

Stochastic Empirical Loading and Dilution Model (SELDM) Version 1.0.0—Appendix 3. Selected Relational Diagrams Showing the Structure of the Database

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U.S. Geological Survey

U.S. Department of the Interior
KEN SALAZAR, Secretary

U.S. Geological Survey
Suzette M. Kimball, Acting Director

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Explanation

These database diagrams show selected tables necessary for defining a SELDM runoff-quality analysis; changes in the design, table names, relationships, and field names will cause errors in the model code.

Key-symbol definitions







-  Primary key: One or more key values that uniquely define a set of values that compose one data entry
-  Parent key: A key value that can be used to uniquely define one or more data entries in another (child) table
-  Foreign key (child): One or more key values that are defined by a unique data entry in another (parent) table

Table-symbol definitions

Table name
 Key
Data values

Independent table: A data table that has no foreign key fields in the primary key; the key values define each data entry; table names are above the first dividing line; key values are above the second dividing line




Table name
 Key 1  Key 2
Data values

Dependent table: A data table that has one or more foreign key fields in the primary key; the combination of key values define each data entry; table names are above the first dividing line; key values are above the second dividing line

Table-name prefix definitions





- tbl** Basic data table
- tds** Static domain table: Provides detailed data values to other tables by using the primary key as an index value; all values in the table are preset in the design
- tdx** User-extendable domain table: Provides detailed data values to other tables by using the primary key as an index value; values in the table may be entered by the user
- tas** Simple association table: Provides a link defining a relationship between data entries in different tables; each data entry is defined by a combination of primary key values from other tables
- tad** Association table with data: Provides a link defining a relationship between data entries in different tables; each data entry is defined by a combination of primary key values from other tables; each data entry also includes data that are associated with the combination of key values

Table-color definitions

-  Highway analysis table: The highway analysis table contains the primary data, or links to the primary data that are used to run the SELDM model; the highway analysis table is shown with a different color than the other graphical user interface (GUI) input tables to show how the different data tables support the definition of each analysis; most data entries in this table are defined by the SELDM user with the GUI; data entries in this table also can be made by knowledgeable Microsoft Access¹ database users with the Microsoft Access software database tools
-  GUI input table: The data entries in these tables are defined by the SELDM user with the GUI; these tables contain the primary data, or links to the primary data that are used to run each SELDM analysis; data entries in this table also can be made by knowledgeable Microsoft Access database users with the Microsoft Access software database tools
-  Database input table: The data entries in these tables are defined by using the Microsoft Access software database tools; these tables contain the primary data, or links to the primary data that are used to run the SELDM model; because the values in these tables are preloaded, it is not necessary to modify data in these tables for most SELDM applications; data entries in this table must be made by knowledgeable Microsoft Access database users with the Microsoft Access software database tools because there is no GUI for populating these tables

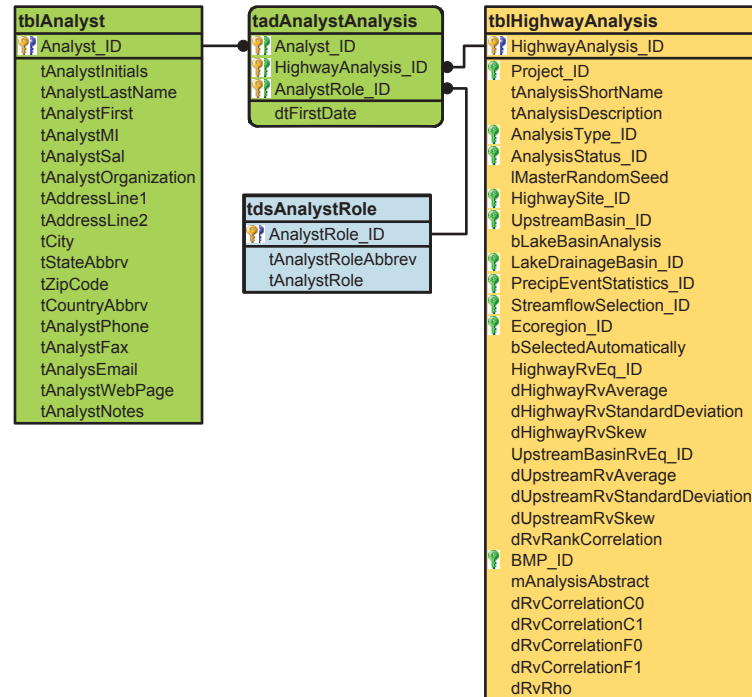
Database-relationship definitions

[The parent end of the relationship is on the left and the child end is on the right; one value of the parent key may define one or more values in the child table]

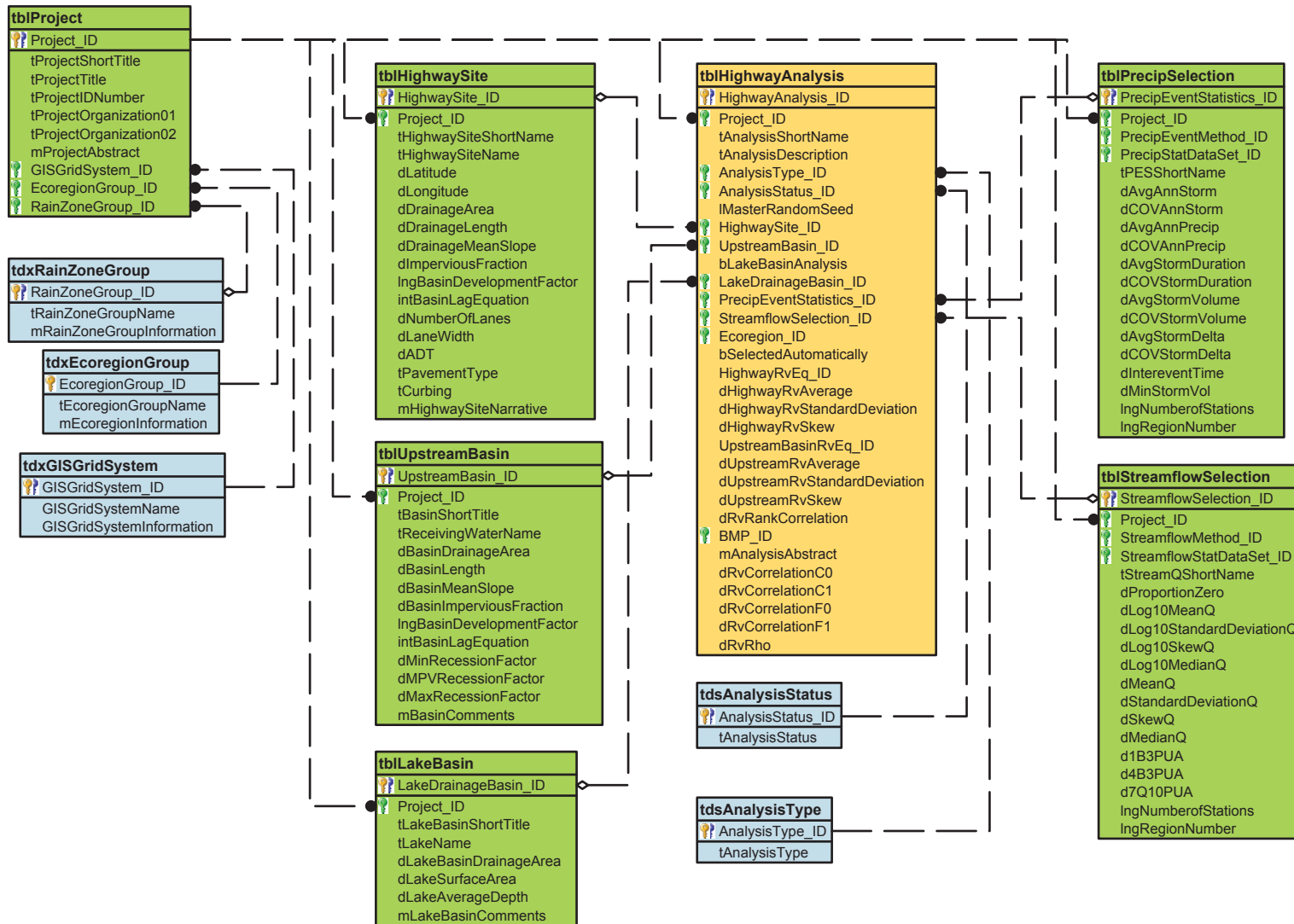
-  Strong relationship: Defines part of the primary key in the child table
-  Weak relationship (mandatory): Provides data by using a non-primary key in the child table; a key-field value is mandatory when a data entry is created
-  Weak relationship: Provides data by using a non-primary key in the child table; a key-field value is not mandatory when a data entry is created, but is defined later in the analysis-specification process
-  Virtual relationship: A weak relationship that provides data by using more than one non-primary key in the child table; the virtual relationship is not specified in the database design, but is implemented by the SELDM program code; virtual relationships are needed in the model because Microsoft Access does not fully support relationships from a single key in a parent table to multiple key fields in a child table

1. Microsoft Access® is a registered trademark of the Microsoft Corporation.

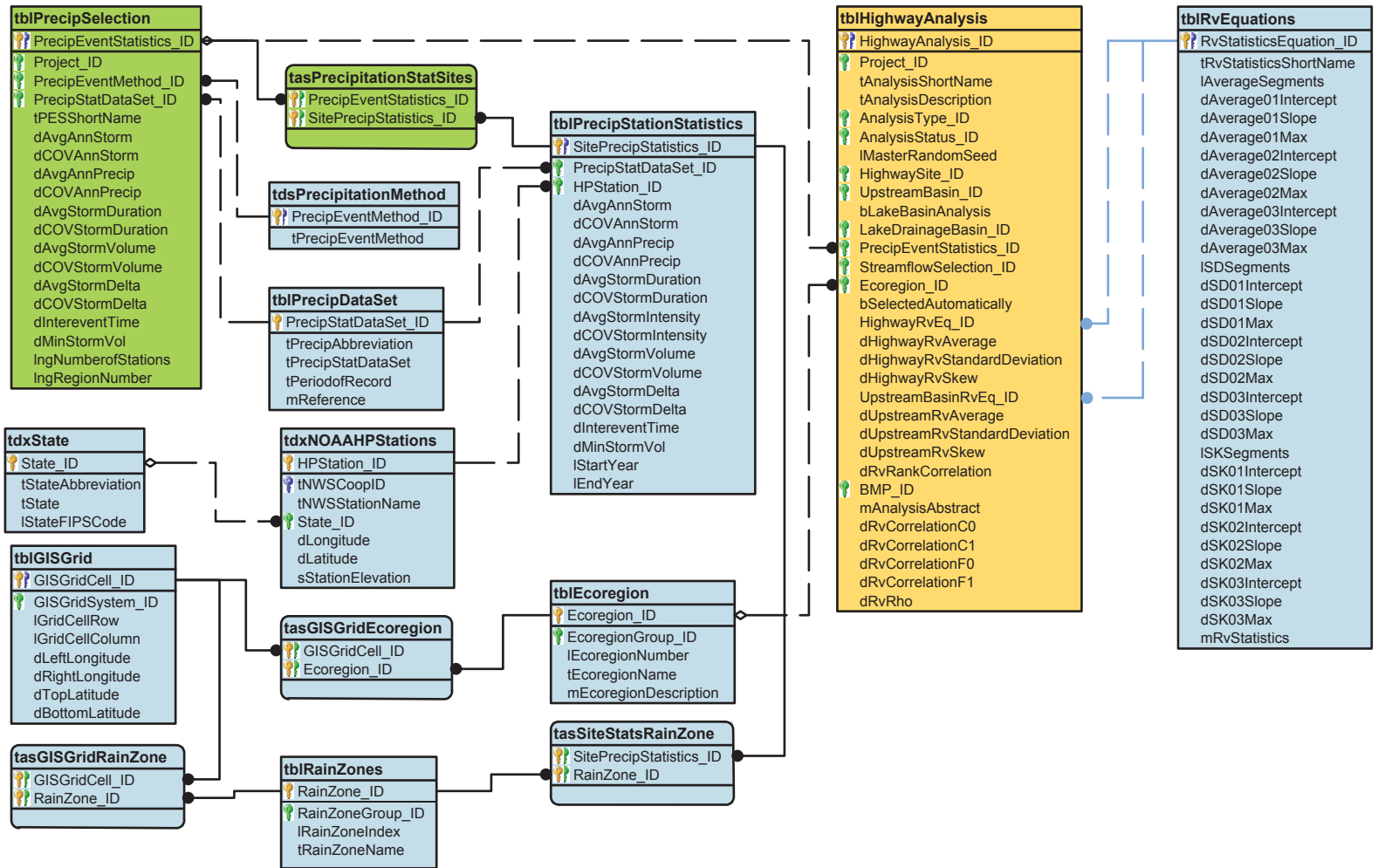
Analyst—Data structure, tables, fields, and relationships



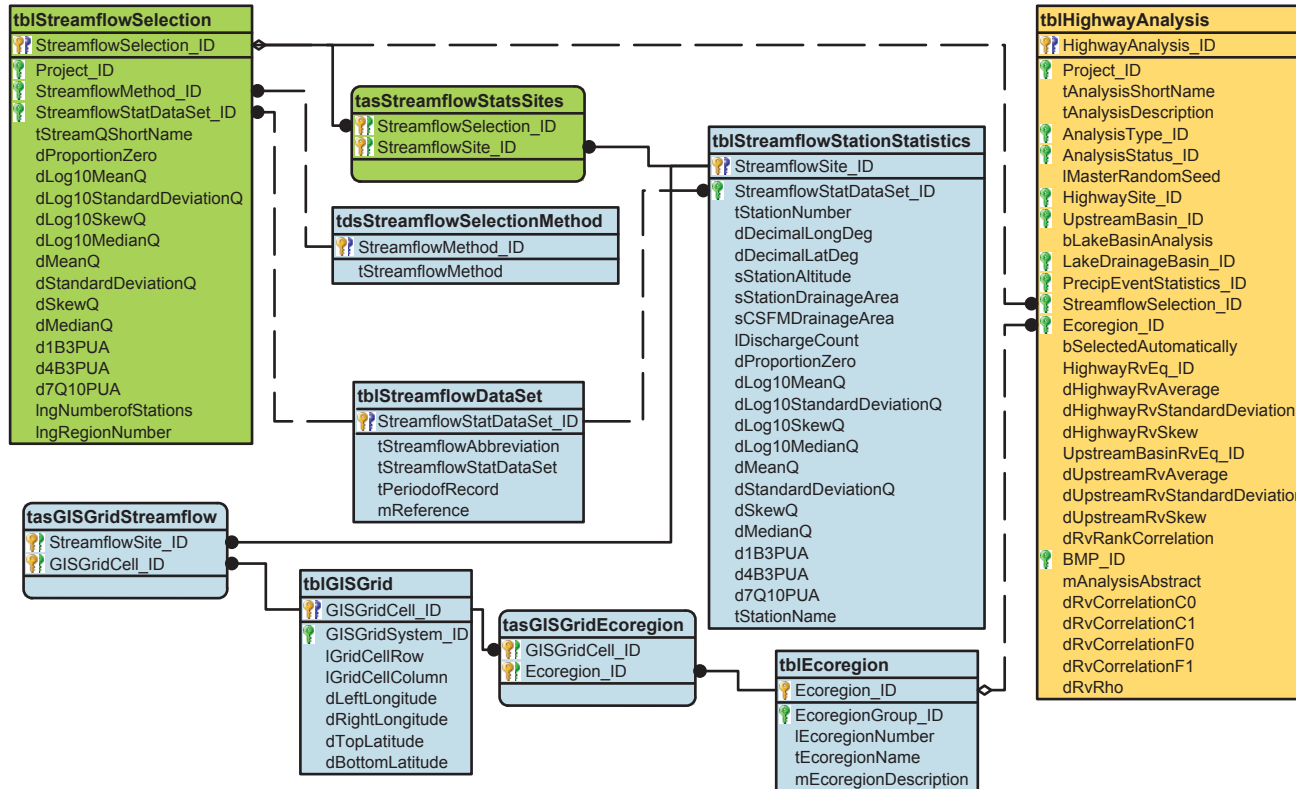
Project—Data structure, tables, fields, and relationships



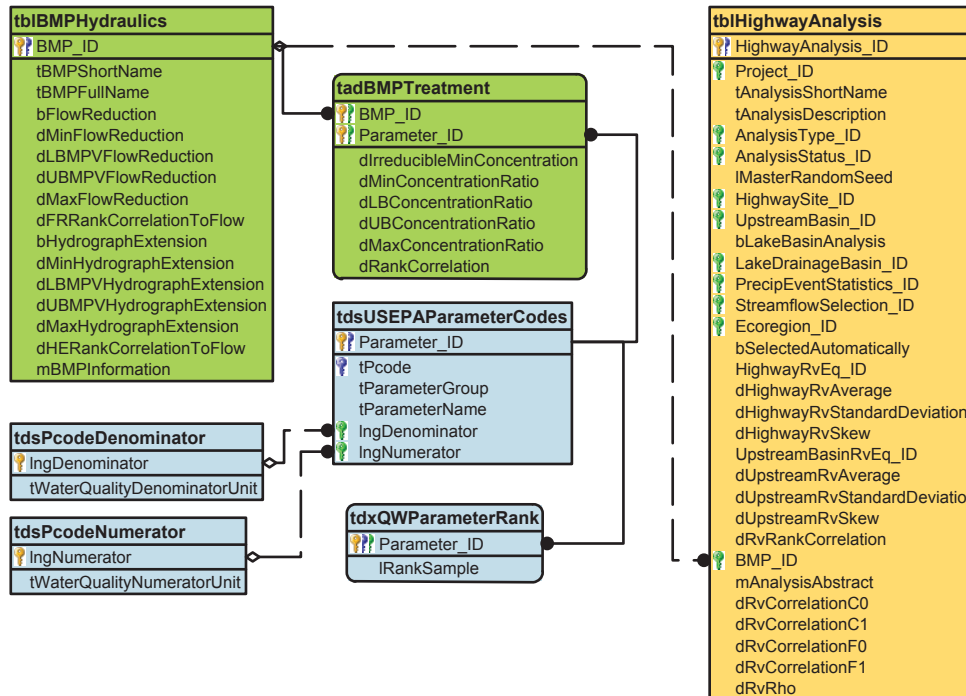
Precipitation and runoff coefficients—Data structure, tables, fields, and relationships



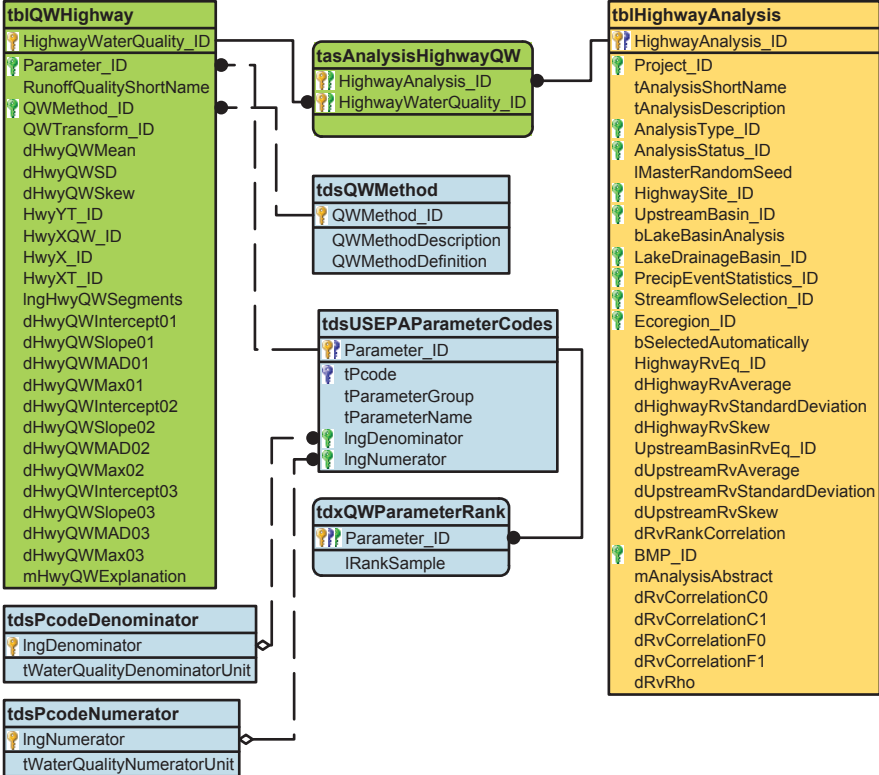
Streamflow—Data structure, tables, fields, and relationships



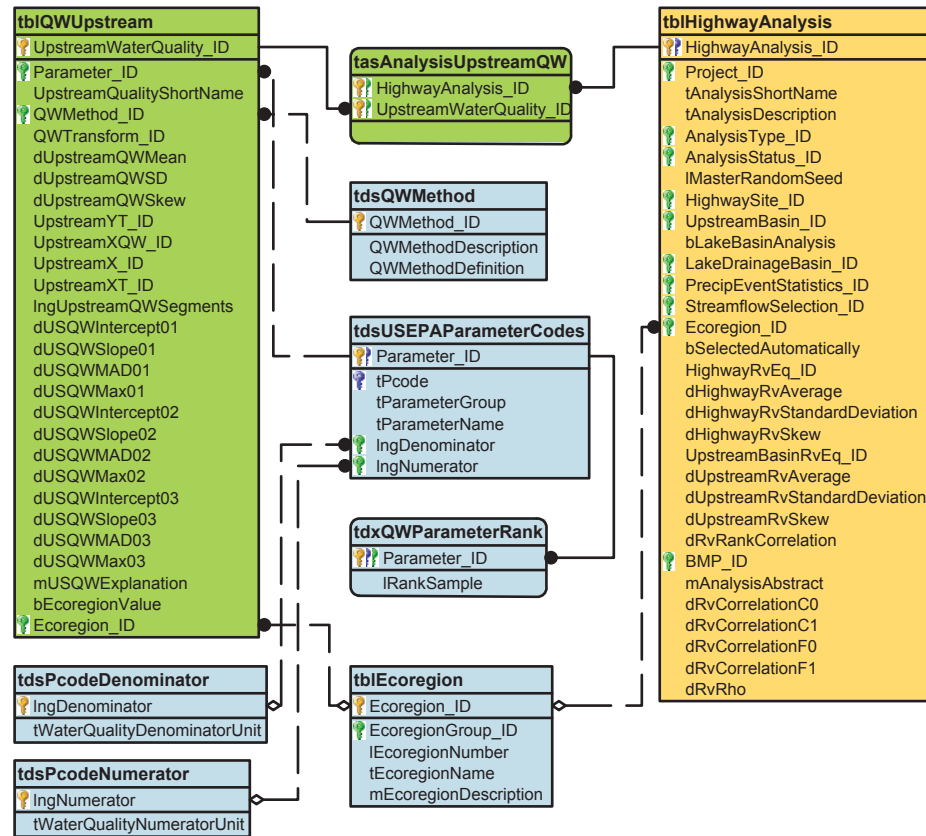
Best Management Practices (BMPs)—Data structure, tables, fields, and relationships



Highway runoff quality—Data structure, tables, fields, and relationships



Upstream water quality—Data structure, tables, fields, and relationships



Downstream water quality—Data structure, tables, fields, and relationships

