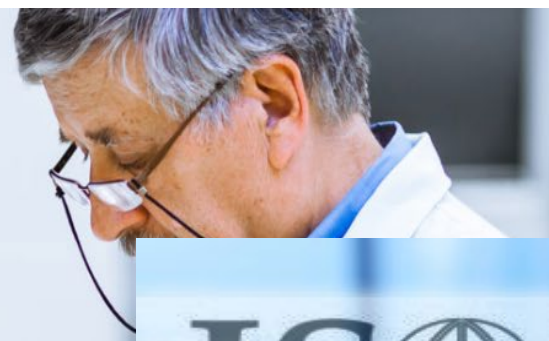


# LIMS: THE BACKBONE TO YOUR QUALITY MANAGEMENT SYSTEM (QMS)

## LABORATORY INFORMATION MANAGEMENT SYSTEMS

"It is no secret that laboratories that automate their operations will not only increase efficiency and productivity, but will also increase market share and profitability."



**Presented by:**

**Stephen Wesson, Senior Sales Account Executive**

**Accelerated Technology Laboratories**



**October 8, 2019**  
9 a.m. to 3 p.m.



# Agenda

ATL

What is ISO 17025:2017

What is a LIMS

Section 5: Structural Requirements

Section 6: Resource Requirements

Section 7: Process Requirements

Section 8: Management Systems Requirements

Review

# Accelerated Technology Laboratories

- **25 Years** of Expertise in LIMS & Laboratory Automation
- Our LIMS solutions are installed in **>600 laboratories** globally
- **ISO 9001:2015** Certified
- Sample Master® and TITAN® LIMS solutions
  - Premise or Hosted (Cloud)
  - Architecture: Client-Server or web based



## ISO/IEC 17025:2017 (International Organization for Standardization)

- This document specifies **the general requirements for the competence, impartiality and consistent operation of laboratories.**
- This document is **applicable to all organizations performing laboratory activities**, regardless of the number of personnel.
- Laboratory customers, regulatory authorities, organizations and schemes using peer-assessment, accreditation bodies, and others use this document in confirming or **recognizing the competence of laboratories.**

# 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.



# The 8 Sections of ISO 17025:2017

- 1) Scope
- 2) Normative References
- 3) Terms and Definitions
- 4) General Requirements
- 5) Structural requirements**
- 6) Resource Requirements**
- 7) Process Requirements**
- 8) Management System Requirements**

INTERNATIONAL  
STANDARD

ISO/IEC  
17025

Third edition  
2017-11

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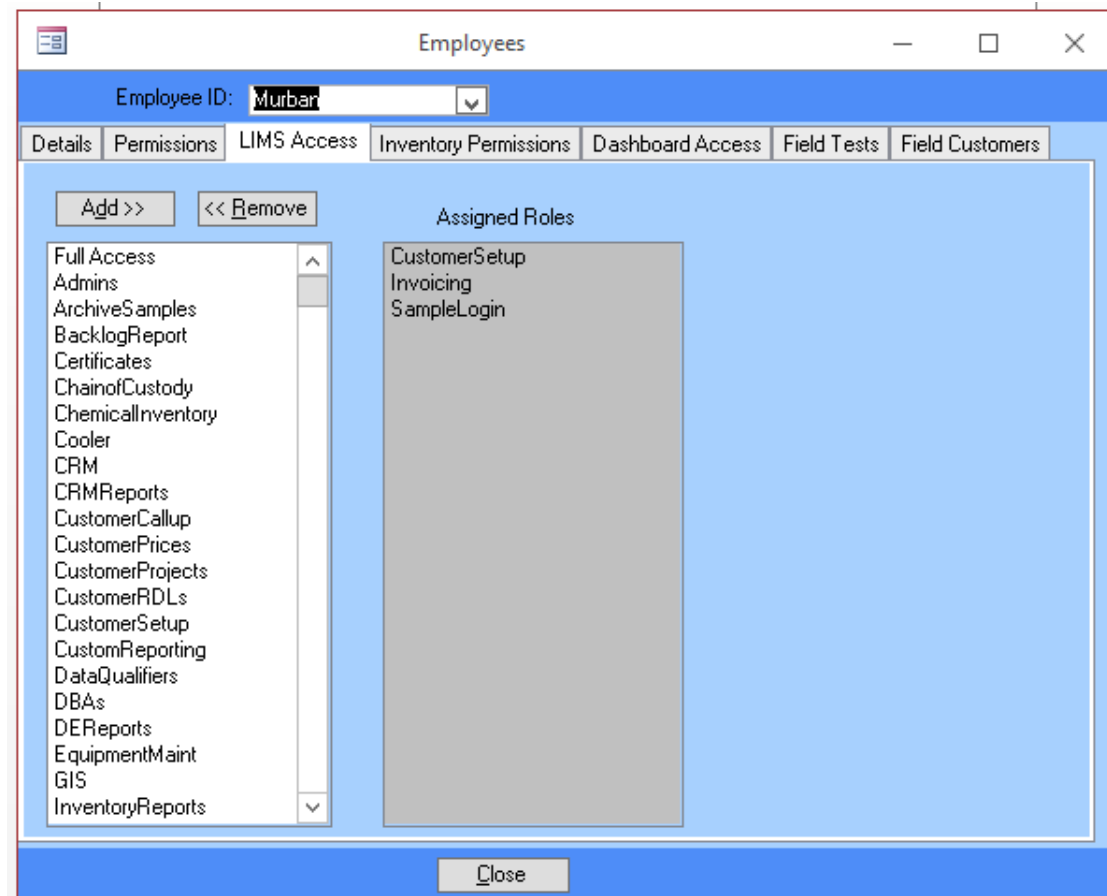
**General requirements for the  
competence of testing and calibration  
laboratories**

*Exigences générales concernant la compétence des laboratoires  
d'étalonnages et d'essais*

# ISO 17025: Section 5 Structural Requirements

## 5.5.b (Organization Roles)

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





# ISO 17025 Section 6 Resource Requirements

## 6.2 Personnel (Employee Training & Certificate Tracking)

**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
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	=	=	=	=	<input type="checkbox"/>	=	=
▶	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					
	Gibbs, Leroy Jethro	Sciuto, Abby Marilyn	Demonstration of Capabilit	06/12/2017	06/12/2017					
	Gibbs, Leroy Jethro	Sciuto, Abby Marilyn	Demonstration of Capabilit	10/19/2016	10/21/2016					
	Gibbs, Leroy Jethro	Sciuto, Abby Marilyn	Demonstration of Capabilit	09/19/2015	10/26/2015					

**Personnel Certificates**

By Employee By Certification By Test

Employee ID:

Certificate Name	Matrix	Test	Method	Certificate Date	Exp. Date	Required
DOC	Drinking Water	E. coli	SM 2320B	11/22/2017	11/22/2018	<input checked="" type="checkbox"/>
DOC	Solid	ICP-MS Total	EPA 200.8	8/21/2016	8/20/2017	<input checked="" type="checkbox"/>
DOC	Waste Water	Alkalinity	SM 2320B	9/3/2018	9/3/2019	<input type="checkbox"/>
Yearly Proficiency	Waste Water	Alkalinity	SM 2320B	11/22/2017	11/22/2018	<input type="checkbox"/>
Yearly Proficiency	Waste Water	ICP-MS Total	SM 2320B	11/22/2017	11/22/2018	<input checked="" type="checkbox"/>
Yearly Proficiency	Waste Water	NO2	EPA 353.2	5/15/2016	5/14/2018	<input checked="" type="checkbox"/>
Yearly Proficiency	Waste Water	pH	SM 2320B	11/22/2017	11/22/2018	<input type="checkbox"/>
Yearly Proficiency	Waste Water	TOC	SM 2320B	11/22/2017	11/22/2018	<input type="checkbox"/>

Close



# ISO 17025 Section 6 Resource Requirements

## 6.4 Equipment (Records shall be retained for equipment which can influence laboratory activities.)



Instrument - 12-305

Name: Agilent 1200 Instrument Type: LC/MS

Asset #: 12-305 Facility: Main Lab

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: ☐ Results Are Corrected For Dilution

☒ Available 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
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 TITANV\ATLUSER on TITANV\8000 - SessionId: 22114

# ISO 17025 Section 6 Resource Requirements

## 6.5 Metrological Traceability (Standard Traceability)

6.5.1 The laboratory shall establish and maintain metrological traceability of its measurement results by means of a documented unbroken chain of calibrations, each contributing to the measurement uncertainty, linking them to an appropriate reference.

File
Edit
Print

New Query
QC Batch ID: QC1902004 | 02/05/2019
New..
Mark 20 Samples
Add Samples

Order ID	Sample ID	Matrix	Test		QC Batch ID	Sample Due	Analysis Due	Site	Cust. Samp ID	Date Collected
19020101	19020101-01	Waste Water	NO2+NO3		QC1902004	2/8/2019	3/1/2019	Lot A		2/1/2019
19020101	19020101-02	Waste Water	NO2+NO3		QC1902004	2/8/2019	3/1/2019	Site #12878		2/1/2019
19020401	19020401-01	Waste Water	NO2+NO3		QC1902004	2/11/2019	3/4/2019	Lot A		2/4/2019
19020401	19020401-02	Waste Water	NO2+NO3		QC1902004	2/11/2019	3/4/2019	Site #12878		2/4/2019
19020401	19020401-04	Waste Water	NO2+NO3		QC1902004	2/11/2019	3/4/2019	Primary 1		2/4/2019

Row Count: 5

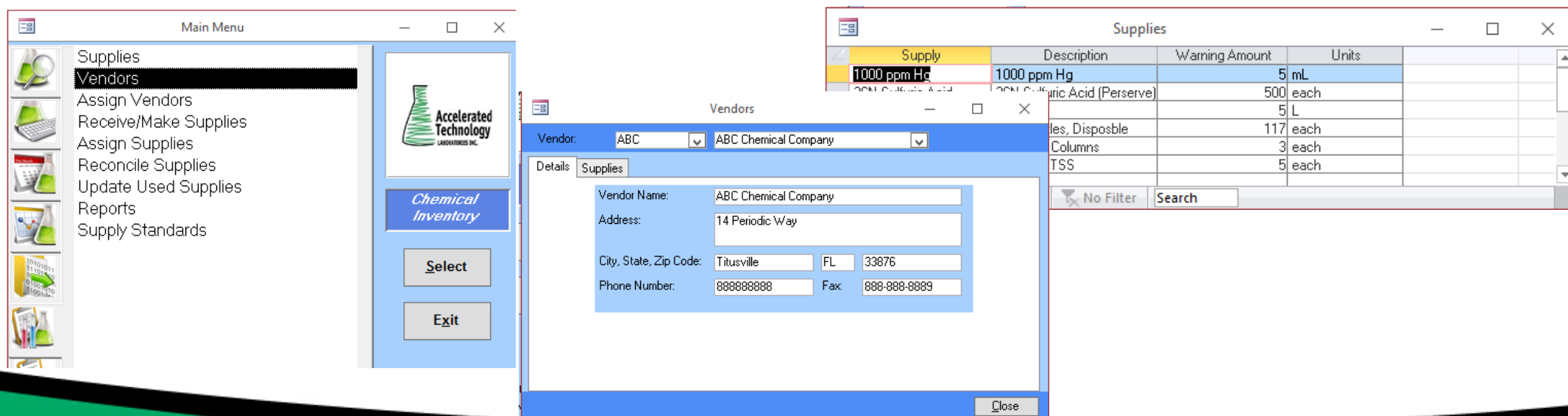
QC Type	Order ID	Sample ID
Duplicate	19020101	19020101-01
MS	19020401	19020401-02

Instrument: Lachat-N  
Initial Calib. STD: NIT051811B  
Calib. Check STD: NIT051811B  
Internal STD: NIT051811A,B,C,D,E  
Surrogate STD:  
LCS/LCSD STD: NIT052311  
MS/MSD STD: NIT121410

# ISO 17025 Section 6 Resource Requirements

## 6.6 Externally provided products & services (Vendors: Purchasing Services and Supplies)

Ensure that services and supplies delivered by third parties do not adversely impact the quality and effectiveness of laboratory operations.



The screenshot displays the software interface for Accelerated Technology Laboratories Inc. It features three overlapping windows: 'Main Menu', 'Vendors', and 'Supplies'.

**Main Menu:** A sidebar menu with options: Supplies, Vendors, Assign Vendors, Receive/Make Supplies, Assign Supplies, Reconcile Supplies, Update Used Supplies, Reports, and Supply Standards. The 'Vendors' option is currently selected.

**Vendors:** A window showing a list of vendors. The 'Vendor' dropdown is set to 'ABC', and the 'Vendor Name' is 'ABC Chemical Company'. Below this, there are input fields for 'Address' (14 Periodic Way), 'City, State, Zip Code' (Titusville, FL, 33876), and 'Phone Number' (8888888888). A 'Select' button is visible.

**Supplies:** A window displaying a table of supplies. The table has columns: Supply, Description, Warning Amount, and Units. The data is as follows:

Supply	Description	Warning Amount	Units
1000 ppm Hg	1000 ppm Hg	5	mL
1000 ppm Hg	1000 ppm Hg	500	each
1000 ppm Hg	1000 ppm Hg	5	L
1000 ppm Hg	1000 ppm Hg	117	each
1000 ppm Hg	1000 ppm Hg	3	each
1000 ppm Hg	1000 ppm Hg	5	each

At the bottom of the 'Supplies' window, there is a 'No Filter' button and a 'Search' button.

# ISO 17025 Section 7 Process Requirements

## 7.1 - Review of Requests, Tenders, and Contracts

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

Customers

Customer: 1 WWTP

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 samp
Monthly River				Routine monthly river sampling f
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 sam
Tuesday				Tuesday routine plant daily samp
Wednesday				Wednesday routine plant daily

Record: 11 No Filter Search

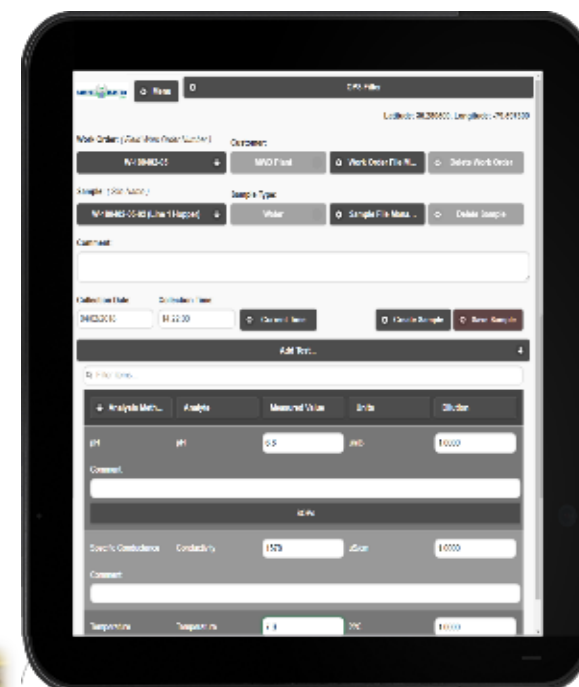
Close

# ISO 17025 Section 7 Process Requirements

## 7.3 – Sampling

Retain Records including:

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




# ISO 17025 Section 7 Process Requirements

## 7.4 – Handling of Test of Calibration items

Lab shall have Procedures to track:

- Transportation
- Receipt
- 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  
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:

Customer Information

Customer ID: PW Regional  
Customer Contact: Andy Hummel  
Billing ID: PW Regional  
Billing Contact: Andy Hummel  
Project ID:  
Project Location:  
PO #:

Sample Disposal

Return Samples  
Dispose After 45 Days

Close

Prelog Login... Samples

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	



# ISO 17025 Section 7 Process Requirements

## 7.5 – Technical records: Technical Records shall include:

All Results (View Only)

Results to Enter

Results to Validate

Results to Approve

Show Results Calculations

Show Limit Calculations

Show Client Sample Info

Sample Results		Sample Surrogates		Blank Results		Blank Surrogates		Spike Results		Spike Surrogates		Standard Results		
Order ID	Sample ID	Test	Parameter	Result	Units	C	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

- Comments
- Results
- QA/QC
- Reports
- Person Responsible
- Date & Time of Activity






# ISO 17025 Section 7 Process Requirements

## 7.8 – Reporting

Reports should include:

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



**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 (NH3)	4500-NH3		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 (NH3)	4500-NH3	Not Detected	ppm	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 #: Approved 

# ISO 17025 Section 7 Process Requirements

## 7.9 - Complaints

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

Customer Relations

Facility ID: WWTP

WWTP

Complaints
Complaint History
Summary
Contacts

ComplaintID: CC112113001

Type: Data question

Severity: Mild

Created: 11/21/2013 10:32:00 AM

by: DBA

☐ Closed

Closed:

by:

User 1:

User 2:

User 3:

User 4:

Details of complaint

Please verify result and Calculations

Status: New

Samples

Sample Number	C
18100504-04	<input type="checkbox"/>
*	<input type="checkbox"/>

New

Event

Close Complaint

Reopen

Create Order

Close

# ISO 17025 Section 7 Process Requirements

## 7.10 - Nonconforming Work

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

Result Entry

Display

☐ All Results (view only)  
☒ Results to Enter  
☐ Results to Validate  
☐ Results to Approve

Show Result Calculations   Show Limit Calculations   Show Client Sample Info

Sample Results	Sample Surrogates	Blank Results	Blank Surrogates	Spike Results	Spike Surrogates	Standard Results
Order ID	Sample ID	Test	Parameter	Result	Units	C + Sample Type Site Rep. Limit Qual. Ret. Time
19020401	19020401-01	Alkalinity	Alkalinity	15	mg/L	<input type="checkbox"/> <input checked="" type="checkbox"/> Grab Lot A 10
19020401	19020401-01	BOD	BOD	25	mg/L	<input type="checkbox"/> <input checked="" type="checkbox"/> Grab Lot A 2
19020401	19020401-01	NO2+NO3	Nitrate-Nitrite as	10	mg/L	<input type="checkbox"/> <input checked="" type="checkbox"/> Grab Lot A 0.06
19020401	19020401-01	pH	pH, (Hydrogen I	7.8	SU	<input type="checkbox"/> <input checked="" type="checkbox"/> Grab Lot A
19020401	19020401-01	TOC	Total Organic C		mg/L	<input type="checkbox"/> <input type="checkbox"/> Grab Lot A 0.17
19020401	19020401-02	Alkalinity	Alkalinity	75	mg/L	<input type="checkbox"/> <input checked="" type="checkbox"/> Composite Site #12B78 10
19020401	19020401-02	NO2+NO3	Nitrate-Nitrite as		mg/L	<input type="checkbox"/> <input checked="" type="checkbox"/> Composite Site #12B78 0.06
19020401	19020401-02	pH	pH, (Hydrogen I			
19020401	19020401-02	TKN	Kjeldahl Nitrogen			
19020401	19020401-02	TSS	Filter Wt	1.700		
19020401	19020401-02	TSS	Volume	100		
19020401	19020401-02	TSS	1st Dry Filter W/T			
19020401	19020401-02	TSS	2nd Dry Filter W/T			
19020401	19020401-02	TSS	TSS (Residue N	Calc		
19020401	19020401-04	BOD	BOD			
19020401	19020401-04	Chloride	Chloride			

Record: 14 of 31 No Filter Search

Close C: Result is Commented Enter

Sample Master v10.0

The Result is above the Range Limit of 50 mg/L.

OK

# Data Qualifiers

View Results

Display

☒ All Results (view only)
 ☐ Results to Enter
 ☐ Results to Validate
 ☐ Results to Approve

Show Result Calculations

Show Limit Calculations

Show Client Sample Info

Sample Results	Sample Surrogates	Blank Results	Blank Surrogates	Spike Results	Spike Surrogates	Standard Results	Data Qualifier	Translation				
Order ID	Sample ID	Test	Parameter	Result	Units	C	+	Qual.	Sample Type	Site	Rej	
12012002	12012002-27	OP	Ortho-phosphate	6.1722	mg/L			J2, Q	Secondary Efflu	0.01		B
12012002	12012002-27	TP	Phosphorus, Tot	12.7121	mg/L			J2, Q	Secondary Efflu	0.04		I
12012002	12012002-27	TSS	Residue Non-Filt	1.096	mg/L			J2, K, T, Q	Secondary Efflu	2		
12012002	12012002-28	Ammonia	Ammonia as N	7.0661	mg/L			J2, Q	Tower 1 Effluent	0.1		J1
12012002	12012002-29	Ammonia	Ammonia as N	0.0461	mg/L			J2, K, T, U, Q	Tower 2 Effluent	0.1		
12012002	12012002-30	Ammonia	Ammonia as N	7.9702	mg/L			J2, Q	Tower 3 Effluent	0.1		J2
12012002	12012002-31	Ammonia	Ammonia as N	5.3051	mg/L			J2, Q	Tower 4 Effluent	0.1		
12012002	12012002-32	Ammonia	Ammonia as N	1.8077	mg/L			J2, Q	Tower 5 Effluent	0.1		J3
12012002	12012002-33	Ammonia	Ammonia as N	4.9645	mg/L			J2, Q	Tower 6 Effluent	0.1		
12012002	12012002-34	Ammonia	Ammonia as N	0.9141	mg/L			J2, Q	Tower Effluent	0.1		J4
12012002	12012002-34	DO	Dissolved Oxygen	10.9638	mg/L			J2, Q	Tower Effluent	0.2		
12012002	12012002-34	NO2	Nitrite-N	3.3255	mg/L			Q	Tower Effluent	0.01		K
12012002	12012002-34	NO2+NO3	Nitrate-Nitrite as	13.8571	mg/L			J2, J3, Q	Tower Effluent	0.06		
12012002	12012002-34	NO3	Nitrate-N	0.7335	mg/L			J2, Q	Tower Effluent	0.06		L
12012002	12012002-34	pH	pH, (Hydrogen Ion)	7.9	SU			J2	Tower Effluent	0.2		
12012002	12012002-34	Temperature	Temperature	15.4	°C			J2, Q	Tower Effluent	0.2		N
12012002	12012002-34	TP	Phosphorus, Tot	8.5294	mg/L			J2, Q	Tower Effluent	0.04		
12012002	12012002-35	Ammonia	Ammonia as N	0.7654	mg/L			J2, Q	Tower Influent	0.1		Q
12012002	12012002-35	DO	Dissolved Oxygen	0.8358	mg/L			J2, Q	Tower Influent	0.2		
12012002	12012002-35	NO2	Nitrite-N	2.4618	mg/L			Q	Tower Influent	0.01		

Record: 107
No Filter
Search

Close
C: Result is Commented
Audit

B

Blank contamination; Analyte detected above the method reporting limit (RepLimit) in an associated blank

I

The reported value is between the laboratory method detection limit (DetectionLimit) and the laboratory practical quantitation limit (PQL)

J1

Reported value is estimated; Surrogate recoveries limits were exceeded (Not between LCL and UCL for Surrogates)

J2

Reported value is estimated; No known QC criteria for this component.

J3

Reported value is estimated; The value failed to meet QC criteria for either precision or accuracy. (Result Not between LCL and UCL for Spikes, Duplicates and Standards)

J4

Reported value is estimated; The sample matrix interfered with the analysis (Percent Recovery Not between LCL and UCL for Spikes )

K

Off-scale low. Actual value is known to be less than the value given (below RepLimit)

L

Off-scale high. Actual value is known to be greater than value given (above RangeLimit), corrected for Prep

N

Non-target analyte; Tentatively identified compound (using mass spectroscopy). (TIC value is True)

Q

Sample held beyond the accepted holding time (AnalysisDueDate)

R

Rejected data; Not suitable for the projects intended use.

T

Value reported is less than the reporting detection limit (below RDL RepLimit)

U

Compound was analyzed for but not detected (below Detection Limit, corrected for Prep, or null)

V

Analyte was detected in both the sample and the associated method blank. (Blank result > Detection Limit or Blank result > 0)

Z

Too Numerous to count (Result = TNTC)

# ISO 17025 Section 7 Process Requirements

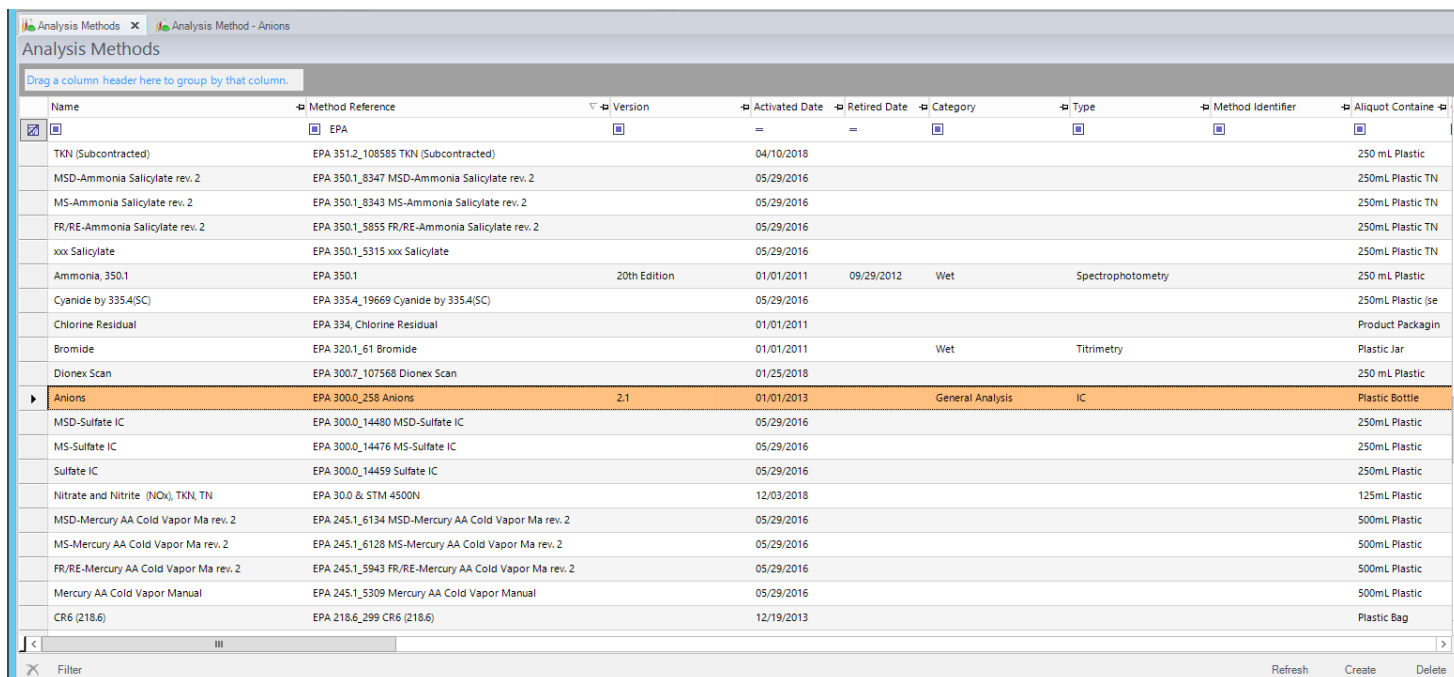
## Section 7.11 Control of Data and Information Management

- This is the only section in ISO 17025 that speaks specifically to LIMS.
  - 7.11.3 – **Data Integrity, Security** and the ability to **record system failures**.
  - 7.11.4 - If a system is managed **off-site**, the **provider/operator must comply with ISO 17025**

# ISO 17025 Section 8 Management System Requirements

## 8.3 – Control of management system documents

- Ensure that all documents are approved, reviewed, with current versions identified.



The screenshot shows a software interface titled 'Analysis Methods' with a table listing various analytical methods. The table has columns for Name, Method Reference, Version, Activated Date, Retired Date, Category, Type, Method Identifier, and Aliquot Container. The 'Anions' section is expanded, showing methods like EPA 300.0, 258 Anions, MSD-Sulfate IC, MS-Sulfate IC, Sulfate IC, Nitrate and Nitrite (NOx), TKN, TN, MSD-Mercury AA Cold Vapor Ma rev. 2, MS-Mercury AA Cold Vapor Ma rev. 2, FR/RE-Mercury AA Cold Vapor Ma rev. 2, Mercury AA Cold Vapor Manual, and CR6 (218.6).

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
<b>Anions</b>	<b>EPA 300.0, 258 Anions</b>	<b>2.1</b>	<b>01/01/2013</b>		<b>General Analysis</b>	<b>IC</b>		<b>Plastic Bottle</b>
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 (NOx), 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

# ISO 17025 Section 8 Management System Requirements

**8.6: Improvement (*Preventative Actions*)**

**8.7: 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







# Review

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

# Questions?



## THANK YOU!

**Stephen Wesson**, Senior Sales Account Executive  
**Accelerated Technology Laboratories**

- Email: [swesson@atlab.com](mailto:swesson@atlab.com)



**October 8, 2019**

9 a.m. to 3 p.m.

