Guidance for Flood Risk Analysis and Mapping

National Flood Hazard Layer

This Document is Superseded.
For Reference Only.

November 2014

FEMA

This guidance document supports effective and efficient implementation of flood risk analysis and mapping standards codified in the Federal Insurance and Mitigation Administration Policy FP 204-07801.

For more information, please visit the Federal Emergency Management Agency (FEMA) Guidelines and Standards for Flood Risk Analysis and Mapping webpage (http://www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping), which explains the policy, related guidance, technical references and other information about the guidelines and standards process.

Nothing in this guidance document is mandatory other than standards codified separately in the aforementioned policy. Alternate approaches that comply with FEMA standards that effectively and efficiently support program objectives are also acceptable.

Document History

Affected Section or Subsection	Date	Revision Description
First Publication	May 2014	Initial version of new transformed guidance. The content was derived from the *Guidelines and Specifications for Flood Hazard Mapping Partners*, Procedure Memoranda, and/or Operating Guidance documents. It has been reorganized and is being published separately from the standards.
3.0 Data Format and Schema	November 2014	Field changes to Flood Insurance Rate Map (FIRM) database schema moved to National Flood Hazard Layer (NFHL) section of *FIRM Database Technical Reference*.

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1.0 NFHL Overview

This document provides guidance for National Flood Hazard Layer (NFHL) data maintenance activities as part of the Risk Mapping Assessment and Planning (MAP) program. The NFHL is intended to be the definitive source of digital flood hazard map data, including all digital effective study and Letter of Map Revision (LOMR) data. Data for the NFHL is available through the FEMA (http://www.fema.gov) and Map Service Center (https://msc.fema.gov) Websites.

Maintenance of the data is primarily conducted by the Production and Technical Services (PTS) Contractors, who each maintain a Regional Flood Hazard Layer (rFHL) for their regions. Studies, LOMRs and corrections from all Mapping Partners, including Cooperating Technical Partners (CTP), are integrated at the rFHL level and transmitted to Customer Data Services (CDS) based on standard intervals defined below in the submission timing section for inclusion in the NFHL. Studies are submitted as close to the effective date as possible. The CDS contractor maintains the NFHL and ensures that it is available for public distribution, as well as interfaces with stakeholders to resolve any issues discovered during use. All data issue resolutions should begin at the PTS rFHL level and then be submitted to the NFHL to maintain proper version control.

2.0 Guidance for the rFHL-to-NFHL Data Transfers from the PTS Contractors to the CDS Contractor

This section outlines the data transfer process from the PTS contractor rFHLs to the NFHL maintained by the CDS contractor.

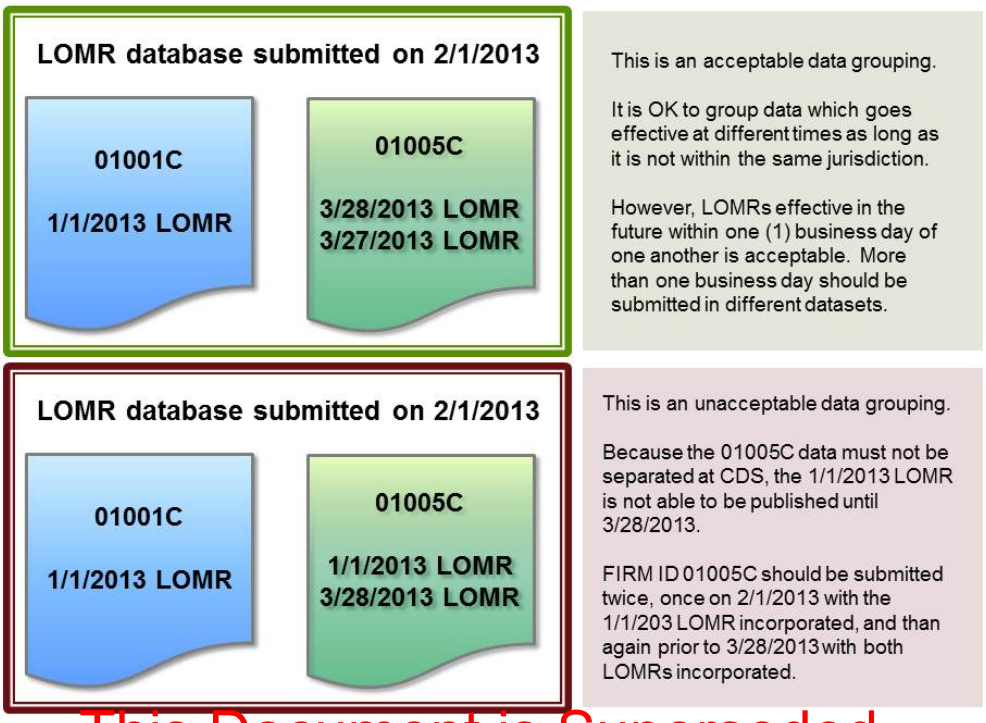
2.1 Submission Content

For the purposes of this document, a dataset is comprised of all data layers for a single jurisdiction. A submission can be comprised of one or more datasets of the same study type (e.g. Countywide Study, Physical Map Revision (PMR), Letter of Map Revision (LOMR) or Fix) grouped together into a personal geodatabase in the 2013 *Flood Insurance Rate Map (FIRM) Database Technical Reference* or subsequent schema adopted by the NFHL.

Each dataset should consist of the effective data for a single, complete jurisdiction (i.e. a single Digital Flood Insurance Rate Map Identification Number (DFIRM ID). The dataset should include all spatial and non-spatial layers and cover the entire jurisdiction.

Datasets should be submitted by study type (Countywide Study or PMR, LOMR or Fix) in separate geodatabases and manifests and submit as indicated in File Name Conventions section. For example, a countywide study and LOMR should not be submitted in the same geodatabase. Study datasets should be submitted in a single geodatabase for each effective date. LOMRs for the same DFIRM ID with future effective dates that are separated by more than one business day should not be submitted to CDS within the same geodatabase. This standard serves a dual purpose in that it prevents data from being loaded into the NFHL prior to its effective date and ensures that data manipulation does not need to occur once received by CDS. Past effective LOMR information can be submitted with a newly effective LOMR. All data manipulation remains at the PTS rFHLs in order to retain proper version control.

Figure 1: Submittal Grouping Example



Each dataset should consist of the best available data for its latest effective date and should contain all currently effective data for the given area. For instance, if a LOMR effective 5/1/2013 is included in a dataset, the dataset should contain all LOMRs effective up to that point. A LOMR should only be submitted to the NFHL when it effectively revises a FIRM database. If the FIRM database effective date is after the LOMR effective data on a given FIRM panel, that S_LOMR feature should be deleted. The LOMR data should now be represented as incorporated data in the study's FIS report, if not these LOMRs are considered superseded by the newer effective panel. The NFHL only contains effective LOMRs, superseded LOMRs and incorporated LOMR polygons should be removed. Any LOMRs that are not superseded by the newly effective panel should be reissued the day after the panel's effective date to ensure these remain in the NFHL.

2.2 Delivery Manifest

In order to ensure that submissions include all intended data and do not include extra data, PTS should submit a delivery manifest in Microsoft Excel (.xls) format detailing the content of each submitted database. One delivery manifest shall be submitted with each geodatabase. The delivery manifest template (Attachment A) should be completed according to the example to comply with CDS completeness checks upon receiving a submission from PTS. If a submittal contains any valid errors that will not pass the NFHL Quality Control (QC) checklist (Attachment C), such as containing multiple datums due to study data, this should be explained in the notes field in the manifest to expedite the approval of the submission.

3.0 Data Format and Schema

Data shall be delivered to CDS in an Environmental Systems Research Institute (ESRI) personal geodatabase format (.mdb) matching the schema and data specifications of the current NFHL database, regardless of what schema was used when producing the FIRM database.

The CDS contractor can provide a template geodatabase in either Personal Geodatabase or ESRI Extensible Markup Language (XML) to the PTS contractors with the appropriate schema and specifications upon request. The personal geodatabase and delivery manifest should be compressed into a zip or 7zip file (7zip is preferred).

Data shall be in the NFHL schema which differs from the FIRM DB schema outlined by the *FIRM Database Technical Reference* in the following ways:

- S_LOMR layer is required
- Data submitted in the 2003 Appendix L or 2011 Appendix L schemas will need to be converted prior to incorporation into the rFHL
- S_LABEL_PT and S_LABEL_LD are not required for 2003 format but are required for data received in the 2011 or newer database schema
- S_Trnsport_Ln required for 2003 format, but 2011 or 2013 format should only be loaded into the NFHL if no Base Index is present or if the source is not Master Address File (MAF) / Topologically Integrated Geographic Encoding and Referencing (TIGER)

- DFIRM ID and VERSION ID fields should be present and attributed in all layers
- DBREV_DT must be attributed with the newest effective date of the Study, LOMR or NTU revision date of the data being submitted
- Agreements on variances from the published attribute value domain lists as agreed to by FEMA, the CDS Contractor and the PTS Contractors and adopted through the Engineering and Mapping IPT. In the event of new domains CDS Contractors and PTS Contractors will work together to seamlessly implement new domains
- All tables and feature classes required by Table 2 in the *FIRM Database Technical Reference* must be populated for the LOMR area (see Attachment E), S_Submittal_Info only required if originated with version greater than 1.1.1.0
- All single space values " " caused by shapefile limitations should be calculated to empty string, "" to adhere to the *FIRM Database Technical Reference* design for NULL values in the database

3.1 Database Schema Conversion

If data is submitted in the 2003 format, PTS contractors should use of the Flood Map Desktop tool available through www.floodmapdesktop.com. This conversion tool from 2003 database to the 2012 version of the NFHL is available for free. This tool was used for the conversion of the NFHL and this data has been through quality review for the 2012 version of the NFHL. There have been slight modifications to align the NFHL with the 2013 version of the *FIRM Database Technical Reference* that will need to be changed manually; all of these changes involve

populating fields with the correct pseudo null value for the 2013 version of the NFHL. 2003 to 2013 Additional Manual Conversion Needs table (Attachment B) documents the changes needed for fields that contain incorrect values after the conversion due to changes in the schema after the conversion project started.

If data was submitted in the 2011 format, PTS contractors will need to convert this manually. Change to the schema has created differences in the 2011 database schema to the 2013 schema. All schema changes as well as conversion needs for each field have been documented in the 2011 to 2013 Schema Manual Conversion Needs table (Attachment B). As long as Mapping Partners use the *Domain Tables Technical Reference* the conversion needs should be limited.

Any future changes to the NFHL schema should be documented and guidance added for conversion needs.

4.0 rFHL Maintenance

PTS Contractors should maintain an up-to-date rFHL for their Regions matching the current NFHL schema and the rFHL database should serve as the basis for data submissions to CDS.

PTS Contractors should comply with all NFHL incorporation and quality standards. These standards increase the quality of the NFHL database and reduce the possibility of errors that could create confusion on flood hazard determinations. Though it is a standard for the flood hazard area data not to have any overlaps, the PTS contractor should also check all remaining data for duplications and correct the data when possible. Data outside of the flood hazard area layer may be overlapping if there are differing attributes to support having multiple features. This applies to Countywide Study, PMR and LOMR processing as well.

4.1 Countywide Study Data Incorporation Procedures

To ensure PTS Contractors download all data that is required of the mapping partner to submit from Citrix, please see section FIRM Database Schema Variations for more information.

4.2 PMR Incorporation Procedures

PMR processing includes incorporating only a portion of the submitted data, if submitted in countywide format, into the rFHL for submittal to the NFHL. This incorporation is not always limited to a clip of the PMR footprint. If political area boundaries are provided outside of the PMR footprint, they should be fully incorporated into the NFHL. Other features to be incorporated may fall outside or cross the PMR boundary. Profile baseline, station start points, cross sections (XS), base flood elevations (BFEs), general structures, levees and other spatial and non-spatial features should be reviewed for incorporation beyond the PMR boundary. Refer to Table 2 of the *FIRM Database Technical Reference* (Attachment E of this document) for a list of tables and feature classes required. Based on the data selected to be incorporated, existing data in the rFHL should be removed and replaced with the PMR data. In an effort to track panel updates and LOMR information not all tables and feature classes are a flat replace. L_Pan_Revis and L_MT2_LOMR should be combined with the existing data that is still relevant in the NFHL; any duplication should be removed. This will allow the NFHL to keep a running list of panel revisions and LOMR information. LOMR polygons that fall within the PMR footprint should be removed from the data; CDS will track these in an archived dataset for any future needs. Tables and feature classes that are linked through foreign keys should be updated through a process that allows the relationship between tables to remain with the introduction of

new features that may have the same foreign key information. The update of any primary key values should be updated in the original table as well as the table that contains the foreign key.

4.3 LOMR Incorporation Procedures

LOMR processing includes incorporating submitted data into the rFHL for submittal to the NFHL. While data technicians must be careful not to introduce errors or make unwanted revisions outside of the LOMR revision footprint, this LOMR incorporation process is not always limited to a clip of the LOMR polygon. Cross sections stationing and multi-frequency elevations changes in the floodway data table also need to be incorporated into the NFHL Database tables S_XS and L_XS_Elev as well. Other examples of the inter-relationship of the FIS Report and FIRM Database exist. Based on the data selected to be incorporated, existing data in the rFHL will be removed and replaced with the LOMR data. However if a LOMR polygon overlaps an existing LOMR polygon, the LOMR polygon feature only will not be removed. Users of the NFHL will be able to determine which LOMR to use as the latest information based on the effective dates. Tables and feature classes that are linked through foreign keys will need to be incorporated through a process that allows the relationship between table and feature classes to remain. LOMR data should be checked against the LOMR map attachment, floodway data table and other relevant tables for accuracy.

Contractors should receive LOMR data from PTS or CTP teams responsible for LOMR production, including the map attachment and relevant flood data tables. The map attachment and flood data table should be used to visually check the data received from the LOMR production team to ensure quality data is being submitted to the NFHL. PTS Contractors will coordinate correction of any errors with the LOMR PTS or CTP production team.

4.4 Engineering Data Integrity

Because the information formerly stored in Data Capture Standards databases have been added to the FIRM Database, PTS Contractors should ensure that all LOMR-related changes to the engineering tables are included in the LOMR submission. Table 2 of the ***FIRM Database Technical Reference*** should be consulted (see Attachment E). If, for example, the LOMR modifies the hydraulic analyses of the stream, the tables listed as Required or Required when Applicable should be updated and included in the submission. This only applies to LOMRs started from data with a version ID greater than 1.1.1.0.

4.5 Notice to Users Incorporation Procedures

After receiving a Notice to Users (NTU), processing should be processed as described above if a countywide study or PMR. The DBREV_DT field in the Study_Info table will need to be updated to the date listed in the L_Pan_Revis for the NTU revision date. Also, any LOMRs that were published and incorporated into the NFHL between the study effective date and the NTU revision date will need to be incorporated into the data prior to submitting the NTU as a fix to CDS.

5.0 Filename Conventions

Filenames should contain information on the PTS Contractor, submission type and date. For FIRMs (Countywide Studies and PMRs), the date in the filename should be the effective date. For LOMRs and other fixes, the date in the filename should be the submission date.

Sample FIRM submission: BakerAECOM_FIRMs_20130116.zip

Sample LOMR submission: RAMPP_LOMRs_20130110.zip

Sample Fix submission: STARR_Fix_20130110.zip

6.0 NFHL Quality

PTS Contractors should comply with all NFHL incorporation and quality standards. It is recommended that PTS Contractors use the Feature Manipulation Engine (FME) QC tool provided by CDS Contractor or other methods of QC using the checklist (Attachment C) provided by CDS to QC data prior to submission to CDS. Some of the corrections may need research into past effective study or LOMR data to confirm the correction or provide information about exceptions to the QC checklist. Additional checks and corrections may be performed by PTS Contractors; these may include but, are not limited to, topology, attribute, domain and relationship corrections.

Upon receiving submitted NFHL data, CDS will conduct an automated QC of all submissions using the NFHL QC tool based on the specifications in the *FIRM Database Technical Reference* with some additional requirements. CDS will notify PTS of any issues discovered during QC for rework and resubmission.

7.0 NFHL Maintenance

After a complete county (community for single-jurisdiction) dataset is submitted to CDS by PTS, CDS will publish each submitted dataset to the NFHL by first removing any existing data for all layers for each DFIRM ID from the NFHL Spatial Database Engine (SDE) database, then replicating all layers for each DFIRM ID to the NFHL SDE database.

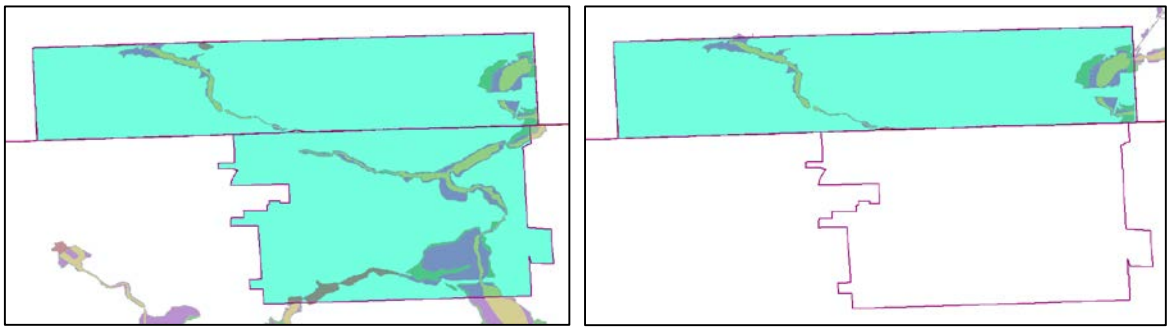
8.0 Error Resolution

Data issues communicated to CDS by users will be investigated by CDS to determine a resolution method when possible. CDS will then communicate the issue(s) to the appropriate PTS contractor responsible for the Region where the issue is present. Data corrections submitted by PTS should comply with all NFHL incorporation and quality standards.

8.1 Multi-County Community Data Overlap

In the case of new study data overlapping a previously mapped portion of a multi-county community, the flood hazard, base flood elevations and cross section data can be removed from the previously effective county data if all flood hazards and political boundaries match exactly. Figure 2 below illustrates how the political and flooding data for the upper portion of the community is exactly the same and will allow for the removal of the data from the county that contains just the upper portion. The political area layer's Area Not Included (ANI) field of the previously effective study should be changed to True. If the previously effective county's S_POL_AR does not contain the full extent of the multi-county community, the missing extent should be incorporated into the previously effective study and the Area Not Included field should be attributed as True. Since the newly effective study supersedes the previously effective study, this removal of flood data and the change to the political area will reduce confusion regarding which DFIRM the community should be included in if a new study is being started. If the newly effective study for the multi county community does not match the previously effective data in the NFHL incorporate as is and notify the region that conflicting flood hazard data exists for the community in question for each DFIRM_ID.

Figure 2: Multi-county Community Example



9.0 Submission Timing

There is a defined window of time in which CDS can publish data to the NFHL without interrupting distribution systems. NFHL submissions received by CDS after 2pm eastern time (ET) will be counted as being received on the next business day. This is necessary to allow for the timely incorporation of data submissions received up until 2pm each day. For example, if CDS receives a submission at 1:59pm (ET) on Thursday, 1/31/2013, it will be logged as received at that time. However, if it is received at 2:01pm (ET) on Thursday 1/31/2013, it will be logged as received on Friday, 2/1/2013 at 9:00am (ET).

- Studies, including PMRs, should be submitted to CDS between 5 and 30 days before the effective date
- Standard LOMRs, LOMRs that are issued before the effective date, should be submitted to CDS 5 to 30 days before the effective date
- Effective on Issuance (EOI) LOMRs, LOMRs that are effective on the same date of issuance, should be submitted to CDS within 10 days of the effective date

10.0 Edge Matching within the NFHL

Detailed guidance on edge matching during a mapping partner's project should be available within FIRM Map Guidance. This guidance will contain information about how the NFHL is used for edge matching. PTS Contractors should not edit flood or political data to match between community boundaries when incorporating data into their rFHL databases, since this would modify effective data. The general rule is for the mapping partner to edge match the FIRM Database feature classes S_Pol_Ar, S_Fld_Haz_Ar and S_Fld_Haz_Ln layers to adjacent counties that are already preliminary (or effective) before the FIRM currently in production. The NFHL or preliminary data of adjacent counties is what needs to be used for edge matching. This is known as the "First in Wins" rule. These layers should be edge matched to the NFHL if available, unless additional updates are ongoing. Generally, edge-matching should be coordinated at the PTS and Regional level at the Acquire Base Map stage but issues may arise during NFHL processing if this was not done by the contractor. For PMR studies, Mapping Partners should edge match within the FIRM at the PMR footprint boundary as well.

11.0 NFHL Quality Corrections

11.1 QC Checklist

The QC Checklist as defined by CDS and PTS describes the checks that all NFHL data submissions to CDS should pass. The checks are not considered to be completely comprehensive; they represent only the basic subset of possible data quality checks that can be completed in an automated fashion on the submitted NFHL databases.

Errors can be identified through a number of automated solutions. CDS has developed and provided to PTS a set of models using third-party FME software that will identify errors on the checklist. Errors can also be identified using common GIS quality verification tools such as ArcGIS Data Reviewer or any number of custom solutions.

Each check has a “severity” indicator in the QC checklist:

11.2 High Severity

These errors directly impact the ability to make correct flood determinations (and thus are usually associated with the Flood Hazard Zones layer) or cause loss of NFHL data integrity / version control.

Error Examples:

- Overlapping Flood Hazard Zone polygons within a county dataset (especially when attributes conflict)
- Flood Hazard Zone polygons with invalid values
- Missing data layers
- PMR or LOMR Dataset submittals missing LOMRs outside of the study area that are currently integrated into the NFHL
- V_DATUM field specified in Cross-section layer does not match V_DATUM specified in Study Info table
    - There are rare examples where disparate vertical datum values are correct but each discovered occurrence should be researched for accuracy due to the datum conversion for validating elevations (e.g. DFIRM ID 29095C though produced in North American Vertical Datum of 1988 (NAVD88) contains a LOMR produced in National Geodetic Vertical Datum of 1929 (NGVD29)). These exceptions should be documented in the submission manifest when delivered.

11.3 Medium Severity

These are errors in supporting data (S_FLD_HAZ_Ar, S_XS, S_BFE, L_XS_Elev and Study_Info) that could impact attributes other than the flood zone, i.e. static BFE elevations, depth and velocity values and vertical datum information. While these can cause problems for more advanced users, they do not always affect the ability to make a flood determination.

Examples:

- DEPTH field not populated for ‘AO’ flood zones

- VEL_UNIT field not populated for flood zone containing a Velocity value

11.4 Low Severity

These errors may lead to confusion or cause redundancy but they generally do not impact the ability of a user to obtain an accurate flood determination.

Examples:

- LOMR included in dataset not attributed as Effective
- LOMR attributed as Effective falls on FIRM Panel with more recent effective date
- Unacceptable null values (such as -9999 in a string field)

12.0 Error Detection and Data Correction

Here is a brief description of the relative levels of effort it would take to correct errors in the NFHL. Errors have been sorted into groups reflecting the relative difficulty to both detect and correct. Real-world examples are provided for each group; each example has been seen in NFHL data more than once and some occur very frequently.

12.1 Level 5

The errors which take the most effort to detect and fix are the geometry and attribute errors which can only be detected by direct comparison of the FIRM panel and/or FIS report (and associated information) to the GIS data, i.e. they cannot be detected programmatically.

Detecting these errors would require detailed visual comparison between other regulatory products and the GIS data. Fixing the errors would require manual correction of the GIS data's geometry or attributes to match the correct regulatory product. It is possible that these errors actually originated on the final FIRM panel and/or final FIRM Database and it is not simply an NFHL data quality issue. Errors such as these should be communicated to the Quality Working Group (QWG) leads for vetting with FEMA Headquarters. Depending on the origination of the errors and the breadth, some of the errors may require the issuance of a Notice to Users for correction.

Examples:

- Incorrectly delineated flood zones (or other map information)
- BFE or cross-section values incorrect
- Secondary information such as depth, velocity, etc. incorrect

12.2 Level 4

Level 4 errors are geometry errors which can be detected programmatically but require manual correction. Detection can be accomplished through comparison of geometry/topology. While this can be very computationally expensive, it can be automated.

The effort required to fix the errors may vary but will always require manually editing the GIS data's geometry. Depending on the exact situation, other regulatory products may or may not need to be referenced to determine the correct geometry.

Examples:

- Overlapping flood zones within a single county dataset
- Gaps in flood zones (within a given county)

12.3 Level 3

Level 3 errors are attribute errors which can be detected programmatically but require manual correction. Detection can be accomplished by identifying mismatches in appropriate data values. This is typically not as computationally expensive as detecting geometry errors and can be done more readily on a large scale. Manual effort is still required to determine the value and make the correction.

Examples:

- Vertical datum mismatch between Study_Info table and Flood Hazard Zone layer
    - There are rare examples where disparate vertical datum values are correct but each discovered occurrence should be researched for accuracy due to the datum conversion for validating elevations (e.g. DFIRM ID 29095C though produced in NAVD88 contains a LOMR produced in NGVD29). These exceptions should be documented in the submission manifest when delivered.
- Missing LEN_UNIT value when STATIC_BFE or DEPTH fields are populated
- Missing Depth value for AO flood zone
- Invalid FLD_ZONE or LN_TYP value
- Invalid combination of FLD_ZONE and ZONE_SUBTY
    - Mecklenburg, NC exceptions should be considered

12.4 Level 2

Level 2 errors are errors within feature classes which can be detected programmatically and corrected manually. Detection can be accomplished through comparison of both geometry and attributes and can be computationally expensive. Minimal manual effort is required to make the correction.

Examples:

- LOMR effective date predates the effective date of the FIRM panel it falls on
- DBREV_DT field not populated

12.5 Level 1

Level 1 errors are attribute errors which can be both detected and fixed programmatically. These are the easiest errors to fix, since the process can be automated entirely.

Examples:

- Flood zone attributed with incorrect SFHA_TF values
- LOMRs attributed as non-effective
- Invalid null values (such as -9999 in a string field)

13.0 FIRM Database Schema Variations

During the history of the NFHL there have only been 2 schemas; prior to June 2013 the NFHL was in a slightly modified version of the 2003 FIRM database. In June 2013 FEMA began publishing the NFHL in the slightly modified version of the *FIRM Database Technical Reference*. These modifications are described in the Data Format and Schema section. This contains the 2003 converted NFHL data and will be updated regularly to incorporate newly effective 2003 and 2011 FIRM database schemas once converted as well as the 2013 database schema. All NFHL data will be published in the 2013 database schema. Any future changes to the FIRM database schema and the NFHL schema should be minimal to reduce the needs to convert the NFHL into a future format. These changes will need to be coordinated with CDS Contractors and PTS Contractors due to the fact that conversion of the NFHL schema is not trivial, due to historic data and the dependencies of numerous systems that would be affected.

Each schema of the FIRM database has different requirements on tables to be submitted. PMRs that start from the 2003 converted NFHL or if Mapping Partners are updating an automated FIS, will have additional requirements. These are in addition to the fields and tables populated during the NFHL conversion, as well as on the attributes within these tables. Table requirements for studies are documented for 2003, 2011 and 2013 (Attachment D). This is to educate the rFHL teams on what they should receive from Mapping Partners to incorporate into the NFHL, when dealing with various schemas. Guidance for updating the FIRM database based on studied streams and updated FIS should be found in the FIRM database guidance as well as PMR guidance.

14.0 Attachment A: Submission Manifest

Table 1: Study Manifest

DFIRM_ID	CASE_NO	EFF_DATE	SEND_DATE	TYPE	SUBTYPE	FIXTYPE	NOTES
02110C		8/19/2013	7/30/2013	Study			
19031C		8/19/2013	7/30/2013	Study			
19061C		8/19/2013	7/30/2013	Study	PMR		Study Contains multiple valid datums

Table 2: LOMR Manifest

DFIRM_ID	CASE_NO	EFF_DATE	SEND_DATE	TYPE	SUBTYPE	FIXTYPE	NOTES
31109C	12-07-2343P	7/31/2013	8/16/2013	LOMR	EOI		
55087C	12-05-6032P	8/23/2013	8/16/2013	LOMR			
29071C	12-05-3320P	8/26/2013	8/16/2013	LOMR	Multi-County		
29073C	12-05-3320P	8/26/2013	8/16/2013	LOMR	Multi-County		

Table 3: Fix Manifest

DFIRM_ID	CASE_NO	EFF_DATE	SEND_DATE	TYPE	SUBTYPE	FIXTYPE	NOTES
02110C	01-23-4567P	8/19/2013	7/30/2013	LOMR		Resub	Corrected invalid LN_TYP values
19031C		8/19/2013	7/30/2013	Study		Fix	Corrected missing polygons in S_Fld_Haz_Ar
19061C		8/19/2013	7/30/2013	Study	PMR	Fix	Corrected missing LOMR

15.0 Attachment B: Manual Conversion Needs

Table 4: 2003 to 2013 Additional Manual Conversion Needs

Table.Field	Change Description	Conversion needs
S_Stn_Start.SOURCE_CIT	Field populated with S_STN_START conversion, but not for L_STN_START conversion	If SOURCE_CIT is NULL, calculate to "NP"
S_Trnsport_Ln.ROUTE_TYP	Field populated with values in NM_TYP field, but left NULL if no value converted over	If ROUTE_TYP is NULL, calculate to "NP"
S_Profil_Basln.START_ID	Field populated with S_PROFIL_BASLN conversion, but not for S_WTR_LN conversion	If START_ID is NULL, calculate to "NP"
L_XS_Elev.FW_WIDTH	Field type changed from required to required when applicable	If FW_WIDTH = -8888, calculate to -9999
L_XS_Elev.XS_AREA	Field type changed from required to required when applicable	If XS_AREA = -8888, calculate to -9999
L_XS_Elev.AREA_UNIT	Field type changed from required to required when applicable	If AREA_UNIT = 'NP', calculate to "" empty string
L_XS_Elev.VELOCITY	Field type changed from required to required when applicable	If VELOCITY = -8888, calculate to -9999
L_XS_Elev.VEL_UNIT	Field type changed from required to required when applicable	If VEL_UNIT = 'NP', calculate to "" empty string
L_XS_Elev.FREEBRD_LL	Field type changed from required to required when applicable	Calculate all values to -9999
L_XS_Elev.FREEBRD_RL	Field type changed from required to required when applicable	Calculate all values to -9999

Table 5: 2011 to 2013 Schema Manual Conversion Needs

Table Field	Change Description	Conversion needs
S_Alluvial_Fan.AREA_UNITS	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Alluvial_Fan.DISCH_UNIT	Field width decreased from 17 to 3	No previous domain, new domain values may be needed.
S_Alluvial_Fan.VEL_UNIT	Field width decreased from 30 to 20, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Alluvial_Fan.DEPTH_UNIT	Field width decreased from 20 to 16, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Alluvial_Fan.FLD_ZONE & S_Alluvial_Fan.ZONE_SUBTY	FLD_ZONE Field width decreased from 55 to 17, ZONE_SUBTY field added. Zone conversions listed. If not listed, not a valid zone combination. Discuss with quality team and CDS to resolve, possible zone combination may be needed.	FLD_ZONE = 'A' converts to FLD_ZONE = 'A' and ZONE_SUBTY = ''
		FLD_ZONE = 'A99' converts to FLD_ZONE = 'A99' and ZONE_SUBTY = ''
		FLD_ZONE = 'AE' converts to FLD_ZONE = 'AE' and ZONE_SUBTY = ''
		FLD_ZONE = '1 PCT ANNUAL CHANCE FLOOD HAZARD CONTAINED IN CHANNEL' converts to 'FLD_ZONE = 'AE' and ZONE_SUBTY = '1 PCT ANNUAL CHANCE FLOOD HAZARD CONTAINED IN CHANNEL'
		FLD_ZONE = 'AH' converts to FLD_ZONE = 'AH' and ZONE_SUBTY = ''
		FLD_ZONE = 'AO' converts to FLD_ZONE = 'AO' and ZONE_SUBTY = ''

Table Field	Change Description	Conversion needs
		FLD_ZONE = 'AREA NOT INCLUDED' converts to FLD_ZONE = 'AREA NOT INCLUDED' and ZONE_SUBTY = ''
		FLD_ZONE = 'D' converts to FLD_ZONE = 'D' and ZONE_SUBTY = ''
		FLD_ZONE = 'OPEN WATER' converts to FLD_ZONE = 'OPEN WATER' and ZONE_SUBTY = ''
		FLD_ZONE = 'V' converts to FLD_ZONE = 'V' and 'ZONE_SUBTYP' = ''
		FLD_ZONE = 'VE' converts to FLD_ZONE = 'VE' and 'ZONE_SUBTYP' = ''
		FLD_ZONE = '0.2 PCT ANNUAL CHANCE FLOOD HAZARD' converts to FLD_ZONE = 'X' and ZONE_SUBTY = '0.2 PCT ANNUAL CHANCE FLOOD HAZARD'
S_Alluvial_Fan.FLD_ZONE & S_Alluvial_Fan.ZONE_SUBTY	FLD_ZONE Field width decreased from 55 to 17, ZONE_SUBTY field added. Zone conversions listed. If not listed, not a valid zone combination. Discuss with quality team and CDS to resolve, possible zone combination may be needed.	FLD_ZONE = 'X AREA OF SPECIAL CONSIDERATION' converts to FLD_ZONE = 'X' and ZONE_SUBTY = 'AREA OF SPECIAL CONSIDERATION'
		FLD_ZONE = '0.2 PCT ANNUAL CHANCE FLOOD HAZARD CONTAINED IN CHANNEL' converts to FLD_ZONE = 'X' and ZONE_SUBTY = '0.2 PCT ANNUAL CHANCE FLOOD HAZARD CONTAINED IN CHANNEL'
		FLD_ZONE = 'X' converts to FLD_ZONE = 'X' and ZONE_SUBTY = 'AREA OF MINIMAL FLOOD HAZARD'

Table Field	Change Description	Conversion needs
S_BFE.LEN_UNIT	Field width increased from 11 to 16, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_CBRS.CBRS_TYP	Field width decreased from 35 to 32, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Cst_Gage.TIME_UNIT	Field width decreased from 20 to 7	No change needed all 2011 domains available in 2013 domain table
S_Cst_Gage.GAGE_TYP	Field width decreased from 40 to 25, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Cst_Tsct_Ln.METHOD	Field width decreased from 20 to 24, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Cst_Tsct_Ln.CSTLN_TYP	Field width decreased from 50 to 40, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Cst_Tsct_Ln.BEACH_SET	Field width decreased from 75 to 63, Domain values updated	Update all values case to match 2013 *Domain Tables Technical Reference*
		SANDY BEACH BACKED BY SHORE PROTECTION STRUCTURES COBBLE, GRAVEL, OR MIXED GRAIN SIZED BEACH AND BERMS' converts to 'Cobble, Gravel, Shingle, or Mixed Grain Sized Beach and Berms'
S_Cst_Tsct_Ln.SHORE_TYP	New field	Populate with pseudo null value when converted
S_Cst_Tsct_Ln.EVENT_TYP	Field width increased from 25 to 37, Domain values updated	Update all values case to match 2013 *Domain Tables Technical Reference*
		1 PERCENT CHANCE FUTURE' converts to '1 Percent Chance Future Conditions'
S_Cst_Tsct_Ln.SIG_PD	Domain removed	This was an error in Appendix L, no affect when converted

Table Field	Change Description	Conversion needs
S_Cst_Tsct_Ln.FTCHLENUNIT	Field width decreased from 20 to 16, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Cst_Tsct_Ln.EROS_METH	Field width decreased from 15 to 12, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Cst_Tsct_Ln.LOC_DESC	Field width increased from 250 to 254	Field increase, no values affected when converted
S_Cst_Tsct_Ln.EVEL_UNIT	Field width decreased from 20 to 16, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Cst_Tsct_Ln.VZONE_EXT	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Cst_Tsct_Ln.LEN_UNIT	Field width increased from 11 to 16, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Cst_Tsct_Ln.TIME_UNIT	Field width decreased from 20 to 7	No change needed all 2011 domains available in 2013 domain table
S_Datum_Conv_Pt.WTR_NM	Field width increased from 26 to 100	Field increase, no values affected when converted
S_Datum_Conv_Pt.LEN_UNIT	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_FIRM_Pan.ST_FIPS	Domain added	No needs, State FIPs values should match domain
S_FIRM_Pan.FIRM_PAN	Added relationships	Relationship with S_Label_Ld and S_Label_Pt added. Relationship with S_Label_Pt already existed, but wasn't documented. Relationship with S_Label_Ld didn't contain FIRM_PAN field in Appendix L and relationship will not exist.
S_FIRM_Pan.PANEL_TYP	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*

Table Field	Change Description	Conversion needs
S_FIRM_Pan.PRE_DATE	New field	Populate with pseudo null value when converted
S_FIRM_Pan.SCALE	Domain added	No needs, common FEMA map scales should match domain
S_FIRM_Pan.BASE_TYP	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Fld_Haz_Ar.STUDY_TYP	Field width decreased from 30 to 28	No change needed all 2011 domains available in 2013 domain table
S_Fld_Haz_Ar.FLD_ZONE & S_Fld_Haz_Ar.ZONE_SUBTY	FLD_ZONE Field width decreased from 55 to 17, ZONE_SUBTY field width decreased from 80 to 57. Zone conversions listed. If not listed, not a valid zone combination. Discuss with quality team and GDS to resolve, possible zone combination may be needed.	FLD_ZONE = 'A' and ZONE_SUBTY = '', no change
		FLD_ZONE = 'A' and ZONE_SUBTY = '1 PCT ANNUAL CHANCE FLOOD HAZARD CONTAINED IN STRUCTURE', no change
		FLD_ZONE = 'A99' and ZONE_SUBTY = '', no change
		FLD_ZONE = 'AE' and ZONE_SUBTY = '', no change
		FLD_ZONE = 'AE' and ZONE_SUBTY = 'ADMINISTRATIVE FLOODWAY', no change

Table Field	Change Description	Conversion needs
		FLD_ZONE = 'AE' and ZONE_SUBTY = 'AREA OF SPECIAL CONSIDERATION', no change
		FLD_ZONE = 'AE' and ZONE_SUBTY = 'COLORADO RIVER FLOODWAY', no change
		FLD_ZONE = 'AE' and ZONE_SUBTY = 'COMMUNITY ENCROACHMENT AREA', no change
		FLD_ZONE = 'AE' and ZONE_SUBTY = 'FLOODWAY', no change
		FLD_ZONE = 'AE' and ZONE_SUBTY = '1 PCT ANNUAL CHANCE FLOOD HAZARD CONTAINED IN STRUCTURE', no change
		FLD_ZONE = '1 PCT ANNUAL CHANCE FLOOD HAZARD CONTAINED IN CHANNEL' converts to 'FLD_ZONE = 'AE' and ZONE_SUBTY = '1 PCT ANNUAL CHANCE FLOOD HAZARD CONTAINED IN CHANNEL'
		FLD_ZONE = 'AE' and ZONE_SUBTY = 'DENSITY FRINGE AREA', no change
		FLD_ZONE = 'AE' and ZONE_SUBTY = 'FLOODWAY CONTAINED IN STRUCTURE', no change
		FLD_ZONE = 'AE' and ZONE_SUBTY = 'FLOWAGE EASEMENT AREA', no change

Table Field	Change Description	Conversion needs
		FLD_ZONE = 'AE' and ZONE_SUBTY = 'NARROW FLOODWAY', no change
S_Fld_Haz_Ar.FLD_ZONE & S_Fld_Haz_Ar.ZONE_SUBTY	FLD_ZONE Field width decreased from 55 to 17, ZONE_SUBTY field width decreased from 80 to 57. Zone conversions listed. If not listed, not a valid zone combination. Discuss with quality team and CDS to resolve, possible zone combination may be needed.	FLD_ZONE = 'AE' and ZONE_SUBTY = 'STATE ENCROACHMENT AREA', no change
		FLD_ZONE = 'AH' and ZONE_SUBTY = '', no change
		FLD_ZONE = 'AO' and ZONE_SUBTY = '', no change
		FLD_ZONE = 'AO' and ZONE_SUBTY =' FLOODWAY', no change
		FLD_ZONE = 'AR' and ZONE_SUBTY = 'AREA WITH REDUCED FLOOD RISK DUE TO LEVEE', no change
		FLD_ZONE = 'AREA NOT INCLUDED' and ZONE_SUBTY = '', no change
		FLD_ZONE = 'D' and ZONE_SUBTY = '', no change
		FLD_ZONE = 'OPEN WATER' and ZONE_SUBTY = '', no change
		FLD_ZONE = 'V' and 'ZONE_SUBTYP' = '', no change
		FLD_ZONE = 'V' and 'ZONE_SUBTYP' = 'RIVERINE FLOODWAY SHOWN IN COASTAL ZONE', no change

Table Field	Change Description	Conversion needs
		FLD_ZONE = 'VE' and ZONE_SUBTY = '', no change
		FLD_ZONE = 'VE' and ZONE_SUBTY = 'RIVERINE FLOODWAY SHOWN IN COASTAL ZONE', no change
		FLD_ZONE = '0.2 PCT ANNUAL CHANCE FLOOD HAZARD' converts to FLD_ZONE = 'X' and ZONE_SUBTY = '0.2 PCT ANNUAL CHANCE FLOOD HAZARD'
		FLD_ZONE = 'X AREA OF SPECIAL CONSIDERATION' converts to FLD_ZONE = 'X' and ZONE_SUBTY = 'AREA OF SPECIAL CONSIDERATION'
		FLD_ZONE = '0.2 PCT ANNUAL CHANCE FLOOD HAZARD CONTAINED IN CHANNEL' converts to FLD_ZONE = 'X' and ZONE_SUBTY = '0.2 PCT ANNUAL CHANCE FLOOD HAZARD CONTAINED IN CHANNEL'
S_Fld_Haz_Ar.FLD_ZONE & S_Fld_Haz_Ar.ZONE_SUBTY	FLD_ZONE Field width decreased from 55 to 17, ZONE_SUBTY field width decreased from 80 to 57. Zone conversions listed. If not listed, not a valid zone combination. Discuss with quality team and CDS to resolve, possible zone combination may be needed.	FLD_ZONE = '0.2 PCT ANNUAL CHANCE FLOOD HAZARD' and ZONE_SUBTY = '0.2 PCT ANNUAL CHANCE FLOOD HAZARD CONTAINED IN STRUCTURE' converts to FLD_ZONE = 'X' and ZONE_SUBTY = '0.2 PCT ANNUAL CHANCE FLOOD HAZARD CONTAINED IN STRUCTURE'

Table Field	Change Description	Conversion needs
		FLD_ZONE = 'X' or FLD_ZONE = 'X' and ZONE_SUBTY = 'AREAS DETERMINED TO BE OUTSIDE THE 0.2 PCT ANNUAL CHANCE FLOODPLAIN' converts to FLD_ZONE = 'X' and ZONE_SUBTY = 'AREA OF MINIMAL FLOOD HAZARD'
		FLD_ZONE = 'X' and ZONE_SUBTY = 'AREA WITH REDUCED FLOOD RISK DUE TO LEVEE', no change
		FLD_ZONE = 'X' and ZONE_SUBTY = '1 PCT DEPTH LESS THAN 1 FOOT', no change
		FLD_ZONE = 'X' and ZONE_SUBTY = '1 PCT DRAINAGE AREA LESS THAN 1 SQUARE MILE', no change
		FLD_ZONE = 'X' and ZONE_SUBTY = '1 PCT FUTURE CONDITIONS CONTAINED IN STRUCTURE', no change
S_Fld_Haz_Ar.LEN_UNIT	Field width increased from 11 to 16, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Fld_Haz_Ar.VEL_UNIT	Field width increased from 17 to 20, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Fld_Haz_Ar.AR_REVERT	New field populated based on S_Zone_AR	Populate with FLD_ZONE value of AR for polygons that match polygons within S_Zone_AR. S_Zone_AR may need to be intersected with S_Fld_Haz_Ar. This intersect applies to fields AR_SUBTRV, and BFE_REVERT as well.

Table Field	Change Description	Conversion needs
S_Fld_Haz_Ar.AR_SUBTRV	New field populated based on S_Zone_AR	Populate with ZONE_SUBTY value of AREA WITH REDUCED FLOOD RISK DUE TO LEVEE for polygons that match polygons within S_Zone_AR.
S_Fld_Haz_Ar.BFE_REVERT	Moved from S_Zone_AR.AR_BFE	Populate with S_Zone_AR.AR_BFE value for polygons that match polygons within S_Zone_Ar.
S_Fld_Haz_Ar.DEP_REVERT	New field	Populate with pseudo null value when converted
S_Fld_Haz_Ar.DUAL_ZONE	New field	Populate with pseudo null value when converted
S_Fld_Haz_Ln.LN_TYP	Field width decreased from 45 to 26, Domain values updated	Update case to match 2013 Domain Tables Technical Reference
		'LIMIT OF DETAILED STUDY / LIMIT OF STUDY' converts to 'Limit Lines'
S_Gage.GAGE_TYP	Field width decreased from 30 to 25, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Gage.AREA_UNIT	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Gen_Struct.STRUCT_TYP	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Gen_Struct.CST_STRUCT	Field width decreased from 40 to 29, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_HWM.LEN_UNIT	Field width increased from 11 to 16, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Label_Ld.LEADER_ID	Field width increased from 11 to 25	Field increase, no values affected when converted

Table Field	Change Description	Conversion needs
S_Label_Ld.LABEL_TYP	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Label_Ld.FIRM_PAN	New field	Populate with pseudo null value when converted
S_Label_Ld.SCALE	New field	Populate with pseudo null value when converted
S_Label_Pt.LABEL_TYP	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Label_Pt.FONT_TYPE	Field width increased from 22 to 27, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Label_Pt.FONT_STYLE	New field	Populate with pseudo null value when converted
S_Label_Pt.FIRM_PAN	New Relationship	Relationship with S_Label_Pt already existed, but wasn't documented.
S_Label_Pt.SCALE	New Domain	No needs, common FEMA map scales should match domain
S_Levee.LEVEE_TYP	Field width decreased from 25 to24, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Levee.DISTRICT	Field width decreased from 15 to 13, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Levee.CONST_DATE	Length changed from 8 to default	No change, was an error in Appendix L, default date field should be used for both schemas
S_Levee.PROT_1PCT	Field removed	Field dropped for NFHL
S_Levee.DGN_FREQ	Changed from Required for all records to Required if applicable to spatial feature	Pseudo null value should change from -8888 to -9999 if used

Table Field	Change Description	Conversion needs
S_Levee.FREEBOARD	Changed from Required for all records to Required if applicable to spatial feature	Pseudo null value should change from -8888 to -9999 if used
S_Levee.LEVEE_STAT	Field width decreased from 25 to24, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Levee.LEN_UNIT	Field width increased from 22 to 27, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_LOMR.DFIRM_ID	Field width decreased from 15 to 6	No needs, DFIRM_ID values should follow 6 digit format described in Appendix L. No values should be truncated
S_LOMR.LOMR_ID	Field width increased from 11 to 25	Field increase, no values affected when converted
S_Nodes.NODE_TYP	Field width decreased from 20 to 16, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Pol_Ar.CID	Relationship added	Relationship listed is an error, should relate to S_Pol_Ar
S_Profil_Basln.WATER_TYP	Field width decreased from 40 to 38, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Profil_Basln.STUDY_TYP	Field width decreased from 30 to 28	No change needed all 2011 domains available in 2013 domain table
S_Profil_Basln.INTER_ZONE	Field removed	Field dropped for NFHL
S_Profil_Basln.DATUM_UNIT	Field width increased from 11 to 16, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Stn_Start.LOC_ACC	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Subbasins.AREA_UNIT	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*

Table Field	Change Description	Conversion needs
S_Subbasins.BASIN_TYP	New field	Populate with pseudo null value when converted
S_Submittal_Info.CASE_NO	Field width increased from 12 to 13	Field increase, no values affected when converted
S_Submittal_Info.STUDY_TYP	Field width decreased from 100 to 28	No change needed all 2011 domains available in 2013 domain table
S_Submittal_Info.TASK_TYP	Field width decreased from 25 to 21, Domain values updated	'DFIRM DATABASE' converts to 'FIRM DATABASE'
		'HYDROLOGIC', 'SURVEY' and 'TERRAIN' convert over as is but no domain exists for these in 2013 NFHL
S_Submittal_Info.HYDRO_MDL	Field width decreased from 100 to 40, domain added	no previous domain, values may be truncated, may fall outside of NFHL domain
S_Submittal_Info.HYDRA_MDL	Field width increased from 40 to 83, domain added	no previous domain, no values should be truncated, may fall outside of NFHL domain
S_Topo_Confindence	New Table	No needs, S_Topo_Confidence should remain empty for studies submitted in the 2011 schema
S_Trnsport_Ln.MTFCC	Field width increased from 25 to 70, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Trnsport_Ln.ROUTE_TYP	Field width increased from 11 to 14, Domain name changed, Domain values updated	'INTERSTATE' converts to 'Interstates'
		'US' converts to 'US Highways'
		'STATE' converts to 'State Highways'
		'COUNTY' converts to 'County Roads'
		'LOCAL' converts to 'Local Roads'

Table Field	Change Description	Conversion needs
S_Tsct_Basln.TBASE_TYP	Field width decreased from 50 to 43, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_Wtr_Ar.WATER_TYP	Field removed	Field dropped for NFHL
S_Wtr_Ar.SHOWN_FIRM	New field	Populate with pseudo null value when converted
S_Wtr_Ar.SHOWN_INDX	New field	Populate with pseudo null value when converted
S_Wtr_Ln.WATER_TYP	Field removed	Field dropped for NFHL
S_Wtr_Ln.SHOWN_FIRM	New field	Populate with pseudo null value when converted
S_Wtr_Ln.SHOWN_INDX	New field	Populate with pseudo null value when converted
S_XS.LEN_UNIT	Field width increased from 11 to 16, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
S_XS.SEQ	Field moved from L_XS_Elev.SEQ	Populate with value from L_XS_Elev.SEQ field for related records, otherwise populate with pseudo null value
S_Zone_Ar	Table removed	Spatial features should be intersected and attributed within S_Fld_Haz_Ar
Study_Info.STUDY_PRE	Field width decreased from 20 to 19, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
Study_Info.JURIS_TYP	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
Study_Info.H_DATUM	Field width increased from 10 to 30, Domain values updated	'NAD83 HARN' converts to '83HARN'
Study_Info.PROJECTION	Field width decreased from 128 to 75	No change needed all 2011 domains available in 2013 domain table

Table Field	Change Description	Conversion needs
Study_Info.PROJ_ZONE	Field width increased from 4 to 5, domain added	Field increase, no values affected when converted. Projection Zone values should match domain
Study_Info.PROJ_UNIT	Field width decreased from 25 to , Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
		'FEET' converts to 'US Survey Feet'
Study_Info.PROJ_SUNIT	Field width decreased from 25 to 18, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
		'FEET' converts to 'US Survey Feet'
Study_Info.PROJ_SZONE	New Field	Populate with pseudo null value when converted
Study_Info.FIS_NM	Field width increased from 14 to 15	Field increase, no values affected when converted
Study_Info.AVG_CFACTR	New Field	Populate with pseudo null value when converted
L_Comm_Info.COM_NFO_ID	Relationships added	Relationship with L_Meetings and L_Pol_FHBM added
L_Comm_Info.REPOS_ST	Field width decreased from 50 to 24	No change needed all 2011 domains available in 2013 domain table
L_Cst_Model.STUDY_TYP	Field width decreased from 100 to 28	No change needed all 2011 domains available in 2013 domain table
L_Cst_Model.SURGE_MDL	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
L_Cst_Model.RUNUP_MDL	Domain values removed	'TAW METHOD' & 'SPM (USACE 1984)' converts to 'OTHER'
L_Cst_Model.EROS_METH	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*

Table Field	Change Description	Conversion needs
L_Cst_Struct.CERT_STAT	Field width decreased from 50 to 44	Update case to match 2013 *Domain Tables Technical Reference*
L_Cst_Struct.LEN_UNIT	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
L_Cst_Struct.STRUCT_MTL	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
L_Cst_Tsct_Elev.EVENT_TYP	Field width increased from 25 to 37, Domain values updated	Update all values case to match 2013 *Domain Tables Technical Reference*
		1 PERCENT CHANCE FUTURE' converts to '1 Percent Chance Future Conditions'
L_Meetings.COM_NFO_ID	Field width increased from 11 to 25	Field increase, no values affected when converted
L_Meetings.MTG_TYP	Field width decreased from 100 to 17, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
		'OTHER OUTREACH' converts to 'Other'
L_MT2_LOMR.STATUS	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
L_Mtg_POC.POC_ID	Field name changed from MTG_POC_ID to POC_ID	PTS Contractor will need to load MTC_POC_ID field into POC_ID field
L_Mtg_POC.POC_NAME	Field name changed from NAME to POC_NAME	PTS Contractor will need to load NAME field into POC_NAME field
L_Mtg_POC.FIRST_NAME	New Field	Populate with pseudo null value when converted
L_Mtg_POC.LAST_NAME	New Field	Populate with pseudo null value when converted
L_Mtg_POC.CEO	New Field	Populate with pseudo null value when converted

Table Field	Change Description	Conversion needs
L_Mtg_POC.FPA	New Field	Populate with pseudo null value when converted
L_Mtg_POC.SHMO	New Field	Populate with pseudo null value when converted
L_Mtg_POC.GIS	New Field	Populate with pseudo null value when converted
L_Mtg_POC.ADDRESS	Field width decreased from 100 to 75	If values from ADDRESS field are truncated, truncated portion should be populated within ADDRESS_2 field.
L_Mtg_POC.ADDRESS_2	New Field	If values from ADDRESS field are truncated, truncated portion should be populated within ADDRESS_2 field, if not populate with pseudo null value when converted
L_Mtg_POC.COMMENTS	New Field	Populate with pseudo null value when converted
L_Pol_FHBM.COM_NFO_ID	Field width increased from 6 to 25, relationship changed.	Relationship listed is an error, should relate to S_Pol_Ar
L_Profil_Bkwtr_El.EVENT_TYP	Field width increased from 25 to 37, Domain values updated	Update all values case to match 2013 *Domain Tables Technical Reference*
		1 PERCENT CHANCE FUTURE' converts to '1 Percent Chance Future Conditions'
L_Profil_Bkwtr_El.LEN_UNIT	Field width increased from 11 to 16, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
L_Profil_Label.ORIENT	Field width decreased from 10 to 6, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
L_Profil_Label.ADJUSTED	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*

Table Field	Change Description	Conversion needs
L_Profil_Label.LEN_UNIT	Field width increased from 11 to 16, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
L_Profil_Panel	New Table	No needs, L_Profil_Panel should remain empty for studies submitted in the 2011 schema
L_Source_Cit.SOURCE_CIT	Exemption to relationship added	Relates to all tables except S_Label_Ld and S_Label_Pt
L_Source_Cit.SCR_DATE	New Field	Populate with pseudo null value when converted
L_Source_Cit.DATE_REF	New Field	Populate with pseudo null value when converted
L_Source_Cit.CONTRIB	New Field	Populate with pseudo null value when converted
L_Source_Cit.NOTES	New Field	Populate with pseudo null value when converted
L_Summary_Discharges.AREA_UNIT	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
L_Summary_Discharges.EVENT_TYP	Field width increased from 25 to 37, Domain values updated	Update all values case to match 2013 *Domain Tables Technical Reference*
L_Summary_Discharges.EVENT_TYP	Field width increased from 25 to 37, Domain values updated	1 PERCENT CHANCE FUTURE' converts to '1 Percent Chance Future Conditions'
L_Summary_Discharges.DISCH_UNIT	Field width decreased from 20 to 3	No change needed all 2011 domains available in 2013 domain table
L_Summary_Discharges.WSEL_UNIT	Field width increased from 11 to 16, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
L_Summary_Elevations.EVENT_TYP	Field width increased from 25 to 37, Domain values updated	Update all values case to match 2013 *Domain Tables Technical Reference*

Table Field	Change Description	Conversion needs
		1 PERCENT CHANCE FUTURE' converts to '1 Percent Chance Future Conditions'
L_Summary_Elevationss.WSEL_UNIT	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
L_Summary_Elevations.SHOWN_FIS	New Field	Populate with pseudo null value when converted
L_Survey_Pt	New Table	No needs, L_Survey_Pt should remain empty for studies submitted in the 2011 schema
L_XS_Elev.FW_WIDTHIN	New Field	Populate with pseudo null value when converted
L_XS_Elev.AREA_UNIT	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
L_XS_Elev.VEL_UNIT	Field width increased from 17 to 20, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
L_XS_Elev.EVENT_TYP	Field width increased from 25 to 31, Domain values updated	Update all values case to match 2013 *Domain Tables Technical Reference*
		1 PERCENT CHANCE FUTURE' converts to '1 Percent Chance Future Conditions'
L_XS_Elev.LEN_UNIT	Field width increased from 11 to 16, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
L_XS_Elev.LVSCENARIO	Domain values updated, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
L_XS_Elev.FREEBRD_LL	Changed from Required for all records to Required if applicable to spatial feature	Pseudo null value should change from -8888 to -9999 if used
L_XS_Elev.FREEBRD_RL	Changed from Required for all records to Required if applicable to spatial feature	Pseudo null value should change from -8888 to -9999 if used

Table Field	Change Description	Conversion needs
L_XS_Elev.SEQ	Field moved from L_XS_Elev.SEQ	Populate S_XS.SEQ with value from L_XS_Elev.SEQ field for related records.
L_XS_Struct.STRUCT_FACE	Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*
L_XS_Struct.LEN_UNIT	Field width increased from 11 to 16, Domain values updated	Update case to match 2013 *Domain Tables Technical Reference*

16.0 Attachment C: Quality Control

Table 6: QC Checklist

Check Source	Submission Type	Check Type	Checked Layers	Severity	Example Error Message	Notes
NFHL QC	All	Data Integrity	All	High	Invalid DFIRM ID Value	Six-digit DFIRM ID value must be present for all records
NFHL QC	All	Data Integrity	All	High	Feature's DFIRM ID does not match a Study_Info record	DFIRM ID for all records must match a DFIRM ID in the Study_Info table
NFHL QC	All	Data Integrity	All	High	Study_Info record does not match any features in data	Each record in Study_Info table must have corresponding data in other tables
NFHL QC	All	Data Integrity	Dataset	High	Missing required layer	Each dataset submitted should contain all required layers
NFHL QC	All	Tracking	All	High	DFIRM ID not included in manifest	The DFIRM ID from each record must match a record in the submission manifest
NFHL QC	All	Tracking	All	High	DFIRM ID in manifest is not present in data	Each DFIRM ID record in the submission manifest should have corresponding data in the database
NFHL QC	LOMR	Tracking	S_LOMR	High	LOMR Case Number not found in database S_LOMR CASE_NO field	Each Case Number record in the submission manifest should have accompanying data in the FIRM database S_LOMR CASE_NO field
NFHL QC	LOMR	LOMR	S_LOMR	High	Missing current NFHL LOMR	LOMR submissions should contain all LOMRs present in the NFHL
NFHL QC	All	Attribute	Study_Info	Medium	Duplicate Study Info record	There should only be one Study Info record for each DFIRM ID
NFHL QC	All	Attribute	S_FIRM_Pan	Medium	Invalid Firm Panel effective date	All Firm Panel effective dates should be valid and non-null (including 8/8/8888 and 9/9/9999)

Check Source	Submission Type	Check Type	Checked Layers	Severity	Example Error Message	Notes
NFHL QC	LOMR	LOMR	S_LOMR	Low	LOMR effective date is earlier than Panel effective date	Only effective LOMRs should be submitted to the NFHL, so all LOMR effective dates should be higher than the effective dates of the panels they fall on
NFHL QC	LOMR	Attribute	S_LOMR	Low	LOMR record not attributed as Effective	All LOMR records should be attributed as Effective. Other LOMR types should not be included in NFHL submissions.
NFHL QC	LOMR	Attribute	S_LOMR	Medium	Invalid LOMR case number	LOMR case numbers should be properly formatted, i.e. XX-XX-XXXXY
NFHL QC	LOMR	Attribute	S_LOMR	Medium	Invalid LOMR effective date	LOMR effective dates should be non-null and properly formatted
NFHL QC	All	Spatial	S_Fld_Haz_Ar	High	Overlapping Flood Zones (conflicting)	Polygons in S_Fld_Haz_Ar should not overlap (this error message triggers when the two polygons have conflicting flood zone values)
NFHL QC	All	Spatial	S_Fld_Haz_Ar	Medium	Overlapping Flood Zones (similar)	Polygons in S_Fld_Haz_Ar should not overlap (this error message triggers when the two polygons have the same flood zone values)
NFHL QC	All	Attribute	S_Fld_Haz_Ar	High	Invalid FLD_ZONE value	FLD_ZONE values should conform to the domain specified in the *FIRM Database Technical Reference*
NFHL QC	All	Attribute	S_Fld_Haz_Ar	High	Invalid ZONE_SUBTY value	ZONE_SUBTY values should conform to the domain specified in the *FIRM Database Technical Reference*
NFHL QC	All	Attribute	S_Fld_Haz_Ln	High	Invalid LN_TYP value	LN_TYP values should conform to the domain specified in the *FIRM Database Technical Reference*

Check Source	Submission Type	Check Type	Checked Layers	Severity	Example Error Message	Notes
DVT 2.8.2.1	All	Attribute	S_Fld_Haz_Ar	High	DVT 2.8.2.1: The AR_REVERT field must be populated when the FLD_ZONE = AR.	The AR_REVERT field must be populated when the FLD_ZONE field is populated with AR
DVT 2.8.2.2	All	Attribute	S_Fld_Haz_Ar	High	DVT 2.8.2.2: FLD_ZONE is SFHA zone type but SFHA_TF does not equal T	Flood zones A, AE, AH, AO, AR, V or VE must be designated as a Special Flood Hazard Area
DVT 2.8.2.4	All	Attribute	S_Fld_Haz_Ar	High	DVT 2.8.2.4: FLD_ZONE is not SFHA zone type but SFHA_TF does not equal F	All X and D flood zones cannot be designated as a Special Flood Hazard Area
DVT 2.8.2.5	All	Attribute	S_Fld_Haz_Ar	Medium	DVT 2.8.2.5: STATIC_BFE must not be populated when FLD_ZONE = AO	An AO flood zone cannot have a STATIC_BFE value
DVT 2.8.2.6	All	Attribute	S_Fld_Haz_Ar	Medium	DVT 2.8.2.6: DEPTH should only be populated where FLD_ZONE = AO	Only AO zones have depth values
DVT 2.8.2.9 (1)	All	Attribute	S_Fld_Haz_Ar	Medium	DVT 2.8.2.9: VEL_UNITS is required when VELOCITY > 0	The VEL_UNITS field should only be populated when the VELOCITY is populated with a value greater than zero
DVT 2.8.2.9 (2)	All	Attribute	S_Fld_Haz_Ar	Medium	DVT 2.8.2.9: VEL_UNITS should not be populated when there is no VELOCITY value	The VEL_UNITS field should only be populated when the VELOCITY is populated with a value greater than zero
DVT 2.8.2.10	All	Attribute	S_Fld_Haz_Ar	Medium	DVT 2.8.2.10: STATIC_BFE and DEPTH cannot both be populated	If the STATIC_BFE field is populated, then the DEPTH field should not be populated and vice versa

Check Source	Submission Type	Check Type	Checked Layers	Severity	Example Error Message	Notes
DVT 2.8.2.11	All	Attribute	S_Fld_Haz_Ar	Medium	DVT 2.8.2.11:The V_DATUM field should be populated if STATIC_BFE is populated	The V_DATUM field of the S_Fld_Haz_Ar table should be populated if STATIC_BFE field is populated
DVT 2.8.2.12 (1)	All	Attribute	S_Fld_Haz_Ar	Medium	DVT 2.8.2.12: LEN_UNIT should be populated if STATIC_BFE or DEPTH fields are populated	The LEN_UNIT field of the S_Fld_Haz_Ar table must only be populated if the STATIC_BFE or DEPTH field is populated
DVT 2.8.2.12 (2)	All	Attribute	S_Fld_Haz_Ar	Medium	DVT 2.8.2.12: LEN_UNIT should not be populated unless STATIC_BFE or DEPTH fields are populated	The LEN_UNIT field of the S_Fld_Haz_Ar table must only be populated if the STATIC_BFE or DEPTH field is populated
DVT 2.9.1.4	All	Attribute	Study_Info, S_XS	Medium	V_DATUM value in S_XS does not match V_DATUM value in Study_Info	S_XS V_DATUM field should equal the V_DATUM field in the STUDY_INFO table.
DVT 2.9.1.5	All	Attribute	Study_Info, S_BFE	Medium	V_DATUM value in S_BFE does not match V_DATUM value in Study_Info	S_BFE V_DATUM field should equal the V_DATUM field in the Study_Info table.
DVT 2.8.2.14	All	Attribute	S_Fld_Haz_Ar	High	Invalid FLD_ZONE / ZONE_SUBTY Combination	FLD_ZONE and ZONE_SUBTY based on *FIRM Database Technical Reference* Table 7
DVT 2.8.2.18	All	Attribute	S_Fld_Haz_Ar	Medium	Invalid AR_SUBTRV value	The AR_SUBTRV field must be populated when the FLD_ZONE field is populated with AR and with subtypes for Zones AE, AO, AH, A, or X based on *FIRM Technical Reference* Table 7

Check Source	Submission Type	Check Type	Checked Layers	Severity	Example Error Message	Notes
DVT 2.8.2.19	All	Attribute	S_Fld_Haz_Ar	Medium	DVT 2.8.2.19: The BFE_REVERT field must be populated when FLD_ZONE = AR and STATIC_BFE is not null	The BFE_REVERT field must be populated when the FLD_ZONE field is populated with AR and with a static BFE value.
DVT 2.8.2.20	All	Attribute	S_Fld_Haz_Ar	Medium	DVT 2.8.2.20: The DEP_REVERT field must be populated when FLD_ZONE = AR and DEPTH is not null	The DEP_REVERT field must be populated when the FLD_ZONE field is populated with AR and with a depth value.
NFHL QC	All	Attribute	S_Fld_Haz_Ar	Medium	BFE_REVERT should be null or -9999 unless FLD_ZONE = AR	BFE_REVERT should be populated with -9999 unless FLD_ZONE = AR
NFHL QC	All	Attribute	S_Fld_Haz_Ar	Medium	DEP_REVERT should be null or -9999 unless FLD_ZONE = AR	DEP_REVERT should be populated with -9999 unless FLD_ZONE = AR

17.0 Attachment D: Schema Requirement Information

Table 7: 2003, 2011 and 2013 Schema Requirements

Table	2003	2011	2013
L_Comm_Info	Required	Required	Required
L_Comm_Revis	NA	Required	Required
L_Meetings	NA	NA	Required
L_Mtg_POC	NA	Required	Required
L_Source_Cit	NA	Required	Required
S_FIRM_Pan	Required	Required	Required
S_Fld_Haz_Ar	Required	Required	Required
S_Fld_Haz_Ln	Required	Required	Required
S_Label_Ld	Required	Required	Required
S_Label_Pt	Required	NA	Required
S_Pol_Ar	Required	Required	Required
S_Pol_Ln	Required	NA	NA
S_Quad_Index	Required	NA	NA
S_Subbasins	NA	Required when Applicable	Required when Applicable
S_Submittal_Info	NA	Required	Required
Study_Info	Required	Required	Required

18.0 Attachment E: FIRM Database Submittal Info

Table 8: FIRM Database Submittal Table

Table Name	Discovery	Acquire Base Map	Develop Topographic Data	Perform Field Survey	Perform Hydrologic Analyses	Perform Hydraulic Analyses	Perform Coastal Analyses	Perform Alluvial Fan Analysis	Perform Floodplain Mapping	Develop DFIRM Database	FIS Database Component	DCS Database Component	LOMR Component
DCS_L_Mtg_POC	R											☐	
DCS_L_Source_Cit	R											☐	
DCS_S_Discovery_Map	R											☐	
DCS_S_HUC	R											☐	
DCS_S_Pol_Ar	R											☐	
DCS_S_Prp_FIRMPan	A											☐	
DCS_S_Trnsport_Ln	R											☐	
S_Alluvial_Fan								R	A	A	A	☐	A
S_Base_Index		A								A		☐	
S_BFE						A			A	A		☐	A
S_CBRS							A		A	A	A	☐	A
S_Cst_Gage							A		A	A	A	☐	A
S_Cst_Tsct_Ln							R		A	A	A	☐	A
S_Datum_Conv_Pt		A								A	A	☐	
S_FIRM_Pan		R								R	R	☐	
S_Fld_Haz_Ar						R	R		R	R	R	☐	R[5]
S_Fld_Haz_Ln										R	R	☐	R[6]
S_Gage					A					A	A	☐	A
S_Gen_Struct		A				A	A	A	A	A	A	☐	A
S_HWM						A	A			A	A	☐	A
S_Hydro_Reach					R					A		☐	A
S_Label_Ld										R			
S_Label_Pt										R			
S_Levee						A	A		A	A	A	☐	A
S_LiMWA							R		A	A	A	☐	A
S_LOMR	NFHL Only												R

Table Name	Discovery	Acquire Base Map	Develop Topographic Data	Perform Field Survey	Perform Hydrologic Analyses	Perform Hydraulic Analyses	Perform Coastal Analyses	Perform Alluvial Fan Analysis	Perform Floodplain Mapping	Develop DFIRM Database	FIS Database Component	DCS Database Component	LOMR Component
S_Nodes					R					A	A	☐	A
S_PFD_Ln							A		A	A		☐	A
S_PLSS_AR		A								A		☐	
S_Pol_Ar		R								R	R	☐	A
S_Profil_Basln						R		R	A	A	A	☐	A
S_Riv_Mrk						A			A	A	A	☐	A
S_Stn_Start						A		R	A	A	A	☐	A
S_Subbasins					R				A	R[1]	A[1]	☐	A
S_Submittal_Info		R	R	R	R	R	R	R	R	R	R	☐	R[7]
S_Topo_Confidence		A										☐	
S_Trnsport_Ln		A								A		☐	A
S_Tsct_Basln							R		A	A	A	☐	A
S_Wtr_Ar		A								A		☐	A
S_Wtr_Ln		A[2]								A		☐	A
S_XS						A		R	A	A	A	☐	A
Study_Info										R	R		R[8]
L_Comm_Info										R	R		A
L_Comm_Revis										R	R		
L_Cst_Model							R		A	A	A	☐	A
L_Cst_Struct							A		A	A	A	☐	A
L_Cst_Tsct_Elev							R		A	A	A	☐	A
L_ManningsN						A				A	A	☐	A
L_Meetings										R	A	☐	A
L_MT2_LOMR										A	A		
L_Mtg_POC										R	A	☐	A
L_Pan_Revis										A	A		
L_Pol_FHBM										A	A		
L_Profil_Bkwtr_El						A			A	A	A	☐	A
L_Profil_Label						A			A	A	A	☐	A

Table Name	Discovery	Acquire Base Map	Develop Topographic Data	Perform Field Survey	Perform Hydrologic Analyses	Perform Hydraulic Analyses	Perform Coastal Analyses	Perform Alluvial Fan Analysis	Perform Floodplain Mapping	Develop DFIRM Database	FIS Database Component	DCS Database Component	LOMR Component
L_Profil_Panel						A			A	A	A	☐	A
L_Source_Cit		R	R	R	R	R	R	R	R	R	R	☐	R
L_Summary_Discharges					R				A	A	A	☐	A
L_Summary_Elevations					A		A[4]			A	A	☐	A
L_Survey_Pt				R								☐	A
L_XS_Elev						A[3]		R	A	A	A	☐	A
L_XS_Struct						A		A	A	A	A	☐	A

[1] Hydrologic Unit Code (HUC) 8 Boundaries used for Index Map and FIS Table preparation must be added to Hydrology subbasins if new hydrologic analyses are performed.

[2] S_WTR_LN is not needed if FIRM is ortho-based or all streams on the FIRMs have profile baselines.

[3] L_XS_Elev is required for all High/ Medium Risk studies and any new Low Risk studies where cross-sections are used, but not for historic low risk studies such as Zone A areas with no model backup.

[4] Coastal stillwater elevations are stored in L_Cst_Tsct_Elev unless there are no corresponding coastal transects in S_Cst_Tsct_Ln. Those non-transect based coastal stillwater elevations are placed in L_Summary_Elevations instead.

[5] Required even if the LOMR removes all SFHA, in order to capture the LOMR source boundary coded as an “OTHER BOUNDARY” and the SOURCE_CIT entry for linking to L_Source_Cit.

[6] Required even if the LOMR removes all SFHA, in order to capture the Zone and Zone Subtype in the S_Fld_Haz_Ar feature class and the SOURCE_CIT entry for linking to L_Source_Cit.

[7] Required even if the LOMR removes all SFHA, in order to capture the LOMR submittal information, such as model types and other background engineering information.

[8] Update of DBREV_DT required for LOMR incorporations into the NFHL.

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