

SIM User's Guide and Reference

Version 2.0.2



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Using This Guide

The SIM User's guide is broken into three sections:

1. **SIM / STORET Overview** – Describes the purpose, design and functionality of SIM and STORET.
2. **Reference** – Provides a quick link reference of SIM features
3. **Appendix** – includes:
 - A list of what's new in SIM version 2.0.2
 - Acceptable STORET values for the various data types

If you are a new user to SIM and STORET, you should read through the overview section to become familiar with the purpose and structure of STORET and SIM.

Advanced users can use the Reference Section of the document by using the quick links within the table of contents. You can link to any item listed in the Table of Contents by holding down the control button and clicking on the item you wish to learn more about.

The Reference Section is designed to provide you with step-by-step instructions for using SIM. Each topic describes the functions and associated concepts, and provides step-by-step instructions for using the tools. The instructions are placed in boxes, which are separate from the text (see box below).

This is an example of a box that contains step-by-step instructions for using a particular feature.



This symbol is used to draw attention to important information to keep in mind as you use SIM.

Section 1 – SIM / STORET Overview

1.2 Introducing SIM

The STORET Import Module (SIM) is an application that helps users batch-load data into STORET. STORET is an EPA maintained database containing ambient water quality data that allows individual agencies to manage their own data at a local level and share it with others via a national data warehouse.

1.3 Understanding STORET Data Structure

To fully understand how to use SIM, it is helpful to first understand the different types of data STORET supports and how they interact with one another.

Prior to loading any data into STORET, you must first be assigned an **Organization ID** from EPA Headquarters. An organization ID is a unique identifier used to link all STORET data back to the submitting organization.

If you have not been assigned an Organization ID, please contact your local STORET coordinator for assistance with obtaining one.

Once you have obtained an Organization ID, start by adding **Projects** into STORET for this organization. A Project can be described as the reason why a set of environmental data is being collected. For example, a state may decide to establish an ambient water quality monitoring network. Alternately, an organization may have several smaller projects related to a specific location, event, or study. An organization must have at least one project completely described before results data can be migrated to STORET. Individual sampling activities and results are then associated with a project. There is no limit to the number of projects an organization may have.

For each project, you must record the locations from which you will be collecting data samples. These data collection sites are called **Stations**. For example, perhaps you have five locations along the Blue River you plan to collect data from. These stations must be added to STORET before results can be recorded for this project. At a minimum, each station must have a name, a location (latitude and longitude) and a unique identifier associated with it.

On occasion, you will run into cases where a station isn't simply a single location, but defines an area where sample data is collected. For example, in lake sampling it may be difficult to return to an exact location so instead you collect samples anywhere within a given area. In this case you would define **Additional Locations** which would be a set of latitude and longitude points that make up the perimeter of the sampling area. You can also have additional locations that record the exact sampling point for each sample collected. Each Additional Location refers to the station with which it is associated.

Once your Projects have been established and the Stations and any Additional Locations have been defined, you are ready to import actual **Results** data. STORET supports water chemistry and biological sampling results as well as field measurements and observations.

All results must be associated with an **Activity** which represents a group of field measurements and observations or the collection of results recorded from a collected sample.

In addition to Projects and Stations, there are other types of data that may be required prior to importing your Results data. The most common of these *meta-data* elements include laboratory information, personnel, as well as sample collection and analytical procedures. These data elements are typically entered at the beginning of the project and updated infrequently.

1.4 SIM File Types

Projects, Stations, Additional Locations, Wells, Biological and Non-biological Results can all be loaded into SIM via text-based data files. Whereas the STORET interface only allows you to enter these items one at a time, SIM allows you to collect multiple records into files which can be batch loaded into STORET. When analyses are completed by a lab, an electronic copy of the data can often be obtained that is compatible with SIM and can be easily loaded directly into STORET. Although SIM does not support the loading of meta-data, there are several applications that can be used to record this information into STORET. Contact your STORET coordinator about options available to you for managing this information.

The following list summarizes the types of data supported by SIM:

- 1. Projects**

Initiatives or reasons why data was collected.

- 2. Stations**

Points or areas where field measurements are made or samples are collected.

- 3. Additional Locations**

Points that define boundaries, sample locations, or observation sites within a station.

- 4. Wells**

Additional Station information for stations of type “Well”. In many cases a single station may be defined for a well field, with each well recorded as an additional sampling point.

- 5. Field Measurements and Non-biological Samples**

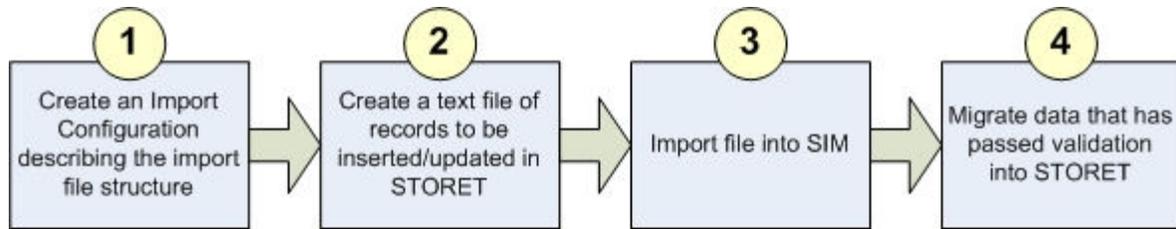
Results of field measurements or the analysis of non-biological samples.

- 6. Biological Samples**

Results associated with biological samples.

1.5 Inserting or Updating STORET Data via SIM

The process for inserting or updating STORET data via the SIM Application is as follows:



1.5.4 Step 1: Create an Import Configuration

An Import Configuration tells SIM how the delimited text file that you are submitting to STORET is structured. Specifically, it states which columns are included (e.g. Station ID, Station Name, etc.) and the position, data type, size, and format of the data in each column. An Import Configuration is required for each type of file you want to import (Project Descriptions, Stations, Additional Locations, Wells, and Results).

If necessary, there are two methods within SIM for creating an Import Configuration:

1. Create a new configuration.
2. Load an existing configuration that has been saved to a file.

For more information on Import Configurations, see *Creating a new Import Configuration* and *Loading an Import Configuration* in the Reference Section and *Appendix B: Listing of Available STORET Columns for Each File Type*.

1.5.5 Step 2: Create a text file of records to be inserted or updated in STORET

Once you have defined your import file structure in an Import Configuration, you must now create a data file that conforms to the Import Configuration. Common software products, such as Excel, Access, or Lotus 1-2-3, can be used to create tables of data that can be saved and exported as delimited text files compatible with SIM. Larger organizations may produce these files as exports from existing data management or laboratory information management systems (LIMS).

Often, an organization will have standard text file formats or templates pre-defined for use with STORET. See your STORET coordinator to see if these exist for your organization.

For more information on data files, see *Working with Data Files* in the Reference Section and *Appendix B: Listing of Available STORET Columns for Each File Type*.

1.5.6 Step 3: Import file into SIM

Once you have formatted your text file and have identified the corresponding Import Configuration, you are ready to import your data into SIM. You use SIM to select your configuration and text file containing your data, and begin the import process. SIM will notify you of any problems with the import process and will keep a log of each import you perform.

For more information on importing data into SIM, see *Importing Data Files* in the Reference Section.

1.5.7 Step 4: Migrate Data to STORET

Once you are satisfied with your import into SIM, you must perform an additional step to migrate your data into STORET.



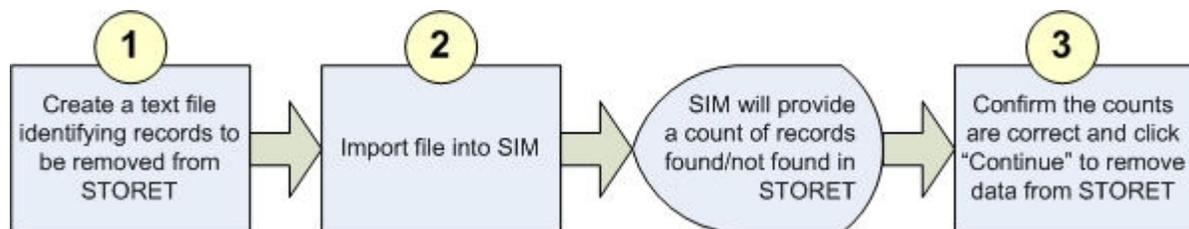
Make sure to validate your data in SIM prior to migrating to STORET. Once an import has been migrated to STORET, the import data (which is no longer needed) is deleted from SIM.

If you find errors in the data after it has been migrated to STORET, SIM provides the ability to delete an entire migration set from STORET (allowing you to start the entire process over again).

For more information on Migrating your Data to STORET, see *Inserting & Updating Data in STORET* in the Reference Section.

1.6 Removing STORET Data via SIM

The process for removing data from STORET via the SIM Application is as follows:



1.6.4 Step 1: Create a text file identifying records to be removed from STORET

Because the file structure for “remove” files is very simple, an Import Configuration is not used. Only a few pieces of information are typically needed to identify the records you wish to remove from STORET. Common software products, such as Excel, Access, or Lotus 1-2-3, can be used to create tables of data that can be saved and exported as delimited text files compatible with SIM.

For more information on the structure of “remove” files, see *Text File Deletion* in the Reference Section.

1.6.5 Step 2: Import file into SIM

Once you have created your text file identifying the records you wish to remove from STORET, you are ready to have SIM process the file and perform the deletes. After importing the text file you select, SIM will provide you with a summary of the number of records found in STORET that match the identifiers in your text file. Additionally, SIM will provide the number which are not found in STORET.

1.6.6 Step 3: Confirm the counts are correct and remove data from STORET

Once you have confirmed that the counts provided by SIM are correct, you confirm that you want it to proceed with removing the identified records from STORET.

Section 2 – Reference

2.1 Working with Data Files

This section presents information related to working with data files. More detail on specific data file contents is given in *Appendix B: Listing of Available STORET Columns for Each File Type*.

2.1.1 About Data File Formats

Before using SIM, you must create text files containing the data you wish to load into STORET. The columns (or fields) in each file are organized in a tabular format where the column delimiter is either a tab, pipe (|), tilde (~), or comma (,).



It's important to use a delimiter that is never used in any of your data, because there is no way for SIM to determine which is the delimiter and which is part of the data. A pipe or tilde are typically the safest delimiter to use.

In addition to the four delimiters allowed in data files, SIM allows a backslash (\) on specific fields that can accept multiple values. For example, you can include multiple Personnel or Project IDs in a Results file by separating each one with a backslash character.

Information on each column/field is provided in Appendix B.

2.1.2 Data File Types

The following list summarizes the types of data supported by SIM:

1. **Project Descriptions**

Initiatives or reasons why data was collected.

2. **Station Descriptions**

Points or areas where field measurements are made or samples are collected.

3. **Additional Locations**

Points that define boundaries, sample locations, or observation sites within a station.

4. **Wells**

Wells that are constructed to gather samples or field measurements.

5. **Field Measurements and Non-biological Samples**

Results of field measurements or the analysis of non-biological samples.

6. **Biological Samples**

Results associated with biological samples.

2.1.3 Activity vs. Results Information

The last two file types listed above contain both activity and result information. A piece of information is said to be *Activity-Level Information* if it can describe something about a particular Sampling Activity but not the individual Results produced from that Activity. For example, the equipment used to collect a sample is a piece of activity-level information. If the sample were analyzed for four different characteristics (therefore producing four Results), each of the four Results would have the same value in the Sample Collection Gear field because all Results came from the same sample. In summary, if a STORET field is said to be activity-level, then all Results produced from that Activity must have the same value for the field in question.

In contrast, *Result-Level Information* is something that describes only one particular Result and does not apply to the other Results on the Activity. An example of result-level information is an Analytical Procedure, which identifies the procedure used to perform the analyses for a particular characteristic. Each result, while still originating from the same Sampling Activity, can have a different Analytical Procedure.

2.2 Working with Import Configurations

An Import Configuration tells SIM how the delimited text file that you are submitting to STORET is structured. Specifically, it states which columns are included (e.g. Station ID, Station Name, etc.) and the position, data type, size, and format of the data in each column. An Import Configuration is required for each type of file you want to import (Project Descriptions, Stations, Additional Locations, Wells, and Results).

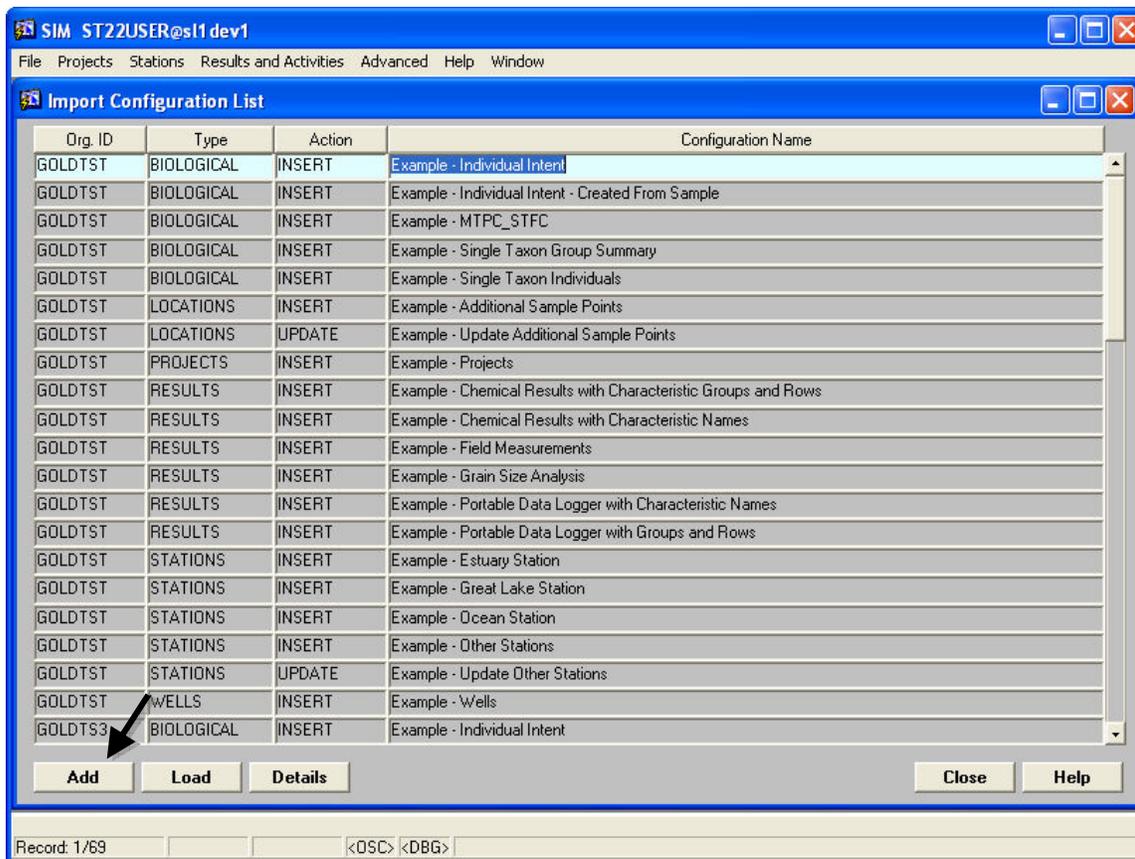
There are two methods for creating an Import Configuration:

1. Create a new configuration from scratch.
2. Load an existing configuration that has been saved to a file.

2.2.4 Creating a new Import Configuration

To create a new Import Configuration:

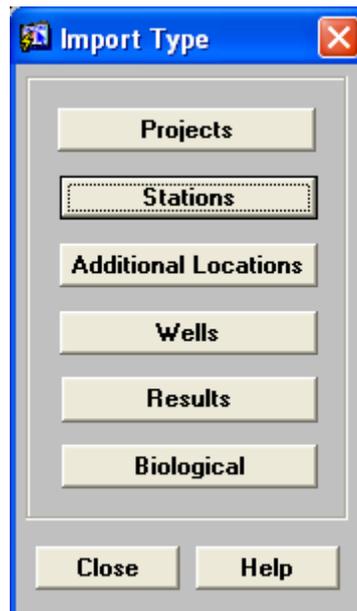
1. Open the Import Configuration List by clicking the “Manage Configurations” button on the SIM Welcome window or by selecting “Advanced” then “Import Configurations List” from the menu. The following window appears:



2. Click the “Add” button to add a new Import Configuration. The following popup appears:



3. If the new import configuration is to be used for inserting data into STORET, click the “Insert” button. If it is to be used for updating existing STORET data, click “Update”. The following popup appears:



4. Select the type of import configuration you wish to create. For example, to create an import configuration to be used when importing biological results, click on the “Biological” button. The Import Configuration window appears:

Import Configuration

Action: Insert

Name: _____

Type: BIOLOGICAL Biological results load definition

Desc: _____

Org ID: DEMOATEST Skip Header: Delimiter: | Pipe:

Req Pos	Column	Max	Include	Generate	Default Value	Column Type	Format
* 1	Trip ID	15	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Freetext	>>
* 2	Station ID	15	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Allowable Values	>>
* 3	Station Visit Number	3	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Freetext	>>
* 4	Project ID	8	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Allowable Values	>>
* 5	Activity ID	12	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Freetext	>>
* 6	Medium	20	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Allowable Values	>>
* 7	Activity Type	13	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Allowable Values	>>
* 8	Activity Category	30	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Allowable Values	>>
* 9	Intent	20	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Allowable Values	>>
* 10	Activity Start Date	10	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Defined Format	>>
* 11	Activity Comments	254	<input type="checkbox"/>	<input type="checkbox"/>		Freetext	>>

Header Template: Trip ID|Station ID|Station Visit Number|Project ID|Activity ID|Medium|Activity Type|Activity Category|Intent|Activity Start Date

Buttons: Move Up, Move Down, Insert "Ignore" Column, Column Translations, Allowable Values, All Translations, Instructions, Copy Configuration, Delete, Save, Close, Help, STORET Help

Record: 1/1 <DSC> <DBG>

5. Fill in the Name and (optionally) the Description field.
6. Choose an Org ID. All data loaded via this import configuration will be related to this organization in STORET. The list of available Org. IDs is based on those you have been assigned in STORET.
7. If you intend to use the first row of your import files for column headings, you should select the “Skip Header” checkbox. This tells SIM to ignore the first row of the import file. The value of this checkbox will serve as the default for each file you import. Accordingly, before importing any file into SIM, you will be given an opportunity to override this setting for the specific file you’re importing.
8. Choose a Delimiter to be used to separate the columns in your import file.



It’s important to use a delimiter that is never used in any of your data, because there is no way for SIM to determine which is the delimiter and which is part of the data. A pipe (|) or tilde (~) are typically the safest delimiter to use.

9. Check the “Include” checkbox for each column that will be included in your import file. An asterisk (*) is used to indicate columns that are required by STORET and must be included in your import configuration (or generated – explained later). See the *Import Configuration* section for more information about the columns and their meaning.
10. To reorder the columns, use the “Move Up” and “Move Down” buttons.

11. If there are columns in your import file which you do not wish to import into STORET, you can flag them as columns to be ignored by SIM. This may be useful if you receive data electronically from a lab or other external data source that includes information that isn't relevant to STORET.

- To insert a column to ignore, scroll down to the appropriate position and click the “Insert “Ignore” Column” button. For example, if wish to ignore column 12 in your import file, scroll down to column 12 in the import configuration and click the “Insert “Ignore” Column” button. A new column will be inserted labeled “<Ignore>”.
- To remove a column that is currently being ignored, uncheck the “Include” checkbox. The column will be removed once you save the Import Configuration.

12. Click the “Save” button to save the Import Configuration.

2.2.5 Import Configuration Columns

Each row in an Import Configuration describes one column in your import file. The following table explains the attributes of each import file column defined in an Import Configuration:

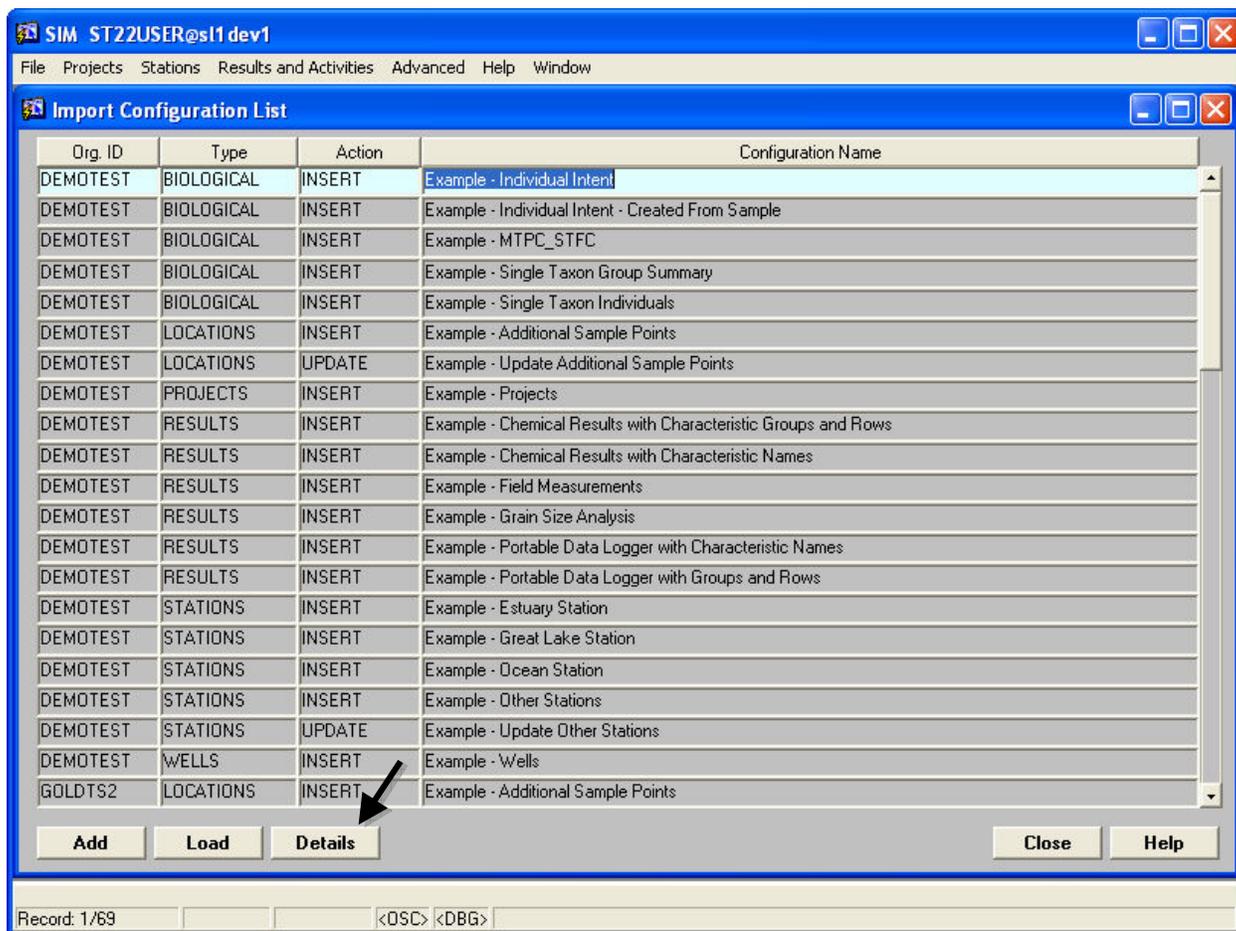
Field	Description
Req	Indicates with a “*” which columns are required by STORET. These columns must be included in your Import Configuration.
Pos	Indicates the position of the column in your file. For example, if the Station ID is in the fourth column in your data file, you would move the Station ID column in the Import Configuration (using the “Move Up” and “Move Down” buttons) until it was in position “4”.
Max	Indicates the maximum length allowed by STORET for this field. Data in your import file that exceeds the max length will be flagged as an error and will not be loaded into SIM.
Include	Indicates whether the column will be included in your import file. If you attempt to uncheck the “Include” checkbox for one of the required columns, SIM will automatically check the “Generate” checkbox for you (see the “Generate” column below).
Generate	Indicates that you wish to have SIM generate values for this column rather than provide the data yourself (in the import file). Use the “Default Value” field (described below) to indicate what value SIM should use for this column when inserting data into STORET. For a couple of specific columns, namely Trip ID & Station Visit Number, where generating one “Default Value” for all rows in the import file would not be sufficient, SIM provides an alternate way to generate values. See the section titled “Setting Import Configuration Instructions” for more information.
Default Value	Indicates a value that SIM should use whenever the value in this column of the import file is left blank. For columns where the “Generate” checkbox is

Field	Description
	checked, this will be the value for all rows imported.
Column Type	<p>Indicates the type of data allowed in this column.</p> <p>The Column Type is always one of the following:</p> <ul style="list-style-type: none"> • Freetext – Any text is allowed in this column (up to the maximum length indicated in the Max Len field). • Defined Format – Indicates that there is a specific format required for data in this column. Use the “Format” field (described below) to indicate which of the allowed formats you will use in your import file. • Allowable Values – Data in your import file must match one of the allowable values defined in STORET for this column. You can use the “Allowable Values” button to view the list of allowable values for this column. Also, to assist you in converting your data to the appropriate value in STORET (for this column), SIM allows you to create translations for specific values in your data file to convert each one to a specific allowed value in STORET. See the section titled “Using Translations” for more information.
Format	<p>Allows you to select the format you will use for data in this column of your import file. The “Format” field is only used for columns whose type is “Defined Format.” Here are the steps to choose a format:</p> <ol style="list-style-type: none"> 1. Click on the “>>” button next to the “Format” field. For example, if you click the “>>” button on the Activity Start Date column, a popup like the following appears: <div data-bbox="717 1167 1127 1705" data-label="Image"> </div> 2. Select a value from the dropdown list, and click the “OK” button.

2.2.6 Viewing and Editing an Existing Import Configuration

Use the following steps to edit an existing configuration:

1. Open the Import Configuration List by clicking the “Manage Configurations” button on the SIM Welcome window or by selecting “Advanced” then “Import Configurations List” from the menu bar. The following window appears:



2. Find the Import Configuration you wish to edit (you can sort on a column by clicking on its heading). Then either double-click the row or select the row and click the “Details” button. The Import Configuration you selected will be displayed
3. Make any desired changes
4. Click the “Save” button if you want to save your changes, or “Close” if you were just viewing the configuration.

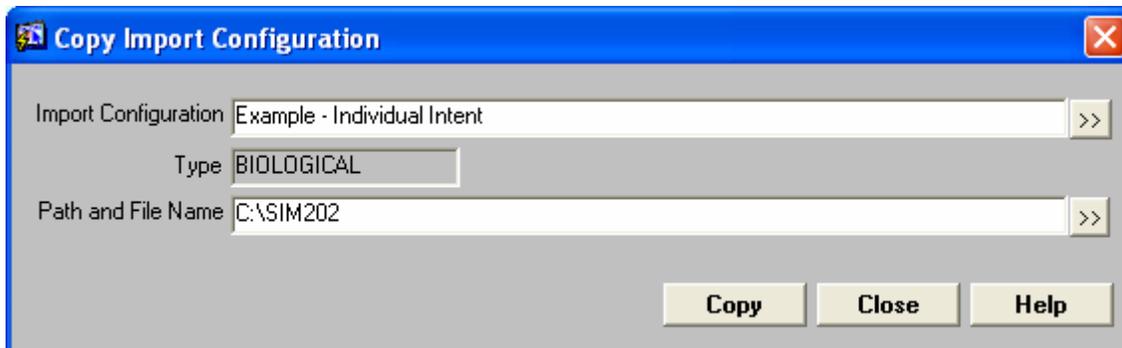
2.2.7 Copying an Import Configuration

The Copy Configuration feature allows you to save your Import Configuration to a file which can later be loaded using the Load Configuration feature. Copying configurations can be useful to:

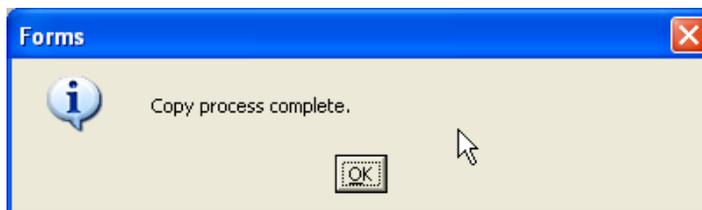
- Create a new configuration that is similar to an existing one.
- Create a duplicate configuration for a different organization
- Copy configurations from a test to a production environment
- Document your import file structure when submitting a support issue or bug report

To copy an Import Configuration:

1. Choose the “Advanced” then “Copy Configuration” menu from the menu bar or click the “Copy Configuration” button on the Import Configuration window. A popup like the following will appear:



2. If you clicked on the button from the Import Configuration Window, the “Import Configuration” field will default to the current Import Configuration. Otherwise, click on the “>>” button to select an existing Import Configuration to copy.
3. Specify a file path and name for the Import Configuration in the “Path and File Name” field. You can use the “Browse” button assist you in filling in the path and file name. Import Configuration files are always saved with a .cfg file extension. So if you specify a file name of “MyConfiguration” it will name the file “MyConfiguration.cfg”. Likewise, if you specify “MyConfiguration.txt” it will be renamed to “MyConfiguration.cfg”.
4. Click on the “Copy” button. If the file already exists, you will be asked if you wish to overwrite this file. If the file does not exist, it will be created.
5. A popup appears to confirm that the copy was successful:



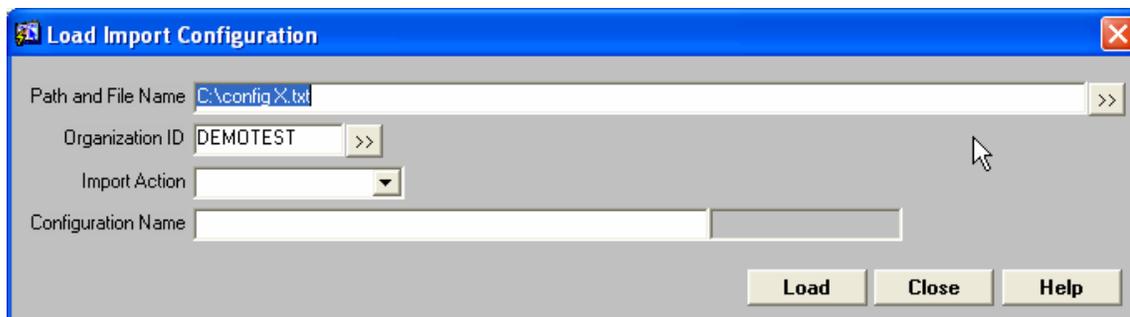
6. Click on the “OK” button, then click on the “Close” button on the Copy Import Configuration window. You can use the Load Configuration feature to load a configuration file you have previously copied.

2.2.8 Loading an Import Configuration

The “Load Configuration” feature allows you to load an Import Configuration from a file previously saved using the “Copy Configuration” feature.

To Load an Import Configuration:

1. Choose the “Advanced” then “Load Configuration” menu from the menu bar or click the “Load” button on the Import Configurations List window. A window like the following will appear:



2. Click on the “>>” button to browse to the file you wish to load.
3. Once a file is selected, all of the fields will be populated with values from the configuration file. You can then change any of the fields before loading the import configuration. For example, you may wish to choose a different name for the new import configuration or assign it to a different organization. Likewise, you may want to use the new import configuration to update data rather than insert data into STORET. You can do this by changing the Import Action field.
4. Click on the “Load” button to create your new Import Configuration in SIM.
5. If a configuration with the same Organization ID and Configuration Name already exists, you will be notified that you must choose a different name or delete the original configuration before continuing. Otherwise, a new Import Configuration will be created.

2.2.9 Using Translations

Translations allow you convert values in your import file to values compatible with STORET. For instance, you could translate a CAS number in your import file to the appropriate STORET “Characteristic” name. This is important as it allows the data provider to use terms that are meaningful to him/her and rely on SIM to translate these terms to something that is meaningful to STORET. Thus, import files can be created directly from external data sources such as a Laboratory Information Management System (LIMS) and then converted during import into SIM.

All translations are associated with an import configuration. Therefore, you can create Import Configurations with different translations in each one in order to accommodate the reporting conventions of different data providers.



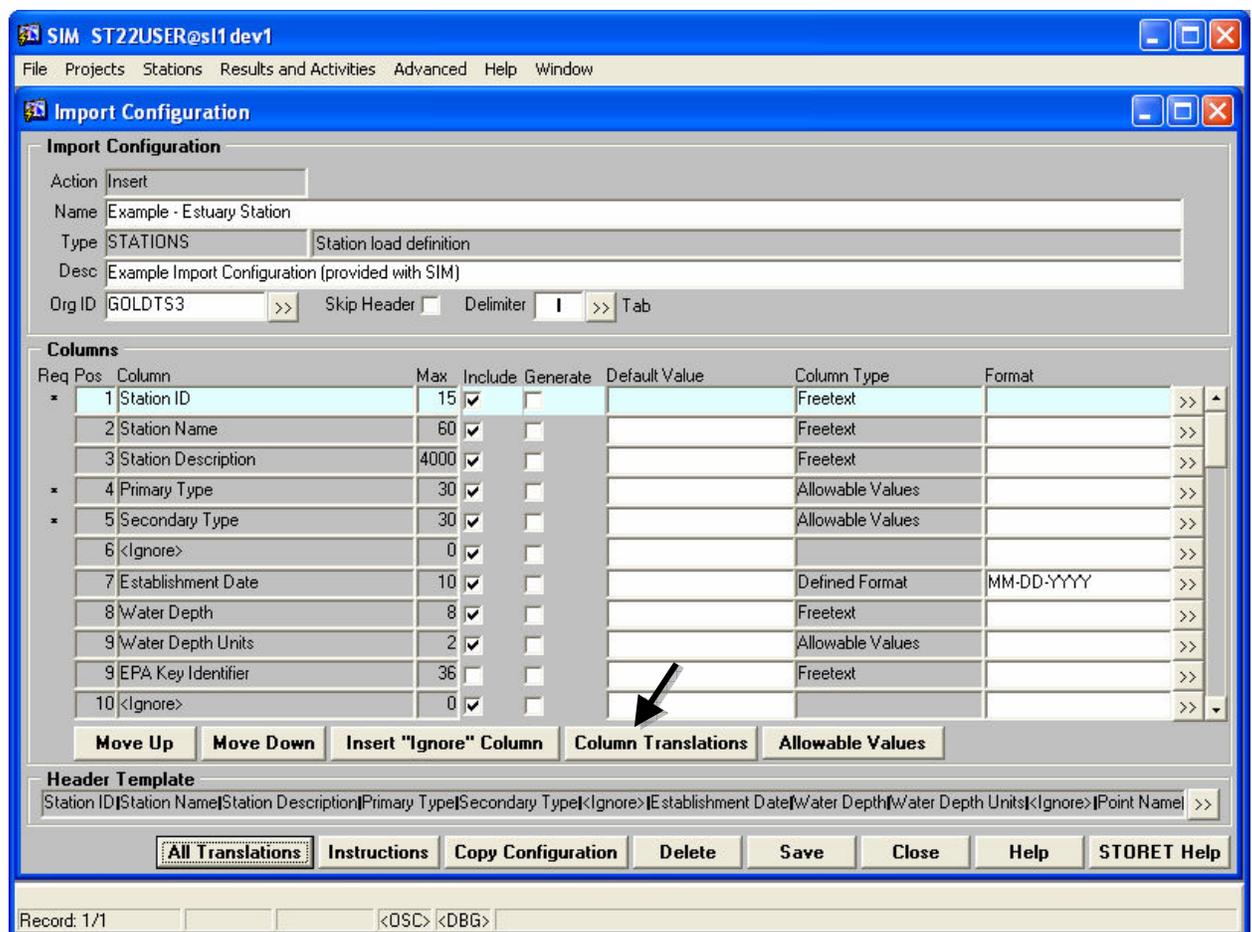
It's important to note that translations are done on a column level. Translations are not a simple search-and-replace function on your entire data file. In other words, a translation created on the "Station Name" column in your Import Configuration will only affect data in the "Station Name" column in your import file.



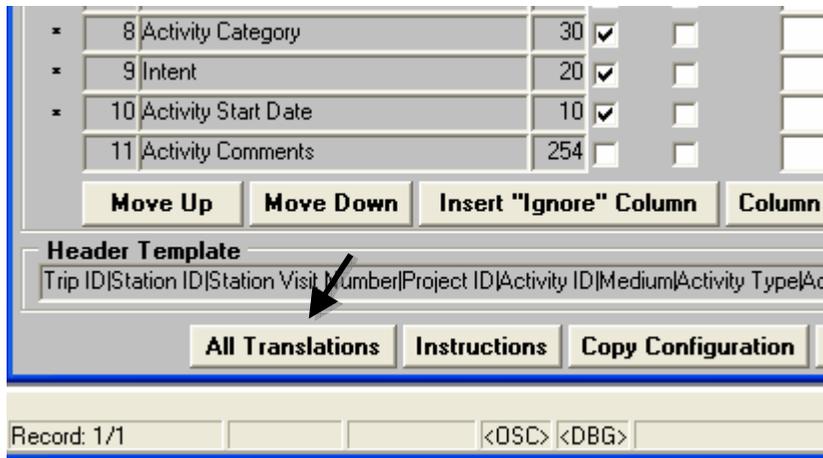
Additionally, translations do not perform partial matches. For example: if you have the value of "Storm Sewer" in a column in your import file and you have a translation created for "Sewer" (for that same column) in your Import Configuration it will not attempt to translate the word "Sewer" in "Storm Sewer" because it's not an exact match on the entire column value.

The following describes the steps in managing translations for an Import Configuration:

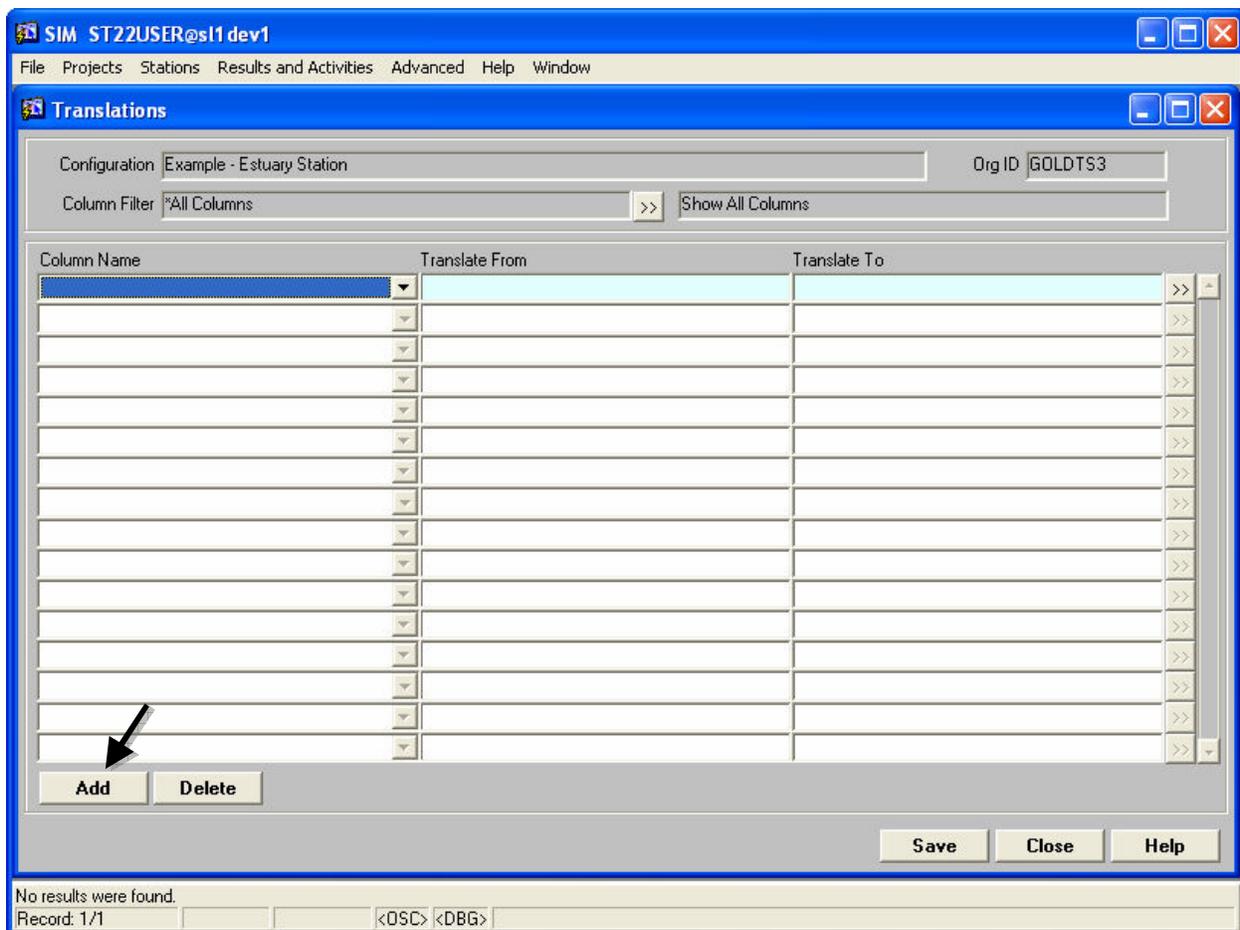
1. Open the Import Configuration you wish to edit. For more information, see the section titled "Viewing and Editing an Existing Import Configuration". The Import Configuration window will then appear:



2. Select the column whose translations you wish to manage and then click the "Column Translations" button.
3. Alternatively, to manage all translations for the entire Import Configuration, click the "All Translations" button.



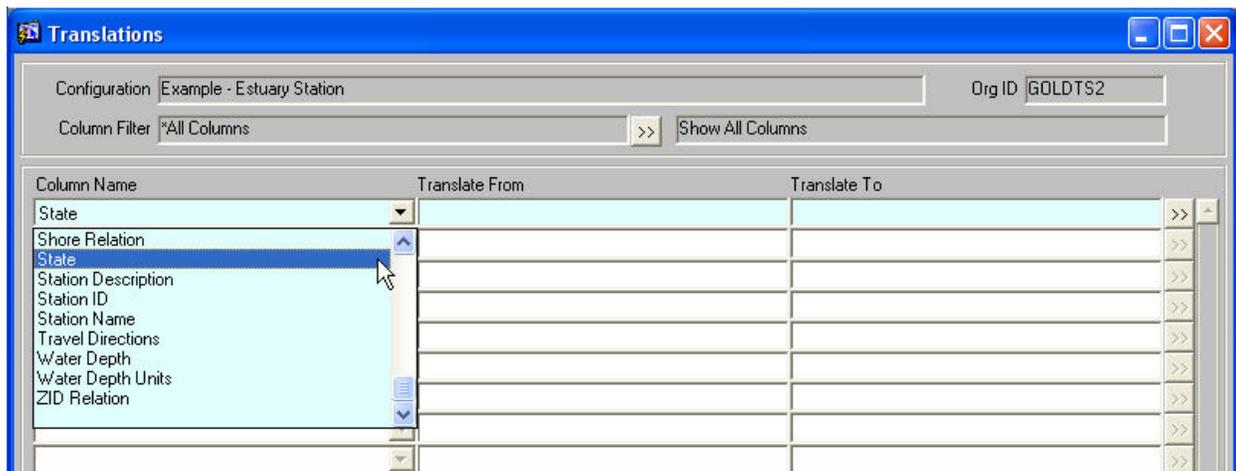
- The Translations window will open and display any existing translations that have been created.



- To add a new translation, click the "Add" button (or manually select a blank row on the form).

6. Fill in the Column Name field (to indicate which column the translation is for).

If you opened the Translations window by clicking the “Column Translations” button (rather than the “All Translations” button) then the Column Name will default to the column you were on in the Import Configurations window. This same behavior will occur if you change the “Column Filter” at the top of the form from something other than “*All Columns”.

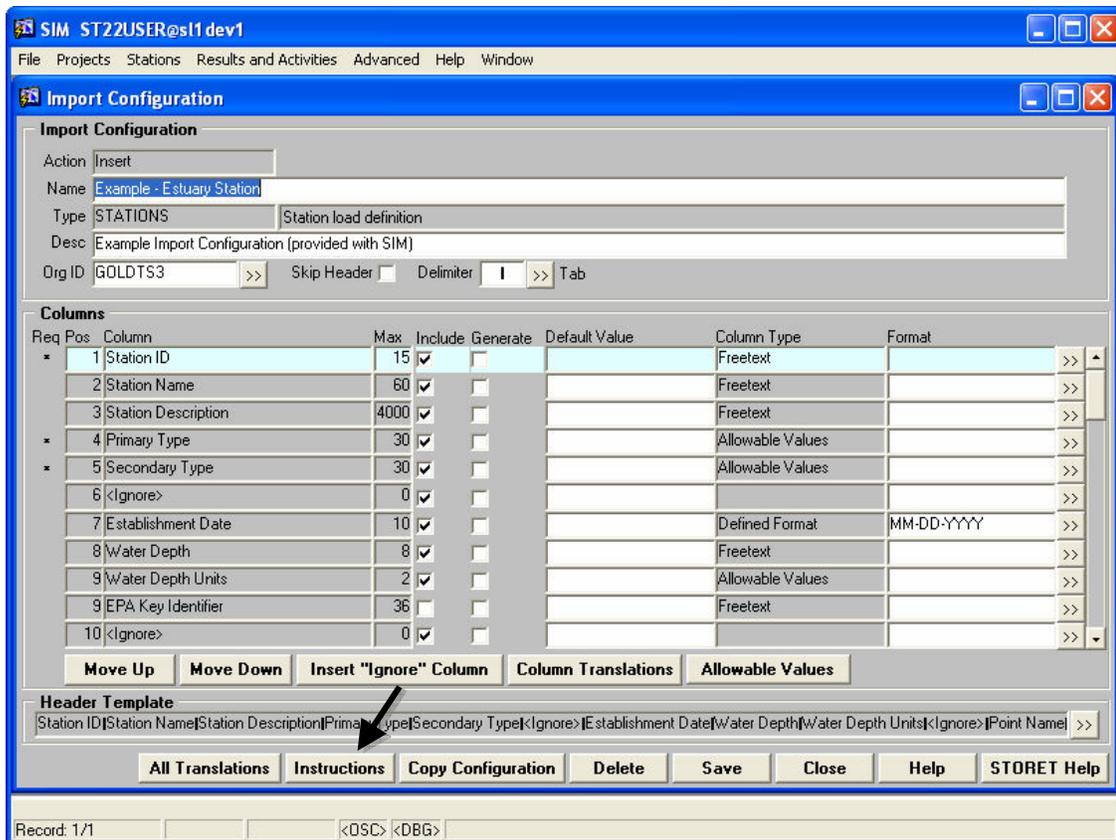


7. Now, fill in the “Translate From” and “Translate To” fields to define a SIM Translation. If you create a translation for a column which has a standard list of values, SIM will require that the value you type in the “Translate To” field match a valid value in STORET. You can use the “>>” button on the “Translate To” field to select a valid value, rather than typing the value manually. You can add as many translations for a column as you wish (by repeating steps 5 - 7).
8. To delete an existing translation, select a translation from the list and click on the “Delete” button.
9. Once you have finished your modifications to the translations, click on the “Save” button.

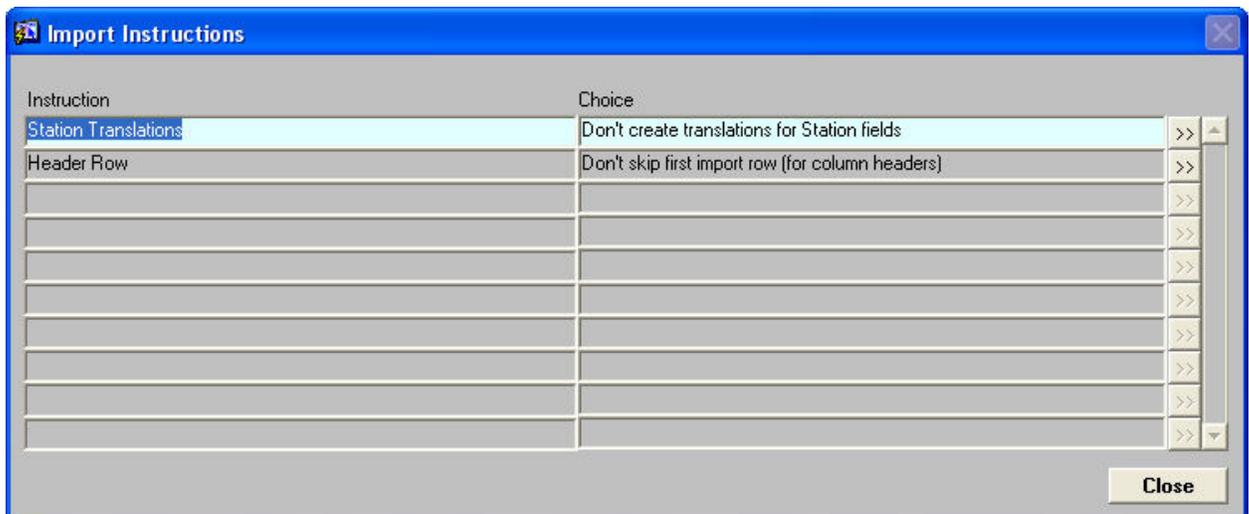
2.2.10 Setting Import Configuration Instructions

The “Set Instructions” button on the Import Configuration window allows you to establish instructions that will be used during the import process. You can specify instructions for skipping the first row in an import file, creating translations automatically for invalid values in your import file, and for generating Station Visits and Trips. To change instructions:

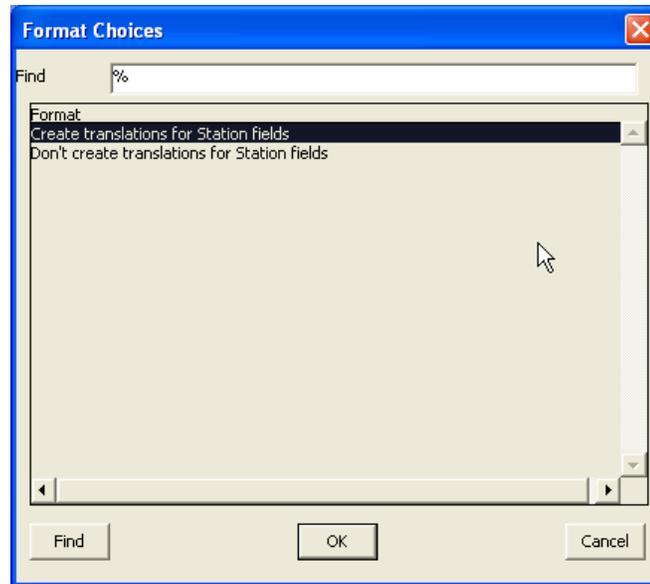
1. Open the appropriate Import Configuration window. A window like the following appears:



2. Click on the “Instructions” button and a window like the following appears:



3. Click on the “>>” button next to the instruction that you want to change and a popup like the following appears:



4. Select from the available choices and click on the “OK” button.

2.2.10.1 Create Translations Instruction



Depending on your import configuration type this instruction will be labeled <File Type> Translations. For the purpose of this section we will assume you are working with Stations and setting the Station Translations instruction.

If you specify “Create translations for Station Fields,” then during the import process, SIM will populate the “Translate From” field on the Translations window with any values that do not match valid STORET values. Once the import has completed, you can then view any translations created by selecting the “Manage Translations” button on the Import Status window. Translations that were automatically created by SIM will be incomplete and will not include a “Translate To” value. Using the Translations window, you can fill in the “Translate To” column with valid STORET values. Then click the “Save” button and return to the Import Status window. At this point you will need to delete this import from SIM and then re-import the file with your new translations. The previously invalid values will now use the translations you have created and the file should be able to load properly.

If you specify the “Don’t create translations for Station fields” option in the Import Configuration Instructions, SIM will simply report an error for invalid values but will not create translations for them.



This instruction does not affect whether translations are used or not. It only addresses whether SIM should automatically create new translations (for invalid values in your import file). Translations will always be used if they exist. There is no way to turn them off (except to delete them).

2.2.10.2 Station Visits Instruction



This instruction is only available on import configurations for “Result” data.

A Station Visit is a stop at a particular station during a Trip for the purpose of making measurements, observations, or collecting samples. During a Visit, any number of measurement, observation, or sample collecting activities may occur.

SIM can automatically generate Station Visits if this information is not provided in the import file. There are three choices available concerning Station Visits:

1. *Read Existing Station Visit from Data File* – When using this instruction, the Station Visit Number must be provided in the import file. If the station visit already exists in STORET, the new results will be associated with the existing station visit and any additional station visit information provided in the import file will be ignored. If the visit does not exist, a new visit will be created using the values from the following columns in your import file: Station ID, Station Visit Arrival Date, Station Visit Number, Visit Comments, and Visit Document/Graphic.
2. *Create one Station Visit per day* - A new Station Visit will be generated for every day in which an activity is started. The station visit numbering is sequential and depends on the order that activities are provided in the import file.
3. *Create one Station Visit per date and time* - A new Station Visit will be generated for every date/time in which an activity is started. Any results that do not have a start time provided will be added to a visit created for the entire day.

2.2.10.3 Trip ID Instruction



This instruction is only available on import configurations for “Result” data.

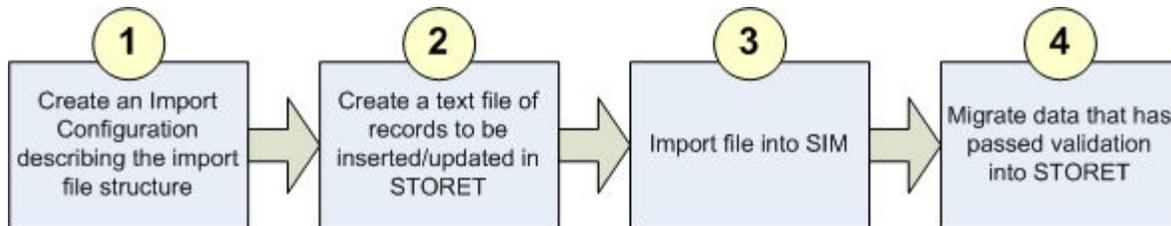
A Trip is an outing or sampling campaign for the purpose of monitoring environmental quality at one or more stations. Each trip must be given a unique Trip ID, which may be up to 15 characters long.

If the data provided in the import file isn’t already organized into Trips, SIM can automatically do this as the data is migrated to STORET. SIM has four choices regarding Trips:

1. *Read Existing Trip from Data File* – If this instruction is selected, the Trip ID must be provided in the import file. If a trip with this ID already exists in STORET, SIM will associate the new results with that trip and ignore any additional trip information provided in the data file. If the Trip does not exist, SIM will check to see if the Trip Name and Trip Start Date have been provided in the import file. If either value has not been provided, SIM will flag this import row and write an error to the error log. If both Trip Name and Trip Start Date have been provided in the import file, a new trip will be created using these values as well as the optional Trip Stop Date.
2. *One Trip per day* - a Trip will be generated for each day in which an Activity Start Date is given (the Trip will be named for that day, month and year, e.g. 07162006).
3. *One Trip per month* - a Trip will be generated for each month in which an Activity Start Date is given (the Trip will be named for that month and year, e.g. 072006).
4. *One Trip per year* - A Trip will be generated for each year in which an Activity Start Date is given (the Trip will be named for that year, e.g. 2006).

2.3 Inserting & Updating Data in STORET

The process for importing each of the supported file types into STORET is the same:

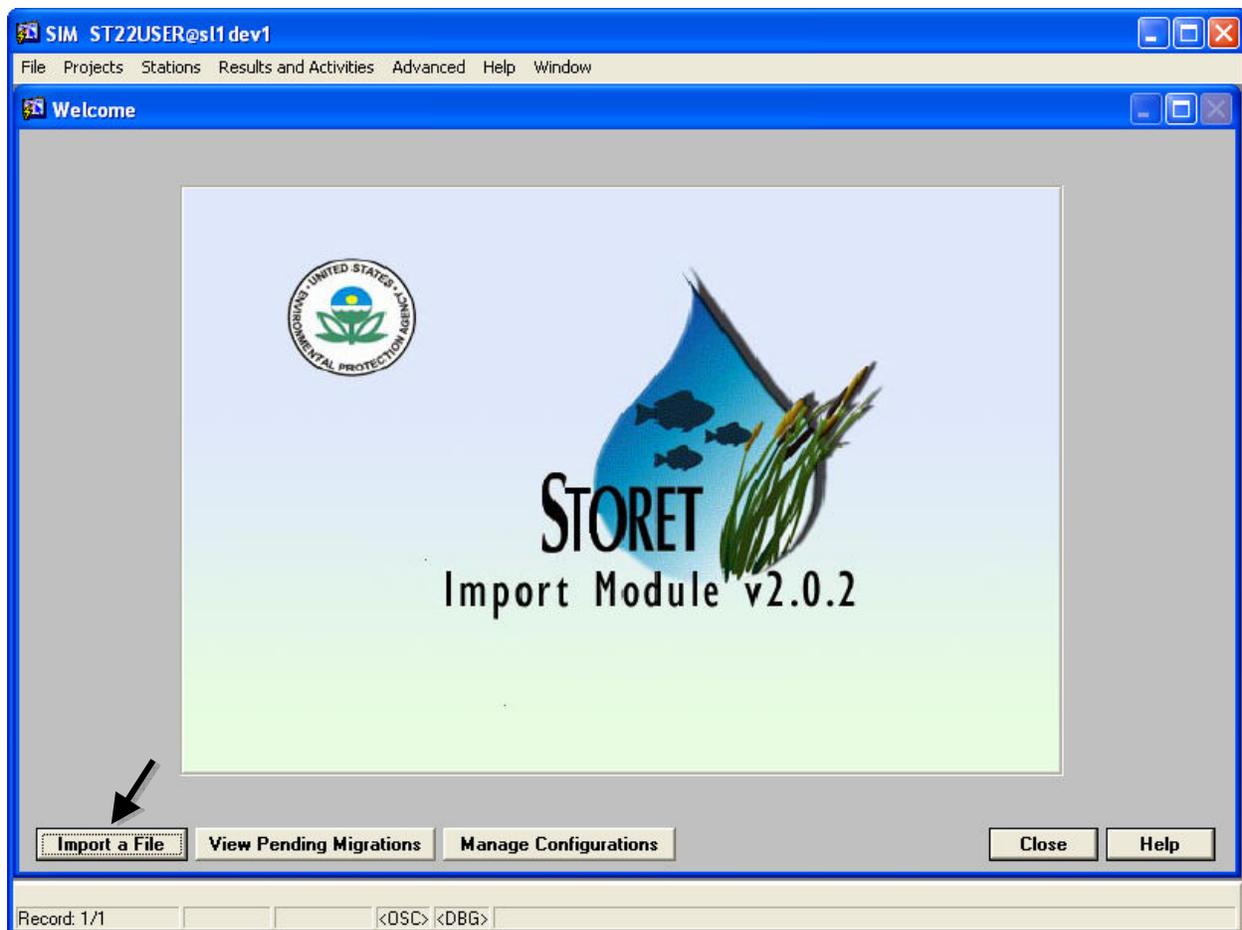


Once you have created your import file and have created a corresponding Import Configuration, you are ready to import your data.

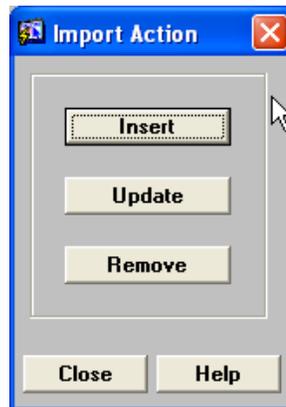
2.3.4 Importing Data Files

To import data files into SIM:

1. From the SIM Welcome window, click the “Import a File” button:

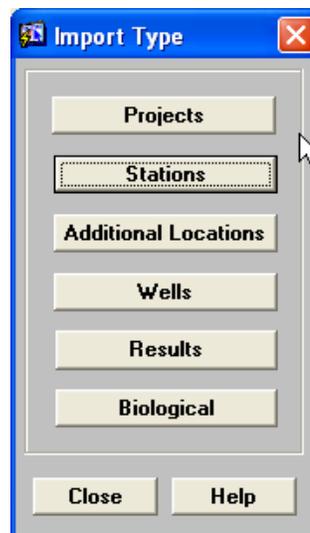


The Import Action window appears:

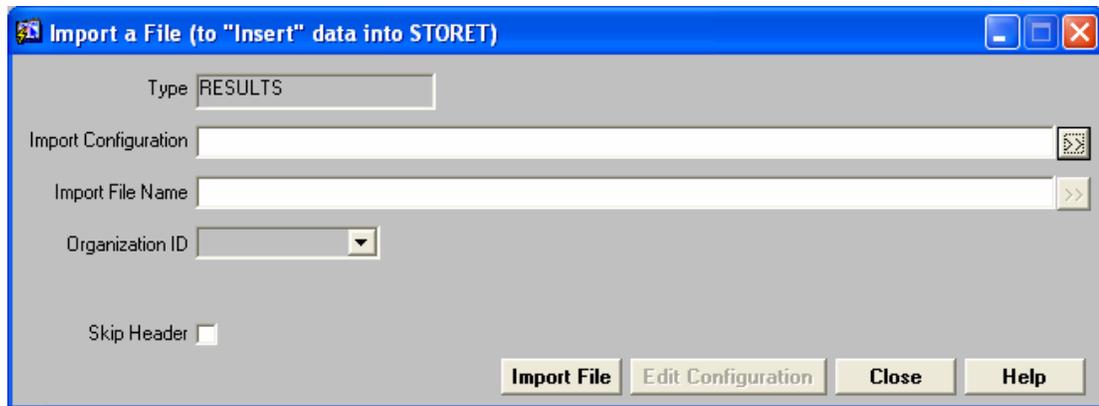


2. If the file you are importing contains new data that needs to be “Inserted” into STORET, then click the “Insert” button. If the file contains existing data you wish to update then press the “Update” button. If the file contains identifiers for data you wish to remove from STORET, then click the “Remove” button. For this example, click the “Insert” button.

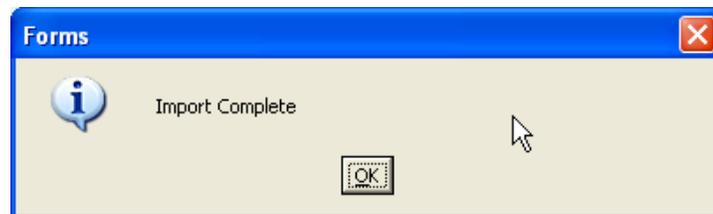
The Import Type window appears:



3. Click on the type of import you are performing. For this example, click the “Results” button. The Import File window appears:



4. Click on the “>>” next to the “Import Configuration” field to select an Import Configuration to use for this import. If you have rights to more than one organization, remember to pick the Import Configuration that corresponds to the organization this data should be attributed to.
5. Next, click on the “>>” button next to the “Import File” field to locate the file you wish to import. Initially the browse window filters the list of files to only those with a .txt extension. If you need to view all files, select “All Files (*.*)” from the “Files of type” drop-down list.
6. The Organization ID field displays the STORET Organization into which the selected data file is to be loaded. This field is automatically filled in by the system, based on the Organization identified in the selected import configuration. This field contains a drop down list of all Organization that you have been granted rights to (in STORET). The Organization can only be changed if you chose “Remove” on the Import Action window (see Step 2) because “Remove” files do not use Import Configurations.
7. If you need to view/edit the Import Configuration you selected you can do so from this window by clicking on the “Edit Configuration” button.
8. Check the “Skip Headers” checkbox if the first line of you import file contains column headers that you wish to skip. This checkbox will default to the setting in your Import Configuration, but you can override it for each import that you perform.
9. Once all the fields have been filled in, you are ready to import the file. Click on the “Import” button to initiate the import process. Once it has completed importing, you will see the following popup:



10. Next, you will be taken to the Import Status window to review the results of your import process. See the section “Viewing Import Status” for more information.

2.3.5 Updating Stations and Additional Locations

Update Stations enables you to do mass updates to Station data in STORET. The ability to update station information is particularly useful in updating location points when new technologies such as GPS allow for more accurate measurements.

The process of updating data is identical to the process of inserting data into STORET. See the “Importing Data Files” section for more information.

The following restrictions apply to updating data in STORET:

- You can update all Station columns except for the Station ID
- You can update all Additional Location columns except for the Station ID, Point Type and Sequence Number .
- Once an update has been migrated to STORET, it is final and cannot be undone. There is no equivalent to the “Delete Migration” feature that is available for Inserts (which undoes any changes to STORET).
- Updates cannot be performed on records that exist in SIM but have not yet been migrated to STORET.
- The Station Type cannot be changed for wells that have additional well information in STORET. If the Station Type were to change it would leave STORET in an invalid state.



A quick way to create an Import Configuration to be used to update data in STORET is by creating a copy of an Import Configuration for “Insert” and loading it as a configuration for “Update”. This is particularly useful if you have extensive translations that you want to preserve in the “Update” Configuration. See the following sections for more information: “Copying and Import Configuration”, “Loading an Import Configuration”

2.3.6 Viewing Pending Migrations

Once a file has been imported into SIM, one step remains before the process is complete: Migrating the data to STORET. Each file that has been imported, but has not yet been migrated, is added to the *Pending Migration List*. You can open the Pending Migrations window by:

1. Clicking on the “View Pending Migrations” button from the SIM Welcome window
2. Selecting the “Advanced” then the “Pending Migrations List” menu from the menu bar.

The Pending Migrations window appears:

Import ID	Import Date	Type	Org ID	File Name	Rows Imported	Errors
102313	04-26-2006	P	GOLDTS2	Example - Projects.txt	4	0
102314	04-26-2006	S	GOLDTS2	Example - Other Stations.txt	4	0
102315	04-27-2006	R	GOLDTS3	Example - Chemical Results with Characteristic Groups and Rows.txt	6	0

The list has the following columns:

Column	Description
Import ID	Unique ID assigned to each import that is performed in SIM.
Import Date	The date of the import
Type	Displays the type of data imported. The possible Types are: P Projects S Stations L Locations W Wells R Results B Biological
Org. ID	The Organization ID to be used when the data is migrated to STORET
File Name	The filename for the data file that was imported
Rows Imported	How many rows were imported
Errors	Displays the number of records imported into SIM that contain errors and cannot be migrated to STORET. For results imports, an error in one result record will raise errors in all other results for the same activity

After selecting the Pending Migration row you wish to act upon, click on one of the following buttons to explore further:

Status Button: Click to view the Import Status window. See the “Viewing Import Status” section below for more information.

Details Button: Click to view the Import Details window. This window will display all messages, warnings, and errors that were logged while importing this import file.

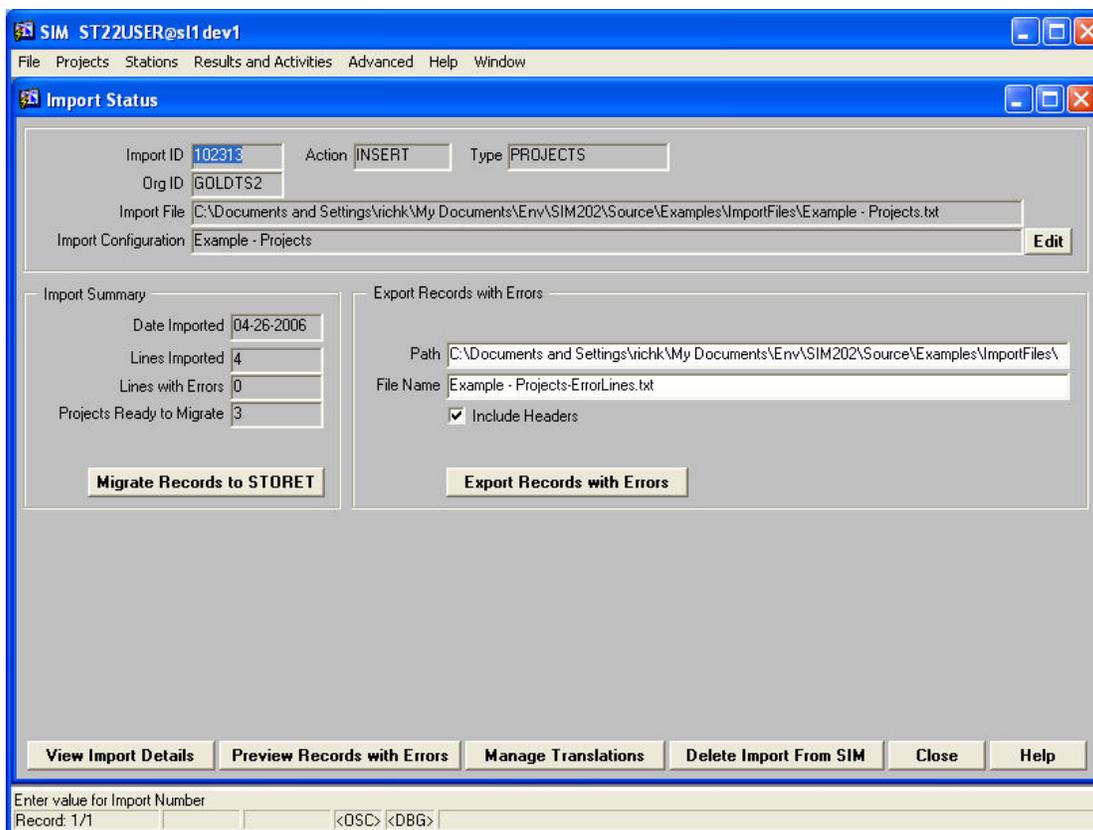
Once an import has been migrated to STORET it is removed from the Pending Migrations List and moved to the Migrations List. See “Viewing the Migrations List” section below for more information.

2.3.7 Viewing Import Status

You arrive at the Import Status window one of two ways:

- Complete a successful import of a text file
- Click the “Status” button on the Pending Migrations window.

The Import Status window appears:



The Import Status window gives you a summary of the import as well as the ability to:

- **Migrate Records to STORET**
Click this button to migrate the data into STORET. See the “Migrating Records to STORET” section for more information.

- **Export Records with Errors**
Click this button to create a new file, identical in structure to your import file, but with only the lines from the import file that did not import successfully. Once these records have been exported to a file, they will be deleted from SIM. The “Lines with Errors” field will be reset back to zero (now that the import is free of errors). See the “Export Records with Errors” section for more information.
- **View Import Details**
Click this button to view messages, warnings or errors that were logged while importing this file. This is particularly helpful to get more information on errors when the “Lines with Errors” field is greater than zero.
- **Preview Records with Errors**
Click this button to view a list of all records that had errors detected during this import. The list will be based on the type of import you performed. For example: if you performed a “Station” import, then the list will be a list of Stations with errors. You can double-click on an item in the list get more details.
- **Manage Translations**
Click this button to add, edit, or remove translations associated with the Import Configuration used with this import. See the *Using Translations* section for more information.
- **Delete Import from SIM**
Click this button to delete an import from SIM. The primary reason to delete an Import from SIM is because there were errors during the import process and you do not wish to migrate the data to STORET at this time.

2.3.8 Export Records with Errors

If errors occur during the import of a text file there are two general approaches you can take to proceed (once you’ve reviewed the errors):

- Delete the Import from SIM.
- Make corrections to the original import file
- Then import the entire file again.

OR...

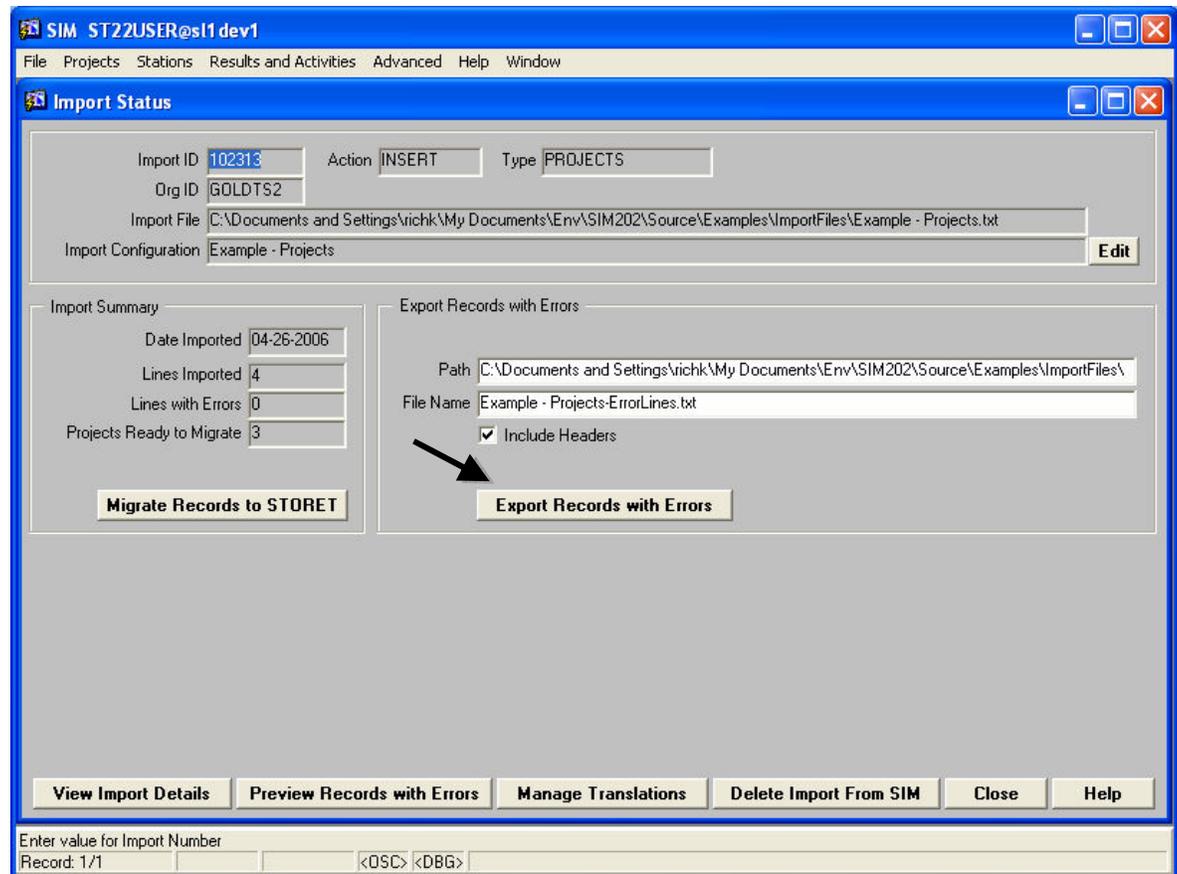
- Export Records with Errors
- Then proceed to migrate the data remaining to STORET.
- Make corrections to the Records with Errors
- Then import the corrected records again.

The choice between these two approaches may be simply a personal preference. In the case of very large import files with few errors it may save time to export the few lines with errors so that you can proceed with migrating the rest of the records to STORET. This way you won’t have to re-import the entire file again (which may take a fair amount of time).

To export records with errors:

1. Open the Import Status window for the appropriate import (see the “Viewing Import Status” section for more information).

The Import Status window appears:



2. Confirm that the “Path” and “File Name” are acceptable for the new file that will be created. If not, change them to something appropriate.
3. Select the “Include Headers” checkbox if you want the export file to include column headers on the first line of the file.
4. Click on the “Export Records with Errors” button. Once these records have been exported to a file, they will be deleted from SIM. Also, the “Lines with Errors” field will be reset to zero.
5. You may now migrate the remaining records to STORET. See the “Migrating Records to STORET” section below.
6. Then the text file created in steps 2-4 can be corrected and re-imported into SIM as a new import file.

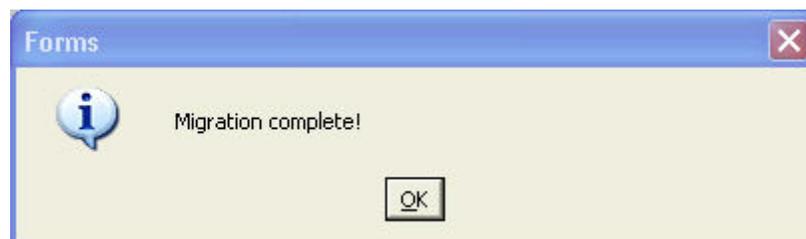
2.3.9 Migrating Records to STORET

Once you have imported your data file, reviewed any errors and exported any error records (if necessary), you are ready to migrate the data to STORET.

1. Open the Import Status window for the appropriate import (see the Viewing Import Status section for more information).

The Import Status window appears:

2. Click the “Migrate Records to STORET” button to migrate the records to STORET. Only records that are without error will be migrated to STORET. If you have records with errors, you will be warned that they will not be migrated and will be deleted from SIM.
3. A popup message will notify you once the migration process has completed.



4. Then the Import Status window will close.

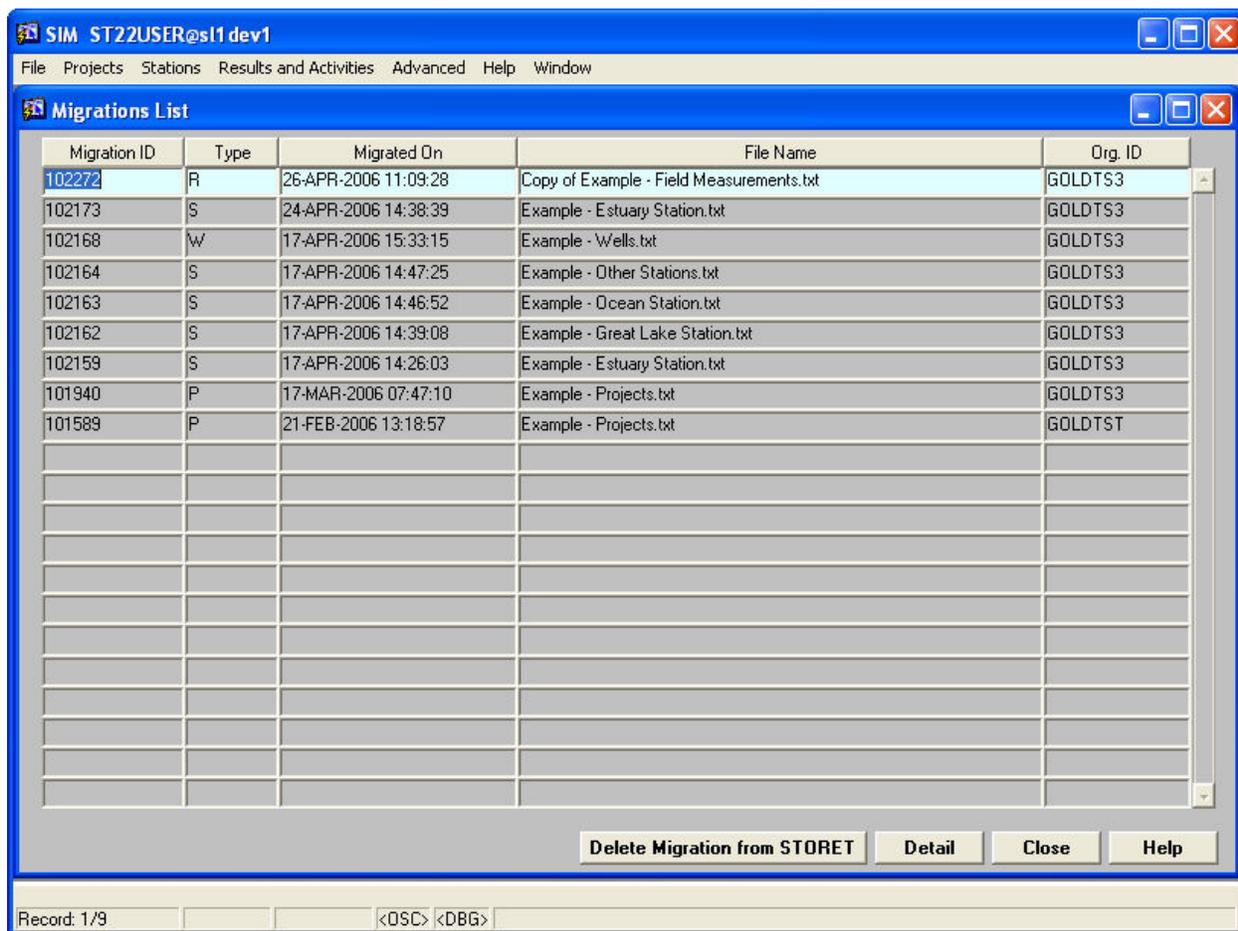
At this point all the data imported into SIM will have been deleted. Likewise, the import will have been removed from the Pending Migrations List and added to the Migrations List. The migrated records now exist in your STORET database and

can be accessed through either the STORET Data Entry Module or STORET Reports Module.

2.3.10 Viewing the Migrations List

Once a data file is migrated to STORET, a row representing it will be added to the Migrations List. The Migrations List serves as a summary of data files which have been migrated to STORET. It can also be used to remove the entire set of data from STORET which was imported from one import file.

You can open the Migrations List window by selecting “Advanced” then “Migrations List” from the menu bar.



The Migrations List has the following columns:

Column	Description
Migration ID	Unique Identifier for each Migration (SIM will use the same ID for the migration as was used for the import – i.e. Import ID)
Type	Displays the type of data migrated. The possible Types are: P Projects S Stations L Locations W Wells

Column	Description
	R Results B Biological
Migrated On	The date of the migration
File Name	The filename for the data file that was imported
Org. ID	The STORET Organization ID for which the migration was completed

2.4 Deleting Data from STORET

There are two ways to delete records from STORET:

1. Find a migration in the Migrations List and delete it
2. Import a text file to identify records to delete from STORET

2.4.4 Migrations List Deletion

If, after migrating data to STORET, you decide that you want to “undo” the migration, you can do so with the Migrations List. By deleting the migration from the Migration List you will also be removing all data from STORET that was part of that migration. Complete the following steps to delete an entire migration from STORET:

1. Open the Migrations List by selecting “Advanced” then “Migrations List” from the menu bar. The Migrations List window appears:

Records Found: the number of records that were part of the original migration that could still be found in STORET.

Records Not Found: the number of records that can no longer found in STORET.

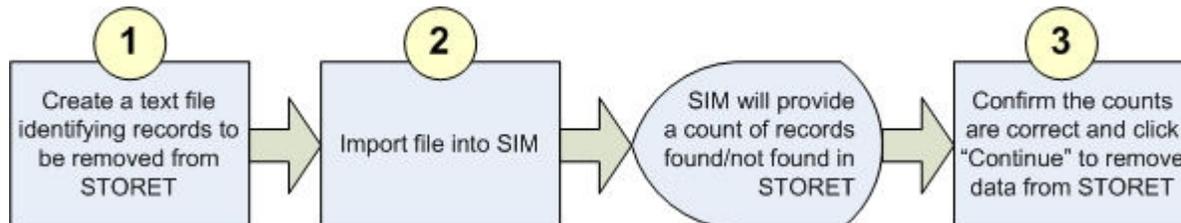
- If everything looks correct, then click the “Continue” button.
Another pop-up window will confirm that the deletion has completed successfully.



Remember that the removal process is permanent. Data is not pulled back into SIM. If you wish to restore the data into STORET you will need to re-import the original data file (or create a new one).

2.4.5 Remove by File

An alternate way to delete data from STORET is to remove records through the use of a text file. Removing by File involves the following steps:



- Create a text file. The import text file contains a list of identifiers that specify each record to remove from STORET. The number of fields required to identify a record depends on the type of data you wish to Delete. When more than one field is required to identify a record, you must separate each field with a delimiter. Valid delimiters include: pipe (|), tilde (~), comma (,) and tab.

The fields required (and the order they must be in) are outlined below:

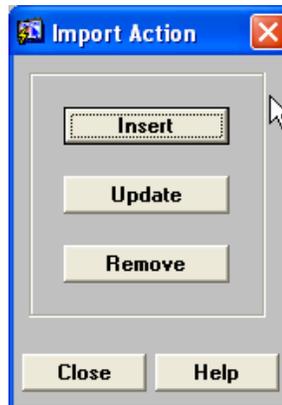
Type	Description	Key Fields
P	Project	<ul style="list-style-type: none"> Project ID
S	Station	<ul style="list-style-type: none"> Station ID
L	Location	<ul style="list-style-type: none"> Station ID Point Type Sequence Number
W	Well	<ul style="list-style-type: none"> Station ID Well Number
R B	Non-Biological Field Measurement Biological Field Measurement	<ul style="list-style-type: none"> Trip ID Station ID Station Visit Number Field Activity ID Replicate Number



It's important to note that individual results cannot be removed. Results are removed at the Activity level, so all the results for an activity will be removed.

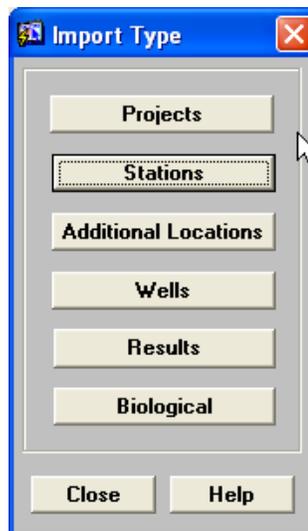
2. Once you have created the text file, you begin the “Remove” process by clicking on the “Import a File” button on the SIM Welcome window.

The Import Action window appears:



3. Click on the “Remove” button.

The Import Type window appears:



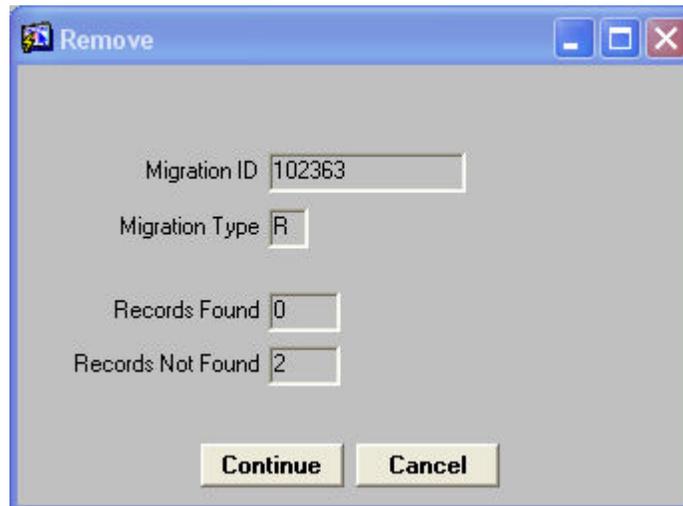
4. Click on the type of data that you wish to remove from STORET (e.g. “Results” for Non-biological Results).

The Import File window appears:



5. Use the “>>” button to pick the Import File Name.
6. Fill in the Organization ID and the delimiter you used in the file. The Delimiter field will not be visible if it is not required.
7. If the first line of the file contains header information, select the Skip Header checkbox.
8. Click on the “Import File” button.

The following popup window appears:



This window is useful to get a summary of the records that will be removed. The following counts are given:

Records Found: the number of records identified in the import file that could be found in STORET.

Records Not Found: the number of records that could not be found in STORET.

9. If everything looks correct, then click the “Continue” button.
Another popup window will confirm that the deletion has completed successfully

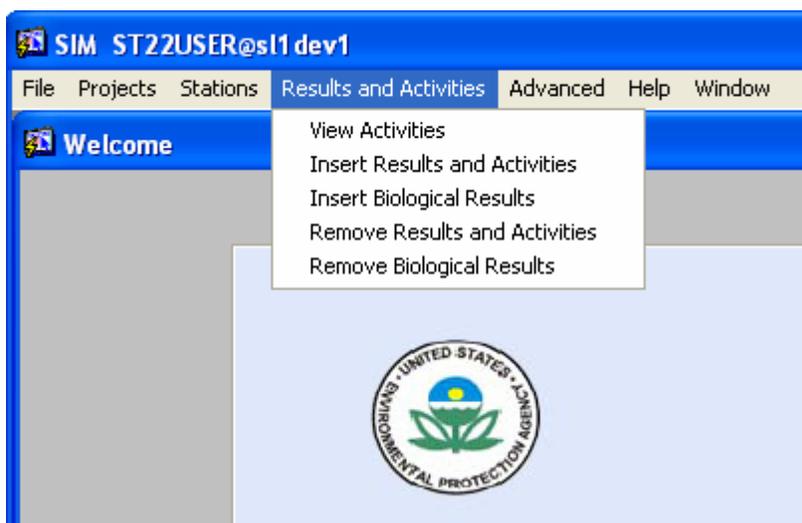


Remember that the removal process is permanent. Data is not pulled back into SIM. If you wish to restore the data into STORET you will need to import a new data file.

2.5 Projects, Stations, and Results Menus

2.5.4 Working with Results and Activities

SIM provides easy access to commonly used Results and Activities functionality in the “Results and Activities” menu, shown in the following graphic:



The following table summarizes each menu item and its function:

Menu Item	Description
View Activities	Provides a list of activities that have been imported into SIM. See the <i>Viewing Activities</i> section below for more information about this feature.
Insert Results and Activities	Jumps right to the window to allow you to import a file of Results (and Activities) data to be <u>inserted</u> into STORET.
Insert Biological Results	Jumps right to the window to allow you to import a file of Biological Results (and Activities) data to be <u>inserted</u> into STORET.
Remove Results and Activities	Jumps right to the window to allow you to import a file of Results (and Activities) data to be <u>removed</u> from STORET. See the <i>Remove by File</i> section for more information.
Remove Biological Results	Jumps right to the window to allow you to import a file of Biological Results (and Activities) data to be <u>removed</u> from STORET. See the <i>Remove by File</i> section for more information.

2.5.4.1 Viewing Activities

The Activity List window displays all activities imported into SIM.

To view the Activity List window:

1. Select the “Results and Activities” then “View Activities” menu from the menu bar. The Activities List window appears:

The screenshot shows the 'Activity Details' window in the SIM application. The window title is 'SIM ST22USER@sl1 dev1'. The menu bar includes 'File', 'Projects', 'Stations', 'Results and Activities', 'Advanced', 'Help', and 'Window'. The main area contains several sections of data entry fields:

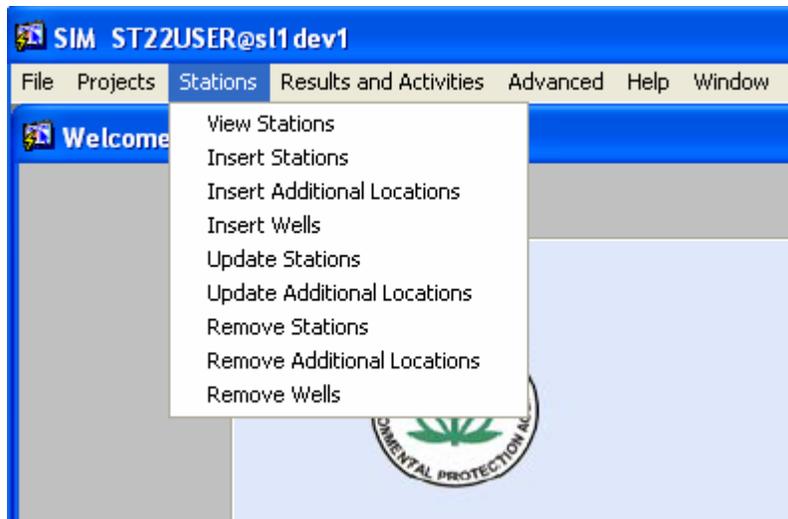
- Org ID:** GOLDTS3
- Trip ID:** 06-2006-1, **Monthly Sampling:** June 2006
- Station ID:** CBC-103, **Station Name:** Choptank River at Potte's Landing
- Visit Nbr.:** 1, **Arrive Date:** 06-20-2006
- Project Identification Code:** CBCP-015
- Cooperating Organization:** (empty)
- Activity Id:** SIMFLD1, **Type:** Field Msr/Obs, **Category:** Routine Habitat Assessment
- Start Date:** 06-20-2006, **Time:** 11:00 EDT
- Stop Date:** 06-20-2006, **Time:** 11:30 EDT
- Personnel:** Dr. Robert, **King**
- Status:** Approved

At the bottom, there are several buttons for navigating to different detail views: Results, Biological Result Groups, Import Errors, Activity Locations, Activity Depth, Activity Parents, Sample Collection Details, Trap/Net Details, and Trawl Details. There are also 'Invalidate', 'Close', and 'Help' buttons. The status is set to 'Approved'.

3. From the Activity Details window, you can:
 - View all activity information as it has been imported into SIM
 - View Results, Biological Result Groups, Activity Locations, Sample Collection, Trawl, or Trap and Net details by clicking on the appropriate buttons at the bottom of the window
 - The status of this activity (and any child activities) and related results can be set to “Not Ready” by clicking the “Invalidate” button. Any activities or results flagged as “Not Ready” will be excluded when migrating data to STORET. This is useful if you are using SIM to QC your data. If an activity is imported which meets all of the STORET data requirements, the status is set to “Approved” during the import process. If you choose to review the data prior to migrating it into STORET, you can now modify the record status for activities that do not pass your QC checks. This allows you to migrate to STORET all records that pass your QC checks and to export all those that do not to a text file for further review. See the “Export Records with Errors” for more information.

2.5.5 Working with Stations

SIM provides easy access to commonly used Station functionality in the “Stations” menu, shown in the following graphic:

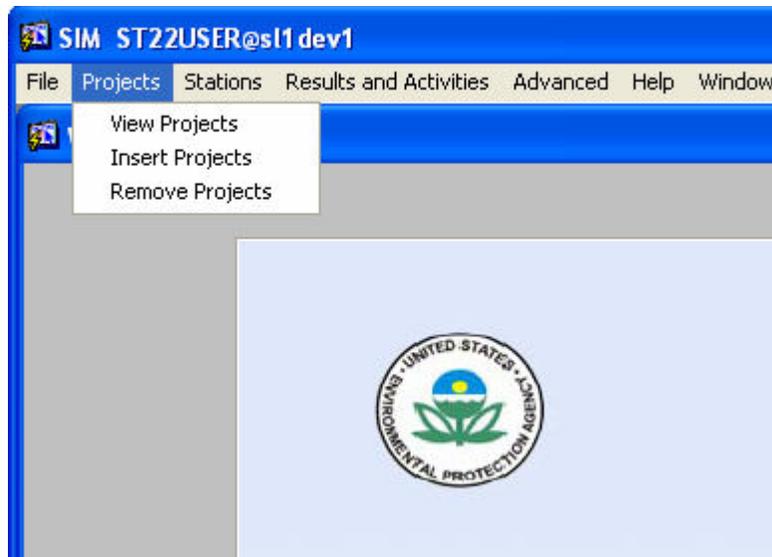


The following table summarizes each menu item and its function:

Menu Item	Description
View Stations	Opens the Stations List window which lists stations that have been imported into SIM. From this list you can click the “Detail” button for more information on a specific station.
Insert Stations	Jumps right to the window to allow you to import a file of Station data to be <u>inserted</u> into STORET.
Insert Additional Location	Jumps right to the window to allow you to import a file of Additional Location data to be <u>inserted</u> into STORET.
Insert Wells	Jumps right to the window to allow you to import a file of Well data to be <u>inserted</u> into STORET.
Update Stations	Jumps right to the window to allow you to import a file of Station data to be <u>updated</u> in STORET. See the <i>Updating Stations and Additional Locations</i> section below for more information.
Update Additional Locations	Jumps right to the window to allow you to import a file of Additional Location data to be <u>updated</u> in STORET. See the <i>Updating Stations and Additional Locations</i> section below for more information.
Remove Stations	Jumps right to the window to allow you to import a file of Station data to be <u>removed</u> from STORET. See the <i>Remove by File</i> section for more information.
Remove Additional Locations	Jumps right to the window to allow you to import a file of Additional Location data to be <u>removed</u> from STORET. See the <i>Remove by File</i> section for more information.
Remove Wells	Jumps right to the window to allow you to import a file of Well data to be <u>removed</u> from STORET. See the <i>Remove by File</i> section for more information.

2.5.6 Working with Projects

SIM provides easy access to commonly used Project functionality in the “Projects” menu, shown in the following graphic:



The following table summarizes each menu item and its function:

Menu Item	Description
View Projects	Provides a list of projects that have been imported to SIM. Also provides a “Detail” button that displays all projects information as it was imported into SIM.
Insert Projects	Jumps right to the window to allow you to import a file of Project data to be <u>inserted</u> into STORET.
Remove Projects	Jumps right to the window to allow you to import a file of Project data to be <u>removed</u> from STORET. See the <i>Remove by File</i> section for more information.

2.6 Hints on Specific Import Issues

2.6.4 Importing Habitat Assessments

SIM supports the migration of both system and user defined habitat assessments.

To import Habitat Assessments:

1. First create a Habitat Assessment Characteristic Group in STORET.
2. Include an activity type of “Field Msr/Obs” and an activity category of “Routine Habitat Assessment” or “Replicate Habitat Assessment” in the import file.
3. Include the Habitat Assessment Characteristic Group and Row IDs along with the appropriate result values in the import file.
4. Initiate the standard import process.



Habitat Assessment imports are differentiated from other imports in that they require the existence of a Characteristic Group and Row in STORET.

2.6.5 Importing Documents and Graphics

Document or graphic files can be imported into SIM and migrated to STORET for Projects, Stations, Station Visits, Activities, and Results. To add documents to your import:

1. In the Import Configuration window check the box to include the Document/Graphic column(s).
2. Place your documents in a specific directory that can be accessed by the database server. The directory is determined by the DOCUMENT_IMPORT_PATH setting in the Systems Settings window (accessible from the “Advanced” menu).
3. Include the complete file name (without the path) of each image in your import file.
4. Initiate the standard import process.

2.6.6 Using Composites with Parents

Composite with Parents data can be imported into SIM and migrated to STORET for either Chemical or Biological Results. To import composite with parents results:

1. Parent Activity samples must either be contained in the same data file as the Child records or must exist in STORET.
2. Add the Parent Sample ID column to the Import Configuration to be used when importing the Child samples.
3. Add all Parent Sample IDs to the import file separated by a “\” for each.
4. Initiate the standard import process.

2.6.7 Associating Cooperating Organizations

Multiple Cooperating Organizations can be associated with an Activity. To add cooperating organizations to your imports:

1. Add the Cooperating Organization column to your Import Configuration (applicable to Results type only)
2. Add Cooperating Organization to the import file.
3. If importing multiple cooperating organizations for an activity, use “\” to separate each.
4. Initiate the standard import process.

2.6.8 Associating Lab Remark Codes

Multiple Lab Remark Codes can be associated with a result. To add lab remark codes to your import:

1. Add the Lab Remark Code column to your Import Configuration (Results type only)
2. Add Lab Remark Codes to the import file.
3. If importing multiple lab remark codes for a result, use “\” to separate each.
4. Initiate the standard import process.

2.6.9 Importing Portable Data Loggers

Portable Data Logger (PDL) data can be imported into SIM and migrated to STORET. To import portable data logger results:

1. Add the new PDL Line Number and PDL Line Name columns to your Import Configuration.
2. Add the Data Logger Line Numbers and Line Names to your import file.
3. Set the Activity Type to “Field Msr/Obs” in the import file.
4. Set the Activity Category to “Portable Data Logger” in the import file.
5. Initiate the standard import process.

For a working example of loading PDL results, access the Portable Data Logger configurations and example files provided with the SIM application.

Section 3– Appendices

3.1 Appendix B: Listing of Available STORET Columns for Each File Type

This appendix lists columns that you can use in your import files and Import Configurations for Projects, Stations, and Results. The tables indicate which elements are required and whether you can enter specific values for each element.

3.1.1 Projects

The fields available to describe a project are outlined in the table below.

Req: R = required in STORET; C = Conditionally required, see description; O = Optional

Field Name	Req	Length	Acceptable Value	Description
Project ID	R	8	Freetext	A unique ID for the Project to which data will be assigned
Name	R	60	Freetext	A unique Name for the Project
Start Date	R	10	Defined Date Format	Date on which the Project (MM-DD-YYYY format) started
Duration	R	15	Freetext	Planned duration of the Project
Purpose	R	4000	Freetext	Project goals, expectations or why this data was collected
Document/Graphic	R	256	Freetext	Document or graphic associated with the project, must be present on the ftp site
Contact	O	4000	Freetext	Name, phone number and email of a contact for this project

3.1.2 Stations

The fields available to describe a station are summarized in the table below. Fields with asterisks have additional information given below the table.

Req: R = required in STORET; C = Conditionally required, see description

Field Name	Req	Length	Acceptable Value	Description
Station ID	R	15	Free text	Unique identifier for the station
Station Name		60	Free text	A geographically descriptive station name
Station Description		4000	Free text	Descriptive text about the station
Primary Type*	R	30	Allowable Values	Station's primary type
Secondary Type*	R	30	Allowable Values	Station's secondary type. Only Primary Types of Canal, Facility, or Wetland can have a Secondary Type.
Establishment Date		10	Defined Format	Date the station was established
Water Depth		8	Free text	Depth of Water at Station
Water Depth Units		2	Allowable Values	Water Depth Units. Required if Water Depth is given.
Document/Graphic		256	Free text	Document/Graphic File Name
EPA Key Identifier		36	Free text	EPA Key Identifier
Point Name		30	Free text	Point of Record Point Name
Latitude*	R	14	Defined Format	Latitude. See available format options.
Latitude Direction		1	Allowable Values	Latitude direction N or S; defaults to "N" if missing
Longitude*	R	15	Defined Format	Longitude. See available format options.

Appendix B: STORET Columns for Each File Type

Field Name	Req	Length	Acceptable Value	Description
Longitude Direction		1	Allowable Values	Longitude direction E or W; defaults to "W" if missing
Lat/Long Measurement Date		10	Defined Format	Lat/Long Measurement Date
Geopositioning Method*	R	3	Allowable Values	Method used to determine Lat/Long coordinates
Geopositioning Datum*	R	5	Allowable Values	Datum used to determine Lat/Long
Scale	C	20	Free text	Map Scale if GeoMeth = Interpolation-Map
State	C	2	Allowable Values	Postal abbreviation for Station's primary state
County		25	Allowable Values	Name or FIPS code for Station's primary county
HUC		8	Allowable Values	Station's 8-digit Hydrologic Unit Code
Ecoregion Name		60	Free text	Ecoregion Name
NRCS Watershed ID		8	Free text	NRCS Watershed ID (HUC 14)
Influence Area		120	Free text	Influence Area
Travel Directions		1999	Free text	Travel Directions
ZID Relation		2	Allowable Values	ZID Relation
Native American Land Name		40	Allowable Values	Native American Land Name
Native American Land State	C	2	Allowable Values	Native American Land State; required if Native American Land Name is given.
Elevation*		9	Free text	Station Elevation
Elevation Units*	C	2	Allowable Values	Units for Elevation; required if Elevation is given.
Elevation Method*	C	3	Allowable Values	Methodology used to determine Elevation; required if Elevation is given.
Elevation Datum*	C	6	Allowable Values	Datum from which elevation is measured; required if Elevation is given.
Elevation Measurement Date		10	Defined Format	Elevation Measurement Date
Ocean Name	C	15	Allowable Values	Ocean Name; required if Primary Type = Ocean
Shore Relation	C	10	Allowable Values	Shore Relation; required if Primary Type = Ocean
Additional Ocean Name		30	Free text	Additional Ocean Location Name
Ocean Station Dist to Shore		6	Free text	Ocean Station Distance to Shore
Ocean Station Dist to Shore Units		3	Allowable Values	Ocean Station Distance to Shore Units; required if Ocean Distance to Shore is given
Ocean Station Ref Point		30	Free text	Ocean Station Reference Point
Ocean Station Bottom Topography		254	Free text	Ocean Station Bottom Topography
Primary Estuary	C	30	Allowable Values	Primary Estuary; required if Primary Type = Estuary
Secondary Estuary		30	Allowable Values	Secondary Estuary
Primary Estuary State	C	40	Allowable Values	Estuary State; required if Primary Type = Estuary
Other Estuary		30	Free text	Other Estuary
Additional Estuary Name		30	Free text	Additional Estuary Location Name
Estuary Distance to Shore		6	Free text	Estuary Distance to Shore

Field Name	Req	Length	Acceptable Value	Description
Estuary Dist to Shore Units	C	3	Allowable Values	Estuary Distance to Shore Units; required if Estuary Distance to Shore is given
Estuary Reference Point		30	Free text	Estuary Reference Point
Great Lake	C	15	Allowable Values	Great Lake; required if Primary Type = Great Lake
Additional Great Lake Name		30	Free text	Additional Great Lake Location Name
Great Lake Dist to Shore		6	Free text	Great Lake Distance to Shore
Great Lake Dist to Shore Units	C	3	Allowable Values	Great Lake Distance to Shore Units; required if Great Lake Distance to Shore is given
Great Lake Reference Point		30	Free text	Great Lake Reference Point

The following sections summarize the more commonly used Station-related fields in STORET.

3.1.2.1 Primary Type/Secondary Type

A station's Primary Type refers to the principle designation of the station (e.g., river/stream, estuary, facility, etc.). All stations must have a Primary Type designation. Some Primary Types can be further classified with a Secondary Type designation. A Secondary Type is required/allowed only if a Primary Type of "Canal", "Facility", or "Wetland" is chosen. Below is a listing of all the valid Primary/Secondary Type designations in STORET:

Station Types - Natural	
Primary Type	Allowed Secondary Type
Cave	
Estuary	
Great Lake	
Lake	
Land	
Ocean	
River/Stream	
Spring	
Wetland	Estuarine, emergent
	Estuarine, forested
	Estuarine, scrub-shrub
	Lacustrine, emergent
	Palustrine, emergent
	Palustrine, forested
	Palustrine, moss-lichen
	Palustrine, shrub-scrub
Riverine, emergent	

Station Types – Non-natural	
Primary Type	Allowed Secondary Type
CERCLA Superfund Site	
Canal	Drainage
	Irrigation
	Transport
Channelized stream	
Combined sewer	
Constructed Wetland	
Facility	Industrial
	Municipal Sewage (POTW)
	Municipal Water Supply (PWS)
	Privately Owned non-industrial
	Other/combined
Gallery	
Land runoff	
Landfill	
Mine/mine discharge	
Reservoir	
Riverine impoundment	
Storm sewer	
Wastepit	
Waste sewer	
Well	

3.1.2.2 Latitude/Longitude

Every station must have valid lat/long coordinates in order to be migrated to STORET. Lat/Long coordinates must be reported in one of the following format options (spaces may be substituted for dashes between coordinate values):

Latitude	Longitude
DD-MM-SS.SSSS	DDD-MM-SS.SSSS
DD-MM.MMMM	DDD-MM.MMMM
DD.DDDDDDD	DDD.DDDDDDD
-DD.DDDDDDD	-DDD.DDDDDDD

3.1.2.3 Geopositioning Method

The Geopositioning Method field provides information on the method that was used to determine the geographic coordinates for a location point. Valid methods are taken from the official EPA Locational Data Policy. This field is required by STORET. The allowed values for Geopositioning Method have changed from STORET v1.2. In STORET v2.0, the Geopositioning Method needs to be one of the codes listed in the table below. In general, codes 016, 027, or 028 are most commonly employed.

Code	Description
001	Address Matching-House Number
002	Address Matching-Block Face
003	Address Matching-Street Centerline
004	Address Matching-Nearest Intersection
005	Address Matching-Primary Name
006	Address Matching-Digitized
007	Address Matching-Other
008	Census Block-1990-Centroid
009	Census Block/Group-1990-Centroid
010	Census Block/Tract-1990-Centroid
011	Census-Other
012	GPS Carrier Phase Static Relative Position
013	GPS Carrier Phase Kinematic Relative Position
014	GPS Code (Pseudo Range) Differential
015	GPS Code (Pseudo Range) Precise Position
016	GPS Code (Pseudo Range) Standard Position (SA Off)
017	GPS Code (Pseudo Range) Standard Position (SA On)
018	Interpolation-Map
019	Interpolation-Photo

Code	Description
020	Interpolation-Satellite
021	Interpolation-Other
022	Loran C
023	Public Land Survey-Quarter Section
024	Public Land Survey-Section
025	Classical Surveying Techniques
026	ZIP Code-Centroid
027	Unknown
028	GPS-Unspecified
029	GPS, with Canadian Active Control System
030	Interpolation - Digital Map Source (TIGER)
031	Interpolation-SPOT
032	Interpolation-MSS
033	Interpolation-TM
034	Public Land Survey-Eighth Section
035	Public Land Survey-Sixteenth Section
036	Public Land Survey-Footing
037	ZIP+4 Centroid
038	ZIP+2 Centroid

3.1.2.4 Geopositioning Datum

The Geopositioning Datum field assists in determining the accuracy of the lat/long measurements. The available datum types represent acknowledged standard reference schemes of known coordinates from which lat/long measurements may be taken. Valid datum types are taken from the official EPA Locational Data Policy. The Geopositioning Datum field is a mandatory field and needs to be one of the following codes:

Code	Description
AMSMA	American Samoa Datum
ASTRO	Midway Astro 1961
GUAM	Guam 1963
JHNSN	Johnson Island 1961
NAD27	North American Datum 1927
NAD83	North American Datum 1983
OLDHI	Old Hawaiian Datum

Code	Description
OTHER	Other
PR	Puerto Rico Datum
SGEOR	St. George Island Datum
SLAWR	St. Lawrence Island Datum
SPAUL	St. Paul Island Datum
UNKWN	Unknown
WAKE	Wake-Eniwetok 1960
WGS72	World Geodetic System 1972
WGS84	World Geodetic System 1984

3.1.2.5 Elevation, Elevation Units, Elevation Method, and Elevation Datum

Elevation and related information is optional in STORET and therefore not required. However, if you would like to include station elevation information then you must also provide values for Elevation Units of Measure, Elevation Method, and Elevation Datum. Below are tables showing the allowed STORET values for Elevation Method and Elevation Datum. Method codes 005 and 008 are most commonly employed while Datums NAVD88 and NGVD29 are most frequently used.

Code	Description
001	GPS Carrier Phase Static Relative Position
002	GPS Carrier Phase Kinematic Relative Position
003	GPS Code (Pseudo Range) Differential
004	GPS Code (Pseudo Range) Precise Position
005	GPS Code (Pseudo Range) Standard Position (SA Off)
006	GPS Code (Pseudo Range) Standard Position (SA On)
007	Classical Surveying Techniques
008	Other
009	Altimetry
010	Precise Leveling-Bench mark
011	Leveling-Non Bench Mark Control Points
012	Trigonometric Leveling
013	Photogrammetric
014	Topographic Map Interpolation

The following table gives the allowed values for elevation.

Code	Description
LTD	Local Tidal Datum
NAVD88	North American Vertical Datum of 1988
NGVD29	National Geodetic Vertical Datum of 1929
OTHER	Other
SEALV	Elevation From Mean Sea-Level
UNKNOWN	Unknown

3.1.3 Results

Below is a summary of the Result-related fields in STORET supported by SIM. Many of the fields must be present in a data file in order for the data to be migrated to STORET while other fields are optional. More information about some of the fields (denoted by an *) is given below the table.

Field Name	Req	Length	Acceptable Value	Comments
Trip ID	R	15	Freetext, Must Exist in STORET	A Trip is an outing for the purpose of monitoring environmental quality at one or more stations. Trips are sometimes called Sampling Campaigns. Each trip is given a unique Trip ID, which may be up to 15 characters long. If the data isn't already organized into Trips, SIM can automatically

Appendix B: STORET Columns for Each File Type

Field Name	Req	Length	Acceptable Value	Comments
				do this as the data is migrated to STORET. See the <i>Setting Import Configuration Instructions</i> section.
Trip Start Date		10	Defined Date Format	The date when the Trip began. This field is mandatory, however SIM can be configured to fill in this information automatically if it is not present in the data set.
Trip Stop Date		10	Defined Date Format	
Trip Name		60	Freetext	
Station ID	R	15	Must Exist in STORET	
Point Type		16	Allowable Values	
Sequence Number		4	STORET Table	
Well or Pipe ID		15	Freetext	
Additional Location Information		254	Freetext	
Station Visit Number	R	3	Freetext	A Station Visit is a stop at a particular station during a Trip for the purpose of making measurements, observations, or collecting samples. During a Visit, any number of measurement, observation, or sample collecting activities may occur. SIM can automatically organize data into Station Visits if this information is not already in the data set. See the <i>Setting Import Configuration Instructions</i> section.
Station Visit Arrival Date		10	Defined Date Format	
Visit Comments		4000	Freetext	
Visit Document/Graphic		256	Freetext	
Project ID	R	8	Must Exist in STORET (Multiple allowed, separated with “\”)	A Project ID is a required field and is used to identify the Project(s) supported by the sampling activity. More than one Project can be associated with an activity if desired. See the Projects section of this document for more information regarding how to set up a Project in STORET.
Activity ID	R	12	Freetext	See Endnote ⁱ
Medium	R	8	Allowable Values	See Endnote ⁱⁱ
Activity Type	R	15	Allowable Values	See Endnote ⁱⁱⁱ
Activity Category	C	30	Allowable Values	See Endnote ^{iv}
Trip QC Type		40	STORET Table	
QC Indicator		1	Allowable Values	
Sample Matrix		4	Allowable Values	
Chain of Custody ID		30	Freetext	
Replicate	C	3	Freetext	

Appendix B: STORET Columns for Each File Type

Field Name	Req	Length	Acceptable Value	Comments
Number				
Parent Sample ID		12	STORET Table	
Activity Start Date	R	10	Defined Date Format	
Activity Start Time		8	Defined Date Format	
Activity Start Time Zone	C	3	Allowable Values	
Activity End Date		10	Defined Date Format	
Activity End Time		8	Defined Time Format	
Activity End Time Zone	C	8	Defined Time Format	
Total Sample Weight		7	Freetext	
Total Sample Weight Units		10	Allowable Values	
Depth to Activity		8	Freetext	
Depth to Activity Units	C	2	Allowable Values	
Relative Depth		8	Allowable Values	
Depth Measured From		30	Freetext	
Lower Depth		8	Freetext	
Upper Depth		8	Freetext	
Upper/Lower Depth Units		2	Allowable Values	
Depth Zone Type		11	Allowable Values	
Thermocline		5	Allowable Values	
Pycnocline		5	Allowable Values	
Halocline		5	Allowable Values	
Personnel		256	STORET Table	
Cooperating Organization		60	STORET Table	
Activity Comments		254	Freetext	
Activity Document/Graphic		256	Freetext	
Sample Collection	C	8	Must Exist in	See Endnote ^v

Appendix B: STORET Columns for Each File Type

Field Name	Req	Length	Acceptable Value	Comments
Procedure ID			STORET	
Gear ID	C	30	Allowable Values	See Endnote ^{vi}
Gear Configuration ID		10	Must Exist in STORET	
Gear Deployment Comments		1999	Freetext	
Sample Preservation, Transport & Storage ID		10	Must Exist in STORET	
Sample Transport and Storage Comments		1999	Freetext	
Field Set Name		30	Freetext	
Field Set ID		10	Freetext	
Detection Condition		40	Allowable Values	
Characteristic Group ID	C	8	Must Exist in STORET	A characteristic is the attribute of the environment that is being investigated. For example, in an analysis for arsenic, the name of the characteristic is arsenic. Examples of other characteristics include chemicals, taxa, life stages, particle sizes, various lengths, volumes, masses, etc. All characteristics must have valid units of measure.
Characteristic Row ID	C	20	Must Exist in STORET	
Characteristic Name	C	60	Allowable Values	
Result Value	C	254	Allowable Values	
Result Value Units	C	10	Allowable Values	
Result Status		1	Allowable Values	Result values are either "Preliminary" or "Final". The field defaults to "Final." This attribute will be used for query purposes; once data is exported to the central STORET database, only "Final" values will be displayed.
Sample Fraction	C	15	Allowable Values	See Endnote ^{vii}
Statistic Type		18	Allowable Values	See Endnote ^{viii}
Value Type		11	Allowable Values	Defaults to "Actual". See Endnote ^{ix}
Precision		12	Freetext	
Confidence Level		8	Allowable Values	
Bias		12	Freetext	
CL Corrected for Bias		1	Allowable Values	

Appendix B: STORET Columns for Each File Type

Field Name	Req	Length	Acceptable Value	Comments
Duration Basis		8	Allowable Values	
Temperature Basis		8	Allowable Values	
Weight basis		12	Allowable Values	
Result Comment		4000	Freetext	
Result Document/Graphic		256	Freetext	
Laboratory ID		8	Must Exist in STORET	
Field/Lab Procedure	C	15	Must Exist in STORET	See Endnote ^x
Field/Lab Procedure Source	C	12	Allowable Values	
Laboratory Certified		1	Allowable Values	
Laboratory Batch ID		10	Freetext	
Lab Remark Codes		6	STORET Table	
Analysis Date		10	Defined Date Format	
Analysis Time		8	Defined Time Format	
Analysis Time Zone	C	3	Allowable Values	
Lab Sample Prep Procedure		15	STORET Table	
Lab Sample Prep Procedure Source		12	STORET Table	
Quantification Low		8	Freetext	See Endnote ^{xi}
Quantification High		8	Freetext	See Endnote ^{xi}
Detection Limit		8	Freetext	See Endnote ^{xi}
Detection Limit Unit*	C	8	Allowable Values	See Endnote ^{xi}
Detection Limit Comment		254	Freetext	
PDL Line Number		8	Freetext	
PDL Line		25	Freetext	

Field Name	Req	Length	Acceptable Value	Comments
Name				

3.1.4 Endnotes

3.1.4.1 ⁱ Activity ID

Each Activity (aka sampling event) completed during a Station Visit must be given an Activity ID in STORET.

There are several rules imposed by STORET that govern how an Activity ID can be assigned:

1. An Activity ID may be up to 12 characters long and it must be unique within a particular Station Visit.
2. Results that have been grouped together under one Activity ID must have the same Medium (water, air, etc.). If a sample of water and sediment from a stream was collected and analyses were run on both the sediment and the water, the results for the sediment portion of the sample would be required to have one Activity ID while the results of the water analyses would be required to have a different Activity ID.
3. All results that have been grouped together under one Activity ID must be of the same Activity Type. Results with an Activity Type of "Field Msr/Obs" may not have the same Activity ID as results that have an Activity Type of "Sample" even though both activities were conducted on the same station visit. Essentially each sample extracted during a station visit should get its own Activity ID, while other activities that have been classified as "Field Msr/Obs" occurring during the same station visit would use a different Activity ID.
4. All results that have been grouped together under one Activity ID must have the same Sample Collection Procedure. This is the procedure used to extract the sample from its environment.
5. Results that have been grouped together under one Activity ID must have the same Sample Preservation, Transport, and Storage Procedure (SPTSP) if it is desired to list an SPTSP (this field is optional). The SPTSP is the procedures used in handling the sample after it has been extracted.

For example, one sample may have been drawn so that a suite of metals analyses could be run on it while another sample may have been drawn so that a chlorophyll analysis could be run on it. A third sample may have been drawn so that biological/bacterial analyses could be drawn. In this case, all three samples would have a Activity Types of "Sample" but could have different Activity ID's since any one of the procedures mentioned in Rules #4 or #5 may be different.

3.1.4.2 ⁱⁱ Medium

The name of the matrix where the field activity occurred. Depending on the Activity Type and Category Type, this field is optional or required. See below for available Medium types and

Category Types that require a medium entry. The following Medium types are available in STORET:

Medium	Description
Air	Where the activity represents the air at the monitoring site.
Sediment	Where the activity represents the physical or chemical characteristics of sediment at the bottom of a water body.
Water	Where the activity represents the physical or chemical composition of water at the monitoring site.
Biological	Where the activity represents the biota (individual or community) at the monitoring site.
Soil	Where the activity represents soil at the monitoring site.
Other	Where the activity represents other characteristics at the monitoring site.

Activity Categories Which Require a Medium

Category Type	Medium Required
Routine Sample	Yes
Field Replicate	Yes
Composite With Parents	Yes
Measurement	No
Observation	No
Habitat	N/A
Depletion Replicate	Yes - Biological
Replicate Measurement	No
Created From Sample	Yes
Integrated Time Series	Yes
Integrated Flow Proportioned	Yes – Water
Integrated Horizontal Profile	Yes – Water
Integrated Vertical Profile	Yes – Water
Composite without Parents	Yes

3.1.4.3 ⁱⁱⁱ Activity Type (Chars Worksheet - Msr/ObsOrSample column)

Field Activities (aka "Sampling Events", "Sampling Activities", or just "Activities") are performed during a Station Visit to evaluate conditions in the environment. Activities consist of samples, field measurements, and observations made on-site. *Sample* collection involves extracting an physical sample of the item of interest from its environmental setting using some type of sampling equipment. *Field Measurements* involve measuring the item of interest in situ, usually using some type of equipment. For example, measuring the water temperature of a river by placing the measuring device into the river itself, rather than extracting a bucketful of water and taking the temperature of the sample is an example of a Field Measurement. *Observations* involve observing the item of interest in its environmental setting usually without using any type of equipment. Recording the flow rate of a stream in qualitative terms such as "dry", "flooding", "normal", etc. would be an example of an Observation. The Activity Type field is a mandatory field and must be one of the three following values:

Activity Type Allowed Values

Allowable Value	Description
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Appendix B: STORET Columns for Each File Type

Field Msr/Obs	Field Measurements refer to those activities conducted in the field, usually involving the use of instruments of some sort that produce environmental results without the creation of samples. Examples include flow measurements, water temperature measurements, and probe measurements (e.g., pH, dissolved oxygen, etc.). Field Observations refer to those activities conducted in the field without the use of instruments; they usually involve the judgment of an observer at some level. Observations produce results without the creation of samples. Examples include habitat evaluations, certain meteorological observations, and general observations about conditions at a station.
Sample	A sample is material collected at the station and taken elsewhere for analysis and evaluation. Examples include water samples, sediment samples, and biological samples, among others. Samples may be created from other samples by either subsetting (Created from Sample) or compositing (Composite with Parents).
Trip QC	An uncontaminated sample matrix spiked with known amounts of analytes from a source independent of the calibration standards. It is generally used to establish intra-laboratory or analyst-specific precision and bias to assess the performance of all or a portion of the measurement system.

3.1.4.4 ^{iv} Activity Category

A descriptor that further distinguishes between the different kinds of samples for a given Activity Type. This field is required by STORET and can be one of the following value depending upon the Activity Type designation:

Allowable Activity Categories When Activity Type = "Field Msr/Obs"

Activity Category	Activity Category Description
Routine Msr/Obs	<i>Measurements</i> involve something measured in its environmental setting usually using some type of equipment. <i>Observations</i> are made by people, usually without the use of equipment, and are frequently qualitative.
Automated Measurement	Measurement made in the field by an automated data logging device, running unattended and producing a suite of data values at repeating intervals set by its owner/operator.
Field Calibration Check	
Portable Data Logger	
Replicate Habitat Assessment	An evaluation of a habitat, repeating an earlier evaluation, used to confirm or assure the previous results.
Replicate Msr/Obs	A measurement "twinned" to another measurement with respect to a field protocol, procedure, etc. Used to confirm/assure measurement results.
Routine Habitat Assessment	A field activity conducted to evaluate a habitat, according to an organization's pre-defined habitat assessment scheme.

Allowable Activity Categories When Activity Type = "Sample"

Activity Category	Activity Category Description
Routine Sample	A sample gathered using straightforward "grab" procedures for purposes of a general evaluation of the environment at the site.
Composite w/o Parents	Describes a sample which is a composite of either several discrete sampling events not described elsewhere, or is a sample collected by a continuous process over some time period. No database record exists as its parent.
Composite with Parents	A sample created by combining two or more "parent" samples may only contribute to such a composite sample once. They are "consumed" by the compositing process.
Created from Sample	This is used when a sample is "created" from another sample. For example, a liver is taken from a fish, or a 100 ml specimen can be drawn from a 500 ml sample.
Depletion Replicate	A sample which is part of a sampling method described as "depletion sampling". It is used to obtain an accurate estimate of the population of a species by observing successive samples which show decreasing numbers.
Field Ambient Conditions Blank	
Field Blank	
Field Equipment Rinsate Blank	
Field Replicate/Duplicate	A sample "twinned" to another sample with respect to procedures, medium, and tools used. Used to confirm or assure sample results.

Field Spike	A "spiked" sample, whose concentration(s) of one or more contaminants have been intentionally increased by a known amount, through the (secret) addition of material to the sample.
Field Split	
Field Subsample	
Field Surrogate Spike	
Integrated Cross-Sectional Profile	
Integrated Flow Proportioned	A sample integrated over an interval or space within which changes in flow are used to alter the proportion of the sampled medium contributing to the integrated sample.
Integrated Horizontal Profile	A discrete/integrated sample, usually derived from a continuous record, representing some portion or segment of a horizontal track within the study area.
Integrated Time Series	A discrete/integrated sample, usually derived from a continuous record, representing some portion or segment of elapsed time within the overall activity duration or sample period.
Integrated Vertical Profile	A discrete/integrated sample, usually derived from a continuous record, representing some portion or segment of a vertical track within the study area.

Allowable Activity Categories When Activity Type = "Trip QC"

Activity Category	Activity Category Description
Ship Container Temp Blk	
Trip Blank	This sample is prepared by putting analyte-free/organic-free water in the container and then adding preservatives and/or reagents. The sample thus prepared accompanies other samples collected on the Trip.
Trip Bottle Blank	
Trip Calibration Blank	
Trip Control Blank	
Trip Equipment Blank	Equipment field blanks are defined as samples which are obtained by running organic-free water over/through sample collection equipment after it has been cleaned.
Trip Field Spike	Organic-free water is taken to the field in sealed containers and poured into the appropriate sample containers at pre-designated locations.
Trip Perform Eval Sample	Self Describing
Trip Post-Preserv Blk	This sample is prepared by putting analyte-free/organic-free water in the container and then adding preservatives.
Trip Pre-Preserv Blk	This sample is prepared by putting analyte-free/organic-free water in the container without adding preservatives.
Trip Reagent Blank	This sample is prepared by putting analyte-free/organic-free water in the container and then adding preservatives and/or reagents.

3.1.4.5 *Sample Collection Procedure (SCP)*

A sample collection procedure is used to describe the methodology used to extract the sample from its environment. These procedures are used in the field to collect samples, measurements, and/or observations. STORET requires a Sample Collection Procedure for all activities whose Activity Type is "Sample". Activities with an Activity Type of "Field Msr/Obs" do not involve taking a physical sample and thus do not allow a Sample Collection Procedure.

An organization can have an unlimited number of sample collection procedures but at a minimum, at least one SCP must be defined. To create a sample collection procedure, you must provide the following information:

1. A *Sample Collection Procedure ID* (max length of 10 characters) that is unique within the organization's list of sample collection/creation procedures.
2. A *procedure name* which simply serves as a brief description of the procedure.
3. (Optional) Additionally, you can associate the procedure with a *gear type*, a *bibliographic citation*, and provide a *description of the procedure*. For more on gear

types please see the "Gear Type" section below. For the Citation field, an organization can either cite a publication from the list of 373 pre-defined citations (i.e. National Citations) in STORET or an in-house publication (an Organizational Citation) if one exists, for example, "<Organization Name> Official Field and Lab Analytical Procedures Manual". That same Citation can then be used to create other Organizational Analytical Procedures if desired. To create an Organizational Citation, the following information is needed:

- i. *Citation Title* - serves as the official name of the publication cited; up to 120 characters long.
- ii. The *Name(s) of Author(s)* of the publication being cited; up to 120 characters long.
- iii. The *Publishing Organization's Name* that issued the publication being cited; up to 120 characters long.
- iv. The *Publication Year* - the copyright year of the publication being cited.
- v. The *Volume and Page Number* within the literature cited that apply to the data supported by the citation.
- vi. (Optional) *Comments* - any additional text concerning the citation; up to 256 characters.

Frequently an organization will define one generic sample collection procedure (e.g., STANDSCP, - Standard Collection Procedure) and use that generic procedure for all characteristics which require a sample collection procedure. This allows data to be migrated even if a procedure for a specific characteristic is unknown. One drawback, however, is that the generality of the procedure doesn't provide much useful information for future end-users of the data. Therefore, you can create sample collection procedures for each characteristic (or for several characteristics) if you like. To do so, you'll need to provide the information itemized above.

Below are some example definitions of Sample Collection Procedures. Shaded columns are optional information while the others are required.

Example Table: Sample Collection Procedure Definition

ID	Procedure Name	Gear Type	Citation	Description
GRAB	Water Grab Sample Collection Procedure	<none>	Sampling Specialists Inc; 2002; Water Grab Sampling Procedure Manual; Sampling Specialists Inc; pp180	Standard Sample Collection Procedure for water samples analyzed in the laboratory. Bottle is rinsed 3 times before collection.
SED	Sediment Sampling	Benthic Grab	J. Smith; 1987; Sampling for Fun and Profit; University of Ohio Press; pp 589	Enough sediment is collected to support three analyses: chemistry, grain size, and biological.

Example Table: Citation Definition

Citation Title	Author(s) Name	Publication Year	Publishing Organization	Volume and Page Number
Water Grab Sampling Procedure Manual	Sampling Specialists Inc	1987	Sampling Specialists Inc	pp 589

3.1.4.6 ^{vi} Gear ID

A *gear type* describes the tool(s) that is usually used to extract the sample or produce it. A gear type is not required in order to define a Sample Collection Procedure, it is simply used to provide more information about the procedure. If desired, choose from the following gear types:

1. **Trap/Substrate** - Devices designed to be deployed in an aquatic environment and later retrieved and examined for the presence of organisms either captured by or attached to the device. Substrates are usually designed to simulate desirable habitat for benthic (bottom dwelling) animals, and organisms "adopt" the device voluntarily. Traps usually imply non-voluntary presence of the organism.
2. **Water Sampler** - Devices that admit water into some kind of container, from which the water is later decanted for analysis. Various tubes, bottles, and bags fall into this category.
3. **Net/Vertical Tow** - Devices constructed mainly of netting designed to be drawn vertically through the water column to capture animals (usually fish, or more frequently, plankton). One kind is more commonly called "vertical plankton net".
4. **Benthic Dredge** - Devices that dredge sediment from the bottom or benthic zone.
5. **Benthic Corer** - Devices that extract cylindrical core samples from the bottom sediment (benthic zone).
6. **Net/Non-Tow** - Devices constructed mainly of netting designed to capture aquatic animals (usually fish) by a deployment and retrieval of the net device.
7. **Net/Horizontal Tow** - Devices constructed mainly of netting that is designed to be trawled or towed from a vessel over a horizontal track, as the vessel moves. Also called "trawls".
8. **Benthic Grab** - Devices that extract a specimen of bottom sediment in a single cut or grab operation.
9. **Electroshock** - Devices that employ electric current to stun or kill animals in the stream (typically fish) to facilitate their collection.
10. **Miscellaneous/Other** - Devices not covered in any of the other categories. Examples include poisons, sport fishing gear, dynamite, cameras, and visual sightings.

3.1.4.7 ^{vii} Sample Fraction

When Results are obtained from a physically-partitioned sample, a Sample Fraction must be provided. A Sample Fraction is a result-level attribute and denotes which portion of a sample is associated with a Result. Below are all the valid Sample Fractions allowed by STORET:

Sample Fraction	Description
Total	The total of all fractions of an analyte.
Dissolved	The result-producing portion of the analyte is found in a liquid medium
Vapor	The result-producing portion of the analyte exists in a gaseous state

Comb Available	Combined Available
Free Available	Free Available
Total Recovrble	Total Recovrble
Total Residual	Total Residual
Filterable	The result-producing portion of the analyte is extracted from the liquid medium by filtration.
Non-Filterable	The result-producing portion of the analyte is in or absorbed to material that passes through the filter during the process of sample filtration.
Acid Soluble	The result-producing portion of the analyte becomes dissolved within the sample following treatment with an appropriate acid.
Suspended	The result-producing portion of the analyte is suspended in the sample medium, either as, or absorbed to, particles that are more or less uniformly dispersed within the medium.
Settleable	The result-producing portion of the analyte is found either in or absorbed to that part of the sample that has fallen or settled (i.e., fallen out of suspension) to the bottom of the sample container.
Non-Settleable	The result-producing portion of the analyte is in or absorbed to particles that remain in suspension in the sample container.
Supernate	The result-producing portion of the analyte is found in the liquid layer above a precipitate produced from a solution of a liquid.
Fixed	The result-producing portion of the analyte is found in the liquid layer above a precipitate produced from the sample.
Volatile	The result-producing portion of the analyte evaporates readily at normal pressures and temperatures.
Non-Volatile	The result-producing portion of the analyte is in a liquid or solid state under normal temperature and pressure.
Pot. Dissolved	Potentially Dissolved

3.1.4.8 ^{viii} *Statistic Type*

The statistic or calculation type that best describes how the result is reported.

Allowed Value	Description
Mean	The arithmetic average of a set of numbers or measurements.
Maximum	Denotes the numerical result of largest value.
Median	In an ordered set of numbers, the most central value or the middle value.
Mode	In a set of results or measurements, that value which occurs most frequently.
Minimum	Denotes the numerical result with the smallest value.
Standard Deviation	A measure of the dispersion of a set of results or measurements. Mathematically, the square root of the arithmetic average of the squares of the individual deviations from the arithmetic mean, or the square root of the variance.
MPN	Most Probable Number. A result predicted, rather than measured, by the method employed. Usually applied to counts of colony forming units like bacteria or algae.
5 pctl	5 th percentile.
10 pctl	10 th percentile.
15 pctl	15 th percentile.
20 pctl	20 th percentile.
25 pctl	25 th percentile.
75 pctl	75 th percentile.
80 pctl	80 th percentile.
85 pctl	85 th percentile.
90 pctl	90 th percentile.
95 pctl	95 th percentile.
<Blank>	Use to clear the field or convey the meaning of "simple result".

3.1.4.9 ^{ix} Value Type

This field provides information about the process that was used in the determination of the result value (e.g., actual measurement, estimation, etc.). The table below summarizes the allowed values for this field:

Allowed Value
Actual
Calculated
Estimated

3.1.4.10 ^x Field/Lab Procedure

Result-level information that denotes the methodologies used in the field and/or lab to generate numeric values (Results) for a particular Characteristic. Some Characteristics must have a valid Field/Lab Analytical Procedure specified while for other Characteristics this information is optional.

An organization can describe its own Analytical Procedures (known as Organizational Analytical Procedures) or it can adopt a comparable National Procedure from the list of National Analytical Procedures. Creating Organizational Lab Procedures allows custom Analytical Procedures to be defined which may more accurately describe the actual methods used to determine a Result than a pre-defined National Procedure.

To create an Organizational Field/Lab Analytical Procedure, the following information must be provided:

2. A unique *Procedure ID*. The Procedure ID can be no more than 15 characters long.
3. A *Procedure Name* which simply serves as a brief description of the procedure
4. A *Procedure Citation* which is a bibliographic reference that is cited to provide additional information concerning an organization's procedures and methods. For the Citation field, an organization can either cite a publication from the list of 373 pre-defined citations in STORET or an in-house publication if one exists, for example, "Official Lab Procedures Manual". That same Citation can then be used to create other Organizational Analytical Procedures if desired. To create a Citation, the following information is needed:
 - i. *Citation Title* - serves as the official name of the publication cited; up to 120 characters long.
 - ii. The *Name(s) of Author(s)* of the publication being cited; up to 120 characters long.
 - iii. The *Publishing Organization's Name* that issued the publication being cited; up to 120 characters long.
 - iv. The *Publication Year* - the copyright year of the publication being cited.
 - v. The *Volume and Page Number* within the literature cited that apply to the data supported by the citation.
 - vi. (Optional) *Comments* - any additional text concerning the citation; up to 256 characters.

5. (Optional) You can also select a piece of *Analytical Equipment* which is the primary piece of equipment used to determine a result value for the target characteristic(s) during an analytical procedure. If you choose to include analytical equipment as part of the procedure, it must be chosen from a list of STORET allowed-values for equipment.
6. (Optional) *Comparable National Procedure* - list a National Procedure that is similar to the one being defined.

Below is an example of a Field/Lab Analytical Procedure definition. Shaded columns contain optional information while the others are required.

Example Table: Field/Lab Analytical Procedure Definition

ID	Procedure Name	Citation	Analytical Equipment	Comparable National Procedure
DO-01	Method for Determination of Dissolved Oxygen, Probe	Commission for a Clean Chesapeake Bay; 1991; Standard Lab Analytical Procedures for Water Monitoring; Virginia Beach Press; 290 pp		HACH 8157 - Dissolved Oxygen in Water

Below is a description of the Citation referenced in the Field/Lab Analytical Procedure description above. All columns are required in order to completely describe a citation.

Example Table: Citation Definition

Citation Title	Author(s) Name	Publication Year	Publishing Organization	Volume and Page Number
Standard Lab Analytical Procedures for Water Monitoring	Commission for a Clean Chesapeake Bay	1991	Virginia Beach Press	Vol 1, pp 290

3.1.4.11 ^{xi} Detection Limit, Quantification Low, Quantification High, Detection Limit Unit

Detection Limit refers to the least (but not necessarily quantifiable) amount of the target substance that could be detected by the instrument or analytical process that was used to determine the result. Above this value, the target substance is presumed to be present. *Quantification Low* and *Quantification High* refer to the limits of an instrument or analytical process when detecting and/or quantifying a substance associated with a result value. The *Quantification High* represents the largest amount of the target substance that could be quantified by the instrument or analytical process while the *Quantification Low* represents the smallest amount. Values above the minimum and below the maximum quantification limits are reported as valid numeric results.

When a result is entered in STORET, it is associated with a Detection Condition. The default Detection Condition is "Detected and Quantified" and most Results fall into this category. The following table summarizes all the available Detection Conditions:

Detection Condition	Value Displayed in Result Value Field
Detected and Quantified (default condition)	Original Result Value
Detected, not Quantified	*Present
Present, above Quantification Limit	*Present, >QL
Not Detected	*Non-detect
Present, below Quantification Limit	*Present, <QL