup>	LookupMulti (LookupMulti-to-String Mapping) <sup>3</sup> See also REQ-DD141R1X-DTC-5

**NOTE 1:** Only those "Notices" from DataType mappings are included here. This is NOT an extensive list of compliance notices. Only those that apply specifically to Data Type.

**NOTE 2:** A string field can hold any alpha or numeric character. Placing numeric information into a string field is not going to lose data. An example is the Data Dictionary "ListingID" string field. A host's implementation **MAY** use a number field.

**NOTE 3:** A multi-select lookup value MAY map into a Data Dictionary String field. An example is the Data Dictionary "OriginatingSystemName" string field. A host may store this as a lookup of predetermined system names. CAUTION: There **MAY** be too much data when the multi-select lookup values are concatenated to fit within the defined string length. **REQ-DD141R1X-DTC-5** specifies that the Single-Select Lookup-to-String mapping is "Compliant."

### Compliance Warnings

A "Compliance Warning" is the same as a compliance notice with an additional deadline requirement. The source of the "warning" must be fixed within a specific timeframe. Future certification MAY be denied if a "warning" is not fixed in the required time.

Any DataType transformation that could result in a loss of data from the applicant's metadata into the Data Dictionary will not be "Compliant."

Requirement ID	DD Simple Data Type	Compliance Warning DataTypes(s)	Compliance Warning Interpretation(s)	Comments / Rule References
REQ-DD141R1X-DTW-1	StringList, Multi	None	<b>Warning<sup>4</sup>:</b> Lookup (Any Single-to-Multi Mapping)	<b>Rule:</b> REQ-DD140R1X-DTI-4

**NOTE 4:** Only those "Warnings" from DataType mappings are included here. This is NOT an extensive list of compliance notices. Only those that apply specifically to Data Type.

**NOTE 5:** A multi-select lookup field may hold the information from a single-select lookup field without losing data.

**REQ-DD141R1X-DTI-4:** For Data Dictionary "StringList, Multi" fields, the applicant Metadata Interpretation field **SHOULD** be "LookupMulti". If the applicant Metadata has a "Lookup" Interpretation and creates a "Single-to-Multi" data mapping, this field will be marked with a "Compliance Warning."

### 2.2.3 Metadata: Precision

**REQ-DD141R1X-P-1:** The applicant Metadata Precision field **SHOULD** be equal to or less than the decimal value in the Data Dictionary "Sug. Max Length" column found in the Data Dictionary. These precision lengths will be marked with as **COMPLIANT**.

**REQ-DD141R1X-P-2:** The applicant Metadata Precision field **MAY** be zero or not present when the Data Dictionary "Sug. Max Length" column found in the Data Dictionary. These "Whole Number-to-Decimal" mappings will be marked with as **COMPLIANT**.

**Note 1:** Where ListPrice equals 14.2, the precision **SHOULD** be 2 or smaller (including "0" or null) to be compliant. Also, where Latitude and Longitude both equal 12.8, the precision **SHOULD** be 8 or smaller to be compliant.

**REQ-DD141R1X-P-3:** The applicant Metadata Precision field **SHOULD NOT** be greater than than the decimal value in the Data Dictionary "Sug. Max Length" column found in the Data Dictionary. These field lengths will be marked with as **NOTICE**.

**Note 2:** Where ListPrice equals 14.2, the precision **MAY** be 3 or greater to receive a notice.

**REQ-DD141R1X-P-4:** A "Decimal-to-Whole Number" mapping is created when the Host data provides any precision value when the Data Dictionary does not have a value. This mapping may result in data loss and the Host field will be an **ERROR**.

### 2.2.4 Metadata: Suggested MaximumLength

**REQ-DD141R1X-ML-1:** The applicant Metadata MaximumLength field **SHOULD** be equal to or less than the "Sug. Max Length" found in the Data Dictionary. These field lengths will be marked with as **COMPLIANT**.

**REQ-DD141R1X-ML-2:** The applicant Metadata MaximumLength field **SHOULD NOT** be greater than than the "Sug. Max Length" found in the

Data Dictionary. These field lengths will be marked as a **NOTICE**.

**REQ-DD141R1X-ML-3:** When the Data Dictionary provides a Suggested Maximum Length, it is expected that the applicant Metadata MaximumLength provides any value. Failure to provide a length (a null value or empty attribute), that field length will be marked as a **WARNING**.

**Note 1:** *Until further clarified in separate Non-RETS Testing Rules, any transport's failure to provide any length for a field where the Data Dictionary provides a length will also be marked as a **WARNING**.*

**REQ-DD141R1X-ML-4:** The applicant Metadata MaximumLength field **MAY** be two more in value than the "Sug. Max Length" found in the Data Dictionary. These field lengths will be marked with as **COMPLIANT**. This is to allow for extra decimal places or sign characters required to represent positive/negative numbers.

## 2.2.5 Metadata: Enumerations

**REQ-DD141R1X-ENUM-1:** The applicant Metadata LongValue **MUST** match the Data Dictionary Enumeration value exactly as defined. Synonyms or spelling variations are not allowed.

**Example 1:** PropertySubType's "Condominium" must be fully spelled out. "Condo" is not accepted.

**NOTE 1:** This spelling requirement only applies to data transport (e.g. Metadata). How the enumeration value is displayed to users is determined by the system administrators.

**REQ-DD141R1X-ENUM-2:** The applicant Metadata enumeration value **MUST** be found in the same enumeration list as defined in the Data Dictionary. Enumeration values found in the wrong field will receive a compliance warning. Enumeration fields containing misplaced values will receive a **WARNING**.

**NOTE 2:** The applicant **MUST** make note of the incorrect location in the Exception Report provided with the application including a time frame on when this will be corrected.

**NOTE 3:** It is acceptable for an enumeration to appear in multiple places if that is desired by the applicant. However, the duplicate would receive a **WARNING** (See Example 2). Some enumerations in different locations may appear to be duplicates but are actually unique based on context provided by location. These enumerations as **COMPLIANT** (See Example 3). Some RETS 1.x implementations may have enumerated lists that are unique to a resource class. Duplicates in these situations are **COMPLAINT** (See Example 4).

**Example 2:** RoomType's "Library" must be found in RoomType. Having "Library" in any other field (and using the same definitions), where it is not defined in the dictionary, will make that field non-compliant (**WARNING**).

**Example 3:** The Enumeration Value "Cabin" should be found in PropertySubType, as specified by the Data Dictionary. It may also appear in ArchitecturalStyle, if required by the data vendor. The duplicate may remain if it has a different definition than other enumerations found in the Data Dictionary. Other common examples of unique enumerations based on location context include: "Yes", "No", "Other", "None", and "See Remarks".

**Example 4:** Depending on the resource class chosen, the PropertySubType field **MAY** use a different enumerated list: PropertySubTypeRESI and PropertySubTypeRENT. The Enumeration Value "Single Family Residence" **MAY** appear in both enumerated lists. This is **COMPLIANT** since there is still only one selection for "Single Family Residence" within in a single class.

**REQ-DD141R1X-ENUM-3:** The applicant enumeration values **MAY** be defined within the metadata OR by an external validation method.

**NOTE 4:** Enumerated fields with values validated outside the metadata **MUST** be noted when applying for certification. Compliance Testers will need the enumerated values found within the field to check for compliance.

**Example 5:** A data vendor that cover a large geographical area may have too many "City" or "MLSAreaMajor" values to enumerate within their metadata. They may choose to use an external means for validation, such as a database or user interface to enforce proper selection.

**REQ-DD141R1X-ENUM-4:** A Data Dictionary Field with a LOCKED Enumeration **MUST NOT** have any additional enumerations. This field **MAY** have fewer as determined by the applicant.

**REQ-DD141R1X-ENUM-5:** A Data Dictionary Field with an OPEN or OPEN (TO BE LOCKED) Enumeration **MAY** have additional OR fewer enumerations as determined by the applicant.

**NOTE 5:** Previously compliant enumerated fields with "OPEN (TO BE LOCKED)" can fall out of compliance in future versions of the Data Dictionary if that field becomes LOCKED.

**NOTE 6:** Enumerations not defined in the Data Dictionary are not under the jurisdiction of compliance testing and will be ignored unless it conflicts with other compliance rules.

**REQ-DD141R1X-ENUM-6:** A Lookup Field **MUST NOT** have additional enumerations that are synonyms of enumerations already found within the field. This applies to Data Dictionary fields with **Locked** Enumeration Lists. These synonyms will be marked as an **ERROR**.

**REQ-DD141R1X-ENUM-7:** A Lookup Field **SHOULD NOT** have additional enumerations that are synonyms of enumerations already found within the field. This applies to Data Dictionary fields with **OPEN or OPEN (To Be Locked)** Enumeration Lists. These duplicates will be marked as a **WARNING**.

**REQ-DD141R1X-ENUM-8:** A Lookup Field **SHOULD NOT** have additional enumerations that are synonyms of enumerations already found within the field. Some Data Dictionary fields have **no enumeration list** defined. Synonym tests on Enumerations only apply on those fields with

enumerations defined in the Data Dictionary.

**Example 6:** The enumerations “Condominium” and “Condo” cannot appear in the same field.

**REQ-DD141R1X-ENUM-9:** A Lookup Field **SHOULD NOT** have additional enumerations that are duplicates of enumerations already found within the field. These duplicates will be marked as an **ERROR**.

**REQ-DD141R1X-ENUM-10:** A Lookup Field **SHOULD NOT** have additional enumerations that are duplicates of enumerations already found within the field. Some Data Dictionary fields have **no enumeration list** defined. Duplication tests on Enumerations only apply on those fields with enumerations defined in the Data Dictionary.

**NOTE 7:** RETS 1.x enumerations consists of LongValue, ShortValue, and Value portions. Testing of enumerations normally focuses on only the LongValue. Testing for duplicates will include ALL “\*Value” portions of the enumeration. To be considered a “Duplicate Error,” all values **MUST** be identical. (Table 1: provides samples from RETS 1.x Metadata with simplified XML for documentation length considerations):

Table 1	Excerpt 1	Excerpt 2
Duplicate Enumerations (All Values Match) ERROR	<pre>&lt;LookupType&gt;   &lt;MetadataEntryID&gt;INDUSTR&lt;/MetadataEntryID&gt;   &lt;LongValue&gt;Industrial&lt;/LongValue&gt;   &lt;ShortValue&gt;INDUSTR&lt;/ShortValue&gt;   &lt;Value&gt;INDUSTR&lt;/Value&gt; &lt;/LookupType&gt;</pre>	<pre>&lt;LookupType&gt;   &lt;MetadataEntryID&gt;INDUSTR&lt;/MetadataEntryID&gt;   &lt;LongValue&gt;Industrial&lt;/LongValue&gt;   &lt;ShortValue&gt;INDUSTR&lt;/ShortValue&gt;   &lt;Value&gt;INDUSTR&lt;/Value&gt; &lt;/LookupType&gt;</pre>
Similar Enumerations (Matching LongValue, Other Values Unique) COMPLIANT	<pre>&lt;LookupType&gt;   &lt;MetadataEntryID&gt;446&lt;/MetadataEntryID&gt;   &lt;LongValue&gt;Arlington&lt;/LongValue&gt;   &lt;ShortValue&gt;ArLin&lt;/ShortValue&gt;   &lt;Value&gt;446&lt;/Value&gt; &lt;/LookupType&gt;</pre>	<pre>&lt;LookupType&gt;   &lt;MetadataEntryID&gt;837&lt;/MetadataEntryID&gt;   &lt;LongValue&gt;Arlington&lt;/LongValue&gt;   &lt;ShortValue&gt;ArlWA&lt;/ShortValue&gt;   &lt;Value&gt;837&lt;/Value&gt; &lt;/LookupType&gt;</pre>
Unique Enumerations (All Values Unique) COMPLIANT	<pre>&lt;LookupType&gt;   &lt;MetadataEntryID&gt;937&lt;/MetadataEntryID&gt;   &lt;LongValue&gt;Kitchen&lt;/LongValue&gt;   &lt;ShortValue&gt;Kitchen&lt;/ShortValue&gt;   &lt;Value&gt;937&lt;/Value&gt; &lt;/LookupType&gt;</pre>	<pre>&lt;LookupType&gt;   &lt;MetadataEntryID&gt;285&lt;/MetadataEntryID&gt;   &lt;LongValue&gt;Master Bedroom&lt;/LongValue&gt;   &lt;ShortValue&gt;Master Bedroom&lt;/ShortValue&gt;   &lt;Value&gt;285&lt;/Value&gt; &lt;/LookupType&gt;</pre>

## 2.2.6 Metadata: Data Formatting

**REQ-DD141R1X-DF-1:** Compliance testing will **NOT** take field formatting into account (i.e. Parcel number, Phone numbers).

**Example:** Different Phone number formats: 555-555-1234, (555) 555-1234, 555.555.1234, etc. All of these are accepted as long as the other field attributes are compliant: DataType, MaximumLength, etc.

## 2.3: RETS 1.x Field Compliance Notices and Compliance Warnings

There are multiple situations where a compliance notice or warning is assigned to a RETS 1.x field. These notices or warnings may fit in one of many cases described in the tables below.

Each compliance warning is assigned a “probation time” in which it is expected that the warning is corrected. **Failure to correct a compliance warning during the probation time may result in a loss of certification.** Compliance notices are NOT assigned a “probation time.”

## Compliance Notices

Type	Compliance Notice Descriptions	Comments / Rule References
<b>Data Types</b>	Where a host provides a data type that does not exactly match what a client is expecting but there wouldn't be a loss of data in the conversion. <b>Example:</b> Host Number --> Client String;	<b>Section 2.2.2.2:</b> These may remain as long as required by the applicant. These CWs will not impact Data Dictionary certification levels.
<b>Suggested Maximum Length</b>	Where a host has a longer maximum length than a client is expecting. There is a potential for data truncation but not guaranteed if the data in the listing does not use the full length allowed.	<b>Rule:</b> REQ-DD141R1X-ML-1
<b>Precision</b>	Where a host provides a precision on a decimal number longer than the client is expecting.	<b>Rule:</b> REQ-DD141R1X-P-1

## Compliance Warnings

Type	Compliance Warning Descriptions	CW Probation Time	Comments / Rule References
<b>Lookup Multi</b>	Where a host provides a single-select lookup but the client is expecting a multi-select.	1 Year	<b>Rule:</b> REQ-DD141R1X-DTI-4
<b>Enumerations</b>	A duplicate enumeration is found in a field not specified by the Data Dictionary.	1 Year	<b>Rule:</b> REQ-DD141R1X-ENUM-2

**Note:** As new situations arise, they will be handled on a case-by-case basis, added to this table, and subject to review.

## 3.0 Data Dictionary Certification Rules

This section contains all of the rules that RESO will use in awarding Data Dictionary Certificates. The specific set of rules that must be passed for "Compliance" are discussed in Section 2.

Certification is awarded when all Data Dictionary fields used within an applicant's Data Dictionary Implementation are mapped and found compliant.

**NOTE 1:** A guiding principle behind Data Dictionary Certification is: "If you do it and the dictionary does it, then you must do it the dictionary way." The Data Dictionary is filled with many "entries" expressed as fields or enumerations. If the data host has a "data container" (field or enumeration) that is similar to the Data Dictionary entry, that container **MUST** be made compliant with the corresponding Data Dictionary entry.

**NOTE 2:** No Data Dictionary fields are "required." An implementation of the Data Dictionary may use as many or as few fields the data host wishes to satisfy their business needs.

**NOTE 3:** A data host may use any additional data fields not found within the Data Dictionary. Any field not defined within the Data Dictionary **SHOULD** be implemented according to the requirements of the transport protocol: RESO RETS 1.x, RESO Web API, etc. These fields may be specific to a host's region or required for operations.

### 3.1 Certification Levels Definition Summary

### 3.2 Certification Level Testing Rules

### 3.3 Certification Levels Field Count Summary

## 3.1 Certification Levels Definition Summary

Different Data Dictionary Certification levels have been defined to recognize those who implement more than the minimum requirements. These higher levels are named after different precious metals: Bronze, Silver, Gold, and Platinum. The minimum certification is named "Core."

**NOTE:** Each certification level builds upon the previous level. Being "Core" is a requirement for "Bronze"; being "Bronze" for "Silver", "Silver" for "Gold", and "Gold" for "Platinum." Generally speaking, failing at a specific level will result in receiving certification at the next level below.

Every field within the Data Dictionary has been assigned to one of these different levels. To be certified at any of these level, all fields used by an applicant at that level **MUST** be compliant.

**EXAMPLE:** To be "Core" certified, all Core fields found in the applicant's implementation must be compliant. To be "Bronze" certified, all Bronze fields must be compliant. This pattern continues for each certification level.

## 3.2 Certification Level Testing Rules

The Data Dictionary Certification has many different levels. This is an effort to provide additional recognition to those who implement more than the minimum requirement.

Core Certification is the minimum requirement set for any Data Dictionary certification. Higher levels of Data Dictionary Certification are named after different precious metals: Bronze, Silver, Gold, Platinum.

### 3.2.1 Data Dictionary Core Certification (Minimum)

### 3.2.2 Data Dictionary Bronze Certification

### 3.2.3 Data Dictionary Silver Certification

### 3.2.4 Data Dictionary Gold Certification

### 3.2.5 Data Dictionary Platinum Certification (Maximum)

### 3.2.1 Data Dictionary Core Certification (Minimum)

These are the minimum requirements that **MUST** be satisfied to receive certification. Any description of Data Dictionary Certification without a precious metal distinction will refer to this minimum level.

**REQ-DD141-DDC-1:** All Data Dictionary Core Fields found AND mapped within the applicant's system MUST be found compliant. Core Fields found within the applicant's Data Dictionary implementation that is NOT mapped or found to be compliant will prevent certification.

**REQ-DD141-DDC-2:** Only those resources that have Core fields defined are evaluated to determine "Core" certification: Media, Member, Office, OpenHouse, and Property.

**NOTE 1:** It is NOT required to implement all five resources. Core certification may be awarded for any number of implemented resources. However, if a resource in this list is implemented, it MUST meet Core standards for the whole implementation to be considered compliant.

**NOTE 2:** The "Core Certification" requirements will roll up into the Bronze requirements at the end of 2016. The Bronze Certification will become the "minimum" for Data Dictionary certification in 2017.

### 3.2.2 Data Dictionary Bronze Certification

Bronze is the first of the certification levels beyond the minimum. All Data Dictionary fields will be evaluated, regardless of what resource they are found in. Any non-compliant Bronze field will prevent Bronze certification.

**REQ-DD141-DBB-1:** All Data Dictionary Bronze Fields found AND mapped within the applicant's system MUST be found compliant. Bronze Fields found within the applicant's Data Dictionary implementation that is NOT mapped or found to be compliant will not be awarded Bronze certification but may be eligible for lower levels.

**REQ-DD141-DBB-2:** Satisfies all requirements for "Core" certification.

**NOTE:** The "Bronze Certification" requirements will roll up into the Silver requirements at the end of 2017. The Silver Certification will become the "minimum" for Data Dictionary certification in 2018.

### 3.2.3 Data Dictionary Silver Certification

Silver certification is the first level where the presence of cautionary warnings impacts certification results.

**REQ-DD141-DDS-1:** All Data Dictionary Silver Fields found AND mapped within the applicant's system MUST be found compliant. Silver Fields found within the applicant's Data Dictionary implementation that is NOT mapped or found to be compliant will will not be awarded Silver certification but may be eligible for lower levels.

**REQ-DD141-DDS-2:** No Cautionary Warnings for Field DataType Conversions are allowed for fields in this Silver level or below.

**REQ-DD141-DDS-3:** Satisfied all requirements for "Bronze" certification.

**NOTE:** The "Silver Certification" requirements will roll up into the Gold requirements at the end of 2018. The Gold Certification will become the "minimum" for Data Dictionary certification in 2019.

### 3.2.4 Data Dictionary Gold Certification

Additional resources have been defined at the Silver certification level. Some of the smaller resources do not have Silver level fields. This is the first level where the presence of cautionary notices impacts certification results.

**REQ-DD141-DDG-1:** All Data Dictionary Gold Fields found AND mapped within the applicant's system MUST be found compliant. Gold Fields found within the applicant's Data Dictionary implementation that is NOT mapped or found to be compliant will will not be awarded Gold certification but may be eligible for lower levels.

**REQ-DD141-DDG-2:** No Cautionary Warnings of any type are allowed.

**REQ-DD141-DDG-3:** No Cautionary Notices for Field DataType Conversions are allowed.

**REQ-DD141-DDG-4:** Satisfied all requirements for "Silver" certification.

**NOTE:** The "Gold Certification" requirements will roll up into the Platinum requirements at the end of 2019. The Platinum Certification will become the only level for Data Dictionary certification in 2020.

### 3.2.5 Data Dictionary Platinum Certification (Maximum)

Platinum is the highest level of certification. This is the 100% compliance level.

**REQ-DD141-DDP-1:** All Data Dictionary Platinum Fields found AND mapped within the applicant's system MUST be found compliant. Platinum Fields found within the applicant's Data Dictionary implementation that is NOT mapped or found to be compliant will will not be awarded Platinum certification but may be eligible for lower levels.

**REQ-DD141-DDP-2:** No Cautionary Warnings or Notices of any type are allowed.

**REQ-DD141-DDP-3:** Satisfies all requirements for "Gold" certification.

**NOTE:** The Platinum Certification will become the only level for Data Dictionary certification in 2020.

### 3.3 Certification Levels Field Count Summary

**Data Dictionary Field Levels:** Details of which fields are within with certification level may be found in the Data Dictionary spreadsheet.

The following table numbers the fields that are in each category per resource.

DD Resource	Core	Bronze	Silver	Gold	Platinum	Unlabeled	Total
<b>Contacts</b>			85				85
<b>History</b>			15				15
<b>Media</b>	11	14				1	26
<b>Member</b>	28	23	6	1	1	3	62
<b>Office</b>	22	9	6	2		1	40
<b>OpenHouse</b>	16	5					21
<b>Property</b>	168	194	103	58	50	8	581
<b>SavedSearch</b>				16			16
<b>TeamMembers</b>					13		13
<b>Teams</b>					35		35
<b>Total</b>	245	245	215	77	99	13	894



## 4.0 Data Dictionary Report Card and Specifications

The Data Dictionary Report Card is used to report to the applicant the certification findings.

This will include a list of the "Compliance Warnings" and "Compliance Notices" that were found during testing.

The structure of the Report Card is based on the current RESO Data Dictionary spreadsheet. The exact format will be determined by the RESO Compliance Staff.

# Change Log

## Data Dictionary Testing Rules Change Log

### Version 1.4.1

#### Version Numbering Updates

- Change the version number to 1.4.1.
- Changing Testing Rule IDs from DD140 to DD141 (throughout document).

#### 2.2.1 Metadata: StandardName

- Added: **REQ-DD141R1X-SN-3**: Added clarification on expectations regarding how Repeating StandardNames are certified.

#### 2.2.2.1 RETS 1.x Metadata DataType and Interpretation Values (Table)

- Modified: **REQ-DD141R1X-DTC-1**: "Empty Interpretation" is an allowable Interpretation ONLY when DataType is "Boolean." Expanding Note 1 to explain changes.

#### 2.2.2.2 RETS 1.x Compliance Errors for Metadata (Table)

- Modified: **REQ-DD141R1X-DTE-1**: An Interpretation is required for Non-Boolean data types: "Number-to-Boolean" and "Date/Timestamp-to-Boolean" mappings (without an Interpretation) is an ERROR.
- Modified: **REQ-DD141R1X-DTE-2**: "Character-to-Date" or "Any Whole Number-to-Date" is an ERROR
- Modified: **REQ-DD141R1X-DTE-4**: "Decimal-to-Whole Number" , "Date-to-Whole Number" or "Timestamp-to-Whole Number" is an ERROR.
- Modified: **REQ-DD141R1X-DTE-5**: Added "Number" Data Types to make this rule consistent with **REQ-DD141R1X-DTE-8**
- Modified: **REQ-DD141R1X-DTE-10**: "Character-to-Timestamp" or "Any Whole Number-to-Timestamp" is an ERROR
- Clarified: **REQ-DD141R1X-DTE-11** does not apply to "Decimal-to-String" mappings, which are compliant.

#### 2.2.2.3 RETS 1.x Compliance Notices and Warnings for Metadata (Table)

- Removed: **REQ-DD141R1X-DTN-2**: "Whole-to-Decimal" Mappings are now **COMPLIANT**.

#### 2.2.3 Metadata: Precision

- Expanded and Changed **REQ-DD141R1X-P-1** to be consistent with Suggested MaximumLength rules.
- New Rule: **REQ-DD141R1X-P-2**: "Whole Number-to-Decimal" mappings will be marked with as **COMPLIANT**.
- Removed: **REQ-DD140R1X-P-2**: A "Whole Number-to-Decimal" mapping [...] will be marked with a "**Compliance Notice**."
- Renumbered existing rules.

#### 2.2.4 Metadata: Suggested MaximumLength

- Expanded **REQ-DD141R1X-ML-1** into ML-1 and ML-2 to provide clarity between COMPLIANT and NOTICE conditions
- Added **REQ-DD141R1X-ML-3** and Note 1: Failure to provide a length when expected is a WARNING.
- Added **REQ-DD141R1X-ML-4** to allow two extra spaces for decimal, positive, negative characters.

#### 2.2.5 Metadata: Enumerations

- Expanded and clarified Note 2 and 3 regarding misplaced and common enumerations. Also added Note 4 and renumbered all other notes for this insertion.
- Expanded **REQ-140R1X-ENUM-6** into ENUM-6, ENUM-7, ENUM-8, ENUM-9, and ENUM-10. Synonym and duplicate tests on Enumerations only apply on those fields with enumerations defined in the Data Dictionary.
- Changed Note 4: Changed example field(s) from "SubdivisionName" to "City" or "MLSAreaMajor".
- Added Note 7 and Table 1: Clarified that Duplicate Enumerations are only when ALL values of the enumerations (LongValue, ShortValue, Value, etc.) are identical.

#### 2.3: RETS 1.x Field Compliance Notices and Compliance Warnings

- Removed "Precision" Notice from the table. Changed other rules to match changes described above.

### Version 1.4.0

#### Version Numbering Updates

- Change the version number to 1.4.0.
- Going forward, the first two digits of the Testing Rules document will match the version number of the Data Dictionary. Any changes to the rules that applies to the same Data Dictionary version will increment the third digit. (1.4.1, 1.4.2, etc.)
- Changing Testing Rule IDs from DD130 to DD140 (throughout document).

#### 2.2.2.1: RETS 1.x Metadata DataType and Interpretation Values

- **REQ-DD140R1X-DTC-5**: Adding "Lookup" as an acceptable Interpretation. Allowing for Single-Select Lookup-to-String mappings to be "Compliant." (See Note 3)

### 2.2.2.3 RETS 1.x Compliance Notices and Warnings for Metadata

- REQ-DD140R1X-DTN-1: Removed "Lookup" as an Interpretation that would cause a "Notice". Allowing for Single-Select Lookup-to-String mappings to be "Compliant" (See Note 3). Multi-Select Lookup-to-String mappings will still receive a "Notice" due to concerns about truncation when adding multiple enumerated values into one string field.

### 2.2.4 Metadata: Suggested Maximum Length - Renamed Section Header, added "Suggested"

- Reclassified the "Warning" given when Host data is longer than the Data Dictionary's length to a "Notice" based on recommendation by Data Dictionary Work Group.
- Also impacts "2.3: RETS 1.x Field Compliance Notices and Compliance Warnings" tables

## 3.0 Data Dictionary Certification Rules

- All pages within this section have been updated to include detailed descriptions of the Core, Bronze, Silver, Gold, and Platinum Certification requirements. Please refer to all pages within this section for the updated rules.

## Version 1.0.3

### 1.4 Impact of Future Data Dictionary Changes to these Testing Rules

- A new page.

### 2.2 RETS 1.x Field-Level Compliance

- REQ-DD130R1X-FLC-2: Added description about the importance of adding Data Dictionary mappings, regardless if fields are fully compliant.

#### 2.2.1 Metadata: StandardName

- Replaced current rule with two new rules to address the use of Non-Data Dictionary fields as RETS 1.x StandardName: REQ-DD130R1X-SN-1 and REQ-DD130R1X-SN-2.
- Added Note clarifying that StandardNames are case sensitive.

#### 2.2.2 Metadata: Data Type and Interpretations

- Moved "REQ-DD130R1X-DTI-3" to 2.2.2.2 (Errors)
- Moved "REQ-DD130R1X-DTI-4" to 2.2.2.3 (Warnings)
- Renumberd "REQ-DD130R1X-DTI-5" to "3" to take the place of rules moved.

##### 2.2.2.1 RETS 1.x Metadata DataType and Interpretation Values (Table)

- Added Requirement Numbering to table for easier reference.
- New COMPLIANT Mapping: "Number-to-String" (Added Note 3, renumbered following notes)
- Removed "Time" as an acceptable DataType for Timestamp - Moved to ERROR page (2.2.2.2)
- Added "Boolean-to-Lookup" as a compliant mapping ONLY for open enumerations. Locked enumerations are errors.

##### 2.2.2.2 RETS 1.x Compliance Errors for Metadata (Table)

- Added Requirement Numbering to table for easier reference.
- A new page to contain all of the known mappings that will result is errors
- New ERROR Mapping: "String-to-LookupMulti" (To match "String-to-Lookup" ERROR)
- New ERROR Mapping: "Boolean-to-Lookup" (Added Note 1)
- New ERROR Mapping: "Timestamp-to-Date" (Added Note 2)
- New ERROR Mapping: "Date-to-Timestamp" (Added Note 2)
- New ERROR Mapping: "Lookup-to-Number" (Added Note 3 with examples)
- New ERROR Mapping: "Character-to-Number"
- New ERROR Mapping: "Decimal-to-Whole" Numbers to match similar logic for Precision REQ-DD130R1X-P-3
- Removed ERROR Mapping: "Whole-to-Decimal" Numbers now classified as a NOTICE
- Sorted table based on "DD Simple Data Type" and renumbered the notes for the new notes added.

##### 2.2.2.3 RETS 1.x Compliance Notices and Warnings for Metadata (Table)

- Added Requirement Numbering to tables for easier reference.
- Renumbered "2.2.2.2" to "2.2.2.3" to make room for new page.
- New NOTICE Mapping: "LookupMulti-to-String" (Expanded "Note 2")
- New NOTICE Mapping: "Whole-to-Decimal" Numbers to match similar logic for Precision REQ-DD130R1X-P-2.
- Removed NOTICE Mapping: "Date-to-Timestamp" (Deleted "Note 3") - Moved to ERROR page (2.2.2.2)

## Version 1.0.2

### 1.2 RESO Certification Flow (Summary)

- Simplified Certification Flow descriptions.

### 1.3 Supplemental Application Information

- Simplified page contents by removing specific application content information. Instructions will be in an external document so testing rules will not need changes when the application changes.

### 2.2.2 Metadata: Data Type and Interpretations

- Expanded and clarified examples and notes.

#### 2.2.2.1 RETS 1.x Metadata DataType and Interpretation Values (Table)

- Added explanatory note describing RETS 1.x DataType and Interpretation.
- Added footnotes to table.

#### 2.2.2.2 RETS 1.x Compliance Notices and Warnings for Metadata (Table)

- Recategorized "Cautionary Warnings" into "Compliance Warnings" and "Compliance Notices" based on severity. Separated example tables into different sections on the same page.