

# USING LIMS TO STREAMLINE YOUR QUALITY MANAGEMENT SYSTEM (QMS)



**Presented by:**  
**Stephen Wesson, Director of Sales**  
**Accelerated Technology Laboratories**



# Agenda

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What is a Quality Assurance Manual?

What is a LIMS?

Outline of A Quality Assurance Manual

Sectional Review of Using LIMS as the backbone to your QAM

Laboratory Documents you can get directly from the LIMS

Review and Q & A

# What is a Laboratory Quality Assurance Manual?

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- A living document stating the Laboratories Policies and Procedures designed to manage quality in accordance with the requirements established by a governing Agency or Agencies.

*"Say what you do! Do what you say!  
And Document the heck out of it!"*

# The Modern LIMS

- Today's LIMS provide laboratories with functionality that extends well beyond – **A Database for Sample Tracking, Data Entry and Reporting.**
- A modern **LIMS** should be the backbone of the Lab's QMS, **offering support for regulatory compliance like ISO 17025, NELAC** and related regulations.



# Sections of a Quality Assurance Manual

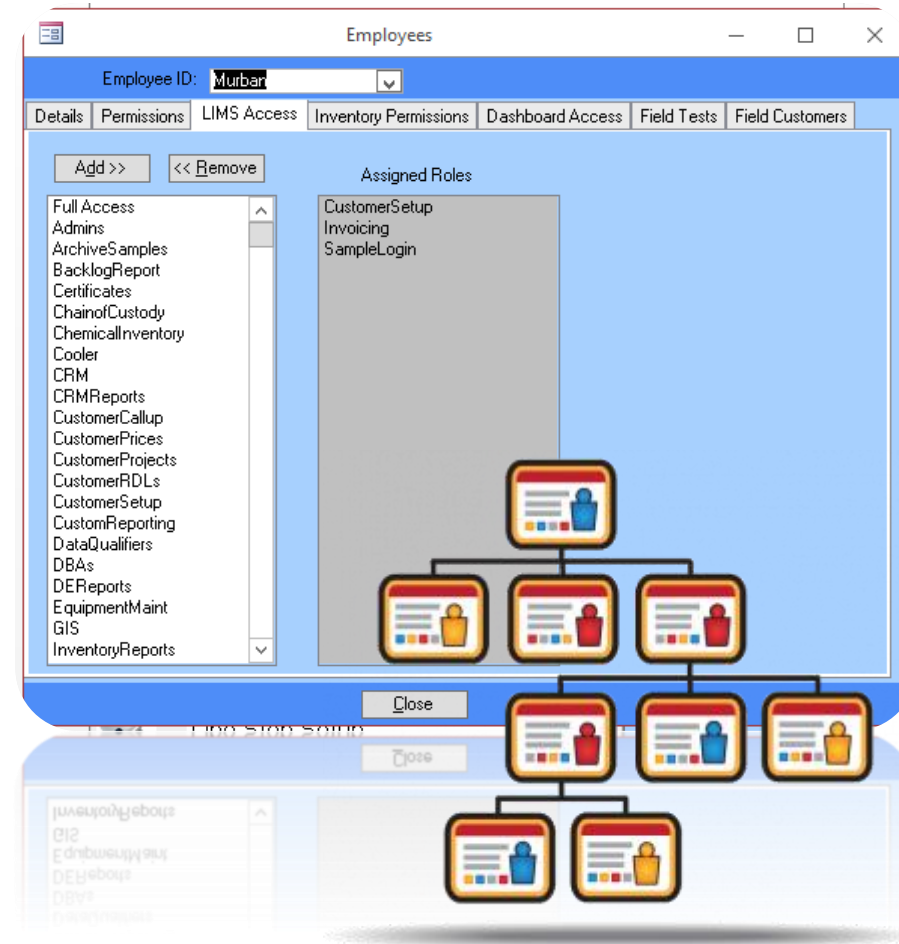
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- |                                       |   |
|---------------------------------------|---|
| 1) Title Page                         | 15) Preventive Action                           |
| 2) Table of contents                  | 16) Control of Records                          |
| 3) Introduction and Scope             | 17) Audits                                      |
| 4) <b>Organization</b>                | 18) Management Review                           |
| 5) Management                         | 19) <b>Data Integrity Investigations</b>        |
| 6) <b>Document control</b>            | 20) <b>Personnel</b>                            |
| 7) <b>Review of Requests</b>          | 21) Accommodations and Environmental Conditions |
| 8) <b>Subcontracting</b>              | 22) Methods and Method validation               |
| 9) <b>Purchasing</b>                  | 23) <b>Calibration Requirements</b>             |
| 10) Service to clients                | 24) <b>Measurement Traceability</b>             |
| 11) <b>Complaints</b>                 | 25) <b>Collection of Samples</b>                |
| 12) <b>Control of Non-conformance</b> | 26) <b>Handling Samples and Test Items</b>      |
| 13) <b>Improvement</b>                | 27) <b>Quality Assurance for Testing</b>        |
| 14) <b>Corrective Actions</b>         | 28) <b>Reporting and Results</b>                |

\* TNI 2016 Quality Manual Template

# 4 – Organization & 20 - Personnel

Specify the responsibility, authority and interrelationship of all personnel who manage, perform or verify work affecting the results of laboratory activities



# 6 – Document Control

- Ensure that all documents are approved, reviewed, with current versions identified. “Controlled Documents”

Analysis Methods

Drag a column header here to group by that column.

Name	Method Reference	Version	Activated Date	Retired Date	Category	Type	Method Identifier	Aliquot Container
TKN (Subcontracted)	EPA 351.2_108585 TKN (Subcontracted)		04/10/2018					250 mL Plastic
MSD-Ammonia Salicylate rev. 2	EPA 350.1_8347 MSD-Ammonia Salicylate rev. 2		05/29/2016					250mL Plastic TN
MS-Ammonia Salicylate rev. 2	EPA 350.1_8343 MS-Ammonia Salicylate rev. 2		05/29/2016					250mL Plastic TN
FR/RE-Ammonia Salicylate rev. 2	EPA 350.1_5855 FR/RE-Ammonia Salicylate rev. 2		05/29/2016					250mL Plastic TN
xxx Salicylate	EPA 350.1_5315 xxx Salicylate		05/29/2016					250mL Plastic TN
Ammonia, 350.1	EPA 350.1	20th Edition	01/01/2011	09/29/2012	Wet	Spectrophotometry		250 mL Plastic
Cyanide by 335.4(SC)	EPA 335.4_19669 Cyanide by 335.4(SC)		05/29/2016					250mL Plastic (se
Chlorine Residual	EPA 334, Chlorine Residual		01/01/2011					Product Packagin
Bromide	EPA 320.1_61 Bromide		01/01/2011		Wet	Titrimetry		Plastic Jar
Dionex Scan	EPA 300.7_107568 Dionex Scan		01/25/2018					250 mL Plastic
▶ Anions	EPA 300.0_258 Anions	2.1	01/01/2013		General Analysis	IC		Plastic Bottle
MSD-Sulfate IC	EPA 300.0_14480 MSD-Sulfate IC		05/29/2016					250mL Plastic
MS-Sulfate IC	EPA 300.0_14476 MS-Sulfate IC		05/29/2016					250mL Plastic
Sulfate IC	EPA 300.0_14459 Sulfate IC		05/29/2016					250mL Plastic
Nitrate and Nitrite (NO <sub>3</sub> ), TKN, TN	EPA 30.0 & STM 4500N		12/03/2018					125mL Plastic
MSD-Mercury AA Cold Vapor Ma rev. 2	EPA 245.1_6134 MSD-Mercury AA Cold Vapor Ma rev. 2		05/29/2016					500mL Plastic
MS-Mercury AA Cold Vapor Ma rev. 2	EPA 245.1_6128 MS-Mercury AA Cold Vapor Ma rev. 2		05/29/2016					500mL Plastic
FR/RE-Mercury AA Cold Vapor Ma rev. 2	EPA 245.1_5943 FR/RE-Mercury AA Cold Vapor Ma rev. 2		05/29/2016					500mL Plastic
Mercury AA Cold Vapor Manual	EPA 245.1_5309 Mercury AA Cold Vapor Manual		05/29/2016					500mL Plastic
CR6 (218.6)	EPA 218.6_299 CR6 (218.6)		12/19/2013					Plastic Bag

Filter Refresh Create Delete



# 7 - Review of Requests, Tenders & Contracts

Customers

Customer: 1 WWT

Details Contacts Projects Project Sampling Project Pricing Project Parameters Project QC Types RDLs Reports

Project ID	Project Number	ProjectName	Project Location	De
All Daily		All Daily Type Samples		
CEFF10 Daily		CEFF10	Comp Final Eff SS#10	
CNPI02 & 3 CNPI02 D				
CNPI02 Daily		CNPI02	No. Prim. Inf. SS# 2	
CNPI03 Daily		CNPI03	No. Prim. Inf. SS# 3	
Friday				Friday routine plant daily sample
Holiday				Holiday samples
Monday				Monday routine plant daily sample
Monthly River				Routine monthly river sampling
new				
Saturday				Weekend Samples
SDW0710 Daily		SDW0710	Dig. W. 7 thru 10	
SMLP-Monthly				Monthly Marina Sample-with out
SMLP-Quarterly				Quarterly Marina Sample
Sunday				Weekend Samples
Thursday				Thursday routine plant daily sample
Tuesday				Tuesday routine plant daily sample
Wednesday				Wednesday routine plant daily sample

Record: 14 No Filter Search

Close

Ensure that requirements of requests, tenders and contracts are **adequately defined, documented and understood.**

Record: 14 No Filter Search

Close



# 8 - Subcontracting of Tests

Customers

Quotes (Last 30 Days)

Work Orders (Last 30 Days)

Delivery Orders (Last 30 Days)

Sales

Invoices (Last 30 Days)

Return Authorizations

Credit Memos

Purchase Orders (Last 30/Created)

Ordered Products (Last 30/Created)

Purchase Requisitions (Last 30 Days)

Purchasing

Inventory Items (Available)

Products (Active)

Production Batches Management

Product

Rental Orders

Rental Returns

Rentals

Administration

Work Order - W-211104-01

Sample - W-211104-01-01 (York ...

Container - W-211104-01-01-3

Aliquot - W-211104-01-01-3-1

Products (Active)

Product - Nessler's Reagent

Sample - W-211104-01-01 (York River State Park (11/4/2021))

General

Composite

Description\Comment

Containers

Conditions

Planned Analyses

Guaranteed Limits

Product Specifications

CAPAs

Files

Aliquots

Aliquot Preparations

Results

Results w/Limits

Drag a column header here to group by that column.

	Aliquot #	Aliquot Date	Analysis Method	Container Type	Original Amount	Promised Due Date	Subcontracted	Subcontracted Vendor Service	Subcontracted Date
		=			=	=			=
	W-211104-01-01-1-1	11/04/2021	TSS, deferred	250 mL Plastic	20.00000		<input type="checkbox"/>		
	W-211104-01-01-1-2	11/04/2021	Ammonium Nitrogen	250 mL Plastic	40.00000		<input type="checkbox"/>		
	W-211104-01-01-2-1	11/04/2021	Coliform; E.coli Colisure P/	100mL Plastic Whi	25.00000		<input type="checkbox"/>		
▶	W-211104-01-01-3-1	11/04/2021	BOD 5-Day	500mL Plastic BO	50.00000		<input checked="" type="checkbox"/>	Eaton Analytical : BOD 5-Day	11/4/2021 10:14
	W-211104-01-01-4-1	11/04/2021	BTEX	VOA	40.00000		<input type="checkbox"/>		
	W-211104-01-01-5-1	11/04/2021	Conductivity - Field	Plastic Bottle	25.00000		<input type="checkbox"/>		
	W-211104-01-01-5-2	11/04/2021	pH Field	Plastic Bottle	25.00000		<input type="checkbox"/>		
	W-211104-01-01-5-3	11/04/2021	Turbidity	Plastic Bottle	25.00000		<input type="checkbox"/>		

<

Filter

# 8 - Subcontracting of Tests

Customers

Quotes (Last 30 Days)

Work Orders (Last 30 Days)

Delivery Orders (Last 30 Days)

Invoices (Last 30 Days)

Return Authorizations

Credit Memos

Purchase Orders (Last 30/Created)

Ordered Products (Last 30/Created)

Purchase Requisitions (Last 30 Days)

Inventory Items (Available)

Products (Active)

Production Batches

Management

Rental Orders

Rental Returns

Administration

Vendors

Vendor - Eaton Analytical

Vendor Service - Eaton Analytical : BO...

Work Orders (Last 30 Days)

Aliquots (Last 30 Days)

Work Order - W-211104-01

Sample - W

Vendor - Eaton Analytical

Name

Eaton Analytical

Account Number

Description

Phone

(626) 386-1100

Email

Fax

Web

☒ Active

Vendor Products

Vendor Services

Vendor Facilities

Addresses

Contacts

Purchase Orders

Vendor Service Accreditations

Limits

CAPAs

User Defined

Files

Drag a column header here to group by that column.

	Service	Service Code	Price	Description
<input checked="" type="checkbox"/>			=	
	Metals Analysis, EPA 200.8	ICP-01	9.87	
	Carbonaceous Biochemical	CBOD-01	15.95	
	TKN (Subcontracted)	TKN(rcid)	6.95	
	BOD 5-Day	BOD5	45.00	

Filter

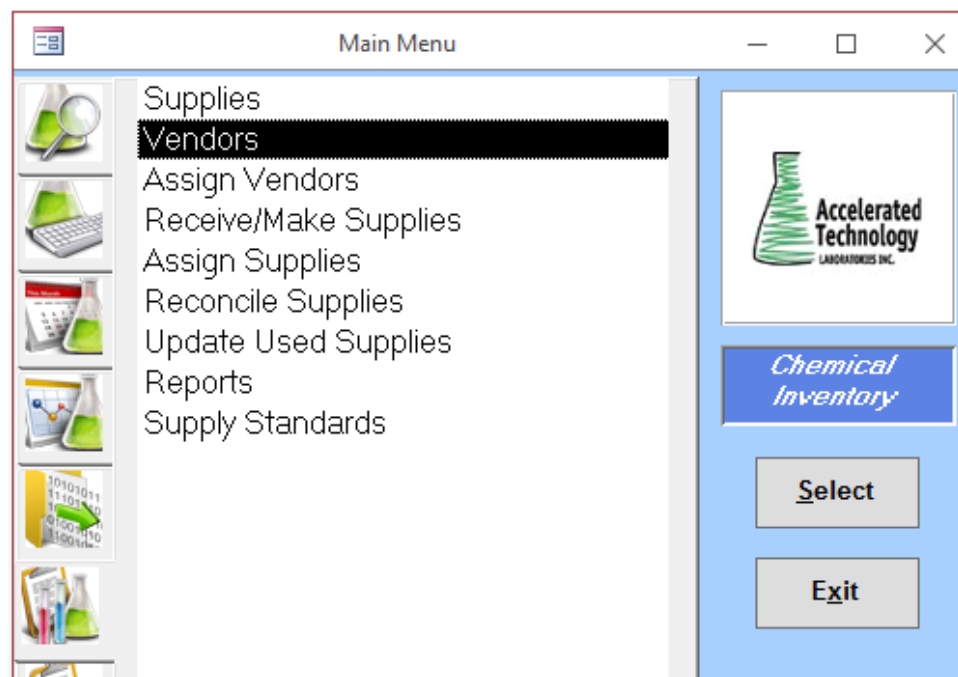
Refresh

Create

Showing 5 item(s)

# 9 – Purchasing Services & Supplies

Approval of Suppliers and a documented procedure for tracking supplies and quality records.



**Main Menu**

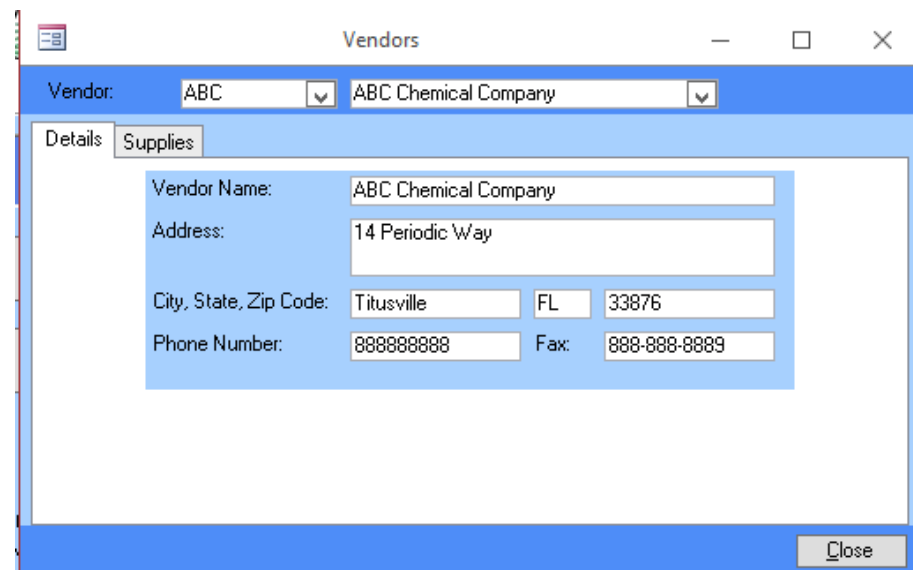
- Supplies
- Vendors**
- Assign Vendors
- Receive/Make Supplies
- Assign Supplies
- Reconcile Supplies
- Update Used Supplies
- Reports
- Supply Standards

**Accelerated Technology LABORATORIES INC.**

**Chemical Inventory**

**Select**

**Exit**



**Vendors**

Vendor:

**Details** **Supplies**

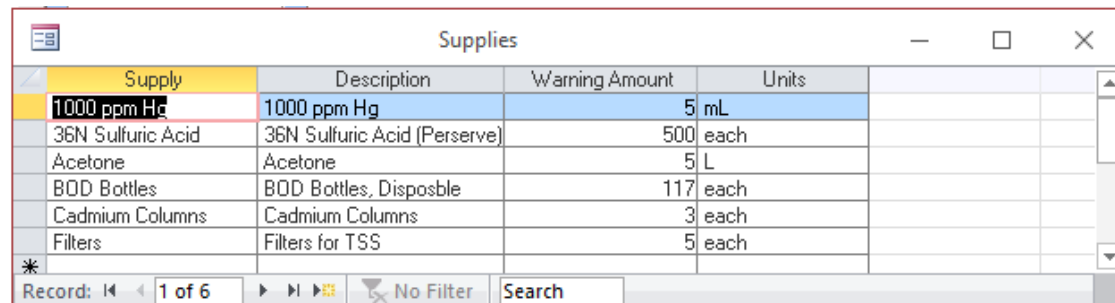
Vendor Name:

Address:

City, State, Zip Code:

Phone Number:  Fax:

**Close**



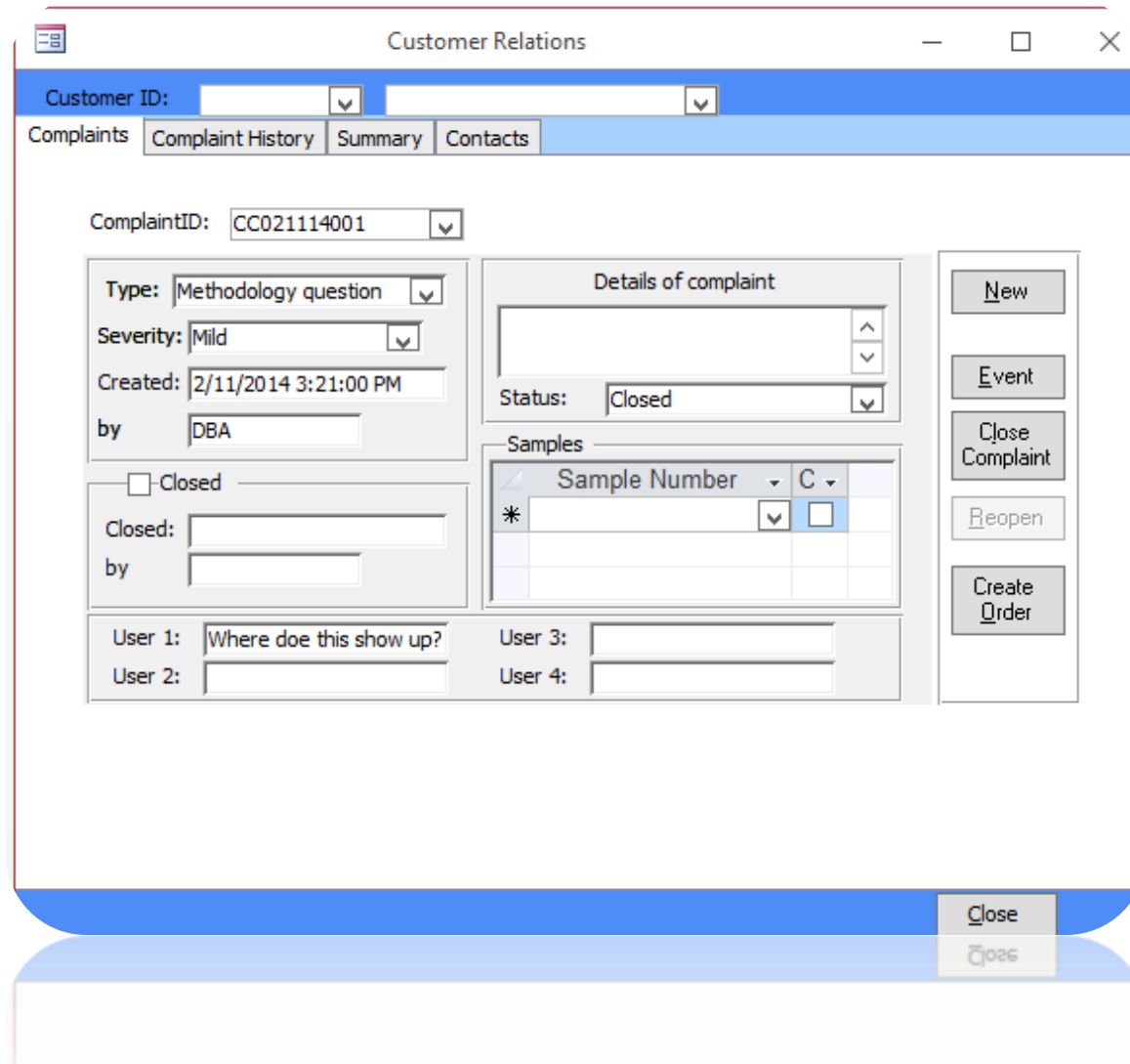
**Supplies**

Supply	Description	Warning Amount	Units
1000 ppm Hg	1000 ppm Hg	5	mL
36N Sulfuric Acid	36N Sulfuric Acid (Perseve)	500	each
Acetone	Acetone	5	L
BOD Bottles	BOD Bottles, Disposable	117	each
Cadmium Columns	Cadmium Columns	3	each
Filters	Filters for TSS	5	each

Record: 1 of 6 No Filter Search

# 11 – Customer Complaints

The laboratory shall have a documented process to receive, evaluate and make decisions on complaints.



The screenshot displays the 'Customer Relations' software window. At the top, there are tabs for 'Complaints', 'Complaint History', 'Summary', and 'Contacts'. The 'Complaints' tab is active. Below the tabs, the 'ComplaintID' is set to 'CC021114001'. The form includes fields for 'Type' (Methodology question), 'Severity' (Mild), 'Created' (2/11/2014 3:21:00 PM), and 'by' (DBA). There is a 'Closed' checkbox and a 'Closed by' field. A 'Details of complaint' section contains a text area and a 'Status' dropdown set to 'Closed'. A 'Samples' table is visible with columns for 'Sample Number' and 'C'. The table has one row with an asterisk in the 'Sample Number' column. On the right side, there are buttons for 'New', 'Event', 'Close Complaint', 'Reopen', and 'Create Order'. At the bottom, there are fields for 'User 1' (Where doe this show up?), 'User 2', 'User 3', and 'User 4'. A 'Close' button is located at the bottom right of the window.

Ensure that nonconforming test and calibration results are adequately followed up, and that corrections are initiated.



**Accelerated  
Technology**  
LABORATORIES INC.



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Technology**  
LEADERS IN LIMS LABORATORIES INC.



# 13/14/15 – Improvement, Corrective & Preventative Actions

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## Corrective Actions - (CAPA)

- a) React to nonconformity (*Investigate Incident*)
- b) Evaluate the need for action (*Root Cause*)
- c) Implement action (*Action Plan*)
- d) Review the effectiveness (*resolution*)
- e) Make changes to management system





# CAPA creation, evaluation, Action and Resolution

Corrective along with preventive actions can easily be managed, and automated alerts can be sent out to key individuals to ensure effective and timely management of any open issues.

CAPAs
CAPA - CAPA-141030-01

CAPA - CAPA-141030-01

CAPA #CAPA-141030-01

NameFailing QC

☒ Corrective Action
☐ Preventative Action

Description

Date Created10/30/2014

Created ByCarter, Rob

Due Date11/28/2014

OwnerFelix, Todd

StateResolved

Resolution Status1635 days

Assignment
Root Cause
Action Plan
Resolution
Files

Customer

Contact

Assigned Employee

Analysis BatchAB-141015-02 (Coliform & E.coli)

Vendor

Ordered Product

Work Order

SampleWO-141014-01-05 (2014-10-14-E)



# 16 - Control of Records

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- Records allow for the historical reconstruction of laboratory activities related to sample-handling and analysis and may include:









Sample information  
Sample Receipt conditions  
Storage information  
Internal Chain of Custody  
Sample Prep. Information  
Raw data  
Hard copy data  
Dates/times for all steps  
Instrument ID  
Instrument calibration  
Analysts

Analyst training records  
Standard traceability  
Inventory traceability  
Temperature Records  
QC records  
Method Specifications  
Client specifications  
Proficiency results  
Records of DOCs  
SOPS used  
Review sign offs

Audit Trails  
Audit records  
CAPA Records  
Data Calculations  
Final results  
Final reports

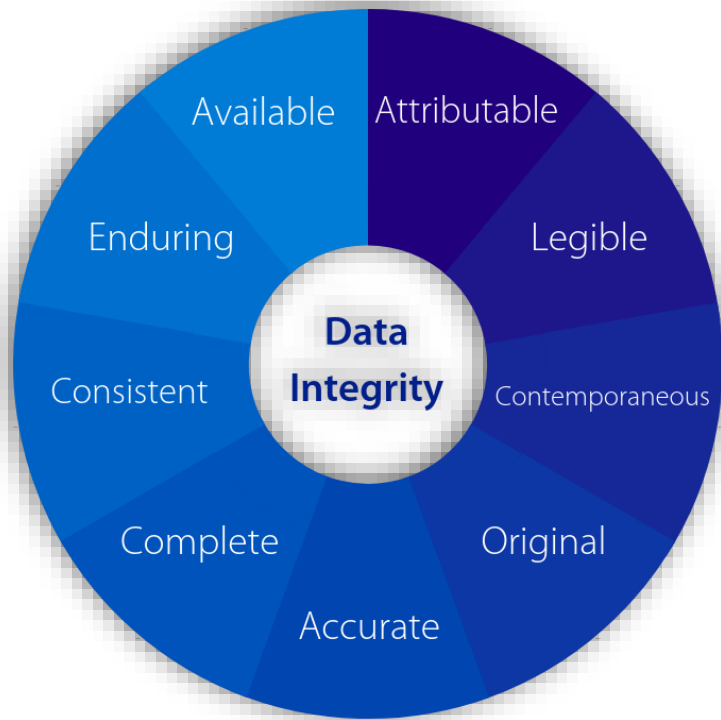
# 16 - Control of Records – Legal Chain of Custody

CHAIN OF CUSTODY RECORD																																							
<b>CLIENT NAME / ADDRESS:</b> McGrains College Drive West End NC 27376				<b>Total # of sample containers</b> 1		<b>Samplers Initials</b> _____		<b>All Samples Refrigerated?:</b> Y ____ N ____ <b>Comment(s):</b>																															
<b>Permit Number</b> U SA				I certify that these samples are representative of the normal daily flow from this facility, and that we are in normal operation at this time.																																			
I/we certify that the samples below have not been out of our custody until relinquished				<b>SIGNATURE OF COMPANY REPRESENTATIVE:</b> _____ <b>Date:</b> _____ <b>Time:</b> _____																																			
<b>SAMPLER(S) SIGNATURE:</b>				<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Set Date</th> <th>End Date</th> <th>Sample ID - Site ID</th> <th>Sample Type</th> <th>Matrix</th> <th>Method</th> <th>Container Type</th> <th>Preservative</th> <th>Sample</th> <th>Blanks</th> </tr> </thead> <tbody> <tr> <td>8/6/2021</td> <td>8/6/2021</td> <td>21080602-01 - Field #123</td> <td></td> <td>Waste Water</td> <td>EPA 200.8 - ICP-MS Total</td> <td>1/2 Gallon Plastic (acid preserved)</td> <td>HNO3 to pH &lt; 2</td> <td></td> <td></td> </tr> <tr> <td>1:23 PM</td> <td>1/1/1900</td> <td>1:23:52 PM</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						Set Date	End Date	Sample ID - Site ID	Sample Type	Matrix	Method	Container Type	Preservative	Sample	Blanks	8/6/2021	8/6/2021	21080602-01 - Field #123		Waste Water	EPA 200.8 - ICP-MS Total	1/2 Gallon Plastic (acid preserved)	HNO3 to pH < 2			1:23 PM	1/1/1900	1:23:52 PM							
Set Date	End Date	Sample ID - Site ID	Sample Type	Matrix	Method	Container Type	Preservative	Sample	Blanks																														
8/6/2021	8/6/2021	21080602-01 - Field #123		Waste Water	EPA 200.8 - ICP-MS Total	1/2 Gallon Plastic (acid preserved)	HNO3 to pH < 2																																
1:23 PM	1/1/1900	1:23:52 PM																																					
Relinquished by: (Signature) _____			Date: _____	Time: _____	Received by: (Signature) _____			Date: _____	Time: _____	Trip B																													
Relinquished by: (Signature) _____			Date: _____	Time: _____	Received by: (Signature) _____			Date: _____	Time: _____	Trip B																													
Relinquished by: (Signature) _____			Date: _____	Time: _____	Received by: (Signature) _____			Date: _____	Time: _____	Trip B																													

Chain of Custody Record and Analysis Request Form																																								
 <b>Accelerated Technology Laboratories, Inc.</b> 496 Holly Grove School Rd. West End, NC 27376				<b>Customer:</b> Lake Lure <b>Work Order #</b> <b>Requester:</b> Weekly - Weekly Monitoring <b>Project:</b> Weekly - Weekly Monitoring																																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="7" style="text-align: center;">Collection Information</th> </tr> <tr> <th>LIMS Sample #</th> <th>Sample #</th> <th>Date</th> <th>Time</th> <th>Collector</th> <th>Analysis Methods</th> <th>Container</th> <th>Received</th> </tr> </thead> <tbody> <tr> <td>W-211028-02-01</td> <td> Sample Effluent (009) (10/28/2021)</td> <td></td> <td></td> <td></td> <td>           zzother name            pH            Temperature - Field            Alkalinity            Ammonia, 350.1            ICP Metals            Anions         </td> <td>           W-211028-02-01-1            W-211028-02-01-1            W-211028-02-01-1            W-211028-02-01-1            W-211028-02-01-1            W-211028-02-01-1            W-211028-02-01-1         </td> <td> <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/> </td> </tr> <tr> <td>W-211028-02-02</td> <td> Sample Influent (008) (10/28/2021)</td> <td></td> <td></td> <td></td> <td>           zzother name            pH            Temperature - Field            Alkalinity            Ammonia, 350.1            ICP Metals            Anions         </td> <td>           W-211028-02-02-1            W-211028-02-02-1            W-211028-02-02-1            W-211028-02-02-1            W-211028-02-02-1            W-211028-02-02-1            W-211028-02-02-1         </td> <td> <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/> </td> </tr> </tbody> </table>										Collection Information							LIMS Sample #	Sample #	Date	Time	Collector	Analysis Methods	Container	Received	W-211028-02-01	 Sample Effluent (009) (10/28/2021)				zzother name pH Temperature - Field Alkalinity Ammonia, 350.1 ICP Metals Anions	W-211028-02-01-1 W-211028-02-01-1 W-211028-02-01-1 W-211028-02-01-1 W-211028-02-01-1 W-211028-02-01-1 W-211028-02-01-1	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	W-211028-02-02	 Sample Influent (008) (10/28/2021)				zzother name pH Temperature - Field Alkalinity Ammonia, 350.1 ICP Metals Anions	W-211028-02-02-1 W-211028-02-02-1 W-211028-02-02-1 W-211028-02-02-1 W-211028-02-02-1 W-211028-02-02-1 W-211028-02-02-1	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
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Customer to sign & date below																																								
Relinquished By: _____ Date/Time: _____				Accepted By: _____ Date/Time: _____				Total Samples: 2  Priority Normal 10.00 day  Date Results Requested																																
Relinquished By: _____ Date/Time: _____				Accepted By: _____ Date/Time: _____																																				
Relinquished By: _____ Date/Time: _____				Accepted By: _____ Date/Time: _____																																				
Relinquished By: _____ Date/Time: _____				Accepted By: _____ Date/Time: _____																																				
Sealed/Locked By: _____ Date/Time: _____				Sealed/Locked Opened By: _____ Date/Time: _____																																				

# 19 - Data Integrity

For data to be acceptable, it should meet certain fundamental elements of quality whether collected or recorded electronically or on paper (1999 FDA Guidance.)



- As companies move to more automated laboratories with computerized systems, most of the fundamental ALCOA+ principles are satisfied by an automatically generated audit trail providing the who, the when, accuracy, originality, and legibility, all on the system with the raw data.

World Health Organization (WHO) - QAS/15.624 –  
Paper addressing Data Management practices in Labs, Water, and Food & Drug environments.

# 20 - Personnel (Employee Training)

- A. SOP Review
- B. Work with trained Analyst
- C. Demonstration of Capability
- D. Perform PE Sample








## Training - Demonstration of Capability

Title:  Code:

Training Category:

Description:

General	Training Courses	Trainer Employees	Employee Type Trainings	Employee Effective Trainings	Exempt Employees	Documents	Notes	Training Resources		
Drag a column header here to group by that column.										
	Trainer	Employee	Course	Started Date	Completed Date	Percentage Complete	Score	Status	Certified Date	Expiration Date
				=	=	=	=		=	=
▶	Gibbs, Leroy Jethro	Sciuto, Abby Marilyn	Demonstration of Capabilit	06/12/2018	06/12/2018	100	98	Completed	06/12/2018	06/12/2019
	Gibbs, Leroy Jethro	David, Ziva	Demonstration of Capabilit	06/12/2018	06/12/2018	100	100	Completed	06/12/2018	06/12/2019
	Gibbs, Leroy Jethro	Sciuto, Abby Marilyn	Demonstration of Capabilit	06/12/2017	06/12/2017	100	99	Completed	06/12/2017	06/12/2018
	Gibbs, Leroy Jethro	Sciuto, Abby Marilyn	Demonstration of Capabilit	10/19/2016	10/21/2016	100	100	Completed	10/21/2016	10/21/2017
	Gibbs, Leroy Jethro	Sciuto, Abby Marilyn	Demonstration of Capabilit	09/19/2015	10/26/2015	100	99	Completed	10/26/2015	10/26/2016

# 23 – Calibration Requirements

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- The laboratory has procedures for the use, maintenance, handling and storage of equipment and they are readily available to laboratory personnel.
- There is a lot of ground to cover here:

Laboratory Equipment Lists  
Laboratory Instrument Lists  
Support Equipment Calibration  
Support Equipment Maintenance  
Calibration Acceptance Criteria  
Routine Maintenance Schedules

Routine Maintenance Records  
Vendor Maintenance Records  
Instrument Calibrations  
Temperature Monitoring



# 23 – Calibration Requirements

The laboratory has procedures for the use, maintenance, handling and storage of equipment and they are readily available to laboratory personnel



Instruments
Instrument - 12-305 x

Instrument - 12-305

Name
Agilent 1200

Asset #
12-305

Description
The Agilent 1200 Series High-Throughput LC/UV/MS system is based on the new Agilent 1200 Series Rapid Resolution LC System providing highest analysis speed and shortest cycle times without compromising robustness and data quality. The sample capacity extension, a small footprint pick-and-place robot, turns the Agilent 1200 Series LC/UV/MS system into an open solution, for high-throughput and multi-user laboratories looking for high capacity and walk-up capabilities. Further the scalable, modular and open...

Run Capacity

Export Path

☒ Available

Instrument Type
LC/MS

Facility
Main Lab

Prep Duration

Analysis Duration

☐ Results Are Corrected For Dilution

State
Available

Analysis Methods
Preparation Methods
QC Control Limits
Runs/Batches
Limits
Calibration
Maintenance
User Defined
Documents
Resources
Results
QC Results

Maintenance History

Drag a column header here to group by that column.

	Maintenance Date	Maintenance Type	Maintenance Contractor	Expiration Date	Notes
<input checked="" type="checkbox"/>					
▶	04/17/2017	Annual Service	Main Lab	04/17/2018	
	04/18/2016	Annual Service	Robert Instruments		
	10/31/2015	Routine	Robert Instruments		Cooling fan was bad. Replaced with a new one.

Filter

Showing 3 item(s)

Logged in as TITANWATLUSER on TITANW/8000 - SessionId: 22114

# 23 – Calibration Requirements



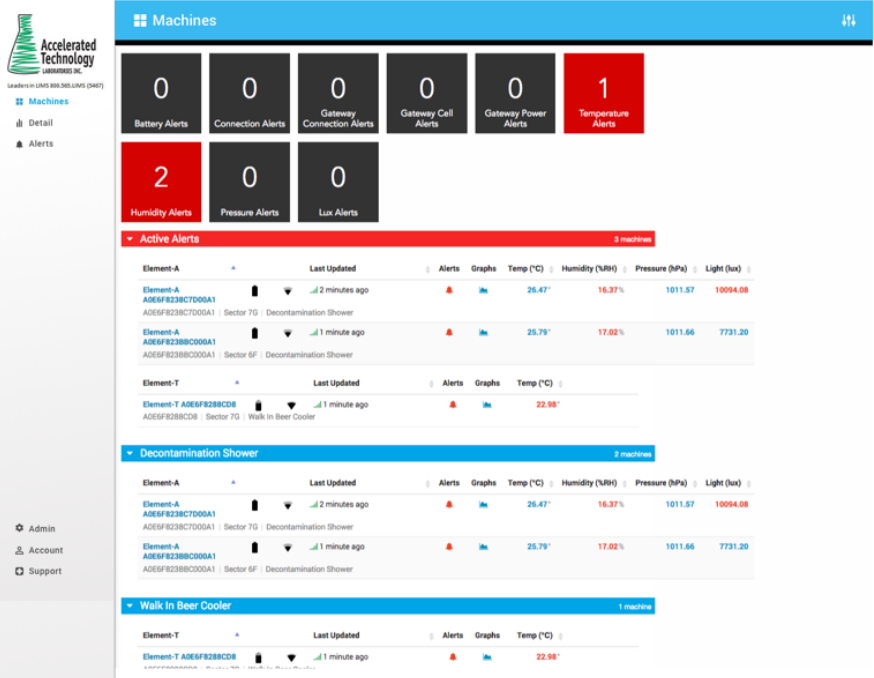
## Calibrations Expiring within 1 Month

Report Date: Thursday, November 4, 2021

Expiration Date	Calibration Description	Instrument	Cert. Agency	Matrix	Test	Method
11/22/2020	Annual Service	ICP	In House	Waste Water	EC_7 metals	EPA 200.7
11/22/2020	Annual Service	ICP	In House	Waste Water	ICP-OES Dissolved	EPA 200.7
9/3/2020	Annual Service	ICP	In House	Waste Water	ICP-OES Total	EPA 200.7
9/3/2020	Annual Service	ICP	In House	Waste Water	Mg (sol)	EPA 200.7
11/22/2020	Annual Service	ICP	In House	Waste Water	Potassium	EPA 200.7
11/22/2020	Annual Service	ICP	In House	Waste Water	Reno Total Metals	EPA 200.7
11/22/2020	Annual Service	ICP	In House	Waste Water	Sodium	EPA 200.7
11/22/2020	Annual Service	ICP	In House	WW Sludge	ICP-OES Total	EPA 200.7
9/3/2020	Annual Service	ICP-MS	In House	Ground Water	ICP-MS Dissolved	EPA 200.8
9/3/2020	Annual Service	ICP-MS	In House	Ground Water	ICP-MS Total	EPA 200.8
11/22/2020	Annual Service	ICP-MS	In House	Waste Water	Antimony	EPA 200.8
11/22/2020	Annual Service	ICP-MS	In House	Waste Water	Arsenic	EPA 200.8
11/22/2020	Annual Service	ICP-MS	In House	Waste Water	Barium	EPA 200.8
11/22/2020	Annual Service	ICP-MS	In House	Waste Water	Beryllium	EPA 200.8
11/22/2020	Annual Service	ICP-MS	In House	Waste Water	Cadmium	EPA 200.8
11/22/2020	Annual Service	ICP-MS	In House	Waste Water	Chromium	EPA 200.8
11/22/2020	Annual Service	ICP-MS	In House	Waste Water	Cobalt	EPA 200.8

# 23 – Calibration Requirements

## Monitor Plus – Remote Temperature Monitoring



Monitor:

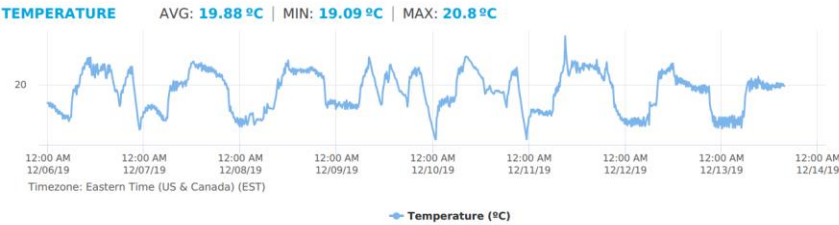
- Fridges
- Freezers
- Incubators
- Humidity chambers



### Summary Report "Weekly Monitoring report" for Element-A 0081F90ECF8200A1

**MACHINE DETAILS**  
 Serial Number: 0081F90ECF8200A1  
 Location: Steve's Demo Unit  
 Description: Steve's Element A  
 Installation date:

**EQUIPMENT DETAILS**  
 Category: Unknown  
 Manufacturer:  
 Model:  
 Service Entered Date:



Replacement of mundane tasks – Temperature Monitoring daily recording of incubators, fridges and freezers

# 24 – Measurement Traceability

Traceability - Batches

Test: NO2+NO3

QC Batch ID: QC2111001

Sample Supplies

Batch Supplies

QC Sample Supplies

Instruments

Supply	Ref #	Lot No.	Container Label	Amount
1-10mL Pipet Tips	006	ABADSFS		
Borate Buffer	016	1321651651		
	LabReferenceNumber	ContainerLabel	LotNumber	VendorID
	016		1321651651	Sigma-A

Record: 1 of 3

No Filter

Search

Items To Update

☒ Supplies
 ☒ Instruments

Apply to Marked Samples

View

QC Batch

New Query

Add Samples

QC Batch ID: QC2111001

New...

Mark

20

Samples

Sample ID	Matrix	Test	QC Batch ID	Product	Sample Date
21080502-02	Drinking Water	NO2+NO3	QC2108005	Site #12B78	8/10/2021
21080502-04	Drinking Water	NO2+NO3	QC2108005	Primary 1	8/10/2021
21080502-01	Drinking Water	NO2+NO3	QC2108005	Lot A	8/12/2021

Record: 1 of 3

No Filter

Search

QC Type	Order ID	Sample ID
Duplicate	21080502	21080502-01
MS	21080502	21080502-01

Instrument: Lachat-N

Initial Calib. STD:

Calib. Check STD:

Internal STD:

Surrogate STD:

LCS/LCSD STD:

MS/MSD STD:

StandardName	Supply	Conc.	Unit

Record: 1 of 3

No Filter

Search

# 24 – Measurement Traceability

Traceability History

Order ID:

Sample ID:

Test:

QC Batch ID:

QC Type:

Instrument:

Supply:

1-10mL Pipet Tips

Ref #:

Date:

5/4/2021

7/31/2021

Retrieve

Disposed Supplies are highlighted in red.

Sample Supplies

QC Supplies

Instruments

Order ID	Sample ID	Test	Supply	Lab Ref #	Container L
21031902	21031902-04	NO2+NO3	1-10mL Pipet Tips	006	
21032201	21032201-01	NO2+NO3	1-10mL Pipet Tips	006	
21032201	21032201-02	NO2+NO3	1-10mL Pipet Tips	006	
21032201	21032201-04	NO2+NO3	1-10mL Pipet Tips	006	
21041901	21041901-01	NO2+NO3	1-10mL Pipet Tips	006	
21041901	21041901-02	NO2+NO3	1-10mL Pipet Tips	006	
21041901	21041901-04	NO2+NO3	1-10mL Pipet Tips	006	
21042002	21042002-01	NO2+NO3	1-10mL Pipet Tips	006	
21042101	21042101-01	NO2+NO3	1-10mL Pipet Tips	006	
21042901	21042901-01	NO2+NO3	1-10mL Pipet Tips	006	
21071301	21071301-01	NO2+NO3	1-10mL Pipet Tips	006	
21071301	21071301-02	NO2+NO3	1-10mL Pipet Tips	006	

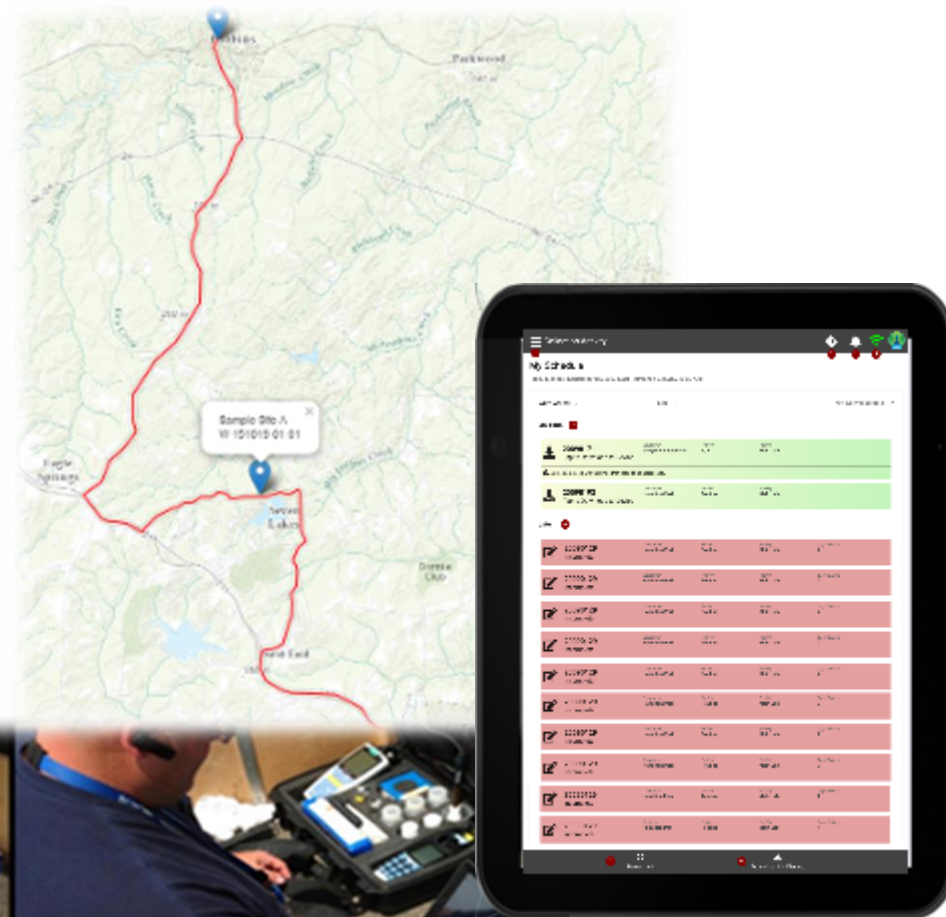
Record: 1 of 12
Unfiltered
Search

Close

# 25 – Collection of Samples

## Retain Records including:


- Reference to sampling methods
- Date, time and conditions of sampling
- Person collecting the samples
- Location information/site identification
- Field Results
- Comments



# 26 – Handling Samples and Test Items

Lab shall have Procedures to track:

- Transportation
- Chain of Custody
- Receipt – Sample Acceptance
- Preservation Checks
- Subsampling
- Storage
- Retention
- Disposal
- Comments



- Sample Tracking
- Data Entry
- Sample Scheduling
- QA/QC
- Electronic Data Transfer
- Chemical Inventory
- Resource Management
- Customer Relationship Management
- LIMS Maintenance

Sample Tracking Module>Sample Login

File Edit Print

Order Information

Order ID: 17112801

Type: ☒ Login ☐ Prelogin

Order Date: 11/28/2017 4:55:36 PM

Signed off by:

Order Due: 1/5/2018

Report Due: 1/5/2018

Priority: Normal

Shipped Via: Fed Ex

Project Manager: Jesus Maza

Comment:

OK

Close

Sample Login>Sample Conditions

Order ID: 17112801

Question	Answer
Were samples submitted in an ice chest?	Yes
Are samples submitted with a Chain of Custody form?	Yes
Is the Chain of Custody form completed properly?	Yes
Are the number of samples the same as stated on the chain of custody?	Yes
Were all containers intact when received?	Yes
Was the Temperature check within acceptable limits?	Yes
Were all samples within the holding time for the requested test(s)?	Yes
Are all samples in proper bottle types with appropriate preservation for the requested tests?	Yes
Are all samples for volatile organic analyses free of headspace?	Yes

Customer Contact: PW Regional

Billing ID: PW Regional

Billing Contact: PW Regional

Project ID: Andy Hummel

Project Location:

PO #:


Sample Disposal

☐ Return Samples ☒ Dispose After 45 Days

Prelog Login... Samples >



# 26 – Handling Samples and Test Items



## Login Report

Customer Name: McGrains

Purchase Order:

Project ID:

Comment:

Order ID: 21101901

Order Date: 10/19/2021

---

Sample #: 21101901-01

Customer Sample #:

Site:

Rec'd: ☒

Quantity: 1

Comment:

Collector:

Matrix: Air

Date Collected: 10/19/21 8:56 AM

Date Received: 10/19/21 8:56 AM

Test	Test Group	Method	Due Date	Priority
Asb PCM Air - 7400		NIOSH 7400	11/2/2021	

---

Sample #: 21101901-02

Customer Sample #:

Site:

Rec'd: ☒

Quantity: 1

Comment:

Collector:

Matrix: Soil

Date Collected: 10/19/21 8:56 AM

Date Received: 10/19/21 8:56 AM

Test	Test Group	Method	Due Date	Priority
Asb PLM Soil - CARB 435		CARB 435 - Asbestos In Aggregate	11/2/2021	
Asb PLM Soil - EPA Region		EPA Region 1 PLM Screening - Qual	11/2/2021	
Asb PLM Soil - Visual Est		EPA 600/R-93/116	11/2/2021	
Asb TEM Soil - CARB 435		CARB 435 - Asbestos In Aggregate	11/2/2021	
Asb TEM Soil - Sieve		Sieve - TEM Confirm	11/2/2021	

Customer Name: McGrains

Purchase Order:

Project ID:

Comment:

Order ID: 21101901

Order Date: 10/19/2021

### SAMPLE CONDITION RECORD

Were samples submitted in an ice chest?	Yes
Are samples submitted with a Chain of Custody form?	Yes
Is the Chain of Custody form completed properly?	Yes
Are the number of samples the same as stated on the chain of custody?	Yes
Were all containers intact when received?	Yes
Was the Temperature check within acceptable limits?	Yes
Were all samples within the holding time for the requested test(s)?	Yes
Are all samples in proper bottle types with appropriate preservation for the requested tests	Yes
Are all samples for volatile organic analyses free of headspace?	N/A

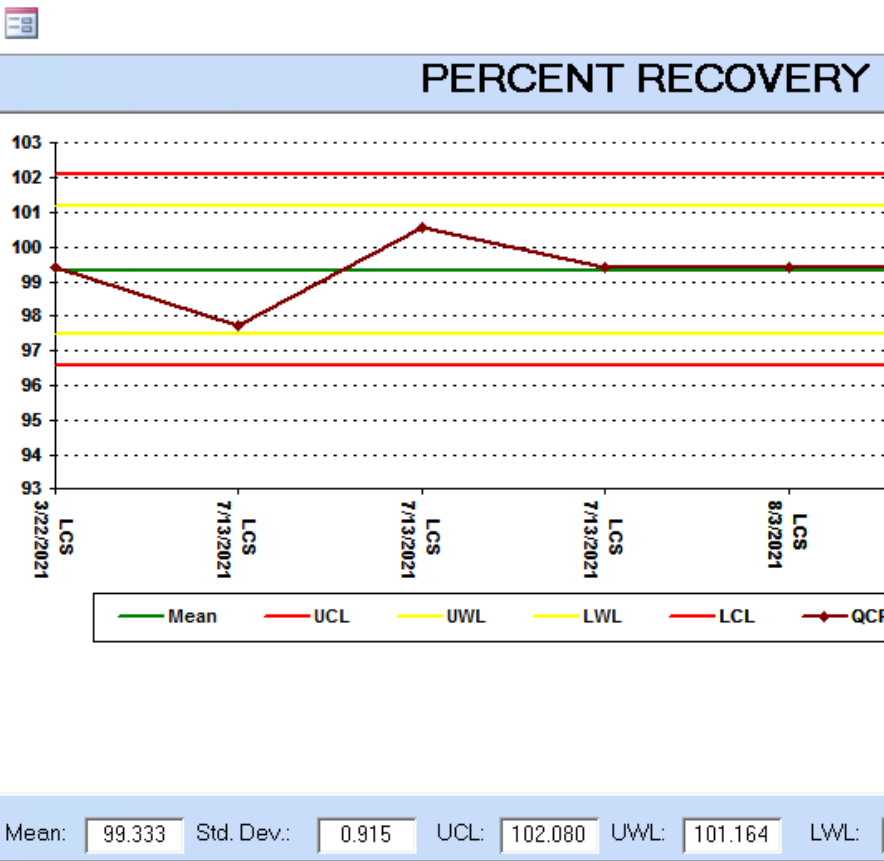
# 27 – Quality Assurance for Testing

## Data Review

<div> <div>All Results (View Only)</div> <div>Results to Enter</div> <div>Results to Validate</div> <div>Results to Approve</div> </div> <div> <div>Show Results Calculations</div> <div>Show Limit Calculations</div> <div>Show Client Sample Info</div> </div>															
Sample Results		Sample Surrogates		Blank Results		Blank Surrogates		Spike Results		Spike Surrogates		Standard Results			
Order ID	Sample ID	Test	Parameter	Result	Units	C	S	Entered By	Entered Date	Validated By	Validated Date	Approved By	Approved Date	Permission	Instrument
12012002	12012002-18	NO2+NO3	Nitrate-Nitrite as N	12.0871	mg/L			CWhitecotton	01/20/2012 15:03	CHindbaugh	01/20/2012 15:03	CHindbaugh	01/21/2012 12:39	Approve	Lachat-N
12012002	12012002-19	NO2+NO3	Nitrate-Nitrite as N	9.113	mg/L			CHindbaugh	01/20/2012 15:03	CHindbaugh	01/20/2012 15:03	CHindbaugh	01/21/2012 12:39	Approve	Lachat-N
12012002	12012002-20	NO2+NO3	Nitrate-Nitrite as N	10.1946	mg/L			CWhitecotton	01/20/2012 15:07	CHindbaugh	01/20/2012 15:07	CHindbaugh	01/21/2012 12:43	Approve	Lachat-N
12012002	12012002-22	NO2+NO3	Nitrate-Nitrite as N	13.5127	mg/L			CHindbaugh	01/20/2012 15:03	CHindbaugh	01/20/2012 15:03	CHindbaugh	01/21/2012 12:39	Approve	Lachat-N
12012002	12012002-24	NO2+NO3	Nitrate-Nitrite as N	6.8	mg/L			VGleason	01/20/2012 15:06	CHindbaugh	01/20/2012 15:06	CHindbaugh	01/21/2012 12:42	Approve	Lachat-N
12012002	12012002-26	NO2+NO3	Nitrate-Nitrite as N	7.43	mg/L			CWhitecotton	01/20/2012 15:07	CHindbaugh	01/20/2012 15:07	CHindbaugh	01/21/2012 12:43	Approve	Lachat-N
12012002	12012002-27	NO2+NO3	Nitrate-Nitrite as N	8.18	mg/L			Mdillon	01/20/2012 15:07	CHindbaugh	01/20/2012 15:07	CHindbaugh	01/21/2012 12:43	Approve	Lachat-N
12012002	12012002-34	NO2+NO3	Nitrate-Nitrite as N	13.8571	mg/L			CWhitecotton	01/20/2012 15:07	CHindbaugh	01/20/2012 15:07	CHindbaugh	01/21/2012 12:43	Approve	Lachat-N
12012002	12012002-35	NO2+NO3	Nitrate-Nitrite as N	13.2424	mg/L			Mdillon	01/20/2012 15:07	CHindbaugh	01/20/2012 15:07	CHindbaugh	01/21/2012 12:43	Approve	Lachat-N
12012003	12012003-01	NO2+NO3	Nitrate-Nitrite as N	8.6781	mg/L			CWhitecotton	01/20/2012 15:21	CHindbaugh	01/20/2012 15:21	CHindbaugh	01/21/2012 12:57	Approve	Lachat-N
12012003	12012003-02	NO2+NO3	Nitrate-Nitrite as N	10.962	mg/L			Mdillon	01/20/2012 15:21	CHindbaugh	01/20/2012 15:21	CHindbaugh	01/21/2012 12:57	Approve	Lachat-N
12012402	12012402-01	NO2+NO3	Nitrate-Nitrite as N	10.4016	mg/kg			CHindbaugh	01/24/2012 15:31	CHindbaugh	01/24/2012 15:31	CHindbaugh	01/25/2012 13:07	Approve	Lachat-N

# 27 – Quality Assurance for Testing

## Control Charts



New Query

Save

Calculate

Chart

Matrix: **Drinking Water**

Test: **NO2+NO3**

Method: **All Methods**

Parameter: **Nitrate-Nitrite as N**

Instrument: **Lachat-N**

Mark Last: 20 Samples

Percent Recovery

Mean: **99.3333**

Std. Dev.: **0.9155**

UCL: **102.0798**

UWL: **101.1643**

LWL: **97.5024**

LCL: **96.5869**

Analysis Date	Analyst	QC Batch ID	QC Type	%Rec	C	+
3/22/2021	DBA	QC2103003	LCS	99.42857	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7/13/2021	DBA	QC2107001	LCS	99.42857	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7/13/2021	DBA	QC2107002	LCS	100.57143	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7/13/2021	DSloan	QC2107003	LCS	97.71429	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8/3/2021	DBA	QC2108004	LCS	99.42857	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8/5/2021	DBA	QC2108005	LCS	99.42857	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

C: Include In Limits Calculation    +: Include in Chart/Data

Close

# 27 – Quality Assurance for Testing

## MDL Calculator

MDL Calculator

Standard

CCV

Blank

Method Blank

Optional

Date Range:

6/1/2020

11/4/2021

Matrix:

Test:

NO2+NO3

Method:

Parameter:

Instrument:

Units:

Grouping:

☒ By Matrix

☒ By Method

Retrieve

Close

MDL Results

New Query

Calculate MDL

Mark

50

Results

Matrix	Test	Method	Param	NumericRes	Units	AnalysisDate	Instrument	QCType	QCBatchID	
Drinking Water	NO2+NO3	EPA 353.2	Nitrate-Nitrite as	1.19	mg/L	8/5/2021 7:27:38 PM	Lachat-N	CCV	QC2108005	<input checked="" type="checkbox"/>
Drinking Water	NO2+NO3	EPA 353.2	Nitrate-Nitrite as	1.21	mg/L	8/5/2021 7:27:38 PM	Lachat-N	CCV	QC2108005	<input checked="" type="checkbox"/>
Drinking Water	NO2+NO3	EPA 353.2	Nitrate-Nitrite as	1.19	mg/L	8/3/2021 1:55:26 PM	Lachat-N	CCV	QC2108004	<input checked="" type="checkbox"/>
Drinking Water	NO2+NO3	EPA 353.2	Nitrate-Nitrite as	1.19	mg/L	8/3/2021 1:55:26 PM	Lachat-N	CCV	QC2108004	<input checked="" type="checkbox"/>
Drinking Water	NO2+NO3	EPA 353.2	Nitrate-Nitrite as	1.19	mg/L	7/13/2021 3:50:03 PM	Lachat-N	CCV	QC2107002	<input checked="" type="checkbox"/>
Drinking Water	NO2+NO3	EPA 353.2	Nitrate-Nitrite as	1.19	mg/L	7/13/2021 3:50:03 PM	Lachat-N	CCV	QC2107002	<input checked="" type="checkbox"/>
Drinking Water	NO2+NO3	EPA 353.2	Nitrate-Nitrite as	1.211	mg/L	7/13/2021 3:50:03 PM	Lachat-N	CCV	QC2107002	<input checked="" type="checkbox"/>
Drinking Water	NO2+NO3	EPA 353.2	Nitrate-Nitrite as	1.19	mg/L	7/13/2021 2:48:54 PM	Lachat-N	CCV	QC2107001	<input checked="" type="checkbox"/>
Drinking Water	NO2+NO3	EPA 353.2	Nitrate-Nitrite as	1.19	mg/L	7/13/2021 2:48:54 PM	Lachat-N	CCV	QC2107001	<input checked="" type="checkbox"/>
Drinking Water	NO2+NO3	EPA 353.2	Nitrate-Nitrite as	1.19	mg/L	7/7/2020 10:55:43 AM	Lachat-N	CCV	QC2007001	<input checked="" type="checkbox"/>
Drinking Water	NO2+NO3	EPA 353.2	Nitrate-Nitrite as	1.2	mg/L	7/7/2020 10:55:43 AM	Lachat-N	CCV	QC2007001	<input checked="" type="checkbox"/>
Drinking Water	NO2+NO3	EPA 353.2	Nitrate-Nitrite as	0.02	mg/L	8/5/2021 7:27:10 PM	Lachat-N	Method Blank	QC2108005	<input type="checkbox"/>
Drinking Water	NO2+NO3	EPA 353.2	Nitrate-Nitrite as	0	mg/L	8/3/2021 1:55:17 PM	Lachat-N	Method Blank	QC2108004	<input type="checkbox"/>
Drinking Water	NO2+NO3	EPA 353.2	Nitrate-Nitrite as	0	mg/L	7/13/2021 2:48:54 PM	Lachat-N	Method Blank	QC2107001	<input type="checkbox"/>

Record: 1 of 19

No Filter

Search

Close

MDL Calculate

New Query

Update Marked

Matrix	Test	Method	Param	MDL	Units	MDLs	MDLb	
Drinking Water	NO2+NO3	EPA 353.2	Nitrate-Nitrite as	0.02	mg/L		0.02	<input type="checkbox"/>

Record: 1 of 1

No Filter

Search


Close

# 28 – Reporting and Results

## Reports should include:

- Title
- Names and Address
- Identification of method
- Date, time of activities
- Results with appropriate units of measure
- Specifications where appropriate
- Deviations & Exclusions (Qualifiers)
- Identification of Authorizing person

## EDDs – Electronic Data Deliverables



**Main Lab**  
 496 Holly Grove School Rd. West End, NC 27376

**Analytical Results Report**

Client: Jordan Lake  
 Attn: Brothers, Misty Lynne (Vice President, Operations)  
 Address: 496 Holly Grove School Rd  
 West End, NC 27376

Work Order Number: W-190923-01  
 Project: Initial Evaluation

Field Sample ID	Laboratory Sample ID	Matrix	Collection Date/Time	Receive Date/Time
Curtis Park	W-190923-01-01	Water	09/20/2019 0000	09/23/2019 1222
Gateway Park	W-190923-01-02	Water	09/20/2019 0000	09/23/2019 1222

Sample Number  
 W-190923-01-01

Field Sample ID  
 Curtis Park

Work Order Number  
 W-190923-01

Parameter	Analytical Method	Result	Qualifier	Units	Dilution	Analysis Batch	Analysis Date	Analyst
Ammonia	Ammonia (N-H)	4500-NH3	2.34	ppm	1.0000	AB-190923-03	09/20/2019 1220	Chandler, Scott

Sample Number  
 W-190923-01-02

Field Sample ID  
 Gateway Park

Work Order Number  
 W-190923-01

Parameter	Analytical Method	Result	Qualifier	Units	Dilution	Analysis Batch	Analysis Date	Analyst
Ammonia	Ammonia (N-H)	4500-NH3	Not Detected	mg/L	1.0000	AB-190923-03	09/20/2019 1220	Chandler, Scott

The results listed in this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This laboratory report is confidential and intended for the sole use of XYZ Laboratory and its client. This report shall not be reproduced, except in full, without written permission from XYZ Laboratories. The Chain of Custody is included and is an integral part of this report. The entire report was reviewed and approved for release.

NELAC Certification #:

The results listed in this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This laboratory report is confidential and intended for the sole use of XYZ Laboratory and its client. This report shall not be reproduced, except in full, without written permission from XYZ Laboratories. The Chain of Custody is included and is an integral part of this report. The entire report was reviewed and approved for release.

NELAC Certification #:

Approved



# Laboratory Documents that come from the LIMS

---

- Quotes
- Bottle Orders
- Labels
- Chain of Custody
- Sample Log-in Report
- Backlogs
- Worklists
- Prep. Logbooks and/or Sheets
- QC Batch Summary
- Results reports
- Certificates of Analysis
- Invoices
- Production Reports
- Control Charts
- Sample Inventory
- Disposal reports
- Expiring Training records
- Expiring Maintenance
- Complaints Reports

# Laboratory Documents that come from the LIMS

---

- Analysis Due Today
- Auto Report Status
- **Backlog**
- **Barcoded Label Report**
- Bottle Order
- **Calibrations Expiring**
- **Certificates Expiring**
- Chain of Custody Internal
- **Chain of Custody**
- CRM Customer History
- CRM Summary by Type
- CRM Open Complaints by Severity
- CRM Executive Summary
- **Disposal Report**
- **Invoice**
- Invoice Sales Tax
- Orders
- Orders Summary
- PreLog Detail
- PreLog Order Details
- PreLog Summary
- **Prep Batch**
- Prep Due Today
- Production
- **QC Batch**
- QC Batch Bench Sheet
- QC Batch Run Sequence
- **QC Control Chart**



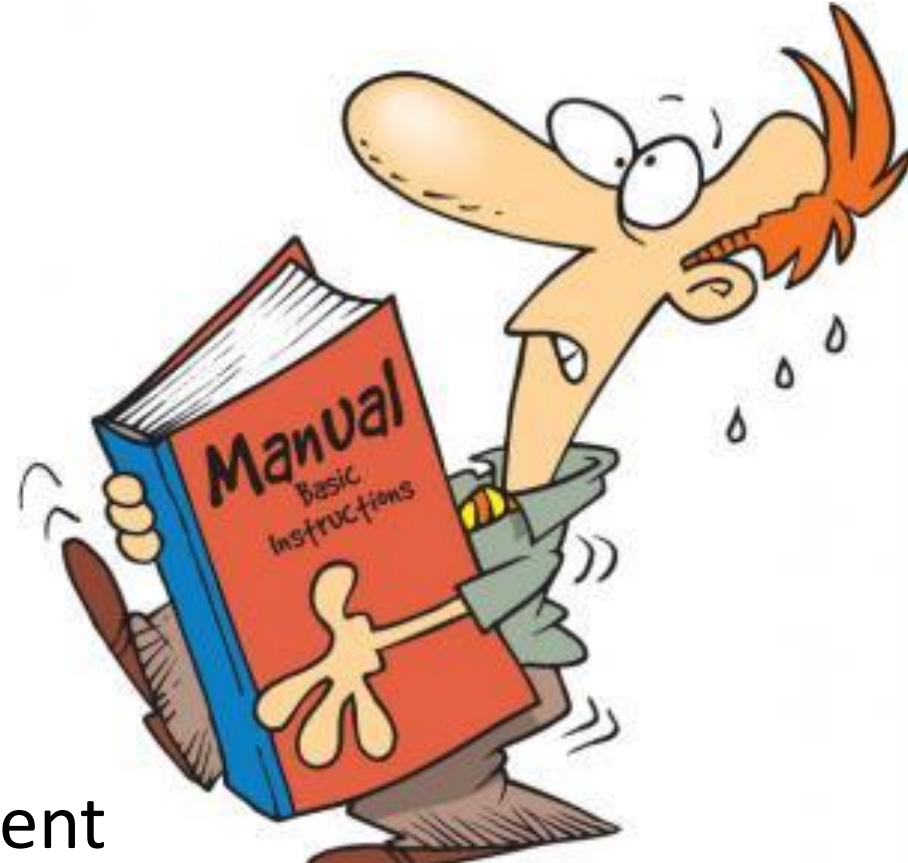
# Laboratory Documents that come from the LIMS

- QC Control Charts Data
- **Quote**
- **Results Audit Trail**
- Run Sequence Bench Sheet
- **Sample Labels**
- Sample Routing Sheet
- **Sample Conditions**
- Supply Below Warning Limit
- Supply Expiring
- **Trend Analysis Chart**
- Test Due Today
- Turn Around Time (TAT)
- **Worklist**
- Worklist Bench Sheet
- Reports Used from Result Reporting:
- **COA Basic**
- COA Basic QC
- COA Chemistry
- COA By Parameter
- COA By Parameter with QC
- COA By Parameter with Surrogate
- COA By Parameter with Surrogate and QC
- COA By Sample
- COA By Sample with QC
- COA By Sample with Surrogate
- COA By Sample with Surrogate and QC
- Results by Order ID
- Results By Order ID With QC
- Results By Order ID With Surrogates
- Results by Parameter
- Results by Sample Number
- Results by Test

# USING LIMS TO STREAMLINE YOUR QUALITY MANAGEMENT SYSTEM (QMS)



So, which is easier a LIMS as the backbone to your Quality Management System or all of those Logbooks, Spreadsheets, worksheets, and hand written records that you currently have?



# THANK YOU!



**Stephen Wesson**, Director of Sales  
**Accelerated Technology Laboratories**

- Email: [swesson@atlab.com](mailto:swesson@atlab.com)
- Stop by Booth #17

