

Version

3.2

STATE HYGIENIC LABORATORY AT THE UNIVERSITY OF IOWA

OpenELIS Manual

STATE HYGIENIC LABORATORY AT THE UNIVERSITY OF IOWA

OPENELIS MANUAL

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OpenELIS

OpenELIS is a robust Enterprise Laboratory Information System built around an extensible and scalable framework. OpenELIS is designed and developed through the collaborative efforts of Public Health Laboratories to accommodate business processes that are common to all public health laboratories; encompassing clinical, environmental, newborn screening, and animal testing.

The goal of the OpenELIS team is to develop a state of the art system that is economically sustainable by reducing both initial investment and ongoing maintenance costs. By using an open source approach, we ensure that the project will continue to evolve and meet the changing needs of the community.

CHAPTER 1 ACCESSING OPENELIS

This manual is organized into two main sections: (1) basic components of the OpenELIS database for new users, such as login, logout, screen elements (fields, buttons, icons, etc.), and how to do a general query, and (2) chapters about specific screens for data entry and analysts. It is recommended that new users first familiarize themselves with the screens relevant to their duties, using the beginning chapter on screen elements as a resource and reference.

We predict this manual will serve two main audiences: new users who need a general overview of the OpenELIS database to supplement their section-specific training and users who need to refer to specific tasks or terms in the manual.

1.1 LOGIN AND LOGOUT

OpenELIS is an application that is accessed through a secure web page. To login to OpenELIS open a compliant web browser and enter your laboratory's designated url.

The following screen should appear in the browser. This is the login screen. Enter your username and password to login to the application. Click on Sign In or press the Enter key.



Figure 1 Login Screen

Once you are logged in to the application you will see the Main Screen, or home screen, with the main menu at the top. It is important to logout of the OpenELIS database after each use, due to patient/client confidentiality. The Logout option is found at the bottom of the Application Menu.

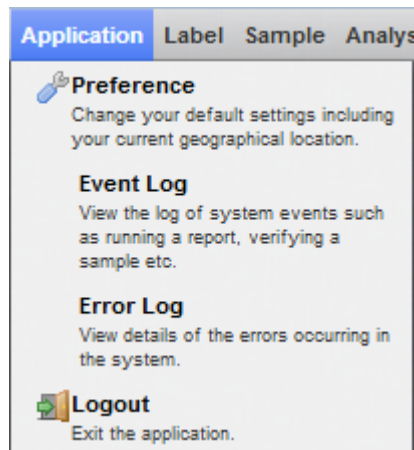


Figure 2 Application Menu

1.2 MAIN MENU

The Main Menu bar can be found at the top of the home screen. The major sections of the main menu consist of Application, Label, Sample, Analysis, Inventory/Order, Report, and Maintenance menus. Use the Main Menu to access all of the modules by expanding each section and clicking on the desired one.

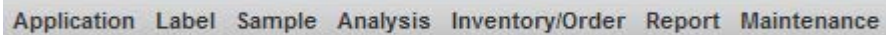


Figure 3 Main Menu

1.3 PREFERENCES

The Preference screen allows the user to change her default settings including her current geographical location. The user's default printer, default bar code printer, and location (e.g., Ankeny, Iowa City, or Lakeside) can be set on this screen. There are dropdown lists for each of these settings. Click the **OK** button to confirm these selections.

The link to the Preference screen is located in the [Application Menu](#).

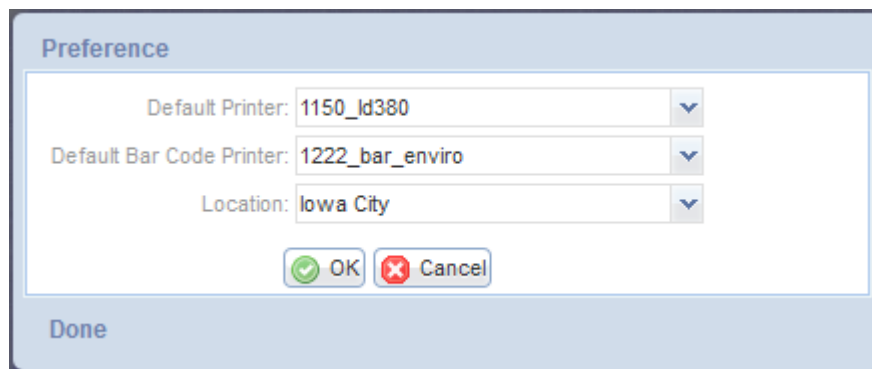


Figure 4 Preference Screen

1.4 EVENT LOG

1.5 ERROR LOG

The Error Log screen allows the user to view error messages and send them to the remote server for troubleshooting by IT staff. The Log Level for viewing/sending can also be selected on this screen. There is also a button that acts to clear the log messages.

The link to the Error Log screen is located in the [Application Menu](#).

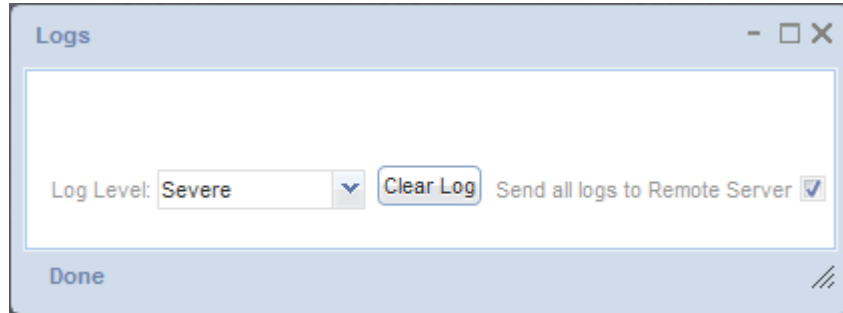


Figure 5 Logs Screen

CHAPTER 2 GENERAL FUNCTIONALITY

2.1 SCREEN ELEMENTS

The following are elements of a typical OpenELIS screen. This section discusses formats, fields, buttons, screen functions, and shortcuts.

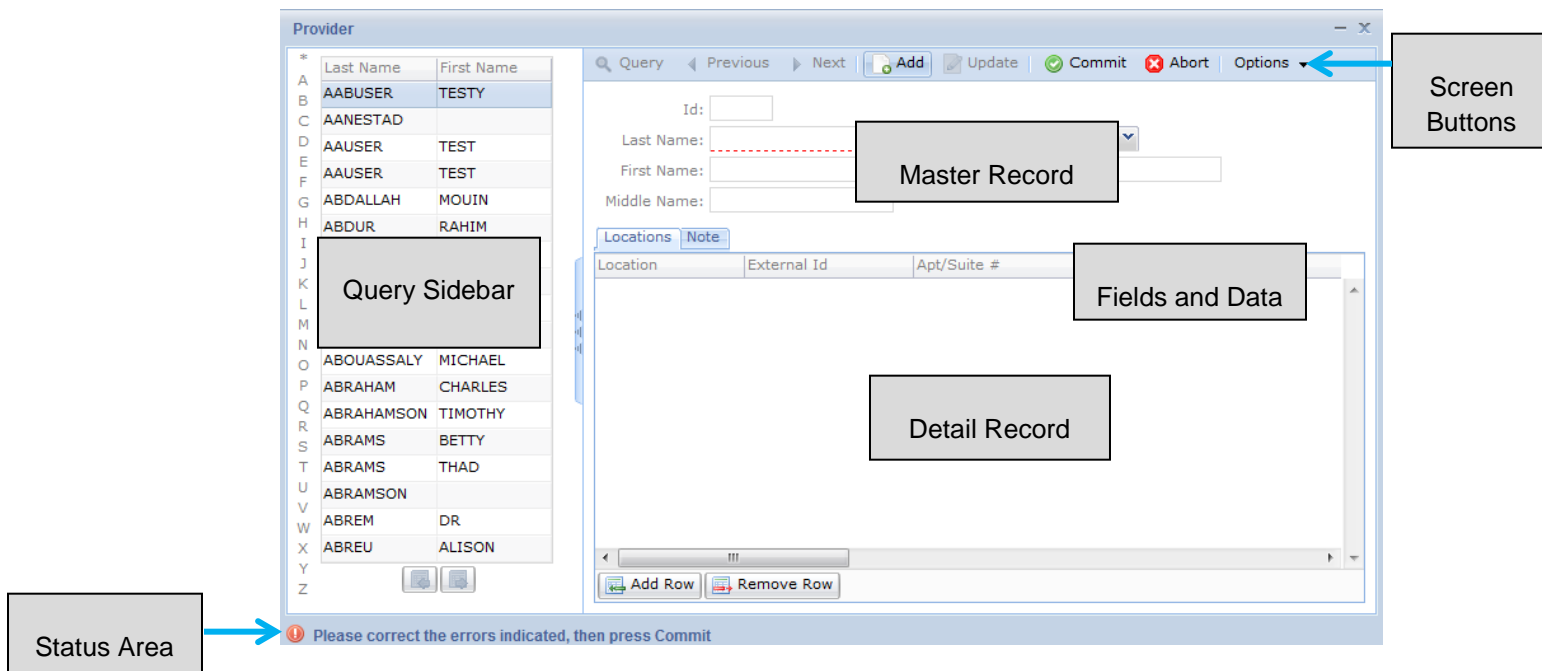



Figure 6 Screen Elements

The **Query Sidebar** that is found on some screens shows a list of the queried results. The result list can be paged forward or backwards by using the arrow buttons  located at the bottom of the sidebar. For additional information, see [QUERY SIDEBAR](#).

The **Screen Buttons** are located at the top of the screen. **Query**, **Add**, **Update**, **Commit**, and **Abort** are common to a majority of the screens.

The major white space in a screen is comprised of **Fields** and **Data**. The user can add information in these fields to query for existing records, add a new record, or update an existing record.

The **Master Record** is found in the upper part of some screens. The fields in the master record display the major items of information associated with the record.

The **Detail Records** are located in the lower part of some screens. The fields in the detail records display detailed information that is associated with the master record at the top.

The **Status Area** displays errors and warnings relevant to the last action that was performed by the user. For more information, see [STATUS AREA](#).

2.1.1 SCREEN BUTTONS

There are three states for each button.

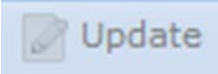
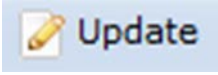

Screenshot of Button	State	Description
	Disabled	The button cannot be clicked if it is not appropriate to the current mode. The button will be grayed out.
	Enabled	The button can be clicked because it is appropriate to the current mode. The button's name will be in black text. The mouse cursor changes from an arrow to a pointing finger.
	Active	The screen is currently in that mode. For example, the button depicted in this example shows the screen to be in the Update mode. It will have a visible rectangular-shaped border.

Figure 7 Screen Button States

Below are the major buttons that are found on most screens along with a brief description of their function. The button must be clicked on most screens before the action can be taken. For example, click the **Query** button first, enter the information next, and then click the **Commit** or **Abort** button.

Button	Description

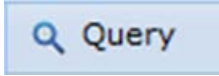
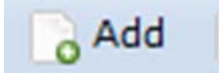

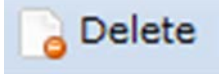


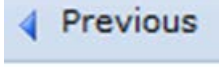
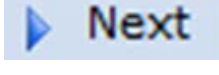
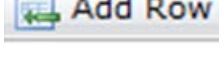
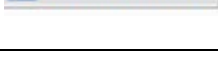
 Query	Allows for the search of existing records within the database.
 Add	Allows for the addition of a new record into the database.
 Update	Allows for a change to be made to the current record.
 Delete	Allows for the deletion of the current record.
 Commit	Enables any action to be committed. This function does not work unless Query, Add, Update, etc. is clicked first, and data is entered in the correct format.
 Abort	Cancels the current operation that is running.
 Previous	Displays the record listed prior to the one currently visible on the screen.
 Next	Skips to the next record or listing.
 Add Row	Allows for the addition of a row to a table.
 Remove Row	Allows for the deletion of a row from a table.

Figure 8 Screen Button Descriptions

2.1.2 QUERY SIDEBAR

DECEMBER, 2017

The **Query Sidebar** shows the results for a query in alphabetical or numerical order. It can be displayed by clicking on the triple arrows on the left side of many screens. The user can click on a letter or number to show the query matches that begin with that letter or number. The query results list can be paged forward or backward by using the arrow buttons located at the bottom of the sidebar. Clicking on the * displays all of the results for the query. Click on the **Next** or **Previous** buttons at the top of the screen to display the records one by one. Select an entry in the query results list to display that record in the right-hand pane.

Clicking on the * displays all of the results that match the query.

Triple arrows to display or hide the Query Sidebar.

The arrow buttons can be used to page forward or backward through the query results list.

Figure 9 Query Sidebar

2.1.3 TYPES OF FIELDS

The following section describes the functionality of the different field types that are utilized in OpenELIS.

2.1.3.1 TEXT FIELDS

Text fields allow the user to enter partial or complete text to add or update a record or to perform a query. Text can also be cut from, and copied and pasted into a text field. The OpenELIS program automatically displays the text as uppercase or lowercase depending upon the field. When the user clicks on a text field to activate it, the border of the text box turns green and a blinking cursor appears inside of it.

Accession #:

Figure 10 Active Text Box

There are required data formats for certain text fields. These are illustrated below.

Data Type	Format	Example
Date	YYYY-MM-DD	2006-05-09
Date/Time	YYYY-MM-DD HH:MM	2006-05-09 13:59
Zip Code	#####-####	52242-5002
Phone # with Extension	###/###-####.####	319/555-1212.3467

Figure 11 Data Formats

2.1.3.2 DROPDOWN LISTS

Dropdown lists allow the user to select from a prepared list of choices. The up and down arrows allow the user to move through the list one choice at a time. The scroll bar allows the user to move up or down through the list more rapidly. Click on the desired choice to enter it into the field. If the wrong item is selected, it can be deleted with the **Backspace** key and the correct selection can be made.

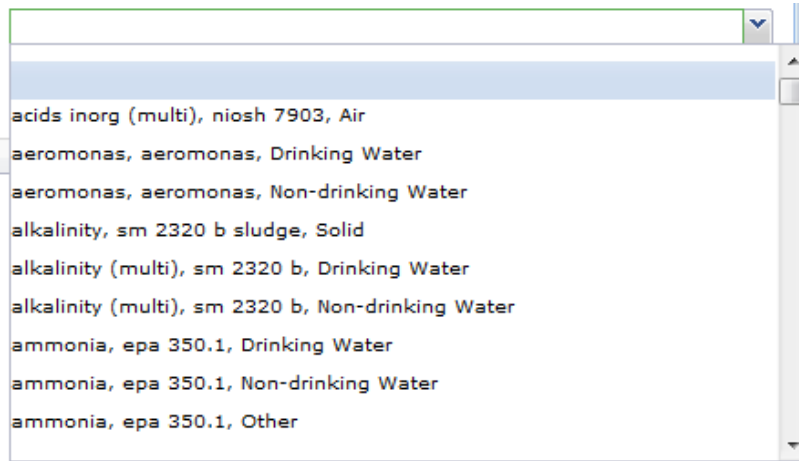


Figure 12 Dropdown List

2.1.3.3 AUTOCOMPLETE

Text fields also have an autocomplete capability. When the user types one or more characters in a text box while in Query Mode, a dropdown list appears. If there is one or more matches to the characters that have been entered, the first match will be highlighted and it can be selected via mouse click or by pressing the **Tab** key on the keyboard.

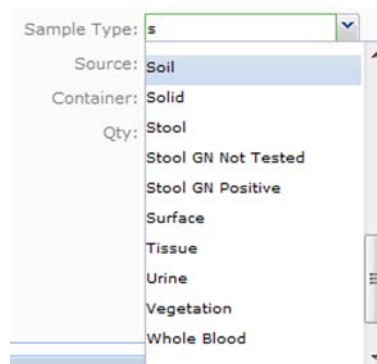


Figure 13 Autocomplete

2.1.3.4 CHECKBOXES

Checking the box next to a description will note that the condition is true. An unchecked box next to a description notes that the condition is false. In the following example, the sample is noted as being hazardous.

Hazardous:

Figure 14 Checkbox

2.1.3.5 TABLES

Tables contain information that is characterized by rows and columns. Each row represents a detailed record of information (e.g., an individual test result, storage information item, QA event). Each column is a different field category. Fields in tables may be text fields, drop-down lists, or checkboxes.

Acc #	Priority	Domain	Section	Test	Method	Collected	Received	Override
568818		Clinical	mycobacti-ic	accuprobe...	hybridiza...	2017-09-22 07:30	2017-09-23 06:30	<input type="checkbox"/>
568818		Clinical	mycobacti-ic	accuprobe...	hybridiza...	2017-09-22 07:30	2017-09-23 06:30	<input type="checkbox"/>
569395		Clinical	mycobacti-ic	miscellane...	miscellan...	2017-09-13 16:20	2017-09-25 14:09	<input type="checkbox"/>
570265		Animal	rabies-ic	rabiestyping	dfa	2017-09-26 05:30	2017-09-27 06:00	<input type="checkbox"/>
570341		PT	inorg_auto-ank	phosphorus	sm 4500 ...		2017-09-27 09:59	<input type="checkbox"/>
570341		PT	inorg_manual-ank	cyanide	sm 4500 ...		2017-09-27 09:59	<input type="checkbox"/>
570341		PT	metals-ank	metal	epa 601...		2017-09-27 09:59	<input type="checkbox"/>
570341		PT	metals-ank	metal	epa 601...		2017-09-27 09:59	<input type="checkbox"/>
570341		PT	inorg_auto-ank	phosphorus	lac 10-11...		2017-09-27 09:59	<input type="checkbox"/>
570341		PT	inorg_auto-ank	phosphorus	lac 10-11...		2017-09-27 09:59	<input type="checkbox"/>
571037		Enviro...	radchem-ic	gross alpha	epa 00-0...	2017-09-28 09:29	2017-09-28 10:05	<input type="checkbox"/>
571037		Enviro...	radchem-ic	gross alph...	epa 00-0...	2017-09-28 09:29	2017-09-28 10:05	<input type="checkbox"/>
571248		Clinical	mycobacti-ic	afb bioche...	bculture	2017-08-23 16:40	2017-09-28 12:27	<input type="checkbox"/>
572409		Enviro...	sample_prep-ank	dig	epa 305...	2017-07-18 10:00	2017-10-02 12:43	<input type="checkbox"/>
572410		Enviro...	sample_prep-ank	dig	epa 305...	2017-06-14 10:30	2017-10-02 12:43	<input type="checkbox"/>
572411		Enviro...	sample_prep-ank	dig	epa 305...	2017-06-14 10:30	2017-10-02 12:43	<input type="checkbox"/>

Figure 15 Table

2.1.3.6 TABS

Many of the OpenELIS screens have tabs in the Detail Record. Each tab contains fields or tables that are grouped by function. Click on the desired tab to see its member fields.

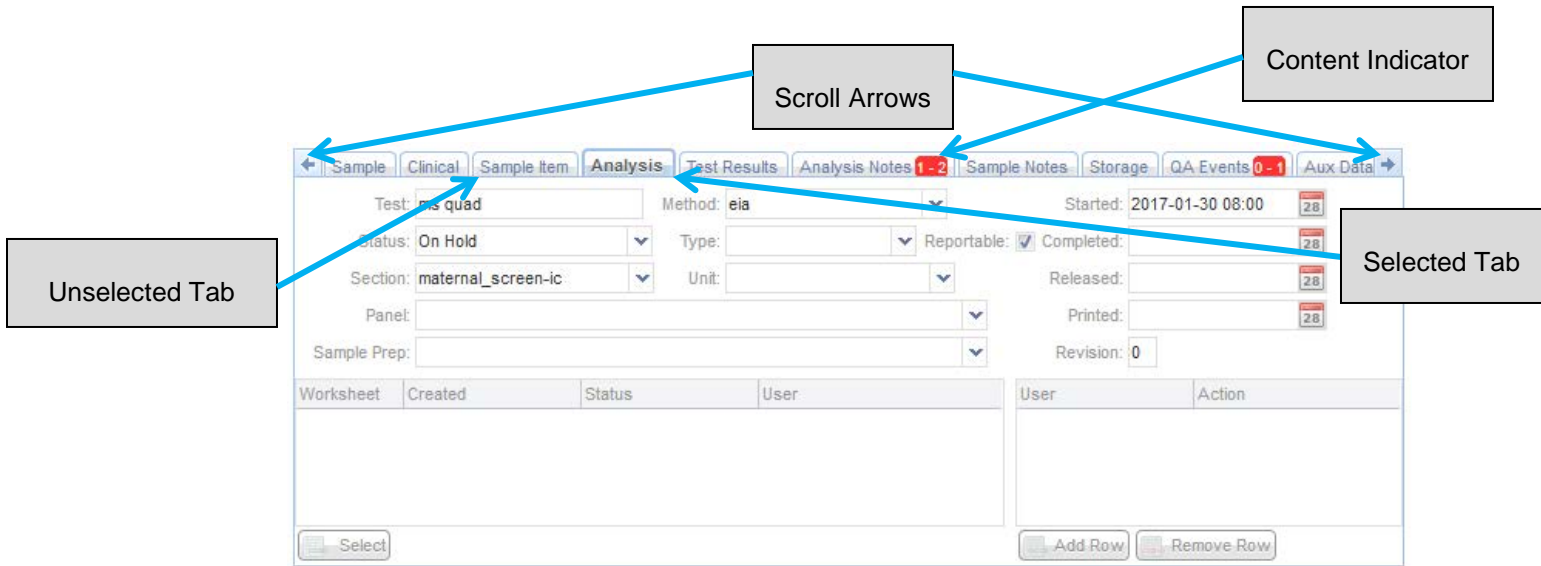


Figure 16 Tabs

2.1.3.6.1 POP-OUT ABILITY OF TABS

One or more tabs can be popped out for easier viewing by dragging it to a different location in the web browser. The tab header will have a white background when it is popped out. The information in the popped-out tab is automatically updated as different rows are selected in the screen. The popped-out tab will return to its usual location in the screen when it is closed.

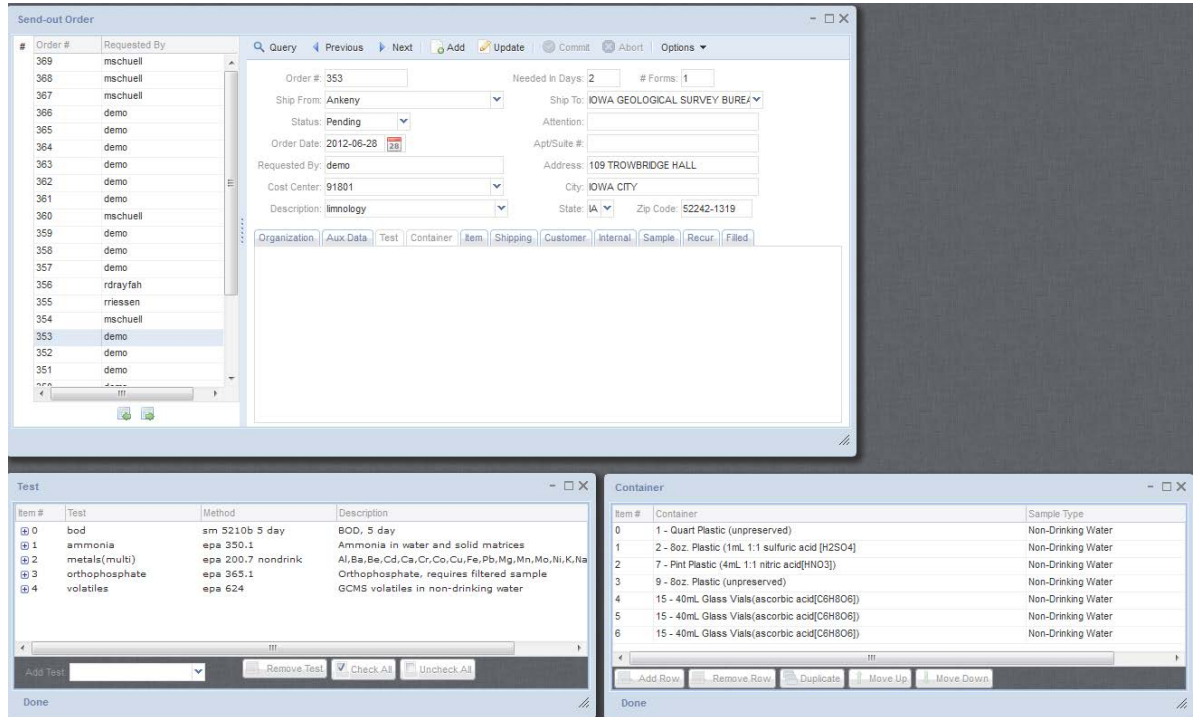


Figure 17 Popped-Out Tabs

2.1.3.7 TREES

Some fields utilize a **Tree Hierarchy**. These trees allow the user to expand (+) or collapse (-) the tree directory by clicking on the respective button.

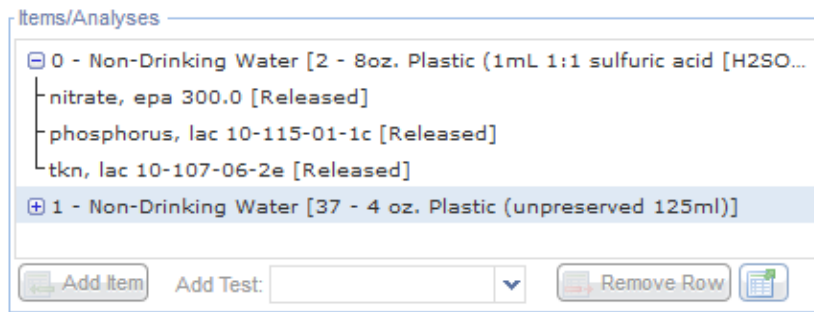


Figure 18 Tree Hierarchy

2.1.4 STATUS AREA

The Status Area displays errors and warnings relevant to the last action that was performed by the user. Many of the error messages will inform the user to correct the indicated errors.

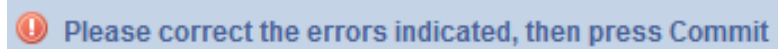



Figure 19 Error Message

Red dashes will be displayed in text fields that are required to have information entered.



Figure 20 Required Field Notification

Multiple errors can also be displayed in the Status Area. The error messages will pop up when the user hovers the mouse on the  symbol.

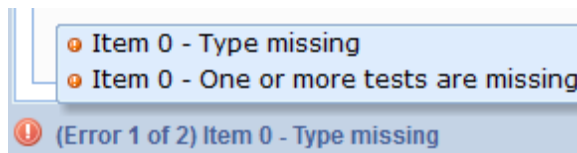


Figure 21 Multiple Errors Message

Sometimes when the record is committed a screen will popup displaying warnings. An example is provided here.

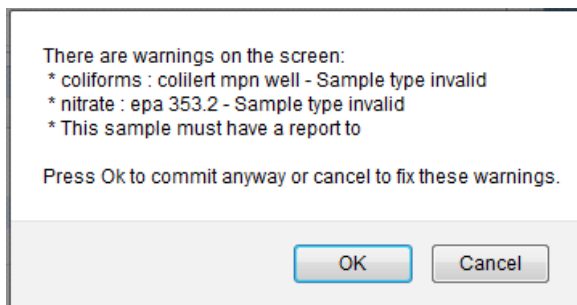


Figure 22 Warning Popup Screen

2.1.5 NAVIGATING THE SCREEN/KEYBOARD SHORTCUTS

The user can navigate through the screen in two ways:

1. By mouse click
2. By moving from field to field by using the **Tab** key

Ctrl Key: Multiple selections from a dropdown list can be performed by clicking on each desired selection while holding down the **Ctrl** key.

Shift Key: A continuous range of selections can be performed by clicking on the first and last desired selections in the range while holding down the **Shift** key.

Keyboard Shortcuts

The following key combinations can be used as shortcuts for the corresponding actions.

Key Combination	Action
Ctrl Q	Query
Ctrl P	Previous
Ctrl N	Next
Ctrl A	Add
Ctrl U	Update
Ctrl M	Commit
Ctrl O	Abort
Ctrl C	Copy
Ctrl V	Paste

Ctrl X	Cut
F2 (on the full sample login screens)	Used to copy a value for a field from the previously loaded full sample login record to a new record (e.g., Collected Date, Client Reference, Report To.) Note: Does not work for patient and mother/guardian fields or for the accession number.
Ctrl 1 through 9 (on the full sample login and Complete and Release screens)	Selects the first through the ninth tab on the full sample login and Complete and Release screens and also sets the focus on the first enabled editable field in the tab on the full sample login screens (e.g., Sample Type on the Sample Item tab.)
Ctrl I (on the full sample login screens)	Sets the focus on the button Add Item on the full sample login screens.
Ctrl T (on the full sample login screens)	Sets the focus on the Add Test autocomplete field on the full sample login screens.

Ctrl 1 (on the Second Data Entry screen)	Selects the value entered by the First Data Entry user when there is a discrepancy.
Ctrl 2 (on the Second Data Entry screen)	Selects the value entered by the Second Data Entry user when there is a discrepancy.
Ctrl 3 (on the Second Data Entry screen)	Displays the value entered by the First Data Entry user after the Second Data Entry user has entered a non-matching value.

Figure 23 Keyboard Shortcuts

2.2 QUERY FUNCTION

OpenELIS screens are designed to allow *query by form*. A query by form allows the user to input data into one or more fields on a screen form. This data specifies the records that should be retrieved from the database. What makes this feature so powerful are the relational, range, alternations, and wildcard symbols that a user can include in a query.

2.2.1 GENERAL QUERY BY FORM CAPABILITIES

Begin a query by form by clicking on the **Query** button. Enter information into any field that you wish to query by. You may use appropriate wildcards to expand or limit your search. Increasing the number of fields that you enter information into will increasingly narrow your search. Begin your query by clicking on the **Commit** button. At this point, the screen will display the first matched record, or you will be informed in an error message in the Status Area that no record matched your query.

2.2.1.1 "AND" OPERATION

The “and” operation is used **between** fields when querying by form. The OpenELIS database is searched for all records that possess **all** of the values entered into the multiple fields.

Example 1: Entering SMITH into the Last Name field and ROBERT into the First Name field during a Provider query will display all records of providers with the name Robert Smith.

Example 2: Selecting “Released” in the Status field and entering 2011-11-11 in the Collected field and CEDAR RAPIDS in the City field during a Private Well Water Sample Login query will display all records for private well water samples from Cedar Rapids that were collected on November 11, 2011 and have been released.

2.2.1.2 “OR” OPERATION

The “or” operation is used **within** fields when querying by form. The OpenELIS database is searched for all records that possess **any** of the values entered into the individual field. The | symbol (Shift \) is used to represent “or”.

Example 1: Entering SMITH|RAMIREZ into the Last Name field during a Provider query will display all records of providers with the last name Smith **or** Ramirez.

Example 2: Entering WAVERLY|KNOXVILLE into the City field during a Private Well Water Sample Login query will display all records for private well water samples from Waverly **or** Knoxville.

2.2.2 FIELD TYPE BEHAVIOR IN QUERY MODE

Certain types of fields behave differently in Query Mode than they do in Add or Update modes. These behavior differences are outlined in this section.

2.2.2.1 DROPDOWN LISTS ALLOW MULTIPLE SELECTIONS

Multiple selections from a dropdown list can be chosen by clicking on each desired selection while holding down the **Ctrl** key. A continuous range of selections can be chosen by clicking on the first and last desired selections in the range while holding down the **Shift** key.

Example: Selecting “Completed” and “Released” in the Status field during an Environmental Sample Login query will display all environmental samples that have been completed **or** released.

2.2.2.2 AUTOCOMPLETE

Autocomplete doesn’t work the same way in Query Mode that it does in Add Mode. This allows the “or” operator to be utilized.

Example: Entering j*|m* in the Collector field during a SDWIS Sample Login query will display all records for SDWIS samples collected by people whose names start with a “j” **or** “m”.

2.2.2.3 CHECKBOXES

Checkboxes can have three states in Query Mode.




Screenshot	State	Description
	“Yes”	All records will be displayed where the designated condition is true.
	“No”	All records will be displayed where the designated condition is false.
	“Indifferent”	The designated condition will be ignored in the query.

Figure 24 Checkbox States in Query Mode

2.2.2.4 PICTURES ARE NOT ENFORCED

Pictures are not enforced in Query Mode.

Example 1: Extended zip codes (5 integers + 4 integers) are not enforced. Five digit zip codes may be entered in the Zip Code field while in Query Mode.

Example 2: Date fields (YYYY-MM-DD) are not enforced. Dates can also be entered in the formats of YYYY/MM/DD, MM-DD-YYYY, or MM/DD/YYYY. Leading zeroes in the month or day parts of the date field do not need to be entered.

2.2.3 QUERY CAPABILITY USING WILDCARDS, RANGES, INEQUALITIES, EMPTY AND NON-EMPTY FIELDS

The use of wildcards, ranges, inequalities, empty and non-empty fields increase the functionality of queries. These capabilities are described below.

2.2.3.1 WILDCARD CHARACTER

The asterisk (*) is used as a wildcard character in queries to substitute for any other character or characters in a string.

Example 1: Entering smi* in the Collector field of an Environmental Sample Login query will display all records by a collector whose name begins with the letters “smi” (e.g., smith joe, smiley patty, smithers winston, etc.)

Example 2: Entering *CO in the Name field of an Organization query will display all records of organizations whose names end with the letters “CO” (e.g., LOUISA CO or ACME MINING CO).

Example 3: Entering *f*1* in the Address field of an Organization query will display all records of organizations that have an “f” **and** a “1” anywhere in the address.

Example 4: Entering *2*|*5* in the Address field of an Organization query will display all records of organizations that have a “2” **or** a “5” anywhere in the address.

2.2.3.2 RANGES

Ranges can be specified in Query Mode by using the .. characters.

Example 1: Entering 200..500 in the Id field of an Organization screen query will display all records of organizations that have an Id in the range of 200 to 500.

Example 2: Entering 2011-12-03 00:00..2011-12-03 23:59 in the Received field of a SDWIS Sample Login query will display all records of SDWIS samples that were received during that 24-hour period.

2.2.3.3 INEQUALITIES

Inequalities can be specified in Query Mode by using the < (less than) and > (greater than) signs.

Example 1: Entering >2013-02-21 12:00 in the Received field of the Sample Tracking screen will display all sample records that were received after 12 PM on February 21, 2013.

Example 2: Entering <50 in the Id field of a Provider screen query will display all records of providers that have an Id less than 50.

Example 3: Entering >27690 in the Order # field of the Send-out Order screen will display all send-out order records that have an order # greater than 27690.

2.2.3.4 EMPTY FIELDS

Queries can be performed for text fields that are empty by inserting the = at the beginning of the field.

Example: Entering = in the beginning of the Location field of a Private Well Water Sample Login query will display all records of private well water samples that have that field empty.

2.2.3.5 NON-EMPTY FIELDS

Queries can be performed for text fields that are not empty by inserting the != at the beginning of the field.

Example: Entering != in the beginning of the Location field of a Private Well Water Sample Login query will display all records of private well water samples in which that field is **not** empty.

2.3 ADD FUNCTION

The Add Function allows for the addition of a new entry into the database after clicking the **Add** button. Most screens require some information to be imputed. Some screens check for duplication of information (eg., Analyte), and will display a warning message that a record with that value already exists in the database.

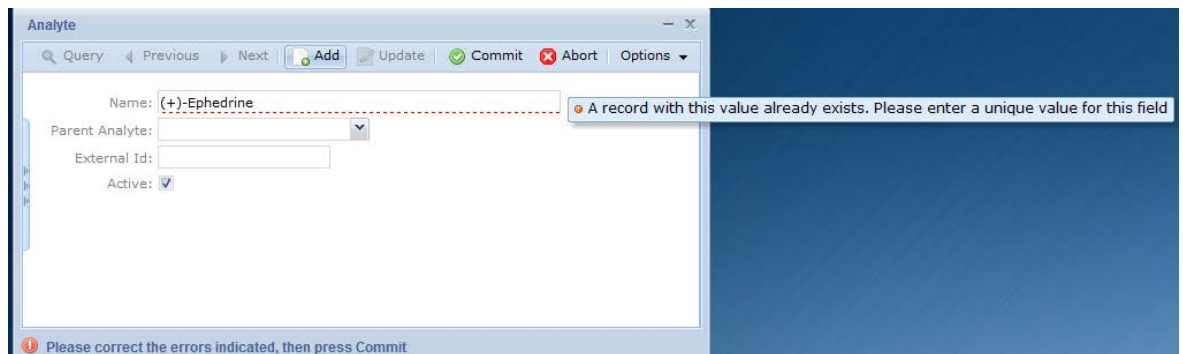


Figure 25 Add Function: Duplicate Record Warning

2.4 UPDATE FUNCTION

The Update Function permits the modification of an entry after clicking the **Update** button. When **Update** is selected the latest version of the record is fetched from the database and it is locked for modification. This guarantees that other users cannot change the record during the duration of the lock (15 minutes). If another user attempts to update or delete the record during the duration of the lock, a message pops up detailing the username of the person who possesses the lock and the expiration date and time of the lock.

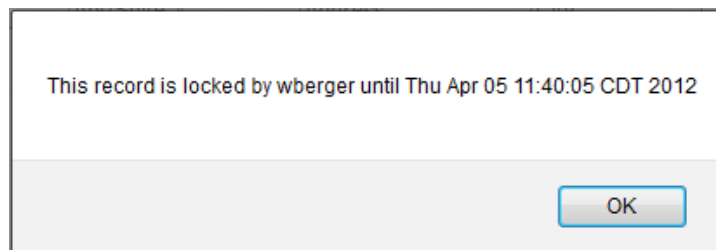


Figure 26 Locked Record

If the user who has acquired the lock on the record fails to update it during the allotted time, a different user can acquire the lock in her place. When the initial user tries to commit her changes, an error message pops up explaining that her lock has expired, and she must abort and start over.

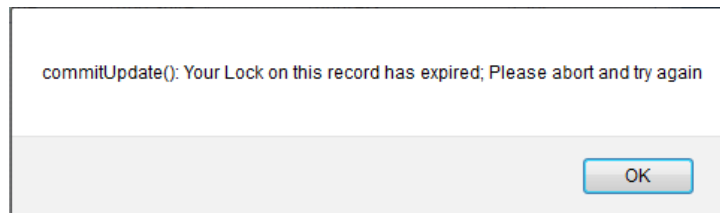


Figure 27 Expired Lock Message

The **Commit** button must be clicked in order to send all modifications back to the database to be recorded. Conversely, the **Abort** button may be clicked to stop the entire operation. If entry errors occur, error messages will be displayed. These errors will need to be fixed, and the **Commit** button clicked again.

2.5 DELETE FUNCTION

Not many screens allow the user to delete records. Clicking the **Delete** button fetches the latest version of the record and locks it. The user should review the data and make sure that he wants to delete the record. He will then need to click **Commit** to confirm the deletion or **Abort** to cancel it.

2.6 OPTIONS MENU

The Options Menu is found on many screens. It allows for the utilization of additional features such as duplicating records, previewing a Final Report, and reviewing history information on the currently displayed entry.

2.6.1 DUPLICATE

The Duplicate function places the screen into Add mode and copies the previous displayed record into the current form with the exception of unique identifiers. An example of the Duplicate option would be to copy an internal or send-out order

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record. In this case, all of the fields are copied except for the Order #, which would be assigned automatically by the system when the record is committed.

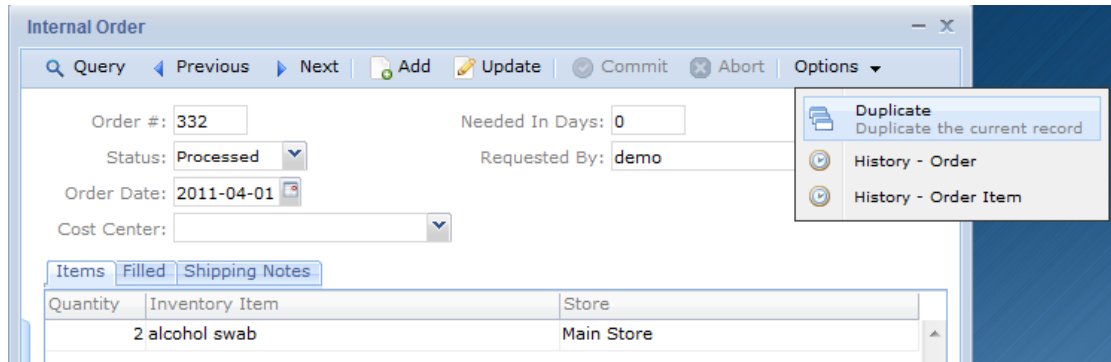


Figure 28 Duplicating a Record

2.6.2 HISTORY

The History feature on various screens gives detailed information about the current record and how it has changed over time at the field level. For screens that display a variety of records, the user will need to select different History options to view the details.

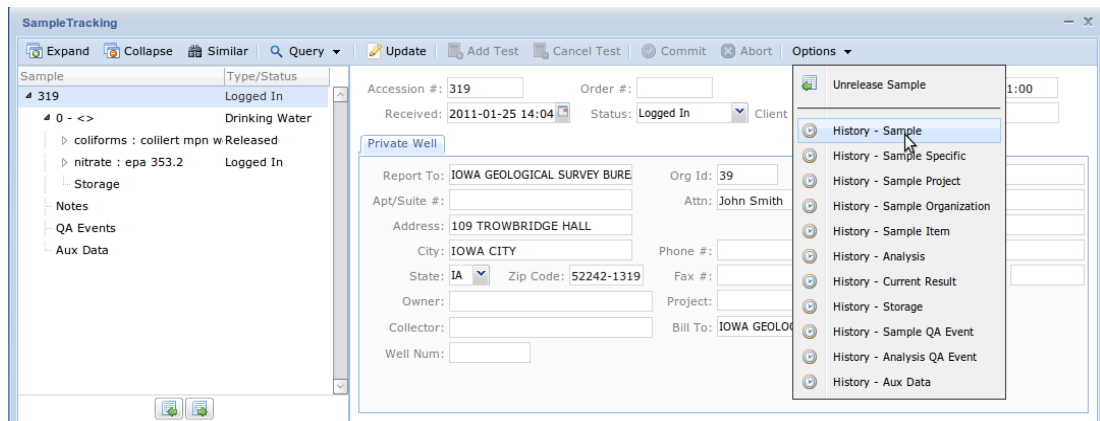
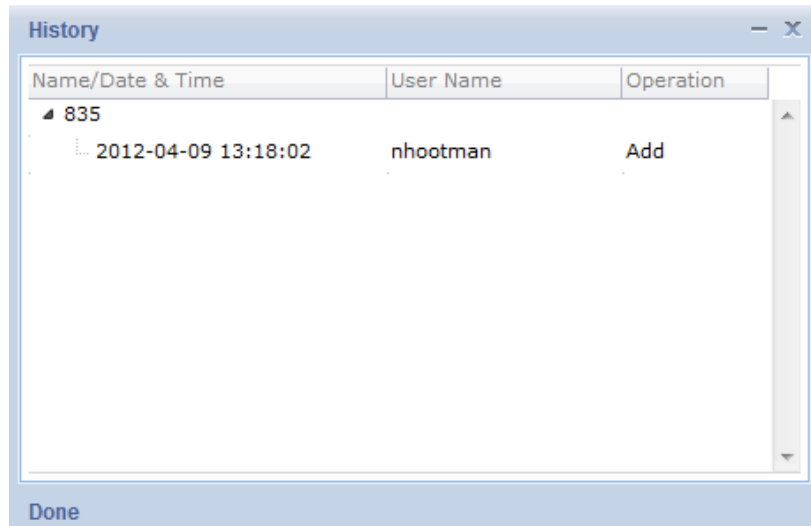


Figure 29 History Option

The History pop-up window allows you to view the operations that were performed on the currently displayed record, when, and by whom. The details can be viewed by clicking and expanding on the drill-down arrows. It lists the Name/Date & Time, User Name, and the

Operation taken by that user for that particular record. The primary operations include Add, Update, and Delete.

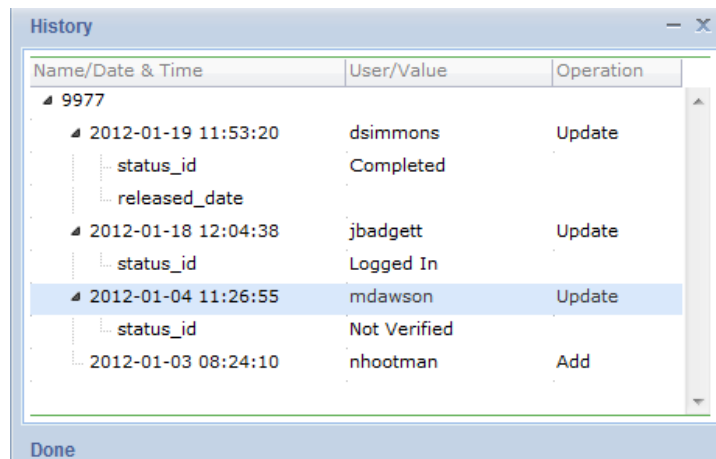


Name/Date & Time	User Name	Operation
▲ 835		
└─ 2012-04-09 13:18:02	nhootman	Add

Done

Figure 30 "Add" Sample History

All records in LIMS start with an "Add" operation. For example, in the History screen above, nhootman added sample accession # 835 to the LIMS at 1:18 PM on April 9, 2012. Since the "Add" operation does not modify any previous record, there aren't any field changes to display.



Name/Date & Time	User/Value	Operation
▲ 9977		
└─ 2012-01-19 11:53:20	dsimmons	Update
└─ status_id	Completed	
└─ released_date		
└─ 2012-01-18 12:04:38	jbadgett	Update
└─ status_id	Logged In	
└─ 2012-01-04 11:26:55	mdawson	Update
└─ status_id	Not Verified	
└─ 2012-01-03 08:24:10	nhootman	Add

Done

Figure 31 "Update" Sample History

The “Update” operation on a history screen displays the field level information before it was modified. Entries in the History screen should be read from bottom to top with the most recent changes at the top. In the example in Figure 32, nhootman added the sample record to the LIMS with an accession number of 9977 at 8:24 AM on January 3, 2012. The sample record was then updated by mdawson at 11:26 AM on January 4, 2012. The variable, status_id, was changed from sample Not Verified to sample Logged In, which is found in the entry above it. Next, at 12:04 PM on January 18, 2012, jbadgett updated the status_id variable from sample Logged In to sample Completed, which is found in the entry above it. Finally, dsimmons updated the status_id variable from sample Completed to its current value (sample Released) at 11:53 AM on January 19, 2012. The “Released” sample status is displayed in the Status field of the current version of the sample record. The sample released_date variable was also updated at this time from an empty field to the released date and time found on the current version of the sample record.

OpenELIS displays the following names or labels in its history screens instead of the Id of the record: dictionary, test, analyte, inventory item, method, organization, project, QA event, sample item, and section.

The history of “Delete” operations are also maintained by the LIMS, including information for every field of that record. However, the user cannot display the history of these records.

CHAPTER 3 MANAGING SAMPLES

One of the key features of a Laboratory Information Management System (LIMS) is its ability to help laboratories store, retrieve, and manage samples.

The life cycle of a sample includes the following basic processes:

1. Samples are received at the laboratory
2. Samples are labeled
3. Samples are entered into the system
 - a. Quick Entry
 - b. Full Login
4. Analyses are added to the container(s)
5. Analysts schedule work by creating worksheets
6. Analysts complete analyses using worksheets
7. Second reviewer verifies and releases results
8. Final Reports become available
 - a. Printed and sent
 - b. Faxed
 - c. Displayed through the web portal

3.1 LABELS

Laboratories routinely label all of their incoming samples using a unique id called accession number. The Label Menu contains two modules that allow users to print sample labels. There are also modules that can be used to print secondary labels that are used during the testing process (e.g., bacterial culture dish labels), labels containing organization information, and labels for smaller sample collection tubes (e.g., blood lead collection tubes).

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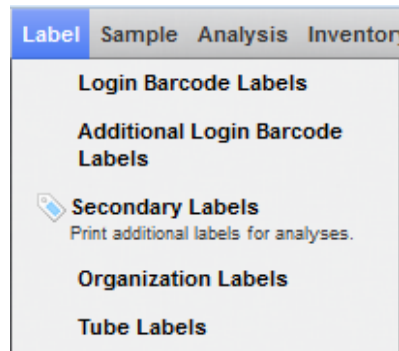


Figure 32 Label Menu

3.1.1 LOGIN BARCODE LABELS

The Login Barcode Labels print screen is used to generate labels containing new accession numbers for initial sample login. The link to this print screen is found in the [Label Menu](#).

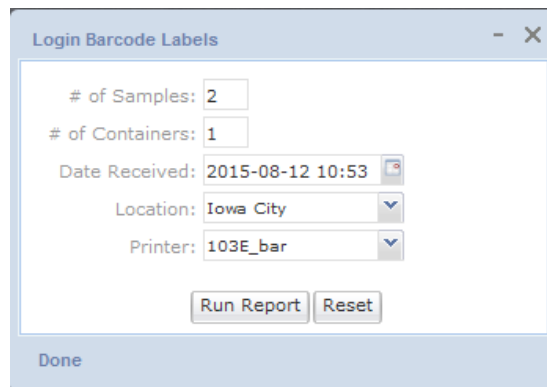


Figure 33 Login Barcode Labels Screen

To print new accession labels, enter the # of Samples that need to be accessioned. Accession numbers are sequentially assigned by the LIMS and cannot be duplicated.

For each accessioned sample, the module will automatically print one label for the Test Request Form and one or more container labels specified by the value in the # of Containers field. For example, to accession two samples each having three containers, enter 2 in the # of Samples field and 3 in the # of Containers field. In this case, a total of eight labels will be printed which includes two labels for the Test Request Forms.

The Date Received defaults to the current date and time but this can be overridden by clicking on the calendar to the right or by entering this information into the field. The Location or the Printer can be changed by clicking on the drop-down arrows to the right. Click **Run Report** to print the labels.

3.1.2 ADDITIONAL LOGIN BARCODE LABELS

The Additional Login Barcode Labels screen is used to print additional sample container labels and replacement labels for existing accession numbers. The link to this print screen is found in the [Label Menu](#).

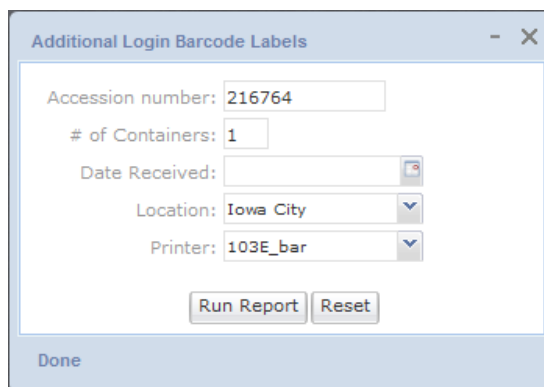


Figure 34 Additional Login Barcode Labels Screen

For a sample that has already been quick entered or fully logged-in, the Date Received field can be left empty on this screen as the sample's received date is already in the system. The Date Received must be entered on this screen if the sample has not been quick entered or fully logged into the system.

To print a replacement label for a Test Request Form:

1. Enter the Accession Number (i.e., 1070) followed by a hyphen and a negative one (i.e., 1070--1).
2. Enter 1 for # of Containers.
3. Optionally enter the Date Received (see above).
4. Click on **Run Report**.

To print a replacement label for a container:

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1. Enter the Accession Number followed by a hyphen and the [sample item](#) number (i.e., 1070-0).
2. Enter 1 for # of Containers.
3. Optionally enter the Date Received (see above).
4. Click on **Run Report**.

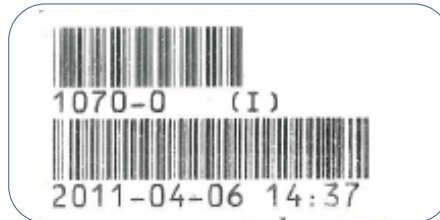


Figure 35 Container Replacement Label

To print labels for additional containers:

1. To print new container labels (i.e., 1070-5 and 1070-6) enter the Accession Number followed by a hyphen and the starting [sample item](#) number to be printed (i.e., 1070-5).
2. Enter the # of Containers (i.e., 2).
3. Optionally enter the Date Received (see above).
4. Click on **Run Report**.

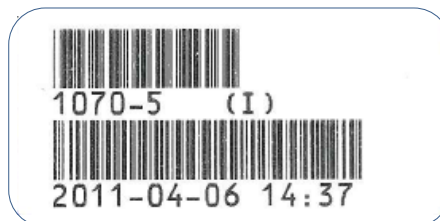
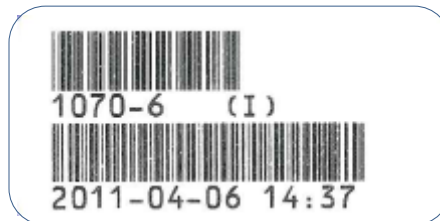


Figure 36 Additional Container Labels




3.1.3 SECONDARY LABELS

The Secondary Labels print screen is used to generate secondary labels that are used during the testing process (e.g., bacterial culture dish labels). Secondary label formats are defined through the [Label](#) module. The link to the Secondary Labels print screen is found in the [Label Menu](#).

Accession #	Test	Method	Qty
254861	refbacti	bculture-aerobic	7

Figure 37 Secondary Labels Screen

The steps to print secondary labels are:

1. Select the Test Name from the autocomplete dropdown list or scan its sample type barcode from the [Test Report](#) into the Entry field.
2. Enter (or scan the barcode of) the sample's accession number into the Entry field. The accession number of the sample will be displayed in the Accession # field at the top of the print screen.
3. A row, containing the Accession #, Test, Method, and Qty (Quantity) of the secondary labels to be printed, will be added to the table in the lower part of the screen.
4. The Qty represents the normal number of secondary labels that are used during analysis and is set in the [Additional Label](#) specifications of the definition of that test. The Qty can be adjusted by clicking the  or  buttons. Click the  button to print one label.

5. If a sample is added to this print screen accidentally, click the **Remove Row** button to remove it from the table.
6. Click the **Print** button to print the secondary labels.

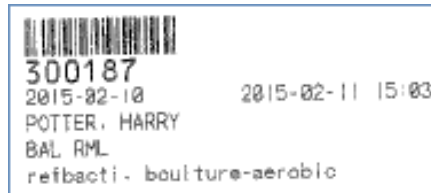


Figure 38 Secondary Label

3.1.4 ORGANIZATION LABELS

The Organization Labels print screen is used to generate labels containing organization id, name, and address information. These labels can be used by client organizations to affix to their Test Request Forms (TRFs), such as newborn screening dried blood spot collection forms. The link to this print screen is found in the [Label Menu](#).

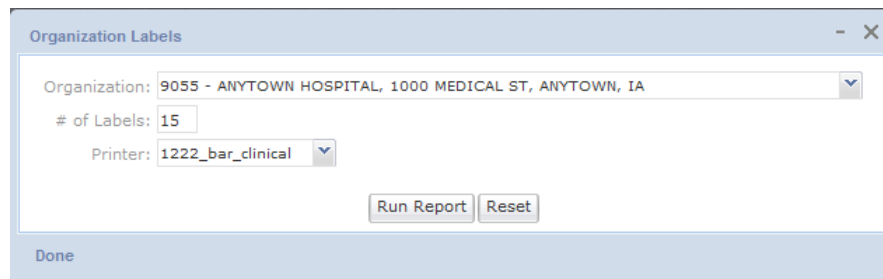
A screenshot of a web application window titled 'Organization Labels'. The window has a light blue header and a white main area. In the main area, there is a dropdown menu for 'Organization' with the text '9055 - ANYTOWN HOSPITAL, 1000 MEDICAL ST, ANYTOWN, IA'. Below this is a text input field for '# of Labels' containing the number '15'. Below that is another dropdown menu for 'Printer' with the text '1222_bar_clinical'. At the bottom of the main area are two buttons: 'Run Report' and 'Reset'. At the very bottom of the window is a blue bar with the text 'Done'.

Figure 39 Organization Labels Screen

In order to print organization labels, enter the [Organization Id](#), the number of labels to be printed, and select the appropriate printer. The organization's id, name, and address will be displayed in the Organization field. Click the **Run Report** button.

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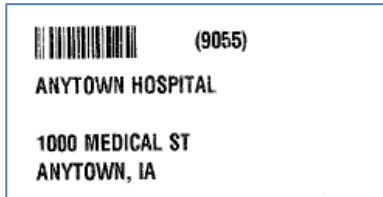


Figure 40 Organization Label

The organization label contains both the barcoded and human-readable organization id, the organization's name, and its address as it is stored in the [Organization](#) screen.

3.1.5 TUBE LABELS

The Tube Labels print screen is used to generate two-part labels for smaller sample collection tubes (e.g., blood collection tubes for blood lead screening). The link to this print screen is found in the [Label Menu](#).

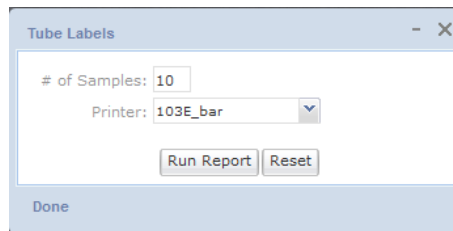


Figure 41 Tube Labels Screen

In order to print tube labels, enter the # of Samples and select the appropriate printer. Click the **Run Report** button. One tube label will be printed for each sample that will be collected. The left half of the label is applied to the test request form, while the right half is applied to the collection tube. Tube numbers are generated sequentially by OpenELIS and currently have the format of three letters followed by three numbers (e.g., ABC123).

The tube number is used during [quick entry](#) to link a sample collection tube to its accession number. The tube number is stored in the [Container Reference](#) field on the Sample Item tab.

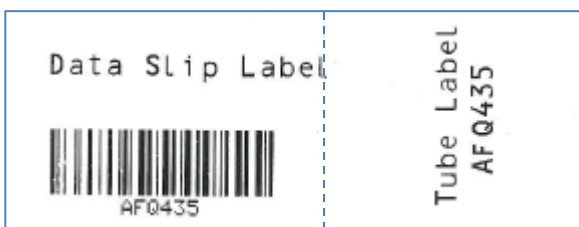


Figure 42 Two-Part Blood Lead Tube Label

3.2 QUICK ENTRY

The Quick Entry feature is primarily used by analysts in order to quickly log-in sample(s) for one or more tests. Once tests are quick entered, secondary labels may be printed, work lists and worksheets may be created, and results may be entered. This allows the analytical work to proceed without having to wait for full sample demographic information to be entered.

The Quick Entry process is not compatible with the full sample login process that uses Order #. For samples that have order information (Send-out Order) the full login module should be used.

The link to the Quick Entry module is found in the first section of the Sample Menu.

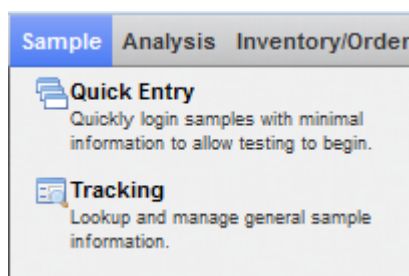


Figure 43 Sample Menu – First Section

3.2.1 FIELD DESCRIPTIONS

DECEMBER, 2017

Accession #	Received	Test	Method	Sample Type	Tube #
-------------	----------	------	--------	-------------	--------

Figure 44 Quick Entry Screen

A description of the use of each field in the Quick Entry Screen follows:

Entry

The Entry field is used to scan data for all the fields: Accession #, Tube #, (Date and Time) Received, and Test, Method, Sample Type. Depending on the type of barcode scanned, the Entry field places the value into the appropriate field. For example, if you scan an accession number into the Entry field, the system will recognize the accession number format, and places the data in the Accession # field. If the scanner is not operational, you may manually enter values in these fields, followed by pressing the Enter key on the keyboard. If barcode entry does not seem to be responding, click in the Entry field before scanning again.

Accession

Scan the accession numbers from the [Login Barcode Labels](#) that need the selected test/method/sample type assigned to them.

Tube

Scan this number from the barcode of the [Tube Label](#) into the Entry field. The Tube # field will be automatically populated. The Tube # has the format of three letters followed by three numbers (e.g., ABC123).

Received

Scan the date and time that the sample was received from the first Test Request Form. A different date and time received only needs to be scanned if it changes.

Test, Method, Sample Type

Scan the barcode for the Test, Method, Sample Type for the test you are assigning from the preprinted [SAMPLE TYPE BARCODE TEST REPORT](#). The correct Test, Method, Sample Type may also be selected from the autocomplete drop-down list.

Test Section

This field is automatically populated if the test is performed by one section. For tests that can be performed in multiple sections and depending on the [test definition](#), the LIMS will:

1. Default to your current location listed in the [Preference screen's Location field](#) if the test definition specifies "Match User Location".
2. Force a selection if the test definition has more than one section.

Current Date/Time

This feature has not been implemented at this time. It could be used at a hospital kiosk when one or two samples are dropped off. Checking this box will enter the current date and time for the received date and time.

Print Labels

This feature has not been implemented at this time. It could be used at a hospital kiosk when one or two samples are dropped off. Checking this box will allow sample labels to be printed from this screen with the next available accession number(s).

Printer

This feature has not been implemented at this time. It could be used at a hospital kiosk when one or two samples are dropped off. Checking this box will allow sample labels to be printed from this screen to the selected printer with the next available accession number(s).

Test Order List

The Test Order List is a temporary holding place for analyses to be assigned to samples. It maintains a list of accession numbers and tests that will be entered into the LIMS. For each accession number and test, a new row will appear in the lower pane of the screen. Each

test for a sample needs to be logged in separately. If a row needs to be removed, select that row and click the **Remove Row** button at the bottom of the screen.

Once the entries have been verified, click the **Commit** button on the screen. All of the tests are now committed to the LIMS, and the current list of accession numbers becomes cleared from the Quick Entry screen. Although it is not a requirement to save, it is recommended that the entries be committed occasionally in case of a power failure.

Be cautious with the entry of analyses. If the wrong test is added to a sample -- it CANNOT BE DELETED from the sample -- only cancelled. However, Sample Type can easily be updated for each sample that was entered incorrectly.

3.2.2 USING QUICK ENTRY FOR A SERIES OF SAMPLES

The following process should be followed to quick enter a series of samples:

1. Scan in the date and time the sample is received.
2. Scan in the test barcode number. A list of tests with corresponding barcodes may be printed from the Test Report Screen located in the Report/Reference Menu. (See [Sample Type Barcode](#) for more information about this feature.)
3. Scan in the tube number (optional).
4. Scan in the accession number.
5. A new entry will appear as a row in the Test Order List.

If the received date and time and/or the test/method/sample type are the same for the next sample in the series, these fields do not have to be scanned in again as the Quick Entry screen will keep them as default values. Only the new accession number needs to be scanned. Again, an error in an entry in the Test Order List may not be corrected. The entry must be deleted with the **Remove Row** button and reentered.

3.3 FULL SAMPLE LOGIN

The full sample login screens are specifically designed for data entry personnel to manage one sample at a time. Every aspect of a sample, i.e., general sample information, sample containers, analyses, QA events, etc., can be entered through these screens.

The sample screens are the primary modes of entering complete sample information. Metadata for samples that were logged-in through Quick Entry are completely entered through these full sample login modules. Information from the Quick Entry sample login is imported into the full sample login screen.

Full sample login is available for each type of **sample domain**: environmental, SDWIS (safe drinking water), clinical, newborn screening, animal, and PT (proficiency testing).

The links to the full sample login modules are located in the second section of the Sample Menu.

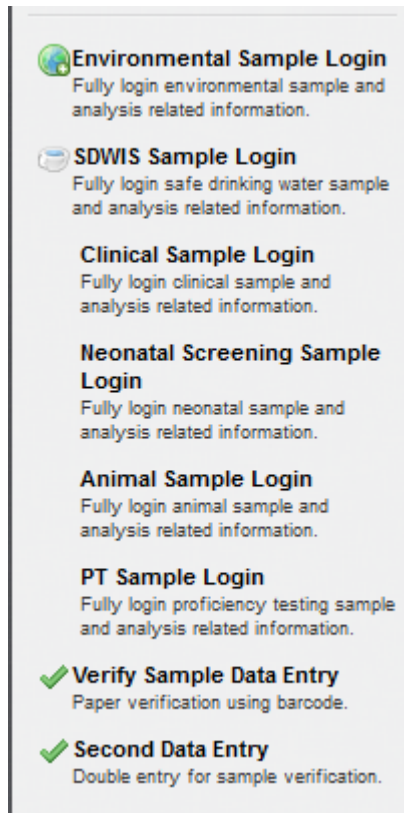


Figure 45 Sample Menu - Second Section

3.3.1 COMMON FIELDS

Many of the fields are the same for each sample domain. These are found at the top and bottom of each full sample login screen. The common fields are shown below.

3.3.1.1 COMMON FULL SAMPLE LOGIN FIELDS – TOP OF SCREEN

Figure 46 Common Full Sample Login Fields - Top of Screen

These are the fields that are found in the top section of all full sample login screens.


Accession

This field is used to enter the unique accession number for the sample. In add and update modes, the LIMS verifies that the accession # is not assigned to another sample. For samples that were quick entered, the LIMS will automatically populate the analysis part of the screen using previously entered data.

The field also ensures that the accession number has already been issued using the Login Barcode Labels module. An error message stating “Invalid Accession Number: Number not in use yet” will appear when an attempt is made to enter an unused accession number.

Figure 47 Error Message - Accession Number Not in Use Yet

Order

The Order # field contains the unique id for a send-out order (for environmental or SDWIS samples) or for an electronic order (for clinical or newborn screening samples). When the Order # from an order is entered, the information from the send-out/electronic order populates the corresponding fields in the full sample login screen. The pop-up button  to the right of Order # pops up a [Send-out Order](#)

[screen](#) containing the send-out order's information or the [EOrder Lookup screen](#) containing the electronic order's base information.

When an electronic order number is entered into the Clinical Sample or Newborn Screening Login screens, the EOrder Lookup screen will pop up so that the user can confirm the order's base information against the paper order form and select the order's row in order to load its data into the full sample login screen.

Collected

This field displays the date the sample was collected, if known.

Time

This field displays the time the sample was collected, if known.

Received

This field displays the date and time that the sample was received at the laboratory. Future dates-times and dates-times that are more than 364 days old cannot be entered in this field.

(Sample) Status

This field displays the status of the sample. The sample statuses are:

- Not Verified – This is the default status of a newly entered sample. A sample remains in this status until it is verified. See [USING PAPER VERIFICATION](#) for more information on the verification process.
- Logged In – After a sample is verified its status changes to Logged In. The sample will remain in this status while testing is being performed unless an issue changes the status to Error.
- Completed – Once all of the analyses are completed, the sample will automatically go to Completed status.
- Error – A sample will go to Error status if there is a problem with its data or analyses. It will remain in this status until the problem(s) is corrected.
- Released – Once all of the analyses are released, the sample will automatically go from Completed to Released status.

The Status field cannot be directly changed by the user. This field changes automatically based on sample and analysis data.

Client Reference

The value displayed in this field is one item that ties the client's information to the sample paperwork. It could be a client's lab number, a patient's ID/Medical Record Number/chart ID, or another unique identifier for a sample that they collect.

OPTIONS MENU

The following features can be accessed through the Options dropdown menu:

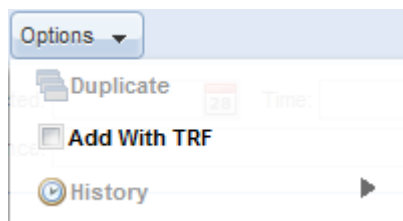


Figure 48 Full Sample Login Screens Option Menu

Duplicate

The Duplicate button places the login screen into Add Mode and copies the information from the previous displayed record into the fields of the current form. All of the fields are copied except for the Accession # which must be entered by the user. Other fields, such as Collected Date, Collected Time, Received Date and Time, Client Reference, and Location can be changed, as necessary, to match the new sample's Test Request Form. If a Test Request Form was attached to the previously displayed record, it will not be copied to the new sample record. This allows the user to manually attach the correct Test Request Form to the new record.

Add With TRF

This option must be checked if the sample information is going to be entered from a scanned Test Request Form (TRF). Selection of this option displays the Data Entry TRF Attachment screen that is used during this process. As an integral part of this process, the

scanned Test Request Form is automatically attached to the sample record. This is a quality assurance measure that ensures that the initial data entry was performed off of the Test Request Form that is attached to the sample record. See [DATA ENTRY FROM AN ATTACHED TEST REQUEST FORM](#) for more information about this process.

History

The History feature gives detailed information about the current record and how it has changed over time at the field level. See [History](#) for more information about interpreting the history of a field or record.

3.3.1.1.1 EORDER LOOKUP SCREEN

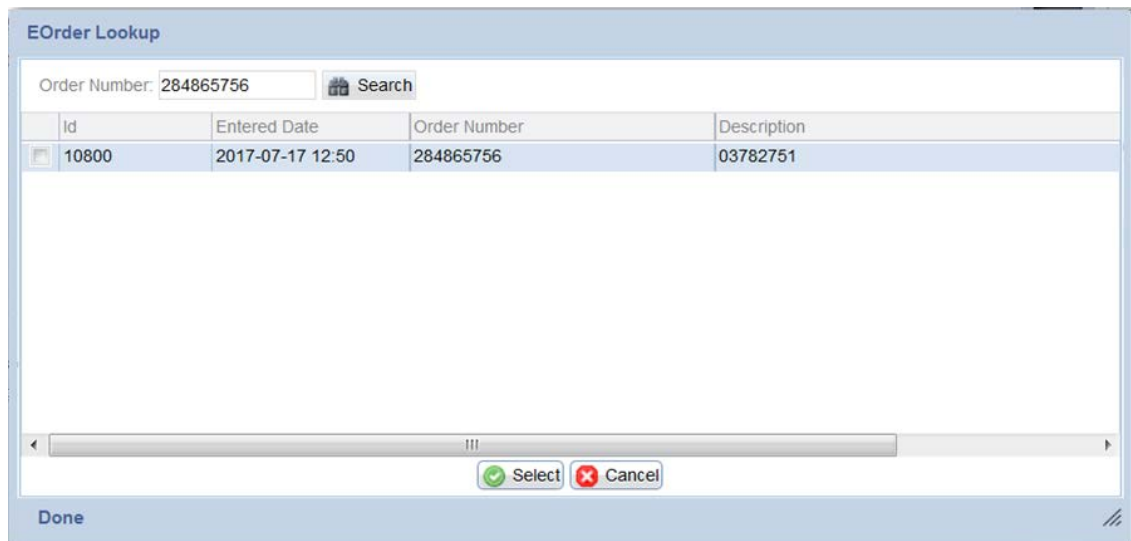


Figure 49 EOrder Lookup Screen

When an electronic order number is entered into the Clinical Sample or Newborn Screening Login screens, the EOrder Lookup screen will pop up so that the user can confirm the order's base information against the paper order form and select the order's row in order to load its data into the full sample login screen.

The fields and buttons on this screen are described below:

Id

The Id is a unique integer that is assigned by the OpenELIS database.

Entered Date

This is the date and time that the electronic order entered the OpenELIS system.

Order Number

The Order Number is used to uniquely identify each electronic order and is determined by the partnering hospital's LIMS.

Description

The Description of the order varies by partnering hospital; it can be a Medical Record Number (or another [Client Reference](#)) or a repeat of the Order Number.

Search

This button allows for electronic orders to be searched by the Order Number.

Select

This button will select the highlighted order and load its data into the full sample login screen.

Cancel

This button will not select the highlighted order or load its data into the full sample login screen.

3.3.1.1.2 PATIENT-ORDER COMPARISON SCREEN

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Patient Id: 590		Order #: 07879288	
Last:	TESTSHL	<<	TESTSHL
First:	NICK	<<	NICK
Birth:	1950-01-01 28	<<	1950-01-01 28
NID:		<<	
Apt/Suite #:		<<	
Address:		<<	123 4TH ST
City:		<<	MARION
State:		<<	IA
Zip Code:		<<	52302
Phone #:	319/555-4875	<<	319/555-4875
Gender:	Male	<<	Male
Race:	WB - White, Black	<<	W - White
Ethnicity:	Non Hispanic	<<	

Done

Figure 50 Patient-Order Comparison Screen

The Patient-Order Comparison screen displays a side-by-side comparison of the data from the existing patient record in the database versus the patient data from an electronic clinical or newborn screening order. This screen will automatically pop up when there is a mismatched value between the two sources. The user can then select which values to copy (or not copy) from the electronic order to the LIMS. This allows the user to select the most complete or accurate information to store in the OpenELIS patient record. The buttons on this screen are described below:



The white double-arrow button is displayed when the specified value is the same in both the patient record and the electronic order.



The gray double-arrow button is displayed when the specified value is different between the two sources. The user can click this button to copy the value from the electronic order

to the patient record. If the user does not click this button for a field, then the value in the patient record will remain unchanged.



The empty button is displayed when the specified field is not allowed to have its value changed through this screen. The [Birth\(date\)](#) and [NID](#) of an existing patient's record cannot be changed through this screen, but must be changed by using the [Edit button](#). If there's a mismatched value in one of these two fields, the red X button will be displayed.

OK

This button will move the changes in the patient data to the Clinical or Newborn Screening Sample Login screen.

Cancel

This button will leave all of the values in the patient record unchanged.

Figure 51 Some Values Copied from an Electronic Order to the Patient Record

The dialog box is titled "Patient-Order Comparison" and is split into two columns. The left column is for "Patient Id: 507" and the right column is for "Order #: Y272002585".

Field	Patient Record	Electronic Order
Last:	DUCK	DUCK
First:	DAFFY	DAFFY
Birth:	2015-01-01 [28]	1964-01-12 [28] (Mismatched)
NID:	974-56-3672	
Apt/Suite #:		
Address:		
City:		
State:	IA	
Zip Code:		
Phone #:		
Gender:	Male	Male
Race:	W - White	
Ethnicity:	Non Hispanic	

Buttons: OK, Cancel

Done

Figure 52 Mismatched Birthdate between Electronic Order and Patient Record

3.3.1.2 COMMON FULL SAMPLE LOGIN FIELDS – MIDDLE OF SCREEN

The "Items/Analyses" tree view shows a single item expanded:

- 0 - Drinking Water [32 - IDEXX 4 oz. Plastic (sodium thiosulfate[Na2S2O3] preservative)]
 - coliforms, colilert pa [Logged In]
 - nitrate + nitrite, epa 127b [Logged In]

Buttons: Add Item, Add Test, Remove Row

Figure 53 Sample Items and Analyses Tree - One Sample Item

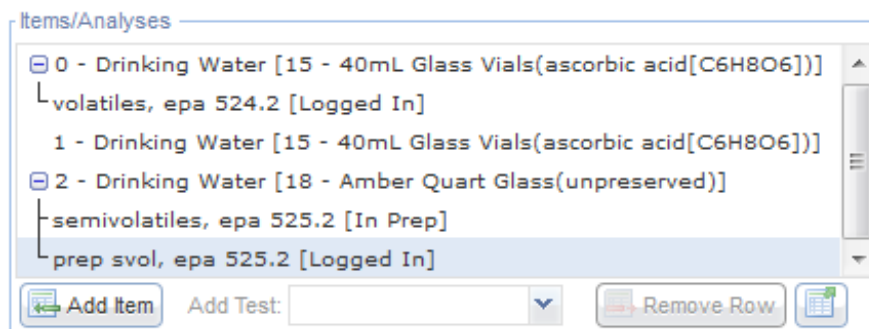


Figure 54 Sample Items and Analyses Tree - Multiple Sample Items

The Sample Items and Analyses tree is found in the middle section of all full sample login screens. This information is organized as a [tree hierarchy](#) with sample items (containers) being preceded with numerals and analyses assigned to the sample item as child objects. The sample type (e.g., Drinking Water) and name of the container (e.g., 18 – Amber Quart Glass(unpreserved)) is specified to the right of each sample item. The analysis status (e.g., Logged In) is specified to the right of the analysis. The buttons shown at the bottom of this section are used to build the tree. The buttons are described below.

Add Item

The **Add Item** button allows for the addition of a sample item to the current sample. A **Sample Item** is a sample container (i.e., a tube of blood, a bottle with a preservative, a sample aliquot) that contains the substance to be tested. When the **Add Item** button is clicked for the initial time, Item 0 is added to the Items/Analyses tree. The sample type is selected from the corresponding drop-down list found in the Sample Item tab located in the lower pane. (See [SAMPLE ITEM TAB](#) for more information.) The sample container can be selected from the Container dropdown list in the Sample Item tab, as well.

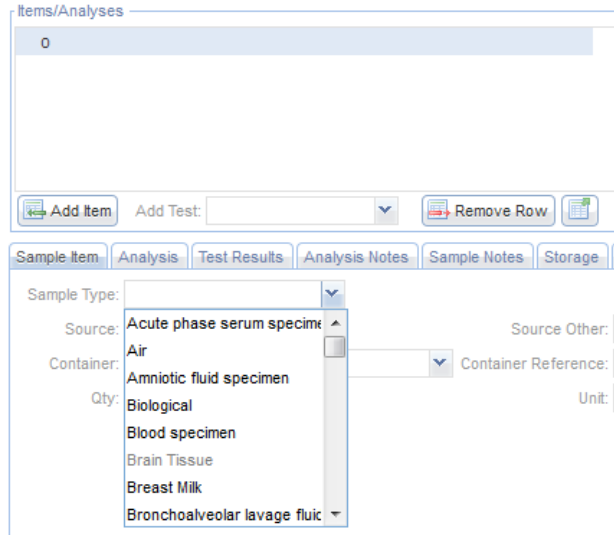


Figure 55 Adding a Sample Item in Full Sample Login

Add Test

The Add Test field allows the user to:

1. Add an analysis to a highlighted sample item
2. Add a peer analysis to a highlighted analysis

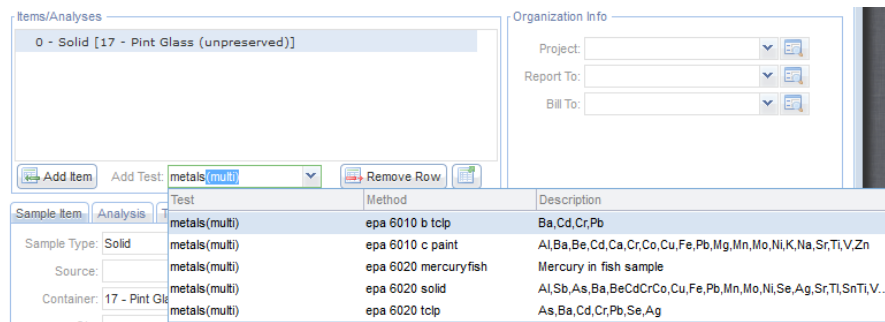


Figure 56 Adding an Analysis to a Sample Item

The beginning of the test or panel name is entered into the Add Test field and an autocomplete dropdown list that matches what has been entered so far will be displayed. Internal test descriptions in the dropdown list can help a user decide which test and method to select. After the test and method pair is selected it will be

displayed in the Items/Analyses tree along with its status. The initial analysis status would be Logged In (or In Prep if there is a prep test for the analysis).

Remove Row

The **Remove Row** button allows you to delete a sample item or analysis that has not yet been committed. Once a sample item row is removed, its preceding numeral is no longer available for reuse. For example, if Sample Item 0 is deleted and a new sample item is added, it cannot be assigned the numeral 0 by the LIMS. If **Remove Row** is clicked for an analysis row after committing, a message pops up warning that the analysis may only be cancelled, not removed.

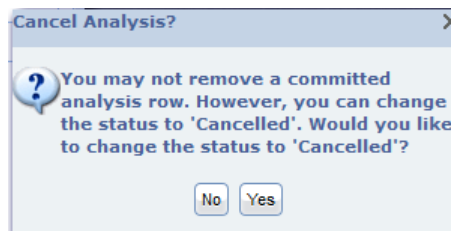



Figure 57 Cancel Analysis? Warning

Pop-out

The **Pop-out** button  displays the Sample Items and Analyses tree in its own screen affording easier readability and the ability to move an analysis to a different sample item. One or more analyses can be moved to a different sample item to reflect the actual workflow of the sample in the laboratory. The process is described below.

1. Click on the **Update** or **Add** button, if necessary.
2. Click on the **Pop-out** button.
3. The Sample Items and Analyses screen will pop up. Select the analysis/analyses to be moved and the sample item to which it will be moved.

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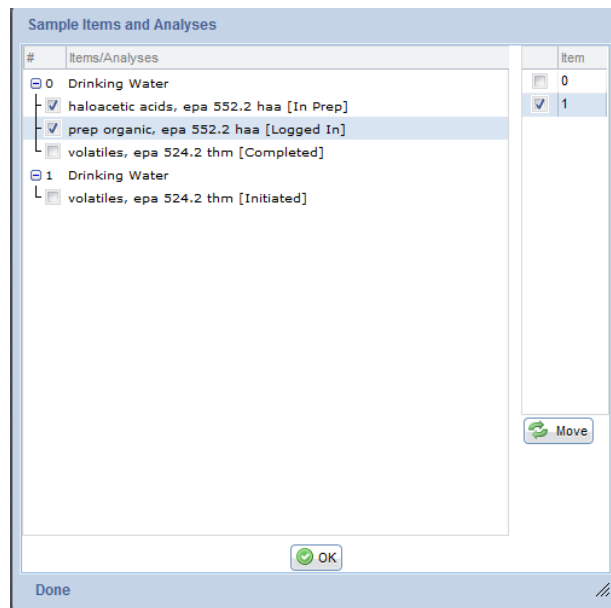


Figure 58 Moving an Analysis to a Different Sample Item

4. Click the **Move** button. The analysis move will be reflected in the sample tree.
5. Click **OK**.

3.3.1.3 COMMON FULL SAMPLE LOGIN FIELDS – BOTTOM OF SCREEN

The screenshot shows the bottom section of the full sample login screen. It features a row of tabs: "Sample Item", "Analysis", "Test Results", "Analysis Notes", "Sample Notes", "Storage", "QA Events", "Aux Data", and "Attachment". Below the tabs are several input fields: "Sample Type:" with a dropdown menu, "Source:" with a dropdown menu, "Source Other:" with a text input field, "Container:" with a dropdown menu, "Container Reference:" with a text input field, "Qty:" with a text input field, and "Unit:" with a dropdown menu.

Figure 59 Common Full Sample Login Fields - Bottom of Screen

The bottom section of each full sample login screen is comprised of multiple tabs. The information in these tabs is mostly tied to sample items and analyses. To change or

view information for each sample item or analysis, select the desired sample item or analysis row in the Items/Analyses tree and click on the tab of interest. The fields located in the bottom section are described below by tab.

The tab content indicator (red oval) to the right of a tab heading displays the quantity of items located in that tab. This signals to the user which tabs need to be examined. For example, the **1-2** to the right of “Sample Notes” means that there is one external sample note and two internal sample notes.

The screenshot shows a tabbed interface with the following tabs: Sample Item, Analysis, Test Results, Analysis Notes, Sample Notes (1-2), Storage, QA Events, Aux Data (4), and Attachment. The 'Sample Notes' tab is active and divided into two sections: 'External' and 'Internal'. The 'External' section contains a text box with the following text: "Upon arrival, sample met container and preservation requirements for the analysis requested. Please review carefully your sample results for additional analyte comments or method exceptions." Below this text is an 'Edit Note' button. The 'Internal' section contains two entries: 'rec'd IC' by nhootman on 2012-01-04 08:36 with a sub-entry '3-3 @ 3C', and 'containers' by recher on 2012-01-03 11:04 with a sub-entry '1-03 to IC'. Below this section is an 'Add Note' button.

Figure 60 Tab Content Indicators

3.3.1.3.1 SAMPLE ITEM TAB

The screenshot shows the 'Sample Item' tab active. The interface includes the following fields and controls: 'Sample Type' dropdown menu set to 'Solid'; 'Source' dropdown menu; 'Source Other' text input field containing 'Oranges'; 'Container' dropdown menu set to '99 - Non SHL Container'; 'Container Reference' text input field; 'Qty' text input field; and 'Unit' dropdown menu.

Figure 61 Sample Item Tab

Sample Type

The Sample Type drop-down list allows for the classification of the sample (e.g., Breast Milk, Dust, Liquid, Oil, etc.). The Sample Type selected affects what tests can be assigned to this sample item. For example, if a “Drinking Water” sample type is selected, the Add Test autocomplete drop-down list will only offer tests that can be performed on drinking water. The sample types that each test can be performed on must be listed in the [test’s definition](#).

Source

This field specifies the source of the sample such as Well Water, Ground Water, etc. For clinical samples, this field is used to specify a collection source such as Capillary for Blood sample type, Left Ear Lobe for Skin Biopsy, etc.

Source Other

This field is a free-text field that can be used to enter more specific source information.

Container

The container is the apparatus that holds the sample. Examples include a bottle, vial, trip blank, culture swab, etc. All SHL container names have the following format: internal id - container name. The container name can be quite descriptive and often specifies its capacity, e.g., 70 - 250ml Brown Plastic Nalgene Bottle (EDTA preservative).

Container Reference

This uppercase text field can be used to uniquely identify the received container by using the manufacturer’s inventory serial id, or the “Build Id” on the container label if the [kit is built](#) through OpenELIS. This field is also used to store the tube number of a blood lead collection tube or the serial number of a newborn screening dried blood spot collection card.

Qty and Unit

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These fields denote the quantity of material in this container. For example, if the container holds 200 mL of water, enter 200 in the Qty field and select mL from the Unit drop-down list.

3.3.1.3.2 ANALYSIS TAB

The screenshot shows the 'Analysis' tab in the OpenELIS interface. At the top, there are several tabs: Sample Item, Analysis (selected), Test Results, Analysis Notes, Sample Notes, Storage, QA Events, and Aux Data. Below these tabs, there are several input fields and dropdown menus:

- Test: semivolatiles
- Method: epa 625 bna, pah
- Status: In Prep
- Section: semivolatile-ic
- Unit: ug/L
- Sample Prep: prep svol, epa 625 bna, pah

 To the right of these fields are date pickers for Started, Completed, Released, and Printed, all showing the date 28. Below the input fields is a table with columns: Worksheet, Created, Status, and User. At the bottom of the table area are buttons for 'Select', 'Add Row', and 'Remove Row'.

Figure 62 Analysis Tab

The Analysis tab shows current test and method information for the selected analysis. This tab is also used to [flip the method](#), section, or unit for an analysis while the record is in Add or Update modes. The fields on this tab and their use are described below.

Test

The test that has been assigned for the analysis is displayed in this field.

Method

The method that has been assigned for the analysis is displayed in this field. The method can be flipped using this tab.

This screenshot shows the 'Analysis' tab with the 'Method' dropdown menu open. The 'Test' field is set to 'coliforms'. The dropdown menu lists the following options:

- colliert mpn sdwa am: MPN Total Coliform & E.coli by Quanti-Tray - morning
- colliert mpn sdwa pm: MPN Total Coliform & E.coli by Quanti-Tray - afternoon
- colliert mpn well: MPN Total Coliform & E.coli by Quanti-Tray

 The 'colliert mpn sdwa pm' option is currently selected in the dropdown.

Figure 63 Method Flipping through the Analysis Tab

(Analysis) Status

This field displays the current analysis status. The different analysis statuses are:

- Logged In – Shows that the analysis is assigned to the sample item and it is ready for testing to begin.
- Initiated – The analysis has been added to an electronic worksheet and testing has begun.
- On Hold – This status is used when the analyst is waiting for an external action (e.g., waiting on a directive from a client, other external events). This status needs to be manually selected.
- Requeue – Indicates that the analysis is rescheduled for re-analysis. See [WORKSHEETS](#) for more detail.
- Completed – The analysis has all of the results and is waiting for a second review. See [COMPLETING AN ANALYSIS](#) for more information.
- Released – The second review has been completed and the result is available for external reporting. See [RELEASING AN ANALYSIS](#) for more information.
- Error Logged In – The analysis is in Logged In status but has missing or incorrect information such as an invalid sample type.
- Error Initiated – The analysis is in Initiated status but has missing or incorrect information.
- Cancelled – Indicates that this analysis is no longer desired and should not be performed. Laboratories often cancel an analysis because of incorrect assignment. See [CANCELLING AN ANALYSIS](#) for more information.
- In Prep – The analysis is waiting for its prep analysis to be completed.
- Error Completed – The analysis is in Completed status but has missing or incorrect information such as an invalid sample type or unit.
- Error In Prep – The analysis is in In Prep status but has missing or incorrect information such as an invalid sample type or unit.

The Status is set to “Logged In” by default (or “In Prep” if a prep analysis needs to be completed first).

(Analysis) Type

This optional field specifies the type of analysis. Current choices include:

- **Preliminary**
OpenELIS manages multiple "readings" of a single analysis as a series of independent analyses. For example, a Tuberculosis sample that is read weekly for 4 weeks will have 4 TB tests assigned to that sample. In this case, the first 3 TB analyses will have a Preliminary flag indicating that more readings will be performed while the last analysis will not have a flag. Preliminary analyses are not counted in the test [Volume Report](#) and are not included in the billing export.
- **Preliminary Final**
This flag indicates that although this "reading" is preliminary, no further readings will be performed. Analyses with this flag are counted in the test [Volume Report](#) and are exported to billing.
- **Dilution**
Sometimes, multiple identical analyses are performed on a single sample due to dilution requirements. For example, a run of an analysis with multiple analytes might only recover a subset of the analytes and will require dilution and a re-run to recover the rest of the analytes. In this case, OpenELIS will have two (or more) analyses: the first one with the non-diluted analytes, and the subsequent analyses with diluted analytes. The first non-diluted analysis will not have any flag while the subsequent analyses will have the dilution flag. The flag affects the billing export (billing by analyte) by adding the diluted analytes to the original non-diluted analysis. Analyses with the dilution flag whose analytes have been added to another analysis will not be included in the billing export.

Reportable

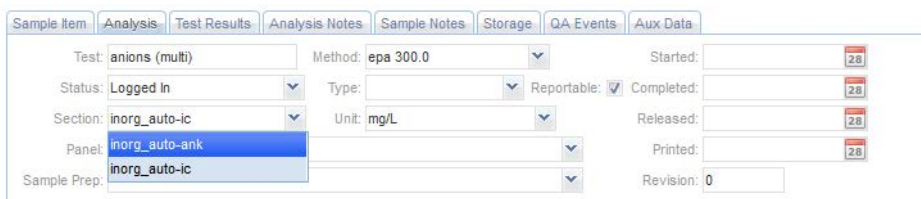
An analysis with the Reportable box checked will have its test results displayed and/or transmitted via the [Final Report](#), web portal data view, or electronically.

This field is defaulted to the [test definition](#) but can be changed to indicate if an analysis should be reported or not. For those systems that create billing, the reportable flag is also used to create billing information.

Section

This field indicates which section is performing the analysis. For tests that can be performed by multiple sections, the [test definition](#) specifies how this field operates.

For tests that can be performed by multiple sections, the analysis's section can be changed by selecting a different section during Add or Update mode.

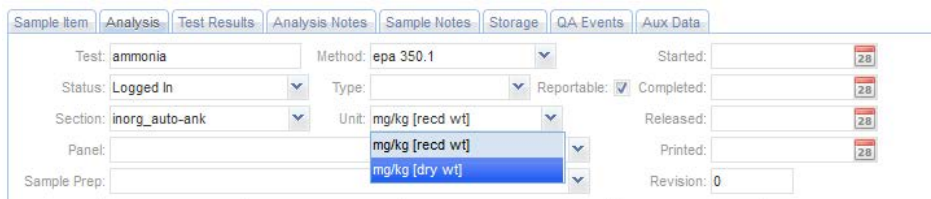


The screenshot shows the 'Analysis' tab of the OpenELIS interface. The 'Section' dropdown menu is open, showing 'inorg_auto-ic' as the selected option. Other options visible include 'inorg_auto-ank' and 'inorg_auto-ic'. The 'Test' field is set to 'anions (multi)', the 'Method' is 'epa 300.0', and the 'Unit' is 'mg/L'. The 'Status' is 'Logged In', and the 'Revision' is '0'. The 'Sample Prep' field is also set to 'inorg_auto-ic'.

Figure 64 Changing an Analysis's Section

Unit

The unit of measure for the analysis is specific to the sample type and is defined on the [Sample Type](#) tab of the test definition. If multiple units have been defined for a sample type, the unit can be changed during Add or Update mode.



The screenshot shows the 'Analysis' tab of the OpenELIS interface. The 'Unit' dropdown menu is open, showing 'mg/kg [recd wt]' as the selected option. Other options visible include 'mg/kg [recd wt]' and 'mg/kg [dry wt]'. The 'Test' field is set to 'ammonia', the 'Method' is 'epa 350.1', and the 'Section' is 'inorg_auto-ank'. The 'Status' is 'Logged In', and the 'Revision' is '0'. The 'Sample Prep' field is empty.

Figure 65 Changing the Unit of an Analysis

Panel

This field displays the [panel](#) that was used to add the tests to the sample. The panel field allows tests to be grouped mainly for electronic messaging in clinical settings. For example, the "nbs panel" test panel includes the tests/methods that are normally assigned to a sample item during newborn screening. An analysis can be linked to a different panel during Update mode.

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Figure 66 Changing the Panel Linkage of an Analysis

Sample Prep

This field displays the prep test/method for the currently selected analysis. If an analysis has a prep analysis assigned, the dependent analysis is placed into In Prep status until the prep analysis is completed. Then the status of the dependent analysis is changed to Logged In and the analysis available date is updated.

At times it may be desirable to choose a previously logged in analysis to be the prep analysis for a dependent analysis. This is accomplished by clicking on the dropdown arrow in the Sample Prep field and selecting the desired prep analysis. For a complete explanation of prep tests, see [Prep Tests](#).

Figure 67 Changing the Sample Prep Analysis of an Analytical Analysis

Started

This field indicates the date and time that the analysis was begun in the laboratory. It is automatically set to when the analysis is placed onto a worksheet but can be

overridden to indicate the actual start time of the analysis. For instruments that are electronically interfaced, this date and time is automatically updated to the injection time.

Completed

This field indicates the date and time that the analysis results were entered into the LIMS. It is automatically set to the date and time the worksheet was loaded back into the system but can be overridden to indicate the actual completion time of the analysis.

Released

This field indicates the date and time that the analysis was released or re-released. This field is set by the system and cannot be changed by the user.

Printed

This field indicates the date and time that the analysis was (or would have been) printed or re-printed on the Final Report.

(Analysis) Revision

The Revision number indicates the current version of the analysis. Laboratories sometimes unrelease an analysis in order to correct analysis information. Each time an analysis is unreleased, the revision number is automatically incremented by one.

Worksheet Table

This table displays all of the worksheets that contain this analysis. For example, if an analysis was run on two different worksheets, this table will have two entries indicating the worksheets.

To view the entire worksheet through the [Worksheet Completion](#) screen, select the row and click the **Select** button below the table.

User Table

This table displays a list of all of the laboratory staff that performed and/or released this analysis. The list is automatically populated by the Worksheet Completion and the Complete and Release modules. Additional entries can be manually added by using the **Add Row** button for those cases when multiple analysts helped complete the analysis.

3.3.1.3.3 TEST RESULTS TAB

A	B	C	D	E
<input type="checkbox"/>	Analyte	Value	Quant Limit	MCL
<input checked="" type="checkbox"/>	Antimony	<0.005	0.005	0.006
<input checked="" type="checkbox"/>	Arsenic	<0.001	0.001	0.010
<input checked="" type="checkbox"/>	Barium	0.15	0.05	2
<input checked="" type="checkbox"/>	Cadmium	<0.001	0.001	0.005
<input checked="" type="checkbox"/>	Chromium	<0.01	0.01	0.1
<input checked="" type="checkbox"/>	Selenium	<0.01	0.01	0.05
<input checked="" type="checkbox"/>	Thallium	<0.001	0.001	0.002
<input type="checkbox"/>	Analyte	Value	Quant Limit	
<input type="checkbox"/>	Aluminum	<0.1	0.1	

Figure 68 Test Results Tab

This tab displays the results of an analysis in an easy-to-read table. The fields and buttons and their uses are described below.

Reportable Checkbox

This checkbox is used to mark an analyte and its related results reportable. This is a second level of reporting capability as the [analysis will also have to be reportable](#). The box in this column header can be used to check (or uncheck) all of the analytes in that group.

This checkbox is defaulted to the [test definition](#) but can be changed to indicate if an analyte and its related values should be reported or not. For those systems that create billing, the reportable flag is also used to create billing information.

Analyte

This column contains the analyte that was tested or the question that was asked. OpenELIS generally calls any question (i.e., Chloroform, Date of Onset, Sign and Symptoms) an analyte.

Value

The Value field is used to enter the result for the corresponding analyte. It can be displayed as a numerical value (<0.5), as a qualitative result (Positive, Negative), as a titer (1:8, <1:256), or a date-time field (2012-12-21 00:01).

Other column analytes, such as Expected Value, Quant Limit, and MCL, might be present depending upon the test definition.

Add Row

This button is used to add an additional test analyte to this tab below the selected row. The Test Analyte Selection screen will pop up allowing the user to choose the desired test analyte(s) to add.

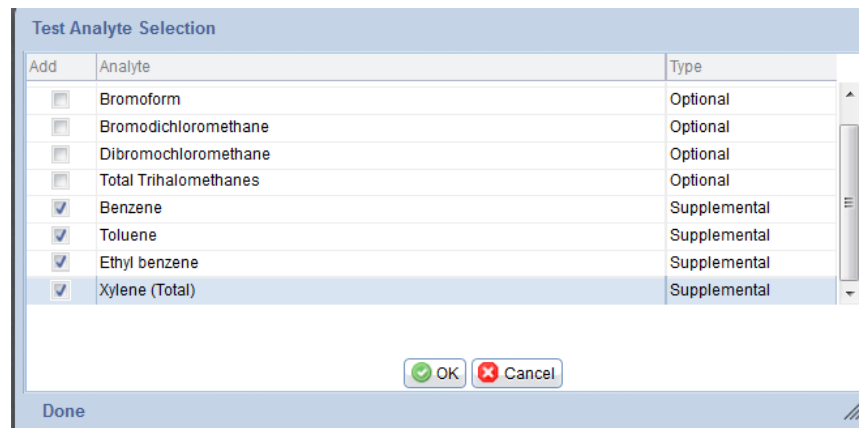


Figure 69 Test Analyte Selection Screen

Remove Row

This button is used to remove an analyte from this tab.

Check All and Uncheck All

These buttons check/uncheck the Reportable column.

Run Scriptlets

A [scriptlet](#) assigned to a test is run when any change is made to the data on the Test Results tab. The **Run Scriptlets** button can be used to force all of the scriptlets assigned to the sample (any applicable test and domain scriptlets) to run.

3.3.1.3.4 ANALYSIS NOTES TAB

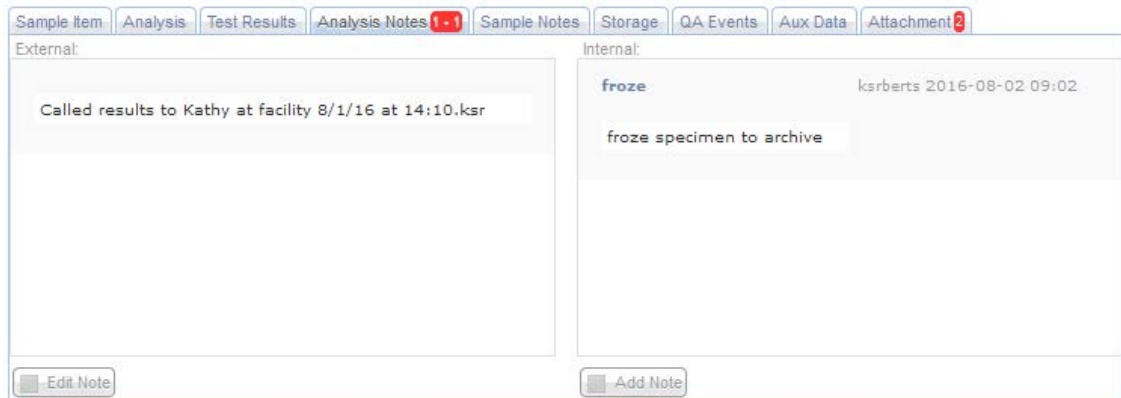



Figure 70 Analysis Notes Tab

The Analysis Notes tab allows for the entering of both internal and external comments that are related to a specific analysis. There is only one external note allowed and it may be edited as many times as needed. Internal notes, however, are individual entries, can only be committed once, and cannot be edited after committal. The subject line, author of the note, and date and time are only present on internal notes. Only external notes appear on result reports.

The tab content indicator (red oval) to the right of a tab heading displays the quantity of items located in that tab. This signals to the user which tabs need to be examined. For example, the  to the right of “Analysis Notes” means that there is one external analysis note and one internal analysis note.

Click the appropriate button (**Edit Note** for an external note or **Add Note** for an internal note) to enter an analysis note. The [NOTE EDITOR](#) screen will pop up for this process.

3.3.1.3.4.1 NOTE EDITOR

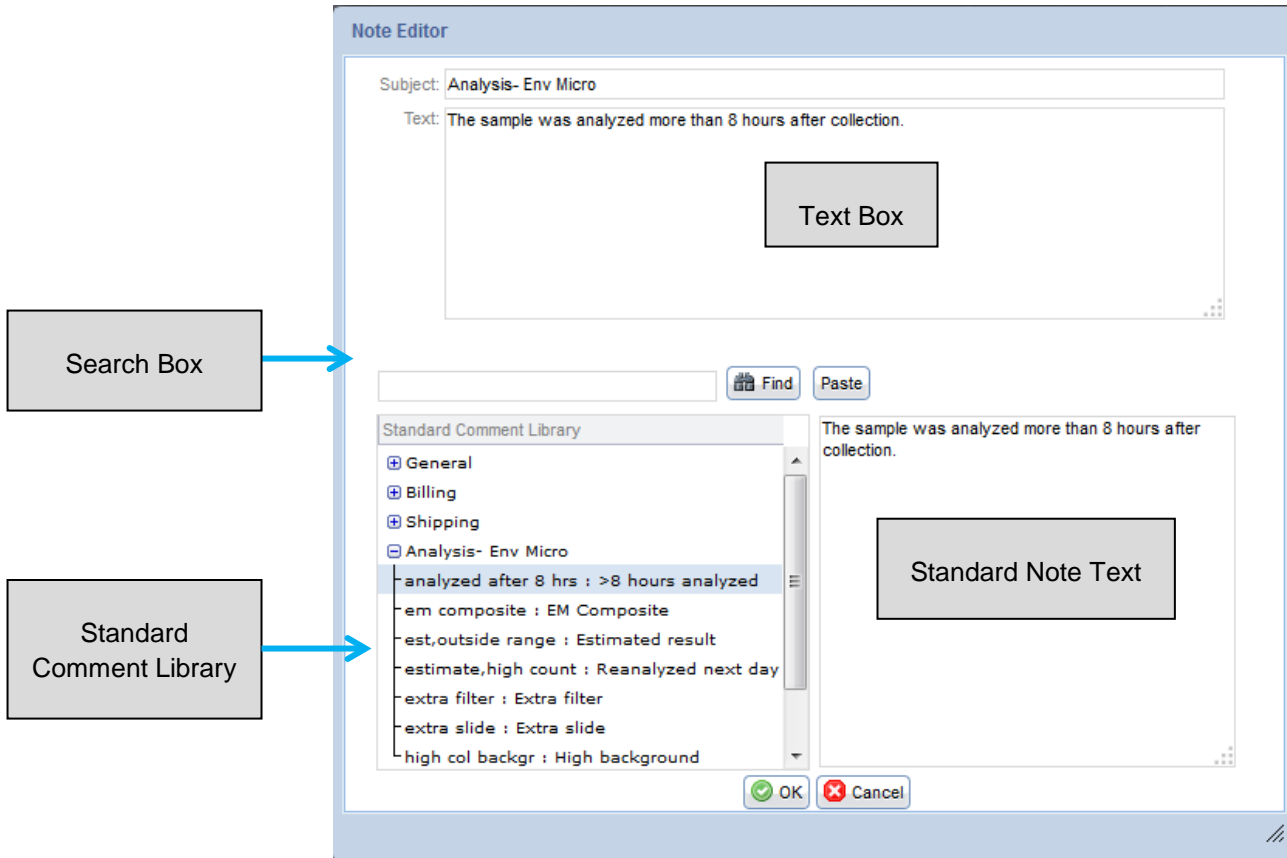



Figure 71 Note Editor

This screen is used for entering all internal and external notes within the LIMS. To type in a note, click in the Text Box and type in the desired note making sure to only return at the end of a paragraph.

You may also copy and paste text from the library of prewritten notes (Standard Notes). These commonly-used notes are organized into categories and can be browsed by clicking on the  icons in the Standard Comment Library table on this screen. When a standard note's *name : description* is selected the text of the note appears in the lower right pane for review. Click the **Paste** button to insert the note's text into the Text Box at the current cursor position. The standard note's category (type) will become the default Subject line for internal notes. The note's text and subject line can be further tailored to meet the individual situation.

Standard notes can also be searched and listed by entering a few letters or words in the Search Box in the middle of the screen and clicking the **Find** button. Standard notes that have names or descriptions matching the search criteria will be displayed.

Click **OK** when finished adding/editing the note.

See [STANDARD NOTE](#) for more information on the structure of a standard note.

3.3.1.3.5 SAMPLE NOTES TAB

Sample Item Analysis Test Results Analysis Notes **Sample Notes** Storage QA Events Aux Data Attachment

External:

Upon arrival, sample met container and preservation requirements for the analysis requested. Please review carefully your sample results for additional analyte comments or method exceptions.

Edit Note

Internal:

General mhayek 2016-08-09 11:07

Recheck bottle has been sent to facility.

Add Note

Figure 72 Sample Notes Tab

The Sample Notes tab allows for entering both internal and external comments that are tied to the entire sample. Sample notes are entered in the same manner as analysis notes. See [ANALYSIS NOTES TAB](#) and [NOTE EDITOR](#) for a detailed explanation.

3.3.1.3.6 STORAGE TAB

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Sample Item	Analysis	Test Results	Analysis Notes	Sample Notes 1-0	Storage 2	QA Events 1-1	Aux Data 5	Attachment 1
User	Location		Check In		Check Out			
mhayek	218, cart #1		2016-08-02 10:05		2016-08-09 12:15			
mhayek	218, shelf, east wall ucmr3		2016-08-09 12:15					

Figure 66 Storage Tab

The Storage tab displays a list of storage locations for the selected analysis or sample item. Click on the **Add Row** button to enter an initial storage location or to move an analysis product or sample item to a new location. The User name and Check In date and time are automatically entered to reflect the logged-in user and current date and time, respectively. The (storage) Location can be selected from an autocomplete drop-down list that displays the Parent (Location), Storage (Sub-)Unit, and (Sub-)Location. The current date and time will be automatically entered in the Check Out field for the previous location. Check In and Check Out dates and times can be manually overridden.

Sample Item	Analysis	Test Results	Analysis Notes	Sample Notes 1-0	Storage	QA Events 1-1	Aux Data 5	Attachment 1
User	Location		Check In		Check Out			
mhayek	ic		2016-08-09 12:20					
		Parent	Storage Unit	Location				
		ic 2242 f2	shelf	2				
		ic 2242 f2	shelf	3				
		ic 2242 f2	shelf	4				
		ic 2242 f2	shelf	5				
		ic 2242 f2	bin	1				
		ic 2242 f2	bin	2				

Figure 73 Selecting a Storage Location for a Sample Item/Analysis Product

3.3.1.3.7 QA EVENTS TAB

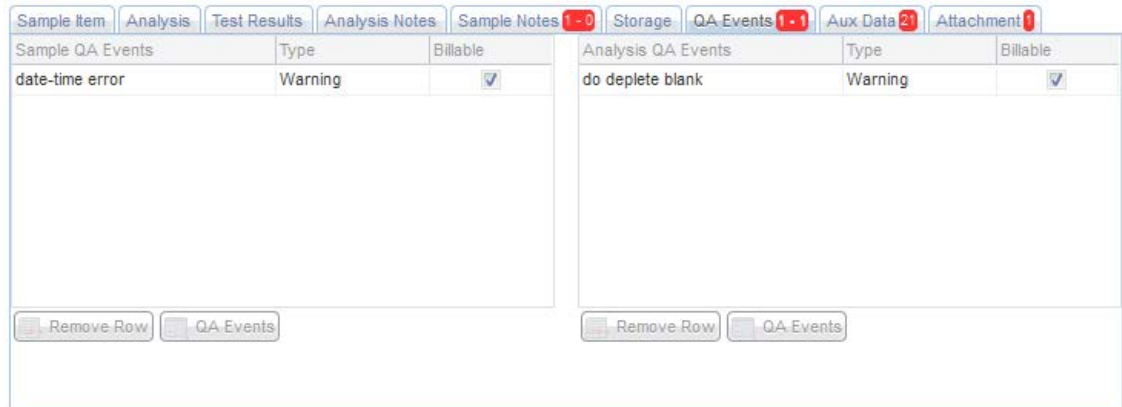


Figure 74 QA Events Tab

Quality Assurance events are flags that can be associated with a sample and/or an analysis to denote an exceptional condition. The Sample QA Events table shows a list of events that are associated with the sample while the Analysis QA Events table shows the events for the currently selected analysis. Analysis QA Events can only be viewed, added, or removed from a specific analysis node, whereas, Sample QA Events can be viewed, added, or removed from any analysis or sample item node.

QA events can be removed (**Remove Row** button) or added (**QA Events** button) using the appropriate button below each table. Clicking on the **QA Events** button will pop up the [QA EVENT SELECTION SCREEN](#). QA events will be listed on the Final Report in the order in which they were selected.* It is strongly recommended not to use more than three QA events for any given sample and to list the Result Override QA event(s) first for clarity and brevity.

The user can also change the Type of QA event (Internal, Result Override, or Warning) by clicking on the dropdown arrow in this field. The Billable checkbox can also be checked or unchecked.

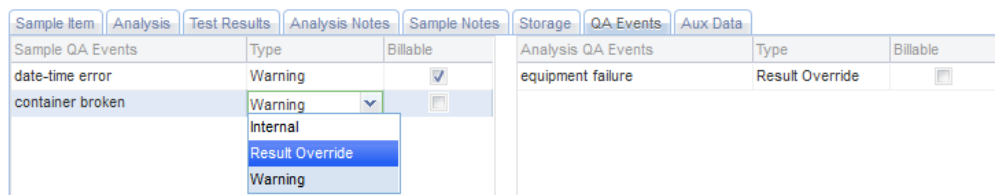


Figure 75 Changing the Type of QA Event

Since sample QA events affect all the analyses on that sample, they cannot be altered if any analysis has been released. The only exception is adding/removing internal QA events; the billable flag is marked billable if the sample/analysis is billable.

See [QA EVENTS](#) for a complete explanation of the benefits and types of QA events.

3.3.1.3.7.1 QA EVENT SELECTION SCREEN

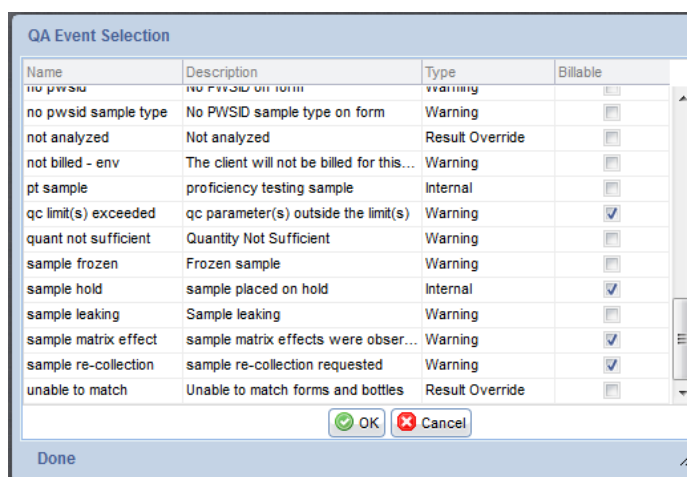


Figure 76 QA Event Selection Screen

The QA Event Selection screen is the vehicle that is used for selecting all sample and analysis QA events. This screen displays a list of available QA events. Test-specific QA events are only displayed when that specific analysis is selected in the Items/Analyses tree. The default QA event type is indicated in the Type column. The Billable checkbox indicates if the QA Event is, by default, billable or not.

Multiple QA events can be **Ctrl-** or **Shift-**selected. Click the **OK** button to insert them onto the QA Events tab.

3.3.1.3.8 AUX DATA TAB

The Aux (Auxiliary) Data tab is used to capture additional questions related to the sample. The auxiliary analytes are grouped together and are usually standard for the type of sample or the particular tests that are assigned. Auxiliary analytes are printed as items on the sample collection form to prompt collectors to gather and complete

this requested information. This information is normally entered through the Aux Data tab located on the full sample login screens or the [SEND-OUT ORDER](#) screen as it becomes available.

Reportable	Name	Value
<input type="checkbox"/>	Received by	RLE
<input type="checkbox"/>	pH	<2
<input type="checkbox"/>	Sample Intact	Yes
<input type="checkbox"/>	Temperature	9.8
<input type="checkbox"/>	Build Id	

Remove Row Aux Groups

Description: Temp upon receipt Method: Unit: degrees C

Figure 77 Aux Data Tab

To add auxiliary groups, click on the **Aux Groups** button. The Aux Group Selection screen will pop up. Clicking the **Remove Row** button removes the entire auxiliary group, not just the individual auxiliary analyte. See [AUX GROUP SELECTION SCREEN](#) for instructions on adding aux groups.

The Aux Data tab contains a table consisting of three columns: Reportable, Name, and Value. In Update Mode an auxiliary analyte can be selected to display its corresponding Description, Method, and Unit, if they are present.

Reportable

The Reportable checkbox may be manually checked (or unchecked) for any auxiliary analyte to mark it as reportable. Reportable auxiliary analytes and their final values are visible through the [Final Report](#), web portal data view, and electronically.

Name

The name of the auxiliary analyte is displayed in this field.

Value

A value for an auxiliary analyte is contained in this field and may be manually entered at any time before sample release. These values can be updated from this tab.

If an auxiliary analyte is [required](#) to have a value and the person entering the sample neglects to enter a value, a warning message will pop-up when committal of the record is attempted. If this warning is ignored and the required value is not entered before or during sample verification, the sample will go to [Error status](#).

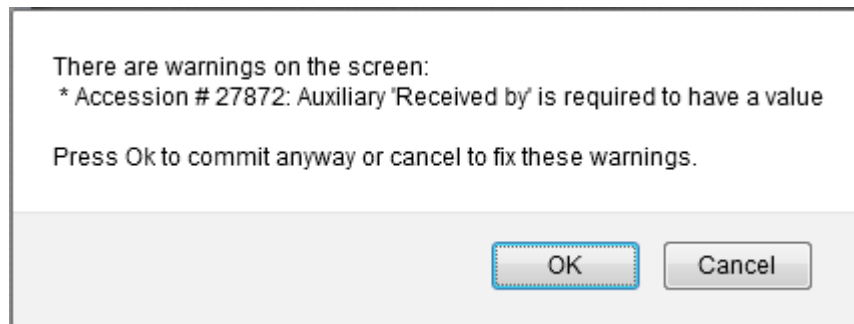


Figure 78 Required Auxiliary Analyte Value Pop-up Warning

Description

The Description field displays additional helpful information about the auxiliary analyte.

Method

This field shows the method that is used to measure the auxiliary analyte, if there is one.

Unit

This field displays the unit of measurement for the auxiliary analyte, if there is one.

[3.3.1.3.8.1 AUX GROUP SELECTION SCREEN](#)

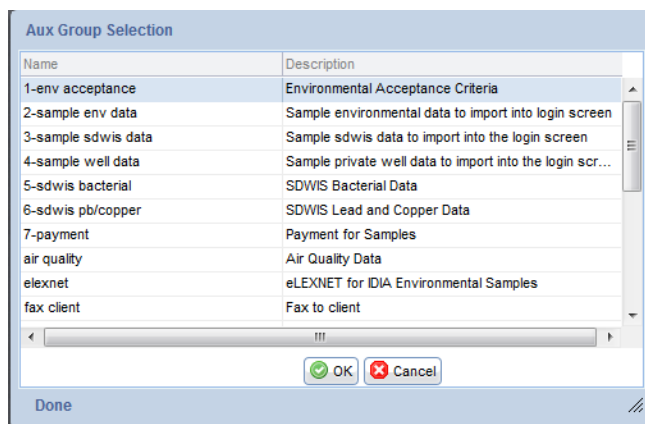


Figure 79 Aux Group Selection Screen

The Aux Group Selection screen is used to select one or more auxiliary groups to be added to a sample. Auxiliary analytes are grouped by function (e.g., environmental acceptance criteria, payment for samples, pool and spa sample data, etc.) Select the desired aux group(s) and click the **OK** button. The auxiliary analytes will populate the Aux Data tab.

3.3.1.3.9 ATTACHMENT TAB

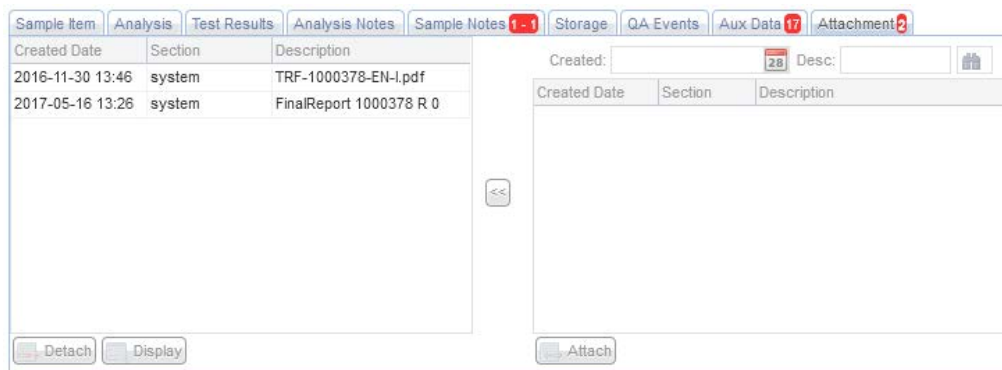


Figure 80 Attachment Tab

The Attachment tab is used to link a file to a sample. These attachments could be linked by the system (e.g., a previous revision of a Final Report) or linked manually by a user (e.g., Test Request Form, email from a client or co-worker, instrument graph, etc.) Files should be uploaded once to OpenELIS; however, they can be linked to multiple samples. Most of the standard file types can be linked and viewed from this

tab (i.e., .pdf, .docx, .doc, .xlsx, .xls, .png, .txt, etc.) Attachments can be restricted so that they can only be viewed by specific groups of people (i.e., bacteriology lab section, client services staff, all internal laboratory staff (section = internal), or anyone with OpenELIS permissions including external clients (section = public)). These groups will first need to be defined through the [LABORATORY SECTION](#) screen.

Previous revisions of Final Reports and Test Request Forms are automatically assigned a section of “system”. Along with attachments that have been assigned a section of “public”, they are available for viewing through the OpenELIS Web Portal by external users with permission to those samples.

The steps for adding an attachment are described in the next two sections.

3.3.1.3.9.1 ATTACHING A NEW FILE

1. While in Add or Update mode, click on the **Attach** button.
2. The Attachment pop-up screen will appear. Drag and drop the desired file onto this screen to upload it to OpenELIS.
3. If it is desirable to change the Description of the file and/or the Section that can view it, click the **Update** button on this pop-up screen and enter the new description and/or select the section. Click **Commit** on this pop-up screen to save these changes. The user must have sufficient permissions in order to change the Description or Section.

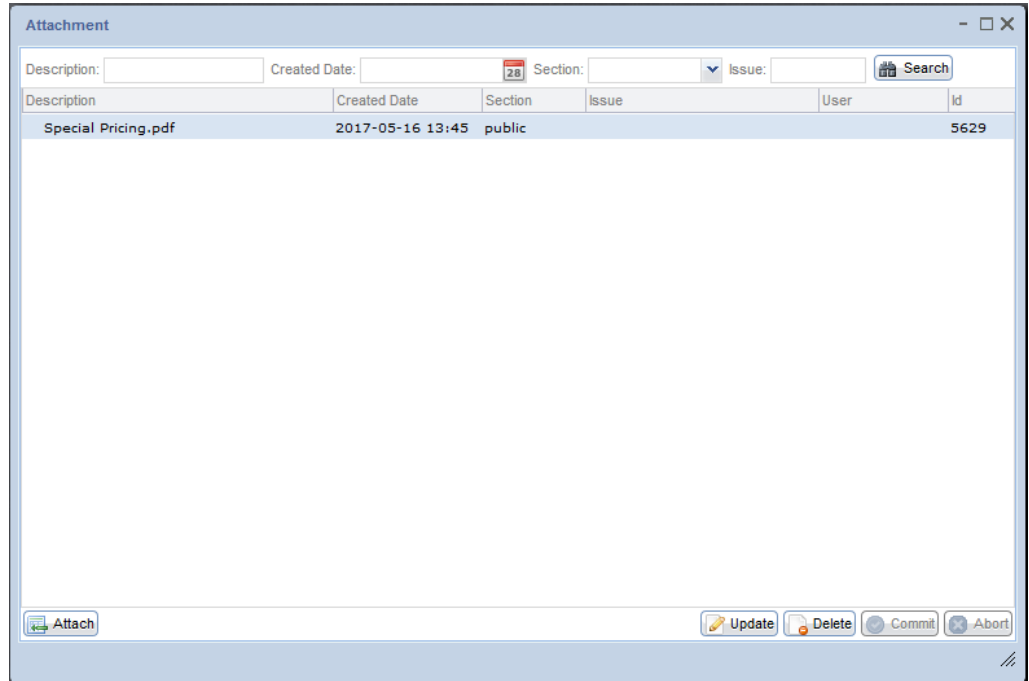


Figure 81 Attachment Pop-up Screen

4. Click **Attach** on this Attachment pop-up screen. The file will be displayed as an attachment on the Attachment tab.

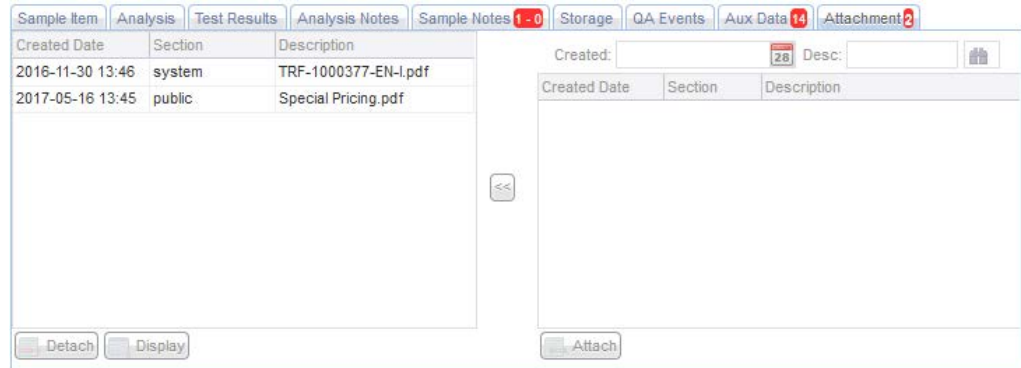



Figure 82 Attachment Tab

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5. Select the attachment's row and click on the **Display** button (or double-click on the row) to view the file. If the wrong file was attached, select the attachment's row and click on the **Detach** button.
6. Click **Commit** and the file will be attached.

3.3.1.3.9.2 ATTACHING A FILE THAT HAS ALREADY BEEN UPLOADED

1. While in Add or Update mode, search for the file that has previously been uploaded into OpenELIS.
2. Search by Created Date (date and time when the file was uploaded into the system) and/or its Description and click on the  button. In the example below, *380503* was entered in the Desc(ription) field to search for the Test Request Form for that accession number.



Created:		Desc: *380503*	
Created Date	Section	Description	
2016-05-23 07:...	system	TRF-380503-CB-I.pdf	

Figure 83 Searching for a Test Request Form by its Accession Number

In the following example, *email* was entered in the Desc(ription) field to search for attachments that contain the word "email" as part of their description.



Created:		Desc: *email*	
Created Date	Section	Description	
2015-03-18 14:...	internal	email - sample type change.pdf	
2015-03-31 15:...	internal	email_ Hold and Refuse Sample...	
2015-04-10 08:...	internal	email data adjustment for IA153...	
2015-04-24 11:21	internal	email dnr reject_04212015.xml ...	
2015-04-24 11:22	internal	email from mangold rejected.pdf	
2015-04-30 14:...	internal	email no payment yet org 6587....	
2015-05-01 10:...	internal	email no payment yet org 6587....	
2015-05-06 09:...	internal	email for Sample Classification ...	
2015-05-06 09:...	internal	email from shawyer wall.pdf	

Figure 84 Searching for a File by Part of its Description

- The search results can be sorted by Created Date, Section, or Description and/or filtered by Section.

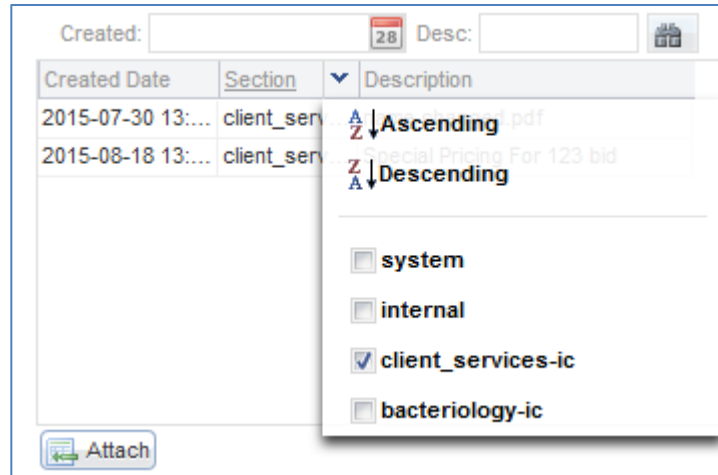



Figure 85 Filtering Results by Section

- Select the desired row from the search results and click on the  button. The file will be displayed as an attachment. (If it is desirable to change the Description and/or Section of the file, follow the steps in the [previous section](#).)
- Select the attachment's row and click on the **Display** button (or double-click on the row) to view the file. If the wrong file was attached, select the attachment's row and click on the **Detach** button.
- Click **Commit** and the file will be attached.
- Repeat this process to attach the file to another sample.

3.3.1.3.9.3 DATA ENTRY FROM AN ATTACHED TEST REQUEST FORM

A pdf version of a Test Request Form (TRF) can be scanned into OpenELIS, attached to the sample's record, and used to enter data into a full sample login screen. This offers several advantages to the laboratory:

- Paper copies of TRFs no longer need to be stored. This can save the laboratory storage fees, filing labor, and physical file space.
- Paper copies of TRFs do not need to be transported from the laboratory's sample accessioning department to its data entry staff or to the respective

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laboratory bench(es). This can eliminate the need to make additional copies of the TRF and also reduces the risk of misplacing or losing a TRF.

3. By first attaching the scanned copy of the TRF to the sample record and then entering data from the attached TRF into the full sample login screen, the laboratory can be assured that the information from a TRF is being entered into the correct sample record. This serves as a quality assurance measure to guard against information being entered off of a paper copy of a TRF into the sample record of the wrong accession number.

After opening the appropriate full sample login screen from the [Sample menu](#), the data entry user should follow these steps to attach a TRF and enter data from it.

1. Under the **Options** menu, check the [Add With TRF](#) box.
2. The Data Entry TRF Attachment screen pops up.

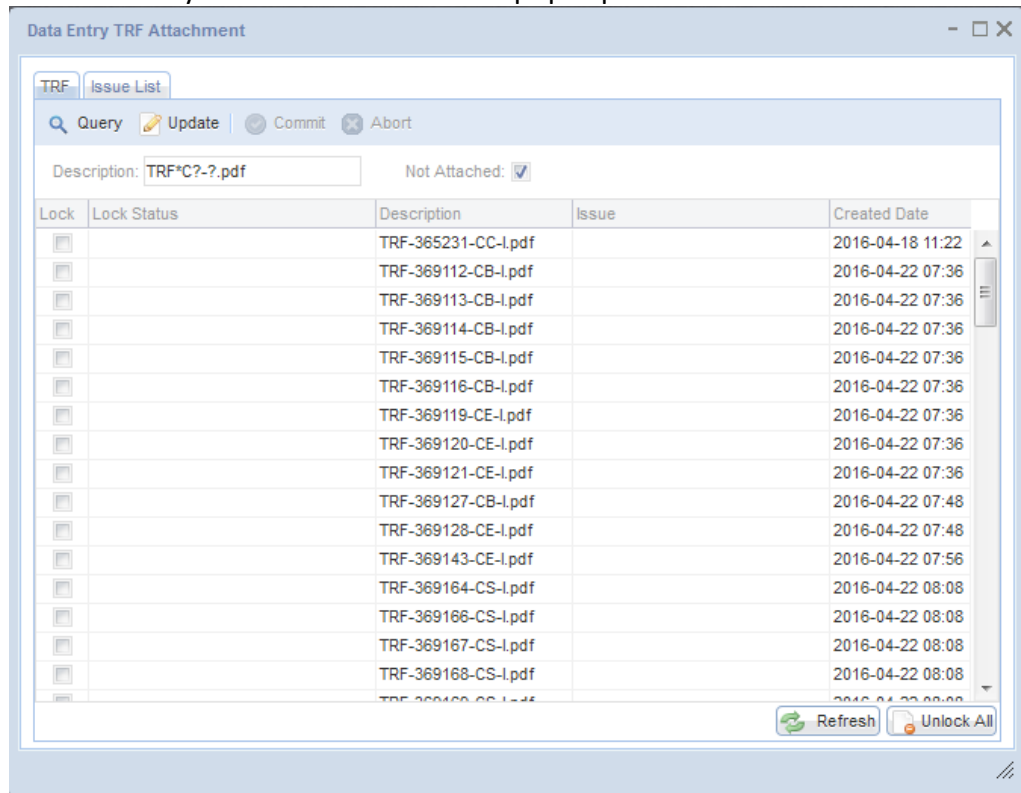


Figure 86 Data Entry TRF Attachment Screen

3. The screen queries for all of the TRFs that match the naming pattern that is specified in the Description text box. The naming pattern for TRFs that is currently being used is: TRF-NNNNNN-FT-L.pdf, where NNNNNN is the

sample's accession number, FT is the two character Form Type (i.e., EN for Environmental, SD for SDWIS, CB for Clinical Bacteriology, CS for Clinical Serology, etc.), and L is the Location Code of the laboratory site (i.e., A for Ankeny, I for Iowa City, L for Lakeside, etc.) The default naming pattern that is queried for a particular sample domain is set as a [system variable](#) in OpenELIS. The user can search for TRFs outside of the default naming pattern by clicking the **Query** button and changing the description pattern.

4. By default, the TRF tab of this screen will display all of the TRFs for that particular sample domain that have not been attached to a sample. If the user wishes to see TRFs that have already been attached to samples, she should uncheck the Not Attached checkbox.
5. The displayed TRFs can be sorted by Created Date in ascending (default) or descending order. The Created Date is the date and time that the TRF was scanned into OpenELIS.

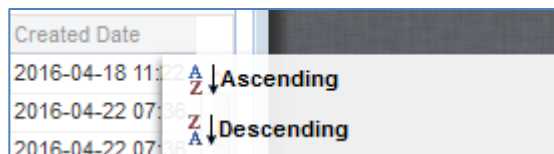


Figure 87 Sorting the TRF Created Date by Ascending or Descending Order

6. When sample login is being performed by multiple people, the data entry staff may wish to divide up the list of displayed Test Request Forms and have each user reserve a group of TRFs by locking them. The user needs to check the Lock checkbox of each TRF that he wishes to lock. If the user successfully locks the TRF for data entry, his username will be displayed in the Lock Status field. If the TRF has already been locked by another user, that username will be displayed in this field and the Lock checkbox will not be able to be checked by the first user. This can be used as a way to notify the data entry staff of which person is entering (or intending to enter) each of the TRFs. The TRF lock is currently set to 30 minutes. One or more TRFs can be unlocked before the 30 minutes has expired by clicking on the **Unlock All** button.

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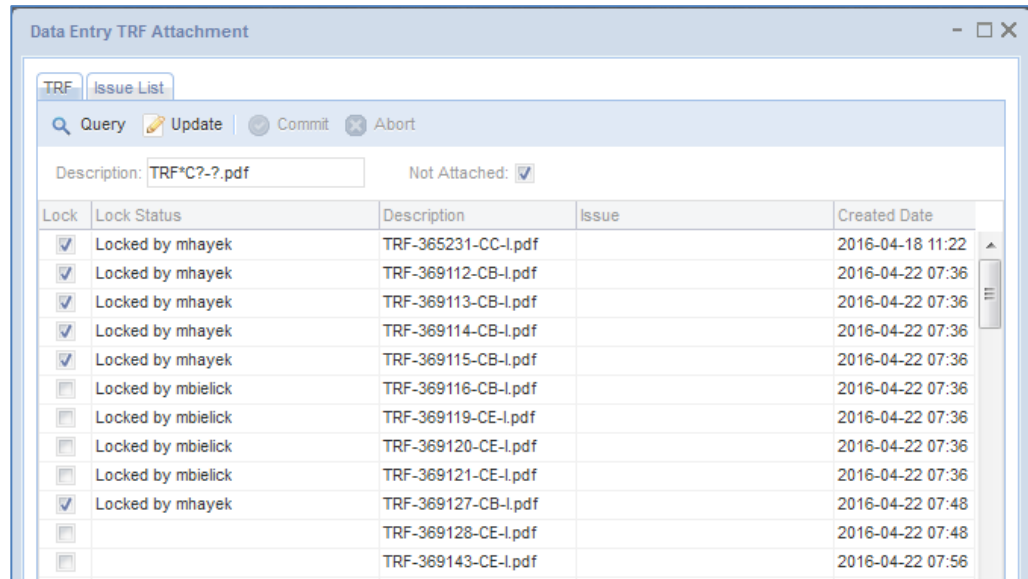


Figure 88 Locking TRFs

If a TRF has already been attached to a sample and a user locks it, the word “Attached” will follow the username of the person who locked it.

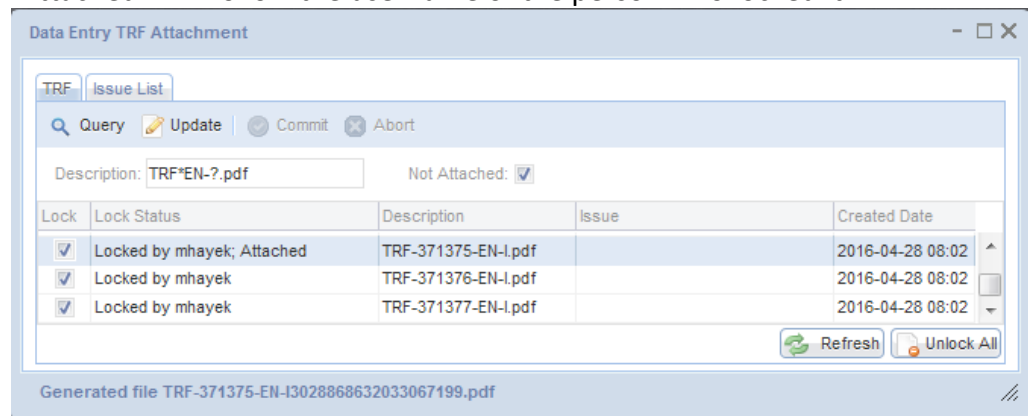


Figure 89 Locking a TRF that Has Already Been Attached

- A TRF can be displayed by clicking on any part of its row, except for the Lock checkbox. This action will highlight the row in blue. The user should first make sure that the TRF that she wishes to enter data from is highlighted and displayed before attaching it to the sample record.

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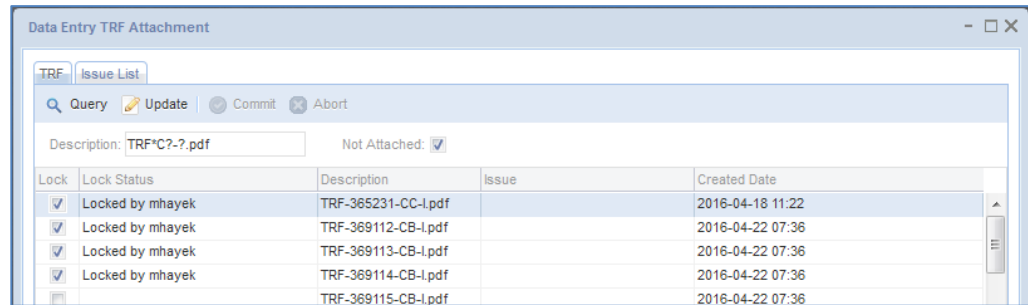


Figure 90 Selecting a TRF to Display and Attach

- Next, click the **Add** button on the full sample login screen. This action automatically attaches the TRF to the sample record. This can be verified by examining the Attachment tab of the login screen.

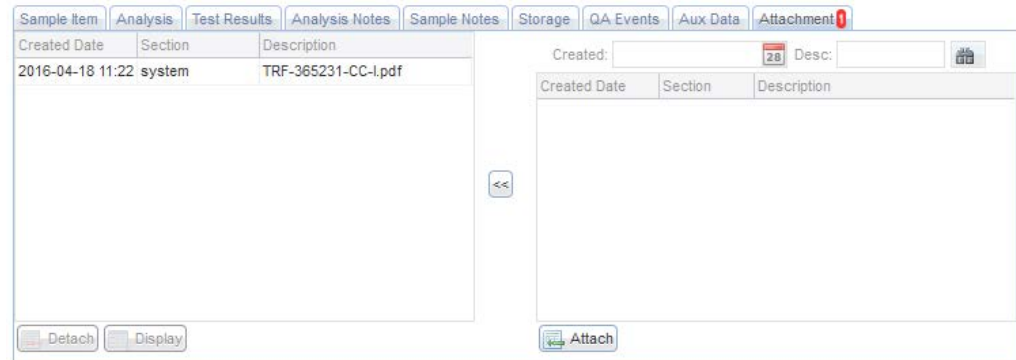


Figure 91 Verifying an Attached TRF

- The user begins entering data from the attached TRF into the full sample login screen beginning with the Accession #. If the Accession # entered does not match the Accession # of the attached TRF, a message warning of this discrepancy will be displayed. This serves as an alert to the user that she is entering information from a different TRF than the one that is attached, and may have attached the wrong TRF to the sample.

 The accession number on 'TRF-365231-CC-I.pdf' is different from the entered accession number

Figure 92 Accession Number Discrepancy Warning Message

- Continue entering data from the attached TRF and click the **Commit** button.
- Select the row of the next TRF to be entered on the Data Entry TRF Attachment screen and repeat the process.
- After a period of time the user may want to refresh the list of TRFs to see if any new ones have been scanned into OpenELIS or to remove ones that have been

entered. Click the **Refresh** button to perform this action. The user must first unlock any attachments that she locked by clicking the **Unlock All** button.

3.3.1.3.9.3.1 ISSUES WITH TEST REQUEST FORMS

Occasionally, an issue prevents a [Test Request Form](#) (TRF) from being fully logged in. This might include a missing name or birth date for a patient, no test being marked on the TRF, or the TRF is a duplicate of one that has already been logged in. A user can notify the other data entry staff of an issue by clicking the **Update** button on the TRF tab of the Data Entry TRF Attachment screen and entering the problem into the Issue field for that TRF. By clicking on the **Update** button, the issue can be modified or removed after resolution (by backspacing out the text).

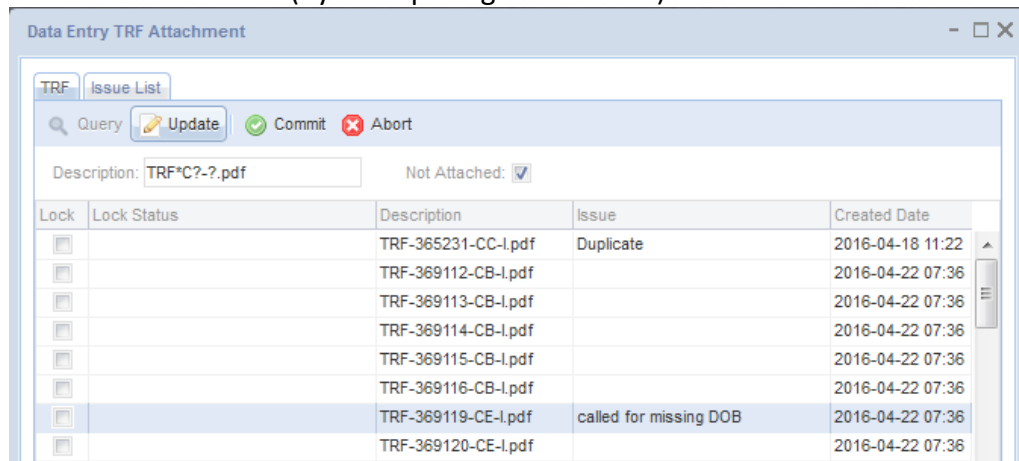


Figure 93 Adding an Issue to a Test Request Form

The Issue List tab of this screen displays all of the TRFs that have had issues added to them, regardless of sample domain. This list can be filtered by User and/or sorted by Created Date. By default, the list is sorted by Created Date in ascending order. An issue can be modified by clicking on the **Update** button or removed after resolution by selecting the **Delete** button. The user can view a TRF by selecting the appropriate row and clicking the **Display** button.

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User	Created Date	Issue	Attachment
cmolande	2016-07-21 10:16	no form yet	TRF-404024-CB-l.pdf
jbeam	2016-07-28 12:23	407367	TRF-40736-SD-A.pdf
mdawson	2016-07-30 09:42	issue no birth date	TRF-407947-CB-l.pdf
bfrench	2016-08-01 10:48	duplicate/issue with scanned copy	TRF-406845-+SD-l.pdf
mfraaken	2016-08-05 14:19	DUPLICATE	TRF-410993-EN-A.pdf
mfraaken	2016-08-05 14:20	DUPLICATE	TRF-410994-EN-A.pdf
mfraaken	2016-08-05 14:21	DUPLICATE	TRF-410995-EN-A.pdf
mfraaken	2016-08-05 14:22	DUPLICATE	TRF-410997-EN-A.pdf
mfraaken	2016-08-05 14:22	DUPLICATE	TRF-410996-EN-A.pdf
mfraaken	2016-08-05 14:23	DUPLICATE	TRF-410998-EN-A.pdf
mfraaken	2016-08-05 14:24	DUPLICATE	TRF-410999-EN-A.pdf
mfraaken	2016-08-05 14:25	DUPLICATE	TRF-411000-EN-A.pdf
mfraaken	2016-08-05 14:25	DUPLICATE	TRF-411001-EN-A.pdf
mfraaken	2016-08-05 14:26	DUPLICATE	TRF-411002-EN-A.pdf
mfraaken	2016-08-05 14:27	DUPLICATE	TRF-411003-EN-A.pdf
stye	2016-08-06 09:59	not fast-logged in; no test entered	TRF-411287-CC-l.pdf
stye	2016-08-08 09:18	already entered	TRF-410176-CV-l.pdf
stye	2016-08-08 09:18	already entered	TRF-410175-CV-l.pdf

Figure 94 Issue List Tab of the Data Entry TRF Attachment Screen

3.3.2 SAMPLE DOMAIN SPECIFIC FIELDS

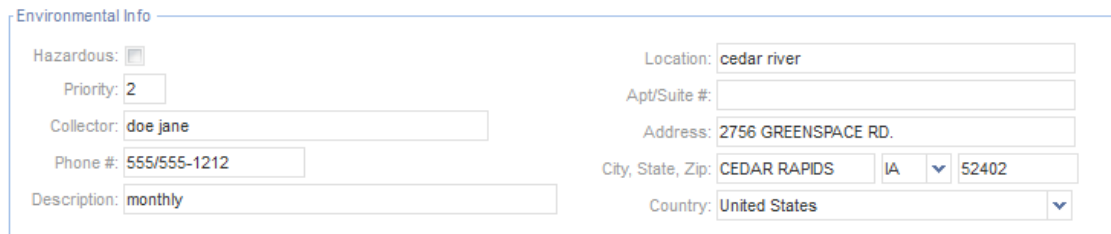
There are various fields on the full sample login screens which are specific to the sample domain. These sample domain specific fields are found in the middle sections of the full sample login screens. The following sections describe these sample domain specific fields.

3.3.2.1 ENVIRONMENTAL SAMPLE SPECIFIC FIELDS

The environmental sample specific fields are located in two separate sections of the Environmental Sample Login screen: Environmental Info and Organization Info.

3.3.2.1.1 ENVIRONMENTAL INFO SECTION

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The screenshot shows a form titled "Environmental Info" with the following fields and values:

Hazardous:	<input type="checkbox"/>	Location:	cedar river
Priority:	2	Apt/Suite #:	
Collector:	doe jane	Address:	2756 GREENSPACE RD.
Phone #:	555/555-1212	City, State, Zip:	CEDAR RAPIDS IA 52402
Description:	monthly	Country:	United States

Figure 95 Environmental Info Section

The Environmental Info section contains environmental sample demographic information. The formats specified for these fields follow.

Hazardous

The checkbox indicates if the sample is considered hazardous. Hazardous samples require special disposal.

Priority

This field may specify the number of days that the client expects for sample turnaround. For example, a value of 3 would specify that the sample should be completed and reported within 3 working days.

This value is used to calculate the [Due Date](#) and the [% Exp\(ected\) Completion](#) for an analysis.

Collector

The collector's name can be specified in the format of *lastname firstname* or a collector ID depending on the laboratory section's SOP. This field is restricted to lower case letters, numbers, and symbols.

Phone

This field may be used to specify the collector's phone number. The field will automatically format the digits for the area code, phone number, and extension (if applicable).

(Sample) Description

This text field is used to further describe the sample such as filter, duplicate, ice, etc. The information about sample type and source should be entered in the [SAMPLE ITEM TAB](#) and not in this field.

Location

The name of the location for the collection of the environmental sample may be specified in this field.

Apt/Suite #

This free text field may contain the apartment or suite number of the collection location.

Address

This free text field may contain the street address of the collection location.

City

This free text field may contain the city of the collection location.

State

The state of the collection location may be selected from the drop-down list. Selections consist of states/provinces of the United States, Canada, and Mexico.

Zip

The five-digit or nine-digit U.S. Postal Zip Code of the collection location may be entered here.

Country

The country of the collection location may be selected from the drop-down list.

3.3.2.1.2 ORGANIZATION INFO SECTION

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Organization Info

Report To: SHL ANKENY

Bill To:

Project: idnr beach

Figure 96 Organization Info Section

The Organization Info section is located to the right of the Items/Analyses tree. It contains the following fields.

Report To

This field is used to specify the organization(s) that receive the test results of the sample. For the (primary) “Report To” organization, the sample results can be accessed through the OpenELIS Web Portal, a mailed Final Report, and faxed on a sample basis (through assignment of sample auxiliary data). (See [FINAL REPORT](#) for more information on the faxing process). “Secondary Report To” organizations will only receive a mailed copy of the Final Report.

The beginning of the Report To organization’s name (or its organization id) can be entered into this autocomplete dropdown field. As part of the autocomplete function, a table will pop up that shows name and address information for organizations that match the characters that have been entered in this field. The user can utilize this information to select the correct organization. Organizations must first be entered in the [ORGANIZATION](#) screen.

Organization Info

Report To: SOL


Name	Apt/Suite #	Street	City	St
SOLON FAMILY PRACTICE CLINIC		510 W MAIN ST STE A	SOLON	IA
SOLON FIRE DEPARTMENT		131 N IOWA ST	SOLON	IA
SOLON VETERINARY CLINIC	127 S DUB...	PO BOX 100	SOLON	IA
SOLON WATER SUPPLY		101 N IOWA ST	SOLON	IA

Figure 97 Organization Autocomplete Dropdown Field

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Name	Apt/Suite #	Street	City	St
IDNR-FO 1		909 W MAIN STE 4	MANCHESTER	IA

Figure 98 Entering an Organization by its Organization Id

A Secondary Report To organization can be selected using the Sample Organization pop-up screen by first clicking on the pop-up button  to the right of the Report To or Bill To fields.

Type	Attention	Id	Name	Apt/Suite #	Street
Report To		329	OSKALOOSA MUNICIPAL WATER DEPT	1208 S 7TH ST	PO BOX 7
Bill To	JOHN DOE	1648	OSKALOOSA CITY OF		220 S MA

Figure 99 Changing the Organization Type on the Sample Organization Screen

The Type field can be changed by clicking on the drop-down arrow. The three options for most domains are Report To (primary), Secondary Report To, and Bill To. Secondary Report To organizations, as well as, the Bill To organization can be added by using the **Add Row** button and selecting the organization from the autocomplete dropdown list in the Name field. The organization id can also be entered into this field. The organizational contact person's name can be entered into the Attention text field.

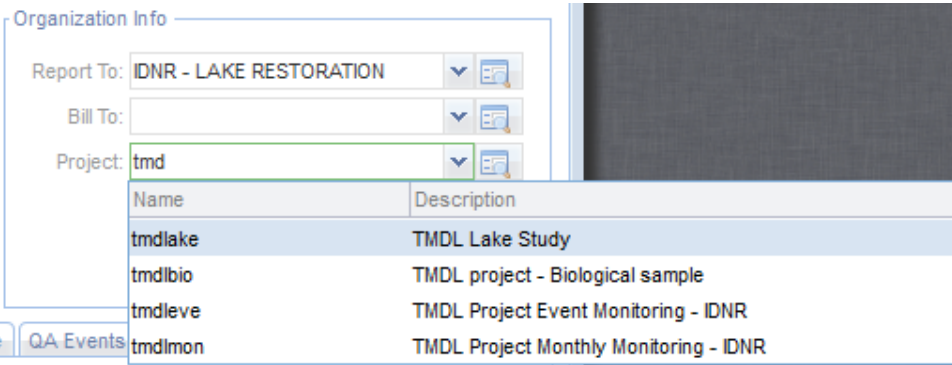
Bill To

The Bill To field operates in the same manner as the [Report To](#) field. The Bill To field only needs to be completed if the billed organization is different from the Report To

organization. A [system variable](#) can be used to automatically set the “Bill To” field to a specific organization (e.g., a state department of natural resources) when a designated Test Request Form is attached to the sample during [full sample login](#).

Project

The Project field is used to assign one or more projects to a sample. Projects can be cross-domain (i.e., clinical and environmental). Projects could be used to designate disease outbreaks for clinical samples. The first project can be added from this field.




The screenshot shows a form titled "Organization Info" with three dropdown menus: "Report To" (set to "IDNR - LAKE RESTORATION"), "Bill To", and "Project" (set to "tmd"). A dropdown menu is open below the "Project" field, displaying a list of projects with their names and descriptions. The "QA Events" button is visible at the bottom left of the form.

Name	Description
tmdlake	TMDL Lake Study
tmdlbio	TMDL project - Biological sample
tmdleve	TMDL Project Event Monitoring - IDNR
tmdlmon	TMDL Project Monthly Monitoring - IDNR

Figure 100 Project Autocomplete Dropdown Field

As part of the autocomplete function of the Project field, a dropdown list will display the Name and Description of projects that match the characters that have been entered in this field. The user can utilize this information to select the correct project.

Additional projects can be added using the Sample Project pop-up screen by clicking on the pop-up button  to the right of the Project field.

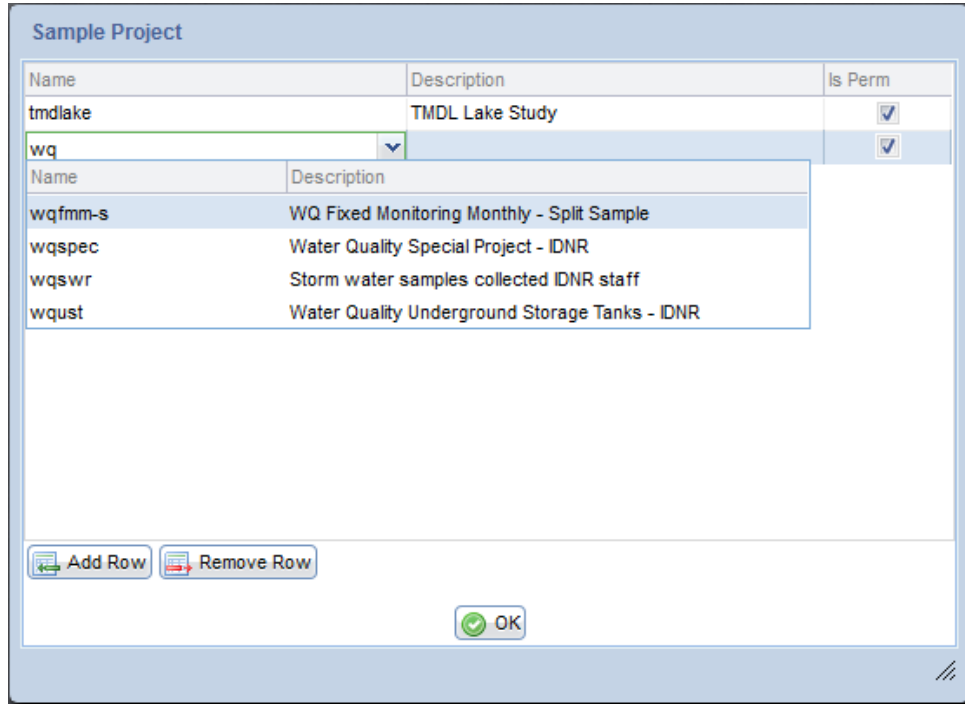


Figure 101 Adding an Additional Project to a Sample

The “Is Perm” checkbox on the Sample Project pop-up screen indicates if the project is permanently assigned to the sample. All projects assigned by the user should have this boxed checked. See [PROJECT](#) screen for more information on projects.

3.3.2.2 SDWIS SAMPLE SPECIFIC FIELDS

The Safe Drinking Water Information System (SDWIS) sample specific fields are located in two separate sections of the SDWIS Sample Login screen: SDWIS Info and Collector/Organization Info.

3.3.2.2.1 SDWIS INFO SECTION

SDWIS Info

PWS Id: IA7537032	PWS Name: KINGSLEY WATER SUPPLY	State Lab #: 27
Facility Id: 01	Sample Type: RT - Routine	Sample Cat: Radio Chemical
Sample Pt Id: 01	Location: pump house	Priority:

Figure 102 SDWIS Info Section

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The SDWIS Info section contains SDWIS sample demographic information. The formats specified for these fields follow.

PWS Id

The PWS (Public Water Supply) Id is a unique identifier assigned by the state to all public water supplies. The PWS Id begins with a two letter state abbreviation followed by a unique seven digit number. The pop-up button to the right of this field can be used to select the PWS Id. The PWS Information screen will pop-up and allow the user to search for a PWS record. When the desired record is located, click on the **Select** button. (For more information on the PWS Information screen, see [PWS INFORMATION](#).)

The screenshot shows the 'PWS Information' window with the following fields and values:

- PWS ID: IA7537032
- Field Office #: FO3
- Status: A
- Population: 1411
- Name: KINGSLEY WATER SUPPLY
- Reason: pop updated per 2010 census
- City: KINGSLEY
- County: PLYMOUTH
- State Type: C
- Start Day: 1, Month: 1, Effective Begin: 2011-03-02
- End Day: 31, Month: 12, Effective End: [empty]

Below the form is a table with the following data:

Name	Type	State ID	Status	Water Type	Available	Identification	Description
ELEVATED STORAGE TOWER (2004)	ST	ST02	A	GW	P		
GENERAL PWS FACILITY	OT	OT01	A	GW	P		
WELL #4 (1997)	WL	WL04	A	GW	P		
PLANT #1	TP	TP01	A	GW	P	RAW	RAW
PLANT #1	TP	TP01	A	GW	P	CFE	CFE
DISTRIBUTION SYSTEM	DS	950	A	GW	P	DB01	KINGSLEY
DISTRIBUTION SYSTEM	DS	950	A	GW	P	DB02	CITY HAL
DISTRIBUTION SYSTEM	DS	950	A	GW	P	DIST	DISTRIBL
DISTRIBUTION SYSTEM	DS	950	A	GW	P	PB	219 BURL
DISTRIBUTION SYSTEM	DS	950	A	GW	P	NFC	NFC
DISTRIBUTION SYSTEM	DS	950	A	GW	P	ART	ART

Figure 103 PWS Information Screen

PWS Name

The PWS (Public Water Supply) Name will be automatically populated when the PWS Id is selected.

State Lab

This number represents the laboratory id that was assigned to your laboratory by the state's laboratory certification program.

Facility Id

This field contains the state assigned water system facility id, also known as the [State ID](#).

(SDWIS) Sample Type

Enter the SDWIS sample type specified for this sample. SDWIS sample types include: Routine, Repeat, Special, Replacement, and Confirmation. This field should not be confused with the Sample Type on the [SAMPLE ITEM TAB](#).

Sample Cat(egory)

The Sample Cat(egory) specifies the SDWIS sample category. The sample categories currently are: Bacterial, Radio Chemical, Chemical, and Pb/Cu.

Sample Pt (Point) Id

This field contains the id of the sample point and is often the same information as the Facility Id.

(Sample Point) Location

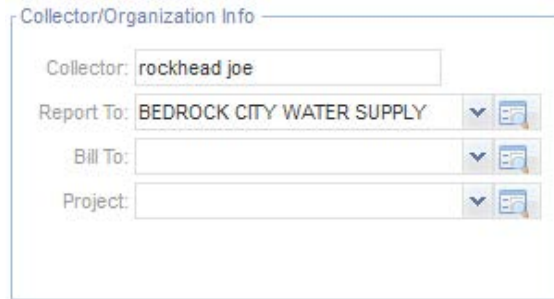
This field contains a description of the sample point location.

Priority

This field may specify the number of days that the client expects for sample turnaround. For example, a value of 3 would specify that the sample should be completed and reported within 3 working days.

This value is used to calculate the [Due Date](#) and the [% Exp\(ected\) Completion](#) for an analysis.

3.3.2.2.2 COLLECTOR/ORGANIZATION INFO SECTION



Collector/Organization Info

Collector: rockhead joe

Report To: BEDROCK CITY WATER SUPPLY

Bill To:

Project:

Figure 104 Collector/Organization Info Section

The Collector/Organization Info section is located to the right of the Items/Analyses tree. It contains the following fields.

Collector

The collector's name can be specified in the format of *lastname firstname* or a collector ID depending on the laboratory section's SOP. This field is restricted to lower case letters, numbers, and symbols.

Report To

This field is used to specify the organization(s) to which results are reported. See [Report To](#) for more information.

Bill To

The Bill To field operates in the same manner as the [Report To](#) field. The Bill To field only needs to be completed if the billed organization is different from the Report To organization. A [system variable](#) can be used to automatically set the "Bill To" field to a specific organization (e.g., a state department of natural resources) when a designated Test Request Form is attached to the sample during [full sample login](#).

Project

The Project field is used to assign one or more projects to a sample. See [Project](#) for more information.

3.3.2.3 CLINICAL SAMPLE SPECIFIC FIELDS

The clinical sample specific fields are located in two separate sections of the Clinical Sample Login screen: Clinical Info and Provider/Organization Info.

3.3.2.3.1 CLINICAL INFO SECTION

Clinical Info

Id: 622		Address: 200 DISNEYWORLD	
Last: MOUSE		City, State, Zip: ORLANDO FL 00215	
First: MINNIE		Phone #: 718/555-1212 Gender: Female	
Birth: 1982-03-18 28		Race: BA - Black, Asian	
NID:		Ethnicity: Hispanic	
Apt/Suite #: 3A			

Figure 105 Clinical Info Section

The Clinical Info section contains demographic information for the patient that is linked to the sample. The formats specified for these fields follow.

(Patient) Id

This field contains the unique OpenELIS patient id that is automatically generated by the LIMS.

Last (Name)

The patient's last name is required to be manually entered (new patient; non-electronic order) or populated from an electronic order or existing patient record (returning patient).

First (Name)

The patient's first name is required to be manually entered in this field (new patient; non-electronic order) or populated from an electronic order or existing patient record (returning patient).

If the Last and First fields contain the same last and first name of an existing patient(s) in the database, the [Patient Lookup screen](#) will pop up and display all of the matching patients. This allows the user to select the correct existing patient or to create a new patient record for the sample, if required, by clicking the **Cancel** button on this screen.

A wildcard (*) can also be used in either the Last or First fields to broaden the search. This will automatically pop up the Patient Lookup screen that will display all matches.

Birth(date)

The patient's birthdate is required to be entered in this field. This field has a format of YYYY-MM-DD and the date may be selected from the calendar to the right of it.

NID

The National Identifier (NID) is a unique identification number issued to a person by a national government. In the United States, the Social Security Number is a person's de facto national identifier. This field is optional and has a format of 000-00-0000. If an existing patient's NID is entered, OpenELIS will automatically pop up the [PATIENT LOOKUP SCREEN](#) to display that patient's demographic information so that the user may confirm that she is selecting the correct patient. Since the NID is a unique number, the system will not allow an NID to be used for more than one patient.

Apt/Suite #

The patient's apartment or suite number can be entered in this field or populated from an existing patient record or electronic order.

Address

The patient's street address can be entered in this field or populated from an existing patient record or electronic order.

City, State, Zip

The patient's city, state, and zip code can be entered in these fields or populated from an existing patient record or electronic order. A two-letter state abbreviation can be either entered or selected from the dropdown list.

Phone #

The patient's phone number can be entered in this field or populated from an existing patient record or electronic order. The field will automatically format the digits for the area code and phone number.

Gender

The patient's gender can be selected in this field or populated from an existing patient record or electronic order. Shortcuts consisting of "f" for Female and "m" for Male can be used to select the gender.

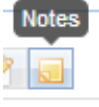
Race

The patient's race can be selected in this field or populated from an existing patient record or electronic order. Shortcuts consisting of 1 – 4 lowercase letters (i.e., "w" for White, "b" for Black, "a" for Asian, etc.) can be used to select the race.

Ethnicity

The patient's ethnicity can be selected in this field or populated from an existing patient record or electronic order. Shortcuts consisting of "h" for Hispanic, "n" for Non Hispanic, and "u" for Unknown can be used to select the ethnicity.

The functions for the buttons located at the top of the Clinical Info section are described below. The name of each button is displayed when the user hovers the

mouse over the button. 

Full Window Search 

This button is used to pop up the Patient Lookup screen to query for an existing patient. See [PATIENT LOOKUP SCREEN](#) for a complete explanation of its use.

Search By Fields 

This button is used to query for an existing patient by a value entered in the Last, First, Birth, and/or NID fields. See [PATIENT LOOKUP SCREEN](#) for a complete explanation of its use.

Unlink 


Occasionally, a sample is linked to the incorrect patient record. This button is used to unlink a sample from a patient so that it can be linked to a different patient. Released samples can only be unlinked through the sample unrelease process. See [UNRELEASE SAMPLE OPTION](#) in the Sample Tracking screen for an explanation of this process.

Edit 

This button allows for an existing patient's demographic information to be changed while in Update mode. This function would be used to accommodate name, birthdate, and address changes (etc.) in the database. This button edits the patient record, so all samples linked to this patient are updated with this new information.

(Patient) Notes  

This button allows for patient-level notes to be added or read by data entry staff. These notes are attached to the patient record and will be visible from any sample that is assigned to the patient. These notes can be used to document phone calls to facilities confirming a patient's demographic information (e.g., date of birth, NID, spelling of name, etc.) Patient notes offers three advantages: 1) the user does not have to add the same sample note to every sample that is assigned to a patient for this type of information, 2) the user does not have to search through every previous sample of a patient to learn if her/his demographic information has been corrected from what is entered on the current [Test Request Form](#) or electronic order, and 3) duplicate phone calls and faxes to facilities confirming this type of information can be easily avoided.

There are no patient notes present in the patient record when the **(Patient) Notes** button is displayed as . When the user clicks this button, the Patient Notes screen pops up. The **Add Note** button is then clicked to pop up the [Note Editor](#) screen so that the user can add a patient note. After entering the note, the user clicks **OK** on both the Note Editor and Patient Notes screens to add the note.

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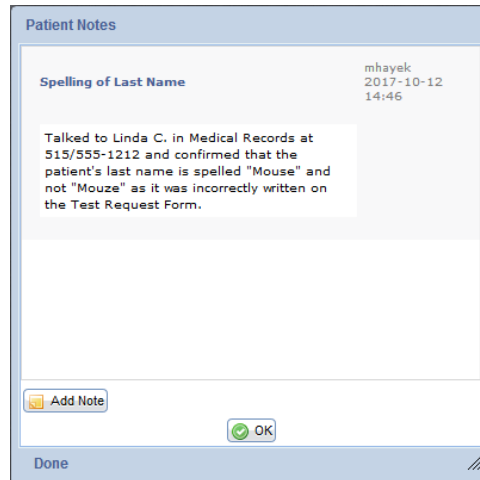



Figure 106 Adding a Patient Note

The **(Patient) Notes** button changes to  after a patient note has been added to a patient record.


When two or more patient records are [merged](#), OpenELIS combines the patient notes into the remaining patient record. A patient note from a former patient record will have the [Patient Id](#), author's username, and date-time stamp of its origin located below its subject line.




Figure 107 Patient Notes from Merged Patient Records

3.3.2.3.2 PATIENT LOOKUP SCREEN

Before a patient can be selected from this screen, he/she will first need to be queried by Last (Name), First (Name), Birth(date), or NID.

An existing patient can be queried in two ways. The user can enter a last name, first name, birthdate, and/or NID and click on the **Search By Fields** button  to search by one or more of these fields. Wildcards (*) can be used in the Last or First fields to search by a partial name. Birthdates or NIDs must be entered in the required format to search by them.



The screenshot shows a patient lookup form with the following fields and controls:

- Id:** An empty text input field.
- Last:** A text input field containing the text "MOUZ*".
- First:** An empty text input field.
- Birth:** A date selection field with a calendar icon and the number "28" visible.
- NID:** An empty text input field.

At the top of the form, there is a toolbar with icons for search (magnifying glass), search by fields (circular arrows), print (printer), and edit (pencil).

Figure 108 Searching by a Partial Last Name


After the Patient Lookup screen pops up, the correct patient can be selected from the patient list in the left-hand pane. When a patient row is clicked, the previous analyses conducted on that patient are displayed in the lower right-hand pane to help the user select the correct patient to link to the sample. The **Select** button is used to choose the patient. The upper right-hand pane is not used for clinical sample logins. After the patient is selected, her/his demographic information will populate the Clinical Info fields. The user should click the **Cancel** button if she doesn't find the correct patient in the database and wants to create a new patient record to link to the sample.

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Id	Last Name	First Name	Birth	Gender
560	MOUZE	MINNIE	1961-11-09	Female
561	MOUZE	MINNY	1970-02-17	Female

Accession #	Received	Test	Method
19376	2015-05-19	tb qftg	elisa

Figure 109 Patient Lookup Screen

The second way to query for an existing patient is to directly open the Patient Lookup Screen (by clicking on the **Full Window Search** button ) and search from there. Once again, wildcards (*) can be used in the Last Name and First Name fields for a patient query. A date range (i.e., 2000-04-01..2000-04-05) can be used in the Birth field for a birthdate search. The **Search** button must be clicked to execute the query. Previous analyses conducted on a patient are displayed, and the correct patient is selected, in the same ways as stated above.

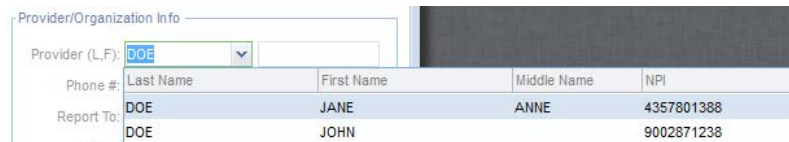
3.3.2.3.3 PROVIDER/ORGANIZATION INFO SECTION

Figure 110 Provider/Organization Info Section

The Provider/Organization Info section is located to the right of the Items/Analyses tree. It contains the following fields.

Provider (L,F)

The left field is an autocomplete dropdown field. Part of the health care provider's last name, [NPI](#), or [External Id](#) is entered here. As part of the autocomplete function, a table will pop up that shows name and NPI information for providers that match the characters that have been entered in this field. The user can utilize this information to select the correct provider. The field containing the provider's first name (on the right) will then be automatically populated. Providers must first be entered in the [PROVIDER](#) screen.



The screenshot shows a form titled "Provider/Organization Info". It has a dropdown menu for "Provider (L,F)" with "DOE" selected. Below it is a table with columns: Last Name, First Name, Middle Name, and NPI. The table contains two rows of data.

Phone #	Last Name	First Name	Middle Name	NPI
Report To:	DOE	JANE	ANNE	4357801388
	DOE	JOHN		9002871238

Figure 111 Provider Autocomplete Dropdown Field

Phone

This field is used to specify the provider's phone number. The field will automatically format the digits for the area code, phone number, and extension (if applicable).

Report To

This field is used to specify the organization(s) to which results are reported. See [Report To](#) for more information.

Bill To

The Bill To field operates in the same manner as the [Report To](#) field. The Bill To field only needs to be completed if the billed organization is different from the Report To organization. A [system variable](#) can be used to automatically set the "Bill To" field to a specific organization (e.g., a state department of public health) when a designated Test Request Form is attached to the sample during [full sample login](#).

Project

The Project field is used to assign one or more projects to a sample. See [Project](#) for more information.

3.3.2.4 NEONATAL SCREENING SAMPLE SPECIFIC FIELDS

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The neonatal screening sample specific fields are located in two separate sections of the Neonatal Screening Sample Login screen: the newborn/guardian section and Provider/Organization Info.

3.3.2.4.1 NEWBORN/GUARDIAN SECTION

Id: 35	NICU: <input checked="" type="checkbox"/>	Id: 36
Last: MILLER-SMITH	Birth Order: 3	Last: MILLER-SMITH
First: ADRIENNE	Gest Age: 39	Maiden: MILLER
Birth (D,T): 2013-12-13 20:48	Feeding: 1 Formula	First: ANGELA
Apt/Suite #: 3B	Weight: 2955	Relation: Mother Birth: 1996-03-28
Address: 1200 3RD AVE.	Transfused: <input type="checkbox"/>	NID: <input type="text"/>
City, State, Zip: ST. ANSGAR IA 50472	Trans Date: <input type="text"/>	Apt/Suite #: 3B
Gender: Female	Trans Age: <input type="text"/>	Address: 1200 3RD AVE.
Race: W - White	Repeat: <input type="checkbox"/>	City, State, Zip: ST. ANSGAR IA 50472
Ethnicity: Non Hispanic	Collect Age: 58	Phone #: 319/985-6754 Gender: Female
	Collect Valid: <input checked="" type="checkbox"/>	Race: W - White Ethnicity: Non Hispanic

Figure 112 Newborn/Guardian Section

The newborn/guardian section contains demographic and medical information for the newborn and demographic information for his/her guardian that are linked to the sample. Both the newborn and his/her guardian are entered as separate patients in the LIMS; both may already be existing patients as a result of prior testing. The newborn's demographic information is located in the left column; the newborn's medical information can be found in the middle column; and the guardian's demographic information is contained in the right column. The formats specified for these fields follow.

Newborn's Demographic Information (Left Column)

Id

This field contains the unique OpenELIS patient id for the newborn that is automatically generated by the LIMS.

Last (Name)

The newborn's last name is required to be manually entered for a new patient or selected from the [PATIENT LOOKUP SCREEN](#) for an existing patient.

First (Name)

The newborn's first name is required to be manually entered in this field for a new patient. If an existing patient has been selected from the Patient Lookup Screen, this field will be automatically populated.

Birth (D,T)

The newborn's birthdate is required to be manually entered in the date field on the left for a new patient. This field has a format of YYYY-MM-DD and the date may be selected from the calendar to the right of it. The time of birth is located on the right and has a format of HH:MM. It may be selected from the clock to the right of it. The time of birth is not required to add a new patient record, but it must be entered later for OpenELIS to calculate the blood spot [collection age](#) of the newborn. If an existing patient has been selected from the Patient Lookup Screen, these fields will be automatically populated.

Apt/Suite #

The newborn's apartment or suite number can be entered in this field or populated from an existing patient record.

Address

The newborn's street address can be entered in this field or populated from an existing patient record.

City, State, Zip

The newborn's city, state, and zip code can be entered in these fields or populated from an existing patient record. A two-letter state abbreviation can be either entered or selected from the dropdown list.

Gender

The newborn's gender can be selected in this field or populated from an existing patient record. Shortcuts consisting of "f" for Female and "m" for Male can be used to select the gender.

Race

The newborn's race can be selected in this field or populated from an existing patient record. Shortcuts consisting of 1 – 4 lowercase letters (i.e., “w” for White, “b” for Black, “a” for Asian, etc.) can be used to select the race.

Ethnicity

The newborn's ethnicity can be selected in this field or populated from an existing patient record. Shortcuts consisting of “h” for Hispanic, “n” for Non Hispanic, and “u” for Unknown can be used to select the ethnicity.

Newborn's Medical Information (Middle Column)**NICU**

This checkbox indicates if the newborn is being treated in the neonatal intensive care unit at the hospital.

Birth Order

This field displays the birth order of the newborn for multiple births (e.g., twins, triplets, etc.) The first newborn born would be labeled A, the second newborn born would be labeled B, etc.

Gest(ational) Age

Gestational age (or menstrual age) is a measure of the age of a pregnancy. It is measured in weeks, from the first day of the woman's last menstrual cycle to the newborn's birthdate, or the corresponding age as estimated by other methods.

Feeding

The feeding method of the newborn in the last 24 hours can be selected from the dropdown menu. Choices include breast milk, formula, both, and fasting.

Weight

The weight of the newborn in grams at the time of blood spot collection is entered in this field.

Transfused

This checkbox indicates if the newborn had a transfusion of any blood products before the sample was collected.

Trans(fusion) Date

This field specifies the date of the last transfusion of any blood products before the sample was collected. The date has a format of YYYY-MM-DD and can be entered using the calendar to the right.

Trans(fusion) Age

OpenELIS calculates the transfusion age (in days) of the newborn using the following formula:

$$\text{Transfusion Age} = \text{Collected Date} - \text{Transfusion Date}$$

Repeat

This checkbox indicates if this is a repeat neonatal screen for the newborn.

Collect(ion) Age

OpenELIS calculates the collection age (in HH:MM) of the newborn using the following formula:

$$\text{Collection Age} = \text{Collected Date and Time} - \text{Birth Date and Time}$$

Collect(ion) Valid

Neonatal screening blood spot collections are only valid if the collection age of the newborn is greater than 24 hours. This checkbox indicates if this is a valid collection.

Guardian's Demographic Information (Right Column)**Id**

This field contains the unique OpenELIS patient id for the guardian that is automatically generated by the LIMS.

Last (Name)

The guardian's last name is required to be manually entered if she is a new patient in the system or selected from the [PATIENT LOOKUP SCREEN](#) for an existing patient.

Maiden (Name)

The guardian's maiden name may be entered in this field if she is a new patient in the system. If an existing patient has been selected from the Patient Lookup Screen, this field will be automatically populated if there is a value present.

First (Name)

The guardian's first name is required to be manually entered in this field if she is a new patient in the system. If an existing patient has been selected from the Patient Lookup Screen, this field will be automatically populated.

Relation

This field specifies the relationship of the guardian to the newborn. Current choices include Mother, Father, Guardian, and Self. This field is defaulted to Mother.

Birth(date)

The guardian's birthdate is required to be manually entered in this field if she is a new patient in the system. This field has a format of YYYY-MM-DD and the date may be selected from the calendar to the right of it. If an existing patient has been selected from the Patient Lookup Screen, this field will be automatically populated.

NID

The National Identifier (NID) is a unique identification number issued to a person by a national government. In the United States, the Social Security Number is a person's de facto national identifier. This field is optional and has a format of 000-00-0000. If an existing patient has been selected from the Patient Lookup Screen, this field will be automatically populated if there is a value present.

Apt/Suite #

The guardian's apartment or suite number can be entered in this field or populated from an existing patient record.

Address

The guardian's street address can be entered in this field or populated from an existing patient record.

City, State, Zip

The guardian's city, state, and zip code can be entered in these fields or populated from an existing patient record. A two-letter state abbreviation can be either entered or selected from the dropdown list.

Phone #

This field is used to specify the guardian's phone number. The field will automatically format the digits for the area code and phone number.

Gender

The guardian's gender can be selected in this field or populated from an existing patient record. Shortcuts consisting of "f" for Female and "m" for Male can be used to select the gender.

Race

The guardian's race can be selected in this field or populated from an existing patient record. Shortcuts consisting of 1 – 4 lowercase letters (i.e., "w" for White, "b" for Black, "a" for Asian, etc.) can be used to select the race.

Ethnicity

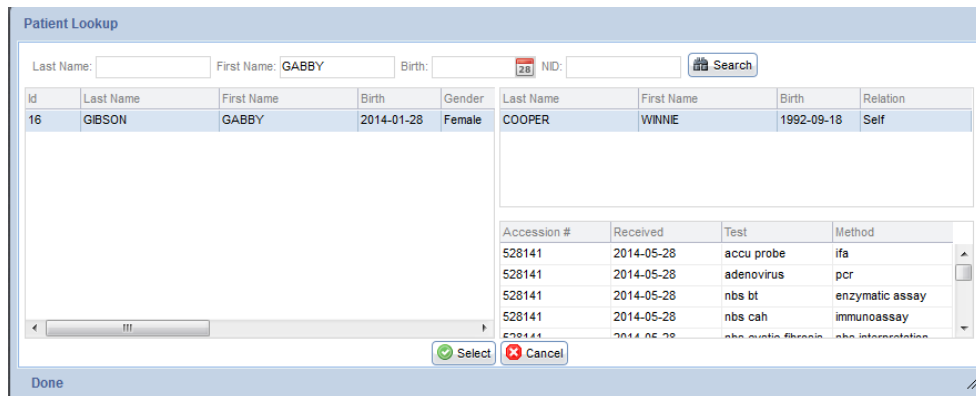
The guardian's ethnicity can be selected in this field or populated from an existing patient record. Shortcuts consisting of "h" for Hispanic, "n" for Non Hispanic, and "u" for Unknown can be used to select the ethnicity.

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The functions for the buttons located at the top of the newborn/guardian section are described below.

Full Window Search

This button is used to pop up the Patient Lookup screen to query for an existing patient. For neonatal screening sample logins the guardian that is currently linked to the newborn (in the left-hand pane) is displayed in the upper right-hand pane. If the guardian remains the same for the newborn, the newborn and his/her guardian are selected and their demographic information will populate the corresponding fields. See [PATIENT LOOKUP SCREEN](#) for a complete explanation of its use.



The screenshot shows the 'Patient Lookup' window with the following data:

Id	Last Name	First Name	Birth	Gender	Last Name	First Name	Birth	Relation
16	GIBSON	GABBY	2014-01-28	Female	COOPER	WINNE	1992-09-18	Self

Accession #	Received	Test	Method
528141	2014-05-28	accu probe	ifa
528141	2014-05-28	adenovirus	pcr
528141	2014-05-28	nbs bt	enzymatic assay
528141	2014-05-28	nbs cah	immunoassay
528141	2014-05-28	nbs genetic fibrosis	nbs interpretation

Figure 113 Selecting an Existing Newborn Patient and His/Her Guardian

Search By Fields

This button is used to query for an existing patient by a value entered in the Last, First, Birth, and/or NID fields. See [PATIENT LOOKUP SCREEN](#) for a complete explanation of its use.

Unlink

Occasionally, a sample is linked to the incorrect patient record. This button is used to unlink a sample from a patient record so that it can be linked to a different patient record. Released samples can only be unlinked through the sample unrelease process. See [UNRELEASE SAMPLE OPTION](#) in the Sample Tracking screen for an explanation of this process.

Edit 

This button allows for an existing patient's demographic information to be changed while in Update mode. This function would be used to accommodate name and address changes in the database. This button edits the patient record, so all samples linked to this patient are updated with this new information. Released samples' patient information can only be edited through the sample unrelease process. See [UNRELEASE SAMPLE OPTION](#) in the Sample Tracking screen for an explanation of this process.

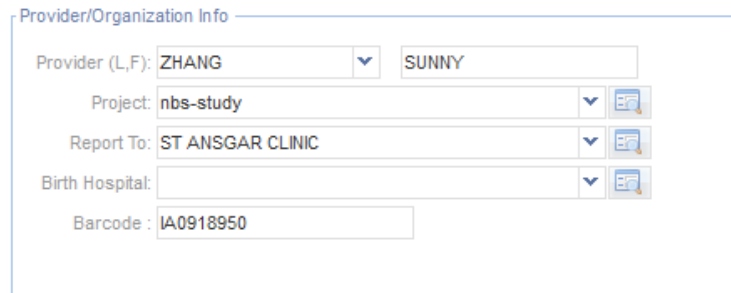
3.3.2.4.2 PROVIDER/ORGANIZATION INFO SECTION

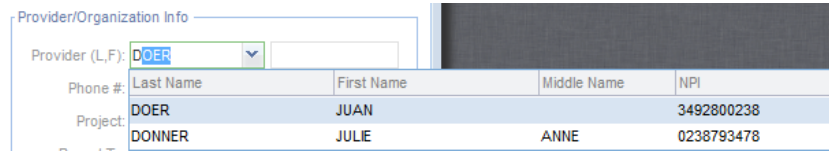
Figure 114 Provider/Organization Info Section

The Provider/Organization Info section is located to the right of the Items/Analyses tree. It contains the following fields.

Provider (L,F)

The health care provider's last name is entered in the autocomplete dropdown field on the left. As part of the autocomplete function, a table will pop up that shows name and NPI information for providers that match the characters that have been entered in this field. The user can utilize this information to select the correct provider. The field containing the provider's first name (on the right) will then be automatically populated. Providers must first be entered in the [PROVIDER](#) screen.

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Phone #	Last Name	First Name	Middle Name	NPI
	DOER	JUAN		3492800238
	DONNER	JULIE	ANNE	0238793478

Figure 115 Provider Autocomplete Dropdown Field

Project

The Project field is used to assign one or more projects to a sample. See [Project](#) for more information.

Report To

This field is used to specify the organization(s) to which results are reported. See [Report To](#) for more information.

Birth Hospital

This autocomplete dropdown field is used to specify the facility of birth for the newborn, as necessary. The facility of birth may be different from the facility that is currently treating the newborn (which would be listed as the “report to” organization). This organization type is unique to the neonatal screening sample domain. It can be selected from the Type dropdown list on the [Sample Organization screen](#).

Barcode

The barcode found on the blood spot collection card should be scanned into this field in order to link the collection card to the sample in the database for archival purposes.

3.3.2.5 ANIMAL SAMPLE SPECIFIC FIELDS

The animal sample specific fields are located in two separate sections of the Animal Sample Login screen: Animal Info and Provider/Organization Info.

3.3.2.5.1 ANIMAL INFO SECTION

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Animal Info

Common:	Bat	Apt/Suite #:	6
Scientific:	Myotis septentrionalis	Address:	123 MAIN STREET
Location:	parking lot	City, State, Zip:	DES MOINES IA 50301

Figure 116 Animal Info Section

The Animal Info section contains animal sample demographic information. The formats specified for these fields follow.

Common

This dropdown field contains the common name of the animal. This field is required. Common names are added through the [Dictionary](#) screen.

Scientific

This dropdown field may contain the scientific name of the animal. Scientific names are added through the [Dictionary](#) screen.

Location

The name of the location for the collection of the animal sample (or location of the animal incident) may be specified in this field.

Apt/Suite #

This free text field may contain the apartment or suite number of the animal collection/incident location.

Address

This free text field may contain the street address of the animal collection/incident location.

City

This free text field may contain the city of the animal collection/incident location.

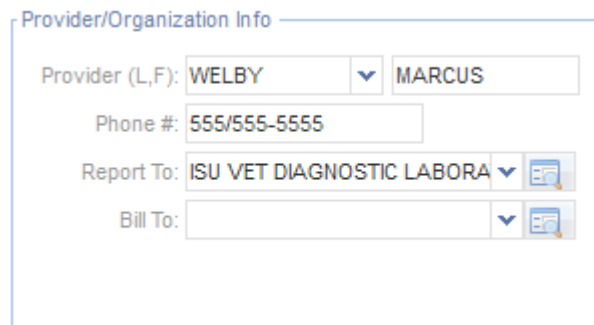
State

The state of the animal collection/incident location may be selected from the drop-down list. Selections consist of states/provinces of the United States, Canada, and Mexico.

Zip

The five-digit or nine-digit U.S. Postal Zip Code of the animal collection/incident location may be entered here.

3.3.2.5.2 PROVIDER/ORGANIZATION INFO SECTION



Provider/Organization Info

Provider (L,F): WELBY ▼ MARCUS

Phone #: 555/555-5555

Report To: ISU VET DIAGNOSTIC LABORA ▼ [Search]

Bill To: [Search]

Figure 117 Provider/Organization Info

The Provider/Organization Info section is located to the right of the Items/Analyses tree. It contains the following fields.

Provider (L,F)

The left field is an autocomplete dropdown field. Part of the veterinarian's/health care provider's last name, [NPI](#), or [External Id](#) is entered here. As part of the autocomplete function, a table will pop up that shows name and NPI information for providers that match the characters that have been entered in this field. The user can utilize this information to select the correct provider. The field containing the veterinarian's/provider's first name (on the right) will then be automatically populated. Veterinarians/providers must first be entered in the [PROVIDER](#) screen.

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Last Name	First Name	Middle Name	NPI
DOE	JANE	ANNE	4357801388
DOE	JOHN		9002871238

Figure 118 Provider Autocomplete Dropdown Field

Phone #

This field is used to specify the veterinarian's/provider's phone number. The field will automatically format the digits for the area code, phone number, and extension (if applicable).

Report To

This field is used to specify the organization(s) to which results are reported. See [Report To](#) for more information.

Bill To

The Bill To field operates in the same manner as the [Report To](#) field. The Bill To field only needs to be completed if the billed organization is different from the Report To organization. A [system variable](#) can be used to automatically set the "Bill To" field to a specific organization (e.g., a state department of public health) when a designated Test Request Form is attached to the sample during [full sample login](#).

3.3.2.6 PT SAMPLE SPECIFIC FIELDS

The proficiency testing sample specific fields are located in two separate sections of the PT Sample Login screen: PT Info and Organization Info.

3.3.2.6.1 PT INFO SECTION

PT Info

Provider: CENTERS FOR DISEASE CONTROL

Additional Domain:

Series: ELITE PANEL 2016 A

Received By: kowens

Due: 28

Figure 119 PT Info Section

The PT Info section contains proficiency testing information that is specific to the sample. The formats specified for these fields follow.

Provider

This dropdown field contains the name of the PT sample provider. PT sample providers are added through the [Dictionary](#) screen.

Series

This free text field contains the name of the PT series.

Due

This optional field can be used to specify the date and time when the PT sample's results are due to the PT sample provider.

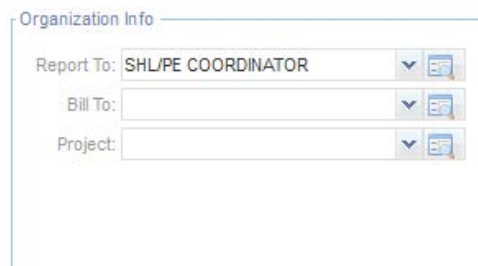
Additional Domain

This dropdown field will be implemented in the future to select an additional sample domain so that its domain-specific information can be displayed. This will be used for maternal and newborn screening data that is patient-specific to prevent it from having to be duplicated in the PT sample tab.

Received By

This field is used to record the OpenELIS username of the person who received the PT sample.

3.3.2.6.2 ORGANIZATION INFO SECTION



Organization Info

Report To: SHL/PE COORDINATOR

Bill To:

Project:

Figure 120 Organization Info Section

The Organization Info section is located to the right of the Items/Analyses tree. It contains the following fields.

Report To

This field is used to specify the organization(s) to which results are reported. See [Report To](#) for more information.

Bill To

The Bill To field operates in the same manner as the [Report To](#) field. The Bill To field only needs to be completed if the billed organization is different from the Report To organization.

Project

The Project field is used to assign one or more projects to a sample. See [Project](#) for more information.

3.4 SAMPLE VERIFICATION

Sample verification is a process that ensures the initial data entered matches the paperwork submitted with the sample. This process can be achieved in several ways with two of the more common being paper verification and double data entry.

3.4.1 PAPER VERIFICATION

All samples entered into OpenELIS are initially in “Not Verified” status. After the sample has been [fully logged in](#), data entry personnel run the [VERIFICATION REPORT](#) to compare the entered data with the data on the Test Request Form (TRF) and reconcile any discrepancies.

After the verification process has been completed, the LIMS needs to change the status of all of the samples to “Logged In”. This is accomplished through the Verify Sample Data Entry screen, whose link is located in the [second section of the Sample Menu](#). The Barcode field accepts an accession number barcode that is located on the Verification Report. Alternatively, an accession number can be entered in this field. Each accession number is displayed in this field for a short time and the field is cleared

to accept the next sample accession barcode. The screen should be closed when all samples have been verified.

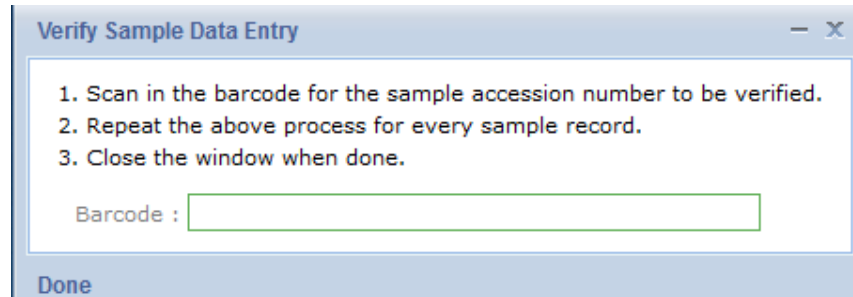


Figure 121 Verify Sample Data Entry Screen

3.4.2 SECOND DATA ENTRY

Another way to verify that the sample information was entered correctly during [full sample login](#) involves having a second person enter the information again from the Test Request Form (TRF) through a different screen. Any discrepancies between the initial and the second data entry will need to be reconciled during the second data entry process.

The user should follow these steps to perform second data entry from an attached TRF.

- Open the Second Data Entry screen by clicking on its link in the [second section of the Sample Menu](#).

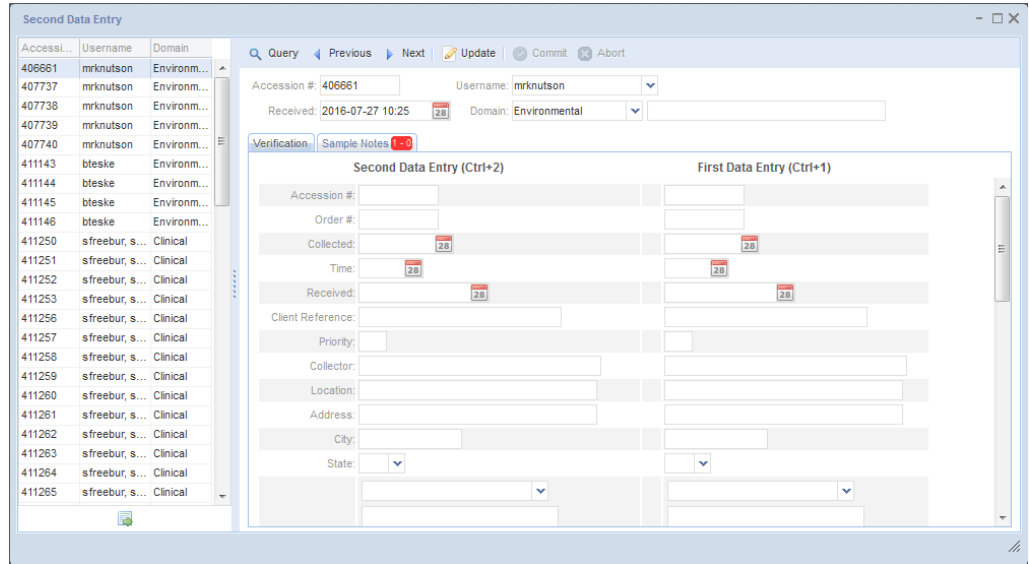


Figure 122 Second Data Entry Screen

- Query for “Not Verified” samples by one or more of the fields on the top of this screen (Accession #, Username, Received date/time, Domain). For example, if you want to verify only clinical samples that were initially entered by the user, jbeam, you would query by a Username of “jbeam” and select “Clinical” for the Domain.

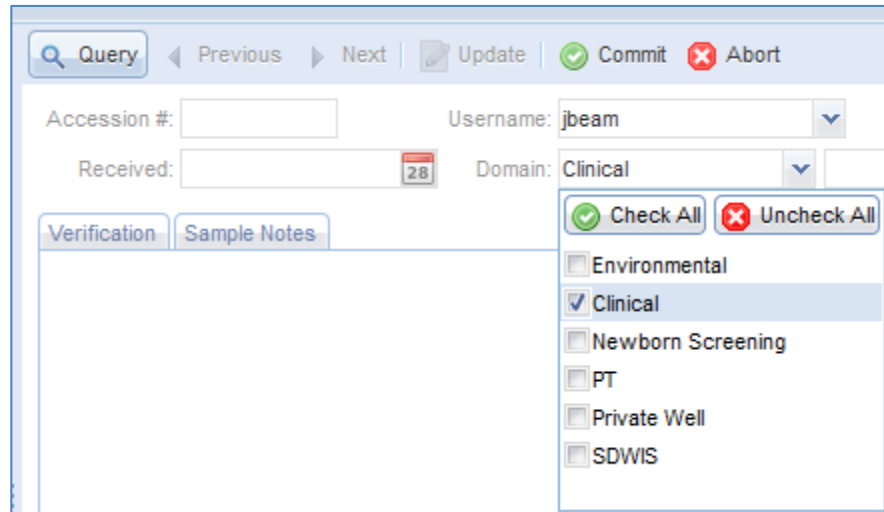


Figure 123 Querying for Not Verified Samples by Username and Domain

- The left pane of the screen displays all of the matches for the query. The list is sorted by Accession # in ascending order. The username of the person who initially entered the sample is displayed along with the sample domain. If two names are listed in the Username column, the first username represents the person who [quick entered](#) the sample, and the second username is the person who [fully logged in](#) the sample.
- Select a row to verify its sample information. The TRF that is attached to that sample will pop up.
- Click the **Update** button and begin entering the information from the attached TRF into the left Second Data Entry column of the Verification tab beginning with the Accession #. Click the Tab key after each entry. If the sample is currently locked by another user who is updating or verifying its information, a lock message will pop up immediately after clicking the **Update** button.



Figure 124 Locked Record Message

- If the second data entry matches the first data entry, a green check mark will be displayed to the right of the entry. If there is a discrepancy, a red X will be displayed there.

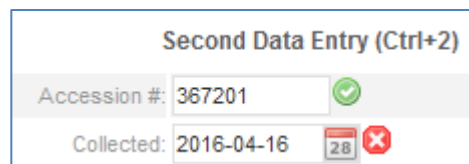


Figure 125 Matching and Mismatched Entries

- If an environmental or SDWIS sample has been linked to a [send-out order](#), the order's information will be automatically loaded into the Second Data Entry screen after the Order # is entered by the user. The phrase "Loaded with Send-

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out Order” will be displayed in the field to the right of the Domain field near the top of the screen. The OpenELIS software will attempt to verify the entries in the sample record against the entries in the send-out order record. Any entries that match between the two records will have a green check mark displayed to their right. If there is a discrepancy between the two records, a red X will be displayed to the right.

The screenshot displays the 'Second Data Entry (Ctrl+2)' screen in OpenELIS. At the top, there are fields for 'Accession #' (1000910), 'Username' (mhayek), 'Received' (2017-10-03 09:55), 'Domain' (SDWIS), and 'Loaded with Send-out Order'. Below this is a 'Verification' tab with a 'Sample Notes 1 - 0' indicator. The main area is divided into two columns: 'Second Data Entry (Ctrl+2)' and 'First Data Entry (Ctrl+1)'. The 'Second Data Entry' column contains fields for 'Accession #', 'Order #', 'Collected', 'Time', 'Received', 'Client Reference', 'PWS ID', 'Facility Id', 'Sample Type', 'Sample Cat', 'Sample Pt Id', 'Location', and 'Collector'. The 'First Data Entry' column contains corresponding empty fields. Green checkmarks are visible next to 'Accession #', 'Order #', 'PWS ID', 'Facility Id', 'Sample Cat', and 'Sample Pt Id'. A red 'X' is visible next to 'Sample Type' (SP - Special). A 'MODERN MANOR' dropdown is at the bottom.

Figure 126 Second Data Entry Screen Loaded with Send-out Order Information and Attempted Verification by the OpenELIS Software

- A mismatched entry could be due to several factors: the first or second data entry person may have mistyped her entry, or they may be interpreting the handwriting/typing on the TRF differently. Another possible explanation is that information contained in a send-out order could have been changed since the TRF was printed from it and sent to the client.
- If the second data entry user retypes the same exact value in the discrepant field, a red X will remain. If the second data entry user enters a different value in the field, and it matches the first data entry value, the red X will change to a

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green checkmark to show that they now match. This would most likely be the outcome when the second data entry person originally mistyped the value.

- However, if the second data entry user enters a different value in the field that does not match the first data entry user's value, the red X will remain and the first data entry user's value will be displayed in the right column.

Second Data Entry (Ctrl+2)		First Data Entry (Ctrl+1)	
Accession #:	367201		
Collected:	2016-04-15	2016-04-14	

Figure 127 First Data Entry Value Being Displayed

- The second data entry user then must reconcile this difference as she compares the two values to the information on the TRF. If she thinks that the value that she entered is correct, she will need to click the **Ctrl** and **2** keys to accept her value. If she thinks that the value that the first data entry user entered is correct, she will need to click the **Ctrl** and **1** keys to accept their value. The red X will change to a green checkmark and a green arrow will show in which direction the value was copied.

Second Data Entry (Ctrl+2)		First Data Entry (Ctrl+1)	
Accession #:	367201		
Collected:	2016-04-15		2016-04-15

Figure 128 Second Data Entry Value Copied Over the First Data Entry Value

Second Data Entry (Ctrl+2)		First Data Entry (Ctrl+1)	
Accession #:	367201		
Collected:	2016-04-14		2016-04-14

Figure 129 First Data Entry Value Copied Over the Second Data Entry Value

- If the second data entry user originally enters a mismatched value, and she is confident that she has typed it correctly, she can utilize a keyboard shortcut to view the value entered by the first data entry user. By clicking the **Ctrl** and **3** keys, she will be able to immediately view the first data entry value. She can

then compare the two values to the TRF and make a determination of which one to accept.

- The second data entry user continues entering information from the attached TRF. Not all of the data entry fields may need to be verified, as this is a laboratory decision. The fields that need to be verified are sample domain-dependent and are specified as active entries in a [dictionary](#) category.
- The beginning of the organization’s name (or its organization id) can be entered for the [Report To](#) or [Bill To](#) organization.

Name	Apt/Suite #	Street	City	St
Report To: IOWA CITY WATER DEPARTMENT				
		410 E WASHINGTO...	IOWA CITY	IA

Figure 130 Entering an Organization by its Organization Id

- If one or more “secondary report to” organizations have been added to a sample, the second data entry user needs to verify that the correct one(s) have been added by comparing the “secondary report to” organization(s) on this screen with the one(s) recorded on the TRF or in the send-out order. The second data entry user checks the Verified box if the correct “secondary report to” organization has been added to the sample. In order to remove or add a “secondary report to” organization, the user will need to go to the [full sample login](#), [Sample Tracking](#), or [Complete and Release](#) screens.

Verified	Organization	Id	Apt/Suite #	Street	City
<input checked="" type="checkbox"/>	ANYTOWN HOSPITAL	9055		1000 MEDICAL ST	ANYTOWN
<input checked="" type="checkbox"/>	ANYTOWN VETERINARY CLINIC	9080		1234 MAIN ST	ANYTOWN

Figure 131 Verifying "Secondary Report To" Organizations

- If one or more sample QA events have been added to a sample, the second data entry user needs to verify that the correct one(s) have been added by comparing the name(s) of the QA event(s) on this screen with the one(s) recorded on the TRF. The second data entry user checks the Verified box if the correct QA event has been added to the sample. In order to remove or add a

QA event, or change its Type or Billable flag, the user will need to go to the [full sample login](#), [Sample Tracking](#), or [Complete and Release](#) screens.

Verified	Name	Type	Billable
<input checked="" type="checkbox"/>	container wrong	Warning	<input checked="" type="checkbox"/>

Sample QA Events:

Figure 132 Verifying a Sample QA Event

- If the user needs to verify auxiliary (aux) data, she can tab down to the Aux Data section and click on the Enter key to set the cursor in the first field that she needs to enter. She can then continue tabbing through these fields to make the necessary entries.

Analyte	Second Data Entry (Ctrl+2)		First Data Entry (Ctrl+1)
Received by	AE	<input checked="" type="checkbox"/>	
pH	<2	<input checked="" type="checkbox"/>	<2
Sample Intact	Yes	<input checked="" type="checkbox"/>	
Temperature	13.7	<input checked="" type="checkbox"/>	
Build Id			

Aux Data:

Figure 133 Verifying Aux Data


- Any external or internal sample notes that have been added to the sample can be viewed from the Sample Notes tab of this screen. The tab content indicator (red oval) to the right of this tab heading displays the quantity of items located in that tab. This signals to the user that this tab needs to be examined. For example, the  to the right of "Sample Notes" means that there are no external sample notes and one internal sample note. Sample notes can be edited or added from this screen. See [SAMPLE NOTES TAB](#) and [NOTE EDITOR](#) for a detailed explanation of this process.



Figure 134 Sample Notes Tab

- After verifying every value and reconciling all discrepancies between the first and second data entry, the user must commit the record. The sample now changes to “Logged In” status.

3.5 QA EVENTS

QA events are flags that denote exceptional conditions associated with a sample or an analysis. These events provide several benefits to the laboratory process:

1. Provide a consistent language to inform the client about issues related to a sample or analysis.
2. Allows the laboratory to monitor and summarize issues by organization, laboratory section(s), or tests for a period of time.
3. Allow laboratories to document and inform the client about all the issues related to a sample or analysis. For example, if a sample was received outside shipping temperature requirements and also exceeded preservation time, that client might be informed to use correct packaging and a faster shipping method.

QA events are categorized into three types:

1. Result Override – these events prohibit the result(s) from appearing on client reports while providing a description of the issue. A red “Result(s) Overridden” message will appear for the analysis on its Test Results tab of the full sample login, Sample Tracking, and Complete and Release screens.

Reportable	Analyte	Value	Quant Limit
<input checked="" type="checkbox"/>	Nitrate + Nitrite as NO3		1

Result(s) Overridden

Figure 135 Result(s) Overridden Message

2. Warning – these events are used to inform the client. The test result(s) are displayed on the client reports
3. Internal – these events are not shown on client reports. They are used for counting internal processes or other housekeeping events.

The Billable checkbox is used to override billing information. When unchecked, it informs the billing module to not bill for that sample/analysis. Only one QA event in the Sample QA Events list needs to be unchecked for the entire sample (and all of its analyses) to not be billed. The same thing is true for the Analysis QA Event list in that, only one unchecked QA event will make that particular analysis not billable.

Sample QA Events	Type	Billable
canceled no charge	Result Override	<input type="checkbox"/>

Analysis QA Event	Type	Billable
-------------------	------	----------

A QA event has been added that makes this sample and all its analyses not billable

Figure 136 Entire Sample Not Billable Message

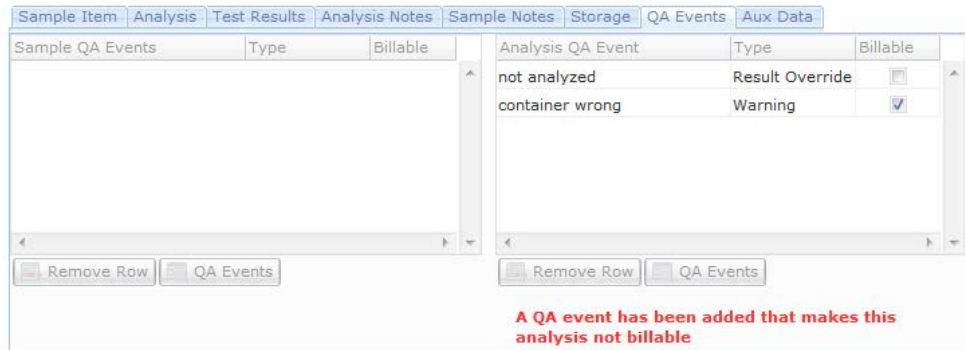


Figure 137 Analysis Not Billable Message

3.6 SAMPLE TRACKING

This screen is designed to provide lookup and general sample management capabilities for any type of sample within the LIMS. Additionally, the screen allows the user to view multiple samples in the structure of an expandable tree. In this way the user can quickly view and compare different pieces of information associated with samples.

The link to the Sample Tracking module is located in the [first section of the Sample Menu](#).

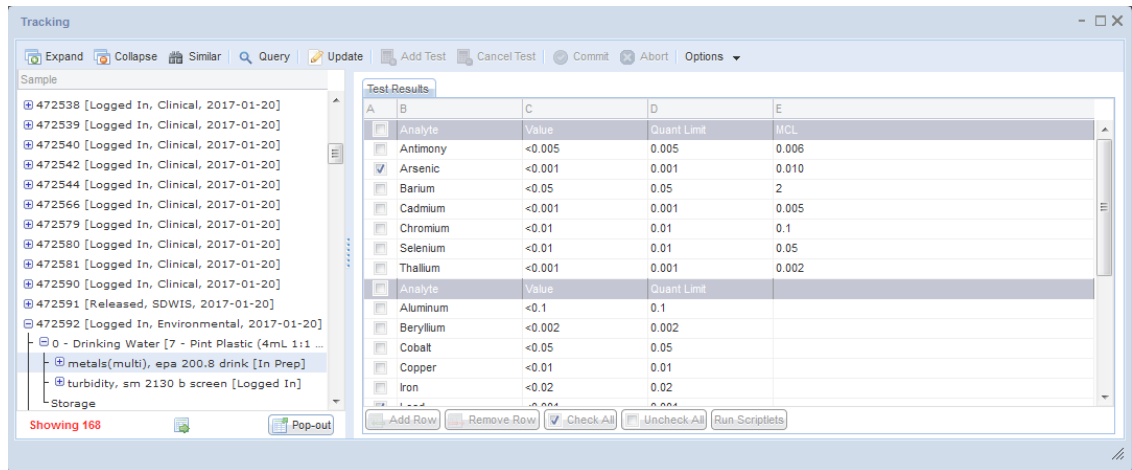


Figure 138 Sample Tracking Screen

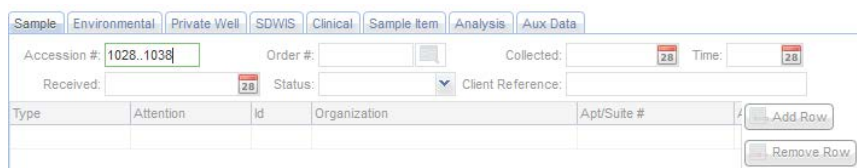
This screen is also used to add and cancel tests, unrelease samples, and change a sample's domain. This screen should NOT be used for entering results or completing analyses since it cannot automatically move an analysis to completed status as you enter results.

3.6.1 MAKING A GENERAL QUERY

Sample Tracking has the benefit of being able to show information on samples in a specific domain or across all sample domains. The latter is accomplished by making a general query. Any of the fields in the Sample, Sample Item, Analysis, or Aux Data tabs can be used to make a general query, as they are not domain-specific. Eight examples are provided below:

Example 1: General Query of a Range of Accession Numbers

Click on **Query** and enter "1028..1038" in the Accession # field located on the Sample tab. Click **Commit**.



The screenshot shows the OpenELIS Sample Tracking interface. The 'Sample' tab is selected. The 'Accession #' field contains the text '1028..1038'. Other fields include 'Order #', 'Collected:' (with a date picker), 'Time:' (with a time picker), 'Received:' (with a date picker), 'Status:' (with a dropdown menu), and 'Client Reference:'. Below the form is a table with columns: Type, Attention, Id, Organization, and Apt/Suite #. There are 'Add Row' and 'Remove Row' buttons to the right of the table.

Figure 139 General Query of a Range of Accession Numbers

Example 2: General Query by Received Date/Time Range and Sample Status

Users can also query based on other sample information (i.e., Order #, Collected Date/Time, Received Date/Time, Sample Status, Client Reference, Organization information, and/or Project information.)

Click on **Query** and enter "2014-04-22 00:00..2014-04-22 23:59" in the Received field and check "Logged In" in the Status field located on the Sample tab. Click **Commit**.

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The screenshot shows the 'Sample' tab in the OpenELIS interface. At the top, there are tabs for 'Sample', 'Environmental', 'Private Well', 'SDWIS', 'Clinical', 'Sample Item', 'Analysis', and 'Aux Data'. Below these are input fields for 'Accession #', 'Order #', 'Collected:' (with a date picker set to 28), and 'Time:' (with a time picker set to 28). There are also fields for 'Received:' (set to 2014-04-22 00:00:00.201), 'Status:' (set to 'Logged In'), and 'Client Reference:'. Below these fields is a table with columns: 'Type', 'Attention', 'Id', 'Organization', and 'Apt/Suite #'. There are 'Add Row' and 'Remove Row' buttons to the right of the table.

Figure 140 Querying through the Sample Tab (Received Date/Time Range and Sample Status)

Example 3: General Query by “Report To” Organization and Project Names

Click on **Query** and check “Report To” from the Type drop-down list. Enter “IDNR-FO 1” in the Organization field and “319-3 slvck” in the Project field located on the Sample tab. Click **Commit**.

This screenshot shows the 'Sample' tab with the 'Type' dropdown menu open, showing 'Report To' selected. The 'Organization' field is set to 'IDNR-FO 1'. Below the table, there is a 'Project' dropdown menu set to '319-3 slvck'. The 'Description' and 'Is Perm' columns are also visible. 'Add Row' and 'Remove Row' buttons are present for both the table and the project dropdown.

Figure 141 Querying through the Sample Tab (Organization and Project Names)

Users can also query based on analysis information (i.e., Test, Method, Analysis Status, Section, Unit, Panel, Started Date/Time, etc.)

Example 4: General Query by Test, Method, and Analysis Status

Click on **Query** and enter “nitrate” in the Test field and “epa 353.2” in the Method field. Check “Initiated” and “Requeue” in the Status field located on the Analysis tab. Click **Commit**.

The screenshot shows the 'Analysis' tab in the OpenELIS interface. The 'Test' field is set to 'nitrate' and the 'Method' is 'epa 353.2'. The 'Status' is 'Initiated, Requeue'. The 'Started' date is '28'. The 'Completed', 'Released', and 'Printed' fields also show '28'. The 'Section' and 'Unit' fields are empty. The 'Sample Prep' field is empty. Below the form is a table with columns 'Worksheet', 'Created', 'Status', and 'User'. There are 'Add Row' and 'Remove Row' buttons at the bottom right.

Figure 142 Querying Through the Analysis Tab (Test, Method, and Analysis Status)

Example 5: General Query by Section and Started Date/Time Range

Click on **Query** and check “enviro_micro-ik” in the Section field and enter “2014-05-09 00:00..2014-05-13 23:59” in the Started field on the Analysis tab. Click **Commit**.

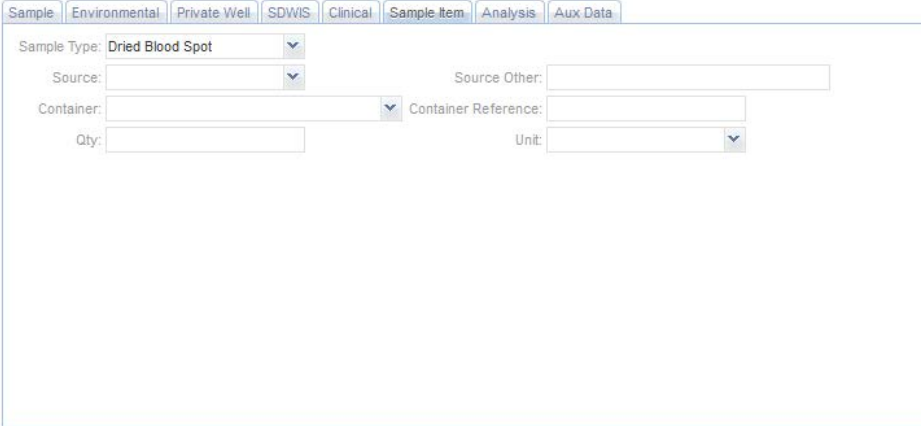
The screenshot shows the 'Analysis' tab with the 'Section' field set to 'enviro_micro-ik'. The 'Started' field contains the date range '2014-05-09 00:00..2014-05-13 23:59'. The 'Sample Prep' field is expanded to show a list of options: 'cdc_reference-ic', 'chlamydia_gc-ic', 'client_services-ic', 'cystic_fibrosis-ank', 'enviro_lead-ank', 'enviro_micro-ank', 'enviro_micro-ic', and 'enviro_micro-ik' (which is checked). The 'Status' field is empty. The 'Completed', 'Released', and 'Printed' fields show '28'. The 'Section' field is highlighted in green. Below the form is a table with columns 'Worksheet', 'Created', 'Status', and 'User'. There are 'Add Row' and 'Remove Row' buttons at the bottom right.

Figure 143 Querying Through the Analysis Tab (Section and Started Date/Time Range)

Example 6: General Query by Sample Type

Click on **Query** and check “Dried Blood Spot” in the Sample Type field. Click **Commit**.

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The screenshot shows a web-based form titled "General Query by Sample Type". At the top, there are several tabs: "Sample", "Environmental", "Private Well", "SDWIS", "Clinical", "Sample Item", "Analysis", and "Aux Data". The "Sample" tab is currently selected. Below the tabs, the form contains the following fields:

- Sample Type:** A dropdown menu with "Dried Blood Spot" selected.
- Source:** A dropdown menu.
- Source Other:** A text input field.
- Container:** A dropdown menu.
- Container Reference:** A text input field.
- Qty:** A text input field.
- Unit:** A dropdown menu.

Figure 144 General Query by Sample Type

Example 7: General Query by Aux Data

1. Click on **Query** and select the Aux Data tab.
2. Click on the Name field and begin entering the auxiliary analyte name (e.g., pH).
3. Choose the desired aux group from the drop-down list (e.g., 1-env acceptance).
4. Enter the desired value or range in the Value field (e.g., "6.8"). It should be noted that the Value field uses string comparison, and as such, all the string character operators such as "*" or "|" are allowed. Only one aux data row (individual auxiliary analyte) can be queried at a time.
5. Click **Commit**.

Reportable	Name	Value
<input type="checkbox"/>	pH	6.8

Description:
 Method:
 Unit:

Figure 145 General Query by Aux Data

Example 8: Querying Using Multiple General Tabs

1. Click on **Query** and check “Report To” from the Type drop-down list on the Sample Tab.
2. Enter “1294” in the organization Id field and check “Logged In” in the Status field.
3. Enter “hpc” in the Test field and “green pour plate” in the Method field on the Analysis tab. Click **Commit**.

Type	Attention	Id	Organization	Apt/Suite #
Report To		1294		

Test: <input type="text" value="hpc"/>	Method: <input type="text" value="green pour plate"/>	Started: <input type="text"/>
Status: <input type="text"/>	Type: <input type="text"/>	Reportable: <input type="checkbox"/>
Section: <input type="text"/>	Unit: <input type="text"/>	Completed: <input type="text"/>
Panel: <input type="text"/>		Released: <input type="text"/>
Sample Prep: <input type="text"/>		Printed: <input type="text"/>
		Revision: <input type="text"/>

Worksheet	Created	Status	User	User	Action
-----------	---------	--------	------	------	--------

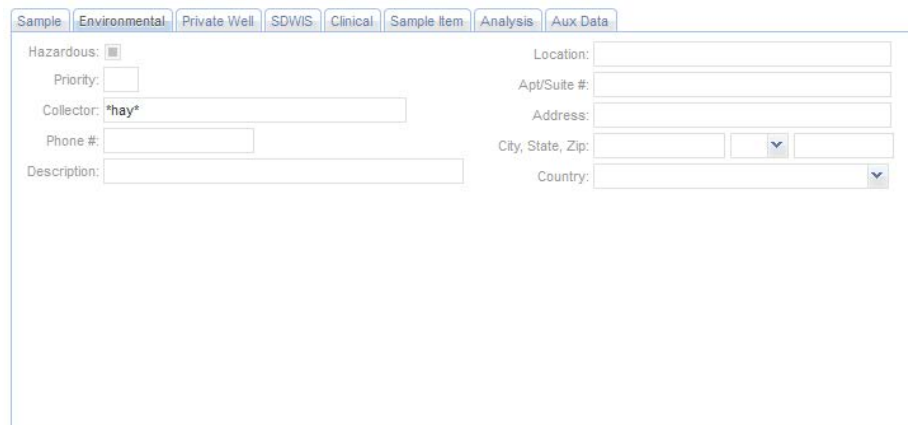
Figure 146 Querying Using Multiple General Tabs

3.6.2 MAKING A DOMAIN-SPECIFIC QUERY

When any field on a domain-specific tab (i.e., Environmental, SDWIS, Clinical, etc.) is used to query for samples, only matches from that particular domain will be returned.

Example 1: Querying Using Domain-Specific Fields Only

Querying for “*hay*” in the Collector field on the Environmental tab returns samples from the environmental sample domain whose collector’s name contains the letters “hay” anywhere in the name.



The screenshot shows the OpenELIS search interface with the 'Environmental' tab selected. The search criteria are as follows:

Field	Value
Hazardous	<input type="checkbox"/>
Priority	<input type="text"/>
Collector	*hay*
Phone #	<input type="text"/>
Description	<input type="text"/>
Location	<input type="text"/>
Apt/Suite #	<input type="text"/>
Address	<input type="text"/>
City, State, Zip	<input type="text"/> <input type="text"/> <input type="text"/>
Country	<input type="text"/>

Figure 147 Domain-Specific Query Using the Environmental Tab

Example 2: Querying Using a Combination of General and Domain-Specific Fields

Querying for a Received date range of “2014-05-01 00:00..2014-05-31 23:59”, a sample Status of “Released”, and patient Last name of “BUGLER” returns only domain-specific matches. Note that the first two criteria are general in nature, and the last one is specific to the Clinical Domain. Only clinical samples that meet all three of the search criteria will be returned.

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Figure 148 Querying Using a Combination of General and Domain-Specific Fields

Example 3: Multiple Domain Querying is Not Allowed

Samples can only be part of one domain so if fields in two different domains are used to query for samples, an error message will be displayed in the Status Area of the screen prohibiting this action. For example, if a query is conducted for samples with a Desc(ription) of “surface water” on the Environmental tab, and a Sample Type of “RT – Routine” on the SDWIS tab, the following error message will be displayed:



 **Please query for only one domain at a time.**

Figure 149 Error Message for a Multiple Domain Query in Sample Tracking

3.6.3 SAMPLE TREE AND NODE TABS

1. The left pane of the Sample Tracking module displays the accession numbers of the samples that have met the search criteria. Sample Tracking will initially display the first 500 samples. Each time the “page forward”  button is clicked, an additional 500 samples are shown. The warning “No more records in this direction” will appear when all of the samples have been displayed. The total number of samples being shown is displayed in red at the bottom of the left pane.

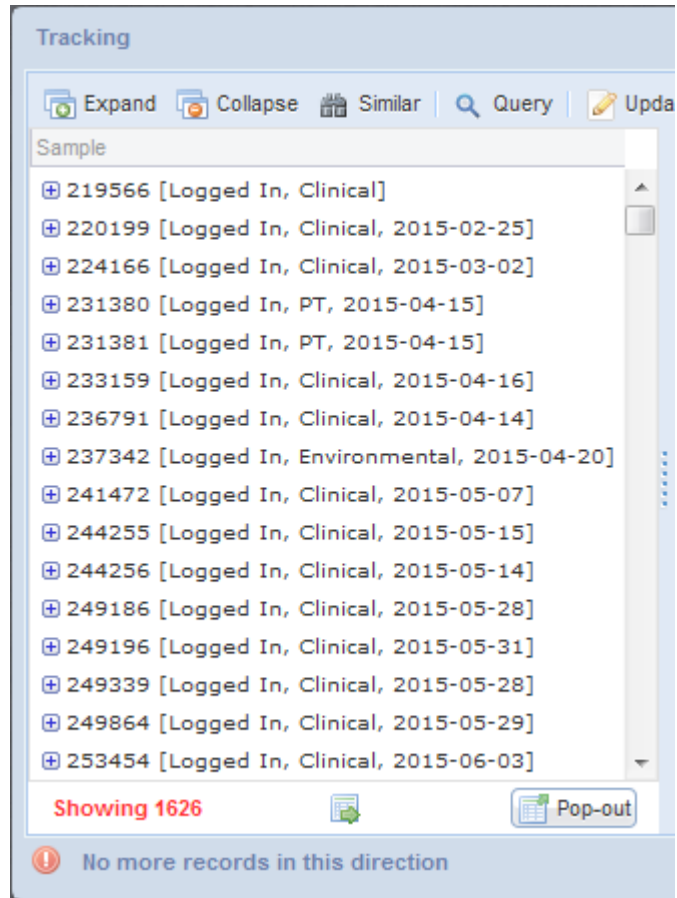



Figure 150 A Listing of Samples Meeting a Query

2. Click on the  icon in the left pane to expand a sample or analysis node or click on the **Expand** button to automatically expand all of the nodes of the entire tree.

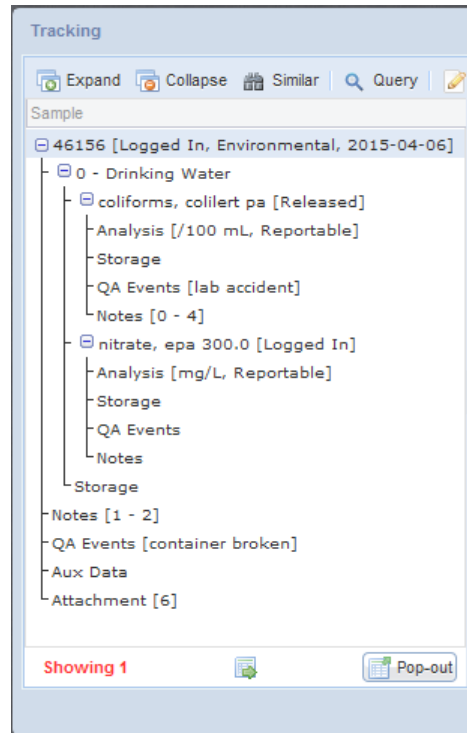



Figure 151 Expanded Sample Tree in Sample Tracking

3. The branches of the tree can be traced to see where each node fits into the sample hierarchy. In the example above, the sample with an accession number of 46156 consists of one sample item, 0, with a sample type of Drinking Water. There are two analyses assigned to this sample item: coliforms, colilert pa and nitrate, epa 300.0. Each analysis can have present and past storage locations, QA events, and external and internal notes. There can also be present and past storage locations for each sample item. Finally, there can be external and internal notes, QA events, aux data, and attachments at the sample level.
4. Node information is often located in square brackets to the right of each node label to easily and quickly relay key information to the user. In the example above, [Logged In, Environmental, 2015-04-06] notifies the user that the sample with accession number 46156 is in logged in status, is in the environmental sample domain, and has a collected date of 2015-04-06. [mg/L, Reportable] signals to the user that the nitrate, epa 300.0 analysis has a unit of mg/L and is marked reportable. Node information that may also be present includes analysis status,

container name, analysis and sample item storage location, sample and analysis QA events, the number of external and internal sample and analysis notes, aux data group(s), and the number of attachments.

5. Click on the  icon to collapse a sample or analysis node or click on the **Collapse** button to automatically collapse all of the nodes of the entire tree.
6. For each accession number, information related to the sample, sample domain, sample item(s), test results, analyses assigned, sample item and analysis storage, sample and analysis QA events, sample and analysis notes, auxiliary data, and attachments can be viewed. Select the node in the tree in the left pane to view the corresponding information in the tab in the right pane.

Example screen shots of each node tab and a description of each field are found in the following subsections.

3.6.3.1 SAMPLE TAB

Accession #:	332088	Order #:	99846	Collected:	2016-01-05	Time:	10:10
Received:	2016-01-05 12:30	Status:	Released	Client Reference:	field blank		
Released:	2016-01-13 15:10	Revision:	0				

Type	Attention	Id	Organization	Apt/Suite #	Street	
Report To	MELANIE KRUSE	1205	SHL LIMNOLOGY	UI RESEARCH PA...	249	Add Row
Bill To	MICHAEL WICHM...	3200	SHL CORALVILLE	UI RESEARCH PA...	249	Remove Row

Project	Description	Is Perm	
01wqfmm	Project Code for IDNR ambient streams contract	<input checked="" type="checkbox"/>	Add Row
			Remove Row


Figure 152 Sample Tab

The fields on this tab are described below.

Accession

The unique accession number of the sample to be analyzed is displayed in this field.

Order #

This field contains the unique Id for a send-out order (for non-clinical samples). The pop-up button  to the right of the Order # pops up a Send-out Order screen. (See [SEND-OUT ORDER](#) for more information.)

Collected

This field displays the date the sample was collected.

Time

This field displays the time the sample was collected.

Received

This field displays the date and time the sample was received at the laboratory.

(Sample) Status

This field displays the status of the sample. See [\(Sample\) Status](#) for a complete description of each status.

Client Reference

The value displayed in this field is one item that ties the client's information to the sample paperwork. It could be a client's lab number or another unique identifier for a sample that they collect.

Released

This field displays the date and time that the entire sample was released.

Revision**Type**

There are three types of organizations currently defined in OpenELIS: Report To, Secondary Report To, and Bill To. See [Report To](#) and [Bill To](#) for more information on these types of organizations.

Attention

This field may contain the name of the person at the client organization who is responsible for this sample.

Id

The organization Id is a unique integer that is used to assign permissions for web users to view the results that are reported to that organization. It also serves as the billing Id for an automated billing program.

Organization

This field contains the complete name of the client organization.

Apt/Suite #, Address, City, State, Zip Code, Country

These fields specify the complete address of the client organization.

Project

This field is used to display the name of a project that has been assigned to a sample. See the [PROJECT](#) screen for more information on projects. Currently, this field has been disabled for clinical samples.

Description

This field contains a detailed description of the project.

Is Perm

This checkbox indicates if the project is permanently assigned to the sample. All projects assigned by the user should have this boxed checked.

3.6.3.2 DOMAIN TAB

The fields on this tab are sample domain-specific and are described below.

3.6.3.2.1 QUICK ENTRY TAB

The Quick Entry tab does not contain any information. This is due to the fact that there aren't any domain-specific fields that are associated with quick-entered samples. Once these samples are fully logged-in, they will become part of a sample domain and will display the appropriate domain-specific fields.

3.6.3.2.2 ENVIRONMENTAL TAB

The screenshot shows the 'Environmental' tab of a sample entry form. It includes the following fields:

- Hazardous:** A checkbox.
- Priority:** A text input field.
- Collector:** A text input field containing 'birmingham uh1003'.
- Phone #:** A text input field.
- Description:** A text input field.
- Location:** A text input field containing 'buffalo beach'.
- Apt/Suite #:** A text input field.
- Address:** A text input field.
- City, State, Zip:** A text input field containing 'BUFFALO IA' with a dropdown arrow.
- Country:** A text input field with a dropdown arrow.

Figure 153 Environmental Tab

The Environmental tab contains environmental sample demographic information. The formats specified for these fields follow.

Hazardous

The checkbox indicates if the sample is considered hazardous. Hazardous samples require special disposal.

Priority

This field specifies the number of days that the client expects for sample turnaround. For example, a value of 3 would specify that the sample should be completed and reported within 3 working days.

Collector

The collector's name can be specified in the format of *lastname firstname* or a collector ID depending on the laboratory section's SOP. This field is restricted to lower case letters, numbers, and symbols.

Phone #

This field is used to specify the collector's phone number. The field will automatically format the digits for the area code, phone number, and extension (if applicable).

Description

This text field is used to further describe the sample such as filter, duplicate, ice, etc. The information about sample type and source should be entered in the [SAMPLE ITEM TAB](#) and not in this field.

Location

The name of the location for the collection of the environmental sample may be specified in this field.

Apt/Suite #, Address, City, State, Zip, Country

These fields may specify the complete address of the collection location of the environmental sample.

3.6.3.2.3 SDWIS TAB

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The screenshot shows a web form with two tabs: 'Sample' and 'SDWIS'. The 'SDWIS' tab is active. The form contains the following fields:

PWS Id:	IA9909305	PWS Name:	2ND PLEASANT VIEW SUBDIVISION
State Lab #:	27	Facility Id:	950
Sample Type:	RT - Routine	Sample Cat:	Bacterial
Sample Pt Id:	950	Location:	
Priority:		Collector:	cartman eric

Figure 154 SDWIS Tab

The SDWIS tab contains SDWIS sample demographic information. The formats specified for these fields follow.

PWS Id

The PWS (Public Water Supply) Id is a unique identifier assigned by the state to all public water supplies. The PWS Id begins with a two letter state abbreviation followed by a unique seven digit number. The pop-up button  to the right of this field can be used to display the PWS Information screen for this public water supply. For more information on the PWS Information screen, see [PWS INFORMATION](#).

PWS Name

The PWS (Public Water Supply) Name is displayed in this field.

State Lab #

This number represents the laboratory id that was assigned to your laboratory by the state's laboratory certification program.

Facility Id

This field contains the state assigned water system facility id, also known as the [State ID](#).

(SDWIS) Sample Type

The SDWIS sample type is specified for this sample. SDWIS sample types include: Routine, Repeat, Special, Replacement, and Confirmation. This field should not be confused with the Sample Type on the [SAMPLE ITEM TAB](#).

Sample Cat(egory)

The Sample Cat(egory) specifies the SDWIS sample category. The sample categories currently are Bacterial, Radio Chemical, Chemical, and Pb/Cu.

Sample Pt Id

The Sample Pt (Point) Id field often contains the same information as the Facility Id.

Location

This is a description of the sampling point location.

Priority

This field may specify the number of days that the client expects for sample turnaround. For example, a value of 3 would specify that the sample should be completed and reported within 3 working days.

Collector

The collector's name can be specified in the format of *lastname firstname* or a collector ID depending on the laboratory section's SOP. This field is restricted to lower case letters, numbers, and symbols.

3.6.3.2.4 CLINICAL TAB

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The screenshot shows the 'Clinical' tab of the OpenELIS interface. It contains a form with the following fields and values:

- Id:** 621
- Last:** MOUSE
- First:** MICKEY
- Birth:** 1980-02-25 (with a calendar icon)
- NID:** (empty)
- Apt/Suite #:** (empty)
- Address:** 200 DISNEYWORLD BLVD
- City, State, Zip:** ORLANDO, FL, 00215
- Phone #:** (empty)
- Gender:** Male
- Race:** U - Unknown
- Ethnicity:** Hispanic
- Provider (L,F):** WELBY, MARCUS
- Phone #:** 515/555-1212

Figure 155 Clinical Tab

The Clinical tab contains demographic information for the patient that is linked to the sample. The formats specified for these fields follow.

(Patient) Id

This field contains the unique OpenELIS patient id that is automatically generated by the LIMS.

Last (Name)

The patient's last name is displayed in this field.

First (Name)

The patient's first name is displayed in this field.

Birth(date)

The patient's birthdate is displayed in this field. This field has a format of YYYY-MM-DD.

NID

The National Identifier (NID) is a unique identification number issued to a person by a national government. In the United States, the Social Security Number is a person's de facto national identifier. This field is optional and has a format of 000-00-0000.

Apt/Suite #

The patient's apartment or suite number can be displayed in this field.

Address

The patient's street address can be displayed in this field.

City, State, Zip

The patient's city, state, and zip code can be displayed in these fields.

Phone #

The patient's phone number can be displayed in this field.

Gender

The patient's gender can be displayed in this field.

Race

The patient's race can be displayed in this field.

Ethnicity

The patient's ethnicity can be displayed in this field.

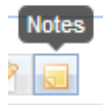
Provider (L,F)

The health care provider's last name and first name are displayed here. The field on the left is an autocomplete dropdown field and its behavior is described in the [full sample login](#) section.

Phone #

The provider's phone number can be displayed in this field. The field will automatically format the digits for the area code, phone number, and extension (if applicable).

The functions for the buttons located at the top of this tab are described below. The name of each button is displayed when the user hovers the mouse over the button.



Full Window Search

This button is used to pop up the Patient Lookup screen to query for a patient. This would be useful if the sample is first unlinked from the current patient in order to be linked to a different patient while in Update Mode. See [PATIENT LOOKUP SCREEN](#) for a complete explanation of its use.

Search By Fields

This button is used to query for a patient by a value entered in the Last, First, Birth, and/or NID fields. This would be useful if the sample is first unlinked from the current patient in order to be linked to a different patient while in Update Mode. See [PATIENT LOOKUP SCREEN](#) for a complete explanation of its use.

Unlink



Occasionally, a sample is linked to the incorrect patient record. This button is used in Update Mode to unlink a sample from a patient so that it can be linked to a different patient. Released samples can only be unlinked through the sample unrelease process. See [UNRELEASE SAMPLE OPTION](#) in the Sample Tracking screen for an explanation of this process.

Edit

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This button allows for a patient's demographic information to be changed while in Update mode. This function would be used to accommodate name and address changes in the database. This button edits the patient record, so all samples linked to this patient are updated with this new information.

(Patient) Notes

This button allows for patient-level notes to be added or read by data entry staff. These notes are attached to the patient record and will be visible from any sample that is assigned to the patient. These notes can be used to document phone calls to facilities confirming a patient's demographic information (e.g., date of birth, NID, spelling of name, etc.) There are not any patient notes present in the patient record when the **(Patient) Notes** button is displayed as . This button changes to  after a patient note has been added to a patient record. See [\(Patient\) Notes](#) for a complete description of this feature.

3.6.3.2.5 NEONATAL SCREENING TAB

3.6.3.2.6 ANIMAL TAB

Sample	Animal
Common: Bat	Apt/Suite #: 6
Scientific: Myotis septentrionalis	Address: 123 MAIN STREET
Location: parking lot	City, State, Zip: DES MOINES IA 50301
Provider (L,F): WELBY	MARCUS
Phone #: 555/555-1212	

Figure 156 Animal Tab

The Animal tab contains animal sample demographic information. The formats specified for these fields follow.

Common

This dropdown field contains the common name of the animal. This field is required. Common names are added through the [Dictionary](#) screen.

Scientific

This dropdown field may contain the scientific name of the animal. Scientific names are added through the [Dictionary](#) screen.

Location

The name of the location for the collection of the animal sample (or location of the animal incident) may be specified in this field.

Apt/Suite #, Address, City, State, Zip

These fields may specify the complete address of the animal collection/incident location.

Provider (L,F)

The veterinarian's/health care provider's last name and first name are displayed here. The field on the left is an autocomplete dropdown field and its behavior is described in the [full sample login](#) section.

Phone #

The veterinarian's/health care provider's phone number can be displayed in this field. The field will automatically format the digits for the area code, phone number, and extension (if applicable).

3.6.3.2.7 PT TAB

DECEMBER, 2017

The screenshot shows a web interface with two tabs: 'Sample' and 'PT'. The 'PT' tab is active. The form contains the following fields:

- Provider: WISCONSIN STATE LAB OF HYGIENE (dropdown menu)
- Additional Domain: (empty dropdown menu)
- Series: LAMP ROUND 36 (text input)
- Received By: prose (dropdown menu)
- Due: 2015-05-29 08:00 (calendar icon)

Figure 157 PT Tab

The PT tab contains proficiency testing information that is specific to the sample. The formats specified for these fields follow.

Provider

This dropdown field contains the name of the PT sample provider. PT sample providers are added through the [Dictionary](#) screen.

Series

This free text field contains the name of the PT series.

Due

This optional field can be used to specify the date and time when the PT sample's results are due to the PT sample provider.

Additional Domain

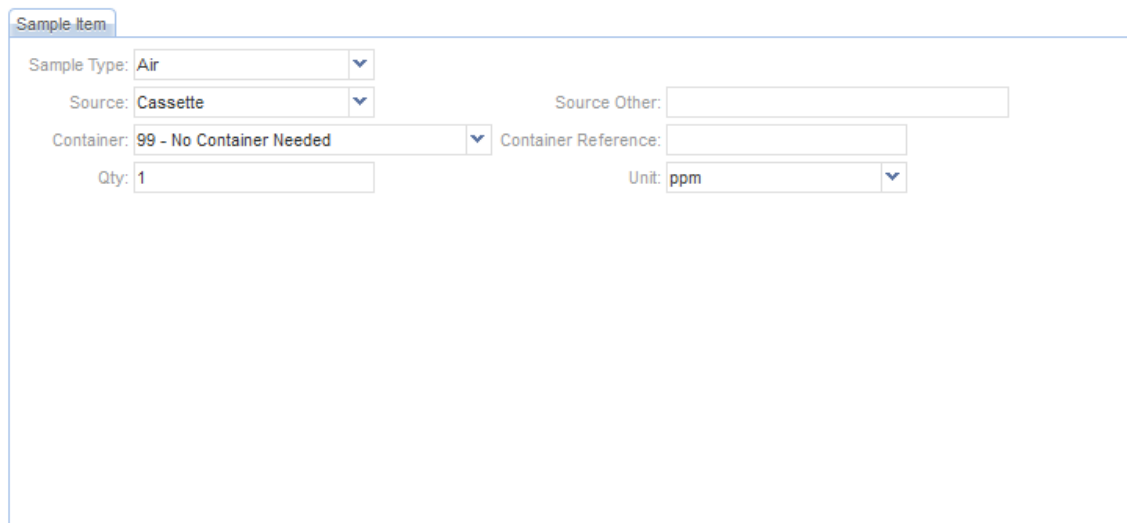
This dropdown field will be implemented in the future to select an additional sample domain so that its domain-specific information can be displayed. This will be used for maternal and newborn screening data that is patient-specific to prevent it from having to be duplicated in the PT sample tab.

Received By

This field is used to record the OpenELIS username of the person who received the PT sample.

3.6.3.3 SAMPLE ITEM TAB

The fields on this tab are described below.



The screenshot shows the 'Sample Item' tab with the following fields and values:

Sample Type:	Air	Source Other:	
Source:	Cassette	Container Reference:	
Container:	99 - No Container Needed	Unit:	ppm
Qty:	1		

Figure 158 Sample Item Tab

Sample Type

The Sample Type drop-down list allows for the classification of the sample (e.g., Breast Milk, Dust, Liquid, Oil, etc.). The Sample Type that has been selected affects what tests can be assigned to this sample item. For example, if a “Drinking Water” sample type is selected, the Add Test autocomplete drop-down list will only offer tests that can be performed on drinking water.

Source

This field specifies the source of the sample such as Well Water, Ground Water, etc. For clinical samples, this field is used to specify a collection source such as Capillary for Blood sample type, Left Ear Lobe for Skin Biopsy, etc.

Source Other

This field is a free-text field that can be used to enter more specific source information.

Container

The container is the apparatus that holds the sample. Examples include a bottle, vial, trip blank, culture swab, etc. All SHL container names have the following format: internal id - container name. The container name can be quite descriptive and often specifies its capacity, e.g., 70 - 250ml Brown Plastic Nalgene Bottle (EDTA preservative).

Container Reference

This text field can be used to uniquely identify the received container by using the manufacturer's inventory serial id, or the "Build Id" on the container label if you are building kits (see [BUILD KITS](#)) through the LIMS.

Qty and Unit

These fields denote the quantity of material in this container. For example, if the container holds 200 mL of water, enter 200 in the Qty field and select mL from the Unit drop-down list.

3.6.3.4 TEST RESULTS TAB

DECEMBER, 2017

Test Results				
A	B	C	D	E
<input type="checkbox"/>	Analyte	Value	Quant Limit	MCL
<input checked="" type="checkbox"/>	Antimony	<0.005	0.005	0.006
<input checked="" type="checkbox"/>	Arsenic	<0.001	0.001	0.010
<input checked="" type="checkbox"/>	Barium	0.15	0.05	2
<input checked="" type="checkbox"/>	Cadmium	<0.001	0.001	0.005
<input checked="" type="checkbox"/>	Chromium	<0.01	0.01	0.1
<input checked="" type="checkbox"/>	Selenium	<0.01	0.01	0.05
<input checked="" type="checkbox"/>	Thallium	<0.001	0.001	0.002
<input type="checkbox"/>	Analyte	Value	Quant Limit	
<input type="checkbox"/>	Aluminum	<0.1	0.1	
<input checked="" type="checkbox"/>	Beryllium	<0.002	0.002	
<input type="checkbox"/>	Cobalt	<0.05	0.05	
<input type="checkbox"/>	Copper	<0.01	0.01	
<input type="checkbox"/>	Iron	<0.02	0.02	
<input type="checkbox"/>	Lead	<0.01	0.01	

Check All
 Uncheck All

Figure 159 Test Results Tab

This tab displays the results of an analysis in an easy-to-read table. The fields and buttons and their uses are described below.

Reportable Checkbox

This checkbox is used to mark an analyte and its related results reportable. This is a second level of reporting capability as the [analysis will also have to be reportable](#). The box in this column header can be used to check (or uncheck) all of the analytes in that group.

This checkbox is defaulted to the [test definition](#) but can be changed to indicate if an analyte and its related values should be reported or not. For those systems that create billing, the reportable flag is also used to create billing information.

Analyte

This column contains the analyte that was tested or the question that was asked. OpenELIS generally calls any question (i.e., Chloroform, Date of Onset, Sign and Symptoms) an analyte.

Value

The Value field is used to enter the result for the corresponding analyte. It can be displayed as a numerical value (<0.5), as a qualitative result (Positive, Negative), as a titer (1:8, <1:256), or a date-time field (2012-12-21 00:01).

Other column analytes, such as Expected Value, Quant Limit, and MCL, might be present depending upon the test definition.

Add Row

This button is used to add an additional test analyte to this tab below the selected row. The Test Analyte Selection screen will pop up allowing the user to choose the desired test analyte(s) to add.

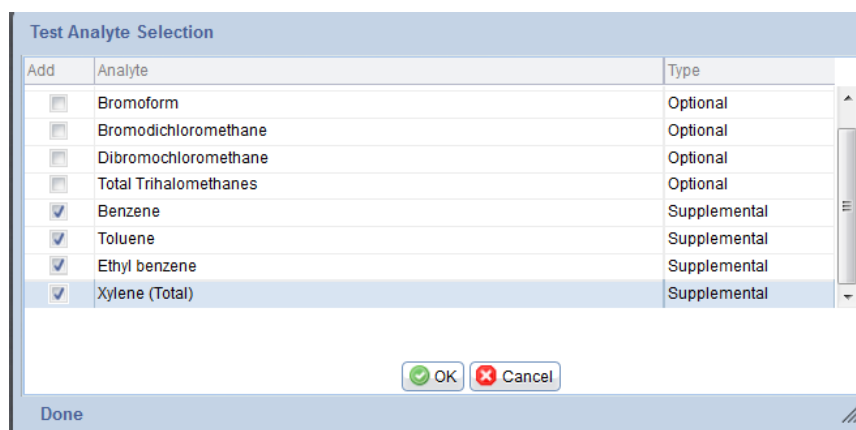


Figure 160 Test Analyte Selection Screen

Remove Row

This button is used to remove an analyte from this tab.

Check All and Uncheck All

These buttons check/uncheck the Reportable column.

Run Scriptlets

A [scriptlet](#) assigned to a test is run when any change is made to the data on the Test Results tab. The **Run Scriptlets** button can be used to force all of the scriptlets assigned to the sample (any applicable test and domain scriptlets) to run.

3.6.3.5 ANALYSIS TAB

The fields on this tab are described below.

The screenshot shows the 'Analysis' tab with the following fields:

- Test: glycols
- Method: uhl h 019
- Status: Released
- Type: [empty]
- Section: liquidchrom-ic
- Unit: mg/L
- Started: 2012-02-28 18:15
- Completed: 2012-03-02 15:25
- Released: 2012-03-02 18:35
- Printed: 2012-03-03 08:30
- Revision: 0

Below the fields is a table with columns: Worksheet, Created, Status, User. To the right is a table with columns: User, Action.

Worksheet	Created	Status	User

User	Action
dlarabee	Completed
smay	Released

Buttons at the bottom include 'Select', 'Add Row', and 'Remove Row'.

Figure 161 Analysis Tab

Test

The test that has been assigned for the analysis is displayed in this field.

Method

The method that has been assigned for the analysis is displayed in this field. The method can be [flipped](#) using this screen.

The screenshot shows the 'Analysis' tab with the following fields:

- Test: coliforms
- Method: colliert mpn sdwa pm
- Status: Initiated
- Type: Method
- Section: enviro_micro-ic
- Unit: [empty]
- Started: 2011-12-15 14:52

The 'Method' dropdown menu is open, showing the following options:

Method	Description
colliert mpn sdwa am	MPN Total Coliform & E.coli by Quanti-Tray - morning
colliert mpn sdwa pm	MPN Total Coliform & E.coli by Quanti-Tray - afternoon
colliert mpn well	MPN Total Coliform & E.coli by Quanti-Tray

Figure 162 Method Flipping through the Analysis Tab

(Analysis) Status

The status of the analysis is displayed in this field. See [\(Analysis\) Status](#) for a complete description of each status.

(Analysis) Type

This optional field specifies the type of analysis. See [\(Analysis\) Type](#) for a complete description of each type.

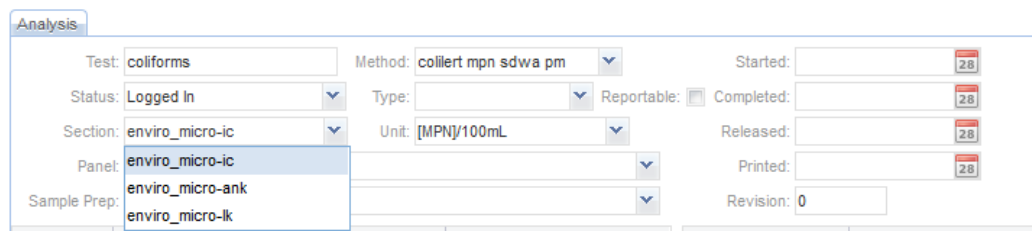
Reportable

An analysis with the Reportable box checked will have its test results displayed and/or transmitted via the [Final Report](#), web portal data view, or electronically.

This field is defaulted to the [test definition](#) but can be changed to indicate if an analysis should be reported or not. For those systems that create billing, the reportable flag is also used to create billing information.

Section

This field indicates which section is performing the analysis. For tests that can be performed by multiple sections, the analysis's section can be changed by selecting a different section during Update mode.



The screenshot shows the 'Analysis' form with the following fields and values:

Test:	coliforms	Method:	colilert mpn sdwa pm	Started:	28		
Status:	Logged In	Type:		Reportable:	<input type="checkbox"/>	Completed:	28
Section:	enviro_micro-ic	Unit:	[MPN]/100mL	Released:	28		
Panel:	enviro_micro-ic	Printed:	28				
Sample Prep:	enviro_micro-lk	Revision:	0				

Figure 163 Changing an Analysis's Section

Unit

The unit of measure for the analysis is specific to the sample type and is defined on the [Sample Type](#) tab of the test definition. If multiple units have been defined for a sample type, the unit can be changed during Update mode.

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The screenshot shows the 'Analysis' form with the following fields and values:

- Test: ammonia
- Method: epa 350.1
- Status: Logged In
- Type: [empty]
- Reportable:
- Completed: [empty]
- Section: inorg_auto-ank
- Unit: mg/kg [dry wt] (highlighted in a dropdown menu)
- Released: [empty]
- Printed: [empty]
- Revision: 0
- Sample Prep: [empty]

Figure 164 Changing the Unit of an Analysis

Panel

This field displays the [panel](#) that was used to add the tests to the sample. The panel field allows tests to be grouped mainly for electronic messaging in clinical settings. For example, the “nbs panel” test panel includes the tests/methods that are normally assigned to a sample item during newborn screening. An analysis can be linked to a different panel during Update mode.

The screenshot shows the 'Analysis' form with the following fields and values:

- Test: coliforms
- Method: colliert pa sdwa pm
- Status: Initiated
- Type: [empty]
- Reportable:
- Completed: [empty]
- Section: enviro_micro-ic
- Unit: /100 mL
- Released: [empty]
- Printed: [empty]
- Revision: 0
- Sample Prep: [empty]
- Worksheet: 404
- Panel: coliform mpn panel (highlighted in a dropdown menu)

Figure 165 Changing the Panel Linkage of an Analysis

Sample Prep

This field displays the prep test/method for the currently selected analysis. If an analysis has a prep analysis, the dependent analysis is placed into In Prep status until the prep analysis is completed. Then the status of the dependent analysis is changed to Logged In and the analysis available date is updated.

At times it may be desirable to choose a previously logged in analysis to be the prep analysis for a dependent analysis. This is accomplished by clicking on the dropdown arrow in the Sample Prep field and selecting the desired prep analysis. For a complete explanation of prep tests, see [Prep Tests](#).

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The screenshot shows the 'Analysis' form in OpenELIS. The fields are as follows:

- Test: pesticides
- Method: uhl h 018 fifra
- Status: In Prep
- Section: liquidchrom-ic
- Unit: ug/kg
- Sample Prep: prep pest, uhl h 018 flu
- Reportable:
- Revision: 0

The Worksheet table contains the following data:

Name	Sample Type	Sequence
prep pest, uhl h 018 dupont	Soil	0
prep pest, uhl h 018 flu	Soil	0

Buttons at the bottom include 'Select', 'Add Row', and 'Remove Row'.

Figure 166 Changing the Sample Prep Analysis of an Analytical Analysis

Started

This field indicates the date and time that the analysis was begun in the laboratory. It is automatically set to when the analysis is placed onto a worksheet but can be overridden to indicate the actual start time of the analysis. For instruments that are electronically interfaced, this date and time is automatically updated to the injection time.

Completed

This field indicates the date and time that the analysis results were entered into the LIMS. It is automatically set to the date and time the worksheet was loaded back into the system but can be overridden to indicate the actual completion time of the analysis.

Released

This field indicates the date and time that the analysis was released or re-released. This field is set by the system and cannot be changed by the user.

Printed

This field indicates the date and time that the analysis was (or would have been) printed or re-printed on the Final Report.

Revision

The Revision number indicates the current version of the analysis. Laboratories sometimes unrelease an analysis in order to correct analysis information. Each time an analysis is unreleased, the revision number is automatically incremented by one.

Worksheet Table

This table displays all of the worksheets that contain this analysis. For example, if an analysis was run on two different worksheets, this table will have two entries indicating the worksheets.

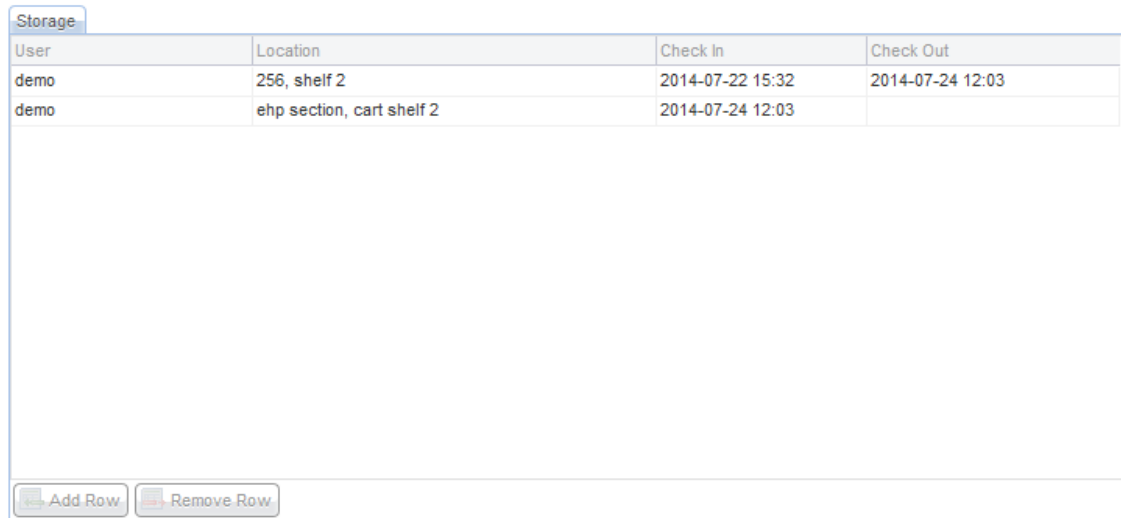
To view the entire worksheet through the [Worksheet Completion](#) screen, select the row and click the **Select** button below the table.

User Table

This table displays a list of all of the laboratory staff that performed and/or released this analysis. The list is automatically populated by the Worksheet Completion and the Complete and Release modules. Additional entries can be manually added by using the **Add Row** button for those cases when multiple analysts helped complete the analysis.

3.6.3.6 STORAGE TAB

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User	Location	Check In	Check Out
demo	256, shelf 2	2014-07-22 15:32	2014-07-24 12:03
demo	ehp section, cart shelf 2	2014-07-24 12:03	

Buttons: Add Row, Remove Row

Figure 167 Storage Tab

The Storage tab displays a list of storage locations for the selected analysis or sample item. Click on the **Add Row** button to enter an initial storage location or to move an analysis product or sample item to a new location. The User name and Check In date and time are automatically entered to reflect the logged-in user and current date and time, respectively. The (storage) Location can be selected from an autocomplete drop-down list that displays the Parent (Location), Storage (Sub-)Unit, and (Sub-)Location. The current date and time will be automatically entered in the Check Out field for the previous location. Check In and Check Out dates and times can be manually overridden.

User	Location	Check In	Check Out
mhayek	ic 2242 f6, bin 0	2015-06-03 09:15	2015-06-26 14:06
mhayek	ic 2242 f6, shelf 1	2015-06-26 14:06	

Parent	Storage Unit	Location
ic 2242 f6	shelf	1
ic 2242 f6	shelf	2
ic 2242 f6	shelf	3
ic 2242 f6	shelf	4
ic 2242 f6	bin	0
ic 2242 f6	door shelves	0

Buttons: Add Row, Remove Row

Figure 168 Selecting a Storage Location for a Sample Item/Analysis Product

3.6.3.7 QA EVENTS TAB

Sample QA Events			Analysis QA Events		
Sample QA Events	Type	Billable	Analysis QA Events	Type	Billable
date-time error	Warning	<input checked="" type="checkbox"/>	equipment failure	Result Override	<input type="checkbox"/>

Buttons: Remove Row, QA Events (for both tables)

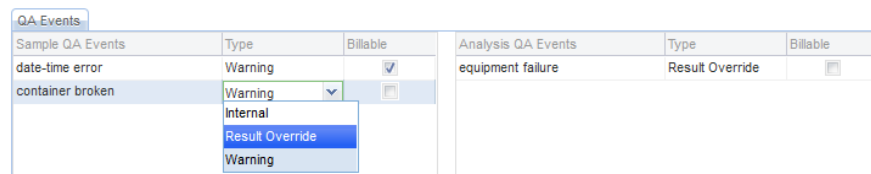
A QA event has been added that makes this analysis not billable

Figure 169 QA Events Tab

Quality Assurance events are flags that can be associated with a sample and/or an analysis to denote an exceptional condition. The Sample QA Events table shows a list of events that are associated with the sample while the Analysis QA Events table shows the events for the currently selected analysis. Analysis QA Events can only be viewed, added, or removed from an analysis QA Events node, whereas, Sample QA

Events can be viewed, added, or removed from either an analysis or sample QA Events node.

QA events can be removed (**Remove Row** button) or added (**QA Events** button) using the appropriate button below each table. Clicking on the **QA Events** button will pop up the [QA EVENT SELECTION SCREEN](#). The user can also change the Type of QA Event (Internal, Result Override, or Warning) by clicking on the dropdown arrow. The Billable checkbox can also be checked or unchecked.



QA Events		
Sample QA Events	Type	Billable
date-time error	Warning	<input checked="" type="checkbox"/>
container broken	Warning	<input type="checkbox"/>

Analysis QA Events		
	Type	Billable
equipment failure	Result Override	<input type="checkbox"/>

Figure 170 Changing the Type of QA Event

Since sample QA events affect all the analyses on that sample, they cannot be altered if any analysis has been released. The only exception is adding/removing internal QA events; the billable flag is marked billable if the sample/analysis is billable.

See [QA EVENTS](#) for a complete explanation of the benefits and types of QA events.

3.6.3.8 ANALYSIS NOTES TAB

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The screenshot shows the 'Analysis Notes' interface. It has a title bar 'Analysis Notes' and two main panels. The left panel is labeled 'External:' and contains a text box with the note: 'An extra filter was processed in order to analyze the entire sample as required by the LT2 rule.' Below this panel is an 'Edit Note' button. The right panel is labeled 'Internal:' and contains a note with the following details: 'General' (subject line), 'Recheck bottle has been sent to facility.' (text), and 'mhayek 2014-07-24 16:22' (author and timestamp). Below this panel is an 'Add Note' button.

Figure 171 Analysis Notes Tab

The Analysis Notes tab allows for the entering of both internal and external comments that are related to a specific analysis. There is only one external note allowed and it may be edited as many times as needed. Internal notes, however, are individual entries, can only be committed once, and cannot be edited after committal. The subject line, author of the note, and date and time are only present on internal notes. Only external notes appear on result reports.

Click the appropriate button (**Edit Note** for an external note or **Add Note** for an internal note) to enter an analysis note. The [NOTE EDITOR](#) screen will pop up for this process.

3.6.3.9 SAMPLE NOTES TAB

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Sample Notes

External:

Upon arrival, sample met container and preservation requirements for the analysis requested. Please review carefully your sample results for additional analyte comments or method exceptions.

Internal:

General mhayek
2014-06-10
11:47

The results should be faxed to Mickey Mowz at 319-555-1212.

Edit Note Add Note

Figure 172 Sample Notes Tab

The Sample Notes tab allows for entering both internal and external comments that are tied to the entire sample. Sample notes are entered in the same manner as analysis notes. See [ANALYSIS NOTES TAB](#) and [NOTE EDITOR](#) for a detailed explanation.

3.6.3.10 AUX DATA TAB

The Aux (Auxiliary) Data tab is used to capture additional questions related to the sample. The auxiliary analytes are grouped together and are usually standard for the type of sample or the particular tests that are assigned. This information is normally entered through the Aux Data tab located on the [FULL SAMPLE LOGIN](#) screens or the [SEND-OUT ORDER](#) screen as it becomes available.

DECEMBER, 2017

Aux Data		
Reportable	Name	Value
<input type="checkbox"/>	Received by	
<input checked="" type="checkbox"/>	pH	6.5
<input type="checkbox"/>	Sample Intact	Yes
<input checked="" type="checkbox"/>	Temperature	25
<input type="checkbox"/>	Build Id	
<input checked="" type="checkbox"/>	Collected Date	2013-06-04
<input checked="" type="checkbox"/>	Collected Time	12:00
<input checked="" type="checkbox"/>	Client Reference	
<input checked="" type="checkbox"/>	Is Hazardous	No
<input checked="" type="checkbox"/>	Collector	falat nathan
<input checked="" type="checkbox"/>	Location	
<input type="checkbox"/>	Location Apt/Suite #	

Description:
 Method:
 Unit:

Figure 173 Aux Data Tab

To add auxiliary groups, click on the **Aux Groups** button. The Aux Group Selection screen will pop up. Clicking the **Remove Row** button removes the entire auxiliary group, not just the individual auxiliary analyte. See [AUX GROUP SELECTION SCREEN](#) for instructions on adding aux groups.

The Aux Data tab contains a table consisting of three columns: Reportable, Name, and Value. In Update Mode an auxiliary analyte can be selected to display its corresponding Description, Method, and Unit, if they are present.

Reportable

The Reportable checkbox may be manually checked (or unchecked) for any auxiliary analyte to mark it as reportable. Reportable auxiliary analytes and their final values are visible through the [Final Report](#), web portal data view, and electronically.

Name

The name of the auxiliary analyte is displayed in this field.

Value

A value for an auxiliary analyte is contained in this field and may be manually entered at any time before sample release. These values can be updated from this tab.

Description

The Description field displays additional helpful information about the auxiliary analyte.

Method

This field shows the method that is used to measure the auxiliary analyte, if there is one.

Unit

This field displays the unit of measurement for the auxiliary analyte, if there is one.

3.6.3.11 ATTACHMENT TAB

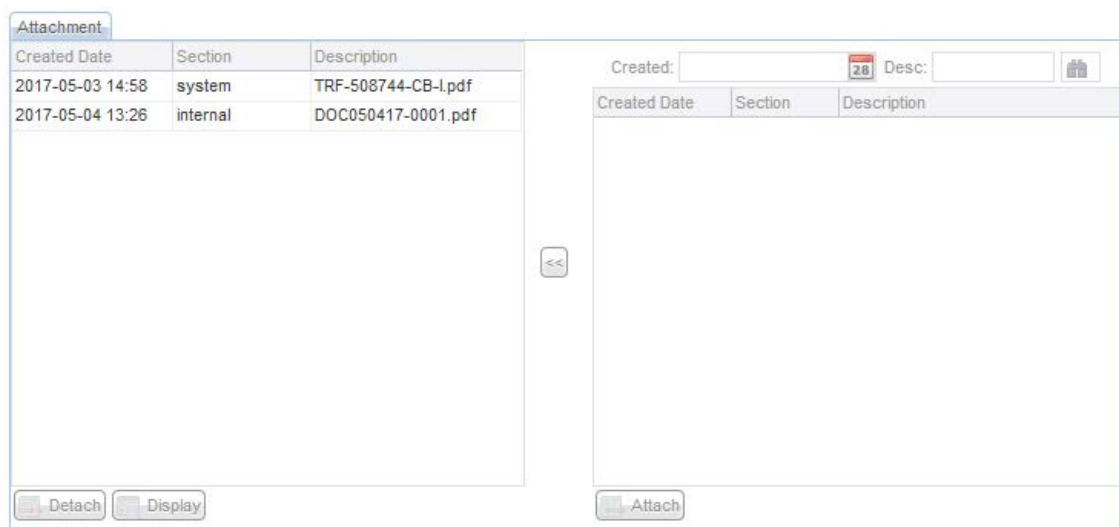


Figure 174 Attachment Tab

The Attachment tab is used to link a file to a sample. These attachments could be linked by the system (e.g., a previous revision of a Final Report) or linked manually by a user (e.g., Test Request Form, email from a client or co-worker, instrument graph, etc.) Files should be uploaded once to OpenELIS; however, they can be linked to multiple samples. Most of the standard file types can be linked and viewed from this tab (i.e., .pdf, .docx, .doc, .xlsx, .xls, .png, .txt, etc.) Attachments can be restricted so

that they can only be viewed by specific groups of people (i.e., bacteriology lab section, client services staff, all internal laboratory staff (section = internal), or anyone with OpenELIS permissions including external clients (section = public)). These groups will first need to be defined through the [LABORATORY SECTION](#) screen.

Previous revisions of Final Reports and Test Request Forms are automatically assigned a section of “system”. Along with attachments that have been assigned a section of “public”, they are available for viewing through the OpenELIS Web Portal by external users with permission to those samples.

The steps for [adding an attachment](#) are described in the Full Sample Login section.

3.6.4 MOVING AN ANALYSIS TO A DIFFERENT SAMPLE ITEM

One or more analyses can be moved to a different sample item to reflect the actual workflow of the sample in the laboratory. The **Pop-out** button at the bottom of the sample tree is used for this procedure.

1. Click on the **Update** button.
2. Click on the **Pop-out** button.
3. The Sample Items and Analyses screen will pop up. Select the analysis/analyses to be moved and the sample item to which it will be moved.

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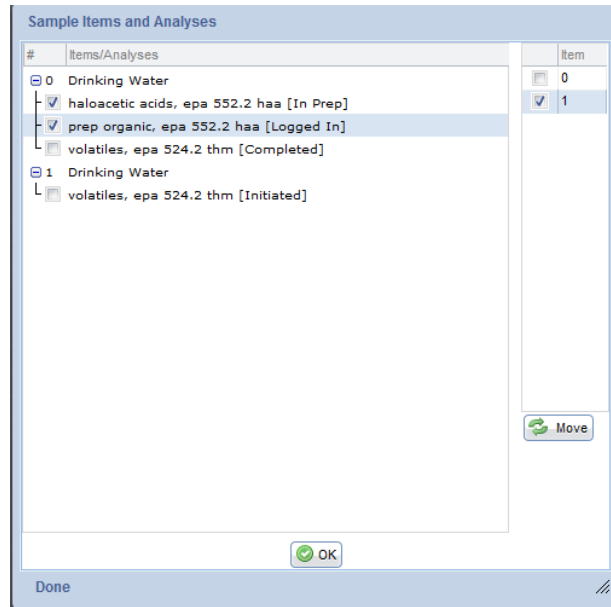


Figure 175 Moving an Analysis to a Different Sample Item

4. Click the **Move** button. The analysis move will be reflected in the sample tree.
5. Click **OK**.

3.6.5 SIMILAR BUTTON

The **Similar** button can be used as a shortcut to query for all samples possessing the same parameter. This button queries for all clinical samples containing the same [Patient Id](#) as the selected sample record. Currently, it has not been implemented for the other sample domains.

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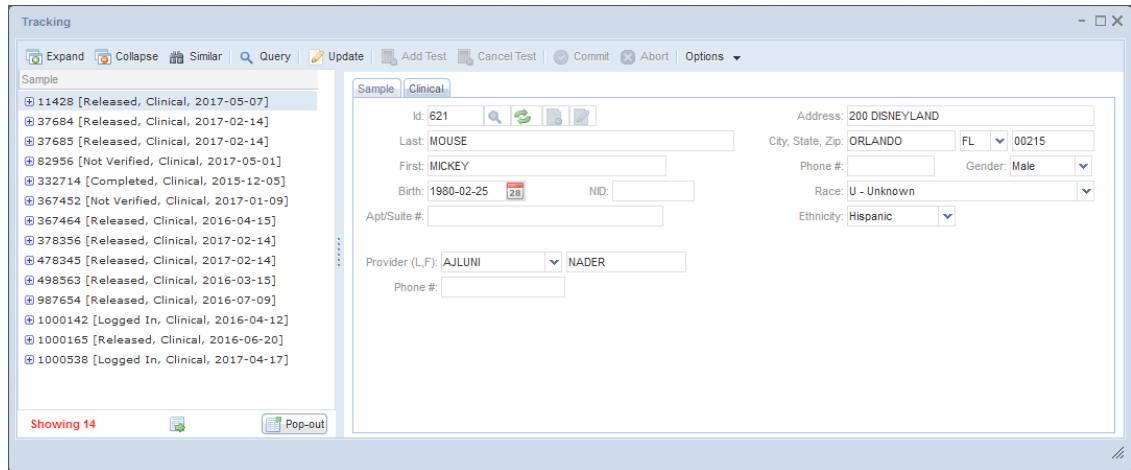


Figure 176 Using the Similar Button to Query for Clinical Samples with the Same Patient Id

3.6.6 ADDING A TEST TO A SAMPLE

A test can be added to an unreleased sample by any user with Assign permission for that test's laboratory section. If the sample has been released, a user with both Unrelease Sample permission and Assign permission for that test's laboratory section will need to first unrelease the sample and then add the test. See [UNRELEASE SAMPLE OPTION](#) for an explanation of how to unrelease a sample.

1. Query by Accession # or another parameter to find the desired sample.
2. Click on the **Update** button.
3. Click on the sample item.
4. Click on the **Add Test** button. The Add Test screen will appear.
5. Begin entering the name of the test that you want to add. Select the desired test and method. Click **OK**.

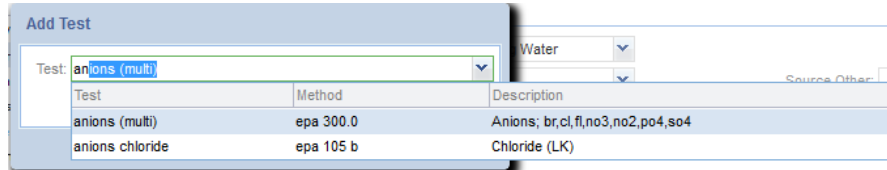


Figure 177 Adding a Test in Sample Tracking

6. Enter any other desired information into the Analysis tab for this new test (i.e., panel, sample prep test, etc).
7. Click on **Commit**, and the test will be added.

3.6.7 CANCELLING A TEST

There are times that a laboratory wishes to remove an analysis from a sample. However, for auditing purposes an analysis cannot be removed from a sample and must be cancelled. Cancelled analyses cannot be updated or un-cancelled and represent analysis that should have never been assigned to a sample. This is different from the case in which a client no longer wishes for a requested analysis to be performed. Here, the laboratory procedure could be to add an overriding QA event. See [CANCELLING AN ANALYSIS](#) for a complete explanation of both of these scenarios.

A test on an unreleased sample can be cancelled by any user with Cancel permission for that test's laboratory section.

1. Query by Accession # or another parameter to find the desired sample.
2. Click on the **Update** button.
3. Click on the analysis that needs to be cancelled.
4. Click on the **Cancel Test** button.
5. This warning message appears on the screen.

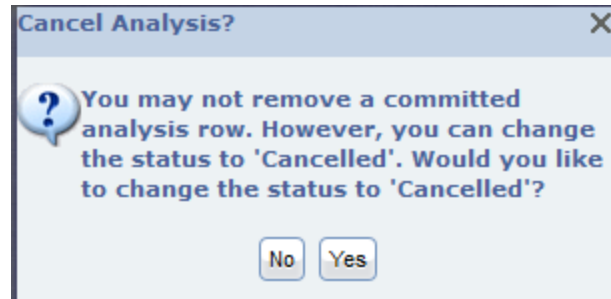


Figure 178 Cancelling an Analysis in Sample Tracking

6. Click on **Yes**.
7. By clicking **Yes**, the status of the logged-in analysis changes to Cancelled.
8. Click **Commit**.

3.6.8 UNRELEASE SAMPLE OPTION

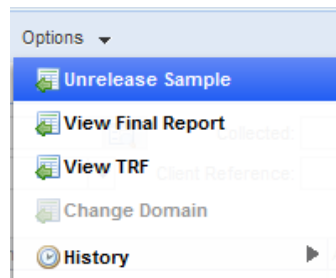


Figure 179 Unrelease Sample Option

This option allows users with Unrelease Sample permission to change sample metadata, add or cancel tests, or to change a sample's domain. Unreleased samples go through several changes:

1. The sample status is changed to Completed. The final sample status depends on the overall statuses of the analyses.
2. The sample's revision number is incremented and its release date is reset.

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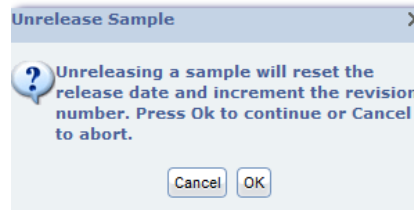


Figure 180 Unrelease Sample Warning

3. It is required to add an internal note to the sample explaining why the sample was unreleased before the record is committed.

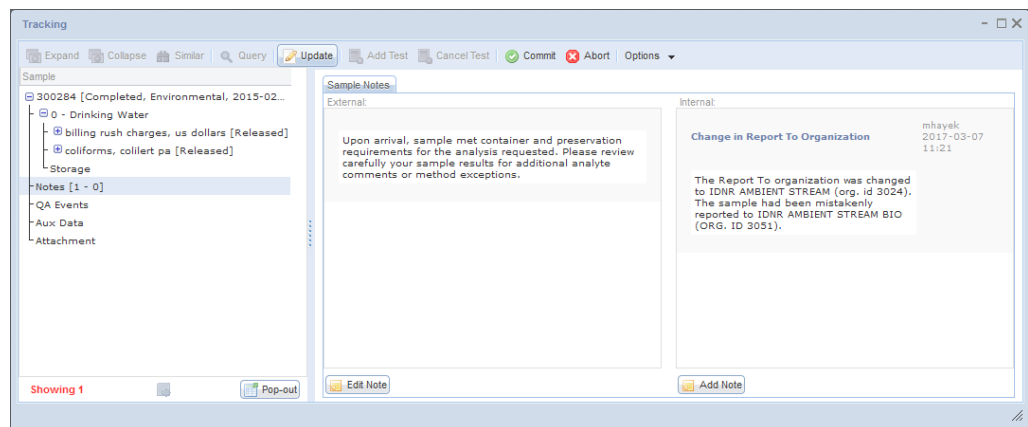


Figure 181 Adding an Internal Sample Note Explaining the Reason for a Sample Unrelease

Released analyses cannot be changed from the Sample Tracking Screen. See [UNRELEASING AN ANALYSIS](#) for this procedure.

3.6.9 VIEW FINAL REPORT OPTION

This option generates a Final Report. Only the analyses that have been released are detailed on the report while pending analyses for the sample will be noted at the top. Click on the View Final Report option to see the report for the selected sample.

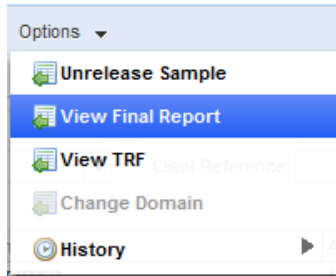


Figure 182 View Final Report Option

Pending Analyses

GCMS Semivolatiles, EPA 525.2

Results of Analyses

Prep by Solid Phase Extraction, EPA 525.2

<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding-right: 5px;">Units</td> <td>mg/L</td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 5px;">Date Analyzed</td> <td>2013-06-05 14:28</td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 5px;">Analyst</td> <td>NAF</td> </tr> </table>	Units	mg/L	Date Analyzed	2013-06-05 14:28	Analyst	NAF	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding-right: 5px;">Analyzed In</td> <td>Coralville</td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 5px;">Date Verified</td> <td>2013-06-05 15:19</td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 5px;">Verifier</td> <td>NAF</td> </tr> </table>	Analyzed In	Coralville	Date Verified	2013-06-05 15:19	Verifier	NAF
Units	mg/L												
Date Analyzed	2013-06-05 14:28												
Analyst	NAF												
Analyzed In	Coralville												
Date Verified	2013-06-05 15:19												
Verifier	NAF												

Description of Units used within this report

mg/L = Milligrams per Liter

Figure 183 Final Report Showing Pending and Released Analyses

3.6.10 VIEW TRF OPTION

This option generates the Test Request Form (TRF) that is attached to the selected sample.

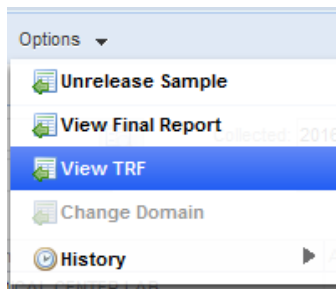


Figure 184 View TRF Option

3.6.11 CHANGE DOMAIN OPTION

There are occasions when a sample associated with one domain needs to be switched to a different domain. The Change Domain option switches the sample while preserving as much data as possible. The only data that will be lost is sample metadata that is domain-specific (i.e., collector, well number, PWS ID).

To change the sample's domain, you must be in Update or Unrelease Sample mode. Select the Change Domain option, select a different domain, and click **OK**.

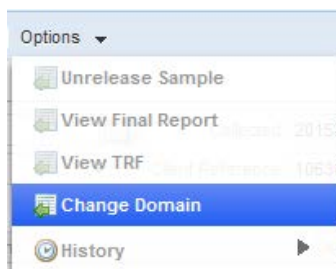


Figure 185 Change Domain Option

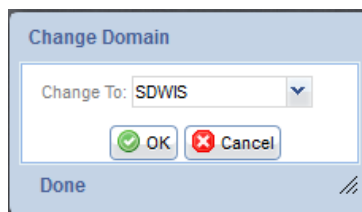


Figure 186 Change Domain Screen

3.6.12 HISTORY OPTION

See [HISTORY](#) for more information on the use of the history function.

3.7 ATTACHMENT SCREEN

The Attachment screen can be used to view, update, and delete attachments in/from OpenELIS. These attachments can be generated by the system (e.g., an earlier revision of a Final Report) or manually linked by the user to a sample, worksheet, or send-out order (e.g., a Test Request Form, an email from a client or co-worker, an instrument graph, a scanned copy of a paper worksheet, etc.) Files should be uploaded once to OpenELIS; however, they can be linked to multiple samples, worksheets, or send-out

orders. The steps for [adding an attachment](#) are described in the Full Sample Login section.

Most of the standard file types can be uploaded to OpenELIS and viewed from this screen (i.e., .pdf, .docx, .doc, .xlsx, .xls, .png, .txt, etc.) Attachments can be restricted so that they can only be viewed by specific groups of people (i.e., bacteriology lab section, client services staff, all internal laboratory staff, or anyone with OpenELIS permissions including external clients. These groups will first need to be defined through the [LABORATORY SECTION](#) screen.

The link to the Attachment screen is located in the [third section of the Sample Menu](#).

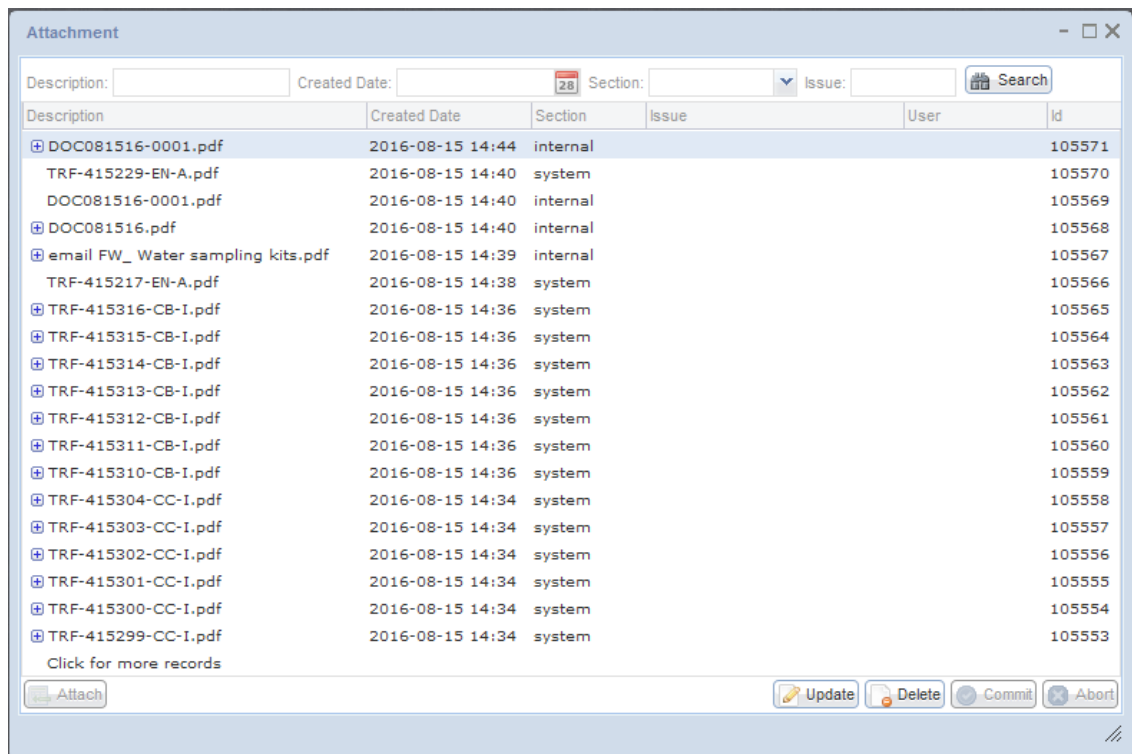





Figure 187 Attachment Screen

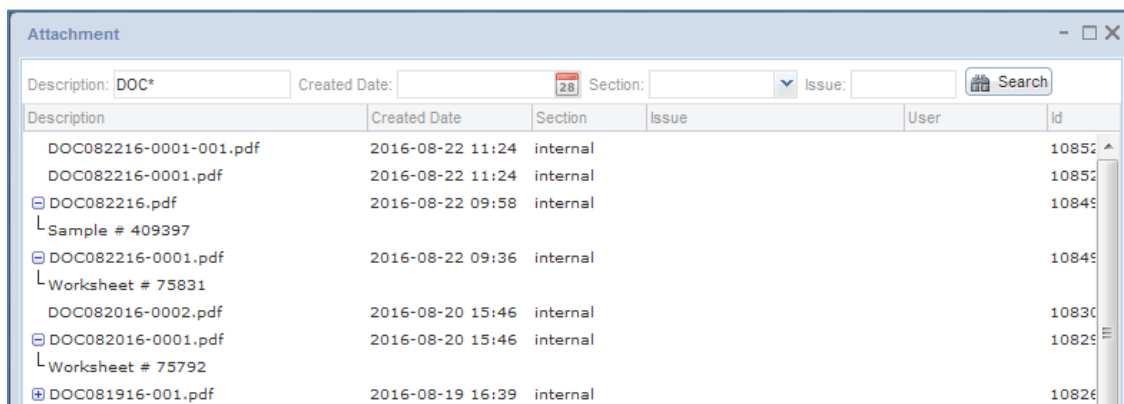
3.7.1 GENERAL FIELDS AND BUTTONS

The general fields and buttons on the Attachment screen are defined below.

Description

This field is the description of the file. It may be the actual file name, but if the description has been changed by a user to make the file's contents more apparent, it will not represent the actual name of the file that has been uploaded or scanned into OpenELIS.

A  icon before an attachment description signifies that the file has been attached. Clicking on this icon expands the tree to show the sample, worksheet, or order numbers to which the file has been attached. If the  icon is not present, the file has not been attached. Click on the  icon to collapse a tree.










Description	Created Date	Section	Issue	User	Id
DOC082216-0001-001.pdf	2016-08-22 11:24	internal			10852
DOC082216-0001.pdf	2016-08-22 11:24	internal			10852
 DOC082216.pdf	2016-08-22 09:58	internal			10845
 Sample # 409397					
 DOC082216-0001.pdf	2016-08-22 09:36	internal			10845
 Worksheet # 75831					
DOC082016-0002.pdf	2016-08-20 15:46	internal			10830
 DOC082016-0001.pdf	2016-08-20 15:46	internal			10825
 Worksheet # 75792					
 DOC081916-001.pdf	2016-08-19 16:39	internal			10826

Figure 188 Expanded Attachment Trees

Created Date

This field represents the date and time that the file was uploaded or scanned into OpenELIS.

Section

Attachments can be assigned to a laboratory section (e.g., inorg_auto-ank) so that they can only be viewed by members of that section. This field displays the section that was assigned to the file. Attachments that are uploaded by users are assigned to the section "internal" by default; the section can be changed. Test Request Forms and previous revisions of a Final Report are assigned to the section "system"; this section cannot be changed.

Issue

This field displays any issues with an attachment. For example, an issue might prevent a Test Request Form (TRF) from being fully logged in. This might include a missing name or birth date for a patient, no test being marked on the TRF, or the TRF is a duplicate of one that has already been logged in. A user can notify the other data entry staff of an issue by [entering it during the full sample login process](#).

User

The username of the person who added the issue to the attachment is displayed in this field.

Id

This field displays the unique identifier for the attachment file. Ids are assigned by the system in sequential order, and if an attachment is deleted its id is not reassigned.

Search

This button is used to execute a search for attachments that meet the criteria specified in the four fields at the top of the Attachment screen. If no search criteria are specified, clicking on the **Search** button will display the 19 most recent attachments in OpenELIS. Clicking on the phrase "Click for more records" will display the next 19 attachments. See [SEARCHING FOR AN ATTACHMENT](#) for examples of the types of searches that can be conducted through this screen.

Attach

This button is disabled on this screen.

Update

The **Update** button can be used to change the Description of the file and/or the Section that can view it. Click **Commit** to save these changes.

Delete

This button is used to delete an attachment from OpenELIS. Examples would include a duplicate Test Request Form or another file that will not be attached to a sample,

worksheet, or send-out order. Click **Commit** to complete the deletion of the file. A file that has already been attached cannot be deleted. If it was attached by mistake, it must first be [detached](#) before it can be deleted.



Figure 189 Attachment Deletion Warning

Commit

This button is used to complete the current operation.

Abort

This button is used to cancel the current operation.

3.7.2 SEARCHING FOR AN ATTACHMENT

If no search criteria are specified, clicking on the **Search** button will display the 19 most recent attachments in OpenELIS. Any of the four fields at the top of the Attachment screen (or a combination of them) can be used to search for one or more attachments. Some examples follow:

- To search for a Test Request Form (TRF) with an accession number of 415217, enter ***415217*** in the Description search box and click the **Search** button.

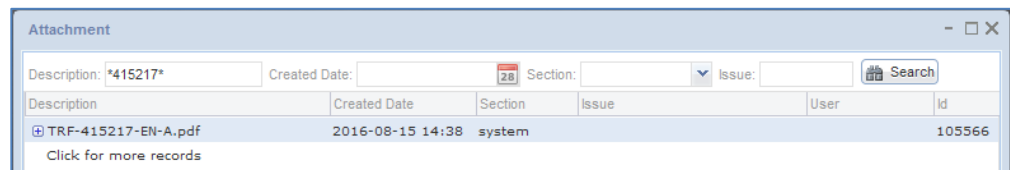
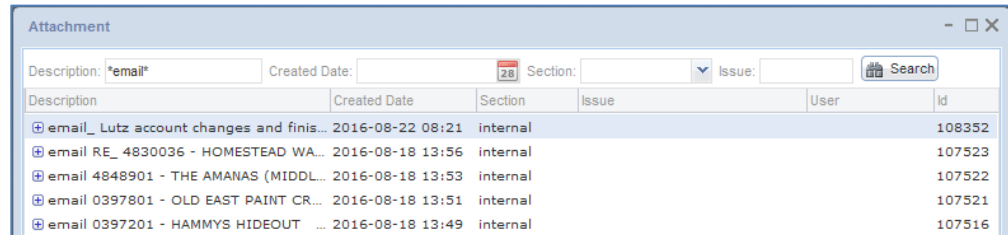


Figure 190 Searching by a TRF Accession Number in the Description Search Box

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- To search for attachments that have the word “email” as part of their description, enter *email* in the Description search box and click the **Search** button.

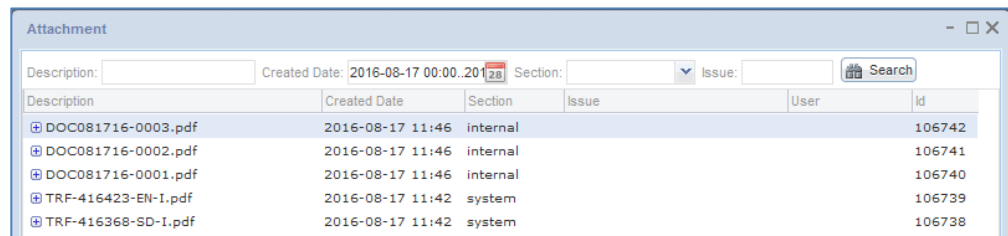


The screenshot shows the 'Attachment' search window with the following search criteria: Description: *email*, Created Date: (empty), Section: (empty), Issue: (empty). The search results table is as follows:

Description	Created Date	Section	Issue	User	Id
email_ Lutz account changes and finis...	2016-08-22 08:21	internal			108352
email RE_ 4830036 - HOMESTEAD WA...	2016-08-18 13:56	internal			107523
email 4848901 - THE AMANAS (MIDDLE...	2016-08-18 13:53	internal			107522
email 0397801 - OLD EAST PAINT CR...	2016-08-18 13:51	internal			107521
email 0397201 - HAMMYS HIDEOUT ...	2016-08-18 13:49	internal			107516

Figure 191 Searching by Part of an Attachment's Description

- To search for attachments that were uploaded to or scanned into OpenELIS during a specific time period, enter the starting date and time..ending date and time (e.g., 2016-08-17 00:00..2016-08-17 12:00) into the Created Date search box and click the **Search** button.

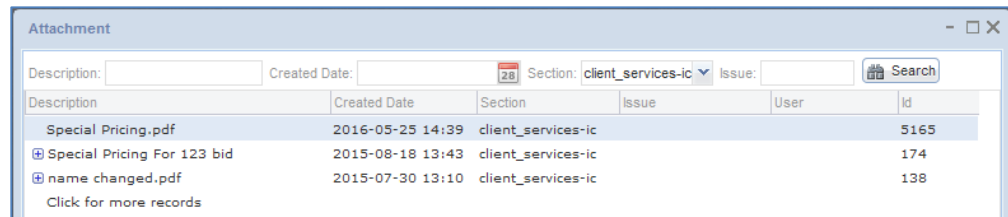


The screenshot shows the 'Attachment' search window with the following search criteria: Description: (empty), Created Date: 2016-08-17 00:00..2016-08-17 12:00, Section: (empty), Issue: (empty). The search results table is as follows:

Description	Created Date	Section	Issue	User	Id
DOC081716-0003.pdf	2016-08-17 11:46	internal			106742
DOC081716-0002.pdf	2016-08-17 11:46	internal			106741
DOC081716-0001.pdf	2016-08-17 11:46	internal			106740
TRF-416423-EN-1.pdf	2016-08-17 11:42	system			106739
TRF-416368-SD-1.pdf	2016-08-17 11:42	system			106738

Figure 192 Searching by a Date-Time Range in the Created Date Search Box

- To search for attachments that have been assigned to a particular section, select the name of the section from the Section dropdown search box and click the **Search** button.



The screenshot shows the 'Attachment' search window with the following search criteria: Description: (empty), Created Date: (empty), Section: client_services-ic, Issue: (empty). The search results table is as follows:

Description	Created Date	Section	Issue	User	Id
Special Pricing.pdf	2016-05-25 14:39	client_services-ic			5165
Special Pricing For 123 bid	2015-08-18 13:43	client_services-ic			174
name changed.pdf	2015-07-30 13:10	client_services-ic			138

Click for more records

Figure 193 Searching by the Section of an Attachment

- To search for attachments that have been assigned an issue, enter part of the issue in between asterisks (e.g., *dup* for duplicate trf) in the Issue search box

and click the **Search** button. Enter an * in the Issue search box and click the **Search** button to display all attachments with issues.

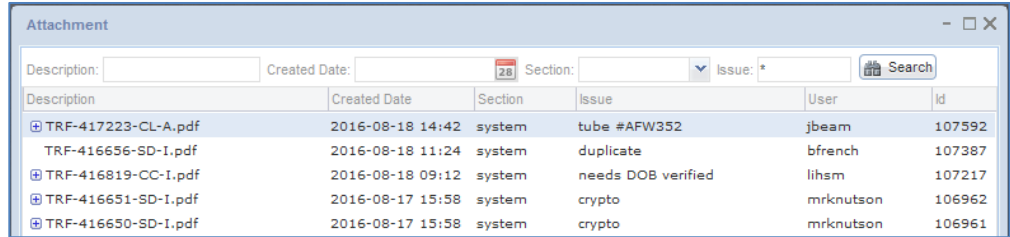


Figure 194 Searching for All Attachments with Issues

3.8 PATIENT MERGE SCREEN

Over time multiple patient records may be added to the LIMS for the same patient. These “duplicate” records are usually due to an incomplete/incorrect name or an incorrect birth date or [NID](#) being submitted or entered on one or more occasions. Before multiple patient records are merged, all of their fields need to be compared for accuracy. One of the patient records may need to be [edited](#) so that it contains a composite of the most complete patient information.

The Patient Merge screen is then used to move all of the patient’s samples to the patient record with the most complete information. The other incomplete patient records are deleted from the LIMS.

The link to the Patient Merge screen is found in the [third section of the Sample Menu](#).

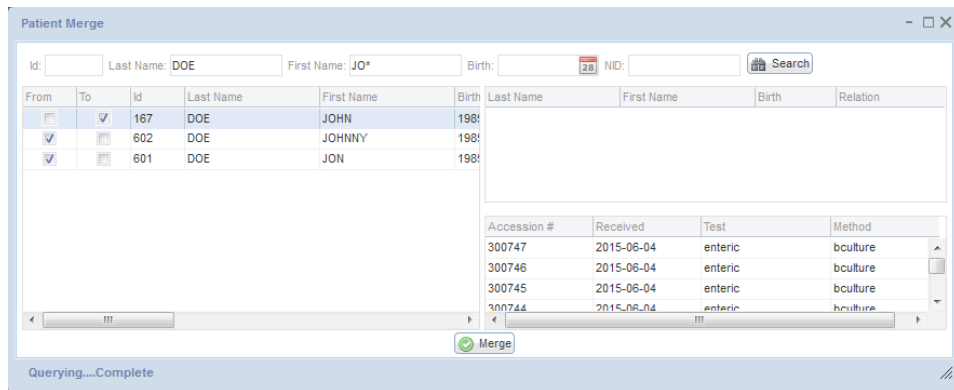


Figure 195 Patient Merge Screen

First, the patient records in question need to be queried by any combination of Patient Id, Last Name, First Name, Birth(date), or NID. The **Search** button must be clicked to execute the query. The query may need to be broadened so that all of the “duplicate” patient records are displayed. In the example above, a search for all of the patient records containing a Last Name of DOE and a First Name of JO* was used to find all of the duplicate records for the same patient (John/Johnny/Jon Doe).

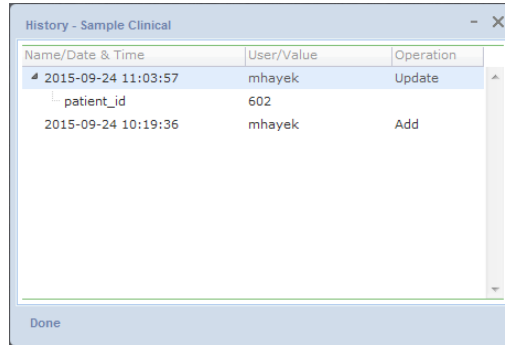
When a patient row is clicked in the left-hand pane, the analyses conducted on that patient are displayed in the lower right-hand pane to help the user determine which incomplete patient record(s) to merge into the complete patient record. The user must check the “From” box(es) of the incomplete patient record(s), the “To” box of the complete patient record, and click the **Merge** button.

The samples linked to the “From” patient record(s) are now linked to the “To” patient record and the “From” patient record(s) are deleted from the system. The system adds an internal sample note to each sample that was previously linked to the “From” patient record(s). The note provides details of the patient merge.



Figure 196 Internal Sample Note Detailing a Patient Merge

The [Patient Id](#) of the “From” patient record is also displayed in the history of the sample’s clinical information.



Name/Date & Time	User/Value	Operation
2015-09-24 11:03:57	mhayek	Update
patient_id	602	
2015-09-24 10:19:36	mhayek	Add

Done

Figure 197 History Showing a Clinical Sample's Previous Patient Id

A patient merge will not automatically generate a new Final Report to be printed. If the client requests a new Final Report containing the merged patient information, the user will need to [manually print or fax](#) it.

CHAPTER 4 MANAGING ANALYSES

Tests are the procedures that are used to analyze the sample; they are the units of work that the analytical staff performs to obtain the results. Tests that are assigned to samples become “analyses”. Analyses have additional information such as the date-time they were assigned to the sample, what status they are in, who performed the analyses, etc. that record the various aspects of the work performed. Much like samples, an analysis has a lifecycle that moves it along from initial login to completion and reporting. For more information on various analysis statuses, see [\(Analysis\) Status](#).

The Analysis Menu provides analysts with access to screens used in their daily processes.

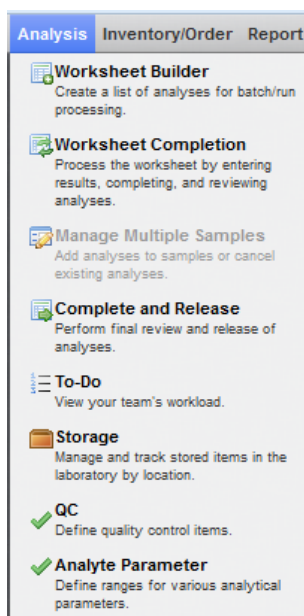


Figure 198 Analysis Menu

4.1 TO-DO LIST

The To-Do List provides a detailed, sortable, filterable listing of items of interest. It is an improvement over the traditional paper to-do list, as it has up-to-the-minute information. The To-Do List is an extremely useful tool for analysts to view the workload across the lab, see what work needs to be done, and target problematic areas, especially analyses with high percent holding time used or high percent expected completion used.

The link to the To-Do List is located in the [Analysis Menu](#).

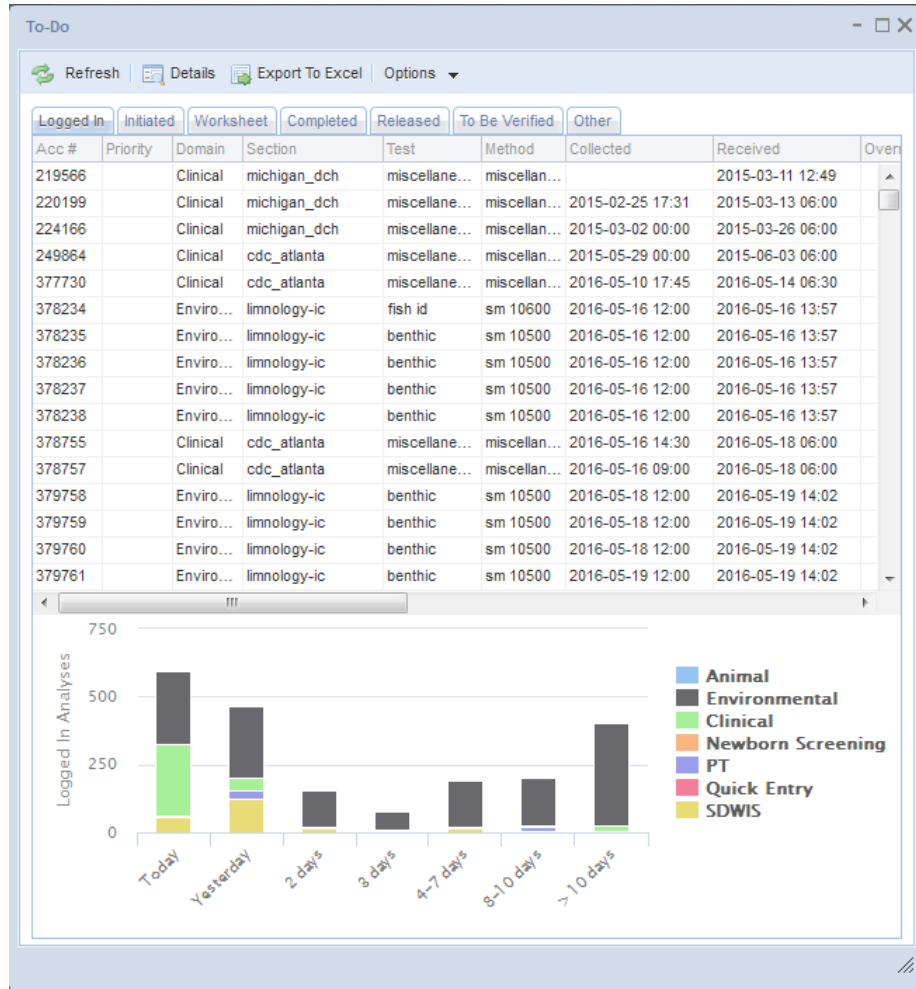


Figure 199 To-Do List

4.1.1 SCREEN BUTTONS, OPTIONS, AND BAR GRAPHS

Refresh Button

The **Refresh** button updates the To-Do List by retrieving up-to-the-minute information from the database.

Details Button

The **Details** button pops up the selected analysis'/sample's information in a [Sample Tracking](#) screen. This can be used by the analyst to view all of the information associated with the selected analysis/sample (i.e., all of the analyses assigned to the sample with possible results, sample items, QA events, notes, aux data, etc.) On the Worksheet tab this button pops up the selected worksheet's [Worksheet Completion](#) screen so the analyst can view the details, QCs, and possible results contained within the worksheet.

Export To Excel Button

This button exports the entire contents of the To-Do List (except for the graphs) to a spreadsheet. Any [filtering and/or sorting](#) that has been performed on the To-Do List will not carry over to Excel. If the user is planning on exporting to Excel, he should do this first, and then perform any sorting and/or filtering in Excel.

Show TRF Option

A user may learn important information by viewing the Test Request Form (TRF) of an analysis/sample. The Show TRF option was developed for that purpose.

The Test Request Form for an analysis/sample can be viewed by checking the **Show TRF** checkbox in the Options drop-down list. TRFs cannot be displayed through the Worksheet tab.

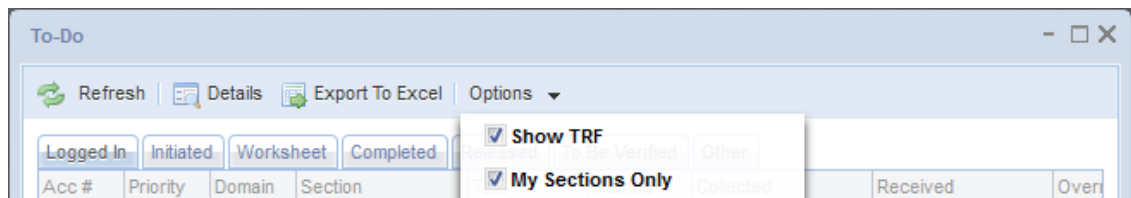


Figure 200 Show TRF and My Sections Only Options

Each different sample that is selected in the To-Do List will automatically cause the displayed TRF to be refreshed.

My Sections Only Option

The **My Sections Only** option is checked by default allowing the To-Do List to be narrowed to analyses that are relevant to the logged-in user. Sections are defined

through the [LABORATORY SECTION](#) screen. Unchecking this box will display the analyses for the entire laboratory. This option does not restrict the samples displayed through the To Be Verified tab.

Bar Graphs

The bottom pane of the To-Do List's Logged In, Initiated, Completed, To Be Verified, and Other tabs displays a bar graph of tab-specific data. Users can hover the mouse pointer on an individual bar to view its time and quantity values.

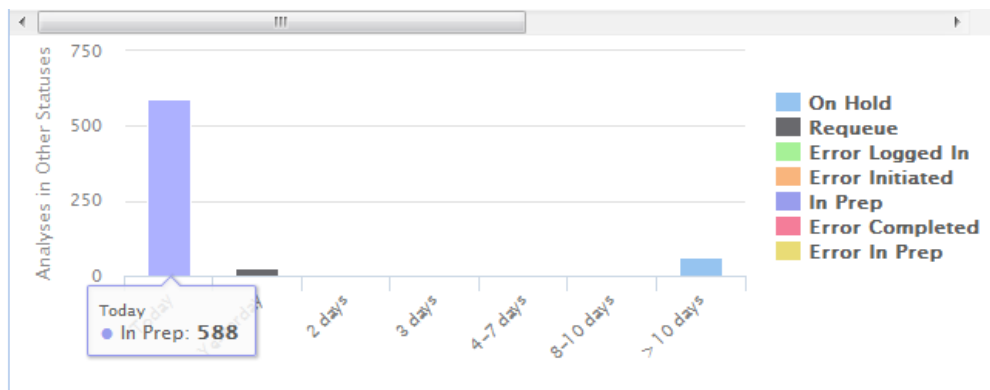


Figure 201 Bar Displaying Time and Quantity Values

If the user has the **My Sections Only** option checked, the bar graphs will only display data for the user's section(s) (with the exception of the To Be Verified tab).

The bar graphs can be customized by the user to only display part of the data. The user can click on the category in the graph's legend to hide or show its data. For example, to only display environmental analyses, the user would click on each of the other sample domain names in the graph's legend to hide their data. OpenELIS will redraw the Environmental bar and the vertical axis to display only the selected data. [Filtering](#) the list of analyses/samples by sample domain (on the Logged In, Initiated, Completed, and To Be Verified tabs) or by status (on the Other tab) will also cause the selected bars and the vertical axis to be redrawn.

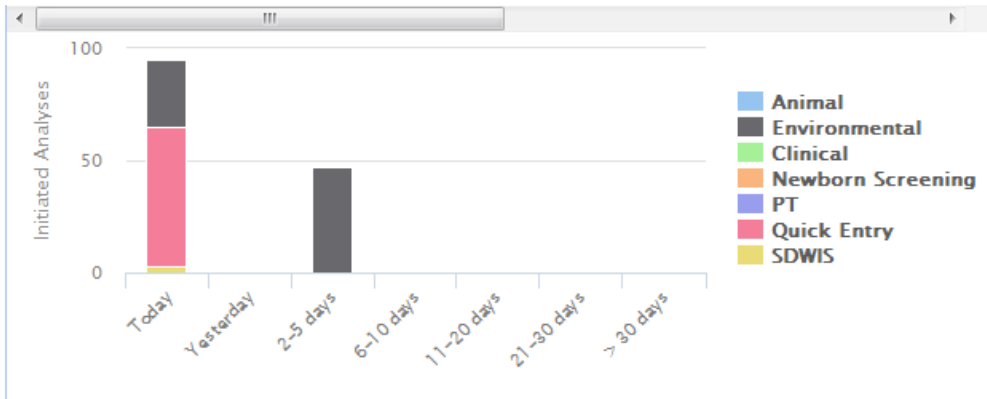


Figure 202 Bar Graph Showing Data from Three Sample Domains

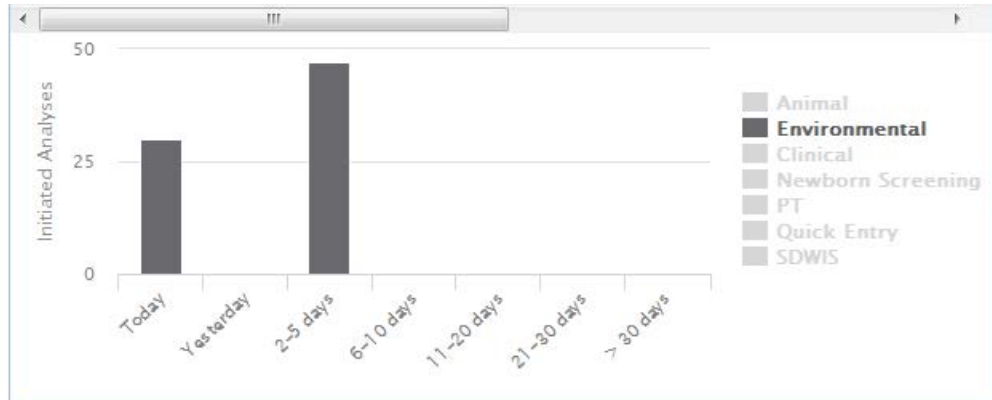


Figure 203 Bar Graph Showing Data from One Sample Domain After Hiding the Data from the Other Two Domains

4.1.2 SORTING AND FILTERING THE TO-DO LIST

The sorting and filtering capabilities that are inherent to the To-Do List allows the user to quickly narrow the list to the desired set. To access the sort or filter menus, hover the mouse on the column heading and click on the dropdown arrow.

The two sorting options that are available in most of the columns are ascending (A to Z) and descending (Z to A) sorts. The following example shows the sort options available for the Received column. When a column is sorted its heading becomes italicized.

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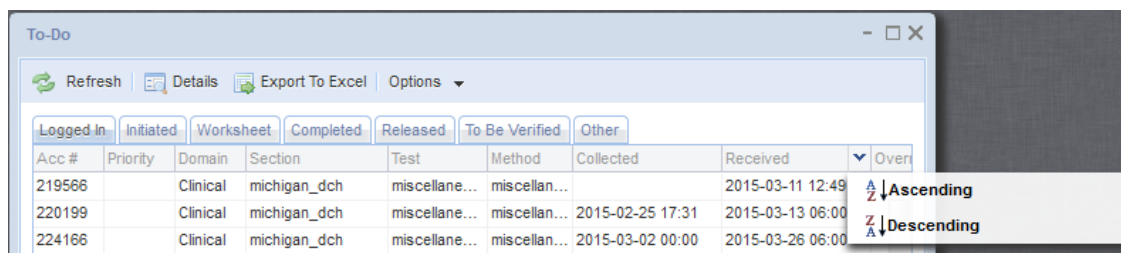


Figure 204 Ascending and Descending Sorting

Filtering is available with many of the columns of the To-Do List. Available filtering options are dictated by the data in that column. One or more filtering options may be checked or unchecked for a column. Users may also apply filters to multiple columns, thus, limiting the list that is displayed even further. When a column is filtered its heading becomes underlined.

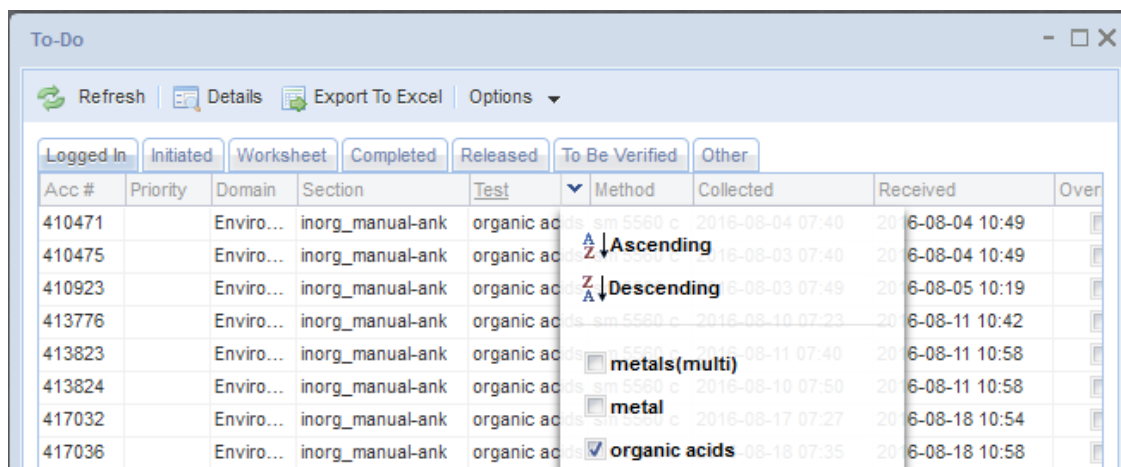


Figure 205 Filtering the To-Do List by Test

It is recommended that the user uncheck filters to go back to a previous set, instead of clicking the **Refresh** button. The **Refresh** button uses more system resources and is only meant to be used to update the To-Do List after a longer period of time has passed.

4.1.3 DOMAIN SPECIFIC FIELD

This field, located on all tabs but the Worksheet tab, contains information which can be used to help identify an analysis/sample. The To-Do List's "Domain Specific Field"

contains information from one or more domain-specific sample fields joined together in the order specified in the table below. If one of the component domain-specific fields is empty, it is skipped in the formation of the To-Do List's "Domain Specific Field".

Sample Domain	Domain Specific Field
Animal	[acn] Animal Common Name
Clinical	Patient Last Name, Patient First Name, Container Reference
Environmental	[pri] Priority [prj] Project [loc] Location
PT	[ptp] PT Provider [ser] Series [cnt] Container Reference
SDWIS	[pws] PWS Name [fac] Facility Id [pri] Priority

Figure 206 Domain Specific Field of the To-Do List

Domain Specific Field	Report To
[loc]-1	ISU/CCEE
[pws]WAHPETON WATER SUPPLY [fac]TP01	WAHPETON WATER SUPPLY
[pws]WAHPETON WATER SUPPLY [fac]TP01	WAHPETON WATER SUPPLY
[prj]01 wqfmm [loc]boone river	IDNR AMBIENT STREAM
[prj]01 wqfmm [loc]iowa river	IDNR AMBIENT STREAM
[prj]01 wqfmm [loc]south skunk river	IDNR AMBIENT STREAM
[prj]01 wqfmm [loc]iowa river	IDNR AMBIENT STREAM
[prj]01 wqfmm [loc]indian creek	IDNR AMBIENT STREAM
[prj]01 wqfmm [loc]cedar river	IDNR AMBIENT STREAM
[prj]01 wqfmm [loc]shell rock river	IDNR AMBIENT STREAM
[prj]01 wqfmm [loc]shell rock river	SHL LIMNOLOGY
[prj]01 wqfmm [loc]cedar river	IDNR AMBIENT STREAM
[prj]01 wqfmm [loc]beaver creek	IDNR AMBIENT STREAM
[prj]01 wqfmm [loc]west fork cedar river	IDNR AMBIENT STREAM
[prj]01 wqfmm [loc]wapsipinicon river	IDNR AMBIENT STREAM
[prj]01 wqfmm [loc]wolf creek	IDNR AMBIENT STREAM

Figure 207 To-Do List's Domain Specific and Report To Fields

4.1.4 LOGGED IN TAB

The Logged In status tab is displayed by default when the To-Do List is opened. This tab provides the analytical staff with their team’s workload of analyses that have been “logged in” to OpenELIS. For an explanation of logged in status, see [\(Analysis\) Status](#). The bar graph in the lower pane of the Logged In tab displays the distribution of analyses by the number of days since the analyses reached logged in status.

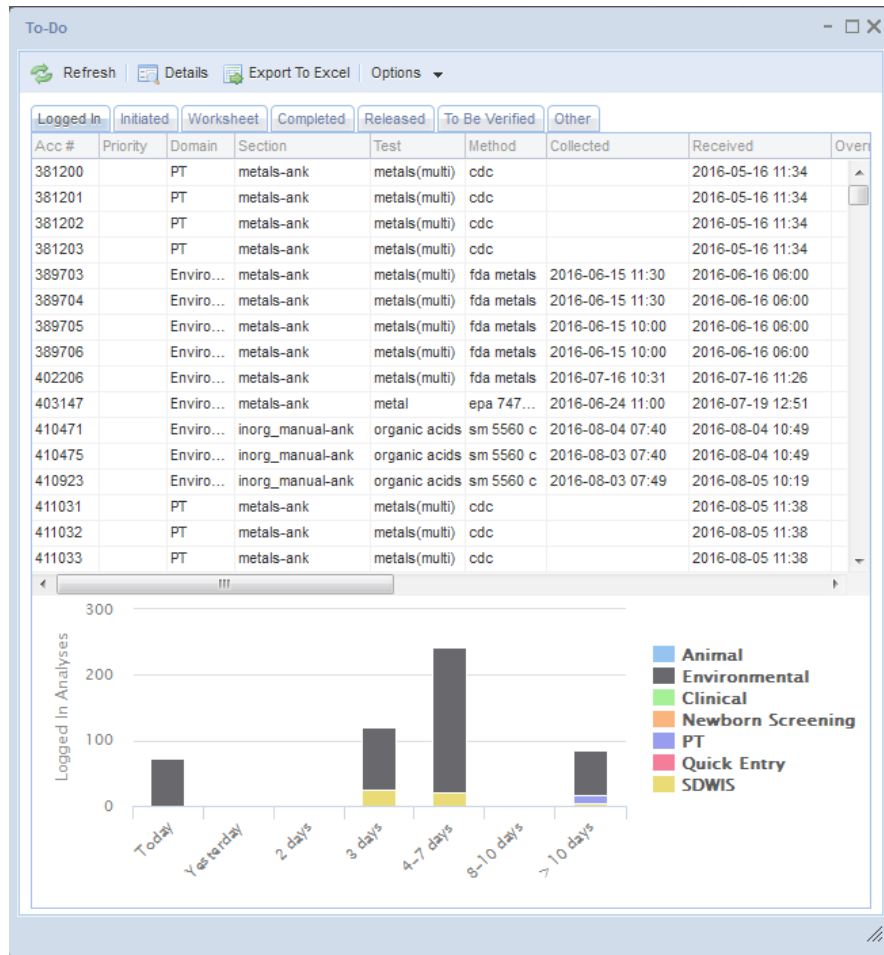


Figure 208 Logged In Tab of To-Do List

The fields found on this tab are detailed below.

Acc(ession) #

The accession number of the logged-in analysis is displayed in this field.

Priority

This field specifies the number of days that the client expects for sample turnaround. For example, a value of 3 would specify that the sample should be completed and reported within 3 working days.

Domain

The sample domain (Environmental, SDWIS, Clinical, Newborn Screening, Animal, PT, or Quick Entry) of the analysis is specified in this field.

Section

The laboratory section that has been assigned to perform the analysis is displayed in this field.

Test

The test that has been assigned for an analysis is displayed in this field.

Method

The method that has been assigned for an analysis is displayed in this field. The method cannot be [flipped](#) using this screen.

Collected (Date and Time)

This field displays the date and time that the sample was collected.

Received (Date and Time)

This field displays the date and time that the sample was received at the laboratory.

Override

A checkmark in this box indicates that the result(s) have been overridden due to a QA event. See [QA EVENTS](#) for more information on Result Override QA Events.

% Holding Used

The Percent Holding Time Used for an analysis is calculated from the [Holding hours](#) value in its test definition:

$$\% \text{ Holding Used} = \frac{(\text{Started DateTime} * - \text{Collected DteTime} **) \times 100}{\text{Holding hours in Test Definition}}$$

* For analyses that have not been started, the Current DateTime is used to show the continual depletion of holding time.

** The % Holding Used is set to 0.0% if Collected DateTime is not present in the system.

The bars in the % Holding Used column are color-coded to allow for easy interpretation.

Color	Percentage Range
Red	75.0 % and Above
Brown	50.0 – 74.9 %
Yellow	25.1 – 49.9 %
Green	25.0 % and Below

Figure 209 To-Do List Bar Colors

% Exp(ected) Completion

The Percent Expected Completion for an analysis is calculated from the [Priority](#) of the sample.

$$\% \text{ Exp Completion} = \frac{(\text{Current DateTime} - \text{Collected DateTime} *) \times 100}{\text{Priority} **}$$

* The Received DateTime is used for this calculation if Collected DateTime is not present in the system.

** The Turnaround Average Days in the test definition is used for this calculation if a Priority value is not present in the system.

The bars in the % Exp Completion column use the same color code as above.

Collected	Received	Override	% Holding Used	% Exp Completion
2016-08-29 08:00	2016-08-29 09:59	<input type="checkbox"/>	5.5%	3.9%
2016-08-29 08:00	2016-08-29 09:59	<input type="checkbox"/>	27.4%	13.7%
2016-08-27 10:40	2016-08-29 10:07	<input type="checkbox"/>	72.1%	43.3%
2016-08-28 09:14	2016-08-29 10:07	<input type="checkbox"/>	40.7%	24.4%
2016-08-29 09:20	2016-08-29 10:07	<input type="checkbox"/>	7.3%	4.4%
2016-08-29 09:40	2016-08-29 10:06	<input type="checkbox"/>	10.2%	20.4%
2016-08-29 09:40	2016-08-29 10:06	<input type="checkbox"/>	10.2%	20.4%
2016-08-29 09:40	2016-08-29 10:06	<input type="checkbox"/>	6.8%	4.1%
2016-08-29 09:40	2016-08-29 10:06	<input type="checkbox"/>	6.8%	4.1%
2016-08-29 09:40	2016-08-29 10:06	<input type="checkbox"/>	6.8%	4.1%
2016-08-29 09:40	2016-08-29 10:06	<input type="checkbox"/>	6.8%	4.1%
2016-08-29 09:40	2016-08-29 10:06	<input type="checkbox"/>	10.2%	4.1%
2016-08-29 09:00	2016-08-29 10:29	<input type="checkbox"/>	11.6%	23.2%
2016-08-29 10:50	2016-08-29 11:05	<input type="checkbox"/>	7.8%	15.6%
2016-08-28 20:30	2016-08-29 12:06	<input type="checkbox"/>	37.6%	75.3%
2016-08-29 11:45	2016-08-29 12:23	<input type="checkbox"/>	5.9%	2.4%

Figure 210 To-Do List's % Holding Used and % Exp Completion Fields

Domain Specific Field

This field contains information which can be used to help identify an analysis/sample. See [Domain Specific Field](#) for more information.

Report To

This field is used to specify the primary organization that receives the results of the sample. See [Report To](#) for more information.

4.1.5 INITIATED TAB

The Initiated status tab displays analyses that have been added to an electronic worksheet and in which testing has begun. The bar graph in the lower pane of the Initiated tab displays the distribution of analyses by the number of days since the analyses were initiated.

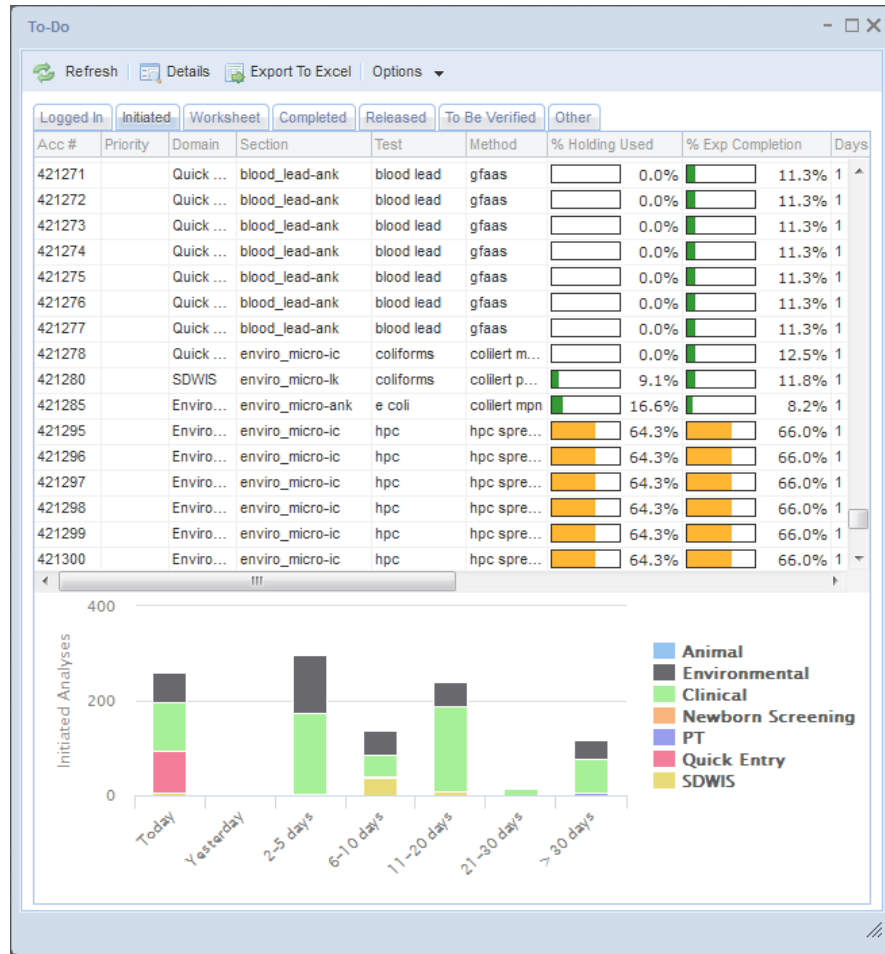


Figure 211 Initiated Tab of To-Do List

The fields found on this tab are detailed below.

Acc(ession) #

The accession number of the initiated analysis is displayed in this field.

Priority

This field specifies the number of days that the client expects for sample turnaround. For example, a value of 3 would specify that the sample should be completed and reported within 3 working days.

Domain

The sample domain (Environmental, SDWIS, Clinical, Newborn Screening, Animal, PT, or Quick Entry) of the analysis is specified in this field.

Section

The laboratory section that has been assigned to perform the analysis is displayed in this field.

Test

The test that has been assigned to an analysis is displayed in this field.

Method

The method that has been assigned to an analysis is displayed in this field. The method cannot be [flipped](#) using this screen.

% Holding Used

The [Percent Holding Time Used](#) for an analysis is displayed in this field.

% Exp(ected) Completion

The [Percent Expected Completion](#) for an analysis is displayed in this field.

Days in Initiated

The number of days that the analysis has been in initiated status is displayed in this field.

Domain Specific Field

This field contains information which can be used to help identify an analysis/sample. See [Domain Specific Field](#) for more information.

Report To

This field is used to specify the primary organization that receives the results of the sample. See [Report To](#) for more information.

4.1.6 WORKSHEET TAB

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The Worksheet tab displays a list of worksheets that are in [Working or Pending Release status](#). Clicking on the **Details** button will pop up and display the selected worksheet through the [WORKSHEET COMPLETION](#) screen.

If the tab includes worksheets that should not be on the list, their worksheet status should be changed.

Worksheet #	Username	Section	Description	Created
76340	twaitec	molecular-ic	flu b, pcr	2016-08-29 08:03
76343	asedlacek	bacteriology-ic	organism pattern dph, pfge	2016-08-29 08:05
76344	asedlacek	bacteriology-ic	organism pattern dph, pfge	2016-08-29 08:06
76346	asedlacek	bacteriology-ic	organism pattern dph, pfge	2016-08-29 08:07
76352	sleksell	inorg_manual-ank	bod, sm 5210b 5 c	2016-08-29 08:12
76353	balbaugh	mycobacti-ic	yeast, identification; fungus, identification	2016-08-29 08:39
76355	sfreebur	virology-ic	hsv shell vial dfa, shell vial culture	2016-08-29 08:45
76358	ajcostel	mycobacti-ic	afb culture, bculture	2016-08-29 09:18
76359	asedlacek	bacteriology-ic	shiga toxin, eia	2016-08-29 09:05
76363	tirado	radchem-ic	gross alpha, epa 900.0 including	2016-08-29 09:33
76364	tirado	radchem-ic	gross beta, epa 900.0 beta	2016-08-29 09:33
76365	dheimdal	inorg_manual-lk	solids, sm 2540 c dissolved	2016-08-29 09:34
76366	prose	blood_lead-ank	blood lead, gfaas	2016-08-29 09:37
76369	khebbeln	bacteriology-ic	o and p, feac	2016-08-29 10:03
76370	khebbeln	bacteriology-ic	trichrome, bio stain	2016-08-29 10:07
76371	khebbeln	bacteriology-ic	crypto cyclo cysto, modified acid fast	2016-08-29 10:08
76373	aberg	inorg_manual-ank	alkalinity, sm 2320 b sludge; alkalinity (multi), sm ...	2016-08-29 10:18
76376	laidridg	sample_prep-ank	dig, epa 3050b envpb wipe	2016-08-29 11:07
76377	jaowns	enviro_micro-ic	coliforms, colliert mpn sdwa am	2016-08-29 11:19
76378	amjhnsn	inorg_manual-ank	solids, sm 2540 g total; solids, epa 160.4 tvs	2016-08-29 11:24
76380	dheimdal	enviro_micro-lk	coliforms, colliert pa sdwa am	2016-08-29 11:58
76381	ccchran	enviro_micro-ic	hpc, hpc spread plate	2016-08-29 12:03
76384	jchapman	serology-ic	syphilis tppa, particle agglut	2016-08-29 13:20
76385	jaowns	enviro_micro-ic	e coli, colliert mpn	2016-08-29 13:34
76386	jchapman	serology-ic	tularemia, tube agglut	2016-08-29 13:51
76388	djones	enviro_micro-ank	e coli, colliert mpn	2016-08-29 13:54
76390	jaowns	enviro_micro-ic	coliforms, colliert mpn sdwa pm	2016-08-29 14:22
76391	ccchran	enviro_micro-ic	coliforms, colliert pa; total coliform, colliert pa	2016-08-29 14:26

Figure 212 Worksheet Tab of To-Do List

The fields found on this tab are detailed below.

Worksheet

This number uniquely identifies the worksheet and is automatically assigned by the LIMS.

Username

The username of the person who built the worksheet is specified in this field.

Section

The laboratory section that has been assigned to perform each analysis listed on the worksheet is displayed in this field. If multiple laboratory sections are assigned to work on the same worksheet, the worksheet will be listed in multiple rows on this tab.

Worksheet #	Username	Section	Description	Created Date
3378	smay	liquidchrom-ic	pharmaceuticals, uhl h 020; prej	2012-03-08 16:17
3378	smay	sample_prep-ic	pharmaceuticals, uhl h 020; prej	2012-03-08 16:17

Figure 213 Worksheet with Multiple Sections Assigned

(Worksheet) Description

This field displays the Worksheet (Description) that was entered during the building of the worksheet. See [Worksheet \(Description\)](#) for more information.

Created (Date and Time)

The date and time that the worksheet was built is displayed in this field.

4.1.7 COMPLETED TAB

The Completed status tab displays a list of analyses that have been completed, but that still need to be reviewed by a second analyst for release.

The bar graph in the lower pane of the Completed tab displays the distribution of analyses by the number of days since the analyses were completed.

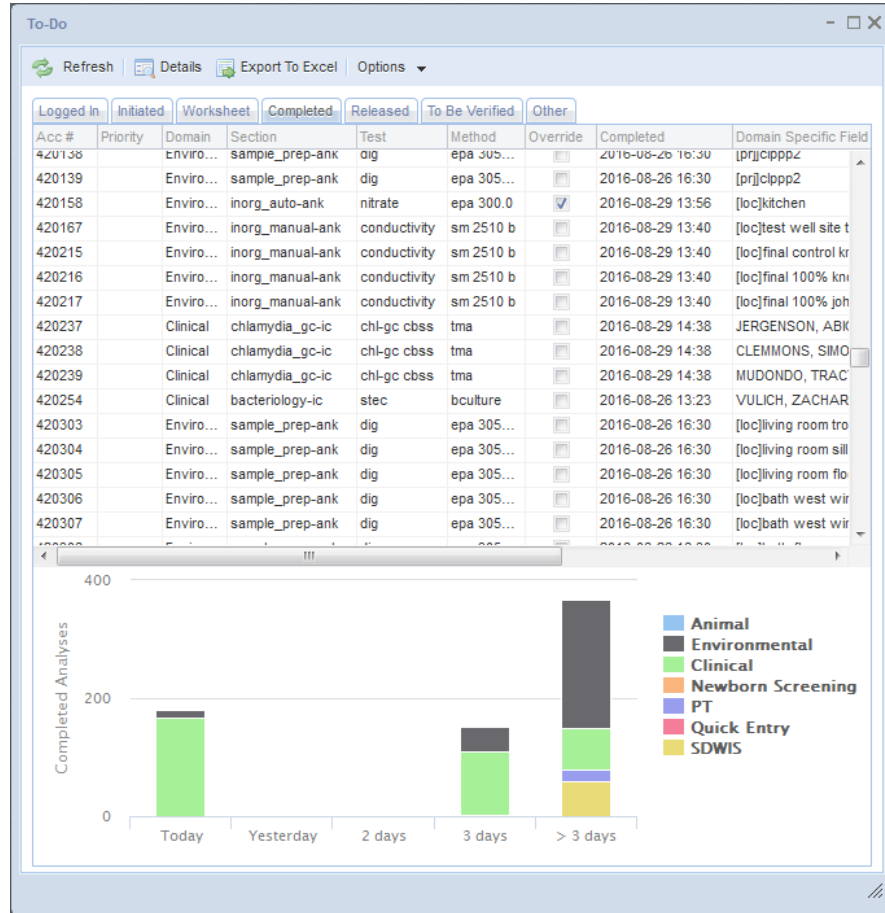


Figure 214 Completed Tab of To-Do List

The fields found on this tab are detailed below.

Acc(ession) #

The accession number of the completed analysis is displayed in this field.

Priority

This field specifies the number of days that the client expects for sample turnaround. For example, a value of 3 would specify that the sample should be completed and reported within 3 working days.

Domain

The sample domain (Environmental, SDWIS, Clinical, Newborn Screening, Animal, PT, or Quick Entry) of the analysis is specified in this field.

Section

The laboratory section that was assigned to perform the analysis is displayed in this field.

Test

The test that was assigned to an analysis is displayed in this field.

Method

The method that was assigned to an analysis is displayed in this field.

Override

A checkmark in this box indicates that the result(s) have been overridden due to a QA event. See [QA EVENTS](#) for more information on Result Override QA Events.

Completed (Date and Time)

The date and time that the analysis was completed is displayed in this field.

Domain Specific Field

This field contains information which can be used to help identify an analysis/sample. See [Domain Specific Field](#) for more information.

Report To

This field is used to specify the primary organization that receives the results of the sample. See [Report To](#) for more information.

4.1.8 RELEASED TAB

The Released status tab is used by client services staff to view the volume of analyses that have been released in the last four days. This tab allows users to easily check to

see if an analysis has been recently released and to look up any information related to it.

Acc #	Domain	Section	Test	Method	Collected	Released	Override	Domain Sp
387706	Enviro...	liquidchrom-ic	pesticides	uhl h 029	2016-05-25 00:00	2016-08-25 19:58	<input type="checkbox"/>	[prj]md
400438	Enviro...	liquidchrom-ic	pesticides	uhl h 006	2016-06-22 00:00	2016-08-26 20:48	<input type="checkbox"/>	[prj]ndi
400438	Enviro...	liquidchrom-ic	pesticides	uhl h 006	2016-06-22 00:00	2016-08-26 20:48	<input type="checkbox"/>	[prj]ndi
400783	Enviro...	sample_prep-ank	turbidity	sm 2130 b	2016-07-13 10:00	2016-08-26 21:58	<input type="checkbox"/>	[prj]01'
401467	Clinical	mycobacti-ic	afb culture	bculture	2016-07-14 16:22	2016-08-26 15:57	<input type="checkbox"/>	LOGEL
401468	Clinical	mycobacti-ic	afb culture	bculture	2016-07-14 00:00	2016-08-26 15:57	<input type="checkbox"/>	OLEAF
401471	Clinical	mycobacti-ic	afb culture	bculture	2016-07-13 12:30	2016-08-26 15:57	<input type="checkbox"/>	BROW
401472	Clinical	mycobacti-ic	afb culture	bculture	2016-07-13 12:46	2016-08-26 15:58	<input type="checkbox"/>	JOHNS
401474	Clinical	mycobacti-ic	afb culture	bculture	2016-07-13 12:00	2016-08-26 15:58	<input type="checkbox"/>	MONRI
401477	Clinical	mycobacti-ic	afb culture	bculture	2016-07-13 14:52	2016-08-26 15:58	<input type="checkbox"/>	MILLEF
401974	Clinical	mycobacti-ic	afb culture	bculture	2016-07-15 12:46	2016-08-27 13:32	<input type="checkbox"/>	DEMO:
401975	Clinical	mycobacti-ic	afb culture	bculture	2016-07-15 12:30	2016-08-27 13:32	<input type="checkbox"/>	PARLIE
401976	Clinical	mycobacti-ic	afb culture	bculture	2016-07-14 09:02	2016-08-27 13:32	<input type="checkbox"/>	JOHNS
401977	Clinical	mycobacti-ic	afb culture	bculture	2016-07-15 10:01	2016-08-27 13:33	<input type="checkbox"/>	JOHNS
401978	Clinical	mycobacti-ic	afb culture	bculture	2016-07-15 08:25	2016-08-27 13:33	<input type="checkbox"/>	ESSAF
401979	Clinical	mycobacti-ic	afb culture	bculture	2016-07-15 08:25	2016-08-27 13:33	<input type="checkbox"/>	ESSAF
401980	Clinical	mycobacti-ic	afb culture	bculture	2016-07-14 12:30	2016-08-27 13:33	<input type="checkbox"/>	EVEN,
401986	Clinical	mycobacti-ic	afb culture	bculture	2016-07-15 05:49	2016-08-27 13:33	<input type="checkbox"/>	KLATT
401987	Clinical	mycobacti-ic	afb culture	bculture	2016-07-15 12:27	2016-08-27 13:33	<input type="checkbox"/>	WILHE
402237	Clinical	mycobacti-ic	accuprobe...	hybridiza...	2016-07-15 20:05	2016-08-26 12:19	<input type="checkbox"/>	SINGH
402237	Clinical	mycobacti-ic	accuprobe...	hybridiza...	2016-07-15 20:05	2016-08-26 12:19	<input type="checkbox"/>	SINGH
402901	Clinical	bacteriology-ic	enteric sero	pcr	2016-07-14 12:35	2016-08-26 15:25	<input type="checkbox"/>	AXTEL
403343	Clinical	mycobacti-ic	afb culture	bculture	2016-07-18 11:00	2016-08-26 15:55	<input type="checkbox"/>	DVELF
403815	Enviro...	sample_prep-ank	dig	uhl lead i...	2016-06-17 00:00	2016-08-26 09:48	<input type="checkbox"/>	[prj]dnt
403815	Enviro...	metals-ank	metal	uhl lead i...	2016-06-17 00:00	2016-08-29 13:23	<input type="checkbox"/>	[prj]dnt
403816	Enviro...	sample_prep-ank	dig	uhl lead i...	2016-06-17 00:00	2016-08-26 09:48	<input type="checkbox"/>	[prj]dnt
403816	Enviro...	metals-ank	metal	uhl lead i...	2016-06-17 00:00	2016-08-29 13:24	<input type="checkbox"/>	[prj]dnt
404020	Clinical	mycobacti-ic	afb culture	bculture	2016-07-20 07:07	2016-08-29 08:27	<input type="checkbox"/>	MENSA

Figure 215 Released Tab of To-Do List

The fields found on this tab are detailed below.

Acc(ession) #

The accession number of the released analysis is displayed in this field.

Domain

The sample domain (Environmental, SDWIS, Clinical, Newborn Screening, Animal, or PT) of the analysis is specified in this field.

Section

The laboratory section that was assigned to perform the analysis is displayed in this field.

Test

The test that was assigned to an analysis is displayed in this field.

Method

The method that was assigned to an analysis is displayed in this field.

Collected (Date and Time)

The date and time that the sample was collected is displayed in this field.

Released (Date and Time)

The date and time that the analysis was released is displayed in this field.

Override

A checkmark in this box indicates that the result(s) have been overridden due to a QA event. See [QA EVENTS](#) for more information on Result Override QA Events.

Domain Specific Field

This field contains information which can be used to help identify an analysis/sample. See [Domain Specific Field](#) for more information.

Report To

This field is used to specify the primary organization that receives the results of the sample. See [Report To](#) for more information.

4.1.9 TO BE VERIFIED TAB

The To Be Verified tab lists the samples that are pending data entry verification. See [SAMPLE VERIFICATION](#) for a complete description of this process.

The bar graph in the lower pane of the To Be Verified tab displays the distribution of “not verified” samples by the number of days since the samples were received at the laboratory.

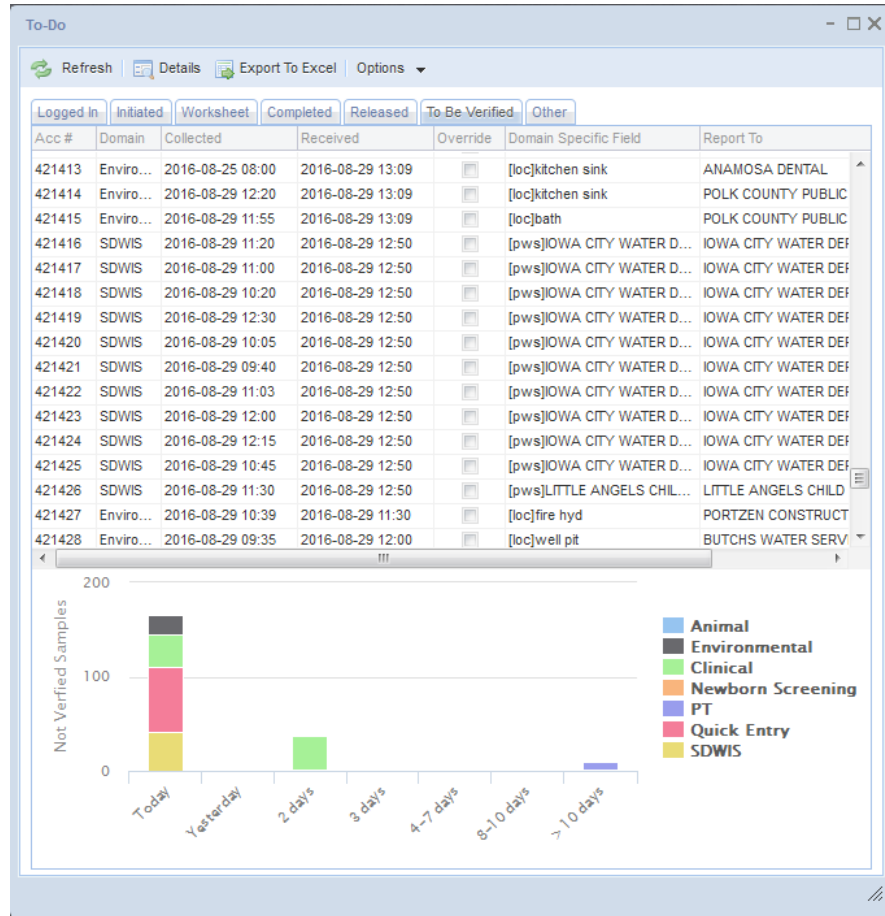


Figure 216 To Be Verified Tab of To-Do List

The fields found on this tab are detailed below.

Acc(ession) #

The accession number of the not verified sample is displayed in this field.

Domain

The sample domain (Environmental, SDWIS, Clinical, Newborn Screening, Animal, PT, or Quick Entry) of the sample is specified in this field.

Collected (Date and Time)

This field displays the date and time that the sample was collected.

Received (Date and Time)

This field displays the date and time that the sample was received at the laboratory.

Override

A checkmark in this box indicates that the result(s) have been overridden due to a QA event. See [QA EVENTS](#) for more information on Result Override QA Events.

Domain Specific Field

This field contains information which can be used to help identify the sample. See [Domain Specific Field](#) for more information.

Report To

This field is used to specify the primary organization that receives the results of the sample. See [Report To](#) for more information.

4.1.10 OTHER TAB

The Other status tab is designed for laboratory staff to troubleshoot issues. This tab displays information for analyses that are not currently in the normal workflow process. These analysis statuses include: Error Completed, Error Initiated, Error In Prep, Error Logged In, In Prep, On Hold, and Requeue. This tab should be referred to frequently when an analysis cannot be found on the other tabs.

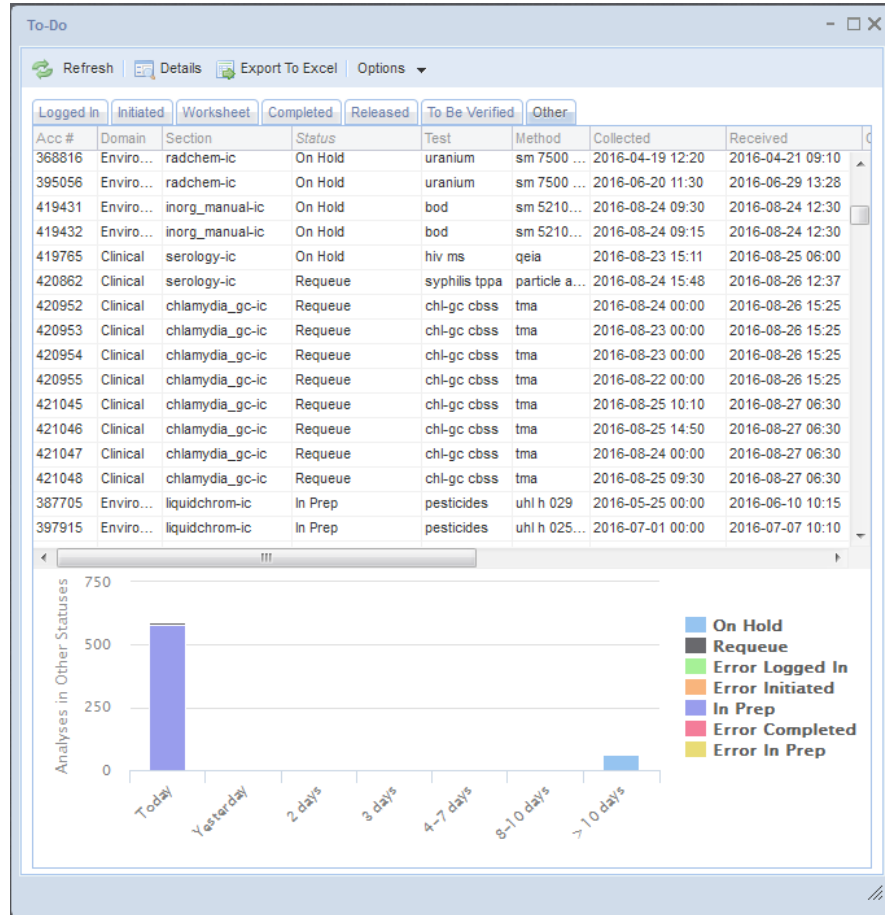


Figure 217 Other Tab of To-Do List

The fields found on this tab are detailed below.

Acc(ession) #

The accession number of the analysis is displayed in this field.

Domain

The sample domain (Environmental, SDWIS, Clinical, Newborn Screening, Animal, PT, or Quick Entry) of the analysis is specified in this field.

Section

The laboratory section that has been assigned to perform the analysis is displayed in this field.

(Analysis) Status

The status of the analysis is displayed in this field. See [\(Analysis\) Status](#) for a complete description of each status.

Test

The test that has been assigned to an analysis is displayed in this field.

Method

The method that has been assigned to an analysis is displayed in this field. The method cannot be [flipped](#) using this screen.

Collected (Date and Time)

This field displays the date and time that the sample was collected.

Received (Date and Time)

This field displays the date and time that the sample was received at the laboratory.

Override

A checkmark in this box indicates that the result(s) have been overridden due to a QA event. See [QA EVENTS](#) for more information on Result Override QA Events.

Domain Specific Field

This field contains information which can be used to help identify an analysis/sample. See [Domain Specific Field](#) for more information.

Report To

This field is used to specify the primary organization that receives the results of the sample. See [Report To](#) for more information.

4.2 ADDING AN ANALYSIS TO A SAMPLE

An analysis can be added to a sample through three different types of screens: the full sample login screens (environmental, private well water, SDWIS, etc.), Sample Tracking, and Quick Entry (as long as the sample has not been fully logged in).

For a complete explanation of the procedure for adding an analysis through the full sample login screens, see [COMMON FULL SAMPLE LOGIN FIELDS – MIDDLE OF SCREEN](#) and [ANALYSIS TAB](#).

For a complete explanation of the procedure for adding an analysis to a sample in Sample Tracking, see [ADDING A TEST TO A SAMPLE IN SAMPLE TRACKING](#).

For a complete explanation of how to add an analysis through the Quick Entry module, see [QUICK ENTRY](#).

4.3 PREP TESTS

A prep test is a test that is a prerequisite for another test. Examples include digestion, leaching, extraction, and concentration. While a test can have multiple prep tests available from which to select, only one prep test can be assigned to the dependent analysis. When there is one or more [optional prep tests](#) available from which to select, the Prep Test Selection screen will pop up to allow a selection. Check the Select box for the desired prep test and click **OK**. If multiple sections can perform the prep test, the lab section that is assigned to perform that analysis can be selected or changed here.

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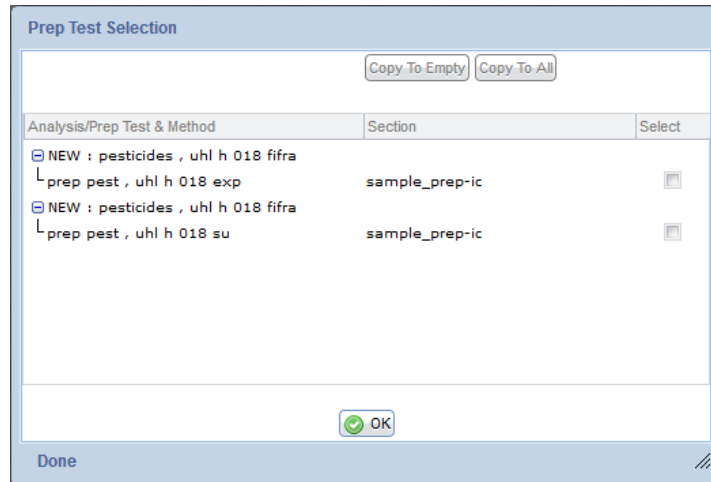


Figure 218 Prep Test Selection Screen for Optional Prep Tests

If a test is added which has a [required prep test](#), the prep test will get added automatically without the Prep Test Selection screen popping up. This applies as long as the prep test's assigned lab section can be set automatically. (The section is set automatically if it is the [default](#) one or by [matching the user's location](#).) Otherwise, the Prep Test Selection screen will pop up to force the user to assign the lab section to perform the analysis. Tests that are defined with a required prep test will have the Select checkbox preselected and it cannot be unselected. Click **OK** to accept the required prep test and to assign the lab section.

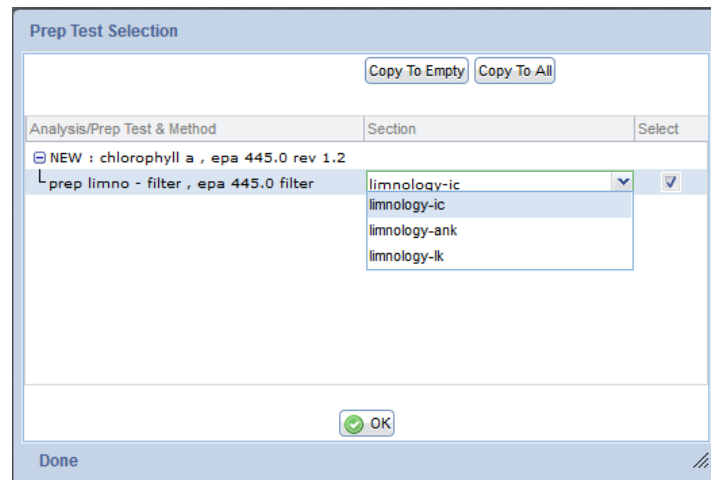


Figure 219 Assigning a Lab Section to Perform a Prep Analysis

The **Copy To All** button copies the highlighted section to all of the prep tests. The **Copy To Empty** button performs the same operation but only on those prep tests that don't have any predefined section. This assumes that the test has been [defined for that section](#).

Another way to select a prep test is by choosing a previously logged in analysis to be the prep analysis for its dependent analysis. See [Sample Prep](#) for an explanation of how to perform this action.

For a complete explanation of how prep tests are built into a dependent test definition, see [Prep Test & Reflex Test](#).

4.4 REFLEX TESTS

Often a result of a test requires an additional or confirmatory test to be performed. This additional test is known as a reflex(ed) test. A reflex analysis is linked to its parent analysis and result, which is important in tracking the testing process.

Multiple tests can be reflexed from a single analysis giving the analyst the choice for selecting the next step. When there are multiple reflex tests available from which to choose or if the reflexing is defined to [prompt](#) the user as to whether or not she wants to add the test (for an optional reflex test), the Reflex Test Selection screen will pop up to allow a selection. Check the Select box(es) for the desired reflex test(s) and click **OK**. If multiple sections can perform the relex test, the lab section that is assigned to perform that analysis can be selected or changed here.

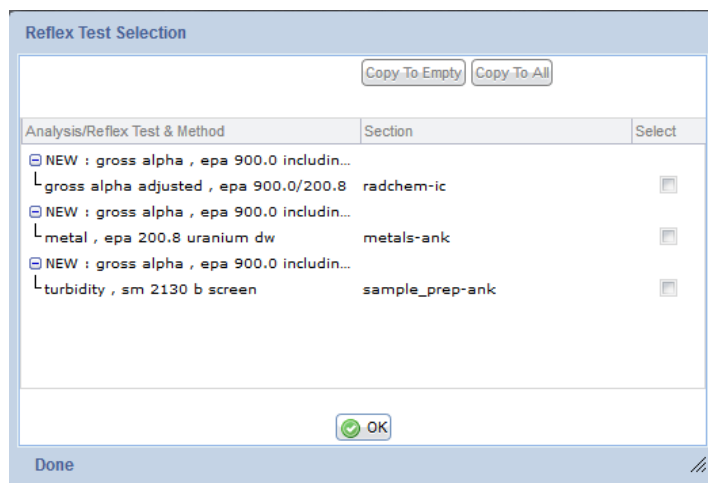


Figure 220 Reflex Test Selection Screen for Optional (“Prompt”) Reflex Tests

If a test result reflexes to a test that is marked with one of the [“Auto-Add” flags](#), “the reflex test will get added automatically without the Reflex Test Selection screen popping up. This applies as long as the reflex test’s section can be set automatically. (The section is set automatically if it is the [default](#) one or by [matching the user’s location](#).) Otherwise, the Reflex Test Selection screen will pop up to force the user to assign the lab section to perform the analysis. In this case, the auto-added (required) reflex test will have its Select checkbox preselected and it cannot be unselected. Click **OK** to accept the required reflex test and to assign its lab section.

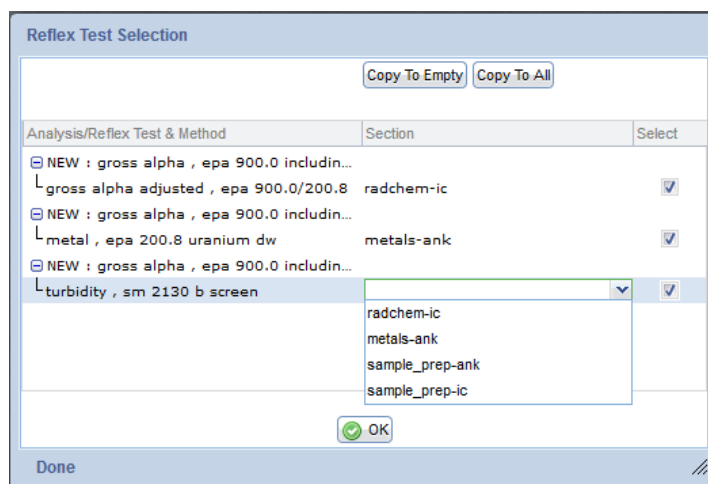


Figure 221 Assigning a Lab Section to Perform a Reflex Analysis

The **Copy To All** button copies the highlighted section to all of the reflex tests. The **Copy To Empty** button performs the same operation but only on those reflex tests that don't have any predefined section. This assumes that the test has been [defined for that section](#).

For a complete explanation of how reflex tests are built into a parent test definition, see [Prep Test & Reflex Test](#).

4.5 CANCELLING AN ANALYSIS

There are times that a laboratory wishes to remove an analysis from a sample. However, for auditing purposes an analysis cannot be removed from a sample and must be cancelled. Once an analysis is cancelled, it cannot be un-cancelled, reported, or modified in any way.

An analysis can be cancelled in two different places. It can be cancelled from the Sample Tracking screen. (See [CANCELLING A TEST IN SAMPLE TRACKING](#).) It can also be cancelled from any of the full sample login screens. Click on the analysis in the "Sample Items and Analyses" section and then click on the **Remove Row** button. A "Cancel Analysis?" warning window pops up allowing the user to change the status of the analysis to cancelled. This action must then be committed to take effect.

DECEMBER, 2017

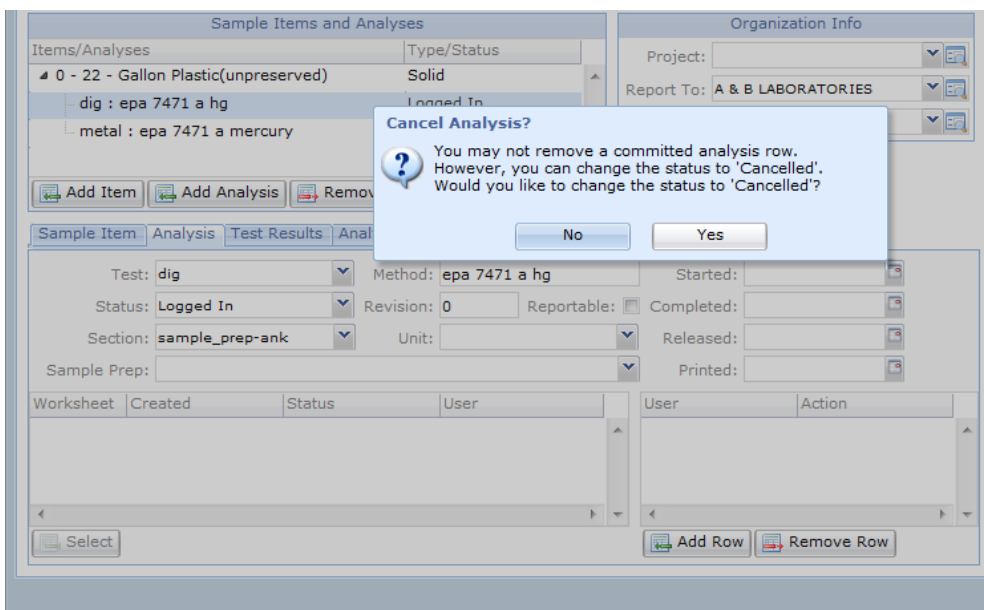


Figure 222 Cancelling an Analysis in Full Sample Login

In the instance where a client no longer wishes for a requested analysis to be performed, the laboratory procedure could be to add an overriding QA event. This still reports that analysis (excluding the results) to the client with possible external comments documenting the client “cancellation”. The reason to do this is because an analysis “cancellation” by a client has billing, turnaround, and analyses volume implications.

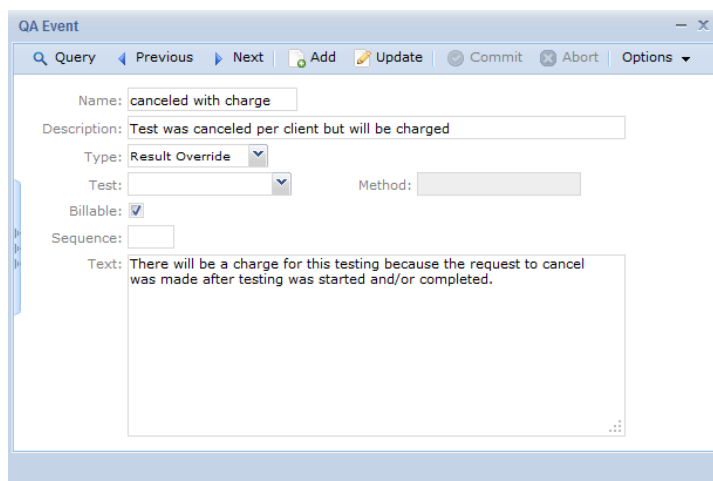


Figure 223 QA Event: Test Was Canceled Per Client But Will Be Charged

4.6 ADDING QA EVENTS, EXTERNAL NOTES, AND INTERNAL NOTES

For general information about QA events, please see [QA EVENTS TAB](#) and [QA EVENTS](#). Additionally, sample level QA events cannot be added/removed if any analysis has been released. This is to prevent the meaning of a previously reviewed analysis from changing on reports.

Sample and analysis internal notes are viewable only by lab personnel and are meant to explain any circumstances of note. The major difference between QA events and notes comes from the fact that QA events can be tracked, tabulated, and analyzed, whereas, notes cannot. For more information on adding external and internal notes, see [ANALYSIS NOTES TAB](#) and [SAMPLE NOTES TAB](#).

4.7 COMPLETING AND RELEASING AN ANALYSIS

The Complete and Release module is used to review, complete, and release analyses. Its link is located in the [Analysis Menu](#).

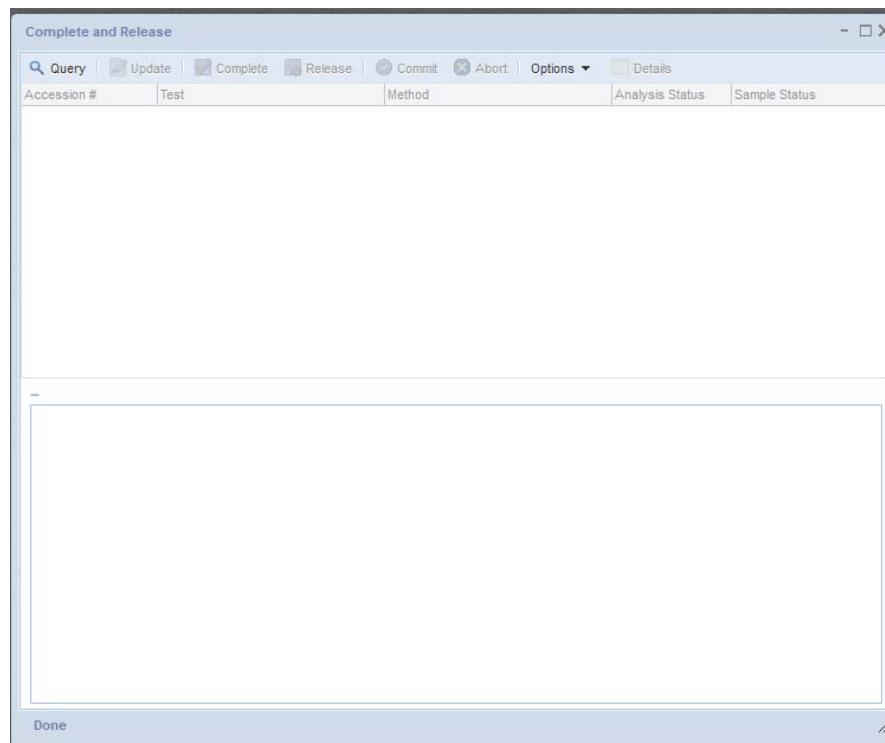


Figure 224 Complete and Release Screen

4.7.1 QUERYING FOR ANALYSES

In order to complete or release analyses, an analyst must first query for the desired analyses, review their information, and update any information that needs to be changed.

- Analysts can query based on sample information (i.e., Accession #, Order #, Collected Date/Time, Received Date/Time, Sample Status, Client Reference,

Organization information, and/or Project information.)

The screenshot shows the 'Sample' tab interface. At the top, there are input fields for 'Accession #', 'Order #', 'Collected:' (with a calendar icon), and 'Time:' (with a clock icon). Below these are 'Received:' (with a date range '2014-04-22 00:00..21' and a calendar icon) and 'Status:' (a dropdown menu set to 'Logged In'). A 'Client Reference:' field is also present. Below the search filters are two tables. The first table has columns: Type, Attention, Id, Organization, Apt/Suite #, and a column with an 'A' icon. The second table has columns: Project, Description, and Is Perm. Both tables have 'Add Row' and 'Remove Row' buttons on the right side.

Figure 225 Querying through the Sample Tab (Received Date/Time Range and Status)

This screenshot shows the same 'Sample' tab interface as Figure 225, but with different search filters. The 'Received:' field is empty. The 'Status:' dropdown is set to 'Logged In'. In the first table, the 'Organization' column has a dropdown menu with 'IDNR-FO 1' selected. In the second table, the 'Project' column has a dropdown menu with '319-3 slvck' selected. The 'Add Row' and 'Remove Row' buttons are visible on the right side of both tables.

Figure 226 Querying through the Sample Tab (Organization and Project Names)

- Analysts can also query based on analysis information (i.e., Test, Method, Analysis Status, Section, Unit, Panel, Sample Prep, Started Date/Time, etc.)

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The screenshot shows the 'Analysis' tab in the OpenELIS interface. The search filters are set as follows: Test: nitrate, Method: epa 353.2, Status: Initiated, Requeue. Other filters include Preliminary, Reportable, Completed, Section, Unit, Released, Panel, Printed, Sample Prep, and Revision. Below the filters are two empty tables with headers: 'Worksheet | Created | Status | User' and 'User | Action'. At the bottom, there are buttons for 'Select', 'Add Row', and 'Remove Row'.

Figure 227 Querying Through the Analysis Tab (Test, Method, and Status)

The screenshot shows the 'Analysis' tab with different search filters: Section: enviro_micro-ik, Started: 2014-05-27 00:00..2014-05-27 23:59. Other filters include Method, Status, Type, Reportable, Completed, Unit, Released, Panel, Printed, Sample Prep, and Revision. The table headers and bottom buttons are the same as in Figure 227.

Figure 228 Querying Through the Analysis Tab (Section and Started Date/Time Range)

- Analysts can also query for all of the analyses that have been loaded on the same worksheet by using the Query By Worksheet option found in the Options drop-down menu.

The 'Query By Worksheet' dialog box is shown. It has a title bar 'Query By Worksheet' and a text input field for 'Worksheet #' containing the value '437'. Below the input field are 'OK' and 'Cancel' buttons. At the bottom of the dialog is a 'Done' button.

Figure 229 Query By Worksheet Option

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- For each analysis listed in the upper pane of the screen, there are information tabs in the lower pane for sample, domain (environmental, private well water, SDWIS, etc.), sample item, analysis, test results, analysis notes, sample notes, storage, QA events, and auxiliary data.

The screenshot shows the 'Complete and Release' window. The top pane displays a table of analysis results:

Accession #	Test	Method	Analysis Status	Sample Status
1270	nitrate	epa 353.2	Initiated	Logged In
1279	nitrate	epa 353.2	Initiated	Logged In
7001	nitrate	epa 353.2	Initiated	Not Verified
7002	nitrate	epa 353.2	Initiated	Not Verified
45121	nitrate	epa 353.2	Initiated	Logged In
45122	nitrate	epa 353.2	Initiated	Logged In
129121	nitrate	epa 353.2	Initiated	Error
810121	nitrate	epa 353.2	Initiated	Not Verified
824112	nitrate	epa 353.2	Initiated	Not Verified
2500259	nitrate	epa 353.2	Initiated	Not Verified
2500260	nitrate	epa 353.2	Initiated	Not Verified
2500261	nitrate	epa 353.2	Initiated	Not Verified

The bottom pane shows the 'Sample Notes' tab selected. The tab heading 'Sample Notes' has a red oval containing '1-2' to its right. The main area of the bottom pane contains a form for sample details and a table of worksheets.

Form fields:

- Test: nitrate
- Method: epa 353.2
- Started: 2011-04-20 15:27
- Status: Initiated
- Section: enviro_micro-ic
- Unit: mg/L
- Revision: 0

Worksheet table:

Worksheet	Created	Status	User
54072	2011-04-20	Working	demo
54084	2011-07-15	Working	demo
54085	2011-07-25	Working	demo
54093	2011-09-28	Working	demo

Figure 230 Query Results of Complete and Release Screen

- The tab content indicator (red oval) to the right of a tab heading displays the quantity of items located in that tab. This signals to the user which tabs need to be examined. For example, the **1-2** to the right of "Sample Notes" means that there is one external sample note and two internal sample notes.



Figure 231 Tab Content Indicators

- Any of the information in these tabs can be updated by clicking on the **Update** button, followed by the **Commit** button.
- The **Details** button is used to pop up the Sample Tracking screen for the selected analysis. This allows the analyst to review all of the analyses, results, notes, and QA events tied to a single sample in a more comprehensive manner. See [Sample Tracking](#) for more information.

4.7.2 GENERAL FIELDS

The general fields located in the upper pane of this screen are described below. Each of these columns can be sorted in ascending or descending order.

Accession #	Test	Method	Analysis Status	Sample Status
34	accu probe		Initiated	Logged In
36	accu probe		Initiated	Logged In
1270	nitrate		Initiated	Logged In
1279	nitrate	epa 353.2	Initiated	Logged In
1501	accu probe	pcr	Initiated	Logged In
5015	accu probe	pcr	Initiated	Error

Figure 232 General Fields of the Complete and Release Screen

Accession

The unique accession number of the sample to be analyzed is displayed in this field.

Test

The test that has been assigned for the analysis is displayed in this field.

Method

The method that has been assigned for the analysis is displayed in this field. The method cannot be [flipped](#) using this screen.

Analysis Status

The status of the analysis is displayed in this field. See [\(Analysis\) Status](#) for a complete description of each status.

Sample Status

This field displays the status of the sample. See [\(Sample\) Status](#) for a complete description of each status.

4.7.3 SAMPLE TAB

Type	Attention	Id	Organization	Apt/Suite #	Address
Report To	KIM WILSON	92	DAVIS COUNTY HOSPITAL		507 N MADISON
Bill To		379	IOWA DEPT OF PUBLIC HEALTH	321 E 12TH ST	LUCAS STATE

Project	Description	Is Perm
venter	Samples submitted through Dr. Wichman	<input type="checkbox"/>
fdal/fern-rad	Food Emergency Response Network	<input type="checkbox"/>


Figure 233 Sample Tab

The fields on this tab are described below.

Accession #

The unique accession number of the sample to be analyzed is displayed in this field.

Order #

This field contains the unique Id for a send-out order (for non-clinical samples). The pop-up button  to the right of the Order # pops up a Send-out Order screen. (See [SEND-OUT ORDER](#) for more information.)

Collected

This field displays the date the sample was collected.

Time

This field displays the time the sample was collected.

Received

This field displays the date and time the sample was received at the laboratory.

(Sample) Status

This field displays the status of the sample. See [\(Sample\) Status](#) for a complete description of each status.

Client Reference

The value displayed in this field is one item that ties the client's information to the sample paperwork. It could be a client's lab number or another unique identifier for a sample that they collect.

Type

There are three types of organizations currently defined in OpenELIS: Report To, Secondary Report To, and Bill To. See [Report To](#) and [Bill To](#) for more information on these types of organizations.

Attention

This field may contain the name of the person at the client organization who is responsible for this sample.

Id

The organization Id is a unique integer that is used to assign permissions for web users to view the results that are reported to that organization. It also serves as the billing Id for an automated billing program.

Organization

This field contains the complete name of the client organization.

Apt/Suite #, Address, City, State, Zip Code, Country

These fields specify the complete address of the client organization.

Project

This field is used to display the name of a project that has been assigned to a sample. See the [PROJECT](#) screen for more information on projects. Currently, this field has been disabled for clinical samples.

Description

This field contains a detailed description of the project.

Is Perm

This checkbox indicates if the project is permanently assigned to the sample. All projects assigned by the user should have this boxed checked.

4.7.4 DOMAIN TAB

The fields on this tab are sample domain-specific and are described below.

4.7.4.1 QUICK ENTRY TAB

The Quick Entry tab does not contain any information. This is due to the fact that there aren't any domain-specific fields that are associated with quick-entered samples. Once these samples are fully logged-in, they will become part of a sample domain and will display the appropriate domain-specific fields.

4.7.4.2 ENVIRONMENTAL TAB

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The screenshot shows the 'Environmental' tab selected in a software interface. The tab bar includes 'Sample', 'Environmental', 'Sample Item', 'Analysis', 'Test Results', 'Analysis Notes', 'Sample Notes 1-0', 'Storage', 'QA Events', and 'Aux Dat'. The main content area contains a form with the following fields:

- Hazardous:
- Priority:
- Collector:
- Phone #:
- Description:
- Location:
- Apt/Suite #:
- Address:
- City, State, Zip:
- Country:

Figure 234 Environmental Tab

The Environmental tab contains environmental sample demographic information. The formats specified for these fields follow.

Hazardous

The checkbox indicates if the sample is considered hazardous. Hazardous samples require special disposal.

Priority

This field specifies the number of days that the client expects for sample turnaround. For example, a value of 3 would specify that the sample should be completed and reported within 3 working days.

Collector

The collector's name can be specified in the format of *lastname firstname* or a collector ID depending on the laboratory section's SOP. This field is restricted to lower case letters, numbers, and symbols.

Phone

This field is used to specify the collector's phone number. The field will automatically format the digits for the area code, phone number, and extension (if applicable).

Description

This text field is used to further describe the sample such as filter, duplicate, ice, etc. The information about sample type and source should be entered in the [SAMPLE ITEM TAB](#) and not in this field.

Location

The name of the location for the collection of the environmental sample is specified in this field.

Apt/Suite #, Address, City, State, Zip, Country

These fields specify the complete address of the location for the collection of the environmental sample.

4.7.4.3 SDWIS TAB



Sample	SDWIS	Sample Item	Analysis	Test Results	Analysis Notes	Sample Notes	Storage	QA Events	Aux Data
PWS Id: IA4950200 		PWS Name: 61 DRIVE-IN THEATER							
State Lab #: 27		Facility Id: 950							
Sample Type: RT - Routine		Sample Cat: Bacterial							
Sample Pt Id: 950		Location: kitchen sink							
Priority: <input type="text"/>		Collector: miller							

Figure 235 SDWIS Tab

The SDWIS tab contains SDWIS sample demographic information. The formats specified for these fields follow.

PWS Id

The PWS (Public Water Supply) Id is a unique identifier assigned by the state to all public water supplies. The PWS Id begins with a two letter state abbreviation followed by a unique seven digit number. The pop-up button  to the right of this field can be used to display the PWS Information screen for this public water supply. For more information on the PWS Information screen, see [PWS INFORMATION](#).

PWS Name

The PWS (Public Water Supply) Name is displayed in this field.

State Lab #

This number represents the laboratory id that was assigned to your laboratory by the state's laboratory certification program.

Facility Id

This field contains the state assigned water system facility id, also known as the [State ID](#).

Sample Type

The SDWIS sample type specified for this sample is displayed in this field. SDWIS sample types include: Routine, Repeat, Special, Replacement, and Confirmation. This field should not be confused with the Sample Type on the [SAMPLE ITEM TAB](#).

Sample Cat(egory)

The Sample Cat(egory) specifies the SDWIS sample category. The sample categories currently are Bacterial, Radio Chemical, Chemical, and Pb/Cu.

Sample Pt Id

The Sample Pt (Point) Id field often contains the same information as the Facility Id.

Location

This is a description of the sampling point location.

Priority

This field may specify the number of days that the client expects for sample turnaround. For example, a value of 3 would specify that the sample should be completed and reported within 3 working days.

Collector

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The collector's name can be specified in the format of *lastname firstname* or a collector ID depending on the laboratory section's SOP. This field is restricted to lower case letters, numbers, and symbols.

4.7.4.4 CLINICAL TAB

The screenshot displays the 'Clinical' tab in the OpenELIS interface. The top navigation bar includes tabs for Sample, Clinical (selected), Sample Item, Analysis, Test Results, Analysis Notes, Sample Notes (0-1), Storage, QA Events, and Aux Data. The main form area contains the following fields:

- Id:** 622
- Last:** MOUSE
- First:** MINNIE
- Birth:** 1982-03-18 (with a calendar icon and '28' in a red box)
- NID:** [Empty field]
- Apt/Suite #:** 200 DISNEYWORLD BLVD
- Address:** 200 DISNEYLAND
- City, State, Zip:** ORLANDO FL 00215
- Phone #:** 718/555-1212
- Gender:** Female
- Race:** W - White
- Ethnicity:** [Empty dropdown]
- Provider (L,F):** WELBY MARCUS
- Phone #:** 515/555-1212

Figure 236 Clinical Tab

The Clinical tab contains demographic information for the patient that is linked to the sample. The formats specified for these fields follow.

(Patient) Id

This field contains the unique OpenELIS patient id that is automatically generated by the LIMS.

Last (Name)

The patient's last name is displayed in this field.

First (Name)

The patient's first name is displayed in this field.

Birth(date)

The patient's birthdate is displayed in this field. This field has a format of YYYY-MM-DD.

NID

The National Identifier (NID) is a unique identification number issued to a person by a national government. In the United States, the Social Security Number is a person's de facto national identifier. This field is optional and has a format of 000-00-0000.

Apt/Suite #

The patient's apartment or suite number can be displayed in this field.

Address

The patient's street address can be displayed in this field.

City, State, Zip

The patient's city, state, and zip code can be displayed in these fields.

Phone #

The patient's phone number can be displayed in this field.

Gender

The patient's gender can be displayed in this field.

Race

The patient's race can be displayed in this field.

Ethnicity

The patient's ethnicity can be displayed in this field.

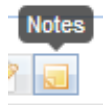
Provider (L,F)

The health care provider's last name and first name are displayed here. The field on the left is an autocomplete dropdown field and its behavior is described in the [full sample login](#) section.

Phone #

The provider's phone number can be displayed in this field. The field will automatically format the digits for the area code, phone number, and extension (if applicable).

The functions for the buttons located at the top of this tab are described below. The name of each button is displayed when the user hovers the mouse over the button.



Full Window Search

This button is used to pop up the Patient Lookup screen to query for a patient. This would be useful if the sample is first unlinked from the current patient in order to be linked to a different patient while in Update Mode. See [PATIENT LOOKUP SCREEN](#) for a complete explanation of its use.

Search By Fields

This button is used to query for a patient by a value entered in the Last, First, Birth, and/or NID fields. This would be useful if the sample is first unlinked from the current patient in order to be linked to a different patient while in Update Mode. See [PATIENT LOOKUP SCREEN](#) for a complete explanation of its use.



Unlink

Occasionally, a sample is linked to the incorrect patient record. This button is used in Update Mode to unlink a sample from a patient so that it can be linked to a different patient. Released samples can only be unlinked through the sample unrelease process. See [UNRELEASE SAMPLE OPTION](#) in the Sample Tracking screen for an explanation of this process.

Edit

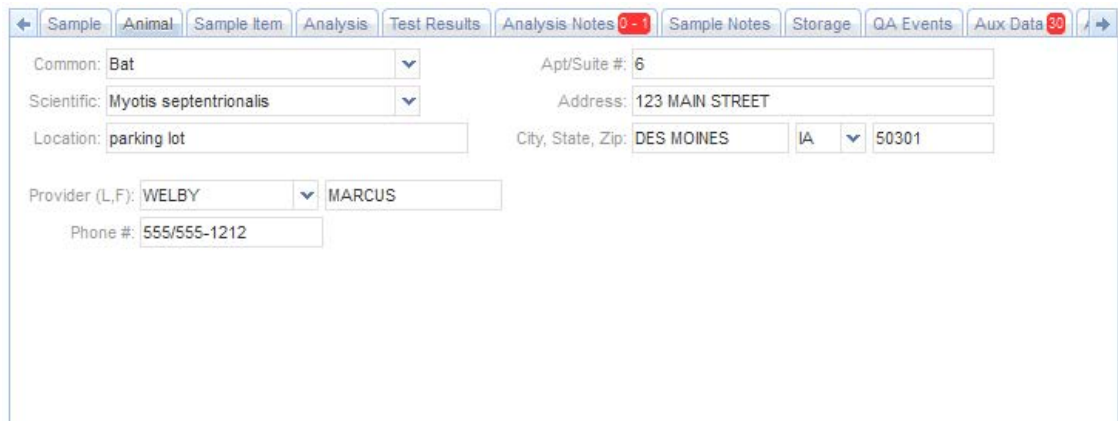
This button allows for a patient's demographic information to be changed while in Update mode. This function would be used to accommodate name and address changes in the database. This button edits the patient record, so all samples linked to this patient are updated with this new information.

(Patient) Notes

This button allows for patient-level notes to be added or read by data entry staff. These notes are attached to the patient record and will be visible from any sample that is assigned to the patient. These notes can be used to document phone calls to facilities confirming a patient's demographic information (e.g., date of birth, NID, spelling of name, etc.) There are not any patient notes present in the patient record when the **(Patient) Notes** button is displayed as . This button changes to  after a patient note has been added to a patient record. See [\(Patient\) Notes](#) for a complete description of this feature.

4.7.4.5 NEONATAL SCREENING TAB

4.7.4.6 ANIMAL TAB



Sample	Animal	Sample Item	Analysis	Test Results	Analysis Notes 0-1	Sample Notes	Storage	QA Events	Aux Data 30
Common:	Bat								
Scientific:	Myotis septentrionalis								
Location:	parking lot								
Apt/Suite #:	6								
Address:	123 MAIN STREET								
City, State, Zip:	DES MOINES	IA			50301				
Provider (L,F):	WELBY	MARCUS							
Phone #:	555/555-1212								

Figure 237 Animal Tab

The Animal tab contains animal sample demographic information. The formats specified for these fields follow.

Common

This dropdown field contains the common name of the animal. This field is required. Common names are added through the [Dictionary](#) screen.

Scientific

This dropdown field may contain the scientific name of the animal. Scientific names are added through the [Dictionary](#) screen.

Location

The name of the location for the collection of the animal sample (or location of the animal incident) may be specified in this field.

Apt/Suite #, Address, City, State, Zip

These fields may specify the complete address of the animal collection/incident location.

Provider (L,F)

The veterinarian's/health care provider's last name and first name are displayed here. The field on the left is an autocomplete dropdown field and its behavior is described in the [full sample login](#) section.

Phone #

The veterinarian's/health care provider's phone number can be displayed in this field. The field will automatically format the digits for the area code, phone number, and extension (if applicable).

4.7.4.7 PT TAB

DECEMBER, 2017

The screenshot shows a web interface with a navigation bar at the top containing tabs: Sample, PT, Sample Item, Analysis, Test Results, Analysis Notes, Sample Notes, Storage, QA Events, Aux Data, and Attachment. The PT tab is active. Below the navigation bar, there are several input fields: 'Provider' is a dropdown menu with 'WISCONSIN STATE LAB OF HYGIENE' selected; 'Additional Domain' is a dropdown menu; 'Series' is a text input field with 'LAMP ROUND 36' entered; 'Received By' is a dropdown menu with 'prose' selected; and 'Due' is a date-time input field showing '2015-05-29 08:00' with a calendar icon and the number '28' in a red box.

Figure 238 PT Tab

The PT tab contains proficiency testing information that is specific to the sample. The formats specified for these fields follow.

Provider

This dropdown field contains the name of the PT sample provider. PT sample providers are added through the [Dictionary](#) screen.

Series

This free text field contains the name of the PT series.

Due

This optional field can be used to specify the date and time when the PT sample's results are due to the PT sample provider.

Additional Domain

This dropdown field will be implemented in the future to select an additional sample domain so that its domain-specific information can be displayed. This will be used for maternal and newborn screening data that is patient-specific to prevent it from having to be duplicated in the PT sample tab.

Received By

This field is used to record the OpenELIS username of the person who received the PT sample.

4.7.5 SAMPLE ITEM TAB

The fields on this tab are described below.

The screenshot shows the 'Sample Item' tab selected in a software interface. The form contains the following fields:

- Sample Type: Air (dropdown menu)
- Source: Cassette (dropdown menu)
- Source Other: (text input field)
- Container: 99 - No Container Needed (dropdown menu)
- Container Reference: (text input field)
- Qty: 1 (text input field)
- Unit: ppm (dropdown menu)

Figure 239 Sample Item Tab

Sample Type

The Sample Type drop-down list allows for the classification of the sample (e.g., Breast Milk, Dust, Liquid, Oil, etc.). The Sample Type that has been selected affects what tests can be assigned to this sample item.

Source

This field specifies the source of the sample such as Well Water, Ground Water, etc. For clinical samples, this field is used to specify a collection source such as Capillary for Blood sample type, Left Ear Lobe for Skin Biopsy, etc.

Source Other

This field is a free-text field that can be used to enter more specific source information.

Container

The container is the apparatus that holds the sample. Examples include a bottle, vial, trip blank, culture swab, etc. All SHL container names have the following format: internal id - container name. The container name can be quite descriptive and often

specifies its capacity, e.g., 70 - 250ml Brown Plastic Nalgene Bottle (EDTA preservative).

Container Reference

This text field can be used to uniquely identify the received container by using the manufacturer's inventory serial id, or the "Build Id" on the container label if you are building kits (see [BUILD KITS](#)) through the LIMS.

Qty and Unit

These fields denote the quantity of material in this container. For example, if the container holds 200 mL of water, enter 200 in the Qty field and select mL from the Unit drop-down list.

4.7.6 ANALYSIS TAB

The fields on this tab are described below.

Worksheet	Created	Status	User

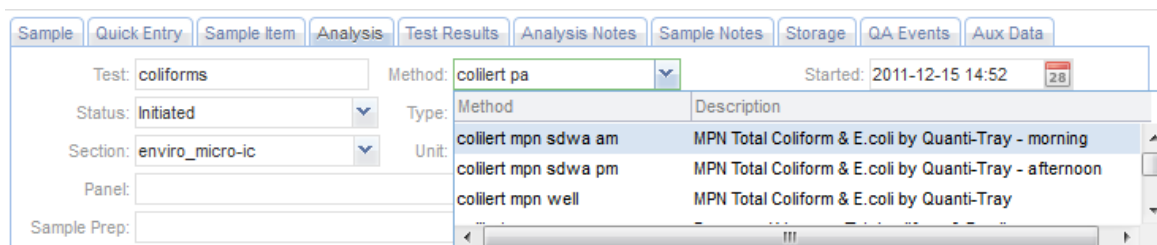
Figure 240 Analysis Tab

Test

The test that has been assigned for the analysis is displayed in this field.

Method

The method that has been assigned for the analysis is displayed in this field. The method can be [flipped](#) using this screen.



The screenshot shows the 'Analysis' tab in the OpenELIS interface. The 'Test' field is set to 'coliforms'. The 'Method' dropdown is currently set to 'colilert pa'. Below this, a table lists available methods for flipping:

Method	Description
colilert mpn sdwa am	MPN Total Coliform & E.coli by Quanti-Tray - morning
colilert mpn sdwa pm	MPN Total Coliform & E.coli by Quanti-Tray - afternoon
colilert mpn well	MPN Total Coliform & E.coli by Quanti-Tray

Figure 241 Method Flipping through the Analysis Tab

(Analysis) Status

The status of the analysis is displayed in this field. See [\(Analysis\) Status](#) for a complete description of each status.

(Analysis) Type

This optional field specifies the type of analysis. See [\(Analysis\) Type](#) for a complete description of each type.

Reportable

An analysis with the Reportable box checked will have its test results displayed and/or transmitted via the [Final Report](#), web portal data view, or electronically.

This field is defaulted to the [test definition](#) but can be changed to indicate if an analysis should be reported or not. For those systems that create billing, the reportable flag is also used to create billing information.

Section

This field indicates which section is performing the analysis. For tests that can be performed by multiple sections, the analysis's section can be changed by selecting a different section during Update mode.

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Sample	Quick Entry	Sample Item	Analysis	Test Results	Analysis Notes	Sample Notes	Storage	QA Events	Aux Data
Test:	coliforms	Method:	colliert pa sdwa am	Started:					28
Status:	Logged In	Type:		Reportable:	<input type="checkbox"/>	Completed:			28
Section:	enviro_micro-ic	Unit:	/100 mL	Released:					28
Panel:	enviro_micro-ic			Printed:					28
Sample Prep:	enviro_micro-ank			Revision:	0				
	enviro_micro-lk								

Figure 242 Changing an Analysis's Section

Unit

The unit of measure for the analysis is specific to the sample type and is defined on the [Sample Type](#) tab of the test definition. If multiple units have been defined for a sample type, the unit can be changed during Update mode.

Sample	Environmental	Sample Item	Analysis	Test Results	Analysis Notes	Sample Notes	Storage	QA Events	Aux Data
Test:	ammonia	Method:	epa 350.1	Started:					28
Status:	Logged In	Type:		Reportable:	<input checked="" type="checkbox"/>	Completed:			28
Section:	inorg_auto-ank	Unit:	mg/kg [recd wt]	Released:					28
Panel:			mg/kg [recd wt]	Printed:					28
Sample Prep:			mg/kg [dry wt]	Revision:	0				

Figure 243 Changing the Unit of an Analysis

Panel

This field displays the [panel](#) that was used to add the tests to the sample. The panel field allows tests to be grouped mainly for electronic messaging in clinical settings. For example, the "nbs panel" test panel includes the tests/methods that are normally assigned to a sample item during newborn screening. An analysis can be linked to a different panel during Update mode.

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Test: coliforms Method: colilert pa sdwa pm Started: 2013-09-19 14:45

Status: Completed Type: Reportable: Completed: 2013-09-20 08:50

Section: enviro_micro-ic Unit: /100 mL Released:

Panel: sdwa coliform pa pm Printed:

Sample Prep: coliform mpn panel Revision: 0

coliform pa panel

sdwa coliform pa am

sdwa coliform pa pm

sdwa coliform mpn am

sdwa coliform mpn pm

sdwa ioc panel

rad composit default

User	Action
kowens	Completed
jkempf	Completed

Figure 244 Changing the Panel Linkage of an Analysis

Sample Prep

This field displays the prep test/method for the currently selected analysis. If an analysis has a prep analysis, the dependent analysis is placed into In Prep status until the prep analysis is completed. Then the status of the dependent analysis is changed to Logged In and the analysis available date is updated.

At times it may be desirable to choose a previously logged in analysis to be the prep analysis for a dependent analysis. This is accomplished by clicking on the dropdown arrow in the Sample Prep field and selecting the desired prep analysis. For a complete explanation of prep tests, see [Prep Tests](#).

Test: pesticides Method: uhl h 018 fifra Started:

Status: In Prep Type: Reportable: Completed:

Section: liquidchrom-ic Unit: ug/kg Released:

Panel:

Sample Prep: prep pest, uhl h 018 flu Printed:

Revision: 0

Name	Sample Type	Sequence
prep pest, uhl h 018 dupont	Soil	0
prep pest, uhl h 018 flu	Soil	0

Figure 245 Changing the Sample Prep Analysis of an Analytical Analysis

Started

This field indicates the date and time that the analysis was begun in the laboratory. It is automatically set to when the analysis is placed onto a worksheet but can be

overridden to indicate the actual start time of the analysis. For instruments that are electronically interfaced, this date and time is automatically updated to the injection time.

Completed

This field indicates the date and time that the analysis results were entered into the LIMS. It is automatically set to the date and time the worksheet was loaded back into the system but can be overridden to indicate the actual completion time of the analysis.

Released

This field indicates the date and time that the analysis was released or re-released. This field is set by the system and cannot be changed by the user.

Printed

This field indicates the date and time that the analysis was (or would have been) printed or re-printed on the Final Report.

Revision

The Revision number indicates the current version of the analysis. Laboratories sometimes unrelease an analysis in order to correct analysis information. Each time an analysis is unreleased, the revision number is automatically incremented by one.

Worksheet Table

This table displays all of the worksheets that contain this analysis. For example, if an analysis was run on two different worksheets, this table will have two entries indicating the worksheets.

To view the entire worksheet through the [Worksheet Completion](#) screen, select the row and click the **Select** button below the table.

User Table

This table displays a list of all of the laboratory staff that performed and/or released this analysis. The list is automatically populated by the Worksheet Completion and the Complete and Release modules. Additional entries can be manually added by using the **Add Row** button for those cases when multiple analysts helped complete the analysis.

4.7.7 TEST RESULTS TAB

A	B	C	D	E	F
<input type="checkbox"/>	Analyte	Value	Unit		
<input checked="" type="checkbox"/>	Accession # 1st Tri Sample	538104			
<input checked="" type="checkbox"/>	Collected 1st Tri Sample	2017-05-22			
<input checked="" type="checkbox"/>	Maternal Weight 1st Tri Sample	334.0	lbs		
<input checked="" type="checkbox"/>	Gestational Age 1st Tri Sample	71 days (10w1d)			
<input type="checkbox"/>	Birth	1988-05-11			
<input checked="" type="checkbox"/>	Egg Donor	No			
<input checked="" type="checkbox"/>	Egg's Age				
<input checked="" type="checkbox"/>	Maternal Age At Delivery	29.6	years		
<input checked="" type="checkbox"/>	Maternal Weight 2nd Tri Sample	326.0	lbs		

Figure 246 Test Results Tab

This tab displays the results of an analysis in an easy-to-read table. The fields and buttons and their uses are described below.

Reportable Checkbox

This checkbox is used to mark an analyte and its related results reportable. This is a second level of reporting capability as the [analysis will also have to be reportable](#). The box in this column header can be used to check (or uncheck) all of the analytes in that group.

This checkbox is defaulted to the [test definition](#) but can be changed to indicate if an analyte and its related values should be reported or not. For those systems that create billing, the reportable flag is also used to create billing information.

Analyte

This column contains the analyte that was tested or the question that was asked. OpenELIS generally calls any question (i.e., Chloroform, Date of Onset, Sign and Symptoms) an analyte.

Value

The Value field is used to enter the result for the corresponding analyte. It can be displayed as a numerical value (<0.5), as a qualitative result (Positive, Negative), as a titer (1:8, <1:256), or a date-time field (2012-12-21 00:01).

Other column analytes, such as Expected Value, Quant Limit, and MCL, might be present depending upon the test definition.

Add Row

This button is used to add an additional test analyte to this tab below the selected row. The Test Analyte Selection screen will pop up allowing the user to choose the desired test analyte(s) to add.

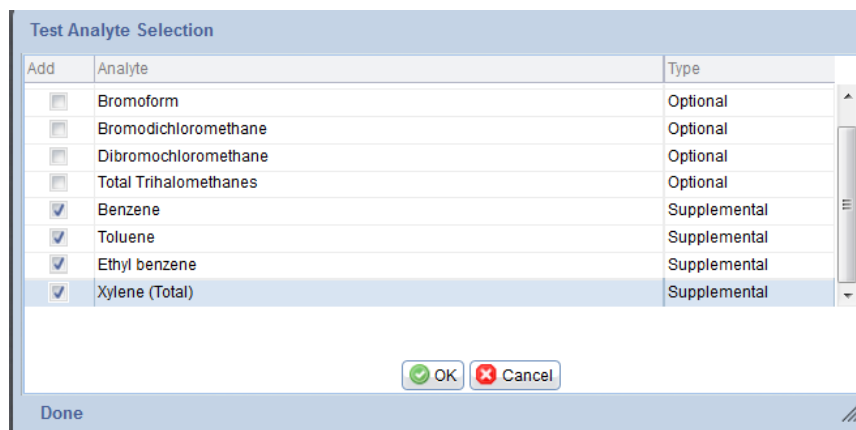


Figure 247 Test Analyte Selection Screen

Remove Row

This button is used to remove an analyte from this tab.

Check All and Uncheck All

These buttons check/uncheck the Reportable column.

Run Scriptlets

A [scriptlet](#) assigned to a test is run when any change is made to the data on the Test Results tab. The **Run Scriptlets** button can be used to force all of the scriptlets assigned to the sample (any applicable test and domain scriptlets) to run.

4.7.8 ANALYSIS NOTES TAB

The screenshot displays the 'Analysis Notes' tab within a software interface. At the top, a navigation bar contains several tabs: 'Sample', 'Clinical', 'Sample Item', 'Analysis', 'Test Results', 'Analysis Notes (1-1)', 'Sample Notes (0-1)', 'Storage', 'QA Events (3-0)', and 'Aux D'. The main content area is divided into two sections: 'External' and 'Internal'. The 'External' section features a text area containing a note: 'This corrected report should supersede the previous incorrect result of "E.coli O157:H7" reported on 7/26/2016. The corrected result was phoned to Amy by Alex Sedlacek on 8/8/2016 at 1420.' Below this text area is an 'Edit Note' button. The 'Internal' section contains a text area with a note: 'Unrelease analysis' followed by 'Unreleasing analysis to correct result.' The author 'asedlacek' and the date and time '2016-08-08 14:20' are displayed to the right of the note. Below the text area is an 'Add Note' button.

Figure 248 Analysis Notes Tab

The Analysis Notes tab allows for the entering of both internal and external comments that are related to a specific analysis. There is only one external note allowed and it may be edited as many times as needed. Internal notes, however, are individual entries, can only be committed once, and cannot be edited after committal. The subject line, author of the note, and date and time are only present on internal notes. Only external notes appear on result reports.

Click the appropriate button (**Edit Note** for an external note or **Add Note** for an internal note) to enter an analysis note. The [NOTE EDITOR](#) screen will pop up for this process.

4.7.9 SAMPLE NOTES TAB

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Figure 249 Sample Notes Tab

The Sample Notes tab allows for entering both internal and external comments that are tied to the entire sample. Sample notes are entered in the same manner as analysis notes. See [ANALYSIS NOTES TAB](#) and [NOTE EDITOR](#) for a detailed explanation.

4.7.10 STORAGE TAB

User	Location	Check In	Check Out
demo	1207, 1207 fridge/freezer 1207	2013-10-16 12:00	2013-10-16 12:00
demo	209, cart #1	2013-10-16 12:00	2014-06-10 12:00
mhayek	218, shelf west wall	2014-06-10 12:00	

Figure 250 Storage Tab

The Storage tab displays a list of storage locations for the selected analysis. Click on the **Add Row** button to enter an initial storage location or to move an analysis product to a new location. The User name and Check In date and time are automatically entered to reflect the logged-in user and current date and time, respectively. The (storage) Location can be selected from an autocomplete drop-down list that displays the Parent (Location), Storage (Sub-)Unit, and (Sub-)Location. The current date and time will be automatically entered in the Check Out field for the previous location. Check In and Check Out dates and times can be manually overridden.

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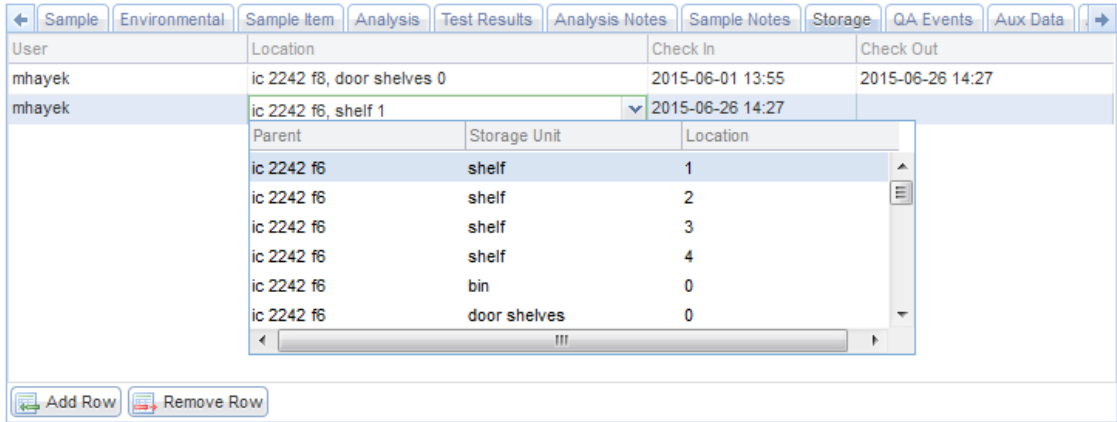


Figure 251 Selecting a Storage Location for an Analysis Product

4.7.11 QA EVENTS TAB

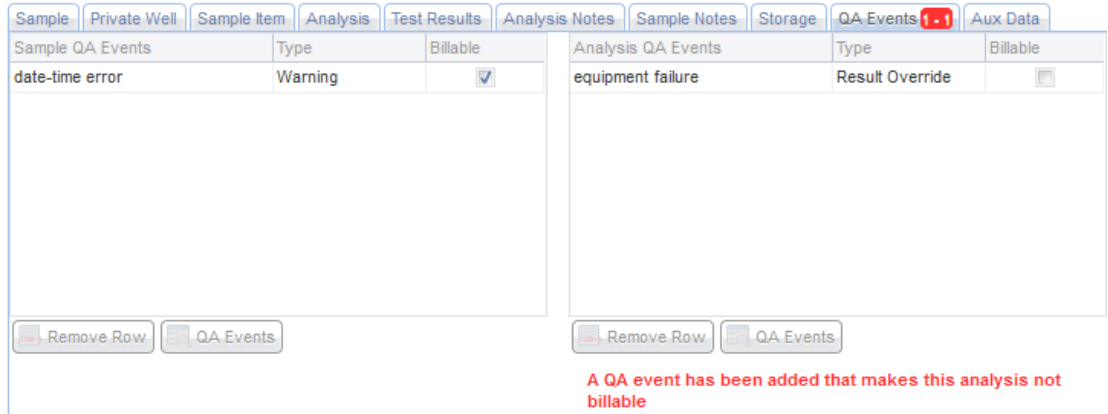


Figure 252 QA Events Tab

Quality Assurance events are flags that can be associated with a sample and/or an analysis to denote an exceptional condition. The Sample QA Events table shows a list of events that are associated with the sample while the Analysis QA Events table shows the events for the currently selected analysis.

QA events can be removed (**Remove Row** button) or added (**QA Events** button) using the appropriate button below each table. Clicking on the **QA Events** button will pop up the [QA EVENT SELECTION SCREEN](#). The user can also change the Type of QA Event

(Internal, Result Override, or Warning) by clicking on the dropdown arrow. The Billable checkbox can also be checked or unchecked.

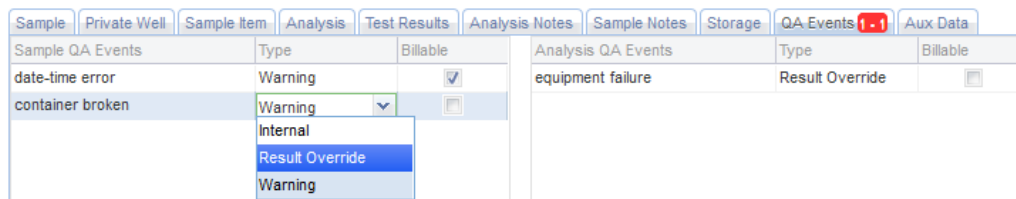


Figure 253 Changing the Type of QA Event

Since sample QA events affect all the analyses on that sample, they cannot be altered if any analysis has been released. The only exception is adding/removing internal QA events; the billable flag is marked billable if the sample/analysis is billable.

See [QA EVENTS](#) for a complete explanation of the benefits and types of QA events.

4.7.12 AUX DATA TAB

The Aux (Auxiliary) Data tab is used to capture additional questions related to the sample. The auxiliary analytes are grouped together and are usually standard for the type of sample or the particular tests that are assigned. This information is normally entered through the Aux Data tab located on the [FULL SAMPLE LOGIN](#) screens or the [SEND-OUT ORDER](#) screen as it becomes available.

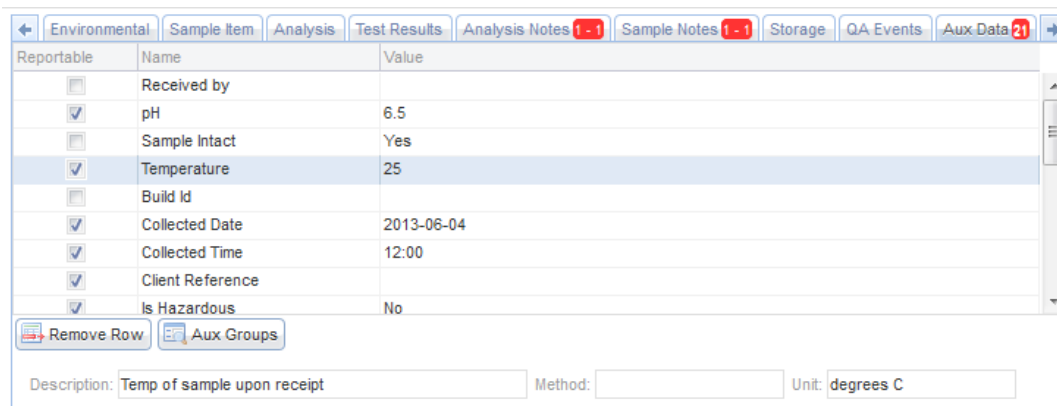


Figure 254 Aux Data Tab

To add auxiliary groups, click on the **Aux Groups** button. The Aux Group Selection screen will pop up. Clicking the **Remove Row** button removes the entire auxiliary group, not just the individual auxiliary analyte. See [AUX GROUP SELECTION SCREEN](#) for instructions on adding aux groups.

The Aux Data tab contains a table consisting of three columns: Reportable, Name, and Value. In Update Mode an auxiliary analyte can be selected to display its corresponding Description, Method, and Unit, if they are present.

Reportable

The Reportable checkbox may be manually checked (or unchecked) for any auxiliary analyte to mark it as reportable. Reportable auxiliary analytes and their final values are visible through the [Final Report](#), web portal data view, and electronically.

Name

The name of the auxiliary analyte is displayed in this field.

Value

A value for an auxiliary analyte is contained in this field and may be manually entered at any time before sample release. These values can be updated from this tab.

Description

The Description field displays additional helpful information about the auxiliary analyte.

Method

This field shows the method that is used to measure the auxiliary analyte, if there is one.

Unit

This field displays the unit of measurement for the auxiliary analyte, if there is one.

4.7.13 ATTACHMENT TAB

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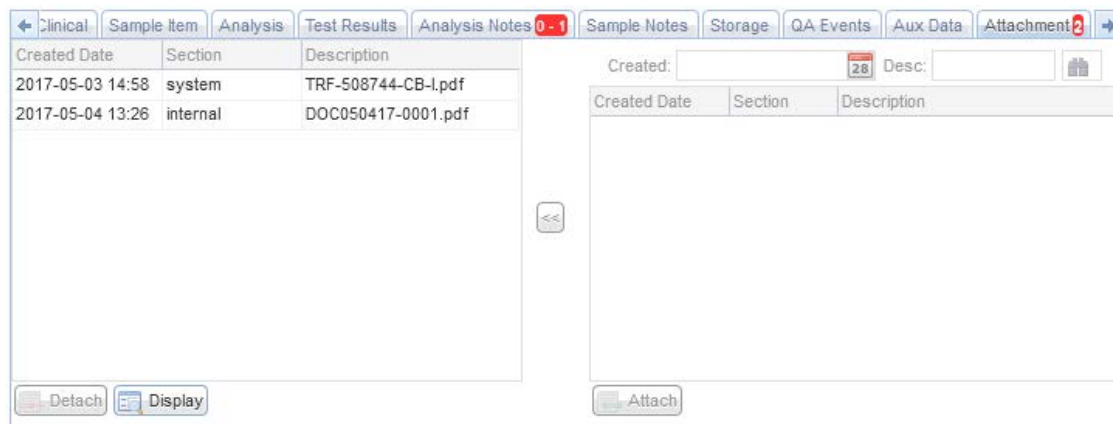


Figure 255 Attachment Tab

The Attachment tab is used to link a file to a sample. These attachments could be linked by the system (e.g., a previous revision of a Final Report) or linked manually by a user (e.g., Test Request Form, email from a client or co-worker, instrument graph, etc.) Files should be uploaded once to OpenELIS; however, they can be linked to multiple samples. Most of the standard file types can be linked and viewed from this tab (i.e., .pdf, .docx, .doc, .xlsx, .xls, .png, .txt, etc.) Attachments can be restricted so that they can only be viewed by specific groups of people (i.e., bacteriology lab section, client services staff, all internal laboratory staff (section = internal), or anyone with OpenELIS permissions including external clients (section = public)). These groups will first need to be defined through the [LABORATORY SECTION](#) screen.

Previous revisions of Final Reports and Test Request Forms are automatically assigned a section of “system”. Along with attachments that have been assigned a section of “public”, they are available for viewing through the OpenELIS Web Portal by external users with permission to those samples.

The steps for [adding an attachment](#) are described in the Full Sample Login section.

4.7.14 COMPLETING AN ANALYSIS

When an electronic worksheet is used to complete an analysis, the Complete function of the Complete and Release module is not needed. (See [WORKSHEET COMPLETION](#))

for a complete description of this process.) This Complete function is used when results are entered manually.

Sample or analysis information can be used to query for analyses that will be completed using this module. (See [QUERYING FOR ANALYSES](#) for more information.) Normally, these analyses will be in Logged In status. The normal process is outlined below:

1. The desired analysis is selected in the top pane of the Complete and Release screen.
2. The Test Results tab is selected in the bottom pane and the analysis values are entered while in Update Mode.

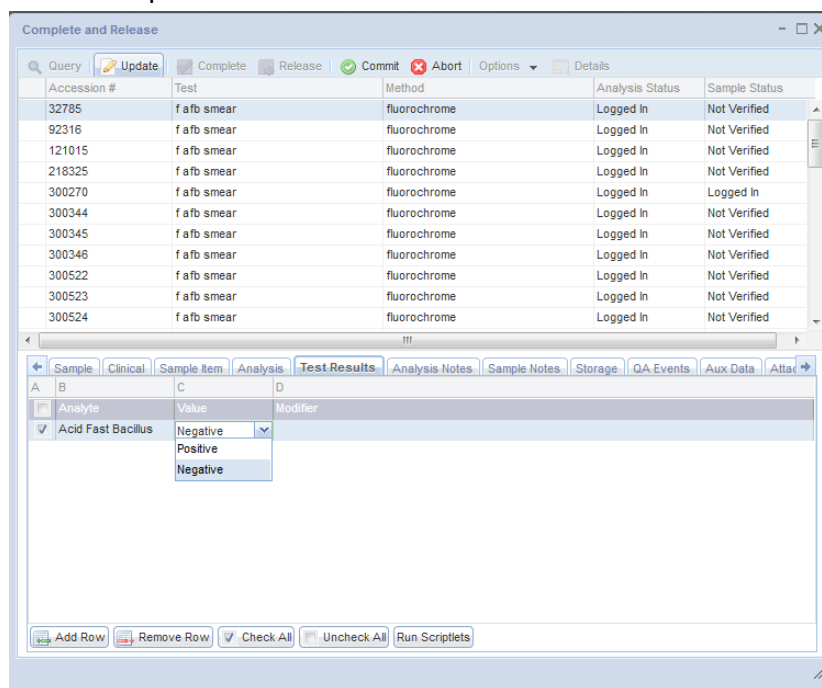


Figure 256 Entering Test Results through the Complete and Release Module

3. The analyst should examine the tabs with content indicators (red ovals) to the right of their headings for accuracy and so that she has a complete understanding of the analysis and sample information. Any additional updates to this information should be made at this time. The [started date and time](#) should be entered by the analyst on the Analysis tab. The **Commit** button

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needs to be clicked to save these changes to the database and to leave Update Mode.

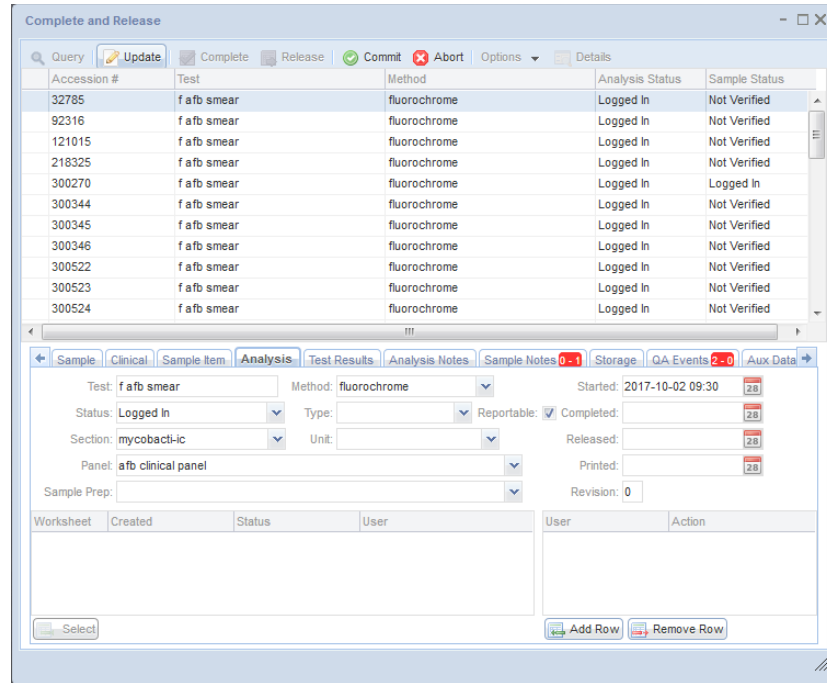


Figure 257 Entering the Started Date and Time for an Analysis

- When the user is certain that the selected analysis is ready to be completed, the **Complete** button is clicked. If the analyst wishes to complete multiple analyses concurrently, the **Ctrl** key can be used to multi-select a non-continuous range of analyses, while the **Shift** Key can be used to multi-select a continuous range of analyses, before the **Complete** button is clicked. Once the **Complete** button is clicked, OpenELIS attempts to lock the sample record for each selected analysis, runs any pertinent scriptlet(s) again, and refreshes the data. A checkbox will be displayed before each analysis row with the pre-selected analyses being checked if they can be completed. Their Analysis Status will be displayed as "Completed" as an indication to the analyst that they will be completed upon committal. The completed date and time will be entered by the system into the [Completed](#) field and the analyst's username and action will be entered into the [User Table](#) of the Analysis tab. If the started date and time was left empty, the completed date and time will also be entered by the system into the [Started](#) field. If the result information is

incomplete or if there is an issue with the execution of a [test scriptlet](#), one or more errors will be displayed on the bottom of the screen.

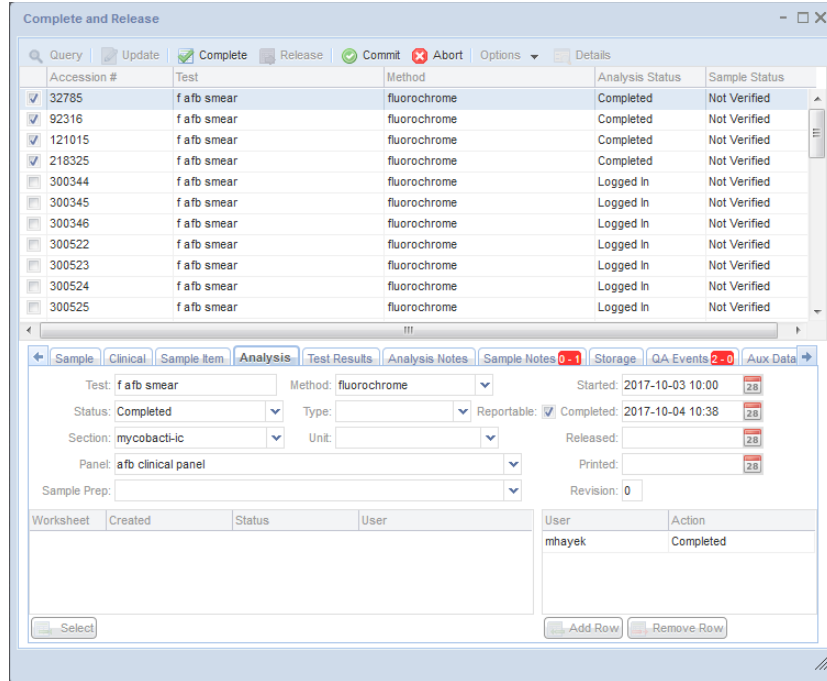


Figure 258 Completing Analyses

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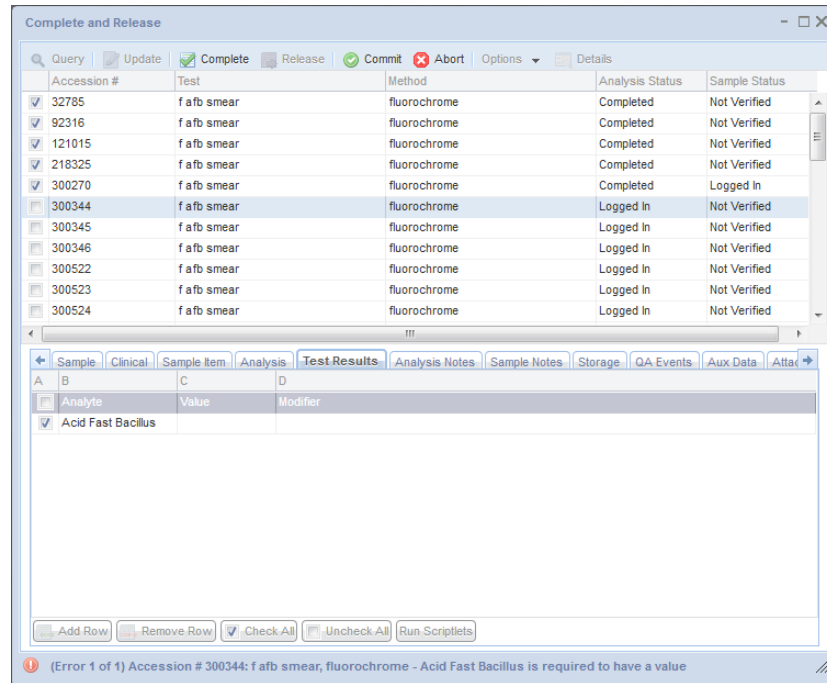


Figure 259 Analysis that Cannot be Completed because it has a Missing Result

5. Additional analyses can be checked for completion. Pre-selected analyses can be unchecked, if it is desired that they not be completed at this time. In this case, the sample will be unlocked and all analyses on the sample will be unchecked and refreshed with their prior data and status. The analyst can review the analyses' results again (and any of the other tabs), especially if it is known that the test possesses scriptlets.
6. The analyst clicks the **Commit** button and the analyses are completed. If this is the final analysis to be completed for the sample, and it has been [verified](#), the sample status also changes to "Completed".

4.7.15 RELEASING AN ANALYSIS

The Complete and Release screen is also used to review and release an analysis.

Sample or analysis information can be used to query for analyses that will be released using this module. (See [QUERYING FOR ANALYSES](#) for more information.) These analyses will be in Completed status. The normal process is outlined below:

1. The desired analysis is selected in the top pane of the Complete and Release screen.
2. The releaser should examine the tabs with content indicators (red ovals) to the right of their headings for accuracy and so that she has a complete understanding of the analysis and sample information. Any final updates to this information should be made at this time. The **Commit** button needs to be clicked to save these changes to the database and to leave Update Mode.
3. It may prove valuable to the releaser to compare the analysis and sample information from the Complete and Release screen to a preview of the Final Report to make sure that this information will be displayed clearly and properly to the client. See [PREVIEW FINAL REPORT OPTION](#) for a complete explanation.
4. When the user is certain that the selected analysis is ready for release, the **Release** button is clicked. If the reviewer wishes to release multiple analyses concurrently, the **Ctrl** key can be used to multi-select a non-continuous range of analyses, while the **Shift** Key can be used to multi-select a continuous range of analyses, before the **Release** button is clicked. Once the **Release** button is clicked, OpenELIS attempts to lock the sample record for each selected analysis, runs any pertinent scriptlet(s) again, and refreshes the data. A checkbox will be displayed before each analysis row with the pre-selected analyses being checked if they can be released. Their Analysis Status will be displayed as “Released” as an indication to the releaser that they will be released upon committal. The analyst’s username and action will be entered by the system into the [User Table](#) of the Analysis tab. If the result information is incomplete or if there is an issue with the execution of a [test scriptlet](#), one or more errors will be displayed on the bottom of the screen.

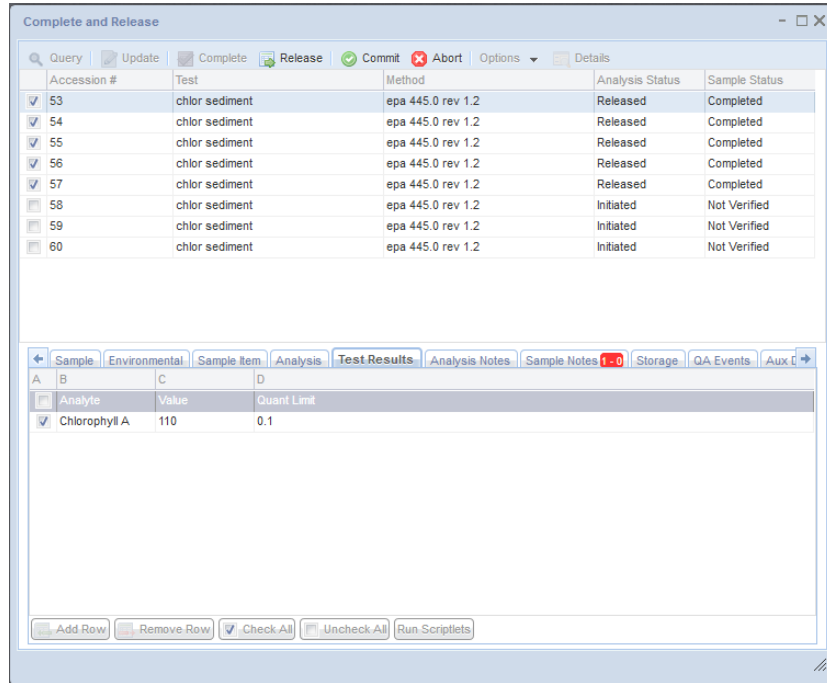


Figure 260 Releasing Analyses

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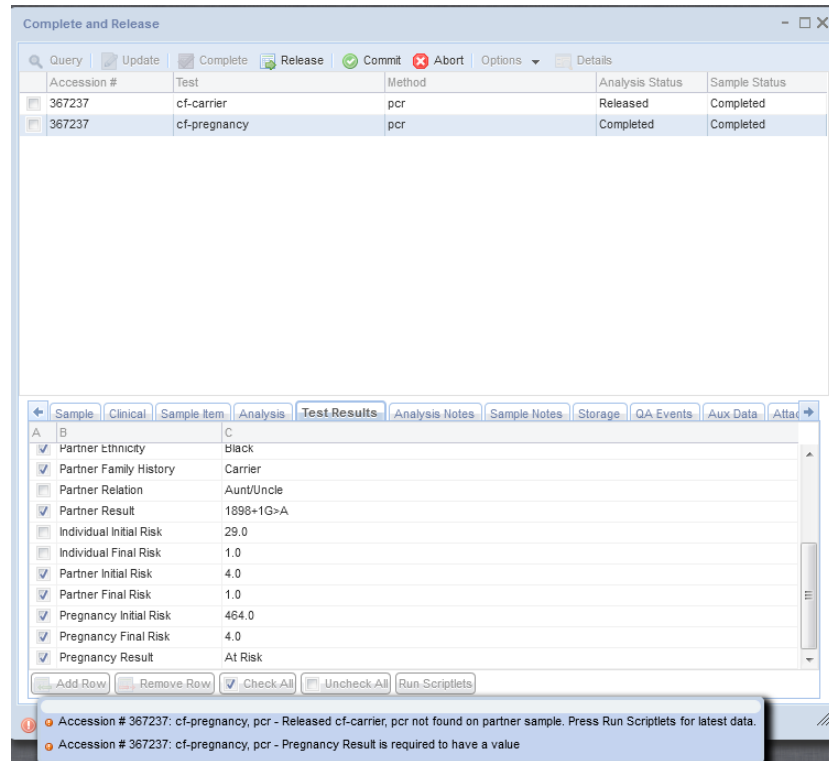


Figure 261 Analysis that Cannot be Released because of a Test Scriptlet Associated Error

5. Additional analyses can be checked for release. Pre-selected analyses can be unchecked, if it is desired that they not be released at this time. In this case, the sample will be unlocked and all analyses on the sample will be unchecked and refreshed with their prior data and status. The releaser can review the analyses' results again (and any of the other tabs), especially if it is known that the test possesses scriptlets.
6. The releaser clicks the **Commit** button and the analyses are released. The released date and time will be entered by the system into the [Released](#) field. If this is the final analysis to be released for the sample, the sample status also changes to "Released".

4.7.16 UNRELEASING AN ANALYSIS

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In order to update any analysis or result information on a released analysis, the analysis needs to be unreleased first. Select the analysis from the top pane of the Complete and Release screen and click on the **Unrelease Analysis** button on the Options drop-down list.

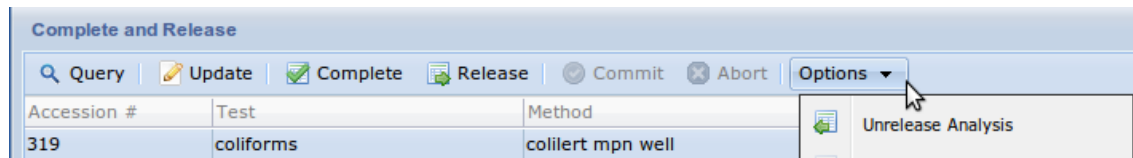


Figure 262 Unreleasing an Analysis

As part of the unrelease process, the system requires an internal note explaining the reason for unreleasing the analysis. The “Unrelease Analysis” message pops up to inform the analyst of this requirement. See [Note Editor](#) for more information about how to add a note.

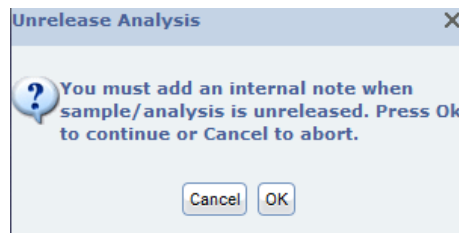


Figure 263 Unreleasing an Analysis Internal Note Requirement

Once an analysis has been unreleased, it will go to Completed status and must be re-released. Only users with analysis release/unrelease permission can perform these actions.

4.7.17 PREVIEW FINAL REPORT OPTION

It is useful for a reviewer to see the completed analysis information and results in a report format before the analysis is released. The Preview Final Report option on the Complete and Release screen was developed for that purpose.

Since this option shows any analysis before it is released*, an “Internal Use” watermark is placed in the background to distinguish between this preview and the actual Final Report.

*The sample must have at least one completed, on hold, or released analysis that is reportable and the sample must have a “report to” organization, in order for the Final Report Preview to be generated.

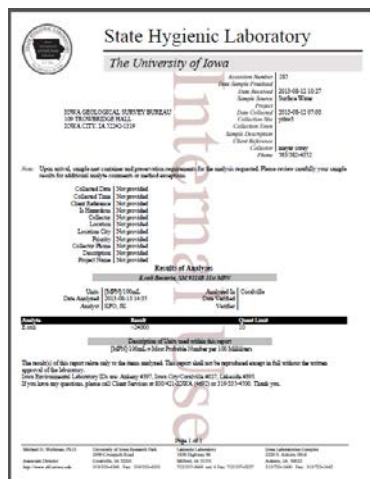


Figure 264 Final Report Preview

An analysis that has not been released can be previewed in Final Report format by checking the **Preview Final Report** checkbox in the Options drop-down list.

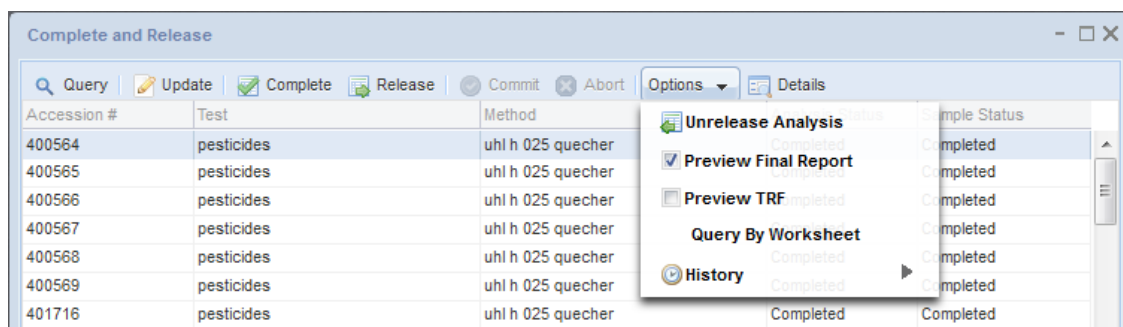


Figure 265 Preview Final Report Option

A side-by-side comparison of the information from the Complete and Release screen and the Final Report Preview can then easily be made. Each different sample that is selected in the Complete and Release screen will automatically cause the Final Report Preview to be refreshed.

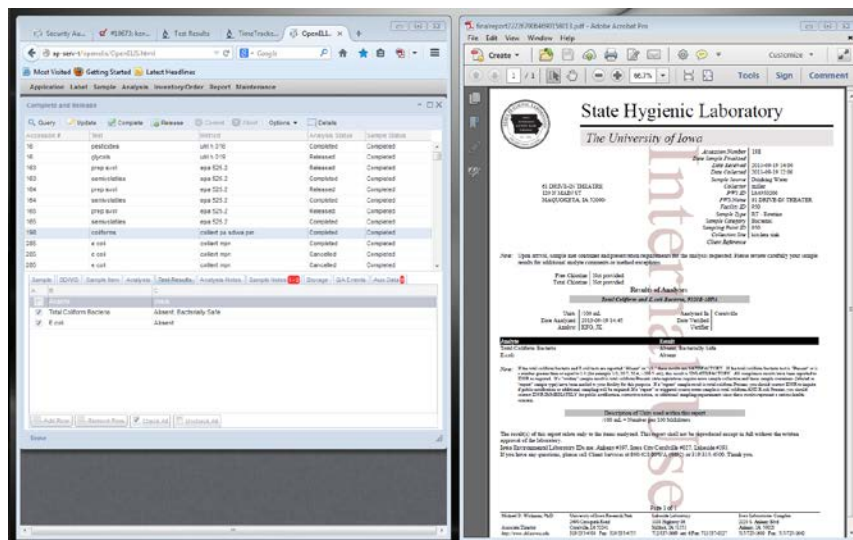


Figure 266 Side-by-Side Comparison of Complete and Release Screen and Final Report Preview

4.7.18 PREVIEW TRF OPTION

An analyst may learn important information by viewing the Test Request Form (TRF) of an analysis. The Preview TRF option on the Complete and Release screen was developed for that purpose.

The Test Request Form for an analysis can be viewed by checking the **Preview TRF** checkbox in the Options drop-down list.

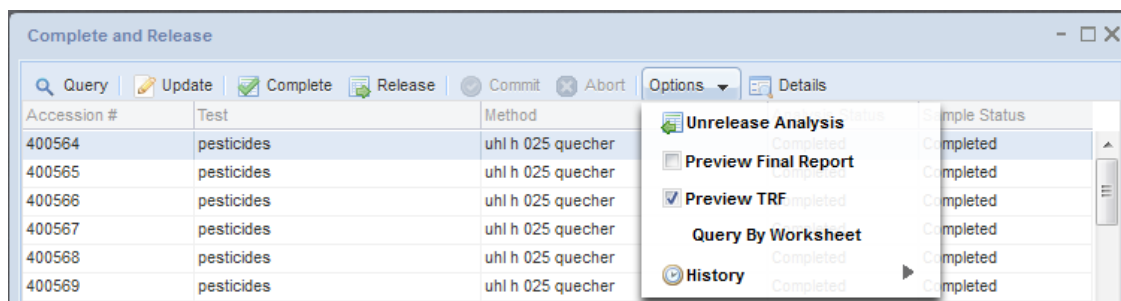


Figure 267 Preview TRF Option

A side-by-side comparison of the information from the Complete and Release screen and the TRF can then easily be made. Each different sample that is selected in the Complete and Release screen will automatically cause the displayed TRF to be refreshed.

4.7.19 HISTORY OPTION

See [HISTORY](#) for more information on the use of the history function.

4.8 STORAGE

The Storage screen provides the ability to view, move, and discard items/analyses products from storage locations. Both sample items (containers) and products of analyses are tracked through this screen: the Current tab shows all of the items/analyses products that are presently in the storage location, while the History tab shows all of the items/analyses products that were formerly stored in that location. This screen is not used for general inventory items such as reagents or standards.

The link to the Storage screen is located in the [Analysis Menu](#).

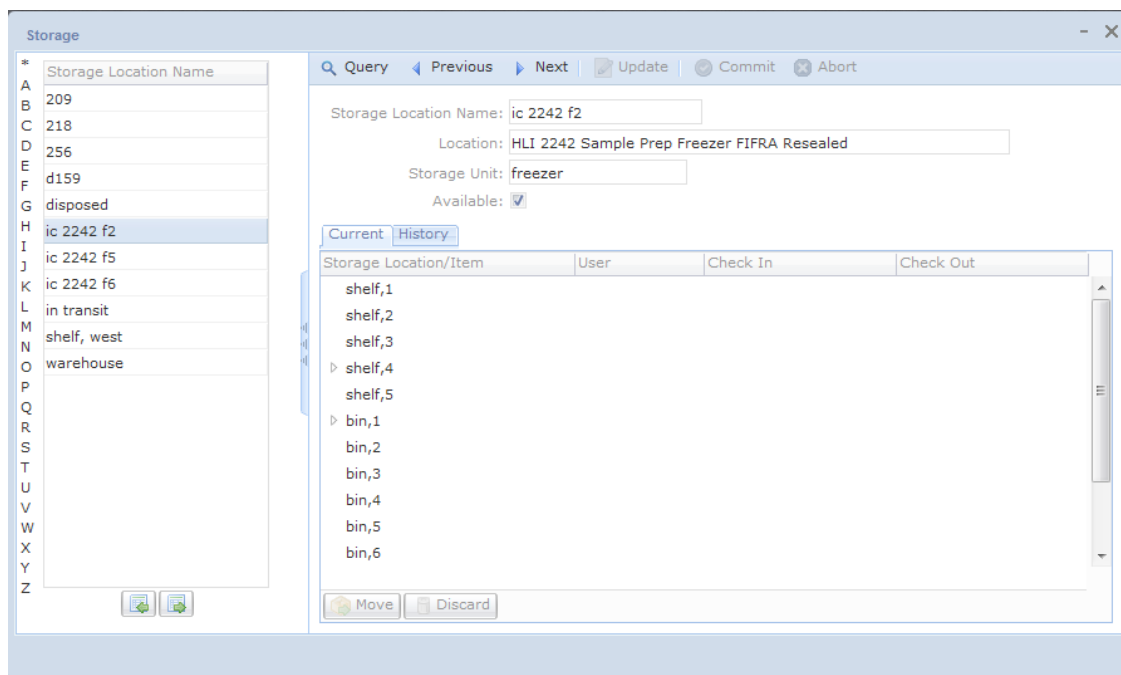


Figure 268 Storage Screen

4.8.1 GENERAL FIELDS

The general fields of the Storage screen are described below. These fields can be used for querying, but cannot be edited through this screen.

Storage Location Name

This is an abbreviated name for the storage location and is usually a room number and/or name. Storage locations are defined through the [STORAGE LOCATION](#) screen.

Location

This field provides a more detailed description of the storage location in the laboratory.

Storage Unit

This field defines the type of storage of this storage location. Examples include bench, cart, fridge, room, shelf, etc. This field is defined by using the [STORAGE UNIT](#) screen.

Available

This checkbox denotes whether the storage location is available for use.

4.8.2 CURRENT TAB

This tab provides a list of sample items/analyses products currently stored in the storage location. Items/analyses products in that location should match this list. The fields of this tab are described below.

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Storage Location/Item	User	Check In	Check Out
shelf,west wall			
5 - 0,12 - 240 mL Amber Gla	mhayek	2014-08-29 15:02	
524 - 0,turbidity : sm 2130 b	demo	2013-10-16 13:29	
2147 - 0,prep svol : epa 525	demo	2011-12-20 09:29	
16894 - 1,prep pest : epa 35	demo	2011-12-16 02:00	
cart,#1			
cart,#2			
11111 - 0,bromate : epa 30C	demo	2011-12-01 10:20	
cart,#3			
cart,#4			
cart,#5			

Figure 269 Current Tab

Storage (Sub-)Location

Each available storage sub-location is displayed on this tab. Sub-locations containing sample items/analyses products must be expanded to view this information.

Item

The sample items/analyses products are displayed in the tree below their storage sub-location. A sample container is displayed with the format of *Accession Number – Sample Item Number, Container name*, while an analysis product is displayed as *Accession Number – Sample Item Number, Test Name : Method Name*.

User

The username of the person who checked in the sample item/analysis product is displayed in this field.

Check In

The date and time that the sample item/analysis product was checked into the storage (sub-)location is displayed in this field.

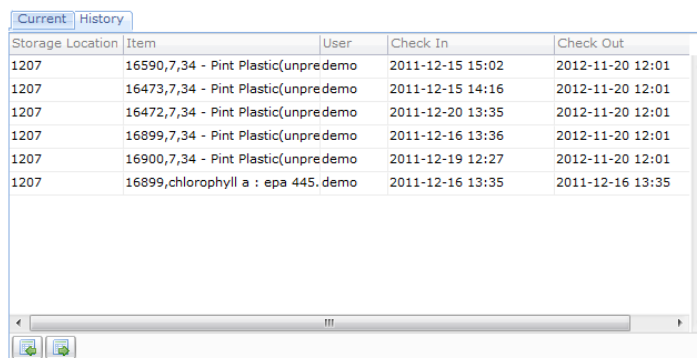
Check Out

The date and time that the sample item/analysis product was checked out of the storage (sub-)location is displayed in this field during the [process of moving it to a new storage location](#). Otherwise, this field will be empty since the item/product is currently being stored in this location.

4.8.3 HISTORY TAB

The History tab displays items that were formerly stored in that location. This provides a permanent record for auditing purposes; showing a chain-of-custody for sample items/analyses products.

The fields of this tab are the same as those found in the [CURRENT TAB](#). The only exceptions are that the Storage Location field only displays the storage location (and not the sub-location) and the Check Out field will never be empty.



Storage Location	Item	User	Check In	Check Out
1207	16590,7,34 - Pint Plastic(unpredemo		2011-12-15 15:02	2012-11-20 12:01
1207	16473,7,34 - Pint Plastic(unpredemo		2011-12-15 14:16	2012-11-20 12:01
1207	16472,7,34 - Pint Plastic(unpredemo		2011-12-20 13:35	2012-11-20 12:01
1207	16899,7,34 - Pint Plastic(unpredemo		2011-12-16 13:36	2012-11-20 12:01
1207	16900,7,34 - Pint Plastic(unpredemo		2011-12-19 12:27	2012-11-20 12:01
1207	16899,chlorophyll a : epa 445, demo		2011-12-16 13:35	2011-12-16 13:35

Figure 270 History Tab

4.8.4 MOVING SAMPLE ITEMS/ANALYSES PRODUCTS TO A NEW LOCATION

Sample items/analyses products from a storage location can be moved to another storage location or discarded. Multiple sample items/analyses products can be moved by **Ctrl**-selecting or **Shift**-selecting them, and then, clicking the **Move** button.

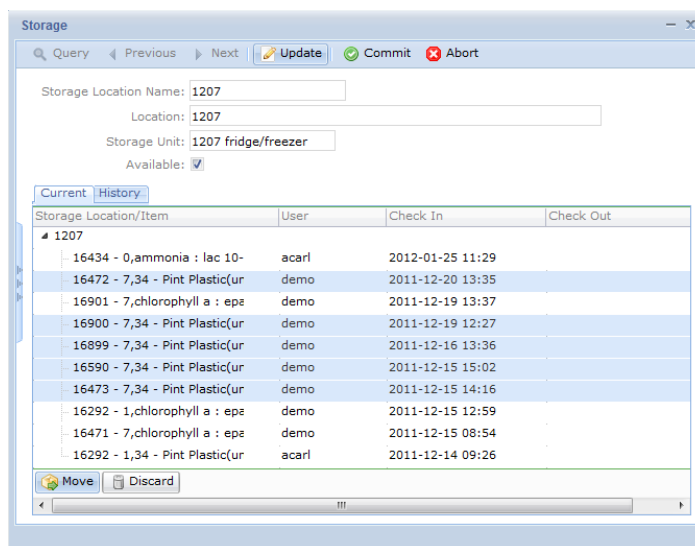


Figure 271 Moving Sample Items/Analyses Products to a New Storage Location

The Storage Location Selection screen will pop up. Click on the dropdown arrow in the Search box to list all storage sub-locations or enter the first few characters of the sub-location's name to narrow your search. Select the new storage location and click **OK**.

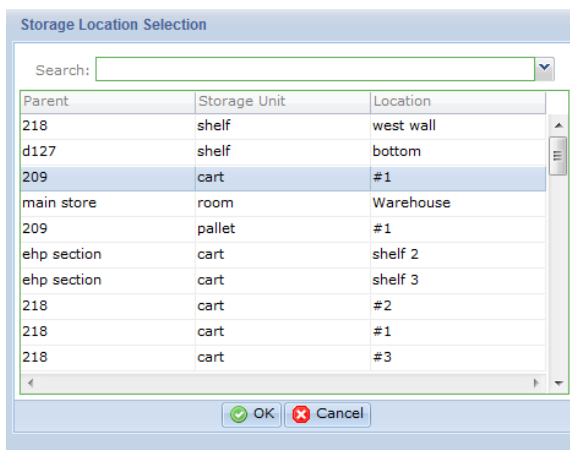


Figure 272 Storage Location Selection Screen

The moved sample items/analyses products will be time-stamped with the current date-time in the Check Out column and will be checked into the new location concurrently. The moved items/analyses will not be displayed in the Current tab of

their former location after the screen is refreshed. They will instead be displayed in the History tab.

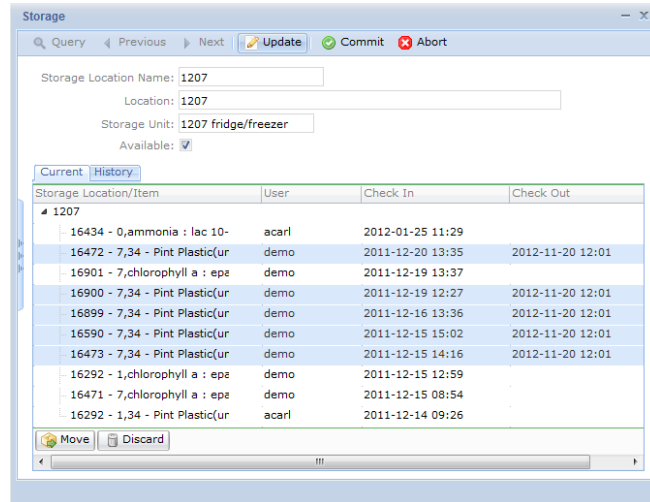


Figure 273 Moved Sample Items/Analyses Products Checked-Out of Former Location

4.8.5 DISCARDING SAMPLE ITEMS/ANALYSES PRODUCTS

Sample items/analyses products can also be discarded from storage. Multiple sample items/analyses products can be discarded by **Ctrl**-selecting or **Shift**-selecting them, and then, clicking the **Discard** button. The difference between discarding and moving sample items/analyses products is that discarding does not check them into a new storage location. They are permanently removed from the LIMS. A record of where these discarded sample items/analyses products were formerly stored will still be viewable through the History tab(s) of their former location(s).

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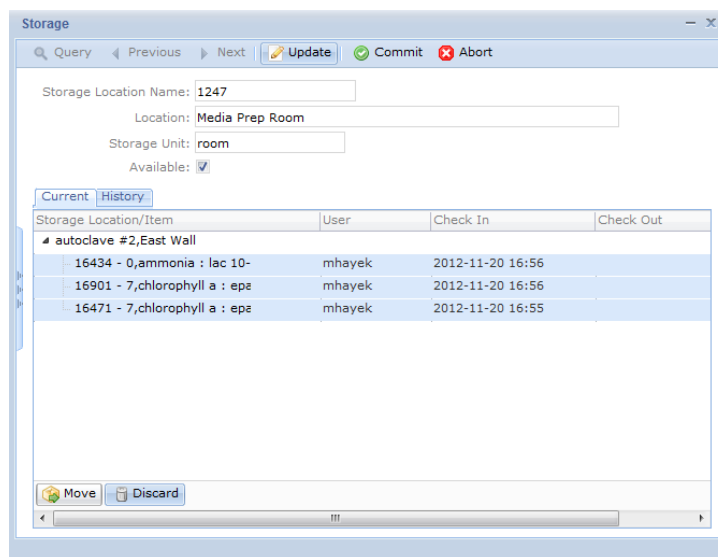


Figure 274 Discarding Sample Items/Analyses Products

Laboratories often desire to maintain logs of materials that are autoclaved, discarded, or sent to other agencies for containment. This can be achieved by creating storage locations such as “autoclave”, “chemical waste pickup”, etc., moving sample items/analyses products to that location first, and then discarding these items from there. Once again, this will provide a permanent record for auditing purposes and provide evidence of chain-of-custody for sample items/analyses products.

4.9 QC

The QC screen is used to define quality control items such as blanks, matrix spikes, lab control spikes, standards, duplicates, calibrations, as well as, reagents and media. This screen is used to capture the analyte and lot information for each defined QC, reagent, and medium.

The link to the QC screen is located in the [Analysis Menu](#).

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Analyte	Type	Trend	Expected Value
Sample Amount	Informational	<input type="checkbox"/>	100 g
Acetochlor	Target	<input checked="" type="checkbox"/>	0.50
Acetochlor OXA	Target	<input checked="" type="checkbox"/>	0.50
Acetochlor ESA	Target	<input checked="" type="checkbox"/>	0.50
Alachlor	Target	<input checked="" type="checkbox"/>	0.50
Alachlor OXA	Target	<input checked="" type="checkbox"/>	0.50
Alachlor ESA	Target	<input checked="" type="checkbox"/>	0.50
Dimethenamid	Target	<input checked="" type="checkbox"/>	0.50
Dimethenamid OXA	Target	<input checked="" type="checkbox"/>	0.50
Dimethenamid ESA	Target	<input checked="" type="checkbox"/>	0.50
Metolachlor	Target	<input checked="" type="checkbox"/>	0.50
Metolachlor OXA	Target	<input checked="" type="checkbox"/>	0.50
Metolachlor ESA	Target	<input checked="" type="checkbox"/>	0.50

Figure 275 QC Screen

4.9.1 GENERAL FIELDS

The general fields of the QC screen are described below.

Id

The unique identifier of the quality control item is assigned by the LIMS.

Name

This is the name for the QC. It is helpful for a laboratory to develop a naming convention for the QCs that help describe their use such as incorporating the test or method and the QC type in their name, i.e., ct/gc tma ih pos, cdc blood low, 016 matrix spike high spike, 1600 sample dup, etc.

Type

This field is used to categorize the QC item. Examples of QC types include Blank, Lab Control Spike, Duplicate, Initial Calibration, Continuing Calibration, Matrix Spike,

Matrix Spike Duplicate, Column Efficiency, Bacteria Duplicate, Information, and Lab Control.

Inventory Item

This autocomplete dropdown field allows you to link the QC to the source inventory item such as a purchased standard or media. See [INVENTORY ITEM](#) for more information on how inventory items are defined and used.

Source

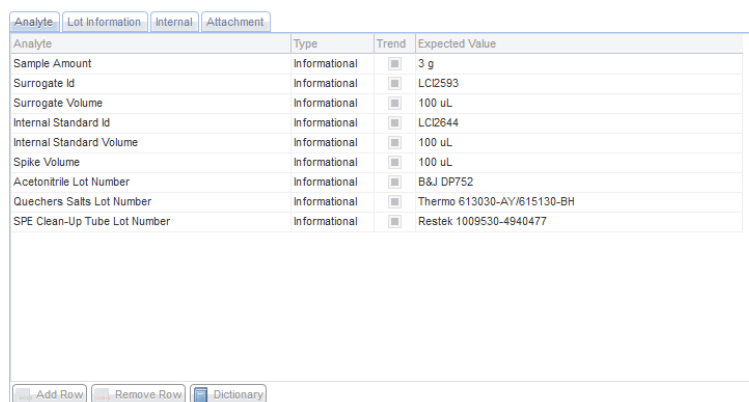
The source of the QC item can be displayed in this field. Examples include the name of the vendor for a purchased QC/reagent/medium or the laboratory's name for an internally manufactured one.

Active

This checkbox denotes whether the QC item is currently usable for analyses.

There are four tabs on the QC screen: Analyte, Lot Information, Internal, and Attachment. They are described in the following sections.

4.9.2 ANALYTE TAB



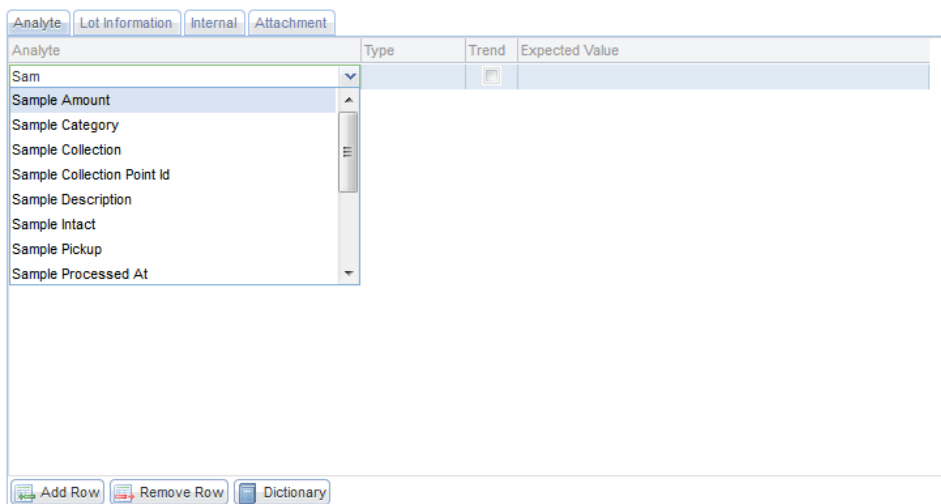
Analyte	Type	Trend	Expected Value
Sample Amount	Informational	<input type="checkbox"/>	3 g
Surrogate Id	Informational	<input type="checkbox"/>	LC2593
Surrogate Volume	Informational	<input type="checkbox"/>	100 uL
Internal Standard Id	Informational	<input type="checkbox"/>	LC2644
Internal Standard Volume	Informational	<input type="checkbox"/>	100 uL
Spike Volume	Informational	<input type="checkbox"/>	100 uL
Acetonitrile Lot Number	Informational	<input type="checkbox"/>	B&J DP752
Quechers Salts Lot Number	Informational	<input type="checkbox"/>	Thermo 613030-AY/615130-BH
SPE Clean-Up Tube Lot Number	Informational	<input type="checkbox"/>	Restek 1009530-4940477

Figure 276 Analyte Tab

The Analyte tab provides information about the component analytes of the QC item. The fields and buttons of this tab are described below.

Analyte

The name of the QC analyte is displayed here. This is an autocomplete field in Add and Update modes and a dropdown list will display partial matches.

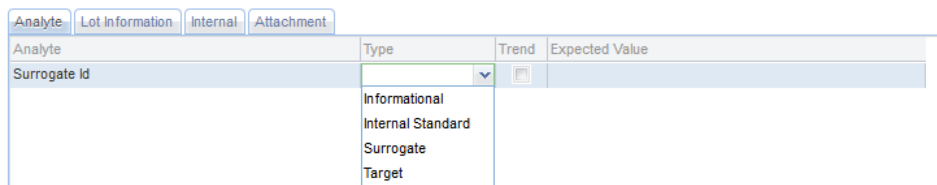


The screenshot shows a software interface with four tabs: 'Analyte', 'Lot Information', 'Internal', and 'Attachment'. The 'Analyte' tab is active. Below the tabs is a table with columns: 'Analyte', 'Type', 'Trend', and 'Expected Value'. The 'Analyte' column contains a dropdown menu with a list of items: 'Sam', 'Sample Amount', 'Sample Category', 'Sample Collection', 'Sample Collection Point Id', 'Sample Description', 'Sample Intact', 'Sample Pickup', and 'Sample Processed At'. The 'Type' column has a small dropdown arrow. The 'Trend' column has a checkbox. The 'Expected Value' column is empty. At the bottom of the interface are three buttons: 'Add Row', 'Remove Row', and 'Dictionary'.

Figure 277 Selecting an Analyte from a Dropdown List

Type

The type of QC analyte is displayed in this field. A dropdown list displays the various QC analyte types. Examples include Informational, Internal Standard, Surrogate, and Target.



The screenshot shows the same software interface as Figure 277, but with the 'Type' dropdown menu open. The dropdown list contains four options: 'Informational', 'Internal Standard', 'Surrogate', and 'Target'. The 'Analyte' column now displays 'Surrogate Id'.

Figure 278 Selecting the Type for a QC Analyte

Trend

This checkbox denotes whether the analyte will be trended in the [QC Chart](#) report.

Expected Value

The expected value of the analyte is displayed in this field. It could be a numerical measurement, dictionary entry, volume, or id, etc. The expected value of each analyte for a QC is loaded on an electronic worksheet and can be viewed through the [Worksheet Completion](#) screen.

Add Row

This button is used to add a new analyte row to the tab.

Remove Row

This button is used to remove an analyte row from the tab.

Dictionary

This Dictionary button is used to add a dictionary item to the Expected Value field. This button pops up the Choose Dictionary Entry screen for this purpose.

Entry	Category
Nanograms per Liter	Description - Unit of Measure
Nanograms per Milliliter	Description - Unit of Measure
Nanograms per Sample	Description - Unit of Measure
Nanometers	Description - Unit of Measure
Natural	Type of Rabies Death
Negative	General Results
Negative for Legionella pneumophila serogroups...	Bacterial Results
Negative for serogroups 1-15	Bacterial Results
Negative for serogroups b-m	Bacterial Results
Negative, with contaminants	General Results

Figure 279 Choose Dictionary Entry Screen

4.9.3 LOT INFORMATION TAB

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Active	Lot Number	Location	Prepared Date	Usable Date	Expire Date	Prepared Volume	Prepared Unit	Prepared By
<input checked="" type="checkbox"/>	3808	Iowa City	2017-05-01 10:11	2017-06-15 10:11	2017-11-17 10:11	12000	mL	rcautino
<input checked="" type="checkbox"/>	04071701	Iowa City	2017-04-07 10:11	2017-04-12 10:11	2017-10-17 10:11	12000	mL	rcautino
<input type="checkbox"/>	10061601	Iowa City	2016-10-07 10:11	2016-10-09 10:11	2017-04-06 10:11	2000	mL	rcautino
<input type="checkbox"/>	3548	Iowa City	2016-10-06 10:11	2016-10-09 10:11	2017-04-06 10:11	3000	mL	rcautino
<input type="checkbox"/>	3510	Iowa City	2016-09-22 10:11	2016-10-05 10:11	2017-03-22 10:11	3000	mL	rcautino

Figure 280 Lot Information Tab

This tab is used to record lot information including lot numbers, preparation, and usability. The fields and buttons of this tab are described below.

Active

This checkbox denotes whether the QC/reagent/medium lot is currently available. Multiple lots can be active at the same time and the [QC LOOKUP SCREEN](#) of the Worksheet Builder module will display all active QC lots.

Lot Number

The lot number of the QC/reagent/medium is displayed in this field. The lot number is an identification number assigned to a particular quantity or lot of material by the manufacturer. Lot numbers must be unique throughout all of the QC items/reagents/media including those manufactured by the laboratory.

Location

This field is used to define the location where the QC/reagent/medium lot is available. The possible locations are listed in a dropdown list.

Prepared Date (and Time)

The date and time when the QC/reagent/medium lot was prepared is displayed in this field.

Usable Date (and Time)

The date and time when the QC/reagent/medium lot can be used is displayed in this field.

Expire Date (and Time)

The date and time when the QC/reagent/medium lot expires is displayed in this field.

Prepared Volume

The volume of the QC/reagent/medium lot that was prepared can be displayed in this optional field.

Prepared Unit

The unit of measurement of the QC/reagent/medium lot that was prepared can be displayed in this optional field. The possible units are listed in a dropdown list.

Prepared By

The OpenELIS username of the person who prepared the QC/reagent/medium lot is displayed in this field.

The functionality of the buttons at the bottom of this tab during Add/Update Mode is described below.

Add Row

This button is used to add a new QC/reagent/medium lot row to this tab. The Active checkbox will be checked by default and the Prepared Date and Prepared By fields will be defaulted to the current date and time and logged-in user, respectively. They may be manually changed, however.

Remove Row

This button allows for the removal of a row on this tab.

Duplicate

When it is desirable to copy most of a lot's information to a new lot, a lot row can be selected and then duplicated using the **Duplicate** button. The Lot Number of the duplicate row will have to be changed because lot numbers must be unique in OpenELIS. Any of the other fields can be manually changed, if necessary.

4.9.4 INTERNAL TAB

The Internal tab displays any internal notes that are related to the QC/reagent/medium. Each internal note is added individually and cannot be edited after committal. Each note consists of a subject line, the author's username, a creation date-timestamp, and the message body.



Figure 281 Internal Tab

An internal note can be added by clicking on the **Add Note** button while in Add/Update mode. This action will pop up the [NOTE EDITOR](#) to be used for this purpose.

4.9.5 ATTACHMENT TAB

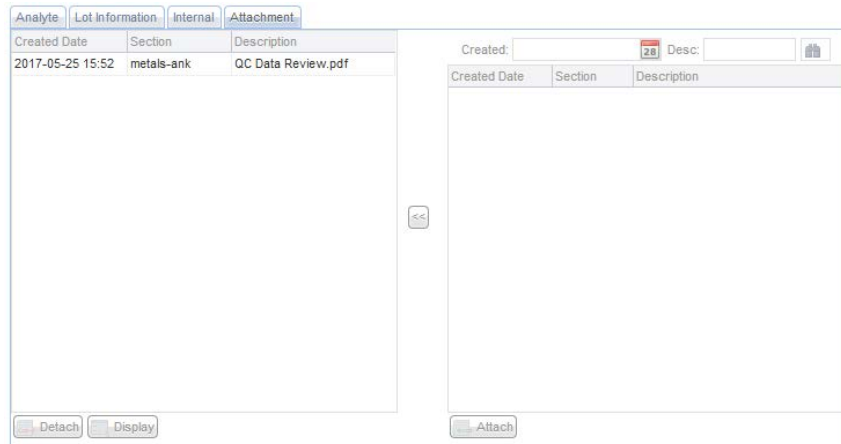


Figure 282 Attachment Tab

The Attachment tab can be used to link a file to a QC/reagent/medium. These attachments can include documentation of QC data validations and reviews. Files should be uploaded once to OpenELIS; however, they can be linked to multiple QCs/reagents/media. Most of the standard file types can be linked and viewed from this tab (i.e., .pdf, .docx, .doc, .xlsx, .xls, .png, .txt, etc.) Attachments can be restricted so that they can only be viewed by specific groups of people (i.e., bacteriology lab section, client services staff, or all internal laboratory staff (section = internal). These groups will first need to be defined through the [LABORATORY SECTION](#) screen.

The steps for [adding an attachment](#) are described in the Full Sample Login section.

4.10 ANALYTE PARAMETER

This screen is used to define a range of performance criteria over a period of time for a set of analytes such as those defined in tests, QCs, or associated with the performance of a provider.

The link to the Analyte Parameter screen is located in the [Analysis Menu](#).

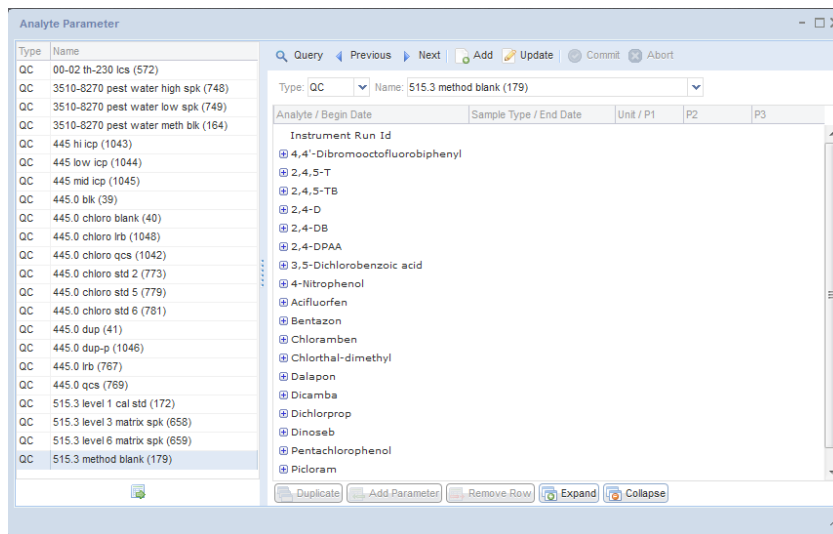



Figure 283 Analyte Parameter Screen

4.10.1 FIELDS

The fields of the Analyte Parameter screen are described below.




Type

Currently, there are three types of analyte parameters implemented in the LIMS: Test, QC, and Provider. One of the types must be selected for a query to be executed. The type specifies as to whether the selected screen applies to a test, QC, or provider. The “continue” button  can be clicked to expand the list that is displayed in the left sidebar.

Name

This field contains the name of the test, QC, or provider to which the analyte parameters are associated. The test name that is displayed consists of the paired test and method names. If a test has been retired, the date range that it was active in the system is displayed in brackets. The QC name that is displayed consists of the QC name followed by its Id in parentheses. The provider name consists of the provider’s last and first names.

Analyte

This field specifies the analyte from the test, QC, or provider. Analytes that have any parameters in the LIMS will have a  icon in front of them. Each individual analyte node can be expanded by clicking on its  icon in order to view its current and past parameter values and their beginning and ending dates. An analyte node can be collapsed by clicking on its  icon. The **Expand** or **Collapse** buttons can be used to automatically expand or collapse all of the analyte nodes on the screen.

Sample Type

This field can be used to further restrict an analyte parameter for a test by type of sample (drinking water, liquid, solid, non-drinking water, etc.). For adding more sample types, duplicate the analyte by using the **Duplicate** button and select the desired sample type.

Unit

This field can be used to further restrict an analyte parameter for a test by unit. Only a unit that is defined for a sample type in the test definition may be selected; units that are not valid will be grayed-out. For adding more units, duplicate the analyte by using the **Duplicate** button and select the desired sample type first, followed by its corresponding unit.



Analyte / Begin Date	Sample Type / End Date	Unit / P1	P2	P3
Dissolved Aluminum				
Dissolved Antimony				
 Dissolved Arsenic	Drinking Water	mg/L		
└ 2015-03-04 10:48	2015-06-30 23:59	0.015	0.064	
 Dissolved Arsenic	Non-Drinking Water	ug/L		
└ 2015-03-04 10:48	2015-06-30 23:59	15	64	
Dissolved Barium				
Dissolved Beryllium				

Figure 284 Analyte Parameters for Specified Sample Types and Units for a Test

Begin Date and End Date

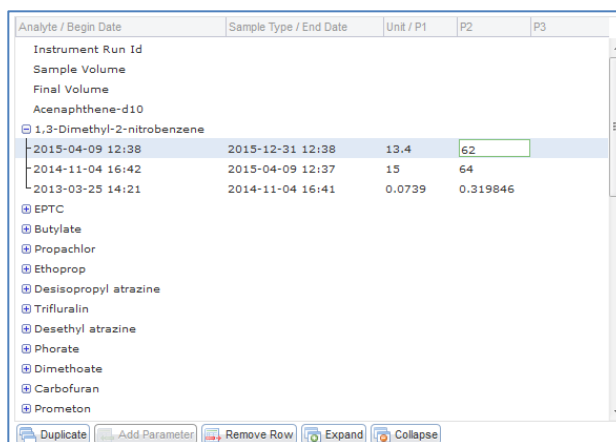
These dates specify the span of time that the parameters' (P1, P2, P3) values are applicable for that analyte in the system.

P1, P2, P3

These fields contain values that are specific to the selected test/QC/provider and analyte. These values are dependent on how that information is used, e.g., they can represent minimum, maximum, and average % recovery or precision limit, Lower Control Limit (LCL), Upper Control Limit (UCL), and mean for QC Charting “analyte parameters (fixed)” option, etc. See [QC Chart](#) for more information on how these analyte parameters can be graphed.

4.10.2 ADDING A NEW ANALYTE PARAMETER VALUE

When it is desirable to enter a new analyte parameter value(s) into the LIMS and retire the previously used value(s), the analyst will need to add a new parameter row. This can be accomplished in either Update or Add modes. The designated analyte row must first be selected and then the **Add Parameter** button is clicked. The Begin Date and End Date are entered along with the new parameter value(s). The End Date of the previous parameter row (if present) will be automatically updated to the minute preceding the Begin Date of the new parameter row. The **Duplicate** button can be used to copy an existing parameter row so that it can be modified slightly (e.g., adjusting a few digits of a parameter value and its corresponding Begin Date and End Date).



Analyte / Begin Date	Sample Type / End Date	Unit / P1	P2	P3
Instrument Run Id				
Sample Volume				
Final Volume				
Acenaphthene-d10				
1,3-Dimethyl-2-nitrobenzene				
2015-04-09 12:38	2015-12-31 12:38	13.4	62	
2014-11-04 16:42	2015-04-09 12:37	15	64	
2013-03-25 14:21	2014-11-04 16:41	0.0739	0.319846	
EPTC				
Butylate				
Propachlor				
Ethoprop				
Desisopropyl atrazine				
Trifluralin				
Desethyl atrazine				
Phorate				
Dimethoate				
Carbofuran				
Prometon				

Figure 285 Adding a New Analyte Parameter Value

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One or more parameter rows can be copied to different analytes. Use **Ctrl** to select all the parameter rows that you wish to copy, select the destination analyte(s), and click the **Duplicate** button. The following example shows a parameter row being copied to four analytes.

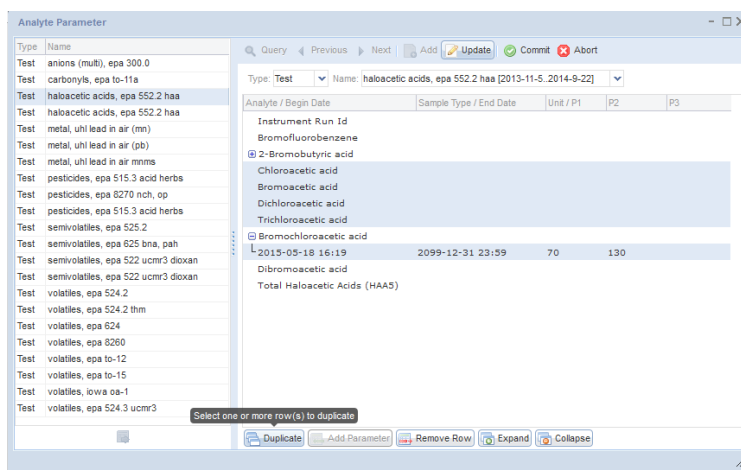


Figure 286 Duplicating a Parameter Row to Additional Analytes

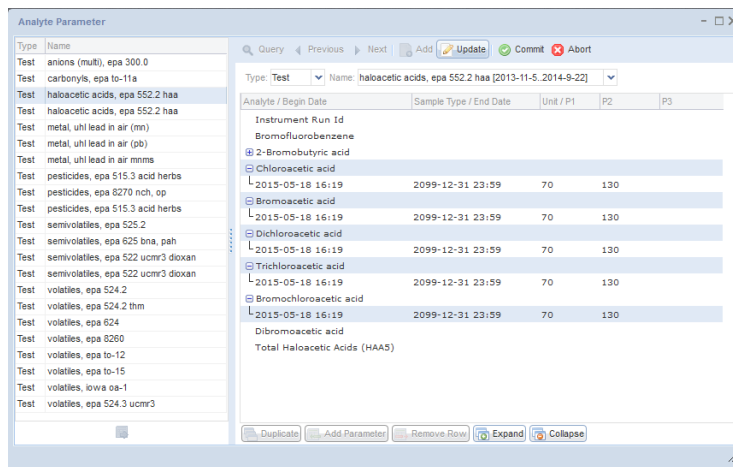


Figure 287 A Parameter Row that has been Duplicated to Additional Analytes

4.10.3 ADDING A NEW ANALYTE PARAMETER RECORD

When it is desirable to enter initial analyte parameter values into the LIMS for a test, QC, or provider, the analyst will need to add a new analyte parameter record. First, the Type needs to be selected while in Add mode. Next, the name of the

test/QC/provider can be partially entered into the autocomplete Name field and it can then be selected from the dropdown list. The current analytes for this test/QC/provider will be loaded onto the screen. The same process is then used to enter parameters that is used for an existing analyte parameter record.

CHAPTER 5. WORKSHEETS

OpenELIS uses an electronic worksheet (bench sheet) to organize and manage laboratory runs or batches. There are many benefits to using an electronic worksheet including reduction in transcription errors, ability to provide automatic calculations, and to easily store and retrieve a significant amount of data. In general, electronic worksheets provide the following functions:

1. The ability to capture and retain all of the raw instrument data per analyte while transferring only a subset to the analysis results
2. Capture and retain QC data
3. Link QC data to analyses
4. Worksheet runs can be tied to the instrument to capture instrument usage
5. Worksheets can be linked to provide continuous calibration or to link a QC validation worksheet to analytical runs
6. Document failed runs, obtain statistics on QCs used and the number of times an analysis has been run, and view the entire run when releasing the analysis

The additional benefit to using an electronic worksheet is to easily create control charts. See [QC CHART](#) for a complete description of this process.

5.1 WORKSHEET BUILDER

The initial step to creating any worksheet utilizes the Worksheet Builder module. The link to the Worksheet Builder module is located in the [Analysis Menu](#).

The Worksheet Builder module allows for worksheets to be queried, a new worksheet to be built, and a previously-built worksheet to be updated. This screen was designed to allow for a great deal of flexibility and freedom which includes making the worksheet incompatible with your run. Pop-up messages have been built into the system to warn the user of these consequences.

“What you see on the Worksheet Builder screen is what you will get on your worksheet!”

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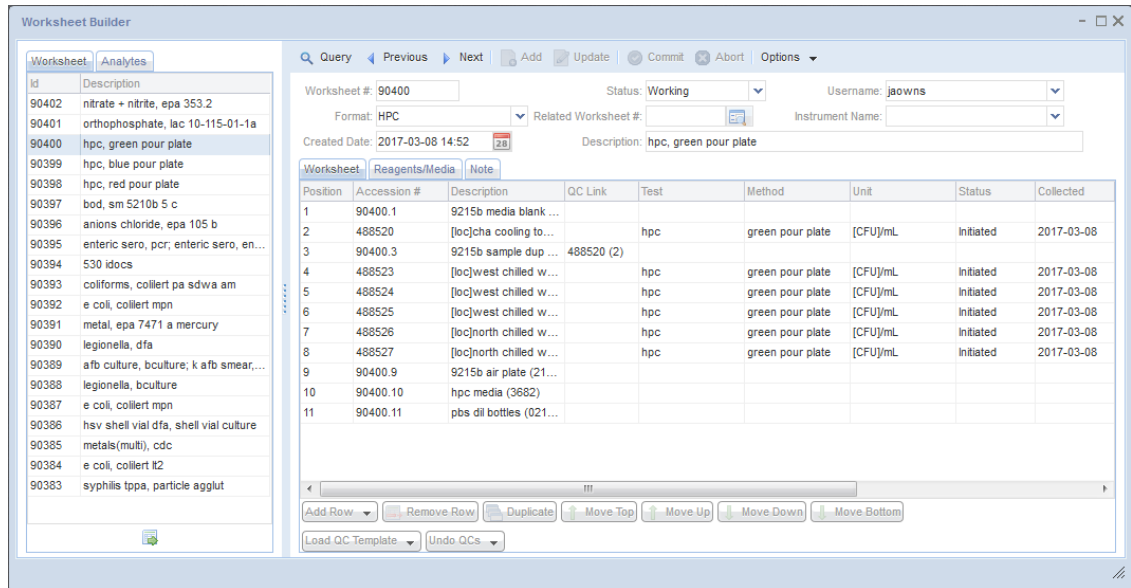


Figure 288 Worksheet Builder Screen

5.1.1 GENERAL FIELDS

The general fields on this screen are described below.

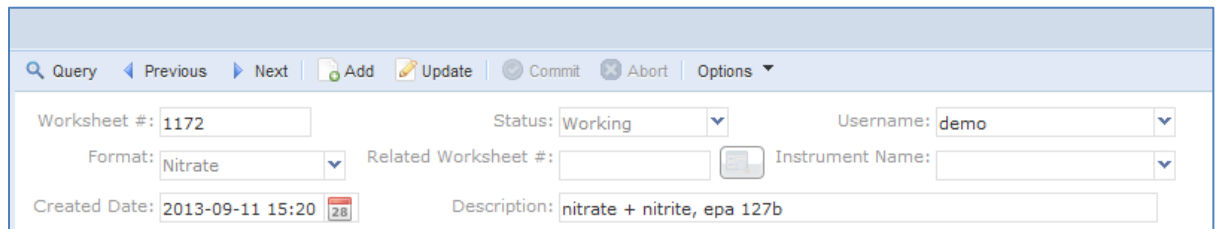


Figure 289 General Fields

Worksheet

This number uniquely identifies the worksheet and is automatically assigned by the LIMS.

(Worksheet) Status

This field specifies the overall status of the worksheet. Worksheet statuses consist of:

- a. **Working.** This is the default status for a worksheet that is in the process of being built, updated, or completed. A worksheet with a status of Done, Failed Run, or Void must have its status changed to Working or Pending Release, in order to, be updated.
- b. **Pending Release.** This status could also be selected when all of the analyses are in Completed status in order to inform the releaser that the worksheet's analyses should be reviewed and released.
- c. **Done.** This status should be selected when all of the analyses are in Completed status and it is normally the end of a worksheet's life cycle. Completed analyses must still be released. See [RELEASING AN ANALYSIS](#) for more information on this procedure.
- d. **Failed Run.** This status should be used when instrument, reagent, or human error causes the run to fail. Selecting this status will change all of the worksheet's analyses to Requeue status so that they may be rerun at a later time.
- e. **Void.** This status should be used when the analyst no longer wishes to use the worksheet because he deems it to be unusable. This status will set all of the analyses back to Logged In status.

Username

The username of the person who built the worksheet is specified in this field. This field is defaulted to the logged-in username, but it may be manually overridden.


Format

The format that will be used to build the worksheet is specified in this field. It is defaulted to the [format](#) that is specified in the test definition of the first analysis that is listed on the worksheet. The format can be changed by the analyst, if needed.

Related Worksheet #

Sometimes, it is useful to link worksheets together due to a functional relationship. An analyst may decide to build a worksheet for a "QC only" run and link it to another worksheet from an analytical run. A large batch of analyses can also be divided into

two worksheets to make them easier to manage. These related worksheets can then be linked together.

A related worksheet can be linked to the worksheet that is being built or updated by clicking on the lookup button.  This will pop up the Worksheet Lookup screen that is used to populate this field. See [Worksheet Lookup Screen](#) for a complete explanation of this screen.

Instrument Name

The name of the instrument that is being used to analyze the run, if applicable, can be selected from this autocomplete field. This field links the instrument log to the worksheet. Instrument log information from the analytical run (including the Worksheet #) is recorded as an entry in the [INSTRUMENT](#) screen.

Created Date (and Time)

The date and time that the worksheet was created is displayed in this field. The created date and time is defaulted to when the **Add** button is clicked to build a new worksheet.

(Worksheet) Description

This field can be used to provide the basic purpose of the worksheet. By default, it lists the “test, method” pairs assigned to samples on the worksheet up to a 60 character maximum. This is a free-text field, however, so other descriptions may be entered (i.e., qc only run, mdl run, etc.) This field is searchable so it may be useful for worksheet queries.

OPTIONS MENU

The following features can be accessed through the Options dropdown menu:

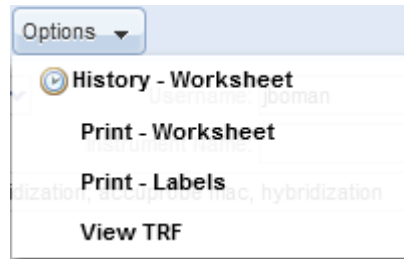


Figure 290 Options Menu

Print - Worksheet

The Print – Worksheet option generates a printable worksheet that can be used by the analyst to help set up the samples and QCs on the bench or in the instrument. Selecting this option pops up the Print screen.

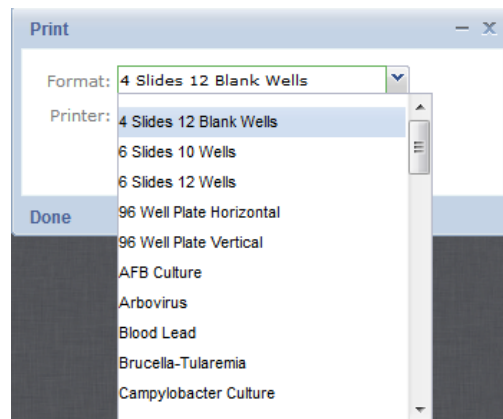


Figure 291 Print - Worksheet Screen

One or more worksheet formats may be available in OpenELIS for a particular test. The Printer field is used for the selection of the network printer to print a hard copy, to view the report in pdf format on the computer monitor (View in PDF), to fax it (fax), or to e-mail it to the user as a pdf file (pdf).

Print - Labels

The Print – Labels option generates one label for each occupied row on the [Worksheet tab](#) of the worksheet. These labels can be affixed to secondary containers used during testing, and have other uses, as well. Selecting this option pops up the Print screen.

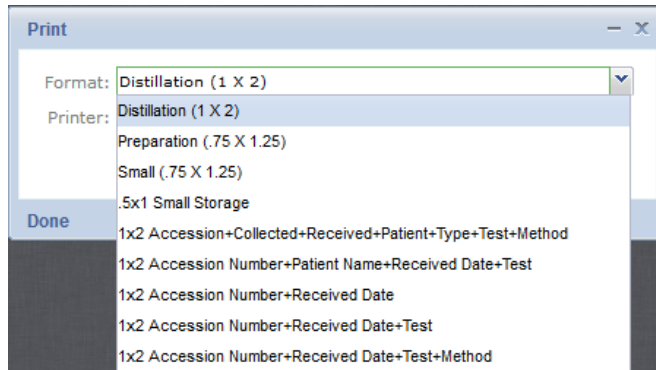


Figure 292 Print - Labels Screen

Various label formats are available in OpenELIS through the code and [Label](#) screen. The Printer field is used for the selection of the network barcode printer.

View TRF

This option generates the Test Request Form (TRF) that is attached to the selected sample. The sample's analysis row must first be selected on the Worksheet tab.

5.1.2 LEFT SIDEBAR

The left sidebar has two tabs: Worksheet and Analytes.

Id	Description
1246	volatiles, epa 524.2; volatiles, ...
1245	volatiles, epa 524.2

Figure 293 Worksheet Tab of Left Sidebar

Worksheet Tab

This tab lists the worksheets that match the query parameters. The Id (worksheet number) and Description of the worksheets are displayed in this tab. Clicking on a worksheet Id/Description row will display the worksheet in the Worksheet tab in the lower pane of the screen. The worksheet ids on this tab are sorted in descending order so that the more recent ones are listed at the top.

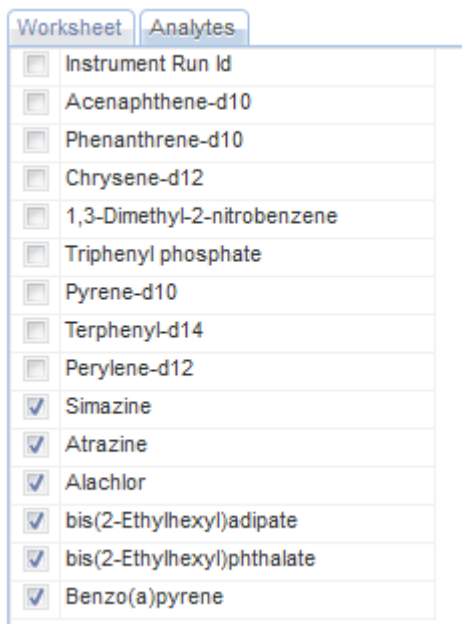


Figure 294 Analytes Tab of Left Sidebar

Analytes Tab

This tab displays the analytes for the selected analysis or QC. In Add or Update mode, all the possible analytes (required, optional, and supplemental) are displayed and individual analytes can be checked/unchecked as reportable. Marking analytes as reportable changes the analysis, including adding the supplemental analytes to the analysis. **Check All** and **Uncheck All** buttons are available at the bottom of this tab to aid in the multi-selection of analytes.

5.1.3 WORKSHEET TAB

The fields of the Worksheet tab in the lower pane of this screen are described below.

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Position	Accession #	Description	QC Link	Test	Method	Unit	Status	Collected
1	488515	[loc]iowa river [rpt]l...		e coli	colilert mpn	[MPN]/100mL	Initiated	2017-03-08
2	90387.2	9223b sample dup ...	488515 (1)					
3	488516	[loc]cedar river [rpt]l...		e coli	colilert mpn	[MPN]/100mL	Initiated	2017-03-08
4	488517	[loc]iowa river [rpt]l...		e coli	colilert mpn	[MPN]/100mL	Initiated	2017-03-08
5	488518	[loc]iowa river [rpt]l...		e coli	colilert mpn	[MPN]/100mL	Initiated	2017-03-08
6	488519	[loc]skunk river [rpt]l...		e coli	colilert mpn	[MPN]/100mL	Initiated	2017-03-08
7	90387.7	colilert18 media (JM...						
8	90387.8	sterile h2o 90ml (36...						
9	90387.9	9223b quanti-tray 2...						

Figure 295 Worksheet Tab

Position

This field specifies the exact position of the sample or QC item in the test run (e.g., Position 1 would indicate the first well on a plate).

Accession #

The unique accession number of the sample or QC item to be tested is displayed in this field. QC items have an Accession # with a format of “worksheet_number.position_number”. When the worksheet is saved the “X” in the QC Accession # is replaced with the Worksheet #. For example, a QC with an Accession # of X.2 means that the QC has been placed in Position 2 on the worksheet that is being built. After the worksheet is saved the Accession # might change to 932.2, meaning that the QC occupies Position 2 on Worksheet # 932.

(Analysis/QC) Description

This field contains information which can be used to help identify an analysis or QC item joined together in the order specified in the table below. If one of these component fields is empty, it is skipped in the formation of this Description field. This information is pulled from either the [FULL SAMPLE LOGIN](#) or the [QC](#) screen.

Sample Domain	Description Field
Animal	[acn] Animal Common Name
Clinical	Patient Last Name, Patient First Name, Container Reference
Environmental	[loc] Location [rpt] Report To
PT	[ptp] PT Provider [ser] Series [cnt] Container Reference
QC	QC Name (Lot Number)
SDWIS	[loc] Location [rpt] Report To

Figure 296 Description Field on a Worksheet

QC Link

This field is used to link a QC item and a sample analysis. Examples include matrix duplicates, matrix spikes, and sample duplicates. The accession number and the position (in parentheses) of the linked QC item or sample analysis are displayed in this field.

Test

The test that has been assigned for a sample analysis is displayed in this field.

Method

The method that has been assigned for a sample analysis is displayed in this field. The method cannot be [flipped](#) using this screen.

Unit

The unit of measure of the sample analysis for the pertinent sample type is displayed in this field. If multiple units have been defined for a sample type, the unit can be changed in Add or Update mode. Since this an autocomplete field, the analyst will first need to delete the original unit and then either start entering the new unit or click on the dropdown arrow to view the possible units for that sample type. The desired unit is then selected.

Position	Accession #	Description	QC Link	Test	Method	Unit	Status	Collected
1	98451	[loc]north entrance ...		volatiles	epa 8260	mg/kg mg/L mg/{sample} ug/kg ug/L ug/{sample}	Initiated	2014-08-06

Figure 297 Worksheet Builder: Changing an Analysis Unit

(Analysis) Status

This field displays the current analysis status. See [\(Analysis\) Status](#) for a definition of each status.

Collected (Date)

This field displays the date that the sample was collected.

Received (Date and Time)

This field displays the date and time that the sample was received at the laboratory.

(Number of Days Until) Due

This field displays the number of days until the analysis is due to be [released](#). A negative value indicates that the analysis is past due.

(Number of Days Until) Due is calculated using the [Priority](#) of the sample.

$$(Number\ of\ Days\ Until)Due = Received\ DateTime + Priority - Current\ DateTime$$

The [Turnaround Average days](#) in the test definition is used for this calculation if a [Priority](#) value is not present in the system.

Expire (Date and Time)

The Expire (Date and Time) for an analysis is calculated from the [Holding hours](#) value in its test definition:

$$\text{Expire (Date and Time)} = \text{Collected DateTime} + \text{Holding hours}$$

The Expire (Date and Time) cannot be calculated (and is left blank) if the [Collected DateTime](#) is not present in the system.

5.1.3.1 BUTTONS

The buttons that are specific to the Worksheet tab are described below.



Figure 298 Worksheet Tab Buttons

Add Row

The Add Row button has seven options that can be used to add a row to the Worksheet tab.

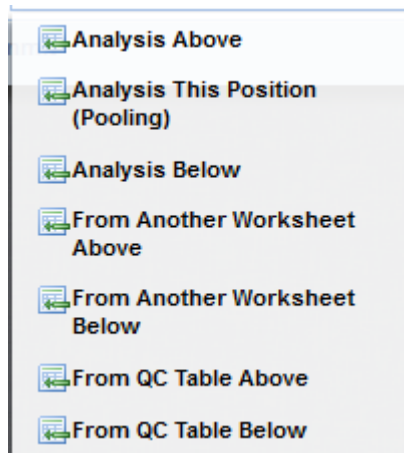


Figure 299 Add Row Button Options

- Analysis Above - This option will insert an analysis row(s) above the currently selected row. It pops up the [Worksheet Analysis Selection Screen](#) which is used to add an analysis.
- Analysis This Position (Pooling) - This option will insert an analysis row(s) in the same position as the currently selected row. This is used for adding pooled samples into one position on a plate. It pops up the [Worksheet Analysis Selection Screen](#) which is used to add an analysis.
- Analysis Below - This option will insert an analysis row(s) below the currently selected row. It pops up the [Worksheet Analysis Selection Screen](#) which is used to add an analysis.
- From Another Worksheet Above – This option will insert an analysis or QC item row(s) from another worksheet above the currently selected row. It pops up the [Worksheet Lookup Screen](#) which is used for this purpose.
- From Another Worksheet Below – This option will insert an analysis or QC item row(s) from another worksheet below the currently selected row. It pops up the [Worksheet Lookup Screen](#) which is used for this purpose.
- From QC Table Above – This option will insert a QC item row(s) above the currently selected row. It pops up the [QC Lookup Screen](#) which is used for this purpose.
- From QC Table Below – This option will insert a QC item row(s) below the currently selected row. It pops up the [QC Lookup Screen](#) which is used for this purpose.

Remove Row

This button allows for the removal of a row in either Add or Update mode. Multiple rows may be removed by **Ctrl-** or **Shift-**selection. If a row is removed, and the Worksheet Completion screen already contains data in that row, that data will be lost. For example, if an analytical run has begun and the instrument interface has already loaded data in a row, and the analyst updates the worksheet by removing that row, the instrument's data will no longer be recorded in OpenELIS. A message will pop up that warns the user of these consequences before the row is removed.

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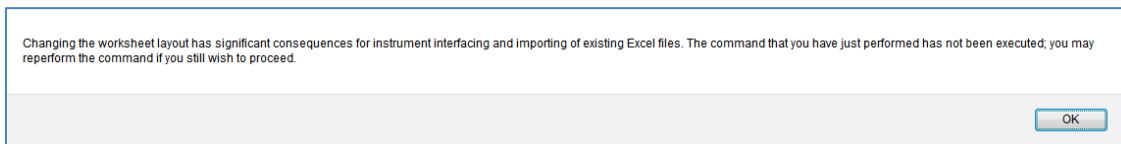


Figure 300 Changing the Worksheet Layout Warning

Duplicate

This button duplicates the selected analysis or QC row, placing the duplicate row immediately below the original row. This functionality can be used to create one or more duplicate analyses or QC items to be run on the worksheet.

Position	Accession #	Description	QC Link	Test	Method	Unit	Status	Colle
1	334050	[loc]501 e market (...)		volatiles	epa 524.2	mg/L	Logged In	2016
2	334352	[loc]orchard view p...		volatiles	epa 524.2	mg/L	Logged In	2016
3	334805	[loc]plant tap [rpt]A...		volatiles	epa 524.2	mg/L	Logged In	2016
4	334806	[loc]well tap [rpt]AT...		volatiles	epa 524.2	mg/L	Logged In	2016
5	334806	[loc]well tap [rpt]AT...		volatiles	epa 524.2	mg/L	Logged In	2016
6	336399	[loc]105 s. walnut [...]		volatiles	epa 524.2	mg/L	Logged In	2016
7	338573	[loc]750 4th st well ...		volatiles	epa 524.2	mg/L	Logged In	2016
8	338636	[loc]plant tap [rpt]W...		volatiles	epa 524.2	mg/L	Logged In	2016
9	339259	[loc]s/ep well #2 [r...		volatiles	epa 524.2	mg/L	Logged In	2016
10	353707	[loc]bld90 well#951 [...]		volatiles	epa 524.2	mg/L	Logged In	2016

!!!

Figure 301 Duplicating an Analysis

Move Top

The **Move Top** button moves the selected analysis or QC row up to the top position on the worksheet. This functionality aids the analyst in ordering the worksheet.

Move Up

The **Move Up** button moves the selected analysis or QC row up one position on the worksheet. This functionality aids the analyst in ordering the worksheet.

Move Down

The **Move Down** button moves the selected analysis or QC row down one position on the worksheet. This functionality aids the analyst in ordering the worksheet.

Move Bottom

The **Move Bottom** button moves the selected analysis or QC row to the bottom position on the worksheet. This functionality aids the analyst in ordering the worksheet.

Load QC Template

The Load QC Template button provides a list of QC templates that can be applied to the worksheet. Often, only one QC template is applied to a worksheet, however, more than one QC template can be applied. A QC template can be defined for each test through the [Test](#) module.

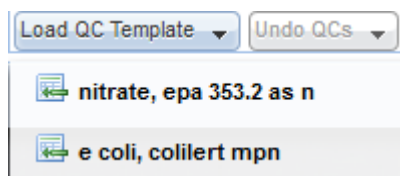


Figure 302 Load QC Template Button Options

Before QCs are added to the worksheet, the system tries to match QCs with the lots that are available in the same location as the user's location in [PREFERENCE](#). If multiple QC lots are available at the same time, the user will get a warning.

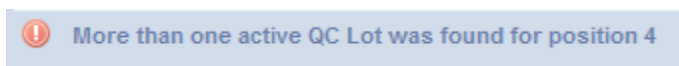


Figure 303 Multiple Active QC Lots Warning

A different active QC lot can be selected from the dropdown list in the QC row's Description field.

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Position	Accession #	Description	QC Link	Test	Method	Unit	Status
1	756	[loc]men's restroom fountain [rpt]ALTOONA WATER SUPPLY		coliforms	colliert mpn sdw...	[MPN]/100mL	Logged In
2	757	[loc]room 114 [rpt]SLEEP INN (2)		coliforms	colliert mpn sdw...	[MPN]/100mL	Logged In
3	758	[loc]322 main st (hhl) [rpt]MACEDONIA WATER SUPPLY		coliforms	colliert mpn sdw...	[MPN]/100mL	Logged In
4	X.4	colliert24 media(CDE456 IC)					

QC Name

colliert24 media(CDE456 IC)

colliert24 media(FGH456 IC)

Add Row Remove Row Load QC Template Undo QCs Duplicate Move Up Move Down

Figure 304 Changing a QC Lot on Worksheet Builder

Undo QCs

The Undo QCs button is used to remove QCs from the Worksheet tab in either Add or Update mode. If a QC is removed, and the Worksheet Completion screen already contains data in that QC row, that data will be lost. For example, if an analytical run has begun and the instrument interface has already loaded data in a QC row, and the analyst updates the worksheet by removing that QC, the instrument's data will no longer be recorded in OpenELIS.

The Undo QCs button has three options. All three Undo QCs options will only remove the QCs that were added during the current Add/Update session.

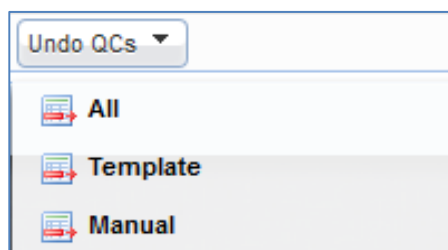


Figure 305 Undo QCs Button Options

- All – This option will removes all QC items regardless of how they were added.
- Template – This option removes all of the QC items that were added by loading a QC template.

- Manual – This option removes all of the QC items that were added manually by using the [Worksheet Lookup Screen](#) or [QC Lookup Screen](#).

If only one or a few QC items need to be removed, the **Remove Row** button is the best option.

5.1.4 REAGENTS/MEDIA TAB

The Reagents/Media tab is used to capture the media or reagents used in an analytical run. The reagents/media are considered quality control items; they must be entered into OpenELIS through the [QC](#) screen.

Description	Location	Prepared Date	Usable Date	Expire Date	Prepared Volume	Prepared Unit	Prepared By
epa 111b tkn std 1 (320313-1J)	Lakeside	2014-07-28 09:33	2014-07-28 09:34	2014-08-04 09:34	200	mL	Ischwarck
epa 111b tkn std 4 (320313-4 J)	Lakeside	2014-07-28 09:34	2014-07-28 09:35	2014-08-04 09:34	250	mL	Ischwarck
epa 111b tkn std 1000 (320313-1000 A)	Lakeside	2013-06-27 10:43	2013-09-30 10:44	2015-04-30 10:44	500	mL	

Figure 306 Reagents/Media Tab

Figure 306 Reagents/Media Tab

The fields of the Reagents/Media tab are described below.

(QC) Description

The Description field lists the name of the QC followed by its lot number in parentheses.

Location

The location where the QC lot is available is displayed in this field.

Prepared Date (and Time)

The date and time when the QC lot was prepared is displayed in this field.

Usable Date (and Time)

The date and time when the QC lot can be used is displayed in this field.

Expire Date (and Time)

The date and time when the QC lot expires is displayed in this field.

Prepared Volume

The volume of the QC lot that was prepared is displayed in this field.

Prepared Unit

The unit of measurement of the QC lot that was prepared is displayed in this field.

Prepared By

The OpenELIS username of the person who prepared the QC lot is displayed in this field.

The functionality of the buttons at the bottom of this tab during Add/Update Mode is described below.

Add Row

This button is used to add a QC item to the bottom row of this tab. It pops up the [QC Lookup Screen](#) which is used for this purpose.

Remove Row

This button allows for the removal of a row on this tab. Multiple rows may be removed by **Ctrl**- or **Shift**-selection.

Move Up

The **Move Up** button moves the selected QC row up in position on the tab.

Move Down

The **Move Down** button moves the selected QC row down in position on the tab.

5.1.5 NOTE TAB

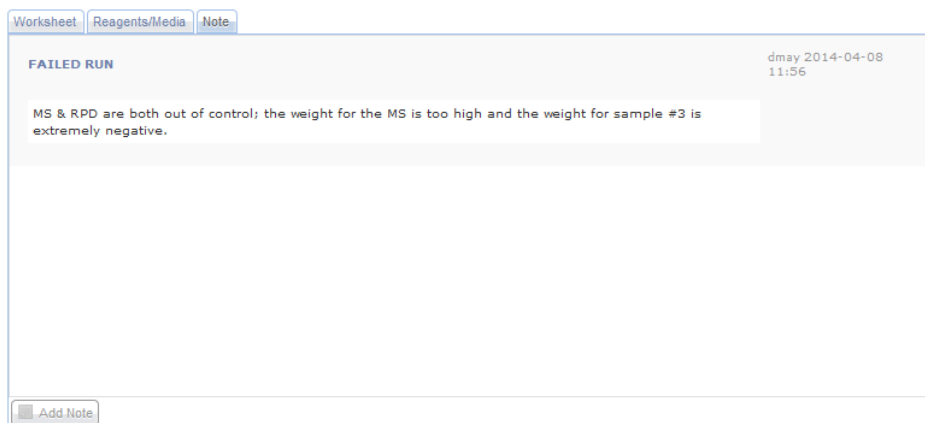


Figure 307 Note Tab

The Note tab on the Worksheet Builder screen is used to write any notes that might be related to the run. This tab is intended to contain notes pertaining to the worksheet (e.g., an explanation of why the run failed). Click **Update** and then **Add Note**. The Note Editor screen will pop up. See [NOTE EDITOR SCREEN](#) for more information on how to use standard notes.

5.1.6 BUILDING A WORKSHEET

The steps below illustrate how to build a worksheet.

1. Select the [Worksheet Builder](#) module from the Analysis Menu. Previously-built worksheets can be queried by any of the fields in the top pane of this screen (Worksheet #, (worksheet) Status, Username, Created Date, Description, etc.) Once a previously built worksheet is selected from the [Worksheet tab of the left sidebar](#), it can then be updated by clicking on the **Update** button.
2. Click on the **Add** button to build a new worksheet. The (worksheet) Status, Username, and Created Date (and Time) fields will be automatically entered with their default values.

3. A worksheet should be built in the following order:
 - a. Analyses should be added first to the worksheet.
 - b. The analyses should be sorted, if desirable, by [Collected \(Date\)](#), [Received \(Date and Time\)](#), [\(Number of Days Until\) Due](#), [\(Analysis\) Status](#), or another parameter.
 - c. QC items should be added manually, if desirable, from another worksheet or from a QC table.
 - d. A QC template can be loaded, if desirable.
4. Click on the [Add Row](#) button and select the Analysis Above or Analysis Below option to add the first analysis row. The [Worksheet Analysis Selection Screen](#) will pop up. Query by the Test/Method of the analyses which will be run. Select the desired analysis status. While the analysis status normally selected will be “Logged In”, other statuses such as “Requeued” may also be chosen when desired. It is possible to query by several other fields (e.g., Section, Received Date, etc.), if necessary. Click the **Search** button.

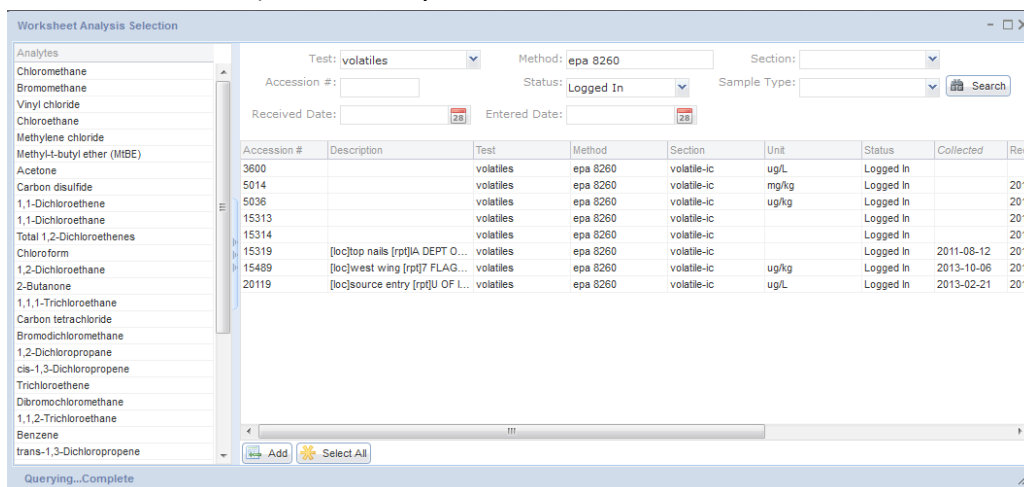


Figure 308 Worksheet Analysis Selection: Querying by Test/Method and Analysis Status

5. **Ctrl**-select or **Shift**-select the analysis rows to add to the worksheet. Alternatively, the **Select All** button can be used to add all of the analyses from the query.
6. Click the **Add** button. The selected analyses will populate the Worksheet tab of the Worksheet Builder Screen. Any analyses that were mistakenly added can be removed by using the **Remove Row** button. Duplicate analyses can be

added by using the [Duplicate](#) button. The [Format](#) that is applicable for the first analysis that is added is automatically selected when building a worksheet. The format may be manually overridden if desired.

- It is possible to re-query for other analyses to be added to the worksheet as many times as necessary. Go back to [Step 4](#) to repeat this process. Some analysts perform separate queries in order to add “Requeued” analyses first to their worksheets, followed by “Logged In” analyses, or vice-versa.
- Analyses can also be added to a new worksheet from another worksheet by using the [Add Row](#) button with the From Another Worksheet Above or From Another Worksheet Below option. These options pop up the [Worksheet Lookup Screen](#). If this process is not desired, skip to [Step 12](#).
- Enter the Worksheet #, Username, and/or (Worksheet) Status (or another search parameter) into the Worksheet Lookup screen that pops up and click **Search**.

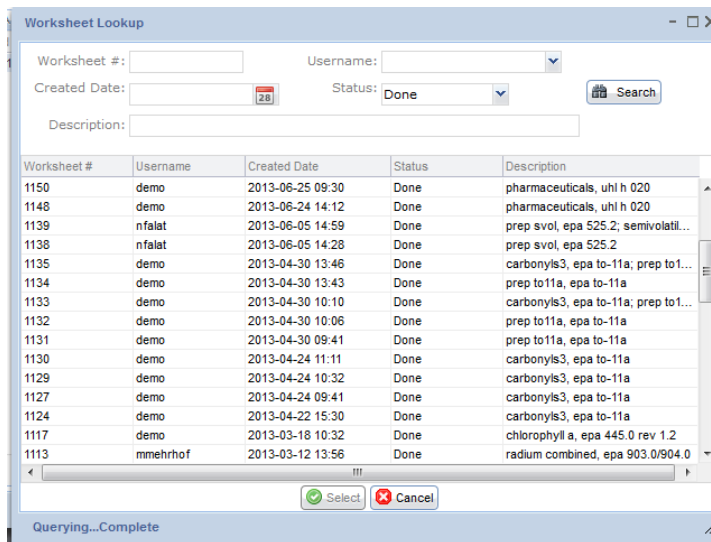


Figure 309 Worksheet Lookup Screen

- Click on the desired worksheet from the list and click **Select**.
- Ctrl-select** or **Shift-select** the rows from the [Worksheet Row Selection \(#XXXXX\) Screen](#) that will be added to the new worksheet and click the **Select** button.

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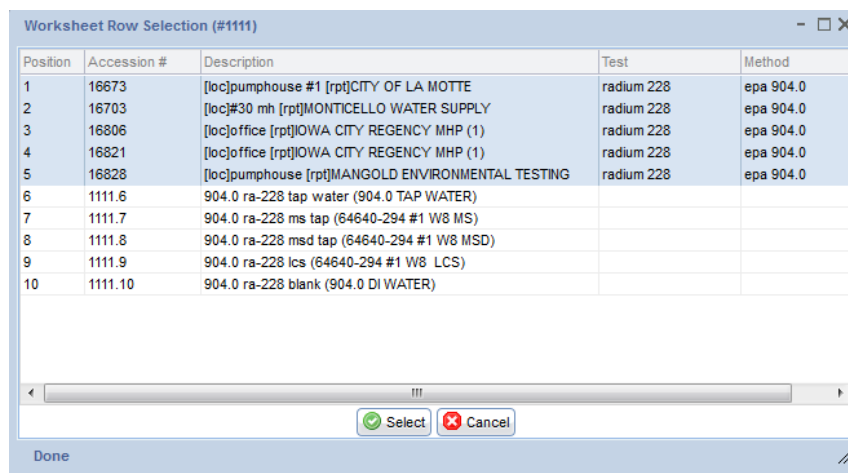


Figure 310 Worksheet Row Selection (#XXXXX) Screen

These selected analyses will be added to the Worksheet Builder screen above (or below) the selected row depending upon the option that was chosen.

12. Any of the fields of the Worksheet Builder screen can be used to sort the analyses list. Once sorted, the saved worksheet will maintain that order. Analyses can also be reordered on the worksheet using the [Move Up](#), [Move Down](#), [Move Top](#), or [Move Bottom](#) buttons.

Position	Accession #	Description	QC Link	Test	Method	Unit	Status	Collected	Received	Due	Expire
1	15588	[loc]sch1 [rpt]HOWARD ...		nitrate	epa 353.2 as n	mg/L	Logged In	2011-09-07	2011-09-16 11:19	-1054	2011-09-09 09:00
2	15589	[loc]sch2 [rpt]HOWARD ...		nitrate	epa 353.2 as n	mg/L	Logged In	2011-09-07	2011-09-16 11:19	-1054	2011-09-09 09:10
3	15590	[loc]sch4 [rpt]HOWARD ...		nitrate	epa 353.2 as n	mg/L	Logged In	2011-09-07	2011-09-16 11:19	-1054	2011-09-09 10:00
4	15292	[loc]kitchen		nitrate	epa 353.2 as n	mg/L	Logged In	2011-09-15	2011-09-16 11:19	-1054	2011-09-17 10:00
5	15293	[loc]outside spigot		nitrate	epa 353.2 as n	mg/L	Logged In	2011-09-15	2011-09-16 11:19	-1054	2011-09-17 08:30
6	15294	[loc]kitchen		nitrate	epa 353.2 as n	mg/L	Logged In	2011-09-15	2011-09-16 11:19	-1054	2011-09-17 08:00
7	15295	[loc]kitchen sink		nitrate	epa 353.2 as n	mg/L	Logged In	2011-09-15	2011-09-16 11:19	-1054	2011-09-17 09:15
8	15296	[loc]well [rpt]CUMBERLA...		nitrate	epa 353.2 as n	mg/L	Logged In	2011-09-15	2011-09-16 11:19	-1054	2011-09-17 09:00
9	15928	[loc]well [rpt]CUMBERLA...		nitrate	epa 353.2 as n	mg/L	Logged In	2011-10-10	2011-10-26 08:00	-1014	2011-10-12 08:30
10	16077	[loc]iowa water plant c...		nitrate	epa 353.2 as n	mg/L	Logged In	2011-11-02	2011-11-08 11:50	-1001	2011-11-04 10:45

Figure 311 Sorting Analyses on the Worksheet Builder Screen by Collected Date

13. QC items can be added manually to a new worksheet in two ways. The first way adds QC items from another worksheet by using the [Add Row](#) button with the From Another Worksheet Above or the From Another Worksheet Below option. This process works the same way as that described for adding analyses from another worksheet in Steps 8 – 11. If this process is not desired, skip to [Step 14](#).

14. The second method of adding QC items manually to a worksheet uses a QC table. If this process is not desired, skip to [Step 19](#).
15. Click the [Add Row](#) button and select the desired option (From QC Table Above or From QC Table Below).
16. The [QC Lookup](#) screen will pop-up over the Worksheet Builder screen. Query for the desired QC by typing a portion of its name with wildcards in the Enter Search box and clicking the **Search** button. Alternatively, the first letter of the QC item's name can be clicked in the sidebar.
17. **Ctrl**-select or **Shift**-select the desired QC items and click **OK**. Additional QC items that are selected from the QC Lookup screen are added above (or below) the selected row on the Worksheet Builder screen.

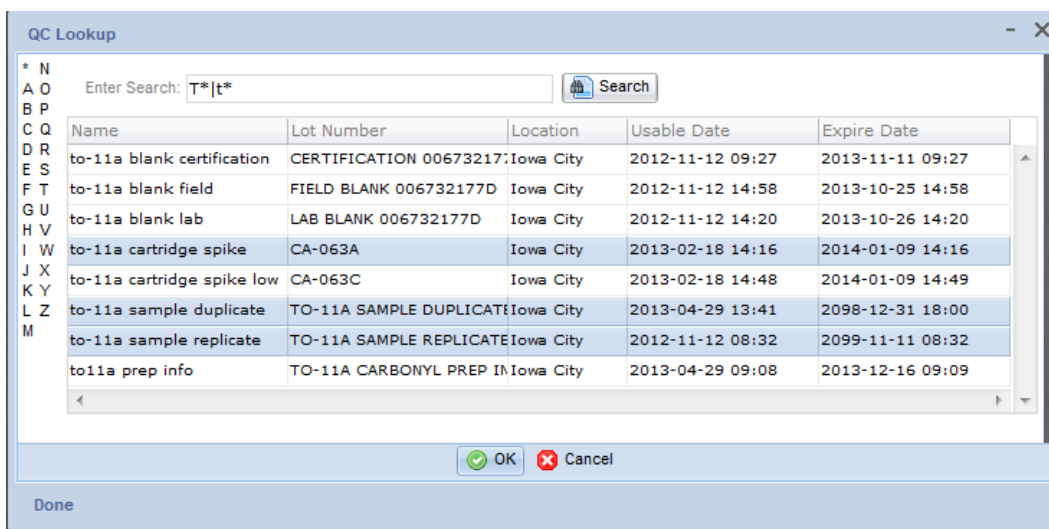


Figure 312 QC Lookup Screen

18. The Manual option of the **Undo QCs** button can be used to undo the loading of QC items that were added manually during the current Add/Update session. The **Remove Row** button should be used to remove one or a few QC items. See [Undo QCs](#) for a complete explanation of this feature.
19. Click on the **Load QC Template** button to load any QC items that are associated with a test definition. See [Load QC Template](#) for a complete explanation of this feature. If this process is not desired, skip to [Step 21](#).
20. The Template option of the **Undo QCs** button can be used to undo a QC template that was loaded during the current Add/Update session. The **Remove**

Row button should be used to remove one or a few QC items. See [Undo QCs](#) for a complete explanation of this feature.

21. The All option of the **Undo QCs** button can be used to remove all QC items that were added during the current Add/Update session regardless of how they were added. The **Remove Row** button should be used to remove one or a few QC items. See [Undo QCs](#) for a complete explanation of this feature.
22. Duplicate QC items can be added by using the [Duplicate](#) button. QCs can also be reordered on the worksheet using the [Move Up](#), [Move Down](#), [Move Top](#), or [Move Bottom](#) buttons.
23. Manually set any desired QC links. For example, when adding a sample duplicate QC, click on the corresponding QC Link field to select the Accession # followed by the Position in parentheses of the sample for which it is a duplicate. Thus, 5506 (3) would be selected in the QC Link field to link the QC X.4 to the sample with an accession number of 5506 located in Position 3.

Position	Accession #	Description	QC Link
1	5504	[loc]plant tap 1 [rpt]JOE SMITH	
2	5505	[loc]plant tap 2 [rpt]JOE SMITH	
3	5506	[loc]plant tap 3 [rpt]JOE SMITH	
4	X.4	00-02 sample dup (00-02 SAMPLE DUP 1)	
5	1275.5	525.2 cont cal 0.0005 (S2381A CONT CAL 0.0005)	
6	1275.6	525.2 cont cal 0.0010 (S2381A CONT CAL 0.0010)	5504 (1)
7	1275.7	525.2 ofw high spike (S2381A OFW)	5505 (2)
8	1275.8	525.2 init cal 0.0005 (S2381A INIT CAL 0.0005)	5506 (3)
9	1275.9	525.2 high matrix spike (S2381A MATRIX SPIKE)	X.4 (4)
10	1275.10	525.2 high matrix spike dup (S2381A MATRIX SP...)	1275.5 (5)
11	1275.11	525.2 init cal 0.0010 (S2381A INIT CAL 0.0010)	1275.6 (6)
			1275.7 (7)

Figure 313 Inserting a QC Link

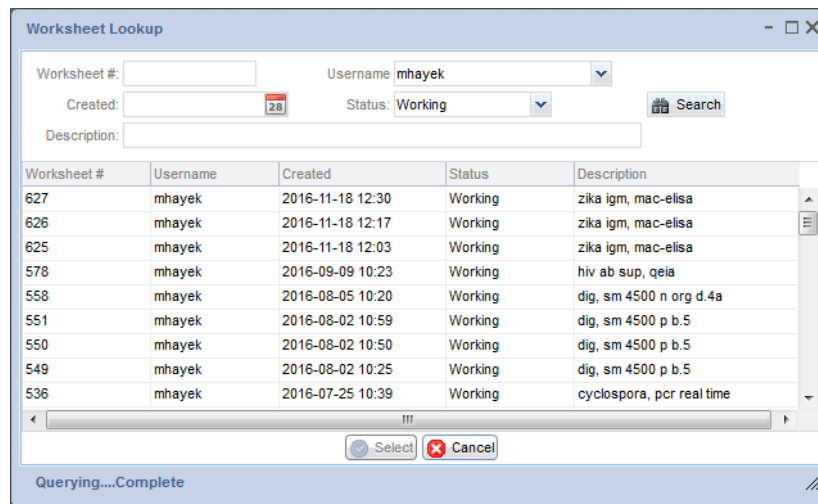
24. Select the Related Worksheet # to link this worksheet to another worksheet, if applicable. See [Related Worksheet #](#) for a complete description of this process.
25. Select the Instrument Name of the instrument that is being used to analyze the run, if applicable. See [Instrument Name](#) for more information.
26. Review the Worksheet Builder screen and click the **Commit** button.
27. The Worksheet # is assigned by the LIMS. The worksheet can be queried at a later time by Username, (Worksheet) Status, Created Date, and/or Description. The worksheet can also be viewed from the [Worksheet Tab of the To-Do List](#). Close the Worksheet Builder screen.

28. Complete the laboratory work.

5.1.7 WORKSHEET LOOKUP SCREEN

The Worksheet Lookup screen can be used to search for (1) other worksheets to link to a related worksheet (see [Related Worksheet #](#)) or (2) a previously-built worksheet from which select rows can be added to a new worksheet (see [Add Row](#)). See [Building a Worksheet](#) for more information.

The fields on this screen are described below.



The screenshot shows the 'Worksheet Lookup' window. At the top, there are input fields for 'Worksheet #', 'Username' (set to 'mhayek'), 'Created' (with a calendar icon showing '28'), and 'Status' (set to 'Working'). A 'Search' button is located to the right of the 'Status' field. Below these fields is a 'Description:' label and an empty text box. The main area contains a table with the following data:

Worksheet #	Username	Created	Status	Description
627	mhayek	2016-11-18 12:30	Working	zika igm, mac-elisa
626	mhayek	2016-11-18 12:17	Working	zika igm, mac-elisa
625	mhayek	2016-11-18 12:03	Working	zika igm, mac-elisa
578	mhayek	2016-09-09 10:23	Working	hiv ab sup, qe1a
558	mhayek	2016-08-05 10:20	Working	dig, sm 4500 n org d.4a
551	mhayek	2016-08-02 10:59	Working	dig, sm 4500 p b.5
550	mhayek	2016-08-02 10:50	Working	dig, sm 4500 p b.5
549	mhayek	2016-08-02 10:25	Working	dig, sm 4500 p b.5
536	mhayek	2016-07-25 10:39	Working	cyclospora, pcr real time

At the bottom of the window, there are 'Select' and 'Cancel' buttons. A status bar at the very bottom indicates 'Querying....Complete'.

Figure 314 Worksheet Lookup Screen

Worksheet #

The worksheet number can be queried using this field.

Username

The username of the person who built the worksheet can be queried using this field.

Created (Date and Time)

The date and time that the worksheet was created can be queried using this field.

(Worksheet) Status

The status of the worksheet can be queried using this field.

(Worksheet) Description

The worksheet description can be queried using this field. See [\(Worksheet\) Description](#) for a complete explanation of this field.

Search Button

This button is used to initiate a worksheet query.

Select Button

This button is used to select a worksheet. This action pops up the [Worksheet Row Selection Screen](#).

Cancel Button

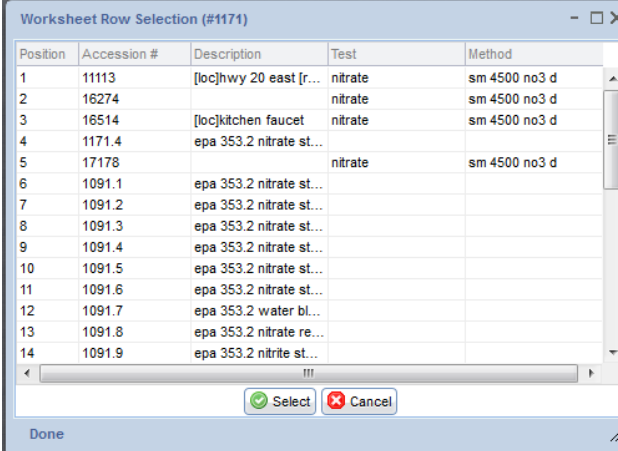
This button is used to cancel out of the Worksheet Lookup screen.

5.1.8 WORKSHEET ROW SELECTION (#XXXXXX) SCREEN

The Worksheet Row Selection (#XXXXXX) screen can be used to select a row(s) from a previously created worksheet to add to a new worksheet. The [Worksheet #](#) is included in parentheses in the name of this screen. See [Building a Worksheet](#) for more information.

The fields on this screen are described below. The Accession #, Description, Test, and Method fields can be sorted in ascending or descending order.

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Position	Accession #	Description	Test	Method
1	11113	[loc]hwy 20 east [r...	nitrate	sm 4500 no3 d
2	16274		nitrate	sm 4500 no3 d
3	16514	[loc]kitchen faucet	nitrate	sm 4500 no3 d
4	1171.4	epa 353.2 nitrate st...		
5	17178		nitrate	sm 4500 no3 d
6	1091.1	epa 353.2 nitrate st...		
7	1091.2	epa 353.2 nitrate st...		
8	1091.3	epa 353.2 nitrate st...		
9	1091.4	epa 353.2 nitrate st...		
10	1091.5	epa 353.2 nitrate st...		
11	1091.6	epa 353.2 nitrate st...		
12	1091.7	epa 353.2 water bl...		
13	1091.8	epa 353.2 nitrate re...		
14	1091.9	epa 353.2 nitrite st...		

Figure 315 Worksheet Row Selection (#XXXXX) Screen

Position

This field specifies the exact position of the sample or QC item in the test run (e.g., Position 1 would indicate the first well on a plate).

Accession #

The unique accession number of the sample or QC item to be tested is displayed in this field. See [Accession #](#) for a complete description of this field.

(Analysis/QC) Description

This field contains information which can be used to help identify an analysis or QC item. See [\(Analysis/QC\) Description](#) for a complete explanation of this field.

Test

The test that has been assigned for a sample analysis is displayed in this field.

Method

The method that has been assigned for a sample analysis is displayed in this field.

Select Button

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This button is used to add the highlighted row(s) to the new worksheet. Multiple rows can be control- or shift-selected before the **Select** button is clicked.

Cancel Button

This button is used to cancel out of the Worksheet Row Selection Screen.

5.1.9 WORKSHEET ANALYSIS SELECTION SCREEN

The Worksheet Analysis Selection screen can be used to search for analyses to add to a worksheet. See [Add Row](#) and [Building a Worksheet](#) for more information.

5.1.9.1 GENERAL FIELDS

The general fields on this screen are described below.

The screenshot shows the 'Worksheet Analysis Selection' window. At the top, there are search filters: 'Test: nitrate', 'Method: epa 353.2 as n', and 'Status: Logged In, Requeu...'. Below these are fields for 'Accession #', 'Received Date', and 'Entered Date'. A 'Search' button is located to the right of the status field. The main area contains a table with the following columns: Accession #, Description, Test, Method, Section, Unit, Status, Collected, Received, Due, Expire, and Priority. The table lists 18 rows of data, all for 'nitrate' tests using 'epa 353.2 as n' method and 'inorg_auto-ank' section. The 'Received' dates range from 2013-06-04 to 2011-10-10. At the bottom of the window, there are 'Add' and 'Select All' buttons. The status bar at the very bottom indicates 'Querying...Complete'.

Accession #	Description	Test	Method	Section	Unit	Status	Collected	Received	Due	Expire	Priority
865		nitrate	epa 353.2 as n	enviro_micro-ic	mg/L	Logged In	2013-06-04	2013-06-12 10:57	-109	2013-06-06 00:00	
1701		nitrate	epa 353.2 as n	inorg_auto-ank	mg/L	Logged In		2011-12-12 11:56	-657		
1702		nitrate	epa 353.2 as n	inorg_auto-ank	mg/L	Logged In		2011-12-12 11:56	-657		
8010		nitrate	epa 353.2 as n	inorg_auto-ank	mg/L	Logged In	2011-07-26	2011-07-27 15:10	-795	2011-07-28 10:00	
8011		nitrate	epa 353.2 as n	inorg_auto-ank	mg/L	Logged In	2011-07-26	2011-07-27 15:15	-795	2011-07-28 10:00	
15065	[loc]#1 outside faucet [rpt]S...	nitrate	epa 353.2 as n	inorg_auto-ank	mg/L	Logged In	2011-05-24	2011-08-12 12:28	-779	2011-05-26 16:15	
15105	[loc]bar faucet [rpt]ALL AB...	nitrate	epa 353.2 as n	inorg_auto-ank	mg/L	Logged In	2011-05-25	2011-08-15 14:15	-776	2011-05-27 14:45	
15292	[loc]kitchen	nitrate	epa 353.2 as n	inorg_auto-ank	mg/L	Logged In	2011-09-15	2011-09-16 11:19	-744	2011-09-17 10:00	
15293	[loc]outside spigot	nitrate	epa 353.2 as n	inorg_auto-ank	mg/L	Logged In	2011-09-15	2011-09-16 11:19	-744	2011-09-17 08:30	
15294	[loc]kitchen	nitrate	epa 353.2 as n	inorg_auto-ank	mg/L	Logged In	2011-09-15	2011-09-16 11:19	-744	2011-09-17 08:00	
15295	[loc]kitchen sink	nitrate	epa 353.2 as n	inorg_auto-ank	mg/L	Logged In	2011-09-15	2011-09-16 11:19	-744	2011-09-17 09:15	
15296		nitrate	epa 353.2 as n	inorg_auto-ank	mg/L	Logged In	2011-09-15	2011-09-16 11:19	-744	2011-09-17 09:00	
15588	[loc]sch1 [rpt]HOWARD CO ...	nitrate	epa 353.2 as n	inorg_auto-ank	mg/L	Logged In	2011-09-07	2011-10-10 14:06	-720	2011-09-09 09:00	
15589	[loc]sch2 [rpt]HOWARD CO ...	nitrate	epa 353.2 as n	inorg_auto-ank	mg/L	Logged In	2011-09-07	2011-10-10 14:06	-720	2011-09-09 09:10	
15590	[loc]sch4 [rpt]HOWARD CO ...	nitrate	epa 353.2 as n	inorg_auto-ank	mg/L	Logged In	2011-09-07	2011-10-10 14:06	-720	2011-09-09 10:00	
15928	[loc]well [rpt]CUMBERLAND...	nitrate	epa 353.2 as n	inorg_auto-ank	mg/L	Logged In	2011-10-10	2011-10-26 08:00	-704	2011-10-12 08:30	

Figure 316 Worksheet Analysis Selection Screen

Test

The test that has been assigned for sample analyses can be queried using this field. The test/method/sample type barcode from the [TEST REPORT](#) can be scanned into this field for use in a query.

Method

The method that has been assigned for sample analyses can be queried using this field.

Section

The laboratory section(s) that have been assigned to perform the analyses can be queried using this field.

Accession #

The accession number(s) of the sample(s) to be analyzed can be queried using this field.

(Analysis) Status

The status(es) of the analyses can be queried using this field. See [\(Analysis\) Status](#) for a definition of each status. Normally, an analyst will query for analyses in Logged In or Requeue status.

Sample Type

The sample type can be queried using this field.

Received Date (and Time)

The date and time that the sample was received at the laboratory can be queried using this field.

Entered Date (and Time)

The date and time that the sample was initially logged into OpenELIS (through either [Quick Entry](#) or [full sample login](#)) can be queried using this field.

5.1.9.2 LOWER PANE FIELDS

The fields of the table in the lower pane are described below. All of these columns may be sorted in either ascending or descending order. By default, the queried analyses are sorted by accession number in ascending order.

Accession #

The unique accession number of the sample to be analyzed is displayed in this field.

(Analysis) Description

This field contains information which can be used to help identify an analysis. See [\(Analysis/QC\) Description](#) for a complete explanation of this field.

Test

The test that has been assigned for a sample analysis is displayed in this field.

Method

The method that has been assigned for a sample analysis is displayed in this field.

Section

The laboratory section that has been assigned to perform the analysis is displayed in this field.

Unit

The unit of measure of the analysis for the pertinent sample type is displayed in this field.

(Analysis) Status

This field displays the current analysis status. See [\(Analysis\) Status](#) for a definition of each status.

Collected (Date)

This field displays the date that the sample was collected.

Received (Date and Time)

This field displays the date and time that the sample was received at the laboratory.

(Number of Days Until) Due

This field displays the number of days until the analysis is due to be completed. See [\(Number of Days Until\) Due](#) for a complete description.

Expire (Date and Time)

The Expire (Date and Time) for an analysis is calculated from the Turnaround Holding Hours value in its test definition. See [Expire \(Date and Time\)](#) for a complete description.

Priority

This field specifies the number of days that the client expects for sample turnaround. For example, a value of 3 would specify that the sample should be completed and reported within 3 working days.

5.1.9.3 OTHER FEATURES

The other features of the Worksheet Analysis Selection screen are described below.

Analytes Sidebar

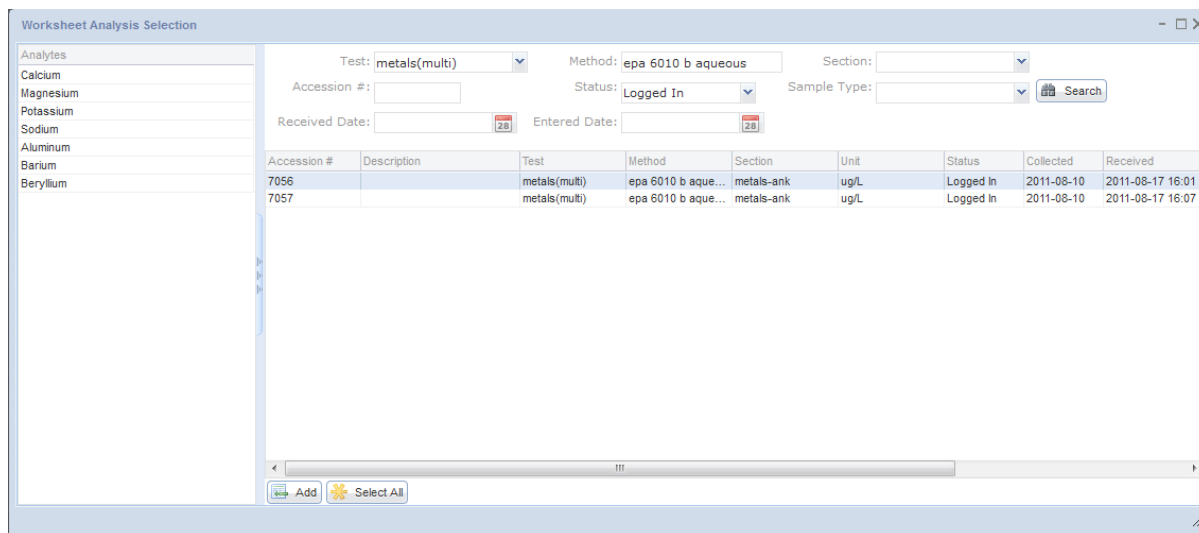


Figure 317 Worksheet Analysis Selection Screen - Analytes Sidebar

The Analytes sidebar will display the analytes that are currently marked as reportable for the selected analysis.

Search Button

This button is used to initiate an analysis search.

Add Button

The **Add** button is used to add the selected analyses to the Worksheet Builder screen.

Select All Button

The **Select All** button is used to select all of the analyses listed on the Worksheet Analysis Selection screen.

5.1.10 QC LOOKUP SCREEN

The QC Lookup screen is used to search for QCs which can be added manually to the worksheet. See [Add Row](#) and [Building a Worksheet](#) for more information.

Its fields are described below.

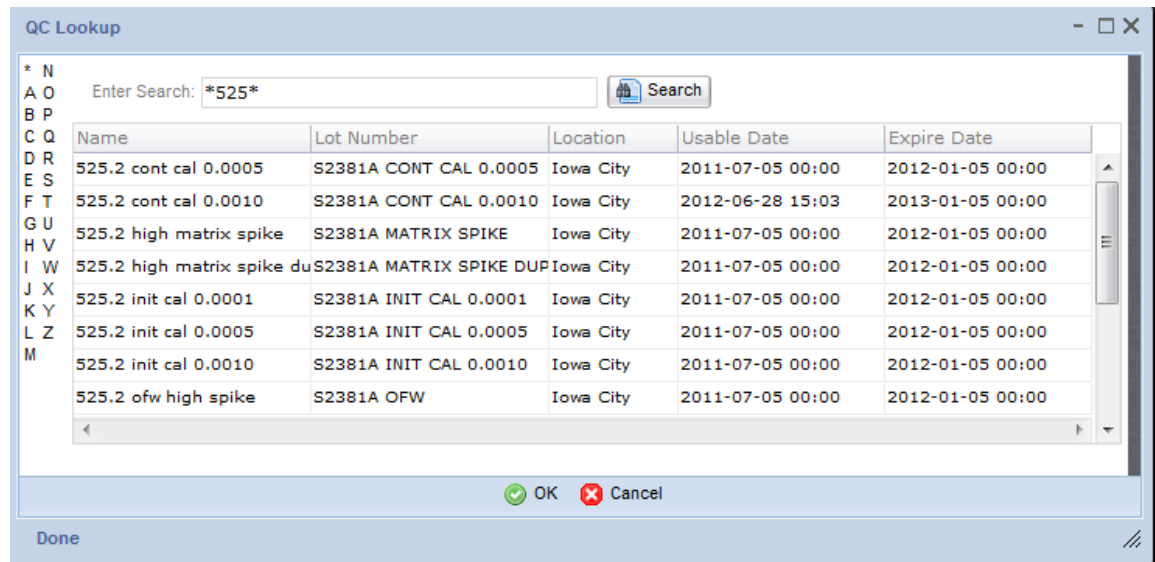


Figure 318 QC Lookup Screen

Enter Search

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The full name of the QC item (or partial name with wildcard(s)) can be entered in this field during a search.

Name

The [name](#) of the QC item is displayed in this field.

Lot Number

The [lot number](#) of the QC item is displayed in this field.

Location

The [location](#) where the QC lot is available is displayed in this field. The QC Lookup screen can be filtered by location so that the user only has to view QC lots from his/her location.

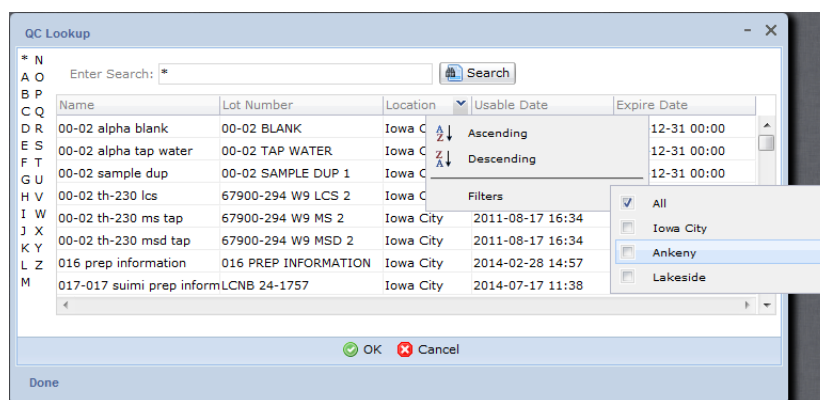


Figure 319 Filtering the QC Lookup Screen by Location

Usable Date (and Time)

The date and time when the QC lot can be [used](#) is displayed in this field.

Expire Date (and Time)

The date and time when the QC lot [expires](#) is displayed in this field.

For a complete explanation of QC item information, see [QC](#).

5.2 WORKSHEET COMPLETION

The Worksheet Completion module allows the laboratory analyst to process a worksheet by entering or reviewing results and QC information, and transferring the worksheet values to the sample results.

The link to the Worksheet Completion module is located in the [Analysis Menu](#).

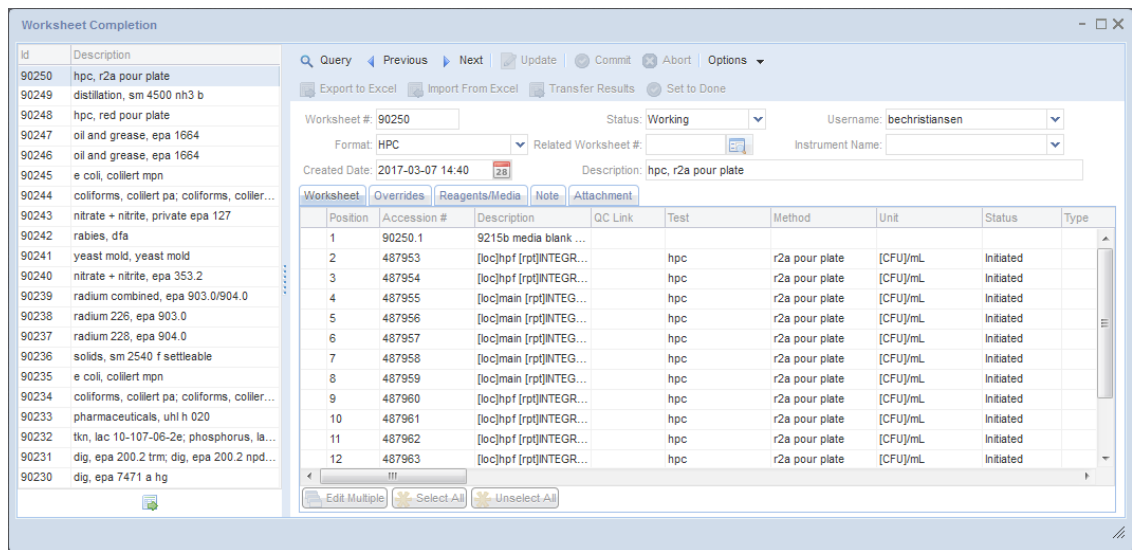


Figure 320 Worksheet Completion Screen

5.2.1 GENERAL FIELDS

The general fields on this screen are described below.

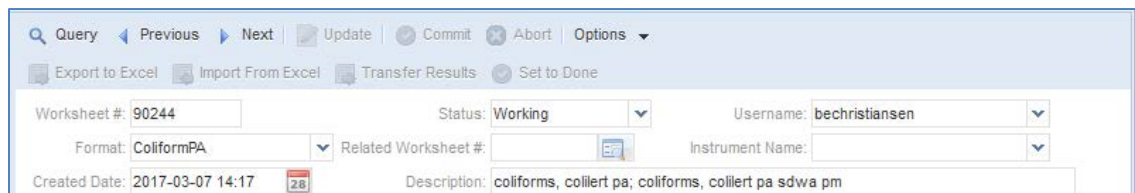


Figure 321 General Fields

Worksheet

This number uniquely identifies the worksheet and is automatically assigned by the LIMS.

(Worksheet) Status

This field specifies the overall status of the worksheet. A worksheet that is in the process of being completed is in Working status. See [\(Worksheet\) Status](#) for an explanation of each status.

Username


The username of the person who built the worksheet is specified in this field. This field is defaulted to the logged-in username, but it may be manually overridden.

Format

The format that was used to build the worksheet is specified in this field.

Related Worksheet #

Sometimes, it is useful to link worksheets together due to a functional relationship. An analyst may decide to build a worksheet for a “QC only” run and link it to another worksheet from an analytical run. A large batch of analyses can also be divided into two worksheets to make them easier to manage. Once the worksheets are linked, QCs from all the worksheets are available for any of the samples for reporting purposes.

A related worksheet can be linked to the worksheet that is being updated by clicking on the lookup button.  This will pop up the Worksheet Lookup screen that is used to populate this field. See [Worksheet Lookup Screen](#) for a complete explanation of this screen.

The lookup button has another use in that the related worksheet can be loaded into the left pane of this screen by clicking on it.

Instrument Name

The name of the instrument that is being used to analyze the run, if applicable, can be selected from this autocomplete field during Update Mode. This field links the

instrument log to the worksheet. Instrument log information from the analytical run (including the Worksheet #) is recorded as an entry in the [INSTRUMENT](#) screen.

Created Date (and Time)

The date and time that the worksheet was created is displayed in this field.

(Worksheet) Description

This field can be used to provide the basic purpose of the worksheet. By default, it lists the “test, method” pairs assigned to samples on the worksheet up to a 60 character maximum. This is a free-text field, however, so other descriptions may be entered in Update Mode (i.e., qc only run, mdl run, etc.) This field is searchable so it may be useful for worksheet queries.

OPTIONS MENU

The following features can be accessed through the Options dropdown menu:

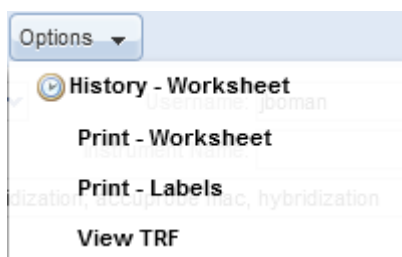


Figure 322 Options Menu

Print - Worksheet

The Print – Worksheet option generates a printable worksheet that can be used by the analyst to help set up the samples and QCs on the bench or in the instrument. Selecting this option pops up the Print screen.

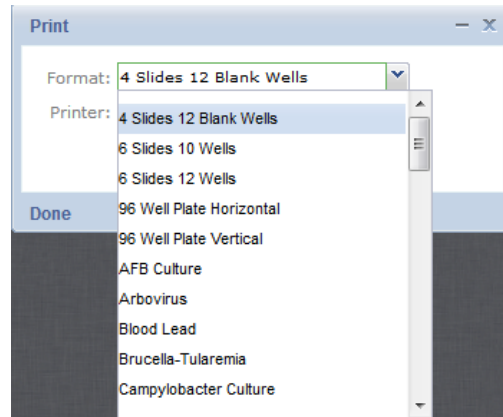


Figure 323 Print - Worksheet Screen

One or more worksheet formats may be available in OpenELIS for a particular test. The Printer field is used for the selection of the network printer to print a hard copy, to view the report in pdf format on the computer monitor (View in PDF), to fax it (fax), or to e-mail it to the user as a pdf file (pdf).

Print - Labels

The Print – Labels option generates one label for each occupied row on the [Worksheet tab](#) of the worksheet. These labels can be affixed to secondary containers used during testing, and have other uses, as well. Selecting this option pops up the Print screen.

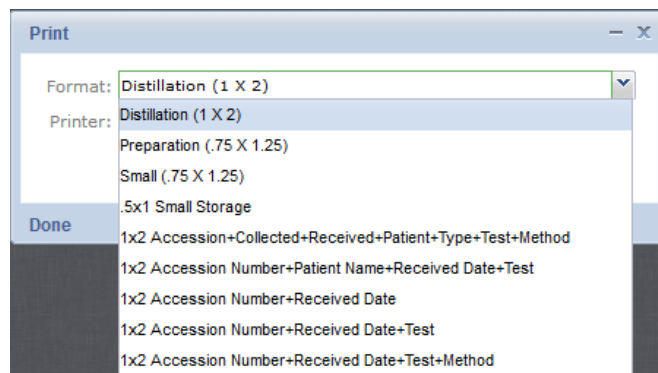


Figure 324 Print - Labels Screen

Various label formats are available in OpenELIS through the code and [Label](#) screen. The Printer field is used for the selection of the network barcode printer.

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View TRF

This option generates the Test Request Form (TRF) that is attached to the selected sample. The sample's analysis row must first be selected on the Worksheet tab.

5.2.2 LEFT SIDEBAR

The left sidebar lists the worksheets that match the query parameters. The Id (worksheet number) and Description of the worksheets are displayed here. Clicking on a worksheet Id/Description row will display the worksheet. The worksheet ids on this sidebar are sorted in descending order so that the more recent ones are listed at the top.

Id	Description
31675	pesticides, epa 8270 nch, op
31674	pesticides, epa 8270 nch, op
31673	dig, epa 3050b envpb wipe
31672	e coli, colilert mpn

Figure 325 Left Sidebar

5.2.3 WORKSHEET TAB

The fields of the Worksheet tab in the lower pane of this screen are described below.

Worksheet	Overrides	Reagents/Media	Note	Attachment	Position	Accession #	Description	QC Link	Test	Method	Unit	Status	Type	Analyte	Reportable	Raw Value	Final Value	Expected Value
					1	106323.1	5210b 5 day bod bl...							Dissolved Oxyge...	<input type="checkbox"/>			<0.2
					2	106323.2	5210b seed control...							BOD, Seeded 5 D...	<input type="checkbox"/>			
					3	106323.3	5210b seed control...							BOD, Seeded & L...	<input type="checkbox"/>			
					4	106323.4	5210b g&g std (A7...							BOD, Seeded 5 D...	<input type="checkbox"/>			396
					5	568077	[loc]effluent [rpt]LO...		bod	sm 5210b 5 c	mg/L	Initiated		CBOD, 5 Day	<input checked="" type="checkbox"/>			
					6	106323.6	5210b 5 c dup (521...	568077 (5)						CBOD, 5 Day	<input type="checkbox"/>			
					7	568078	[loc]raw [rpt]LONE ...		bod	sm 5210b 5 day	mg/L	Initiated		BOD, 5 Day	<input checked="" type="checkbox"/>			
					8	568147	[loc]filter backwas...		bod	sm 5210b 5 day	mg/L	Initiated		BOD, 5 Day	<input checked="" type="checkbox"/>			
					9	568166	[loc]influent 24 hr fr...		bod	sm 5210b 5 day	mg/L	Initiated		BOD, 5 Day	<input checked="" type="checkbox"/>			
					10	568167	[loc]effluent 24 hr [...]		bod	sm 5210b 5 c	mg/L	Initiated		CBOD, 5 Day	<input checked="" type="checkbox"/>			
					11	568272	[loc]final manhole fr...		bod	sm 5210b 5 c	mg/L	Initiated		CBOD, 5 Day	<input checked="" type="checkbox"/>			
					12	568273	[loc]raw manhole fr...		bod	sm 5210b 5 day	mg/L	Initiated		BOD, 5 Day	<input checked="" type="checkbox"/>			

Figure 326 Worksheet Tab

Position

This field specifies the exact position of the sample or QC item in the test run (e.g., Position 1 would indicate the first well on a plate).

Accession #

The unique accession number of the sample or QC item is displayed in this field. QC items have an Accession # with a format of “worksheet_number.position_number”. For example, a QC with an Accession # of 932.2 means that the QC occupies Position 2 on Worksheet # 932.

(Analysis/QC) Description

This field contains information which can be used to help identify an analysis or QC item. See [\(Analysis/QC\) Description](#) for a complete explanation of this field.

QC Link

This field is used to link a QC item and a sample analysis. Examples include matrix duplicates, matrix spikes, and sample duplicates. The accession number and the position (in parentheses) of the linked QC item or sample analysis are displayed in this field.

Test

The test that has been assigned for a sample analysis is displayed in this field.

Method

The method that has been assigned for a sample analysis is displayed in this field. The method cannot be [flipped](#) using this screen.

Unit

The unit of measure of the sample analysis is specific to the sample type and is defined on the [Sample Type Tab](#) of the test definition. If multiple units have been defined for a sample type, the unit can be changed for non-released analyses while in Transfer Results mode.

(Analysis) Status

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This field displays the current analysis status. See [\(Analysis\) Status](#) for a definition of each status. The analysis status can only be manually changed for non-released analyses while in Transfer Results mode.

(Analysis) Type

This optional field specifies the type of analysis. See [\(Analysis\) Type](#) for a complete description of each type.

Worksheet	Overrides	Reagents/Media	Note	Attachment	Position	Accession #	D...	QC Link	Test	Method	Unit	Status	Type	Analyte	Reportable	Final Result	Expected Value
					1	107840.1	ki...							Acid Fast Bacillus	<input type="checkbox"/>	negative	negative
					2	107840.2	ki...							Acid Fast Bacillus	<input type="checkbox"/>	positive	positive
					3	567144	O...		afb culture	bculture		Released	Preliminary Final	Acid Fast Bacillus	<input checked="" type="checkbox"/>	Acid Fast Bacillus isolated, Identification to follow	
					4	570836	J...		afb culture	bculture		Released	Preliminary Final	Acid Fast Bacillus	<input checked="" type="checkbox"/>	Acid Fast Bacillus isolated, Identification to follow	
					5	573216	A...		afb culture	bculture		Released	Preliminary	Acid Fast Bacillus	<input checked="" type="checkbox"/>	Contaminants present	
					6	573845	M...		afb culture	bculture		Released	Preliminary Final	Acid Fast Bacillus	<input checked="" type="checkbox"/>	Acid Fast Bacillus isolated, Identification to follow	
					7	574509	G...		afb culture	bculture		Released	Preliminary	Acid Fast Bacillus	<input checked="" type="checkbox"/>	Contaminants present	
					8	575233	S...		k afb smear	carbol fuchsin stain		Released		Acid Fast Bacillus	<input checked="" type="checkbox"/>	Positive	

Figure 327 Worksheet Containing Preliminary and Preliminary Final Analyses

Analyte

This column contains the analyte that was tested. OpenELIS generally calls any question (i.e., Chloroform, Date of Onset, Sign and Symptoms) an analyte.

Reportable

This checkbox is used to mark an analyte and its related results reportable. This is a second level of reporting capability as the analysis will also have to be reportable. The analyte reportable flag can only be flipped for non-released analyses while in Transfer Results mode.

Raw Value

The Raw Value field can be used to enter the result for the corresponding analyte. Raw Values may include any measurement (i.e., volume measurements, pH measurements, or measurements that came off an analytical instrument). The Raw

Value can be entered manually or may be supplied from an instrument that has been electronically interfaced with OpenELIS.

Some considerations for Raw Values include:

- a. Raw Values could be different from the Final Values. Some tests require multiple dilutions and the Raw Value is not representative of the Final Value.
- b. Raw value is stored only in the worksheet and not copied to your analysis. Capturing raw values is important – if another user changes the Final Value, there will not be any raw values to view or compare.
- c. The Raw Value is not rounded or formatted. Final Value is rounded and formatted if it is specified in the test definition.

Final Value

The Final Value is what goes into the Value field on the Test Results tab of the [full sample login](#), [Sample Tracking](#), and [Complete and Release](#) screens and are the values that are reported. A Final Value can be displayed as a numerical value (<0.5), as a qualitative result (Positive, Negative), as a titer (1:8, <1:256), or a date-time field (2012-12-21 00:01). The Final Value can be entered manually or it may be imported from an Excel spreadsheet or an instrument that has been electronically interfaced with OpenELIS.

Final Values can be manually overridden (e.g., to report an average of calculated values).

Expected Value

Expected Values include information, defaults, concentrations for chemical analytes, surrogates and internal standards, target analytes for a method blank, and typical values for a QC item, etc.

Other Column Analytes

Other column analytes, such as Quantitation Limit and MCL, might be present depending upon the test definition.

Edit Multiple Button

The **Edit Multiple** button can be used to enter the same analyte raw value, final value, or other value in multiple analysis or QA rows. First, the user needs to be in Update mode and **Ctrl-** or **Shift-**select the desired rows to edit, or use the **Select All** button to choose all of the rows on the Worksheet tab, if applicable. The “If Empty” checkbox should be unchecked if it is desirable to override any existing values.

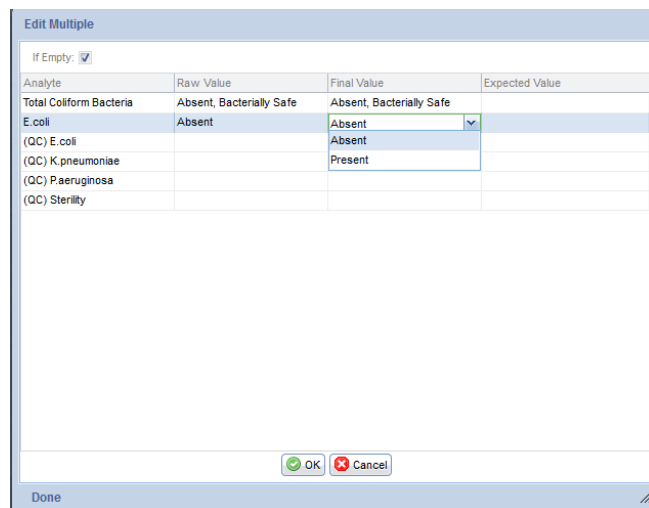


Figure 328 Worksheet Tab: Edit Multiple Pop-up Window

Run Scriptlets

A [scriptlet](#) assigned to a test is run when any change is made to a result. The **Run Scriptlets** button can be used to force all of the scriptlets assigned to the sample (any applicable test and domain scriptlets) to run.

5.2.4 OVERRIDES TAB

The Overrides tab of the Worksheet Completion screen allows the user to override several pieces of information for an analysis. The fields of the Overrides tab in the lower pane of this screen are described below.

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Position	Accession #	Description	Test	Method	User(s)	Started	Completed
1	98704		gram stain	bio stain	mhayek,bcook	2014-08-06 10:34	2014-08-06 14:55
2	98705		gram stain	bio stain	mhayek,bcook	2014-08-06 10:34	2014-08-06 14:55
3	98706		gram stain	bio stain	mhayek,bcook	2014-08-06 10:34	2014-08-06 14:55
4	98707		gram stain	bio stain	mhayek,bcook	2014-08-06 10:34	2014-08-06 14:55

Worksheet Overrides Reagents/Media Note

Edit Multiple Select All Unselect All

Figure 329 Overrides Tab

Position

This field specifies the exact position of the sample or QC item in the test run (e.g., Position 1 would indicate the first well on a plate).

Accession #

The unique accession number of the sample or QC item to be tested is displayed in this field. QC items have an Accession # with a format of “worksheet_number.position_number”. For example, a QC with an Accession # of 932.2 means that the QC occupies Position 2 on Worksheet # 932.

(Analysis/QC) Description

This field contains information which can be used to help identify an analysis or QC item. See [\(Analysis/QC\) Description](#) for a complete explanation of this field.

Test

The test that has been assigned for a sample analysis is displayed in this field.

Method

The method that has been assigned for a sample analysis is displayed in this field. The method cannot be [flipped](#) using this screen.

User(s)

By default, the logged-in user is credited with completing the analysis when its result(s) is transferred to the sample. Multiple usernames can be entered in these cells to allow credit for completion of the analysis to be shared. The username of the logged-in user must be entered for he/she to receive credit in such a situation. An OpenELIS username should be entered followed by a comma, and with no spaces between usernames.

Started (Date and Time)

The Overrides tab is also used to correct the Started (Date and Time) for an analysis or QA event to the actual date and time that the analysis or QA event began. The Started (Date and Time) is set by default to the worksheet Created Date (and Time).

Completed (Date and Time)

The Completed (Date and Time) for each analysis can also be overridden, if necessary, using this tab. The Completed (Date and Time) is set by default to the date and time that the analysis's result(s) is transferred to the sample.

Edit Multiple Button

The **Edit Multiple** button can be used to enter the same values in the User(s), Started, or Completed fields in multiple analysis or QA rows. First, the user needs to be in Update mode and **Ctrl-** or **Shift-**select the desired rows to edit, or use the **Select All** button to choose all of the rows on the Overrides tab, if applicable. The "If Empty" checkbox should be unchecked if it is desirable to override any existing values.

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Figure 330 Overrides Tab: Edit Multiple Pop-up Window

5.2.5 REAGENTS/MEDIA TAB

The Reagents/Media tab is used to capture the media or reagents used in an analytical run. The reagents/media are considered quality control items; they must be entered into OpenELIS through the [QC](#) screen.

Description	Location	Prepared Date	Usable Date	Expire Date	Prepared Volume	Prepared Unit	Prepared By
epa 111b tkn std 1 (320313-1J)	Lakeside	2014-07-28 09:33	2014-07-28 09:34	2014-08-04 09:34	200	mL	Ischwarck
epa 111b tkn std 4 (320313-4 J)	Lakeside	2014-07-28 09:34	2014-07-28 09:35	2014-08-04 09:34	250	mL	Ischwarck
epa 111b tkn std 1000 (320313-1000 A)	Lakeside	2013-06-27 10:43	2013-09-30 10:44	2015-04-30 10:44	500	mL	

Figure 331 Reagents/Media Tab

The fields of the Reagents/Media tab are described below.

(QC) Description

The Description field lists the name of the QC followed by its lot number in parentheses.

Location

The location where the QC lot is used is displayed in this field.

Prepared Date (and Time)

The date and time when the QC lot was prepared is displayed in this field.

Usable Date (and Time)

The date and time when the QC lot can be used is displayed in this field.

Expire Date (and Time)

The date and time when the QC lot expires is displayed in this field.

Prepared Volume

The volume of the QC lot that was prepared is displayed in this field.

Prepared Unit

The unit of measurement of the QC lot that was prepared is displayed in this field.

Prepared By

The OpenELIS username of the person who prepared the QC lot is displayed in this field.

The functionality of the buttons at the bottom of this tab during Update Mode is described below.

Add Row

This button is used to add a QC item to the bottom row of this tab. It pops up the [QC Lookup Screen](#) which is used for this purpose.

Remove Row

This button allows for the removal of a row on this tab. Multiple rows may be removed by **Ctrl-** or **Shift-**selection.

Move Up

The **Move Up** button moves the selected QC row up in position on the tab.

Move Down

The **Move Down** button moves the selected QC row down in position on the tab.

5.2.6 NOTE TAB

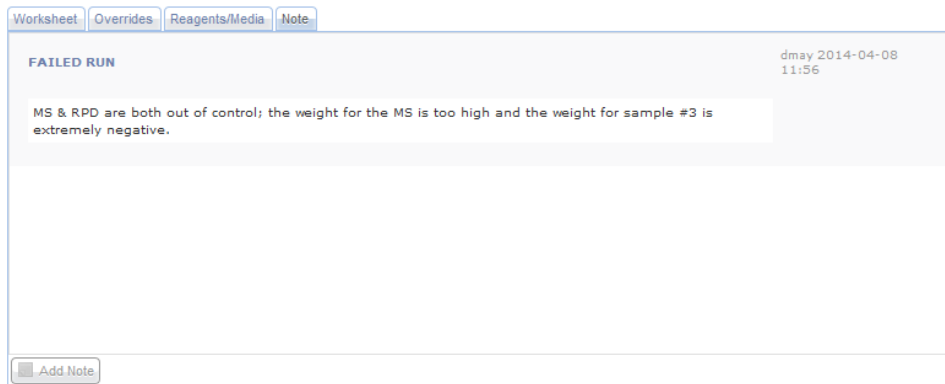


Figure 332 Note Tab

The Note tab on the Worksheet Completion screen is used to write any notes that might be related to the run. This tab is intended to contain notes pertaining to the worksheet (e.g., an explanation of why the run failed). Click **Update** and then **Add Note**. The Note Editor screen will pop up. See [NOTE EDITOR SCREEN](#) for more information on how to use standard notes.

5.2.7 ATTACHMENT TAB

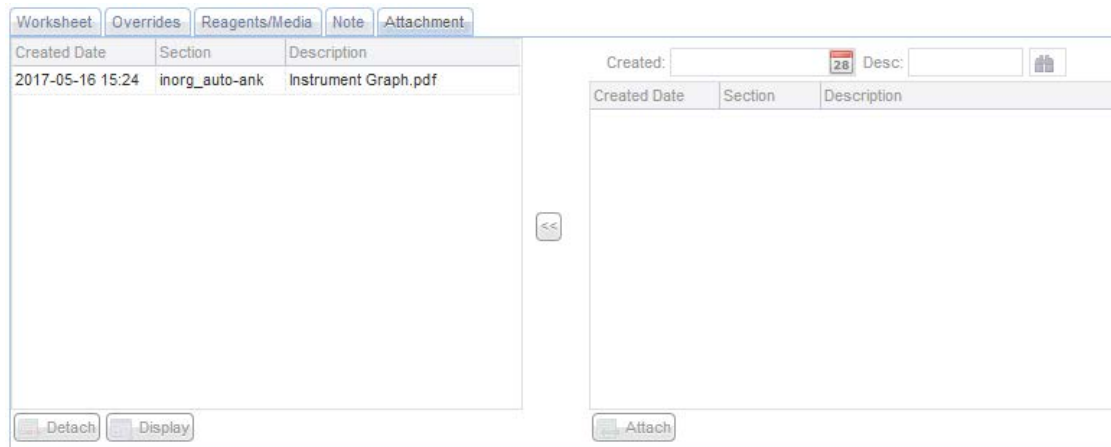


Figure 333 Attachment Tab

The Attachment tab is used to link a file to a worksheet. Worksheet attachments can include a graph from an instrument, a scanned copy of a paper worksheet, etc. Files should be uploaded once to OpenELIS; however, they can be linked to multiple worksheets. Most of the standard file types can be linked and viewed from this tab (i.e., .pdf, .docx, .doc, .xlsx, .xls, .png, .txt, etc.) Attachments can be restricted so that they can only be viewed by specific groups of people (i.e., bacteriology lab section, client services staff, or all internal laboratory staff (section = internal). These groups will first need to be defined through the [LABORATORY SECTION](#) screen.

The steps for [adding an attachment](#) are described in the Full Sample Login section.

5.2.8 COMPLETING A WORKSHEET

The steps below illustrate how to complete a worksheet.

1. Click on the Worksheet Completion module in the [Analysis Menu](#).
2. A created worksheet can be queried by one or more of the general fields located at the top of this screen, such as Worksheet #, Username, Created Date, Description, and/or Status. Normally, an analyst will query for a worksheet in Working status.
3. All of the information and the analytes from the test definition of an analysis are loaded into the Worksheet Completion screen. An analysis/QC item may have multiple rows of analytes.

4. The values that are used to complete the worksheet can be entered in three ways:
 - a. Manually into the Worksheet Completion screen
The raw, final, and other values may be entered or updated in Update Mode.
 - b. Exporting to/Importing from Excel
When calculations are used to convert raw values to final values it is advantageous to use an Excel template that has been created for that specific worksheet format. The calculations are built into the Excel template as macros. The user may also feel that she/he can view and input values easier in Excel. See [EXPORTING TO/IMPORTING FROM EXCEL](#) for a complete description of this process.
 - c. Instrument Interfacing
For instruments that are interfaced with OpenELIS, the values from the instrument are automatically updated in the worksheet in the background. An instrument interface can be programmed to update raw, final, started date and time of analysis, and other values into the worksheet. The user can then review the values and change any values that need to be updated.
5. Review and update any information as necessary, including raw, final, other values, and information on the Overrides, Reagents/Media, Note, and Attachment tabs.
6. The results must still be transferred to the samples' records by clicking on the **Transfer Results** button. A checkbox will be displayed in front of each sample's Position number and it will be checked by default, as long as no analyses were run in replicate on that worksheet. If the analyst only wishes to transfer some of the worksheet's results, she should uncheck the analyses that she doesn't want to transfer. This could be useful if a result seems questionable and the analyst decides that it should be rerun.

Position	Accession #	Description	QC Link	Test	Method	Unit	Status	Analyte	Reportable	Raw Value	Final Value
<input checked="" type="checkbox"/>	1	[loc]adult bathroom ...		coliforms	collert pa sdwa am /100 mL		Initiated	Total Coliform Ba... E.coli	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Absent, Bacterially Safe Absent	Absent, Bacterially Safe Absent
<input checked="" type="checkbox"/>	2	[loc]school kids sin...		coliforms	collert pa sdwa am /100 mL		Initiated	Total Coliform Ba... E.coli	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Absent, Bacterially Safe Absent	Absent, Bacterially Safe Absent
<input checked="" type="checkbox"/>	3	[loc]2 comp sink kt...		coliforms	collert pa sdwa am /100 mL		Initiated	Total Coliform Ba... E.coli	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Absent, Bacterially Safe Absent	Absent, Bacterially Safe Absent
<input type="checkbox"/>	4	[loc]bar sink [prt]C...		coliforms	collert pa sdwa am /100 mL		Initiated	Total Coliform Ba... E.coli	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Absent, Bacterially Safe Absent	Absent, Bacterially Safe Absent
<input checked="" type="checkbox"/>	5	[loc]well [prt]CAFE L...		coliforms	collert pa sdwa am /100 mL		Initiated	Total Coliform Ba... E.coli	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Absent, Bacterially Safe Absent	Absent, Bacterially Safe Absent
<input checked="" type="checkbox"/>	6	[loc]men wc [prt]C...		coliforms	collert pa sdwa am /100 mL		Initiated	Total Coliform Ba... E.coli	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Absent, Bacterially Safe Absent	Absent, Bacterially Safe Absent

Figure 334 Deselecting an Analysis during Transfer of Results

- If analyses were run in replicate the checkboxes for those replicates will be unchecked by default. A warning message will notify the user of this situation. This allows the analyst to select the result(s) from the analysis that she wishes to transfer to the sample’s record.

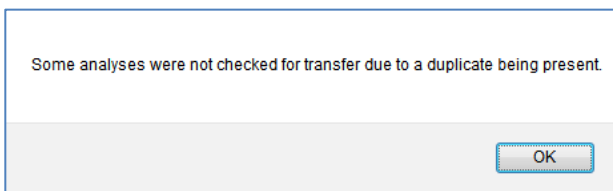
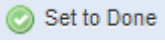


Figure 335 Analyses Not Selected for Results Transfer Warning

Position	Accession #	Description	QC Link	Test	Method	Unit	Status	Analyte	Reportable	Raw Value	Final Value
<input checked="" type="checkbox"/>	1	[loc]adult bathroom [prt]LITTLE A...		coliforms	collert pa sdwa am /100 mL		Initiated	Total Coliform Ba... E.coli	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Absent, Bacterially Safe Absent	Absent, Bacterially Safe Absent
<input type="checkbox"/>	2	[loc]school kids sink [prt]LITTLE ...		coliforms	collert pa sdwa am /100 mL		Initiated	Total Coliform Ba... E.coli	<input type="checkbox"/> <input checked="" type="checkbox"/>	Absent, Bacterially Safe Absent	Absent, Bacterially Safe Absent
<input type="checkbox"/>	3	[loc]school kids sink [prt]LITTLE ...		coliforms	collert pa sdwa am /100 mL		Initiated	Total Coliform Ba... E.coli	<input type="checkbox"/> <input checked="" type="checkbox"/>	Absent, Bacterially Safe Present	Absent, Bacterially Safe Present
<input checked="" type="checkbox"/>	4	[loc]2 comp sink kitch [prt]CAFE L...		coliforms	collert pa sdwa am /100 mL		Initiated	Total Coliform Ba... E.coli	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Absent, Bacterially Safe Absent	Absent, Bacterially Safe Absent
<input checked="" type="checkbox"/>	5	[loc]bar sink [prt]CAFE IGUANAS...		coliforms	collert pa sdwa am /100 mL		Initiated	Total Coliform Ba... E.coli	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Absent, Bacterially Safe Absent	Absent, Bacterially Safe Absent
<input checked="" type="checkbox"/>	6	[loc]well [prt]CAFE IGUANAS INC		coliforms	collert pa sdwa am /100 mL		Initiated	Total Coliform Ba... E.coli	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Absent, Bacterially Safe Absent	Absent, Bacterially Safe Absent

Figure 336 Replicate Analyses are Not Selected for Results Transfer by Default

- Unit of measurement, analysis status, and reportability of analytes can be changed for non-released analyses during Transfer Results Mode. The status of an analysis can be changed by selecting the appropriate choice from the dropdown list. This is normally only done to change the analysis status to On Hold or Requeue. It is not necessary to change the status of each analysis to Completed, as the system will automatically attempt to do this provided that all of the required results have been entered.

9. The **Commit** button must be clicked for the results and other possible changes to be transferred to the samples' records.
10. After the analyst is finished with the worksheet, the status of the worksheet should be changed to one of the following:
 - a. **Done.** This status should be selected when all of the analyses are in Completed status and it is normally the end of a worksheet's life cycle. The  button can be used for this purpose. Completed analyses must still be released. See [RELEASING AN ANALYSIS](#) for more information on this procedure.
 - b. **Pending Release.** This status could also be selected when all of the analyses are in Completed status in order to inform the releaser that the worksheet's analyses should be reviewed and released.
 - c. **Failed Run.** This status should be used when instrument, reagent, or human error causes the run to fail. Selecting this status will change all of the worksheet's analyses to Requeue status so that they may be rerun at a later time.
 - d. **Void.** This status should be used when the analyst no longer wishes to use the worksheet because he deems it to be unusable. This status will set all of the analyses back to Logged In status.

Once the values have been transferred to the samples' records, any future changes in the worksheet values must be re-transferred to the results again using the [transfer procedure](#).

5.2.9 EXPORTING TO/IMPORTING FROM EXCEL

The steps below illustrate how to export an OpenELIS worksheet to Excel, enter results, perform calculations, override users, started dates and times, and completed dates and times if necessary, and import the data from Excel back into OpenELIS.

1. After the OpenELIS worksheet has been loaded into the Worksheet Completion screen the **Export to Excel** button is clicked to transfer the data to an Excel template. The Excel template has the same columns and values that are found in the Worksheet Completion screen. An analysis/QC item may have

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multiple rows of analytes depending upon the test definition. The location of the saved Excel file on the network drive will be specified in the Status Area of this screen.

Worksheet was exported to M:\OpenELIS\demo-worksheets\1574_mhayek.xls

Figure 337 Storage Location of Excel File

- Open the Excel worksheet file. If an Excel Security Warning pops up saying “Macros have been disabled.”, click on the **Enable Content** button.
- Click the **Yes** button on the Security Warning pop-up message: “Do you want to make this file a Trusted Document?”. Excel has the capability to automatically enable macros for certain Excel files. Ask your IT group on how to enable this option.

Position	Accession #	Description	QC Link	Test	Method	Status	Analyte	Reportable	Run Value	Final Value	Expected Value
1	912.1	323.2 prep information					Surrogate/Internal Std Id	N			3.0004
2							Surrogate/Internal Std Volume	N			300 uL
3							Spike Volume	N			300 uL
4							Reagent Water pH	N			7
5							Methylene chloride Lot Number	N			8&J DF138
6							Ethyl acetate Lot Number	N			8&J D0085
7							Methanol Lot Number	N			8&J DF006
8							C18 Disk Lot Number	N			SM 32809
9							Sample Volume	N			300 mL
10	912.2	323.2 o/w method blank					Instrument Run Id	N			
11							Acenaphthene-d10	N			0.0025
12							Phenanthrene-d10	N			0.0025
13							Chrysene-d12	N			0.0025
14							1,3-dimethyl-2-nitrobenzene	N			0.0025
15							Triphenyl phosphite	N			0.0025
16							Pyrene-d10	N			0.0025
17							Terphenyl-d18	N			0.0025
18							Perylene-d12	N			0.0025
19							Simazine	N			<0.0001
20							atrazine	N			<0.0001
21							Alachlor	N			<0.0001
22							bis(2-ethylhexyl)sebacate	N			<0.0006
23							bis(2-ethylhexyl)sebacate	N			<0.0006
24							Benzo[a]pyrene	N			<0.0001
25							Sample Volume	N			350 mL
26	912.3	323.2 tap water blank					Instrument Run Id	N			
27							Acenaphthene-d10	N			0.0025
28							Phenanthrene-d10	N			0.0025
29							Chrysene-d12	N			0.0025
30							1,3-dimethyl-2-nitrobenzene	N			0.0025
31							Triphenyl phosphite	N			0.0025
32							Pyrene-d10	N			0.0025
33							Pyrene-d10	N			0.0025

Figure 338 Excel Worksheet

- Every cell in blue cannot be edited. They are write-protected.
- The bar at the top can be used to collapse (- button) and expand (+ button) the middle columns of the spreadsheet so that the user can easily edit the values in the white columns on the right side of the spreadsheet.

6. Every worksheet has several built-in Macro buttons to perform routine calculations or data transfers. The **Copy to Final** button copies all values from the Raw Value or Calculated Value column to the Final Value column. All of these types of values are saved back to the LIMS. The Raw Value is not rounded in the Excel worksheet but may be rounded to compute the Final Value if it is specified in the test definition.

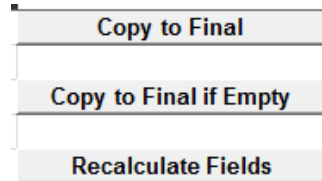


Figure 339 Excel Macro Buttons

7. The **Copy to Final if Empty** button copies values from the Raw Value (or Calculated Value) column to the Final Value column, only for those Final Value cells that are empty. This is used so that values that are already entered in the Final Value column are not overridden.
8. The **Recalculate Fields** button does a number of checks and calculates the macros (i.e., completes the Calculated Value column, compares results to Range Low and Range High values, determines Calculated % Recovery based on Expected Value, etc.)
9. The Overrides tab of an Excel worksheet allows the user to override several pieces of information for an analysis. By default, the logged-in user is credited with completing the analysis when its result(s) is transferred to the sample. Multiple usernames can be entered in the User(s) cells to allow credit for completion of the analysis to be shared. The username of the logged-in user must be entered for he/she to receive credit in such a situation. An OpenELIS username should be entered followed by a comma, and with no spaces between usernames. Make sure it is copied down for each analysis row, if appropriate.

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	A	B	C	D	E	F	G	H
1	Position	Accession #	Description	Test	Method	User(s)	Started	Completed
2	1	932.1	525.2 prep information			mhayek,mbielick,wberger	2012-05-30 11:43	
3	2	932.2	525.2 ofw method blank			mhayek,mbielick,wberger	2012-05-30 11:43	
4	3	932.3	525.2 tap water blank			mhayek,mbielick,wberger	2012-05-30 11:43	
5	4	5150	[loc]plant tap 2 [rpt]IOWA CITY WATER DEPARTMENT (1)	prep svol	epa 525.2	mhayek,mbielick,wberger	2012-05-31 09:20	
6	5	5151	[loc]plant tap 3 [rpt]IOWA CITY WATER DEPARTMENT (1)	prep svol	epa 525.2	mhayek,mbielick,wberger	2012-05-31 09:20	
7	6	932.6	525.2 ofw high spike			mhayek,mbielick,wberger	2012-05-30 11:43	
8	7	932.7	525.2 sample duplicate			mhayek,mbielick,wberger	2012-05-30 11:43	

Figure 340 Overrides Tab of an Excel Worksheet

10. The Overrides tab may also be used to correct the Started (Date and Time) for an analysis or QA event to the actual date and time that the analysis or QA event began. The Started (Date and Time) is set by default to the worksheet Created Date (and Time).
11. The Completed (Date and Time) for each analysis can also be overridden, if necessary, using this tab. The Completed (Date and Time) is set by default to the date and time that the analysis's result(s) is transferred to the sample.
12. When finished make sure to save and close the Excel file so that it doesn't sit on the network drive indefinitely.
13. If necessary, re-open the Worksheet Completion module and query and load the desired worksheet.
14. Click the **Import from Excel** button. The Worksheet Completion screen is populated with the values from the completed Excel worksheet.
15. The results and other values still need to be transferred to the samples' records and the worksheet status should be changed. See [COMPLETING A WORKSHEET](#) for a complete description of this process.

CHAPTER 6. ORGANIZATIONS, PROJECTS, AND PROVIDERS

Organization, provider, and project information form the basis for many of the client interactions with the system. For example, the sample “Report To” organization provides the necessary permissions for external users to view their results through the web portal; projects group samples for disease outbreak/case management or to provide billing/contract discounts. Similarly, the provider information offers hospitals the ability, through electronic data exchange, to notify physicians when their results are available.

Organization, project and provider information can be queried, added, or updated through these three specific screens. Only select personnel will have permission to update or add these records, whereas, most lab personnel will only be allowed to query this information.

Querying for organization, project, or provider information works in the same manner as any of the other OpenELIS queries. Clicking on the * at the top of the Query Sidebar displays all of the current records in alphanumeric order. The user can page through the records or click on the initial letter/number of the name of the organization, project, or provider. Alternatively, a query can be conducted using most fields. See [QUERY SIDEBAR](#) and [QUERY FUNCTION](#) for more information on performing queries.

Organization, project, and provider information can be added in much the same way in which other records in OpenELIS are added and updated. A description of the fields on each of the three screens follows.

6.1 ORGANIZATION

The Organization screen contains information about all of the clients that interact with the laboratory. This includes diverse organizations such as environmental regulatory agencies, private businesses, municipalities, homeowners, hospitals, physician offices, etc. Due to the pervasive effect that organization information has on the reporting, billing, and statistical analysis processes, only select personnel will have permission to update or add these records. The duplication of organization records is allowed in OpenELIS, but this action will most likely lead to confusion. It should only be performed as a last resort.

Having duplicate organizations will also lead to other errors, such as samples being assigned to a wrong organization. This has confidentiality implications both in terms of sending a Final Report to an incorrect organization and providing immediate web access to someone else's results.

Many laboratories have developed a standard process for adding new organizations to the system which includes querying for an organization in multiple ways such as a partial name search, looking for all of the organizations in the same city/address, etc.

The link to the Organization screen is found in the third section of the Sample Menu.

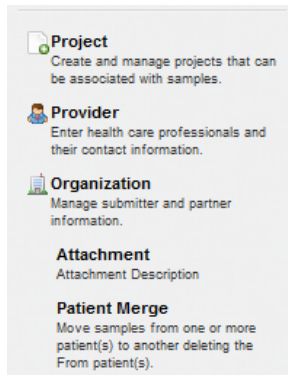


Figure 341 Sample Menu - Third Section

6.1.1 GENERAL FIELDS

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The screenshot shows the 'Organization' screen. On the left is a list of organizations with a search bar and a list of letters (A-Z). The main area contains a form for editing an organization. The form has the following fields:

- Id: 3201
- Name: SHL ANKENY
- City: ANKENY
- Apt/Suite #: IDWA LABORATOIRES COMPLEX
- State: IA
- Zip Code: 50023
- Address: 2220 S ANKENY BLVD
- Country: (dropdown)
- Parent Org: (dropdown)
- Active:

Below the form is a table for contacts:

Type	Contact Name	Work #	Home #	Cell #	Fax #
[Empty table body]					

Buttons for 'Add Row' and 'Remove Row' are located at the bottom of the contact table.

Figure 342 Organization Screen

The general fields of the Organization screen are detailed below.

Id

The organization id is a unique integer that is used to assign permissions for web users to view the results that are reported to that organization. It also serves as the billing id for an automated billing program.

Name

This field contains the complete name of the client organization.

Apt/Suite #, Address, City, State, Zip Code, Country

These fields specify the complete address of the client organization. Zip Code is a required field.

Parent Org(anization)

Subsidiary organizations can be linked to their parent organization in order to determine overall sample volumes, discounts, and other statistics.

Active

The Active checkbox indicates whether samples can be linked to this organization. For organizations that no longer exist, the laboratory should deactivate the organization. If an organization changes its name or address, the updated information will not only affect future reports but also previously reported samples. This is the correct behavior because the laboratory would want to send an updated Final Report to the current correct address.

6.1.2 CONTACT TAB

Contact	Parameter	Note						
Type	Contact Name	Work #	Home #	Cell #	Fax #	Email	Apt/Suite	
General	Jim Smith	515/555-1212				jsmith@abc123.com		
General	Sally Sunrise	515/555-1278		515/555-6789	515/555-1301	ssunrise@abc123.com		

Figure 343 Contact Tab

The Contact tab can hold contact information for the organization. The **Add Row** button is used to add a contact.

The fields on this tab are described below.

(Contact) Type

This required field is used to specify the type of contact: General, Certified Operator, Secure Fax Contact, Lab, etc. Additional contact types can be added through the [Dictionary](#) screen.

Contact Name

The name of the contact person is entered in this required field.

Work #

The work telephone number of the contact person can be entered in this field. The Work # of the first General contact for a “report to” organization is displayed on the [Abnormals Call List Report](#) and [Normals Call List Report](#).

Home #

The home telephone number of the contact person can be entered in this field.

Cell #

The cellular telephone number of the contact person can be entered in this field.

Fax #

The fax number of the contact person can be entered in this field.

Email

The email address of the contact person can be entered in this field.

Apt/Suite #, Address, City, State, Zip Code, Country

The mailing address of the contact person (if different from that of the organization) can be entered in these fields.

6.1.3 PARAMETER TAB

Contact Parameter Note	
Type	Value
Receivable Report-To Email	jsmith@abc123.com
Released Report-To Email	jsmith@abc123.com
Receivable Report-To Email	ssunrise@abc123.com
Released Report-To Email	ssunrise@abc123.com
Secure Fax Number	515/555-1301
Fax # Verification Date	2015-02-16
Don't Print Final Report	2014-07-23
Organization Type	CLINICAL

Figure 344 Parameter Tab

This tab is used to set special parameters at the organization level. The Type field specifies the specific name of the parameter, while the Value field contains a related value, such as a date, e-mail address, or fax number. The **Add Row** button is used to add a parameter. Common organization parameters are detailed below.

Parameter Type	Value	Function of Parameter
Receivable Report-To Email	E-mail address of web access user	Notifies user that sample has been received at the lab

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Released Report-To Email	E-mail address of web access user	Notifies user that sample/analysis has been released by the lab
Secure Fax Number	Secure fax number that can be used to send clinical results (999/999-9999)	The first secure fax number that is listed will automatically populate the Fax # field of the Final Report screen. It is also displayed on the Abnormals Call List Report and Normals Call List Report .
Final Report Fax Number	Fax number of "report to" organization (999/999-9999)	All Final Reports for this organization are automatically faxed to this number. SHL will only use secure fax numbers for clinical organizations.
Fax # Verification Date	Date that the secure fax number was verified (yyyy-mm-dd)	Records the date of verification of a clinical organization's secure fax number
Organization Type	CLINICAL STD Clinic Family Planning Clinic etc.	Used to distinguish different types of organizations for various purposes (e.g., generating clinical test request forms, specifying an organization for a specific data transfer, etc.)
Don't Print Final Report	Effective date (yyyy-mm-dd)	Causes the Final Report to not be printed (for paperless reporting)
Hold/Refuse Sample	Effective date (yyyy-mm-dd)	Used to notify lab staff that samples from this organization

		should be held or refused due to chronic non-payment
--	--	--

Figure 345 Organization Parameters

6.1.4 NOTE TAB

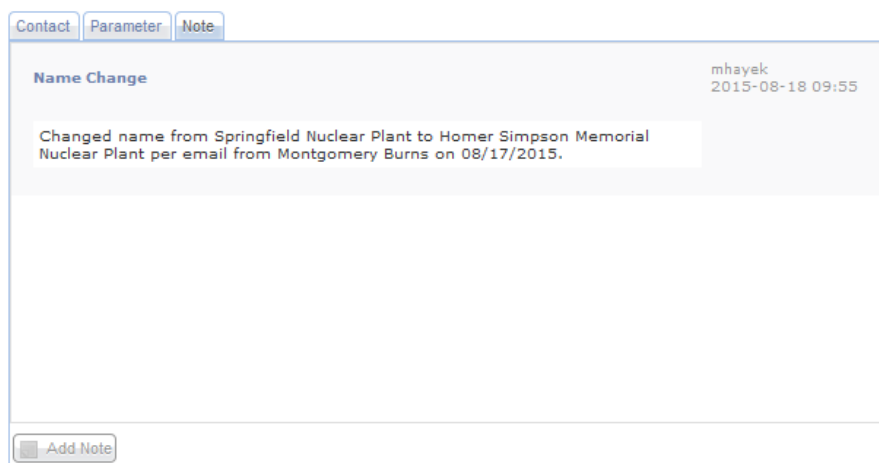


Figure 346 Organization Note Tab

The Note tab can be used to document a change or log client calls for use by other staff. The **Add Note** button is used to accomplish this task. This brings up the [NOTE EDITOR](#) which is used to enter a note.

6.2 PROJECT

The Project screen contains information about the projects in the LIMS. Projects are utilized to group multiple samples that are related, for example, all of the samples collected from a certain river or clean-up site or all of the samples collected from an outbreak. Projects can also play an important role in billing since the project can be tied to a contract or special pricing.

To reduce ambiguity, project names have to be unique. However, a project name can be reused if the previous project is deactivated. This is useful in case the begin/end date for the project or other parameters have changed.

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The link to the Project screen is found in the [third section of the Sample Menu](#).

The screenshot shows the 'Project' screen with the following details:

- Project List (Left):** A list of projects with '16wscomp' selected.
- Form Fields (Right):**
 - Id:** 9
 - Name:** 16wscomp
 - Description:** Water Supply Complaint - IDNR
 - Owner:** smarine
 - Active:**
 - Reference To:** (empty)
 - Begin Date:** 2011-09-01
 - End Date:** 2099-12-31
 - Scriptlet:** (empty)
- Parameter Table:**

Parameter	Operation	Value
-----------	-----------	-------

Figure 347 Project Screen

The fields of the Project screen are detailed below.

Id

The project id is a unique integer assigned to each project by the LIMS. This id is also used to assign permissions for web users to view the results that are assigned to that project.

Name

This field contains the abbreviated name of the project and it appears on results reports and web access dropdown lists for selection.

Description

This field contains a detailed description of the project.

Owner

The Owner field contains the username of the person responsible for the project in the LIMS.

Active

The Active checkbox indicates whether future samples can be linked to this project. For projects that are no longer current, the laboratory should deactivate the project.

Reference To

This field may contain an external identifier. Examples include an external contract number, a CDC case number, or a CDC outbreak number.

Begin Date

This is the date that the project officially started.

End Date

This is the date that the project is scheduled to terminate.

Scriptlet

This functionality has not yet been implemented.

Parameter Table

This functionality has not yet been implemented.

6.3 PROVIDER

The Provider screen contains demographic information about individual health care providers. The provider information is used for newborn screening and other clinical samples throughout the system including electronic orders and results.

The link to the Provider screen is found in the [third section of the Sample Menu](#).

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Location	External Id	Apt/Suite #	Address	City	State	Zip
Star Trek Memorial H...	222222222		835 VULCAN WAY	MILKY WAY	IA	522
Star Trek Physicians...	11	307	122 ENTERPRISE AVE	MILKY WAY	IA	522

Figure 348 Provider Screen

6.3.1 GENERAL FIELDS

The general fields of the Provider screen are detailed below.

Id

The provider id is a unique identifier that is assigned by OpenELIS.

Last Name, First Name, Middle Name

These fields compose the complete name of the provider.

Type

This field denotes the type of provider (i.e., doctor, nurse practitioner, physician assistant, etc.) Additional provider types can be added through the [Dictionary](#) screen.

NPI

This field contains the National Provider Identifier. It is a unique 10-digit identification number issued to health care providers in the United States by the Centers for Medicare and Medicaid Services (CMS).

Source

This field denotes the source of the information for that provider, such as a state provider registry. Provider sources can be added through the [Dictionary](#) screen.

6.3.2 LOCATIONS TAB

Location	External Id	Apt/Suite #	Address	City	State	Zip Code	Country	Work #	Home #	Cell #	Fax #	Email
Star Trek Memorial Hospital	222222222		835 VULCAN WAY	MILKY WAY	IA	52290-1234	United States	319/354-0096.173	319/342-9967	319/345-9373	319/354-0090	bonesmccoy@startrek.net
Star Trek Physicians Group	11	307	122 ENTERPRISE AVE	MILKY WAY	IA	52290-1234	United States	319/335-6060.90	319/342-9967	319/345-9373	319/335-6010	bonesmccoy@startrek.net

Figure 349 Locations Tab

This tab allows for entering complete contact information for each work location of the provider. A new location can be added by using the **Add Row** button.

The fields on this tab are described below.

Location

This required field is used to specify the name of the work location of the provider (e.g., the specific hospital name or clinic name).

External Id

The External Id is the identifier for that provider that is assigned by her organization and is used for electronic orders to match provider information.

Apt/Suite #, Address, City, State, Zip Code, Country

The mailing address of the provider's work location can be entered in these fields.

Work

The telephone number of the provider at that work location can be entered in this field.

Home

The home telephone number of the provider can be entered in this field.

Cell

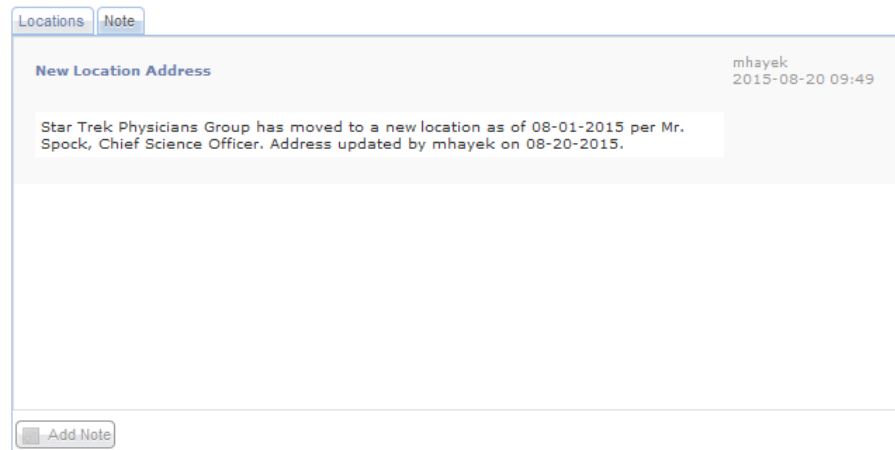
The cellular telephone number of the provider can be entered in this field.

Fax #

The fax number of the provider at that work location can be entered in this field.

Email

The email address of the provider at that work location can be entered in this field.

6.3.3 NOTE TAB

The screenshot shows a web interface with two tabs: "Locations" and "Note". The "Note" tab is active. The note content is as follows:

New Location Address mhayek
2015-08-20 09:49

Star Trek Physicians Group has moved to a new location as of 08-01-2015 per Mr. Spock, Chief Science Officer. Address updated by mhayek on 08-20-2015.

At the bottom of the note area, there is a button labeled "Add Note".

Figure 350 Note Tab

The Note tab can be used to document a change or explain any part of the provider's information. The **Add Note** button is used to accomplish this task. This brings up the [NOTE EDITOR](#) which is used to enter a note.

CHAPTER 7. MANAGING INVENTORY AND ORDERS

Many public health laboratories require the capability to manage inventory items in direct support of the testing process, as well as, the ability to send inventory such as kits and media to other organizations.

The inventory and order modules are all conveniently located on the Inventory/Order Menu. These modules include: Internal Order, Vendor Order, Send-out Order, Fill Order, Shipping, Build Kits, Inventory Transfer, Inventory Receipt, Inventory Adjustment, and Inventory Item.

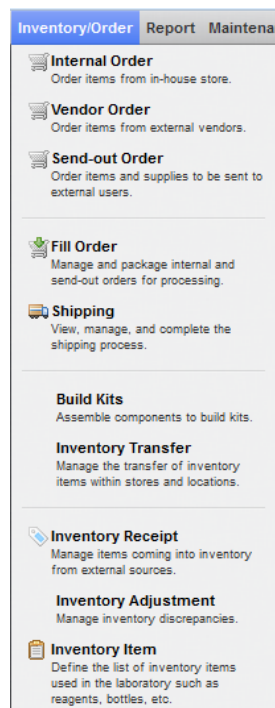


Figure 351 Inventory/Order Menu

7.1 INVENTORY ITEM

The purpose of the Inventory Item module is to define the list of **inventory items** used in the laboratory such as reagents, containers, instructions, labels, and kits. Inventory items may be queried, updated, and added in the usual manner. See [QUERY FUNCTION](#) for more information on general query formats and capabilities.

Before inventory items can be entered into the system, there are two concepts that should be considered, namely “store” and “storage location”. The **store** is used to define how items are replenished and dispensed. This includes a **general store** that contains all the inventory items of the laboratory that are purchased and dispensed at vendor quantities – acid in 2.5 liter containers and gauze in quantities of 1000/box. The general store is used to requisition items for laboratory bench use and manufacturing stores.

For laboratories that build kits or manufacture media or reagents, additional **manufacturing stores** will be setup to manage the inventory in smaller, dispensed quantities. For example, to build a bacterial water kit you will need a bottle, a Styrofoam mailer, and a chipboard bottle mailer all in a quantity of one, which will not be available in the general store. The manufacturing store is used to hold a subset of general store items that are dispensed at the minimum level needed to build any kits in that store. Using the acid example from above, the manufacturing store would transfer acid from the general store in quantities of 2500 mL while dispensing it in quantities of 1 mL.

The concept of the store should not be confused with **storage location**. The items in a store can be placed in one or more storage locations, even at separate geographical locations. Each storage location will maintain its own quantity on hand and lot information (depending on item parameters).

7.1.1 GENERAL FIELDS

The link to the Inventory Item module is found in the bottom section of the [Inventory/Order Menu](#).

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Component	Description	Quantity
bottle, 4oz idexx sodium thio	Bottle, plastic, 4oz IDEXX (preserved)	1
bottle, 4oz idexx	Bottle, plastic, 4oz IDEXX (unpreserved)	1

Figure 352 Inventory Item Screen

The fields in the upper pane of the Inventory Item Screen include:

Id

The Inventory Item Id is a unique identifier assigned by the LIMS.

Name

This is the abbreviated name of the inventory item and can consist of a number and/or words (e.g., “#17”, “#15 trip blank”, or “label, hazard, #8”. This field appears in all of the dropdowns on the other inventory and order screens.

Description

This field contains a detailed description of the inventory item, such as “Private well kit”, “instr for atrazine immunoassay”, or “Bottle, Plastic, 120ml clear IDEXX (sodium thiosulfate)”.

Category

This field specifies the classification of the inventory item (i.e., General Lab Supplies, Standards, Gas Cylinders/Tanks, Solvents/Reagents, Office Supplies, and Containers, etc.)

Store

This is the name of the store that stocks this item. A laboratory often has a general store and one or more manufacturing stores for building kits, reagents and media.

Min(imum) Order Level

This integer when appended with the Dispensed Units selection specifies the minimum amount of the item which should be ordered from the external vendor.

Reorder Level

This integer when appended with the Dispensed Units selection specifies the threshold amount of the item which will trigger an external vendor order to be created if the Auto Reorder parameter is checked.

Max(imum) Order Level

This integer when appended with the Dispensed Units selection specifies the maximum amount of the item which should be ordered from the external vendor.

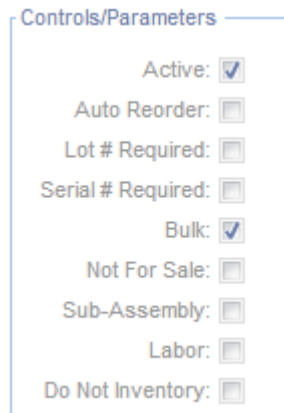
Dispensed Units

This field specifies the unit in which the item is dispensed. Examples include: each, package, case, bottle, box, jug, mg, kg, and mL.

Options

The **Duplicate** button in the Options drop-down menu allows for an inventory item to be easily duplicated.

7.1.2 CONTROL/PARAMETERS



Controls/Parameters

- Active:
- Auto Reorder:
- Lot # Required:
- Serial # Required:
- Bulk:
- Not For Sale:
- Sub-Assembly:
- Labor:
- Do Not Inventory:

Figure 353 Controls/Parameters

In the upper right corner of the Inventory Item screen is located the Controls/Parameters section. The following controls/parameters may be checked:

Active

This parameter denotes whether the inventory item is available to be used in the system. If the Active checkbox is not checked, the item has been retired.

Auto Reorder

If this parameter is checked, the inventory order report will include this item if the quantity on hand falls below the Reorder Level.

Lot # Required

The lot number is an identification number assigned to a particular quantity or lot of material from a single manufacturer. When items with this flag are being replenished through the Vendor Order or Build Kits processes, additional requirements and/or information is requested:

1. When receiving or building inventory, the user needs to provide lot number information. Lot numbers from a single vendor are unique; laboratory manufactured items should follow the same rules and have a unique numbering system.
2. An expiration date can be entered for any item marked with Lot # Required.

3. When receiving inventory, items received in one shipment are different from items received in an earlier or later shipment, even if all the other information is identical. See [INVENTORY RECEIPT](#) screen for more information.
4. When building kits, the quantity requested (the number of kits that can be built) is dependent on its components and their quantity on-hand. See [BUILD KITS](#) screen for more information.

Serial # Required

This field triggers the LIMS to create serialized inventory. Serialized inventory are always at quantities of one and can be uniquely identified through their system-wide, unique serial number. Newborn screening collection cards are an example of serialized inventory since each card has a unique serial barcode.

Bulk

The field indicates that all quantities of this item do not require detailed tracking. The inventory system will continue to track inventory levels and locations but not lot, serial, or expiration information.

Not For Sale

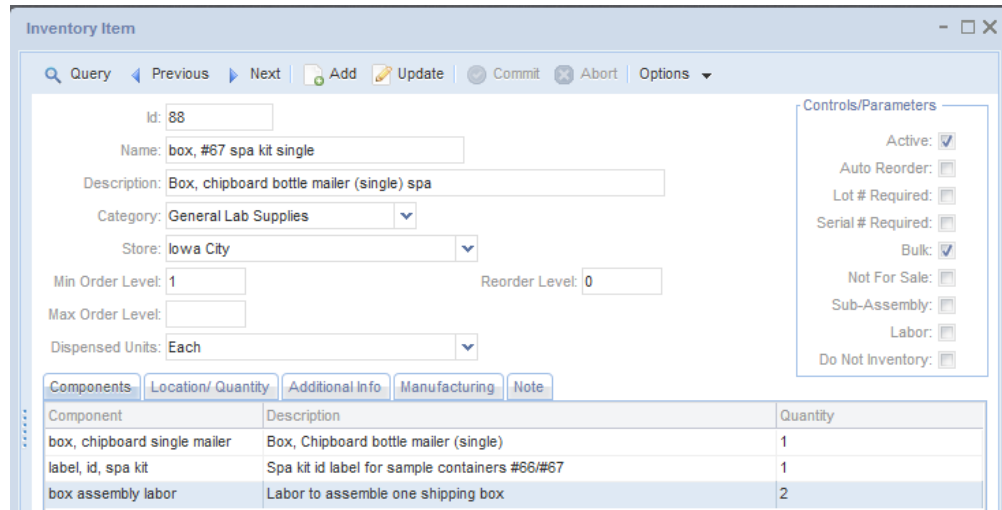
This flag is used to indicate that the item is used internally and should not be sent to other organizations.

Sub-Assembly

This field indicates that the item is used as part of another item such as a kit. These types of items are often marked Not For Sale.

Labor

To accurately manage costs, staff time for building kits or preparing reagents can be entered and managed through the inventory process. For example, a laboratory can create an inventory item called “box assembly labor” in units of one minute and then assign the item as a component to various kits. This item needs to be replenished and inventoried with an associated cost just like any other inventory item. A standard inventory report can then account for this cost.



Component	Description	Quantity
box, chipboard single mailer	Box, Chipboard bottle mailer (single)	1
label, id, spa kit	Spa kit id label for sample containers #66/#67	1
box assembly labor	Labor to assemble one shipping box	2

Figure 354 Labor Component of an Inventory Item

Do Not Inventory

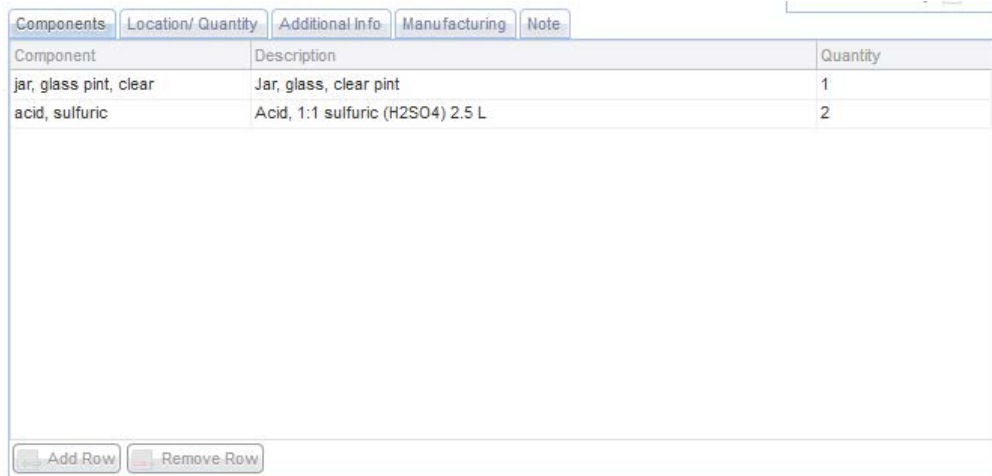
Items marked with this flag do not have to be replenished and the system does not subtract from their quantities as they are being used. For building kits, the instructions that are sent with kits are marked with Do Not Inventory. This allows the instructions to be printed on demand without having to preprint and physically store the instructions. See [BUILD KITS](#) screen for more information.

There are five tabs found in the lower pane of the Inventory Item Screen: Components, Location/Quantity, Additional Info, Manufacturing, and Note.

7.1.3 COMPONENTS TAB

Some inventory items are made from multiple components. The Components Tab displays the list of components that are part of this inventory item. To use a component, the component must first be entered into OpenELIS as an inventory item. Most inventory items will not have any components, with kits being the major exception. For example, a Private Well Water Kit consists of two components: one 4 oz. plastic IDEXX bottle (preserved) and one 4 oz. plastic IDEXX bottle (unpreserved).

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Component	Description	Quantity
jar, glass pint, clear	Jar, glass, clear pint	1
acid, sulfuric	Acid, 1:1 sulfuric (H2SO4) 2.5 L	2

Figure 355 Components Tab

The fields of this tab are described below:

Component

The entry in this field is taken from the Name field of the component item's record.

Description

The entry in this field is taken from the Description field of the component item's record.

Quantity

This field specifies the quantity of the component used within the inventory item (kit).

7.1.4 LOCATION/QUANTITY TAB

This tab displays all the location(s) where this inventory item is or has been stored. Locations with a quantity of zero are displayed for documentation purposes as they provide lot and expiration data. The list is sorted by quantity in descending order.

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Components	Location/ Quantity	Additional Info	Manufacturing	Note	
Loc #	Location	Lot No.	Serial #	Expiration Date	Qty
16422	d159, room Manufacturing Store Ankeny	INAA-R1579		2018-03-29	268
16385	d159, room Manufacturing Store Ankeny	INAA-R1579		2018-03-29	237
16321	d159, room Manufacturing Store Ankeny	INAA-R1579		2018-03-29	208
16016	209, ic limnology Inventory	INAA-R1371		2017-10-20	114
16313	218, temporary items transfer	INAA-R1579		2018-03-29	108
16482	218, cart #2	INAA-R1579		2018-03-29	105
16221	d159, room Manufacturing Store Ankeny	INAA-R1579		2018-03-29	96
16079	d159, room Manufacturing Store Ankeny	INAA-R1579		2018-03-29	72
16193	d159, room Manufacturing Store Ankeny	INAA-R1579		2018-03-29	67
16320	d159, room Manufacturing Store Ankeny	INAA-R1579		2018-03-29	55
16331	218, cart #2	INAA-R1579		2018-03-20	45
16190	d159, room Manufacturing Store Ankeny	INAA-R1579		2018-03-29	33
15516	209, ic limnology Inventory	INAA-R1371		2017-10-20	8

Figure 356 Location/Quantity Tab

The fields of this tab are described below:

Loc(ation)

This field specifies a unique ID for that item received at that location and time.

Location

This field specifies the physical location where the item is or has been stored. A location is defined using the [STORAGE LOCATION](#) screen and each part of the name is separated by a comma.

Lot No.

The lot number is an identification number assigned to a particular quantity or lot of material from a single manufacturer. The [INVENTORY RECEIPT](#) screen is used to enter the lot number for an item that is received from an external vendor, whereas, the [BUILD KITS](#) screen is used to enter the lot number for an item that is manufactured internally. See [Lot # Required](#) for more information on lot numbers.

Serial

This field specifies the system-wide, unique serial number for an individual item. Serialized inventory are always at quantities of one.

Expiration Date

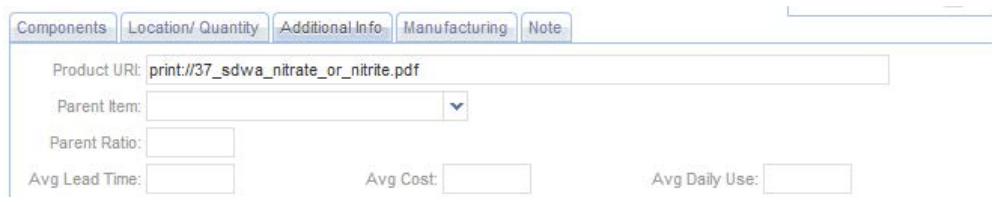
This date specifies when the quantity at that location will expire. The [INVENTORY RECEIPT](#) screen is used to enter the expiration date for an item that is received from an external vendor, whereas, the [BUILD KITS](#) screen is used to enter the expiration date for an item that is manufactured internally.

Qty (Quantity)

This field specifies the number of the item at that location.

7.1.5 ADDITIONAL INFO TAB

This tab provides additional information about inventory, inventory transfer, and usage statistics for the inventory item.



The screenshot shows a software interface with five tabs: Components, Location/Quantity, Additional Info (selected), Manufacturing, and Note. Below the tabs are several input fields: Product URI (text box containing 'print://37_sdwa_nitrate_or_nitrite.pdf'), Parent Item (dropdown menu), Parent Ratio (text box), Avg Lead Time (text box), Avg Cost (text box), and Avg Daily Use (text box).

Figure 357 Additional Info Tab

The fields of this tab are described below:

Product URI

The Product URI (uniform resource identifier) field identifies a product resource for the inventory item such as a product or vendor web page. Another use for this field is to provide on-demand printing. On-demand printing is used to print forms such as collection or shipping instructions at the time the kit is being assembled or inventory is being sent out.

For on-demand printing, the format of the URI is “print://filename.ext”. The directory path is specified in the system variable, `inventory_uri_directory`, and is prepended to the filename to locate the file. The file content must be suitable to be sent directly to the printer; Word or Excel documents will not work but PS or PDF formats can often be directly processed by the printer.

Parent Item

This field links together two related inventory items that exist in different stores. This function is used to link items from a manufacturing store with the same item in a general store to facilitate automatic inventory transfer during kit building. Please see [BUILD KITS](#) for a complete explanation.

Parent Ratio

This field is used to multiply the quantity transferred from the parent inventory store. For example, a value of 5 means that for every 1 item transferred from the parent (general) store, 5 items are placed in the child (manufacturing) store.

Avg (Average) Lead Time

This field is currently not implemented.

Avg (Average) Cost

This field is currently not implemented.

Avg (Average) Daily Use

This field is currently not implemented.

7.1.6 MANUFACTURING TAB

The Manufacturing Tab displays assembly instructions for kits, reagents, and media. The **Edit** button opens a Rich Text Editor so that bolding, italicizing, numbering, and bulleting, etc., can be used to edit the instructions/recipe. The instructions can be repeatedly modified and saved.



Figure 358 Manufacturing Tab

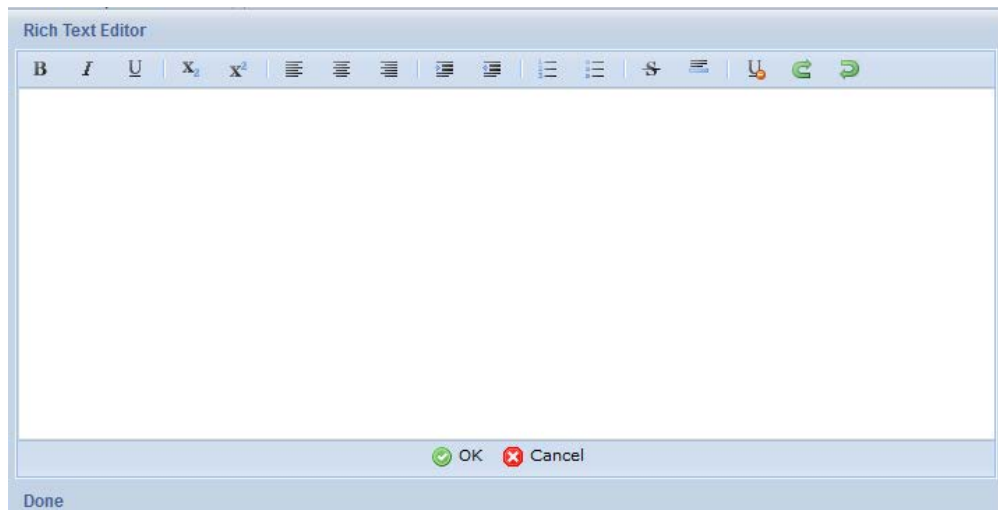


Figure 359 Rich Text Editor

7.1.7 NOTE TAB

This tab is used for internal notes. The **Add Note** button pops up the [NOTE EDITOR](#) so that a plain text note can be added. These notes cannot be modified after committal.

DECEMBER, 2017



Figure 360 Note Tab

7.2 INTERNAL ORDER

The Internal Order module allows the user to order items from the in-house stores. Previous internal orders can be queried by any of the fields. See [QUERY FUNCTION](#) for more information on general query formats and capabilities.

This screen can also be used to view orders that are automatically created when the staff builds kits or transfers inventory from one location or store to another.

The link to the Internal Order module is found in the top section of the [Inventory/Order Menu](#).

DECEMBER, 2017

#	Order #	Requested By
495		demo
493		mhayek
492		mhayek
491		mhayek
490		mhayek
489		mhayek
487		demo
470		mhayek
459		bmills
458		bmills
452		bmills
451		bmills
383		demo
343		demo
342		demo
341		demo
340		demo
339		demo
338		demo
337		demo
336		demo
327		demo
326		demo
314		demo
313		kvanauke

Item	Filled	Shipping Notes	
Quantity		Inventory Item	Store
1		jar, glass qt clear	Iowa City
10		acid, sulfuric	Iowa City

Figure 361 Internal Order Screen

7.2.1 GENERAL FIELDS

The general fields of this screen are described below.

Order #

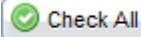
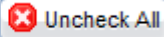
This is a unique system-wide order number assigned by the LIMS. All orders (internal, send-out, and vendor) share the same pool of order numbers.

Needed In Days

This field specifies the number of days from the Order Date in which the order needs to be filled. For automatically placed orders, the system enters a value of zero.

(Order) Status

The status of the order is specified in this field. See [\(Order\) Status](#) for a definition of each status.

Check All and Uncheck All   buttons are available in this field to aid in the multi-selection of order statuses while in Query Mode.

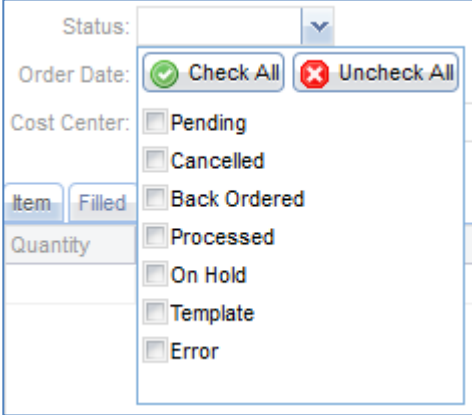


Figure 362 Order Status Selection in Query Mode

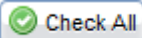
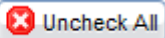
Requested By

This field is defaulted to the username but can be overridden to the requesting person or the department name.

Order Date

This is the date that the order was entered into the system. This date can be changed to reflect the actual order date.

Cost Center

This field contains the organizational unit, program, or project that is responsible for the cost of the order. This field is linked with the dictionary category system name “cost_centers”. Check All and Uncheck All   buttons are available in this field to aid in the multi-selection of cost centers while in Query Mode.

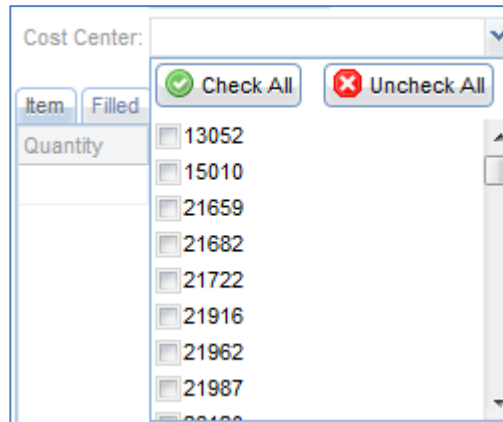


Figure 363 Cost Center Selection in Query Mode

Options

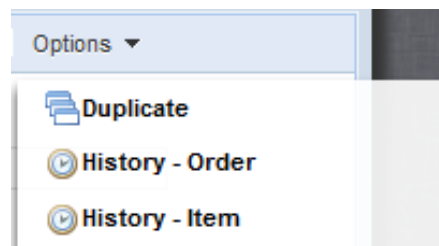


Figure 364 Internal Order Options Menu

The **Duplicate** button in the Options drop-down menu allows for an order to be easily duplicated.

The **History** menu can be used to examine the previous values, operations, and users at both the order and item level with their associated date-timestamps. See [History](#) for more information.

There are three tabs present in the lower pane of the Internal Order screen that provide details of the order: Item, Filled, and Shipping Notes. The tabs are described below.

Pop-out Ability of Tabs

DECEMBER, 2017

One or more of these tabs can be popped out for easier viewing by dragging them to a different location in the web browser. The tab headers will have a white background when they are popped out. The information in the popped-out tabs is automatically updated as different orders are selected in the left sidebar of the Internal Order screen. The popped-out tab(s) will return to their usual location in the Internal Order screen when they are closed.

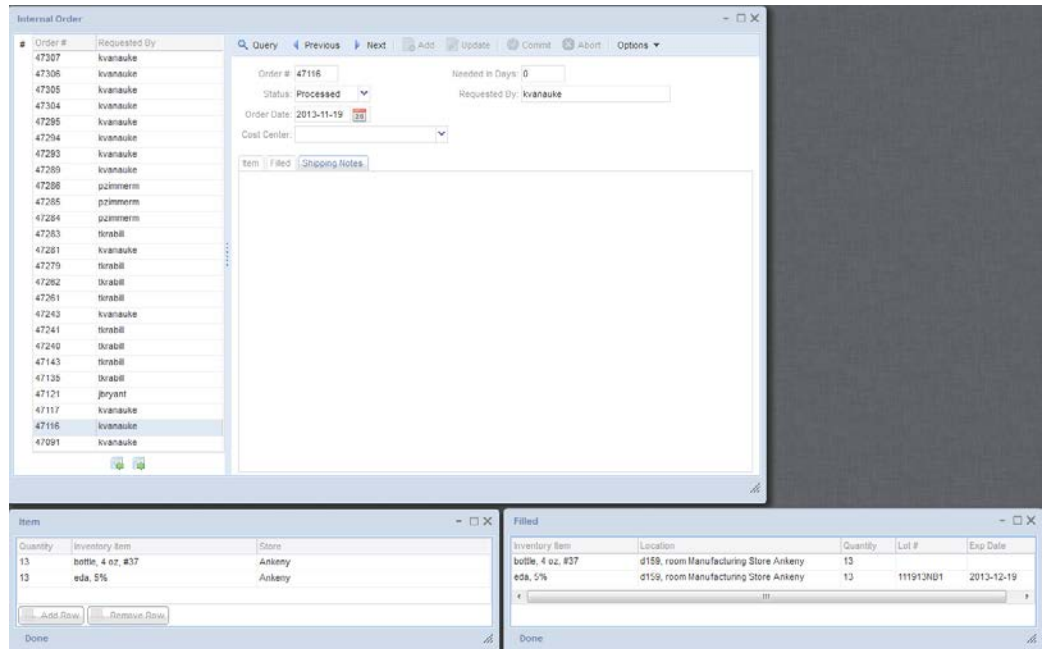
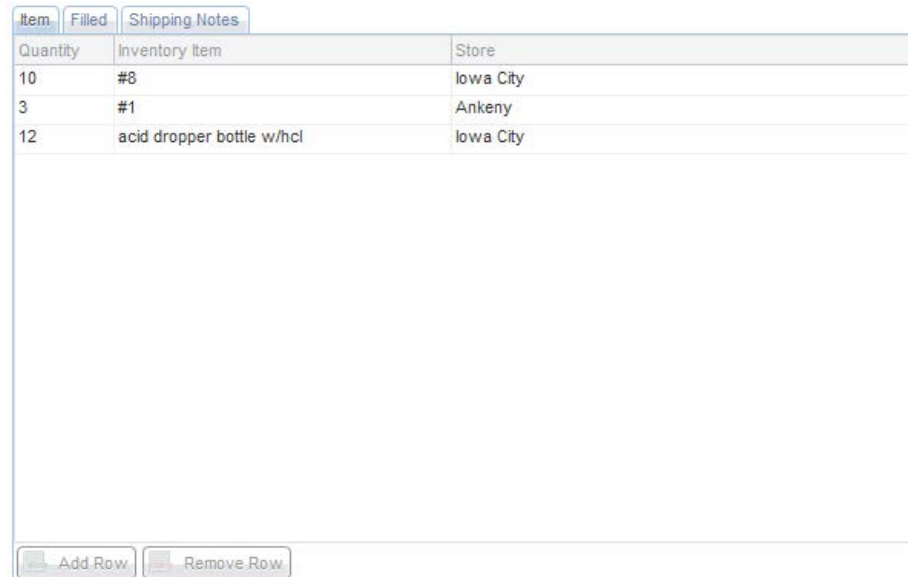


Figure 365 Popped-Out Internal Order Screen Tabs

7.2.2 ITEM TAB

The Item tab contains a table that lists the items that were requested in the internal order.

DECEMBER, 2017



Quantity	Inventory Item	Store
10	#8	Iowa City
3	#1	Ankeny
12	acid dropper bottle w/hcl	Iowa City

Buttons: Add Row, Remove Row

Figure 366 Internal Order Screen - Item Tab

The Item tab contains three columns: Quantity, Inventory Item, and Store.

Quantity

The number of each inventory item being requested is specified in this field.

Inventory Item

This field contains the name of the inventory item that is being requested. See [INVENTORY ITEM](#) for a detailed explanation of how inventory items are created and managed in OpenELIS.

Store

This is the name of the store from which this item is being requested. A laboratory often has a general store and one or more manufacturing stores for building kits, reagents and media. See [INVENTORY ITEM](#) for a detailed explanation of stores.

The Item tab has two buttons: **Add Row** and **Remove Row**.

Add Row

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This button is used to add an inventory item to the internal order. A drop-down list allows for the inventory item and its associated store to be easily selected. The Quantity of the inventory item must be entered.

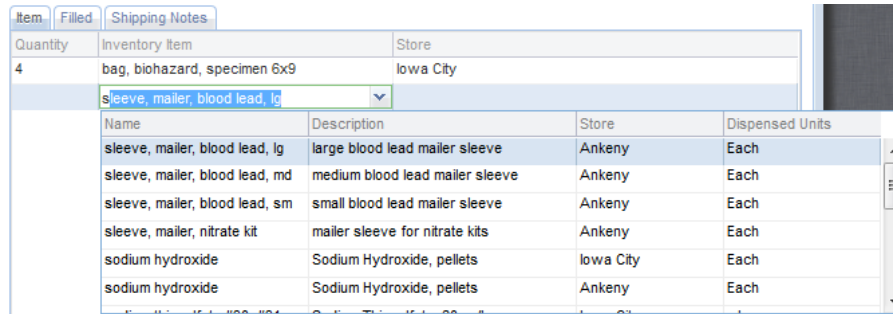


Figure 367 Adding an Inventory Item to an Internal Order

Remove Row

This button can be used to remove an inventory item from an internal order.

7.2.3 FILLED TAB

The Filled tab displays the items that were filled for processed orders along with related information.

Inventory Item	Location	Quantity	Lot #	Exp Date
bottle, 4 oz, #37	d159, room Manufacturing Store Ankeny	3		
eda, 5%	d159, room Manufacturing Store Ankeny	3	111913NB1	2013-12-19

Figure 368 Internal Order Screen - Filled Tab

The fields located on this tab are described here.

Inventory Item

This field contains the name of the inventory item that was filled. See [INVENTORY ITEM](#) for a detailed explanation of how inventory items are created and managed in OpenELIS.

Location

This field specifies the physical location from where the item was taken. A location is defined using the [STORAGE LOCATION](#) screen and each part of the name is separated by a comma.

Quantity

The number of each inventory item that was filled is shown in this field. If an item is filled from more than one location, there will be multiple rows with different quantities.

Lot No.

The lot number is an identification number assigned to a particular quantity or lot of material from a single manufacturer. The [INVENTORY RECEIPT](#) screen is used to enter the lot number for an item that is received from an external vendor, whereas, the [BUILD KITS](#) screen is used to enter the lot number for an item that is manufactured internally. See [Lot # Required](#) for more information on lot numbers.

Exp(iration) Date

This date specifies when the quantity at that location will expire. The [INVENTORY RECEIPT](#) screen is used to enter the expiration date for an item that is received from an external vendor, whereas, the [BUILD KITS](#) screen is used to enter the expiration date for an item that is manufactured internally.

7.2.4 SHIPPING NOTES TAB

The Shipping Notes tab is used to enter a note specifying how the items should be shipped. This note can be written or edited by clicking on the **Edit Note** button. This action will pop up the [NOTE EDITOR](#) to be used for this purpose.

This information is displayed on the [SHIPPING NOTES TAB](#) of the Fill Order screen.

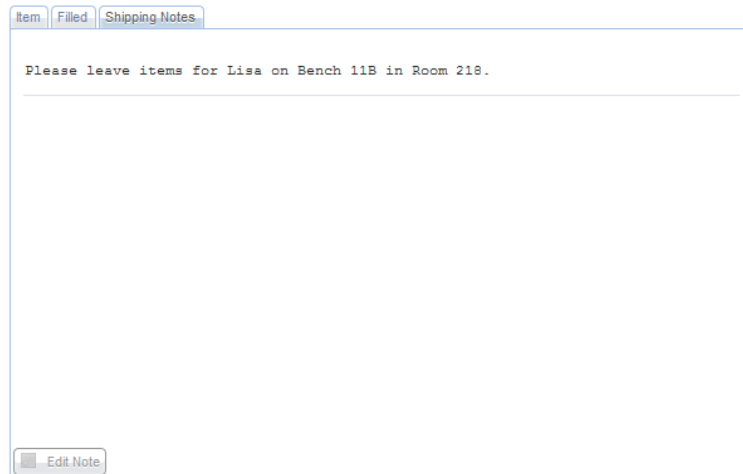


Figure 369 Internal Order Screen - Shipping Notes Tab

7.3 VENDOR ORDER

The Vendor Order module allows the user to order items from external vendors. Any item that is managed in the inventory system can be ordered from any vendor. The system does not manage a preferred vendor list. However, similar orders are often duplicated which functionally provides the same capability.

Once the order is placed in the system, the purchasing department can locate and process the newly created orders. Additional information such as Order Date and Ext(ernal) Order # can be entered as the order is being placed with the vendor.

The users can track their orders through this screen. See [QUERY FUNCTION](#) for more information on general query formats and capabilities. Once the order is received by the laboratory, the status of the order will change to "Processed".

The link to the Vendor Order module is found in the top section of the [Inventory/Order Menu](#).

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Item	Filed	Shipping Notes	Quantity	Inventory Item	Store	Unit Cost	Catalog #
50				absorbent sheet 3x4	Iowa City	1.2	cv-37681
25				label, hazard, white, h2so4	Iowa City	0.75	ar-98523

Figure 370 Vendor Order Screen

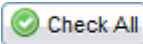
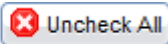
7.3.1 GENERAL FIELDS

The general fields of this screen are described below.

Order

This is a unique system-wide order number assigned by the LIMS. All orders (internal, send-out, and vendor) share the same pool of order numbers.

(Order) Status

The status of the order is specified in this field. See [\(Order\) Status](#) for a definition of each status. Check All and Uncheck All   buttons are available in this field to aid in the multi-selection of order statuses while in Query Mode.

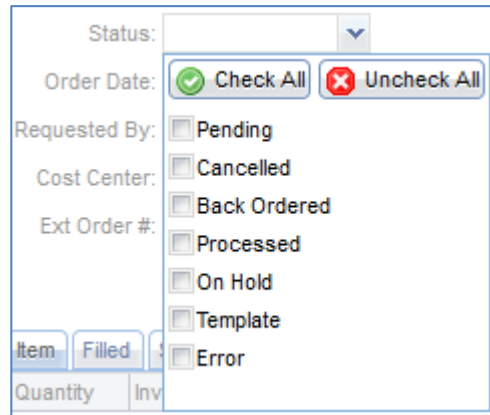


Figure 371 Order Status Selection in Query Mode

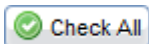
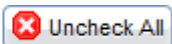
Order Date

This is the date that the order was entered into the system. This date can be changed to reflect the actual order date.

Requested By

This field is defaulted to the username but can be overridden to the requesting person or the department name.

Cost Center

This field contains the organizational unit, program, or project that is responsible for the cost of the order. This field is linked with the dictionary category system name “cost_centers”. Check All and Uncheck All   buttons are available in this field to aid in the multi-selection of cost centers while in Query Mode.

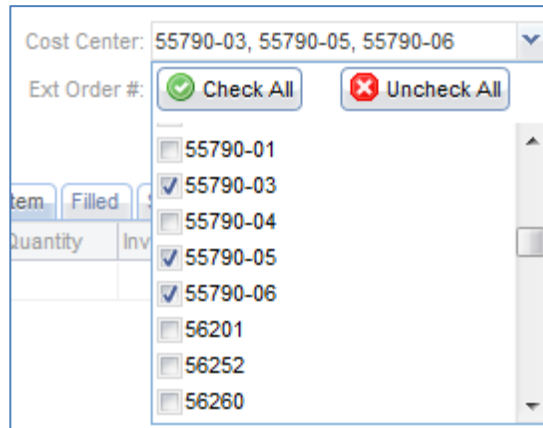


Figure 372 Cost Center Selection in Query Mode

Ext(ernal) Order #

Many times when an order is placed with a vendor, the vendor issues an order number that is unique to their system. This field is used to capture that information and can be used in the [INVENTORY RECEIPT](#) screen to quickly locate and receive an order using the vendor's paper manifest.

Needed In Days

This field specifies the number of days in which the order needs to be filled.

Vendor

This is the name of the external vendor. A vendor is an organization that must be defined in the [ORGANIZATION](#) screen. An autocomplete drop-down table can be used in Add Mode to select the vendor.

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Vendor:	CAC			
Attention:	Name	Street	City	St
Apt/Suite #:	CAC	3090 104TH	URBANDALE	IA
Address:	CAFE IGUANAS INC	108 MAIN STREET	HILLS	IA
	CAHOY INC	411 EAST MAIN ST...	FREDERICKSBURG	IA
City:	CAHOY PUMP SERVICE	200 GRANT ST	MARNE	IA
State:	CALAMUS WATER SUPPLY	2ND AND MAIN ST...	CALAMUS	IA
	CALDWELL BANKER	70 STURGIS CORN...	IOWA CITY	IA

Figure 373 Vendor Organization Drop-Down List in Add Mode

Attention

This text field may contain the name of the person at the vending company who is responsible for servicing the order.

Apt/Suite #, Address, City, State, Zip Code

Once a vendor is selected, the associated address information from the [ORGANIZATION](#) screen will automatically populate these fields.

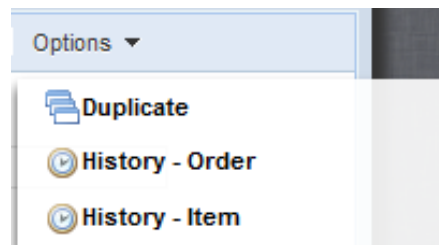
Options

Figure 374 Vendor Order Options Menu

The **Duplicate** button in the Options drop-down menu allows for an order to be easily duplicated.

The **History** menu can be used to examine the previous values, operations, and users at both the order and item level with their associated date-timestamps. See [History](#) for more information.

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There are three tabs present in the lower pane of the Vendor Order screen that provide details of the order: Item, Filled, and Shipping Notes. The tabs are described below.

Pop-out Ability of Tabs

One or more of these tabs can be popped out for easier viewing by dragging them to a different location in the web browser. The tab headers will have a white background when they are popped out. The information in the popped-out tabs is automatically updated as different orders are selected in the left sidebar of the Vendor Order screen. The popped-out tab(s) will return to their usual location in the Vendor Order screen when they are closed.

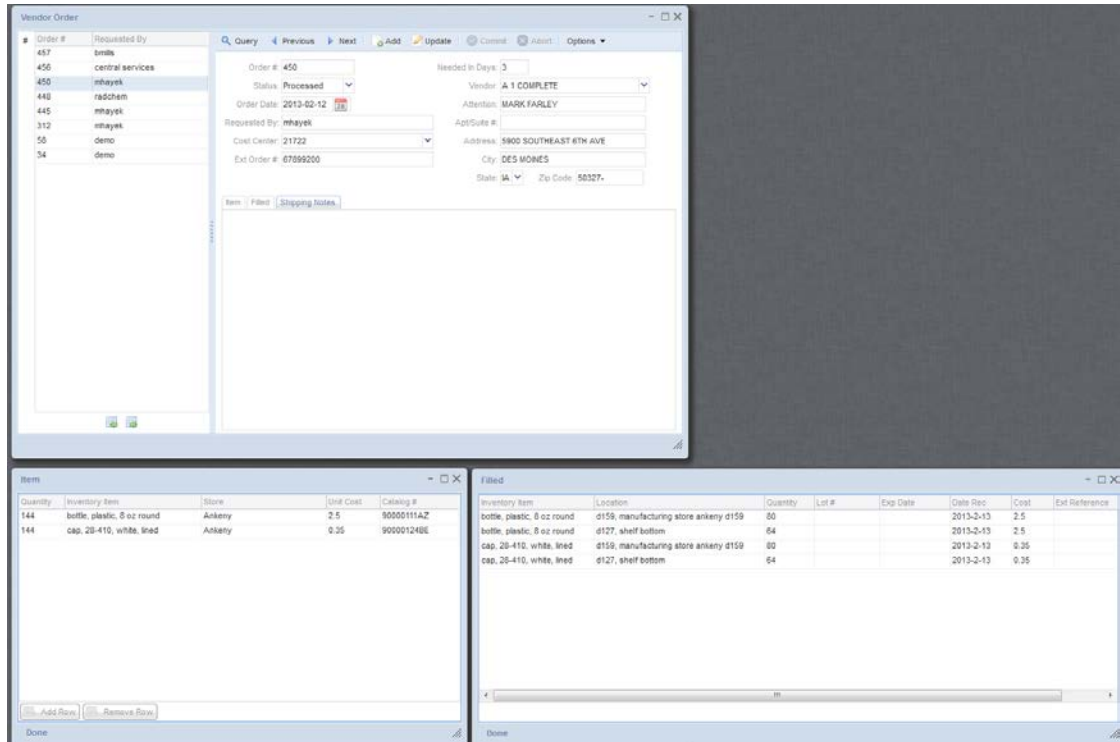
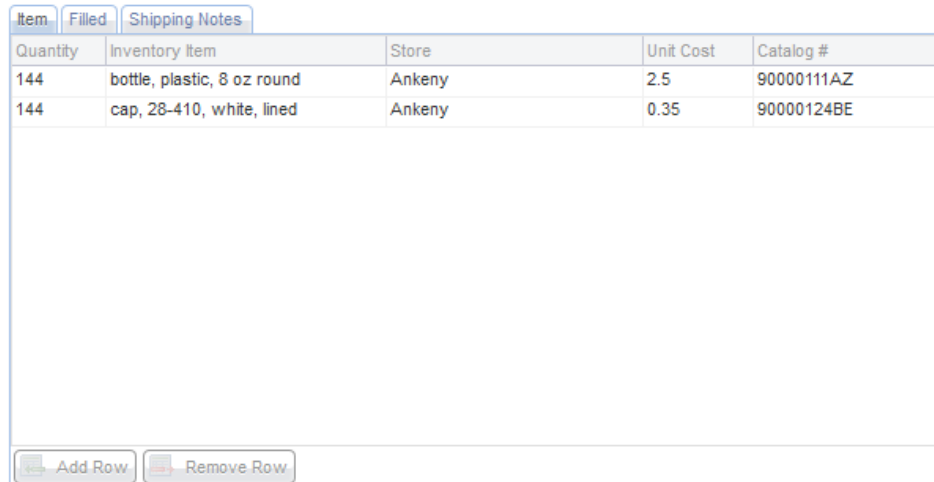


Figure 375 Popped-Out Vendor Order Screen Tabs

7.3.2 ITEM TAB

The Item tab contains a list of items that were requested in the vendor order.



Quantity	Inventory Item	Store	Unit Cost	Catalog #
144	bottle, plastic, 8 oz round	Ankeny	2.5	90000111AZ
144	cap, 28-410, white, lined	Ankeny	0.35	90000124BE

Buttons: Add Row, Remove Row

Figure 376 Vendor Order Screen - Item Tab

The fields located on this tab are described here.

Quantity

The number of each inventory item being requested is specified in this field.

Inventory Item

This field contains the name of the inventory item that is being requested. See [INVENTORY ITEM](#) for a detailed explanation of how inventory items are created and managed in OpenELIS.

Store

This is the name of the store where the inventory item will be housed when it arrives. A laboratory often has a general store and one or more manufacturing stores for building kits, reagents and media. See [INVENTORY ITEM](#) for a detailed explanation of stores.

Unit Cost

This optional field contains the unit cost of each item in U.S. dollars as quoted by the vendor.

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Catalog

This optional field may be used to record the vendor's catalog number. This information is often useful to the ordering department to match a specific item from the vendor.

The Item tab has two buttons: **Add Row** and **Remove Row**.

Add Row

This button is used to add an inventory item to the vendor order. A drop-down list allows for the inventory item and its associated store to be easily selected. The Quantity of the inventory item must be entered.

Quantity	Inventory Item	Store	Unit Cost	Catalog #
1	absorbent sheet 3x4	Iowa City		
5	bag, 3500ml bird rinse #54			

Name	Description	Store	Dispensed Units
bag, 3500ml bird rinse #54	Bag, plastic 3500ml bird rinse	Iowa City	Each
bag, 4x6, printed, specimen	4x6 specimen bag for blood lead kit	Ankeny	Each
bag, biohazard, specimen 6x9	Bag, specimen, biohazard	Iowa City	Case
bag, wire enclosure 5.5 x 9	Bag, sterile, sampling 5.5 X 9 with wir...	Iowa City	Each
blood bloc, 4x4	blood bloc super absorbent for blood l...	Ankeny	Each
bottle, 1/2 gallon, plastic	1/2 gallon plastic round jug	Ankeny	Each

Figure 377 Adding an Inventory Item to a Vendor Order

Remove Row

This button can be used to remove an inventory item from a vendor order.

7.3.3 FILLED TAB

The Filled tab displays the items that have been received from the vendor.

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Item	Filled	Shipping Notes	Inventory Item	Location	Quantity	Lot #	Exp Date	Date Rec	Cost	Ext Reference
			bottle, plastic, 8 oz round	d159, manufacturing store ankeny d159	80			2013-2-13	2.5	
			bottle, plastic, 8 oz round	d127, shelf bottom	64			2013-2-13	2.5	
			cap, 28-410, white, lined	d159, manufacturing store ankeny d159	80			2013-2-13	0.35	
			cap, 28-410, white, lined	d127, shelf bottom	64			2013-2-13	0.35	

Figure 378 Vendor Order Screen - Filled Tab

The fields located on this tab are described here.

Inventory Item

This field contains the name of the inventory item that was received. See [INVENTORY ITEM](#) for a detailed explanation of how inventory items are created and managed in OpenELIS.

Location

This field specifies the physical location where the item was placed. A location is defined using the [STORAGE LOCATION](#) screen and each part of the name is separated by a comma.

Quantity

This field displays the quantity of the item received. If an item is stored in more than one location, or the item was received multiple times because of a back order, there will be multiple rows with different quantities, received dates, and possibly, lot numbers and expiration dates.

Lot No.

The lot number is an identification number assigned to a particular quantity or lot of material from a single manufacturer. The [INVENTORY RECEIPT](#) screen is used to enter the lot number for an item that is received from an external vendor. See [Lot # Required](#) for more information on lot numbers.

Exp(iration) Date

This date specifies when the quantity at that location will expire. The [INVENTORY RECEIPT](#) screen is used to enter the expiration date for an item that is received from an external vendor.

Date Rec(eived)

The date that the item was received from the vendor is displayed in this field. The [INVENTORY RECEIPT](#) screen is used to enter the date that an item is received from an external vendor.

Cost

The actual unit cost of the item in U.S. dollars is displayed in this field. The [INVENTORY RECEIPT](#) screen is used to enter the actual unit cost of an item that is received from an external vendor.

Ext(ernal) Reference

This free text field may contain any reference information related to the item or the order such as the purchase order number, sequestered lot information, etc.

7.3.4 SHIPPING NOTES TAB

The Shipping Notes tab is used to enter a note specifying how the items should be shipped. This note can be written or edited by clicking on the **Edit Note** button. This action will pop up the [NOTE EDITOR](#) to be used for this purpose.



Figure 379 Vendor Order Screen - Shipping Notes Tab

7.4 SEND-OUT ORDER

The Send-out Order module provides two functions, namely the ability to send testing kits and supplies to external clients, and capture some of the client's sampling needs such as tests to be performed, containers that are being sent to the laboratory, and whom to bill for the sample. All of this information is transferred to the sample(s) through the [FULL SAMPLE LOGIN](#) screens.

The link to the Send-out Order module is found in the top section of the [Inventory/Order Menu](#).

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Type	Attention	Id	Name	Apt/Suite #
Report To	MARTHA FREEMAN	4739	UIHC EPIDEMIOLOGY	GH C520
Bill To	KATHY BUGG	4740	UIHC ENGINEERING SERVICES	GH C116
Secondary Report To	DALE FLANNERY	641	UIHC ENGINEERING SERVICES	GH-BT0019

Figure 380 Send-out Order Screen

7.4.1 GENERAL FIELDS

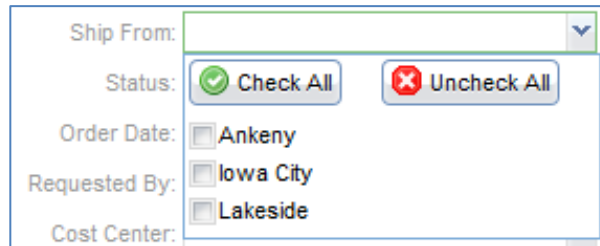
The general fields of this screen are described below.

Order

This is a unique system-wide order number assigned by the LIMS. All orders (internal, send-out, and vendor) share the same pool of order numbers. This field is present in both the top pane and the left sidebar.

Ship From

The site from where the send-out order is shipped is captured in this field. Laboratories often have multiple sites that can ship out orders to external clients. This field is available on the [FILL ORDER](#) screen and can be used by each site to filter their send-out orders.



The screenshot shows a form with the following fields and controls:

- Ship From:** A dropdown menu.
- Status:** Two buttons: "Check All" (with a green checkmark icon) and "Uncheck All" (with a red X icon).
- Order Date:** A checkbox followed by the text "Ankeny".
- Requested By:** A checkbox followed by the text "Iowa City".
- Cost Center:** A checkbox followed by the text "Lakeside".

Figure 381 "Ship From" Selection in Query Mode

(Order) Status

The status of the order is specified in this field:

- Pending – the order is waiting to be filled through the [FILL ORDER](#) screen.
- Cancelled – the order processor can use this status to indicate the order has been cancelled because it is not needed.
- Back Ordered – the order filler can use this status to indicate the order, in whole or in part, is back ordered.
- Processed – the order has been filled through the [FILL ORDER](#) screen.
- Recurring – This status is only used for send-out orders. A recurring order is one where the same items need to be shipped out at regular intervals (i.e., monthly, quarterly, annually). See [RECUR TAB](#) for a complete explanation of how recurring send-out orders are created.
- On Hold – the order is not ready to be filled due to missing items or information. This status can be selected by the order requester to indicate the order should not be filled yet.
- Template – this status is used to specify that an order is used as a template to create other orders, either manually or automatically by the system (as is the case in SDWA Bacteria Additional, Trigger, and Repeat orders).
- Error – the system will place a send-out order in error status when there is an issue with the recurring order that created it. This could be due to an organization, inventory item, container, auxiliary group, sample type, or test being assigned to the order that has since been inactivated in the system. The system will create an [internal note](#) that explains the reason for the error status. The error status could also be due to a recurring order that has either a

“Ship To”, “Report To”, or “Bill To” organization that possesses the “Hold/Refuse Sample” parameter.



Figure 382 Internal Notes Explaining Error Status

Order Date

This is the date that the order was entered into the system. This date can be changed to reflect the actual order date.

Requested By

This field is defaulted to the username of the person who entered the order, but it can be overridden to the requesting person or the department name. This field is present in both the top pane and the left sidebar.

Cost Center

This field contains the organizational unit, program, or project that is responsible for the cost of the order. This field is linked with the dictionary category system name “cost_centers”.

If the user attempts to duplicate a send-out order that contains a cost center that has subsequently been inactivated, OpenELIS will display an error that the cost center has not been duplicated.

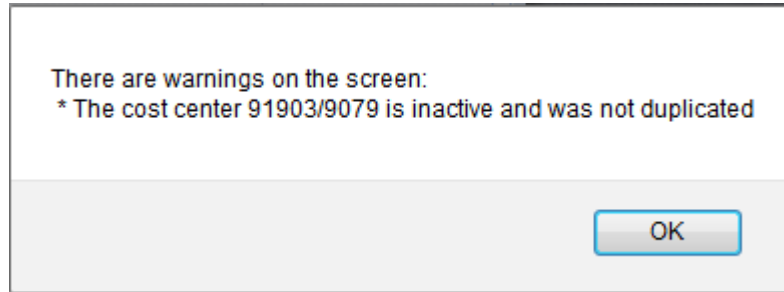


Figure 383 Inactive Cost Center Warning

Description

This optional field contains information that characterizes the order, i.e., quarterly monthly, daily, nitrate, private well, non-drinking water, pool/spa yearly, clinical virus, etc. This free text field functions similarly to an autocomplete field in Add Mode by offering the previously “learned” entries to reduce typing and variations.

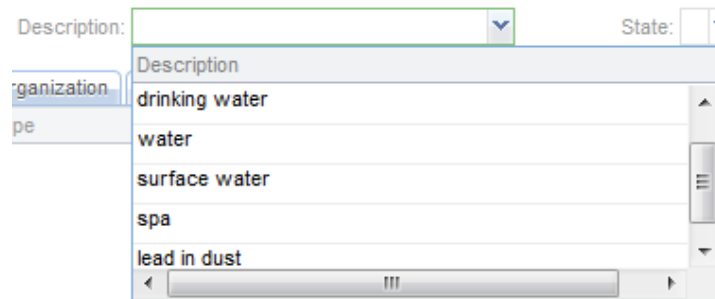


Figure 384 "Learned" Descriptions in Add Mode

Needed In Days

This field specifies the number of days from the Order Date in which the order needs to be sent.

Forms

This field specifies the number of copies of the Order Request Form that will be printed in the shipping process. The number of copies is often tied to the sampling frequency. See [SHIPPING](#) for more information.

Ship To Id, Name

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This is the organization id and name of the external client to which the order needs to be shipped. This client must be defined in the [ORGANIZATION](#) screen. An autocomplete drop-down list can be used in enter the “ship to” organization.

Name	Apt/Suite #	Street	City	St
UIHC		200 HAWKINS DR	IOWA CITY	IA
UIHC (5)	MICU	200 HAWKINS DRIV...	IOWA CITY	IA
UIHC CLINICAL PATHOLOGY LAB	6240 RCP	200 HAWKINS DR	IOWA CITY	IA
UIHC ENGINEERING SERVICES	GH-BT0019	200 HAWKINS DR	IOWA CITY	IA
UIHC ENGINEERING SERVICES	MECHANIC...	200 HAWKINS DR	IOWA CITY	IA
UIHC ENGINEERING SERVICES	GH C116	200 HAWKINS DR	IOWA CITY	IA

Figure 385 Adding the "Ship To" by its Organization Name

The “ship to” organization can also be added by entering its [organization id](#) in the Name field.

Name	Apt/Suite #	Street	City	St
UIHC ENGINEERING SERVICES	MECHANIC...	200 HAWKINS DR	IOWA CITY	IA

Figure 386 Adding the "Ship To" by its Organization Id

The “ship to” organization can be queried by entering its organization id in the Id field or its name (or partial name with wildcard character(s)) in the Name field.

Figure 387 Querying the "Ship To" by its Organization Id

Figure 388 Querying the "Ship To" by its Partial Name with a Wildcard Character

Attention

This text field may contain the name of the person at the external “ship to” organization who is responsible for receiving or procuring the order.

Apt/Suite #, Address, City, State, Zip Code

Once a “ship to” organization is selected, the associated address information from the [ORGANIZATION](#) screen will automatically populate these fields.

Options

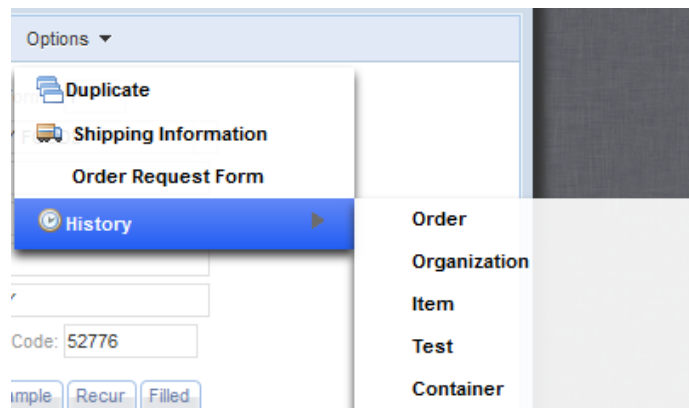


Figure 389 Send-out Order Options Menu

The **Duplicate** button in the Options drop-down menu allows for an order to be easily duplicated. Commonly placed orders can be created as [templates](#) and duplicated as needed. A warning message will pop up if the user tries to duplicate an existing order that has either a “Ship To”, “Report To”, or “Bill To” organization that possesses the “Hold/Refuse Sample” parameter.

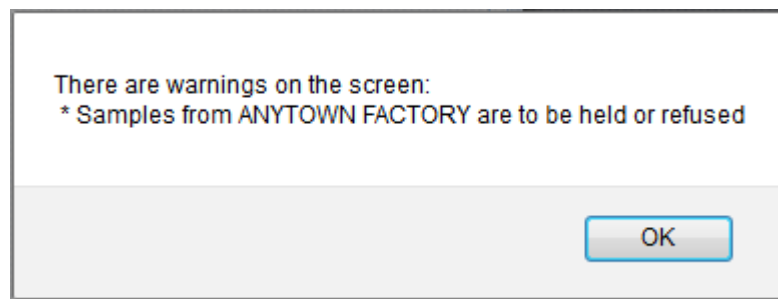


Figure 390 Hold/Refuse Sample Warning

The **Shipping Information** button in the Options menu pops up the Shipping screen with all of the information that is relevant to shipping the send-out order. See [SHIPPING](#) for more information on this screen.

The **Order Request Form** button in the Options menu pops up the Order Request Form for the send-out order in PDF format. The Order Request Form is used to provide the details of the send-out order and document sample collection information. This form already has the “Report To” and “Bill To” information, Requested Analyses/Tests, and possibly default values for some of the requested collection information. There is also a Chain of Custody/Tracking Signatures section, a sample receiving information section, areas to record Build IDs, and an area to affix an Accession Sample Label. This form is printed and sent out with the order.

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Order #: 564 Pages in Order: 1 of 1 Containers in Order: 0	REPORT TO: 2961 SHL CORALVILLE 2490 CROSSPARK RD CORALVILLE, IA 52241	BILL TO: 2961 SHL CORALVILLE 2490 CROSSPARK RD CORALVILLE, IA 52241
--	--	--

Requested Analyses/Tests

SDWA
 Total Coliform Bacteria (Present/Absent)

Complete or correct the following information

Collected Date: _____ Collected Time: _____
yyyy-mm-dd 24 hour format hh:mm

Client Reference: u of i water plant PWS Id: IA5225101

State Lab #: _____ Facility Id: 950

Sample Type: RT - Routine Sample Cat: Bacterial

Sample Collection Point 950 Location: _____
 Id: _____

Collector: _____

Free Chlorine: _____ Total Chlorine: _____

Chain of Custody/Tracking Signatures

Relinquished By: _____	Date/Time: _____ <small>year / mm / dd Military Time</small>
SHL Sample Receiving Custodian: _____	Date/Time: _____ <small>year / mm / dd Military Time</small>
Relinquished By: _____	Date/Time: _____ <small>year / mm / dd Military Time</small>
SHL Sample Receiving Custodian: _____	Date/Time: _____ <small>year / mm / dd Military Time</small>

For SHL Use Only – Please do not write below this line

Received By: _____ pH: _____

Evidence of Tampering: Yes No Evidence of Cooling: Yes No

Date Printed: 2013-11-14

Bottles Received: _____ Temperature (Celsius): _____

BUILD ID _____

PLACE THE ACCESSION LABEL WITHIN THIS BOX

Environmental Sample Collection Form

State Hygienic Laboratory

Leahsville Laboratory
1836 Main St
Milford, IA 51351-7207
Phone # 712-337-3809

Ankeny Laboratory
2295 W. Highway 80
Ankeny, IA 50023-8003
Phone # 515-725-1600
<https://www.shl.iowa.edu>

U of I Research Park
100 Research Park
Coralville, IA 52241-4721
Phone # 319-335-4500 or
800-421-ICWA

Figure 391 Order Request Form

The **History** menu can be used to examine the previous values, operations, and users at both the record and field level with their associated date-timestamps. See [History](#) for more information.

There are eleven tabs present in the lower pane: Organization, Aux(iliary) Data, Test, Container, Item, Shipping, Customer, Internal, Sample, Recur, and Filled.

7.4.2 ORGANIZATION TAB

The Organization tab contains the names and addresses of the “report to”, “bill to”, “secondary report to”, or “birth hospital” organizations. This information is only needed if it is different from the “ship to” information. These organizations must be defined in the [ORGANIZATION](#) screen.

Type	Attention	id	Name	Apt/Suite #	Address	City	State	Zip Code	Country
Report To	GENE AUTRY	1294	U OF I CHILLED WATER PLANT		255 HAWKINS DR	IOWA CITY	IA	52242-	United States
Bill To	ROY ROGERS	641	UIHC ENGINEERING SERVICES	GH-BT0019	200 HAWKINS DR	IOWA CITY	IA	52242-	United States
Secondary Report To	DALE EVANS	641	UIHC ENGINEERING SERVICES	GH-BT0019	200 HAWKINS DR	IOWA CITY	IA	52242-	United States

Figure 392 Organization Tab

Any of the fields on the Organization tab can be used to query for send-out orders for an organization.

The fields found in this tab are defined below.

Type

There are four types of organizations currently defined in OpenELIS: [Report To](#), [Secondary Report To](#), [Bill To](#), and [Birth Hospital](#). A query can be limited to one or more of these types of organizations.

Attention

This free text field may contain the name of the person at the client organization who is responsible for this order.

Id

The [organization's id](#) is displayed in this field. An organization can be queried by entering its organization id in this field or its name (or partial name with wildcard character(s)) in the Name field.

Organization	Aux Data	Test	Container	Item	Shipping	Customer	Internal	Sample	Recur	Filled	Attachment
Type	Attention		Id		Name				Apt/Suite #		
Bill To			999								

Figure 393 Querying by a "Bill To" Organization's Id

Organization	Aux Data	Test	Container	Item	Shipping	Customer	Internal	Sample	Recur	Filled	Attachment
Type	Attention		Id		Name				Apt/Suite #		
Report To					MERCY MED*						

Figure 394 Querying by a "Report To" Organization's Partial Name with a Wildcard Character

Name

The organization's name or id is added to this field.

Name	Apt/Suite #	Address		City
U OF I C				
Name	Apt/Suite #	Street	City	St
U OF I CHEMISTRY DEPARTMENT		208 IATL BUILDING	IOWA CITY	IA
U OF I CHEMISTRY DEPT		230 N MADISON ST	IOWA CITY	IA
U OF I CHILLED WATER PLANT		255 HAWKINS DR	IOWA CITY	IA
U OF I CIVIL & ENV ENGINEER		4111 SEAMANS CE...	IOWA CITY	IA
U OF I CIVIL & ENV ENGINEER		205 WATER PLANT	IOWA CITY	IA
U OF I CIVIL & ENV ENGINEERING		4105 SEAMANS CE...	IOWA CITY	IA

Figure 395 Adding an Organization by its Name

Name	Apt/Suite #	Address		City
1294				
Name	Apt/Suite #	Street	City	St
U OF I CHILLED WATER PLANT		255 HAWKINS DR	IOWA CITY	IA

Figure 396 Adding an Organization by its Id

Apt/Suite #, Address, City, State, Zip Code, Country

Once an organization is selected, the associated address information from the [ORGANIZATION](#) screen will automatically populate these fields.

7.4.3 AUX(ILIARY) DATA TAB

The Aux(iliary) Data tab is used to capture additional questions related to sample collection. The auxiliary analytes are grouped together and are usually standard for the type of sample that is being collected. Auxiliary analytes that have the reportable box checked are printed on the [Order Request Form](#) with possible values (e.g., PWS Id, collection Location, etc.)

The auxiliary data associated with the order is transferred to the sample at full sample login. Some of the auxiliary analytes are special and their pre-populated values are copied to general sample or domain-specific fields. For example, the value of the PWS Id auxiliary analyte is automatically copied to the [PWS ID](#) field of the SDWIS sample login screen. The auxiliary analytes that are not special are copied to the sample login [AUX DATA TAB](#) for entry of their values.

To add auxiliary group(s), click on the **Aux Groups** button. The Aux Group Selection screen will pop up. Clicking the **Remove Row** button removes the entire auxiliary group, not just the individual auxiliary analyte. See [AUX GROUP SELECTION SCREEN](#) for instructions on adding aux groups.

Reportable	Name	Value
<input type="checkbox"/>	Received by	
<input type="checkbox"/>	pH	
<input type="checkbox"/>	Sample Intact	Yes
<input type="checkbox"/>	Temperature	
<input type="checkbox"/>	Build Id	
<input checked="" type="checkbox"/>	Collected Date	
<input checked="" type="checkbox"/>	Collected Time	
<input checked="" type="checkbox"/>	Client Reference	
<input type="checkbox"/>	Is Hazardous	
<input checked="" type="checkbox"/>	Collector	

Description: Method: Unit:

Figure 397 Aux Data Tab

Auxiliary analytes can be used to query for send-out orders. Select the auxiliary analyte from the appropriate aux group, if there is more than one choice available.

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Reportable	Name	Value
<input type="checkbox"/>	Project Name	
	Analyte	Group
	Project Name	2-sample env data
	Project Name	3-sample sdwis data
	Project Name	4-sample well data

Figure 398 Selecting an Auxiliary Analyte in Query Mode

A value must be entered for the auxiliary analyte for the query to execute correctly.

Organization	Aux Data	Test	Container	Item	Shipping	Customer	Internal	Sample	Recur	Filled	Attachment
Reportable	Name	Value									
<input type="checkbox"/>	Project Name	319 ugl									

Figure 399 Querying for Send-out Orders by Project Name

As in any free-text or numerical field, the use of wildcards, ranges, inequalities, empty and non-empty fields can be used in the Value field. See [QUERY CAPABILITY USING WILDCARDS, RANGES, INEQUALITIES, EMPTY AND NON-EMPTY FIELDS](#) for more information.

Organization	Aux Data	Test	Container	Item	Shipping	Customer	Internal	Sample	Recur	Filled	Attachment
Reportable	Name	Value									
<input type="checkbox"/>	Client Reference	!=									

Figure 400 Querying for Send-out Orders by a Non-Empty Client Reference Value

The Aux Data tab contains a table consisting of three columns: Reportable, Name, and Value. In Add or Update modes an auxiliary analyte can be selected to display its corresponding Description, Method, and Unit, if they are present.

Reportable

The Reportable checkbox may be manually checked (or unchecked) for any auxiliary analyte to mark it as reportable. Reportable auxiliary analytes, and any entered default values, are printed on the [Order Request Form](#). Reportable auxiliary analytes and their final values are also printed on the [Final Report](#).

Name

The name of the auxiliary analyte is displayed in this field.

Value

A default value for an auxiliary analyte may be manually entered in this field.

Description

The Description field displays additional helpful information about the auxiliary analyte. This information is also printed on the [Order Request Form](#) beneath each prompt line.

Method

This field shows the method that is used to measure the auxiliary analyte, if there is one.

Unit

This field displays the unit of measurement for the auxiliary analyte, if there is one.

7.4.4 TEST TAB

The Test tab allows for the desired test(s)/method(s) to be assigned to the order. Additionally, this tab shows the sample items and the tests that are associated with each one. The Test and Container tabs (or any of the Send-out Order screen tabs) can be popped-out so that the selections in these two tabs can be easily compared and proofread. See [Pop-Out Ability of Tabs](#) for an explanation of this procedure.

Item #	Id	Test	Method	Description
0	143	bod	sm 5210b 5 day	BOD, 5 day
1	111	ammonia	epa 350.1	Ammonia in water and solid matrices
2	232	metals(multi)	epa 200.7 nondrink	Al,Ba,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Na,Sr,Ti,V
3	730	orthophosphate	epa 365.1	Orthophosphate, requires filtered sample
4	41	volatiles	epa 624	GCMS volatiles in non-drinking water

Add Test:

Figure 401 Test Tab

The Test tab contains five fields: Item #, Id, Test, Method, and Description. All of these fields except for the Description are queryable.

Item

Each sample item is numbered for identification starting with 0. A sample item can have one or more tests/methods assigned to it. (See [Sample Item](#) for more information.) The Item # can be changed by clicking on it and entering a different number.

Organization	Aux Data	Test	Container	Item	Shipping	Customer	Internal	Sample	Recur	Filled	Attachment
Item #	Id	Test		Method	Description						
⊕ 0	143	bod		sm 5210b 5 day	BOD, 5 day						
⊕ 1	111	ammonia		epa 350.1	Ammonia in water and solid matrices						
⊕ 2	232	metals(multi)		epa 200.7 nondrink	Al,Ba,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Na,Sr,Ti,V						
⊕ 3	730	orthophosphate		epa 365.1	Orthophosphate, requires filtered sample						
⊕ 4	41	volatiles		epa 624	GCMS volatiles in non-drinking water						

Figure 402 Changing the Item # in the Test Tab

(Test) Id

The [Test Id](#) is a unique integer that is assigned by the system to each test that is defined in OpenELIS. The Test Id can be queried on this tab.

Organization	Aux Data	Test	Container	Item	Shipping	Customer	Internal	Sample	Recur	Filled	Attachment
Item #	Id	Test		Method	Description						
	111										

Figure 403 Querying by a Test Id

Test

This field displays the name of the test that is assigned to the sample item number. This information is defined using the [TEST](#) module.

Method

This field displays the test method that is assigned to the sample item number. This information is defined using the [METHOD](#) module.

Description

This field displays the internal description of the test that is assigned to the sample item number. This information is defined using the [TEST](#) module.

At the bottom of the Test tab are located the **Add Test** menu and the **Remove Test**, **Check All**, and **Uncheck All** buttons.

Add Test

This menu is used to add a test to the send-out order. The beginning of the test name can be entered in the **Add Test** field. An autocomplete drop-down list pops up allowing for the desired test, method, and description to be selected. The selected test/method/description is automatically added to Item # 0. The Item # can then be changed. See [Item #](#) for more information on this procedure.

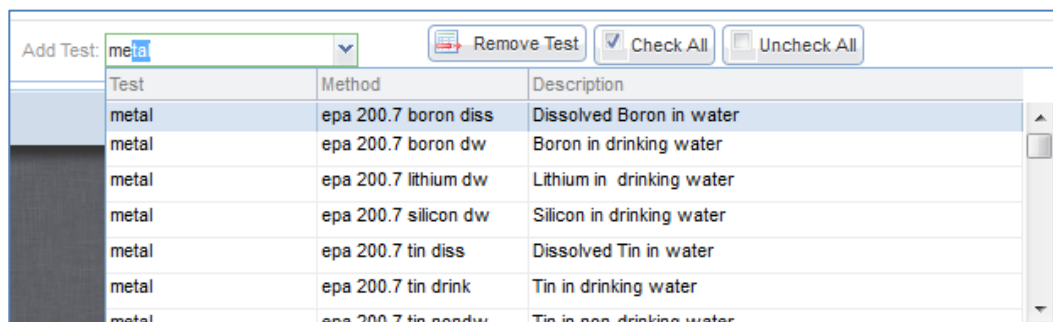


Figure 404 Adding a Test by its Name

A test can also be added by its Test Id.

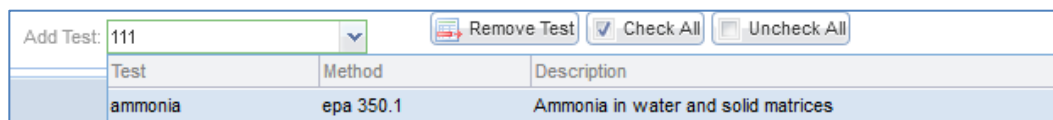


Figure 405 Adding a Test by its Id

Remove Test

This button is used to remove a test from a send-out order.

Check All and Uncheck All

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This tab also has the capability to select one or more analytes on multi-analyte tests. The analyte(s) can be selected by clicking on the sign in front of the Item # to expand the tree and checking the requested analyte(s). The tree can be collapsed at a node by clicking on the sign in front of the Item #.

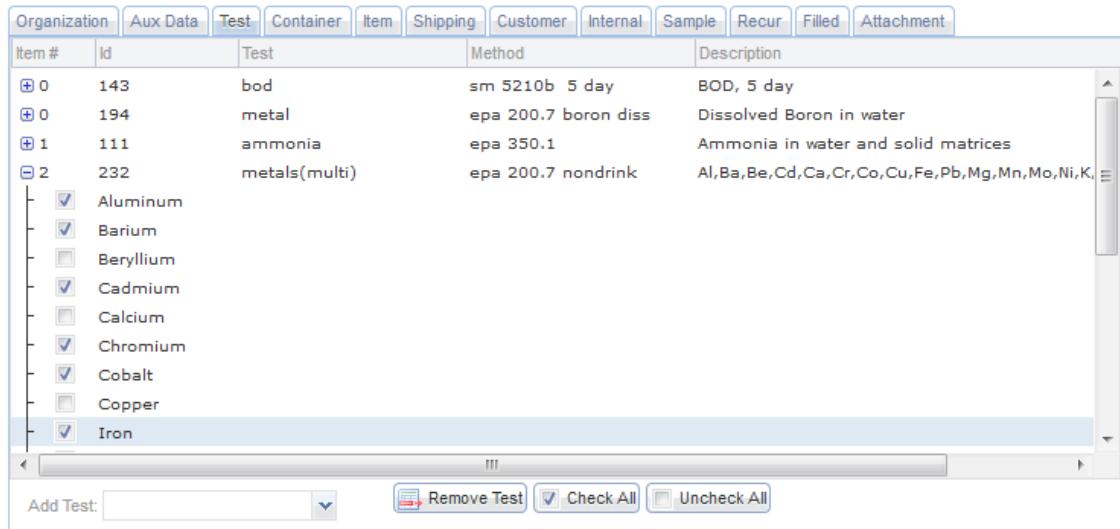


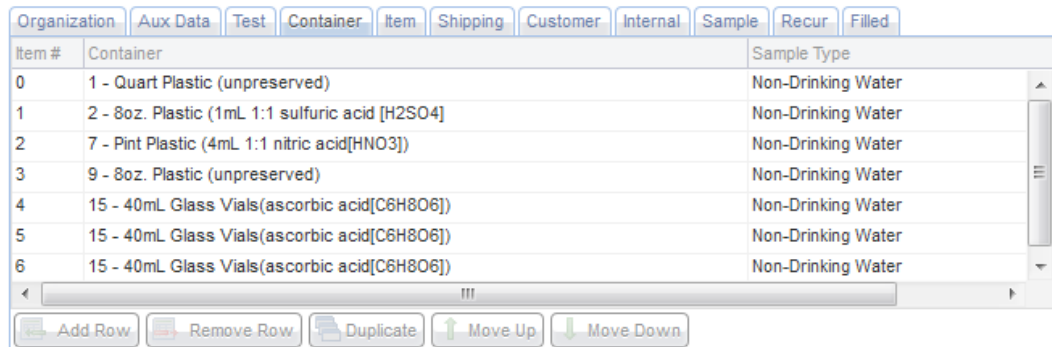
Figure 406 Expanding the Tree for a Multi-Analyte Test

The **Check All** button allows for all analytes in a multi-analyte test to be easily selected for testing. The **Uncheck All** button reverses this action.

7.4.5 CONTAINER TAB

The Container tab lists all of the containers that are expected to come back to the laboratory from each sample collection. These containers are not the same as the inventory on the Item tab. The [ITEM TAB](#) lists the inventory that is being shipped out with the order. The Container and Test tabs (or any of the Send-out Order screen tabs) can be popped-out so that the selections in these two tabs can be easily compared and proofread. See [Pop-Out Ability of Tabs](#) for an explanation of this procedure.

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Item #	Container	Sample Type
0	1 - Quart Plastic (unpreserved)	Non-Drinking Water
1	2 - 8oz. Plastic (1mL 1:1 sulfuric acid [H2SO4])	Non-Drinking Water
2	7 - Pint Plastic (4mL 1:1 nitric acid[HNO3])	Non-Drinking Water
3	9 - 8oz. Plastic (unpreserved)	Non-Drinking Water
4	15 - 40mL Glass Vials(ascorbic acid[C6H8O6])	Non-Drinking Water
5	15 - 40mL Glass Vials(ascorbic acid[C6H8O6])	Non-Drinking Water
6	15 - 40mL Glass Vials(ascorbic acid[C6H8O6])	Non-Drinking Water

Figure 407 Container Tab

The Container tab consists of three columns: Item #, Container, and Sample Type.

Item

Each sample item is numbered for identification starting with 0. See [Sample Item](#) for more information.

Container

The name of the container is displayed in this field. Containers must first be defined using the [DICTIONARY](#) screen.

Sample Type

The type of sample is displayed in this field. The Sample Type drop-down list allows for the classification of the sample (e.g., Breast Milk, Dust, Liquid, Oil, etc.). The sample type selected affects what tests can be assigned to this sample item.

The Container tab has five buttons: **Add Row**, **Remove Row**, **Duplicate**, **Move Up** and **Move Down**.

Add Row

This button is used to add a container to the order. Drop-down lists allow for the container and its associated sample type to be easily selected.

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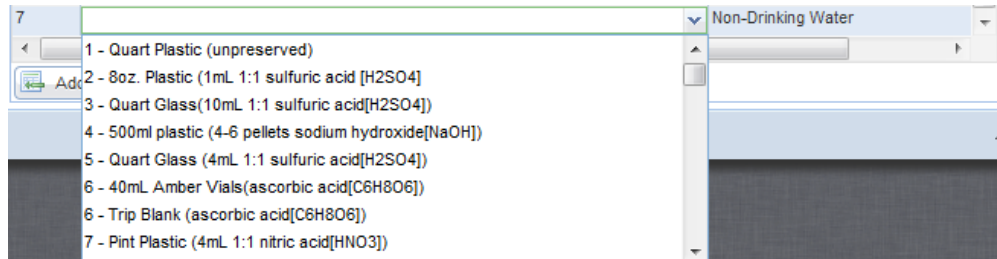


Figure 408 Adding a Container to a Send-out Order

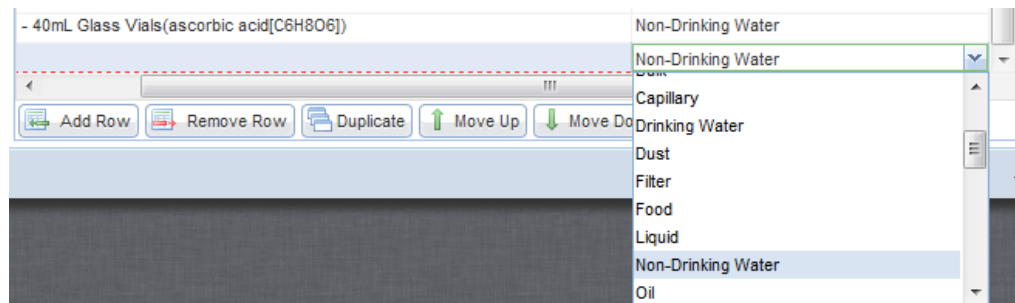


Figure 409 Selecting the Sample Type for a Container that is Being Added to a Send-out Order

Remove Row

This button can be used to remove a container.

Duplicate

This button duplicates the container and sample type of the selected row. The system assigns the following integer as the item # for the duplicate and reorders all of the successive item numbers in consecutive order.

Move Up

The **Move Up** button moves the selected container row up in position on the tab, thereby lowering its Item #. The system reorders all of the previous and successive container rows by Item # in consecutive order.

Organization	Aux Data	Test	Container	Item	Shipping	Customer	Internal	Sample	Recur	Filled
Item #	Container								Sample Type	
0	1 - Quart Plastic (unpreserved)								Non-Drinking Water	
1	1 - Quart Plastic (unpreserved)								Non-Drinking Water	
2	2 - 8oz. Plastic (1mL 1:1 sulfuric acid [H2SO4])								Non-Drinking Water	
3	9 - 8oz. Plastic (unpreserved)								Non-Drinking Water	
4	9 - 8oz. Plastic (unpreserved)								Non-Drinking Water	
5	9 - 8oz. Plastic (unpreserved)								Non-Drinking Water	
6	32 - IDEXX 4 oz. Plastic (sodium thiosulfate[Na2S2O3])								Non-Drinking Water	
7	34 - Pint Plastic(unpreserved)								Non-Drinking Water	

Add Row
 Remove Row
 Duplicate
 Move Up
 Move Down

Figure 410 Moving a Container Row Up on the Container Tab

Move Down

The **Move Down** button moves the selected container row down in position on the tab, thereby increasing its Item #. The system reorders all of the previous and successive container rows by Item # in consecutive order.

Organization	Aux Data	Test	Container	Item	Shipping	Customer	Internal	Sample	Recur	Filled
Item #	Container								Sample Type	
0	1 - Quart Plastic (unpreserved)								Non-Drinking Water	
1	1 - Quart Plastic (unpreserved)								Non-Drinking Water	
2	2 - 8oz. Plastic (1mL 1:1 sulfuric acid [H2SO4])								Non-Drinking Water	
3	9 - 8oz. Plastic (unpreserved)								Non-Drinking Water	
4	9 - 8oz. Plastic (unpreserved)								Non-Drinking Water	
5	9 - 8oz. Plastic (unpreserved)								Non-Drinking Water	
6	32 - IDEXX 4 oz. Plastic (sodium thiosulfate[Na2S2O3])								Non-Drinking Water	
7	34 - Pint Plastic(unpreserved)								Non-Drinking Water	

Add Row
 Remove Row
 Duplicate
 Move Up
 Move Down

Figure 411 Moving a Container Row Down on the Container Tab

7.4.6 ITEM TAB

The Item tab contains the supplies and kits that the laboratory is sending to the external client with this order. The items that are being sent out can match exactly the containers listed on the [CONTAINER TAB](#), but this is not a requirement. These items

could be more or less than what the laboratory expects returned for each sampling (e.g., a 3 month supply or no supplies if the client is using their own inventory).

Organization	Aux Data	Test	Container	Item	Shipping	Customer	Internal	Sample	Recur	Filled
Quantity	Inventory Item		Store							
2	#1		Ankeny							
1	#2		Ankeny							
3	#9		Ankeny							
1	#32		Iowa City							
0	#34		Ankeny							

Figure 412 Item Tab

The Item tab contains three columns: Quantity, Inventory Item, and Store.

Quantity

The number of each inventory item that will be sent out with the order is entered in this field.

Inventory Item

This field contains the name of the inventory item that will be sent out. See [INVENTORY ITEM](#) for a detailed explanation of how inventory items are created and managed in OpenELIS.

Store

This is the name of the store from which this item will be sent out. A laboratory often has a general store and one or more manufacturing stores for building kits, reagents and media. See [INVENTORY ITEM](#) for a detailed explanation of stores.

The Item tab has two buttons: **Add Row** and **Remove Row**.

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Add Row

This button is used to add an inventory item to the order. A drop-down list allows for the inventory item and its associated store to be easily selected. The Quantity of the inventory item must be entered.

Name	Description	Store	Dispensed Units
bag, 3500ml bird rinse #54	Bag, plastic 3500ml bird rinse	Iowa City	Each
bag, 4x6, printed, specimen	4x6 specimen bag for blood lead kit	Ankeny	Each
bag, biohazard, specimen 6x9	Bag, specimen, biohazard	Iowa City	Case
bag, wire enclosure 5.5 x 9	Bag, sterile, sampling 5.5 X 9 with wir...	Iowa City	Each
blood bloc, 4x4	blood bloc super absorbent for blood l...	Ankeny	Each
bottle, 1/2 gallon, plastic	1/2 gallon plastic round jug	Ankeny	Each

Figure 413 Adding an Inventory Item to a Send-out Order

Remove Row

This button can be used to remove an inventory item from a send-out order.

7.4.7 SHIPPING TAB

The Shipping tab is used to enter a note specifying how the items should be shipped to the external client. Examples of shipping instructions include: “Send a cooler with ice packs.” and “Need two separate coolers.” This information is displayed on the [SHIPPING NOTES TAB](#) of the Fill Order screen.

This note can be written or edited by clicking on the **Edit Note** button. This action will pop up the [NOTE EDITOR](#) to be used for this purpose.


Organization Aux Data Test Container Item Shipping Customer Internal Sample Recur Filled

Cooler with ice pack before 10 pm.

Edit Note

Figure 414 Shipping Tab

A Shipping tab note will be displayed in the “Special Instructions” section of the Shipping Manifest.




State Hygienic Laboratory

The University of Iowa

Nov 20, 2013 **SHIPPING MANIFEST** Page 1 of 1

SHIP TO Ship From: Iowa City

Shipping Id: SH47



SPECIAL INSTRUCTIONS:
Cooler with ice pack before 10 pm.

Order Number	QTY		COMMODITY DESCRIPTION
382	3	#10	Bottle, plastic, 1/2 gal (unpreserved)
382	3	#1	Bottle, plastic, Qt

Figure 415 Shipping Manifest - Special Instructions

7.4.8 CUSTOMER TAB

The Customer tab is used to enter information for the external client. This information is displayed under the “Requested Analyses/Tests” heading of the Order Request

Form to provide a generic description of the tests, test panels, or other instructions to the client.

Environmental Sample Collection Form	Requested Analyses/Tests	
	PRIVATE WELL	
	Coliform Bacteria/E. coli (Present/Absent)	
	Please enclose check for \$13 payable to: State Hygienic Laboratory	

	Complete or correct the following information	
	Amount Enclosed: _____	Check Number: _____
	Collected Date: _____ <small>yyyy-mm-dd</small>	Collected Time: _____ <small>24 hour format hh:mm</small>
	Report To Phone #: _____ <small>000/111-2222</small>	Location: _____ <small>kitchen sink, plant tap, etc.</small>
	Location Street Address: _____	Location City: _____
Location State: _____	Owner: _____ <small>Print last, first name</small>	
Collector: _____ <small>Print last, first name</small>		

Figure 416 Order Request Form - Requested Analyses/Tests

This note can be written or edited by clicking on the **Edit Note** button. This action will pop up the [NOTE EDITOR](#) to be used for this purpose.

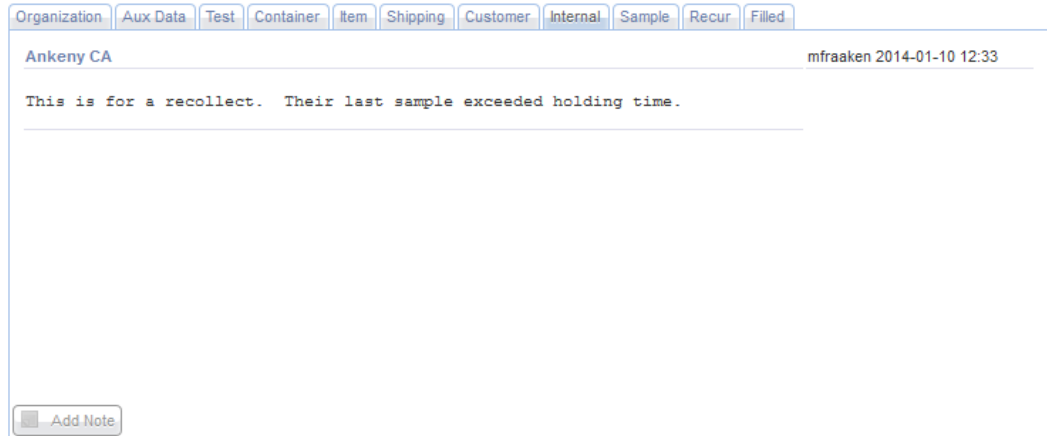
Organization	Aux Data	Test	Container	Item	Shipping	Customer	Internal	Sample	Recur	Filled
<p>PRIVATE WELL</p> <p>Coliform Bacteria/E. coli (Present/Absent)</p> <p>Please enclose check for \$13 payable to: State Hygienic Laboratory</p> <p>_____</p>										
<input type="button" value="Edit Note"/>										

Figure 417 Customer Tab

7.4.9 INTERNAL TAB

The Internal tab displays any internal notes that are related to the send-out order. Internal notes are meant to be viewed by laboratory personnel only. Each internal

note is added individually and cannot be edited after committal. Each note consists of a subject line, the author's username, a creation date-timestamp, and the message body.



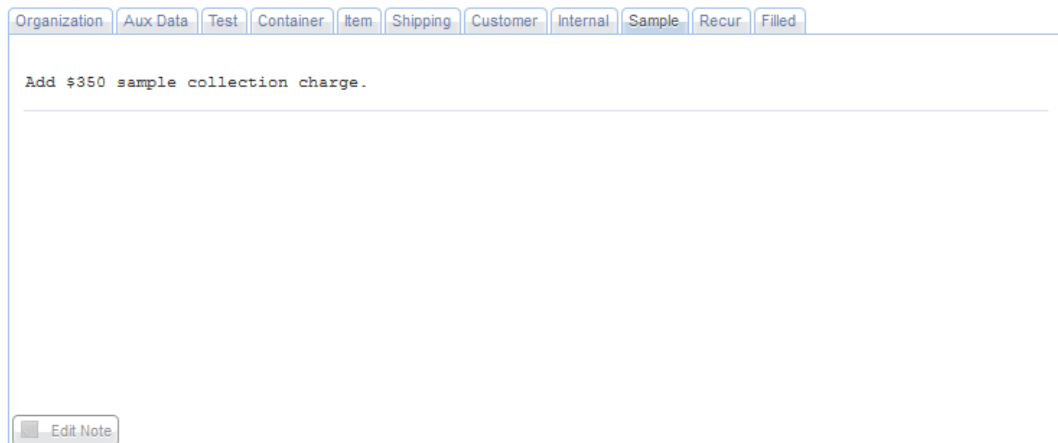
The screenshot shows a web interface with a navigation bar at the top containing tabs: Organization, Aux Data, Test, Container, Item, Shipping, Customer, Internal, Sample, Recur, and Filled. The 'Internal' tab is selected. Below the navigation bar, the text 'Ankeny CA' is on the left and 'mfraaken 2014-01-10 12:33' is on the right. The main content area contains the text 'This is for a recollect. Their last sample exceeded holding time.' Below this text is a horizontal line and a large empty text area. At the bottom left of the form is a button labeled 'Add Note'.

Figure 418 Internal Tab

An internal note can be added by clicking on the **Add Note** button. This action will pop up the [NOTE EDITOR](#) to be used for this purpose.

7.4.10 SAMPLE TAB

The Sample tab was designed to enter a note that will be added automatically to the [sample-level internal notes](#) when the sample is logged-in from this order.



The screenshot shows a web interface with a navigation bar at the top containing tabs: Organization, Aux Data, Test, Container, Item, Shipping, Customer, Internal, Sample, Recur, and Filled. The 'Sample' tab is selected. Below the navigation bar, the text 'Add \$350 sample collection charge.' is displayed. Below this text is a horizontal line and a large empty text area. At the bottom left of the form is a button labeled 'Edit Note'.

Figure 419 Sample Tab

A sample-level internal note can be written or edited by clicking on the **Edit Note** button. This action will pop up the [NOTE EDITOR](#) to be used for this purpose.

7.4.11 RECUR TAB

The Recur Tab displays the details for recurring send-out orders. “Recurring orders” are not actually orders; they are templates for creating future orders. On the designated recurrence date(s), the “recurring order” will create an actual send-out order in the system. Any change to the recurring order will only affect future orders.

Organization	Aux Data	Test	Container	Item	Shipping	Customer	Internal	Sample	Recur	Filled														
Active: <input checked="" type="checkbox"/>																								
Begin Date: 2013-12-01 <input type="text"/>																								
End Date: 2014-12-01 <input type="text"/>																								
Frequency: 1 Unit: Month <input type="text"/>																								
Parent Order #: <input type="text"/>																								
Show Upcoming Dates																								
<table border="1"> <thead> <tr> <th>Order Will Recur On</th> </tr> </thead> <tbody> <tr><td>2013-12-1</td></tr> <tr><td>2014-1-1</td></tr> <tr><td>2014-2-1</td></tr> <tr><td>2014-3-1</td></tr> <tr><td>2014-4-1</td></tr> <tr><td>2014-5-1</td></tr> <tr><td>2014-6-1</td></tr> <tr><td>2014-7-1</td></tr> <tr><td>2014-8-1</td></tr> <tr><td>2014-9-1</td></tr> <tr><td>2014-10-1</td></tr> <tr><td>2014-11-1</td></tr> <tr><td>2014-12-1</td></tr> </tbody> </table>											Order Will Recur On	2013-12-1	2014-1-1	2014-2-1	2014-3-1	2014-4-1	2014-5-1	2014-6-1	2014-7-1	2014-8-1	2014-9-1	2014-10-1	2014-11-1	2014-12-1
Order Will Recur On																								
2013-12-1																								
2014-1-1																								
2014-2-1																								
2014-3-1																								
2014-4-1																								
2014-5-1																								
2014-6-1																								
2014-7-1																								
2014-8-1																								
2014-9-1																								
2014-10-1																								
2014-11-1																								
2014-12-1																								

Figure 420 Recur Tab

The fields in this tab are described below.

Active

This checkbox denotes whether the send-out order is set to recur in the system.

Begin Date

The send-out order is set to start recurring on this date. This date is important, in that, all the reoccurrences are calculated from this date. For example, the system will not allow you to select a day “31” with frequency of 1 month since not every month has 31 days.

End Date

The send-out order is set to stop recurring on this date.

Frequency and Unit

Together these fields specify the interval at which the order recurs. For example,

Frequency: Unit:

means that the order will recur monthly.

Frequency: Unit:

means that the order will recur weekly. Units can be specified as days, months, and years.

Order Will Recur On

Clicking on the **Show Upcoming Dates** button displays the dates when the order will recur. This feature makes it convenient to see when an actual order will be created.

Parent Order #

The Parent Order # field is only populated on actual orders that are created from a “recurring order”. This field displays the order number of the “recurring order” that is used as the template to create the actual order.

7.4.12 FILLED TAB

The Filled tab displays the items that were filled for processed orders along with related information.

Inventory Item	Location	Quantity	Lot #	Exp Date
#1	218, cart #3	10		
#74	main store, room Warehouse	15	20130416#74	2014-4-16

Figure 421 Filled Tab

The fields located on this tab are described here.

Inventory Item

This field contains the name of the inventory item that was filled. See [INVENTORY ITEM](#) for a detailed explanation of how inventory items are created and managed in OpenELIS.

Location

This field specifies the physical location from where the item was taken. A location is defined using the [STORAGE LOCATION](#) screen and each part of the name is separated by a comma.

Quantity

The number of each inventory item that was filled is shown in this field. If an item is filled from more than one location, there will be multiple rows with different quantities.

Lot No.

The lot number is an identification number assigned to a particular quantity or lot of material from a single manufacturer. The [INVENTORY RECEIPT](#) screen is used to enter the lot number for an item that is received from an external vendor, whereas, the [BUILD KITS](#) screen is used to enter the lot number for an item that is manufactured internally. See [Lot # Required](#) for more information on lot numbers.

Exp(iration) Date

This date specifies when the quantity at that location will expire. The [INVENTORY RECEIPT](#) screen is used to enter the expiration date for an item that is received from an external vendor, whereas, the [BUILD KITS](#) screen is used to enter the expiration date for an item that is manufactured internally.

7.5 FILL ORDER

The Fill Order screen is used to process orders by gathering inventory items and packaging them for possible shipping. The screen is capable of managing both internal

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and send-out orders. The user can query in this screen by most of the fields. By default, a query will be performed for any orders with a status of Pending, although orders with a status of Cancelled, Back Ordered, Processed, or Error may also be queried. When an order in the upper pane of the screen is selected, its details are displayed in the lower pane.

The link to the Fill Order module is found in the second section of the [Inventory/Order Menu](#).

Ord #	Status	Order Date	Ship From	Cost Center	Requested By	Ship To	Description	# Days	Days L
128569	Pending	2017-01-15	Ankeny	60100	bteske	RIVER PRODUCTS COMPAN'	monthly	10	1
128570	Pending	2017-01-15	Ankeny	60100	bteske	RIVER PRODUCTS COMPAN'	monthly	10	1
128572	Pending	2017-01-15	Ankeny	60100	bteske	SPIRIT LAKE WATERWORKS	monthly	10	1
128573	Pending	2017-01-15	Ankeny	60100	bteske	SPIRIT LAKE WATERWORKS	monthly	10	1
128574	Pending	2017-01-15	Ankeny	60100	bteske	SPIRIT LAKE WATERWORKS	monthly	10	1
128575	Pending	2017-01-15	Ankeny	60100	bteske	THE RAJ	monthly	10	1
128576	Pending	2017-01-15	Ankeny	60100	bteske	U OF I WATER PLANT	monthly	10	1
128577	Pending	2017-01-15	Ankeny	60100	bteske	U OF I WATER PLANT	monthly	10	1
128578	Pending	2017-01-15	Ankeny	60100	bteske	U OF I WATER PLANT	monthly	10	1
128579	Pending	2017-01-15	Ankeny	60100	bteske	WAHPETON WATER SUPPLY	monthly	10	1

Figure 422 Fill Order Screen

7.5.1 GENERAL FIELDS

The general fields of this screen are described below.

Checkbox

The checkbox is used to select one or more orders to fill simultaneously. Only orders with the same shipping destination, status, and type can be selected to process together. This capability allows the laboratory to save shipping costs by combining

orders sent to the same client. A popup message will warn the user if this is not the case.

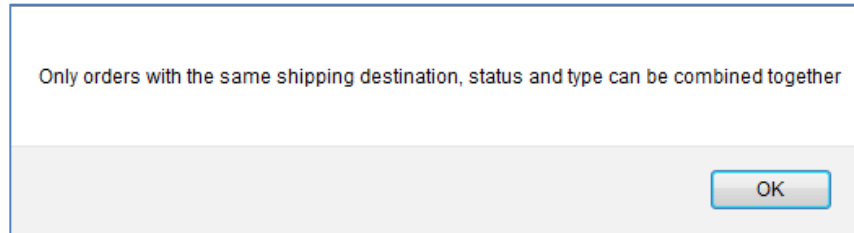


Figure 423 Fill Order Warning Message

Ord(er) #

This is a unique system-wide order number assigned by the LIMS. All orders (internal, send-out, and vendor) share the same pool of order numbers. Orders can be queried or sorted by the Order Number.

(Order) Status

The status of the order is specified in this field. See [\(Order\) Status](#) for a definition of each status. Orders can be queried by one or more statuses.

Order Date

This is the date that the order was entered into the system. This date may have been changed to reflect the actual order date. Orders can be queried or sorted by the Order Date.

Ship From

The site from where the send-out order is to be shipped is captured in this field. Laboratories often have multiple sites that can ship out orders to external clients. This field can be used by each site to query for their send-out orders.

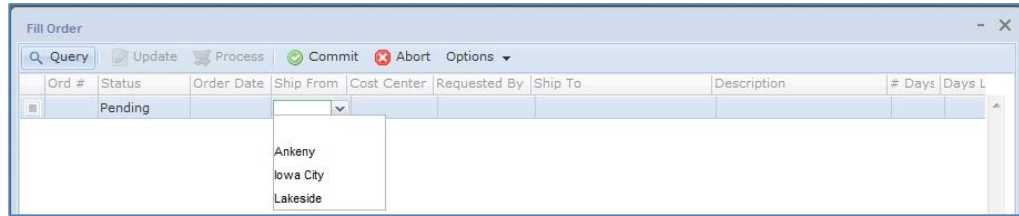


Figure 424 Querying by the “Ship From” Field

Cost Center

This field contains the organizational unit, program, or project that is responsible for the cost of the order. This field is linked with the dictionary category system name “cost_centers”. Orders can be queried by the cost center.

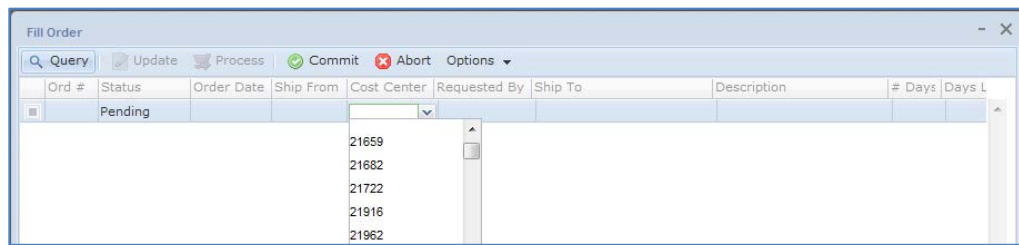


Figure 425 Querying by the Cost Center Field

Requested By

This field normally displays the username of the person who entered the order, but it could have been overridden to the requesting person or the department name. Orders can be queried or filtered by the Requested By field.

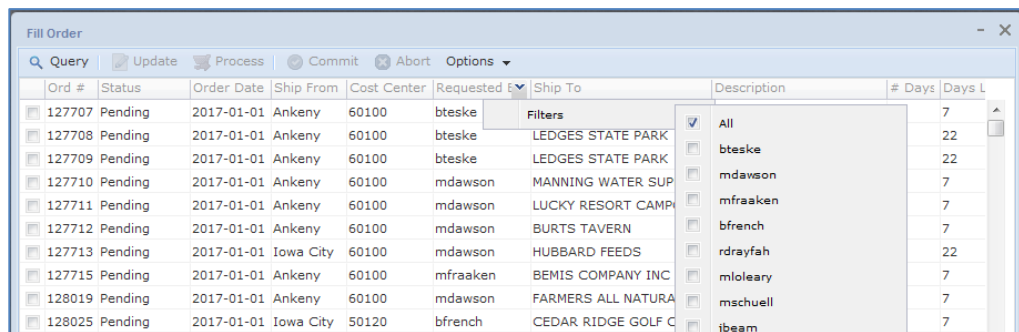


Figure 426 Filtering by the Requested By Field

Ship To

This is the name of the external client to which the send-out order needs to be shipped. This client must be defined in the [ORGANIZATION](#) screen. This field can be used to query or filter the name of the organization for which send-out orders are currently being processed.

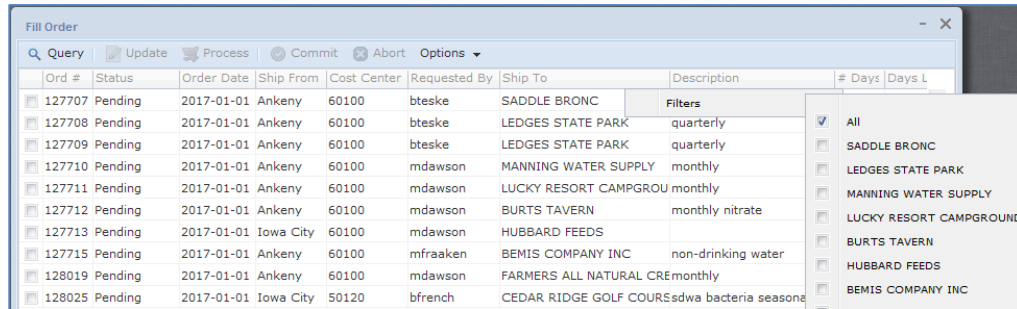


Figure 427 Filtering by the “Ship To” Field

Description

This optional field contains information that characterizes the order, i.e., quarterly monthly, daily, nitrate, private well, non-drinking water, pool/spa yearly, clinical virus, etc. This field can be used to query or filter the kind of order that is to be processed at that time. See the [Description](#) field in the Send-out Order module for more information.

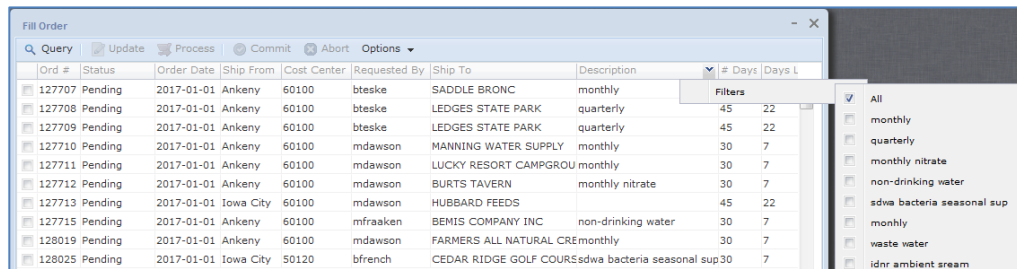


Figure 428 Filtering by the Description Field

Days

This field specifies the number of days from the Order Date in which the order needs to be sent. This static number is taken from the [Needed in Days](#) field of a send-out or internal order. Orders can be queried or sorted by this field.

Days Left

This dynamically-calculated field displays the number of days from the current date before the order needs to be sent. It is the difference of the # Days value and the number of days that have elapsed since the Order Date. A value of 0 in this field means that the order should be sent today; a negative value means that the order is past due. By default orders are sorted from the lowest number of days left to the highest number of days left. This field can also be manually sorted. This field is not query-able since it is not found in the database.

Type

This field specifies the type of order: Internal or Send-out. Orders can be queried or filtered by their type.

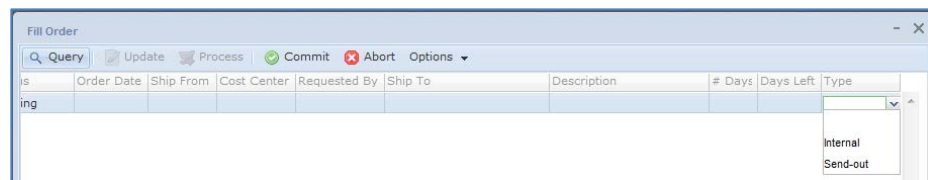


Figure 429 Querying by the Type of Order

The tabs in the lower pane of the Fill Order screen are Shipping Notes, Items, and Customer Notes.

7.5.2 SHIPPING NOTES TAB

The Shipping Notes tab is used to display a note(s) specifying how the items should be shipped to the external or internal client. Any shipping notes that are present in this

tab have been imported from the [SHIPPING TAB](#) of the Send-out Order screen or the [SHIPPING NOTES TAB](#) of the Internal Order screen, respectively.

Currently, shipping notes cannot be added from this screen, so the **Add Note** button has been disabled.

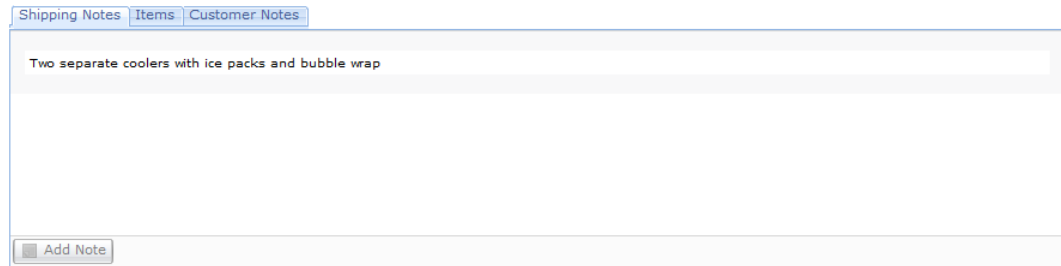


Figure 430 Shipping Notes Tab

7.5.3 ITEMS TAB

The Items tab has two sections: Ship To Address and Items Ordered. See [Items Tab \(Pending Order\)](#) for a screen shot of this tab.

7.5.3.1 SHIP TO ADDRESS SECTION

The Ship To Address displays the complete address information of the external client to which the send-out order needs to be shipped. This client must be defined in the [ORGANIZATION](#) screen.

This section contains the following fields:

Cost Center

This field contains the organizational unit, program, or project that is responsible for the cost of the order. This field is linked with the dictionary category system name "cost_centers".

Attention

This text field may contain the name of the person at the external "ship to" organization who is responsible for receiving or procuring the order.

Apt/Suite #, Address, City, State, Zip Code

These fields display the complete address information of the “ship to” organization as it has been entered in the [ORGANIZATION](#) screen.

7.5.3.2 ITEMS ORDERED SECTION

The Items Ordered section of the Items tab contains the supplies and kits that the laboratory is sending to the external client or internally with this order.

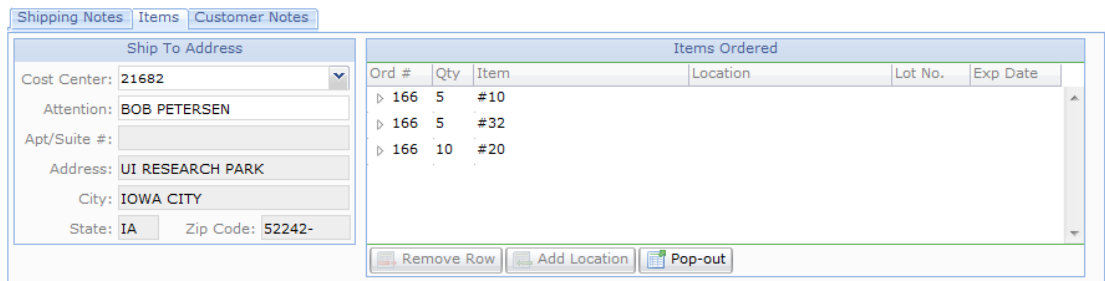


Figure 431 Items Tab (Pending Order)

When a send-out or internal order is pending, the requested items will not have a current location, lot number, or expiration date associated with them. The location (and the lot number and expiration date if there are ones) will be specified in the tree after the order has been processed.

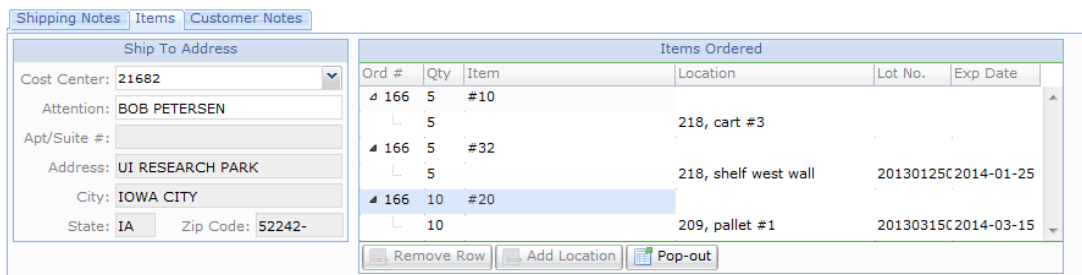


Figure 432 Items Tab (Processed Order)

The fields in this section are described below.

Ord(er) #

This is a unique system-wide order number assigned by the LIMS. All orders (internal, send-out, and vendor) share the same pool of order numbers.

Qty

The requested quantity is displayed in this field in the first row for an item. The quantity to be filled is entered in this field in the second row for an item (the “location row”). If an item is filled from more than one location, there will be multiple location rows with different quantities entered. If the requested quantity is not needed, the processor can change this value which will automatically update this field in the order.

Item

This field contains the name of the inventory item that is being requested. See [INVENTORY ITEM](#) for a detailed explanation of how inventory items are created and managed in OpenELIS.

Location

This field specifies the physical location from where the item was taken to fill the order. A location is defined using the [STORAGE LOCATION](#) screen and each part of the name is separated by a comma.

Lot No.

The lot number is an identification number assigned to a particular quantity or lot of material from a single manufacturer. The [INVENTORY RECEIPT](#) screen is used to enter the lot number for an item that is received from an external vendor, whereas, the [BUILD KITS](#) screen is used to enter the lot number for an item that is manufactured internally. See [Lot # Required](#) for more information on lot numbers.

Exp(iration) Date

This date specifies when the quantity at that location will expire. The [INVENTORY RECEIPT](#) screen is used to enter the expiration date for an item that is received from an external vendor, whereas, the [BUILD KITS](#) screen is used to enter the expiration date for an item that is manufactured internally.

Remove Row

This button is used to remove a location row before the order is processed.

Add Location

This button is used to add a location row while filling an order.

Pop-out

This button opens the Items Ordered section in a larger window to enhance the readability of the tree. All additions/changes performed in the larger window are transferred when the window is closed.

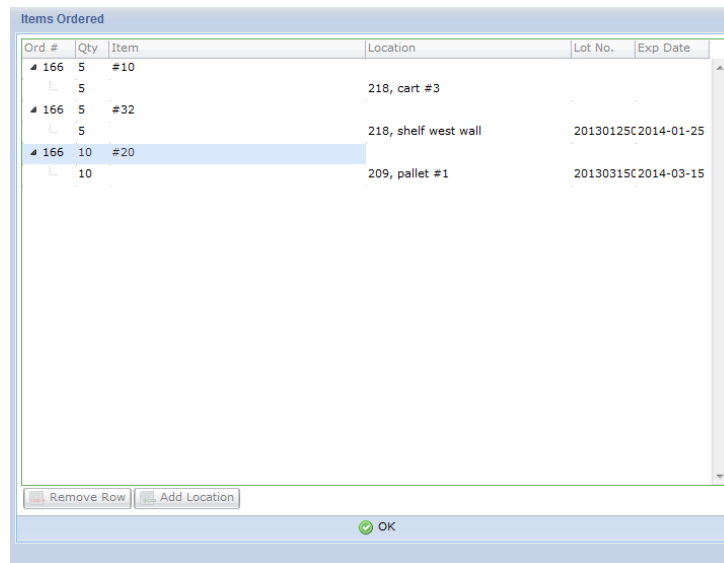


Figure 433 Items Ordered Pop-out Screen

Options

The **Shipping Information** button in the Options menu pops up the Shipping screen with all of the information that is relevant to shipping the send-out order. See [SHIPPING](#) for more information on this screen.

7.5.4 CUSTOMER NOTES TAB

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The Customer Notes tab is used to enter or edit information for the external client. This information is displayed under the “Requested Analyses/Tests” heading of the Order Request Form to provide a generic description of the tests, test panels, or other instructions to the client. Any customer notes that are present in this tab have been imported from the [CUSTOMER TAB](#) of the Send-out Order screen, and they may be edited by clicking on the **Edit Note** button. This action will pop up the [STANDARD NOTE SELECTION SCREEN](#) to be used for this purpose.

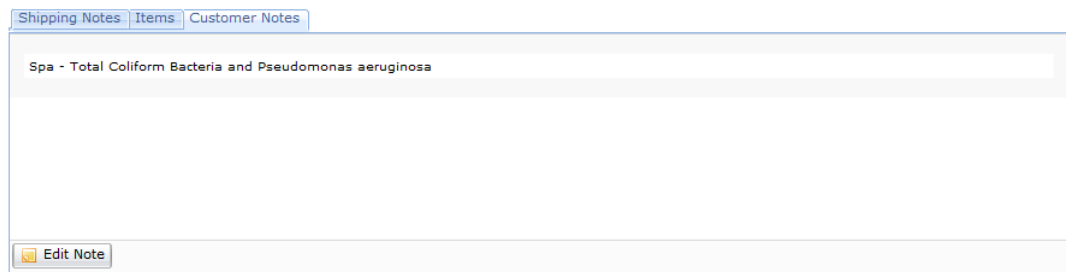


Figure 434 Customer Notes Tab

7.5.5 PROCESS FOR FILLING AN ORDER

The steps to fill an order are listed below.

1. Orders to be filled can be queried by any of the fields in the Fill Order Screen.

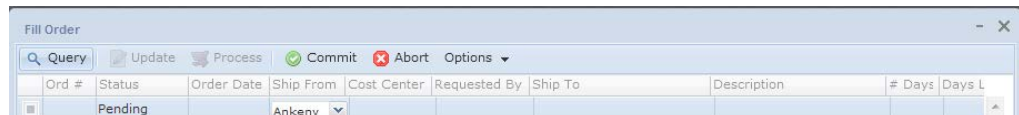


Figure 435 Querying for Pending Orders by the “Ship From” Field

2. The pending orders can be filtered to see if any of them can be combined for processing and shipping.

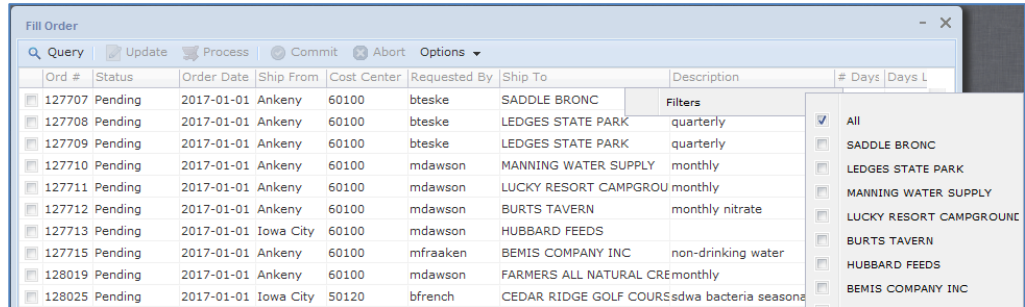


Figure 436 Filtering Pending Orders by the “Ship To” Field

- The **Update** button is clicked and the box(es) is checked in front of the desired order(s) to be filled.

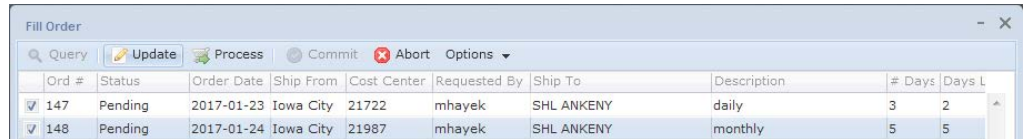


Figure 437 Selecting an Order(s) to be Filled

- The item row to be filled is selected and the **Add Location** button is clicked.

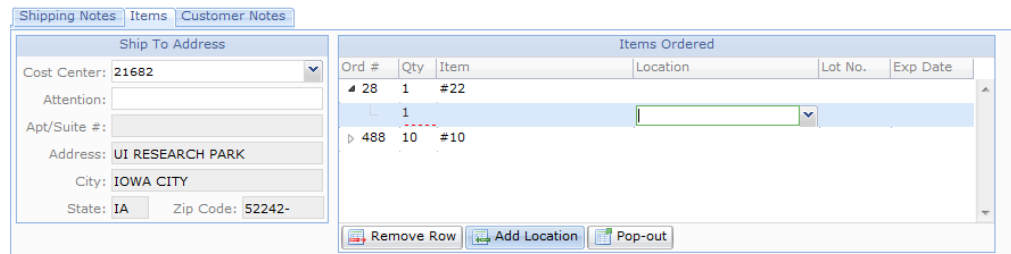


Figure 438 Adding a Current Location for an Item to be Filled

- The current location of the item that will be used to fill the order must be chosen. The lot number and expiration date are automatically entered if this information is present in the system.

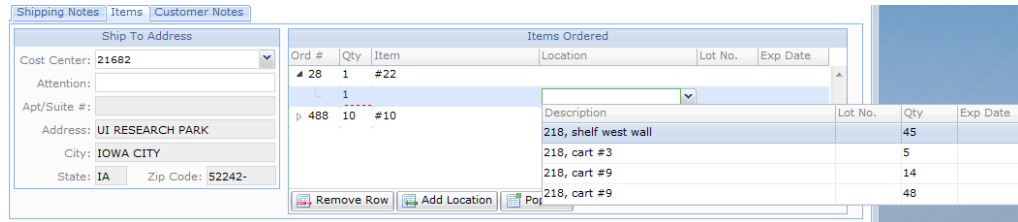


Figure 439 Selecting the Current Location of an Item that Will be Used to Fill an Order

- If the quantity requested is more than the quantity on hand at an individual location, a warning message will pop up.

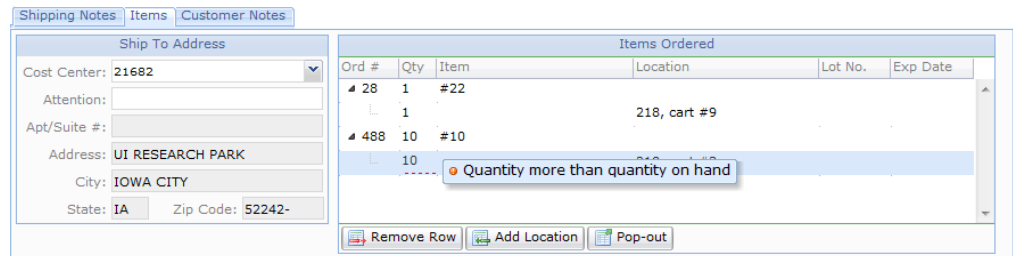


Figure 440 Insufficient Quantity On Hand Warning

- In this situation, quantities from different locations must be combined to fill the order.

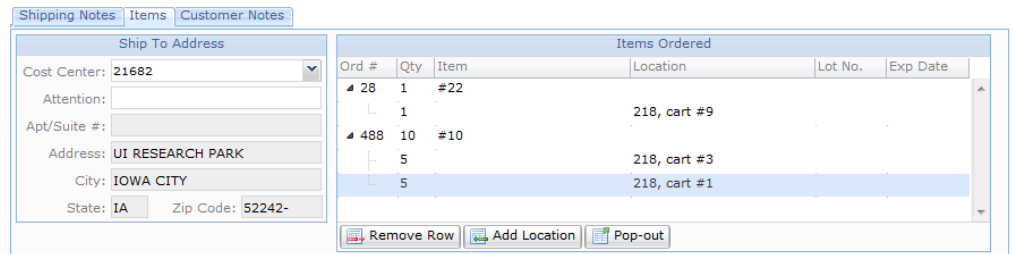


Figure 441 Combination of Quantities from Different Locations

- The Customer Notes may be edited, if necessary.
- The **Process** button is clicked, and the Shipping screen pops up.
- For information on how to use the Shipping screen, see [SHIPPING](#).

7.6 SHIPPING

The Shipping module is used to view, manage, and complete the shipping process for send-out orders. The link to the Shipping module is found in the second section of the

[Inventory/Order Menu](#). The **Shipping Information** option on the Send-out Order and Fill Order screens will also pop up the Shipping screen allowing the user to enter or view shipping information.

Shipping

Q Query Previous Next Add Update Commit Abort Options

Id: 56 Shipped Date: 2013-03-06

Status: Shipped Cost:

of Packages: 1 Shipped To: SHL LAKESIDE

Shipped From: Ankeny Attention:

Processed Date: 2013-03-06 Apt/Suite #:

Processed By: recher Address: 1838 HWY 86

Shipped Method: UPS City: MILFORD

State: IA Zip Code:

Items Shipping Notes

Qty	Item	Tracking #'s
1	Order # 484: #1	1ZX538634744854998
1	Order # 484: #1 instr 48hr holding time	

Add Row Remove Row Lookup Item Add Row Remove Row

Done

Figure 442 Shipping Screen

7.6.1 GENERAL FIELDS

The general fields on this screen are described below.

(Shipping) Id

The Shipping Id is a unique identifier assigned by the LIMS.

(Order) Status

The status of the order is specified in this field.

Cancelled – the order processor can use this status to indicate the order has been cancelled because it is not needed.

Processed – the order has been filled through the [FILL ORDER](#) screen.

Shipped – the order has been shipped out.

of Packages

The number of packages into which an order is divided should be entered in this field. This number will be used to calculate how many shipping labels will be printed.

Shipped From

The site from where the send-out order is to be shipped is captured in this field. Laboratories often have multiple sites that can ship out orders to external clients.

Processed Date

The date that the order was processed through the [FILL ORDER](#) screen is displayed in this field.

Processed By

This field is defaulted to the username of the employee who processed the order through the [FILL ORDER](#) screen, but it can be overridden.

Shipped Method

The shipping courier can be selected from a dropdown list contained in this field.

Shipped Date

The date when the order is shipped is entered in this field. The current date is automatically entered into this field when the shipment is processed through the [PROCESS SHIPPING](#) option.

Cost

The shipping cost in U.S. dollars should be entered into this field.

Shipped To

This is the name of the external client to which the order will be (or has been) shipped. This client must be defined in the [ORGANIZATION](#) screen.

Attention

This text field may contain the name of the person at the external “shipped to” organization who is responsible for receiving or procuring the order.

Apt/Suite #, Address, City, State, Zip Code

The associated address information for the “shipped to” organization will automatically populate these fields.

Options

Other than the history options, there are two other choices in the Options menu: Process Shipping and Print. The **Process Shipping** option allows the user to scan in a barcode for the shipping record and any tracking numbers associated with that record. See [PROCESS SHIPPING](#) for a complete explanation of this process.

The **Print** option pops up the Shipping Print Screen allowing the user to select which items (shipping manifest, shipping labels, collection and shipping instructions, and/or order request form) to print or reprint. See [SHIPPING PRINT SCREEN](#) for more information.

7.6.2 ITEMS TAB

The Items tab has three fields: Qty, Item, and Tracking #'s.

Items		Shipping Notes
Qty	Item	Tracking #'s
1	Order # 402: #15	1Z123UD456
0	Order # 402: #15 instr for sdwa vocs	1Z289238923
1	Order # 399: #15	
0	Order # 399: #15 instr for sdwa vocs	

Buttons: Add Row, Remove Row, Lookup Item (under Items); Add Row, Remove Row (under Tracking #'s)

Qty

The shipped quantity for each item is displayed in this field.

Item

This field contains the order number and the name of the shipped item separated by a colon.

The **Lookup Item** button pops up the pertinent Send-out Order screen so that the complete details of the order may be viewed.

The **Add Row** and **Remove Row** buttons below this field have been disabled.

Tracking #'s

This field may contain the tracking number(s) of the shipment. Tracking numbers can be entered manually after clicking the **Add Row** button below this field, or by scanning an associated barcode through the Process Shipping screen.

7.6.3 SHIPPING NOTES TAB

The Shipping Notes tab is used to add a note(s) specifying how the items should be shipped to the external client. Any shipping notes that are present in this tab have not been imported from the [SHIPPING TAB](#) of the Send-out Order screen.

This note can be written by clicking on the **Add Note** button. This action will pop up the [STANDARD NOTE SELECTION SCREEN](#) to be used for this purpose.

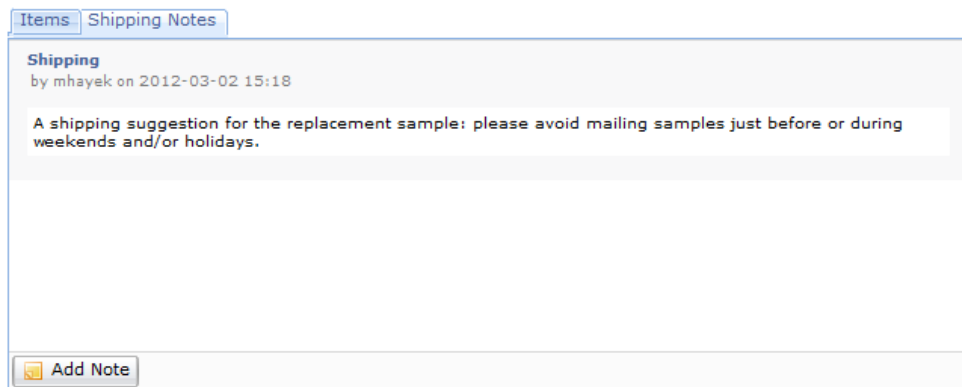


Figure 443 Shipping Screen - Shipping Notes Tab

7.6.4 SHIPPING PRINT SCREEN

After a shipping record has been committed a Shipping Print Screen will pop up with the options of Print Manifest, Print Labels, Print Instructions, and Print Request Form checked by default. The user's preferences for printer and barcode printers are also selected by default. Any of these print options can be changed on this screen.

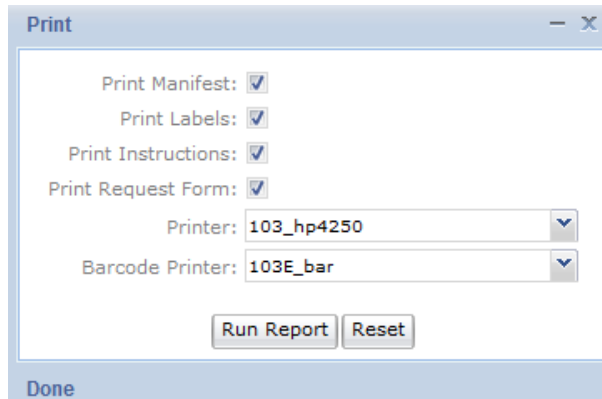



Figure 444 Shipping Print Screen


The Shipping Manifest provides the details of the shipment and is enclosed within the first shipping box. It displays the "Ship To" address, "Ship From" location, and Shipping Id in the top section. This is followed by a table that lists the Order Number, Qty, name of the item, and Commodity Description for each shipped item.



State Hygienic Laboratory

The University of Iowa

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SHIPPING MANIFEST
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<p>SHIP TO</p> <p>DAVE THOMAS 61 DRIVE-IN THEATRE 129 N MAIN ST MAQUOKETA, IA 52060-</p>	<p>Ship From: Ankeny Shipping Id: SH33</p> 
---	--

Order Number	QTY	COMMODITY DESCRIPTION
305	2	acid, hydrochloric 1:1
305	2	acid, nitric

Figure 445 Shipping Manifest

A shipping label is automatically printed for each shipping box according to the number specified in the [# of Packages](#) field on the Shipping screen. A shipping label is affixed to the outside of each shipping box. The “ship from” address is located in the top left corner of the shipping label, while the “ship to” address is printed at the bottom. The upper right corner contains the shipping method (courier, FedEx, pick up, UPS, USPS, etc.), shipping barcode, shipping id, and cost center code. An example of a shipping label is displayed below.

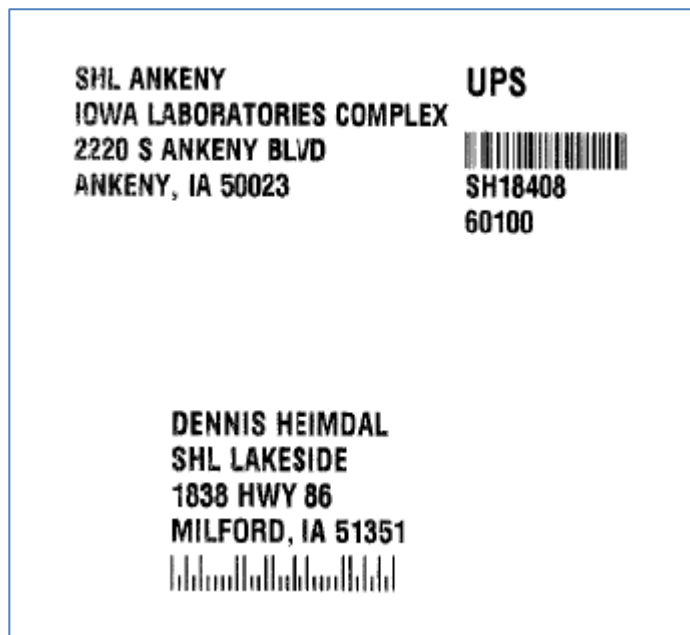


Figure 446 Shipping Label

The Collection and Shipping Instructions provide an explanation of how the sample(s) should be collected, handled, and shipped for the specific test. The external test name, followed by the sample container number to be used, is printed at the top of the instructions. The following sections consist of Collection and Handling instructions, Shipping Instructions, and Contact Information.

Oil and Grease in Water (EPA 1664)	
Collection and Shipping Instructions	<u>Container #3</u> Preservative Added DO NOT RINSE OUT PRESERVATIVE
	Collection and Handling <ul style="list-style-type: none">• Be sure ice packs are frozen prior to sample collection.• Care should be exercised when handling any container with preservative. In case of contact with skin or clothing, immediately rinse with water.• Run water for at least 2 – 3 minutes to flush the line.• Fill container slowly with water to within ½ inch from top – Do not overflow.• Seal the container tightly.• Complete information on the container label.• Begin cooling sample to < 6°C (43°F).• Fill out the sample collection form provided.• Ship sample promptly after collection.
	Shipping Instructions <ul style="list-style-type: none">• Package sample with frozen ice packs or bagged ice for shipment to the laboratory.• UPS and Fed Ex (ground) are examples of shipment options to ensure rapid delivery.• Sample may be brought directly to either the Ankeny or Iowa City laboratories.
	Contact Information <ul style="list-style-type: none">• Client Services: questions, orders, etc., 800-421-4692 or 319-335-4500

Figure 447 Collection and Shipping Instructions

The Order Request Form is used to provide the details of the send-out order and document sample collection information. This form already has the “Report To” and “Bill To” information, Requested Analyses/Tests, and possibly default values for some of the requested collection information. There is also a Chain of Custody/Tracking Signatures section, a sample receiving information section, areas to record Build IDs, and an area to affix an Accession Sample Label. This form is printed and sent out with the order.

For an example of an Order Request Form, see [Order Request Form](#).

7.6.5 PROCESS SHIPPING

The **Process Shipping** option allows the user to scan in a barcode for the shipping record and any tracking numbers associated with that record.

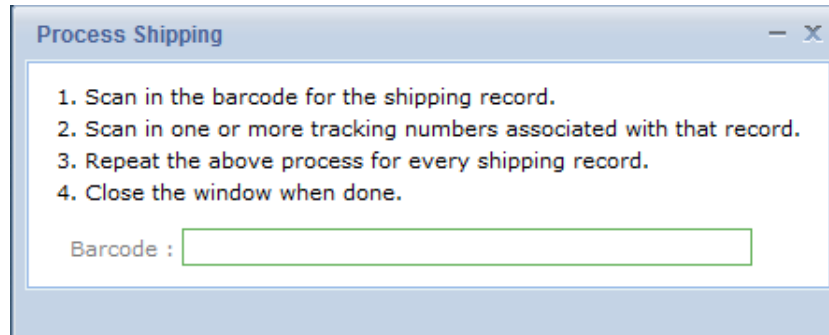


Figure 448 Process Shipping Screen

The scanner will recognize the format of the barcode that is being scanned. The shipping record barcode should be scanned first, followed by any associated tracking number(s). A series of shipping records and tracking numbers can be scanned in this way. The scanned shipping record will automatically change from a status of “Processed” to “Shipped” and the Shipped Date will be populated with the current date. Additional tracking numbers can still be scanned in this manner at a later time.

7.7 BUILD KITS

The Build Kits screen enables the user to assemble components in order to build kits for both internal laboratory and external client use. The kit must first be defined as an [inventory item](#) before kits can be assembled.

The link to the Build Kits module is found in the third section of the [Inventory/Order Menu](#).

Component	Location	Lot No.	Unit	Total	On Hand
-----------	----------	---------	------	-------	---------

Figure 449 Build Kits Screen

7.7.1 GENERAL FIELDS

The general fields at the top of the Build Kits screen are described below.

Kit

This field displays the name of the kit to be manufactured.

Requested

The number of requested kits to be built is entered in this field.

Add To Existing

When this box is checked the kits being built will be added to the number of existing kits at the specified storage location. This can only be done for bulk items. See [Bulk](#) under Inventory Item for more information. If any component of the kit has a lot # value then it cannot be considered a bulk item, and this checkbox will be inactivated.

Location

This field specifies the location where the kits being built will be stored. The storage location's name is normally displayed in the format of "storage location, sublocation".

Lot No.

The lot number of the kits being built must be entered in this field for lotted (non-bulk) items. The lot number is a unique identifier which can be used to track the kits that are built at that time. See [Lot # Required](#) under Inventory Item for a complete description.

Exp(iration) Date

The expiration date for lotted (non-bulk) items may be entered in this optional field. The calendar icon may be clicked to pop out a calendar to use to enter this date.

Ext(ernal) QC

This optional field is used to link the kits that have been built to an external QC.

7.7.2 COMPONENT FIELDS

The component fields at the bottom of the Build Kits screen are described below.

Component

This field contains the name of each component item that is used to manufacture the kit. Each component item must already be present as a distinct inventory item in OpenELIS. See [Inventory Item](#) for more information.

Location

This field specifies the location from where that component is being taken. The storage location's name is normally displayed in the format of "storage location, sublocation".

Lot No.

The lot number of the component is displayed in this field for lotted (non-bulk) items. See [Lot # Required](#) under Inventory Item for a complete description.

Unit

The dispensed unit of the component is displayed in this field. See [Dispensed Unit](#) under Inventory Item for a complete description.

Total

The number of kits that are requested to be built (# Requested) dictates the total of each component that needs to be used during the manufacturing process. The total of each component that is needed is calculated using the [Quantity](#) field for that component on the Inventory Item definition screen. For kits that are composed of multiple components, these quantities, in effect, create a ratio of component items. In other words, if fifty #11 kits are being requested to be built, and the quantity of component A that is needed to build one kit is 1 and the quantity of component B that is needed to build one kit is 2, OpenELIS will automatically enter 50 in the Total field for component A and 100 in the Total field for component B.

On Hand

The On Hand field indicates the number of each component that is available at that storage location. The quantity on hand of the component must equal or exceed the Total number that is needed to build the requested number of kits.

7.7.3 PROCESS FOR BUILDING A KIT

The steps to build a kit are listed below.

1. After the **Add** button is clicked, the initial characters of the kit's name can be typed in the autocomplete Kit field, which will allow the desired kit to be selected from a dropdown table. The kit Name, Desc(ription), manufacturing Store, and Dispensed Units are displayed in the dropdown table to help the user select the correct kit. See [INVENTORY ITEM](#) for an explanation of each of these fields.

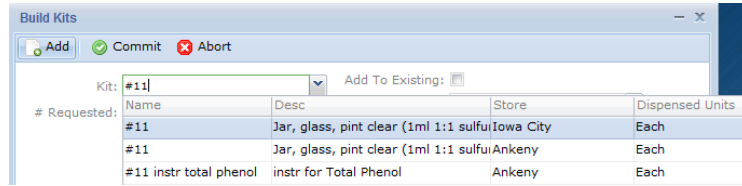


Figure 450 Entering a Kit Name

- The component(s) of the kit will be automatically displayed in the lower pane of the screen along with their dispensed unit(s) and total(s) needed. The # Requested defaults to 1 and the component totals will reflect this. If the user changes the # Requested, the totals will automatically be updated to their needed quantities while still maintaining the component ratio defined for that kit.

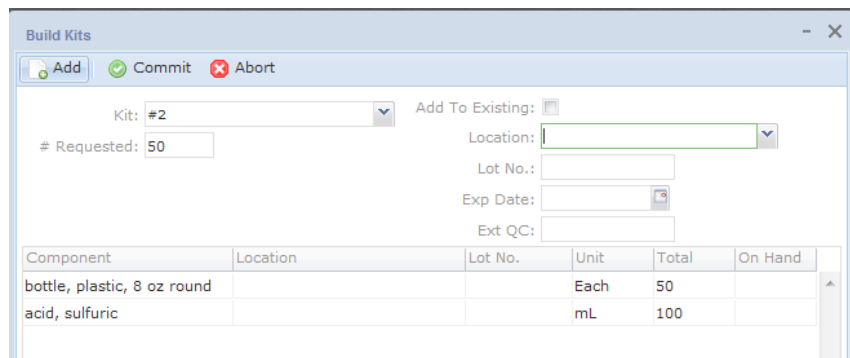


Figure 451 Changing the # Requested Updates the Component Totals

- The storage location of the kit needs to be selected from the Location autocomplete dropdown field. If a lot # is not required for the kit (i.e., it is a bulk item), it can be added to an existing inventory of the kit by checking the Add To Existing checkbox. When this box is checked, only storage locations that already contain the kit will be displayed in the Location dropdown table along with their quantity on hand of that kit.

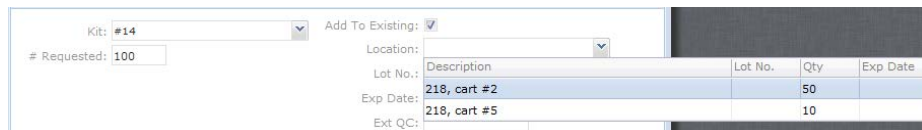


Figure 452 Adding Bulk Kits to an Existing Inventory

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- If the kit requires a lot #, it needs to be entered along with the kit's expiration date (optional) in their respective fields. An external QC can be entered for any type of kit (lotted or bulk).

Figure 453 Entering a Kit's Lot Number and Expiration Date

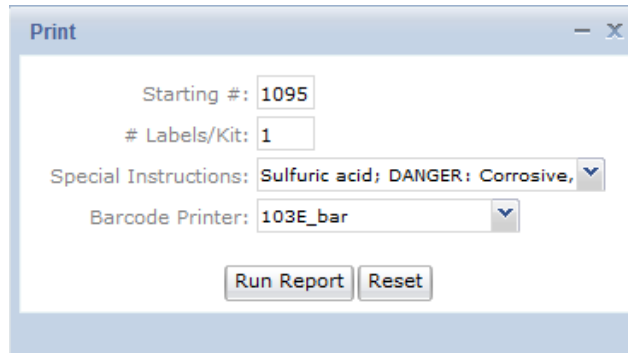
- The user then must select the location of each component from a dropdown table. The Description of the location, Qty on hand, and Lot No. and Exp. Date (if applicable) of available inventories for that component will be displayed in the dropdown table. The Location, Lot No. (if applicable), and On Hand fields will be automatically updated with the correct information after a component's location is selected.

Component	Location	Lot No.	Unit	Total	On Hand
bottle, plastic, 8 oz round	d159, room Manufacturing Store		Each	10	50
acid, sulfuric			mL	20	
	Description	Lot No.	Qty	Exp Date	
	218, cart #10	81711-HJS-72772	4980	2020-12-31	
	d159, room Manufacturing Store Ankeny	PHS-8280198	2500	2019-05-01	

Figure 454 Selecting a Component's Location

- If there is an insufficient quantity available of a component for the number of kits requested, the user can select a location with a smaller quantity on hand and the component totals and number of kits requested will automatically be lowered to fit the chosen quantity.
- It may also be desirable to transfer a quantity of a component to a different storage location by clicking on the **Transfer** button at the bottom of the screen. Currently, the [Parent Item](#) needs to be set for the component for the Inventory Transfer screen to pop-up. See [INVENTORY TRANSFER](#) for more information on transfers.
- After the **Commit** button is clicked, the Kit Labels Print Screen pops up. The user can specify the Starting # for the kit labels, the # Labels/Kit, and whether or not Special Instructions should be printed on the labels.

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Print

Starting #: 1095

Labels/Kit: 1

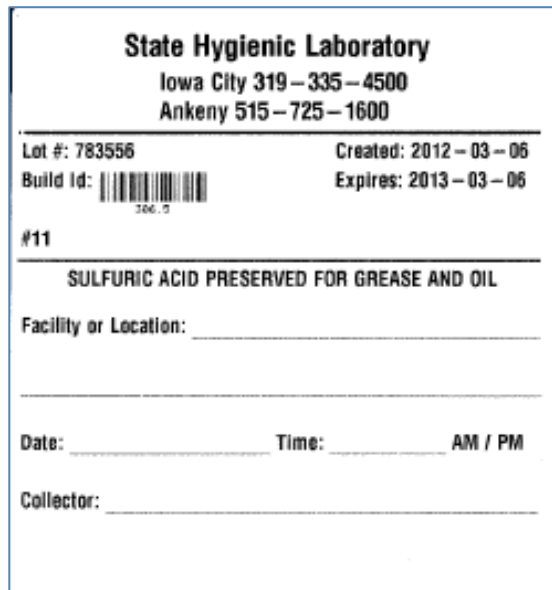
Special Instructions: Sulfuric acid; DANGER: Corrosive

Barcode Printer: 103E_bar


Run Report Reset

Figure 455 Kit Labels Print Screen

9. An example of a kit label is shown below.



State Hygienic Laboratory
Iowa City 319-335-4500
Ankeny 515-725-1600

Lot #: 783556 Created: 2012-03-06
Build Id:  Expires: 2013-03-06

#11

SULFURIC ACID PRESERVED FOR GREASE AND OIL

Facility or Location: _____

Date: _____ Time: _____ AM / PM

Collector: _____

Figure 456 Kit Label

7.8 INVENTORY TRANSFER

The Inventory Transfer screen is used to manage the transfer of inventory items within stores and storage locations. This module will even take into account the mathematical calculation involved in the transfer of a larger inventory unit (i.e., jug, box, gross) into smaller dispensed units (i.e., mL, mg, each) that can be used for kit building or bench work.

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The link to the Inventory Transfer module is found in the third section of the [Inventory/Order Menu](#).

The screenshot shows the 'Inventory Transfer' window. At the top, there are buttons for 'Add', 'Commit', and 'Abort'. Below this is a table with the following data:

From Item	From Loc	On Hand	Qty	To Item	Add To Exst	To Loc
#14	218, cart #2	50	5	#14	<input checked="" type="checkbox"/>	218, cart #5

Below the table are 'Add Row' and 'Remove Row' buttons. At the bottom, there is an 'Item Information' section with the following fields:

Description	Store	Dispensed Units	Lot No.	Exp Date
From: Vial, glass, 40ml amber (unpreserved)	Iowa City	Each		<input type="text" value="28"/>
To: Vial, glass, 40ml amber (unpreserved)	Iowa City	Each		<input type="text" value="28"/>

Figure 457 Inventory Transfer Screen

7.8.1 GENERAL FIELDS

The general fields at the top of the Inventory Transfer screen are described below.

From Item

The inventory item that will be transferred “from” its current location is selected from an autocomplete dropdown table. The Name, Store, Location, and Qty (On Hand) will be displayed for each inventory item that matches the characters that have been entered in this field.

From Loc(ation)

The current storage location of the inventory item is displayed in this field after the “from” item is selected.

On Hand

The quantity on hand of the inventory item at its current storage location is displayed in this field after the “from” item is selected.

Qty (Quantity)

The quantity to be transferred of the “from” inventory item is entered in this field.

To Item

The inventory item that will be transferred “to” a new location is selected from an autocomplete dropdown table. Usually, the “To Item” is the same as the “From Item”. In the case of transferring a parent item from a general store to a child item in a manufacturing store, the “From Item” will be the parent item and the “To Item” will be the child item. (See [Parent Item](#) and [Parent Ratio](#) for more information.)

The Name, Store, and Dispensed Units will be displayed for each possible inventory item that qualifies for the “To Item”.

Add to Exst (Existing)

When this box is checked the “To Item” will be added to the number of existing items at the specified storage location. This can only be done for bulk items. See [Bulk](#) under Inventory Item for more information.

To Loc(ation)

The new storage location of the “To Item” is selected in this field.

7.8.2 ITEM INFORMATION

When an inventory transfer row is clicked in the top pane of this screen, the details of the “from item” and “to item” are displayed in the Item Information pane at the bottom. The Item Information fields are described below.

Description

This field contains a detailed [description of the inventory item](#), such as “Private well kit”, “instr for atrazine immunoassay”, or “Bottle, Plastic, 120ml clear IDEXX (sodium thiosulfate)”.

Store

This is the name of the [store](#) where the inventory item was available or to where it will be transferred. A laboratory often has a general store and one or more manufacturing stores for building kits, reagents and media. See [INVENTORY ITEM](#) for a detailed explanation of stores.

Dispensed Units

This field specifies the [unit in which the item is dispensed](#). Examples include: each, package, case, bottle, box, jug, mg, kg, and mL.

Lot No.

The lot number (if applicable) of the inventory item is displayed in this field. The lot number is a unique identifier which can be used to track the inventory item. See [Lot # Required](#) under Inventory Item for a complete description.

Exp(iration) Date

The expiration date for lotted (non-bulk) items may be displayed in this field.

7.8.3 PROCESS FOR TRANSFERRING INVENTORY

The steps to transfer inventory are listed below.

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1. Click the **Add** button followed by the **Add Row** button. Select the item that will be transferred using the From Item autocomplete dropdown table. The From, Item, From Loc(ation) and On Hand quantity will be automatically entered.

The screenshot shows the 'Inventory Transfer' window with the 'Add' button selected. The 'From Item' dropdown is open, displaying a table with the following data:

Name	Store	Location	Qty
vial, 40ml amber	Iowa City	218, cart #7	440
vial, 40ml clear gl	Iowa City	218, cart #7	30
vial, 40ml clear gl	Iowa City	218, cart #9	20

Figure 458 Selecting the "From Item"

2. The quantity being transferred needs to be entered in the Qty field.
3. The To Item needs to be selected using its autocomplete dropdown table. In the case of transferring a parent item from a general store to a child item in a manufacturing store, select the appropriate child item by examining the Store and Dispensed Units in the dropdown table.

The screenshot shows the 'Inventory Transfer' window with the 'Add' button selected. The 'To Item' dropdown is open, displaying a table with the following data:

Name	Store	Dispensed Units
acid, sulfuric	Iowa City	mL
acid, sulfuric	Ankeny	mL
acid, sulfuric	Main	Jug

Figure 459 Selecting the "To Item" for a Transfer of a Parent Item to a Child Item

4. The new storage location of the item being transferred needs to be selected from the To Loc(ation) autocomplete dropdown field.
5. If a lot # is not required for the item (i.e., it is a bulk item), it can be transferred to an existing inventory of the item by checking the Add To Exst (Existing) checkbox. When this box is checked, only storage locations that already contain the item will be displayed in the To Loc(ation) dropdown table along with their quantity on hand of that item.

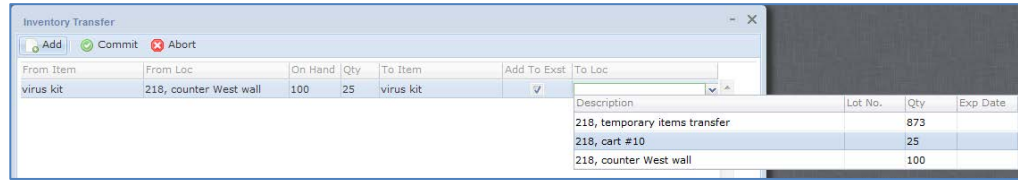


Figure 460 Transferring Bulk Items to an Existing Inventory

- Review the Item Information to make sure that the desired transfer will occur.

Item Information				
Description	Store	Dispensed Units	Lot No.	Exp Date
From: Acid, 1:1 sulfuric (H2SO4) 2.5 L	Main	Jug	829UDE92801H98	2020-8-1
To: Acid, 1:1 sulfuric (H2SO4) 2.5 L	Ankeny	mL	829UDE92801H98	2020-8-1

Figure 461 Item Information for a Transfer of a Parent Item to a Child Item

- Click the **Commit** button to complete the inventory transfer.

7.9 INVENTORY RECEIPT

The Inventory Receipt module is used to manage items that are placed into inventory from external sources, such as those ordered from a vendor. The received items could have been ordered through the [Vendor Order](#) module or through some other process.

The link to the Inventory Receipt module is found in the bottom section of the [Inventory/Order Menu](#).

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Ord #	Ext Order #	Date Rec	UPC	Inventory Item	Vendor	# Req	# Rec	Cost
312	34AC-856642			#62	A & B LABORATORIES	100		

Figure 462 Inventory Receipt Screen

7.9.1 GENERAL FIELDS

The general fields at the top of the Inventory Receipt screen are described below.

Ord(er) #

This is a unique system-wide order number assigned by the LIMS. All orders (internal, send-out, and vendor) share the same pool of order numbers.

Ext(ernal) Order #

Many times when an order is placed with a vendor, the vendor issues an order number that is unique to their system. This field is used to capture that information and can be used in the Inventory Receipt screen to quickly locate and receive an order using the vendor's paper manifest.

Date Rec(eived)

The date that the inventory items are received at the laboratory is recorded in this field. The calendar icon may be clicked to pop out a calendar to use to enter this date.

UPC

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The Universal Product Code for the inventory item may be displayed in this field.

The Universal Product Code for an inventory item can be initially entered in this field in Add Mode to associate it with the inventory item. Future receipts of this inventory item can then be entered into the system in Add Mode by entering part of the UPC and selecting the correct UPC/Inventory Item pair from the autocomplete dropdown table.



Figure 463 Selecting a UPC/Inventory Item Pair in Add Mode

Inventory Item

This field contains the name of the inventory item that is being received. See [INVENTORY ITEM](#) for a detailed explanation of how inventory items are created and managed in OpenELIS. An autocomplete drop-down table can be used in Add Mode to select the Inventory Item. This table displays the Name, Store, and Dispensed Units of possible inventory items.

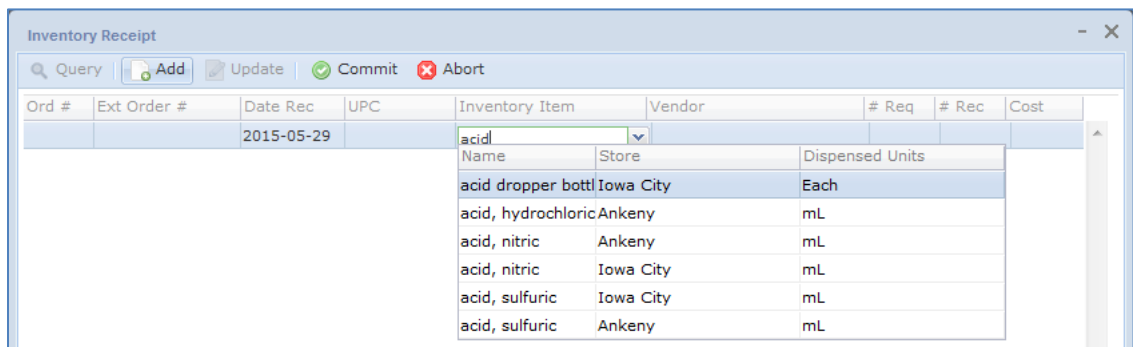


Figure 464 Selecting an Inventory Item in Add Mode

Vendor

This is the name of the external vendor. A vendor is an organization that must be defined in the [ORGANIZATION](#) screen. An autocomplete drop-down table can be used in Add Mode to select the vendor.

Req(uested)

The number of the inventory item being requested is specified in this field. This value is pulled from the [Quantity](#) field for vendor orders.

Rec(eived)

The number of the inventory item being received is entered in this field.

Cost

The unit cost of each item in U.S. dollars may be entered in this field. The quoted price is pulled from the [Unit Cost](#) field for vendor orders, but it may be overridden to reflect the actual unit cost.

When an inventory item row is clicked in the top pane of this screen, the details of its receipt are displayed in the three tabs present in the lower pane. The tabs (Items, Vendor Address, and Shipping Notes) are described below.

7.9.2 ITEMS TAB

The Items tab displays and is used to capture information that is specific to the received inventory item.

Items | Vendor Address | Shipping Notes

Add To Existing:

Description: Acid, 1:1 sulfuric (H2SO4) 2.5 L Location: 218, cart #4

Store: Iowa City Lot No.: 892882700117

Dispensed Units: mL Ext QC: Exp Date: 2019-03-27

Figure 465 Items Tab

The fields located on this tab are described here.

Description

This field contains a detailed description of the inventory item, such as “Private well kit”, “instr for atrazine immunoassay”, or “Bottle, Plastic, 120ml clear IDEXX (sodium thiosulfate)”.

Store

This is the name of the store where the inventory item will be available when it arrives. A laboratory often has a general store and one or more manufacturing stores for building kits, reagents and media. See [INVENTORY ITEM](#) for a detailed explanation of stores.

Dispensed Units

This field specifies the unit in which the item is dispensed. Examples include: each, package, case, bottle, box, jug, mg, kg, and mL.

Add To Existing

When this box is checked the inventory item being received will be added to the number of existing items at the specified storage location. This can only be done for bulk items. See [Bulk](#) under Inventory Item for more information.

Location

This field specifies the location where the inventory item will be stored. The storage location’s name is normally displayed in the format of “storage location, sublocation”.

Lot No.

The lot number of the inventory item being received must be entered in this field for lotted (non-bulk) items. The lot number is a unique identifier which can be used to track the inventory item. See [Lot # Required](#) under Inventory Item for a complete description.

Ext(ernal) QC

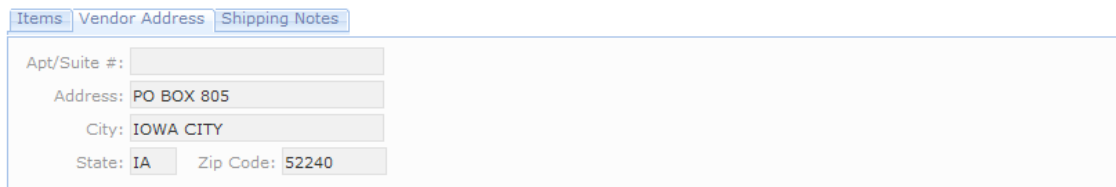
This optional field is used to link the inventory item to an external QC.

Exp(iration) Date

The expiration date for lotted (non-bulk) items may be entered in this optional field. The calendar icon may be clicked to pop out a calendar to use to enter this date.

7.9.3 VENDOR ADDRESS TAB

The Vendor Address tab displays the complete address of the vendor.



Items Vendor Address Shipping Notes

Apt/Suite #:

Address: PO BOX 805

City: IOWA CITY

State: IA Zip Code: 52240

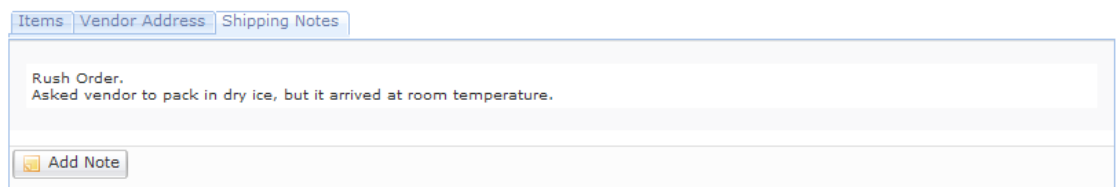
Figure 466 Vendor Address Tab

Apt/Suite #, Address, City, State, Zip Code

Once a vendor is selected for the inventory item, the associated address information from the [ORGANIZATION](#) screen will automatically populate these fields.

7.9.4 SHIPPING NOTES TAB

The Shipping Notes tab may display a note specifying how the item should have been shipped. A Shipping Note can be added during the [VENDOR ORDER](#) process. Information regarding how the item was actually shipped or its condition upon arrival can be added through the Inventory Receipt screen by clicking on the **Add Note** button. This action will pop up the [NOTE EDITOR](#) to be used for this purpose.



Items Vendor Address Shipping Notes

Rush Order.
Asked vendor to pack in dry ice, but it arrived at room temperature.

Figure 467 Shipping Notes Tab

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7.9.5 RECEIVING ITEMS ORDERED THROUGH THE VENDOR ORDER MODULE

The steps to receive items ordered through the [VENDOR ORDER](#) module are listed below.

1. When a laboratory receives a shipment of items that is has ordered through the Vendor Order module, the order can be queried using the internal order # (Ord #) or external order # (Ext Order #).



Figure 468 Querying by Ext Order #

2. All inventory items that are part of the vendor order will be displayed in the top pane of the screen.

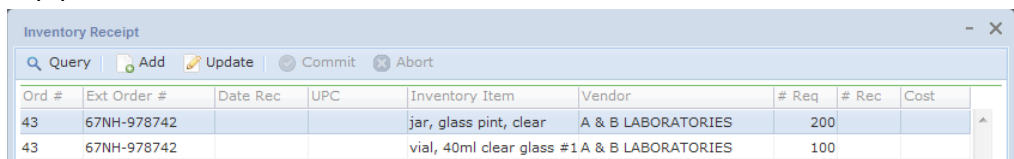


Figure 469 Inventory Items from a Vendor Order

3. Click the **Update** button and enter the Date Rec(eived) and # Rec(eived) for each inventory item. The quoted cost in U.S. dollars is pulled from the [Unit Cost](#) field for vendor orders, but it may be overridden to reflect the actual unit cost.

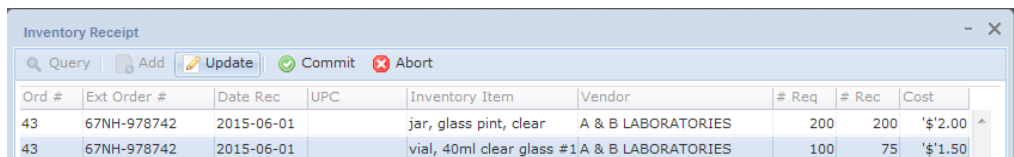


Figure 470 Entering Date Rec(eived) and # Rec(eived)

4. The storage location of the item needs to be entered in the Location autocomplete dropdown field on the Items tab. If a lot # is not required for the item (i.e., it is a bulk item), it can be added to an existing inventory of the item by checking the Add To Existing checkbox. When this box is checked, only

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storage locations that already contain the item will be displayed in the Location dropdown table along with their quantity on hand of that item.

Description	Lot No.	Qty	Exp Date
218, cart #2		300	

Figure 471 Adding Bulk Items to an Existing Inventory

- If the item requires a lot #, it needs to be entered along with the item's expiration date (optional) in their respective fields. An external QC can be entered for any type of item (lotted or bulk).

Figure 472 Entering an Item's Lot Number and Expiration Date

- Information regarding how the item was actually shipped or its condition upon arrival can be added through the Shipping Notes tab by clicking on the **Add Note** button.
- Click the **Commit** button to complete the inventory receipt.

7.9.6 RECEIVING ITEMS ORDERED THROUGH ANOTHER SYSTEM

Some laboratories may use another system (other than OpenELIS) to order inventory items from external sources. The Inventory Receipt module can still be used to receive and enter these items into OpenELIS through Add Mode.

The steps to receive items ordered through another system are listed below.

- Click the **Add** button followed by the **Add Row** button. Enter the Date Rec(eived) and select the item from the Inventory Item autocomplete dropdown table. Alternatively, if the UPC has been previously entered into the system, the correct UPC/Inventory Item pair can be selected from the UPC autocomplete dropdown table.

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- Select the vendor from its autocomplete dropdown table and enter the # Rec(eived). The actual unit cost may be entered in the Cost field.

Ord #	Ext Order #	Date Rec	UPC	Inventory Item	Vendor	# Req	# Rec	Cost
		2015-06-03		acid, nitric	A & B LABORATORIES		5	'\$35.00

Figure 473 Receiving Items Ordered through Another System

- The storage location of the item needs to be entered in the Location autocomplete dropdown field on the Items tab. If a lot # is not required for the item (i.e., it is a bulk item), it can be added to an existing inventory of the item by checking the Add To Existing checkbox. When this box is checked, only storage locations that already contain the item will be displayed in the Location dropdown table along with their quantity on hand of that item.

Description	Lot No.	Qty	Exp Date
218, cart #2		300	

Figure 474 Adding Bulk Items to an Existing Inventory

- If the item requires a lot #, it needs to be entered along with the item's expiration date (optional) in their respective fields. An external QC can be entered for any type of item (lotted or bulk).

Description	Lot No.	Qty	Exp Date
218, cart #6	KYTR34-06781		2020-10-15

Figure 475 Entering an Item's Lot Number and Expiration Date

- Click the **Commit** button to complete the inventory receipt.

7.10 INVENTORY ADJUSTMENT

The Inventory Adjustment screen is utilized for the management of discrepancies in inventory.

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The link to the Inventory Adjustment module is found in the bottom section of the [Inventory/Order Menu](#).

Loc #	Inventory Item	Storage Location	On Hand	Phys #	Adj Quan
2625	#1	d159, room Manufacturing Store Ankeny	49	50	1
2630	#8	d159, room Manufacturing Store Ankeny	73	69	-4

Figure 476 Inventory Adjustment Screen

7.10.1 FIELDS

The fields of the Inventory Adjustment screen are described below.

Adjustment #

This number is automatically assigned by the LIMS to identify individual adjustment records.

Description

This required free-text field is used to describe the inventory adjustment. Examples include: build kit error, physical inventory adjustment, and unknown discrepancy. This field may provide useful for searching for prior inventory adjustments.

Adj(ustment) Date

This field is used to record the date of the inventory adjustment. The Adjustment Date defaults to the current date but can be overridden to capture the actual adjustment date.

User

The username of the person who is logged into OpenELIS is captured in this field.

Store

The name of the store that stocks the item to be adjusted is selected from this field. A laboratory often has a general store and one or more manufacturing stores for building kits, reagents and media. See [INVENTORY ITEM](#) for a detailed explanation of stores.

Loc(ation) #

This field displays a unique ID for the inventory item received at the specified storage location and time. The location # can be selected from this autocomplete dropdown field.

Inventory Item

The name of the inventory item is selected from this autocomplete dropdown field. The store that has been selected will limit the Inventory Item dropdown table to items from that store.

Storage Location

This field displays the location where the inventory item is currently stored. The storage location's name is normally displayed in the format of "storage location, sublocation".

On Hand

The quantity on hand of the inventory item at the specified Storage Location and Loc # is displayed in this field. This value represents the quantity that is currently accounted for in the OpenELIS system.

Please note: When viewing previous Inventory Adjustment records, the On Hand value reflects the current quantity of the inventory item accounted for in the OpenELIS system, not the quantity of the item that was accounted for in the system at the time of the inventory adjustment.

Phys(ical) #

The actual physical quantity of the inventory item at the specified Storage Location and Loc # is entered in this field.

Adj(ustment) Quan(tity)

This field will display the difference between the On Hand and Phys # values. A negative value indicates that there are fewer actual items at the specified Storage Location and Loc # than were previously recorded in the system. A positive value indicates that there are more actual items at the specified Storage Location and Loc # than were previously recorded in the system.

Left Sidebar

The left sidebar displays the Adjustment # and Adj(ustment) Date of all records that match the search criteria of a query. They are listed in descending order by Adjustment #.

7.10.2 PROCESS FOR ADJUSTING INVENTORY

The steps to adjust inventory are listed below.

1. Click the **Add** button and enter the Description of the adjustment. Change the Adj Date if necessary to reflect the actual date of adjustment.
2. Select the Store from the dropdown list.
3. Click the **Add Row** button. Select the desired item using the Inventory Item autocomplete dropdown table. The name of the inventory item, store, storage location, quantity on-hand, and the lot number and expiration date (if applicable) are displayed in the Inventory Item dropdown table to help the

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user select the correct item and its location. Alternatively, the Loc # field can be used to select the inventory item and its location.

Loc #	Inventory Item	Storage Location	On Hand	Phys #	Adj Quan
	acid, sulfuric	d127, shelf bottom	121211	2012-12-1	2380
	acid, sulfuric	d159, manufacturing store	a829UDE928C	2020-8-1	2500

Figure 477 Selecting the Inventory Item to be Adjusted

4. The Loc #, Inventory Item, Storage Location and On Hand fields will be automatically populated with this information.
5. The actual physical quantity of the inventory item at the specified Storage Location and Loc # is entered in the Phys # field.
6. The adjustment quantity will be displayed in the Adj Quan field.
7. Add an additional row for each inventory item that needs to be adjusted.
8. Click the **Commit** button to complete the inventory adjustment.

CHAPTER 8. DEFINING TESTS AND METHODS

The Test , Method, and Panel modules define the testing procedures that are used in OpenELIS.

8.1 TEST DEFINITION

The Test module defines information about tests that are available in OpenELIS. A test's definition is central to the lifecycle of an analysis. The test definition specifies important

parameters such as the internal and reporting name, turnaround times, reporting options, allowed sample types and units, analytes and their possible result values, prep tests and reflex tests, and QC templates for worksheets.

The link to the Test module is located in the top section of the Maintenance Menu.

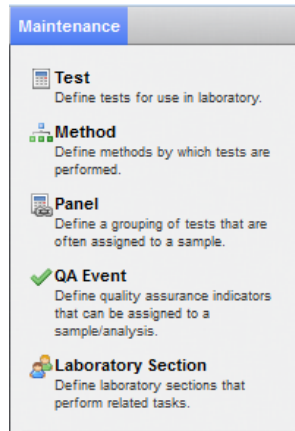


Figure 478 Maintenance Menu - Top Section

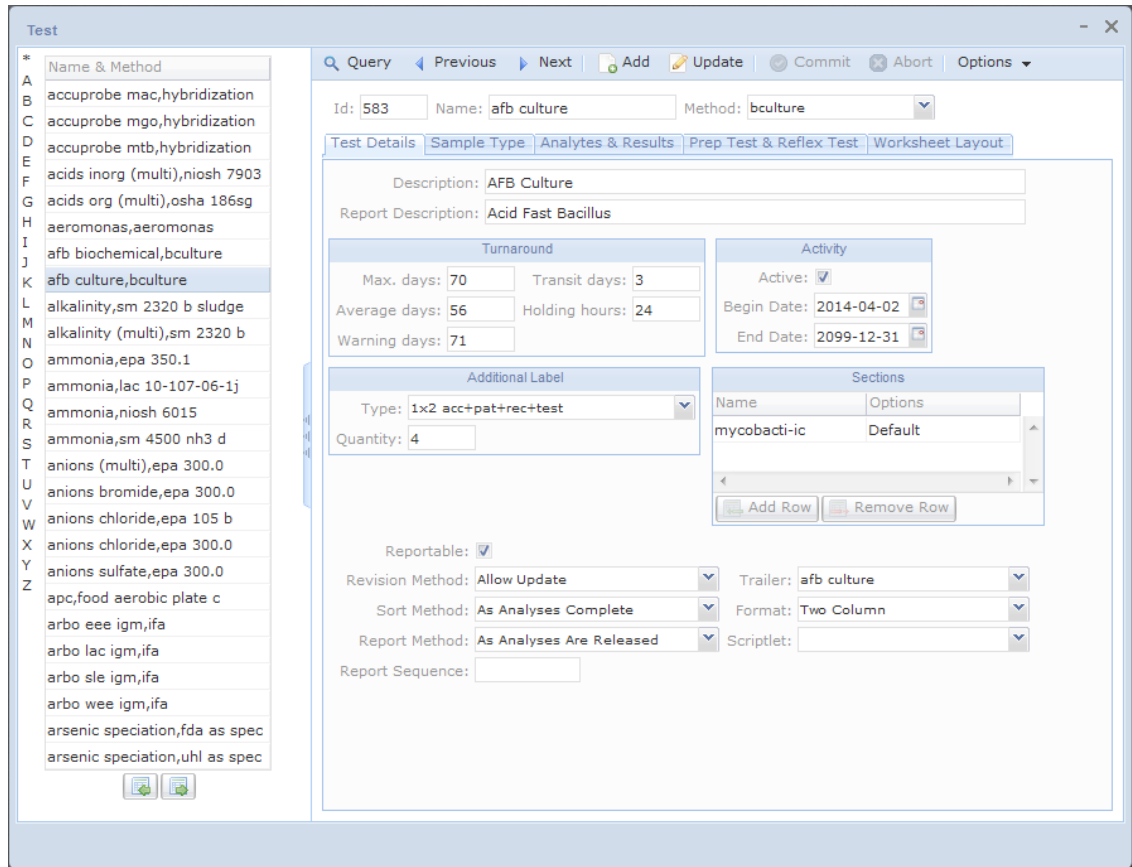


Figure 479 Test Screen

8.1.1 GENERAL FIELDS AND OPTIONS

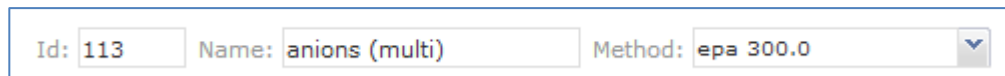


Figure 480 General Fields

The general fields and options at the top of the Test module are described below.

Id

The test Id is a unique integer that is assigned by the system.

Name

This is the abbreviated internal name of the test. The test name appears in conjunction with the method name on many of the screens (i.e., Test screen, Sample Tracking, Complete and Release, sample login screens, worksheets, various reports, etc.) There can be multiple tests with the same test name, but with different methods and unique test Id's. This allows the analyst to “flip” the method of a test without having to cancel the original test and adding a new one.

Method

This is the abbreviated internal name of the method by which that test is performed. A method is required for each test defined within the OpenELIS database. See [Method](#) for a complete description of how methods are defined.

Left Sidebar

The left sidebar displays the “test name,method name” of all tests that match the search criteria of a query. They are listed in alphabetical order.

Duplicate Option

The **Duplicate** button on the Options menu allows the user to duplicate an existing test definition. This is convenient for when the user wants to use an existing test definition as a template to create a new one.

There are five tabs on the Test screen that define all of the other specifications of the test: Test Details, Sample Type, Analytes & Results, Prep Test & Reflex Test, and Worksheet Layout.

8.1.2 TEST DETAILS TAB

The fields on the Test Details tab are described below.

Description

This field contains a detailed internal description of the test. The Description can be used by laboratory staff to further explain the use of the test.

Report Description

This is the name of the test as it appears in results reporting to the client.

Description:	Alkalinity: total, phenolphthalein, HCO ₃ , CO ₃ in water
Report Description:	Alkalinity as CaCO ₃

Figure 481 Description and Report Description

Turnaround Max. days

This field contains the maximum number of days from the time that the sample is [received](#) to when the analysis should be [released](#). This value is used to trigger the sending of the [Turnaround Maximum email](#) to the designated recipient(s) listed for that laboratory section.

Turnaround Average days

This field contains the average number of days from the time that the sample is [received](#) to when the analysis should be [released](#).

This value is used to calculate the [Due Date](#) if a [Priority](#) value is not present in the system.

Turnaround Warning days

This field contains the number of days after a sample is [received](#) that the appropriate laboratory staff should be warned that it soon needs to be [released](#). This value is used to trigger the sending of the [Turnaround Warning email](#) to the designated recipient(s) listed for that laboratory section.

Transit days

This field contains the maximum number of days from the time that the sample is [collected](#) to when it should be [received](#) in the laboratory.

Holding hours

This field contains the maximum number of hours from the time that the sample is [collected](#) until the analysis should be [started \(initiated\)](#).

The [expiration date and time](#) for an analysis is calculated from this value.

Turnaround	
Max. days: <input type="text" value="12"/>	Transit days: <input type="text" value="1"/>
Average days: <input type="text" value="7"/>	Holding hours: <input type="text" value="336"/>
Warning days: <input type="text" value="10"/>	

Figure 482 Turnaround Fields

Active

As laboratory procedures change it becomes necessary to “age out” or inactivate a test definition. This allows the new version of the test to keep the old internal test and method name. This is accomplished by unchecking the Active checkbox of the old definition and activating the new definition. The new definition will be the only one that can then be assigned to new samples. The OpenELIS database will still maintain the old test definition for archival purposes as it is still associated with the old samples. The OpenELIS code will check to make sure that there are not multiple active test definitions with the same internal test and method name.

Begin Date

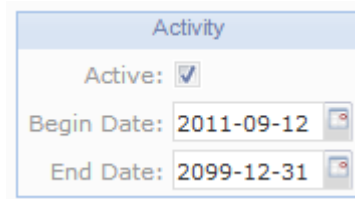
The date that the test definition was available for use in the system is entered in this field.

End Date

The date that the test definition was inactivated (or is estimated to be inactivated) is entered in this field.

The OpenELIS code will check to make sure that the Begin Date and End Date range for two test definitions with the same internal test and method name do not overlap.

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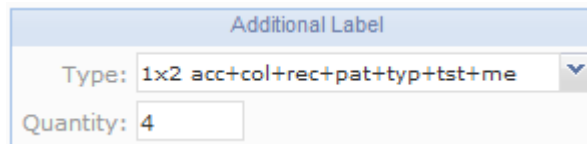


The screenshot shows a form titled "Activity". It contains three fields: "Active" with a checked checkbox, "Begin Date" with the value "2011-09-12" and a calendar icon, and "End Date" with the value "2099-12-31" and a calendar icon.

Figure 483 Activity Fields

Additional Label: Type and Quantity

These fields may contain the type and quantity of secondary labels that are used during the testing process. Secondary labels can be printed through the [SECONDARY LABELS](#), [WORKSHEET BUILDER](#), or [WORKSHEET COMPLETION](#) screens. The Type and Quantity are automatically set when additional labels are printed through the Secondary Labels screen, however, the quantity can still be adjusted from this screen. Only one label for each occupied row of a worksheet can be generated through the Worksheet Builder or Worksheet Completion modules.

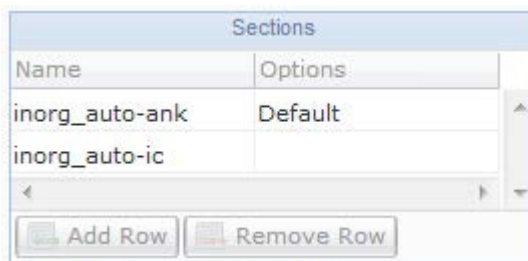


The screenshot shows a form titled "Additional Label". It contains two fields: "Type" with a dropdown menu showing the value "1x2 acc+col+rec+pat+typ+tst+me" and a downward arrow, and "Quantity" with a text input field containing the value "4".

Figure 484 Additional Label: Type and Quantity

Sections: Name and Options

The Name field specifies the laboratory section(s) that can perform the test. These sections are defined through the [LABORATORY SECTION](#) screen. Sections are added to and removed from the test definition by using the **Add Row** and **Remove Row** buttons, respectively.



Sections	
Name	Options
inorg_auto-ank	Default
inorg_auto-ic	

Add Row Remove Row

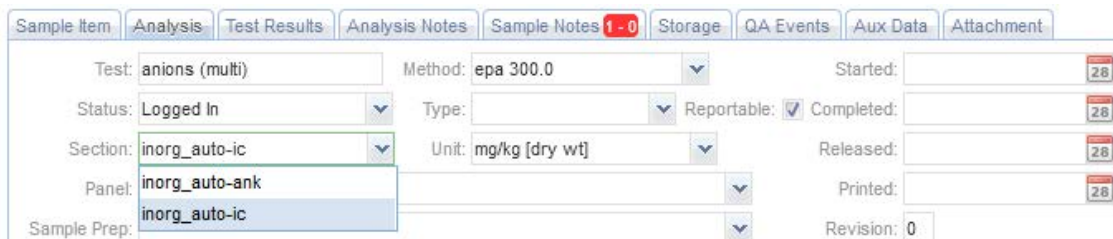
Figure 485 Sections: Name and Options

There are three options for each section: Default, Match User Location, and “blank”.

Default: OpenELIS will automatically select the default section when the test is added through [Quick Entry](#), [Sample Tracking](#), or the [full sample login screens](#).

Match User Location: OpenELIS will automatically select the section that matches the user’s location set in the [Preference](#) screen when a test is added. If a user does not have a location set that matches one of the listed sections with this option, the user will have to select the desired section when adding the test.

“Blank” Option: OpenELIS will allow the user to select this section when the test is added, thus overriding the default section.



Sample Item	Analysis	Test Results	Analysis Notes	Sample Notes 1-0	Storage	QA Events	Aux Data	Attachment
Test:	anions (multi)	Method:	epa 300.0	Started:				
Status:	Logged In	Type:		Reportable:	<input checked="" type="checkbox"/>	Completed:		
Section:	inorg_auto-ic	Unit:	mg/kg [dry wt]	Released:				
Panel:	inorg_auto-ank			Printed:				
Sample Prep:	inorg_auto-ic			Revision:	0			

Figure 486 Selecting a Section with a "Blank" Option

If all of the sections listed for a test have the “blank” option, the user will have to select the desired section every time when adding the test.

Reportable

This checkbox denotes whether the entire test will have its results displayed and/or transmitted via the [Final Report](#), web portal data view, or electronically to the client, by default. An individual analysis can be marked reportable or not-reportable through

the Analysis tab of the [Sample Tracking](#), [Complete and Release](#), or the [full sample login screens](#).

Revision Method

This field determines how analyses are revised. There are 3 options, but only the first one has been implemented.

Allow Update: this option allows for a released analysis to be [unreleased](#) so that changes can be made to it. The analysis will then have to be re-released.

Copy and Update: this option would also first require the analyst to click the Unrelease Analysis button for the analysis that will be revised. The software would then copy this analysis data to an entirely new analysis that would possess the next revision number and a status of Completed. The analyst would make changes to the analysis copy and release it. The original analysis would not be changed.

Ask: this option would ask the user whether the Allow Update or Copy and Update revision method should be used on the selected analysis.

Sort Method

This field determines how the tests are sorted on the [Final Report](#). If all of the released analyses on the sample's Final Report use the "As Analyses Complete" option, they will be sorted in reverse order of [Released Date](#). Any value in the Report Sequence field will be ignored. If all of the released analyses on the sample's Final Report use the "By Test Sequence" option, they will all be sorted by their [Report Sequence](#) values. If there is a mix of released analyses with both options on the Final Report, the analyses using the "By Test Sequence" option will be displayed first, followed by the analyses using the "As Analyses Complete" option. Clinical tests are often sorted by "As Analyses Complete", whereas, environmental and SDWIS tests are often sorted "By Test Sequence".

Report Method

This field determines when the [Final Report](#) is printed. The "As Analyses Are Released" option will cause a report to be automatically printed whenever an analysis is released on the sample. It is usually used for clinical tests so that the medical provider receives

the most current test results in the mail as soon as they are available. The “Complete Sample Only” option will cause a report to be automatically printed only after all of the analyses on the sample have been released. It is usually used for environmental and SDWIS tests so that the client can view the totality of results on the sample after it has finished testing.

The OpenELIS Web Portal makes all test results available on a sample “As Analyses Are Released”, regardless of which option is assigned to the definitions of the individual tests.

Report Sequence

This field is used to establish the order that analyses are displayed on the [Final Report](#) when the “By Test Sequence” option is selected for the [Sort Method](#) of that test. Tests using this option are sorted (displayed) in ascending order of their Report Sequence.

Trailer

This field links the test to its test trailer. A test trailer contains a block of standard information for the [Final Report](#) that is associated with one or more tests. A test trailer is often an explanation of how the test was conducted, how the results should be interpreted, or it may contain an accreditation laboratory ID. A test can have only one test trailer, and the trailer cannot be altered based on individual test results. Test trailers are defined using the [Trailer for Test](#) screen.

Format

The Format field specifies how the test is formatted on the [Final Report](#). Currently, there are eight different column formats available in OpenELIS (e.g., Two Column, Three Column, Four Column Long Analyte, etc.) They are defined through the [Dictionary](#) screen.

Scriptlet

A scriptlet is a specialized piece of software code that implements some form of business logic. It is normally associated with a data operation, such as performing a calculation or setting an interpretation. A scriptlet assigned to a test is run when any change is made to the data on the Test Results tab of one of its analyses. The **Run**

Scriptlets button on the [Complete and Release](#), [Sample Tracking](#), [full sample login screens](#) or [Worksheet Completion](#) can be used to force all of the scriptlets assigned to the sample (any applicable test and domain scriptlets) to run. Scriptlets are defined through the [Dictionary](#) screen.

Reportable:	<input checked="" type="checkbox"/>		
Revision Method:	Allow Update	Trailer:	ankeny ih
Sort Method:	By Test Sequence	Format:	Three Column
Report Method:	Complete Sample Only	Scriptlet:	
Report Sequence:	635		

Figure 487 Fields at the Bottom of the Test Details Tab

8.1.3 SAMPLE TYPE TAB

The fields on the Sample Type tab are described below.

Sample Type

In OpenELIS, the [sample type](#) that is selected limits the possible tests that can be assigned to the [sample item](#). Because of this, each of the possible sample types that the test can be performed on must be listed on this tab. Sample types are defined through the [Dictionary](#) screen.

Unit of Measure

One or more units of measure can be specified for each sample type. Units of measure are defined through the [Dictionary](#) screen. This field can be left empty, if there isn't a unit of measure for a sample type. This is often the case for clinical tests. The units of measure for the sample types that were tested are displayed on the [Final Report](#).

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Sample Type	Unit of Measure
Solid	mg/kg [dry wt]
Solid	mg/kg [recd wt]
Air	ug/{sample}
Other	mg/L
Other	mg/kg [dry wt]
Other	mg/kg [recd wt]
Drinking Water	mg/L
Non-Drinking Water	mg/L
PT Sample	mg/L
PT Sample	mg/kg [dry wt]
Solid	% [dry wt]
Solid	% [recd wt]
Other	% [dry wt]
Other	% [recd wt]

Figure 488 Sample Types and Units of Measure for an Environmental Test

Sample Type	Unit of Measure
Bronchoalveolar lavage fluid sample	
Sputum specimen	
Bronchial brushings sample	
Pleural fluid specimen	
Biopsy sample	
Peritoneal fluid sample	
Blood specimen	
Urine specimen	
Cerebrospinal fluid sample	
Specimen from wound	
Tissue specimen	
Other	
Mycobacterial isolate specimen	
Synovial fluid specimen	
Bacterial isolate specimen	

Figure 489 Sample Types for a Clinical Test

8.1.4 ANALYTES & RESULTS TAB

The Analytes & Results tab is used to create the test's arrangement of row and column analytes and their permissible values for use throughout the LIMS. This arrangement should be carefully considered as it has implications for data entry, worksheets, instrument interfacing, completing and releasing analyses, electronic results interfacing, and the display of the results on the Final Report. This tab is divided into two panes: Test Analytes (upper pane) and Test Results (lower pane).

8.1.4.1 TEST ANALYTES (UPPER PANE)

Test analytes are arranged as row analytes and column analytes in order to form a 2-dimensional table that has the same basic arrangement as a spreadsheet. In order to describe how this pane works, some basic terms need to be defined.

Header

A test definition can contain one or more headers. A header is used to label the columns of analytes and results of the test throughout the LIMS. Headers have a gray background in order to make them easily distinguishable. The column labels “Analyte” and “Value” are hard-coded into a header whenever a new one is added to a test definition.

Test Details Sample Type Analytes & Results Prep Test & Reflex Test Worksheet Layout			
1	2	3	4
Analyte	Value	Quant Limit	MCL
Asbestos	1	2	4
Analyte	Value		
Structures Counted	3		
Total Water Filtered (ml)	3		
Grid Area (mm2)	3		
Openings Counted	3		
Effective Filter Area (mm2)	3		

Figure 490 A Test with Two Headers

Row Analyte

A row analyte is an analyte that occupies the first cell of a row. Each row analyte has a name that is displayed in Column 1 and an associated [result group](#) that is linked in Column 2. Column 1 is labeled “Analyte” and Column 2 is labeled “Value” throughout OpenELIS (with the exception of worksheets where Column 2 could be labeled Final Value, Final Result, or Result). Row analytes must first be added through the [Analyte](#) screen.

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1	2
Analyte	Value
Ethnicity	1
Family History	2
Relation	3
Reproductive Partner's Name	6
Reproductive Partner's Date of Birth	7
CFTR Gene	4
Initial Risk	5

Figure 491 Row Analytes and their Linked Results Groups in a Test Definition

Column Analyte

A column analyte is an analyte that occupies cells of a header after Column 2. Column analytes are paired up with row analytes much like a spreadsheet. The cell where they intersect contains their linked [result group](#). Column analytes can be added to successive columns or inserted between existing columns. Column analytes must first be added through the [Analyte](#) screen.

3	4
Expected Value	Surrogate Percent Recovery
4	6
4	6
4	6
4	6

Figure 492 Column Analytes and their Linked Results Groups in a Test Definition

Result Group

A result group is a group of possible results. Each result group is numbered and its members are defined in the [Test Results](#) (lower pane). The number of the applicable result group occupies each intersecting cell in the upper pane. When this number is clicked, that result group is displayed in the lower pane. The same result group can be used by multiple analytes.

At a minimum, a test will need one row analyte, one result group, and one header.

1	2
Analyte	Value
Acid Fast Bacillus	1



Figure 493 Test Consisting of 1 Row Analyte, 1 Result Group, and 1 Header

Tests can also have many row analytes, column analytes, result groups, and headers.

1	2	3	4
Analyte	Value		
Instrument Run Id	3		
Analyte	Value	Int Std Response	
Fluorobenzene	4	5	
Chlorobenzene-d5	4	5	
1,4-Dichlorobenzene-d4	4	5	
Analyte	Value	Expected Value	Surrogate Percent R
Dibromofluoromethane	6	4	6

Figure 494 Test Consisting of Many Row Analytes, Column Analytes, Result Groups, and Headers

Table Options

There are 3 table options that are used to build the Test Analytes table: Analyte, Column, and Header. The  button is used to add a table option and the  button is used to remove one of the options. When initially creating the table, a Header needs to be added first.

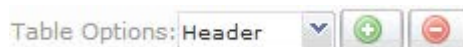



Figure 495 Adding a Header

Row analytes can be added by selecting "Analyte" from the Table Options dropdown list and clicking the  button. The names of the row analytes can then be entered.


1	2
Analyte	Value
Hydrobromic acid	
Nitric acid	
Phosphoric acid	
Sulfuric acid	
Sulfuric acid	
Sulfuric acid Lot Number	
Sulfuric acid/Methanol Lot Number	

Figure 496 Adding Row Analytes

Column analytes can be added by entering their names into the header.

1	2	3	4
Analyte	Value	Quant	
Hydrobromic acid		Quant Limit	
Nitric acid		Quant Limit (%)	
Phosphoric acid		Quant Limit (mg/m3)	
Sulfuric acid		Quant Limit (ppm)	
		QuantIFERON TB Gold	

Figure 497 Adding a Column Analyte

Additional columns can be inserted or added to the right of the last column by selecting “Column” from the Table Options dropdown list and clicking the  button. The focus of the cursor must be in the cell of the column analyte before which the new column is to be inserted.

Analyte	Value	Expected Value	Surrogate Percent Recd
Methyl-t-butyl ether-d3	8	12	17




Table Options: Column   Type: Optional  Reportable: Scriptlet:

Figure 498 Inserting a New Column before an Existing One

Type

This field is used to specify the type for each row and column analyte. The types are described below.

Required: Required analytes must have values in order for the analysis to be completed.

Optional: Optional analytes do not need to have values in order for the analysis to be completed. Optional analytes will always be displayed along with the required analytes when the test is assigned.

Supplemental: Supplemental analytes are not displayed automatically upon assignment of the test, but they can be manually added through the [Sample Tracking](#), [Complete and Release](#), and [full sample login](#) screens. Supplemental analytes do not need to have values in order for the analysis to be completed.

Read Only: A value cannot be entered for a Read Only analyte. Its value is pulled from its result group as a default value or as determined by its [test scriptlet](#).

Reportable

This checkbox denotes whether a row or column analyte and its related values will be displayed and/or transmitted via the [Final Report](#), web portal data view, or electronically to the client, by default. The analyte's reportability can be changed for an individual analysis through the Test Results tab of the [Sample Tracking](#), [Complete and Release](#), or the [full sample login](#) screens.

This is a second level of reporting capability as the [analysis will also have to be reportable](#).

A row analyte or column analyte must be selected in order to set or view its type and reportability. If a column analyte is set to reportable, but the corresponding row analyte is set to not-reportable, the entire row will not be reported.

1	2	3	4
Analyte	Value		
Clinical Diagnosis	1		
Date of Onset	2		
Varicella-Zoster Virus DNA	3		

Table Options: Analyte Type: Required Reportable: Scriptlet:

Figure 499 Row Analyte Set to Required and Reportable

1	2	3	4
Analyte	Value		
Instrument Run Id	3		
Analyte	Value	Int Std Response	
Fluorobenzene	4	5	
Chlorobenzene-d5	4	5	
1,4-Dichlorobenzene-d4	4	5	
Analyte	Value	Expected Value	Surrogate Perc
Dibromofluoromethane	6	4	6

Table Options: Analyte Type: Optional Reportable: Scriptlet:

Figure 500 Column Analyte Set to Optional and Not-Reportable

Scriptlet

Analyte scriptlets have not been implemented in OpenELIS to date.

8.1.4.2 TEST RESULTS (LOWER PANE)

The lower pane contains all of the possible result values for the test. These values are separated into numbered [result groups](#) containing the “rules” of permissible values for each analyte to which they are linked. These rules include applicable units, value types, numerical ranges or dictionary values, defaults, flags, significant digits, and rounding methods. The fields in this pane are described below.

Unit

The Unit field can be used to distinguish different numerical ranges, default values, significant digits, and/or rounding methods for each unit of measure that is applicable to the selected analyte. Each distinct “rule” or default value for a unit needs to be defined in its own row. For Result Group 1 in the example below, ug/L and mg/kg each have two permissible ranges and one default value. There are two different numerical ranges for each unit because a different number of significant digits is applied to each range.

Unit	Type	Value	Flags	S.D.	Rdng. Method
ug/L	Numeric	0,9.99999		1	Sig Fig Not Scientif
ug/L	Numeric	10,10000000		2	Sig Fig Not Scientif
ug/L	Default	<5			
mg/kg	Numeric	0,0.00999999		1	Sig Fig Not Scientif
mg/kg	Numeric	0.01,10000000		2	Sig Fig Not Scientif
mg/kg	Default	<0.005			

Figure 501 Different Result Ranges and Defaults for Different Units

Type

This field defines the type of value for that result row. The test results types are defined in the [Dictionary](#) screen. Current test result types in OpenELIS are:

Dictionary: these values must first be defined as entries in the [Dictionary](#).

Numeric: these values are interpreted as numeric values by the OpenELIS code so that they can be used in computations.

Titer: these values are interpreted as titers by the OpenELIS code and are displayed as ratios throughout the LIMS.

Date: these values represent dates and must be formatted as yyyy-mm-dd.

Date-Time: these values represent date-times and must be formatted as yyyy-mm-dd hh:mm (24-hour clock).

Time: these values represent times and must be formatted as hh:mm (24-hour clock).

Default: these values define the default value for the result.

Alpha Lowercase: these values can contain lowercase letters, numbers, or symbols.

Alpha Uppercase: these values can contain uppercase letters, numbers, or symbols.

Alpha Mixed Case: these values can contain lowercase letters, uppercase letters, numbers, or symbols.

Value

The possible results values are specified in this field. This would include numeric and titer ranges, dictionary values, and default values. A value is not specified for a date, date-time, time, alpha lowercase, alpha uppercase, or alpha mixed case type.

Numeric ranges: these ranges have the format of x,y where x is the lower limit of the range and y is the upper limit of the range. The lower limit is included in the range and the upper limit is excluded. For example, a range of 0,100 would include 0, 0.000001, 50, 99.999999, but not 100. Numeric ranges for the same unit (or without a unit specified) cannot overlap. A < or > sign can be entered along with a number for a numeric value. The number part of the value must still be within the range, while the > or < sign is ignored (with the exception that <y is allowed). For example, a range of 0,100 would include <0, >10, >99.99999, <100, but not >100.

Titer ranges: these ranges have the format of x:y where x is the lower limit of the denominator of the titer range and y is the upper limit of the denominator of the titer range. The lower limit is included in the range and the upper limit is excluded. For example, a titer range of 1:257 would include 1:1, 1:2, 1:4, 1:32, 1:256, but not 1:257. Titer ranges for the same unit (or without a unit specified) cannot overlap. A <, >, <=, or >= sign can be entered along with a ratio for a titer value. The denominator part of the titer value must still be within the range, while the <, >, <=, or >= sign is ignored (with the exception that <y is allowed). For example, a range of 1:257 would include >1:1, <1:2, <=1:16, >=1:256, <1:257, but not >1:257, >=1:257, or <=1:257.

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Unit	Type	Value	Flags	S.D.	Rdng. Method
	Titer	1:1025	Abnormal; DPH		

Figure 502 Titer Range

Dictionary values: each dictionary value must occupy its own row and must first be defined as an entry in the [Dictionary](#). Dictionary values can be typed in this field or they can be selected by clicking on the [Dictionary button](#).

Default values: there can only be one default value for an individual unit (or without a unit specified). A default value can be of any type, but that type must be listed in a separate row and the default value must fall within the designated numeric or titer range or match one of the dictionary values that are listed.

Unit	Type	Value	Flags	S.D.	Rdng. Method
	Numeric	10,10001		2	Integer + Sig Fig ↑
	Default	100		2	Integer + Sig Fig ↑

Figure 503 Numerical Default Value

Unit	Type	Value	Flags	S.D.	Rdng. Method
	Dictionary	Indeterminate			
	Dictionary	Negative			
	Dictionary	Positive	Abnormal; DPH		
	Default	Negative			

Figure 504 Dictionary Default Value

Flags

This field has several uses including: to flag a result as normal or abnormal, to send it electronically to one or more regulatory agencies (i.e., Centers for Disease Control and Prevention (CDC), a state department of public health (DPH), a state department of natural resources (DNR)), for informational purposes only, or a combination of the above. An empty field would signify a result that is considered normal and is not being sent electronically to a regulatory agency.

Unit	Type	Value	Flags	S.D.	Rdng. Method
	Dictionary	Achromobacter denitrificans	Abnormal		
	Dictionary	Achromobacter piechaudii	Abnormal		
	Dictionary	Achromobacter species	Abnormal; CDC		
	Dictionary	Achromobacter xylosoxidans	Abnormal; DNR		
	Dictionary	Acid Fast Bacillus isolated	Abnormal; DPH		
	Dictionary	Acidovorax species	Abnormal; DPH; CDC		
	Dictionary	Acidovorax temperans	CDC		
	Dictionary	Acinetobacter baumannii	DNR		
	Dictionary	Acinetobacter haemolyticus	DPH		

Buttons: Add Group, Add Row, Remove Row, Dictionary Information

Figure 505 Selecting a Flag(s) for a Result Value

Unit	Type	Value	Flags	S.D.	Rdng. Method
	Dictionary	Aeromonas media	Abnormal		
	Dictionary	Aeromonas species	Abnormal		
	Dictionary	Aeromonas trota	Abnormal; DPH		
	Dictionary	Aeromonas veronii biovar veronii	Abnormal		
	Dictionary	Aeromonas veronii bv. sobria	Abnormal		
	Dictionary	Aggregatibacter actinomycetemcomitans	Abnormal		
	Dictionary	Alcaligenes faecalis	Abnormal		
	Dictionary	Anaerobic gram negative cocci			
	Dictionary	Anaerobic gram negative rod			

Figure 506 Different Flags on Different Result Values

S.D. (Significant Digits)

This field specifies the number of significant digits that will be displayed for the result throughout OpenELIS and to the client (if that analyte is [reportable](#)). In the example below, a [raw value](#) of 0.030 from an instrument would be displayed as a [final result value](#) with one significant digit (0.03) since it falls within the first numerical range, whereas, a raw value of 0.100 from an instrument would be displayed as a final result value with two significant digits (0.10) since it falls within the second range. If the

number of significant digits is specified without selecting a [rounding method](#) that utilizes significant figures, then the code will ignore this value.

1 2 3 4						
	Type	Value	Flags	S.D.	Rdng. Method	
	Numeric	0.01,0.0991		1	Sig Fig Not Scientif	▲
	Numeric	0.1,240000001		2	Sig Fig Not Scientif	

Figure 507 Different Significant Digits Specified for Different Numerical Ranges

Rdng. (Rounding) Method

This field specifies the rounding method that is used for the numerical result throughout OpenELIS. Numerical results are not required to have a rounding method. Current rounding methods in OpenELIS are:

Sig Fig: the result value is rounded and the number of significant figures are maintained as defined by the value in the [S.D.](#) field. The result is displayed in scientific notation if the number is less than 10^{-3} or greater than or equal to 10^7 , or when the number might have an ambiguous number of significant figures. The rounding uses the following rules:

1. If the digit to the right of the last significant digit is a 0, 1, 2, 3, or 4, then the number is rounded down to the correct number of significant digits.
2. If the digit to the right of the last significant digit is a 6, 7, 8, or 9, then the number is rounded up to the correct number of significant digits.
3. If the digit to the right of the last significant digit is a 5, and any of the digits to the right of this 5 are not 0, then the number is rounded up to the correct number of significant digits.
4. If the digit to the right of the last significant digit is a 5, and all of the digits to the right of this 5 are 0, and the last significant digit is even, then the number is rounded down to the correct number of significant digits.
5. If the digit to the right of the last significant digit is a 5, and all of the digits to the right of this 5 are 0, and the last significant digit is odd, then the number is rounded up to the correct number of significant digits.

For example, if “0.00000001” was entered for a result that is defined to have a S.D. of 3, it would be displayed as “1.00E-8”. If “1005” was entered for a result that is defined to have a S.D. of 3, it would be displayed as “1.00E3”. If “100” was entered for a result that is defined to have a S.D. of 3, it would be displayed as “100.”

Sig Fig Not Scientific: this rounding method works in the same manner as [Sig Fig](#) with the additional stipulation that the result is not displayed in scientific notation. For example, if “0.004” was entered for a result that is defined to have a S.D. of 3, it would be displayed as “0.00400”. If “20” was entered for a result that is defined to have a S.D. of 2, it would be displayed as “20.” If “20” was entered for a result that is defined to have a S.D. of 3, it would be displayed as “20.0”. If “32.5” was entered for a result that is defined to have a S.D. of 2, it would be displayed as “32”

Integer: the result value is rounded to the nearest whole number. For example, “17.50” would be rounded to “18”, whereas, “17.49999” would be rounded to “17”.

Integer + Sig Fig: the result value is [rounded using the rules](#) described above to the number of significant figures as defined by the value in the [S.D.](#) field and then that intermediate value is rounded to the nearest whole number. The result is displayed in scientific notation if the number is less than 10^{-3} or greater than or equal to 10^7 , or when the number might have an ambiguous number of significant figures.

For example, if “1450.0” was entered for a result that is defined to have a S.D. of 2, it would be rounded to “1400”. If “1455.0” was entered for a result that is defined to have a S.D. of 3, it would be rounded to “1460”. If “0.49950” was entered for a result that is defined to have a S.D. of 3, it would be rounded to “1”. If “9850.0” was entered for a result that is defined to have a S.D. of 2, it would be rounded to “9800”.

Integer + Sig Fig Not Scientific: This rounding method works in the same manner as [Integer + Sig Fig](#) with the additional stipulation that the result is not displayed in scientific notation. For example, if “2034.7” was entered for a result that is defined to have a S.D. of 2, it would be rounded to “2000”. If “2045.0” was entered for a result that is defined to have a S.D. of 3, it would be rounded to “2040”. If “0.49850” was entered for a result that is defined to have a S.D. of 3, it would be rounded to “0”.

Buttons

Add Group

This button creates a new [result group](#) in the lower pane. A result group must contain at least one row.

Add Row

This button adds a row to the selected result group.

Remove Row

This button removes a row from the selected result group.

Dictionary

Dictionary values can be selected by clicking on this button to pop up the Choose Dictionary Entry screen. Clicking on the first letter of the desired dictionary entry in the left sidebar will display all of the entries that start with that letter and their dictionary categories. The list of dictionary entries can also be narrowed to show only related entries by selecting a category and clicking the **Search** button.

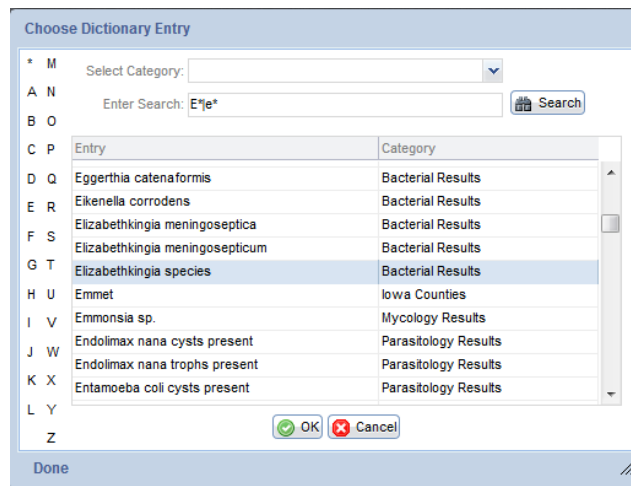


Figure 508 Selecting a Dictionary Entry to Define a Possible Result Value

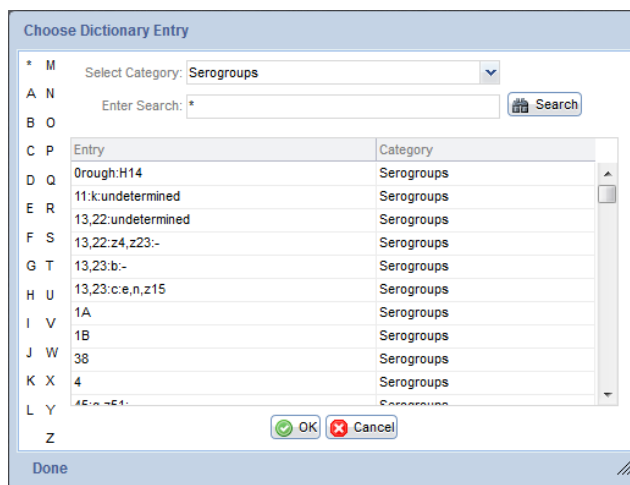


Figure 509 Narrowing a List of Dictionary Entries by their Category

8.1.5 PREP TEST & REFLEX TEST TAB

This tab is divided into two panes: Prep Test (upper pane) and Reflex Test (lower pane).

8.1.5.1 PREP TEST (UPPER PANE)

Often in laboratory testing, a preparatory test (i.e., a digestion, extraction, leaching, or another method) is used to prepare the sample for the primary analytical test. The upper pane of this tab is used to specify one or more prep tests for the test that is being defined. A prep test must first be defined as a separate test in OpenELIS before it can be defined as a prep test for another test. See [Prep Tests](#) for a description of how prep tests are assigned to primary analyses.

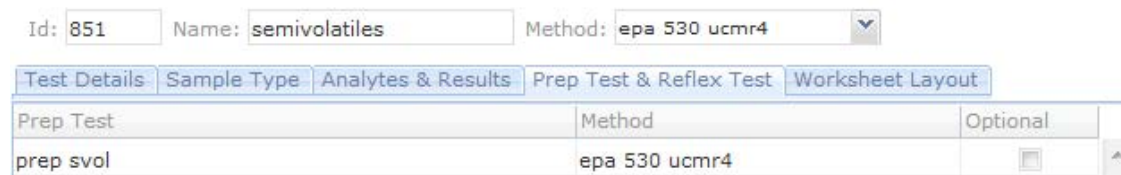


Figure 510 Prep Test Defined for an Analytical Test

There are three fields for the Prep Test half of this tab and two buttons: **Add Row** and **Remove Row**.

Prep Test

The test and method of the prep test can be selected from an autocomplete dropdown list. The [name](#) of the prep test will then be displayed in this field.

Test	Method	Description
prep svol	epa 3510 water bna	Separatory funnel prep for BNA semivolatiles
prep svol	epa 3550 solid bna	sonication prep for BNA semivolatiles
prep svol	epa 522 ucmr3 dioxan	solid phase extraction prep for 1,4-dioxane for dr
prep svol	epa 525.2	solid phase extraction prep for drinking water
prep svol	epa 525.2 modified	solid phase extraction prep for water
prep svol	epa 530 ucmr4	Solid phase extraction for semivolatiles in d
prep svol	epa 541 ucmr4	Solid phase extraction for alcohols in drinkin
prep svol	epa 548.1	extraction prep for endothall by GC/MS
prep svol	epa 625 bna, pah	Separatory funnel prep for BNA semivolatiles
prep svol	uhl h 020	prep for Pharmaceuticals by LC/MS/MS

Figure 511 Selecting a Prep Test and Method

Method

The name of the prep test's [method](#) will then be displayed in this field after the prep test and method are selected.

Optional

This checkbox is used to mark a prep test as optional. If the prep test is required to be performed, this box should not be checked. There cannot be more than one required prep test. In other words, there can be a required prep test and one or more optional prep tests or all of the prep tests can be optional.

8.1.5.2 REFLEX TEST (LOWER PANE)

Often a result of a test requires an additional or confirmatory test to be performed. This additional test is known as a reflex(ed) test. A reflex analysis is linked to its parent analysis and result, which is important in tracking the testing process. The lower pane of this tab is used to specify one or more reflex tests for the parent test that is being

defined. A reflex test must first be defined as a separate test in OpenELIS before it can be defined as a reflex test for another test. See [Reflex Tests](#) for a description of how reflex tests are assigned to parent analyses.

Id: Name: Method:

Prep Test	Method	Optional

Reflex Test	Method	Analyte	Result	Flags
syphilis tppa	particle agglut	Syphilis VDRL	Reactive	Prompt, Non-d
syphilis tppa	particle agglut	Syphilis VDRL	Weakly Reactive	Prompt, Non-d

Figure 512 Reflex Test Defined for a Parent Test

There are five fields for the Reflex Test half of this tab and two buttons: **Add Row** and **Remove Row**.

Reflex Test

The test and method of the reflex test can be selected from an autocomplete dropdown list. The [name](#) of the reflex test will then be displayed in this field.

Reflex Test	Method	Analyte	Result	Flags
<input type="text" value="svd"/>				
Test	Method	Description		
syphilis tppa	particle agglut	Syphilis by TPPA		
syphilis vdrl	csf-flocculation	Syphilis by VDRL (CSF)		
syphilis vdrl	serum-flocculation	Syphilis by VDRL (Serum)		

Figure 513 Selecting a Reflex Test and Method

Method

The name of the reflex test's [method](#) will then be displayed in this field after the reflex test and method are selected.

Analyte and Result

These fields are used together to specify the analyte and corresponding result value of the parent test that will trigger the reflex test. In the example shown [above](#), a "Reactive" or "Weakly Reactive" result for the "Syphilis VDRL" analyte of the "syphilis vdrl, serum-flocculation" test will reflex to the "syphilis tppa, particle agglut" test.

Flags

The flag assigned to the row determines how the reflexing will work for that analyte and result. This is a required field. There are 8 flags currently implemented in OpenELIS:

Auto-Add: this flag will automatically add the reflex test for the specified analyte and result for every instance that it occurs on a sample.

Prompt: this flag will pop up the [Reflex Test Selection screen](#) that asks the user if she/he wants to add the reflex test for the specified analyte and result for every instance that it occurs on a sample.

Auto-Add, Non-duplicate: this flag will automatically add the reflex test for the specified analyte and result if it has not already been added to a sample.

Prompt, Non-duplicate: this flag will pop up the [Reflex Test Selection screen](#) that asks the user if she/he wants to add the reflex test for the specified analyte and result if it has not already been added to a sample.

Auto-Add, Not-reportable: this flag will automatically add the reflex test for the specified analyte and result for every instance that it occurs on a sample. OpenELIS will automatically change the parent analysis to [not reportable](#).

Prompt, Not-reportable: this flag will pop up the [Reflex Test Selection screen](#) that asks the user if she/he wants to add the reflex test for the specified analyte and result for

every instance that it occurs on a sample. OpenELIS will automatically change the parent analysis to [not reportable](#).

Auto-Add, Non-duplicate, Not-reportable: this flag will automatically add the reflex test for the specified analyte and result if it has not already been added to a sample. OpenELIS will automatically change the parent analysis to [not reportable](#).

Prompt, Non-duplicate, Not-reportable: this flag will pop up the [Reflex Test Selection screen](#) that asks the user if she/he wants to add the reflex test for the specified analyte and result if it has not already been added to a sample. OpenELIS will automatically change the parent analysis to [not reportable](#).

8.1.6 WORKSHEET LAYOUT TAB

The Worksheet Layout tab can be used to define the format, capacity, QC and reagent/media template, and other characteristics of an electronic worksheet that can be built for the test. This tab is divided into three sections: General Fields, QC Items, and Analytes Excluded from Worksheet.

8.1.6.1 GENERAL FIELDS

The fields in this section are described below.

Format

This field lists the worksheet format that is associated with the test. Each worksheet format must first be defined through the [Dictionary](#) screen before it can be assigned to a test definition.

Subset Capacity

This field represents the maximum number of [worksheet positions](#) that comprise a standard subset of the total analytical run for that test (i.e., a 96-well plate, a 100-tube rack, etc.)

Total Capacity

This field represents the maximum number of [worksheet positions](#) that comprise a total analytical run for that test. In the example below, a QuantiFERON-TB Gold, ELISA run can have a total capacity on one worksheet of six ELISA plates that each can contain 36 worksheet positions (216 total positions).

The screenshot shows a web form for 'Worksheet Layout'. At the top, there are input fields for 'Id' (829), 'Name' (tb qftg), and 'Method' (elisa). Below these are five tabs: 'Test Details', 'Sample Type', 'Analytes & Results', 'Prep Test & Reflex Test', and 'Worksheet Layout'. The 'Worksheet Layout' tab is active. Inside this tab, there is a 'Format' dropdown menu set to 'QFTG'. Below that are two input fields: 'Subset Capacity' (36) and 'Total Capacity' (216). At the bottom of the tab is a 'Scriptlet' dropdown menu.

Figure 514 Worksheet Layout General Fields

Scriptlet

This field lists the worksheet scriptlet that is associated with the test. A scriptlet is a specialized piece of software code that implements some form of business logic. A worksheet scriptlet is normally associated with a worksheet operation, such as assisting with building a specific layout or triggering analysis status changes. A worksheet scriptlet is run when [loading a QC template](#) and when [transferring results](#) from the worksheet to the analyses. Scriptlets are defined through the [Dictionary](#) screen.

8.1.6.2 QC ITEMS

The QC Items table is used to define the [QC template](#) that can be loaded onto an electronic worksheet that contains the test. The columns of this table are described below.

DECEMBER, 2017

QC Items		
Position	Type	QC Name
1	Fixed	flu a pcr sipc
2	Fixed	pcr neg amp
3	Fixed	hsc
	Reagent / Media	superscript
	Reagent / Media	invitrogen
	Reagent / Media	flu a ppm

Figure 515 QC Items Table

Position

This column defines the [position](#) where the QC Item will be placed on the worksheet. The position number only applies to Fixed, Fixed Always, and Duplicate [test worksheet item types](#).

(Test Worksheet Item) Type

This column is used to differentiate between the different types of test worksheet items.

Fixed: this QC item will be added to the worksheet that is being built if there are enough samples loaded to reach that position. For example, if a QC item is defined to be fixed at Position 43, it will not be added if only the first 41 positions are loaded.

Fixed Always: this QC item will be added to the defined worksheet position regardless of whether there are enough samples loaded to reach that position. For example, if a QC item is defined to be fixed always at Position 50, it will be added even if only the first 5 positions are loaded.

Duplicate: this type will take the sample in the previous position and duplicate it to the defined position.

Random: this QC item will be added to a random position on the worksheet to be determined by the software, as long as it does not already contain a QC. It works in a

similar fashion to a fixed QC, in that, if there are not enough samples loaded to reach the random position that the code has determined for that QC, it will not be added.

Last of Subset: this QC item will be added to the last position of each subset (as specified by the [subset capacity](#) for the test). This type would be used, for example, if the analyst wants the QC placed at the end of each plate for a multi-plate run.

Last of Run: this QC item will be added to the last position of the worksheet (run). The QC could be in the middle of the last plate or test tube rack if it does not contain a full sample load.

Last of Subset & Run: this QC item will be added to either the last of the subset or the last of the run. If a position is both the last of a subset and of the run, this type will only add one QC to that position.

Reagent/Media: this type will load the specified test worksheet item into the [Reagents/Media tab](#) of the Worksheet Builder screen. Reagents/Media will be loaded in the order that they are defined in this table.

QC Name

This is the name of the QC or Reagent/Media item as defined through the [QC](#) screen.

8.1.6.3 ANALYTES EXCLUDED FROM WORKSHEET

This table is used to list the row analytes of the test that will be excluded from a worksheet containing that test. The columns of this table and the buttons that are used to build it are described below.

DECEMBER, 2017

Analytes excluded from worksheet		
Analyte	Repeat	Flag
Clinical Diagnosis	1	
Date of Onset	1	
Fever	1	
Surveillance	1	
Gram stain morphology	1	

< >



 + Analyte  - Analyte

Figure 516 Analytes Excluded from Worksheet Table

Analyte

This column lists the [row analyte\(s\)](#) that will be excluded from the worksheet.

Repeat

This field has not been implemented.

Flag

This field has not been implemented.

+ Analyte

The **+ Analyte** button is used to include one or more analytes to the exclusion table.

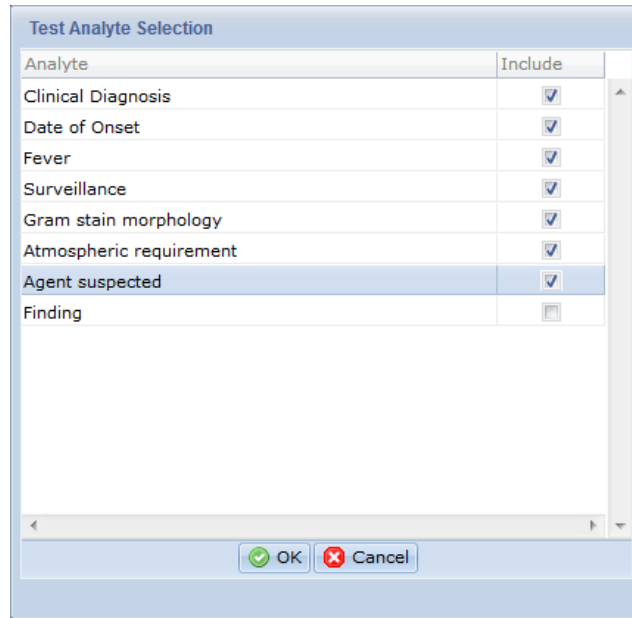


Figure 517 Including Analytes in the Exclusion from Worksheet Table

- Analyte

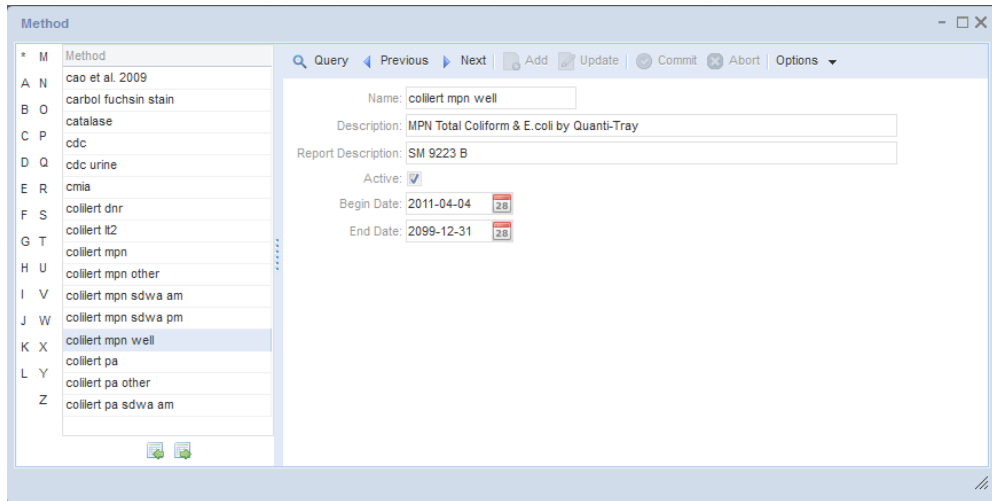
The – **Analyte** button is used to remove the selected Analyte from the table.

8.2 METHOD

The Method screen is used to define methods by which tests are performed. A method is required for each test defined within the OpenELIS database.

The link to the Method screen is located in the [top section of the Maintenance Menu](#).

DECEMBER, 2017



The screenshot shows the 'Method' screen in OpenELIS. On the left, there is a list of methods categorized by letter (A-Z). The selected method is 'collert mpn well'. The right pane displays the details for this method:

- Name: collert mpn well
- Description: MPN Total Coliform & E.coli by Quanti-Tray
- Report Description: SM 9223 B
- Active:
- Begin Date: 2011-04-04
- End Date: 2099-12-31

Figure 518 Method Screen

8.2.1 FIELDS

The fields of the Method screen are described below.

Name

This is the abbreviated internal name of the method. The method name appears in conjunction with the test name on many of the screens (i.e., Test screen, Sample Tracking, Complete and Release, sample login screens, worksheets, various reports, etc.)

Description

This field contains a detailed internal description of the method. The Description can be used by laboratory staff to further explain the use of the method.

Report Description

This is the name of the method as it appears in results reporting to the client.

Active

This checkbox denotes whether the method is available to be used for future testing. If the Active checkbox is not checked, the method has been retired.

Begin Date

The date that the method was available for use in the system is entered in this field.

End Date

The date that the method was inactivated (or is estimated to be inactivated) is entered in this field.

8.3 PANEL

The Panel screen is used to define a group of tests (and often auxiliary group(s)) that are normally assigned together to a sample. The assignment of a panel to a sample is faster and less error-prone than assigning individual tests/auxiliary groups.

The link to the Panel screen is located in the [top section of the Maintenance Menu](#).

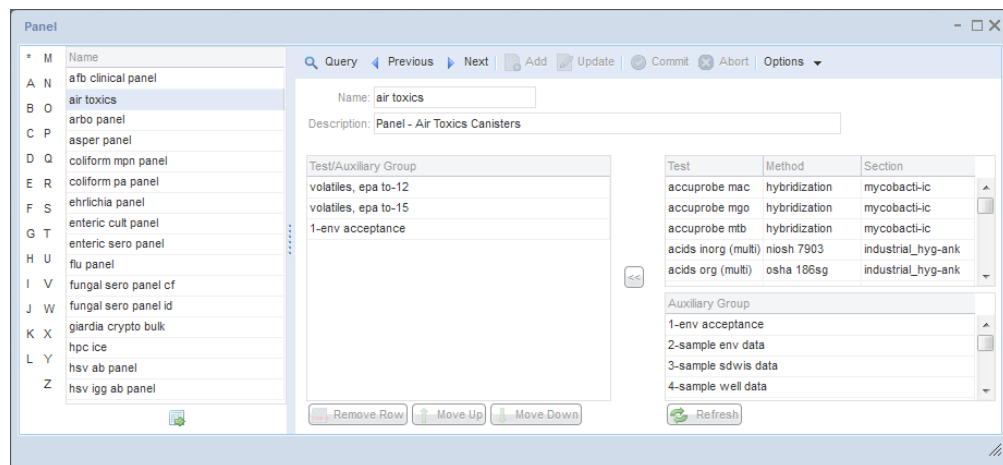


Figure 519 Panel Screen

8.3.1 FIELDS AND TABLES

The fields and tables of the Panel screen are described below.

Name

This field contains the abbreviated name of the panel. The panel's name is used in dropdown lists on many of the other screens (i.e., Sample Tracking, Complete and Release, and the sample login screens.)

Description

This field contains a detailed description of the panel. The Description can be used by laboratory staff to further explain the use of the panel.

Test and Auxiliary Item

This table displays the names of the test(s) and/or auxiliary group(s) that compose the panel.

Test/Method/Section

This table displays the tests/methods with their corresponding laboratory sections that are currently active in OpenELIS.


Auxiliary Group

This table displays the auxiliary groups that are currently active.

8.3.2 CREATING A PANEL

The steps to create a panel are listed below.

DECEMBER, 2017

1. Click the **Add** button and enter the Name and Description of the panel.
2. Select the test(s) that will compose the panel from the Test/Method/Section table and click the  button to move them to the Test and Auxiliary Item table.
3. If an auxiliary group(s) is to be added to the panel, select it from the Auxiliary Group table and move it to the panel in the same manner.
4. The **Move Up** and **Move Down** buttons can be used to reorder the contents of the panel. The **Remove Row** button can be used to delete a test or auxiliary group from the panel. Press **Commit** to save the panel to OpenELIS.

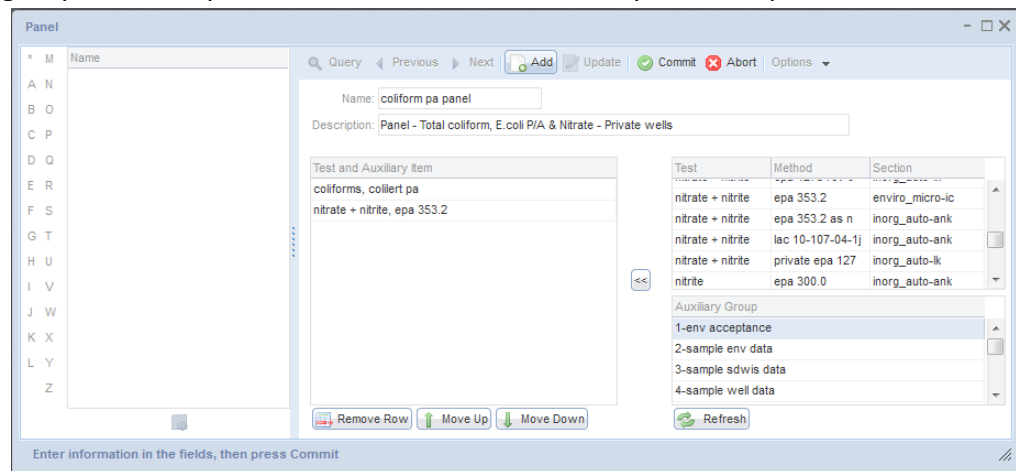


Figure 520 Creating a Panel

CHAPTER 9. DEFINING NEW QUESTIONS (ANALYTES) AND ANSWERS (DICTIONARY)

9.1 ANALYTE

The Analyte screen is used to define the questions for test definitions, QCs, and auxiliary prompts.

The link to the Analyte screen is located in the second section of the Maintenance Menu.

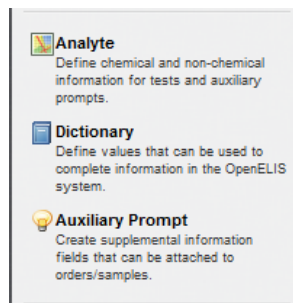


Figure 521 Maintenance Menu – Second Section

* M	Name
A N	Y1092X C>A
B O	Y1092X C>G
C P	Y122X
C P	Yeast
D Q	Yttrium
E R	Yttrium-91
F S	Yttrium-91m
G T	
H U	
I V	
J W	
K X	
L Y	
Z	

id: 1211
Name: Yttrium
Parent Analyte:
External id: 7440-65-5
Active:

Figure 522 Analyte Screen

9.1.1 FIELDS

The fields of the Analyte screen are described below.

Id

The Analyte Id is a unique integer that is assigned by the system.

Name

The name of the analyte is entered in this field. Analyte names are displayed on the Test Results tab, Aux Data tab, QC screen, Analyte Parameter screen, worksheets, Final Reports, etc.

Parent Analyte

This field is used to link the analyte to its parent analyte.

External Id

This field contains an identifier such as a CAS Registry Number or an id that can be used for some other purpose in the software code.

Active

This checkbox denotes whether the analyte is available for future use in test definitions, QCs, and auxiliary prompts. If the Active checkbox is not checked, the analyte has been retired.

9.2 DICTIONARY

The Dictionary screen is used to define values that can be used to complete information in OpenELIS.

The link to the Dictionary screen is located in the [second section of the Maintenance Menu](#).

DECEMBER, 2017

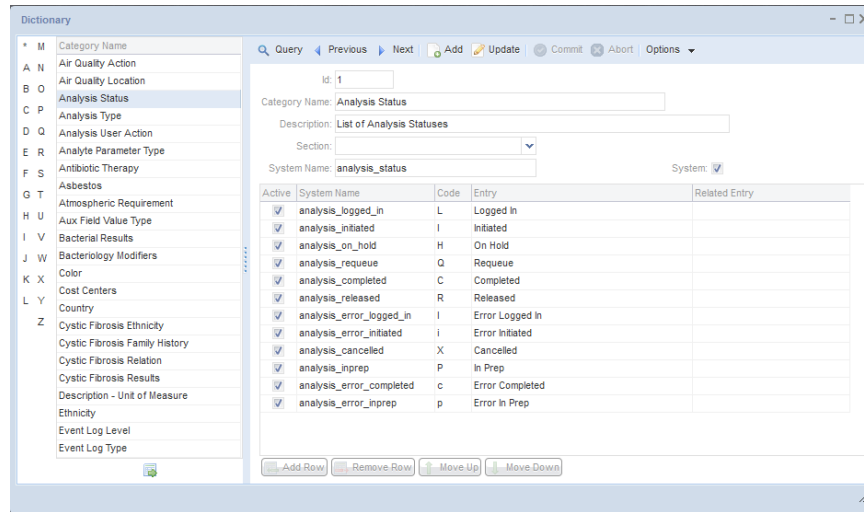


Figure 523 Dictionary Screen

9.2.1 CATEGORY FIELDS

Dictionary entries are organized into categories. The fields in the upper pane of the Dictionary screen apply to the dictionary category. They are described below.

Id

The Dictionary Category Id is a unique integer that is assigned by the system.

Category Name

The name of the dictionary category is entered in this field. This field can be used to narrow a dictionary search when selecting an entry to add to a test definition, QC, or auxiliary prompt.

Description

This field contains a more detailed explanation of the use of the dictionary category.

Section

This field can be used to link the dictionary category to a laboratory section.

System Name

This field contains the name of the category as it is used by the system code.

System

This checkbox denotes those categories that are part of the system software. Categories that are not marked as “System” are often used for analysis results and auxiliary data values.

9.2.2 ENTRY FIELDS

The table in the lower pane of the Dictionary Screen contains the dictionary entries for each category. The fields of this table are described below.

Active

This checkbox denotes whether the dictionary entry is available for future use in OpenELIS. If the Active checkbox is not checked, the entry has been retired.

System Name

This field may contain the name of the entry as it is used by the system code.

Code

This field may contain an abbreviation of the entry which can be used for translations to other systems.

Entry

This field contains the name of the entry as it is displayed in a drop-down list.

Related Entry

This field can be used to link an entry to another entry in the software code. For example, a serogroup can be linked to its related bacterial organism through this field. The worksheet software can be coded so that after the analyst selects the serogroup of the organism that has been identified, the final value field will be automatically populated with the name of the related bacterial organism.

9.3 AUXILIARY PROMPT

The Auxiliary Prompt screen is used to define and organize supplemental information fields that can be attached to orders and samples.

The link to the Auxiliary Prompt screen is located in the [second section of the Maintenance Menu](#).

Figure 524 Auxiliary Prompt Screen

9.3.1 GROUP FIELDS

Auxiliary items (analytes) are organized into functional groups (i.e., environmental acceptance criteria, air quality data, pool and spa sample information). The fields in the upper pane of the Auxiliary Prompt screen apply to the auxiliary group. They are described below.

Group Name

The name of the auxiliary group is entered in this field. Auxiliary items must be added as a group through the [Aux Group Selection screen](#).

Description

This field contains a detailed description of the auxiliary group. The Description can be used to further explain the use of the group.

Active

This checkbox denotes whether the auxiliary group is available for future use in OpenELIS. If the Active checkbox is not checked, the group has been retired.

Begin Date

The date that the auxiliary group was available for use in the system is entered in this field.

End Date

The date that the auxiliary group was retired (or is estimated to be retired) is entered in this field.

9.3.2 ANALYTE FIELDS

The table in the middle pane of the Auxiliary Prompt screen contains the analytes (items) for each aux. group. The fields of this table are described below.

Analyte

The name of the analyte is entered in this field. If the analyte is new to the LIMS, it must be entered through the [Analyte](#) screen.

The data type and possible values for an analyte can be set by first clicking on the analyte row, adding a row in the bottom pane of the screen, and selecting the data type in the Type field. Possible data types include Dictionary, Numeric, Date-Time, Alpha Mixed Case, and Default. Possible values can then be entered in the Value field. Dictionary values can be selected by clicking on the **Dictionary** button to pop up the Choose Dictionary Entry screen. Numeric value ranges can be entered in the format of “lowest possible value,highest possible value (not-inclusive)”.

Method

This field shows the method that is used to measure the auxiliary analyte, if there is one.

Unit

This field displays the unit of measurement for the auxiliary analyte, if there is one.

Act(ive)

This checkbox denotes whether the auxiliary analyte is available for future use in OpenELIS. If the Active checkbox is not checked, the analyte has been retired.

Req(quired)

This checkbox denotes if a value for the analyte must be entered into the system. Required auxiliary analytes without values display a warning pop-up message in the sample login screens upon committal and change the sample status to [Error](#) if the sample goes through verification without these values being entered.

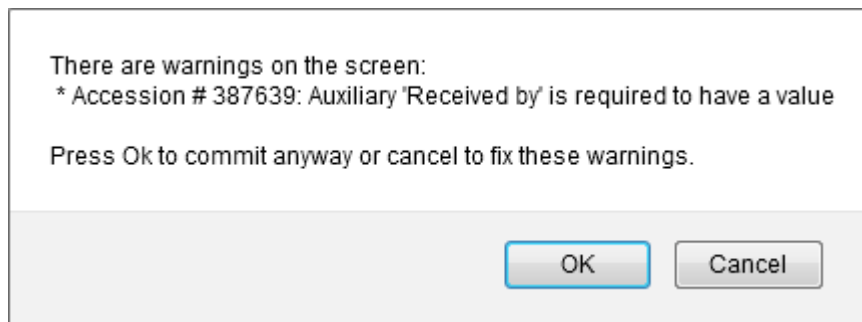


Figure 525 Pop-up Warning for Missing Auxiliary Analyte Value

Rep(ortable)

This checkbox is used to set the default reporting behavior of the analyte. Reportable auxiliary analytes, and any entered default values, are printed on the [Order Request Form](#). Reportable auxiliary analytes and their final values are also printed on the [Final Report](#).

Description

The Description field displays additional helpful information about the auxiliary analyte. This information is also printed on the [Order Request Form](#) beneath each prompt line.

Scriptlet

If a scriptlet is linked to the analyte, it will be displayed in this field.

CHAPTER 10. SUPPORT MODULES

The OpenELIS Support Modules define such diverse entities as storage units and locations, testing instruments, test trailers, standard notes, labels, laboratory sections, and QA events. This chapter describes each of these modules.

10.1 QA EVENT

The QA event screen is used to define quality assurance indicators that can be assigned to an entire sample or an individual analysis, as the situation warrants. For general information about QA events, please see [QA EVENTS TAB](#) and [QA EVENTS](#).

The QA Event screen may be accessed through the link in the [top section of the Maintenance Menu](#).

* M	Name	Test
A N	no form	
B O	no human exposure	rabies
C P	no patient id	chl-gc cbss
D Q	no sample received	
E R	not analyzed	
F S	not analyzed-clot	blood lead
G T	not analyzed-clot	blood lead
H U	not anlzd-no partner	cf-carrier
I V	not anlzd-no partner	cf-carrier
J W	not anlzd-no partner	cf-carrier
K X	not anlzd-no partner	cf-pregnancy
L Y	not anlzd-no partner	cf-pregnancy
Z	not billed - env	

QA Event Form Fields:

- Name: no form
- Description: No form received
- Type: Warning
- Test: [Dropdown]
- Method: [Text]
- Billable:
- Sequence: [Text]
- Text: No sample information form received.

Figure 526 QA Event Screen

10.1.1 FIELDS

The fields of the QA Event screen are described below.

Name

This is the abbreviated name of the QA event. The name is used to select the QA event and is then displayed on the QA Events tab of the [Sample Tracking](#), [Complete and Release](#), and [full sample login](#) screens.

Description

This field contains a detailed description of the QA event. The Description can be used to further explain the use of the QA event.

Type

This column specifies the default type (Internal, Result Override, or Warning) of the QA event. The [QA event type](#) can still be changed by the user at the time that the QA event is assigned.

QA events will be listed on the Final Report in the order that they were selected. It is strongly recommended not to use more than three QA events for any given sample and to list the Result Override QA event(s) first for clarity and brevity.

Test and Method

These fields specify the test and method to which this QA event is associated. These fields are empty for general QA events. General QA events are used by many sections of the laboratory; whereas, test-specific QA events can only be assigned to their designated test(s) and method(s). Test-specific QA events will only be displayed in the [QA EVENT SELECTION SCREEN](#) when their corresponding analysis is selected.

Billable

This column shows the default billing behavior of each QA event. QA events that are marked as not billable will override the charging for an analysis (or all analyses on a sample if it is assigned at the sample level). For example, when the QA event “lab accident” is assigned to an analysis that is routinely billed, the QA event overrides the billing, and that analysis will not be charged. The [billable checkbox](#) can still be selected or unselected by the user at the time that the QA event is assigned.

Sequence

The Sequence field can be used to specify the order in which QA events are displayed on the Final Report. QA events without a Sequence value will appear first on the Final Report; followed by QA events in ascending order of their Sequence value.

Text

The Text field displays the explanation of the QA event as it will be displayed to the client on the Final Report.

Duplicate Button

This button can be used to duplicate an existing QA event so that a modified version can be added to the system. It is particularly useful when adding the same test-specific QA event for multiple tests and methods.

10.2 LABORATORY SECTION

The purpose of the Laboratory Section screen is to define service groups within the laboratory that perform related testing or other work. The purpose of defining laboratory sections using this screen is three-fold.

- To assign appropriate OpenELIS permissions to employees.
- To link a test with a particular laboratory section(s) for assignment of analyses to the section staff's workload.
- To link e-mail notifications for certain testing thresholds (e.g., MCL violations, turnaround time warnings and maximums) to designated employees of that laboratory section.

The Laboratory Section screen may be accessed through the link in the [top section of the Maintenance Menu](#).

The screenshot shows the 'Laboratory Section' window. On the left is a list of sections with a search bar and a 'Name' column. The right side is a form for editing a section. The form has the following fields:

- Name: sample_prep-ik
- Description: Sample Preparation Lakeside
- External:
- Organization: SHL LAKESIDE
- Parent Section: (dropdown menu)

Below the form is a table with the following data:

Type	Value
MCL Violation Email	bart-simpson@uiowa.edu
Turnaround Max Email	bart-simpson@uiowa.edu
Turnaround Warn Email	bart-simpson@uiowa.edu
Turnaround Max Email	moe-szyslak@uiowa.edu
Turnaround Warn Email	moe-szyslak@uiowa.edu

At the bottom of the form are 'Add Row' and 'Remove Row' buttons. The status bar at the bottom left says 'Updating...Complete'.

Figure 527 Laboratory Section Screen

10.2.1 FIELDS

The fields of the Laboratory Section screen are described below.

Name

This field contains an abbreviated section name. The laboratory section name is used to assign an analysis and is displayed on the Sample Tracking, Complete and Release, To-Do List, Quick Entry, and full sample login screens and many reports.

Description

This field contains the complete section name.

External

This field is a checkbox indicating if this section is external to the laboratory. External sections can be used to designate reference laboratories that your laboratory sends test requests that it does not perform.

Organization

This autocomplete dropdown field contains the name of the organization which encompasses this laboratory section (e.g., SHL LAKESIDE, SHL ANKENY, CENTERS FOR DISEASE CONTROL). These organizations must be defined in the [ORGANIZATION](#) screen.

Parent Section

This autocomplete dropdown field can be used to link a subsection of the laboratory to its parent section.

Type and Value

These fields specify the type of laboratory section parameter and their associated values. The three parameter types currently in OpenELIS are all system-generated e-mail notifications: MCL Violation Email, Turnaround Warn(ing) Email, and Turnaround Max(imum) Email. The values for each of these three types consist of the e-mail addresses of employees belonging to that lab section who will receive these email notifications.

10.3 LABEL

The Label screen is used to define formats for additional analysis labels.

The Label screen may be accessed through the link in the fourth section of the Maintenance Menu.

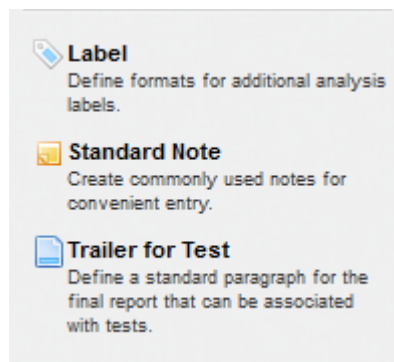


Figure 528 Maintenance Menu – Fourth Section

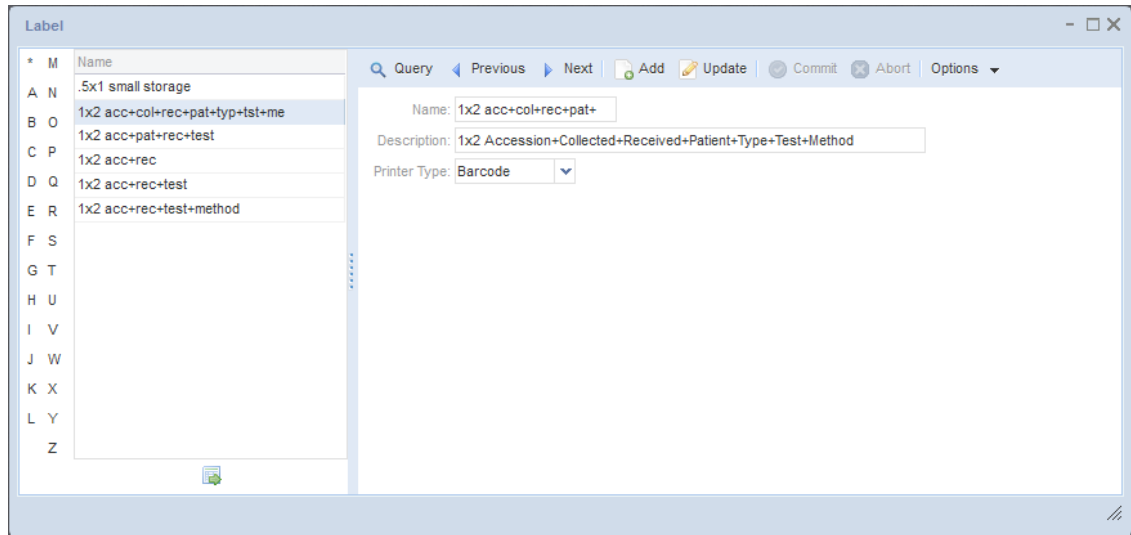


Figure 529 Label Screen

10.3.1 FIELDS

The fields of the Label screen are described below.

Name

This field contains an abbreviated label format name. The name is used to assign a label type (format) to the [Additional Label](#) specification of a test's definition.

Description

This field contains a detailed description of the label format.

Printer Type

The type of printer (e.g., Barcode) used for printing this label format is specified in this field.

10.4 STANDARD NOTE

The Standard Note screen is used to create commonly used notes for convenient entry. Standard notes can be thought of as prewritten notes that are used in standard situations. Standard notes can be applied at the sample or analysis level, and

externally or internally, as the situation dictates. See [ANALYSIS NOTES TAB](#) and [NOTE EDITOR](#) for more information on how to search, insert, and edit standard notes.

The link to the Standard Note screen is located in the [fourth section of the Maintenance Menu](#).

M	Name
A N	<3 ml-afb
B O	<3 ml-legionella
C P	>1 legionella spp
D Q	acceptance criteria
E R	anaerobic cult
F S	analyzed >ht
G T	avoid weekends
H U	b4
I V	bacillus morphology
J W	bal
K X	bat exposure only
L Y	called clinic
Z	called clinic w/#
	clinical significance

Figure 530 Standard Note Screen

10.4.1 FIELDS

The fields of the Standard Note screen are described below.

Name

This field contains an abbreviated name of the standard note.

Description

The Description field offers a longer explanation for the use of the standard note. The *name : description* of standard notes are displayed in the [NOTE EDITOR](#) screen so that standard notes can be previewed and selected.

Type

These are the pre-defined categories for standard notes. They are displayed as nodes in the [NOTE EDITOR](#) screen so that standard notes can be easily previewed. The standard note's type becomes the default subject line for internal notes.

Text

This field contains the exact text of the standard note. This text is printed on the Final Report if this standard note is added as an external note. It can still be tailored to meet the individual situation, after it has been selected in the [NOTE EDITOR](#) screen.

10.5 TRAILER FOR TEST

The Trailer for Test screen allows you to define a block of standard information for the Final Report that is associated with one or more tests. A test trailer is often an explanation of how the test was conducted, how the results should be interpreted, or it may contain an accreditation laboratory ID. A test can have only one test trailer, and the trailer cannot be altered based on individual test results.

The link to the Trailer for Test screen is located in the [fourth section of the Maintenance Menu](#).

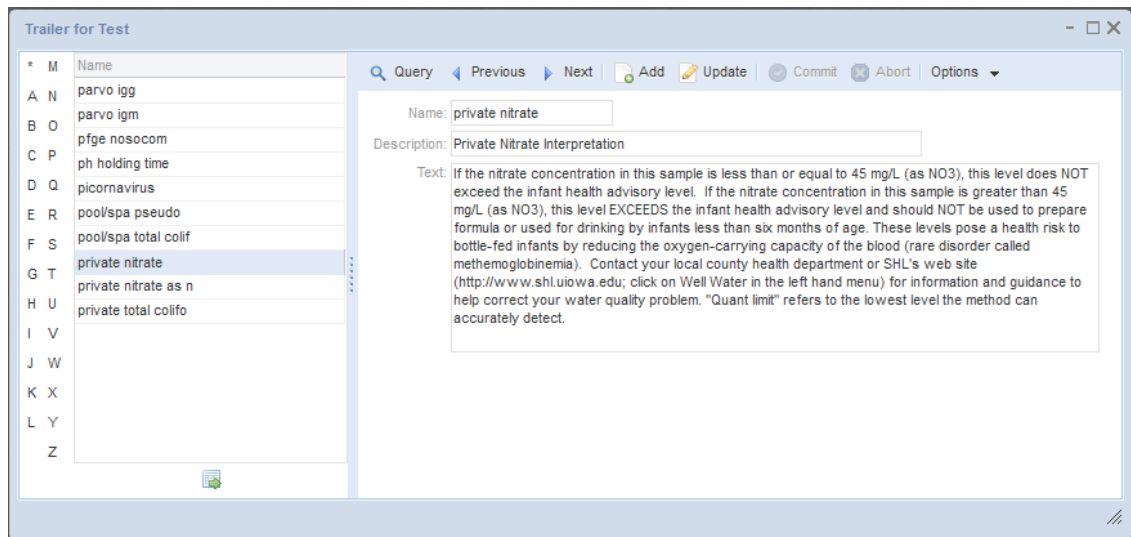


Figure 531 Trailer for Test

10.5.1 FIELDS

The fields of the Trailer for Test screen are described below.

Name

This field contains an abbreviated name of the test trailer. The name is used to assign the test trailer to a test definition.

Description

The Description field offers a longer explanation for the use of the test trailer.

Text

The text of the test trailer is italicized in the Final Report and it is displayed in the Note section below the associated analysis results.

Analyte	Result	Result (ppm)	% Desorption Efficiency	Quant Limit
n-Butyl alcohol	2860		90	360

Note: Calculation of concentration is based upon sampling information provided to the laboratory by the client. AIHA-LAP, LLC accreditation Laboratory ID 102530. Sample results are not blank corrected.

Figure 532 Test Trailer Displayed in a Final Report

10.6 STORAGE UNIT AND STORAGE LOCATION

The Storage Location screen is used in conjunction with the Storage Unit screen to create storage places in the laboratory for inventory items, sample items (containers), and products of analyses. Inventory items are then managed in these storage locations through the [INVENTORY/ORDER](#) screens, while the storage of sample items and analyses products are managed through the [STORAGE](#), Sample Tracking, Complete and Release, and full sample login screens.

The fifth section of the Maintenance Menu contains the links to the Storage Unit and Storage Location screens.

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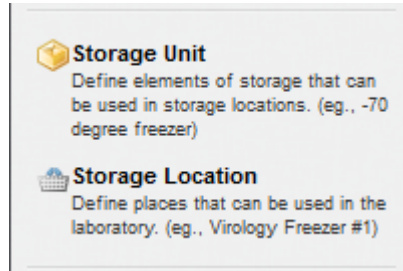


Figure 533 Maintenance Menu – Fifth Section

10.6.1 STORAGE UNIT

The Storage Unit Screen is used to define elements of storage that can be utilized in storage locations. Storage units can include carts, refrigerators, freezers, rooms, tables, temporary, etc.

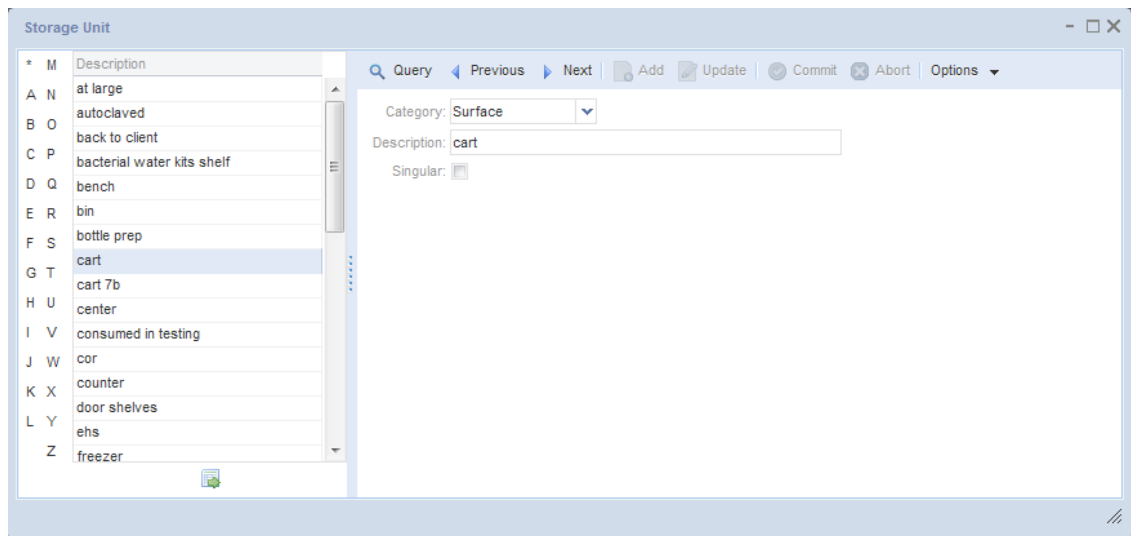


Figure 534 Storage Unit Screen

An explanation of the use of each field is found below.

Category

This field categorizes the storage unit (i.e., room, fridge, surface, etc.)

Description

The Description field provides a brief characterization of the storage unit (i.e., cart, fridge, bench, counter, room, table, pallet, landfill, temporary, etc.)

Singular

This checkbox denotes whether the storage unit is a solitary item.

10.6.2 STORAGE LOCATION

The Storage Location screen defines actual places that can be used in the laboratory for storage. Storage locations may hold sample items, analysis products, and/or general inventory items such as reagents, standards, and kits.

The screenshot shows the 'Storage Location' window. On the left is a list of storage locations with columns for Name and a letter indicator. The selected location is '218'. The right pane shows the details for this location:

- Name: 218
- Location: Manufacturing Store IC
- Storage Unit: room
- Available:

Below these fields is a table with the following columns: Storage Sub Unit, Location, and Available.

Storage Sub Unit	Location	Available
cart	#1	<input checked="" type="checkbox"/>
cart	#2	<input checked="" type="checkbox"/>
cart	#3	<input checked="" type="checkbox"/>
cart	#4	<input checked="" type="checkbox"/>
cart	#5	<input checked="" type="checkbox"/>
cart	#6	<input checked="" type="checkbox"/>
cart	#7	<input checked="" type="checkbox"/>
cart	#8	<input checked="" type="checkbox"/>
cart	#9	<input checked="" type="checkbox"/>
cart	#10	<input checked="" type="checkbox"/>
temporary	items transfer	<input checked="" type="checkbox"/>
bacterial water kits shelf	#32 bacterial kit	<input checked="" type="checkbox"/>
counter	West wall	<input checked="" type="checkbox"/>

At the bottom of the detailed view are 'Add Row' and 'Remove Row' buttons. The status bar at the bottom left says 'Updating...Complete'.

Figure 535 Storage Location Screen

An explanation of the use of each field is found below.

Name

This is an abbreviated name for the storage location and is usually a room number and/or name.

Location

This field provides a more detailed description of the storage location in the laboratory.

Storage Unit

This field defines the type of storage of this storage location. Examples include bench, cart, fridge, room, shelf, etc. This field is defined by using the [STORAGE UNIT](#) screen.

Available

This checkbox denotes whether the storage location is available for use.

Storage Sub Unit

This autocomplete dropdown field contains a description of the storage sub unit. The list of possible storage sub units is the same as the list of storage units. This field is defined by using the [STORAGE UNIT](#) screen.

Location

The Location field specifies the location (or a further descriptor) of the storage sub unit. The *storage sub unit, location* pair is used in the various storage tabs/screens to give a more complete description of the storage sub-location. Examples include cart #3, pallet #5, shelf top, etc.

Available

This checkbox denotes whether the storage sub unit is currently available to be used.

10.7 INSTRUMENT

The Instrument screen is utilized to define instruments that can be used in the laboratory. It can also associate instruments with analytical runs that utilize electronic worksheets.

The sixth section of the Maintenance Menu contains the link to the Instrument module.

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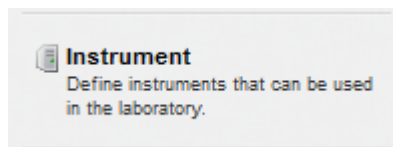


Figure 536 Maintenance Menu – Sixth Section

Type	Worksheet	Begin Date	End Date	Note
Run Pending	114451	2017-12-18		
Run Completed	113906	2017-12-11	2017-12-14	
Run Completed	113668	2017-12-07	2017-12-11	
Run Completed	112468	2017-11-29	2017-11-29	
Run Completed	112199	2017-11-22	2017-11-22	
Run Completed	111616	2017-11-15	2017-11-20	
Run Completed	111547	2017-11-14	2017-11-14	
Run Completed	110801	2017-11-08	2017-11-10	

Figure 537 Instrument Screen

10.7.1 GENERAL FIELDS

The general fields of the Instrument screen are described below.

Name

This field contains an abbreviated name of the instrument. The instrument name is used to link an [electronic worksheet](#) to the instrument's log.

Description

This field can hold a detailed description of the instrument.

Model

This field can contain the instrument's model number.

Serial #

This required field contains the instrument's serial number as provided by the manufacturer.

(Instrument) Type

This dropdown field is used to categorize the instrument (i.e., Balance, Gas Chromatograph, Phased Contrast Microscope, pH Meter, etc.)

Location

This field contains the location of the instrument. The laboratory section that uses the instrument could also be specified in this field along with the room number (e.g., semivolatile-ic, 2160-Q or inorg_auto_ank, D136).

Active

This checkbox denotes whether the instrument is active or not in the OpenELIS system. If the Active checkbox is not checked, the instrument has been retired.

Begin Date

The date that the instrument was available for use in the system can be entered in this field.

End Date

The date that the instrument was retired (or is estimated to be retired) can be entered in this field.

Query Sidebar

The Query Sidebar displays the Name and Serial # of the instruments that match the query.

10.7.2 LOG TAB

An [electronic worksheet](#) that is linked to an instrument will have its run information recorded as an entry in the Log tab of the Instrument screen.

The fields of the Log tab are described below.

(Instrument Log) Type

This dropdown field is used to categorize the log entry (i.e., Instrument Check, Maintenance, Offline, Run Completed, Run Pending, Service Call).

A “Run Pending” log entry is added to the Log tab when an electronic worksheet in “Working” status is linked to the instrument. The Instrument Log Type for this entry is then changed by the system to “Run Completed” when the worksheet’s status is changed to “Done” or “Failed Run”. A worksheet with a status of “Void” will have its entry removed from the instrument’s Log tab.

An entry with a Type of “Instrument Check”, “Maintenance”, “Offline”, or “Service Call” can be added to the Log tab to record these types of events. In these cases, the Worksheet field can be left empty and the Begin Date and End Date can be used to record the period of time that the instrument could not be used.

The log entries can be filtered by their Instrument Log Type.

Type	Worksheet	Begin Date	End Date	Note
Maintenance		2014-07-28		
Service Call		2012-03-27	2012-03-27	New Column lot #2010A

Figure 538 Filtering Log Entries by Instrument Log Type

Worksheet

The Worksheet # of the analytical run is recorded by the LIMS in this field. The log entries can be sorted in ascending or descending order by this value.

Begin Date

The Created Date of the worksheet is used as the beginning date of the run by default. It can be overridden to capture the actual beginning date. The log entries can be sorted in ascending or descending order by this value.

End Date

The date that the status of the worksheet is changed to “Done” or “Failed Run” is captured in this field by the system. It can be overridden to reflect the actual ending date, if necessary. The log entries can be sorted in ascending or descending order by this value.

Note

This field can be used to enter a note about the run, such as the reason that the instrument was offline or a description of the maintenance that was being performed on the instrument. The user can enter the note directly into the field or click on the **Show Note** button to pop up a Note Editor window to use to enter the note.

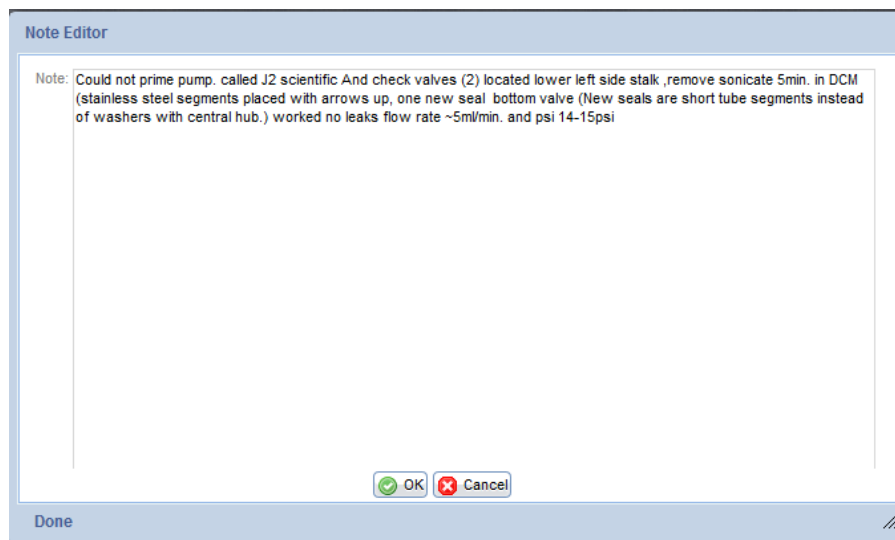


Figure 539 Instrument Note Added through the Note Editor

10.7.3 ATTACHMENT TAB

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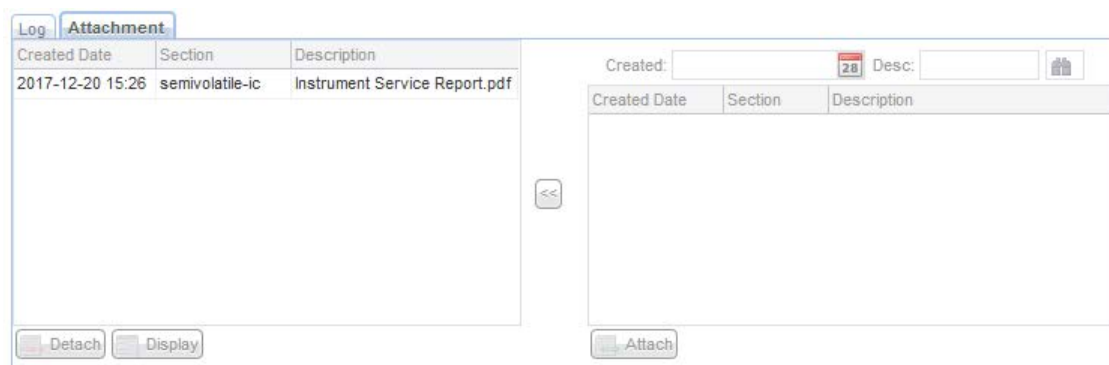


Figure 540 Attachment Tab

The Attachment tab is used to link a file to an instrument record. Instrument attachments can include vendor contacts, maintenance agreement information, or service reports, etc. Files should be uploaded once to OpenELIS; however, they can be linked to multiple instruments. Most of the standard file types can be linked and viewed from this tab (i.e., .pdf, .docx, .doc, .xlsx, .xls, .png, .txt, etc.) Attachments can be restricted so that they can only be viewed by specific groups of people (i.e., molecular lab section, analytical services lab section, or all internal laboratory staff (section = internal). These groups will first need to be defined through the [LABORATORY SECTION](#) screen.

The steps for [adding an attachment](#) are described in the Full Sample Login section.

10.8 SYSTEM VARIABLE

The System Variable screen is used by OpenELIS administrators to define system properties.

The seventh section of the Maintenance Menu contains the link to the System Variable screen.

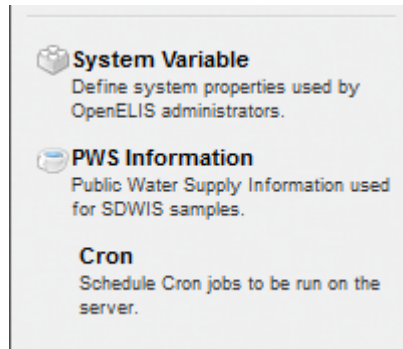


Figure 541 Maintenance Menu – Seventh Section

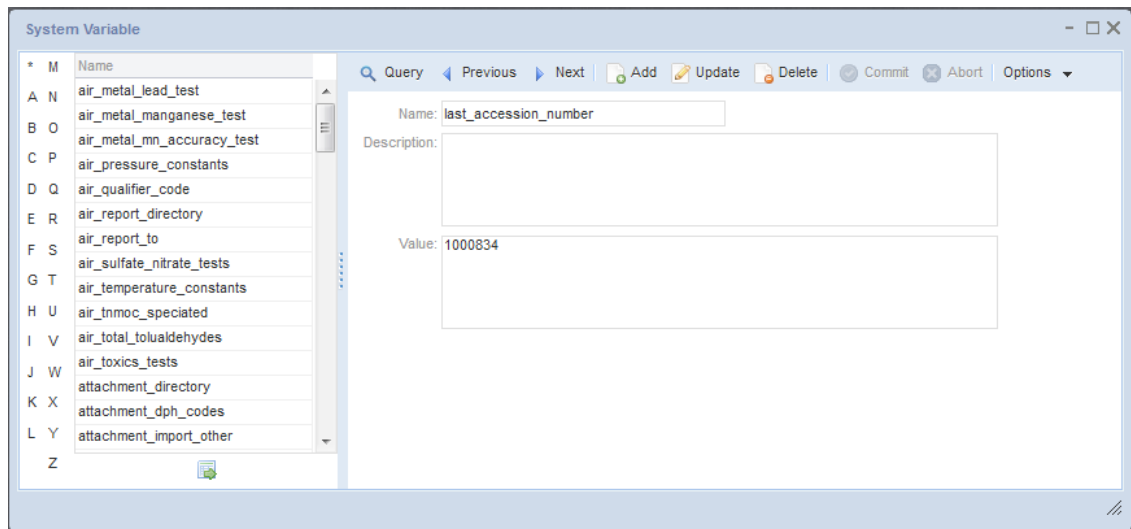


Figure 542 System Variable Screen

10.8.1 FIELDS

The fields of the System Variable screen are described below.

Name

This field contains the name of the system variable. System variable names use underscores to separate individual words and are lowercase.

Description

This optional field can be used to describe the contents of the Value field, or the use of the system variable, if necessary.

Value

This field contains the value of the system variable. Values can consist of numbers, words, ids, dates and times, file directories, etc. For example, the system variable named “do_not_reply_email_address” could have a value of “do-not-reply@shl.uiowa.edu”. The system variable named “last_billing_report_run” has a value consisting of the date and time that the system last ran the billing report.

10.9 PWS INFORMATION

The PWS Information screen is used to view public water supply information pertaining to SDWIS samples.

The link to this screen is located in the [seventh section of the Maintenance Menu](#).

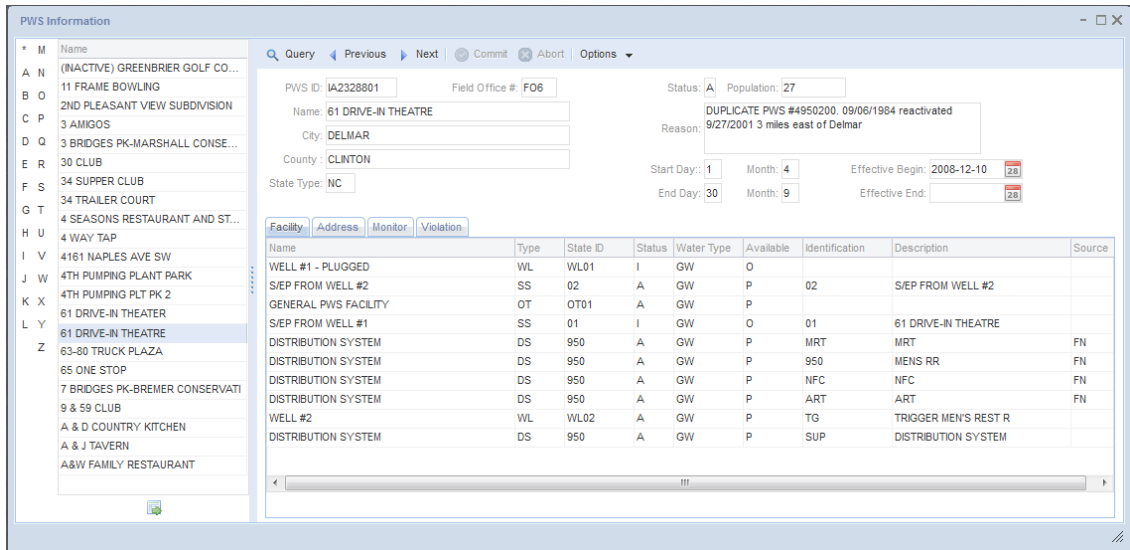


Figure 543 PWS Information Screen

10.9.1 GENERAL FIELDS

The upper pane of the PWS Information screen contains general information describing the public water supply. The fields are defined as follows.

PWS ID

The PWS (Public Water Supply) ID is a unique identifier assigned by the state to all public water supplies. The PWS ID begins with a two letter state abbreviation followed by a unique seven digit number (e.g., IA0533884).

Field Office #

This is the number of the Iowa Department of Natural Resources field office which has jurisdiction over this public water supply (e.g., FO4).

Name

The name of the PWS is displayed in this field.

City

The nearest city to the public water supply is shown here.

County

The county in which the PWS is located is specified in this field.

State Type

This field specifies the type of public water supply as classified by the state in which it is located. State Types can include C to denote a community water system, NC for a non-community water system, and NTNC for a non-transient non-community water system.

Status

The status of the PWS is specified in this field. Codes consist of A for active, I for inactive, and P for pending.

Population

This field contains the number of people who are served by this PWS (i.e., population of the municipality, seating capacity of the restaurant, number of residents of the housing development, etc.)

Reason

This field provides a place to explain such circumstances as: the PWS has merged with another PWS, the PWS has discontinued operation, or to correct or add additional demographic information.

Start Day and Month

These fields display the beginning day and month during a year in which PWS service is provided.

End Day and Month

These fields display the ending day and month during a year in which PWS service is provided.

Effective Begin

This field shows the effective date that the PWS began providing service.

Effective End

This field shows the effective date that the PWS quit providing service.

10.9.2 FACILITY TAB

Facility									
Name	Type	State ID	Status	Water Type	Available	Identification	Description	Source	
WELL # 1 ()	WL	WL01	I	GW	O				
GENERAL PWS FACILITY	OT	OT01	I						
S/EP FROM WELL #1	SS	01	I						
DISTRIBUTION SYSTEM	DS	950	I			MRT	MRT	FN	
DISTRIBUTION SYSTEM	DS	950	I			ART	ART	FN	
DISTRIBUTION SYSTEM	DS	950	I			NFC	NFC	FN	

Figure 544 Facility Tab

A facility is a component of a public water supply system (e.g., distribution system, well, water treatment plant). These facilities have various characteristics that are described on this tab. The fields on this tab are defined below.

Name

This field displays the name of the facility (i.e., Distribution System, Well #1 (1959), Treatment Plant, General PWS Facility, Breezeway Tap #1, etc.)

Type

This field denotes the facility type. Some examples include a code of DS for distribution system, TP for treatment plant, WL for well, and OT for other.

State ID

This identifier is assigned by the state to distinguish each facility. It is also known as the [Facility Id](#). For the state of Iowa, the State ID is a text field. All source entry points (S/EP) from 1 to 9 begin with a leading zero (e.g., 01). Most distribution systems have a State ID (Facility Id) of 950 or above.

Status

This field displays the status of the facility (e.g., A for active and I for inactive).

Water Type

This field denotes the type of water (e.g., GW for groundwater, SW for surface water, GU for groundwater under the direct influence of surface water).

Available

This field characterizes the availability of the facility (e.g., P for permanent, S for seasonal, and E for emergency).

Identification

This field normally matches the facility's State ID, except for some sampling in the distribution system. Possible values include: MRT (maximum residence time), ART (average residence time), and NFC (near first customer).

Description

This is a text field describing the sample location (e.g., 202 S 4TH, BATHROOM TAP, WATER PLANT, WELL #2, DISTRIBUTION SYSTEM, RAW, etc.)

Source

This is the source of the water sample (e.g., FN for finished water and RW for raw water).

10.9.3 ADDRESS TAB

Facility	Address	Monitor	Violation	Type	Active	Name	Addr1	Addr2	City	State	Zip Code	FIPS	Phone #
OP	A	PALO COMMUNITY CENTER	ATTN WATER SUPT	PO BOX 229	PALO	IA	52324-0229	19					
OW	A	PALO, CITY OF	ATTN TERRY SANDERS MAYOR	PO BOX 229	PALO	IA	52324-0229	19					
AC	A	PALO COMMUNITY CENTER	ATTN WATER SUPT	PO BOX 229	PALO	IA	52324-0229	19					

Figure 545 Address Tab

The Address tab provides name, address and other contact information for the public water supply. The fields are described below.

Type

This field denotes the type of contact that is specified in this row. Options include: OP for the operator of the PWS, OW for the owner of the PWS, and AC for the administrative contact for the PWS.

Active

The status of the PWS contact is specified in this field. Codes consist of A for active, I for inactive, and P for pending.

Name

The name of the owner, operator, or administrative contact for the PWS is provided in this field.

Addr1

This is the first line of the address. This field is often used to specify the name of the person to whose attention correspondence should be sent.

Addr2

This is the second line of the address and often contains the street address or post office box.

City, State, Zip Code

These fields contain the city, state, and zip code of the owner, operator, or administrative contact for the PWS.

FIPS

The Federal Information Processing Standard (FIPS) code is contained in this field for the state in which the PWS is located (e.g., 19 for the state of Iowa).

Phone #

The phone number of the owner, operator, or administrative contact for the PWS can be contained in this field.

10.9.4 MONITOR TAB

Facility	Address	Monitor	Violation	Type	Name	Series	# Sample	Begin Date	End Date	Frequency	Period
02	WELL 2, 3, 4_5 AFTER TREATMENT	ARSENIC		02	WELL 2, 3, 4_5 AFTER TREATMENT	ARSENIC	1	2016-01-01	2018-12-31	THREE YEARS	4TH QUARTER
950	DISTRIBUTION SYSTEM	Total Trihalomethanes (TTHM)		950	DISTRIBUTION SYSTEM	Total Trihalomethanes (TTHM)	2	2014-08-01	2014-08-31	YEARLY - RT	AUGUST
950	DISTRIBUTION SYSTEM	Halooacetic Acids (HAA5)		950	DISTRIBUTION SYSTEM	Halooacetic Acids (HAA5)	2	2014-08-01	2014-08-31	YEARLY - RT	AUGUST
950	DISTRIBUTION SYSTEM	Lead and Copper		950	DISTRIBUTION SYSTEM	Lead and Copper	20	2014-06-01	2014-09-30	THREE YEARS-PB	PBCU YEAR
02	WELL 2, 3, 4_5 AFTER TREATMENT	Radionuclides(RAD) - Gross Alpha		02	WELL 2, 3, 4_5 AFTER TREATMENT	Radionuclides(RAD) - Gross Alpha	1	2010-07-01	2019-06-30	NINE YEARS	2ND QUARTER
02	WELL 2, 3, 4_5 AFTER TREATMENT	Inorganic Chemicals (IOC) - Regulated		02	WELL 2, 3, 4_5 AFTER TREATMENT	Inorganic Chemicals (IOC) - Regulated	1	2007-01-01	2015-12-31	NINE YEARS	4TH QUARTER
02	WELL 2, 3, 4_5 AFTER TREATMENT	Nitrate		02	WELL 2, 3, 4_5 AFTER TREATMENT	Nitrate	1	2013-10-01	2014-09-30	YEARLY	3RD QUARTER
02	WELL 2, 3, 4_5 AFTER TREATMENT	SODIUM		02	WELL 2, 3, 4_5 AFTER TREATMENT	SODIUM	1	2016-01-01	2016-12-31	YEARLY	4TH QUARTER
02	WELL 2, 3, 4_5 AFTER TREATMENT	Radionuclides(RAD) - Combined Radium		02	WELL 2, 3, 4_5 AFTER TREATMENT	Radionuclides(RAD) - Combined Radium	1	2012-07-01	2021-06-30	NINE YEARS	2ND QUARTER
02	WELL 2, 3, 4_5 AFTER TREATMENT	Volatle Organic Chemicals (VOC) - Regulated		02	WELL 2, 3, 4_5 AFTER TREATMENT	Volatle Organic Chemicals (VOC) - Regulated	1	2012-07-01	2018-06-30	SIX YEARS	2ND QUARTER
02	WELL 2, 3, 4_5 AFTER TREATMENT	Synthetic Organic Chemicals (SOC) - Regulated		02	WELL 2, 3, 4_5 AFTER TREATMENT	Synthetic Organic Chemicals (SOC) - Regulated	1	2012-07-01	2018-06-30	SIX YEARS	2ND QUARTER
950	DISTRIBUTION SYSTEM	Coliform Bacteria		950	DISTRIBUTION SYSTEM	Coliform Bacteria	4	2014-09-01	2014-09-30	MONTHLY	PER MONTH

Figure 546 Monitor Tab

The Monitor tab provides monitoring requirements for distribution systems and a public water supply's other facilities such as wells, water treatment plants, etc. Monitoring requirements indicate the type of monitoring (analytical series), number of samples, the period between which those samples must be collected, and the frequency of monitoring. The fields are described below.

Type

This field contains the facility's [State ID](#).

Name

This field contains the [name of the facility](#).

Series

This field specifies the analytical series that is being monitored (i.e., Lead and Copper, Nitrate, Coliform Bacteria, Total Trihalomethanes, etc.)

Sample

This field specifies the number of samples that are required to be tested. For Coliform Bacteria and Lead and Copper monitoring this could be more than one sample.

Begin Date

Sampling should start on or after this date.

End Date

Sampling should end on or before this date. If a sampling cycle runs over several calendar quarters, then sampling is usually conducted in the last quarter. The last quarter of the sampling cycle is indicated in the [Period](#) field.

Frequency

The frequency, or spacing, between sampling.

Period

This is the time frame when the sample(s) should be taken. Generally, this is the last quarter of a given frequency cycle. For Lead and Copper, the sampling period would be from June 1 to September 30 (the PBCU Year).

10.9.5 VIOLATION TAB

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Facility	Address	Monitor	Violation	
Facility Id		Series	Violation Date	Sample ID
950		Coliform Bacteria	2015-06-01	
950		Coliform Bacteria	2015-07-01	
950		Coliform Bacteria	2015-08-01	
950		Coliform Bacteria	2015-09-01	

Figure 547 Violation Tab

The Violation tab automatically displays SDWIS violations for routine (RT) bacterial samples. A violation triggers a send-out order containing new containers for re-sampling to be created. The fields are described below.

Facility Id

This field contains the state assigned water system facility id ([State ID](#)) that encountered the SDWIS violation.

Series

This field specifies the analytical series that detected the SDWIS violation. Currently, violations are only being recorded for the Coliform Bacteria series.

Violation Date

This field displays the date of the SDWIS violation. The date is automatically set to the 1st day of the month of the violation.

Sample ID

This field displays the serialized id that is generated by the database for the sample. After a [send-out order](#) for re-sampling is created, the sample id is automatically cleared from this field.

10.10 CRON

“Cron” is the time-based job scheduler in Linux and Unix-based computer operating systems. Cron enables users to schedule jobs (commands or shell scripts) to run periodically at certain times or dates. It is commonly used to automate system

maintenance or administration. The OpenELIS Cron module is used by system administrators to schedule cron jobs to be run on the LIMS server.

The link to this screen is located in the [seventh section of the Maintenance Menu](#).

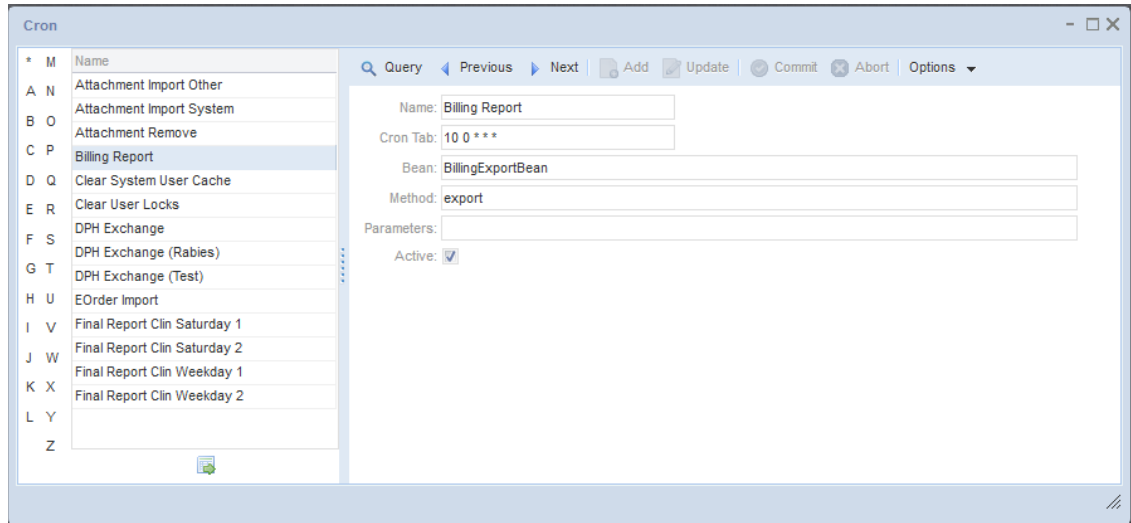


Figure 548 Cron Screen

10.10.1 FIELDS

The fields on the Cron screen are detailed below.

Name

This field contains the name of the cron job.

Cron Tab

The Cron Tab (cron table) field contains the time component for the cron job. The values are entered in this order: Minute Hour Day Month DayofWeek. The wildcard character (*) accepts any value. DayofWeek can have an integer value from 0 (Sunday) to 6 (Saturday). In the example above, the Billing Report will be run at 12:10 AM every day. A cron job with a Cron Tab entry of 30 8 * * 6 will be run at 8:30 AM every

Saturday. A cron job with a Cron Tab entry of `0 15 * * 1,2,3,4,5` will be run at 3:00 PM every weekday.

Bean

The Bean field contains the Java class that contains the method that this cron job is trying to call.

Method

This field contains the method that the cron job is trying to call.

Parameters

This field contains the parameters passed to the stated method.

Active

The Active checkbox displays whether this cron job is currently active in the system.

CHAPTER 11. REPORTS

The Report Menu of the OpenELIS LIMS allows users to set parameters that generate dynamic, predetermined reports.

11.1 VERIFICATION REPORT

The link to the Verification Report print screen is located in the Login section of the Report Menu.

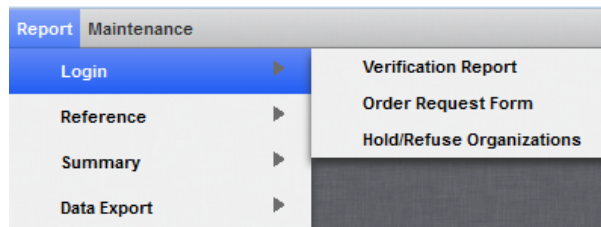


Figure 549 Login Section of the Report Menu

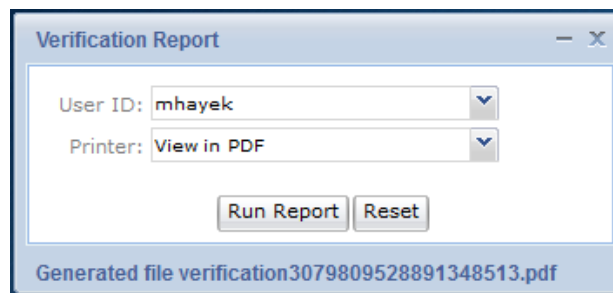


Figure 550 Verification Report Print Screen

All samples entered into OpenELIS are initially in “Not Verified” status. After the sample has been [fully logged in](#), data entry personnel run the Verification Report to compare the entered data with the data on the Test Request Form and correct any discrepancies. The Verification Report creates a list containing sample, sample item, and test/method information for this purpose. The User ID of the person who fully logged-in the samples is entered in this field to print her workload. If this field is left empty, the User ID defaults to the user who is currently logged-in to OpenELIS. The samples printed on the Verification Report are ordered by accession number.

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After the verification process has been completed, the LIMS needs to change the status of all of the samples to “Logged In”. This is accomplished through the Verify Sample Data Entry screen. For more information on sample entry paper verification see [PAPER VERIFICATION](#).

Accession Number: 14021		Revision:	Order#:	Collection Date/Time: 2012-02-24 09:00
Received Date/Time: 2012-02-24 14:29		Status: Not Verified	Client Reference:	
Description: Collector: hayek mike Collection Site: frank farms		Hazardous: N Phone: Priority: Project:		
Attention: Report To: A & B LABORATORIES Apt/Suite #: Address: 10100 E FREEWAY STE 100 City, State, Zip: HOUSTON, TX 77029- Phone: Fax:		Bill To: A & B LABORATORIES Apt/Suite #: Address: 10100 E FREEWAY STE 100 City, State, Zip: HOUSTON, TX 77029- Phone: Fax:		
<i>Notes:</i>				
Sample Item #0				
Sample Type: Solid		Source: Sediment		
Quantity:		Source Other:		
Container Reference:		Container: 22 - Gallon Plastic(unpreserved)		
		Unit: mg/L		
Mercury analysis of solid samples, Cold vapor				
Status: Logged In		Revision:	Reportable: Y	
Section: metals-ank		Unit: mg/kg [dry wt]		
<i>QA Events:</i>				
Mercury digestion of solid samples, Mercury digestion of solid samples				
Status: Cancelled		Revision:	Reportable: N	
Section: sample_prep-ank		Unit:		
<i>QA Events:</i>				

Figure 551 Verification Report

11.2 ORDER REQUEST FORM

The link to the Order Request Form print screen is located in the [Login section of the Report Menu](#).

Figure 552 Order Request Form Print Screen

The Order # needs to be entered into this screen along with the printer selection. The Order Request Form will contain all of the information that is pertinent to the order. See [Order Request Form](#) in the Send-out Order section for a detailed description of the Order Request Form.

11.3 HOLD/REFUSE ORGANIZATIONS REPORT

Occasionally, organizations are delinquent in paying their invoices to laboratories. When a laboratory's payment policy necessitates that samples be refused or held from an organization until their account is in good standing, the Hold/Refuse Sample parameter may be assigned to that organization. (See the Organization screen's [Parameter Tab](#) section for more information.) This parameter is then used to generate the Hold/Refuse Organizations Report. This report is designed to alert sample receiving and accessioning staff to hold or refuse samples from these organizations.

The link to the Hold/Refuse Organizations Report print screen is located in the [Login section of the Report Menu](#).

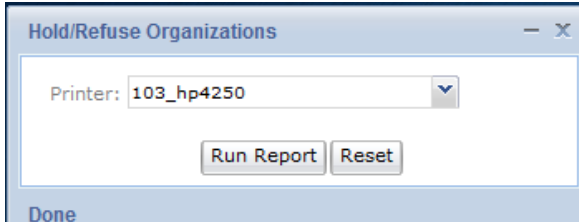


Figure 553 Hold/Refuse Organizations Report Print Screen

The Hold/Refuse Organizations Report contains the following fields:

Org. ID

This field specifies the [internal identifier for the organization](#).

Name, Address, City, State, Zip Code

These fields specify the name and address information of the [organization](#).

Refuse Info

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This field displays the effective date (yyyy-mm-dd) when samples from the organization are to be refused or held.

Dec 31, 2012
10:12:03

Organizations with Hold/Refuse Flag

1 of 1
mhayek

Org. ID	Name	Address	City	State	Zip Code	Refuse Info
2915	ABC TESTING INC	654 COMMERCIAL AVE	FORT WAYNE	IN	43871-	2012-06-01
2975	CITY OF NIXON WATERWORKS	735 RAILROAD LANE	NIXON	IA	59073	2012-10-01
2976	ELMER FUDD	7534 155TH AVE	SPIVEYS CORNER	IA	56734	2012-10-06
2974	FLINTSTONE DRILLING SERVICE	9007 JOE ROCKHEAD LN	BEDROCK	MT	78653	2012-04-09
2973	MARILYN MONROE	222 WHARF AVE	LEXINGTON GREEN	IA	54999	2012-09-15

Figure 554 Hold/Refuse Organizations Report

11.4 TEST REPORT

The Test Report screen prints a list of all active tests within the LIMS. Tests are grouped by laboratory sections.

The link to the Test Report print screen is located in the Reference section of the Report Menu.

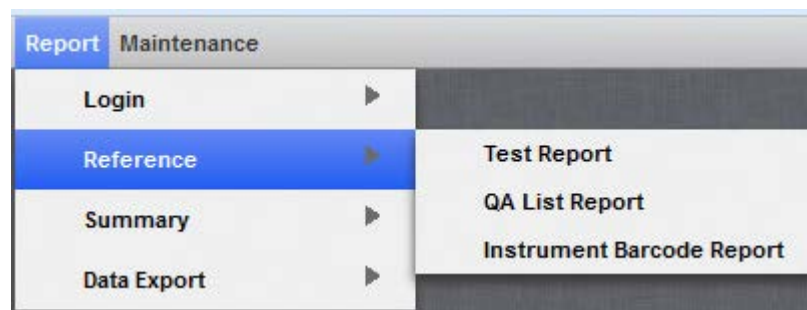


Figure 555 Reference Section of the Report Menu

11.4.1 PRINT SCREEN FIELDS

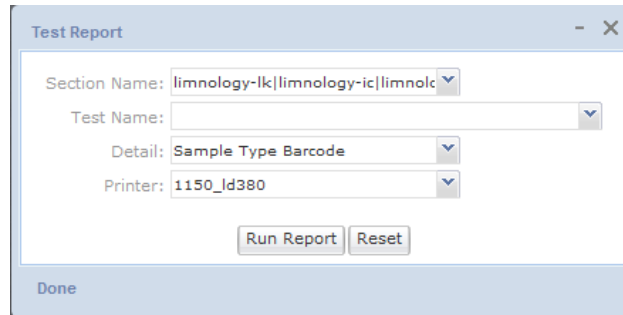


Figure 556 Test Report Print Screen

The fields on the Test Report print screen are defined below.

Section Name

This field can be used to narrow the report to tests performed by one or more laboratory sections. Multiple sections can be **Ctrl**-selected.

Test Name

This field can be used to narrow the report to one or more tests. Multiple tests can be **Ctrl**-selected.

Detail

The Test Report can be generated in three formats using the Detail dropdown list: Name List, Sample Type Barcode, and Full Detail. Each of these formats is described in the following sections.

Printer

This field is used for the selection of the network printer to print a hard copy, to view the report in pdf format on the computer monitor (View in PDF), to fax it (fax), or to e-mail it to the user as a pdf file (pdf).

11.4.2 NAME LIST

This is a brief characterization of each test/panel by Section, Test/Panel name, Method name, and the (test/panel) Description. Tests are listed alphabetically, followed by panels.

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Section	Test/Panel name	Method name	Description
limnology-ank	benthic	sm 10500	Benthic Macroinvertebrate Analysis by Standard Methods 10500
	conductivity-fm	iso 7888-1985	Field Specific Conductance by ISO 7888-1985
	dissolved oxygen-fm	astm d 888-05 c	Field Dissolved Oxygen by Luminescence
	dissolved oxygen-fm	datalogger-sonde	Field Dissolved Oxygen by Hydrolab
	dissolved oxygen-fm	sm 4500-o g	Field Dissolved Oxygen by Membrane Electrode Method
	fish id	sm 10600	Fish Analysis by Standard Method 1060
	flow-fm	flow-csi	Flow Rate for NPDES Compliance Sampling
	flow-fm	flow-stream	Stream Flow
	microscopy	microscopy	Microscopic Identification

Figure 557 Name List Test Report

11.4.3 SAMPLE TYPE BARCODE

This format includes all of the information that is present in the Name List format with the addition of barcodes for each defined sample type/unit of measure pair of a particular test/panel. Tests are listed alphabetically, followed by panels. This report format can be used during [QUICK ENTRY](#) to scan in a test/panel for a sample.










Section	Test/Panel name	Method name	Description
sample_prep-ic	leaching	epa 1311 tc1p	TCLP leaching
		Sample type	Unit of measure
		Other	
		Solid	
	microcystins	immunoassay	Immunoassay for microcystins
		Sample type	Unit of measure
		Drinking Water	ppb
		Non-Drinking Water	ppb
	pesticides	immunoassay	Immunoassay for pesticides
		Sample type	Unit of measure
		Drinking Water	ug/L
		Non-Drinking Water	ug/L

Figure 558 Sample Type Barcode Test Report

11.4.4 FULL DETAIL

This format gives the complete test details including Section, Test name, Method name, (test) Description, Sample type, Unit of measure, and individual analyte specifications. This format does not include sample type barcodes or panels.

Section	Test/Panel name	Method name	Description
metals-ank	arsenic speciation	uhl as spec	Arsenic speciation
		Sample type	Unit of measure
		Drinking Water	ug/L
		Non-Drinking Water	ug/L
		Analyte	Result # Report Type
		Arsenic (III)	1 N Optional
		Quant Limit	2 Y Required
		Arsenic (V)	1 N Optional
		Quant Limit	2 Y Required
		R # Unit of measure	Type Value Sig
		1	Numeric 0.100000
			Default <1.0
		2	Numeric 0.100000
			Default 1.0

Figure 559 Full Detail Test Report

11.5 QA LIST REPORT

The QA List Report contains the details of all quality assurance events that have been defined within the LIMS for quick reference.

The link to the QA List Report print screen is located in the [Reference section of the Report Menu](#).

11.5.1 PRINT SCREEN FIELDS

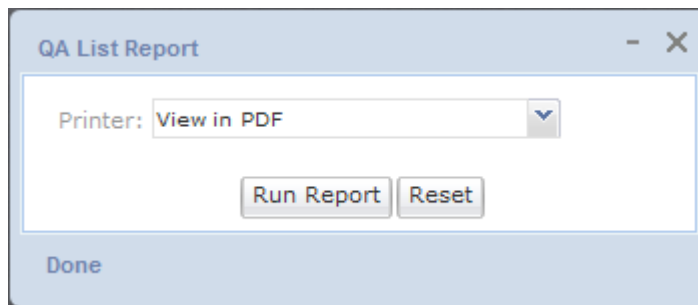


Figure 560 QA List Report Print Screen

The fields on the QA List Report print screen are defined below.

Printer

This field is used for the selection of the network printer to print a hard copy, to view the report in pdf or Excel format on the computer monitor (View in PDF, View in Excel), to fax it (fax), or to e-mail it to the user as a pdf file (pdf).

11.5.2 REPORT COLUMNS

Mar 07, 2017 16:40:34		QA Event List				Page 1 of 14 mhayek
Name	Description	Test	Method	Type	Billable	Text
cancel no charge	Test was canceled per client - client NOT charged			Result Override	No	Test was canceled per client's request.
cancel with charge	Test was canceled per client but will be charged			Result Override	Yes	There will be a charge for this testing because the request to cancel was made after testing was started and/or completed.
change test	Health care provider has requested a change of test			Result Override	No	Health care provider has requested a change of test.
client contamination	Client contamination			Warning	Yes	Information from sender indicates possible sample contamination.
client info updated	Client information has been updated			Warning	Yes	Client information has been updated.
container broken	Sample container was broken			Warning	Yes	Sample container was broken during transit.

Figure 561 QA List Report (PDF Version)

The details of all quality assurance events in OpenELIS are listed on this report. They must be defined first through the [QA Event](#) module.

The columns on the QA List Report are defined below.

Name

This is the abbreviated name of the QA event. The name is used to select the QA event and is then displayed on the QA Events tab of the Sample Tracking, Complete and Release, and full sample login screens.

Description

This column contains a detailed description of each QA event. The Description can be used to further explain the use of the QA event.

Test and Method

These columns specify the test and method to which this QA event is associated. These fields are empty for general QA events. General QA events are used by many sections of the laboratory; whereas, test-specific QA events can only be assigned to their designated test(s) and method(s). Test-specific QA events will only be displayed in the [QA EVENT SELECTION SCREEN](#) when their corresponding analysis is selected.

Type

This column specifies the default type (Internal, Result Override, or Warning) of the QA event. The [QA event type](#) can still be changed by the user at the time that the QA event is assigned.

Billable

This column shows the default billing behavior of each QA event. QA events that are marked as not billable will override the charging for an analysis (or all analyses on a sample if it is assigned at the sample level). For example, when the QA event “lab accident” is assigned to an analysis that is routinely billed, the QA event overrides the billing, and that analysis will not be charged. The [billable checkbox](#) can still be selected or unselected by the user at the time that the QA event is assigned.

Text

The Text field displays the explanation of the QA event as it will be displayed to the client on the Final Report.

11.6 INSTRUMENT BARCODE REPORT

Analysts often need to build a “sequence file” of what samples and QCs they need to run on their instrument. Instrument software utilizes a “sample id” for each sample or QC item. The Instrument Barcode Report generates a barcoded “sample id” that provides the link between the instrument software file and the OpenELIS worksheet.

The link to the Instrument Barcode Report print screen is located in the [Reference section of the Report Menu](#).

11.6.1 PRINT SCREEN FIELDS



Figure 562 Instrument Barcode Report Print Screen

The fields on the Instrument Barcode Report print screen are defined below.

Worksheet Id

This [id](#) uniquely identifies the worksheet and is automatically assigned by the LIMS.

Barcode Type

This field offers two versions of the report: Position # and Worksheet Lookup. The Position # version provides a barcode of each [position number](#) along with the information pertaining to that sample/QC. The Worksheet Lookup version provides a barcode of each [Worksheet Lookup entry](#) along with the related information for that sample/QC. The barcoded value is used as the “sample id” in the instrument software file.

Printer

This field is used for the selection of the network printer to print a hard copy, to view the report in pdf or csv format on the computer monitor (View in PDF, View in CSV), to fax it (fax), or to e-mail it to the user as a pdf file (pdf).

11.6.2 REPORT COLUMNS

Sep 17, 2015 16:42:20 Instrument Barcode Report for Worksheet #50812 1 of 7 mhayek

Created: 2015-09-16 08:47 Description: chl-gc cbss, tma Instrument:

Position	Worksheet Lookup	Accession #	QC Link	Test / QC	Method / QC Lot #	QC Type	QC Code	Units
1	chl-gc tma kit ct	50812.1		chl-gc tma kit ct	116621	Lab Control	lc	
2	chl-gc tma kit gc	50812.2		chl-gc tma kit gc	116625	Lab Control	lc	
3	293121	293121		chl-gc cbss	tma			
3	293124	293124		chl-gc cbss	tma			
3	293122	293122		chl-gc cbss	tma			
3	293123	293123		chl-gc cbss	tma			
4	293125	293125		chl-gc cbss	tma			
4	293128	293128		chl-gc cbss	tma			
4	293126	293126		chl-gc cbss	tma			
4	293127	293127		chl-gc cbss	tma			

Figure 563 Instrument Barcode Report – Position # Version

Sep 17, 2015 14:08:14 Instrument Barcode Report for Worksheet #50901 1 of 2 mhayek

Created: 2015-09-17 09:02 Description: metal_epa_245.2mercury ndw Instrument:

Position	Worksheet Lookup	Accession #	QC Link	Test / QC	Method / QC Lot #	QC Type	QC Code	Units
1	mercury blank	50901.1		mercury blank	MERCURY BLANK	Blank	blk	
2	mercury blank	50901.2		mercury blank	MERCURY BLANK	Blank	blk	
3	mercury ipc	50901.3		mercury ipc	CL6-92HGY-IPC	Lab Control Spike	ics	
4	mercury ipc	50901.4		mercury ipc	CL6-92HGY-IPC	Lab Control Spike	ics	
5	mercury ipc	50901.5		mercury ipc	CL6-92HGY-IPC	Lab Control Spike	ics	
6	mercury qcs	50901.6		mercury qcs	G2-HG02119	Lab Control Spike	ics	
7	mercury qcs	50901.7		mercury qcs	G2-HG02119	Lab Control Spike	ics	
8	mercury blank	50901.8		mercury blank	MERCURY BLANK	Blank	blk	
9	mercury blank	50901.9		mercury blank	MERCURY BLANK	Blank	blk	
10	mercury blank	50901.10		mercury blank	MERCURY BLANK	Blank	blk	
11	mercury dw spike	50901.11		mercury dw spike	CL6-92HGY-DW	Matrix Spike	ms	
12	mercury dw spike	50901.12		mercury dw spike	CL6-92HGY-DW	Matrix Spike	ms	
13	286335	286335		metal	epa 245.2mercury ndw			mg/L
14	288871	288871		metal	epa 245.2mercury ndw			mg/L
15	288871@dup	50901.15	288871 (14)	mercury dup	MERCURY-DUP	Duplicate	dup	
16	288871@ms	50901.16	288871 (14)	mercury dw spike	CL6-92HGY-DW	Matrix Spike	ms	
17	288871@msd	50901.17	288871 (14)	mercury water dup spike	CL6-92HGY-DSPIKE	Matrix Spike Duplicate	msd	

Figure 564 Instrument Barcode Report – Worksheet Lookup Version

The columns on the Instrument Barcode Report are defined below.

Position

The [position](#) of the sample/QC on the worksheet is displayed in this column. The position is barcoded on the [Position # version of the report](#).

Worksheet Lookup

This column is barcoded on the [Worksheet Lookup version of the report](#). It displays either the [sample accession number](#), [QC name](#), or a combination of two other fields. If the [QC Link](#) and [QC Code](#) fields are empty for that position, then the accession number is barcoded for a sample or the QC name is barcoded for a QC in the Worksheet Lookup field. If both the QC Link and QC Code values are present, then these two values are concatenated as QC_Link@QC_Code (i.e., 288871@dup, 292224@msd).

Accession #

The unique [accession number](#) of the sample or QC item to be tested is displayed in this column.

QC Link

The accession number and the position (in parentheses) of the [linked QC item or sample analysis](#) is displayed in this column.

Test/QC

The name of the [test](#) that has been assigned for a sample analysis or the name of the [QC](#) is displayed in this column.

Method/QC Lot #

The name of the [method](#) that has been assigned for a sample analysis or the [lot number](#) of the QC is displayed in this column.

QC Type

The [type of QC](#) is displayed in this column. Examples of QC types include blank, duplicate, lab control spike, initial calibration, continuing calibration, matrix spike, matrix spike duplicate, column efficiency, bacteria duplicate, information, and lab control.

QC Code

The code for the [QC Type](#) is displayed in this column. The QC Code is used during instrument interfacing to perform different types of calculations. QC types and their corresponding codes are defined through the [DICTIONARY](#) screen.

Unit

The [unit](#) of measure of the sample analysis for the pertinent sample type is displayed in this column.

11.7 SAMPLES IN-HOUSE REPORT

The Samples In-House Report provides details of analyses that are being processed or have been processed. Any of the fields on its print screen can be utilized to provide a custom sample listing.

The link to the Samples In-House Report print screen is found in the Summary section of the Report Menu.

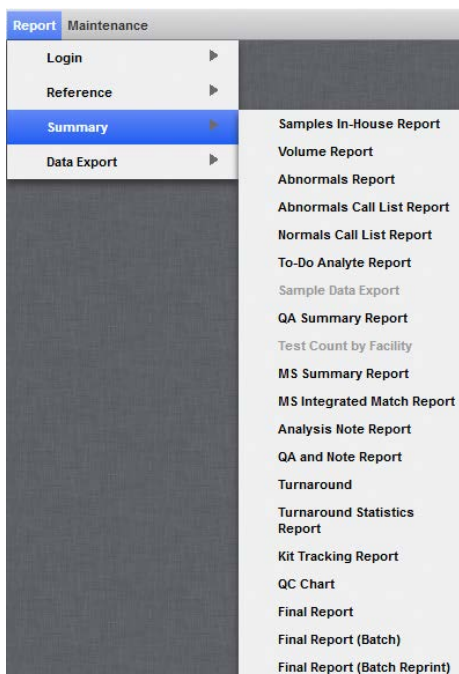


Figure 565 Summary Section of the Report Menu

11.7.1 PRINT SCREEN FIELDS

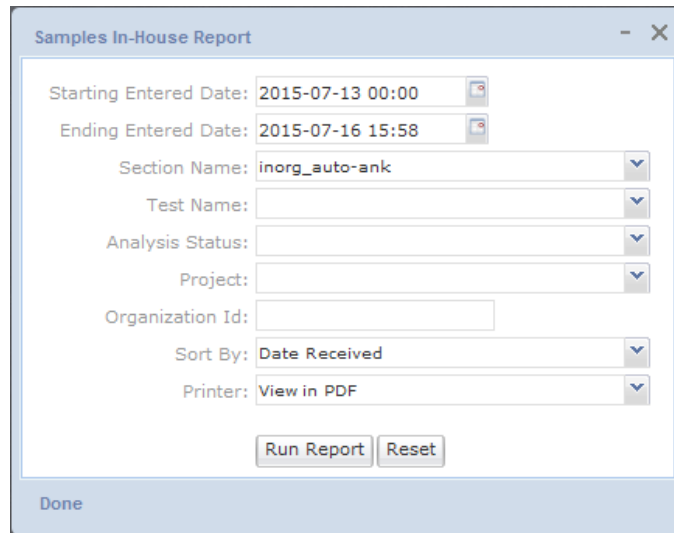


Figure 566 Samples In-House Report Print Screen

The fields on the Samples In-House Report print screen are defined below.

Starting Entered Date and Ending Entered Date

These fields are used together to specify a range of dates for the generation of the report. The Entered Date is the date and time that the sample was initially logged into OpenELIS (through either [Quick Entry](#) or [full sample login](#)).

Section Name

This field can be used to narrow the report to analyses performed by one or more laboratory sections. Multiple sections can be **Ctrl**-selected.

Test Name

This field can be used to narrow the report to analyses performed though one or more tests. Multiple tests can be **Ctrl**-selected.

Analysis Status

This field can be used to narrow the report to analyses with one or more statuses. Multiple [analysis statuses](#) can be **Ctrl**-selected.

Project

This field can be used to narrow the report to analyses on samples assigned to one or more [projects](#). Multiple projects can be **Ctrl**-selected.

Organization Id

This field can be used to narrow the report to analyses on samples assigned to a specific [organization id](#).

Sort By

This field determines the column on the report that will be used to determine the sorting order. The analyses can be sorted by Accession Number (the default), Collection Date, Date Received, Test & Method, and Analysis Status.

Printer

This field is used for the selection of the network printer to print a hard copy, to view the report in pdf format on the computer monitor (View in PDF), to fax it (fax), or to e-mail it to the user as a pdf file (pdf).

11.7.2 REPORT COLUMNS

Accession	Collected	Received	Sample Type	Test Method	Status	Due Date	Expires
75511	2012-12-28 11:01	2012-12-28 14:08	Drinking Water	nitrite, sm 4500 no2 b	Released	2012-12-30 14:08	2012-12-30 11:01
75512	2012-12-28 11:00	2012-12-28 14:08	Drinking Water	nitrite, sm 4500 no2 b	Released	2012-12-30 14:08	2012-12-30 11:00
75526	2012-12-28 13:45	2012-12-28 16:59	Non-Drinking	bod, sm 5210b 5 c	Initiated	2013-01-03 16:59	2012-12-30 13:45
75527	2012-12-28 15:30	2012-12-28 16:59	Non-Drinking	bod, sm 5210b 5 c	Initiated	2013-01-03 16:59	2012-12-30 15:30
75528	2012-12-28 14:30	2012-12-28 16:59	Non-Drinking	bod, sm 5210b 5 c	Initiated	2013-01-03 16:59	2012-12-30 14:30
75559	2012-12-31 10:00	2012-12-31 11:39	Non-Drinking	bod, sm 5210b 5 c	Logged In	2013-01-06 11:39	2013-01-02 10:00
75596	2012-12-31 12:40	2012-12-31 13:51	Non-Drinking	bod, sm 5210b 5 day	Logged In	2013-01-06 13:51	2013-01-02 12:40

Figure 567 Samples In-House Report

The columns on the Samples In-House Report are defined below.

Accession #

The sample accession number of the analysis is displayed in this column.

Collected

This column displays the date and time that the sample was collected.

Received

This column displays the date and time that the sample was received at the laboratory.

Sample Type

This column displays the sample type of the sample.

Test, Method

This column displays the internal [test](#) and [method](#) names of the analysis.

(Analysis) Status

This column displays the [status of the analysis](#).

Due Date

This column displays the date and time that the analysis is due to be [released](#).

The Due Date is calculated using the [Priority](#) of the sample.

$$\text{Due Date} = \text{Receied DateTime} + \text{Prrity}$$

The [Turnaround Average days](#) in the test definition is used for this calculation if a Priority value is not present in the system.

Expires (Date and Time)

The expiration date and time for an analysis is calculated from the [Holding hours](#) value in its test definition.

$$\text{Expires (Date and Time)} = \text{Collecte DateTime} + \text{Holdng hours}$$

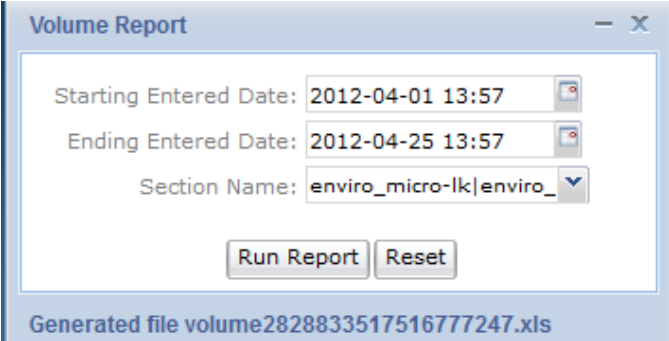
The Expires (Date and Time) cannot be calculated (and is left blank) if the Collected DateTime is not present in the system.

11.8 VOLUME REPORT

The Volume Report provides a count of analyses by test/method and by laboratory section.

The link to the Volume Report print screen is found in the [Summary section of the Report Menu](#).

11.8.1 PRINT SCREEN FIELDS



The screenshot shows a window titled "Volume Report" with a close button (X) in the top right corner. Inside the window, there are three input fields: "Starting Entered Date:" with the value "2012-04-01 13:57", "Ending Entered Date:" with the value "2012-04-25 13:57", and "Section Name:" with a dropdown menu showing "enviro_micro-lk|enviro_". Below these fields are two buttons: "Run Report" and "Reset". At the bottom of the window, a status bar displays the text "Generated file volume2828833517516777247.xls".

Figure 568 Volume Report Print Screen

The fields on the Volume Report print screen are defined below.

Starting Entered Date and Ending Entered Date

These fields are used together to specify a range of dates for the generation of the report. The Entered Date is the date and time that the sample was initially logged into OpenELIS (through either [Quick Entry](#) or [full sample login](#)).

Section Name

This field can be used to narrow the report to analyses performed by one or more laboratory sections. Multiple sections can be **Ctrl**-selected.

11.8.2 REPORT COLUMNS

volume2828833517516777247 [Read-Only] [Compatibility Mode]											
	A	B	C	D	E	F	G	H	I	J	K
1	Section	Test	Method name	Logged In	Initiated	On Hold	Completed	Released	Other	TestTotal	Section Total
2	enviro micro-ank	MPN Total Coliform & E.	colilert mpn well				2	6	0	8	349
3	enviro micro-ank	P/A Total Coliform &	colilert pa					16	0	16	349
4	enviro micro-ank	Total Coliform & E.coli	colilert mpn sdwa am						1	1	349
5	enviro micro-ank	Total Coliform & E.coli	colilert pa sdwa am					1	0	1	349
6	enviro micro-ank	Total Coliform & E.coli	colilert pa sdwa pm				4	168	0	172	349
7	enviro micro-ank	HPC, all other water	blue pour plate					6	0	6	349
8	enviro micro-ank	E.coli MPN (Colilert)	colilert mpn				4	123	2	129	349
9	enviro micro-ank	Fecal Coliform by	mf fecal					8	1	9	349
10	enviro micro-ank	MPN Total Coliform & E.	colilert mpn other				2		5	7	349
11	enviro micro-ic	MPN Total Coliform & E.	colilert mpn well		7			120	0	127	2302
12	enviro micro-ic	P/A Total Coliform &	colilert pa	1	21			299	0	321	2302
13	enviro micro-ic	Nitrate for Private Drinking	epa 353.2	1	33			357	3	394	2302
14	enviro micro-ic	Total Coliform & E.coli	colilert mpn sdwa am					5	0	5	2302
15	enviro micro-ic	Total Coliform & E.coli	colilert mpn sdwa pm					10	0	10	2302
16	enviro micro-ic	Total Coliform & E.coli	colilert pa sdwa am		18			350	0	368	2302

Figure 569 Volume Report

The Volume Report utilizes a spreadsheet format. Each row represents an individual test/method performed by a section. The columns on the Volume Report are defined below.

Section

The laboratory section that is assigned to perform the analyses is displayed in this column.

Test

The Description of the test is displayed in this column.

Method name

The name of the method is displayed in this column.

Logged In

The number of analyses for that test/method that are in Logged In status is displayed in this column.

Initiated

The number of analyses for that test/method that are in Initiated status is displayed in this column.

On Hold

The number of analyses for that test/method that are in On Hold status is displayed in this column.

Completed

The number of analyses for that test/method that are in Completed status is displayed in this column.

Released

The number of analyses for that test/method that are in Released status is displayed in this column.

Other

The number of analyses for that test/method that are in Requeue, In Prep, Cancelled, Error Logged In, Error Initiated, Error Completed, or Error In Prep status is displayed in this column.

Test Total

The total number of analyses for that test/method is displayed in this column.

Section Total

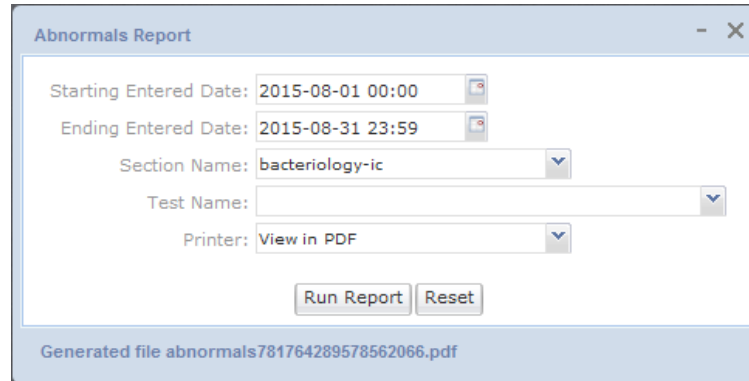
The total number of analyses for that section is displayed in this column.

11.9 ABNORMALS REPORT

The Abnormals Report provides a listing of test results that are considered abnormal. Abnormal results have the [“Abnormal” flag](#) set for them in the test definition. The number of abnormal results along with the total number of analyses performed are displayed by organization, city, and for the entire report period.

The link to the Abnormals Report print screen is found in the [Summary section of the Report Menu](#).

11.9.1 PRINT SCREEN FIELDS



The screenshot shows a web-based form titled "Abnormals Report". It includes the following fields and controls:

- Starting Entered Date: 2015-08-01 00:00
- Ending Entered Date: 2015-08-31 23:59
- Section Name: bacteriology-ic
- Test Name: (empty)
- Printer: View in PDF
- Buttons: Run Report, Reset
- Footer: Generated file abnormals781764289578562066.pdf

Figure 570 Abnormals Report Print Screen

The fields on the Abnormals Report print screen are defined below.

Starting Entered Date and Ending Entered Date

These fields are used together to specify a range of dates for the generation of the report. The Entered Date is the date and time that the sample was initially logged into OpenELIS (through either [Quick Entry](#) or [full sample login](#)).

Section Name

This field can be used to narrow the report to analyses performed by one or more [laboratory sections](#). Multiple sections can be **Ctrl**-selected.

Test Name

This field can be used to narrow the report to analyses performed though one or more [tests](#). Multiple tests can be **Ctrl**-selected.

Printer

This field is used for the selection of the network printer to print a hard copy, to view the report in pdf format on the computer monitor (View in PDF), to fax it (fax), or to e-mail it to the user as a pdf file (pdf).

11.9.2 REPORT COLUMNS

DECEMBER, 2017

City	Organization Name	Test name	Method name	Abnormal	Total
SIOUX CENTER	SIOUX CENTER HEALTH	enteric sero	agght	1 Organism Identified : Escherichia coli	2
				1 Organism Identified : Salmonella subspecies I	
		organism pattern dph	pfge	1 Organism : Salmonella subspecies I	2
				1 Organism : Escherichia coli	
		<i>SIOUX CENTER Totals:</i>			1 Organism Identified : Escherichia coli
			1 Organism : Salmonella subspecies I		
			1 Organism : Escherichia coli		
			1 Organism Identified : Salmonella subspecies I		
SIOUX CITY	UNITYPOINT HEALTH ST LUKES	enteric sero	agght	1 Organism Identified : Escherichia coli	2
		o and p	fecac		1
		trichrome	bio stain		1
<i>SIOUX CITY Totals:</i>			1 Organism Identified : Escherichia coli	4	

Figure 571 Abnormals Report

The columns on the Abnormals Report are defined below.

City

The clinical organization's city is displayed in this column. Organizations must be defined using the [ORGANIZATION](#) module. The report is sorted alphabetically by this field.

Organization Name

The name of the clinical organization is displayed in this column.

Test name

The abbreviated name of the [test](#) is displayed in this column.

Method name

The abbreviated name of the [method](#) is displayed in this column.

Abnormal

This column provides the details of the abnormal results. Each unique abnormal result occupies its own row. The quantity of the result, the name of the analyte, and the name of the abnormal result are displayed. For example, "2 Organism Identified: Salmonella species" means that the "Salmonella species" abnormal result was assigned to the analyte "Organism Identified" on two different occasions for that organization's samples. If this field is empty, no abnormal results were assigned to this test for that organization's samples.

Total

The total number of times that this test was conducted for that organization is displayed in this column.

City Totals

The City Totals are highlighted in light gray and are located at the end of the last organization listed for that city. The abnormal results are added together for all of the organizations in that city and listed in the Abnormal column. The total number of analyses performed for the organizations in that city is listed in the Total column.

Report Totals

The Report Totals are highlighted in dark gray and are located at the end of the report. The abnormal results are added together for all of the organizations and listed in the Abnormal column. The total number of analyses performed for all of the organizations is listed in the Total column.

<i>Report Totals:</i>	1 Legionella pneumophila DNA : Detected	229
	2 Norovirus RNA : Detected	
	1 Rhinovirus : Detected	
	2 Norovirus GII : Detected	
	5 Bordetella pertussis : Detected	

Figure 572 Abnormals Report - Report Totals

11.10 ABNORMALS CALL LIST REPORT

The Abnormals Call List Report provides a listing of test results that are considered abnormal along with sample and analysis information and the submitting organization's name, id, address, phone number, and fax number. The abnormal results are grouped by submitting ("report to") organization so that the user can call appropriate personnel at the organization at one time for all of their samples with abnormal results. Abnormal results have the ["Abnormal" flag](#) set for them in the test definition. This report is currently coded for clinical samples only.

The link to the Abnormals Call List Report print screen is found in the [Summary section of the Report Menu](#).

11.10.1 PRINT SCREEN FIELDS

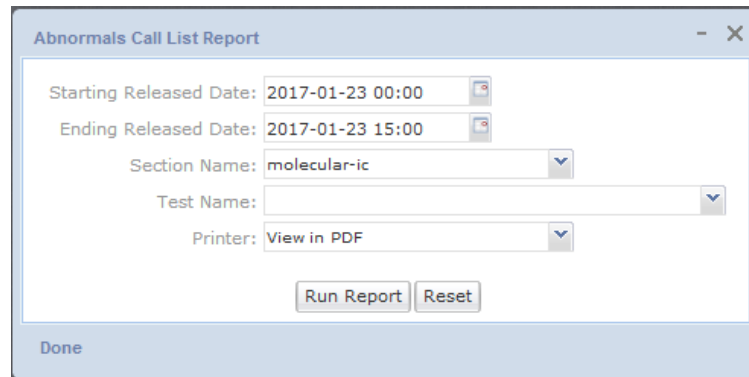


Figure 573 Abnormals Call List Report Print Screen

The fields on the Abnormals Call List Report print screen are defined below.

Starting Released Date and Ending Released Date

These fields are used together to specify a range of dates for the generation of the report. The [Released Date](#) is the date and time that the analysis was released. Analyses must be released in order to be queried.

Section Name

This field can be used to narrow the report to tests performed by one or more [laboratory sections](#). Multiple sections can be **Ctrl**-selected.

Test Name

This field can be used to narrow the report to analyses performed by one or more [tests](#). Multiple tests can be **Ctrl**-selected.

Printer

This field is used for the selection of the network printer to print a hard copy, to view the report in pdf format on the computer monitor (View in PDF), to fax it (fax), or to e-mail it to the user as a pdf file (pdf).

11.10.2 REPORT FORMAT

DECEMBER, 2017

Aug 22, 2017 16:02:26		Abnormals Call List Analyses released from 2017-08-22 00:00 to 2017-08-22 15:58				Page 1 of 1 mhayek	
ANYTOWN HOSPITAL(9055)		1000 MEDICAL ST ANYTOWN, IA, 52999		Phone: 319/555-1212 Fax: 319/555-1414			
18765	2017-08-21 08:45	8932476923	MOUSE, MICKEY	1980-02-25	Male	WELBY, MARCUS (328)	
	Influenza B	Nasopharyngeal swab	Analyte	Influenza B RNA	Result	Detected	
	Influenza B Subtype	Nasopharyngeal swab	Analyte	Influenza B Subtype RNA	Result	Yamagata	
18789	2017-08-22 07:30	490235ac726	SIMPSON, HOMER	1964-05-20	Male	WELBY, MARCUS (328)	
	Syphilis by VDRL (Serum)	Serum specimen	Analyte	Syphilis VDRL	Result	Reactive	
			Titer		1:16		

Figure 574 Abnormals Call List Report

The “report to” organization’s information is highlighted in black and precedes the information for the individual samples with abnormal results. Sample information is highlighted in dark gray, analysis information is highlighted in light gray, and the analytes and abnormal results are not highlighted. The fields on the Abnormals Call List Report are defined below.

“Report To” Organization Name, Id, and Address

The name, id, and complete address of the [“report to” organization](#) is listed at the beginning of the black section.

Phone

The Work # of the first [General contact](#) (if present) for the “report to” organization is displayed to the right of its address.

Fax

The first [Secure Fax Number](#) (if present) on the Parameter tab of the “report to” organization is displayed below its phone number.

Accession

The sample’s [accession number](#) is displayed at the beginning of the dark gray row.

Collected Date and Time

The date and time that the sample was [collected](#) (if present) is displayed to the right of the accession number.

Client Reference

The [client reference](#) (if present) is displayed to the right of the Collected Date and Time.

Patient's Last Name, First Name

The [patient's last name, first name](#) are displayed to the right of the Client Reference.

Patient's Birth Date

The [patient's birth date](#) is displayed to the right of the patient's last name, first name.

Patient's Gender

The [patient's gender](#) (if present) is displayed to the right of the patient's birth date.

Provider's Last Name, First Name, and Id

The [provider's last name, first name, and id](#) (if present) are displayed to the right of the patient's gender.

Test Description

The [description of the test](#) that was performed is displayed at the beginning of a light gray row.

Sample Type

The [sample type](#) is displayed to the right of the test description.

Analyte

The name(s) of the [analyte\(s\)](#) that had an abnormal result(s) is displayed to the right of the sample type. Both the [analysis](#) and [analyte](#) have to be marked reportable in order for an abnormal result to be displayed on this report.

Result

The [abnormal result](#) is displayed to the right of its analyte.

11.11 NORMALS CALL LIST REPORT

The Normals Call List Report provides a listing of test results that are considered normal along with sample and analysis information and the submitting organization's name, id, address, phone number, and fax number. The normal results are grouped by submitting ("report to") organization so that the user can call appropriate personnel at the organization at one time for all of their samples with normal results. Normal results do not have the ["Abnormal" flag](#) set for them in the test definition.

The link to the Normals Call List Report print screen is found in the [Summary section of the Report Menu](#).

11.11.1 PRINT SCREEN FIELDS

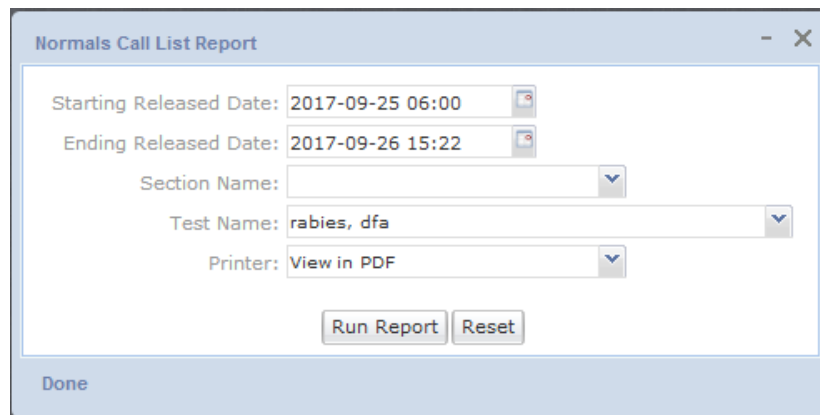


Figure 575 Normals Call List Report Print Screen

The fields on the Normals Call List Report print screen are defined below.

Starting Released Date and Ending Released Date

These fields are used together to specify a range of dates for the generation of the report. The [Released Date](#) is the date and time that the analysis was released. Analyses must be released in order to be queried.

Section Name

This field can be used to narrow the report to tests performed by one or more [laboratory sections](#). Multiple sections can be **Ctrl**-selected.

Test Name

This field can be used to narrow the report to analyses performed by one or more [tests](#). Multiple tests can be **Ctrl**-selected.

Printer

This field is used for the selection of the network printer to print a hard copy, to view the report in pdf format on the computer monitor (View in PDF), to fax it (fax), or to e-mail it to the user as a pdf file (pdf).

11.11.2 REPORT FORMAT

ANYTOWN VETERINARY CLINIC(9080)		1234 MAIN ST ANYTOWN, IA, 54321		Phone: 515/555-1212 Fax: 515/555-1313	
235145	2017-09-22 13:13	526386	Dog		
	Rabies Detection by DFA	Brain Tissue	Analyte	Rabies Virus	Result
					Negative
<p><i>from: mhayek on: 2017-09-25 10:08 re: Called Negative Result</i> Told Shannon C. (receptionist) that the Rabies result was negative.</p>					
Owner Name	MICKEY MOUSE	Person Exposed 1 Name	MINNIE MOUSE		
Owner Address	5673 153RD AVE, ANYTOWN, IA 54321	Person Exposed 1 Age	57		
Owner Phone #	319/555-1212	Person Exposed 1 Gender	Female		
County	Linn	Person Exposed 1 Address	5673 153RD AVE, ANYTOWN, IA 54321		
Animal Vaccinated	Yes	Person Exposed 1 Phone #	319/555-1313		
Vaccination Current	No	Person Exposed 1 Exposure Date	2017-09-22		
Date of Animal Death	2017-09-22	Person Exposed 1 Location of Bite	BACK OF LEFT HAND		
Type of Rabies Death	Euthanized	Another Animal Exposed	No		
Human Exposure	Yes				

Figure 576 Normals Call List Report

The “report to” organization’s information is highlighted in black and precedes the information for the individual samples with normal results. Sample information is highlighted in dark gray, analysis information is highlighted in light gray, and the analytes, normal results, internal analysis notes, and auxiliary data are not highlighted. The fields on the Normals Call List Report are defined below.

“Report To” Organization Name, Id, and Address

The name, id, and complete address of the [“report to” organization](#) is listed at the beginning of the black section.

Phone

The Work # of the first [General contact](#) (if present) for the “report to” organization is displayed to the right of its address.

Fax

The first [Secure Fax Number](#) (if present) on the Parameter tab of the “report to” organization is displayed below its phone number.

Accession #

The sample’s [accession number](#) is displayed at the beginning of the dark gray row.

Collected Date and Time

The date and time that the sample was [collected](#) (if present) is displayed to the right of the accession number.

Client Reference

The [client reference](#) (if present) is displayed to the right of the Collected Date and Time.

Animal Common Name

The [common name](#) of the animal that was tested is displayed to the right of the Client Reference for animal samples.

Test Description

The [description of the test](#) that was performed is displayed at the beginning of a light gray row.

Sample Type

The [sample type](#) is displayed to the right of the test description.

Analyte

The name(s) of the [analyte\(s\)](#) that had a normal result(s) is displayed to the right of the sample type. Both the [analysis](#) and [analyte](#) have to be marked reportable in order for a normal result to be displayed on this report.

Result

The [normal result](#) is displayed to the right of its analyte.

Internal Analysis Note(s)

Any [internal analysis notes](#) are displayed below the normal result(s). The author of the note, date-time stamp, and subject line are displayed in the italicized first line. The text of the note is displayed in the subsequent line(s) as normal text.

Auxiliary Data

[Aux \(auxiliary\) data](#) (if present) is displayed in a two-column format below the internal analysis note(s) for a sample. Aux data has to be marked [reportable](#) in order for it to be displayed on this report.

11.12 TO-DO ANALYTE REPORT

The To-Do Analyte Report can be used to list the analytes that need to be tested and reported for an analysis. This report also provides other useful information such as the sample collection date, analysis test/method and status, prep test/method and status, “report to” organization, and priority. This information is useful to the analyst so that he can plan and prioritize his analytical runs for the day or week.

The link to the To-Do Analyte Report print screen is found in the [Summary section of the Report Menu](#).

11.12.1 PRINT SCREEN FIELDS

The screenshot shows a web-based form titled "To-Do Analyte Report". The form includes the following fields and options:

- Starting Entered Date: 2015-07-17 00:00
- Ending Entered Date: 2015-07-20 16:19
- Section Name: metals-ank
- Test Name: (empty)
- Prep Test Name: (empty)
- Analysis Status: Requeue|In Prep|Initiated|Logged In
- Sort By: Accession Number
- Printer: View in PDF

Buttons: Run Report, Reset

Generated file: todoAnalyte3790655539249292498.pdf

Figure 577 To-Do Analyte Report Print Screen

The fields on the To-Do Analyte Report print screen are defined below.

Starting Entered Date and Ending Entered Date

These fields are used together to specify a range of dates for the generation of the report. The Entered Date is the date and time that the sample was initially logged into OpenELIS (through either [Quick Entry](#) or [full sample login](#)).

Section Name

This field can be used to narrow the report to analyses performed by one or more laboratory sections. Multiple sections can be **Ctrl**-selected.

(Analytical) Test Name

This field can be used to narrow the report to analyses performed though one or more “analytical” tests. Multiple tests can be **Ctrl**-selected.

Prep Test Name

This field can be used to narrow the report to analyses with one or more prep tests assigned to them. Multiple prep tests can be **Ctrl**-selected.

Analysis Status

This field can be used to narrow the report to “analytical” analyses with one or more statuses. Multiple [analysis statuses](#) can be **Ctrl**-selected. The To-Do Analyte Report print screen uses a default of Requeue, In Prep, Initiated, or Logged In for the analysis status, as these are the statuses of primary interest to the analyst.

Sort By

This field determines the column on the report that will be used to determine the sorting order. The analyses can be sorted by Accession Number (the default), Collection Date, Test & Method, Analysis Status, and Prep Test & Method.

Printer

This field is used for the selection of the network printer to print a hard copy, to view the report in pdf format on the computer monitor (View in PDF), to fax it (fax), or to e-mail it to the user as a pdf file (pdf).

11.12.2 REPORT COLUMNS

Aug 01, 2017 15:13:20		To-Do Analyte Report						4 of 4 mhayek
Accession #	Collected	Sample Type	Test, Method	Status	Prep Test, Method	Status	Report To	
544244	2017-07-31 14:10	Non-Drinking Water	metals(multi), epa 200.8 low level	Logged In			SHL	
		Arsenic	Cadmium		Chromium	Copper		
		Lead	Nickel		Selenium	Silver		
		Zinc						
544562	2017-08-01 06:05	Drinking Water	metals(multi), epa 200.8 sdwa pb-cu	In Prep	turbidity, sm 2130 b screen	Logged In	IOWA CITY	
		Lead	Copper					
544575	2017-08-01 09:00	Drinking Water	metals(multi), epa 200.7 drink	In Prep	turbidity, sm 2130 b screen	Logged In	CENTRAL	
		Sodium						

Figure 578 To-Do Analyte Report

The columns on the To-Do Analyte Report are defined below.

Accession

The sample accession number of the analysis and its barcode is displayed in this column. If the sample has a [priority](#), its value is displayed in parentheses below its accession number.


544021	2017-07-28 10:00	Drinking Water
	Arsenic	
(3)		

Figure 579 Sample with a Priority of 3 Days

Collected

This column displays the date and time that the sample was collected.

Sample Type

This column displays the sample type of the sample.

(“Analytical”) Test, Method

This column displays the test and method of the “analytical” analysis.

(“Analytical” Analysis) Status

This column displays the [status](#) of the “analytical” analysis.

Prep Test, Method

This column displays the test and method of the prep analysis.

(Prep Analysis) Status

This column displays the [status](#) of the prep analysis.

Report To

This column displays the first portion of the [“report to”](#) organization for the analysis.

Reportable Analytes

The reportable analytes for the “analytical” analysis are highlighted in gray and listed below the analysis information. This allows the analyst to quickly determine how to set up the analysis to meet the client’s needs.

11.13 QA SUMMARY REPORT

The QA Summary Report screen generates a report listing the QA events that have been linked to specific samples or analyses for a selected date range. Depending upon the level of detail that is selected, this report will also display the organization names, accession numbers, and test and methods that are associated with the individual QA events.

The link to the QA Summary Report print screen is found in the [Summary section of the Report Menu](#).

11.13.1 PRINT SCREEN FIELDS

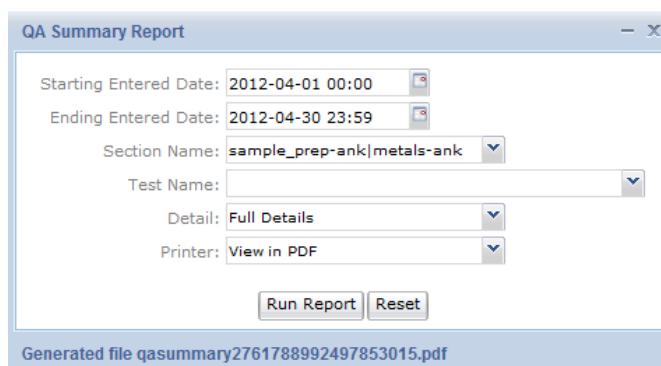


Figure 580 QA Summary Report Print Screen

The fields on the QA Summary Report print screen are defined below.

Starting Entered Date and Ending Entered Date

These fields are used together to specify a range of dates for the generation of the report. The Entered Date is the date and time that the sample was initially logged into OpenELIS (through either [Quick Entry](#) or [full sample login](#)).

Section Name

This field can be used to narrow the report to QA events tied to analyses/samples performed by one or more laboratory sections. Multiple sections can be **Ctrl**-selected.

Test Name

This field can be used to narrow the report to QA events tied to analyses/samples performed though one or more tests. Multiple tests can be **Ctrl**-selected.

Detail

The QA Summary Report can be generated in three formats using the Detail dropdown list: Full Details, Client Summaries, and Grand Totals Only. Each of these formats is described in the following sections.

Printer

This field is used for the selection of the network printer to print a hard copy, to view the report in pdf format on the computer monitor (View in PDF), to fax it (fax), or to e-mail it to the user as a pdf file (pdf).

11.13.2 FULL DETAILS

The Full Details version of the QA Summary Report lists each organization's name, city, and state in a gray background as a section header followed by a row for each QA event assigned to that organization for the specified time period. The first column of the report lists the sample accession numbers that have QA events tied to them. The second column denotes whether the QA event is at the sample level (-sample-) or is linked to a specific analysis (test name, method name). The third column specifies the [internal QA event name](#). There is a Totals row for each organization that summarizes this information. (See [CLIENT SUMMARIES](#) for more information.) Near the end of the report is located the Grand Totals which summarizes this information for all of the organizations that are part of this report. (See [GRAND TOTALS ONLY](#) for more information.)

Jul 21, 2015 10:48:14		QA Summary Report From 2015-07-01 10:03 to 2015-07-14 10:03		Page 1 of 27 mihayek
ATRIUM VILLAGE		HILLS, IA		
	264601	-sample-	old/incorrect form	
Totals:	1 Sample(s)	0 Analyses	1 old/incorrect form	
BROADLAWNS MEDICAL CENTER		DES MOINES, IA		
	262885	-sample-	date-time error	
	265976	-sample-	i-call	
			incomplete form	
			i-call	
Totals:	2 Sample(s)	0 Analyses	1 date-time error 2 i-call 1 incomplete form	
CAMP COURAGEOUS		MONTICELLO, IA		
	261690	-sample-	exceed temp	
	263704	-sample-	exceed temp	
Totals:	2 Sample(s)	0 Analyses	2 exceed temp	
CAMP IO-DIS-E-CA		SOLON, IA		
	264780	bod, sm 5210b 5 c	do deplete	
Totals:	1 Sample(s)	1 Analyses	1 do deplete	

Figure 581 QA Summary Report - Full Details

A bar graph is located at the end of the report that illustrates the grand totals for each QA event.

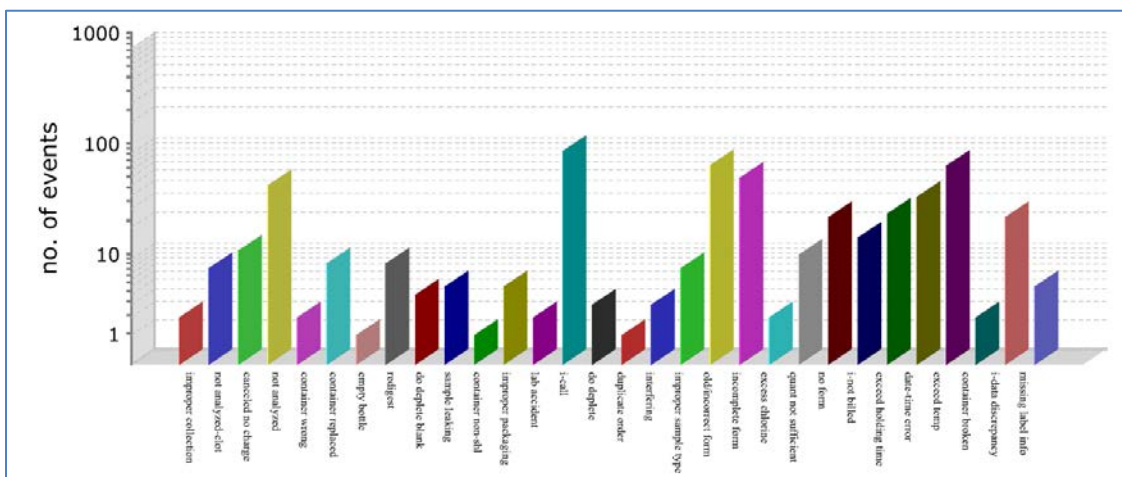


Figure 582 QA Summary Report - Bar Graph of Grand Totals

11.13.3 CLIENT SUMMARIES

DECEMBER, 2017

The Client Summaries version of the QA Summary Report lists each organization's name, city, and state in a gray background as a section header followed by the totals for the QA events assigned to that organization for the specified time period. The Totals denote the number of samples and analyses that have QA events tied to them, and list the quantity of each specific QA event. Near the end of the report is located the Grand Totals which summarizes this information for all of the organizations that are part of this report. A [bar graph](#) is located at the end of the report that illustrates the grand totals for each QA event. (See [GRAND TOTALS ONLY](#) for more information.)

Apr 30, 2012 11:40:44	From	QA Summary Report 2012-04-01 10:20 to 2012-04-30 10:20	Page 1 of 5 mhayek
UNKNOWN ORGANIZATION			
Totals:	16 Sample(s)	4 Analyses	1 quant not sufficient 4 no form 8 i-not billed 5 not analyzed 1 i-call
BENTON CO HEALTH DEPT VINTON, IA			
Totals:	11 Sample(s)	0 Analyses	11 i-not billed
BGM HIGH SCHOOL SWIM POOL BROOKLYN, IA			
Totals:	1 Sample(s)	0 Analyses	1 missing label info
CEDAR CO HEALTH DEPT TIPTON, IA			
Totals:	4 Sample(s)	0 Analyses	4 i-not billed
CLIMAX MOLYBDENUM COMPANY FORT MADISON, IA			
Totals:	1 Sample(s)	0 Analyses	1 i-not billed 1 not analyzed 1 container broken

Figure 583 QA Summary Report - Client Summaries

11.13.4 GRAND TOTALS ONLY

The Grand Totals Only version of the QA Summary Report denotes the number of samples and analyses that have QA events tied to them, and lists the quantity of each specific QA event for all of the organizations that are part of this report. A [bar graph](#) is located at the end of the report that illustrates the grand totals for each QA event.

DECEMBER, 2017

Apr 30, 2012 11:59:46		QA Summary Report From 2012-04-01 10:20 to 2012-04-30 10:20		Page 1 of 1 mhayek
Grand Totals:	700 Sample(s)	89 Analyses	5 canceled no charge 32 not analyzed 14 container wrong 1 missing pws info 1 trc performed 1 empty bottle 1 replicate 86 container non-shl 1 estimated flow 20 i-call 3 do deplete 1 not billed - env 2 container not rec'd 4 interfering 12 incomplete form 4 unable to match 4 quant not sufficient 15 no form 219 i-not billed 14 exceed holding time 63 date-time error 359 exceed temp 4 container broken 24 missing label info	

Figure 584 QA Summary Report - Grand Totals Only

11.14 MS SUMMARY REPORT

11.14.1 PRINT SCREEN FIELDS

11.14.2 REPORT FORMAT

11.15 MS INTEGRATED MATCH REPORT

The MS (Maternal Screening) Integrated Match Report provides lab staff with a call reminder list of patients who are approaching the deadline to have their second sample collected for the Maternal Screen Integrated test. This report includes the patient's, organization's, and provider's names, provider's phone number, collection date, and gestational age of the Maternal Screen Integrated Sample 1 analysis, and the last date that the second sample for the Maternal Screen Integrated test can be collected.

The link to the Turnaround Report print screen is found in the [Summary section of the Report Menu](#).

11.15.1 PRINT SCREEN FIELDS

DECEMBER, 2017

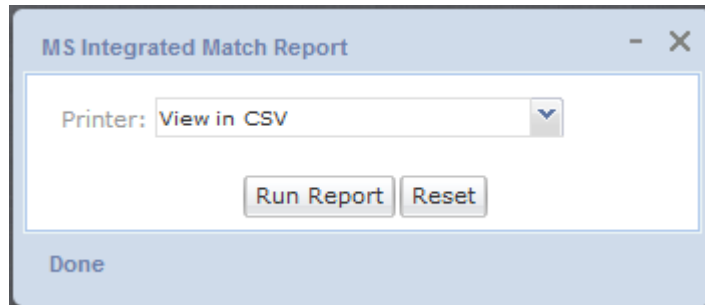


Figure 585 MS Integrated Match Report Print Screen

The field on the MS Integrated Match Report print screen is defined below.

Printer

This field is used for the selection of the network printer to print a hard copy, to view the report in pdf or csv format on the computer monitor (View in PDF, View in CSV), to fax it (fax), or to e-mail it to the user as a pdf file (pdf).

11.15.2 REPORT FORMAT

	A	B	C	D	E	F	G	H	I	J	K
1	Acc #	Last Name	First Name	Organization Name	Organization City	Provider Last Name	Provider First Name	Provider Phone	Collected	Gest. Age	Days 146
2	389568	MOUSE	MINNIE	ANYTOWN HOSPITAL	ANYTOWN	WELBY	MARCUS	319/555-1212	9/25/2017	87	11/23/2017
3	389645	DOE	JANE	ANYTOWN HOSPITAL	ANYTOWN	WELBY	MARCUS	319/555-1212	9/19/2017	79	11/25/2017

Figure 586 MS Integrated Match Report

The columns on the MS Integrated Match Report are defined below.

Acc

The sample accession number of the Maternal Screen Integrated Sample 1 analysis is displayed in this column.

Last Name

The [patient's last name](#) of the Maternal Screen Integrated Sample 1 analysis is displayed in this column.

First Name

The [patient's first name](#) of the Maternal Screen Integrated Sample 1 analysis is displayed in this column.

Organization Name

The name of the ["report to" organization](#) of the Maternal Screen Integrated Sample 1 analysis is listed in this column.

Organization City

The city of the ["report to" organization](#) of the Maternal Screen Integrated Sample 1 analysis is listed in this column.

Provider Last Name

The [provider's last name](#) (if present) of the Maternal Screen Integrated Sample 1 analysis is displayed in this column.

Provider First Name

The [provider's first name](#) (if present) of the Maternal Screen Integrated Sample 1 analysis is displayed in this column.

Provider Phone

The [provider's phone number](#) (if present) of the Maternal Screen Integrated Sample 1 analysis is displayed in this column.

Collected

The date that the sample from the Maternal Screen Integrated Sample 1 analysis was [collected](#) is displayed in this column.

Gest. Age

The Gestational Age is a measure of the age of the pregnancy as based upon the Crown Rump Length (CRL) of the fetus as measured by ultrasound during the first trimester of pregnancy. The difference between the ultrasound date and the [Collected Date](#) (in days) is added to this calculation to obtain the Gestational Age value. This value (in days) is calculated through the Maternal Screen Integrated Sample 1 analysis.

Days 146

This is the last date that the second sample for the Maternal Screen Integrated test can be collected. It is calculated by the equation of [Collected Date](#) – [Gestational Age](#) + 146 days. The report is sorted in ascending order by this column.

Considerations

1. The code checks to make sure that the second sample for the Maternal Screen Integrated test hasn't already been received for the associated Maternal Screen Integrated Sample 1 analysis to be included in the report.
2. The Maternal Screen Integrated Sample 1 analysis has to be released and its sample has to have been entered into OpenELIS within the last 70 days for it to be included in the report.
3. The "Days 146" value must be between the current date and 20 days in the future for the Maternal Screen Integrated Sample 1 analysis to be included in the report.
4. Maternal Screen Integrated Sample 1 analyses with either Result Override or "partial (scriptlet) override" QA events are excluded from this report. "Partial (scriptlet) override" QA events are Warning QA events that have a scriptlet assigned to them that allows for partial results (usually patient demographic data or sample metadata) to be displayed on the Final Report but for actual test results to be overridden. These "partial (scriptlet) override" QA events include: low results, ga outside range, and ga recal.

11.16 ANALYSIS NOTE REPORT

The Analysis Note Report displays notes that have been assigned to an analysis. Among other uses, it can be utilized by laboratory staff to search for notes that have been added by maternal screening follow-up staff through the OpenELIS Web Portal. The conversation between these two parties can also be tracked through this report. While only internal analysis notes are searched in the report query, all of the internal and external analysis notes assigned to the samples that match the query will be displayed in the report.

The link to the Analysis Note Report print screen is found in the [Summary section of the Report Menu](#).

11.16.1 PRINT SCREEN FIELDS

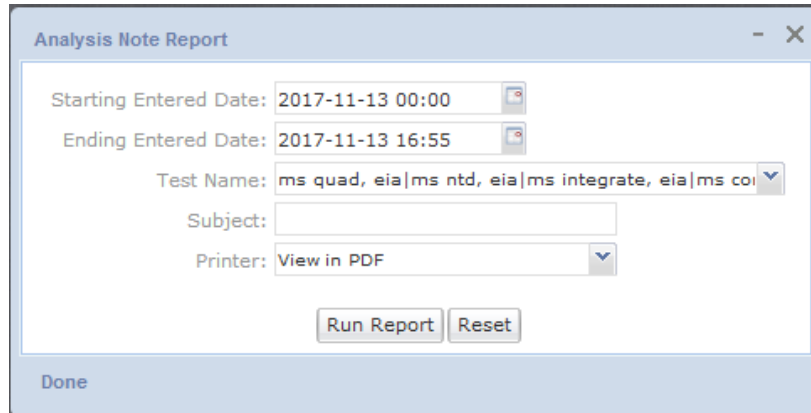


Figure 587 Analysis Note Report Print Screen

The fields on the Analysis Note Report print screen are defined below.

Starting Entered Date and Ending Entered Date

These fields are used together to specify a range of dates for the generation of the report. The Entered Date is the date and time that an internal analysis note was entered into OpenELIS.

Test Name

This field can be used to narrow the report to internal notes tied to analyses performed through one or more tests. Multiple tests can be **Ctrl**-selected.

Subject

This field can be used to narrow the report to samples/analyses possessing an internal note with a subject that matches this entry. The [wildcard character](#) (*) can be used in this field; the [“or operator”](#) (|) cannot. External notes do not possess a subject so they cannot be directly searched through this field.

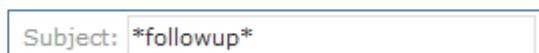


Figure 588 Searching by a Partial Subject of an Internal Note

Printer

This field is used for the selection of the network printer to print a hard copy, to view the report in pdf format on the computer monitor (View in PDF), to fax it (fax), or to e-mail it to the user as a pdf file (pdf).

11.16.2 REPORT FORMAT

Accession #	Description	Test, Method	Status	Organization
398661	DOE, JANE, Y435893671 <i>from: mhayek on: 2017-11-15 11:33 re: Ultrasound Date Called 515-555-1212 and talked to Libby who provided an u/s date of 2017-11-13 to go with BPD of 32.8 mm. from: mhayek on: 2017-11-15 11:31 re: Note From EOrder Container ID Y435893671</i>	ms quad, eia	Logged In	ANYTOWN HOSPITAL(9055)
398675	MOUSE, MINNIE, Y2300107897 <i>from: mhayek on: 2017-11-15 11:26 re: Ultrasound Date Called 515-555-1212 and talked to Dr. Welby who provided an u/s date of 2017-11-14 with a CRL of 23 mm. from: mhayek on: 2017-11-15 11:23 re: Note From EOrder Container ID Y2300107897</i>	ms 1st integ, eia	Logged In	ANYTOWN HOSPITAL(9055)

Figure 589 Analysis Note Report

The columns on the Analysis Note Report are defined below.

Accession

The sample accession number of the analysis containing one or more internal analysis notes is displayed in this column.

Description

This column displays the [domain specific field](#) which is used to help describe the sample.

Test, Method

This column displays the internal [test](#) and [method](#) names of the analysis.

(Analysis) Status

This column displays the [status of the analysis](#).

Organization

The name and id of the [“report to” organization](#) is listed in this column.

Analysis Note(s)

Any [analysis notes](#) are displayed below the sample and analysis information in descending order of date-time stamp. The author of the note, date-time stamp, and subject line are displayed in the italicized first line of a note. The text of the note is displayed in the subsequent line(s) as normal text. External analysis notes will have a subject line of *re: null* on this report since external notes do not possess a subject line.

from: mhayek on: 2017-11-15 11:26 re: Ultrasound Date
Called 515-555-1212 and talked to Dr. Welby who provided an u/s date of 2017-11-14 with a CRL of 23 mm.

Figure 590 Internal Analysis Note

11.17 QA AND NOTE REPORT

The QA and Note Report displays all sample and analysis level QA events and notes for a sample/analysis that matches the report query. This provides the user with a complete picture of any special circumstances related to the sample and its analyses. The QA and Note Report collates this information in an easy-to-read, user-friendly format. The same information that can be gathered through the [Sample Tracking](#), [Complete and Release](#), or [full sample login screens](#) is now available in a printable/save-able format that does not require sifting through each sample. This report could be used by quality assurance/sample resolution staff who are looking for trends in the QA events and/or notes that are being assigned to a specific laboratory section’s or submitting organization’s samples/analyses. Samples or analyses that do not possess any QA events or notes will not be displayed on this report.

The link to the QA and Note Report print screen is found in the [Summary section of the Report Menu](#).

11.17.1 PRINT SCREEN FIELDS

QA and Note Report

Starting Entered Date: 2017-12-01 00:00

Ending Entered Date: 2017-12-13 15:47

Section Name: serology-ic

Report To Name or Id:

Test Name:

QA Event Name: *container*

Subject:

Printer: View in PDF

Run Report Reset

Done

Figure 591 QA and Note Report Print Screen

The fields on the QA and Note Report print screen are defined below.

Starting Entered Date and Ending Entered Date

These fields are used together to specify a range of dates for the generation of the report. The Entered Date is the date and time that the sample was initially logged into OpenELIS (through either [Quick Entry](#) or [full sample login](#)).

Section Name

This field can be used to narrow the report to samples containing an analysis performed by the specified laboratory section. Multiple sections can be **Ctrl**-selected.

Report To Name or Id

This field can be used to narrow this report to samples [reported to](#) one or more organizations. Only one organization id can be queried at a time, but multiple organization names can be queried by using the wildcard character (*), “or operator” (|), or a combination of the two. See [QUERY FUNCTION](#) for more information.

Report To Name or Id: 9055

Figure 592 Searching by an Organization Id

Full or partial names of organizations can be entered in this free-text field.

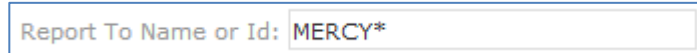
A screenshot of a search field with the label "Report To Name or Id:" and the text "MERCY*" entered.

Figure 593 Searching by a Partial Organization Name Using the * Wildcard

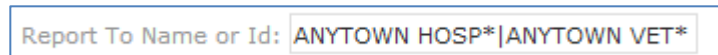
A screenshot of a search field with the label "Report To Name or Id:" and the text "ANYTOWN HOSP*|ANYTOWN VET*" entered.

Figure 594 Searching by Multiple Organization Names Using the | and * Symbols

Test Name

This field can be used to narrow the report to analyses performed through one or more tests. Multiple tests can be **Ctrl**-selected.

QA Event Name

This field can be used to narrow the report to samples/analyses possessing one or more QA events. The abbreviated name of the QA event is entered here. The names of QA events are available through the [QA Event screen](#) or the [QA List Report](#). Partial or multiple QA event names can be queried by using the wildcard character (*). The | character cannot be used in this field.

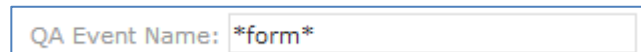
A screenshot of a search field with the label "QA Event Name:" and the text "*form*" entered.

Figure 595 Searching by a Partial QA Event Name Using the * Wildcard

Subject

This field can be used to narrow the report to samples/analyses possessing an internal note with a subject that matches this entry. The [wildcard character](#) (*) can be used in this field; the "[or operator](#)" (|) cannot. External notes do not possess a subject so they cannot be directly searched through this field.

A screenshot of a search field with the label "Subject:" and the text "*rovider*" entered.

Figure 596 Searching by a Partial Subject of an Internal Note

While only internal notes can be searched through the Subject field, all of the internal and external notes assigned to the samples/analyses that match the query will be displayed in the report.

When searching by entries in both the QA Event Name and Subject fields, an “or” query is executed, rather than the usual “and” query. For example, if the following query is executed, samples/analyses containing either the QA event “date-time*” or the internal note subject “*rovider*” will be displayed. In other words, the sample/analysis does not have to contain both the QA event and the subject.

QA Event Name:	date-time*
Subject:	*rovider*

Figure 597 Searching by a QA Event Name or an Internal Note Subject

Printer

This field is used for the selection of the network printer to print a hard copy, to view the report in pdf format on the computer monitor (View in PDF), to fax it (fax), or to e-mail it to the user as a pdf file (pdf).

11.17.2 REPORT FORMAT

Accession #	Description/Test, Method	Received	Status	Report To (Id)
367236	MOUSE, MICKEY, cf-carrier, pcr <i>[ian] from: mhayek on: 2017-10-03 10:43 re: testing testing</i>	2017-10-02 13:45	Completed	ANYTOWN HOSPITAL(9055)
389568	MOUSE, MINNIE, <i>[isn] from: mhayek on: 2017-11-20 10:59 re: adding provider phone number 319/555-1212</i>	2017-09-26 14:27	Released	ANYTOWN HOSPITAL(9055)
398661	DOE, JANE, Y435893671 ms quad, eia <i>[ian] from: mhayek on: 2017-11-15 11:33 re: Ultrasound Date Called 515-555-1212 and talked to Libby who provided an u/s date of 2017-11-13 to go with BPD of 32.8 mm. [ian] from: mhayek on: 2017-11-15 11:31 re: Note From EOrder Container ID Y435893671</i>	2017-11-14 09:45	Not Verified	ANYTOWN HOSPITAL(9055)
398675	MOUSE, MINNIE, Y2300107897 ms 1st integ, eia <i>[ian] from: mhayek on: 2017-11-15 11:26 re: Ultrasound Date Called 515-555-1212 and talked to Dr. Welby who provided an u/s date of 2017-11-14 with a CRL of 23 mm. [ian] from: mhayek on: 2017-11-15 11:23 re: Note From EOrder Container ID Y2300107897</i>	2017-11-15 08:00	Not Verified	ANYTOWN HOSPITAL(9055)

Figure 598 QA and Note Report

Once again, the QA and Note Report displays all sample and analysis level QA events and notes for a sample/analysis that matches the report query. Samples or analyses that do not possess any QA events or notes will not be displayed on this report.

The columns/fields on the QA and Note Report are defined below.

Accession #

The accession number of the sample containing one or more QA events or notes is displayed in this column.

Description/Test, Method

This column displays either the sample description ([domain specific field](#)) or the [test](#) and [method](#) names of the analysis. The user must have permission to the “patient” module of OpenELIS, in order to view information for clinical and newborn screening samples.

Received

This column displays the date and time that the sample was [received](#) at the laboratory.

Status

This column displays either the status of the [sample](#) or the [analysis](#).

Report To (Id)

The name and id of the [“report to” organization](#) is listed in this column. The samples on this report are initially sorted alphabetically by the “report to” name. Within each “report to” grouping, the samples are next sorted by Accession # in ascending order.

Order of QA Events and Notes

Any sample level QA events and notes are displayed below the sample information line (the line containing the sample description). Any sample level QA events are listed first, followed by the sample level external note (if present), and, then, any sample level internal notes in descending order of date-time stamp.

Any analysis level QA events and notes are displayed below the analysis information line (the line containing the test and method name). Any analysis level QA events are listed first, followed by the analysis level external note (if present), and, then, any analysis level internal notes in descending order of date-time stamp.

Each type of QA event and note is preceded by a tag that describes its characteristics. These tags are defined in the footer of every page of the report and below:

[sqa] = Sample QA

[aqa] = Analysis QA

[esn] = External Sample Note

[isn] = Internal Sample Note

[ean] = External Analysis Note

[ian] = Internal Analysis Note

QA Event Format

An italicized QA event line displays the [name](#) of the QA event, followed by its [QA type](#), and, then, its [billable flag](#).

378937	<i>[loc]east pile</i> <i>[sqa] container wrong, Warning, Billable</i>	2017-11-07 13:30	Released	ANYTOWN RECYCLING CENTER(10311)
--------	--	------------------	----------	---------------------------------

Figure 599 Sample QA Event

Note Format

The author of the note, date-time stamp, and subject line (for internal notes only) are displayed in the italicized first line of a note. The text of the note is displayed in the subsequent line(s) as normal text. External notes do not possess a subject line.

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ms quad, eia Logged In
[ian] from: mhayek on: 2017-11-15 11:33 re: Ultrasound Date
Called 515-555-1212 and talked to Libby who provided an u/s date of 2017-11-13 to go with BPD of 32.8 mm.

Figure 600 Internal Analysis Note

11.18 TURNAROUND REPORT

The Turnaround Report provides turnaround times for tests within a selected date range.

The link to the Turnaround Report print screen is found in the [Summary section of the Report Menu](#).

11.18.1 PRINT SCREEN FIELDS

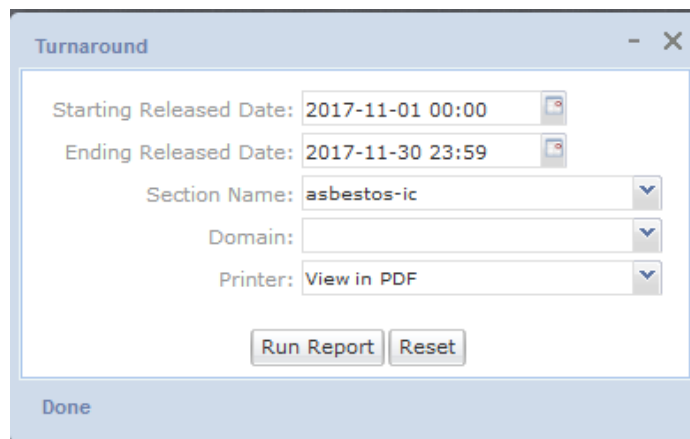


Figure 601 Turnaround Report Print Screen

The fields on the Turnaround Report print screen are defined below.

Starting Released Date and Ending Released Date

These fields are used together to specify a range of dates for the generation of the report. The [Released Date](#) is the date and time that the analysis was released.

Section Name

This field can be used to narrow the report to tests performed by one or more laboratory sections. Multiple sections can be **Ctrl**-selected.

Domain

This field can be used to narrow the report to samples from one or more [sample domains](#). Multiple domains can be **Ctrl**-selected from the dropdown list.

Printer

This field is used for the selection of the network printer to print a hard copy, to view the report in pdf format on the computer monitor (View in PDF), to fax it (fax), or to e-mail it to the user as a pdf file (pdf).

11.18.2 REPORT FORMAT

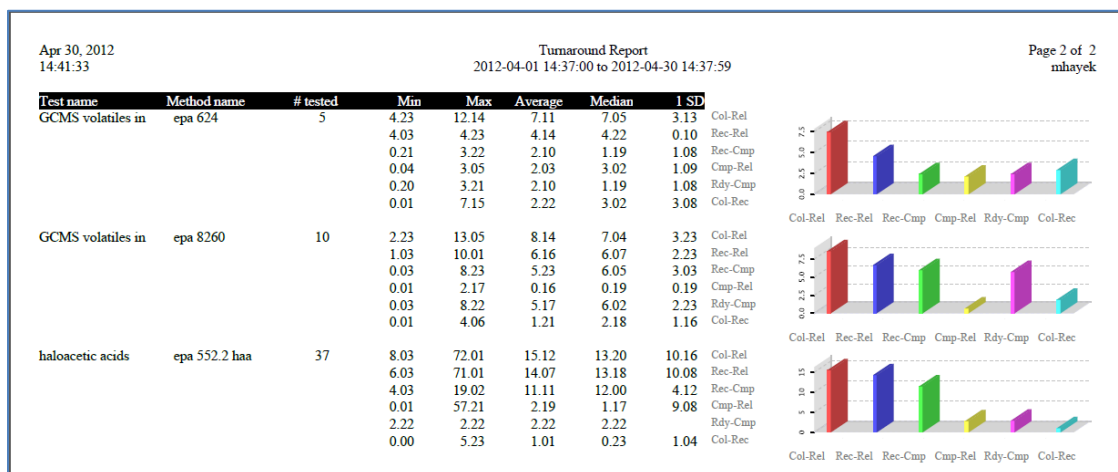


Figure 602 Turnaround Report

The columns on the Turnaround Report are defined below.

Test name

The first portion of the Description of the test is displayed in this column. The report lists these test descriptions alphabetically.

Method name

The name of the method is displayed in this column.

tested

The number of analyses performed using this test and method is displayed in this column.

Min(imum)

The minimum turnaround time for the test and method is displayed in this column.

Max(imum)

The maximum turnaround time for the test and method is displayed in this column.

Average

The average turnaround time for the test and method is displayed in this column.

Median

The median turnaround time for the test and method is displayed in this column.

1 SD (Standard Deviation)

The first standard deviation of the turnaround time for the test and method is displayed in this column.

There are six different types of turnaround times calculated on the report. Each one occupies its own row for the test and method and they are labeled to the right of their values.

- Col-Rel (sample collected date/time to analysis released date/time)
- Rec-Rel (sample received at the lab date/time to analysis released date/time)
- Rec-Cmp (sample received at the lab date/time to analysis completed date/time)
- Cmp-Rel (analysis completed date/time to analysis released date/time)
- Rdy-Cmp (analysis available (ready) date/time to analysis completed date/time)
 - The analysis available (ready) date/time would be after any applicable prep analyses have been performed.

- Col-Rec (sample collected date/time to sample received at the lab date/time)

All turnaround times are in days and hours, i.e., 4.09 represents 4 days and 9 hours. There is a bar graph to the right of each test and method that illustrates these six different average turnaround times.

11.19 TURNAROUND STATISTICS REPORT

The Turnaround Statistics Report graphs the turnaround times for tests within a selected date range. This report provides additional drilldown capabilities over the [TURNAROUND REPORT](#) including the ability to:

- exclude analyses from the turnaround statistics calculations
- select the plot interval (daily, weekly, monthly)
- choose the type(s) of turnaround times to be calculated and plotted
- limit the report to one test and method
- exclude PT samples
- limit the report to one organization

The link to the Turnaround Statistics Report screen is found in the [Summary section of the Report Menu](#).

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Turnaround Statistics Report

Starting Released Date: 2015-07-14 00:00
Ending Released Date: 2015-07-21 23:59
Show Analysis:
Plot Interval: Daily
Plot Statistic: ALL

Section:
Test:
Exclude PT Sample:
Organization:
Printer: View in PDF

Plot	Plot Date	Test	Method	Stat Ty	Min	Max	Avg	1 SD	# Te	Plot	Acc	Rev	Col-	Col-	Col-	Rec-R	Rec-C	Rec-C	Init-C	Init-R	Comp
<input checked="" type="checkbox"/>	2015-07-14	flow-fm	flow-csi	Rec-Rel	5.20	5.20	5.20		1	<input checked="" type="checkbox"/>	2647	0	0.22	0.23	6.15	0.00	4.20	5.16	2.20	3.17	0.20
<input checked="" type="checkbox"/>	2015-07-14	ph-fm	sm 4500 h	Rec-Rel	5.20	5.20	5.20		1	<input checked="" type="checkbox"/>	2647	0	0.22	0.23	6.15	0.00	4.20	5.16	2.20	3.17	0.20
<input checked="" type="checkbox"/>	2015-07-14	temperature-fm	sm 2550	Rec-Rel	5.20	5.20	5.20		1	<input checked="" type="checkbox"/>	2656	0	0.03	0.03	4.00	0.00	3.00	3.21	2.20	3.17	0.20
<input checked="" type="checkbox"/>	2015-07-14	nitrate	epa 353.2 as n	Rec-Rel	4.20	4.20	4.20	0.00	4	<input checked="" type="checkbox"/>	2656	0	0.03	0.03	4.00	0.00	3.00	3.21	2.20	3.17	0.20
<input checked="" type="checkbox"/>	2015-07-14	nitrate + nitrite	epa 127b rev 0	Rec-Rel	3.21	5.16	4.06	0.18	9	<input checked="" type="checkbox"/>	2656	0	0.03	0.03	4.00	0.00	3.00	3.21	2.20	3.17	0.20
<input checked="" type="checkbox"/>	2015-07-14	nitrate + nitrite	private epa 127	Rec-Rel	3.20	3.20	3.20		1	<input checked="" type="checkbox"/>	2656	0	0.03	0.03	4.00	0.00	3.00	3.21	2.20	3.17	0.20
<input checked="" type="checkbox"/>	2015-07-14	nitrite	sm 4500 no2 b	Rec-Rel	4.20	4.20	4.20	0.00	4	<input checked="" type="checkbox"/>	2656	0	0.03	0.03	4.00	0.00	3.00	3.21	2.20	3.17	0.20
<input checked="" type="checkbox"/>	2015-07-14	dissolved oxygen-fm	astm d 888-09	Rec-Rel	0.17	0.17	0.17		1	<input checked="" type="checkbox"/>	2656	0	0.03	0.03	4.00	0.00	3.00	3.21	2.20	3.17	0.20
<input checked="" type="checkbox"/>	2015-07-14	flow-fm	flow-stream manual	Rec-Rel	0.17	0.17	0.17		1	<input checked="" type="checkbox"/>	2656	0	0.03	0.03	4.00	0.00	3.00	3.21	2.20	3.17	0.20

Select All Unselect All Select All Unselect All

Done

Figure 603 Turnaround Statistics Report Screen

11.19.1 GENERAL FIELDS AND BUTTONS

Turnaround Statistics Report

Starting Released Date: 2014-01-01 00:00
Ending Released Date: 2014-12-31 23:59
Show Analysis:
Plot Interval: Monthly
Plot Statistic: Rec-Cmp|Col-Rel|Rec-R

Section: asbestos-ic
Test:
Exclude PT Sample:
Organization:
Printer: View in PDF

Get Data Plot Data

Figure 604 General Fields

The general fields and buttons at the top of the Turnaround Statistics Report screen are defined below.

Starting Released Date and Ending Released Date

These fields are used together to specify a range of dates for the generation of the report. The [Released Date](#) is the date and time that the analysis was released.

Show Analysis

This checkbox should be selected if the user wishes to view the individual analyses' turnaround times that are used to compute the turnaround statistics (minimum, maximum, average, and one standard deviation). Individual analyses with outlying turnaround times can be excluded from these calculations. Please see [GENERATING A TURNAROUND STATISTICS REPORT](#) for instructions on this procedure.

Plot Interval

This dropdown field is used to select the plot interval: Daily, Weekly, or Monthly.

- A Daily plot interval displays the average value for the turnaround time on the graph for each day of the report period.
- A Weekly plot interval displays the average value for the turnaround time on the graph for each week of the report period. Each data point on the graph is labeled with Sunday's date for that week.
- A Monthly plot interval displays the average value for the turnaround time on the graph for each month of the report period. Each data point on the graph is labeled with a date of the 1st of that month.

Plot Statistic

This dropdown field is used to select the type(s) of turnaround times to be plotted. Multiple turnaround types can be **Ctrl**-selected.

- ALL (All 9 turnaround times are plotted on the graph)
- Col-Rec (sample collected date/time to sample received at the lab date/time)
- Col-Rdy (sample collected date/time to analysis available (ready)* date/time)
- Col-Rel (sample collected date/time to analysis released date/time)
- Rec-Rdy (sample received at the lab date/time to analysis available (ready)* date/time)
- Rec-Cmp (sample received at the lab date/time to analysis completed date/time)
- Rec-Rel (sample received at the lab date/time to analysis released date/time)
- Init-Cmp (analysis initiated (started) date/time to analysis completed date/time)
- Init-Rel (analysis initiated (started) date/time to analysis released date/time)
- Cmp-Rel (analysis completed date/time to analysis released date/time)

*The analysis available (ready) date/time would be after any applicable prep analyses have been performed.

Section

This field can be used to narrow the report to analyses performed by one laboratory section.

Test

This field can be used to narrow the report to analyses performed through one test.

Exclude PT Sample

This checkbox should be selected to exclude analyses of PT samples from the turnaround statistics calculations.

Organization

This autocomplete dropdown field can be used to narrow the report to analyses on samples assigned to a specific organization.

Printer

This field is used for the selection of the network printer to print a hard copy, to view the report in pdf format on the computer monitor (View in PDF), to fax it (fax), or to e-mail it to the user as a pdf file (pdf).

Get Data

This button is used to retrieve the queried data from the database and to perform the statistical calculations.

Plot Data

This button is used to plot the turnaround time values on the Turnaround Statistics Report.

11.19.2 STATISTICS TABLE

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Plot	Plot Date	Test	Method	Stat Tyr	Min	Max	Avg	1 SD	# Te
<input checked="" type="checkbox"/>	2014-01-01	asbestos	epa 600 r93 116	Rec-Rel	0.19	73.23	14.12	23.04	93
<input checked="" type="checkbox"/>	2014-01-01	asbestos	niosh 7400	Rec-Rel	0.23	38.22	23.05	16.03	24
<input checked="" type="checkbox"/>	2014-01-01	asbestos gravimetric	epa 600 r93 116	Rec-Rel	6.01	7.19	7.11	0.14	13
<input checked="" type="checkbox"/>	2014-01-01	microscopy	microscopy	Rec-Rel	0.05	30.20	23.04	15.07	4
<input checked="" type="checkbox"/>	2014-02-01	asbestos	epa 600 r93 116	Rec-Rel	0.08	7.02	3.00	1.09	84
<input checked="" type="checkbox"/>	2014-02-01	asbestos gravimetric	epa 600 r93 116	Rec-Rel	4.00	7.02	5.11	1.13	5
<input checked="" type="checkbox"/>	2014-02-01	asbestos	epa 100.2	Rec-Rel	6.03	22.22	14.12	11.20	2
<input checked="" type="checkbox"/>	2014-03-01	asbestos	epa 600 r93 116	Rec-Rel	0.01	29.22	7.19	10.20	61
<input checked="" type="checkbox"/>	2014-03-01	asbestos	epa 100.2	Rec-Rel	2.04	15.23	11.02	7.18	3

Select All Unselect All

Figure 605 Statistics Table

The Statistics Table, located in the lower left pane of this screen, displays the turnaround time statistics that have been calculated for each plot period for a specific test. The fields of this table are defined below.

Plot

This box needs to be checked in order to display the plot period's statistics and plot its average turnaround time on the report.

Plot Date

This field displays the beginning date of the plot period. The length of the plot period is determined by the [Plot Interval](#) selection.

Test

The abbreviated name of the test is displayed in this field.

Method

The abbreviated name of the method is displayed in this field.

Stat Type

This field shows the type of [plot statistic](#) that is being displayed in this row. The first type of turnaround time that was selected from the Plot Statistic dropdown list will be displayed as the Stat Type. Rec-Rel is displayed as the Stat Type on the screen when ALL is selected as the Plot Statistic.

Min(imum)

The minimum turnaround time for that test's plot period is displayed in this field.

Max(imum)

The maximum turnaround time for that test's plot period is displayed in this field.

Avg (Average)

The average turnaround time for that test's plot period is displayed in this field.

1 SD (Standard Deviation)

The first standard deviation of the turnaround time for that test's plot period is displayed in this field.

Tested

The number of analyses performed during that test's plot period is displayed in this field.

11.19.3 ANALYSES TABLE

Plot	Acc #	Rev	Col-	Col-	Col-	Rec-R	Rec-C	Rec-R	Init-Ci	Init-Rt	Comp
<input checked="" type="checkbox"/>	142141	0	10.00	10.00	14.06	0.00	3.23	4.06	0.18	1.01	0.06
<input checked="" type="checkbox"/>	142141	0	10.00	13.23	14.06	3.22	3.23	4.06	0.18	1.01	0.06
<input checked="" type="checkbox"/>	142142	0	10.00	10.00	14.06	0.00	3.23	4.06	0.18	1.01	0.06
<input checked="" type="checkbox"/>	142142	0	10.00	13.22	14.06	3.22	3.23	4.06	0.18	1.01	0.06
<input checked="" type="checkbox"/>	142143	0	10.00	10.00	14.06	0.00	3.23	4.06	0.18	1.01	0.06
<input checked="" type="checkbox"/>	142143	0	10.00	13.22	14.06	3.22	3.23	4.06	0.18	1.01	0.06
<input checked="" type="checkbox"/>	142144	0	9.23	10.00	14.06	0.00	3.23	4.06	0.18	1.01	0.06
<input checked="" type="checkbox"/>	142145	0	9.23	10.00	14.05	0.00	3.23	4.06	0.18	1.01	0.06
<input checked="" type="checkbox"/>	142146	0	9.23	9.23	14.05	0.00	3.23	4.06	0.18	1.01	0.06

Select All Unselect All

Figure 606 Analyses Table

The Analyses Table, located in the lower right pane of this screen, displays the individual analyses' turnaround times that have been used to calculate the turnaround statistics that will be displayed on the report. The fields of this table are defined below.

Plot

This box needs to be checked in order to use the individual analysis' turnaround times in the statistical calculations.

Acc(ession) #

The accession number of the analysis is displayed in this field.

Rev(ision)

The revision number of the analysis is displayed in this field.

Turnaround Times

The rest of the fields display the individual turnaround times for the analysis. See [Plot Statistic](#) for a definition of each type of turnaround time.

11.19.4 GENERATING A TURNAROUND STATISTICS REPORT

The steps to generate a Turnaround Statistics Report are listed below.

1. Enter the Starting Released Date and Ending Released Date.
2. Check the Show Analysis box in order to review the turnaround times of individual analyses for outlying values, if desired. This box can also be checked after the **Get Data** button is clicked.
3. Select the Plot Interval and Plot Statistic.
4. Select the Section, Test, and/or Organization in order to limit the report by any of these parameters, if desired.
5. Check the Exclude PT Sample box in order to exclude analyses of PT samples from the turnaround statistics calculations, if desired.
6. Select your Printer choice.
7. Click the **Get Data** button.

8. The Statistics Table will display the turnaround time statistics that have been calculated for each plot period for a specific test. All rows are checked by default to display their statistics and plot their average turnaround times on the report. Uncheck a row if you do not want it to be plotted.
9. If the Show Analysis box is checked, turnaround times of individual analyses can be viewed in the Analyses Table by selecting a row in the Statistics Table. Individual analyses with outlying turnaround times can be excluded from the turnaround statistical calculations by unchecking them for plotting.
10. Click the **Plot Data** button to generate the report. The header of each page displays the time period of the report and the associated test and method. The average turnaround times of the test and method are plotted at the top of the report, whereas, the turnaround statistics are displayed at the bottom of the report. All turnaround times are in days and hours, i.e., 4.09 represents 4 days and 9 hours. The types of turnaround times are displayed on the report in the order that they were selected from the Plot Statistic dropdown list. The turnaround statistics for Col-Rec, Col-Rdy, Col-Rel, Rec-Rdy, and Rec-Com are displayed on the report when ALL is selected as the Plot Statistic. However, all 9 types of turnaround times are plotted on the graph.

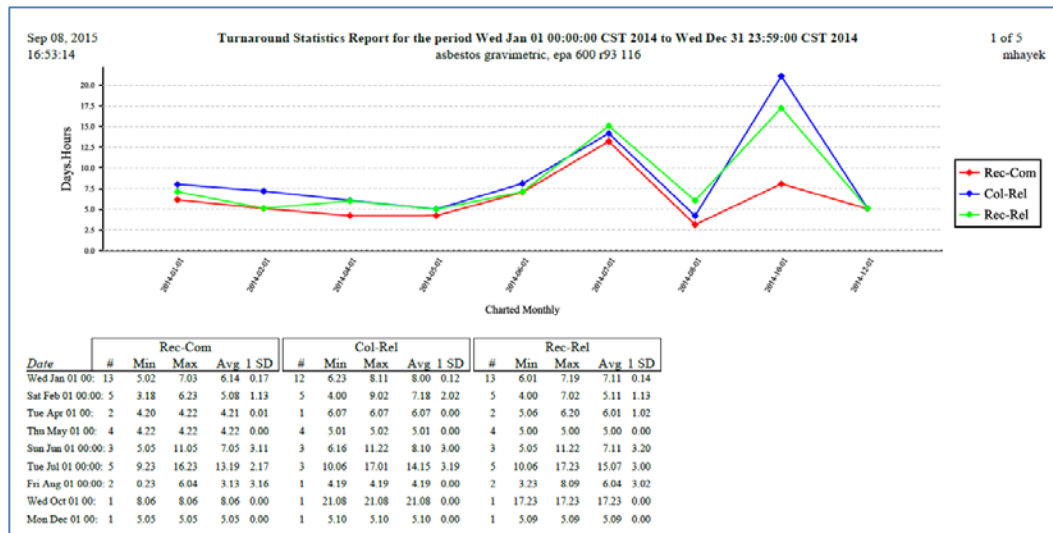


Figure 607 Turnaround Statistics Report

11.20 KIT TRACKING REPORT

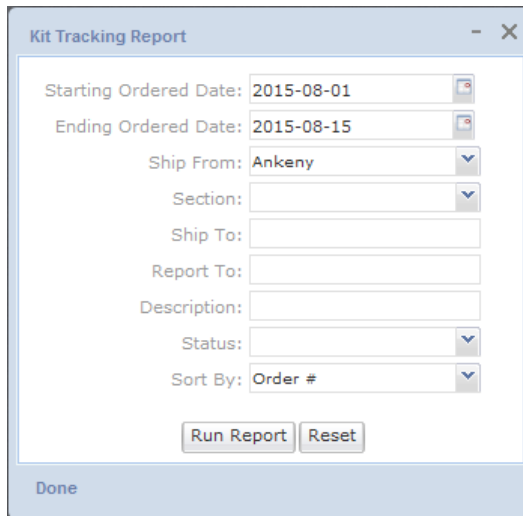
The Kit Tracking Report can be used to monitor the kits/containers that have been sent out to the laboratory's external clients. For each send-out order the user can view the client organization, status of the order, quantity and types of kits that are expected to be returned to the lab with samples, tests assigned to the order (if present), and the accession numbers of the samples that have been received to date.

The report has two major uses:

1. It can be used to track the quantity and types of kits that have been sent to an organization. When compared with the number of samples that have been received to date for these orders, the user can determine if a surplus of items are being sent to an organization. This information can be used to save the laboratory inventory and shipping expenses.
2. A more accurate estimate of a laboratory section's upcoming workload can be made by examining the tests that are assigned to the orders, the number of orders, and the samples that have been received to date.

The link to the Kit Tracking Report print screen is found in the [Summary section of the Report Menu](#).

11.20.1 PRINT SCREEN FIELDS



The screenshot shows a window titled "Kit Tracking Report" with a close button (X) in the top right corner. The window contains several input fields and dropdown menus for filtering the report. The fields are: "Starting Ordered Date" (text input with value "2015-08-01"), "Ending Ordered Date" (text input with value "2015-08-15"), "Ship From" (dropdown menu with value "Ankeny"), "Section" (dropdown menu), "Ship To" (text input), "Report To" (text input), "Description" (text input), "Status" (dropdown menu), and "Sort By" (dropdown menu with value "Order #"). Below the fields are two buttons: "Run Report" and "Reset". At the bottom left of the window, there is a "Done" button.

Figure 608 Kit Tracking Report Print Screen

The fields on the Kit Tracking Report print screen are defined below.

Starting Ordered Date and Ending Ordered Date

These fields are used together to specify a range of dates for the generation of the report. The Ordered Date is the date that the order was entered into the system. This date is located in the [Order Date](#) field of the Send-out Order screen.

Ship From

The report can be limited to the site(s) from where the send-out orders were shipped. Laboratories often have multiple sites that can ship out orders to external clients. These sites are defined in the [DICTIONARY](#) screen.

Section

The report can be limited to the laboratory section(s) that will perform the tests assigned to the send-out orders. The test(s) assigned to an order (if applicable) are located in the [TEST TAB](#) of the Send-out Order screen.

Ship To

The report can be limited to the name of the external client to which the orders were shipped. This organization is located in the [Ship To](#) field of the Send-out Order screen.

Report To

The Kit Tracking Report can be limited to the name of the external client to which the test results were reported. The “report to” organization (if present) is located in the [ORGANIZATION TAB](#) of the Send-out Order screen. A “report to” organization only needs to be added to a send-out order if it is different from the “ship to” organization.

Description

The report can be limited by the description of the orders. The [description](#) of an order is located on the Send-out Order screen.

Status

The report can be limited by the status of the orders. See [\(Order\) Status](#) for a definition of each status.

Sort By

This field specifies the column by which to sort the Kit Tracking Report. The options include: Order #, Order Status, Order Date, Ship From, Ship To, Report To, Requested By, and Cost Center. The default is Order #.

11.20.2 REPORT COLUMNS

	A	B	C	D	E	F	G	H	I	J	K	L
1	Order	Order Status	Order Date	Ship To	Ship From	Report To	Test Name	Qty & Container	Qty & Item	Accession #	Rest By	Cost Center
2	118707	Processed	2016-08-23	(372) THE RAJ	Ankeny		solids by usgs i-3765-85susp	1 / 1 - Quart Plastic	1 / #1		mdawson	60100
4									1 / #1 instr solids			
5	118708	Processed	2016-08-23	(3026) MARSHALLT OWN WATER WORKS (SHIP TO)	Ankeny	(1433) MARSHALLT OWN WATER WORKS (RPT BILL)	chlontite by epa 300.0	1 / 58 - Pint Plastic/ethyldendiami	1 / #58		mdawson	60100
6									1 / #58 instr chlontite			
7												
8												
9	118709	Processed	2016-08-23	(635) IOWA CITY REGENCY MHP	Iowa City		ammonia by lac 10-107-06-1j	1 / 1 - Quart Plastic	1 / #1	421628	mdawson	60140
10							bod by sm 5210b 5 c	1 / 2 - 8oz Plastic	1 / #1 instr 48hr holdover time			
11								(1mL 1:1 sulfuric acid	1 / #2			
12								re2SO4	1 / #2 instr nh3, no2=no3, etc			
13												
14												

Figure 609 Kit Tracking Report

The Kit Tracking Report utilizes a spreadsheet format. Each merged row represents an individual send-out order. The columns on the report are defined below.

Order #

This is the [order number](#) assigned by the LIMS to the send-out order.

Order Status

The [status](#) of the send-out order is specified in this cell.

Order Date

This is the [date](#) that the send-out order was entered into the system.

Ship To

This is the organization id and name of the external client [to which the order needs to be shipped](#).

Ship From

The laboratory site [from where the send-out order is shipped](#) is displayed in this cell.

Report To

This is the organization id and name of the external client [to which the test results will be reported](#) if it is different from the “ship to” organization.

Test Name

This column contains the names of all of the tests and methods assigned to each order in the format of “test name by method name”. The test(s) assigned to an order (if applicable) are located in the [TEST TAB](#) of the Send-out Order screen.

Qty & Container

This column lists all of the containers and their quantities that are expected to come back to the laboratory from each sample collection. The format of this field is quantity / container name (e.g., 2 / 99 – Non SHL means that two # 99 Non – SHL containers are expected to come back with each sample collection. These containers are entered on the [CONTAINER TAB](#) of the Send-out Order screen.

Qty & Item

This column lists all of the inventory items and their quantities that are being shipped out with the order. The format of this field is quantity / item name (e.g., 1 / #32 (bacterial water kit) means that one # 32 (bacterial water kit) is being shipped out with the order. These items are entered on the [ITEM TAB](#) of the Send-out Order screen.

Accession #

This column contains the [accession numbers](#) of the samples that have been entered into the LIMS that are linked to the send-out order.

Rqst (Requested) By

This cell contains the username of the [person who entered the order](#), the requesting person, or the department name.

Cost Center

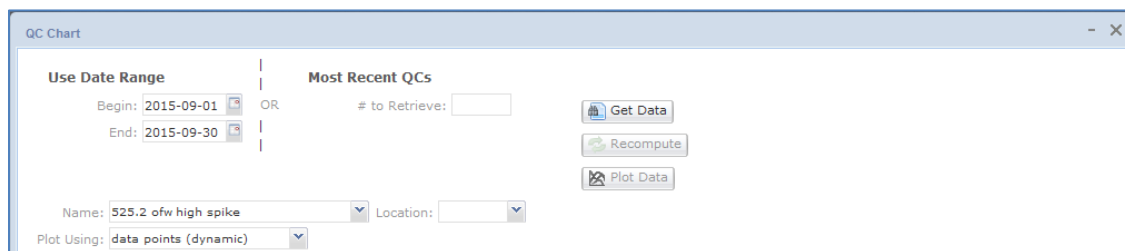
This cell contains the organizational unit, program, or project that is responsible for the [cost of the order](#). This field is linked with the dictionary category system name “cost_centers”.

11.21 QC CHART

The QC Chart screen is used to generate a table of QC analyte data points which can then be plotted to display a series of statistics.

The link to the QC Chart screen is found in the [Summary section of the Report Menu](#).

11.21.1 GENERAL FIELDS AND BUTTONS



The screenshot shows the 'QC Chart' window with the following fields and buttons:

- Use Date Range:** Begin: 2015-09-01, End: 2015-09-30.
- Most Recent QCs:** # to Retrieve: [text input].
- Buttons:** Get Data, Recompute, Plot Data.
- Name:** 525.2 ofw high spike.
- Location:** [dropdown menu].
- Plot Using:** data points (dynamic).

Figure 610 General Fields

The general fields and buttons at the top of the QC Chart screen are defined below.

Use Date Range/Begin/End

Data can be retrieved based on a date range or on a quantity of most recent QCs. When using the first option, the Begin and End fields are used to specify the desired date range. This date represents the [Created Date](#) of the worksheet that contains the designated QC.

Most Recent QCs/# to Retrieve

When using the second option, the # to Retrieve field is used to specify the quantity of most recent QCs to fetch from OpenELIS.

Name

This autocomplete text field is used to enter the name of the QC to chart. The Name and Type of the QCs that match the characters that have been entered are displayed to help the user select the desired QC.

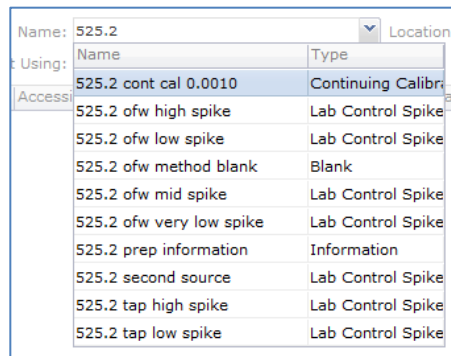


Figure 611 QC Name Autocomplete Field

Currently, only the “Lab Control Spike” type has been implemented for charting; future design enhancements are needed to retrieve and chart data for QCs of other types (Duplicate, Blank, Lab Control, etc.).

Location

The retrieval of QC information can be restricted to a single laboratory [location](#) by using this dropdown field. Leaving this field empty will retrieve QCs from all laboratory locations.

Plot Using

The Plot Using option specifies whether the control limits and other statistics should be computed dynamically or statically. Selecting the “data points (dynamic)” option will use the QC data to compute standard deviation, control limits, etc. Selecting the “analyte parameters (fixed)” option will select the same data but produces a chart illustrating control limits based on fixed parameters P1 and P2 which can be set in the [Analyte Parameter](#) module.

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Get Data

This button retrieves all the matching data along with calculated values. Data from worksheets having a status of “Void” and “Failed Run” are excluded in the data retrieval. When retrieving QC data based on the “# to Retrieve” option, the prep worksheet is counted even though it may contain no values to plot; therefore, the number of QCs retrieved may differ from the number of data points retrieved.

Recompute

This button is used to re-compute the statistics displayed in the Data Table and on the report after one or more data points have been deselected for plotting.

Plot Data

This button is used to plot the data on the report.

11.21.2 DATA TABLE

Plot	Accession #	Lot No.	Creation Date	Analyte	Value1	Value2	Plot Val	Mean	UWL	UCL	LWL	LCL
<input checked="" type="checkbox"/>	7999.14	S2441B OFW	2012-07-27 12:20	Benzo(a)pyrene	0.0025	111.12	0.002776	0.002815	0.004903	0.0059470	0.000726	-0.00
<input checked="" type="checkbox"/>	7999.14	S2441B OFW	2012-07-27 12:20	1,3-Dimethyl-2-nitrobenzene	0.0025	84.32	0.002106	0.002175	0.002728	0.0030020	0.001631	0.00
<input checked="" type="checkbox"/>	7999.14	S2441B OFW	2012-07-27 12:20	Simazine	0.0025	42.08	0.001052	0.001985	0.003274	0.0039110	0.000697	0.00
<input checked="" type="checkbox"/>	7999.14	S2441B OFW	2012-07-27 12:20	Atrazine	0.0025	103.92	0.002596	0.002796	0.004555	0.0054340	0.001037	0.00
<input type="checkbox"/>	7999.14	S2441B OFW	2012-07-27 12:20	Alachlor	0.0025	107.44	0.002686	0.00314	0.005529	0.006724	0.00075	-0.00
<input checked="" type="checkbox"/>	7999.14	S2441B OFW	2012-07-27 12:20	bis(2-Ethylhexyl)phthalate	0.0025	89.08	0.002227	0.002446	0.004435	0.00543	0.000457	-0.00
<input checked="" type="checkbox"/>	7999.14	S2441B OFW	2012-07-27 12:20	bis(2-Ethylhexyl)adipate	0.0025	88.76	0.002215	0.002454	0.003971	0.0047250	0.000938	0.00
<input checked="" type="checkbox"/>	7999.14	S2441B OFW	2012-07-27 12:20	Triphenyl phosphate	0.0025	110.48	0.002762	0.002716	0.003287	0.0035720	0.002146	0.00
<input checked="" type="checkbox"/>	7999.14	S2441B OFW	2012-07-27 12:20	Pyrene-d10	0.0025	99.52	0.002486	0.002991	0.004179	0.0047730	0.001802	0.00

Select
 Unselect
 Select All
 Unselect All

Figure 612 Data Table

The Data Table, located in the lower pane of this screen, displays the data and statistics that have been calculated for each QC analyte. The fields of this table are defined below.

Plot

This checkbox is used to select whether the corresponding analyte data point should be used in computations and plotted. The Data Table can be sorted by Accession #, Lot No., Creation Date, or Analyte in order to view or unselect a range.

Accession #

This is the unique identifier for the QC and is defined in the format of worksheet_number.position_number. For example, Accession # 1718.8 indicates that the QC item was originally located on Worksheet 1718 and in position 8. If the QC was initially added to a sample preparation worksheet, the Accession # will indicate the prep_worksheet_number.position_number.

Lot No.

This field displays the unique [lot number](#) for the QC.

Creation Date

This is the date-time that the worksheet that contains the QC item was [created](#). For prep QCs that are included on an analytical worksheet, the creation date references the analytical worksheet.

Analyte

This field contains the name of the [QC analyte](#).

Value1, Value2, Plot Value

These values are dependent on the [QC type](#). Please refer to the relevant QC type section for specific information.

Mean

This field displays the average of the plot values for the specific analyte. It is calculated from the currently retrieved QC data. When the “analyte parameters (fixed)” option is selected, the Mean is equal to the fixed parameter, P3.

UWL (Upper Warning Limit)

This field represents +2 SD (standard deviations) from the mean. It is a measure of the upper limit of uncertainty for precision.

UCL (Upper Control Limit)

This field represents +3 SD from the mean. This calculation indicates the upper threshold at which the process output is considered statistically “unlikely”. When the “analyte parameters (fixed)” option is selected, the UCL is equal to the fixed parameter, P2.

LWL (Lower Warning Limit)

This field represents -2 SD from the mean. It is a measure of the lower limit of uncertainty for precision.

LCL (Lower Control Limit)

This field represents -3 SD from the mean. This calculation indicates the lower threshold at which the process output is considered statistically “unlikely”. When the “analyte parameters (fixed)” option is selected, the LCL is equal to the fixed parameter, P1.

11.21.3 REPORT FORMAT

The QC Chart Report is produced from the table of selected data points in the QC Chart screen by clicking the **Plot Data** button. The values and statistics for each QC analyte are displayed on separate pages. This report includes a graph of the plot values, as well as, a table of statistics. The UCL, LCL, UWL, LWL, and Mean are found on every QC Chart Report. The other statistics vary and are based on the QC’s parameters.

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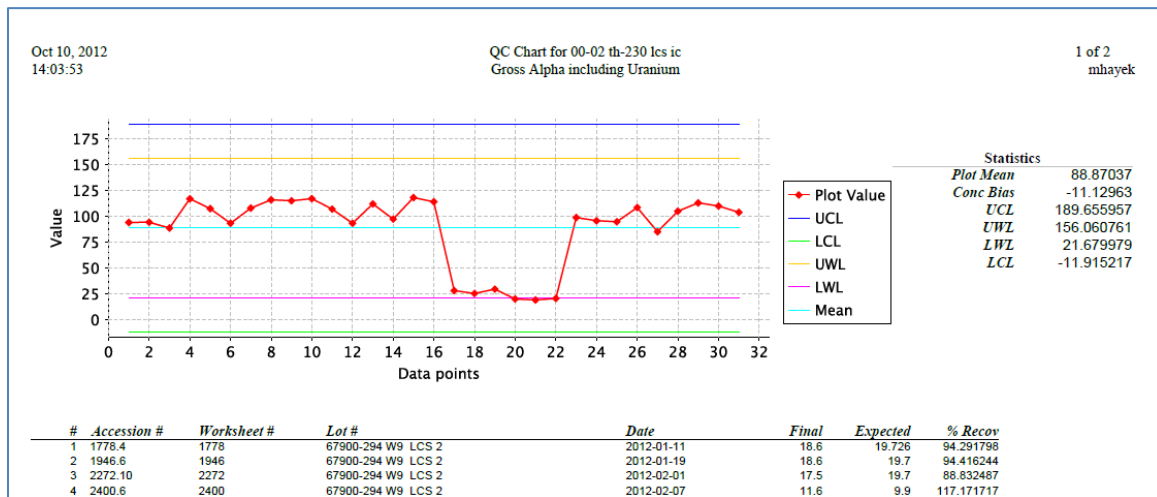


Figure 613 QC Chart Report

The individual QC analyte information and values are displayed below the graph. They are: (Data Point) #, Accession #, Worksheet #, Lot #, (Creation) Date, Value1, Value2, and Plot Value. The Worksheet # on the QC Chart Report refers to the worksheet from which the data for the QC analyte was retrieved.

11.21.4 LAB CONTROL SPIKES

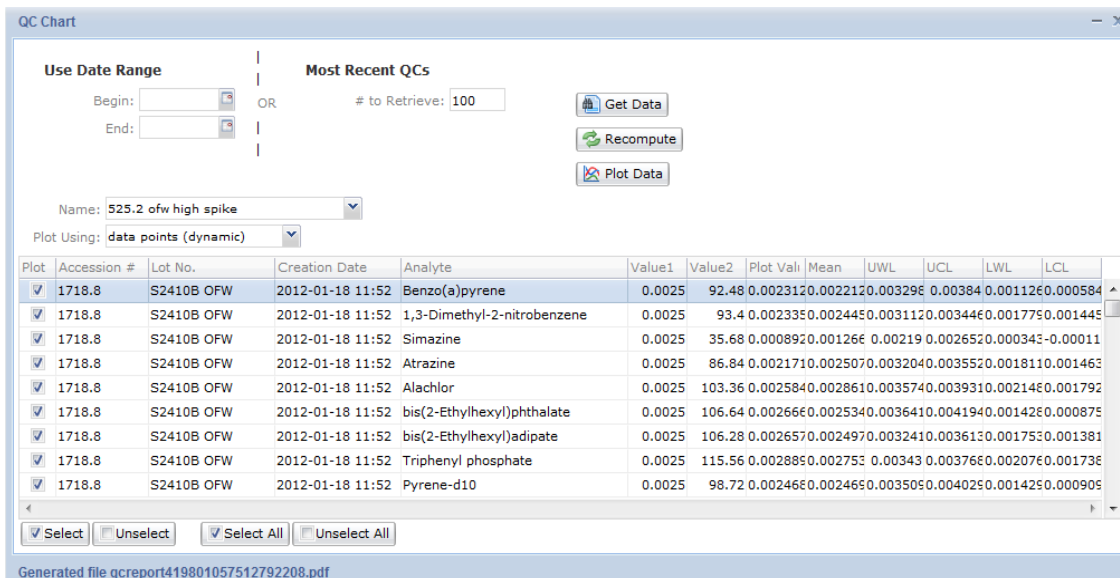


Figure 614 QC Chart Screen for a Lab Control Spike

The fields of the QC Chart screen as they relate to lab control spikes are defined below.

Value1: Expected Value

The Value1 field is the Expected Value from the analytical worksheet. It may differ from the QC definition. Its column is labeled as Expected on the QC Chart Report.

Value2: % Recovery

This Value2 field represents the percent recovery and is calculated based on the following formula:

$$\% \text{ Recovery (Value2)} = \frac{\text{Final Value (Plot Value) for each QC Result} \times 100}{\text{Expected Value (Value1) for each individual analyte}}$$

Its column is labeled as % Recovery on the QC Chart Report.

Plot Value: Final Value

The Plot Value field is the Final Value for each QC result, and its column is labeled Final Value on the QC Chart Report.

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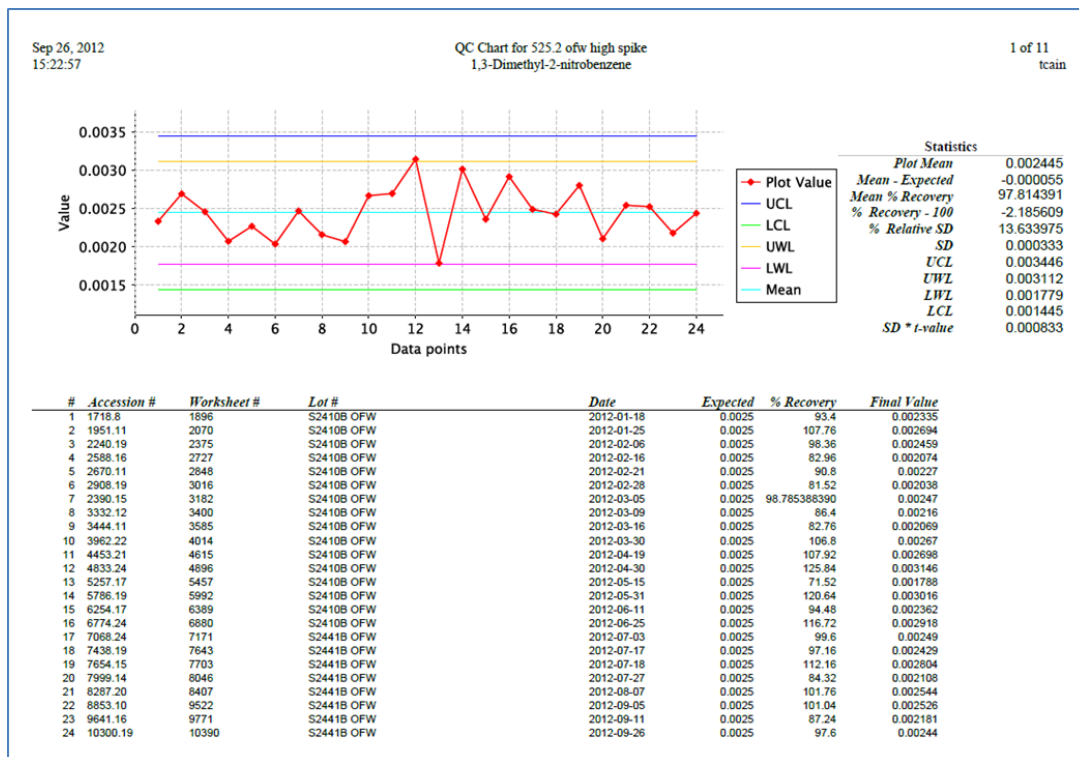


Figure 615 QC Chart Report for a Lab Control Spike

The following values are located in the Statistics table at the top of the QC Chart Report. The Mean – Expected, % Recovery – 100, and Mean % Recovery values are based on the assumption that the Expected Value is assumed to be fixed for an individual QC.

Plot Mean

This value is the calculated average of all of the plotted QC Final Values for that analyte.

Mean - Expected

This value represents the bias in concentration and is based on the mean of the Final Values minus the Expected value for Data Point #1 in the table.

Mean % Recovery

This value is the calculated average of all of the % Recovery values in the table for that analyte.

% Recovery – 100

This value is calculated by subtracting 100 from the Mean % Recovery. It represents the bias in percent (uncertainty for accuracy).

% Relative SD

This value is the standard deviation divided by the mean times 100.

SD

The sample standard deviation is calculated from the following formula

$$s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2}$$

where **s** is the standard deviation, **N** stands for the size of the sample, $\{x_1, x_2, \dots, x_N\}$ are the observed values of the sample items, and \bar{x} is the mean value of the sample items.

SD * t-value

This value is the standard deviation times the student's t-value using a table of t-values. The table contains 200 t-values for ≥ 201 data points. SD * t-value may be used to calculate method detection limits with a minimum of seven data points at an appropriate concentration.

11.22 FINAL REPORT

Normally, Final Reports are printed automatically from OpenELIS through a [cron](#) job. The Final Report screen is used when it is necessary to manually print or fax a single Final Report.

The link to the Final Report screen is found in the [Summary section of the Report Menu](#).

11.22.1 SCREEN FIELDS

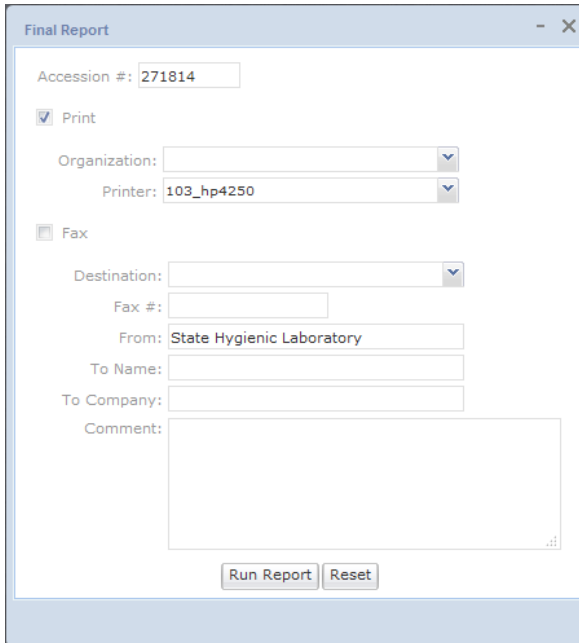
The screenshot shows a web application window titled "Final Report". At the top, there is a text input field for "Accession #" containing the value "271814". Below this, there is a checked checkbox labeled "Print". Underneath the "Print" checkbox, there are two dropdown menus: "Organization:" and "Printer:", with the value "103_hp4250" selected in the "Printer:" dropdown. Below these, there is an unchecked checkbox labeled "Fax". Underneath the "Fax" checkbox, there are several text input fields: "Destination:", "Fax #:", "From:" (containing "State Hygienic Laboratory"), "To Name:", and "To Company:". At the bottom of the form is a large text area for "Comment:". At the very bottom of the window, there are two buttons: "Run Report" and "Reset".

Figure 616 Final Report Screen - Print Option

The Final Report screen is divided into two sections based on its two functions: printing and faxing.

The fields on the Final Report screen are defined below.

Accession #

The sample accession number of the Final Report to be printed or faxed is entered in this field.

Print

This box must be checked in order to print the Final Report. It is checked by default on this screen.

Organization

After the Accession # is entered, OpenELIS will display all of the “[report to](#)” organizations (both primary and secondary) in the Organization drop-down list. If the first option in the drop-down list (the “blank” choice) is selected, then separate copies of the Final Report will be printed for all of the “report to” organizations. Alternatively, one of the organizations may be selected to populate the “report to” name and address of the Final Report and only that copy will be printed.

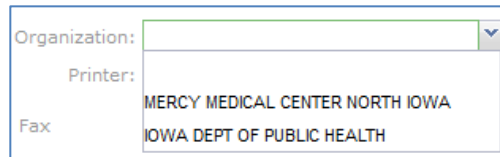


Figure 617 Organization Dropdown List Displaying Multiple "Report To" Organizations

Printer

This field is used for the selection of the network printer (or the “View in PDF” option to view the Final Report in pdf format on the computer monitor before sending it to a printer).

Fax

This checkbox must be selected to fax the Final Report.

Destination

The Destination dropdown list allows for OpenELIS to automatically populate some of the remaining fields on this screen in two ways.

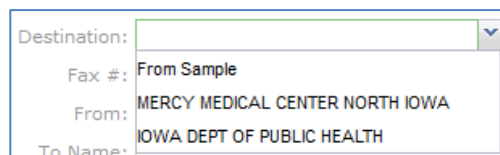


Figure 618 Destination Dropdown List Displaying Multiple Faxing Options

1. If the name of a “report to” organization is selected in the Destination dropdown list, the LIMS will automatically enter any relevant parameters that are present in the Organization screen and in the sample record (i.e., Fax #, To Name, To Company). The first [Secure Fax Number](#) listed on the Parameter tab

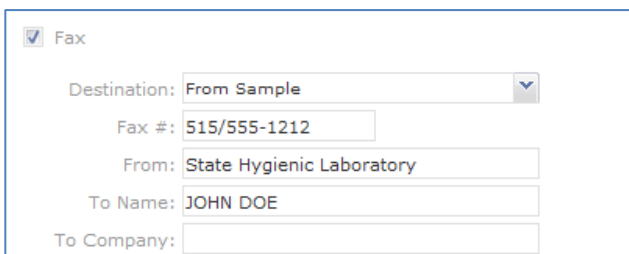
of the Organization screen will automatically populate the Fax # field. The To Name is automatically populated from the [Attention](#) field of the sample. The To Company is automatically populated with the name of the selected “report to” organization.



The screenshot shows a form titled "Fax" with a checked checkbox. The fields are: Destination: MERCY MEDICAL CENTER NORTH IOWA (dropdown), Fax #: 641/428-7899 (text), From: State Hygienic Laboratory (text), To Name: (empty text), and To Company: MERCY MEDICAL CENTER NORTH IOWA (text).

Figure 619 Selecting a "Report To" Organization for the Destination May Automatically Populate Certain Fields

2. If “From Sample” is selected from the Destination dropdown list, the LIMS will automatically enter any relevant auxiliary data values that are present in the sample record (i.e., Fax # and To Name). The Fax # field is automatically populated from the “Final Report FAX Number” auxiliary data value. The To Name field is automatically populated with the “Fax to attention” auxiliary data value.



The screenshot shows a form titled "Fax" with a checked checkbox. The fields are: Destination: From Sample (dropdown), Fax #: 515/555-1212 (text), From: State Hygienic Laboratory (text), To Name: JOHN DOE (text), and To Company: (empty text).

Figure 620 Selecting "From Sample" for the Destination May Automatically Populate Certain Fields

Fax

The fax # of the recipient of the Final Report must be entered in this field. It can be automatically populated by OpenELIS (see [Destination](#) above) or may be entered manually. It will be printed on the fax cover sheet.

From

This field is defaulted to the name of the laboratory but may be manually overridden (e.g., to the name of the sender). It will be printed on the fax cover sheet.

To Name

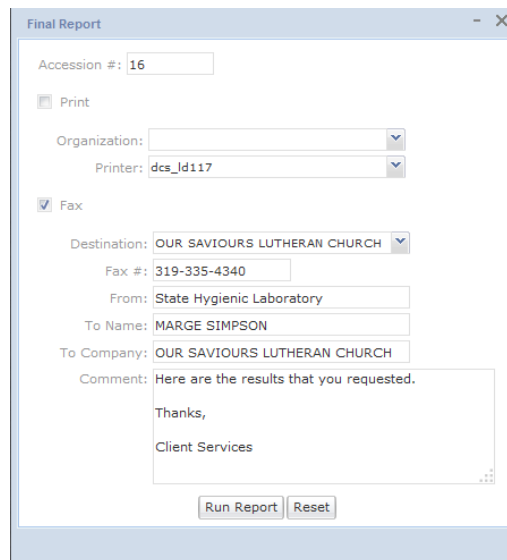
The name of the recipient of the faxed Final Report can be entered in this field. It can be automatically populated by OpenELIS (see [Destination](#) above) or may be entered manually. It will be printed on the fax cover sheet.

To Company

The name of the fax recipient's organization can be entered in this field. It can be automatically populated by OpenELIS (see [Destination](#) above) or may be entered manually. It will be printed on the fax cover sheet.

Comment

Any pertinent comment relative to the faxed Final Report may be entered in this free-text field. It will be printed on the fax cover sheet.




The screenshot shows a web application window titled "Final Report". The window contains the following fields and controls:

- Accession #: 16
- Print
- Organization: [dropdown menu]
- Printer: dcs_Id117
- Fax
- Destination: OUR SAVIOURS LUTHERAN CHURCH
- Fax #: 319-335-4340
- From: State Hygienic Laboratory
- To Name: MARGE SIMPSON
- To Company: OUR SAVIOURS LUTHERAN CHURCH
- Comment: Here are the results that you requested.
Thanks,
Client Services
- Buttons: Run Report, Reset

Figure 621 Final Report Screen - Fax Option

A cover sheet is automatically generated and faxed along with the Final Report.

From State Hygienic Laboratory Tue 01 May 2012 04:37:30 PM CDT Page 1 of 3



State Hygienic Laboratory

The University of Iowa

Fax

Attention: ATTENTION
Company: BERGSON WATER SUPPLY
Fax Number: 3193354340


From: State Hygienic Laboratory
Date: Tue May 01 2012, 16:37 CDT

Pages excluding cover sheet: 2

Comments:

comments

Figure 622 Fax Cover Sheet



State Hygienic Laboratory

The University of Iowa

SHL LAKESIDE
1838 HWY 86
MILFORD, IA 51351

<p><i>Accession Number</i> 11255 <i>Date Sample Finalized</i> 2012-03-12 14:50 <i>Date Received</i> 2012-01-10 13:14 <i>Sample Source</i> Non-Drinking Water <i>Project</i> WQSPEC <i>Date Collected</i> 2012-01-10 00:00 <i>Collection Site</i> site 2 <i>Collection Town</i> WAHPETON <i>Sample Description</i> <i>Client Reference</i> igl-student <i>Collector</i> halverson alex <i>Phone</i> </p>	
---	--

Note: Upon arrival, sample met container and preservation requirements for the analysis requested. Please review carefully your sample results for additional analyte comments or method exceptions.

Field Temperature 5.7	
Field pH 7.0	

Results of Analyses

Nitrate as N, SM 4500-NO3 D 18th

Units mg/L	Analyzed In Lakeside	
Date Analyzed 2012-01-12 00:00	Date Verified 2012-03-12 13:30	
Analyst DPH	Verifier DLS	

Analyte	Result	Quant Limit	MCL
Nitrate nitrogen as N	3.6	0.2	10

Note: The MCL (maximum contaminant level) is only applicable to compliance monitoring samples under the Safe Drinking Water Act (SDWA).

ortho-Phosphate as P, SM 4500-P E 18th

Units mg/L	Analyzed In Lakeside	
Date Analyzed 2012-01-10 00:00	Date Verified 2012-03-12 13:29	
Analyst DPH	Verifier DLS	

Analyte	Result	Quant Limit	
ortho-Phosphate as P	~0.01	0.02	

Total Phosphorus as P, SM 4500-P E 18th

Units mg/L	Analyzed In Lakeside	
Date Analyzed 2012-01-10 00:00	Date Verified 2012-03-12 13:30	
Analyst DPH	Verifier DLS	
Analysis Prep Total Phosphorus Digestion, SM 4500 P B.5 18th		


Analyte	Result	Quant Limit	
Total Phosphorus as P	0.020	0.02	

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<p>Michael D. Wichman, Ph.D. Associate Director http://www.shl.uiowa.edu</p>	<p>University of Iowa Research Park 2490 Crosspark Road Coralville, IA 52241 319/335-4500 Fax: 319/335-4555</p>	<p>Lakeside Laboratory 1838 Highway 86 Milford, IA 51351 712/337-3669 ext. 6 Fax: 712/337-0227</p>	<p>Iowa Laboratories Complex 2220 S. Ankeny Blvd Ankeny, IA 50023 515/725-1600 Fax: 515/725-1642</p>
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Figure 623 Example Final Report p. 1

DECEMBER, 2017



State Hygienic Laboratory

The University of Iowa

Accession Number | 11255

Turbidity, SM 2130 B 18th

Units [NTU]	Analyzed In Lakeside	Date Analyzed 2012-01-11 00:00	Date Verified 2012-03-08 08:08
Analyst DPH	Verifier DLS		

Analyte	Result	Quant Limit
Turbidity	1.6	1.0

Description of Units used within this report

[NTU] = Nephelometric Turbidity Units
mg/L = Milligrams per Liter

The result(s) of this report relate only to the items analyzed. This report shall not be reproduced except in full without the written approval of the laboratory.
Iowa Environmental Laboratory IDs are: Ankeny #397, Iowa City/Coralville #027, Lakeside #393.
If you have any questions, please call Client Services at 800/421-IOWA (4692) or 319/335-4500. Thank you.

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515/725-1600 Fax: 515/725-1642

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Figure 624 Example Final Report p. 2

11.23 FINAL REPORT (BATCH)

Normally, Final Reports are printed automatically from OpenELIS through a [cron](#) job. The Final Report (Batch) screen is used when it is necessary to manually print all of the

Final Reports that have yet to be printed. These Final Reports must meet all of the regular criteria for printing (i.e., the analysis must be released and [reportable](#) to the organization, the organization must not possess the “[Don’t Print Final Report](#)” parameter, etc.) Printing through this screen populates the [Printed Date](#) for the analysis.

The link to the Final Report (Batch) screen is found in the [Summary section of the Report Menu](#).

11.23.1 SCREEN FIELDS

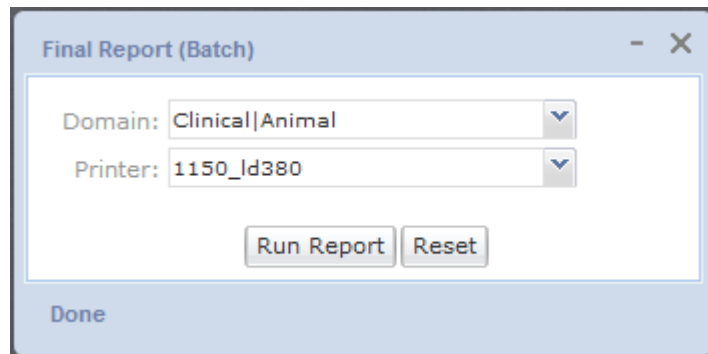


Figure 625 Final Report (Batch) Screen

The fields on the Final Report (Batch) screen are defined below.

Domain

This field can be used to narrow the search to Final Reports from one or more [sample domains](#). Multiple domains can be **Ctrl**-selected from the dropdown list.

Printer

This field is used for the selection of the network printer (or the “View in PDF” option to view the Final Reports in pdf format on the computer monitor before sending them to a printer).

11.24 FINAL REPORT (BATCH REPRINT)

Occasionally, there is an issue during a batch printing of Final Reports (i.e., printer malfunction, paper jam, etc.) and not all of the reports get printed. These Final Reports have been marked as printed in OpenELIS and will have a [Printed Date](#) assigned, but a paper copy was not actually printed. Since these Final Reports cannot be printed again through the next printing [cron](#) job or manually through the [Final Report \(Batch\) screen](#), the Final Report (Batch Reprint) screen must be utilized to manually reprint the affected reports. Printing through this screen does not update the existing [Printed Date](#) for the analysis.

The link to the Final Report (Batch) screen is found in the [Summary section of the Report Menu](#).

11.24.1 SCREEN FIELDS

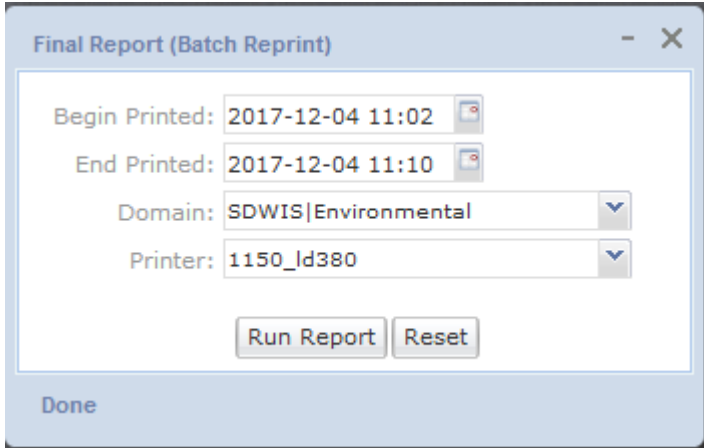


Figure 626 Final Report (Batch Reprint) Screen

The fields on the Final Report (Batch Reprint) screen are defined below.

Begin Printed and End Printed

These fields are used together to specify a range of date-times for the reprinting of the affected Final Reports. In this case, the [Printed Date](#) is the date and time that the Final Report should have been printed through either a cron job or the Final Report (Batch) screen.

Domain

This field can be used to narrow the search to Final Reports from one or more [sample domains](#). Multiple domains can be **Ctrl**-selected from the dropdown list.

Printer

This field is used for the selection of the network printer (or the “View in PDF” option to view the queried Final Reports in pdf format on the computer monitor before sending the affected ones to a printer).

11.25 AIR QUALITY EXPORT

The Air Quality Export module generates a series of | - delineated text files that can then be uploaded to other systems, such as the Environmental Protection Agency’s Air Quality System (AQS). The air quality data files that are currently being generated include air toxics, metals, and speciation (sulfate/nitrate) testing.

The link to the Air Quality Export screen is found in the Data Export section of the Report menu.

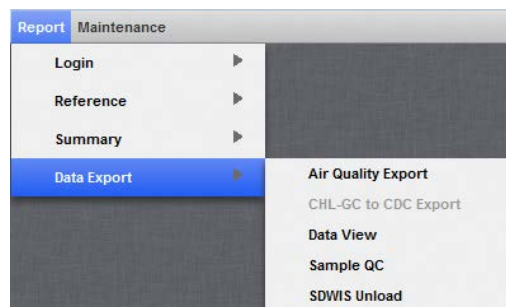


Figure 627 Data Export Section of Report Menu

11.25.1 SCREEN FIELDS

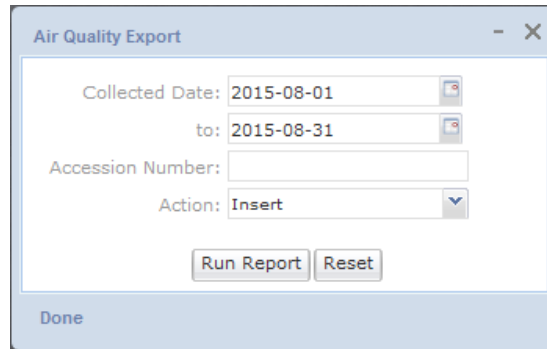


Figure 628 Air Quality Export Screen

The fields on the Air Quality Export screen are defined below.

Collected Date and to

These fields are used together to specify a range of dates for the generation of the export files. The Collected Date is the date that the air quality sample was collected. Normally, these fields are used when performing the Insert action.

Accession Number

When it is necessary to Update or Delete the data for one sample, the Accession Number of the sample is normally entered instead of the Collected Date range. Performing this action will generate a single file that only contains information and results for that sample.

Action

There are three actions currently performed through this module.

- Insert – is used to generate a new series of export files that will be uploaded to the other system.
- Update – is used to generate a single file to upload when there has been a change to the sample's information or results.
- Delete – is used to generate a single file to upload when it has been determined that a sample's information and results should be deleted from the other system. This could be due to a [Result Override QA Event](#) or a determination that the sample is unreliable due to an unusual situation.

11.26 DATA VIEW

The Data View module generates a customizable spreadsheet allowing the user to compare information across a range of samples, analyses, analytes, and/or results. This spreadsheet can be used as a mode for exporting data to other applications.

The link to the Data View screen is found in the [Data Export section of the Report menu](#).

The Data View module contains three query buttons and nine tabs which are described in the following sections.

11.26.1 QUERY BUTTONS

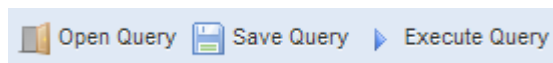


Figure 629 Query Buttons

There are three query buttons located at the top of the Data View screen. Their functions are described below.

Open Query

This button allows the user to navigate to the location of a saved query in order to open it. This action will automatically load the saved query into the Data View screen. Both search parameters and selected output fields will be populated. These fields can still be adjusted (i.e., date ranges) and additional fields may also be added to the query and output. The [output column order](#) of the saved query will be loaded, but it can still be adjusted, as necessary.

Save Query

A query can be saved for future use by clicking on this button. The query XML file should be saved to the user's desktop, home folder, or a shared drive and given a good descriptive name.

Execute Query

This button is used to run a Data View query.

11.26.2 QUERY TAB

The screenshot shows the 'Data View' window with the 'Query' tab selected. The interface includes a toolbar with 'Open Query', 'Save Query', and 'Execute Query' buttons. Below the toolbar are tabs for 'Query', 'Common', 'Environmental', 'SDWIS', 'Clinical', 'Neonatal', 'PT', 'Animal', and 'Column Order'. The main area is divided into three sections: 'Sample Fields To Search By', 'Analysis Fields To Search By', and 'Filters'. The 'Sample Fields' section includes input fields for 'Accession #', 'Collected', 'Received', 'Entered', and 'Released', each with a 'To' field and a date picker. It also has 'Client Reference', 'Report To', 'Project', and 'Domain' dropdowns. The 'Analysis Fields' section includes 'Test' (with 'syphilis*' entered), 'Method', 'Reportable', 'Status', 'Completed', 'Released' (with a date range from 2017-02-01 00:00 to 2017-02-28 23:59), and 'Section'. The 'Filters' section has checkboxes for 'Exclude Result Override' and 'Analytes in Single Row', and dropdowns for 'Result' and 'Aux Data'. A 'Done' button is at the bottom left.

Figure 630 Query Tab

The Query tab is used to define the parameters of the data search. This tab allows the user to search by sample and/or analysis fields. The data can also be restricted by sample domain and filtered on this screen. For the use of the wildcard character (*), “or operator” (|), and other query capabilities, see [QUERY FUNCTION](#).

The fields on the Query tab are defined below.

Sample Fields To Search By

Accession #

Data can be queried by a range of sample accession numbers.

Collected (Date)

Data can be queried by a range of sample collection dates.

Received (Date and Time)

Data can be queried by a range of dates and times that samples were received at the laboratory.

Entered (Date and Time)

Data can be queried by a range of dates and times that samples were initially logged into OpenELIS (through either [Quick Entry](#) or [full sample login](#)).

(Sample) Released (Date and Time)

Data can be queried by a range of dates and times that entire samples were released.

Client Reference

Data can be queried by either part of all of the information in the [Client Reference](#) field for a set of samples.

Project

Data can be queried for one or more projects. See [PROJECT](#) for more information.

Report To/Bill To

Data can be queried for one or more “[report to](#)” or “[bill to](#)” organizations. The type of organization (Report To or Bill To) can be selected from the dropdown list.

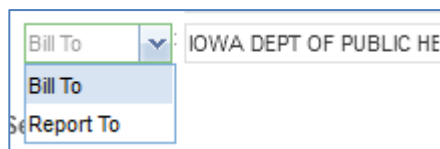


Figure 631 Selecting the Type of Organization

Full or partial names of organizations must be entered in the free-text field; organization ids cannot be used here.



Report To ▼ : MERCY*

Figure 632 Searching by a Partial Organization Name Using the * Wildcard



Report To ▼ : IDNR-FO 2|IDNR-FO 3|IDNF

Figure 633 Searching by Multiple Organization Names Using the | Symbol

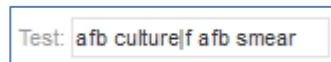
Domain

Data can be limited to one sample domain (Animal, Environmental, Clinical, Newborn Screening, PT, SDWIS) by making the desired selection in this field. If this field is left empty, data will be queried from all sample domains.

Analysis Fields To Search By

Test

Data can be queried for one or more tests.

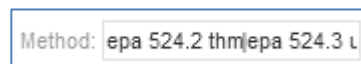


Test: afb culture|f afb smear

Figure 634 Searching by Multiple Test Names Using the | Symbol

Method

Data can be queried for one or more methods.



Method: epa 524.2 thm|epa 524.3 L

Figure 635 Searching by Multiple Method Names Using the | Symbol

Reportable

Data can be limited to [reportable analyses](#) only by selecting “Yes” or non-reportable analyses only by selecting “No”. Leaving this field empty will query for both reportable and non-reportable analyses.

(Analysis) Status

Data can be queried for one or more [analysis statuses](#).

Completed (Date)

Data can be queried by a range of dates that analyses were completed.

(Analysis) Released (Date and Time)

Data can be queried by a range of dates and times that analyses were released.

Section

Data can be queried for one or more [laboratory sections](#) that performed the analyses.

Filters

Exclude Result Override

Selection of this filter will exclude all [result override](#) analyses from the queried data.

Analytes In Single Row

By default Data View outputs each row analyte (both results and auxiliary data) as an individual row in a spreadsheet. Result rows are listed first, followed by any auxiliary data.

Selection of the “Analytes In Single Row” feature displays all of the analytes (both results and auxiliary data) in a single row for an analysis. The results are displayed in a columnar format after the sample and analysis fields. Any auxiliary data will also be displayed as columns after the results. Multiple analyses assigned to a sample will still occupy individual rows.

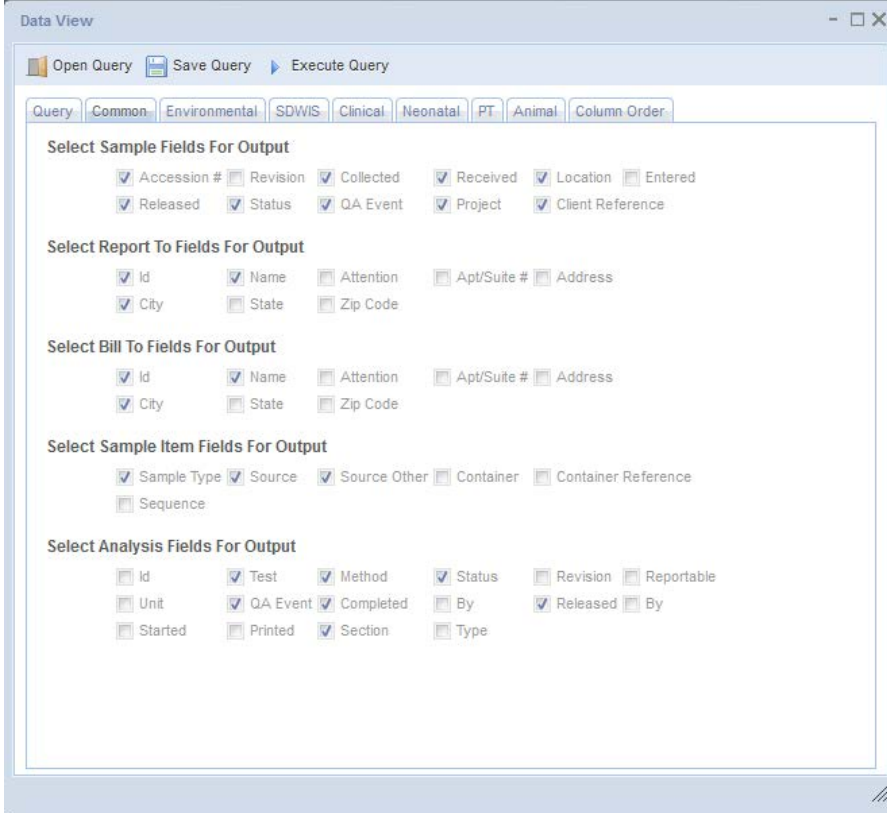
Result

Selection of this filter allows for the exclusion of all results from or the inclusion of not-reportable results within the queried data. Leaving this field empty will query for [reportable results](#) only.

Aux Data

Selection of this filter allows for the exclusion of all auxiliary data from or the inclusion of not-reportable auxiliary data within the queried data. Leaving this field empty will query for [reportable auxiliary data](#) only.

11.26.3 COMMON TAB



The screenshot shows the 'Data View' window with the 'Common' tab selected. The window has a menu bar with 'Open Query', 'Save Query', and 'Execute Query'. Below the menu bar are tabs for 'Query', 'Common', 'Environmental', 'SDWIS', 'Clinical', 'Neonatal', 'PT', 'Animal', and 'Column Order'. The main content area is divided into five sections, each with a title and a list of fields with checkboxes:

- Select Sample Fields For Output:**
 - Accession # Revision Collected Received Location Entered
 - Released Status QA Event Project Client Reference
- Select Report To Fields For Output:**
 - Id Name Attention Apt/Suite # Address
 - City State Zip Code
- Select Bill To Fields For Output:**
 - Id Name Attention Apt/Suite # Address
 - City State Zip Code
- Select Sample Item Fields For Output:**
 - Sample Type Source Source Other Container Container Reference
 - Sequence
- Select Analysis Fields For Output:**
 - Id Test Method Status Revision Reportable
 - Unit QA Event Completed By Released By
 - Started Printed Section Type

Figure 636 Common Tab

The Common tab of the Data View module contains fields that are common to all sample domains. Checkboxes allow for the selection of the fields to be displayed as columns on the Data View spreadsheet. These fields are grouped by their source: Sample, Report To, Bill To, Sample Item, and Analysis.

The fields on this tab are defined below.

Select Sample Fields For Output

Accession #

Selection of this box will display the samples' accession numbers on the spreadsheet.

(Sample) Revision

Selection of this box will display the samples' revision numbers on the spreadsheet. A revision of "0" denotes that there has not been a revision to the sample information.

Collected (Date and Time)

Selection of this box will display the samples' [collected](#) dates and times on the spreadsheet.

Received (Date and Time)

Selection of this box will display the dates and times that the samples were [received](#) at the laboratory.

Location

Selection of this box will display the location that the samples were received at the laboratory. OpenELIS determines this location by parsing the [Location Code](#) from the Description of the Test Request Form file that is attached to the sample during full sample login.

Entered (Date and Time)

Selection of this box will display the dates and times that the samples were initially logged into OpenELIS (through either [Quick Entry](#) or [full sample login](#)).

(Sample) Released (Date and Time)

Selection of this box will display the dates and times that the entire samples were released.

(Sample) Status

Selection of this box will display the [status of the samples](#).

QA Event

Selection of this box will display the names of the [QA events](#) assigned at the sample level (if present).

Project

Selection of this box will display the [project\(s\)](#) that were assigned to the samples.

Client Reference

Selection of this box will display the [Client Reference](#) values for the samples.

Select Report To Fields For Output**(Organization) Id**

Selection of this box will display the [organization ids](#) of the “report to” organizations for the samples.

Name

Selection of this box will display the names of the [“report to”](#) organizations for the samples.

Attention

Selection of this box will display the names of the people at the “report to” organizations to whose attention the results are reported.

Apt/Suite #, Address, City, State, Zip Code

Selection of these boxes will display the complete address information of the “report to” organization.

Select Bill To Fields For Output**(Organization) Id**

Selection of this box will display the [organization ids](#) of the “bill to” organizations for the samples.

Name

Selection of this box will display the names of the [“bill to”](#) organizations for the samples.

Attention

Selection of this box will display the names of the people at the “bill to” organizations to whose attention the billing information should be sent.

Apt/Suite #, Address, City, State, Zip Code

Selection of these boxes will display the complete address information of the “bill to” organization.

Select Sample Item Fields For Output**Sample Type**

Selection of this box will display the [sample types](#) of the sample items.

Source

Selection of this box will display the [sources](#) of the sample items (if present).

Source Other

Selection of this box will display the [Source Other](#) information of the sample items (if present).

Container

Selection of this box will display the [containers](#) that were used to hold the sample items (if present).

Container Reference

Selection of this box will display the [container references](#) for the sample items (if present).

Sequence

Selection of this box will display the item numbers of the [sample items](#).

Select Analysis Fields For Output

(Analysis) Id

Selection of this box will display the unique ids of the analyses. This can be used to distinguish individual analyses performed in replicate on the same sample.

Test

Selection of this box will display the [tests](#) that were assigned to the samples.

Method

Selection of this box will display the [methods](#) that were assigned to the samples.

(Analysis) Status

Selection of this box will display the [status of the analyses](#).

(Analysis) Revision

Selection of this box will display the analyses' [revision](#) numbers on the spreadsheet. A revision of "0" denotes that there has not been a revision to the analysis.

Reportable

Selection of this box will display whether the analyses are [reportable](#) or not.

Unit

Selection of this box will display the [units of measurement](#) for the analyses (if present).

QA Event

Selection of this box will display the names of the [QA events](#) assigned at the analysis level (if present).

(Analysis) Completed (Date and Time)

Selection of this box will display the dates and times that the analyses were [completed](#).

(Completed) By

Selection of this box will display the usernames of the analysts who completed the analyses.

(Analysis) Released (Date and Time)

Selection of this box will display the dates and times that the analyses were [released](#).

(Released) By

Selection of this box will display the usernames of the analysts who released the analyses.

Started (Date and Time)

Selection of this box will display the dates and times that the analyses were [started](#) (initiated).

Printed (Date and Time)

Selection of this box will display the dates and times that the analyses were (or would have been) printed on the Final Report.

Section

Selection of this box will display the names of the [sections](#) who performed the analyses.

(Analysis) Type

Selection of this box will display the type of the analyses (if present). The [analysis types](#) currently in OpenELIS are Dilution, Preliminary, and Preliminary Final.

11.26.4 ENVIRONMENTAL TAB

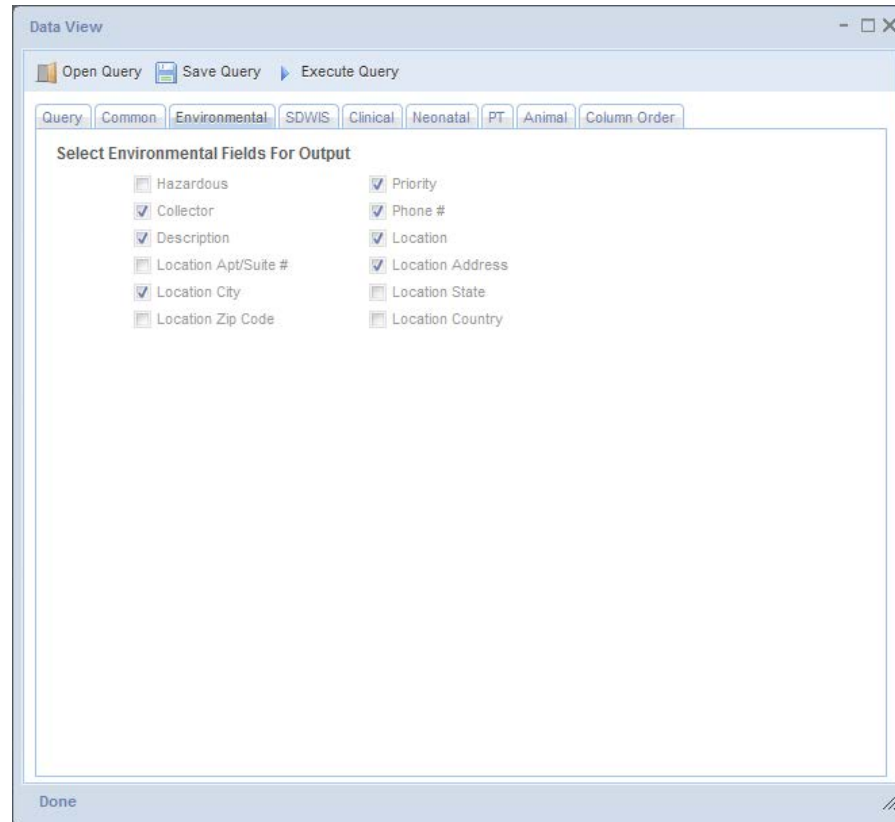


Figure 637 Environmental Tab

The Environmental tab contains fields that are specific to the Environmental sample domain. Checkboxes allow for the selection of the fields to be displayed as columns on the Data View spreadsheet.

The fields on this tab are defined below.

Hazardous

Selection of this box will display whether the samples are considered hazardous.

Priority

Selection of this box will display the [priority](#) of the samples (if present).

(Environmental) Collector

Selection of this box will display the [collectors](#) of the environmental samples.

(Collector) Phone #

Selection of this box will display the phone numbers of the collectors.

(Sample) Description

Selection of this box will display the [descriptions](#) of the samples.

(Sample Collection) Location

Selection of this box will display the names of the sample collection [locations](#).

Location Apt/Suite #, Address, City, State, Zip Code, Country

Selection of these boxes will display the complete address information of the collection locations (if present).

11.26.5 SDWIS TAB

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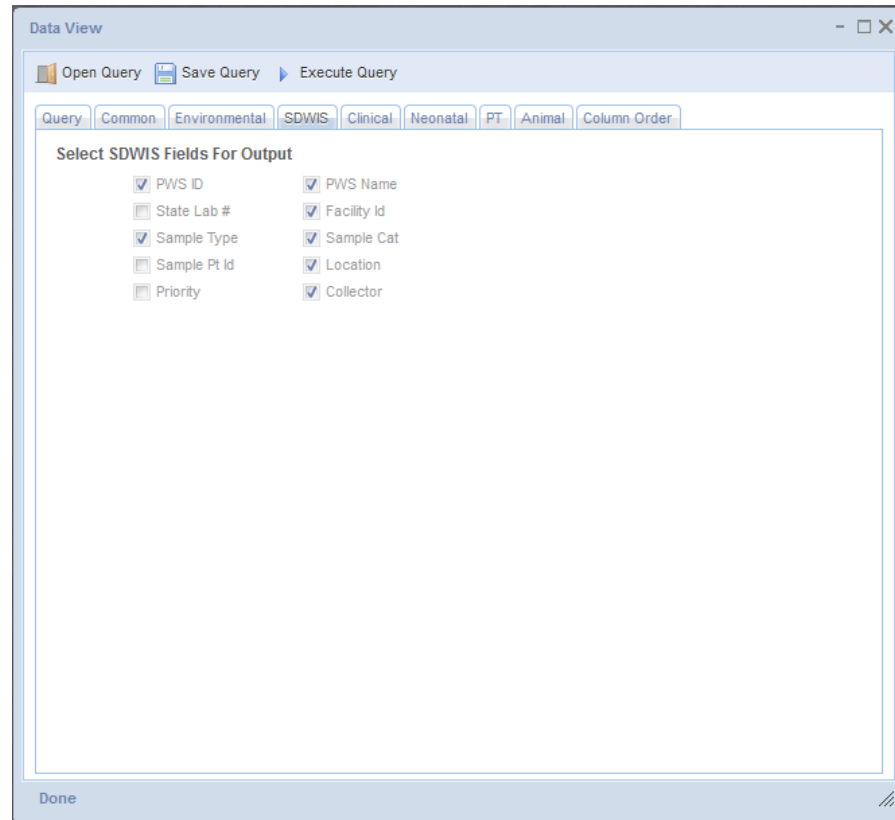


Figure 638 SDWIS Tab

The SDWIS tab contains fields that are specific to the SDWIS sample domain. Checkboxes allow for the selection of the fields to be displayed as columns on the Data View spreadsheet.

The fields on this tab are defined below.

PWS Id

Selection of this box will display the [PWS Ids](#) of the public water supplies that were tested.

PWS Name

Selection of this box will display the names of the public water supplies that were tested.

State Lab #

Selection of this box will display the laboratory id that was assigned to the testing laboratory by the state's laboratory certification program.

Facility Id

Selection of this box will display the state assigned water system facility ids, also known as the [State IDs](#).

(SDWIS) Sample Type

Selection of this box will display the SDWIS sample types specified for these samples. SDWIS sample types include: Routine, Repeat, Special, Replacement, and Confirmation.

Sample Cat(egory)

Selection of this box will display the SDWIS sample categories specified for these samples. The sample categories currently are: Bacterial, Radio Chemical, Chemical, and Pb/Cu.

Sample Pt (Point) Id

Selection of this box will display the ids of the sample points.

(Sample Point) Location

Selection of this box will display the descriptions of the sample point locations.

Priority

Selection of this box will display the [priority](#) of the samples (if present).

(SDWIS) Collector

Selection of this box will display the [collectors](#) of the SDWIS samples.

11.26.6 CLINICAL TAB

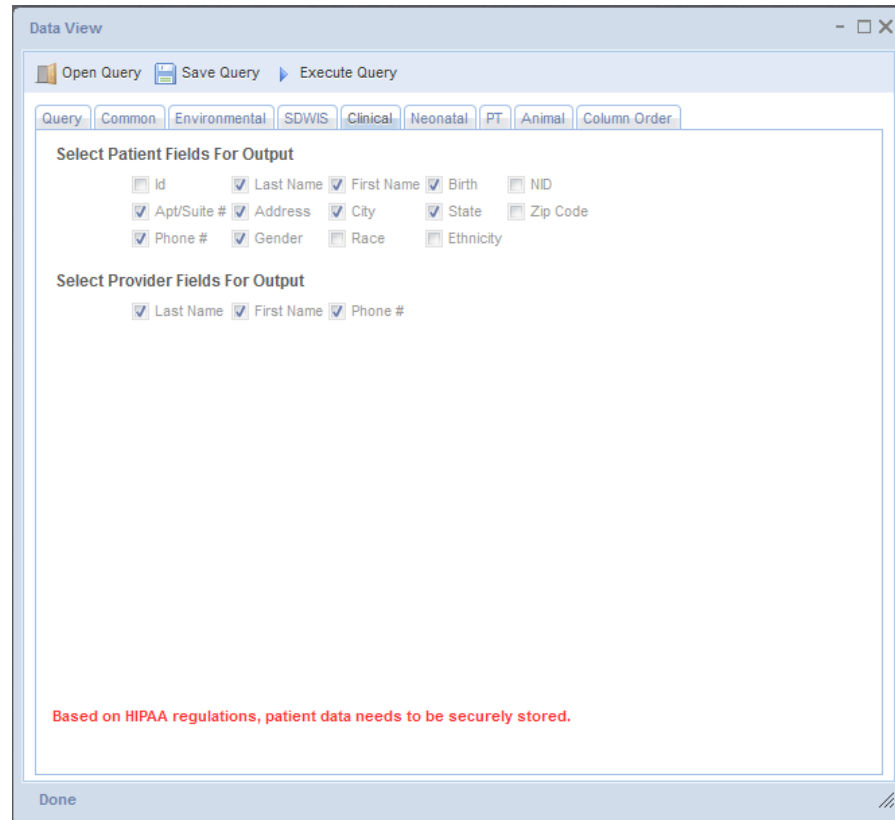


Figure 639 Clinical Tab

The Clinical tab contains fields that are specific to the Clinical sample domain. Checkboxes allow for the selection of the fields to be displayed as columns on the Data View spreadsheet.

The fields on this tab are defined below.

(Patient) Id

Selection of this box will display the unique OpenELIS ids of the patients who were tested.

(Patient) Last Name

Selection of this box will display the last names of the patients who were tested.

(Patient) First Name

Selection of this box will display the first names of the patients who were tested.

Birth(date)

Selection of this box will display the birthdates of the patients who were tested.

NID

Selection of this box will display the [National Identifiers](#) of the patients who were tested.

Apt/Suite #, Address, City, State, Zip Code

Selection of these boxes will display the complete address information of the patients who were tested.

(Patient) Phone #

Selection of this box will display the phone numbers of the patients who were tested.

Gender

Selection of this box will display the gender of the patients who were tested.

Race

Selection of this box will display the race of the patients who were tested.

Ethnicity

Selection of this box will display the ethnicity of the patients who were tested.

(Provider) Last Name

Selection of this box will display the last names of the health care providers for the patients.

(Provider) First Name

Selection of this box will display the first names of the health care providers for the patients.

(Provider) Phone #

Selection of this box will display the phone numbers of the health care providers for the patients.

11.26.7 NEONATAL TAB

11.26.8 PT TAB

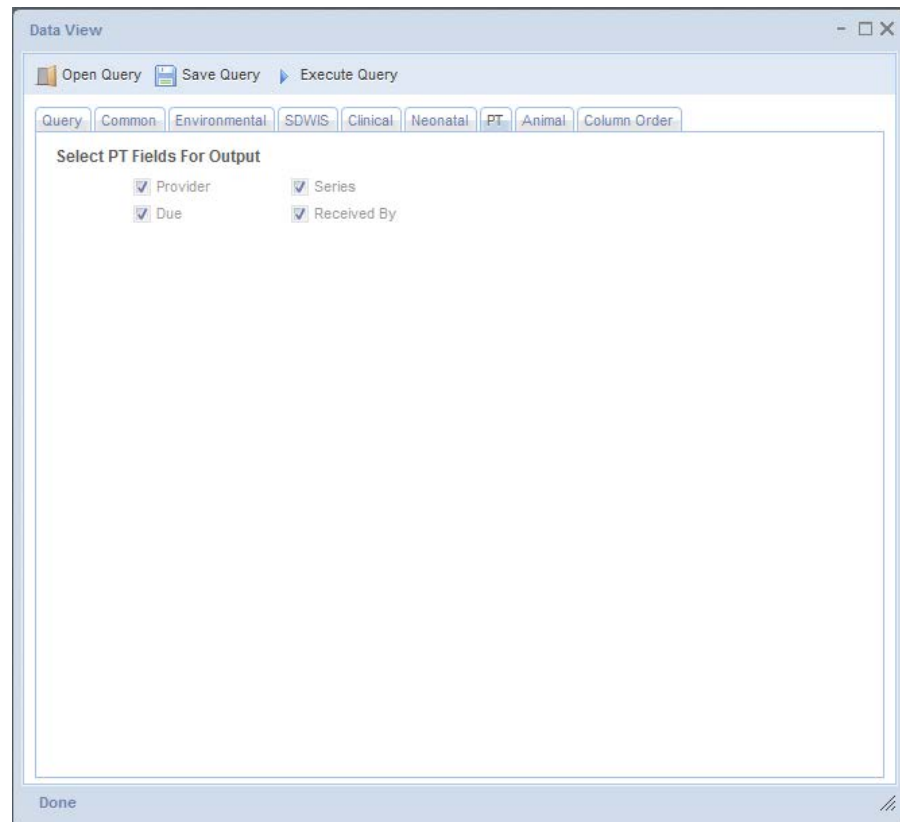


Figure 640 PT Tab

The PT tab contains fields that are specific to the PT sample domain. Checkboxes allow for the selection of the fields to be displayed as columns on the Data View spreadsheet.

The fields on this tab are defined below.

Provider

Selection of this box will display the names of the providers of the PT samples.

Series

Selection of this box will display the names of the PT series.

Due

Selection of this box will display the dates and times when the PT samples' results are due to the PT providers.

Received By

Selection of this box will display the OpenELIS usernames of the persons who received the PT samples.

11.26.9 ANIMAL TAB

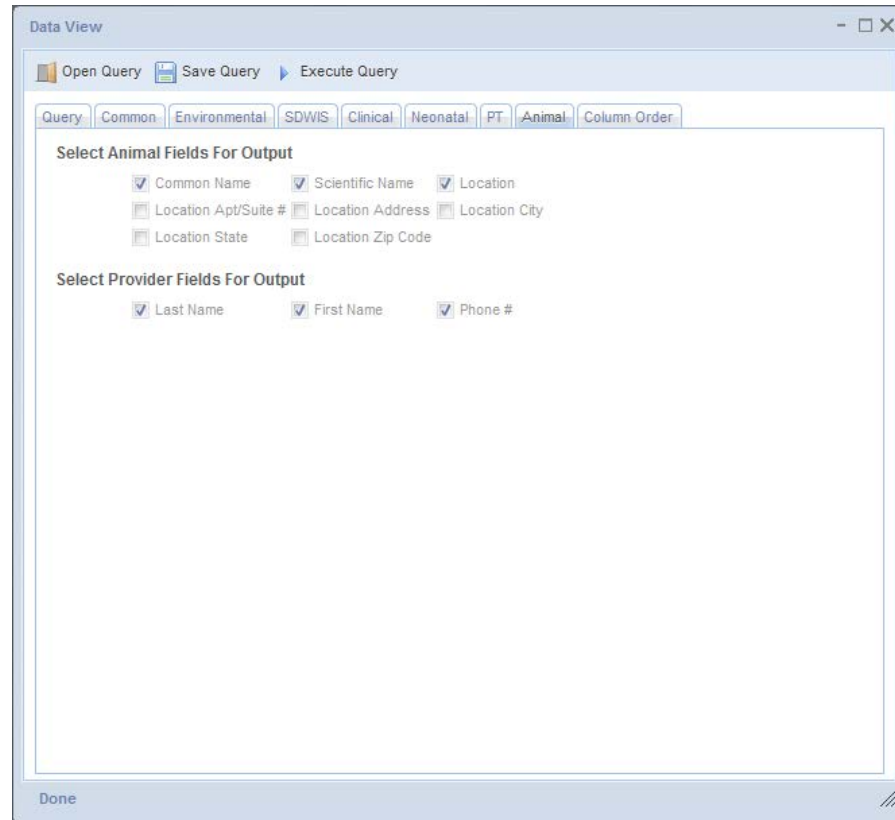


Figure 641 Animal Tab

The Animal tab contains fields that are specific to the Animal sample domain. Checkboxes allow for the selection of the fields to be displayed as columns on the Data View spreadsheet.

The fields on this tab are defined below.

Common Name

Selection of this box will display the common names of the animals that were tested.

Scientific Name

Selection of this box will display the scientific names (if present) of the animals that were tested.

Location

Selection of this box will display the names of the collection locations of the animal samples (or locations of the animal incidents), if present.

Location Apt/Suite #, Address, City, State, Zip Code

Selection of these boxes will display the complete address information of the animal collection/incident locations (if present).

(Provider) Last Name

Selection of this box will display the last names of the veterinarians/health care providers for the samples.

(Provider) First Name

Selection of this box will display the first names of the veterinarians/health care providers for the samples.

(Provider) Phone #

Selection of this box will display the phone numbers of the veterinarians/health care providers for the samples.

11.26.10 COLUMN ORDER TAB

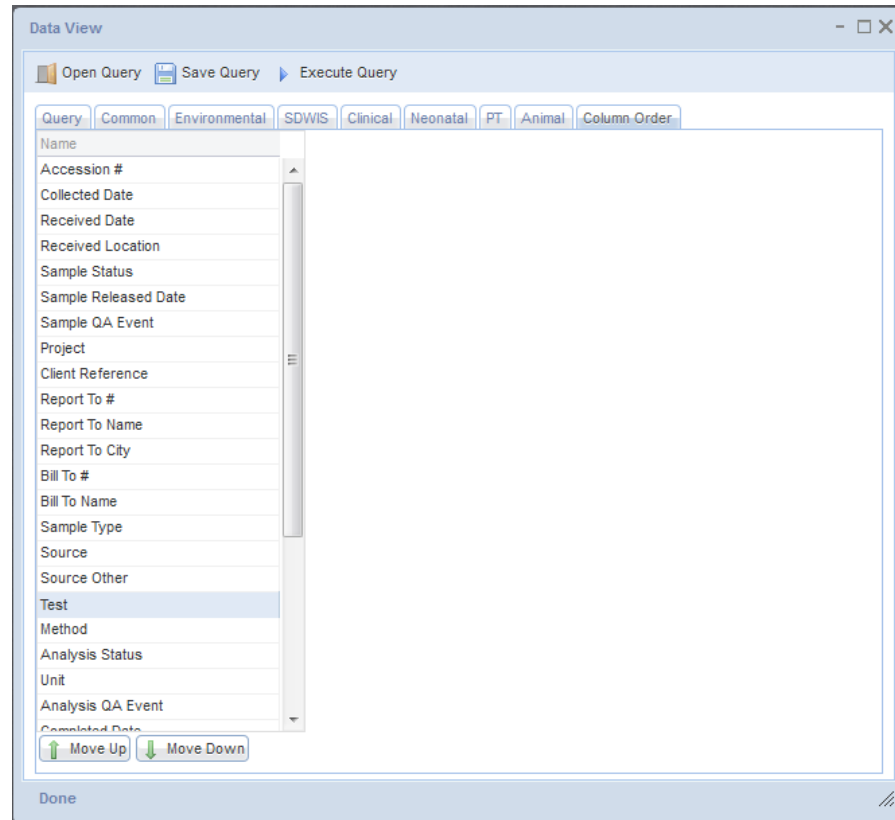


Figure 642 Column Order Tab

By default, the columns on the Data View spreadsheet are outputted in the order that the fields are checked on the Common and domain-specific tabs.

The **Move Up** and **Move Down** buttons on the Column Order tab are used to rearrange this order.

11.26.11 HOW TO GENERATE A DATA VIEW SPREADSHEET

Several steps must be performed in order to generate a Data View spreadsheet. These are outlined below.

1. Enter the search parameters on the Query tab. At least one pair of "From" and "To" fields must have values entered. Examples would include the Accession #, Collected, Received, and Released fields. Unless the analysis released date, the sample released date, or an analysis status of released is used for the query,

results may contain default values that are present in the test definition. As always, entering information in multiple fields will limit your query.

2. Restrict the data to a specific sample domain by using the Domain dropdown field (if desired). If this field is left empty, data will be queried from all sample domains.
3. Apply any filters (if desired). For example, in order to perform a count of analyses, [exclude all results](#) and [aux data](#).
4. Select the fields for output to the spreadsheet from the Common tab and the domain-specific tab (if desired). It is recommended that at least a few fields (i.e., Accession #, Sample or Analysis Status, (Report To or Bill To) Name, Sample Type) be selected to distinguish analyses in the spreadsheet. Use the Column Order tab to rearrange the order of the outputted columns.
5. Click the **Execute Query** button at the top of the screen.
6. The Filter by Test Analyte and Aux Data screen will pop up. Select the test analyte(s) and/or auxiliary data in the left-hand panes to use to filter the data. The output can also be filtered to only display specific test results and/or aux data values by selecting them in the right-hand panes. Alternatively, use the **Select All** buttons to display all of the corresponding analysis results and auxiliary data values. Aux data will only be displayed for samples that possess the selected results. However, all of the aux data values will be displayed if the [Exclude All filter is selected for the results](#).

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Filter by Test Analyte and Aux Data

Test Analyte

Name
<input checked="" type="checkbox"/> Acid Fast Bacillus
<input type="checkbox"/> Adenovirus
<input type="checkbox"/> Arthropod Identified
<input type="checkbox"/> Atmospheric requirement
<input type="checkbox"/> Bordetella pertussis
<input type="checkbox"/> CFTR Gene
<input type="checkbox"/> Chlamydia rRNA
<input type="checkbox"/> Chlamydia pneumoniae DNA
<input type="checkbox"/> Cluster Code
<input type="checkbox"/> Cryptosporidium sp.

Select All Unselect All

Result

<input type="checkbox"/> Negative, with contaminants
<input type="checkbox"/> No Acid Fast Bacillus isolated after 3 weeks
<input type="checkbox"/> Negative
<input checked="" type="checkbox"/> Positive
<input type="checkbox"/> No Acid Fast Bacillus isolated
<input checked="" type="checkbox"/> Acid Fast Bacillus isolated with contaminants
<input checked="" type="checkbox"/> Acid Fast Bacillus isolated, Identification to fo...
<input type="checkbox"/> Redigest
<input checked="" type="checkbox"/> Acid Fast Bacillus isolated

Select All Unselect All

Aux Data

Name
<input type="checkbox"/> Amount Enclosed
<input type="checkbox"/> POC Nitrate
<input type="checkbox"/> POC Sulfate
<input type="checkbox"/> POC TO-11
<input type="checkbox"/> POC TO-12
<input type="checkbox"/> POC TO-15
<input type="checkbox"/> Purchase Order
<input type="checkbox"/> State Code

Select All Unselect All

Value

<input type="checkbox"/> 1985

Select All Unselect All

Run Report Cancel

Done

Figure 643 Filter by Test Analyte and Aux Data Pop-up Screen

7. Click the **Run Report** button.
8. Open or save the Data View Spreadsheet.

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	A	B	C	D	E	F	G	H	I	J	K
1	Accession #	Collection Date	Released Date	Sample Status	Sample Type	Test	Method	Location City	Analyte	Value	Quant Limit
2	22706	2012-03-19 12:30	2012-04-02 10:26	Released	Air	asbestos	niosh 7400	CEDAR RAPIDS	Fiber Density	110 fibers/mm2	7 fibers/mm2
3	22706	2012-03-19 12:30	2012-04-02 10:26	Released	Air	asbestos	niosh 7400	CEDAR RAPIDS	Fibers	0.12	0.010
4	22706	2012-03-19 12:30	2012-04-02 10:26	Released	Air	asbestos	niosh 7400	CEDAR RAPIDS	IntraLab Sr	0.16	no units
5	22706	2012-03-19 12:30	2012-04-02 10:26	Released	Air	asbestos	niosh 7400	CEDAR RAPIDS	IntraLab Sr	0.11	no units
6	22706	2012-03-19 12:30	2012-04-02 10:26	Released				CEDAR RAPIDS	Flow Rate	x2	
7	22706	2012-03-19 12:30	2012-04-02 10:26	Released				CEDAR RAPIDS	Start Date and Time	2012-03-19 12:30	
8	22706	2012-03-19 12:30	2012-04-02 10:26	Released				CEDAR RAPIDS	Stop Date and Time	2012-03-19 15:30	
9	22706	2012-03-19 12:30	2012-04-02 10:26	Released				CEDAR RAPIDS	Volume Collected	180	
10	22707	2012-03-19 12:30	2012-04-02 10:25	Released	Air	asbestos	niosh 7400	CEDAR RAPIDS	Fiber Density	<7 fibers/mm2	7 fibers/mm2
11	22707	2012-03-19 12:30	2012-04-02 10:25	Released	Air	asbestos	niosh 7400	CEDAR RAPIDS	Fibers	<0.045	0.045
12	22707	2012-03-19 12:30	2012-04-02 10:25	Released	Air	asbestos	niosh 7400	CEDAR RAPIDS	IntraLab Sr	0.16	no units
13	22707	2012-03-19 12:30	2012-04-02 10:25	Released	Air	asbestos	niosh 7400	CEDAR RAPIDS	IntraLab Sr	0.25	no units
14	22707	2012-03-19 12:30	2012-04-02 10:25	Released				CEDAR RAPIDS	Flow Rate	x2	
15	22707	2012-03-19 12:30	2012-04-02 10:25	Released				CEDAR RAPIDS	Start Date and Time	2012-03-19 12:30	
16	22707	2012-03-19 12:30	2012-04-02 10:25	Released				CEDAR RAPIDS	Stop Date and Time	2012-03-19 13:00	
17	22707	2012-03-19 12:30	2012-04-02 10:25	Released				CEDAR RAPIDS	Volume Collected	60	
18	22708	2012-03-20 08:30	2012-04-02 10:26	Released	Air	asbestos	niosh 7400	CEDAR RAPIDS	Fiber Density	<7 fibers/mm2	7 fibers/mm2
19	22708	2012-03-20 08:30	2012-04-02 10:26	Released	Air	asbestos	niosh 7400	CEDAR RAPIDS	Fibers	<0.010	0.010
20	22708	2012-03-20 08:30	2012-04-02 10:26	Released	Air	asbestos	niosh 7400	CEDAR RAPIDS	IntraLab Sr	0.16	no units
21	22708	2012-03-20 08:30	2012-04-02 10:26	Released	Air	asbestos	niosh 7400	CEDAR RAPIDS	IntraLab Sr	0.25	no units

Figure 644 Data View Spreadsheet

11.27 SAMPLE QC

The link to the Sample QC screen is found in the [Data Export section of the Report Menu](#).

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