California Environmental Laboratory Accreditation Program

Environmental Laboratory

Technical Advisory Committee (ELTAC) Meeting

June 15, 2016

NOTICE OF ENVIRONMENTAL LABORATORY TECHNICAL ADVISORY COMMITTEE (ELTAC) MEETING

REVISED

June 15, 2016
10:00 a.m. – 5:00 p.m.
(or until completion of business)

Location 1	**Location 2**
California Environmental Protection Agency Building	Metropolitan Water District of Southern California
1001 I Street, Room 2540	700 N. Alameda Street, Room US2-456
Sacramento, CA 95814	Los Angeles, CA 90012

The Environmental Laboratory Accreditation Program (ELAP) will host a meeting of its technical advisory committee, as noted above. The notice and agenda for this meeting and others can be found at www.waterboards.ca.gov/elap. For further information regarding this agenda, see below or contact ELAP at elapca@waterboards.ca.gov or (916) 323-3431.

This meeting is available via teleconference and webcast. Connection information is located at the bottom of this notice.

AGENDA

ITEM #1 - Call to Order/Roll Call

ITEM #2 - Public Comments on Items Not on Agenda
(The Committee will not take any action but will consider placing any item raised on the agenda at a future meeting.)

ITEM #3 – Summary of May 11, 2016 Meeting and Approval of Minutes

ITEM #4 – DELAPO Report

ITEM # 5 – Unfinished Business
1. Laboratory Accreditation Standards
2. Proposed Process for Agency Coordination and to Update Laboratory Community on Future Regulatory Actions
3. Auditor Checklists
4. Fee Structure

ITEM # 6 – Committee Reports
1. Field of Testing Worksheet Review

ITEM #7 – Close
1. Review Action Items

Summary of Revisions: Item #6 – Committee Reports was originally listed as Item #5. Sub items 1, 2, and 3 in the listed Item #5 – Unfinished Business have been reordered. Sub item 4 was added to Item #5. No content changes have been made to any existing item.

Action may be taken on any item on the agenda. The time and order of agenda items are subject to change at the discretion of the ELTAC Chair and may be taken out of order. The meeting will be adjourned upon completion of the agenda, which may be at a time earlier or later than posted in this notice.

In accordance with the Bagley-Keene Open Meeting Act, all meetings of ELTAC are open to the public.

Government Code section 11125.7 provides the opportunity for the public to address each agenda item during discussion or consideration by ELTAC prior to ELTAC taking any action on said item. Members of the public will be provided appropriate opportunities to comment on any issue before ELTAC, but the ELTAC Chairperson may, at his or her discretion, apportion available time among those who wish to speak. Individuals may appear before ELTAC to discuss items not on the agenda; however, ELTAC can neither discuss nor take official action on these items at the time of the same meeting [Government Code sections 11125 and 11125.7(a)].

The meeting locations are accessible to the physically disabled. A person who needs a disability-related accommodation or modification in order to participate in the meeting may make a request by contacting Katelyn McCarthy at (916) 323-3431 or emailing katelyn.mccarthy@waterboards.ca.gov. Providing your request at least five business days before the meeting will help to ensure availability of the requested accommodation.

Connection Information

Webcast	www.calepa.ca.gov/broadcast
Web Meeting (includes audio)	https://stateofcaswrcbweb.centurylinkccc.com/CenturylinkWeb/KatelynM
Dial-in option	1-877-820-7831, Passcode 675535# Or 1-720-279-0026, Passcode 675535#

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
ELTAC MEETING
Wednesday, May 11, 2016 – 10:00 a.m.
1001 I Street
Sacramento, CA 95814
And
700 N. Alameda Street, Room US2-456
Los Angeles, CA 90012

Meeting Agenda

TIME	AGENDA ITEM	PRESENTER(S)
10:00am	Item #1 - Call to Order *Objective: Roll call.*	Andy Eaton, *Chairperson*
10:05am	Item #2 - Public Comments on Items not on Agenda	Open
10:10am	Item #3 – Summary of May 11, 2016 Meeting & Approval of Minutes *Objective: Recall previous assignments and amend or approve minutes.*	Andy Eaton
10:20am	Item #4 – DELAPO Report *Objective: Update members on recent developments and activities.*	Christine Sotelo, *DELAPO*
10:30am	Item #5 - Unfinished Business 1. Laboratory Accreditation Standards – "Accreditation Standard Questions" *Objective: Provide information on standard discussion.*	Christine Sotelo

11:00am	Item #5 – Unfinished Business – Cont. 1. Laboratory Accreditation Standards – “Agency Partner Needs” *Objective: Define state agency partner needs for committee.*	Carol Wortham, *State Agency Partners Committee*
11:30am	Item #5 – Unfinished Business – Cont. 1. Laboratory Accreditation Standards – “The Impact of TNI on Government Owned Laboratories in California, Florida, and New York” *Objective: Provide information for committee consideration.*	David Kimbrough, *ELTAC*
12:00pm	Item #5 – Unfinished Business – Cont. 1. Laboratory Accreditation Standards – Florida Case Study Testimony *Objective: Provide requested information to committee.*	Vanessa Soto-Contreras, *Florida Department of Health*
12:30pm-1:30pm	Out To Lunch	
1:30pm	Item #5 – Unfinished Business – Cont. 1. Laboratory Accreditation Standards – “A Small Laboratory’s Experience” *Objective: Provide requested information to committee.*	Mary Johnson, *Rock River Water Reclamation District, Illinois*
2:00pm	Item #5 – Unfinished Business – Cont. 1. Laboratory Accreditation Standards – “The Road to Accreditation: One Lab’s Path to Success” *Objective: Provide requested information to committee.*	Adrienne Tapia, *Brazos River Authority, Texas*
2:30pm	Item #5 – Unfinished Business – Cont. 1. Laboratory Accreditation Standards – “In Support of California Adoption of the TNI Standard”	Allison Mackenzie, *ELTAC*

	Objective: Provide information for committee consideration.	
3:00pm	Item #5 – Unfinished Business – Cont. 2. Proposed process for agency coordination and to update laboratory community on future regulatory actions *Objective: Finalize recommendation.*	Stephen Clark, *ELTAC*
3:30pm	Item #5 – Unfinished Business – Cont. 3. Auditor Checklists *Objective: Reach decision on next step.*	Andy Eaton, David Kimbrough
4:00pm	Item #5 – Unfinished Business – Cont. 4. Fee Structure *Objective: Reach decision on next step.*	Andy Eaton
4:15pm	Item #6 – Committee Reports 1. Field of Testing Worksheet Committee *Objective: Update members on recent developments and activities. Reach decision on next step.*	Rich Gossett, *Chairperson, Field of Testing Subcommittee*
4:45pm	Item #7 – Close 1. Review Action Items *Objective: Review assignments generated during the meeting.*	Andy Eaton
5:00 pm	Adjourn	

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
ELTAC MEETING
Wednesday, June 15, 2016– 10:00 a.m.
1001 I Street
Sacramento, CA 95814
And
700 N. Alameda Street, Room US2-456
Los Angeles, CA 90012

MEETING PACKET

AGENDA ITEM #1

Call to Order/Roll Call

Name	Affiliation	Type	Present
Christine Sotelo	ELAP	DELAPO	
Katelyn McCarthy	ELAP, Scribe	Scribe	
Mindy Boele	CWEA	Rep	
Jill Brodt	Brelje and Race Laboratories	Rep	
Bruce Burton	Division of Drinking Water	SRAE	
Gail Cho	CA Dept. of Fish and Wildlife	SRAE	
Stephen Clark	Pacific EcoRisk	Rep	
Ronald Coss	CWEA	Rep	
Huy Do	CASA	Rep	
Andy Eaton,	Eurofins Eaton Analytical	Rep	
Miriam Ghabour	Metropolitan Water District of Southern California	Rep	
Bruce Godfrey	ACIL	Rep	
Anthony Gonzales	CAPHLD	Rep	
Rich Gossett	Physis Environmental	Rep	
David Kimbrough	Pasadena Water and Power	Rep	
Mark Koekemoer	Napa Sanitation District	Rep	
Bruce LaBelle	Dept. of Toxic Substances Control	SRAE	
Allison Mackenzie	Babcock Laboratories	Rep	
Guilda Neshvad	Positive Lab Service	Rep	
Renee Spears	State Water Resources Control Board	SRAE	

Abbreviation	Member Type
DELAPO	Designated ELAP Officer, nonvoting
Scribe	Minutes (non-member)
SRAE	State Regulatory Agency Employee, nonvoting
Rep	Representative Member, voting

AGENDA ITEM #2

Public Comments on Items Not on Agenda

Members of the public may address the Environmental Laboratory Technical Advisory Committee (ELTAC) regarding items that are not contained in the meeting agenda at this time.

However, ELTAC may not discuss or take action on any item raised during this public comment session, except to decide whether to place the matter on the agenda of a future meeting [Government Code sections 11125 and 11125.7(a)].

AGENDA ITEM #3

Approval of Minutes from March 23, 2016 Meeting

The Environmental Laboratory Technical Advisory Committee (ELTAC) is asked to review and approve the March 23, 2016 Meeting Minutes.

<u>Attachment:</u>
Draft Minutes from May 11, 2016 ELTAC Meeting

<u>Proposed Revisions:</u>

ITEM #6 –

Member Boele proposed noting a request to ELAP to provide a list of end user criteria for acceptable data.

AGENDA ITEM #4

Designated ELAP Officer (DELAPO) Report

AGENDA ITEM #5

Unfinished Business

1. Laboratory Accreditation Standards

Presentations:

- *"Accreditation Standard Questions (and Options)"* – Christine Sotelo, ELAP

  Attachments: State Programs list

- *"Agency Partner Needs"* – Carol Wortham, State Agency Partners Committee

- *"The Impact of TNI on Government Owned Laboratories in California, Florida, and New York"* – David Kimbrough, ELTAC

  Attachments: White Paper # 1 – Accreditation Standards for ELAP; White Paper # 2 – The Impact of TNI on Government Owned Laboratories in California, Florida, and New York

- Florida Case Study Testimony – Vanessa Soto-Contreras, Florida Department of Health

- *"A Small Laboratory's Experience"* – Mary Johnson, Rock River Reclamation District, Illinois

- *"The Road to Accreditation: One Lab's Path to Success"* – Adrienne Tapia, Brazos River Authority, Texas

- *"In Support of California Adoption of the TNI Standard"* – Allison Mackenzie, ELTAC

  Attachments: White Paper # 3 – In Support of California Adoption of the TNI Standard by Allison Mackenzie; Memorandum: Comparison of TNI and OW Laboratory Assessment Standards, Raymond Merrill, Eastern Research Group, Inc.

2. Proposed process for agency coordination and to update laboratory community on future regulatory actions.

   Attachments: Proposed Framework for State Agency Requests to ELAP for New Analytical Methods and Lowered Reporting Limits, drafted by Stephen Clark, ELTAC

3. Auditor Checklists

<u>Attachments:</u>

- Need for New Method Checklists

<u>EPA 218.6</u>

- ELTAC Developed – EPA 218.6 Revision 3.3 (1994) – Hexavalent Chromium by Ion Chromatography
- ELAP Developed – EPA 218.6 Revision 3.3 (1994) - Determination of Dissolved Hexavalent Chromium by Ion Chromatography
- EPA Method 218.6, Revision 3.3 (1994)

<u>SM 2130 B</u>

- ELTAC Developed – Turbidity by EPA 180.1, SM2130B-2001
- ELAP Developed – SM 2130 B - Turbidity
- Standard Method 2130

<u>SM 2540 F</u>

- ELTAC Developed – Residue, Settleable SM 2540F
- ELAP Developed – 2540 F 20th Edition 1994 – Settleable Solids
- Standard Method 2540

4. Fee Structure

   Attachments: Accreditation Statistics – June 9, 2016; Method Statistics – June 10, 2016

AGENDA ITEM #6

Committee Reports

1. Field of Testing Worksheet Review

   Attachments: California ELAP ELTAC FOT Subcommittee Report, June 15 , 2016

AGENDA ITEM #7

Close

1. Review Action Items

CALIFORNIA ENVIRONMENTAL LABORATORY TECHNICAL ADVISORY COMMITTEE (ELTAC)
COMMITTEE MEETING MINUTES
May 11, 2016

More information on the Environmental Laboratory Accreditation Program (ELAP) and previous ELTAC meetings can be found at http://www.waterboards.ca.gov/elap.

CALL TO ORDER

DELAPO Christine Sotelo called the meeting to order on May 11, 2016 at 10:00 a.m. at the California Environmental Protection Agency Headquarters, 1001 I Street, Conference Room 2540, Sacramento, CA and the Metropolitan Water District of Southern California, 700 N. Alameda Street, Room US2-456, Los Angeles, CA 90012.

COMMITTEE MEMBERS PRESENT

DELAPO: Christine Sotelo
Representatives:

Mindy Boele
Jill Brodt
Stephen Clark
Huy Do
Andy Eaton
Miriam Ghabour
Bruce Godfrey
Anthony Gonzalez
Rich Gossett
Dave Kimbrough
Mark Koekemoer
Allison Mackenzie
Guilda Neshvad

Alternate:

John Quinn (alternate for SRAE Bruce Labelle)

State Regulatory Agency Employees:

Gail Cho

Not Present:

Ronald Coss
Bruce LaBelle

OTHER STAFF PRESENT

Scribe: Katelyn McCarthy
ELAP: Maryam Khosravifard, Angela Anand, Ruby Lau, Naeem Ahmad
Water Boards Office of Enforcement: Nickolaus Knight
Office of Public Participation: Gita Kapahi

ANNOUNCEMENT

- *Evacuation information in case the fire alarm goes off during the meeting.*
- *The Committee meeting is being webcasted and recorded.*

COMMITTEE MEETING

PUBLIC FORUM

Any member of the public may address and ask question of the Committee relating to any matter within ELTAC's scope provided the matter is not on the agenda, or pending before the Advisory Committee.

No Action Taken

Commenter
Nick Haring, City of San Diego

COMMITTEE BUSINESS

ITEM #1 - Call to Order/Roll Call

ITEM #2 - Public Comments on Items Not on Agenda
(The Committee will not take any action but will consider placing any item raised on the agenda at a future meeting.)

No Action Taken

ITEM #3 – Approval of Revised Minutes from March 23, 2016 Meeting

Motion: Member Clark motioned to adopt the revised minutes.
Seconded by: Member Gossett
MOTION CARRIED: May 11, 2016

Aye:	All
Nay:	None
Absent:	None
Abstain:	None

ITEM #4 – DELAPO Report

- ***On April 19, 2016, the State Water Resources Control Board adopted a resolution to allow the Executive Director or designee to enter into a multi-year contract for ELAP assessor training and laboratory audits.***
- ***Robert Brownwood joined the Division of Drinking Water as Assistant Deputy Director.***
- ***Nicolaus Knight from the Office of Enforcement is ELAP's enforcement attorney.***
- ***The contents of the Bagley-Keene Open Act were discussed in regards to forwarding emails amongst committee members.***

ITEM #5 – Committee Reports

1. Field of Testing Worksheet Review

Motion: A motion was made by Member Godfrey to form a subcommittee including Members Brodt, Cho, Eaton, Gossett, Kimbrough, and Neshvad to lead the task of reviewing the Field of Testing Worksheet review.
Seconded by: Member Gossett
MOTION CARRIED: May 11, 2016

Aye:	All
Nay:	None
Absent:	None
Abstain:	None

2. ELTAC Mission Statement

Motion: A motion was made by Member Clark to adopt the revised ELTAC Mission Statement.
Seconded by: Member Boele
MOTION CARRIED: May 11, 2016

Aye:	All
Nay:	None
Absent:	None
Abstain:	None

Informational Item – Lower 1, 2, 3 Trichloropropane Reporting Limits

- ***Presented by Bill Draper, Drinking Water Radiation Laboratory***

No Action Taken

ITEM #6 – Unfinished Business

1. Discussion of Laboratory Standards

No Action Taken

ITEM #7 – New Business

1. ELTAC Constituency Contacts/By-Laws Expectations

No Action Taken

2. Auditor Checklists

Motion: A motion was made by Chairperson Eaton to table the topic until the next meeting.
Seconded by: Member Clark
Amendment: An amendment to the motion was made by Member Kimbrough to allocate thirty minutes to the next meeting agenda and to review a representative checklist during that time.
Seconded by: Member Clark
AMENDMENT CARRIES: May 11, 2016

Aye:	All
Nay:	None
Absent:	Member Gossett Member Neshvad
Abstain:	None

AMENDED MOTION CARRIED: May 11, 2016

Aye:	All
Nay:	None
Absent:	Member Gossett Member Neshvad
Abstain:	None

3. Draft Regulations on Fee Structure

No Action Taken

ITEM #9 - Close
1. Review action items

ADJOURNMENT
The Committee adjourned at 4:42pm.

State Program Types

State	Type of Program	DW	NPW	SW	QMS
Arizona	State-created	x	x	x	
Arkansas	State-created				
Connecticut	State-created	x	x	x	x
Kentucky	State-created	x	x		x
North Carolina	State-created	x	x	x	x
Ohio	State-created	x	x	x	
Rhode Island	State-created	x	x		x
South Carolina	State-created	x	x		x
Washington	State-created	x	x	x	x
West Virginia	State-created	x	x	x	
Wisconsin	State-created	x	x	x	x
Alabama	DW Cert Manual	x			
Alaska	DW Cert Manual	x			
Colorado	DW Cert Manual	x			
Delaware	DW Cert Manual	x			
Hawaii	DW Cert Manual	x			
Idaho	DW Cert Manual	x			
Indiana	DW Cert Manual	x			
Iowa	DW Cert Manual	x		x	
Maine	DW Cert Manual	x			
Maryland	DW Cert Manual	x			
Massachusetts	DW Cert Manual	x			
Michigan	DW Cert Manual	x			
Mississippi	DW Cert Manual	x			
Missouri	DW Cert Manual	x			
Montana	DW Cert Manual	x			
Nebraska	DW Cert Manual	x			
Nevada	DW Cert Manual	x	x	x	
North Dakota	DW Cert Manual	x			
South Dakota	DW Cert Manual	x			
Tennessee	DW Cert Manual	x			
Florida	NELAP	x	x	x	x
Illinois	NELAP	x	x	x	x
Kansas	NELAP	x	x	x	x
Louisiana	NELAP	x	x	x	x
Minnesota	NELAP	x	x	x	x
New Hampshire	NELAP	x	x	x	x
New Jersey	NELAP	x	x	x	x
New York	NELAP	x	x	x	x
Oregon	NELAP	x	x	x	x
Pennsylvania	NELAP	x	x	x	x
Texas	NELAP	x	x	x	x
Utah	NELAP	x	x	x	x
Vermont	NELAP	x			x
Virginia	NELAP/Dual	x	x	x	x
Georgia	NELAP or 17025	x			x
New Mexico	NELAP or 17025	x			x
Oklahoma	NELAP Pending	x	x	x	x
Wyoming	No program				

White Paper #1: Accreditation Standards for ELAP

By David Kimbrough, Pasadena Water & Power

Presented to the Environmental Laboratory Technical Advisory Committee, May 11, 2016

> The Environmental Laboratory Technical Advisory Committee (ELTAC) has been given the task of discussing the pros and cons of adopting a new accreditation standard. This whitepaper is an attempt to provide the ELTAC with one perspective on this matter in an effort to stimulate thinking and discussion.

1) Introduction

The Environmental Laboratory Accreditation Program (ELAP) was created to ensure that California regulatory agencies received reliable results from laboratories that are used for regulatory compliance monitoring. California has been involved in environmental laboratory issues since the 1920's and has been accrediting drinking water and wastewater laboratories since the early 1950's. The United States Environmental Protection Agency's drinking water certification program was largely based on what California was doing.

Over the last 20 years ELAP has largely failed to achieve most of its goals. It often only barely functioned, failing to routinely conduct on-site assessments (OSAs) and/or conducting incomplete OSAs, inconsistent review of laboratory Proficiency Testing Samples (PTSs), failing to adequately process forms, generally resulting in ineffective and incomplete assessments of laboratory performance. The core problem was a failure of management to direct and train staff in a consistent and effective fashion.

When ELAP was transferred to the State Water Resources Control Board, Board management assessed that ELAP needed to be overhauled. Part of that process was the creation of an Expert Review Panel (ERP). The ERP's task was to assess ELAP and present recommendations to get ELAP back on track. The ERP spent a year taking in information from ELAP, the laboratory community, the State Regulatory Agencies that ELAP are supposed to support, and others. The ERP prepared a report with a number of recommendations for helping to improve ELAP. Most of those recommendations were well received by all stakeholders.

The one exception was on the subject of "Accreditation Standards". The ERP recommended that ELAP adopt a new Accreditation Standard that could be uniformly applied to all laboratories by all ELAP staff. The ERP provided Three Options on how this goal might be achieved. The ERP suggested that accreditation requirements found in The National Environmental Laboratory Accreditation Conference (NELAC) Institute's (TNI) documents might be incorporated into ELAP's new Accreditation Standard. The ERP argued that an Accreditation Standard based on a Quality Systems approach was best. However, many stakeholders objected to using the TNI documents as a prescription to resolve ELAP's shortcomings. The feeling was that implementation of the TNI Standard requirements would be detrimental to ELAP's efforts to return to a fully functional program, and it would be detrimental to the interests of most ELAP accredited laboratories.

2) The Heart of Accreditation

The way the State of California has historically accredited environmental laboratories is in principle quite simple. The State, through its regulatory agencies in regulation, permit conditions, and other similar instruments, identifies analytical methods for particular analytes that it considers acceptable. Bodies with permits from State regulatory agencies are required to use laboratories that employ these approved methods for the combination of analytes necessary to assess compliance sample quality. Laboratories that analyze compliance samples for these permitted bodies apply to ELAP for accreditation for the methods and analytes that the permittees are required to use. ELAP then determines whether the laboratory is competent to analyze those samples for those agencies by those methods for those analytes.

3) Accreditation Standard

An Accreditation Standard is a set of requirements that ELAP uses to assess whether a laboratory is competent to analyze sample for a particular regulatory agency for a particular method for a particular analyte.

What should the Accreditation Standard contain that will allow ELAP to work better?

a) The starting point must then a list of which combination of approved method and analyte each State Regulatory Agency requires its permittees to use. From this list, laboratories can apply to ELAP for accreditation.

i. Historically approved methods have been grouped together into Fields of Accreditation or Testing (FOA or FOT). All approved methods for a given regulatory agency that are related are grouped into FOAs. For example all methods approved by the Division of Drinking Water for elements are currently grouped into FOA 103. This would include Atomic Absorption Spectrometry, Atomic Emission Spectrometry, Mass Spectrometry, and so forth.

ii. In most cases, more than one analytes can be analyzed by a particular method. ELAP has in the past allowed laboratories to seek accreditation for just particular analytes rather than just by method. Units of Accreditation (UOA) would consist of a combination of Regulatory Agency – Method – Analyte.

iii. However in some cases ELAP required laboratories to be accredited for all analytes for which the method was approved irrespective of whether the laboratory had any clients who were required to test for those analytes.

b) The accreditation process for assessing a laboratory's competence for any given UOA has four parts:

i. Laboratories need to be required to fill out forms providing ELAP with key information about the laboratory. This is important for ELAP to be able to assess the laboratory's capabilities.

ii. Laboratories need to be required to pay a fee. This is important to fund ELAP's activities.

iii. Laboratories need to be required to purchase, analyze, and successfully pass PTSs to assess laboratory performance.

iv. Laboratories need to be required to participate in an OSA to determine if the information on the forms is correct and to rectify any deficiencies found.

c) ELAP has had a set of requirements for what information needs to be on each form for each UOA.

i. Location of the Laboratory
ii. FOAs and UOAs being applied for
iii. Organization
iv. Qualifications of Staff
v. Facilities

vi. Methods
vii. Equipment
viii. Quality Assurance

d) ELAP has a set of requirements for assessing if each of these areas with specific standards. These standards come from:
   i. The approve methods themselves
   ii. The regulations and statutes of the State of California
   iii. The Quality Assurance Manual of the laboratory

e) If a laboratory can demonstrate that they can comply with the requirements for each UOA, ELAP will accredit it.

4) Accreditation Standard vs. Quality System

The ERP Report and ELAP appear to use the term Accreditation Standards to mean, approximately, the same thing as Quality Systems at times. However, this is not accurate. Even the ERP implies as much in their own report where they write:

> *"ELAP should adopt a clear standard to which it accredits laboratories, and it should implement this standard as soon as possible because it is a foundation of many of the other Panel recommendations. Standards that are based on quality systems provide ongoing checks to help ensure that all functions of the laboratory, regardless of size, are in compliance, resulting in greater confidence in the data produced. The Panel envisions three possible routes the State could take to achieve this: (1) Create ELAP's own State-specific standard; (2) modify and adopt an existing standard; or (3) adopt an existing standard. "*

The ERP is arguing for an Accreditation Standard **based on** Quality Systems which implies, correctly, that an Accreditation Standard is different from a Quality System.

ELAP is of course a regulatory enforcement program, it can only accredit laboratories based on what is in their regulations (adopted by ELAP through the Office of Administrative Law under the Administrative Law Act) and enabling statutes (adopted by the State Legislature), i.e. what is in law. ELAP's statutes and regulations lay out procedures for how ELAP will assess a laboratory and determine if they are to be granted or denied accreditation. Accreditation Standard is thus their statutes and regulations. ELAP's statutes 100830(a)(2) allow ELAP to adopt regulations to establish requirements for *"Quality Assurance"*. The statutes state that ELAP:"…*may issue, deny, renew, or suspend a certificate of accreditation for individual units or fields. Suspension and denial of units or fields of accreditation shall be based on a laboratory's failure to comply with this article and regulations adopted thereunder."* ELAP did indeed adopt regulations to do this, including a section Quality Systems (called *"Quality Assurance"* in Article 8 §64815) so any future regulation would necessarily include this as well.

<u>If ELAP needs a new Accreditation Standard, it would need to write or amend, at a minimum, a new set of regulations, if not also a new set of statutes.</u>

5) Quality System

a) TNI

The TNI documents are not a Quality System, despite the use of the term. They represent what could, at best be described as part of a Quality System. The entire concept of Quality Management System is to manage the quality of the product from beginning to end. Data Quality Objectives (DQOs), Measurement Quality Objectives (MQOs), Data Quality Indicators (DQIs), Measurement Quality Indicators, would need to be established in statute, regulation, in permits, sampling plans, and the like for them to be established. The DQO's might vary from project to project so there might be Quality Assurance Project Plans (QAPPs). Without these elements established beforehand, a laboratory cannot have a meaningful Quality System. A laboratory Quality System can only be but one part of a larger Quality Management System. The TNI Quality System elements are merely the outline, a framework, for establishing the laboratory component of a broader Quality Management System.

b) ELAP

If ELAP is interested in establishing a Quality Management System it would involve working with the Division of Drinking Water (DDW) to establish DQOs, MQOs, DQIs, MQIs, and so forth that would apply to all of the work of the DDW, not just the laboratories. The same could be done for the Division of Water Quality, the Department of Toxic Substances Control, the Department of Fish and Wildlife, etc.

6) The Three Options

a. Option 1 – The "Do It Yourself" (DIY) Option

   The ERP explained Option 1 this way: *"The major benefit of creating a State-specific standard is that it would ensure the resulting laboratory requirements meet program and client needs. This effort will allow the State to include only those requirements it considers important for laboratory performance. Major drawbacks are the difficulty, cost, and time associated with writing an original document. Additionally, this option would require the State to develop State-specific training protocols for ELAP assessors, and provide resources to communicate the new requirements to the laboratories. These drawbacks make selecting this option time and cost-prohibitive."*

   The ERP provides no insights into what this Accreditation Standard might look like, it merely argues that the process of establishing this Accreditation Standard would be time-consuming and costly. The ERP does not explain how it determine that this was the more costly approach. It appears to assume that ELAP would be beginning from scratch. This assumption however is incorrect. ELAP has its own existing regulations with which to start, as well as draft regulations developed earlier by a joint ELAP-ELTAC committee, and the regulations from other state laboratory accreditation programs are accessible and available.

b. Option 2– The "Hybrid" Option

   The ERP explained Option 2 this way: *"The major benefit of modifying an existing standard is that it would save time and resources compared to the development of a State-specific standard. The major drawback is that the savings of time and resources might be relatively small in comparison to Option 1. The Panel heard testimony at its August 2015 meeting about an effort by the State of Wisconsin to modify an existing standard. The Panel learned that reaching consensus on the modifications to the standard and the adoption process took an extensive amount of time and, in the end, resulted in an imperfect standard. This, in effect, isolated Wisconsin's laboratory program, which is not recognized by other states, adding costs and placing restrictions on Wisconsin laboratories conducting business across state lines. Because California's laboratory community is much larger than*

Wisconsin's, the Panel believes that the timeframe for development and adoption of a modified standard would be more protracted than Wisconsin's timeframe. From the information presented, it became clear to the Panel that this option is not practical for ELAP in the immediate future."

Option 2 is supposed to be a "hybrid" of TNI (although TNI is not named explicitly; this was made clear during the ERP's public hearings in Sacramento and Costa Mesa). However, the Wisconsin regulations are all of 25 pages long (as opposed to over 200 for the TNI document), only nine of which are Quality Systems. The Wisconsin regulations used many of the same ideas found in TNI, mainly from Volume 1 Module 2, but none of the exact language. They just started with some of the TNI documents but completely re-wrote it to suit their own needs. Further, most of the Wisconsin regulations are completely independent of the TNI documents. Option 2 is not really any more "hybrid" than Option 1would be.

As a practical matter, there is no real difference between Options 1 and 2. The ERP did not favor Option 2 for the same reason it did not favor Option 1: it would take too much time and energy from ELAP to establish. It is certainly true that since there is little, if any, difference between the two Options, it is doubtful that it would take any more or less time to develop an Accreditation Standard by either process.

c. Option 3 – The TNI Option

The ERP explained Option 3 this way: *"The major benefit of adopting an existing standard is that the time and resources needed to implement it will be greatly reduced. The major drawback is the lack of ability to customize it to meet State-specific needs. Thus, it would be critical to select the correct standard. The State would need to ensure that the standard it selects meets its clients' requirements and contains proper resources for both assessors and laboratories to ensure a smooth, consistent implementation."*

i. The ERP's main argument is that The TNI Option is the easiest and quickest Accreditation Standard to adopt, the "Off-The-Shelf" solution. The ERP also notes that this option provides a greater range of inter-state reciprocity and would allow ELAP "…to take advantage of a wealth of available resources and support" although exactly what is meant by that is not explained. What resources and support and from whom they would be provided is not detailed.

ii. One of the key differences between TNI accreditation documents and the existing system is the requirement that laboratory analyze two PTSs per year. This was a source of considerable consternation among laboratories as PTS analysis is an expensive process. However, the ERP recommended that ELAP not implement two PT samples per year right away but be implemented at some later unspecified date. A large part of the TNI documents involve PTS, Module 1 of Volume 1, Module 2 of Volume 2, and all of Volume 3. This raises the question as to what the ERP is actually recommending in Option 3. ELAP staff organized two seminars in early April, 2016 to give a description of TNI. At those seminars only Volume 1, Module 2 was discussed, which was the Quality Systems section.

iii. Is the ERP recommending that ELAP adopt all three volumes of TNI in its entirety or only parts? If it is the entire three volume set, how would ELAP implement that recommendation from the ERP to not require two PTSs per year? If the ERP is recommending that ELAP implement only parts of the three volumes of the TNI documents, which parts are they recommending? Is it only Volume 1, Module 2 or are other parts recommended as well? It is hard to see how ELAP can implement all of TNI requirements while not requiring two PTSs per year.

iv. The ERP suggests that a variety of resources and support are available if the TNI documents are used. If ELAP did not adopt all of the TNI documents would those resources and support still be available?

v. Further, if ELAP is only going to take parts of TNI and not others, and thus develop those other parts itself, it is not really going to be any faster than developing its own standard or hybrid standard.

7) Three Options?

a) If ELAP does not adopt TNI as whole and only parts in Option 3, Option 2 and Option 3 are pretty much the same, as is Option 1. In fact, it may well be the case that there is only one option, ELAP has to write its own regulations and draw upon a different source, possibly including TNI, either directly or indirectly as was done in Wisconsin.

b) Irrespective of which of these Options are eventually chosen by ELAP, a draft regulatory package will still need to be prepared. The Administrative Procedures Act (APA) requires that a regulatory package have four elements. These are: (1) the proposed text; (2) the Initial Statement of Reasons; (3) the STD Form 399 Economic and Fiscal Impact Statement; and (4) the Notice of Proposed Regulatory Action (notice). The actual text of the regulations is not necessarily the biggest part of this package. So there is actually little real difference in terms of how much time ELAP would have to spend to adopt the new Accreditation Standard. The ERP's recommendation for Option 3 was entirely based on how quickly and easily it could be adopted.

c) So at the end of the day, the only real question is this: How would using any part of the TNI documents help ELAP function better?

8) TNI Problems

a. It is, it would seem, still unresolved which version of the TNI documents would be used. Some TNI compliant states still use the 2003 version (e.g. Florida), the remainder use the 2009 version, but TNI itself will soon be releasing the 2016 version. It is difficult to fully assess this option if it is unknown which version is to be used.

b. The 2009 and 2016 TNI Documents are, or will be, copyright protected. Much of the text is taken word for word from the ISO 17025 Standard which has very exacting copyright restrictions held by ISO. This is similar to the situation with the California Building Code and Fire Code. Each is developed by a third party as the TNI documents are but are incorporated into State law as Title 24 Part 1 – 12 (http://www.bsc.ca.gov/Home/Current2013Codes.aspx) which includes the Fire Code as Part 9 (https://law.resource.org/pub/us/code/bsc.ca.gov/gov.ca.bsc.2013.09.pdf). The State of California owns the copy right on these documents. It would seem logical that the same relationship apply to the TNI documents.

c. Further, the TNI documents are locked behind paywall. Interested parties who want to determine their opinion about the TNI documents would have pay. This places an unreasonable burden upon any interested party who might wish to provide comment either in preparation for the ELTAC meeting or during the formal comment period required by the APA. All of the Building Codes, including the Fire Code, are available for free online.

d. Until these problems are resolved, it would be hard to consider using TNI documents, as a whole or in parts, for ELAP's Accreditation Standard.

9) Criteria for the Assessment of the Accreditation Standards

a. Since there is really only one real Option, ELAP will have to write a set of regulations compliant with the APA. This includes associated documents containing all of the elements of an Accreditation Standard. The only question is should some elements from TNI be included or not?

b. The ERP was created because ELAP was not performing its functions adequately and was created to provide advice on how ELAP can improve. The ERP was not created to try to improve or reform laboratory performance for the most part. As a result, when assessing the issue of Accreditation Standards there should be **Two Criteria**:

   i. The **Primary Criterion** in determining which option ELAP should implement must be whether including language from the TNI document improves or diminishes ELAP's ability to do its job.

   ii. The **Secondary Criterion** should be whether including language from the TNI document improves or diminishes the laboratories' ability to their jobs.

   iii. Current requirements are found in the methods that laboratories are accredited for and in current regulations described above in 2) Accreditation Standards.

10) Primary Criterion

a. Which TNI Documents? - Part of the problem with using the TNI documents is that it is not clear which TNI documents are to be used. There are 1998 documents, 2003 documents, 2009 documents, and the 2016 documents. The former is cited in ELAP's enabling legislation and all three of the latter have been suggested for use at various times by various individuals. It is difficult to see how ELAP can effectively use the TNI documents when there are four different TNI documents and which is being proposed is unknown.

b. TNI is Inaccessible - The different difficulty in assessing the usefulness of the TNI requirements is that they are not publically available. The TNI seminar of April 2016 was confined to just the Quality Systems (Volume 1, Module 2) and no substantive documents were allowed to be removed from the room. Furthermore, there is no available recording of these events, as was initially promised during and after the workshops. The discussion below is based on notes from that event.

i. Non-TNI Requirements - It is essential to note that these requirements are in addition to the method specific requirements, not in place of them. So ELAP staff will have to conduct On-Site Assessments (OSAs) and other accreditation activities using both the TNI requirements and the existing method specific requirements.

ii. The sheer bulk of the 2003 requirements seems be an entire problem all by itself. ELAP staff will have to be trained to review an 85 page checklist (or whatever similarly large checklist is developed for either the 2009 or 2016 documents) with 1126 separate requirements. It will take a tremendous amount of training to master all of these requirements which is beyond the equally immense training required to master the individual method requirements.

iii. At the April 7 Rancho Cordova TNI Workshop, Jerry Parr noted that the TNI requirements do not provide any additional benefit to accuracy, precision, or protection of public health, which are part of ELAP's objective.

iv. During the April 9 Costa Mesa TNI Workshop, Chris Gunning indicated that it took him, on average, an entire day to conduct an OSA based solely on the Quality Systems General Requirements (Module 2) requirements alone. These requirements are the same for every laboratory. Using PWP's laboratory as an example, currently ELAP staff take one day to conduct a complete OSA for Field of Testing 101, 102, 103, and 105. The amount of time ELAP staff would take to conduct an OSA on PWP just adding the Quality Systems General Requirements would immediately double. Since PWPs lab is typical of a typical California small government laboratory, this would automatically double OSA auditor time for small labs, and even more time would need to be allotted for large laboratories. However, there are additional requirements that were not discussed at the Quality Systems for specific types of analysis which involve requirements not found in methods or current regulation:

a) Module 3: Asbestos Testing
b) Module 4: Chemical Testing
c) Module 5: Microbiological Testing
d) Module 6: Radiochemical Testing
e) Module 7: Toxicity Testing

v. For example, technical requirements not found in approved methods at the April 9 workshop: VOLUME 1, MODULE 5 Quality Systems for Microbiological Testing - 1.7.5 b) had unique Sample Handling requirements.

a) "Microbiological samples from known chlorinated sources (such as wastewater effluent), unknown sources where chlorine usage is suspected (such a new client or a new source) and all potable water sources (including source water) shall be checked for absence of chlorine residual."

b) This would seem to suggest that all Colilert bottles for TC/EC and HPC would have to be checked for chlorine residual.

c) There are however provisos: *"Laboratories that receive samples from potable water sources (including source water) that have a demonstrated history of acceptable preservation may check a sample from each source at a frequency of once per month if":*

I. "the laboratory can show that the received sample containers are from their laboratory;

II. sufficient sodium thiosulfate was in each container before sample collection to neutralize at minimum 5 mg/L of chlorine for drinking water and 15 mg/L of chlorine for wastewater samples;

III. one container from each batch of laboratory prepared containers or lot of purchased ready-to-use containers is checked to ensure efficacy of the sodium thiosulfate to 5 mg/1 *chlorine or 15 mg/L chlorine as appropriate and the check is documented;*

IV. *chlorine residual is checked in the field and actual concentration is documented with sample submission."*

vi. This requirement is not found in any approved method so ELAP will have to be trained on this as well as the actual method requirements. This places additional and unneeded burdens on ELAP staff.

vii. A second example comes from Volume 2 Section 6.0 which requires: "*[ELAP] shall assess the laboratory to ensure that PT samples are tracked, prepared, and analyzed in the same manner as routine samples. The Primary AB shall require the laboratory demonstrate through their records that..*" a through g.

1. This requires that ELAP staff will have to review all data from all PT samples on each OSA.
2. It creates an additional set of requirements that ELAP staff have to be trained for.
3. It adds a great deal more work as ELAP staff have to review the analytical batch for all PT samples.

c. TNI would be very labor intensive

i. Again using PWP's laboratory as an example, for ELAP to incorporate the Quality System's General Requirements and the Modules 4 & 5 could easily triple the amount of time ELAP staff would have to spend just at the location for the OSA. This would also triple the amount of time spent in preparation for the OSA and for follow-up.

ii. ELAP had been an NELAP approved Accreditation Body for many years, approximately from 2000 – 2014. When ELAP offered TNI (NELAP) accreditation, their fees were three times higher than for their conventional accreditation. When ELAP proposed those fees, they justified them by saying that a NELAP OSA took three times as much effort. This analysis would appear to support that assessment.

iii. Suffice it to say it is clear that if ELAP were to adopt even just part of the TNI document, it would require vast amount of time to both train ELAP staff and for ELAP staff to actually implement.

iv. On page iv of the ERP's final report it notes: "*ELAP has insufficient resources to accomplish its mission*", an assessment that many familiar with the ELAP would readily agree with. However, given this reality, it is hard to see how burdening ELAP's limited personnel resources with three times the necessary work makes any sense.

v. The TNI requirements are vague, ambiguous, difficult to implement, and do not serve to assist ELAP in protecting public health. These requirements do not provide any additional protection to public health nor do they improve the accuracy or precision of the laboratory results.

vi. Further, many of these requirements do not actually have any objective standard. In this case, there is no explanation as to what is or is not an acceptable policy or procedure. How do assessors assess a policy without any standard to compare it to? This is a "Standardless Requirement".

d.

1. For example requirement 4.6.1 says: "*The laboratory shall have a policy and procedure(s) for the selection and purchasing of services and supplies it uses that affect the quality of the tests and/or calibrations. Procedures shall exist for the purchase, reception and storage of reagents and laboratory consumable materials relevant for the tests and calibrations.*"

2. Another example of requirements that are vague, ambiguous, difficult to implement, and do not serve to assist ELAP in protecting public health is from Section 4.5 on Subcontracting where Section 4.5.1 contradict each other. 4.5.5 requires the use of TNI accredited laboratories as sub-contractors while 4.5.1 has a very broad definition.

a. 4.5.1 says: "*When a laboratory subcontracts work, whether because of unforeseen reasons (e.g. workload, need for further expertise or temporary incapacity) or on a continuing basis (e.g. through permanent subcontracting, agency or franchising arrangements), this work shall be placed with a competent subcontractor. A competent subcontractor is one that, for example, complies with this International Standard for the work in question.*"

b. However 4.5.5 says: "*When a laboratory subcontracts work, this work shall be placed with a laboratory accredited to this Standard for the tests to be performed or with a laboratory that meets applicable statutory and regulatory requirements for performing the tests and submitting the results of tests performed. The laboratory performing the subcontracted work shall be indicated in the final report. The laboratory shall make a copy of the subcontractor's report available to the client when requested.*"

e. Using TNI requirements to supplement existing requirements would be counter-productive to ELAP. It would drain resources while providing no additional benefits to ELAP as compared to using the existing requirements.

11)Secondary Criterion

The needs of the laboratories are largely the same as ELAP. The TNI documents alone are huge, complex, ambiguous, vague, and time-consuming to read and understand. Vast amounts of new resources will be drawn into the process of accreditation if TNI were to be incorporated into ELAP's Accreditation Standard. Given the fact that incorporating TNI into ELAP's Accreditation Standard is not intended to help the laboratories (it is to help ELAP according to the original ERP charge questions), it is hard to make the case for including TNI documents. If anything, the case is even stronger for the laboratories for not including the TNI documents. ELAP staff at least is made up of full time accreditation officers; they have more of a basis to learn all of the additional requirements. Most laboratories do not have the resources to review and incorporate the TNI documents. 80% of laboratories accredited by ELAP have five or fewer staff members, a great many have only one or two, and quite a few do not even have single full time laboratory staff member. Some laboratories consist only of operators who spend a few hours a week in the laboratory and the director is simply a supervisor who oversees several units, the laboratory is just one.

12)Conclusion

The fundamental problem that caused ELAP's problems was the lack of leadership and management skills. The old Accreditation Standard was a problem but it was not the main problem. Adopting a new Accreditation Standard will be helpful but will not provide ELAP's with leadership or management. Given these realities including TNI requirements into ELAP's Accreditation Standard simply does not make sense. This is true whether the question is examined from the point of view of restoring ELAP's ability to do its job or from the needs of the laboratory community. Using the TNI documents as part of ELAP's new Accreditation Standard would place an undue burden on the ELAP program, creating a drain on limited resources while providing no benefits. The use of standardless requirements, which produce vague and ambiguous documents actually amplifies ELAP's historic problem with inconsistency between assessors. It will vastly expand the amount of time ELAP staff will need to conduct OSAs. Requiring two PTSs per year, if that is implemented, will require more ELAP staff resources that it does not have and place an unneeded load on laboratories.

White Paper #2: The Impact of TNI on Government Owned Laboratories in California, Florida, and New York

By David Kimbrough, Pasadena Water & Power

> When the States of Florida and New York required all laboratories to be NELAP/TNI compliant the number of government owned laboratories decreased while when California allowed laboratories to choose to the use TNI, the number of government owned laboratories increased.

Presented to the Environmental Laboratory Technical Advisory Committee, June 15, 2016

1. Background

In 2015 the State Water Resources Control Board established The Expert Review Panel (ERP) was created to address the many shortcomings of the previous management of the Environmental Laboratory Accreditation Program (ELAP). The ERP made a number of recommendations, one of which was for ELAP to adopt a new Accreditation Standard. Here is what the ERP wrote:

"*Adopt laboratory accreditation standards: The use of an appropriate accreditation standard by which laboratories are assessed is critical to ELAP's credibility, to the usability of the data generated, and to the general success of the program. The laboratory standards ELAP is using are insufficient and out of date. The State should adopt an existing, external set of accreditation standards as an immediate remedy and, in the future, refine it to enhance alignment with State-specific needs.* ***The accreditation standards chosen must include quality system and method-based requirements***."

No one to date has disagreed with the general point, ELAP's Accreditation Standard, which is its regulations, is badly out of date. The portion of ELAP's regulations dealing with data quality is very thin. No one has disagreed that ELAP needs a new Accreditation Standard. The main area of contention to date has been whether a new Accreditation Standard really needs to include a Quality System and if so, how that Quality System should be structured.

The ERP provided Three Options, or general approaches, for how to develop a Quality System. The ERP has suggested that accreditation requirements found in the documents of The NELAC Institute (TNI) would be helpful to ELAP, either in part or in their entirety, as a basis for the Quality System component of the new Accreditation Standard. Since the ERP's report has been released this one part of the ERP report has been the source of considerable controversy. Many laboratories have objected to the use of TNI as the basis for the Quality Systems component of a new Accreditation Standard. They argue that the requirements found in the TNI documents are vague, ambiguous, and onerous. Further they do not little if anything to improve data quality. They also note that the documents contain a vast number of requirements that produce an undue burden on laboratories. For example, in just Volume 1, Module 2 alone there are 231 separate management requirements and 300 technical requirements which every laboratory, no matter how large or small, must comply with. There many more requirements found in the other modules of Volume 1 and 2. While this is a considerable amount of work for any laboratory to comply with, it is particularly a problem for smaller laboratories. 80% of laboratories accredited by ELAP have five staff members or fewer and many do not even have full time dedicated laboratory staff member. Many smaller treatment facilities have certified operators and other staff who share the laboratory work.

Most of the discussion to date has been about the ***potential impact*** of using TNI quality systems as part of the Accreditation Standard on smaller laboratories. There has been little discussion about the ***actual impact*** of the use of TNI on real laboratories where TNI quality systems have already been implemented. Among first states to adopt TNI were California, Florida, and New York. So in an attempt to measure the real effects of TNI in practice a study was conducted to assess the impact of TNI on laboratories owned by governments in these three states.

2. Study Design

The approach of this study was to examine the number of accredited laboratories owned by governments in a state where TNI quality systems were implemented and how those numbers changed over the years and compare that to the change in numbers of government owned laboratories in a state where TNI quality systems were not required.

In 2000 the State of Florida adopted the November 1998 National Environmental Accreditation Conference (NELAC, the predecessor of TNI) and adopted the 2003 NELAC requirements in 2002. California likewise authorized ELAP to adopt regulations to enforce the 1998 NELAC requirements. Other state laboratory accreditation programs did the same thing, such as New York and California.

Some states, like Florida and New York, required all laboratories to comply with the TNI quality systems requirements. Other state programs, such as California and Louisiana allowed each laboratory to choose whether they wanted to use the TNI quality system or not. Virginia and Wisconsin require commercial laboratories to use TNI quality system but not non-commercial laboratories.

So Florida and New York represent good test cases for the impacts of requiring TNI requirement on smaller government owned laboratories. More importantly the Florida Department of Environmental Protection maintains two databases that are available on line. One is a list of all currently accredited laboratories, the "Active" database. The other database includes all laboratories which were once accredited by the Florida Department of Health (FDOH) but are no longer. New York likewise has an on-line database for currently accredited laboratories and the author of this report has a database of TNI (NELAP) accredited laboratories from 2001.

California represents the other extreme; no government owned laboratories were required to use the TNI quality system and none chose to do so. The California Environmental Laboratory Accreditation Program (ELAP) has a database of currently accredited laboratories. This can be compared to past versions of that database. The author has a database of California ELAP laboratories from 2001 and downloaded both the list of currently accredited laboratories and a database from 2008.

By comparing the how the number of government owned laboratories changed between these three states, the actual impact of requiring the use of the TNI quality system on government owned laboratories can be assessed.

3. Results

a. Florida

The Florida DOH databases contain the dates of when the status of a laboratory was changed, e.g. from "State" to "NELAP" or "State" to "Inactive" for each Field of Accreditation that the laboratory had. Addresses and telephone numbers were also available in both databases. Laboratories physically located in the State of Florida and those without are both included. These databases were created in March of 2002 and records of changes in status prior to that are not available.

https://fldeploc.dep.state.fl.us/aams/index.asp

There are a total of 376 laboratories in the Inactive database and 368 in the Active database. There were 202 Inactive laboratories which were physically located in Florida as were 233 Active laboratories. 89 of these inactive laboratories are associated with local municipalities and other government agencies, mostly laboratories associated with sewage treatment plants but also drinking water facilities, county and state public health laboratories, and university laboratories. Among the active laboratories located in Florida, there were 109 utility owned (both public and private), 77 commercial, 21 Environmental Pollution laboratories, 11 Department of Health (State or County) laboratories, six university laboratories, three Federal laboratories, and 12 “others”. Non-government laboratories on the inactive list included bottled water companies (Zephyrhills Spring Water Company), private utilities (The Villages Environmental Laboratory), commercial laboratories (Advanced Environmental Laboratories, Inc. – Gainesville), in-house laboratories (Tropicana), and so forth.

Not all of these inactive laboratories actually ceased to exist or even lost accreditation. This could be determined by determining which county the Inactive laboratory was physically located and then checking all laboratories in that county in the Active database. Some laboratories had simply changed their names, or moved to new locations, or were purchased by other laboratories, or were consolidated after a parent company was purchased. Zephyrhills Spring Water Company was purchased by a larger firm which already had a laboratory at another facility. Advanced Environmental Laboratories, Inc. – Gainesville simply moved a few blocks away and got a new certificate number.

However those reasons rarely apply to the government laboratories listed, although it did in some cases. Port St. Lucie Utility Systems Department Laboratory(E56489) was listed as inactive but had simply been renamed and given a new Department of Health (DOH) certificate number (E56718). In another case the City of Cocoa had had two laboratories, one for their wastewater treatment plant and one for their drinking water plant. After NELAP was implemented, the two were consolidated and the wastewater laboratory was closed. There were 10 government owned laboratories that were either moved, had a name change, or were consolidated. There were 79 that closed altogether.

For example of how this analysis worked, the City of Atlantic Beach had a laboratory (E52465) in their small Wastewater Treatment Plant (3.5 MGD). In the Inactive database this laboratory was recorded as analyzing Biochemical Oxygen Demand (BOD), Fecal Coliforms, Dissolved Oxygen, Chlorine Residual, Total Suspended Solids, Temperature, and pH. When these analytes were queried as to when the laboratory the results indicated that it had closed before March of 2002. A review of all laboratories in Duval County revealed no laboratories in Atlantic Beach at all and none associated with the City of Atlantic Beach anywhere in Duval County. The Director of the City’s plants was contacted via email. He indicated in an email response that the City had closed its laboratory because of the expenses associated with NELAP accreditation (see below).

The City of Bartow Wastewater Treatment Plant Laboratory (E54339) is also listed as inactive. However a review of the database revealed no information about when the City of Bartow relinquished its accreditation. A telephone call to the treatment plant operator on duty revealed that the plant had indeed dropped their accreditation as soon as the TNI requirements were added

Of the 79 government owned laboratories located in Florida that actually closed completely, 44 of these laboratories closed within six years of Florida requiring all laboratories to comply with NELAP/TNI requirements. These laboratories tended to be smaller, performing smaller numbers of tests which were generally simpler and were associated with utilities, such as a sewage treatment plant. For example the City of Belle Glade's Wastewater Treatment Plant had been accredited for 17 analytes, including pH, NH_3, NO_3, NO_2, TKN, Organic Nitrogen, BOD, DO, Chloride, Phosphorus, Conductivity, TDS, TSS, Total Coliforms, Fecal Coliforms, and E. coli. This laboratory, which is located in Palm Beach County, relinquished its accreditation in 2003. The laboratories that closed after the first six years tended to be the State and County public health laboratories. A few of these laboratories performed more complex tests, such as the Polk County Health Department laboratory analyzed Gross Alpha, Gross Beta, Radium 226, and Radium 228 which closed in 2016.

See Figure 1

b. California

In contrast, in California, in 2001 there were 727 certificates of accreditation issued to laboratories both physically in California and outside. Today there are 734 certificates, 108 of which are for laboratories located outside the State of California. Some certificates were for mobile laboratories and some laboratories held two certificates, one for NELAP accreditation and one for non-NELAP accreditation. So there is not a one to one correspondence between the number of certificates and the number of laboratories but the number of laboratories with more than certificate is not large. Moreover, government owned laboratories do not have multiple certificates except when they have separate multiple fixed location laboratories.

In 2001 there were 284 government owned laboratories that were accredited by ELAP. By 2008 the number had grown to 312 and by 2015 the numbers was 345, an increase of 61. This despite the fact that 35 government owned laboratories had closed or were consolidated. For example, the Ventura Regional Sanitation District closed their laboratory in 2005 and contracted out all of their laboratory work. Scott Valley Water District made a similar decision about the same time. Many of the government owned laboratories that closed were military facilities which closed, such as Brooks Air Force Base which closed in 2002. The City of Oxnard had two laboratories listed in 2001 but now only has one. The Elsinore Valley Municipal Water District closed its Canyon Lake Treatment Plant laboratory but maintains their Regional Laboratory. Los Alisos Water District merged with the El Toro Water District so their laboratories merged as well. Despite these closings many more government owned laboratories opened. Alameda County Water District, the California Men's Colony, and East Bay Municipal Utilities District all had laboratories in 2001 but opened second laboratories after 2008. The Cities of Arcata, Auburn, Banning, Calistoga, Pacifica, Paso Robles, Pismo Beach, and Hollister opened new laboratories after 2001. Cambria Community Services District (CSD, Quincy CSD, Rancho Murrieta CSD, Quartz Valley Indian Reservation all added new laboratories.

See Figure 2

c. New York

As noted earlier, the New York Environmental Laboratory Accreditation Program (NY ELAP) has an on-line database of currently accredited laboratories.

http://www.wadsworth.org/regulatory/elap/certified-labs

This database was queried for all government owned laboratories that were physically located in the State of New York. There were 121. The 2001 database was queried for all laboratories physically located in the State of New York. There was no field for whether they were government owned or not. Then the list from the 2001 was compared to the 2016 list and all of the laboratories that were on both lists were laboratories were identified. Then the 2001 database was searched for government laboratories not found in the 2016 database. There were 221 government owned laboratories in the 2001, a difference of 100. Actually more than 100 government laboratories were no longer accredited but there were a number of new government laboratories that added accreditation. One laboratory that closed was actually moved and renamed. The Hawthorne Laboratory in Hawthorne had been the Kensico Laboratory in Vahalla.

4. Conculsions

All three states, California, Florida, and New York had adopted the use of TNI requirements at the same time. Florida and New York required all laboratories to comply with the TNI requirements while California allowed laboratories to choose. Between 2001 and 2015 the number of government laboratories, particularly smaller utility laboratories decreased in both Florida and New York while in California the numbers increased. The data would indicate that the undue burden and excessive efforts to maintain TNI accreditation was the cause of the decline in the number of government laboratories in these two states.

Addendum 1

Email from the City of Atlantic Beach

Mr. Kimbrough,

Yes, it was cost effect for us to sent lab work out than keep our accreditation. We have a small Wastewater Plant (3.5 MGD) with minimum staff.

Harry McNally
Plants Division Director
City of Atlantic Beach
902 Assissi Lane
Atlantic Beach Fl 32233
Phone: 904-247-5838
Fax: 904-242-3475
E-mail: hmcnally@coab.us

From: Kimbrough, David [mailto:dkimbrough@cityofpasadena.net]
Sent: Wednesday, April 27, 2016 7:39 PM
To: Mc Nally, Harry
Subject: Laboratory Accreditation

Mr. McNally,

I am writing in regards to the City of Atlantic Beach's Wastewater Treatment Plant's (WTP) laboratory. I run a small municipal laboratory for the City of Pasadena here in California which is accredited by the State of California. The Florida Department of Environmental Protection maintains two databases of laboratories accredited by the State of Florida, those that are active and those that are inactive. The City of Atlantic Beach's WTP's laboratory is listed in the inactive database. According to the data, the lab had relinquished accreditation some times before 2002.

If you do not mind my asking, why did the WTP drop its accreditation? Did it has something to do with NELAP accreditation?

Thank you for your attention in this matter.

David Eugene Kimbrough, Ph.D.
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Pasadena, CA 91101
Before Noon – 626.744.3704
After Noon - 626.744.7315
F626.396.7428

Addendum 2

Email from the Orange County, Florida

In Florida yes. Many of the smaller utility labs dropped participation and went to larger commercial labs to get their work done.
Kim

From: Kimbrough, David [mailto:dkimbrough@cityofpasadena.net]
Sent: Wednesday, November 04, 2015 6:33 PM
To: Kunihiro, Kim
Subject: RE: NELAP - TNI

Hello,

If I recall correctly, a significant number of smaller labs dropped out of the accreditation program when TNI became mandatory way back when. Did I remember that correctly?

David.

From: KIM.KUNIHIRO@ocfl.net [mailto:KIM.KUNIHIRO@ocfl.net]
Sent: Wednesday, November 04, 2015 2:53 PM
To: Kimbrough, David
Subject: RE: NELAP - TNI

Yes
We are still a NELAP/TNI approved lab. Would be happy to discuss with you. I was on vacation for a week because my daughter got married but have some time on Friday if you want to talk
Kim
[redacted]

From: Kimbrough, David [mailto:dkimbrough@cityofpasadena.net]
Sent: Tuesday, November 03, 2015 12:53 PM
To: Kunihiro, Kim
Subject: NELAP - TNI

Hello Kim,

I do not know if you remember me but I was with Castaic Lake Water Agency and we spoke a number of times about the situation in Florida in regards to NELAP and TNI. Are you still involved in all of that? If so, could we talk some more?

David Eugene Kimbrough, Ph.D.
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PLEASE NOTE: Florida has a very broad public records law (F. S. 119).
All e-mails to and from County Officials are kept as a public record.
Your e-mail communications, including your e-mail address may be disclosed to the public and media at any time.

Figure 1

Government Run Laboratories on the Inactive List
With Department of Health ID#, Organization Name, Year Accreditation was Relinquished, and Current Status

DOH ID	Organization	Year	County	Status
E72949	UF-IFAS Wetland Biogeochemistry Laboratory		Alchua	Moved
E22794	FL Dept. of Health - Bradford County Health Department	2005	Bradford	No Lab
E63359	Kennedy Space Center Laboratory for Sewage Treatment Operations		Brevard	Renamed
E53727	City of Cocoa Water Treatment Plant		Brevard	Consolidated
E53456	Brevard County Utility Services - Mims Water Treatment Plant	2001	Brevard	No Lab
E56756	City of Lauderhill Water Treatment Plant	2003	Broward	No Lab
E56300	City of Pembroke Pines Wastewater Treatment Plant	2013	Broward	No Lab
E56721	City of North Lauderdale Water Plant	2004	Broward	No Lab
E56725	City of Tamarac Utilities Laboratory	2015	Broward	No Lab
E46093	Coral Springs Improvement District Laboratory	2002	Broward	No Lab
E56744	City of Hallandale Beach Water Treatment Plant	2006	Broward	No Lab
E34830	FL DEP - South District Laboratory	2008	Charolette	No Lab
E24768	FL Dept. of Health - Citrus County Health Department	2012	Citrus	No Lab
E96766	Miami-Dade County Public Schools, Department of Materials Testing and Evaluation	2011	Dade	No Lab
E661069	NOAA - AOML Nutrient Laboratory	2013	Dade	No Lab
E06897	UF-TREC Soil and Water Laboratory	2011	Dade	No Lab
E32890	FL DEP - NE District	2008	Duval	No Lab

E52465	City of Atlantic Beach Wastewater Treatment Plant	2001	Duval	No Lab
E11062	FL Department of Health - Pensacola Branch Laboratory	2015	Escambia	No Lab
E31887	FL DEP - NW District Chemistry Laboratory	2008	Escambia	No Lab
E71176	University of West Florida Wetlands Research Laboratory		Escambia	Moved
E51289	City of Port St. Joe Wastewater Treatment Plant Laboratory	2005	Gulf	No Lab
E54466	City of Wauchula Wastewater Treatment Plant	2003	Hardee	No Lab
E24704	FL Dept. of Health - Hernando County Health Department	2002	Hernando	No Lab
E55378	City of Sebring Wastewater Treatment Plant	2003	Highland	No Lab
E25705	FL Dept. of Health - Highlands County Health Department	2013	Highland	No Lab
E34886	FL DEP - SW District Chemistry Laboratory	2008	Hillsborough	No Lab
E44301	Plant City Water Pollution Control Laboratory	2003	Hillsborough	No Lab
E43877	City Of Vero Beach, Wastewater Treatment Plant	2012	Indian River	No Lab
E53303	City of Vero Beach Environmental Control Laboratory	2005	Indian River	No Lab
E53306	City of Leesburg Wastewater Utility Laboratory	2014	Lake	No Lab
E51431	Florida State Hospital Wastewater Treatment Plant	2005	Lee	No Lab
E45849	Fiesta Village Wastewater Laboratory	2014	Lee	No Lab
E55419	Bonita Springs Utilities WRF Lab	2001	Lee	No Lab
E31640	FL DEP - Central Laboratory/Innovation Park Satellite Laboratory		Leon	Moved
E54461	City of Bradenton Water Reclamation Laboratory	2012	Manatee	No Lab
E54712	City of Bradenton Water Treatment Plant Laboratory	2005	Manatee	No Lab
E23708	FL Dept. of Health - Marion County Health Department	2011	Marion	No Lab

E63507	U.S. Geological Survey, WRD, OWQRL	2005	Marion	No Lab
E52335	City of Fernandina Beach Wastewater Treatment Plant	2006	Nasau	No Lab
E51561	Niceville, Valparaiso, Okaloosa County Regional Sewer Board, Inc.		Okaloosa	Renamed
E51497	City of Mary Esther Wastewater Treatment Plant	2003	Okaloosa	No Lab
E56584	Okeechobee Utility Authority Wastewater Treatment Plant Laboratory	2014	Okeechobee	No Lab
E56970	Okeechobee Utility Authority Wastewater Treatment Plant	2002	Okeechobee	No Lab
E56723	Okeechobee Utility Authority Water Treatment Plant	2005	Okeechobee	No Lab
E33863	FL DEP - Central District Laboratory	2008	Orange	No Lab
E13800	FL Dept. of Health - Bureau of Radiation Control	2012	Orange	No Lab
E53136	City of Winter Park Estates Laboratory	2007	Orange	No Lab
E43155	Orange County Environmental Protection Division	2004	Orange	No Lab
E53321	City of Winter Garden Wastewater Pollution Control Facility		Orange	Renamed
E53421	City of St. Cloud Water and Wastewater Facilities	2002	Osceola	No Lab
E16122	FL Department of Health - West Palm Beach Branch Laboratory	2011	Palm Beach	No Lab
E56264	City of Royal Palm Beach Utilities Dept. Wastewater Treatment Plant Laboratory	2006	Palm Beach	No Lab
E56034	City of Belle Glade Wastewater Treatment Plant	2003	Palm Beach	No Lab
E24709	FL Dept. of Health - Pinellas County Health Department	2010	Pinellas	No Lab
E54369	City of Tarpon Springs Wastewater Treatment Plant	2005	Pinellas	No Lab
E54508	City of Dunedin Wastewater Treatment Plant	2010	Pinellas	No Lab
E54743	City of St. Petersburg - Cosme	2005	Pinellas	No Lab

	Water Treatment Plant Laboratory			
E74916	University of South Florida	2012	Pinellas	No Lab
E54020	City of Clearwater - Marshall Street Water Pollution Control Laboratory	2003	Pinellas	No Lab
E24710	FL Dept. of Health - Polk County Health Department	2016	Polk	No Lab
E54339	City of Bartow Wastewater Treatment Plant Laboratory	2001	Polk	No Lab
E54373	City of Haines City Wastewater Treatment Plant	2005	Polk	No Lab
E84746	FL DACS Central Dairy Laboratory	2001	Polk	No Lab
E54336	City of Fort Meade Wastewater Treatment Plant Laboratory	2001	Polk	No Lab
E54066	City of Winter Haven Wastewater Treatment Plant #3	2006	Polk	No Lab
E54305	City of Winter Haven Wastewater Treatment Plant #2 - Lake Conine	2004	Polk	No Lab
E54266	City of Auburndale Wastewater Laboratory	2003	Polk	No Lab
E52474	City of Palatka Wastewater Treatment Plant	2004	Putnam	No Lab
E22779	Dept. of Health - Putnam County Environmental Health Department	2005	Putnam	No Lab
E54426	City of Venice - Eastside Wastewater Treatment Plant	2003	Sarasota	No Lab
E54524	Florida Governmental Utility Authority - Gulf Gate Laboratory	2003	Sarasota	No Lab
E24711	FL Dept. of Health - Sarasota County Health Department	2009	Sarasota	No Lab
E54736	City of Sarasota Water Plant Laboratory		Sarasota	Moved
E54326	City of Venice Water Reclamation Laboratory	2004	Sarasota	No Lab
E53372	City of Sanford Water Reclamation Facility Laboratory	2004	Seminole	No Lab
E53390	Seminole County Environmental Services Greenwood Lakes Treatment Plant	2002	Seminole	No Lab

E53416	City of Winter Springs Wastewater Reclamation Facility	2015	Seminole	No Lab
E22770	FL Dept. of Health - St. Johns County Health Department - Environmental Eng.	2011	St. Johns	No Lab
E76888	University of Florida Soil and Water Science Laboratory	2012	St. Lucie	No Lab
E26789	FL Dept. of Health - St. Lucie County Health Department	2007	St. Lucie	No Lab
E76857	UF / IFAS / IRREC - Lab 25 (C. Wilson)	2015	St. Lucie	No Lab
E56489	Port St. Lucie Utility Systems Department Laboratory		St. Lucie	Moved
E36885	FL DEP - SE District Lab	2007	St. Lucie	No Lab
E52400	City of Perry Wastewater Treatment Plant	2002	Taylor	No Lab
E23111	Volusia County Environmental Health Laboratory	2014	Volusia	No Lab
E53732	City of New Smyrna Beach Water Treatment Plant Laboratory	2006	Volusia	No Lab
E53758	Port Orange Utility - Garnsey Water Treatment Plant Laboratory		Volusia	Consolidated
E53343	City of Ormond Beach Public Utilities	2005	Volusia	No Lab

Figure 2

Government Run Laboratories Accredited by California ELAP in 2001, 2008, and 2016 and Current Status

2001	2008	2015	Status
AGUA DE LEJOS TREATMENT PLANT LABORATORY	x	Agua De Lejos Treatment Plant Laboratory	
ALAMEDA COUNTY ENVIRONMENTAL HEALTH LABORATORY			**Consolidated**
ALAMEDA COUNTY PUBLIC HEALTH LABORATORY	x	Alameda County Public Health Laboratory	
ALAMEDA COUNTY WATER DISTRICT	x	Alameda County Water District Water Quality Lab	
		Alameda County Water District Water Treatment Plant 2	
		Alvarado Wastewater Chemistry Lab.	
	x	American Canyon Wastewater Treatment Laboratory	
ANTELOPE VALLEY-EAST KERN WATER AGENCY	x	Antelope Valley-East Kern Water Agency	
		Arcata - City Water Quality Laboratory	
	x	Banning - City WWTP Laboratory	
BARSTOW WASTEWATER RECLAMATION LABORATORY	x	Victor Valley Wastewater Reclamation Authority Lab	
BIG BEAR AREA REGIONAL WASTEWATER AGENCY	x	Big Bear Area Regional Wastewater Agency	
BRYTE BEND WATER TREATMENT PLANT LABORATORY	x	Bryte Bend Water Treatment Plant - City of Sacramento	
BURBANK CITY WATER DEPARTMENT	x	Burbank City Water and Power	
BROOKS AIR FORCE BASE ARMSTRONG LABORATORY / OEA			**Closed**
BURBANK WASTEWATER TREATMENT FACILITY	x	City of Burbank Water Reclamation Plant	

LABORATORY		Laboratory	
CALIFORNIA DEPARTMENT OF WATER RESOURCES	x	CA Dept of Water Resources Bryte Chemical Laboratory	
CALIFORNIA DEPARTMENT OF CORRECTIONS	x	California Men's Colony Wastewater Treatment Plant	
	x	California Men's Colony Water Treatment Plant	
CALIFORNIA DEPARTMENT OF FISH AND GAME	x	CA Dept of Fish & Game, Fish & Wildlife Water Pollution	
	x	CA Dept.of Food & Ag, Center for Analytical Chemistry	
DEPT OF PARKS AND RECREATION LABORATORY	x	Cal Dept of Parks and Recreation Laboratory	
	x	California Fish & Game - Aquatic Toxicology Lab	
CAMARILLO SANITARY DISTRICT		Camrosa Water Reclamation Facility Laboratory	
	x	Cambria Community Services District	
		Calistoga City Dunaweal WWTP Laboratory	
CAMROSA WATER DISTRICT LABORATORY	x	Camrosa Water District Laboratory	
CANYON LAKE WATER TREATMENT PLANT LAB		(EVMWD)	**Consolidated**
CARMEL AREA WASTEWATER DISTRICT	x	Carmel Area Wastewater District	
CARMEL VALLEY COUNTY SANITATION DISTRICT			**Closed**
CARPINTERIA SANITARY DISTRICT LABORATORY	x	Carpinteria Sanitary District	
CASITAS MUNICIPAL WATER DISTRICT	x	Casitas Municipal Water District	
CASTAIC LAKE WATER AGENCY	x	Castaic Lake Water Agency	
CENTRAL COAST WATER AUTHORITY	x	Central Coast Water Authority	
CENTRAL CONTRA COSTA	x	Central Contra Costa	

SANITARY DISTRICT		Sanitary District	
CENTRAL MARIN SANITATION AGENCY	x	Central Marin Sanitation Agency	
CHINO BASIN MUNICIPAL WATER DISTRICT			**Closed**
CITY OF ANAHEIM WATER QUALITY LABORATORY	x	City of Anaheim Water Quality Laboratory	
CITY OF ANTIOCH WATER TREATMENT PLANT	x	City of Antioch	
		City of Auburn - Operation Management International	
CITY OF ATWATER	x	City of Atwater Wastewater Treatment Facility Lab.	
CITY OF AVALON	x	City of Avalon Wastewater Treatment Facility Laboratory	
CITY OF BAKERSFIELD - WASTEWATER TREATMENT PLANT 3	x	City of Bakersfield - Wastewater Treatment Plant #3	
CITY OF BAKERSFIELD WASTEWATER TREARMENT PLANT 2	x	City of Bakersfield Wastewater Treatment Plant #2	
	x	City of Banning WWTP Laboratory	
CITY OF BENICIA WASTEWATER FACILITY	x	City of Benicia Wastewater Laboratory	
CITY OF BENICIA WATER TREATMENT PLANT LABORATORY	x	City of Benicia Water Plant Laboratory	
		City of Brentwood Water Quality Laboratory	
CITY OF BRAWLEY	x	City of Brawley Wastewater Laboratory	
CITY OF BURLINGAME WASTEWATER TREATMENT PLANT	x	Veolia Water ~ Burlingame Wastewater Facility	
	x	City of Calexico	
CITY OF CHICO WATER POLLUTION CONTROL PLANT	x	City of Chico Water Pollution Control Plant Lab	
CITY OF COALINGA WATER TREATMENT PLANT LAB			**Closed**
	x	City of Corning -	

		Wastewater Treatment Plant	
	x	City of Davis Wastewater Treatment Plant	
EL CENTRO WASTEWATER TREATMENT PLANT	x	City of El Centro Wastewater Treatment Plant	
CITY OF ESCONDIDO WATER QUALITY LABORATORY	x	City of Escondido Water Quality Laboratory	
CITY OF EUREKA WATER AND WASTEWATER LABORATORY	x	City of Eureka Water & Wastewater Laboratory	
CITY OF FAIRFIELD WATER TREATMENT PLANT	x	City of Fairfield	
CITY OF FORTUNA WASTEWATER TREATMENT PLANT	x	City of Fortuna Wastewater Treatment Plant	
	x	City of Fresno Surface Water Treatment Facility	
CITY OF FRESNO WASTEWATER MANAGEMENT LABORATORY	x	City of Fresno Wastewater Management Division Lab	
CITY OF GRASS VALLEY	x	City of Grass Valley - Water Quality Laboratory	
CITY OF HANFORD - WASTEWATER TREATMENT PLANT LAB	x	City of Hanford Wastewater Treatment Plant	
CITY OF HAYWARD WPCF LABORATORY	x	City of Hayward Wpcf Laboratory	
CITY OF HOLLISTER TREATMENT PLANT	x	City of Hollister Treatment Plant	
CITY OF HOLTVILLE			**Closed**
CITY OF IMPERIAL WASTEWATER PLANT LABORATORY			**Closed**
CITY OF LIVERMORE WATER RECLAMATION PLANT	x	City of Livermore Water Reclamation Plant	
CITY OF LODI WHITE SLOUGH WPCF	x	City of Lodi White Slough WPCF Lab	
CITY OF LOMPOC WATER TREATMENT PLANT	x	City of Lompoc Water Treatment Plant Lab	
CITY OF LOS ANGELES DEPT OF WATER & POWER	x	City of Los Angeles DWP	
CITY OF LOS ANGELES DEPT.	x	City of Los Angeles DWP	

OF WATER & POWER		Environmental Lab.	
CITY OF LOS ANGELES STANDARDS TESTING LABORATORY	x	City of Los Angeles DWP-Standards Testing Labor	
	x	City of Madera WWTP Laboratory	
CITY OF MANTECA WQCF LAB	x	City of Manteca WQCF Lab	
CITY OF MARTINEZ WATER TREATMENT PLANT	x	City of Martinez	
CITY OF MERCED WASTEWATER TREATMENT PLANT	x	City of Merced Wastewater Laboratory	
CITY OF MILLBRAE WATER POLLUTION CONTROL	x	City of Millbrae Water Pollution Control	
CITY OF MODESTO	x	City of Modesto Water Quality Laboratory	
CITY OF MT. SHASTA WASTEWATER LABORATORY	x	City of Mt Shasta Wastewater Laboratory	
CITY OF NAPA, PUBLIC WORKS DEPT.	x	City of Napa	
CITY OF NEEDLES			**Closed**
CITY OF OCEANSIDE	x	City of Oceanside Water Utilities Department Lab	
CITY OF ORANGE WATER DEPARTMENT	x	City of Orange	
CITY OF OXNARD LABORATORY SERVICES PROGRAM	x	City of Oxnard	
CITY OF OXNARD WATER LABORATORY			**Consolidated**
		City of Pacifica, Calera Creek Plant	
CITY OF PALM SPRINGS	x	Palm Springs Wastewater Treatment Plant	
CITY OF PASADENA WATER QUALITY LABORATORY	x	City of Pasadena Water Quality Laboratory	
		City of Paso Robles Water Quality Laboratory	
CITY OF PETALUMA WASTEWATER TREATMENT PLANT	x	City of Petaluma Water Quality Laborator	
		City of Pismo Beach Water	

		Quality Laboratory	
CITY OF PLACERVILLE, HANGTOWN CREEK WWTP	x	City of Placerville Water Reclamation Facility	
CITY OF POMONA WATER DIVISION LABORATORY	x	Pomona Treatment Plant Laboratory	
CITY OF PORTERVILLE LABORATORY	x	City of Porterville Laboratory	
CITY OF POWAY WATER TREATMENT PLANT			**Closed**
CITY OF RED BLUFF WATER RECLAMATION PLANT LAB.	x	City of Red Bluff Water Reclamation Plant Lab	
CITY OF REDDING PUBLIC WORKS DEPARTMENT	x	City of Redding Clear Creek Lab	
CITY OF REDDING STILLWATER WW TREATMENT FACILITY	x	City of Redding Stillwater Lab	
CITY OF REDLANDS LABORATORY	x	City of Redlands Joint Utilities Lab	
CITY OF REEDLEY WASTEWATER TREATMENT PLANT LAB.	x	City of Reedley Wastewater Treatment Plant Lab	
CITY OF RICHMOND WASTEWATER POLLUTION CONTROL PLT	x	City of Richmond Wastewater Treatment Plant L	
CITY OF RIVERSIDE LABORATORY SERVICES	x	City of Riverside - Laboratory Services	
CITY OF ROSEVILLE	x	City of Roseville Dry Creek Water Quality Lab	
		City of Roseville Pleasant Grove Water Quality Lab	
CITY OF SACRAMENTO WATER QUALITY LABORATORY	x	City of Sacramento, Water Quality Lab	
CITY OF SAN BERNARDINO WATER DEPARTMENT			**Closed**
CITY OF SAN BUENAVENTURA SANITATION LABORATORY	x	City of San Buenaventura Laboratory	
CITY OF SAN CLEMENTE WATER QUALITY LABORATORY	x	City of San Clemente Water Quality Laboratory	
CITY OF SAN DIEGO - MARINE MICRO LABORATORY	x	City of San Diego's Industrial Waste Laboratory	
CITY OF SAN DIEGO INDUSTRIAL WASTE	x	City of San Diego - Marine Microbiology Lab	

LABORATORY			
CITY OF SAN DIEGO WASTEWATER CHEMISTRY LABORATORY	x	City of San Diego Met. Wastewater Dept. Tox Lab	
CITY OF SAN DIEGO WATER QUALITY LABORATORY	x	City of San Diego Water Quality Laboratory	
CITY OF SAN LUIS OBISPO WATER RECLAMATION FACILITY	x	City of San Luis Obispo	
CITY OF SAN MATEO	x	City of San Mateo Wastewater Treatment Plant	
CITY OF SANTA BARBARA	x	City of Santa Barbara - Water Resources Lab	
CITY OF SANTA MARIA WASTEWATER TREATMENT LAB	x	City of Santa Maria Wastewater Treatment Plant Lab	
CITY OF SANTA MONICA WATER DIVISION	x	City of Santa Monica Water Quality Laboratory	
CITY OF SCOTTS VALLEY	x	City of Scotts Valley Wastewater Reclamation Facility Lab	
CITY OF SHASTA LAKE	x	City of Shasta Lake Wastewater Treatment Facility	
	x	City of Simi Valley Water Quality Control Laboratory	
	x	City of South San Francisco-San Bruno	
CITY OF STOCKTON MUNICIPAL UTILITIES DEPT. LAB	x	City of Stockton, Municipal Utilities Department	
CITY OF ST. HELENA			**Closed**
CITY OF SUNNYVALE WATER POLLUTION CONTROL LAB	x	City of Sunnyvale Environmental Laboratory	
CITY OF THOUSAND OAKS UTILITIES DEPARTMENT			**Closed**
CITY OF TRACY PUBLIC WORKS DEPARTMENT	x	City of Tracy Public Works Department Laboratory	
CITY OF TULARE WATER POLLUTION CONTROL FACILITY	x	City of Tulare	
CITY OF TURLOCK	x	City of Turlock	

CITY OF VACAVILLE WATER QUALITY LABORATORY	x	City of Vacaville Water Quality Laboratory	
CITY OF VALLEJO WATER DEPARTMENT LABORATORY	x	City of Vallejo Water Department Laboratory	
CITY OF VISALIA WASTEWATER TREATMENT PLANT	x	City of Visalia Water Conservation Plant Laboratory	
CITY OF WATSONVILLE	x	City of Watsonville Utilities Department Laboratory	
CITY OF WEST SACRAMENTO WW TREATMENT PLANT LAB	x	George Kriskoff Water Treatment Plant	
	x	City of Woodland Wastewater Operations Lab	
	x	Coachella Sanitary District	
COACHELLA VALLEY WATER DISTRICT	x	Coachella Valley Water District Laboratory	
COUNTY OF ORANGE PUBLIC FACILITIES & RESOURCES			**Closed**
COUNTY OF RIVERSIDE DEPARTMENT OF HEALTH			**Closed**
COUNTY OF SAN LUIS OBISPO WATER QUALITY LAB	x	San Luis Obispo County Water Quality Lab	
		CSUMB Los Huertos Lab	
	x	Contra Costa Water District Lab	
DESERT WATER AGENCY	x	Desert Water Agency	
	x	Crescent City Water Quality Laboratory	
	x	Delta Diablo Sanitation District Laboratory	
DUBLIN SAN RAMON SERVICES DISTRICT	x	Dublin San Ramon Services District	
EAST BAY MUNICIPAL UTILITY DISTRICT	x	East Bay Municipal Utility District	
		East Bay Municipal Utility District Emergency Facility	
EASTERN MUNICIPAL WATER DISTRICT - PERRIS	x	Eastern Municipal Water District	
EL DORADO COUNTY HEALTH DEPARTMENT	x	El Dorado County Public Health Department	
EL TORO WATER DISTRICT LABORATORY	x	El Toro Water District Laboratory	

ENCINA WASTEWATER AUTHORITY LABORATORY	x	Encina Wastewater Authority Laboratory	
CITY OF LOS ANGELES EMD - HYPERION TREATMENT PLANT	x	City of Los Angeles EMD Los Angeles Hyperion WRP	
CITY OF LOS ANGELES BUREAU OF SANITATION, LA - G	x	City of Los Angeles EMD Los Angeles Glendale WRP	
CITY OF LOS ANGELES BUREAU OF SANITATION	x	City of Los Angeles EMD Terminal Island WRP	
TILLMAN WATER RECLAMATION PLANT	x	City of Los Angeles EMD Los Angeles DCT WRP	
E.V.M.W.D. REGIONAL WASTEWATER LABORATOEY	x	E.V.M.W.D. Regional Laboratory	
FAIRFIELD-SUISUN WASTEWATER TREATMENT FACILITY	x	Fairfield-Suisun Sewer District	
	x	Fallbrook Public Utility District	
		Fillmore Wastewater Recycling Plant Laboratory	
FORT BRAGG MUNICIPAL IMPROVEMENT DISTRICT # 1	x	Fort Bragg Municipal Laboratory	
FORT HUNTER LIGGETT WASTE WATER LABORATORY			**Closed**
FRESNO COUNTY PUBLIC HEALTH LABORATORY	x	Fresno County Public Health Laboratory	
	x	Granite Canyon - UC Davis Lab	
	x	Georgetown Divide Public Utility District	
GOLETA SANITARY DISTRICT	x	Goleta Sanitary District	
GOLETA WATER DISTRICT	x	Goleta Water District	
HELIX WATER DISTRICT	x	Helix Water District	
HERITAGE RANCH COMMUNITY SERVICES DISTRICT	x	Heritage Ranch C.S.D. Environmental Lab. #1	
		Healdsburg City Water Reclamation Facility	
	x	Hill Canyon Wastewater Treatment Plant Laboratory	
		Hollister - City Treatment Plant	
HUMBOLDT COUNTY PUBLIC	x	Humboldt County Public	

HEALTH LABORATORY		Health Laboratory	
		IIRMES	
IMPERIAL COUNTY PUBLIC HEALTH LABORATORY	x	Imperial County Public Health Laboratory	
INYO COUNTY ENVIRONMENTAL HEALTH LABORATORY	x	Inyo County Environmental Health Services	
		Inyo County Water Lab	
	x	Inland Empire Utilities Agency Laboratory	
IRVINE RANCH WATER DISTRICT LABORATORY	x	Irvine Ranch Water District	
		Jamieson Canyon Water Treatment Plant	
	x	John C. Bargar Water Treatment Plant	
KERN COUNTY PUBLIC HEALTH LABORATORY	x	Kern County Public Health Laboratory	
KERN COUNTY WATER AGENCY	x	Kern County Water Agency, Water Quality Lab	
KERN SANITATION AUTHORITY	x	Kern Sanitation Authority	
KINGS COUNTY PUBLIC HEALTH LABORATORY	x	Kings County Public Health Laboratory	
	x	Kirkwood Meadows Public Utilities District	
LAGUNA COUNTY SANITATION DISTRICT	x	Laguna County Sanitation District	
LAGUNA ENVIRONMENTAL LABORATORY	x	Laguna Environmental Laboratory	
LAKE ARROWHEAD COMMUNITY SERVICES	x	Lake Arrowhead Community Services District	
LAS PALMAS RANCH WATER RECLAMATION FACILITY	x	Lake Bard Water Filtration Plant Laboratory	
	x	Lake Wildwood Wastewater Treatment Plant	
	x	Las Gallinas Valley Sanitary District	
LAS VIRGENES MUNICIPAL WATER DISTRICT	x	Las Virgenes Municipal Water District Laboratory	
	x	Latham Regional Treatment Plant Laboratory	
LAWRENCE BERKELEY	x	LBNL Environmental	

LABORATORY		Measurements Laboratory	
LAWRENCE LIVERMORE NATIONAL LABORATORY	x	Lawrence Livermore National Laboratory	
	x	Linda County Water District WTP	
LOMPOC REGIONAL WASTEWATER RECLAMATION LAB.	x	Lompoc Regional Wastewater Reclamation Lab	
LONG BEACH TREATMENT PLANT LABORATORY	x	Long Beach Treatment Plant Laboratory	
	x	Long Beach Public Health Laboratory	
	x	Long Beach Water Department Water Quality Lab	
LOS ALISOS WATER DISTRICT		(El Toro Water District)	**Consolidated**
LOS ANGELES COUNTY AGRICULTURAL COMMISSION	x	Los Angeles County Agricultural Commissioner	
LOS ANGELES COUNTY PUBLIC HEALTH LABORATORY	x	Los Angeles County Public Health Lab	
LOS ANGELES COUNTY SANITATION DISTRICT	x	Joint Water Pollution Control Water Quality Lab	
LOS ANGELES COUNTY SANITATION DISTRICT	x	Los Coyotes Treatment Plant Laboratory	
LOS ANGELES COUNTY SANITATION DISTRICT	x	Saugus Treatment Plant Laboratory	
LOS ANGELES COUNTY SANITATION DISTRICT	x	Water Pollution Control Laboratory	
LOS ANGELES COUNTY SANITATION DISTRICT	x	Valencia Treatment Plant Laboratory	
LOS ANGELES COUNTY SANITATION DISTRICT	x	Whittier Narrows Treatment Plant Laboratory	
LOS ANGELES COUNTY SANITATION DISTRICT	x	Pomona Treatment Plant Laboratory	
LOS ANGELES COUNTY SANITATION DISTRICT	x	Lancaster Treatment Plant Laboratory	
LOS ANGELES HARBOR DEPARTMENT TESTING LAB	x	Port of Los Angeles Testing Laborator	
MADERA COUNTY PUBLIC HEALTH LABORATORY	x	Madera County Public Health Laboratory	
MALIBU MESA WATER RECLAMATION FACILITY	x	Malibu Mesa Water Reclamation Plant Lab	
MAMMOTH COUNTY WATER	x	Mammoth Community	

DISTRICT LAB		Water District	
MARIN COUNTY PUBLIC HEALTH LABORATORY	x	Marin County Public Health Laboratory	
MARIN MUNICIPAL WATER DISTRICT	x	Marin Municipal Water District	
MARINA COAST WATER DISTRICT	x	Marina Coast Water District	
MARIPOSA PUBLIC UTILITY DISTRICT	x	Mariposa Public Utility District	
		Meadowlark Water Reclamation Facility Lab	
MERCED COUNTY DEPARTMENT OF PUBLIC HEALTH LAB	x	Merced County Public Health Laboratory	
	x	Metro Biosolids Center Wastewater Chemistry SD	
METROPOLITAN WATER DISTRICT OF SO. CAL.	x	MWDSC- Joseph Jensen WTP Lab.	
METROPOLITAN WATER DISTRICT OF SO. CAL.	x	MWDSC - F.E. Weymouth WTP Laboratory	
METROPOLITAN WATER DISTRICT OF SO. CAL.	x	MWDSC - Henry J. Mills WTP Lab	
ROBERT B. DIEMER FILTRATION PLANT LABORATORY	x	MWDSC - Robert B. Diemer WTP Lab.	
METROPOLITAN WATER DISTRICT OF SO. CAL.	x	MWDSC - Robert A. Skinner WTP Lab	
METROPOLITAN WATER DISTRICT OF SO. CAL.	x	MWD - La Verne Water Quality Laboratory	
MISSION SPRINGS WATER DISTRICT	x	Mission Springs Water District	
MODESTO REGIONAL WATER TREATMENT PLANT	x	Modesto Regional Water Treatment Plant	
		Montecito Sanitary District Laboratory	
MONTEREY COUNTY CONSOLIDATED LABORATORY	x	Monterey County Consolidated Environmental Lab	
MONTEREY REGIONAL WATER POLLUTION CONTROL AGCY	x	Monterey Regional Water Pollution Control Agency	
MORRO BAY - CAYUCOS WW TREATMENT PLANT	x	Morro Bay - Cayucos Wastewater Treatment Plant	
	x	Mt. Shasta - City	

		Wastewater Laboratory	
MOULTON NIGUEL WATER LABORATORY	x	South Orange County Wastewater Authority Reg. Lab	
MT. VIEW SANITARY DISTRICT	x	Mt. View Sanitary District	
NAPA COUNTY HEALTH & HUMAN SERVICES LABORATORY	x	Napa - Solano County Public Health Laboratory	
NAPA SANITATION DISTRICT	x	Napa Sanitation District Laboratory	
NAVAL WEAPONS STATION			**Closed**
NEVADA IRRIGATION DISTRICT WATER LABORATORY	x	Nevada Irrigation District Water Laboratory	
NEWPORT BEACH CITY WATER LABORATORY			**Closed**
NILAND SANITARY DISTRICT	x	Niland Sanitary District	
NORTH BAY REGION WATER TREATMENT PLANT	x	North Bay Regional Water Treatment Plant	
	x	North City Wastewater Chemistry Lab	
NORTH COAST COUNTY WATER DISTRICT	x	North Coast County Water District	
NORTH MARIN WATER DISTRICT	x	North Marin Water District	
	x	North of River Sanitary District No. 1	
		North San Mateo County Sanitation District	
NOVATO SANITARY DISTRICT LABORATORY	x	Novato Sanitary District Laboratory	
OCEANSIDE WPCP LABORATORY DIVISION	x	Oceanside - City Water Utilities Department Lab	
OJAI VALLEY SANITATION DISTRICT	x	Ojai Valley Sanitation District	
OLIVEHURST PUBLIC UTILITY DISTRICT	x	Olivehurst Public Utility District Lab	
ORANGE COUNTY PUBLIC HEALTH LABORATORY	x	Orange County Public Health Laboratory	
ORANGE COUNTY SANITATION DISTRICT	x	Orange County Sanitation District	
ORANGE COUNTY WATER DISTRICT MAIN LABORATORY	x	Orange County Water District	

ORO LOMA SANITARY DISTRICT	x	Oro Loma Sanitary District	
	x	Sewerage Commission - Oroville Region	
OROVILLE - WYANDOTTE IRRIGATION DISTRICT			**Closed**
OTAY WATER DISTRICT	x	Otay Water District	
PADRE DAM MWD, WASTEWATER TREATMENT PLANT	x	Padre Dam WD	
PALMDALE WATER DISTRICT	x	Palmdale Water District	
PALO ALTO REGIONAL WATER QUALITY CONTROL LAB	x	Palo Alto Regional Water Quality Control Lab	
PELICAN BAY STATE PRISON	x	Pelican Bay State Prison Water Quality Lab	
	x	Petaluma City Water Quality Laboratory	
PINOLE-HERCULES WATER POLLUTION CONTROL PLANT	x	Pinole-Hercules Water Pollution Control Plant	
PITTSBURG MUNICIPAL WATER WORKS	x	Pittsburg Municipal Water Treatment Plant Lab	
PLACER COUNTY PUBLIC HEALTH LABORATORY	x	Placer County Public Health Laboratory	
PLEASANTON CITY WATER DEPARTMENT LABORATORY	x	Pleasanton City Water Laboratory	
		Plumas County Environmental Health	
		Point Loma Wastewater Chemistry Lab	
	x	Porterville City Laboratory	
		Quartz Valley Indian Reservation Microbiology Lab	
	x	Quincy Community Services District	
	x	Rancho Murieta Community Services District Lab	
		Robinson Ranch Water Reclamation Plant	
RIVERBANK ARMY AMMUNITION PLANT	x		**Closed**

RIVERSIDE COUNTY SERVICE AREA #51			**Closed**
	x	Rio Vista, North West Wastewater Treatment Plant	
	x	Rodeo Sanitary District	
	x	R.E. Badger Filtration Plant	
SACRAMENTO COUNTY PUBLIC HEALTH LAB.	x	Sacramento County Public Health Laboratory	
SACRAMENTO COUNTY REGIONAL PLANT CONTROL LAB	x	Sacramento Regional County Sanitation District	
SAN BERNARDINO COUNTY PUBLIC HEALTH LABORATORY	x	San Bernardino County Public Health Laboratory	
	x	San Clemente - City Water Quality Laboratory	
SAN DIEGO COUNTY PUBLIC HEALTH LABORATORY	x	San Diego County Public Health Laboratory	
SAN ELIJO JOINT POWERS AUTHORITY LABORATORY	x	San Elijo Joint Powers Authority Laboratory	
SAN FRANCISCO AIRPORT - FACILITES O&M	x	Mel Leong Treatment Plant Laboratory	
SAN FRANCISCO DEPT. OF PUBLIC HEALTH	x	San Francisco Public Utilities Commission WQD	
SAN FRANCISCO WATER DEPARTMENT	x	San Francisco Puc - Moccasin Laboratory	
SAN FRANCISCO WATER DEPARTMENT	x	San Francisco Puc - Sunol Valley WTP Lab	
	x	Searles Valley Minerals Regulatory Compliance Lab	
TREASURE ISLAND SEWAGE TREATMENT PLANT LAB	x	SFPUC WQD Treasure Island WPCP Lab	
SOUTH EAST REGIONAL RECLAMATION AUTHORITY	x	Southeast Laboratory San Francisco PUC	
SAN JOAQUIN COUNTY PUBLIC HEALTH LABORATORY	x	San Joaquin County Public Health Laboratory	
SAN JOSE/SANTA CLARA WATER POLLUTION CONTROL PLANT	x	San Jose/ Santa Clara WPCP Laboratory	
SAN LEANDRO WATER POLLUTION CONTROL PLANT LAB	x	San Leandro Water Pollution Plant	

SAN LORENZO VALLEY SURFACE WATER TREATMENT	x	San Lorenzo Valley Water District	
SAN LUIS OBISPO COUNTY PUBLIC HEALTH LABORATORY	x	San Luis Obispo County Public Health Dept. Lab	
SAN MATEO COUNTY PUBLIC HEALTH LABORATORY	x	San Mateo County Public Health Lab	
	x	San Simeon Wastewater Treatment Plant Lab	
	x	Santa Rosa Water Reclamation Facility Lab	
SANITARY DISTRICT NO. 5 OF MARIN COUNTY	x	Sanitary District No. 5 of Marin County	
SANTA BARBARA COUNTY HEALTH CARE SERVICES			**Closed**
SANTA BARBARA COUNTY PUBLIC HEALTH LABORATORY	x	Santa Barbara County Public Health Lab	
SANTA CLARA VALLEY WATER DISTRICT LABORATORY	x	Santa Clara Valley Water District	
		Santa Cruz County Sanitation District Lab	
	x	Santa Cruz County - Health Services Agency Lab	
SANTA CRUZ MUNICIPAL UTILITIES	x	Santa Cruz - City Water Lab	
SANTA CRUZ PUBLIC WORKS DEPARTMENT	x	Santa Cruz - City - WWTF Lab	
SANTA MARGARITA WATER DISTRICT	x	Santa Margarita Water District	
SAUSALITO - MARIN CITY SANITARY DISTRICT	x	Sausalito - Marin City Sanitary District	
SANTA CLARA COUNTY PUBLIC HEALTH LABORATORY	x	Santa Clara County Public Health Lab	
SCOTTS VALLEY WATER DISTRICT			**Closed**
SELMA-KINGSBURG-FOWLER COUNTY SAN. DIST.	x	Selma-Kingsburg-Fowler County Sanitation District	
SEWER AUTHORITY MID-COASTSIDE	x	Sewer Authority Mid-Coastside	
SEWERAGE AGENCY OF SOUTHERN MARIN	x	Sewerage Agency of Southern Marin	
SEWERAGE COMMISSION - OROVILLE REGION	x	Sewerage Commission - Oroville Region	
	x	Shasta County Public	

		Health Laboratory	
SIMI VALLEY COUNTY SANITATION LABORATORY	x	Simi Valley - City Water Quality Control Laboratory	
		Soledad City Water Quality Control Laboratory	
SONOMA COUNTY PUBLIC HEALTH LABORATORY	x	Sonoma County Public Health Laboratory	
SONOMA COUNTY WATER AGENCY	x	Sonoma County Water Agency - Russian River	
SONOMA COUNTY WATER AGENCY	x	Sonoma County Water Agency - Sonoma	
SOUTH BAYSIDE SYSTEM AUTHORITY	x	South Bay Wastewater Chemistry Laboratory	
SOUTH SAN LUIS OBISPO COUNTY SANITATION DISTRICT	x	South San Luis Obispo County Sanitation District	
SOUTH TAHOE PUBLIC UTILITY DISTRICT	x	South Tahoe Public Utility District	
SOUTH SAN JOAQUIN IRRIGATION DISTRICT	x	Nick C. Degroot Water Quality Laboratory	
	x	SPAWAR Systems Center San Diego Bioassay Lab	
	x	SRCSD Environmental Laboratory	
STANISLAUS COUNTY PUBLIC HEALTH LABORATORY	x	Stanislaus County Public Health Laboratory	
STOCKTON EAST WATER DISTRICT	x	Waidhofer Water Treatment Plant - Stockton	
ST. HELENA HOSPITAL CLINICAL LABORATORY	x	St. Helena Hospital Clinical Laboratory	
SUSANVILLE CONSOLIDATED SANITARY DISTRICT	x	Susanville Sanitary District WWTP Lab	
SWEETWATER AUTHORITY	x	Sweetwater Authority	
TAHOE TRUCKEE SANITATION AGENCY	x	Tahoe-Truckee Sanitation Agency	
THE WATER LABORATORY OF SOUTH LAKE TAHOE			**Closed**
THREE VALLEYS MUNICIPAL WATER DISTRICT	x	Three Valleys Municipal Water District	
	x	Travis AFB - Water Laboratory	
TULARE COUNTY HEALTH SERVICES LABORATORIES	x	Tulare County Public Health Laboratory	

TULELAKE WATER LABORATORY			**Closed**
		Twin Oaks Valley Water Treatment Plant	
		UC Davis Aquatic Toxicology Laboratory	
	x	Ukiah Wastewater Treatment Plant	
UNION SANITARY DISTRICT		Union Sanitary District	
	x	United States Mint San Francisco Lab	
	x	UC Davis, Wastewater Treatment Plant Lab	
US ARMY HEADQUARTERS - CA MEDICAL DETACHMENT			**Closed**
US NATIONAL PARK SVC. YOSEMITE WW FACILITY	x	US NPS - Yosemite - El Portal	
US NAVY, ENVIRONMENTAL ANALYSIS FACILITY			**Closed**
US NAVY, ENVIRONMENTAL CHEMISTRY LABORATORY			**Closed**
U.S. ARMY CENTER FOR HEALTH PROMOTION			**Closed**
U.S. MARINE CORPS LOGISTICS BASE			**Closed**
VALLEJO SANITATION AND FLOOD CONTROL DISTRICT	x	Vallejo Sanitation & Flood Control District	
		Valley Center Municipal Water District Lab	
VALLEY SANITARY DISTRICT	x	Valley Sanitary District	
	x	Vandenberg AFB - Aerospace Fuels Laboratory	
VENTURA COUNTY HEALTH DEPARTMENT	x	Ventura County Health Department Laboratory	
VENTURA COUNTY WATERWORKS DISTRICTS	x	Ventura County Waterworks Districts	
VENTURA REGIONAL SANITATION DISTRICT LABORATORY			**Closed**
	x	Veolia - City of Rialto Waste Water Treatment Plant	

	x	Victor Valley Wastewater Reclamation Authority Lab	
VISTA IRRIGATION DISTRICT	x	Vista Irrigation District	
WAWONA WATER AND WASTEWATER LABORATORY	x	Wawona Water And Wastewater Laboratory	
WEAVERVILLE SANITARY DISTRICT	x	Weaverville Sanitary District	
WEST BASIN WATER QUALITY LABORATORY	x	West Basin Water Quality Laboratory	
	x	Walnut Valley Water District	
WESTERN MUNICIPAL WATER DISTRICT			
	x	West County Wastewater District	**Closed**
WILLITS WATER QUALITY CONTROL PLANT	x	Willits City Laboratory	
YOLO COUNTY HEALTH DEPARTMENT LABORATORY	x	Yolo County Health Department	
YUBA CITY WATER/WASTEWATER LABORATORY	x	Yuba City Water/wastewater Laboratory	
YUCAIPA VALLEY WATER DISTRICT			**Closed**
ZONE 7 WATER AGENCY	x	Zone 7 Water Quality Laboratory	
285	**310**	**343**	**35**

Figure 3

Government Run Laboratories Accredited by New York ELAP in 2001 and 2016

Laboratory	**County**	**City**	**2001**	**2016**
Adams (V) Wastewater Treatment Plant	Jefferson	Adams	x	
AMHERST (T) WPCF	Erie	Ahmerst		x
AKRON (V) SEWAGE PLANT	Erie	Akron	x	x
NYSDOT Materials Bureau	Albany	Albany	x	
NYSDOH ORG ANALYTICAL CHEMISTRY LAB	Albany	Albany	x	x
NYSDOH INORGANIC & NUCLEAR CHEMISTRY	Albany	Albany	x	x
WADSWORTH CENTER BIODEFENSE LABORATORY	Albany	Albany		x
NYSDOH ENVIRONMENTAL BIOLOGY LABORATORY	Albany	Albany	x	x
Albany County Sewer District	Albany	Albany	x	x
ALBANY WATER QUALITY LAB	Albany	Albany		x
ALBION POLLUTION CONTROL FAC	Orleans	Albion	x	x
Alden Public Works Lab	Erie	Alden	x	
Erie County Sewer District #4 & #5	Erie	Alden	x	
AMSTERDAM WATER TREATMENT	Montomery	Amsterdam	x	x

Erie County Sewer District #2	Erie	Angola	x	
Arcade Waste Treatment Plant	Wyoming	Arcade	x	
Bowery Bay Water Pollution Control Plant	Queens	Astoria	x	
GREATER ATLANTIC BEACH WATER RECLAMATION DISTRICT	Nasaau	Atlantic Beach	x	x
Attica Sewage Treatment Plant	Wyoming	Attica	x	
AUBURN WPCP (LAB)	Cayuga	Auburn	x	x
Auburn Memorial Hospital Lab	Cayuga	Auburn	x	
AUBURN WATER TREATMENT PLANT	Cayuga	Auburn		x
Somerset-Barker Sewage Trmt pl	Somerset	Baker	x	
BATAVIA WASTEWATER TREATMENT FACILITY	Genesee	Batavia	x	x
BATAVIA (C) WATER TREATMENT PLANT	Genesee	Batavia	x	x
Beacon (C) STP	Duchess	Beacon	x	
Bear Mountain Regional Lab	Rockland	Bear Mountain	x	
BINGHAMTON WATER TREATMENT PLANT	Broome	Binghamton	x	x
Blasdell (V)	Erie	Blasdell	x	
Bloomfield (V)	Ontario	Bloomfield	x	
Rensselaer Darrin Fresh Water Institute	Warren	Bolton Landing	x	
Boonville (V) Sewage Treatment Plant	Oneida	Boonville	x	

SUNY Brockport	Monroe	Brockport	x	
Hunts Point WPCP	Bronx	Bronx	x	
Coney Island Plant (WPCP)-NYCDEP	Kings	Brooklyn	x	
Owls Head Plant (WPCP) - NYCDEP	Kings	Brooklyn	x	
26th Ward WPCP - NYCDEP	Kings	Brooklyn	x	
Owl's Head Process Lab-WPCP-NYCDEP	Kings	Brooklyn	x	
Red Hook Water Poll Plant-NYCDEP	Kings	Brooklyn	x	
Red Hook Water Pollution Control Lab	Kings	Brooklyn	x	
NEWTOWN CREEK PROCESS CONTROL LAB	Kings	Brooklyn	x	x
Keyspan Energy System Lab/Brooklyn	Kings	Brooklyn	x	
NEWTOWN CREEK MICROBIOLOGY LABORATORY	Kings	Brooklyn	x	x
KINGS COUNTY HOSPITAL CENTER/PATHOLOGY DEPT	Kings	Brooklyn	x	x
ERIE COUNTY PUBLIC HEALTH LABORATORY	Erie	Buffalo	x	x
BUFFALO SEWER AUTHORITY	Erie	Buffalo	x	x
Erie County Southtowns Agency	Erie	Buffalo	x	x
BUFFALO WATER AUTHORITY FILTRATION PLANT LABORATORY	Erie	Buffalo	x	x
Canajoharie Wastewater Trmt Pl	Montomery	Canajoharie	x	

CANANDAIGUA WASTEWATER TREATMENT FACILITY	Ontario	Canandaigua	x	
CANANDAIGUA WATER TREATMENT PLANT	Ontario	Canandaigua	x	
Canastota Water Pollution Control Plant	Madison	Canastota	x	
CANISTEO WASTEWATER PLANT LAB	Steuben	Canisteo	x	x
Canton Water Filtration Plant	St. Lawrence	Canton	x	
Carthage - W Carthage Water Poll Control	Jefferson	Carthage	x	
Castleton Wastewater Lab	Rensselaer	Castleton	x	
Catskill (Village)	Greene	Catskill	x	
Cedarhurst Water Poll Cntl Plt	Nassau	Cedarhurst	x	
SOUTH & CENTER CHAUTAUQUA LAKE SEWER DISTRICT	Chautauqua	Celoron	x	x
Chateaugay (V)	Franklin	Chateaugay	x	
MAIN PUMP STATION NO 5	Erie	Cheektowaga	x	x
Tallman Island WPCP	Queens	College Point	x	
Cornwall (T) Sewer Department	Orange	Cornwall	x	
DIST WATER QUAL OPS NYCDEP DISTRIBUTION LAB	Queens	Corona	x	x
NYCDEP BEC - ASBESTOS LABORATORY	Queens	Corona		x

LEFRAK CITY PRIORITY POLLUTANTS LAB-NYCDEP	Queens	Corona	x	x
NORTHERN WESTCHESTER JOINT WATER WORKS	Westchester	Cortlandt Manor		x
Cortland Wastewater Treatment Plant	Courtland	Courtland	x	
STURGEON POINT WATER TREATMENT PLANT	Erie	Derby		x
Dolgeville Wastewater Treatment Plant	Fulton	Dolgeville	x	
DUNKIRK WWTP LAB	Chautauqua	Dunkirk	x	x
Dunkirk Steam Station	Chautauqua	Dunkirk	x	
DUNKIRK WATER TREATMENT PLANT LAB	Chautauqua	Dunkirk	x	x
Ellicottville (V)	Cattaraugus	Ellicottville	x	
ELMA (T) SEWER DISTRICTS-ROLLING GREEN LANE	Erie	Elma	x	x
ELMIRA WATER BOARD	Chemung	Elmira	x	x
Chemung Co Sewer District #1	Chemung	Elmira	x	x
CHEMUNG CO ELMIRA SD	Chemung	Elmira	x	
ENDICOTT WASTEWATER TREATMENT	Broome	Endicott	x	x
BROOME-TIOGA BOCES	Broome	Endicott		x
Endicott Water Lab	Broome	Endicott	x	
Jamestown WWTP Lab	Chautauqua	Falconer	x	
NYCDEP HAZARDOUS MATERIALS LAB	Queens	Flushing	x	x

Fonda Fultonville Wastewater	Montomery	Fonda	x	
Washington Co Sewer Dist #2 STP	Washington	Fort Edward	x	x
FULTON SEWAGE TREATMENT PLANT	Oswego	Fulton	x	x
GASPORT SD#1 STP	Niagra	Gasport	x	x
Marsh Creek WWTP	Seneca	Geneva	x	
WATERLOO WATER TREATMENT PLANT LAB	Seneca	Geneva		x
Glens Falls WWTP	Warren	Glen Falls	x	
Finch Pruyn Waste Treatment	Warren	Glen Falls	x	
NMPC Albany Steam Results Lab	Albany	Glenmont	x	
Gloversville Water Works	Fulton	Glowersvill e	x	
Gouverneur WWTF	St. Lawrence	Gouverne ur	x	
GRAHAMSVILLE LABORATORY	Sullivan	Grahamsv ille	x	x
GRAND ISLAND WASTEWATER PLANT	Erie	Grand Island	x	x
Granville Sewage Treatment Plant	Washington	Granville	x	
Great Neck Wtr Poll Cntrl Dist	Nassau	Great Neck	x	
Nott Road Wastewater Treatment	Albany	Guilderlan d	x	
Brockport (V) Water Plant	Monroe	Hamlin	x	
Orange Co Dept of Environ Facilities & Srvcs	Orange	Harriman	x	

SUFFOLK CO PUBLIC & ENV HEALTH LAB	Suffolk	Hauppauge	x	x
SUFFOLK COUNTY WATER AUTHORITY LABORATORY	Suffolk	Hauppauge	x	
HAWTHORNE LABORATORY	Westchester	Hawthorne		x
ROCHESTER (C) WATER BUREAU	Lingston	Hemlock	x	x
NASSAU COUNTY DEPT OF HEALTH	Nasaau	Hempstead	x	x
Herkimer Water Pollution Control Plant	Herkimer	Herkimer	x	
Erie County Sewer District #3	Erie	Holland	x	
Holley Water Pollution Control	Orleans	Holley	x	
Honeoye Falls WWTP	Monroe	Honeoye Falls	x	
Hoosick Falls (V) WWTP	Rensselaer	Hoosick falls	x	
HORNELL (C) WATER TREATMENT PLANT	Steuben	Hornell	x	x
Hornell Water Poll Control Plt	Steuben	Hornell	x	x
CITY OF ITHACA WATER TREATMENT PLANT LABORATORY	Tompkins	Ithaca		x
Cornell University Filtration Plant	Tompkins	Ithaca	x	
ITHACA AREA WASTE WATER TREATMENT FACILITY	Tompkins	Ithaca	x	x
SOUTHERN CAYUGA LAKE INTERMUNICIPAL WATER	Tompkins	Ithaca	x	x

Jamaica Water Pollution Control Plant	Queens	Jamaica	x	
GLOVERSVILLE-JOHNSTOWN JWTF	Fulton	Johnstow n	x	x
JORDAN (V) WATER POLLUTION CONTROL PLANT	Onondaga	Jordan	x	x
KINGSTON WATER DEPARTMENT LAB	Ulster	Kingston		x
KINGSTON LABORATORY - NYC DEP	Ulster	Kingston		x
Kingston Universal Community Laboratory	Ulster	Kingston	x	
Erie Co Water Auth - D F Kane W Q Lab	Erie	Lackawa nna	x	
Erie County Sewer District #6	Erie	Lackawa nna	x	
LAKE PLACID VILLAGE	Essex	Lake Placid	x	x
Lakeville Sewage Treatment Plt	Lingston	Lakewille	x	
MOHAWK VIEW LABORATORY	Albany	Latham	x	x
MOHAWK VIEW WATER POLLUTION CONTROL PLAN	Albany	Latham	x	x
Lawrence (V) Water Pollution Control Inc	Nassau	Lawrence	x	
Leroy Sewage Treatment Plant	Genesee	Leroy	x	
TOWN OF LEWISTON	Niagra	Lewiston	x	x
Liberty (V)	Sullivan	Liberty	x	
LITTLE FALLS WASTEWATER	Herkimer	Little Falls		x

TREATMENT PLANT				
BELGRAVE WATER POL CNTRL DIST	Queens	Little Neck	x	x
ONONDAGA COUNTY DEPT WATER ENV PROTECTIO	Onondaga	Liverpool		x
LOCKPORT WASTEWATER TREATMENT PLANT	Niagra	Lockport	x	x
LOCKPORT WATER TREATMENT PLANT LAB	Niagra	Lockport	x	x
OTISCO WATER TRMT PLANT	Onondaga	Marcellus	x	x
MARION (T) WASTEWATER TREATMENT PLANT	Wayne	Marion	x	x
CHAUTAUQUA COUNTY HEALTH	Chautauqua	Mayville	x	x
SARATOGA CO SEWER DIS #1	Saratoga	Mechanicville	x	x
MIDDLEPORT TREATMENT FACILITY	Niagra	Middleport	x	x
MINETTO NY LABORATORY	Oswego	Minetto	x	x
Herkimer Co Wastewater Plant	Herkimer	Mohawk	x	
MONTICELLO (V)	Sullivan	Montecello	x	x
North River Laboratory	New York	New York	x	
NYC DOHMH PUBLIC HEALTH LAB - BIOTHREAT RESPONSE LAB	New York	New York	x	x
WARDS ISLAND PROCESS CONTROL LAB	New York	New York	x	x
North River WPCP	New York	New York	x	
CCNY ENVIRONMENTAL LAB	New York	New York	x	x

ENVIRONMENTAL SCIENCES AND TOXICOLOGY LABORATORY	New York	New York		x
Newark (V) Wastewater Treatment Plant	Erie	Newark	x	
Chadwick Lane Filter Plant	Orange	Newburg h	x	
Niagara Falls Wastewater Laboratory	Niagra	Niagara Falls	x	
NIAGARA COUNTY WATER DISTRICT	Niagra	Niagra Falls	x	x
Niagara Falls Drinking Water Lab	Niagra	Niagra Falls	x	
OCC Niagara Works Laboratory	Niagra	Niagra Falls	x	
NIAGARA FALLS WATER BOARD WASTEWATER LABORATORY	Niagra	Niagra Falls	x	x
Northport Sewage Treatment Plant	Suffolk	Northport	x	
Quest International (Norwich) WWTP	Chenango	Norwich	x	
NORWICH WATER SYSTEM	Chenango	Norwich	x	x
OGDENSBURG WATER POLLUTION CTR PT	St. Lawrence	Ogdensb urg	x	x
Newfane Wastewater Trmt Plt	Niagra	Olcott	x	
TOWN OF OYSTER BAY ENVIRONMENTAL LABORATORY	Nasaau	Old Bethpage	x	x
CATTARAUGUS COUNTY LABORATORY	Cattaraugus	Olean	x	x
OLEAN (C) WATER TREATMENT	Cattaraugus	Olean	x	x

PLANT				
OLEAN WASTEWATER TREATMENT PLT	Cattaraugus	Olean	x	x
ONEIDA (C) WATER POLLUTION CONTROL PLANT	Madison	Oneida	x	x
ONEONTA (C) WATER LABORATORY	Otsego	Oneonta	x	x
Oneonta WWTP	Otsego	Oneonta	x	
ONTARIO WATER UTILITIES DEPT	Wayne	Ontario	x	x
ROCKLAND COUNTY SEWER DISTRICT #1 LABORA	Rockland	Orangeburg	x	x
TOWN OF ORANGETOWN, SEWER DEPARTMENT	Rockland	Orangeburg	x	x
OSSINING (V) WATER DEPT LAB-INDIAN BROOK	Westchester	Ossining	x	x
OSWEGO WATER TREATMENT PLANT LAB	Oswego	Oswego	x	x
METROPOLITAN WATER BOARD	Oswego	Oswego		x
CONSOLIDATED LABORATORIES	Oswego	Oswego		x
Oswego Harbor Power	Oswego	Oswego	x	
Owego (V) Police Dept/sewer Dept	Tioga	Owego	x	
Lederle Waste Treatment Lab	Rockland	Pearl River	x	
Campfield Reservoir & Filter Plant	Westchester	Peekskill	x	x
Crawford (T) Water and Sewer	Orange	Pine Bush	x	
PLATTSBURGH WPCP LABORATORY	Clinton	Plattsburgh		x

HEMPSTEAD DEPT CONSERVATION & WATERWAY	Nasaau	Point Lookout	x	x
Port Chester WWTP	Westchester	Port Chester	x	
PORT WASHINGTON WPCD	Nasaau	Port Washington	x	x
Port Washington WPCD	St. Lawrence	Potsdam	x	
Poughkeepsie (C) Water Works	Dutchess	Poughkeepsie	x	
NYSDEC Div of Environ Remed Lab	Rensselaer	Rensselaer	x	
East Greenbush Sewage Trmt Plant	Rensselaer	Rensselaer	x	
MONROE COUNTY ENVIRONMENTAL LABORATORY	Monroe	Rochester	x	x
MONROE COUNTY WATER AUTHORITY WTP	Monroe	Rochester	x	x
Rockaway WPCP - NYCDEP	Queens	Rockaway Park	x	
Salamanca Wastewater Treatment Plant	Cattaraugus	Salamanca	x	
SCHENECTADY (C) WATER LABORATORY	Schenectady	Schenectady	x	x
Tom Whitbeck - Water Laboratory	Otsego	Schenevus	x	
Sherman (V) Wastewater Treatment Plant	Chautauqua	Sherman	x	

Ben Nesin Laboratory - NYC DEP	Ulster	Shokan	x	
Yorktown Cons Water & Storage Dist.#1	Westchester	Shrub Oak	x	
Fallsburg (T) Env Lab	Sullivan	South Fallsburg	x	x
Spencerport Wastewater Trmt	Monroe	Spencerport	x	
OAKWOOD BEACH PROCESS CONTROL LAB	Richmond	Staten Island	x	
INTERSTATE ENVIRONMENTAL COMMISSION	Richmond	Staten Island	x	x
Port Richmond Water Pollution Ctrl Plant	Richmond	Staten Island	x	
Oakwood Beach WPCP	Richmond	Staten Island	x	x
STONY POINT (T)	Rockland	Stoney Point	x	x
St Johnsville Waste Trmt Plant	Montomery	St. Johnsville	x	
SUFFERN VILLAGE WATER SUPPLY	Rockland	Suffern	x	x
Onondaga County D & S	Onondaga	Syracuse	x	
ONONDAGA CO WATER AUTHORITY	Onondaga	Syracuse	x	x
Upstate Freshwater Institute	Onondaga	Syracuse	x	
Oneida Water Treatment Plant	Oneida	Taberg	x	
TONAWANDA (T) WATER TREATMENT PLANT	Erie	Tonawanda	x	x

Tonawanda (T) Wastewater	Erie	Tonawanda	x	x
VAN DE WATER TREATMENT PLANT	Erie	Tonawanda	x	x
NORTH TONAWANDA WWTP	Niagra	Tonawanda	x	x
Tonawanda (C) Water Plant	Erie	Tonawanda	x	
RENSSELAER CO. SEWER DISTRICT #1	Rensselaer	Troy	x	x
USGS NEW YORK WATER SCIENCE CENTER	Rensselaer	Troy		x
TROY (C) PUBLIC UTILITY DEPARTMENT	Rensselaer	Troy	x	x
Brookhaven National Lab - SEP Division	Suffolk	Upton	x	x
ONEIDA COUNTY WATER POLLUTION CONTROL	Oneida	Utica	x	x
Upper Mohawk Valley Reg Water Board	Oneida	Utica	x	
MOHAWK VALLEY WATER AUTHORITY	Oneida	Utica		x
Kensico Lab NYC DEP- B W S DWQC	Westchester	Valhalla	x	
WESTCHESTER COUNTY BIODEFENSE LABORATORY	Westchester	Valhalla	x	x
BINGHAMTON-JOHNSON (C) STP	Broome	Vestal	x	x
WALWORTH WATER POLLUTION	Wayne	Walworth	x	x

CONTROL FAC				
Cedar Creek Wpc Plant	Nassau	Wantagh	x	
Cedar Creek Special Projects Lab	Nassau	Wantagh	x	
WARDS ISLAND PRIORITY POLLUTANTS LAB- NYCDEP	New York	Wards Island	x	x
ALBION (V) WATER PLANT	Orleans	Waterport		x
WATERTOWN (C) WATER PLANT	Jefferson	Watertown	x	x
WATERTOWN POLLUTION CONTROL PLANT LABORA	Jefferson	Watertown	x	x
Webster (T) Wastewater Treatment Plant	Monroe	Webster	x	x
MCWA WEBSTER WTP	Monroe	Webster		x
WELLSVILLE WASTEWATER TRMT PLANT	Allegany	Wellsville	x	x
SCDPW SANITATION DIVISION LABORATORY	Suffolk	West Babylon		x
JOINT REGIONAL SEWERAGE BOARD	Rockland	West Haverstraw	x	x
West Hempstead Water District	Nassau	West Hempstead	x	
US Military Academy Target Hill WWTP	Orange	West Point	x	
US Military Academy Lusk Water Plant	Orange	West Point	x	
ERIE 1 BOCES	Erie	West		x

		Seneca		
NIAGARA CO SEWER DISTRICT #1	Niagra	Wheatfiel d	x	x
Whitehall (V) Wastewater Treatment Facility	Washington	Whitehall	x	
Yonkers Joint Treatment Plant	Westchester	Yonkers	x	
Bureau of Water Sanitation Lab	Westchester	Yonkers	x	
NYC DEP Croton Laboratory	Westchester	Yorktown	x	
Yorktown Medical Laboratory Inc	Westchester	Yorktown Heights	x	
248			221	121

Alachua County

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NELAP-Certified Organizations - Location Results

Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County
5970	E82001	Advanced Environmental Laboratories, Inc. - Gainesville	Commercial	4965 SW 41st Blvd.	Gainesville	FL	32608	Alachua
6315	E82998	Amec Foster Wheeler Environment & Infrastructure Inc.	Commercial	404 S.W. 140th Terrace	Newberry	FL	32669	Alachua
6241	E82924	BCS Laboratories, Inc. - Gainesville	Commercial	4609 NW 6th Street, Building A	Gainesville	FL	32609	Alachua
6159	E82840	Columbia Technologies Mobile Unit 09	Commercial	6821 SW Archer Road	Gainesville	FL	32608	Alachua
5842	E22701	FL Dept. of Health - Alachua County Health Department	DOH CHD	224 S.E. 24th Street	Gainesville	FL	32641	Alachua
5859	E92293	Florida Department of Transportation - State Materials Office	Other State	5007 NE 39th Ave.	Gainesville	FL	32609	Alachua
6193	E52876	Gainesville Regional Utilities/ Deerhaven Generating Station	Utility	10001 NW 13th Street	Gainesville	FL	32653	Alachua
5887	E82295	Hydrosphere Research Environmental Services, Inc.	Commercial	11842 Research Circle	Alachua	FL	32615	Alachua
5903	E52099	Kanapaha Laboratory - Gainesville Utilities	Utility	3901 South West 63rd Blvd	Gainesville	FL	32608	Alachua
5714	E52741	Murphree Water Treatment Plant	Utility	1600 N. E. 53rd Avenue	Gainesville	FL	32609	Alachua
5636	E82031	M¿rieux NutriSciences	Commercial	3437 SW 24th Avenue	Gainesville	FL	32607	Alachua
6167	E72850	UF/IFAS Environmental Water Quality Laboratory	University	631 Wallace Building	Gainesville	FL	32611	Alachua

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**UF-IFAS Wetland Biogeochemistry Laboratory**
DOH ID:	E72949

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	EPA 350.1	Ammonia as N	12/20/2004	From: Applied To: Applied	NELAP NELAP	FL FL	1/6/2005
Non-Potable Water	EPA 350.1	Ammonia as N	1/20/2005	From: No Certification To: Applied	None NELAP	FL	1/6/2005
Non-Potable Water	EPA 350.1	Ammonia as N	10/12/2005	From: Applied To: Accredited	NELAP NELAP	FL FL	10/16/2005
Non-Potable Water	EPA 350.1	Ammonia as N	7/1/2007	From: Accredited To: Inactive	NELAP NELAP	FL FL	7/19/2007
Non-Potable Water	SM 4500-NH3 G	Ammonia as N	4/25/2008	From: No Certification To: Applied	None NELAP	FL	5/1/2008
Non-Potable Water	SM 4500-NH3 G	Ammonia as N	8/8/2008	From: Applied To: Accredited	NELAP NELAP	FL FL	9/16/2008
Non-Potable Water	SM 4500-NH3 G	Ammonia as N	3/3/2015	From: Accredited To: Suspended	NELAP NELAP	FL FL	3/3/2015
Non-Potable Water	SM 4500-NH3 G	Ammonia as N	7/1/2015	From: Suspended To: Inactive	NELAP NELAP	FL FL	7/1/2015
Solids	EPA 350.1	Ammonia as N	12/20/2004	From: No Certification To: Applied	None NELAP	FL	1/6/2005
Solids	EPA 350.1	Ammonia as N	8/25/2005	From: Applied To: Withdrawn	NELAP NELAP	FL FL	8/27/2005

Bradford County

Alachua
Bay
Brevard
Broward
Charlotte
Citrus
Collier
Columbia
Dade
Duval
Escambia
Flagler
Hamilton
Hendry
Hernando
Hillsborough
Indian River
Jackson
Lake
Lee
Leon

There are no Laboratories Currently Accredited in Bradford County

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 01/23/2016 8:18:22 AM

Organization:	**FL Dept. of Health - Bradford County Health Department**
DOH ID:	**E22794**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9223 B	Total coliforms ~and~ E. coli	11/14/2002	From: Accredited To: Accredited	STATE NELAP	FL	1/17/2003
Drinking Water	SM 9223 B	Total coliforms ~and~ E. coli	5/31/2005	From: Accredited To: Relinquished	NELAP NELAP	FL FL	6/13/2005

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Last updated: April 23, 2015

Brevard County

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Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County
6251	E83934	Analytical Laboratories of Florida - Mobile Lab #1	Commercial	2265 Leaside Court	Merritt Island	FL	32952	Brevard
6402	E831090	Analytical Laboratories of Florida, Inc. - Mobile Lab #2	Commercial	2265 Leaside Court	Merritt Island	FL	32952	Brevard
5674	E53268	Brevard County Water Resources Laboratory	Utility	3630 North Courtenay Pkwy	Merritt Island	FL	32953	Brevard
5694	E53449	City of Cape Canaveral Water Reclamation Plant	Utility	601 Thurm Blvd.	Cape Canaveral	FL	32920	Brevard
5698	E53263	City of Cocoa Beach Water Reclamation Laboratory	Utility	1600 West Minuteman Causeway	Cocoa Beach	FL	32931	Brevard
5730	E53332	City of Melbourne Wastewater Treatment Compliance Monitoring Laboratory	Utility	835 North Apollo Blvd	Melbourne	FL	32935	Brevard
5729	E53730	City of Melbourne Water Treatment Plant Laboratory	Utility	6055 Lake Washington Road	Melbourne	FL	32934	Brevard
5743	E53491	City of Palm Bay Utilities Corporation	Utility	1080 Troutman Blvd.	Palm Bay	FL	32905	Brevard
5768	E53121	City of Titusville - Laboratory Services	Utility	4800 Deep Marsh Road	Titusville	FL	32780	Brevard
5801	E83330	DB Environmental Laboratories, Inc.	Commercial	365 Gus Hipp Blvd.	Rockledge	FL	32955	Brevard
5907	E63478	Kennedy Space Center Environmental Microbiology Laboratory	Federal	Building M7-355, Room 2272	Kennedy Space Center	FL	32899	Brevard
6040	E63483	US Air Force - Cape Canaveral AFS Environmental Laboratory	Federal	54731 Scrub Jay Rd.	CCAFS	FL	32925	Brevard
5901	E53262	Water Quality Assurance Laboratory	Utility	351 Shearer Blvd.	Cocoa	FL	32922	Brevard

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

There are no transaction entries for this FOA.
Please note that the AAMS Database was created in March 2002.
No transaction history entries exist prior to this date.
If you have further questions regarding this FOA
please contact the DOH Lab Certification Program (904-791-1599).

Brevard County Utilties

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Last updated: Apr

Mims Water Treatment Plant

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 01/23/2016 8:18:22 AM

Organization:	City of Cocoa Water Treatment Plant
DOH ID:	E53727

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9221 E	Fecal coliforms	7/1/2003	From: Accredited To: Accredited	STATE NELAP	FL	7/2/2003
Drinking Water	SM 9221 E	Fecal coliforms	10/18/2007	From: Accredited To: Relinquished	NELAP NELAP	FL FL	10/26/2007

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Last updated: April 23, 2015

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	Kennedy Space Center Laboratory for Sewage Treatment Operations
DOH ID:	E63359

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	11/12/2002	From: Suspended To: Relinquished	STATE STATE	*	11/12/2002

Broward County

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NELAP-Certified Organizations - Location Results

Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County
5646	E82535	Advanced Environmental Laboratories, Inc. - Miami	Commercial	10200 USA Today Way	Miramar	FL	33025	Broward
5675	E46053	Broward County Environmental Protection and Growth Management Department	Environmental - Pollution Control	3211 College Avenue	Davie	FL	33314	Broward
5676	E56441	Broward County Water and Wastewater Services Laboratory	Utility	2401 North Powerline Road	Pompano Beach	FL	33069	Broward
5701	E56716	City of Deerfield Beach Water Treatment Plant	Utility	290 Goolsby Boulevard, Bldg. D	Deerfield Beach	FL	33442	Broward
5710	E56084	City of Fort Lauderdale Environmental Laboratory	Utility	949 NW 38th Street	Ft. Lauderdale	FL	33309	Broward
5720	E56407	City of Hollywood Utilities Laboratory	Utility	1621 North 14th Avenue	Hollywood	FL	33020	Broward
5727	E56131	City of Margate Utilities	Utility	6630 NW 9th Street	Margate	FL	33063	Broward
5731	E56565	City of Miramar West Water Treatment Plant	Utility	4100 South Flamingo Road	Miramar	FL	33027	Broward
5748	E56402	City of Plantation Utilities Department Laboratory	Utility	6500 NW 11th Place	Plantation	FL	33313	Broward
5749	E56172	City of Pompano Beach Utilities Laboratory	Utility	1205 N.E. 5th Avenue	Pompano Beach	FL	33060	Broward
5762	E56158	City of Sunrise Utilities Laboratory	Utility	777 Sawgrass Corporate Parkway	Sunrise	FL	33325	Broward
5807	E86772	E. M. Analytical, Inc.	Commercial	8000 North Ocean Drive	Dania	FL	33004	Broward
5827	E86563	Environmental Reagent Service	Commercial	3860 SW 30th Avenue	Hollywood	FL	33312	Broward
6006	E86006	Florida-Spectrum Environmental Services, Inc.	Commercial	1460 West McNab Road	Ft. Lauderdale	FL	33309	Broward
6042	E86240	Pace Analytical Services-South Florida	Commercial	3610 Park Central N.	Pompano Beach	FL	33064	Broward
6421	E861109	Professional Environmental Testing and Consulting, LLC	Commercial	4650 SW 51st Street, #702	Davie	FL	33314	Broward

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	Coral Springs Improvement District Laboratory
DOH ID:	E46093

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 5210 B	Carbonaceous BOD (CBOD)	7/2/2002	From: Accredited To: Inactive	NELAP NELAP	FL FL	9/9/2002

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	City of Hallandale Beach Water Treatment Plant
DOH ID:	E56744

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 4500 F-C	Fluoride	2/2/2006	From: Accredited To: Relinquished	NELAP NELAP	FL FL	2/3/2006

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	City of Lauderhill Water Treatment Plant
DOH ID:	E56756

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9222 B	Total coliforms	10/2/2002	From: Accredited To: Suspended	STATE STATE		10/10/2002
Drinking Water	SM 9222 B	Total coliforms	4/2/2003	From: Suspended To: Relinquished	STATE NELAP	FL	4/14/2003

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Last updated: April 23, 2015

NELAP-Certified Laboratories

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Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	City of North Lauderdale Water Plant
DOH ID:	E56721

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9223 B	Total coliforms ~and~ E. coli	3/24/2004	From: Accredited To: Relinquished	STATE STATE		3/25/2004

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	City of Pembroke Pines Wastewater Treatment Plant
DOH ID:	E56300

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 2540 C	Residue-filterable (TDS)	12/3/2013	From: Accredited To: Relinquished	NELAP NELAP	FL FL	12/4/2013

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	City of Tamarac Utilities Laboratory
DOH ID:	E56725

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	NA + MUG	Escherichia coli	12/29/2004	From: No Certification To: Accredited	None NELAP	FL	1/7/2005
Drinking Water	NA + MUG	Escherichia coli	6/16/2009	From: Accredited To: Relinquished	NELAP NELAP	FL FL	6/23/2009
Drinking Water	SM 9223 B	Escherichia coli	3/13/2002	From: No Certification To: Accredited	None NELAP	FL	5/19/2008
Drinking Water	SM 9223 B	Escherichia coli	6/1/2010	From: Accredited To: Suspended	NELAP NELAP	FL FL	6/1/2010
Drinking Water	SM 9223 B	Escherichia coli	6/7/2010	From: Suspended To: Accredited	NELAP NELAP	FL FL	6/7/2010
Drinking Water	SM 9223 B	Escherichia coli	7/1/2015	From: Accredited To: Inactive	NELAP NELAP	FL FL	7/10/2015

Charlotte County

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NELAP-Certified Organizations - Location Results

Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County	Phone
5663	E85086	Benchmark EA South	Commercial	1001 Corporate Avenue, Suite 102	North Port	FL	34289	Charlotte	(941) 625-3137
5682	E54436	Charlotte County Utilities - East Port Laboratory	Utility	3100 Loveland Blvd	Port Charlotte	FL	33980	Charlotte	(941) 764-4300
5753	E55724	City of Punta Gorda Water Treatment Plant	Utility	38100 Washington Loop Road	Punta Gorda	FL	33982	Charlotte	(941) 639-2057

Hits: 3

NELAP-Certified Laboratories

Laboratories <u>no longer certfied</u> Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**FL DEP - South District Laboratory**
DOH ID:	E34830

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 5210 B	Biochemical oxygen demand	1/22/2002	**From:** No Certification **To:** Applied	None NELAP	FL	12/20/2002
Non-Potable Water	SM 5210 B	Biochemical oxygen demand	7/1/2003	**From:** Applied **To:** Accredited	NELAP NELAP	FL FL	8/13/2003
Non-Potable Water	SM 5210 B	Biochemical oxygen demand	5/12/2008	**From:** Accredited **To:** Relinquished	NELAP NELAP	FL FL	5/12/2008

Chatham County

Bay
Brevard
Broward
Charlotte
Citrus
Collier
Columbia
Dade
Duval
Escambia
Flagler
Hamilton
Hendry
Hernando
Hillsborough
Indian River
Jackson
Lake
Lee

There are no Laboratories Currently Accredited in Chatham County

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**Chatham County Health Department Laboratory**
DOH ID:	**E37980**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	EPA 1600	Enterococci	12/19/2005	**From:** Applied **To:** Applied	NELAP NELAP	FL FL	12/21/2005
Non-Potable Water	EPA 1600	Enterococci	12/19/2005	**From:** No Certification **To:** Accredited	None NELAP	FL	12/21/2005
Non-Potable Water	EPA 1600	Enterococci	12/21/2005	**From:** Accredited **To:** Applied	NELAP NELAP	FL FL	12/21/2005
Non-Potable Water	EPA 1600	Enterococci	4/24/2006	**From:** Accredited **To:** Accredited	NELAP NELAP	FL FL	5/19/2006
Non-Potable Water	EPA 1600	Enterococci	4/24/2006	**From:** Applied **To:** Accredited	NELAP NELAP	FL FL	5/19/2006
Non-Potable Water	EPA 1600	Enterococci	11/1/2012	**From:** Accredited **To:** Relinquished	NELAP NELAP	FL FL	11/7/2012

Citrus County

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NELAP-Certified Organizations - Location Results

Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County	Phone
6196	E54879	Crystal River Unit 3 Chemistry Laboratory	Utility	15760 West Powerline Street	Crystal River	FL	34428	Citrus	(352) 795-6486
5977	E84492	S.A.C. Environmental Laboratory	Commercial	5376 South Suncoast Boulevard	Homosassa	FL	34446	Citrus	(352) 621-3513

NELAP-Certified Laboratories

Laboratories <u>no longer certfied</u> Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**FL Dept. of Health - Citrus County Health Department**
DOH ID:	**E24768**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9223 B	Escherichia coli	1/14/2003	**From:** No Certification **To:** Accredited	None NELAP	FL	5/19/2008
Drinking Water	SM 9223 B	Escherichia coli	12/7/2010	**From:** Accredited **To:** Suspended	NELAP NELAP	FL FL	12/7/2010
Drinking Water	SM 9223 B	Escherichia coli	1/13/2011	**From:** Suspended **To:** Accredited	NELAP NELAP	FL FL	1/14/2011
Drinking Water	SM 9223 B	Escherichia coli	7/1/2012	**From:** Inactive **To:** Inactive	NELAP NELAP	FL FL	7/17/2012
Drinking Water	SM 9223 B	Escherichia coli	7/1/2012	**From:** Inactive **To:** Inactive	NELAP NELAP	FL FL	7/17/2012
Drinking Water	SM 9223 B	Escherichia coli	7/1/2012	**From:** Accredited **To:** Inactive	NELAP NELAP	FL FL	7/16/2012

Dade County

NELAP-Certified Organizations - Location Results

Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County
5649	E86198	All State Engineering and Testing Consultants, Inc.	Commercial	9600 NW 79th Ave	Hialeah Gardens	FL	33016	Dade
5736	E56733	City of North Miami Beach Quality Control Laboratory	Utility	19150 N. W. 8th Avenue	Miami	FL	33169	Dade
5737	E56722	City of North Miami Water Treatment Plant	Utility	12098 N. W. 11th Avenue	North Miami	FL	33168	Dade
5797	E46126	Dade County Department of Regulatory and Economic Resource	Environmental - Pollution Control	211 West Flagler Street	Miami	FL	33130	Dade
5817	E86795	EMSL Analytical, Inc. - FL	Commercial	Skylake Executive Industrial Park	North Miami Beach	FL	33179	Dade
6336	E761019	Environmental Analysis Research Lab (EARL) at the Southeast Environmental Research Center (SERC)	University	Florida International Univ.	Miami	FL	33181	Dade
5838	E16533	FL Department of Health - Miami Branch Laboratory	DOH LAB	1325 N.W. 14th Avenue, Building 7	Miami	FL	33125	Dade
5862	E56717	Florida Keys Aqueduct Authority - Florida City Treatment Plant	Utility	S. W. 192nd Avenue ~and~ 354th Street	Florida City	FL	33034	Dade
5927	E56236	Miami-Dade Central District Wastewater Treatment Plant Laboratory	Utility	Virginia Key Beach Road	Virginia Key-Miami	FL	33149	Dade
5928	E56512	Miami-Dade North District Wastewater Treatment Plant Laboratory	Utility	2575 Northeast 151st Street	North Miami Beach	FL	33160	Dade
5929	E56227	Miami-Dade South District Wastewater Treatment Plant Laboratory	Utility	8950 S.W. 232nd Street	Miami	FL	33190	Dade
5931	E56720	Miami-Dade Water & Sewer Authority - Orr Water Treatment Plant Laboratory	Utility	6800 S. W. 87th Avenue	Miami	FL	33173	Dade
5930	E56731	Miami-Dade Water & Sewer Department - John E. Preston Water Quality Laboratory	Utility	1100 West Second Avenue - 2nd Floor	Hialeah	FL	33010	Dade
6247	E76930	Southeast Environmental Research Center (SERC)	University	FIU (Florida International University)	Miami	FL	33199	Dade
6277	E76960	Southeast Environmental Research Center Mercury Laboratory Florida International University	University	VH 316, FIU SERC	Miami	FL	33199	Dade

NELAP-Certified Laboratories

Laboratories <u>no longer certfied</u> Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**Miami-Dade County Public Schools, Department of Materials Testing and Evaluation**
DOH ID:	E96766

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 3113 B	Lead	4/24/2001	**From:** Accredited **To:** Accredited	STATE NELAP	FL	1/21/2003
Drinking Water	SM 3113 B	Lead	7/1/2011	**From:** Accredited **To:** Inactive	NELAP NELAP	FL FL	7/8/2011

NELAP-Certified Laboratories

Laboratories <u>no longer certfied</u> Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**NOAA - AOML Nutrient Laboratory**
DOH ID:	E661069

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	EPA 353.4	Nitrate as N	1/5/2010	**From:** No Certification **To:** Applied	None NELAP	FL	1/11/2010
Non-Potable Water	EPA 353.4	Nitrate as N	5/28/2010	**From:** Applied **To:** Accredited	NELAP NELAP	FL FL	8/10/2010
Non-Potable Water	EPA 353.4	Nitrate as N	3/11/2013	**From:** Inactive **To:** Inactive	NELAP NELAP	FL FL	3/12/2013
Non-Potable Water	EPA 353.4	Nitrate as N	3/11/2013	**From:** Accredited **To:** Relinquished	NELAP NELAP	FL FL	3/12/2013
Non-Potable Water	EPA 353.4	Nitrate as N	3/11/2013	**From:** Relinquished **To:** Inactive	NELAP NELAP	FL FL	3/12/2013

NELAP-Certified Laboratories

Laboratories <u>no longer certfied</u> Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**UF-TREC Soil and Water Laboratory**
DOH ID:	E06897

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	EPA 350.1	Ammonia as N	9/24/2003	**From:** Applied **To:** Accredited	NELAP NELAP	FL FL	1/9/2004
Non-Potable Water	EPA 350.1	Ammonia as N	8/31/2010	**From:** Accredited **To:** Suspended	NELAP NELAP	FL FL	8/31/2010
Non-Potable Water	EPA 350.1	Ammonia as N	2/28/2011	**From:** Suspended **To:** Relinquished	NELAP NELAP	FL FL	3/1/2011

Duval County

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NELAP-Certified Organizations - Location Results

Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County	Phone
6366	E821051	ADPEN Laboratories, Inc.	Commercial	11757 Central Parkway	Jacksonville	FL	32224	Duval	(904) 645-9169
5786	E82502	ALS Environmental - Jacksonville	Commercial	9143 Philips Highway	Jacksonville	FL	32256	Duval	(904) 739-2277
5643	E82574	Advanced Environmental Laboratories, Inc.	Commercial	6601 Southpoint Parkway	Jacksonville	FL	32216	Duval	(904) 363-9350
6374	E821059	Diversified Environmental Laboratories, Inc.	Commercial	3653 Regent Boulevard, Suite 509	Jacksonville	FL	32224	Duval	(904) 807-9625
5822	E82277	Environmental Conservation Laboratories, Inc. (ENCO) - Jacksonville	Commercial	4810 Executive Park Court, Suite 111	Jacksonville	FL	32216	Duval	(904) 296-3007
5850	E12700	Florida DOH Bureau of Laboratories - Jacksonville	DOH LAB	1217 Pearl Street	Jacksonville	FL	32202	Duval	(904) 791-1508
6230	E12913	Florida DOH Bureau of Labs - Environmental Microbiology	DOH LAB	1217 Pearl St.	Jacksonville	FL	32202	Duval	(904) 791-1600
5899	E52459	JEA Laboratory Services	Utility	1002 N. Main Street	Jacksonville	FL	32206	Duval	(904) 665-4517
5895	E42342	Regulatory Compliance Department	Environmental - Pollution Control	515 West 6th Street, 3rd Floor Lab	Jacksonville	FL	32206	Duval	(904) 253-1529

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**FL DEP - NE District**
DOH ID:	**E32890**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	EPA/ 600/ 8-78 / 017 P. 124	Fecal coliforms	1/13/2003	**From:** No Certification **To:** Applied	None NELAP	FL	1/14/2003
Non-Potable Water	EPA/ 600/ 8-78 / 017 P. 124	Fecal coliforms	8/14/2003	**From:** Applied **To:** Withdrawn	NELAP NELAP	FL FL	8/26/2003
Non-Potable Water	EPA/ 600/ 8-78 / 017 P. 124	Fecal coliforms	7/1/2008	**From:** Withdrawn **To:** Inactive	NELAP NELAP	FL FL	7/31/2008
Non-Potable Water	SM 9222 D	Fecal coliforms	1/13/2003	**From:** No Certification **To:** Applied	None NELAP	FL	1/14/2003
Non-Potable Water	SM 9222 D	Fecal coliforms	1/15/2004	**From:** Applied **To:** Accredited	NELAP NELAP	FL FL	1/16/2004
Non-Potable Water	SM 9222 D	Fecal coliforms	7/1/2008	**From:** Accredited **To:** Inactive	NELAP NELAP	FL FL	7/31/2008

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

There are no transaction entries for this FOA.
Please note that the AAMS Database was created in March 2002.
No transaction history entries exist prior to this date.
If you have further questions regarding this FOA
please contact the DOH Lab Certification Program (904-791-1599).

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City of Atlantic Beach Wastewater Treatment Plant

Last updated: April 23, 2015

Escambia County

Florida Department of Environmental Protection

NELAP-Certified Organizations - Location Results

Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County	Phone
5993	E81140	Ascend Performance Materials LLC	Commercial	3000 Old Chemstrand Road, Building 707	Cantonment	FL	32533	Escambia	(850) 968-7000
5833	E51361	Emerald Coast Utilities Authority	Utility	9250 Sturdevant Street	Pensacola	FL	32514	Escambia	(850) 969-6688
6428	E911116	Escambia County Water Quality Laboratory	Other	3363 West Park Place	Pensacola	FL	32505	Escambia	(850) 595-1873
6173	E91861	International Paper Pensacola Mill Central Laboratory	Other	375 Muscogee Rd	Cantonment	FL	32533	Escambia	(850) 968-2121
6032	E81181	TRAC - Biomonitoring Services Laboratory	Commercial	14 South 2nd Street	Pensacola	FL	32507	Escambia	(850) 456-5836
5985	E81010	TestAmerica Pensacola	Commercial	3355 McLemore Drive	Pensacola	FL	32514	Escambia	(850) 474-1001
6286	E71969	University of West Florida Wetlands Research Laboratory	University	University of West Florida	Pensacola	FL	32514	Escambia	(850) 474-2060

Hits: 7

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**FL Department of Health - Pensacola Branch Laboratory**
DOH ID:	**E11062**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	READYCULT	Escherichia coli	4/25/2005	From: No Certification To: Accredited	None NELAP	FL	5/19/2008
Drinking Water	READYCULT	Escherichia coli	7/27/2010	From: Accredited To: Relinquished	NELAP NELAP	FL FL	7/27/2010
Drinking Water	READYCULT	Escherichia coli	7/27/2010	From: Accredited To: Accredited	NELAP NELAP	FL FL	7/27/2010
Drinking Water	SM 9223 B	Escherichia coli	5/28/2010	From: No Certification To: Applied	None NELAP	FL	6/1/2010
Drinking Water	SM 9223 B	Escherichia coli	7/26/2010	From: Applied To: Accredited	NELAP NELAP	FL FL	7/27/2010
Drinking Water	SM 9223 B	Escherichia coli	7/1/2015	From: Accredited To: Inactive	NELAP NELAP	FL FL	8/6/2015

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**FL DEP - NW District Chemistry Laboratory**
DOH ID:	**E31887**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	10/7/2002	From: No Certification To: Applied	None NELAP	FL	12/17/2002
Non-Potable Water	SM 9222 D	Fecal coliforms	10/1/2003	From: Applied To: Accredited	NELAP NELAP	FL FL	1/9/2004
Non-Potable Water	SM 9222 D	Fecal coliforms	12/19/2007	From: Accredited To: Relinquished	NELAP NELAP	FL FL	1/4/2008

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**University of West Florida Wetlands Research Laboratory**
DOH ID:	**E71176**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	EPA 202.1	Aluminum	7/1/2005	From: Accredited To: Inactive	NELAP NELAP	FL FL	7/20/2005

Gulf County

Alachua
Bay
Brevard
Broward
Charlotte
Citrus
Collier
Columbia
Dade
Duval
Escambia
Flagler
Hamilton
Hendry
Hernando
Hillsborough
Indian River
Jackson
Lake
Lee
Leon

There are no Laboratories Currently Accredited in Gulf County

NELAP-Certified Laboratories

Laboratories <u>no longer certfied</u> Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**City of Port St. Joe Wastewater Treatment Plant Laboratory**
DOH ID:	**E51289**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9221 E	Fecal coliforms	7/1/2003	**From:** Accredited **To:** Inactive	NELAP NELAP	FL FL	7/24/2003
Non-Potable Water	SM 9221 C	Fecal coliforms	7/1/2003	**From:** Accredited **To:** Inactive	NELAP NELAP	FL FL	7/24/2003

Hardee County

Alachua
Bay
Brevard
Broward
Charlotte
Citrus
Collier
Columbia
Dade
Duval
Escambia
Flagler
Hamilton
Hendry
Hernando
Hillsborough
Indian River
Jackson
Lake
Lee
Leon

There are no Laboratories Currently Accredited in Hardee County

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**City of Wauchula Wastewater Treatment Plant**
DOH ID:	**E54466**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 5210 B	Carbonaceous BOD (CBOD)	7/1/2003	**From:** Accredited **To:** Inactive	STATE STATE		6/26/2003

Hernando County

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Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/21/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County	Phone
6002	E44149	Southwest Florida Water Management District	Environmental - Pollution Control	2379 Broad Street	Brooksville	FL	34609	Hernando	(352) 796-7211

Hits: 1

NELAP-Certified Laboratories

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Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**FL Dept. of Health - Hernando County Health Department**
DOH ID:	**E24704**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9221 E	Fecal coliforms	4/17/2002	**From:** Accredited **To:** Accredited	STATE NELAP	FL	2/27/2003
Drinking Water	SM 9221 E	Fecal coliforms	10/1/2003	**From:** Accredited **To:** Relinquished	NELAP NELAP	FL FL	9/30/2003

Highland County

Bay
Brevard
Broward
Charlotte
Citrus
Collier
Columbia
Dade
Duval
Escambia
Flagler
Hamilton
Hendry
Hernando
Hillsborough
Indian River
Jackson
Lake
Lee

There are no Laboratories Currently Accredited in Highland County

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**City of Sebring Wastewater Treatment Plant**
DOH ID:	E55378

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 5210 B	Carbonaceous BOD (CBOD)	2/3/2003	**From:** Accredited **To:** Relinquished	STATE STATE		2/10/2003

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 01/23/2016 8:18:22 AM

Organization:	**FL Dept. of Health - Highlands County Health Department**
DOH ID:	E25705

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	ENTEROLERT	Enterococci	12/11/2009	**From:** No Certification **To:** Applied	None NELAP	FL	12/15/2009
Non-Potable Water	ENTEROLERT	Enterococci	12/11/2009	**From:** Accredited **To:** Applied	NELAP NELAP	FL FL	12/1/2010
Non-Potable Water	ENTEROLERT	Enterococci	11/29/2010	**From:** Accredited **To:** Accredited	NELAP NELAP	FL FL	12/16/2010
Non-Potable Water	ENTEROLERT	Enterococci	11/29/2010	**From:** Applied **To:** Accredited	NELAP NELAP	FL FL	11/30/2010
Non-Potable Water	ENTEROLERT	Enterococci	11/30/2010	**From:** Applied **To:** Accredited	NELAP NELAP	FL FL	12/16/2010
Non-Potable Water	ENTEROLERT	Enterococci	11/27/2013	**From:** Accredited **To:** Relinquished	NELAP NELAP	FL FL	12/2/2013

Hillsborough County

Florida Department of Environmental Protection

NELAP-Certified Organizations - Location Results

Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County	Phone
5645	E84589	Advanced Environmental Laboratories, Inc. - Tampa	Commercial	9610 Princess Palm Avenue	Tampa	FL	33619	Hillsborough	(813) 630-9616
5765	E54737	City of Tampa Water Quality Laboratory	Utility	7125 North 30th Street	Tampa	FL	33610	Hillsborough	(813) 231-5233
6389	E241077	FDOH-Hillsborough Environmental Laboratory	DOH CHD	1105 E. Kennedy Blvd.	Tampa	FL	33602	Hillsborough	(813) 307-8059
5840	E14157	FL Department of Health - Tampa Branch Laboratory	DOH LAB	3602 Spectrum Boulevard	Tampa	FL	33612	Hillsborough	(813) 974-8000
5884	E44057	Hillsborough County Environmental Protection Commission	Environmental - Pollution Control	3629 Queen Palm Dr.	Tampa	FL	33619	Hillsborough	(813) 627-2600
5885	E44104	Hillsborough County Public Utilities Department BSOC Environmental Laboratory	Environmental - Pollution Control	332 N. Falkenburg Road	Tampa	FL	33619	Hillsborough	(813) 264-3887
6409	E541097	Hillsborough County Public Utilities Dept Environmental Lab (Central)	Utility	9460 E. Columbus Dr.	Tampa	FL	33619	Hillsborough	(813) 272-5977
5886	E54208	Howard F. Curren Advanced Wastewater Treatment Plant Analytical Laboratory	Utility	2545 Guy Verger Blvd.	Tampa	FL	33605	Hillsborough	(813) 247-3451
5909	E84025	KNL Environmental Testing	Commercial	3202 N. Florida Ave.	Tampa	FL	33603	Hillsborough	(813) 229-2879
5925	E84747	Meryman Environmental, Inc.	Commercial	10408 Bloomingdale Avenue	Riverview	FL	33569	Hillsborough	(813) 626-9551
6131	E84809	Pace Analytical Services - Tampa	Commercial	5460 Beaumont Center Blvd., Suite 520	Tampa	FL	33634	Hillsborough	(813) 881-9401
5972	E84207	Spectrum Analytical, Inc. Florida Division	Commercial	8405 Benjamin Road, Suite A	Tampa	FL	33634	Hillsborough	(813) 888-9507
6022	E54272	Tampa Electric Company Laboratory Services	Utility	5012 Causeway Boulevard	Tampa	FL	33619	Hillsborough	(813) 630-7378
6016	E84282	TestAmerica - Tampa	Commercial	6712 Benjamin Road - Suite 100	Tampa	FL	33634	Hillsborough	(813) 885-7427

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NELAP-Certified Laboratories

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Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	FL DEP - SW District Chemistry Laboratory
DOH ID:	E34886

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	10/7/2002	From: No Certification To: Applied	None NELAP	FL	12/17/2002
Non-Potable Water	SM 9222 D	Fecal coliforms	8/18/2003	From: Applied To: Accredited	NELAP NELAP	FL FL	10/10/2003
Non-Potable Water	SM 9222 D	Fecal coliforms	1/10/2006	From: Accredited To: Suspended	NELAP NELAP	FL FL	1/10/2006
Non-Potable Water	SM 9222 D	Fecal coliforms	8/7/2006	From: Suspended To: Accredited	NELAP NELAP	FL FL	8/11/2006
Non-Potable Water	SM 9222 D	Fecal coliforms	3/28/2008	From: Accredited To: Relinquished	NELAP NELAP	FL FL	4/15/2008

NELAP-Certified Laboratories

Laboratories <u>no longer certfied</u> Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	Plant City Water Pollution Control Laboratory
DOH ID:	E44301

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 4500-Cl G	Residual free chlorine	9/17/2003	From: Accredited To: Relinquished	STATE STATE		9/25/2003

Indian River County

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Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County
5849	E23759	FL Dept. of Health - Indian River County Health Department	DOH CHD	1900 27th Street	Vero Beach	FL	32960	Indian River

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	City of Vero Beach Environmental Control Laboratory
DOH ID:	E53303

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 4500 F-C	Fluoride	3/10/2003	From: Accredited To: Accredited	STATE NELAP	FL	4/11/2003
Drinking Water	SM 4500 F-C	Fluoride	7/1/2012	From: Accredited To: Inactive	NELAP NELAP	FL FL	7/17/2012
Drinking Water	SM 4500 F-C	Fluoride	7/1/2012	From: Inactive To: Inactive	NELAP NELAP	FL FL	7/17/2012
Non-Potable Water	SM 4500 F-C	Fluoride	3/10/2003	From: Accredited To: Accredited	STATE NELAP	FL	4/11/2003
Non-Potable Water	SM 4500 F-C	Fluoride	7/1/2012	From: Inactive To: Inactive	NELAP NELAP	FL FL	7/17/2012
Non-Potable Water	SM 4500 F-C	Fluoride	7/1/2012	From: Accredited To: Inactive	NELAP NELAP	FL FL	7/17/2012

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 01/23/2016 8:18:22 AM

Organization:	City Of Vero Beach, Wastewater Treatment Plant
DOH ID:	E43877

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 2540 D	Residue-nonfilterable (TSS)	10/24/2002	From: No Certification To: Applied	None NELAP	FL	10/28/2002
Non-Potable Water	SM 2540 D	Residue-nonfilterable (TSS)	4/1/2003	From: Accredited To: Accredited	NELAP NELAP	FL FL	5/23/2003
Non-Potable Water	SM 2540 D	Residue-nonfilterable (TSS)	5/23/2003	From: Applied To: Accredited	NELAP NELAP	FL FL	5/23/2003
Non-Potable Water	SM 2540 D	Residue-nonfilterable (TSS)	8/3/2005	From: Accredited To: Relinquished	NELAP NELAP	FL FL	8/5/2005

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Last updated: April 23, 2015

Lake County

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NELAP-Certified Organizations - Location Results

Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County	Phone
5708	E53443	City of Eustis Wastewater Treatment Plant	Utility	801 Bates Avenue	Eustis	FL	32726	Lake	(352) 357-4282
5767	E53313	City of Tavares Wastewater Utilities Laboratory	Utility	2770 Woodlea Road	Tavares	FL	32778	Lake	(352) 742-6225
5911	E43183	Lake County Water Resource Management Laboratory	Environmental - Pollution Control	12923 County Landfill Road	Tavares	FL	32778	Lake	(352) 343-3776
5967	E83141	Plant Technicians, Inc.	Commercial	101 Satellite Court	Leesburg	FL	34748	Lake	(352) 787-2944

NELAP-Certified Laboratories

Laboratories <u>no longer certfied</u> Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**City of Leesburg Wastewater Utility Laboratory**
DOH ID:	**E53306**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 5210 B	Carbonaceous BOD (CBOD)	2/28/2014	**From:** Accredited **To:** Relinquished	NELAP NELAP	FL FL	3/5/2014

Lee County

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Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

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LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County
5695	E55261	City of Cape Coral ERD Laboratory	Utility	3310 SW 20th Avenue	Cape Coral	FL	33914	Lee
5712	E55517	City of Fort Myers, Central Laboratory	Utility	1618 Matthew Drive	Ft. Myers	FL	33907	Lee
5851	E25706	FL Dept. of Health - Lee County Health Department	DOH CHD	60 Danley Drive, Unit 1	Ft. Myers	FL	33907	Lee
5916	E45049	Lee County Environmental Laboratory	Environmental - Pollution Control	60-2 Danley Drive	Ft. Myers	FL	33907	Lee
6262	E25945	Lee County Hyacinth Control District Water Quality Laboratory	Environmental - Pollution Control	15191 Homestead Road	Lehigh Acres	FL	33971	Lee
5981	E85457	Sanders Laboratories, Inc. (South)	Commercial	10090 Bavaria Road	Ft. Myers	FL	33913	Lee

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	Bonita Springs Utilities WRF Lab
DOH ID:	E55419

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 5210 B	Carbonaceous BOD (CBOD)	8/29/2001	From: Accredited To: Relinquished	STATE STATE		11/12/2002

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	Florida State Hospital Wastewater Treatment Plant
DOH ID:	E51431

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 5210 B	Carbonaceous BOD (CBOD)	9/30/2005	From: Accredited To: Revoked	NELAP NELAP	FL FL	10/5/2005

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

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Database Version: 05/14/2016 08:30:00

Organization:	Fiesta Village Wastewater Laboratory
DOH ID:	E45849

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	9/26/2002	From: No Certification To: Applied	None NELAP	FL	9/30/2002
Non-Potable Water	SM 9222 D	Fecal coliforms	4/17/2003	From: Applied To: Accredited	NELAP NELAP	FL FL	8/1/2003
Non-Potable Water	SM 9222 D	Fecal coliforms	3/18/2014	From: Accredited To: Relinquished	NELAP NELAP	FL FL	3/18/2014

Leon County

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NELAP-Certified Organizations - Location Results

Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County	Phone
5641	E81350	Ackuritlabs, Inc.	Commercial	3345 North Monroe Street, Suite B	Tallahassee	FL	32303	Leon	(850) 562-7751
6407	E811095	Advanced Environmental Laboratories, Inc. - Tallahassee	Commercial	2639 North Monroe Street Suite D	Tallahassee	FL	32303	Leon	(850) 219-6274
6346	E311029	Bureau of Agricultural Environmental Laboratories (BAEL)	Other State	3125 Conner Blvd, Building 7	Tallahassee	FL	32399	Leon	(850) 414-1556
5763	E51259	City of Tallahassee Water Quality Laboratory	Utility	4505-A Springhill Road	Tallahassee	FL	32305	Leon	(850) 891-1200
5837	E31780	Florida DEP Laboratory	Other State	2600 Blair Stone Road	Tallahassee	FL	32399	Leon	(850) 245-8059
6095	E81676	McGlynn Laboratories, Inc.	Commercial	568 Beverly Court	Tallahassee	FL	32301	Leon	(850) 570-1476
6020	E81782	Talquin Electric Cooperative, Inc.	Utility	4852 Woodlane Circle	Tallahassee	FL	32303	Leon	(850) 562-2115
6015	E81005	TestAmerica Tallahassee	Commercial	2846 Industrial Plaza Drive	Tallahassee	FL	32301	Leon	(850) 878-3994

Hits: 8

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**FL DEP - Central Laboratory/Innovation Park Satellite Laboratory**
DOH ID:	**E31640**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	EPA 624	1,1,1-Trichloroethane	10/19/2011	**From:** Accredited **To:** Inactive	NELAP NELAP	FL FL	1/17/2012
Non-Potable Water	EPA 8260	1,1,1-Trichloroethane	7/1/2003	**From:** No Certification **To:** Accredited	None NELAP	FL	9/24/2003
Non-Potable Water	EPA 8260	1,1,1-Trichloroethane	10/19/2011	**From:** Accredited **To:** Inactive	NELAP NELAP	FL FL	1/17/2012
Solids	EPA 8260	1,1,1-Trichloroethane	10/19/2011	**From:** Accredited **To:** Inactive	NELAP NELAP	FL FL	1/17/2012

Manatee County

NELAP-Certified Organizations - Location Results

Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County	Phone
5668	E84167	Benchmark EnviroAnalytical, Inc.	Commercial	1711 12th Street East	Palmetto	FL	34221	Manatee	(941) 723-9986
5919	E44247	Manatee County Parks and Natural Resources Department	Environmental - Pollution Control	1501 Dam Road	Bradenton	FL	34212	Manatee	(941) 742-5980
5924	E54719	Manatee County Utilities Department WTPQC Laboratory	Utility	17915 Waterline Road	Bradenton	FL	34212	Manatee	(941) 746-3020
5920	E54560	Manatee County Utility Department Central Laboratory	Utility	4751 66th Street West	Bradenton	FL	34210	Manatee	(941) 792-8811
5892	E84578	Mosaic Fertilizer LLC Environmental Laboratory	Commercial	7450 County Road 630	Mulberry	FL	33860	Manatee	(863) 428-4436

Hits: 5

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**City of Bradenton Water Treatment Plant Laboratory**
DOH ID:	**E54712**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 3111 B	Zinc	5/6/2004	From: Accredited To: Relinquished	NELAP NELAP	FL FL	5/17/2004
Drinking Water	SM 3111 B	Zinc	7/1/2012	From: Inactive To: Inactive	NELAP NELAP	FL FL	7/16/2012
Drinking Water	SM 3111 B	Zinc	7/1/2012	From: Inactive To: Inactive	NELAP NELAP	FL FL	7/16/2012
Drinking Water	SM 3111 B	Zinc	7/1/2012	From: Relinquished To: Inactive	NELAP NELAP	FL FL	7/16/2012

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NELAP-Certified Laboratories

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Transaction History Query Results

Database Version: 01/23/2016 8:18:22 AM

Organization:	**City of Bradenton Water Reclamation Laboratory**
DOH ID:	**E54461**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 5210 B	Carbonaceous BOD (CBOD)	4/11/2005	From: Inactive To: Relinquished	NELAP NELAP	FL FL	4/19/2005
Non-Potable Water	SM 5210 B	Carbonaceous BOD (CBOD)	4/11/2005	From: Accredited To: Inactive	NELAP NELAP	FL FL	4/19/2005

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Marion County

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Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/21/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County
5659	E83265	Aqua Pure Water & Sewage Service, Inc.	Commercial	10865 East State Road 40	Silver Springs	FL	34488	Marion
5738	E53377	City of Ocala Water Quality Laboratory	Utility	4200 SE 24th Street	Ocala	FL	34471	Marion
6401	E831089	Marion County Water Test Lab., LLC	Commercial	3940 SE 45th Ct.	Ocala	FL	34480	Marion

Hits: 3

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**FL Dept. of Health - Marion County Health Department**
DOH ID:	**E23708**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9223 B	Escherichia coli	11/7/2002	**From:** No Certification **To:** Accredited	None NELAP	FL	5/19/2008
Drinking Water	SM 9223 B	Escherichia coli	7/1/2011	**From:** Accredited **To:** Inactive	NELAP NELAP	FL FL	7/11/2011

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 01/23/2016 8:18:22 AM

Organization:	**U.S. Geological Survey, WRD, OWQRL**
DOH ID:	**E63507**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	EPA 410.4	Chemical oxygen demand	7/15/2003	**From:** Accredited **To:** Accredited	STATE NELAP	FL	8/15/2003
Non-Potable Water	EPA 410.4	Chemical oxygen demand	9/30/2004	**From:** Accredited **To:** Relinquished	NELAP NELAP	FL FL	5/12/2005

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Nasau County

Florida Department of Environmental Protection

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Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County	Phone
6179	E92860	Rayonier Performance Fibers, LLC.	Other	10 Gum Street	Fernandina Beach	FL	32035	Nassau	(904) 277-1480
6223	E92906	WestRock CP, LLC	Other	North 8th Street	Fernandina Beach	FL	32034	Nassau	(904) 277-7731

Hits: 2

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 01/23/2016 8:18:22 AM

Organization:	**City of Fernandina Beach Wastewater Treatment Plant**
DOH ID:	**E52335**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	7/8/2003	From: Accredited To: Accredited	STATE NELAP	FL	8/21/2003
Non-Potable Water	SM 9222 D	Fecal coliforms	10/28/2005	From: Accredited To: Relinquished	NELAP NELAP	FL FL	10/28/2005

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Okaloosa County

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Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County	Phone
5655	E81384	Analytical Services Corporation	Commercial	921 Hospital Drive	Niceville	FL	32578	Okaloosa	(850) 678-5313
5713	E51279	City of Fort Walton Beach Environmental Laboratory	Utility	203 B Hollywood Blvd NW	Ft. Walton Beach	FL	32548	Okaloosa	(850) 833-9632
5802	E51586	Destin Water Users, Inc.	Utility	14 Industrial Park Lane	Destin	FL	32541	Okaloosa	(850) 837-6146
6161	E51843	Niceville-Valparaiso Regional Sewer Board, Inc.	Utility	507 Highway 85 North	Niceville	FL	32578	Okaloosa	(850) 678-6613
5946	E51050	Okaloosa County Water and Sewer Laboratory	Utility	250 Roberts Boulevard	Ft. Walton Beach	FL	32547	Okaloosa	(850) 651-7133

Hits: 5

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

There are no transaction entries for this FOA.
Please note that the AAMS Database was created in March 2002.
No transaction history entries exist prior to this date.
If you have further questions regarding this FOA
please contact the DOH Lab Certification Program (904-791-1599).

Niceville-Valparaiso Okaloosa Sewage Board

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Last updated: April 23, 2015

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	City of Mary Esther Wastewater Treatment Plant
DOH ID:	E51497

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 5210 B	Carbonaceous BOD (CBOD)	7/1/2003	From: Accredited To: Inactive	NELAP NELAP	FL FL	6/19/2003

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Okeechobee County

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Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/21/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County
5669	E86618	Florida-Spectrum Environmental Services-Big Lake Laboratory	Commercial	610 Parrot Avenue North	Okeechobee	FL	34972	Okeechobee

Hits: 1

NELAP-Certified Laboratories

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Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**Okeechobee Utility Authority Water Treatment Plant**
DOH ID:	**E56723**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9221 E	Fecal coliforms	10/10/2002	**From:** Accredited **To:** Revoked	STATE STATE		10/18/2002
Drinking Water	SM 9221 E	Fecal coliforms	10/10/2002	**From:** Revoked **To:** Revoked	STATE STATE		10/18/2002

NELAP-Certified Laboratories

Laboratories <u>no longer certfied</u> Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**Okeechobee Utility Authority Wastewater Treatment Plant Laboratory**
DOH ID:	**E56584**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	5/23/2005	**From:** Accredited **To:** Relinquished	NELAP NELAP	FL FL	5/26/2005

Laboratories <u>no longer certfied</u> Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**Okeechobee Utility Authority Wastewater Treatment Plant**
DOH ID:	**E56970**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 2540 D	Residue-nonfilterable (TSS)	7/25/2005	**From:** No Certification **To:** Applied	None NELAP	FL	7/28/2005
Non-Potable Water	SM 2540 D	Residue-nonfilterable (TSS)	8/17/2005	**From:** Applied **To:** Accredited	NELAP NELAP	FL FL	8/18/2005
Non-Potable Water	SM 2540 D	Residue-nonfilterable (TSS)	7/1/2014	**From:** Accredited **To:** Inactive	NELAP NELAP	FL FL	7/15/2014

Orange County

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Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

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LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County	Phone
5685	E53844	City of Apopka Wastewater Treatment Facility Laboratory	Utility	333 Snowden Road	Apopka	FL	32704	Orange	(407) 703-1700
5779	E53246	City of Winter Park Central Utilities Laboratory	Utility	1409 Howell Branch Road	Winter Park	FL	32789	Orange	(407) 623-3327
5818	E87804	EMSL Analytical, Inc. - Orlando	Commercial	3303 Parkway Center Court	Orlando	FL	32808	Orange	(407) 599-5887
5823	E83182	Environmental Conservation Laboratories, Inc. (ENCO) - Orlando	Commercial	10775 Central Port Drive	Orlando	FL	32824	Orange	(407) 826-5314
6343	E1031026	Environmental Research & Design, Inc.	Research Institute	3419 Trentwood Blvd., Suite 102	Orlando	FL	32812	Orange	(407) 855-9465
6061	E83033	Florida Radiochemistry Services, Inc.	Commercial	5456 Hoffner Rd. Suite 201	Orlando	FL	32812	Orange	(407) 382-7733
6066	E43639	Orange County Environmental Protection Division	Environmental - Pollution Control	3165 McCrory Place, Suite 200	Orlando	FL	32803	Orange	(407) 836-1461
5952	E53398	Orange County Utilities Central Laboratory	Utility	9124 Curry Ford Road	Orlando	FL	32825	Orange	(407) 254-9550
5953	E53566	Orlando Utilities Commission	Utility	Water Quality Laboratory	Orlando	FL	32839	Orange	(407) 244-8779
5975	E43069	Reedy Creek Improvement District Environmental Sciences	Environmental - Pollution Control	2191 South Service Lane	Lake Buena Vista	FL	32830	Orange	(407) 824-7301
5640	E83510	SGS Accutest - Orlando	Commercial	4405 Vineland Road, Suite C-15	Orlando	FL	32811	Orange	(407) 425-6700
6000	E83484	Southern Research Laboratories, Inc.	Commercial	2251 Lynx Lane, Suite 1	Orlando	FL	32804	Orange	(407) 522-7100
6035	E83294	Tri-Tech Laboratories, Inc.	Commercial	4403 Vineland Road	Orlando	FL	32811	Orange	(407) 422-4667

Hits: 13

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	FL DEP - Central District Laboratory
DOH ID:	E33863

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	10/8/2002	From: No Certification To: Applied	None NELAP	FL	10/11/2002
Non-Potable Water	SM 9222 D	Fecal coliforms	8/5/2003	From: Applied To: Accredited	NELAP NELAP	FL FL	10/17/2003
Non-Potable Water	SM 9222 D	Fecal coliforms	5/17/2006	From: Accredited To: Suspended	NELAP NELAP	FL FL	5/17/2006
Non-Potable Water	SM 9222 D	Fecal coliforms	5/31/2006	From: Suspended To: Accredited	NELAP NELAP	FL FL	5/31/2006
Non-Potable Water	SM 9222 D	Fecal coliforms	7/1/2008	From: Accredited To: Inactive	NELAP NELAP	FL FL	8/4/2008

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	FL Dept. of Health - Bureau of Radiation Control
DOH ID:	E13800

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	EPA 900.0	Gross-alpha	7/1/2012	From: Accredited To: Inactive	STATE STATE	FL	7/16/2012

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	City of Winter Park Estates Laboratory
DOH ID:	E53136

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	7/14/2003	From: Accredited To: Accredited	STATE NELAP	FL	7/28/2003
Non-Potable Water	SM 9222 D	Fecal coliforms	10/31/2007	From: Accredited To: Relinquished	NELAP NELAP	FL FL	12/12/2007
Non-Potable Water	SM 9222 D	Fecal coliforms	10/31/2007	From: Accredited To: Accredited	NELAP NELAP	FL FL	12/12/2007

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	Orange County Environmental Protection Division
DOH ID:	E43155

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	EPA 608	delta-BHC	2/17/2003	From: Accredited To: Accredited	STATE NELAP	FL	3/3/2003
Non-Potable Water	EPA 608	delta-BHC	12/23/2003	From: Accredited To: Relinquished	NELAP NELAP	FL FL	1/6/2004
Solids	EPA 8081	delta-BHC	2/17/2003	From: Accredited To: Accredited	STATE NELAP	FL	3/3/2003
Solids	EPA 8081	delta-BHC	12/23/2003	From: Accredited To: Relinquished	NELAP NELAP	FL FL	1/6/2004

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	City of Winter Garden Wastewater Pollution Control Facility
DOH ID:	E53321

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	5/27/2003	From: Accredited To: Accredited	NELAP NELAP	FL FL	6/17/2003
Non-Potable Water	SM 9222 D	Fecal coliforms	6/30/2007	From: Accredited To: Inactive	NELAP NELAP	FL FL	6/29/2007

Osceola County

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Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County
5721	E53311	Toho Water Authority Laboratory	Utility	1614 S. John Young Parkway	Kissimmee	FL	34741	Osceola

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**City of St. Cloud Water and Wastewater Facilities**
DOH ID:	**E53421**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 5210 B	Carbonaceous BOD (CBOD)	10/21/2002	**From:** Accredited **To:** Relinquished	STATE STATE		10/21/2002

Palm Beach County

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LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County	Phone
6408	E861096	Capzer Pharmaceuticals	Commercial	3677 23rd Ave. South	Lake Worth	FL	33461	Palm Beach	(561) 493-4000
5690	E56386	City of Boca Raton Quality Control Laboratory	Utility	Utility Services-1401 West Glades Road, Bldg. 24	Boca Raton	FL	33431	Palm Beach	(561) 338-7327
5691	E56739	City of Boynton Beach Utilities Department	Utility	5469 West Boynton Beach Boulevard	Boynton Beach	FL	33437	Palm Beach	(561) 742-6404
5703	E56367	City of Delray Beach Environmental Services Laboratory	Utility	200 SW 6th Street	Delray Beach	FL	33444	Palm Beach	(561) 573-6674
5722	E56760	City of Lake Worth Water Treatment Plant Laboratory	Utility	301 College Street	Lake Worth	FL	33460	Palm Beach	(561) 586-1710
5744	E56726	City of Palm Springs Water Treatment Plant	Utility	360 Davis Road	Palm Springs	FL	33461	Palm Beach	(561) 434-5120
5773	E56065	City of West Palm Beach East Central Wastewater Plant	Utility	4325 North Haverhill Road	West Palm Beach	FL	33417	Palm Beach	(561) 837-4061
5774	E56738	City of West Palm Beach Public Utilities Water Laboratory	Utility	1009 Banyan Boulevard	West Palm Beach	FL	33401	Palm Beach	(561) 822-2271
5834	E86048	Everglades Laboratories, Inc.	Commercial	1602 Clare Avenue	West Palm Beach	FL	33401	Palm Beach	(561) 833-4200
5835	E76463	Everglades Research and Education Center	University	3200 East Palm Beach Road	Belle Glade	FL	33430	Palm Beach	(561) 993-1593
5864	E56078	Florida Power & Light Central Laboratory	Utility	6001A Village Boulevard	West Palm Beach	FL	33407	Palm Beach	(561) 640-2055
6064	E86647	Frederick C. Bathe Environmental Consultant	Commercial	13088-57th Place North	Royal Palm Beach	FL	33411	Palm Beach	(561) 255-9739
5902	E86546	Jupiter Environmental Laboratories, Inc.	Commercial	150 South Old Dixie Hwy	Jupiter	FL	33458	Palm Beach	(561) 575-0030
5918	E56026	Loxahatchee River Environmental Control District	Utility	2500 Jupiter Park Drive	Jupiter	FL	33458	Palm Beach	(561) 747-5709
5964	E56428	PGA Wastewater Treatment Facility - Seacoast Utility Authority	Utility	11498 Nursery Lane	Palm Beach Gardens	FL	33418	Palm Beach	(561) 627-2900
5958	E56090	Palm Beach County Water Utilities	Utility	13026 Jog Road, Building K	Delray Beach	FL	33446	Palm Beach	(561) 638-5040
6274	E86957	Palm Beach Environmental Laboratories, Inc.	Commercial	1550 Latham Road, Suite 2	West Palm Beach	FL	33409	Palm Beach	(561) 689-6701
5984	E56029	Seacoast Utility Authority - Central Lab	Utility	4200 Hood Road	Palm Beach Gardens	FL	33410	Palm Beach	(561) 627-2900
6045	E56064	South Bay Environmental Laboratory	Utility	36064 U.S. Highway 98	Bryant	FL	33439	Palm Beach	(863) 902-3112
6394	E561082	South Central Regional Waste Water Treatment Plant Laboratory	Utility	1801 North Congress Avenue	Delray Beach	FL	33445	Palm Beach	(561) 272-7061
5995	E46077	South Florida Water Management District Chemistry Laboratory	Environmental - Pollution Control	8894 Belvedere Road, Building 374	West Palm Beach	FL	33411	Palm Beach	(561) 681-2500
6030	E56749	Town of Jupiter Water System	Utility	17403 Central Boulevard	Jupiter	FL	33458	Palm Beach	(561) 746-8343
6097	E56679	Village of Tequesta	Utility	901 N. Old Dixie Hwy	Tequesta	FL	33469	Palm Beach	(561) 575-6235
6046	E56514	Village of Wellington Water Treatment Laboratory	Utility	1100 Wellington Trace	Wellington	FL	33414	Palm Beach	(561) 791-4030

Hits: 24

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**FL Department of Health - West Palm Beach Branch Laboratory**
DOH ID:	**E16122**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	5/10/2002	From: Accredited To: Accredited	STATE NELAP	FL	2/27/2003
Non-Potable Water	SM 9222 D	Fecal coliforms	3/11/2005	From: Accredited To: Suspended	NELAP NELAP	FL FL	3/11/2005
Non-Potable Water	SM 9222 D	Fecal coliforms	4/6/2005	From: Suspended To: Accredited	NELAP NELAP	FL FL	4/7/2005
Non-Potable Water	SM 9222 D	Fecal coliforms	9/29/2011	From: Accredited To: Inactive	NELAP NELAP	FL FL	9/29/2011
Non-Potable Water	SM 9222 D	Fecal coliforms	9/29/2011	From: Inactive To: Inactive	NELAP NELAP	FL FL	9/29/2011

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**City of Royal Palm Beach Utilities Dept. Wastewater Treatment Plant Laboratory**
DOH ID:	**E56264**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9223 B	Total coliforms ~and~ E. coli	4/28/2006	From: Accredited To: Relinquished	NELAP NELAP	FL FL	5/1/2006

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 01/23/2016 8:18:22 AM

Organization:	**City of Belle Glade Wastewater Treatment Plant**
DOH ID:	**E56034**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	EPA 350.2	Ammonia as N	7/24/2001	From: Accredited To: Accredited	STATE NELAP	FL	2/18/2003
Non-Potable Water	EPA 350.2	Ammonia as N	4/5/2003	From: Accredited To: Relinquished	NELAP NELAP	FL FL	4/4/2003

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Pinellas County

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NELAP-Certified Organizations - Location Results

Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County	Phone
5697	E54021	City of Clearwater Public Utilities Laboratory	Utility	1605 Harbor Drive	Clearwater	FL	33755	Pinellas	(727) 462-6660
5724	E54364	City of Largo Wastewater Treatment Plant	Utility	5100 150th Avenue North	Clearwater	FL	33760	Pinellas	(727) 518-3080
5739	E54309	City of Oldsmar Wastewater Treatment Plant	Utility	351 Lafayette Boulevard	Oldsmar	FL	34677	Pinellas	(813) 855-4612
5965	E54357	Pinellas County Utilities Laboratory	Utility	1620 Ridge Road, Building B	Largo	FL	33778	Pinellas	(727) 582-2302
5998	E84129	Southern Analytical Laboratories, Inc.	Commercial	110 Bayview Blvd	Oldsmar	FL	34677	Pinellas	(813) 855-1844
6009	E44058	St. Petersburg Environmental Compliance Division Laboratory	Environmental - Pollution Control	1635 Third Avenue North	St. Petersburg	FL	33713	Pinellas	(727) 892-5696

Hits: 6

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**FL Dept. of Health - Pinellas County Health Department**
DOH ID:	E24709

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9223 B	Escherichia coli	5/16/2002	From: No Certification To: Accredited	None NELAP	FL	5/19/2008
Drinking Water	SM 9223 B	Escherichia coli	6/30/2010	From: Inactive To: Inactive	NELAP NELAP	FL FL	7/7/2010
Drinking Water	SM 9223 B	Escherichia coli	6/30/2010	From: Accredited To: Inactive	NELAP NELAP	FL FL	7/7/2010

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 01/23/2016 8:18:22 AM

Organization:	**City of Dunedin Wastewater Treatment Plant**
DOH ID:	E54508

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 5210 B	Carbonaceous BOD (CBOD)	10/31/2006	From: Accredited To: Relinquished	NELAP NELAP	FL FL	11/7/2006
Non-Potable Water	SM 5210 B	Carbonaceous BOD (CBOD)	2/6/2008	From: Relinquished To: Applied	NELAP NELAP	FL FL	3/20/2008
Non-Potable Water	SM 5210 B	Carbonaceous BOD (CBOD)	6/13/2008	From: Applied To: Accredited	NELAP NELAP	FL FL	6/27/2008
Non-Potable Water	SM 5210 B	Carbonaceous BOD (CBOD)	10/1/2010	From: Accredited To: Relinquished	NELAP NELAP	FL FL	10/5/2010

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Transaction History Query Results

Database Version: 05/21/2016 08:30:00

Organization:	**University of South Florida**
DOH ID:	E74916

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	EPA 1623	Cryptosporidium	10/7/2003	From: Applied To: DATA ERROR	NELAP NELAP	FL FL	10/7/2003
Drinking Water	EPA 1623	Cryptosporidium	10/7/2003	From: No Certification To: Applied	None NELAP	FL	10/7/2003
Drinking Water	EPA 1623	Cryptosporidium	10/7/2003	From: DATA ERROR To: Applied	NELAP NELAP	FL FL	10/7/2003
Drinking Water	EPA 1623	Cryptosporidium	5/10/2004	From: Accredited To: Accredited	NELAP NELAP	FL FL	6/3/2004
Drinking Water	EPA 1623	Cryptosporidium	5/24/2004	From: Applied To: Accredited	NELAP NELAP	FL FL	6/3/2004
Drinking Water	EPA 1623	Cryptosporidium	7/1/2005	From: Accredited To: Relinquished	NELAP NELAP	FL FL	6/30/2005
Non-Potable Water	EPA 1623	Cryptosporidium	11/1/2004	From: No Certification To: Applied	None NELAP	FL	11/12/2004
Non-Potable Water	EPA 1623	Cryptosporidium	11/8/2004	From: Applied To: Accredited	NELAP NELAP	FL FL	2/16/2005
Non-Potable Water	EPA 1623	Cryptosporidium	11/8/2004	From: Applied To: Accredited	NELAP NELAP	FL FL	3/4/2005
Non-Potable Water	EPA 1623	Cryptosporidium	2/16/2005	From: Accredited To: Applied	NELAP NELAP	FL FL	2/16/2005
Non-Potable Water	EPA 1623	Cryptosporidium	6/30/2006	From: Accredited To: Inactive	NELAP NELAP	FL FL	7/25/2006
Non-Potable Water	EPA 1623	Cryptosporidium	7/1/2006	From: Inactive To: Inactive	NELAP NELAP	FL FL	7/25/2006

NELAP-Certified Laboratories

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Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**City of Tarpon Springs Wastewater Treatment Plant**
DOH ID:	E54369

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 5210 B	Carbonaceous BOD (CBOD)	6/30/2005	From: Accredited To: Relinquished	NELAP NELAP	FL FL	6/30/2005

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**City of St. Petersburg - Cosme Water Treatment Plant Laboratory**
DOH ID:	E54743

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9222 B	Total coliforms	7/3/2002	From: Accredited To: Accredited	STATE NELAP	FL	12/22/2004
Drinking Water	SM 9222 B	Total coliforms	6/30/2005	From: Accredited To: Relinquished	NELAP NELAP	FL FL	6/30/2005

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 01/23/2016 8:18:22 AM

Organization:	**City of Clearwater - Marshall Street Water Pollution Control Laboratory**
DOH ID:	E54020

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 2320 B	Alkalinity as $CaCO_3$	7/1/2003	From: Accredited To: Inactive	STATE STATE		7/24/2003

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Polk County

NELAP-Certified Organizations - Location Results

Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County	Phone
6027	E54728	City of Lakeland -Thomas B. Williams Water Treatment Plant	Utility	1501 Kendrick Lane	Lakeland	FL	33805	Polk	(863) 834-6717
6308	E54991	City of Lakeland Mcintosh Main Lab	Utility	3400 E. Lake Parker Dr.	Lakeland	FL	33805	Polk	(863) 834-5605
5723	E54180	City of Lakeland Wastewater Treatment Plant - Glendale	Utility	1825 Glendale Street	Lakeland	FL	33803	Polk	(863) 834-8277
5954	E84098	FTS Analytical Services	Commercial	5675 New Tampa Hwy	Lakeland	FL	33815	Polk	(863) 646-8526
6197	E84880	Florida-Spectrum Environmental Services Inc.- Lakeland Laboratory	Commercial	1910 Harden Boulevard	Lakeland	FL	33803	Polk	(863) 686-4271
5963	E84088	Florida-Spectrum Environmental Services, Inc - Pembroke Laboratory	Commercial	528 Gooch Road	Ft. Meade	FL	33841	Polk	(863) 285-8145
5934	E84567	Mid Florida Water Lab	Commercial	8 Oakwood Road	Winter Haven	FL	33880	Polk	(863) 965-2540
6242	E84925	Phoslab Environmental Services, Inc.	Commercial	806 W. Beacon Road	Lakeland	FL	33803	Polk	(863) 682-5897
5968	E44082	Polk County Natural Resources Division	Environmental - Pollution Control	4189 Ben Durrance Road	Bartow	FL	33830	Polk	(863) 534-7370

Hits: 9

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization: FL Dept. of Health - Polk County Health Department

DOH ID: E24710

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9221 E	Fecal coliforms	9/18/2003	From: Accredited To: Relinquished	NELAP NELAP	FL FL	9/23/2003
Non-Potable Water	SM 9221 E	Fecal coliforms	3/21/2007	From: No Certification To: Applied	None NELAP	FL	3/23/2007
Non-Potable Water	SM 9221 E	Fecal coliforms	7/6/2007	From: Applied To: Accredited	NELAP NELAP	FL FL	9/8/2007
Non-Potable Water	SM 9221 E	Fecal coliforms	1/31/2016	From: Accredited To: Inactive	NELAP NELAP	FL FL	2/1/2016

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

FL DACS Central Dairy Laboratory

Transaction History Query Results

There are no transaction entries for this FOA.
Please note that the AAMS Database was created in March 2002.
No transaction history entries exist prior to this date.
If you have further questions regarding this FOA
please contact the DOH Lab Certification Program (904-791-1599).

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

There are no transaction entries for this FOA.
Please note that the AAMS Database was created in March 2002.
No transaction history entries exist prior to this date.
If you have further questions regarding this FOA
please contact the DOH Lab Certification Program (904-791-1599).

City of Ft. Meade

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Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization: City of Winter Haven Wastewater Treatment Plant #2 - Lake Conine

DOH ID: E54305

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	4/29/2004	From: Accredited To: Relinquished	NELAP NELAP	FL FL	5/27/2004

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 01/23/2016 8:18:22 AM

Organization: City of Haines City Wastewater Treatment Plant

DOH ID: E54373

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	5/10/2002	From: Accredited To: Accredited	STATE NELAP	FL	2/28/2003
Non-Potable Water	SM 9222 D	Fecal coliforms	2/1/2005	From: Accredited To: Relinquished	NELAP NELAP	FL FL	2/2/2005

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization: FL Dept. of Health - Sarasota County Health Department

DOH ID: E24711

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9223 B	Escherichia coli	11/25/2002	From: No Certification To: Accredited	None NELAP	FL	5/19/2008
Drinking Water	SM 9223 B	Escherichia coli	7/1/2009	From: Accredited To: Inactive	NELAP NELAP	FL FL	7/10/2009

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization: City of Winter Haven Wastewater Treatment Plant #3

DOH ID: E54066

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	9/4/2002	From: Accredited To: Accredited	STATE NELAP	FL	8/20/2004
Non-Potable Water	SM 9222 D	Fecal coliforms	11/14/2006	From: Accredited To: Relinquished	NELAP NELAP	FL FL	4/18/2007

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 01/23/2016 8:18:22 AM

Organization: City of Auburndale Wastewater Laboratory

DOH ID: E54266

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 5210 B	Carbonaceous BOD (CBOD)	7/1/2003	From: Accredited To: Inactive	NELAP NELAP	FL FL	7/24/2003

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Putnam County

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LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County
6326	E821009	Certified Labs of Florida	Commercial	141 Richardson Lane	Melrose	FL	32666	Putnam
6008	E42206	St. Johns River Water Management District	Environmental - Pollution Control	4049 Reid Street	Palatka	FL	32177	Putnam

Hits: 2

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 01/23/2016 8:18:22 AM

Organization:	**Dept. of Health - Putnam County Environmental Health Department**
DOH ID:	**E22779**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9223 B	Total coliforms ~and~ E. coli	12/6/2002	**From:** Accredited **To:** Accredited	STATE NELAP	FL	12/30/2002
Drinking Water	SM 9223 B	Total coliforms ~and~ E. coli	7/30/2005	**From:** Accredited **To:** Relinquished	NELAP NELAP	FL FL	8/10/2005

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NELAP-Certified Laboratories

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Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**City of Palatka Wastewater Treatment Plant**
DOH ID:	**E52474**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	7/24/2003	**From:** Accredited **To:** Accredited	STATE NELAP	FL	12/9/2003
Non-Potable Water	SM 9222 D	Fecal coliforms	6/28/2004	**From:** Accredited **To:** Relinquished	NELAP NELAP	FL FL	7/7/2004

Sarasota County

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LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County
5707	E54211	City of Englewood Water District	Utility	201 Selma Avenue	Englewood	FL	34223	Sarasota
5756	E54348	City of Sarasota Wastewater Treatment Plant Laboratory	Utility	1850 12th Street	Sarasota	FL	34236	Sarasota
5921	E84191	Marinco Bioassay Laboratory, Inc.	Commercial	4569 Samuel Street	Sarasota	FL	34233	Sarasota
5940	E84091	Mote Marine Laboratory	Commercial	1600 Ken Thompson Parkway	Sarasota	FL	34236	Sarasota
5980	E84380	Sanders Laboratories, Inc. - Nokomis	Commercial	1050 Endeavor Ct.	Nokomis	FL	34275	Sarasota
6114	E54677	Sarasota County Utilities - Pump Station #2 Laboratory	Utility	1001 South Beneva Road	Sarasota	FL	34232	Sarasota
5983	E54356	Sarasota County Utilities - T. Mabry Carlton Water Treatment Plant Laboratory	Utility	1255 T. Mabry Carlton Parkway	Venice	FL	34293	Sarasota

Hits: 7

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	City of Venice Water Reclamation Laboratory
DOH ID:	E54326

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 5210 B	Carbonaceous BOD (CBOD)	7/28/2002	From: Accredited To: Accredited	STATE NELAP	FL	2/13/2003
Non-Potable Water	SM 5210 B	Carbonaceous BOD (CBOD)	12/6/2004	From: Accredited To: Relinquished	NELAP NELAP	FL FL	12/14/2004

NELAP-Certified Laboratories

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Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	City of Venice - Eastside Wastewater Treatment Plant
DOH ID:	E54426

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	EPA 310.1	Alkalinity as CaCO3	2/13/2003	From: Accredited To: Relinquished	STATE STATE		2/20/2003

NELAP-Certified Laboratories

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Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	Florida Governmental Utility Authority - Gulf Gate Laboratory
DOH ID:	E54524

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	EPA 350.2	Ammonia as N	1/29/2003	From: Accredited To: Relinquished	STATE STATE		3/14/2003

NELAP-Certified Laboratories

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Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	FL Dept. of Health - Sarasota County Health Department
DOH ID:	E24711

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9223 B	Escherichia coli	11/25/2002	From: No Certification To: Accredited	None NELAP	FL	5/19/2008
Drinking Water	SM 9223 B	Escherichia coli	7/1/2009	From: Accredited To: Inactive	NELAP NELAP	FL FL	7/10/2009

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	City of Sarasota Water Plant Laboratory
DOH ID:	E54736

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 4500-H+-B	pH	12/18/2002	From: Accredited To: Relinquished	STATE NELAP	FL	1/2/2003

Seminole County

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Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

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LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County
5982	E53076	Advanced Environmental Laboratories, Inc. - Orlando	Commercial	380 Northlake Blvd., Suite 1048	Altamonte Springs	FL	32701	Seminole
5684	E53258	City of Altamonte Springs Environmental Laboratory	Utility	960 Keller Road	Altamonte Springs	FL	32714	Seminole
5740	E53087	City of Orlando, Environmental Laboratory Services	Utility	601 Iron Bridge Circle	Oviedo	FL	32765	Seminole
5869	E83018	Flowers Chemical Laboratories	Commercial	481 Newburyport Avenue	Altamonte Springs	FL	32701	Seminole

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**FL Dept. of Health - Sarasota County Health Department**
DOH ID:	**E24711**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9223 B	Escherichia coli	11/25/2002	From: No Certification To: Accredited	None NELAP	FL	5/19/2008
Drinking Water	SM 9223 B	Escherichia coli	7/1/2009	From: Accredited To: Inactive	NELAP NELAP	FL FL	7/10/2009

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**City of Sanford Water Reclamation Facility Laboratory**
DOH ID:	**E53372**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 4500-NH3 E (18th Ed.)/TITR	Ammonia as N	6/14/2004	From: Accredited To: Relinquished	STATE NELAP	FL	6/30/2004

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**City of Winter Springs Wastewater Reclamation Facility**
DOH ID:	**E53416**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	8/19/2002	From: Accredited To: Accredited	STATE NELAP	FL	11/1/2002
Non-Potable Water	SM 9222 D	Fecal coliforms	1/5/2015	From: Accredited To: Relinquished	NELAP NELAP	FL FL	1/5/2015

St. John's County

NELAP-Certified Organizations - Location Results

Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

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LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County
5759	E52408	City of St. Augustine Water Pollution Control Laboratory	Utility	501 Riberia Street	St. Augustine	FL	32085	St. Johns
6007	E52485	St. Johns County Utility Department Environmental Laboratory	Utility	860 W. 16th Street	St. Augustine	FL	32080	St. Johns

NELAP-Certified Laboratories

Laboratories <u>no longer certfied</u> Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**FL Dept. of Health - St. Johns County Health Department - Environmental Eng.**
DOH ID:	**E22770**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9223 B	Escherichia coli	5/16/2002	**From:** No Certification **To:** Accredited	None NELAP	FL	5/19/2008
Drinking Water	SM 9223 B	Escherichia coli	7/1/2011	**From:** Inactive **To:** Inactive	NELAP NELAP	FL FL	7/12/2011
Drinking Water	SM 9223 B	Escherichia coli	7/1/2011	**From:** Accredited **To:** Inactive	NELAP NELAP	FL FL	7/12/2011

St. Lucie County

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LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County
5752	E56718	City of Port St. Lucie Utility Systems Department	Utility	7599 LTC Parkway	Port St. Lucie	FL	34986	St. Lucie
5678	E86562	Flowers Chemical Labs - South	Commercial	571 NW Mercantile Place	Port St. Lucie	FL	34986	St. Lucie
5870	E56729	Fort Pierce Utilities Authority Water Treatment Plant	Utility	715 South 25th Street	Ft. Pierce	FL	34950	St. Lucie

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization: FL Dept. of Health - St. Lucie County Health Department

DOH ID: E26789

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	3/11/2003	From: Applied To: Accredited	STATE STATE		3/28/2003
Non-Potable Water	SM 9222 D	Fecal coliforms	8/21/2003	From: Accredited To: Accredited	STATE NELAP	FL	10/8/2004
Non-Potable Water	SM 9222 D	Fecal coliforms	5/15/2007	From: Accredited To: Relinquished	NELAP NELAP	FL FL	5/30/2007

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization: University of Florida Soil and Water Science Laboratory

DOH ID: E76888

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	EPA 300.0	Orthophosphate as P	9/26/2002	From: No Certification To: Applied	None NELAP	FL	12/17/2002
Non-Potable Water	EPA 300.0	Orthophosphate as P	6/4/2003	From: Applied To: Accredited	NELAP NELAP	FL FL	7/28/2003
Non-Potable Water	EPA 300.0	Orthophosphate as P	12/18/2012	From: Accredited To: Relinquished	NELAP NELAP	FL FL	12/18/2012

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization: UF-IFAS Wetland Biogeochemistry Laboratory

DOH ID: E72949

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	EPA 350.1	Ammonia as N	12/20/2004	From: Applied To: Applied	NELAP NELAP	FL FL	1/6/2005
Non-Potable Water	EPA 350.1	Ammonia as N	1/20/2005	From: No Certification To: Applied	None NELAP	FL	1/6/2005
Non-Potable Water	EPA 350.1	Ammonia as N	10/12/2005	From: Applied To: Accredited	NELAP NELAP	FL FL	10/16/2005
Non-Potable Water	EPA 350.1	Ammonia as N	7/1/2007	From: Accredited To: Inactive	NELAP NELAP	FL FL	7/19/2007
Non-Potable Water	SM 4500-NH3 G	Ammonia as N	4/25/2008	From: No Certification To: Applied	None NELAP	FL	5/1/2008
Non-Potable Water	SM 4500-NH3 G	Ammonia as N	8/8/2008	From: Applied To: Accredited	NELAP NELAP	FL FL	9/16/2008
Non-Potable Water	SM 4500-NH3 G	Ammonia as N	3/3/2015	From: Accredited To: Suspended	NELAP NELAP	FL FL	3/3/2015
Non-Potable Water	SM 4500-NH3 G	Ammonia as N	7/1/2015	From: Suspended To: Inactive	NELAP NELAP	FL FL	7/1/2015
Solids	EPA 350.1	Ammonia as N	12/20/2004	From: No Certification To: Applied	None NELAP	FL	1/6/2005
Solids	EPA 350.1	Ammonia as N	8/25/2005	From: Applied To: Withdrawn	NELAP NELAP	FL FL	8/27/2005

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization: FL DEP - SE District Lab

DOH ID: E36885

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	9/19/2002	From: No Certification To: Applied	None NELAP	FL	12/16/2002
Non-Potable Water	SM 9222 D	Fecal coliforms	4/22/2003	From: Applied To: Withdrawn	NELAP NELAP	FL FL	4/23/2003
Non-Potable Water	SM 9222 D	Fecal coliforms	3/15/2006	From: Accredited To: Applied	NELAP NELAP	FL FL	6/15/2006
Non-Potable Water	SM 9222 D	Fecal coliforms	3/15/2006	From: Withdrawn To: Applied	NELAP NELAP	FL FL	3/17/2006
Non-Potable Water	SM 9222 D	Fecal coliforms	6/6/2006	From: Applied To: Accredited	NELAP NELAP	FL FL	6/15/2006
Non-Potable Water	SM 9222 D	Fecal coliforms	6/6/2006	From: Applied To: Accredited	NELAP NELAP	FL FL	11/4/2006
Non-Potable Water	SM 9222 D	Fecal coliforms	7/1/2007	From: Accredited To: Inactive	NELAP NELAP	FL FL	7/19/2007

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization: Port St. Lucie Utility Systems Department Laboratory

DOH ID: E56489

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	3/4/2005	From: No Certification To: Applied	None NELAP	FL	3/7/2005
Non-Potable Water	SM 9222 D	Fecal coliforms	5/13/2005	From: Applied To: Withdrawn	NELAP NELAP	FL FL	5/13/2005

Taylor County

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NELAP-Certified Organizations - Location Results

Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County	Phone
6187	E92870	Foley Cellulose LLC	Other	One Buckeye Drive	Perry	FL	32348	Taylor	(850) 584-1576

Hits: 1

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	City of Perry Wastewater Treatment Plant
DOH ID:	E52400

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 9222 D	Fecal coliforms	9/18/2002	From: Accredited To: Relinquished	NELAP NELAP	FL FL	9/20/2002

Volusia County

Florida Department of Environmental Protection

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NELAP-Certified Organizations - Location Results

Laboratories Certified Under NELAP by the Florida Department of Health

Organization Name and Location Query Results

Database Version: 05/14/2016 08:30:00

LAB ID	DOH ID	Organization	Type	Street Address	City	State	Zip	County
5700	E53073	City of Daytona Beach Environmental Monitoring Laboratory	Utility	3651 LPGA Blvd	Daytona Beach	FL	32124	Volusia
5702	E53362	City of DeLand Environmental Services Laboratory	Utility	1101 South Amelia Avenue	DeLand	FL	32724	Volusia
5705	E53785	City of Edgewater - Alan R. Thomas Water Treatment Plant	Utility	3315 State Road 442	Edgewater	FL	32132	Volusia
5706	E53480	City of Edgewater Environmental Services Laboratory	Utility	500 West Ocean Avenue	Edgewater	FL	32132	Volusia
5719	E53445	City of Holly Hill Water & Wastewater Treatment Plant Laboratory	Utility	453 LPGA Boulevard	Holly Hill	FL	32117	Volusia
5750	E53504	City of Port Orange Central Lab	Utility	817 Oak Street	Port Orange	FL	32127	Volusia
5814	E83079	Pace Analytical Services-Florida	Commercial	8 East Tower Circle	Ormond Beach	FL	32174	Volusia
6025	E83755	The Water Shed Laboratories, Inc.	Commercial	304 South Spring Garden Ave.	Deland	FL	32720	Volusia
5942	E43334	Utilities Commission New Smyrna Beach Laboratory	Environmental - Pollution Control	3119 State Road 44	New Smyrna Beach	FL	32168	Volusia

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**Volusia County Environmental Health Laboratory**
DOH ID:	**E23111**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9223 B	Escherichia coli	1/24/2001	**From:** No Certification **To:** Accredited	None NELAP	FL	5/19/2008
Drinking Water	SM 9223 B	Escherichia coli	4/17/2014	**From:** Accredited **To:** Inactive	NELAP NELAP	FL FL	4/29/2014

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**City of New Smyrna Beach Water Treatment Plant Laboratory**
DOH ID:	**E53732**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9223 B	Total coliforms ~and~ E. coli	3/28/2006	**From:** Accredited **To:** Relinquished	NELAP NELAP	FL FL	4/15/2006

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**Port Orange Utility - Garnsey Water Treatment Plant Laboratory**
DOH ID:	**E53758**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Drinking Water	SM 9223 B	Escherichia coli	1/20/2002	**From:** No Certification **To:** Accredited	None NELAP	FL	5/19/2008
Drinking Water	SM 9223 B	Escherichia coli	7/1/2009	**From:** Accredited **To:** Inactive	NELAP NELAP	FL FL	7/10/2009

NELAP-Certified Laboratories

Laboratories no longer certfied Under NELAP by the Florida Department of Health

Transaction History Query Results

Database Version: 05/14/2016 08:30:00

Organization:	**City of Ormond Beach Public Utilities**
DOH ID:	**E53343**

Program	Method	Analyte	Date Effective	Status	Accreditation Type	Primary AA	Date Entered
Non-Potable Water	SM 4500-P E	Orthophosphate as P	6/30/2005	**From:** Accredited **To:** Relinquished	NELAP NELAP	FL FL	6/30/2005

In Support of California Adoption of the TNI Standard

Allison Mackenzie

Babcock Laboratories, Inc.

Prepared for the May 11th, 2016

Environmental Laboratory Technical Advisory Committee (ELTAC) meeting

In Support of California Adoption of the TNI Standard

> "ELAP does not have a relevant accreditation standard…" and "…these deficiencies have cost the program credibility among key constituencies" (Phelps, Adelson, Arms, Miller, & Speis, 2015).

These were some of the stark conclusions of a panel of five laboratory accreditation experts from across the United States after their external examination of the existing California Environmental Laboratory Accreditation Program (CA ELAP). Their conclusion was that not only does California need a robust accreditation standard, but adoption in a timely fashion is of critical importance as hundreds of labs across the state and the country test and report thousands of pieces of analytical data—data that is vital to the protection of the public health and preservation of the environment—to California agencies daily. This paper will explore the key reasons why CA ELAP should adopt The NELAC Institute (TNI) Standard. Simply stated, the TNI Standard is the most comprehensive, practical, and economically viable option available to CA ELAP.

To begin, it is important to understand the basic purpose of accreditation. According to the website of the California State Water Resources Control Board (SWRCB), "ELAP-accredited laboratories have demonstrated capability to analyze environmental samples using approved methods" (ELAP, 2016). The purpose of a quality systems based laboratory standard is to ensure the competency of a laboratory to produce data of known and documented quality. All labs—public and private— produce data for decision making purposes affecting public health and safety and therefore must be held to the same standard, regardless of lab size. Labs perform compliance testing that is vital to the future of environmental sustainability and human health (Morgan, 2015; See also Appendix B). It is precisely because State agencies use this analytical data to monitor and make decisions regarding the environment and public health that ELAP "provides evaluation and accreditation on environmental testing laboratories to ensure the quality of analytical data [produced]" (ELAP, 2016). With ELAP's purpose defined, we can assume that CA ELAP agrees with Parr's (2010) following statement on data quality:

> Data of known and documented quality is critical for end users of environmental measurement data and government agencies to make accurate, reliable and cost-effective decisions to protect the public health and the environment.

Focusing an accreditation system on methods alone is insufficient to ensure quality and consistency. As Parr (2010; See also Appendix C) continues to explain:

> An important factor in improving the quality of environmental data and ensuring that the data are adequate for the intended purpose, is a consistent, stringent, comprehensive and yet practical accreditation program to ensure the competency of all environmental testing laboratories and related sampling and measurement organizations in the United States.

With this understanding of the basic purpose of accreditation under CA ELAP and the need for a quality system based laboratory standard to ensure data quality, this paper proposes that CA ELAP should adopt the TNI Standard because it is the most comprehensive, practical, and economically viable option available to CA ELAP.

Comprehensive

Sitting on the edge of the Pacific Rim and boasting the world's 8th largest economy, California is a global leader in agriculture, education, industry, manufacturing and technology (Sisney, Garosi, 2015). Interstate and international commerce depend on mutual recognition of standards and in fact, California's trade and commerce extend across all fifty states and into countries around the world.

The TNI Standard employs the International Organization for Standardization (ISO) 17025, a quality systems document recognized nationally and internationally for the conformity assessment of testing laboratories. ISO standards, including ISO 17025, are used around the globe and are requisite in many nations, including the European Union (EU) countries and in Asia, (ISO, 2014).

With ISO 17025 as the foundation, the TNI laboratory standard adds requirements, specifications, and clarifications unique to the environmental field and necessary to assure a consistent approach to quality and establish the foundation for data comparability between labs. At the present time, the TNI Standard is recognized in over twenty five (25) states across the United States and has full reciprocity in twenty three (23) states. Twelve (12) states are qualified as TNI Assessment Bodies (AB) and TNI has been adopted by several states as the only acceptable accreditation standard across all regulatory programs, (Morgan, 2015; See also Appendix B). Founded in 1998 as the National Laboratory Accreditation Council and the National Laboratory Accreditation Program (NELAC & NELAP), the TNI Standard is well established and widely recognized (Parr, 2010; See also Appendix C).

Perhaps the most important feature of the TNI Standard is that it is a consensus-based standard which has been developed over twenty years with input and comment from hundreds of laboratory and regulatory professionals at the federal, state, and local levels. Countless hours of time have been devoted by experts with proficiency in all areas of environmental testing—from microbiology and chemistry to whole effluent toxicity and radiological testing—to create the TNI Standard. Hundreds of professionals gather twice each year at TNI conferences to discuss, clarify, recommend, and ultimately adopt improvements to the Standard with input having been derived from multiple committees working throughout the year. Collaboration and technical knowledge is the power of TNI, resulting in recognition of the TNI Standard as an American National Standard by the American National Standards Institute (ANSI).

Founded in 1918, ANSI's mission is "To enhance both the global competitiveness of U. S. business and the U. S. quality of life by promoting…consensus standards and conformity assessment systems" (ANSI, 2016). In addition to creating guidelines and standards that impact energy, agriculture, construction, etc., a key activity of ANSI is to evaluate the competence of organizations that determine conformity assessment. ANSI recognition of TNI and the Standard adds credibility and further wide-spread recognition.

TNI is a comprehensive standard because it includes more than one aspect of accreditation. TNI has established standards for laboratory Performance Testing (PT) and for the providers of PTs. It outlines the requirements necessary for conformity in production, distribution, and evaluation of PTs and the generation and interpretation of PT results. Additionally, TNI addresses the quality systems necessary for an organization or program that provides accreditation under the Standard—the conformity of the AB. The AB's must also adopt quality systems and practices to maintain consistency and demonstrate competence, and to ensure objectivity in assessment.

The TNI Standard has also shown scalability and applicability to a wide variety of laboratories. Large laboratories with more than 75 staff, specialty laboratories such as whole effluent toxicity and microbiology laboratories, and small laboratories with only one or two employees have all successfully implemented and benefited from the TNI Standard (Morgan, 2009). TNI and the lab professionals engaged in the continuous evaluation and improvement of the Standard have demonstrated a commitment to quality and sensitivity to the limited resources of small labs. In fact, many of the resources available through TNI, the working committees, and at the annual meetings are a direct reflection of this commitment. These resources include templates for Quality Assurance Manuals and Standard Operating Procedures (SOPs) and training webinars on implementation.

Practical

Adoption of the TNI Standard in California is the most practical option offering the quickest and most efficient implementation. The Standard is already well established and would not require the resources that would be necessary to create a California laboratory accreditation standard from scratch. At the onset, it took more than ten years to complete and adopt the first TNI Standard and more than five years is spent just to update the existing Standard.

In Wisconsin, a state that opted to take elements of existing standards and customize them, the process of creating and adopting a standard took six years (Sotomayor, 2015; See also Appendix D). Even using the regulatory framework developed more than six years ago in California as a starting point, agreement and consensus would take time and create delays. Given the constraints of the Bagley-Keene Act—and the strongly held opinions of members of ELTAC, the regulated community, and the regulatory agencies—collaboration would be both contentious and costly.

Adoption of the TNI Standard would enable ELAP and environmental laboratory managers to spend valuable time learning and applying the Standard and refining their existing laboratory systems and processes to meet the new criteria. Training and orientation of laboratory personnel could also begin sooner rather than waiting for new program development, approval and implementation. Additionally, the drafting, review and adoption of new regulations can begin in a more time efficient manner.

Data suggests TNI Standard adoption and implementation would improve data quality and defensibility across numerous regulatory programs: drinking water, recycled water, wastewater, and solid waste. According to a 2009 NELAP survey with 553 respondents from 42 states and six countries, 85% of the labs surveyed believed that implementation of NELAP had improved the quality and defensibility of the data they produced. 294 of the respondents were labs with 10 or fewer staff members and 17.5% (97) were small labs with less than three employees. Further, 476 out of 553 labs felt that NELAP improves employee quality awareness (Morgan, 2009). Implementing a standard that benefits both the data consumers and data producers is exceptionally practical.

Accreditation consistency is enhanced by the TNI Standard because ABs and labs must follow the same quality systems based program. Not only are the expectations of the accredited labs more clearly defined, but the AB must also meet clearly defined expectations. Therefore, in addition to serving the needs of State agencies by ensuring data quality and defensibility, the Standard also serves the needs of labs by ensuring the AB follows a specific set of rules and it offers a means of reconciling differences of perception through a formal standard interpretation request process.

Economical

Development of a customized California laboratory accreditation standard would be costly and fiscally irresponsible. According to conservative estimates, each year that the ELTAC and ELAP spend working to create a standard will cost the state of California, public agencies, and commercial laboratories somewhere between $200,000 and $500,000 (Appendix A). Even three years spent to accomplish the initiative could have a potential price tag of $1.5 Million. Arguably, that money is better invested in implementation and training instead of recreating the proverbial wheel.

A common misconception is that TNI places an undue financial burden on labs based on size. As previously discussed, there has been considerable effort made to streamline TNI requirements and to minimize the cost of implementation to small laboratories. All laboratories should be capable of the same level of quality, documentation, and technical ability. Indeed, all laboratory data—especially data used for regulatory compliance—must be of known quality and integrity. **Size of population served should not have a bearing on the quality and reliability of the lab or the lab's test results.** Organizations and agencies unwilling or incapable of investing the time to meet a minimum level of regulatory conformity and quality should not be generating data critical to protection of the public health and the environment.

Finally, the TNI Standard provides the State of California and the laboratory community with resources that they would otherwise lack. The power of TNI rests in collaboration with environmental professionals across the United States, with direct access through TNI to the top experts in the environmental field and at regulatory agencies, and with the myriad resources developed by those professionals over the course of the existence of the national laboratory accreditation efforts. Without a doubt, the TNI Standard is the most economically viable option that is fiscally responsible to the water rate payer and to the California taxpayer.

In conclusion, if the intention of CA ELAP is to best serve its stakeholders—laboratories, State agencies, regulators, and the general public—adopting the TNI Standard is the answer. The TNI Standard is comprehensive in scope, service, and expertise. Its ISO 17025 and consensus-based foundation give the Standard wide-spread recognition, support, and applicability. The Standard is well-established and has proven benefits, making it the most practical choice in terms of manageable and effective implementation. Furthermore, adopting the TNI Standard is the most cost-effective solution for the State, as it can invest in implementation and training rather than the development of a new, untested program. In addition, the Standard will help ensure all labs operate at the appropriate level of quality—a level that is consistent with the quality of protection to which the public and environment are entitled. In short, the Standard is the best option for California which is why CA ELAP should adopt the TNI Standard.

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Appendix A

Potential Financial Burden of ELAP-created or Modified Accreditation Standard

A 4-hour-long Environmental Laboratory Advisory Committee meeting held monthly to discuss and craft an accreditation standard for California will cost approximately $230,000 per year. This estimate can rapidly escalate and easily double if meetings are held more frequently, or ELTAC members devote more than 10 hours a month to development of a standard.

ELAP time: 19 hours x 12 months x $72/hour = $16,416

ELTAC time: 18 committee members x 10 hours x 12 months x $100/hour = $216,000

These estimates do not include facilities costs, IT costs, or travel costs associated with meetings.

Assumptions

1. Fully burdened cost of ELAP staff as reported by Larsen and Sotelo to the Expert Review Panel in March, 2015 is $72/hour.
2. Estimated staff time to prepare documents and post notifications for committee meetings compliant with Bagley-Keene Act is 3 labor hours per meeting.
3. Estimated staff time for 4 employees to attend a 4 hour committee meeting is 16 labor hours.
4. The average fully burdened cost to the employer of ELTAC members is $100/hour.
5. Estimated ELTAC time to attend monthly meetings is an average of 6 hours per member.
6. Estimated time spent by ELTAC members to research and prepare for monthly meetings is an average of 4 hours per month.

- Salary range for QA Director $105,991 to $167,652 with median of $139,521 based on website: http://www1.salary.com/CA/Anaheim/Quality-Assurance-Director-salary.html
- Benefits based on Rancho California Water District website: http://www.ranchowater.com/index.aspx?NID=138

ACIL LABORATORY ACCREDITATION PERSPECTIVE

Presented by: Judith R. Morgan, MS, REM
ACIL Environmental Sciences Section, Chairman
ESC Lab Sciences
VP, Chief Regulatory Officer
Mt. Juliet, TN

ESC LAB SCIENCES
YOUR LAB OF CHOICE

Enhancing Public Health and Safety
Through Quality Testing and Engineering

ACIL

American Council of Independent Laboratories (ACIL)

- Founded in 1937
- Trade association representing independent, commercial scientific and testing laboratories
- Membership is comprised of professional services firms engaged in:
  - ✓ testing
  - ✓ product certification
  - ✓ consulting
  - ✓ research and development
- Affiliate members are manufacturer’s laboratories, consultants, and suppliers to the industry

American Council of Independent Laboratories (ACIL)

- **ACIL exists to support the needs of the Independent Testing Industry**

Independent Testing Firms are defined as:

Commercial entities engaged in the following activities for the public:	
Analysis	Product Certification
Testing	Research & Dev
Inspection	Sampling
Materials engineering	Related other consulting services

AND

Not affiliated with any institution, company, or trade group that might affect their ability to conduct investigations, render reports, or give professional, objective, and unbiased counsel

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YOUR LAB OF CHOICE

Enhancing Public Health and Safety Through Quality Testing and Engineering

ACIL White Paper - 2012

"Economic Benefits of National Environmental Laboratory Accreditation Using an Alternative Accreditation Process"

Summarizes the maturity of the National Environmental Laboratory Accreditation Program (NELAP)

Outlines the need for the use of 3rd Party Accreditation

Addresses economic benefit to state budgets

Outlines the process to migrate from traditional certification/accreditation programs to 3rd party based programs

ACIL Representation

Maxwell Report 2014

- Top 30 Environmental Laboratories
  - ✓ Represent 1.02 Billion in Revenue
- ACIL Environmental Laboratory Members
  - ✓ Represent 9 of the Top 12
  - ✓ Total 672M in Revenue from Maxwell Top 30 members
- ACIL Environmental Laboratory Members represent an estimated 750M of the total available environmental market.

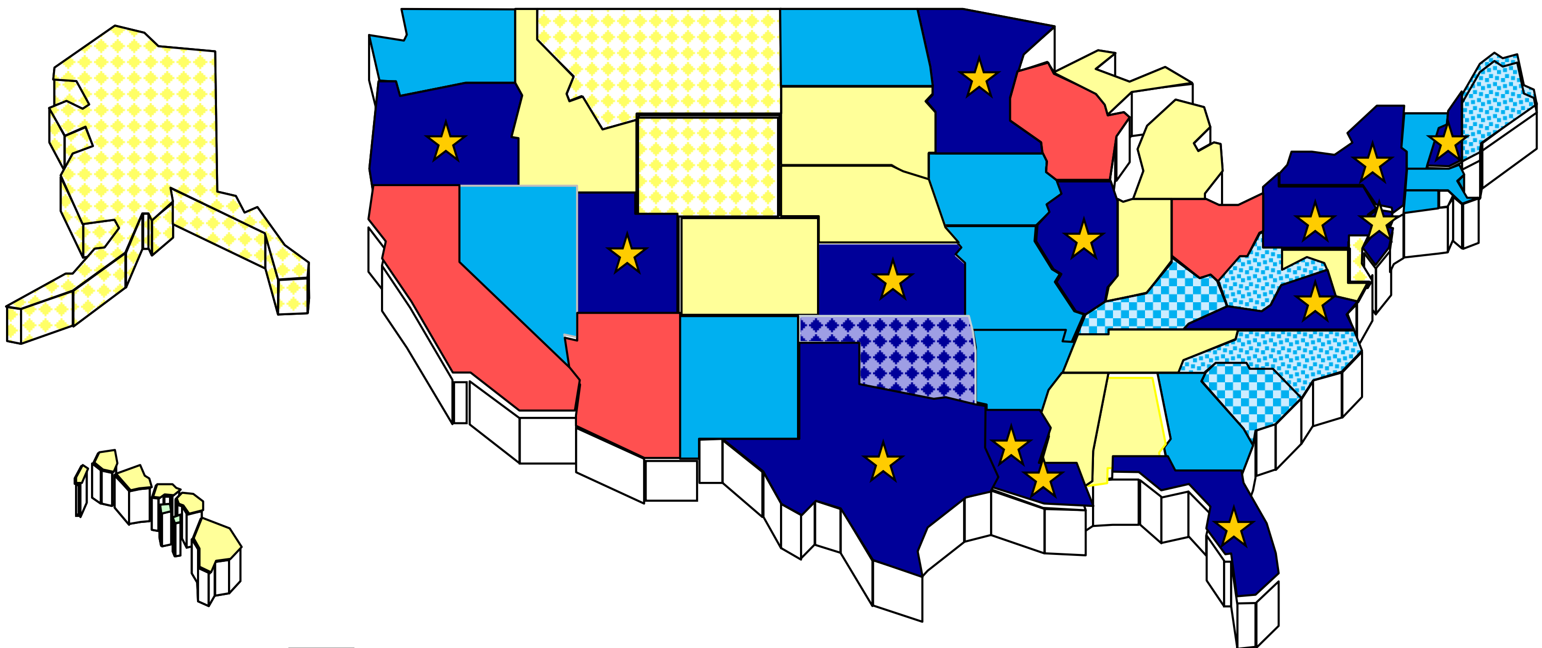
ESC LAB SCIENCES
YOUR LAB OF CHOICE

Enhancing Public Health and Safety
Through Quality Testing and Engineering

ACIL

Appendix B

The National Program Today

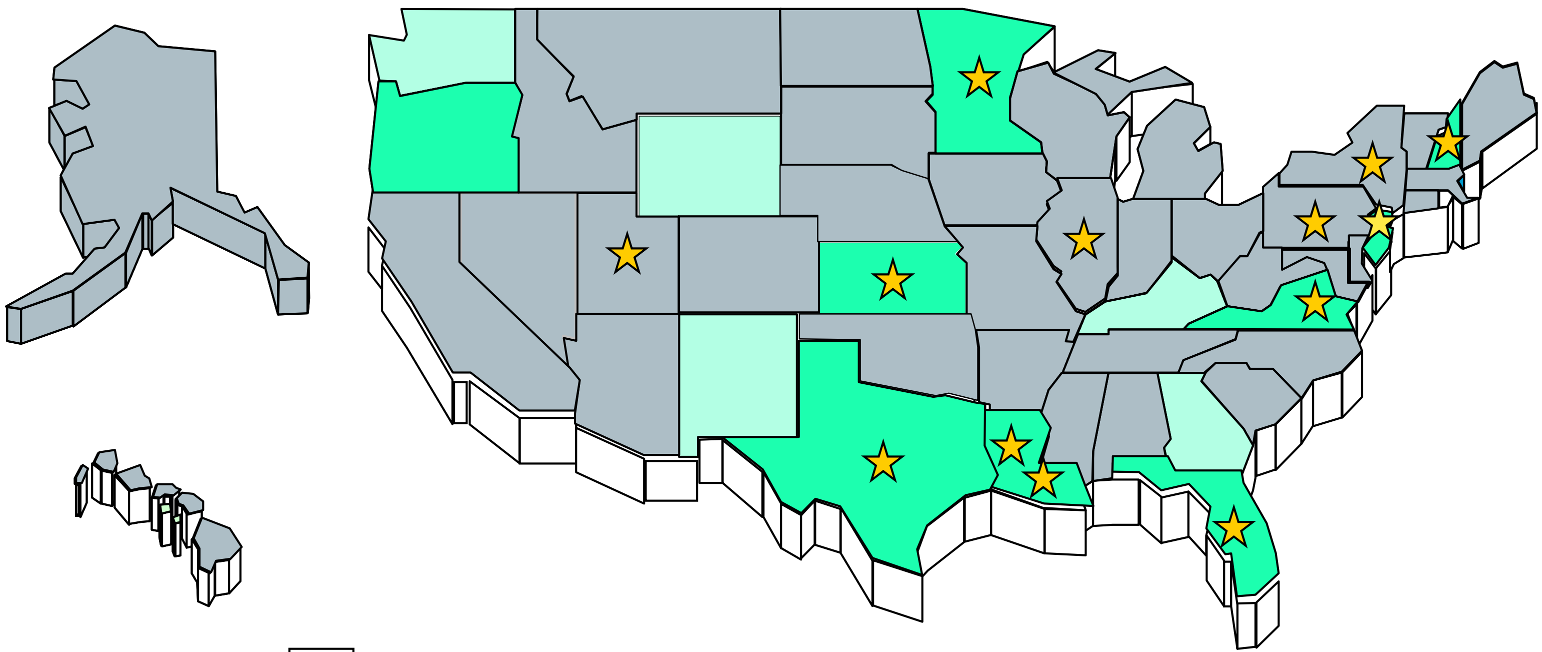


- NELAP Accreditation Body (14)
- Accept NELAP (Full reciprocity)
- Accept NELAP & Applies State Reqs
- Has a State program that incorporates NELAP elements
- State program with significant differences (4)
- Drinking Water Primacy Only (12)
- Drinking Water Primacy + Specialty Area (ie: UST)
- Working on NELAP Application

Enhancing Public Health and Safety
Through Quality Testing and Engineering

Appendix B

Contract Assessors and 3rd Party Accreditation



NELAP Accreditation Body

States using contract assessors

States accepting 3rd Party Accreditation (General and/or Specialty)

Others using or specifying 3rd Party Accreditation and/or Assessment:

Dept. of Defense, Dept. of Energy, EPA NLLAP, EPA NVLAP, etc.

ESC LAB SCIENCES YOUR LAB OF CHOICE

Enhancing Public Health and Safety Through Quality Testing and Engineering

ACIL

ACIL Vision for CA ELAP

1. Realization of Equivalency Among Data Producers

- **All labs**, public and private:
  - ✓ Produce data that determines public health and safety
  - ✓ Must be held to the same standard
  - ✓ Perform compliance testing that is key to the future of environmental sustainability and human health
- **No** defendable **reason** for ELAP to have two programs
- Data defensibility is necessary for all compliance monitoring and is not proportional to size
  - ✓ No different than other professionals: Note that the medical profession does not offer different levels of MD's based on population served.
- Size and revenue are not proportional to quality expectation
  - ✓ **All** laboratories are capable of the same level of quality system and technical ability
  - ✓ Environmental equity and justice, knows no budget or size

ACIL Vision for CA ELAP

2. Accreditation Consistency – National Consensus Based Standard

- Adopt a National Consensus Based Standard (TNI Standard)
- CA rejoin NELAP
  - ✓ CA can actively participate in the development , implementation and adoption of the standard.
  - ✓ Provides peer collaboration and support via the Accreditation Council
- Reform current regulations to adopt a **single program** built on a national consensus based standard
  - ✓ TNI is accredited by ANSI and the TNI Standard incorporates multiple ISO standards
- TNI Standard (ISO 17025 Based)
  - ✓ Requires the same foundational quality system regardless of lab type or size.
  - ✓ Defensibility is achieved via adherence to the same requirements for quality, technical, personnel, ethics/data integrity, and documentation
- **Ultimate goal** is to provide data of known and documented quality that is consistent across **ALL** providers, public and private.

WHY the TNI Standard…

- ANSI Accredited
- Incorporates ISO 17025 as the foundation for quality systems
- Most experienced and expansive "brain trust" of individuals participate in the development:
  - ✓ Many more participants and resources than any single agency has
  - ✓ Known experts with specific disciplines, from public & private sectors, including multiple non-NELAP states, collaborate together
- Polices & Processes in place for: Organization, standard development, balance, stakeholder representation, acceptance, and implementation
- Formal Standard Interpretation Request (SIR) Process:
  - ✓ Aids in ensuring consistent interpretation and implementation of the standard
  - ✓ AC must agree on interpretation
  - ✓ Interpretations are incorporated into future standard revisions
  - ✓ Available to entire membership and community
- Requires consistency for method validation, addition of non-traditional analytes, data integrity, data qualification and many other processes not addressed by every individual state program.

ACIL Vision for CA ELAP

3. Accreditation Consistency – Accreditor Options

- Require program conformance to ISO 17011
- Accept 3rd party accreditation via existing Accreditation Bodies (AB) conforming to ISO 17011
- **All ABs need oversigh**t to maintain consistency and guarantee improvement
- ABs with no oversight **cannot objectively** identify, monitor and correct their own insufficiencies
  - ✓ TNI ELSS Volume 2 requires a review of each Accreditation Body to ensure uniform conformance to the standard and assess documentation, procedures, qualifications and training
- Utilize TNI's Non Governmental Accreditation Body (NGAB) program to be implemented this year (2015)
  - ✓ TNI ELSS Volume 2 adds value above and beyond pure 17011
  - ✓ The program ensures that all NGABs comply with the TNI Standard
- Utilize known and qualified contract assessors to augment the program (like Florida). This provides access to additional qualified personnel in high volume or unusually busy time periods.
- Laboratories want the **option to choose** a suitable and equivalent path for their needs:
  - ✓ For accreditation
  - ✓ That best fits their needs and requirements for laboratory conformity assessment

ACIL Vision for CA ELAP

4. Establish Recognition/Reciprocity with Other Programs ….. (states, national entities or private accreditation services)

- Existing programs, currently conforming to the TNI Standard, are **consistently** implemented, enforced, and assessed.

- Existing Reciprocities/recognitions:
  - ✓ 14 NELAP AB's – Full bi-directional recognition
  - ✓ WA – Full recognition of NELAP and A2LA
  - ✓ GA - Full recognition of NELAP and A2LA, ACLASS, AIHA, CALA, NSF, QAI
  - ✓ 29 Others – Full recognition of NELAP
  - ✓ 9 "DW Only" Primacy states will accept NELAP in lieu of home state

NOTE:

- 45 States reference NELAP, in full or part, in their regulations
- DOD incorporates NELAP combined with additional program specific requirements. Accreditation is granted by approved 3rd party accreditors conforming to ISO 17011.

ACIL Vision for CA ELAP

5. Personnel Consistency

- **Professionalism** and technical knowledge are requirements.
- Adopt personnel requirements that include **training** that is **consistent** with requirements of ANSI, TNI and/or other relevant consensus organizations
- TNI Environmental Laboratory Sector Standard (ELSS) provides qualification requirements for:
  - ✓ Accreditors and Assessors (TNI ELSS V2M1 & V2M3)
  - ✓ Laboratory Personnel (TNI EL V1M2)
- Utilize the available national resources via TNI Educational and Training network
- National standard compliance reaches beyond the program constraints and limited program implementation of the EPA DW Certification Manual (which is insufficient for NPDES, RCRA, and other regulatory programs).

ACIL Vision for CA ELAP

6. Personnel Qualifications

- Assessors must have:
  - ✓ Actual experience in a testing laboratory
  - ✓ Education in a scientific discipline
  - ✓ The knowledge, experience, and personality to mentor and suggest improvements
  - ✓ Successful auditing experience
  - ✓ Necessary resources to provide assistance
  - ✓ Solid understanding of applicable standards, methods, quality and technology
  - ✓ Desire to stay current on new technology and methods in order to ensure proper implementation and documentation
  - ✓ Credentials that prove their expertise

ACIL Vision for CA ELAP

7. Fees

- Offer Separate licensing and accreditation options
- Fees should be commensurate with type of accreditation:
  - ✓ Licensing (reduced cost) – "Full reciprocity = less resources"
    - ☆ ELAP labor is limited to review of reciprocal accreditation documents
    - ☆ PT review, Corrective Actions, etc. are the responsibility of the reciprocal/accepted accreditor
  - ✓ Full accreditation via ELAP – ELAP provides all services for accreditation, which requires increased resources thus a higher cost
- Should use above suggested options to:
  - ✓ Save taxpayer monies
  - ✓ Ensure consistency of requirements across CA and neighboring state borders
  - ✓ Move the program to a position of relevance to today's labs and data users

ACIL Vision for CA ELAP

7. Fees - Example

In 2012 CA NELAP fees were a multiple of ELAP fees:

A fully accredited reciprocal out-of-state commercial lab

NELAP = $17,200 vs ELAP $5400

Both are reciprocal recognitions and are **document review only**, since the primary accreditor is responsible for accreditation details and documents

ACIL Vision for CA ELAP

8. Proficiency Testing Program

- **Ensure evaluation consistency:** Mandate the use of ISO* approved providers participating in the national consensus based standards process.
- **Provide real time review of PT results**: Require true corrective action, suspension or other actions where necessary.
- **Develop a thorough process for PT review:** Define actions related to unacceptable PTs and enforce in a timely manner
- **Reciprocal/recognized accreditors maintain PT tracking** for their laboratories. No need to duplicate effort.
  - ✓ reduce cost and save time/labor for CA
- **Consider contracting PT review to a 3rd Party –** Save time, resources, and improve accuracy and efficiency

** ISO Guide 34:2009(E) General requirements for the competence of reference material producers.*
ISO 17043:2010(E) General requirements for proficiency testing

ACIL Vision for CA ELAP

9. Provide Program Services to Labs and Data Users

- Create metrics that reflect accountability measures for timeliness and service. Be transparent regarding operations.
- Keep community updated and provide assistance for regulatory rule changes (fed and state): i.e. Method Update Rule (MUR)
- Provide valuable services and communication in a timely manner to the accredited community
- Provide outreach, quality assurance functions, and assistance to improve the laboratory community
- Provide access to knowledgeable personnel who are available to assist with questions or issues and can provide consistent feedback
- Include up to date program news and FAQs on the ELAP website
- ELAP should help data users (public/private) understand the basic requirements needed to produce data of known and documented quality

Top Priorities

1. Mandate a national consensus based standard (i.e. TNI)
2. Apply the standard to all laboratories
3. Utilize 3rd party resources to remove the current backlog and close gap between current programs and national standard
    a) ISO 17011 Accreditation Bodies (NELAP ABs, NGABs)
    b) Contract assessors
4. Reorganize the program and personnel to support the implementation and maintenance of the national standard
5. Allow for a licensing or full accreditation option with appropriate fees for each
6. Current draft regulations introduce language and acronyms outside of industry standard. Recommend re-writing and simplifying the regulations to reference a national standard and provide support operations accordingly

Conclusions

- All environmental labs produce data that determines current and future public health and safety
- **All labs**, public and private, must be held to the same standard across the entire industry. Labs want a level playing field.
- Complete data defensibility is necessary and is not proportional to laboratory size
- CA needs a single program built on a national consensus based standard (ie: TNI standard) and should rejoin NELAP
- All accreditations should be performed by ABs conforming to ISO 17011
- Labs want a choice for accreditation.
- Options should exist for accreditation and fees:
  - ✓ NELAP – Full service via state or contract assessment, where state evaluates and monitors all requirements, including PTs, Corrective Actions, etc.
  - ✓ NGAB – Licensing by CA via ISO 17011 AB, where accreditor evaluates and monitors all requirements, including PTs, Corrective Actions, etc.

Conclusions

- Establish reciprocity or recognition with other programs conforming to a national consensus based standard
- Adopt personnel requirements that are consistent with requirements of ANSI, TNI and/or other relevant consensus organizations
- Require personnel to be experienced and credentialed
- Mandate the use of ISO accredited providers for Proficiency Testing
- Provide timely, value added, services to the lab community that will promote improvement and consistency while advancing the knowledge base of the laboratory

Thank you for your time!

Questions?

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L·A·B S·C·I·E·N·C·E·S
YOUR LAB OF CHOICE

Enhancing Public Health and Safety
Through Quality Testing and Engineering

Appendix C

HISTORY AND FUTURE OF LABORATORY ACCREDITATION

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ABSTRACT

In 1978, the US Environmental Protection Agency (EPA) initiated a laboratory certification program for laboratories involved in analyzing drinking water and delegated the authority for operation of the program to state agencies. Over the ensuing years, many states expanded this program to include other environmental media. As a result of efforts that began in 1987, a National Environmental Laboratory Accreditation Program (NELAP) has been created and is now managed by The NELAC Institute (TNI). This article summarize the activities leading up to the formation of TNI, describe in detail the core programs being performed by the new organization and provide information about the future of national laboratory accreditation.

INTRODUCTION

Laboratory accreditation serves multiple purposes for different constituents. In general, NELAP accreditation attests to the competency of a laboratory for conducting environmental measurements.

- For the public, NELAP accreditation promotes confidence that environmental data used to make policy decisions to protect public health and the environment are generated by laboratories with demonstrated competence.
- For data users, NELAP accreditation serves a consumer protection purpose. It provides assurance that the laboratory has been evaluated and has met accepted standards of competency established by and within the profession.
- For the profession, NELAP accreditation advances the field by promoting accepted standards of practice and advocating rigorous adherence to these standards.
- For government agencies, NELAP accreditation provides a basis to determine whether environmental monitoring data are adequate for their intended use.
- For the laboratory, NELAP accreditation provides ongoing internal and external evaluations, demonstrates a commitment to continuous improvement, provides an effective mechanism for accountability, and enhances its reputation.

THE BEGINNING

Almost all environmental compliance, regulatory and clean-up decisions are made based on measurement information. Data of known and documented quality is critical for end users of environmental measurement data and government agencies to make accurate, reliable and cost-effective decisions to protect the public health and the environment. An important factor in improving the quality of environmental data and ensuring that the data are adequate for the intended purpose, is a consistent, stringent, comprehensive and yet practical accreditation program to ensure the competency of all environmental testing laboratories and related sampling and measurement organizations in the United States.

EPA, with the states as its implementation partners, maintains requirements for the certification of drinking water laboratories as well as outlining accreditation requirements for laboratories that analyze lead in paint and asbestos. Many states independently established accreditation programs covering the analysis of waste waters, solid and hazardous wastes, and air samples. In the 1980's, the commercial laboratory community began to advocate for a single national accreditation program to consolidate the multiple state programs that contained divergent accreditation requirements. A national program would provide the foundation for ensuring the capability and competence of laboratories to foster the generation of data of known and documented quality. Over twenty years ago, EPA recognized the problem of uncoordinated, inconsistent and redundant state and federal laboratory accreditation programs. In a 1988 Report to Congress on the comparability of laboratory test procedures, the EPA recommended that it explore the feasibility of establishing a uniform, national laboratory accreditation program

In 1990, EPA's Environmental Monitoring Management Council (EMMC) established an ad-hoc panel to respond to the concerns from laboratories and regulators about the diverse number of state accrediting programs with different, sometimes conflicting requirements. This group was to consider the feasibility and advisability of a national environmental laboratory accreditation program. The workgroup concluded that a national program was a viable option, and recommended that EPA consult with representatives of all stakeholders, by establishing a federal advisory committee.

The Committee on National Accreditation of Environmental Laboratories (CNAEL) was chartered in 1991 under the Federal Advisory Committee Act (FACA) and its members represented the stakeholder community (federal, state accrediting programs, commercial laboratories, etc.). CNAEL was to explore the possibilities of a national program and provide recommendations to EPA concerning the alternatives for a national program as well as the implementation and administration of such a program. In its final report to EMMC in 1992, CNAEL recommended that a self-supporting national program for laboratory accreditation be established and provided recommended models and structure for the organization that would implement the program. CNAEL recommended the program consist of performance evaluation testing, combined with a laboratory process and quality assurance certification program, which would include onsite audits.

THE EARLY YEARS

In response to the CNAEL recommendations, EPA, state and federal representatives formed the State/EPA Focus Group in 1993. The participants in these meetings represented EPA program offices, state regulatory agencies, states with differing types of accrediting programs, and federal agencies that had a need to perform environmental testing. This group developed a proposed

framework, modeled after the National Conference on Weights and Measures and prepared a draft Constitution, Bylaws and Standards, which were published in the Federal Register in December 1994.
On February 16, 1995, state and federal officials voted to approve an interim Constitution and Bylaws – thus establishing the National Environmental Laboratory Accreditation Conference (NELAC), a standards setting organization. The major objective of NELAC was to develop accreditation standards and adopt them so that the standards could be used to support a National Environmental Laboratory Accreditation Program (NELAP). These standards were developed by a set of standing committees, who were each responsible for a chapter of the NELAC standards.

In 1999, NELAP was established with 11 states receiving recognition as NELAP accreditation bodies. The goal of NELAP is to foster cooperation among the current accreditation activities of different states and other governmental agencies and to unify the state and federal agency standards. Each of the recognized accreditation bodies must implement the NELAC standards, and must accept the accreditation of laboratories accredited by other NELAP accreditation bodies. There are currently 13 state agencies that are recognized NELAP accreditation bodies.

NELAC was structured as an association of co-regulators: EPA, the states, and other federal agencies. Stakeholder groups such as commercial laboratories, municipalities, and trade groups were encouraged to attend meetings and participate on the NELAC committees. A vote to approve standards was limited to representatives from the state and federal agencies. If a private-sector organization felt the need to provide recommendations, such consensus could only be solicited through a committee chartered under the Federal Advisory Committee Act (FACA). In 1997, the Environmental Laboratory Advisory Board (ELAB) was established under the FACA to provide consensus advice on various issues, including recommendations on the NELAC standards.

NELAC was established as a way for the national laboratory accreditation effort to begin. The NELAC operations developed and adopted standards for laboratory accreditation. In addition in 2002, the initial standard for field activities was passed. This 2002 NELAC standard was the first to recognize the need for accreditation of field sampling and measurement organizations. However, not having the authority of an act of Congress to establish an accreditation program, NELAC relied on the voluntary participation of states to implement the program. States that decide to become part of the program are expected to use one set of requirements, the "NELAC Standards."

EPA had always intended for the program to be self-sufficient. EPA followed the recommendations of CNAEL in retaining oversight of the program, but expected a graduation into autonomy. It is clear that without EPA's leadership and monetary support NELAC would not have progressed beyond the conceptual stage, but lacking an anchoring Federal statute, NELAC could not presume continued funding from EPA or the Agency's perpetual management of the program.

THE TRANSITION

Two significant events occurred in the late 1990's that required changes to the original NELAC structure:

- The National Technology Transfer and Advancement Act (NTTAA) became law in March 1996. The NTTAA outlined requirements Federal agencies must implement relative to the use of private sector standards and conformity assessment practices. Federal agencies were directed to adopt private sector standards, wherever possible, in lieu of creating proprietary, non-consensus standards.
- A revised OMB Circular A-119 was issued in February 1998. This circular established policies on Federal use and development of voluntary consensus standards and on conformity assessment activities. Voluntary standards were defined as standards that were developed by a voluntary consensus standard body (VCSB). OMB Circular A-119 further defined the attributes and functions of a VCSB, which included, among other requirements, balanced interests in the standards development and approval process.

Clearly, NELAC, in its original structure, did not meet the definition of a voluntary consensus organization. Therefore, in 2002, NELAC amended its Constitution and By-Laws to make the conference a standards adoption body only. NELAC established itself as an organization that could receive and consider standards that have been developed by standards development organizations that use a consensus process as defined in OMB A-Circular 119. The last NELAC standard was published in 2003 and implemented in 2005.

While there are many recognized voluntary consensus standard bodies (ASTM International, American Industrial Hygiene Association (AIHA), etc.), no one group came forward to develop standards specifically designed for accreditation of environmental laboratories and field activities. In 2002, a new voluntary consensus standard organization, the Institute for National Environmental Laboratory Accreditation (INELA) was formed with a mission of developing standards for NELAC and other organizations to use.

INELA was incorporated as a non-profit member organization. The membership was entitled to vote on all standards and could voluntarily participate on any committee. INELA formed expert committees that functioned like the standing committees of NELAC, but with balanced representation from all stakeholder groups. Using the NELAC standards as a template, these expert committees began the process of developing consensus standards. The first INELA standard was accepted by member vote in September 2004, but was not adopted by the organization as it did not represent any significant change over the 2003 NELAC standard.
In May, 2005, INELA began the process of reorganizing the 2004 standard so that a single volume would contain all the requirements for accrediting a targeted program such as environmental laboratories, field operations, taxonomy, etc.

THE RESTRUCTURING EFFORTS

Appendix C

The EPA Office of Research and Development (ORD) began providing financial and staffing support from the early meetings of the State-EPA Focus Groups. The ORD funding support allowed the National Environmental Laboratory Accreditation Conference (NELAC) and the National Environmental Laboratory Accreditation Program (NELAP) to begin operations and provided direct support through August 2006. At the Interim meeting in 2000, EPA reminded the NELAC community of the recommendation in the Committee on National Accreditation of Environmental Laboratories (CNAEL) document dealing with self-sufficiency. In 2005, Lara Phelps, the NELAC Executive Director announced that a series of cooperative agreements would provide support for facilitating NELAC's transition to self sufficiency. These were awarded to several groups for various tasks deemed necessary to support the future program. As a step toward self sufficiency, Ms Phelps resigned from her role as NELAC and NELAP Executive Director in August, 2006, but continued as the project manager for the self-sufficiency effort.

The National Forensic Science Technology Center (NFSTC) was selected as the primary organization to assist the NELAC board in determining the structure and format of a future organization. The NELAC board selected a team of individuals, the Self Sufficiency Task Group (SSTG) to provide recommendations on a plan for self-sufficiency, and a transition strategy to ensure the continuation of the NELAC and NELAP activities until the transition was complete. The SSTG solicited input from the NELAC community during the January 2006 NELAC meeting. The suggestions from this meeting were used to develop a draft vision, mission and purpose for the new organization, and to identify key characteristics that the new organization should possess. In addition, the SSTG used the input from the meetings to develop a strategy for transition into a new organization, and identified immediate, interim and final goals.
The SSTG also considered current standard setting organizations and solicited offers from professional organizations who might be interested in assisting with the NELAC self-sufficiency efforts. INELA was one several organizations that responded to this solicitation. Of the responses, INELA best fit the characteristics and criteria defined by the SSTG.

After an informal meeting between the INELA Board of Directors and representatives of the SSTG in April, 2006, the SSTG drafted a non-binding Memorandum of Understanding (MOU) for consideration and approval by both the INELA and NELAC Boards of Directors. In June 2006, both boards approved the MOU and selected five members from each organization to form a joint Partnership Planning Team (PPT) to explore the potential combination of the two organizations. The PPT developed a proposed model for the new organization and presented this to the stakeholder community at the NELAC meeting in Kansas on August 14 and 15, 2006.

THE PLAN FOR TRANSITION TO SELF-SUFFICIENCY

The presentation in August 2006 covered the proposed mission, values, organization, governance and structure of a transformed organization that would build on the attributes of both NELAC and INELA.

The underlying assumptions the PPT provided for moving towards a combination were:

- Combining the operations of NELAC and INELA would result in a stronger organization.
- Combining operations would allow NELAC to achieve self-sufficiency quicker.
- Combining operations would be less disruptive to the stakeholder community.

The core values identified by the PPT as necessary in the transformed organization were:

- An organization that is inclusive and responsive to the needs of all stakeholders
- An organization based upon integrity and honesty
- A quality based organization that encompasses both a belief that the program is worthwhile and that quality is the underlying value for everything that is done.

The PPT recommended that the corporate structure of the organization be that of an incorporated 501(c)3, not-for-profit member organization managed by a board of directors.

At the end of the NELAC meeting, a vote was held by the government officials in attendance that overwhelmingly confirmed that the NELAC Board of Directors should continue to work with INELA on pursuing options for working together. The INELA membership in attendance at the meeting unanimously endorsed this direction as well. Based on the outcome of the NELAC meeting, the PPT continued its work with the goal of having the transformed organization operational by the next meeting of these groups in January 2007.

The PPT met by teleconference on a weekly basis and had a three-day meeting in late September, 2006, to complete their task of developing recommendations. Concurrently with this effort, the NELAC board formed a task group to develop recommendations about the governance and structure of the accreditation programs. These efforts were completed in October, 2006 at which time recommendations were sent to the NELAC and INELA boards for their consideration and were published on both the NELAC and INELA websites in a special report titled *Recommendations for Combining NELAC and INELA Operations*. A meeting of the INELA and NELAC Boards of Directors and Committee chairs occurred on November 6, 2006, to consider the recommendations.

FORMATION OF THE NELAC INSTITUTE

On November 6, 2006 a giant step towards achieving the long-term goal of the environmental laboratory and monitoring communities to have a national accreditation program was realized. After years of an evolving program under the auspices of the NELAC and INELA, the respective Board of Director's took actions necessary to form The NELAC Institute (TNI).

The actions taken on November 6th to form TNI were the result of years of hard work to create a national program through NELAC, years of hard work by INELA to create a consensus process for the development of accreditation standards, and months of intense exploration by a Partnership Planning Team (PPT) representing both entities that culminated in this new organization. As reflected in the new name, The NELAC Institute (TNI) has combined the heritage of NELAC with the consensus process of INELA into one organization.

The NELAC Institute (TNI) is a 501(c)3 non-profit organization whose mission is to foster the generation of environmental data of known and documented quality through an open, inclusive, and transparent process that is responsive to the needs of the community. The organization is managed by a Board of Directors and is governed by organizational Bylaws. Members of the organization include individuals from laboratories, data users, federal and state agencies and anyone interested in promoting environmental data of known and documented quality.

More information about TNI is available at www.nelac-institute.org.

TNI's PROGRAMS

The NELAC Institute operates the following major programs:

- Consensus Standards Development,
- Laboratory Accreditation System,
- National Environmental Laboratory Accreditation,
- National Environmental Field Activities Accreditation
- Proficiency Testing, and
- Technical Assistance.

Consensus Standards Development Program (CSDP)

The purpose of the Consensus Standards Development Program (CSDP) is to develop consensus standards for the accreditation of environmental laboratories. Accreditation standards are developed by Expert Committees using a consensus process that includes the elements of openness, balance, due process, and consensus as established by Circular A-119 published by the US Office of Management and Budget. Standards have been developed that are widely applicable, and will therefore promote a uniform national program of environmental laboratory accreditation. These standards are modular, allowing their assembly into a series of volumes, each specifically designed for a stakeholder group (Laboratories; Accreditation Bodies; Proficiency Test Providers; Proficiency Test Provider Oversight Bodies; and Field Sampling and Measurement Organizations). The standards that have been developed by this program are summarized in Table 1.

Table 1. TNI Accreditation Standards

Environmental Laboratory Sector

Volume 1: Management and Technical Requirements for Laboratories Performing Environmental Analysis
Module 1 - Proficiency Testing
Module 2 - Quality Systems: General Requirements
Module 3 - Asbestos Testing
Module 4 - Chemical Testing
Module 5 - Microbiological Testing
Module 6 - Radiochemical Testing
Module 7 - Toxicity Testing
Volume 2: General Requirements for Accreditation Bodies Accrediting Environmental Laboratories
Module 1 - General Requirements
Module 2 - Proficiency Testing
Module 3 – On-site Assessment
Volume 3: General Requirements for Environmental Proficiency Test Providers
Volume 4: General Requirements for an Accreditor of Environmental Proficiency Test Providers
Field Sampling and Measurement Organization (FSMO) Sector
Volume 1: General Requirements for Field Sampling and Measurement Organizations
Volume 2: General Requirements for Accreditation Bodies Accrediting Field Sampling and Measurement

It is important to note that the TNI laboratory accreditation standard differs from the EPA certification program in one very significant manner. The TNI standard is based on ISO/IEC

17025, an international standard that contains both technical and management requirements. The TNI standards also address the policy defined by EPA to adopt quality systems during sample collection and testing operations. (See ANSI/ASQ E-4 2004)

National Environmental Laboratory Accreditation Program (NELAP)

The National Environmental Laboratory Accreditation Program (NELAP) was established as a means to improve the quality and consistency of environmental data throughout the United States. Although NELAP is a national program; state governmental agencies serve as Accreditation Bodies. States, which apply to NELAP to become an accreditation body, may select to operate an accreditation program which covers all of the EPA regulatory programs or as few as one. For example, many states may select to only accredit laboratories for chemistry and microbiology under the drinking water program. Other states may select to operate a comprehensive program, which includes all types of analyses for all types of media (i.e., hazardous waste, waste water, drinking water, air, soil, etc.) under the five EPA regulatory programs [i.e., Clean Air Act (CAA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Clean Water Act (CWA), Resource Conservation and Recovery Act (RCRA), and Safe Drinking Water Act (SDWA)]. There is no requirement that a state incorporate any particular portion of the possible scope into its program. The scope of accreditation, the type of laboratory included under the state's program, including the regulatory or voluntary nature of the program itself, the assessment of fees, and the use of third party assessors are all options of the state.

A NELAP Accreditation Body will accept by recognition, the accreditation status of a laboratory issued by another NELAP Accreditation Body (this is called secondary accreditation). Each Accreditation Body must adopt and adhere to this principle as a condition of membership in NELAP. In accepting the accreditation status of a laboratory through recognition, the Accreditation Body assumes accreditation responsibilities as a secondary accreditation body.
A laboratory seeking accreditation must apply to its home state Accreditation Body for accreditation. However, if the Accreditation Body does not offer accreditation for testing in conformance with a particular field of accreditation (matrix-method/technology-analyte/analyte group), laboratories may obtain primary accreditation for that particular field of accreditation from any other NELAP Accreditation Body.

National Environmental Field Activities Program

The National Environmental Field Activities Program (NEFAP) is an accreditation program for field sampling and measurement organizations (FSMOs). TNI has published the accreditation standard for organizations that perform measurements in the field and collect samples. The standard is a management system standard.

The TNI Standard addresses the industry need for ensuring that field data and sample information must be of a known and documented quality. The data from environmental laboratories is only as good as the sample collected and presented for measurement. Many professionals in the environmental industry have often wondered why the sample collection and field testing do not require an independent review of these operations. Field test data used in making environmental decisions must be produced by organizations with a management system that is comparable to the fixed laboratory testing accreditation requirements.

The requirement for accreditation of field activities is extremely limited in regulatory programs or is does not exist in any government program. Therefore this is a voluntary program that is managed through the oversight of TNI to ensure consistency of implementation. The implementation of this standard by ABs and FSMOs will demonstrate that these organizations are interested in independent assessment of their organization to produce information and data that is appropriate for the intended use by their clients.

The TNI standard for FSMOs is modeled after ISO/IEC 17025:2005 “General Requirements for the Competence of Testing and Calibration Laboratories”. TNI Standard Volume 1 is the FSMO Competency standard which is the same international standard for fixed laboratories. TNI Standard Volume II is the FSMO accreditation body (AB) requirements to accredit FSMOs. The AB standard is based on ISO/IEC 17011:2004 “Conformity Assessment – General Requirements for Accreditation Bodies Accrediting Conformity Assessment Bodies”.

Proficiency Testing Program

Proficiency Testing (PT) is defined as a means of evaluating a laboratory's performance under controlled conditions relative to a given set of criteria through analysis of unknown samples provided by an external source. The TNI PT program consists of:

- A PT Expert Committee that establishes the requirement for proficiency testing.
- A PT Program Executive Committee who manages the implementation of the program.
- A PT Provider Accreditor that accredits organizations as PT Providers.
- Private and public sector PT Providers that manufacture and provide PT samples and evaluate the results.

The TNI PT Expert Committee has developed standards for laboratory proficiency testing and proficiency testing samples, including: criteria for selection of the providers of the samples; protocols for the use of proficiency test samples and data in the accreditation of laboratories; and criteria for Proficiency Test Provider Accreditors (PTPAs).

The PT Executive Committee maintains a national PT program that contains the following elements:

- Fields of Proficiency Testing (analytes, concentrations, matrices and acceptance limits) appropriate for the scope of environmental monitoring performed in the United States
- Oversight of organizations that provide PT samples to laboratories to ensure these organizations are competent to do so.

Technical Assistance Program

The purpose of the Technical Assistance Program is to provide assistance to stakeholders, particularly those seeking accreditation and those who accredit. The program develops tools, training, and other resources to enable stakeholders to efficiently participate, adopt, implement and comply with the TNI standards. Specifically, this program:

- Develops tools and templates to assist laboratories and accreditation bodies with implementing accreditation programs.
- Ensures that training programs relevant to the needs of the stakeholder community are provided.
- Ensures that laboratory assessors have a forum to discuss common issues.
- Develops a mentoring program to assist both laboratories and accreditation bodies with implementing accreditation programs.
- Provides a voice and solution strategies for small organizations.

THE FUTURE

Lessons from history provide insight into key practices offering stability and growth to the new organization.

- TNI has achieved short-term financial stability, primarily through cooperative agreements with EPA and membership dues, but also through sound fiscal practices such as maintaining a small staff and virtual office with low administrative overhead.
- There is very strong stakeholder support for the work TNI is doing with more than 90% of its stakeholders believing in the programs being offered.
- Dedicated volunteers with a passion for this effort, committee structure and balance, and the expertise and experience of the organization's membership are all proven assets.
- Significant progress has been made towards implementing a new accreditation standard.
- Committees to operate the TNI programs are well established and viable.
- TNI has been accredited by the American National Standards Institute as a consensus standards organization.
- An infrastructure has been established to allow TNI to expand the program into non-traditional areas of monitoring such as field sampling and measurements, stack emission testing, and taxonomy.

Implementation of the New TNI Standards

The 2003 NELAC Standard has been used by NELAP-recognized Accreditation Bodies (ABs) since 2005, and as such, is very familiar to the ABs as well as the accredited laboratory community and other stakeholders. However, the 2003 NELAC standard contains language about the operation of an organization that no longer exists, contains administrative detail that does not pertain to the operation of an accreditation program, contains obsolete language from an obsolete version of ISO 17025, is very hard to read and understand by laboratories that have not been accredited, and is not recognized by the EPA as a consensus standard. The 2003 NELAC Standard is widely perceived as one of the barriers to increasing the participation of both laboratories and states in the program.

The 2009 TNI standards, which have been in development since 2003, were developed to respond to criticisms of the 2003 NELAC standard. The TNI standards were developed by a true consensus process, use the current version of ISO 17025, have incorporated ISO 17011, are organized to make it easier for a laboratory to understand the requirements, and have improved some of technical weaknesses in the 2003 NELAC standard.

National Accreditation

TNI's vision is that every organization that generates environmental monitoring data will be accredited to a consensus standard. For this vision to become a reality, a number of actions need to occur.

- TNI needs to reach out to EPA program offices and state agencies to understand their needs and concerns and then take action to address these needs and concerns.
- TNI needs to reach out to those laboratories that believe the program to be too onerous and find ways to alleviate their concerns.

To address these concerns, TNI's Advocacy Committee has taken on the task of reaching out to other organizations to understand their needs and concerns on national accreditation and bring those needs and concerns back to TNI for action. Specifically, the Advocacy committee has initiated efforts to meet with EPA program offices (e.g., Air, Solid Waste, Wastewater), other federal agencies, state agencies, and other data users to understand their needs for reliable environmental data and work to ensure the TNI program meets the needs of all data users, and to meet with trade associations representing laboratories to understand their perspectives on laboratory accreditation and work to ensure the TNI program addresses their concerns.

Small Laboratories

Many small laboratories perceive the 2003 NELAC standard has too onerous. TNI believes many of these concerns can be solved with the outreach effort that has begun, but TNI also believes more can be done to help small laboratories. TNI has already accomplished some actions to help small laboratories:

- a Quality Manual template has been developed
- templates for technical and administrative Standard Operating Procedures have been developed,
- laboratory "mentoring sessions" are now a integral component of every TNI meeting,
- several training courses and workshops to help small laboratories have been held, and
- the position of Small Laboratory Advocate within TNI has been created.

As a result of these actions, many small laboratories, including many 1 and 2 person laboratories have become accredited over the last few years. TNI believes much more can be done, including:

- developing more tools and guidance,
- offering web-based training,
- ensuring that all requirements in the standard are essential for data quality, and
- improving the consistency of laboratory assessments.

Presented at WEFTEC in October, 2008, updated in 2010.

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Hybrid Accreditation Standards: Wisconsin's Laboratory Accreditation

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PARTNERS FOR A CLEANER ENVIRONMENT

Milwaukee Metropolitan Sewerage District

Disclaimer

The views and opinions expressed in and during this presentation are solely the author's and do not represent the official positions of the Laboratory Certification and Registration Program of the Wisconsin Department of Natural Resources or the Milwaukee Metropolitan Sewerage District.

Consult these links for official information:

http://dnr.wi.gov/regulations/labcert/

http://www.mmsd.com/

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Program Profile

* Chemistry and Whole Effluent Toxicity
* SDWA, NPDES, RCRA, CERCLA
* Commercial, Municipal, Public Health, Industrial
* In and Out of State
* Fee Supported
* Registration for Non-Commercials
* Certification for Commercials

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Hybrid Program

* Certification vs. registration
* NELAP elements vs. state requirements
* Drinking water vs. all other matrices
* Attempt to merge the best of several systems
* Follows already established tradition

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NELAP Technical Advisory Committee (TAC)

- In 1998 recommended becoming a NELAP AA
- Two-tiered system:
  - Commercials NELAP
  - Others covered by State program
- Needed a change in the Statute
- Required legislative sponsorship

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Green Bay Packers Rule

- Had a strong sponsor in House of Representatives.
- However, Senate leader focused on funding alternatives for GBP stadium renovation.
  - Would not consider any rule changes until GBP stadium renovation satisfied party's concern.
- Stadium renovation funding mechanism approved.
- WI NELAP statute changed approved by House, not considered by Senate.
  - Rule change died in session.

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Aftermath

* Agency got cold feet.
  * Commercials objected to two-tiered system.
  * Municipals did not want to be part of NELAP.
  * Both groups essentially lobbied against a NELAP compromise.
* No sponsor in next legislative session.
* No substantial internal or external support to become a NELAP AA (AB).

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Other Reasons for 1998 Outcome

* Wisconsin's Program predated NELAP by more than a decade.
* Lack of local control over the accreditation standard.
* Perceived by some as a costly alternative that did not add significant value to what already was in place.
* Suspicion from the not-for-profit sector that commercials would take over.
* Commercials insistence on a single accreditation tier.

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Regroup

* Realization that NR 149 needed change.
  * The Code had not undergone a major revision since it was created in 1986.
* Formed NR 149 Rule Advisory Committee to:
  * Use the NELAC Standards as the basis for NR 149 revision.
  * Take what was best and sensible from the NELAC Standards.
  * Retain some Wisconsin-specific provisions.

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The Product

- Extensive compromising and negotiation.
- Process took approximately six years.
- Revised NR 149 published in April 2008.
- Revision became effective September 2008.
- Process for revising the 2008 version has started.
  - New rule process would take at least three years to complete.

NELAP Items that Made It

- Tiers of Accreditation
  - Technology – Matrix – Analyte
  - Method – Matrix – Analyte
- Quality Systems Approach
- Majority of the provisions of the Quality Systems Standard

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NELAP Items that Did NOT Make It

- Two PTs per year
  - NR 149 requires one PT in combination with either three quality control standards or a second source verification program.
- Internal audits
- Annual management system reviews
- Personnel qualifications
- Unannounced assessments
- Five-years for records retention

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Items Unique to NR 149

- Extensive and "particular" calibration section for analytical instruments.
- Exclusion of PTs for AA flame analysis and colorimetric procedures.
  - Must analyze three quality control standards evenly spaced in a year.
- Program does not accept solid PT sample results.

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Observations

* NELAP has raised the bar.
* Systems approach has worked.
* Documentation has improved dramatically.
* Laboratories certified under NR 149 have been able to transition to NELAP relatively easily.

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On the Other Hand…

- Have lost all reciprocal agreements previously in place with non-NELAP states.
- Easy for out-of-state laboratories to miss Wisconsin specific requirements.
- Remain in partial isolation.
- Have not lessened assessment load.

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My Laboratory

* Certified for chemistry by WDNR under NR 149.
* Certified for microbiology by WDATCP under ATCP 77.
* Accredited to 2009 TNI Standards by Florida.
* Not that difficult to maintain certifications and accreditations.
  * Similar to complying with special client requirements.
* NELAP accreditation improves credibility of results.
  * Needed or useful to market Milorganite®

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Editorials

* Have uniformity as a principal goal.
* Shun preferences that buy you little and that are obstacles to uniformity.
* If you must have a two-tiered program, make demarcation clear and provide incentives that favor joining NELAP.
* Avoid incorporating provisions in statute.
* Try to incorporate as much as possible by reference.

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And…

* Know that adopting a standard in whole has advantages:
  * Do not have to argue over selection.
  * Do not have to re-invent content.
  * Gives reason to justify all requirements.

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MEMORANDUM

To: Lara Autry, US EPA

From: Raymond G. Merrill, Eastern Research Group, Inc.

Date: December 15, 2008

Subject: Draft 2008 Crosswalk between the OW Certification Manual and the TNI Environmental Laboratory Sector Accreditation Standard

The text and tables that follow are a comparison of EPA Office of Water's Fifth Edition (January 2005) Manual for the Certification of Laboratories Analyzing Drinking Water and the 2008 NELAC Institute (TNI) Standards for accreditation of environmental laboratories. As an addition to the review, ERG also provides input on whether TNI standards conform to the International Standards Organization (ISO) requirements in related areas. This review and comparison updates the previous comparison completed by Versar Inc. in May of 2006. We've summarized the major differences in the two programs below and we've also provided detailed tables describing the similarities and differences. If you have any questions or comments please feel free to contact me.

Comparison of TNI and OW Laboratory Assessment Standards

The following tables present a comparison between the EPA Office of Water Fifth Edition (January 2005) Manual for the Certification of Laboratories Analyzing Drinking Water (OW CM) including Supplement 1 to the Fifth Edition of the Manual for the Certification of Laboratories Analyzing Drinking Water (EPA 815-F-08-006, June 2008) and the 2008 TNI Standards (December 2007).

Review and keywords searches were performed on the TNI Standards and the Supplement to the OW CM primarily. The previous comparison of OW CM certification standards performed by Versar was used to capture some of the original OW CM requirements that were not changed with the publication of the June 2008 supplement.

Tables are formatted with six columns identifying the:

- assessment subject,
- TNI citation,
- TNI Citation conformance to ISO 17025,
- OW CM citation,
- similarities and
- differences

"Not Found" as noted in the tables indicates that a requirement or topic in one assessment standard was not located in the comparison standard. If the TNI reference was found to be ISO/IEC 17011 or ISO/IEC 17025 compliant, this was noted in the appropriate column of the table.

The purpose of this comparison is to define the technical differences between the two programs. In doing so, the differences between the two programs can be evaluated by Environmental Laboratory Advisory Board (ELAB) to formulate advice to EPA on future improvements to laboratory compliance or accreditation programs. This effort will in turn provide information needed to improve the National

Program for laboratory accreditation and promote a single onsite inspection and assessment process rather than the current certification process requiring independent multiple states assessment.

With the recent update to the TNI Standards and the Supplement to the OW CM, the two standards moved toward the goal of a unified process for certification or accreditation. The recent Supplement to the OW CM refers to TNI. Also the TNI standard update includes some SWDA-based requirements from the drinking water program.

The organization of the contents of the OW CM and TNI Standard differ. Chapters in the OW CM include an Introduction (I), Responsibilities (II), Implementation (III), Critical Elements of Chemistry (IV), Critical Elements of Microbiology (V), and Critical Elements of Radiochemistry (VI). The updated TNI standard consists of 4 Volumes, two of which contain a number of Modules.

The TNI volumes cover laboratory assessment requirements for more than drinking water laboratory assessment (e.g., solid waste, air) The first volume the of the TNI standard entitled "Volume 1, Management and Technical Requirements for Laboratories Performing Environmental Analysis," contains Module 1 (Proficiency Testing), Module 2 (Quality Systems General Requirements), Module 3 (Quality Systems for Asbestos Testing), Module 4 (Quality Systems for Chemical Testing), Module 5 (Quality Systems for Microbiological Testing), Module 6 (Quality Systems for Radiochemical Testing), and Module 7 (Quality Systems for Toxicity Testing). Volume 2, General Requirements for Accreditation Bodies Accrediting Environmental Laboratories, contains Module 1 (General Requirements), Module 2 (Proficiency Testing), and Module 3 (On-Site Assessment). Volume 3 is General Requirements for Environmental Proficiency Test Providers. Volume 4 is General Requirements for an Accreditor of Environmental Proficiency Test Providers.

Both standards are valid approaches to assess laboratories and improve quality programs in laboratories analyzing environmental samples. The OW CM is more focused on drinking water programs and requires a laboratory to adhere to the quality control defined by the method and to prepare a quality plan that reflects that control. No attempt has been made to summarize the quality requirements in OW methods or to compare the method specific requirements with the TNI standard. Therefore, some of the differences noted in the two standards may be accounted for in the OW methods.

TNI requires a quality system and a quality manual (however named) that documents the system. The TNI standard requires laboratories to meet requirements in the contract they sign with their client(s). If specific quality requirements are not listed in the contract then the quality requirements in the methods coupled with the laboratory's Quality Plan have primary authority for setting specific quality requirements during sample analysis. OW CM certification are restricted to meeting the quality requirements in prescribed methods for drinking water in contrast to TNI which has greater scope and is geared toward the needs of individual clients and their data quality requirements. Therefore, differences between the OW CM and TNI standards related to specific QC requirements listed in the methods are of less importance than the broader program requirements for each group.

TNI standard tends to require more documentation and detail on QA/QC requirements since there is no standard set of methods to reference. TNI accreditation evaluates laboratories on their quality program responding to client or contract agreements and the methods referenced in the contract agreements. OW CM evaluates laboratories on the performance of reference methods which contain the body of QC details required by the program.

The education and experience required for the personnel who perform methods evaluated by either of the two assessment approaches (manuals) a significant different. The OW CM provides more detail on individual positions and education/experience levels in the method sections. Other than the technical manager, TNI does not provide education or experience requirements for laboratory personnel. TNI focuses on documentation of qualifications for analysis and demonstration of proficiency by the laboratory analysts rather than formal education and degrees.

Documentation required from a certified or accredited laboratory is a topic where the two manuals have significant differences. The TNI requires much more documentation than the OW CM. Differences include the TNI requirement for a comprehensive Quality Manual for laboratory operation and responsibility for program management. The OW requirement for a Quality Plan is much more like a project specific project plan. While the OW requirement can include all that the TNI standard requires, the OW CM does not list in detail the requirements for either the Quality Plan or method SOPs.

TNI does not address several important topics to the drinking water program covered by OW such as Principal State Laboratories, Interim Certification, reciprocity, and numerous method specific technical details.

The two approaches also differ in several non-technical areas. OW CM does not discuss subcontracting, management reviews, internal audits, data integrity training, electronic transmission of results, preventative action, and client confidentiality, TNI includes specific requirements for each of these topics.

Subject	The NELAC Institute (TNI) Standard Reference	ISO Reference	OW/Drinking Water Laboratory Certification Program (DWLCP) Reference	Similarities	Differences
Implementation					
Document Titles			Manual for the Certification of Laboratories Analyzing Drinking Water and Supplement 1 to EPA 815-R-05-004		
Evaluation of Certification Program***	Environmental Laboratory Sector TNI Standards Adopted December 22, 2007 Management and Technical Requirements for Laboratories Performing Environmental Analysis		III.1	Similar sections, different programmatic roles. The Office of Water Certification Manual (OW CM) and the NELAC Institute (TNI) Standard both describe the roles, the responsibilities, and the structures of their respective programs.	Differences in the standards reflect the differences between the overall programs. TNI Standard outlines aspects of its program in greater detail than OW CM.
Requirements for Certification of Laboratories	EL-V1M1-2008 Section 4.0, EL-V2M2-2008 Sections 5.1.1, 5.2.1, 5.2.3, EL-V2M3-ISO-2008 Section 5.1		III.2	Both require Proficiency Test (PT) samples, Programs differ on the initial and ongoing requirements.	OW CM requires passing a PT for each analyte/each method once a year. The National Environmental Laboratory Accreditation Conference Institute (TNI) standard, handles PTs in much more detail. TNI has differing requirements for initial (2 successful PTs for each matrix, technology/method, and analyte), continuing (2 successful PTs per

Subject	The NELAC Institute (TNI) Standard Reference	ISO Reference	OW/Drinking Water Laboratory Certification Program (DWLCP) Reference	Similarities	Differences
Implementation					
					year for each matrix, technology/method, and analyte), and experimental PTs (2 PTs for each matrix, technology/method, and analyte).
Requirements for Certification of Laboratories	EL-V1M1-2008 Section 4.0, EL-V2M2-2008 Sections 5.1.1, 5.2.1, 5.2.3, EL-V2M3-ISO-2008 Section 5.1		III.2	Both programs require onsite assessment.	Programs differ regarding on-site audit frequency; OW CM requires once every three years with questionnaires given on other years, TNI requires onsite assessment once every two years.
Individual(s) Responsible for the Certification Program	EL-V1M1-2008 Section 3.1, EL-V2M1-ISO-2008 Section 3.2	ISO/IEC 17011	III.3	Each program has officers or authorities empowered to certify or accredit laboratory programs.	The program structures also differ slightly by definition and duties of authorities within the program. OW CM has Certification Authority (CA), Certification Program Manager (CPM), and Certification Officers (CO) that may represent the state and regional personal. TNI Standard has Accreditation Bodies whose authority is generally derived from regulatory authority acceptance of the accreditation process.
On-Site Laboratory Audit Team	EL-V2M3-ISO-2008 Sections 4.2.3, 4.2.4, 4.2.5		III.4.1	Both programs require appropriate education/training.	OW CM requires that auditors have a Bachelor's degree or equivalent education/experience in the field they certify. OW CM requires that the CO complete the appropriate EPA laboratory training course. OW CM has no requirement for

Subject	The NELAC Institute (TNI) Standard Reference	ISO Reference	OW/Drinking Water Laboratory Certification Program (DWLCP) Reference	Similarities	Differences
Implementation					
					supervised assessments. TNI states an assessor shall hold at least a Bachelor's degree in a scientific discipline or have commensurate experience acquired by having performed verified assessments of environmental laboratories, and have completed and attained a passing score on the written examination of courses approved by the employing accreditation body on assessing quality systems and all technical disciplines comprising a technology or combination of method and technology that the assessor will assess. Also states that an assessor needs to have participated in one or two on-site assessments under the supervision of a qualified assessor before performing an unsupervised assessment.
Third Party Auditors	EL-V2M1-ISO-2008 Sections 3.1, 7.4.2	ISO/IEC 17011	III.3, III.4.2, Appendix D	Both standards state the Accreditation Body (AB) may use a third-party assessor if outside expertise is required, so long as the body verifies the third party is free of conflict of interest and competent to perform the assessment.	Appendix D of the OW CM manual discusses EPA's policy on third party auditors and potential for conflict of interest. TNI takes full responsibility for all subcontracted assessments and assess the potential for conflict of interest.

Subject	The NELAC Institute (TNI) Standard Reference	ISO Reference	OW/Drinking Water Laboratory Certification Program (DWLCP) Reference	Similarities	Differences
Implementation					
Plans for Certification of Laboratories and Certification Process	EL-V2M1-ISO-2008 Sections 4.6, 7.7.2	ISO/IEC 17011	III.5, III.7	OW CM's CPM and TNI 's AB have similar responsibilities for planning assessments.	The TNI standard has pre-specified procedures for certification. These procedures are detailed for the laboratory in Volume 1 and Volume 2. OW CM refers to CPM as the individual responsible for developing and recording certification plans, schedules, etc. A similar comparison can be made to a TNI Assessment Board (certifying, auditing, and auditing record keeping elements), who establishes the plans and procedures for on-site assessments. The OW CM process is less prescriptive, using terms like should and may. The OW program allows the CPM to make program decisions based on the audit assessment.

Subject	The NELAC Institute (TNI) Standard Reference	ISO Reference	OW/Drinking Water Laboratory Certification Program (DWLCP) Reference	Similarities	Differences
Implementation					
Principal State Laboratories (Laboratories that have available facilities capable of performing analytical measurements for all federally mandated contaminants specified in the State Primary Drinking Water Regulations)	Not Found		III.6	No	TNI omission.
Terminology: Certified vs. Accredited	EL-V1M1-ISO-2008 Section 4.0		III.8.1	Both programs address laboratory assessment.	TNI uses the term accredited, OW CM uses the term certified. TNI stipulates differences between the accreditation process of initial and continuing accreditation. Participation in the TNI process is voluntary.
Provisionally Certified	EL-V2M1-ISO-2008 Section 3.0, EL-V1M1-ISO-2008.1 Section 3.0	ISO/IEC 17011	III.8.2	Both programs address performance and nonperformance issues in laboratories.	TNI uses the term suspension- the laboratory can not perform analysis for which field it is suspended. OW CM allows the laboratory to conduct the analysis if the client is aware of its certification status, unless the evaluation team believes that the laboratory can perform the analysis within acceptable limits. TNI provides additional causes for suspension (i.e. failure to maintain a quality system); OW CM lists the

Subject	The NELAC Institute (TNI) Standard Reference	ISO Reference	OW/Drinking Water Laboratory Certification Program (DWLCP) Reference	Similarities	Differences
Implementation					
					cause as being deficiencies either in PT studies or on-site visits. TNI- The status can be reversed if compliance is demonstrated to the primary AA. TNI also mentions the right to due process.
Not Certified	EL-V2M1-2008.1 Sections 7.5.6.1, 7.9, EL-V2M2-2008.1 Section 10.0		III.8.3	Both programs state that deficiencies prevent laboratories from becoming certified.	OW CM states that a laboratory is not certified if it has deficiencies and cannot produce valid data. TNI includes an outline of deficiencies that prevent a laboratory from becoming accredited. It also categorizes these deficiencies in three categories: suspended, withdrawn, or reduced accreditation. TNI mentions due process. Due process in reference to certification status is not discussed in OW CM, but in other sections is does states that the laboratory has the right to be heard by EPA.
Interim Certification	Not Found		III.8.4	No	OW CM states that an on-site audit should be made as soon as possible but not later than 3 years after an interim certification is granted.
Drinking Water Laboratories	EL-V1M6-2008 Section 1.5.2.2 (MDL)		III.9	Both programs require methods that meet the client's requirements.	OW CM-Laboratories that analyze drinking-water samples for Safe Drinking Water Act (SDWA) compliance monitoring shall use methods whose detection limits

Subject	The NELAC Institute (TNI) Standard Reference	ISO Reference	OW/Drinking Water Laboratory Certification Program (DWLCP) Reference	Similarities	Differences
Implementation					
					meet the requirements of 40 CFR 141. Although TNI does not have specific subsections or sections dealing with this exact subject matter, TNI does stipulate that laboratories must meet federal agency requirements, and the requirements of the methods they use, which would include the Safe Drinking Water Act.
Laboratory Quality Assurance Plan	EL-V1M2-2008 Sections 4.2.2, 5.9		III.11	OW CM recommends a quality plan, TNI requires a quality plan.	OW CM-laboratory must adhere to the quality control required by the methods and should prepare a quality plan, while TNI requires a quality system and quality manual (however named). OW CM does not require that QA Plan format include an identifier, page number, etc. OW CM does not state that the QA Plan contain information on review of new work requests, a policy for deviations from documented procedures or method specifications. OW CM does not state that major equipment or electronic signatures be included in the QA Plan. Nor does it state that procedures for dealing with complaints or protecting confidentiality be included.
Laboratory	EL-V1M2-ISO-2008	ISO/IEC	III.11.1	Programs are similar for	Other than the Technical Manager,

Subject	The NELAC Institute (TNI) Standard Reference	ISO Reference	OW/Drinking Water Laboratory Certification Program (DWLCP) Reference	Similarities	Differences
Implementation					
organization and responsibility	Section 4.1, 4.2, 5.2	17025		technical management and QA management.	TNI does not specify positions or type/amount of education, experience, and/or training needed, only "appropriate". Waiver of academic training is also not discussed in the TNI standards. OW CM does not indicate whether the person responsible for preparing a document may or may not review the report for final release. OW CM describes the internal audit process through a certification program. OW CM does not specifically state that laboratory personnel can conduct internal audits to check compliance with certification or accreditation standards.
Methodology	EL-V1M2-ISO-2008 Section 5.4		III.13.2	Both programs require methods that meet client requirements.	OW CM requires Federal Reference Methods listed in specific sections of IV, V, I (and specified in 40 CFR part 141). TNI states that methods published in international, regional, or national standards shall preferably be used, but that the laboratory use methods which meet client requirements.
On-Site Evaluation	EL-V2M3-ISO-2008 Sections 5.0, 6.0	ISO/IEC 17011, most of Section 6.0 is	III.13.3	Both programs require onsite assessment.	OW CM suggests that an on-site assessment be conducted once every three years and sooner if the laboratory previously did not do

Subject	The NELAC Institute (TNI) Standard Reference	ISO Reference	OW/Drinking Water Laboratory Certification Program (DWLCP) Reference	Similarities	Differences
Implementation					
		ISO/IEC 17011			well during an audit or has had a major change. For TNI , the interval between the surveillance on-site assessments should not exceed 2 years, with the first surveillance on-site assessment carried out no later than 12 months from the date of initial accreditation.
Notification of Certifying Authority (CA) of Major Changes	Not Found		III.13.4	No	TNI does not require accrediting authority be notified that major changes have occurred. TNI requires changes be documented in the appropriate laboratory documents.
PT Criteria	EL-V2M1-ISO-2008 Section 7.0	Most of TNI Standard Section 7.0 is ISO/IEC 17011	III.14.1, 14.2	Both programs require PT sample analysis as a means to evaluate laboratory conformance to the standard.	TNI requires the laboratory to conduct two PT studies for each field of proficiency testing per year for “matrix-technology/method-analyte/analyte group”. OW CM requires PT samples to be analyzed at least annually for “regulated contaminants for which they wish to be certified, by each method for which they wish to be certified (OW CM I Introduction)”.
Certification or Accreditation Status Review	EL-V2M1-ISO-2008 Section 7.0		III.14.1, 14.2	Both programs use PT performance as a means to downgrade certification or accreditation status.	OW CM states that a laboratory should be downgraded to provisionally certified, whereas, TNI may suspend a laboratory for failure to comply with PT analysis

Subject	The NELAC Institute (TNI) Standard Reference	ISO Reference	OW/Drinking Water Laboratory Certification Program (DWLCP) Reference	Similarities	Differences
Implementation					
					requirements. An OW CM laboratory may continue to do work but have to note suspension in writing on any report. A TNI accredited laboratory can not continue as a certified laboratory after failure to comply and suspension. Both TNI Standards and OW CM specify their own procedures and criteria for downgrading/revoking certification status. TNI and OW CM both require analysis of PTs and penalize for falsification; but TNI provides more detail. TNI mentions due process, OW CM states that EPA or the state provide technical assistance to help identify and resolve the problem. TNI discusses other aspects like personnel requirements that may cause suspension, OW CM does not.
Criteria/ Procedures for Revocation	EL-V2M1-2008.1 Sections 7.5.6.1, 7.9.1, 7.9.4.2, EL-V2M2-2008.1 Section 10.0		III.14.3, 14.4	Both programs have procedures for revocation of certificates.	OW CM states that a laboratory is not certified if it has deficiencies and cannot produce valid data. TNI lists the deficiencies that lead to revocation. TNI mentions due process. Due process in reference to certification status is not discussed in OW CM, but in other sections is does state that the

Subject	The NELAC Institute (TNI) Standard Reference	ISO Reference	OW/Drinking Water Laboratory Certification Program (DWLCP) Reference	Similarities	Differences
Implementation					
					laboratory has the right to heard by EPA.
Upgrading or Reinstatement of Certification	EL-V1M1-2008.1 Section 8.0, EL-V2M1-2008.1 Section 7.9.5		III.14.5	Both standards require the facility to pass accreditation status before upgrading or reinstatement can be done.	OW CM requires a written request from the laboratory seeking upgrading or reinstatement of certification. TNI-requires the laboratory to meet the requirements for continued accreditation to be reinstated after suspension, . Under TNI, to reinstate accreditation after revocation, the laboratory must meet the requirements for initial accreditation.
Record Keeping	EL-V1M2-ISO-2008 Section 4.13	ISO/IEC 17025	III.15	Both programs address records maintenance.	OW CM states that records should be maintained for a minimum of 6 years and TNI states a minimum of 5 years. OW CM addresses that the record keeping procedures should be documented in the QA Plan. TNI requires that a laboratory establish a record keeping system that allows the history of the sample and associated data to be readily understood through the documentation. TNI includes records of subcontractors, disposal of records, legibility, and storage environment, preventing unauthorized access, archiving files, naming files, or overwriting/obliterating old files,

Subject	The NELAC Institute (TNI) Standard Reference	ISO Reference	OW/Drinking Water Laboratory Certification Program (DWLCP) Reference	Similarities	Differences
Implementation					
					electronic data storage, whereas OW CM does not.
Reciprocity	Not Found		III.16	No	Although TNI does support reciprocity between states and regions, no statement was found in the standard regarding reciprocity.
Alternate Test Procedures (ATPs)	EL-V1M4-ISO-2008 Section 1.5.3.d		III.18	Non-standard methods must be validated for certification in both programs.	The OW CM requires new methods or modified methods be approved by the EPA via written submission. TNI only requires that the new/modified method be validated through laboratory analysis and documented for their review. TNI offers Tier I, Tier II, and Tier III requirements in US EPA Office of Water's Alternate Test Procedure (ATP) as a possible approval process.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
PT Studies, and Use of Accreditation					
Analysis of PT samples and use of own laboratory PT results	EL-V1M1-2008.1 Section 5.1		III.13.1, III.14.3, IV.7.2.1, V.7.2, VI.7.2	Both TNI and OW CM state that the PT sample shall be analyzed in the same manner as routine samples.	OW CM also states that the laboratory should be able to provide documentation that the person analyzing the samples is a laboratory employee who routinely analyzes drinking water compliance

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
PT Studies, and Use of Accreditation					
					samples. TNI lists actions that should not be taken with PT samples, such as subcontracting, analyzing PT samples for other labs to gain accreditation, obtaining results from PT providers, or discussing PT results with other labs. OW CM does not discuss these issues.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Organization					
Legal responsibility	EL-V1M2-ISO-2008 Section 4.1.1, EL-V2M1-ISO-2008 Section 4.1		IV.8.1, V.8.1, VI.8.1	No	The OW CM does not discuss the legal responsibility of the accreditation body. TNI states that the accredited laboratory or organization can be held legally responsible. It also discusses the legal responsibility of the AB.
Activities carried out according to a defined standard	EL-V1M2-ISO-2008 Section 4.1.2		II	Both programs require activities performed to the standards.	OW CM states that the EPA encourages the States to base certification of drinking water laboratories either upon criteria contained in the manual or upon state-developed equivalents that are at least as stringent as the manual. TNI states that laboratories should carry out activities in such a way as to meet the requirements of this International Standard and to satisfy the needs of the customer, the regulatory authorities or organizations providing recognition.
Instrument testing & calibration.	EL-V1M2-ISO-2008 Section 4.1.2		III.11.6 (calib.), III.11.2 (client objective)	Both programs have requirements for calibration.	TNI requires laboratories to perform testing in such a way to meet the needs of the client and regulatory authorities or organizations. OW CM states that the QA Plan should include processes to identify clients' data quality objectives (DQOs). OW CM presents QC such as calibrations as method-specified.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Organization					
					TNI requires laboratories to perform calibration in such a way to meet the needs of the client and regulatory authorities or organizations.
Quality system	All of EL-V1M2-ISO-2008, EL-V2M1-ISO-2008 Section 5.7.4	Most of the V1M2 (if not all) is ISO/IEC 17025	III.2, III.11, IV.7, V.7, VI.7	With the Supplement to OW CM, both standards require a quality system to be implemented.	TNI requires that the effectiveness of the required quality system be reviewed in the annual internal audit.
Management system that covers other facilities (temp. or mobile)	EL-V1M2-ISO-2008 Section 4.1.3	ISO/IEC 17025	III.11.4	Both standards require the management system to cover temporary facilities of all types.	OW CM does not discuss management of mobile or field activities, however it does describe the similar concept of field work throughout the standard. TNI -The management system shall cover work carried out in the laboratory's permanent facilities, at sites away from its permanent facilities, or in associated temporary or mobile facilities.
Conflict of interest (between data quality/compliance with other topics)	EL-V1M2-ISO-2008 Section 4.1.4, EL-V2M1-ISO-2008 Section 7.4	ISO/IEC 17025,ISO/IEC 17011	Appendix D	Both standards emphasize the importance in preventing conflicts of interest between the laboratory and the accrediting body.	TNI-The accreditation body, shall identify, analyze and document the relationships with related bodies to determine the potential for conflict of interest, whether they arise from within the accreditation body or from the activities of the related bodies. Where conflicts are identified, appropriate action shall be taken. OW CM- Conflict of Interest is found in Appendix D addressing sensitivity to potential conflict of interest, but no real discussion of conflict of interest.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Organization					
Personnel with authority and resources to carry out work and see deviations from quality system	EL-V1M2-ISO-2008 Sections 4.1.5.a, 4.1.5.b, 4.1.5.h	ISO/IEC 17025	III.10.2 and III.10.3	Programs are similar although worded differently.	TNI discusses that the laboratory must have technical management who have the authority and resources to carry out work and see departures from the management system and initiate preventive actions. OW CM states the QA Manager should be independent from lab management and have access to senior management.
Protect client confidentiality and storage of data	EL-V1M2-ISO-2008 Sections 4.1.5.c, 4.7.1, 5.4.7.2	ISO/IEC 17025	IV.8.2, V.8.2, VI.8.2	No	OW CM does not discuss client confidentiality, but does discuss reporting stored results to clients before removal. TNI discusses protecting confidential information, both discuss records retention.
Ensure internal and external pressure does not affect personnel	EL-V1M2-ISO-2008 Section 4.1.5.b	ISO/IEC 17025	Not Found	No	TNI-(4.1.5.b) have arrangements to ensure that its management and personnel are free from any undue internal and external commercial, financial and other pressures and influences that may adversely affect the quality of their work; OW CM does not discuss the issue of internal and external pressure that would impede on competence, integrity, or impartiality.
Organization (lab and larger entity) structure and job specification of personnel	EL-V1M2-ISO-2008 Sections 4.1.5.e, 4.1.5.f, EL-V1M2-ISO-2008 Section 4.0	ISO/IEC 17025	III.11.1	Both standards mandate that the laboratory structure and personnel job specifications should be outlined in the Management Plan (TNI) or Quality Assurance Plan (OW CM.)	

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Organization					
Adequate supervision, supervision by personnel who are familiar with test. Technical managers document personnel qualifications?	EL-V1M2-ISO-2008 Sections 4.1.5.g, 4.1.5.h	ISO/IEC 17025	III.10.2, IV.1.1, V.1.1, VI.1.1	Both programs have specifications for personnel performing analysis. Neither standard indicates whether or not a technical manager documents personnel qualifications.	OW CM supervisors and personnel working at a specific type of lab (chemist, micro., and radio.) have their specifications of education etc. listed under appropriate section. TNI standard 5.2.6.1 for technical managers requires a BS with 24 credit hours in chemistry and 2 years in analysis, a year experience or masters/doctorate. OW CM does not have credit hour requirements in chemistry or analysis. TNI technical managers of limited laboratories (covering only one field) have an associate's degree in specific type with 16 hours college credit hours and 2 years in analysis in appropriate field.
QA manager who is independent but has access to upper management	EL-V1M2-ISO-2008 Sections 4.1.5.i, 4.1.7.1	ISO/IEC 17025	III.10.1-3, III.11	Both standards ask that quality assurance managers have direct access to upper management and be independent from the management.	OW CM does not indicate whether or not the QA manager has functions independent from laboratory operations for which they have QA oversight. It does state that the QA manager should be independent from the laboratory management, if possible. The OW CM plan does not state that the QA manager is responsible for conducting internal audits or for corrective actions (section III.11 indicates that the QA plan should state who that person is). TNI does not specify that the QA manager needs to have a bachelors degree

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Organization					
					and a year of experience in quality assurance. OW CM supervisors and personnel working at a specific type of lab (chemist, micro., and radio.) have their specifications of education etc. listed under appropriate sections. The OW CM document does not elaborate on the specific requirements of the QA manager position. TNI states that the technical director may also be the QA manager; (the QA manager has functions independent from laboratory operations for which they have QA oversight (4.1.7.1.b)).
Appoint deputies for key managerial personnel like the technical director and quality manager	EL-V1M2-ISO-2008 Section 4.1.5.j	ISO/IEC 17025	Not Found	No	TNI requires the laboratory to appoint deputies for key managerial personnel (NOTE: Individuals may have more than one function and it may be impractical to appoint deputies for every function). OW CM plan does not discuss appointing deputies for key management staff.
PT Testing	EL-V1M1-2008.1, EL-V2M2-ISO-2008		III.13.1, III.14, IV.7.2.1, V.7.2, VI.7.4	Both require PT testing and obtaining PT samples from acceptable certification suppliers.	TNI -Volume 1, Module 1 provides the requirements for laboratory participation in the TNI Proficiency Testing (PT) program. To obtain initial accreditation, the laboratory shall successfully analyze two unique TNI compliant PT samples (FoPT) for each field of accreditation being sought. The

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Organization					
					laboratory must obtain PT samples from a PTOB/PTPA approved PT provider. The results from the PT studies must be returned to the PT provider for analysis. The accrediting authority (AA) should have access to the results of the PT testing. OW CM-sites a CFR for maintaining certification status through proficiency testing. Drinking water labs must satisfactorily analyze a PT sample at least annually for chemical contaminants. The lab must obtain PT samples from a supplier acceptable to the appropriate certification authority (CA).

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Quality System					
Quality Assurance	EL-V1M2-ISO-2008 Section 5.9, individual technical modules	ISO/IEC 17025	III.11, IV.4.5, V.7, VI.7	Both include specific QA in individual method sections.	In general, OW CM specifies that laboratories should maintain a Quality Assurance Plan and lists the topics for inclusion in the plan. QA is discussed throughout the TNI document with requirements for a quality management plan for the laboratory operation. (Section EL-V1M2-ISO-2008 Section 5.9) as a technical requirement of

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Quality System					
					accreditation.
Laboratory documentation to ensure quality	EL-V1M2-ISO-2008 Sections 1.1, 4.2.2	ISO/IEC 17025	III.11, IV.7, V.7, VI.7	Quality documentation is required: OW CM's QA Plan, TNI 's QA Manual	OW CM states that laboratories must adhere to the method required QC and document these activities in a QA Plan. TNI states the laboratory's management system policies related to quality, including a quality policy statement, shall be defined in a quality manual (however named). OW CM suggests a QA Plan, whereas TNI requires a QA Manual.
Objectives included in QA plan	EL-V1M2-ISO-2008 Sections 4.2.2, 4.2.8.3.g, 4.2.8.3.h	ISO/IEC 17025	III.11, IV.7, V.7, VI.7	No	TNI standard indicates that a quality policy statement should be issued under the authority of top management. OW CM QA Plan does not include the laboratory's objectives but requires project data quality objectives per EPA QA/R-5.
Quality manual inclusions	EL-V1M2-ISO-2008 Sections 4.2.2, 4.2.5, 4.2.6, 4.2.8.3, 4.2.8.4	ISO/IEC 17025	III.11, IV.7, V.7, VI.7	Both list the required inclusions.	The OW CM does not have specific title page and table of contents instructions, TNI does. OW CM does not state that the quality manual should state the structure of QA plan. OW CM does not state that the QA manual should provide a reference of exceptions from the manual for managers to follow. TNI requires exceptions to be referenced or documented: 4.2.8.4.m).
Manual should include responsibilities of the QA manager.	EL-V1M2-ISO-2008 Sections 4.2.6, 4.2.8.2	ISO/IEC 17025	III.11.1 and III.10, IV.7, V.7, VI.7	Both include responsibilities of the QA manager.	

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Quality System					
List schedules of internal and external system and data quality audits and interlaboratory comparisons	EL-V1M2-ISO-2008 Sections 4.0 (interlab comp), 4.1.7.1.f, 4.11.5, 4.14, 4.2.8.4.c	ISO/IEC 17025	III.11.10	Both programs have requirements for internal QA checks.	OW CM states that the QA Plan should list schedules of internal and external system and data quality audits and interlaboratory comparisons (may reference SOP). TNI states the quality manual shall contain or reference verification practices, which may include inter-laboratory comparisons, proficiency testing programs, use of reference materials and internal quality control schemes (4.2.8.4.c)

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Document Control					
Control of all documents in the quality system	EL-V1M2-ISO-2008 Section 4.3	ISO/IEC 17025	III.11 (intro)	Yes	
Revision status of QA manual	EL-V1M2-ISO-2008 Sections 4.2, 4.3.2.1, EL-V2M1-ISO-2008 Section 5.7.4	ISO/IEC 17025	III.11 for QA plan and III.11.3 for procedures	Both programs require review and update of the QA manual/plan.	The OW CM manual requires annual review of both the QA plan and all SOPs. TNI requires an annual review of the quality manual during the internal audit. TNI also requires identifying the current revision, which OW CM does not address.
Specification of outdated/function/ availability of QA manual	EL-V1M2-ISO-2008 Section 4.3.2.2	ISO/IEC 17025	III.11, IV.7.1.1, V.7.1.1, VI.7.1.1	No	OW CM does not have a requirement that deals with handling invalid manuals once revisions are conducted. Section

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Document Control					
					III.11 simply states that it is the responsibility of the QA manager to conduct periodic revisions of the manual and make sure appropriate information is always included. TNI has defined procedures for handling obsolete documents.
Identification of QA Manual documents and ID type text	EL-V1M2-ISO-2008 Sections 4.3.2.3, 4.3.3.2	ISO/IEC 17025	III.11	No	The OW CM manual does not specifically state that QA manuals should include an identifier, page number, etc as required in EPA QA/R-5. OW CM requires the date of last revisions of SOPs. TNI recommends QA Plan document format with identifier, page number, revision, etc.
Review of documents (who and do they have references)	EL-V1M2-ISO-2008 Sections 4.1.7.1, 4.3.2, 4.3.3.1	ISO/IEC 17025	III.11.1	No	TNI-Changes to documents shall be reviewed and approved by the same function that performed the original review unless specifically designated otherwise. The designated personnel shall have access to pertinent background information upon which to base their review and approval (4.3.3.1).
Altered text highlighted and hand amendments, process for changing electronic documents	EL-V1M2-ISO-2008 Sections 4.3.3.2, 4.3.3.3, 4.3.3.4	ISO/IEC 17025	III.11.5, III.11.13, IV.8.2, IV.8.6, V.8.2, VI.8.2, VI.8.6	No	OW CM has control of electronic data throughout, however does not address altered text in electronic documents or QA documents. TNI requires the altered or new text to be identifiable in the document or the appropriate attachments (4.3.3.2). As well as, procedures to describe how changes in documents

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Document Control					
					maintained in computerized systems are made and controlled (4.3.3.4).

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Review of Requests, Tenders and Contracts					
Reviews	EL-V1M2-ISO-2008 Section 4.4	ISO/IEC 17025	Not Found	No	CM OW does not address review of contracts. TNI discusses it in detail.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Subcontracting					
Subcontracting	EL-V1M2-ISO-2008 Section 4.5, EL-V2M1-ISO-2008 Section 7.4, EL-V2M3-ISO-2008 Section 6.2	ISO/IEC 17025, ISO/IEC 17011	Not Found	No	OW CM does not discuss the issue of subcontracting.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Purchasing Services and Supplies					
Procedures for purchasing, reception, and storage of	EL-V1M2-ISO-2008 Section 4.6, EL-V1M2-ISO-2008	ISO/IEC 17025	VI.7	No	In the radiochemistry method of the OW CM, it is stated that the QA program should encompass the

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Purchasing Services and Supplies					
reagents and standards	Section 5.6.4.2				purchase of supplies. This is the only mention of a purchasing procedure in the OW CM. TNI requires a laboratory policy/procedure for the selection and purchasing of services and supplies.
Chain-of-Custody Procedures	EL-V1M2-ISO-2008 Sections 5.8.7.4, 5.8.7.5, 5.8.8, EL-V1M3-2008 Section 1.7.8.1	ISO/IEC 17025	III.12, Appendix A	Both discuss chain-of-custody procedures.	OW CM gives a detailed example of the chain-of-custody procedure in Appendix A. TNI also contains a detailed requirement for COC.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Service to Client					
Laboratory service to client and confidentiality	EL-V1M2-ISO-2008 4.7, EL-V2M1-ISO-2008 4.4	ISO/IEC 17025, ISO/IEC 17011	III.11.2	No	OW CM has "Process used to identify clients' Data Quality Objectives" listed as a QAP inclusion, but provides no details on the confidentiality or laboratory response to client complaints. TNI requires a laboratory to cooperate with the client, monitor their performance in relation to the work performed for that client, and provide confidentiality.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Control of Nonconforming Environmental Testing and/or Calibration Work					
Policy and procedure for nonconformity with own procedures	EL-V1M2-ISO-2008 Sections 4.9, 4.11, EL-V2M1-ISO-2008 Sections 5.5, 5.6	ISO/IEC 17025, ISO/IEC 17011	Not Found	No	TNI requires laboratories to have a policy/procedure to implement in the event of work that does not conform to testing procedures. OW CM does not require such a policy.
Action required for nonconformance	EL-V1M2-ISO-2008 Section 4.11, EL-V2M1-ISO-2008 Section 5.5	ISO/IEC 17025, ISO/IEC 17011	Not Found	No	TNI requires laboratories to have a policy/procedure to implement corrective actions when work does not conform to testing procedures. OW CM does require a corrective action procedure in the laboratory QAP, but does not mention nonconformance.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Preventive Action					
Preventive action	EL-V1M2-ISO-2008 Section 4.12, EL-V2M1-ISO-2008 Section 5.6	ISO/IEC 17025, ISO/IEC 17011	Not Found	No	TNI requires laboratories to have a procedure to identify potential sources of nonconformity. OW CM does not require such a policy.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Control of Records					
Record system	EL-V1M1-2008.1 5.3, EL-V1M2-ISO-2008 4.13,	ISO/IEC 17025 except Sect. 5.3	III.11.13, III.15, IV.8.2, V.8.2, VI.8.2,	Both include a list of required records. Both have a similar minimum length of	

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Control of Records					
	5.8.7(records are mentioned throughout Vol1)		IV.8.1, V.8.1, VI.8.1	record storage, OW CM: 6 years, TNI: 5 years.	
Data access and disposal procedures and other criteria	EL-V1M2-ISO-2008 Section 4.13	ISO/IEC 17025	III.5, III.11.12, III.15, IV.8, V.8, VI.8, III.11.13	No	OW CM does not describe disposal of records, legibility, and storage environment or procedures for preventing unauthorized access. OW CM does not have a set format for archiving files, naming files, or overwriting/obliterating old files. TNI discusses control of records in detail.
History of records	EL-V1M2-ISO-2008 Sections 4.13.3.a, 4.13.3.f	ISO/IEC 17025	Not Found	No	TNI requires laboratories to establish a record keeping system shall allow the history of the sample to be readily available.
Raw data	EL-V1M2-ISO-2008 Section 4.13.3.f.i	ISO/IEC 17025	IV.8.4, V.8.4, VI.8.4, IV.8.2, V.8.2, VI.8.2	Both programs discuss raw data management.	
Mistakes and alterations	EL-V1M2-ISO-2008 Section 4.13.2.3	ISO/IEC 17025	IV.8.3, V.8.3, VI.8.3, IV.8.2, V.8.2, VI.8.2	Yes	All records of analyses must be available for inspection by accrediting authorities. OW CM manual does not have this requirement.
Security of records	EL-V1M2-ISO-2008 Sections 4.13.3.f.xv, 4.13.3.e, 4.13.1.2, 4.13.1.3, 4.13.1.4	ISO/IEC 17025	IV.2, IV.8.2, V.8.2, VI.2.1, VI.8.2, III.11.8, III.11.13	Both require a suitable environment and security of electronic data.	OW CM provides general guidance for security and maintenance of data. TNI has specific requirements for confidentiality, security of data such as indexing of records and disposal procedures.
Samples	EL-V1M2-ISO-2008 Section 4.13.3	ISO/IEC 17025	III.11.4, III.11.5,	Both require similar sample/data documentation,	OW CM discusses required records throughout the manual, but not as a

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Control of Records					
			III.12, Appendix A, IV.6, V.6, VI.6, IV.8.3, V.8.3, VI.8.3	but TNI provides more detail.	list of required records. TNI requires sample/data documents that allow the history of the sample to be readily understood and list what is to be included.
Retention of raw data, final reports, SOPs, PT	EL-V1M2-ISO-2008 Section 4.13.3.f	ISO/IEC 17025	III.11.8, III.11.13, III.15, Introduction	Yes	
Sampling, analytical and administrative records	EL-V1M2-ISO-2008 Section 4.13.3.f	ISO/IEC 17025	IV.8.4, V.8.4, VI.8.4, IV.8.3, V.8.3, VI.8.3, III.10.1, III.11.1, III.12	Similar, but TNI requires more detailed sample/data records.	TNI requires more records including all manual calculations and a log of signatures for personnel authorized to sign laboratory records or deliverables. OW CM does not discuss required records at the same level of detail.
Reconstruction of Data	EL-V1M2-ISO-2008 Section 4.13.3.f	ISO/IEC 17025	IV.8.5	Both require adequate information be available to allow the auditor to reconstruct the final results for compliance samples and PT samples.	
Internal audits	EL-V1M2-ISO-2008 Section 4.14	ISO/IEC 17025	Not Found	No	According to TNI, the laboratory shall periodically conduct internal audits of its activities.
Steps taken after audit finds errors or deficiency	EL-V1M2-ISO-2008 Sections 4.14.2, 4.14.3, 4.14.4	ISO/IEC 17025	Not Found	No	TNI requires that in the event of audit findings, the laboratory shall take timely corrective action, record the findings and corrective actions, and follow-up.

Subject	TNI Standard Reference	TNI Reference	OW/DWLCP Reference	Similarities	Differences

		conform to ISO?			
Management Reviews					
Management Reviews	EL-V1M2-ISO-2008 Section 4.15, EL-V2M1-ISO-2008 Section 5.8	ISO/IEC 17025, ISO/IEC 17011	Not Found	No	OW CM does not discuss reviews that are conducted by quality assurance managers. TNI requires a management review of the QA/QC program in a laboratory.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Data Integrity					
Data integrity and follow-up of audits	EL-V1M2-ISO-2008 Sections 4.2.8.1, 4.2.8.1, 4.16	ISO/IEC 17025	Not Found	No	TNI requires the laboratory to establish and maintain a documented data integrity system Laboratories maintain SOPs that accurately reflect current laboratory activities, such as assessing data integrity.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Personnel					
Personnel	EL-V1M2-ISO-2008 Section 5.2	ISO/IEC 17025	III.10, III.11.1, IV.1, V.1, VI.1, 4.1.1.1	Similar Programs	TNI does not specify positions (NOT including technical directors, Sect. 5.2.6.1) or type/amount of education, experience, and/or training needed, only "appropriate". Waiver of academic training is also not discussed in the TNI standards.
Contracted Personnel	EL-V1M2-ISO-2008 Section 5.2.3	ISO/IEC 17025	V.1.1	Vague	TNI-The laboratory shall use personnel who are employed by, or under contract to, the laboratory.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Personnel					
					Where contracted and additional technical and key support personnel are used, the laboratory shall ensure that such personnel are supervised and competent and that they work in accordance with the laboratory's management system. OW CM only discusses contracted personnel for the supervisor/consultant position in the critical elements for microbiology chapter.
Personnel Job Descriptions	EL-V1M2-ISO-2008 Section 5.2.4	ISO/IEC 17025	III.11.1	Similar Requirements	
Personnel Records	EL-V1M2-ISO-2008 Section 5.2.5	ISO/IEC 17025	III.10.2, III.11.1, IV.1, V.1, VI.1, IV.8.4.6	Similar Requirements	
Up to Date Training	Individual technical modules Section 1.6.3		VI.1.5, IV.7.2.9	Similar requirements of ongoing demonstration of competence in the chemistry and radiochemistry sections.	OW CM only mentions ongoing demonstrations of proficiency for analysts and technicians in the critical elements for chemistry and radiochemistry chapter. TNI addresses ongoing demonstrations of proficiency in individual technical modules.
Activity Documentation	EL-V1M2-ISO-2008 Section 4.1.4	ISO/IEC 17025	III.11.7, IV.8, V.8, VI.8	Similar in regard to documenting the method and QC procedures used.	TNI-If the laboratory is part of an organization performing activities other than testing and/or calibration, the responsibilities of key personnel in the organization that have an involvement or influence on the testing and/or calibration activities of the laboratory shall be defined in order

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Personnel					
					to identify potential conflicts of interest.
Data Integrity Training	EL-V1M2-ISO-2008 Section 5.2.7	ISO/IEC 17025	Not Found	No	OW CM does not discuss data integrity training.
Laboratory Analyst and Technician	Individual technical modules Section 1.6		IV.1.2 and IV.1.3	No	OW CM specifies required education and experience for the laboratory analyst and technician, in addition to specialized training for the operation of analytical instrumentation. Additional requirements apply for the analysis of compliance samples. TNI-The analyst (s) shall demonstrate on-going capability by meeting the quality control requirements of the method, laboratory SOP, client specifications, and/or this Standard. TNI does not discuss educational or experience requirements for the laboratory analyst and technician.
Sampling Personnel	EL-V1M2-ISO-2008 Sections 4.13.2.1, 5.2, 5.2.5	ISO/IEC 17025	IV.1.4	Yes	OW CM requires that personnel who collect samples should be trained in the proper collection technique for all types of samples which they collect. Their technique should be reviewed by experienced sampling or laboratory personnel. TNI-The management shall authorize specific personnel to perform particular types of sampling, test and/or calibration, to issue test reports and calibration certificates, to give opinions and interpretations and to operate

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Personnel					
					particular types of equipment. The laboratory shall maintain records of the relevant authorization (s), competence, educational and professional qualifications, training, skills and experience of all technical personnel, including contracted personnel.
Waiver of Academic Training Requirement	EL-V1M2-2008 Section 5.2.6.2		IV.1.5	Similar with some exceptions	Similar, but TNI does not have a "Waiver". OW CM-The certification officer may waive the need for specified academic training, on a case-by-case basis, for highly experienced analysts. TNI -A person who does not meet the technical manager education credential requirements, but meets the listed requisites can be a technical manager.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Accommodations and Environmental Conditions					
Facilities and Control of Environmental Conditions	EL-V1M2-ISO-2008 Section 5.3	ISO/IEC 17025	IV.2, V.2, VI.2, III.11.4, III.11.11, III.11.12	Both require measures to prevent cross contamination.	TNI is not as specific as the OW CM in the standards for measures to prevent cross contamination. TNI does not describe the specific environment of the laboratory (i.e. cleanliness, instrument location, area for sample preparation, safety, and cleaning of glass wear).
Preventive maintenance procedures and schedules	EL-V1M2-ISO-2008 Sections 5.5.3, 5.5.5.g, 5.5.6, EL-V1M5-2008 Section 1.7.3.7.b.ii	ISO/IEC 17025	III.11.11	Yes	OW CM mentions that the preventative maintenance procedures and schedules should be addressed in the QA plan. TNI mentions that the laboratory shall have procedures for use and planned maintenance of measuring equipment to ensure proper functioning and in order to prevent contamination or deterioration.
Laboratory Safety	EL-V1M2-ISO-2008 Section 4.2.8.5.f.viii	ISO/IEC 17025	IV.4.4, V.4, VI.4.4	Similar	OW suggests that laboratory personnel apply general and customary safety practices as a part of good laboratory practices. Each laboratory is encouraged to have a safety plan as part of their SOP. Where safety practices are required in an approved method, they must be followed. For radiochemistry, OW CM requires certain protective equipment. TNI just states that safety shall be included or referenced in each test method.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Environmental Test and Calibration Methods and Method Validation					
Environmental Test and Calibration Methods and Method Validation	EL-V1M2-ISO-2008 Sections 5.4, 5.5	ISO/IEC 17025	III.11.4, III.11.5, III.11.6, III.11.7, III.11.8, III.11.9, IV.3, V.3, VI.3, IV.5.1, VI.7.1	Yes	OW CM discusses use of EPA-approved methods, whereas TNI discusses client-specified and laboratory-approved methods. TNI discusses that deviation from environmental test and calibration methods should occur only if the deviation has been documented, technically justified, authorized, and accepted by the customer. OW CM does not.
SOPs with dates of last revision	EL-V1M2-ISO-2008 Sections 4.2.8.5.c, 5.4.1	ISO/IEC 17025	III.11.3	Both require annual review, signatures, and dated revisions.	TNI requires archive of SOPs so previous data can be paired with SOP requirements in force at the time of analysis.
Methods manual	EL-V1M2-ISO-2008 Section 5.9.3, EL-V1M2-ISO-2008 Section 5.4.1, EL-V1M7-2008 Section 1.7.1.1.d(tox)		III.11, IV.5.1	Both require manuals to be available, and have provisions for using non-standard methods.	TNI specifies the items to be included or referenced for each test method. The quality control protocols specified by the laboratory's SOP shall be followed (see Section 4.2.8.5 in this Standard). The laboratory shall ensure that the essential standards outlined in the individual Technical Modules or mandated methods or regulations (whichever are more stringent) are incorporated into their method manuals. When it is not apparent which is more stringent, the QC in the mandated method or regulations is to be followed. OW CM states that laboratories should

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Environmental Test and Calibration Methods and Method Validation					
					prepare a written description of its QA activities.
Methods for clients	EL-V1M2-ISO-2008 Section 5.4.2	ISO/IEC 17025	III.11.2	No	OW CM has "Process used to identify clients' Data Quality Objectives" listed as a QAP inclusion, but provides no details on the topic. TNI discusses that the laboratory shall use methods that meet the needs of the customer.
Standards and Methods	EL-V1M2-ISO-2008 Sections 5.4.1, 5.4.2, 5.4.3, 5.4.4, 5.4.5	ISO/IEC 17025 except 5.4.4 and 5.4.5	IV.5, V.5, VI.5, IV.8.2, V.8.2, VI.8.2	Yes	OW CM does not discuss if laboratories must use the latest valid edition of a standard.
Method Confirmation and Demonstration	EL-V1M2-ISO-2008 Section 5.4, Individual technical modules Section 1.5	ISO/IEC 17025 except technical modules	III.11.9, V.5.6.1.4.1, V.5.6.1.4.5	Yes	OW CM does not discuss test method confirmation and validation (TNI 5.4.2, 5.4.5). OW CM specifies certain procedures that require initial and continuing demonstration of method capability and performance. TNI states that all methods should require those demonstrations and includes specific documentation and time requirements. TNI also addresses method validation in the individual technical modules.
Environmental Test and Calibration Methods	EL-V1M2-ISO-2008 Section 5.4	ISO/IEC 17025	Not Found	Similar	OW CM discusses use of EPA-approved methods, whereas TNI discusses client-specified and laboratory-approved methods.
Uncertainty	EL-V1M2-ISO-2008 Sections 4.13.2.1, 5.4.1, 5.4.6	ISO/IEC 17025 except Sect. 5.4.6	VI.7, 8.4.7, 8.5.9	No	OW CM only discusses uncertainty in the critical elements for radiochemistry chapter. TNI-The laboratory shall retain sufficient

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Environmental Test and Calibration Methods and Method Validation					
					information to facilitate, if possible, identification of factors affecting the uncertainty. The laboratory shall use appropriate methods and procedures for all tests and/or calibrations within its scope, including where appropriate, an estimation of the measurement uncertainty.
Calculations and Data	EL-V1M2-ISO-2008 Sections 4.13.2.2, 5.4.7.1, 5.9.3.a.v, individual technical modules	ISO/IEC 17025 except Sect. 5.4.7.1	III.11.3, III.11.8, III.11.9, III.11.13, IV.8.2, IV.8.6, V.8.2, VI.7.6, VI.8.2, VI.8.6	Yes	
Laboratory Software Configuration or Modification Validation	EL-V1M2-ISO-2008 Sections 4.13.3.f.xv, 5.4.7.2, 5.5.5	ISO/IEC 17025 except Sect. 5.4.7.2	III.11.13, IV.8.6, VI.8.6	Yes	
Calibration Curve	EL-V1M2-ISO-2008 Sections 5.5.1, 5.9.3.a.iii, individual technical modules	ISO/IEC 17025	IV.7.2.3	Yes	
Calibration Check	EL-V1M2-ISO-2008 Sections 5.9.3.a.iii, 5.5.10, 5.6.3.3, individual technical modules, EL-V1M4-2008 Section 1.7.2 (chem), EL-V1M5-2008 Section 1.7.2 (microb), EL-V1M6-	ISO/IEC 17025 except Sect. 5.6.3.3 and technical modules	IV.7.2.4	Yes	

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Environmental Test and Calibration Methods and Method Validation					
	2008 Section 1.7.1.b(radio)				
Quantitation of Multicomponent Organic Analytes	EL-V1M4-2008 Sections 1.7.2.b, 1.7.3.2.3.b (chem)		IV.7.2.10	Both have provisions for quantitation of multicomponent organic analytes using a representative number of components.	OW CM (chemistry) indicates the analyst's professional judgment should be used and refers to EPA SW 846 for more information. A representative number (5-9) of peaks is suggested. TNI (chemistry) indicates that for continuing calibration and LCS for multi-component analytes, a representative chemical related substance or mixture can be used.
Low Level Quantitation	EL-V1M6-2008 (radiochem)		IV.7.2.12	No	OW CM-Minimum reporting limits (MRL) must be below the MCL. Laboratories should run a Laboratory Fortified Blank (LFB) at their MRL every analysis day and should not report contaminants at levels less than the level at which they routinely analyze their lowest standard. TNI-For low level samples the laboratory may analyze duplicate laboratory control samples or a replicate matrix spike to determine reproducibility within a preparation batch in place of a sample replicate.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences

Equipment					
Laboratory Equipment and Instrumentation	EL-V1M2-ISO-2008 Section 5.5, individual technical modules	ISO/IEC 17025 except technical modules	IV.3, V.3, VI.3	Both standards cover equipment and instrumentation	OW CM does not mention the use of equipment outside of a laboratories permanent control. TNI does not mention specific types of equipment and/or specific maintenance/calibration requirements.
Calibration	EL-V1M2-ISO-2008 Section 5.5	ISO/IEC 17025	IV.3, 4, 5, 6, 7; V.3, 4, 5, 6, 7; VI.3, 4, 5, 6, 7; III.11.6	Yes	Calibration requirements in the TNI standards are divided into two parts (analytical support equipment and instrument calibration). TNI-Instrument calibration requirements presented in the technical modules. Calibration requirements in the OW CM standards are found within the equipment, general laboratory practices, analytical methodology, sample, and quality control sections of each critical elements chapter (Section 3, 4, 5, 6, and 7 of Ch. IV, V, and VI).
Support Equipment	EL-V1M2-ISO-2008 Sections 5.5, 5.5.13.1	ISO/IEC 17025	III.11.9, III.11.11, III.11.12, IV.3, IV.7.1, V.3, V.8.5, VI.3, VI.7	Yes	OW CM specifies that preventive maintenance documents should be kept for five years. TNI does not mention specific types of equipment and/or specific maintenance/calibration requirements. OW CM specifies type of equipment, proper maintenance, and calibration for certain pieces of equipment needed in each critical element chapter.
Specific Device Accuracy	EL-V1M2-ISO-2008 Section 5.5.13.1.e	ISO/IEC 17025	Not Found	No	OW CM does not discuss mechanical volumetric dispensing devices or glass microliter syringes. TNI-Volumetric dispensing devices (except Class A glassware and Glass microliter syringes) must be

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Equipment					
					checked for accuracy on a quarterly basis.
Autoclave	EL-V1M5-2008 Section 1.7.3.7.b.ii		V.3.5	Both require autoclave operation records.	OW CM only mentions the use of an autoclave in the critical elements for microbiology chapter. OW CM does not state that pressure should be recorded for each run of the autoclave. TNI-Records of autoclave operations shall be maintained for every cycle. Records shall include: date, contents, maximum temperature reached, pressure, time in sterilization mode, total run time (may be recorded as time in and time out) and analyst's initials.
Instrument Calibration	EL-V1M2-ISO-2008 Section 5.5, individual technical modules	ISO/IEC 17025 except technical modules	III.11.3, III.11.9, IV.3, 7; V.3, 7; VI.3, 7, III.13.2	Similar but not identical	TNI standard does not specify detailed procedural steps for calibration, but establishes the essential elements for selection of the appropriate techniques. OW CM does not discuss verification of initial instrument calibrations by a standard obtained from a second manufacturer or lot (TNI 1.7.1.1.d for chem)(1.7.1.a.iv for radio). OW CM does not state if the lower calibration standard should be above the detection limit. TNI-the lowest cal point shall be at or below the LOQ. (1.7.1.1.f for chem)
Zero point and single point calibration standard	EL-V1M1-2008.1 Section 5.2.1.b, EL-V1M4-2008 Section	ISO/IEC 17025 except technical	Not Found	No	OW CM does not discuss instrument technology with validated techniques from

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Equipment					
	1.7.1.1.h (chem)	modules			manufacturers or methods employing standardization with a zero point and a single point calibration standard.
Calibration Results	EL-V1M2-ISO-2008 Sections 5.5.2		III.11.9, III.11.12, IV.3, 7; V.3, 7; VI.3, 7	Yes	
Equipment use and maintenance	EL-V1M2-ISO-2008 Sections 5.5.6, 5.5.7		IV.3, 4, 5, 6, 7; V.3, 4, 5, 6, 7; VI.3, 4, 5, 6, 7; III.11.11, III.11.12	Yes	OW CM states that corrective actions are performed, described, and documented. OW CM does not discuss a “control of nonconforming work” procedure (TNI 5.5.7).
Equipment Records	EL-V1M2-ISO-2008 Sections 5.4.1, 5.5.3, 5.5.4, 5.5.5, 5.5.13.1, EL-V1M5-2008 Section 1.7.3.7.b.ii (microb)	ISO/IEC 17025 except technical modules	III.11.11, V.8.5, VI.7	OW CM's microbiology and radiochemistry sections require equipment records similar to TNI.	OW CM does not specify the exact items needed in records for equipment or labeled on equipment. TNI-The laboratory must have instructions on the use and operation of all relevant equipment, and on the handling and preparation of items for testing and/or calibration, or both.
Continuing instrument calibration verification	EL-V1M2-ISO-2008 Sections 5.9.3.a.iii, 5.5.10, 5.6.3.3, individual technical modules, EL-V1M4-2008 Section 1.7.2 (chem), EL-V1M5-2008 Section 1.7.2 (microb), V1M6 Section 1.7.1.b (radio)	ISO/IEC 17025 except Sect. 5.6.3.3 and technical modules	III.11.6, IV.7.2.4, VI.3.1.2, VI.3.1.5	No	In OW CM continuing instrument calibration verification is discussed in the chemistry and radiochemistry methods of the OW CM. TNI requires a standard from a second manufacturer or lot as continuing calibration verification for chemical testing and radiochemical testing.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Measurement Traceability					
Measurement Traceability	EL-V1M2-ISO-2008 Section 5.6		IV.3, 4, 5, 6, 7; V.3, 4, 5, 6, 7; VI.3, 4, 5, 6, 7	Yes	
Testing Laboratories	EL-V1M2-ISO-2008 Sections 5.4.6, 5.9.3, EL-V1M7-2008 Sections 1.7.1.1(tox),1.7.1.6.q	ISO/IEC 17025 except Sect. 5.4.6 and technical modules	III.11.6, III.11.13, IV.3, 4, 5, 6, 7; V.3, 4, 5, 6, 7; VI.3, 4, 5, 6, 7	Yes	
Reference Standards and Materials	EL-V1M2-ISO-2008 Sections 4.2.8.4, 5.6.3, 5.6.4, 5.9.1, 5.9.3, individual technical modules	ISO/IEC 17025 except Sect. 5.6.3 and technical modules	IV.3, IV.7, V.3, V.7, VI.3, VI.7, III.11.3, III.11.13	Yes	OW CM specifies type of equipment, reference material, and calibration for certain pieces of equipment needed in each critical element chapter. TNI does not mention a specific type of reference standard or material and/or specific calibration requirements, however it states "Where possible, traceability shall be to national or international standards of measurement or to national or international standard reference materials" (TNI 5.6.4.1.b).
Records and Label	EL-V1M2-ISO-2008 Sections 5.6.4.2, 5.8.5, 5.8.6, individual technical modules	ISO/IEC 17025 except Sect. 5.6.4.2 and technical modules	III.11.6, 11.7, 11.9, 11.13	Yes	OW CM does not specify the exact items needed in records or labeled for all standards, reagents, reference materials and media.
Record keeping procedures	EL-V1M1-2008.1 Section 5.3, EL-V1M2-ISO-2008	ISO/IEC 17025 except Sect. 5.3	III.11.13, III.15, IV.8.2, V.8.2, VI.8.2,	Both have lists of inclusions for their individual record keeping procedures. Have	OW CM-records should be maintained for 6 years. A list of inclusions is provided. TNI-records

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Measurement Traceability					
	Sections 4.13, 5.8.7, (records are mentioned throughout Vol1)		IV.8.1, V.8.1, VI.8.1	similar record retentions - OW CM 6 years and TNI 5 years.	should be maintained for 5 years. Provides a list of information necessary for reconstruction of data.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Sampling					
Sampling	EL-V1M2-ISO-2008 Sections 5.4.1, 5.4.2, 5.5.2, 5.7, 5.8.4 Note 2, individual technical modules	ISO/IEC 17025 except technical modules	III.11.4, III.11.5, III.11.9, III.11.13	Yes	
Sample Collector	EL-V1M2-ISO-2008 Sections 4.13.2.1, 5.2.5	ISO/IEC 17025	IV.6.5	No	OW CM makes a general statement about sample collector training requirements. The records must include the identity of personnel responsible for the sampling, performance of each test and/or calibration and checking of results. TNI requires name of collector to be documented
Sample Compositing	Not Found		IV.6.7	No	OW CM–Compositing must be done in the laboratory, and only if the laboratory detection limit is adequate for the number of samples being composited (maximum of five).

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Handling of Samples					
Samples	EL-V1M1-2008.1 Sections 5.0, 5.8, individual technical modules	ISO/IEC 17025 except Sect. 5.0 and technical modules	III.11.4, III.11.5, IV.6, V.6, VI.6	Yes	
Identification	EL-V1M2-ISO-2008 Sections 5.8.2, 5.8.5	ISO/IEC 17025	III.11.4, III.11.5, IV.6, V.6, VI.6, Appendix A	Yes	
Temperature	EL-V1M2-ISO-2008 Sections 5.3.2, 5.8.4, 5.8.9.a.i, individual technical modules	ISO/IEC 17025 except technical modules	IV.6.2, V.6.3	Yes	TNI mentions regulatory or method criteria for temperature, but gives a general guide for sample temperature if none is given. Also has more information in individual technical modules. OW CM is more specific than TNI on shipping and storage temperature.
Neutralization (stabilization)	EL-V1M2-ISO-2008 Sections 5.8.4, 5.8.9.a, EL-V1M5-2008 Sections 1.7.5.b (microb)	ISO/IEC 17025 except technical modules	V.3.15.4	OW CM and TNI specify that sodium thiosulfate should be added to each container to neutralize any residual chlorine.	OW CM and TNI standards specify that sodium thiosulfate should be added to each container to neutralize any residual chlorine, but OW CM does not list minimum concentrations that samples should be neutralized to. TNI instructs laboratory to neutralize at minimum 5 mg/l of chlorine for drinking water and 15 mg/l of chlorine for wastewater samples.
Sample Rejection	EL-V1M2-ISO-2008 Sections 5.8.3, 5.8.7.2.a	ISO/IEC 17025	IV.6.1	No	Only OW CM discusses rejection of samples in the critical elements for chemistry chapter.
Maximum Holding Times	Not Found EL-V1M2-ISO-2008	ISO/IEC 17025 except Sect.	IV.6.3	No	OW CM has a general statement indicating that holding times are to

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Handling of Samples					
	Sections 4.13.3.f.v, 5.10.11.a, EL-V1M7-2008 Section 1.7.1.6.s(tox)	5.10.11.a and technical modules			be followed according to the specific method being used. TNI specifies hold time prescribed by the method and approved by the regulatory agency. TNI does present some hold times, such as: "The maximum holding time of effluents (elapsed time from sample collection to first use in a test) shall not exceed thirty-six (36) hours; samples may be used for renewal up to seventy-two (72) hours after first use except as prescribed by the method and approved by the regulatory agency having authority for program oversight" (EL-V1M7-2008 1.7.1.6.s).
Sample Collection and Transport	EL-V1M2-ISO-2008 Sections 5.4, 5.7, 5.8, individual technical modules	ISO/IEC 17025	IV.6.4	Both OW and TNI make general statements and indicate that sample collection is to be followed as specified in the method being used.	
Chain-of-Custody	EL-V1M2-ISO-2008 Sections 5.8.7.2.b.i, 5.8.7.4, 5.8.7.5, 5.8.8, EL-V1M3-2008 Section 1.7.8.1(asbestos)	ISO/IEC 17025 except technical modules	Appendix A, IV.8, V.8, VI.8	Both discuss chain-of-custody procedures.	TNI is not as specific in the chain-of-custody procedures for handling of samples and does not include examples of chain-of-custody forms in their standards.
Sample Acceptance	EL-V1M2-ISO-2008 Section 5.8.6	ISO/IEC 17025	IV.6.1 V.6, VI.6	OW CM states the laboratory should document its rejection criteria. TNI requires the laboratory to develop an overall sample acceptance	

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Handling of Samples					
				policy addressing the items listed in Section 5.8.6.	
Handling/Storage of Samples	EL-V1M2-ISO-2008 Section 5.8		III.11.4, III.11.5, IV.6, V.6, VI.6, Appendix A.D	Yes	
Storage Temperature	EL-V1M2-ISO-2008 Sections 5.8.4, 5.8.9		III.11.5, IV.6.2	Both discuss storing samples at appropriate temperatures.	Temperature requirement is only discussed in the critical elements for chemistry chapter of the OW CM standards. TNI discusses it more broadly, mentions using method specified temperatures for storage.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Assuring the Quality of Environmental Test and Calibration Results					
Quality Control	EL-V1M2-ISO-2008 Sections 5.9.1, 5.9.2, 5.9.3	ISO/IEC 17025	III.11, IV.7, V.7, VI.7	Yes	

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Reporting the Results					
Data reduction, validation, reporting and verification	EL-V1M2-ISO-2008 Section 5.10, Individual technical modules		III.11.8	No	OW CM only mentions that the procedure for data reduction, validation, and reporting should be included in the QA Plan.
Sample Report	EL-V1M2-ISO-2008 Sections 5.10.2, 5.10.3	ISO/IEC 17025	III.11.8, IV.6.6, VI.8.5, Appendix A	Both OW CM and TNI identify the minimal requirements of what should be included in sample reports.	OW CM discusses sample report format in the chemistry and radiochemistry methods. TNI encompasses all methods and requires more information for the Sample Report, such as consecutive page numbers, accreditation statements, management signatures etc.
Calibration Reporting Requirements	EL-V1M2-ISO-2008 Sections 5.10.1, 5.10.2, 5.10.4	ISO/IEC 17025 except Sect. 5.10.4	IV.8.4.5, VI.8.4.5	Yes	OW CM does not discuss calibration certificates or specific reporting requirements for calibration. However, OW CM does discuss calibration requirements and specifies type of equipment, reference material, and calibration for certain pieces of equipment needed in each critical element chapter. OW CM's critical elements of chemistry and radiochemistry chapters state that calibration and standards information must be reported in the analytical records. TNI specifies the actual items and circumstances that should be reported for calibration.
Subcontractor Reports	EL-V1M2-ISO-2008 Section 5.10.6		Not Found	No	OW CM does not discuss reporting requirements for work performed by contractors. TNI-When the test

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Reporting the Results					
					report contains results of tests performed by subcontractors, these results shall be clearly identified. The subcontractor shall report the results in writing or electronically. When a calibration has been subcontracted, the laboratory performing the work shall issue the calibration certificate to the contracting laboratory.
Electronic Transmission of Results	EL-V1M2-ISO-2008 Sections 5.4.7, 5.10.7		Not Found	No	OW CM does not discuss requirements in the case of transmission of environmental test or calibration results by telephone, telex, facsimile or other electronic or electromagnetic means. TNI-In the case of transmission of test or calibration results by telephone, telex, facsimile or other electronic or electromagnetic means, the standard requires conformance to the International Standards Organization requirement (see also 5.4.7).
Understandable Format	EL-V1M2-ISO-2008 Section 5.10.8		III.11.13, IV.8, V.8, VI.8, Appendix A	Yes	TNI-The format shall be designed to accommodate each type of test or calibration carried out and to minimize the possibility of misunderstanding or misuse.
Amendment to Test Reports and Calibration Certificates	EL-V1M2-ISO-2008 Section 5.10.9		Not Found	No	OW CM standards do not discuss requirements for amendments to test reports or calibration certificates.
Action in Response to	EL-V1M2-ISO-2008	ISO/IEC 17025	IV.9	No	TNI does not specify the

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Reporting the Results					
Noncompliant Laboratory Results	Section 5.10.3.1.b				notification of water authority.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Demonstration of Capability					
Initial Demonstration of Capability (DOC)	Individual technical module Section 1.6.2		IV.7.2.9, IV.8.4.6, V.5.6.1.4, III.11.9, IV.7.2.11	No	OW CM does require an Initial Demonstration of Capability be performed, but does not indicate when it is necessary. TNI-An initial DOC shall be conducted prior to using any test method, and at any time there is a change in instrument type, personnel or test method or any time that a method has not been performed by the laboratory or analyst in a twelve (12) month period.
Specifics of sample preparation and reporting	Individual technical module Sections 1.6.2.2, 1.6.3		IV.7.2.9, IV.8.4.6, V.5.6.1.4	No, program specific differences exist.	OW CM does not indicate that the samples used are from outside sources. For biological testing, TNI does not specifically state that the DOC test consists of ten reagent water samples spiked with enumerated sewage or equivalent at 1-2 PFU per sample for each coliphage type used or for each coliphage type analyzed, three field samples are spiked with 1-2 PFU, however it does give guidelines to prepare DOC samples. TNI

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Demonstration of Capability					
					provides non-specific requirements for initial and on-going DOC in each test module. OW CM does not indicate the steps that need to be taken if the initial DOC fails. TNI does.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Essential Quality Control Requirements: Chemical Testing					
Availability of QC Information	EL-V1M2-ISO-2008 Section 4.13.3.c	ISO/IEC 17025	IV.7.1.2	All quality control information should be readily available for inspection by auditors.	
Balances and Weights	EL-V1M2-ISO-2008 Section 5.5.13.1	ISO/IEC 17025	IV.7.1.3	Should be appropriate for the application to be used; balances should be calibrated at least annually. TNI requires that support equipment be calibrated or verified at least annually.	
Color Standards	Not Found		IV.7.1.4	No	TNI has no specific information about color standards.
Temperature Measuring Devices	EL-V1M2-ISO-2008 Section 5.5.13.1, EL-V1M5-2008 Section 1.7.3.7.b.i	ISO/IEC 17025	IV.7.1.5	Both require calibration or calibration verification.	OW CM has more detail and additional (more frequent calibration) requirements for digital thermometers, thermocouples, and infrared detection devices. TNI requires that support equipment be calibrated or verified at least annually.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Essential Quality Control Requirements: Chemical Testing					
Traceability of Calibration	EL-V1M2-ISO-2008 Section 5.6.3	ISO/IEC 17025	IV.7.1.6	Both require calibrations of all measurement devices be traceable to national standards whenever applicable.	
Negative Control Purpose	EL-V1M4-2008 Section 1.7.3.1		IV.7.2.5	Both require a blank.	OW CM-blank should be analyzed as required by the method. TNI requires one method blank analysis at a minimum per preparation batch.
Laboratory Control Samples	EL-V1M4-2008 Section 1.7.3.2		IV.7.2.2	Both require a Laboratory Control Samples (LCS).	OW CM at least one LCS should be analyzed per quarter and LFBs as required by the method. TNI requires one LCS analysis at a minimum per preparation batch.
Matrix Spikes	EL-V1M4-2008 Section 1.7.3.3		IV.7.2.7	Both require a Matrix Spike (MS).	Both OW CM and TNI mention that the test method specifies the frequency of MS analysis, however OW CM does not mention Matrix Spike Duplicates (MSDs).
Detection Limits	EL-V1M4-2008 Section 1.5.2		IV.7.2.9, 7.2.11	Yes	OW CM is much more specific than TNI in stating the procedures and requirements for determining detection limits.
Quality Control Samples	EL-V1M4-2008 Section 1.7.3		IV.7.2.2	Yes	OW CM specifies frequency and procedures for detection limit studies of quality control samples.
Analytical Test	EL-V1M4-2008 Section 1.4 (Method Selection)		Not Found	No	OW CM does not discuss the involvement of the analytical method process or the matrix of interest. TNI-If there is not a regulatory requirement for the parameter/method combination, the

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Essential Quality Control Requirements: Chemical Testing					
					parameter/method combination need not be validated under 1.5.1.b as a non-standard method if it can be analyzed by another similar standard method of the same matrix and technology.
Detection Documentation	EL-V1M4-2008 Section 1.5.2		IV.8	Yes	
Data Reduction Documentation	EL-V1M4-2008 Section 1.7.3.4		IV.7, 8	Yes	OW CM specifies the process and method of documentation. TNI specifies that the procedures for data reduction shall be documented.
Quality of Standards and Reagents	EL-V1M4-2008 Section 1.7.3.5		IV.4.1.1, 4.2.1, 4.3.1	Both specify the reagents must meet the method requirements.	TNI specifies that the quality of water sources shall be monitored, documented, and shall meet method specified requirements.
Verification of Titrants	EL-V1M4-2008 Section 1.7.3.5.c		Not Found	No	OW CM does not discuss the verification of concentrations of titrants, TNI does.
Selectivity	EL-V1M4-2008 Section 1.7.3.6		Not Found	No	TNI lists requirements for selectivity, OW CM does not.
Glassware preparation	Not Found		IV.4.2.2, IV.4.2.3	No	OW CM refers glassware cleaning requirements to those specified in the methods (summaries provided). TNI does not discuss glassware preparation in this technical module.
Analytical Methods - Analyses approved by the State	EL-V1M4-2008 Section 1.4		IV.5.2	No	TNI states "When a laboratory is required to analyze a parameter by a specified method due to a regulatory requirement, the parameter/method combination is recognized as a standard method".

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Essential Quality Control Requirements: Chemical Testing					
Sample Collection, Handling, and Preservation	EL-V1M2-2008 Sections 5.7, 5.8, EL-V1M4-2008 Section 1.7.5		IV.6.7	Yes	OW CM was more specific in the requirements.
Quality Control	EL-V1M4-2008 Section 1.7.3		Entire Section of IV.7 (except 7.1.1 to 7.1.3, 7.2.5, 7.2.9, and 7.2.11)	Yes	OW CM was more specific in the requirements.
Action Response to Noncompliant Laboratory Results	Not Found		Entire Section of V.9	No	The listed OW CM sections on action regarding QC failure or noncompliant lab results are either not found or only briefly discussed in TNI.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Whole Effluent Testing Detailed Method Review					
Toxicity Testing	EL-V1M7-2008		Not Found	No	OW CM does not discuss or contain a section regarding toxicity testing.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Microbiology Testing Detailed Method Review					
Supervisor/consultant and analyst	EL-V1M2-2008 Section 5.2.6.1		V.1.1, V.1.2	TNI and OW CM have similar educational requirements.	TNI and OW CM have similar educational requirements, but TNI requires 16 college credit hours microbiology and biology while

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Microbiology Testing Detailed Method Review					
					OW CM requires one course if the degree is in a field other than microbiology. OW CM also states that the supervisor needs to have two weeks of federal training of drinking water analysis or 80 hours on the job training and a laboratory may have consultants fulfill these duties if documentation showing that the consultant is acceptable to the state is presented during audits. OW CM requires that analysts have at least a high school degree; three months of microbiology testing experience in water, milk, or food media. TNI does not specify media or necessary bench criteria.
Waiver of academic training	EL-V1M2-2008 Section 5.2.6.2		V.1.3	Similar	TNI does not have an experience "Waiver" for academic training. OW CM-The certification officer may waive the need for specified academic training, on a case-by-case basis, for highly experienced analysts. TNI-A person who does not meet the technical manager education credential requirements, but meets the listed requisites can be a technical manager.
Personnel records	EL-V1M5-2008 Section 1.6 (DOC), V1M2-2008 Section 5.2		V.1.4	OW CM and TNI require similar records for personnel.	TNI makes this the responsibility of the management and includes an analyst signature record sheet.
Sterility Checks and Blanks	EL-V1M5-2008 Section 1.7.3.1		V.3, 4, 5, V.5.1.6.4	Yes	TNI does not list control organisms or frequency for testing

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Microbiology Testing Detailed Method Review					
					commercially prepared medium. OW CM has specific requirements.
Filtration	EL-V1M5-2008 Sections 1.7.3.1.b.ii, 1.7.3.1.b.v		V.5.4.1.2, V.5.4.1.3	Both discuss rinsing the filtration funnels.	OW CM states that the funnel may be exposed to UV light at specified wavelength and time. OW CM states to test for growth and all data must be rejected if the control indicates contamination. TNI does not.
Container Sterility	EL-V1M5-2008 Section 1.7.3.1.b.iii		V.4.2	Both specify one check per lot (commercial) or batch (lab-prepared).	TNI does not specify the procedure for confirming container sterility such as amount and type of broth, incubation, etc.
Reagent grade water	EL-V1M5-2008 Section 1.7.3.5.c		V.4.3	Yes	OW CM provides quality requirements. Both have specific parameters with associated frequencies for testing.
Dilution Water Sterility	EL-V1M5-2008 Section 1.7.3.1.b.iv		V.4.4.3	Both specify one check per lot (commercial) or batch (lab-prepared).	TNI does not specify the procedure for confirming container sterility such as amount and type of broth, incubation, etc.
Dilution/rinse Water	Not Found		V.4.4 (except V.4.4.3 above), V.5.3.2.1.1, 4.3.2, 8.2	No	
Plate Counts	Not Found		V.5.4.2.8	No	OW CM does not discuss using only one microbiology analyst for duplicate plate counts in a laboratory.
Proficiency Test	EL-V1M2-2008 Section 5.0, EL-V1M5-2008 Sections		V.7.2, V.8.2	Yes	

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Microbiology Testing Detailed Method Review					
	1.5, 1.71				
Target Organisms	Not Found		V.4, V.5	No	
Test methods	EL-V1M5-2008 Section 1.4		V.3, 4, 5, 6, 7	Yes	
Media	EL-V1M5-2008 Sections 1.7.3.5.a, 1.7.3.5.b, 1.7.3.5.d		V.5.1.6, III.11, V	Yes	
Product Shelf Life	EL-V1M5-2008 Section 1.7.3.5		V.5.1.6.1, 5.1.6.2, 5.1.6.3	Yes	OW CM notes that caked or discolored dehydrated media should be discarded. TNI mentions using media during its shelf life.
Media Documentation	EL-V1M5-2008 Section 1.7.3.5.d		V.5.1.6.2, 5.1.6.3	Yes	For media prepared in the laboratory and media prepared commercially, OW CM does not state that the manufacturer, the amount of media prepared, and the expiration date must be documented. TNI does not state that sterilization time and temperature must be recorded.
Selectivity	EL-V1M5-2008 Section 1.7.3.6		Not Found	No	OW CM does not mention the preservation, preparation, and use of reference stocks.
Lab Facilities	EL-V1M5-2008 Section 1.7.3.7.a		V.2	Yes	TNI does not require laboratory to maintain effective separation between areas where activities are incompatible.
Temperature Measuring Devices	EL-V1M5-2008 Section 1.7.3.7.b.i		V.3.3	Yes	OW CM states the actual calibration, record, etc. requirements for temperature measuring devices. TNI only discusses if devices are "appropriate". TNI requires at least

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Microbiology Testing Detailed Method Review					
					annual verification (see EL-V1M2-2008, Section 5.5.13.1) OW CM gives more detail.
Autoclaves	EL-V1M5-2008 Section 1.7.3.7.b.ii		V.3.5.1, V.3.5.2	Yes	OW CM does not discuss initial evaluation of the autoclave. TNI does not discuss time requirements for the autoclave.
Autoclave Temperature	EL-V1M5-2008 Section 1.7.3.7.b.ii		V.3.5.4	Yes	OW CM does not discuss the use of temperature sensitive tape.
Autoclave Records and Maintenance	EL-V1M5-2008 Section 1.7.3.7.b.ii		V.3.5.3	Yes	OW CM does not discuss or require a pressure check and calibration of the temperature device during annual maintenance of the autoclave. TNI lists the autoclave operation records that must be maintained. TNI requires annual maintenance and includes a pressure check and calibration of the temperature device.
Autoclave Timing	EL-V1M5-2008 Section 1.7.3.7.b.ii		V.3.5.5	Yes	TNI requires the autoclave mechanic timing device to be checked quarterly against a stopwatch and documented.
Autoclave Parts	Not Found		V.3.5.6	No	TNI does not mention autoclave door seals and drain screens.
Volumetric Equipment	EL-V1M5-2008 Section 1.7.3.7.b.iii		V.3	Yes	OW CM specifies types of volumetric equipment and requirements for each. TNI requires volumetric equipment with movable parts be verified for accuracy quarterly, other volumetric equipment verified once per lot prior to first use.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Microbiology Testing Detailed Method Review					
UV Instruments	EL-V1M5-2008 Section 1.7.3.7.b.iv		V.3.16.2	Yes	TNI requires UV instruments tested quarterly for effectiveness
UV Cleaning	Not Found		V.3.16.1	No	TNI does not discuss the frequency or process for cleaning the UV instruments.
UV Support Equipment	Not Found		V.3	No	OW CM specifies type of calibration requirements for support equipment. TNI specifies calibration according to the method specified requirements.
Incubator, Water Baths, and Ovens	EL-V1M5-2008 Section 1.7.3.7.b.v		V.3.4.1, 3.4.2, 3.6.1	Yes	OW CM specifies temperature and time in incubators, ovens, and water baths. TNI requires the temperature of incubators and water baths to be documented twice daily each day of use
Oven	EL-V1M5-2008 Section 1.7.3.7.b.v.2		V.3.6.3, 3.4.2, 3.6.3	Yes	TNI requires ovens to be checked for sterilization effectiveness monthly.
Glassware	EL-V1M5-2008 Section 1.7.3.7.b.vi		V.3.14.1	Yes	TNI does not discuss a description of plastic items.
Glassware Inhibitory Residue Test	EL-V1M5-2008 Section 1.7.3.7.b.vi.3		V.4.5.3	Yes	TNI requires annual testing and with every change in washing procedure
Glassware pH Reaction	EL-V1M5-2008 Section 1.7.3.7.b.vi.4		V.4.5.4	Yes	OW CM specifies the procedure for this test. TNI requires this test at least once daily each day of washing
Glassware Washing	EL-V1M5-2008 Section 1.7.3.7.b.vi		V.4.5.1	Yes	Similar, however TNI does not specify the use of distilled or deionized water for the final rinse.
Laboratory equipment and supplies	EL-V1M5-2008 Section 1.7.3.7.b		V.3.3, 3.5, 3.6, 3.13,	No	OW CM is more specific in discussing laboratory equipment in

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Microbiology Testing Detailed Method Review					
			3.15, 3.17, V.3.1, 3.2, 3.7, 3.8, 3.9, 3.10, 3.11, 3.12, 3.14, 3.15, and 3.17		general. Such as the temperature monitoring devices, OW CM discusses having a QC record book for specific temperature device information; whereas, TNI does not. TNI and OW CM standards on pipettes differ, and OW CM specifies that they have a precision and accuracy within 2.5%. TNI discusses volumetric equipment as a whole and not pipettes specifically. OW CM contains separate sections in the standard for volumetric glass and pipettes. TNI discusses UV Instruments in general OW CM contains separate standards for each type. TNI does not discuss size of containers sufficient for fermentation media, legible markings in graduated cylinders and pipettes (2.5% tolerance), and tube closings. The listed OW CM sections that were not previously discussed regarding laboratory equipment and supplies are either not found or only briefly discussed in the TNI standard. In most cases, OW CM was more specific in the maintenance and calibration requirements.
General Laboratory Practices	Not Found		V.4.1, 4.4	No	Not found in TNI. In most cases, OW CM was more specific in the testing and notification requirements.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Microbiology Testing Detailed Method Review					
Analytical Methodology	EL-V1M5-2008 Section 1.4		Entire Section of V.5 (except 5.1.6 to 5.1.6.4, 5.4.1.2, 5.4.1.3, 5.4.2.8, and 5.6.1.4)	No	OW CM was more specific in the methods requirements. TNI does not list specific methods as a requirement, unless already prescribed to meet federal or local regulations.
Sample Collection, Handling, and Preservation	EL-V1M5-2008 Section 1.7.5		Entire Section of V.6 (except 6.5 and 6.6)	No	OW CM was more specific in the sampling/handling/preservation requirements.
Action Response to Laboratory Results	Not Found		Entire Section of V.9	No	Not found in TNI. In most cases, OW CM was more specific in the testing and notification requirements.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Radiochemical Analysis Detailed Method Review					
Laboratory Supervisor/Technical Manager	EL-V1M2-2008 Section 5.2.6.1		VI.1.1	Similar requirements for Laboratory Supervisor/Technical Manager.	TNI standard 5.2.6.1 requires a BS with 24 credit hours in chemistry and 2 years experience in analysis or only one year experience with a masters/doctoral. OW CM does not have credit hour requirements and requires only one year of experience. TNI does list several exceptions to this depending on the particular lab environment.
Laboratory Analyst	Not Found		VI.1.2	No	OW CM gives specific education, training and experience

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Radiochemical Analysis Detailed Method Review					
					requirements for an analyst. TNI does not give specific requirements for an analyst, but does for a technical director in 5.2.6.1
Technician	Not Found		VI.1.3	No	See above comment for laboratory analyst.
Sampling Personnel	Not Found		VI.1.4	No	See above comment for laboratory analyst and technician.
Initial and Ongoing Demonstration of Proficiency for Analysts and Technicians	EL-V1M6-2008 Section 1.6.2		VI.1.5	Ongoing DOCs can be performed via QC or the method by which the initial DOC was performed.	The OW CM describes specific means by which an initial DOC must be performed. TNI gives ways to complete an initial DOC if not specified by the method or regulation.
Method Blanks	EL-V1M6-2008 Section 1.7.3.1		VI.1.5	Both required a background check daily.	OW CM mentions instrument and reagent blanks. OW CM requires an instrument blank to check background analyzed on each day. Instrument must be placed out of service if blank is out of control. TNI requires at a minimum one method blank per batch (of no more than twenty samples). Data with a failing method blank should be reprocessed for analysis or flagged with the appropriate data-qualifying codes.
Data Produced by Analysts and Technicians in Training	Not Found		VI.1.6	No	OW CM states that this data must be reviewed by a fully qualified analyst or the lab supervisor. TNI requires final data review and release by a Technical Director.
Waiver of Academic	EL-V1M2-2008		VI.1.7	Yes	OW CM offers an academic waiver

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Radiochemical Analysis Detailed Method Review					
Training	Section 5.2.6.2.c				to highly-experienced analysts. TNI does not have a "waiver", but does require twelve months prior laboratory management experience at the time of application for certification if academic requirements are not met.
Positive, negative, and other controls	EL-V1M6-2008 Section 1.7.3		VI.3.1.5, VI.4.2, VI.7.3	Yes	See method blank discussion above concerning negative controls. Positive controls have specific criteria in the OW CM, while NELAC details these as "laboratory control samples" that are spiked with an analyte of interest and analyzed to meet specific performance criteria. OS CW details matrix spike requirements for field collection, which TNI omits. TNI includes criteria for surrogate spikes, which the OS CW omits.
Radiation Counting Instruments	EL-V1M6-2008 Section 1.7.1		VI.3.1	Detection limits are similar.	TNI does not provide detailed information on the overall process of calibration of each type of radioactivity counter, while the OW CM does. OW CM does not address background levels measurement. TNI goes into specific detail about this.
Liquid Scintillation Counting (LSC) system Background Check	EL-V1M6-2008 Sections 1.7.1.a, 1.7.1.b, 1.7.1.c		VI.3.1.1	Both agree that background checks should be performed daily.	TNI does not describe the check process in detail.
Gas~flow	EL-V1M6-2008		VI.3.1.2	Both agree that background	

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Radiochemical Analysis Detailed Method Review					
Proportional Counting System Background Check	Section 1.7.1.c			checks should be performed daily.	
Alpha Scintillation Counting System Background Check	Not Found		VI.3.1.3	No	TNI does not describe the background check process in detail. OW CM mandates a background check performed each time a set of compliance monitoring samples is analyzed, or weekly.
Scintillation Cell System Background Check	EL-V1M6-2008 Section 1.7.1.c		VI.3.1.4	No	TNI states that background checks must be performed daily. OW CM states they must be performed each time a set of compliance monitoring samples is analyzed. OW CM provides more information about this technology.
Gamma Spectrometer Systems Background Check	EL-V1M6-2008 Section 1.7.1.c		VI.3.1.5	Both agree that background checks should be performed monthly.	
Alpha Spectrometer Systems Background Check	EL-V1M6-2008 Section 1.7.1.c		VI.3.1.6	Both agree that background checks should be performed monthly.	
Other Radiation Instrumentation Background Checks	Not Found		VI.3.1.7	No	OW CM states that the calibration and background checks should be consistent with the method being used and the manufacturer's recommendation. NELAC wrote the section on Radiation Counting Instruments to be all-inclusive, thus this is not applicable to that standard.
Chemicals/reagents	EL-V1M6-2008 Section 1.7.2.5		VI.4.1	Yes	OW CM does not discuss standards for purchasing from outside US

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Radiochemical Analysis Detailed Method Review					
					commercial suppliers.
Reagent Water	EL-V1M6-2008 Section 1.7.2.5		VI.4.2	No	TNI requires that reagent water meet the standards of the method in use. OW CM has more specific parameters required for reagent water.
Glassware/Plasticware	EL-V1M6-2008 Section 1.7.2.7.b		VI.4.3	Both state that glassware should be washed in accordance with the method in use.	TNI states if there is no specification in the method, then the washing procedure should be documented. OW CM includes a specific procedure to wash glassware when the correct procedure is not documented in the method.
Safety	Not Found		VI.4.4	Both standards state that proper safety measures should be addressed in the laboratory standard operating procedures.	The TNI standard does not address safety specifically for radiochemical analysis.
Analytical Methods: Standard Operating Procedures (VI.5.1)	EL-V1M2-2008 Sections 3.0, 4.2.8.5		VI.5	Yes	The OW CM states that the methods cited in 40 CFR parts 141.25 (a) and (b) must be used. OW CM also includes a table listing those methods. TNI does mention requirements for SOPs in general.
Sample Collection, Handling, and Preservation: Composited Samples (VI.6)	Not Found		VI.6.1	No	TNI does not include composite samples.
Matrix spikes and duplicates (replicates),	EL-V1M6-2008 Sections 1.7.2.3.a,		VI.7.7.1, VI.7.7.2,	Yes	See above discussion about positive controls for matrix spike

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Radiochemical Analysis Detailed Method Review					
low level samples	1.7.2.3.b		VI.7.2.12		comparison. Duplicates in the OW CM are described as replicate analysis of the same sample, however TNI defines this as a replicate piece of sample carried through the entire sample process. The OW CM also describes the process in more detail. Concerning low level samples, the OW CM states that target levels below the MRL should not be reported. TNI asks that an instrument duplicate be run to determine data reproducibility to assess the accuracy of low level samples.
Laboratory control samples	EL-V1M6-2008 Sections 1.6.1, 1.6.2.2, 1.6.3, 1.7.2.2		VI.7.7.3	Yes	TNI does not state that the batch has to be thrown away if samples are recounted and LCS (if LCS assessments have already exceeded the limits) assessment is still unsatisfactory. TNI requires at a minimum one per batch. TNI does not describe the process in detail.
Activity level and source of matrix spikes and LCS	EL-V1M6-2008 Sections 1.7.2.2.g, 1.7.2.3.a.vii		VI.7.72	Yes	The TNI states that the matrix spikes should be spiked at a level five times the minimum detectable activity (MDA) and an LCS should be spiked at ten times the MDA. The OM CW requires the matrix spikes to be spiked at ten times the anticipated sample activity level and handles the LCS samples in the same way. The TNI also states that a matrix spike can be used in place

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Radiochemical Analysis Detailed Method Review					
					of an LCS.
LCS or matrix spike for more than one isotope	EL-V1M6-2008 Sections 1.7.2.2.g, 1.7.2.3.a.vii		Not Found	No	The OM CW does not address this issue.
Initial demonstration of capability	EL-V1M6-2008 Section 1.6.2		VI.1.5	Both standards require an IDC to be performed for each instrument and at times when a change of personnel or method occurs.	
PT	EL-V1M2-2008 Section 5.0, EL-V1M5-2008 Sections 1.5, 1.71		VI.7.4	No	TNI does not discuss in detail mixed alpha and mixed beta/gamma PT studies.
Instrument calibration (general)	EL-V1M6-2008 Section 1.7.1.1		III.11.6	No	TNI goes into far more detail about instrument calibration, while the OW CM standard only describes the basic components of instrument calibration requirements.
Alpha and gamma spectroscopy calibration	EL-V1M6-2008 Sections 1.7.1.b.i, 1.7.1.b.ii		VI.3.1.5, VI.3.1.6	Yes	TNI does not describe the calibration process in detail for any particular analysis.
Gas~proportional and liquid scintillation calibration	EL-V1M6-2008 Section 1.7.1.b.iii		VI.3.1.2, VI.3.1.1	Yes	TNI does not describe the calibration process in detail for any particular analysis.
Scintillation counters calibration	EL-V1M6-2008 Section 1.7.1.b.iv		VI.3.1.3	Yes	TNI does not describe the calibration process in detail for any particular analysis.
Background measurements	EL-V1M6-2008 Section 1.7.1.c		VI.3.1, VI.3.1.5, VI.3.1.6, VI.3.1.2, VI.3.1.1, VI.3.1.3,	Neither standard provides specific procedures to determine background measurements for radiation counting instruments.	TNI does not state background measurements for every type of radiation counting instrument.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Radiochemical Analysis Detailed Method Review					
			VI.7.8		
Detection limit	EL-V1M6-2008 Section 1.5.2.1		VI.3.1, VI.3.1.5, VI.3.1.6, VI.3.1.2, VI.3.1.1, VI.3.1.3	Yes	The OW CM does not list specific procedures for detection limit determination or requirements other than the limits mentioned in the CFR. TNI describes very specific requirements for detection limits.
Results with uncertainties reported	EL-V1M6-2008 Section 1.5.4		VI.8.4	No	TNI states that uncertain results should be flagged appropriately. There is no specific mention of this in the OW CM.
QC program maintain and establish provisions for radionuclide standards	EL-V1M6-2008 Section 1.6.2.2		Not Found	No	The OW CM does not mention radionuclides in relation to QC programs. TNI mentions radionuclides in LCS samples where gamma-ray spectrometry is used.
Issues of purchase and labels of standards and reagents	EL-V1M6-2008 Section 1.7.2.5		VI.4.1	Yes	See above "Reagent" discussion for major differences. In addition, the OW CM does not mention reagent labeling specifically.
Cross~contamination and background checks	EL-V1M6-2008 Section 1.7.2.7.c		VI.3.1.2, VI.3.1.5, VI.3.1.6	Yes	OW CM does not mention ways to prevent cross~contamination. OW CM does not make clear that background checks for gamma spectrometry are conducted each day of use.
Laboratory facilities (general for radiochemical)	EL-V1M6-2008 Section 1.7.3.7		VI.2, VI.4.4, VI.4.3	No	The OW CM is more specific in its expectations of cleanliness, instrument placement, etc. TNI only requires the laboratory facilities to be in such a state as not to affect testing results.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Radiochemical Analysis Detailed Method Review					
Aspects of records and data reporting	EL-V1M6-2008 Section 4.13		VI.8.2, VI8.3, and parts of VI.8.4, VI.8.5, VI.8.6	No	TNI specifies a five-year hold time on all data, while the OW CM requires ten years. The OW CM also specifies on what medium data may be backed up.
Instrument and Method Performance Charts/Records	EL-V1M6-2008 Section 1.7.1.b		VI.7.8	Both discuss control charting.	TNI specifies control charting methods for each type of radiation counting instrument.
Action Response to Noncompliant Laboratory Results	Not Found		VI.9	No	Action taken in response to non-compliant results is discussed only briefly in the TNI standard, however, the OW CM states that the appropriate authorities must be notified when non-compliant results are reported.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Air Testing Detailed Method Review					
Air Testing			Not Found	No	OW CM only applies to laboratories dealing with water.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
Asbestos Testing					
Asbestos Testing			Not Found	No	OW CM only applies to laboratories dealing with water.

Proposed Framework for State Agency Requests to ELAP for New Analytical Methods and Lowered Reporting Limits

State agencies in California occasionally require new analytical methods, or lowered reporting limits for promulgated methods, to achieve their regulatory goals. When new regulations are released that requires either new analytical methods or lower reporting limits, the regulated community must have access to certified laboratories that are capable of performing the methods to achieve regulatory compliance. As there have been occasions when new regulations have been adopted that required lower reporting limits prior to the capabilities being developed by California certified labs, the goal of this document is to provide a framework for State agencies to submit requests for new methods/lower reporting limits to the Environmental Laboratory Accreditation Program (ELAP), which regulates laboratory accreditation in California.

ELAP attends various meetings to coordinate with the State Water Board's Division of Drinking Water (DDW) on regulatory issues. On a weekly and monthly basis, ELAP management attends DDW Executive management meetings, which helps to ensure efficient, consistent, and effective implementation of DDW requirements and directions from upper management. The meetings include the DDW Deputy Director (DD) and Assistant DDs, program managers, Regional, and Branch Engineers. Additionally, ELAP resides under the Program Management Branch of DDW, which includes ELAP and the Technical Operations Section. The Regulations Unit resides within the Technical Operations Section that develop MCLs. Program Management Branch meetings are scheduled quarterly for additional coordination.

In addition to ELAP's engagements within the State Water Board, there are other opportunities for agency collaboration. Within the State and Regional Water Boards, a Roundtable is the coordinating body for a specific program (e.g., Surface Water Ambient Monitoring Program – SWAMP) within the State or Regional Water Board organization structure. It ensures efficient, consistent, and effective implementation of program requirements and directions from upper management. It consists of program managers and staff from each Water Board organization (Regional Water Board and State Water Board Division and/or Office) who have a direct role in the conduct and implementation of the program associated with the Roundtable.

Should DDW (either Executive Management meetings or Program Management Branch), State/Regional Water Board Roundtables, or other State agencies need lower analytical reporting limits or method development for new analytes, the following process should be followed:

1. submit their request in writing to Chief of ELAP.
2. the ELAP Chief will submit the request to the Environmental Laboratory Technical Advisory Committee (ELTAC), which was established to assist with technical matters that impact the laboratory community.
3. ELTAC will form a committee to evaluate the request, comprised of ELTAC members that have expertise in the analytical method.
4. should the ELTAC committee determine that the request should be achievable by CA certified laboratories, they will request that ELAP provide them with a list of laboratories that are certified for the method (in the case of lower reporting limits) or for similar methods (in the case of methods for new analytes).

5. the ELTAC committee will draft a letter, to be approved by the ELTAC, that will be submitted to the labs identified by ELAP. The letter is to identify the problem, summarize the justification from the State agency, request a determination of current capabilities, request a timeline for the development of capabilities if they do not exist, and establish a timeline for a return response.
6. The ELTAC committee will review the responses from the labs and prepare a summary of the responses.
7. Should the labs be capable of achieving the State agency needs, then the summary of capabilities will be submitted to the ELAP Chief for distribution to the State agency.
8. Should the labs not have the current capabilities to achieving the State agency needs, then the summary identifying the current status along with a projected timeline for capabilities development will be submitted to the ELAP Chief for distribution to the State agency.

Need for New Method Checklists

ELAP's Program Development team reviewed the checklists developed by the previous ELTAC and determined the documents no longer meet the needs for their intended use. Specifically, the checklists lack the necessary detail to account for the varying knowledge and skill levels encompassed by the diverse set of ELAP staff.

By itemizing all the steps in the method that impact the outcome of the analysis and specifying applicable performance criteria limits, nothing is overlooked. The checklist will more accurately reflect the method ensuring a thorough and comprehensive audit, and improve consistency between both new and veteran auditing staff.

In addition, reorganization and reformatting of the previous ELTAC checklists is needed to provide improved readability and ease of use. Including a disclaimer statement clarifies the intent and purpose of the checklist.

Enclosed are three sets of checklists that highlight the above comments.

Developed by ELTAC
EPA 218.6 (Hexavalent Chromium by Ion Chromatography)
Revision 3.3 (1994)

Lab Name: Certificate # Auditor: Date

Laboratory Response		References	ELAP Evaluation
	1. Sample Collection and Storage		
	1.1 High density polypropylene sample containers	6.3.1	
	1.2 Dissolved Cr (VI) filter the sample thru 0.45 µm filter. Adjust the pH of the sample to 9-9.5 with buffer	8..2	
	1.3 The samples are stored at $4^{O}C$ for 24H	8.3	
	2. Instrument & Equipment		
	2.1 Make & model of ion-chromatograph	6.1	
	2.2 Separator column AS7 or equivalent	6.1.7	
	2.3 Guard column NG1or equivalent	6.1.1	
	2.4 Detector UV/Visible with 530nm	6.1.8	
	2.5 Data acquisition hardware and software	6.1.9	
	2.6 Other lab equipment	6.2-6.3	
	3. Standards and Reagents		
	3.1 Ammonium Hydroxide, Ammonium Sulfate, 1,5 Diphenycarbazide ACS grade	7.1	
	Methanol HPLC grade, Concentrated Sulfuric acid		
	3.2 Reagent water	7.2	
	3.3 Stock Cr (VI) standard prepared in lab or vendor	7.3	
	3.4 LRB, LFB & QCS	7.4-7.6	
	3.5 Eluent	7.7	
	3.6 Post column Reagent	7.8	
	3.7 Buffer Solution	7.9	
	4. Procedures/Calibration		
	4.1 Filtered, pH adjusted samples at ambient temperature prior to analysis	11.1	
	4.2 Establish IC operating conditions	11.2/10.1-10.2	
	4.3 Calibrate the instrument with minimum 3 calibration standards that bracket the anticipated concentration range of samples	11.3	
	4.4 Coefficient of correlation (r) for the calibration curve should be 0.999 or greater	11.4	
	4.5 Sample concentrations that exceed the calibration range must be diluted & reanalyzed	11.5	
	5.0 Quality Control		
	5.1 The initial demonstration of Performance	9.2	
	5.1.1 MDL annually, new operator, change in instrument	9.2.1	
	5.1.2 LDR	9.2.3	
	5.2 Assessing Lab Performance	9.3	
	5.2.1 LRB One/Batch, after calibration, every 10samples & at the end <MRL	9.3.1/9.3.4	
	5.2.2 IPC One/Batch, after calibration, every 10samples & at the end ±5%	9.3.4	
	5.2.3 LFB 90-110%	9.3.5	
	5.2.4 QCS 90-110%	9.3.2.2	
	5.3 Assessing Analyte recovery & Data Quality	9.4	
	5.3.1 LFM 10 % of the field samples	9.4.1	
	5.3.2 LFM 90-110%	9.4.3	

Determination of Dissolved Hexavalent Chromium by Ion Chromatography **EPA 218.6 Revision 3.3 (1994)**

Additional QC requirements for this method: ______________________

Laboratory SOP Number/ Revision/ Date: ______________________

Facility Name: ______________________ ELAP Cert. #: ______________________

ELAP Inspector: ____________ Analyst Name: ______________________ Inspection Date: ____________

Item to be Evaluated:	Method Reference	Y	N	N/A	Comments
Sample Collection and Storage:					
Was the sample stored at 4°C and analyzed within 24 hours of collection?	1.4				
For determination of dissolved Cr (VI); was the sample filtered through a 0.45 µg filter? Was the sample filtered in the field or the lab?	8.1				
Was the pH adjusted to 9-9.5 by adding a buffer solution? Was pH adjusted in the field or the lab?	8.1				
Apparatus:					
Is the Ion chromatograph equipped with a pump capable of withstanding a minimum backpressure of 2000 psi and delivering constant flow in the range of 1-5 mL/min?	6.1.1				
Does the Guard Column contain an organics removing sorbent such as Dionex IonPac NG1 or equivalent?	6.1.6				
Is the Separator Column packed with high capacity anion exchange resin such as Dionex IonPac AS7 or equivalent?	6.1.7				
Is the wavelength of the visible lamp detector set at 530 nm?	6.1.8				
Has reusable labware been soaked overnight in laboratory grade detergent and water, rinsed with water, soaked for 4 hours in dilute nitric and hydrochloric acid, followed by rinsing with tap water and ASTM Type I water?	6.2				
Note: Chromic acid must not be used for cleaning glassware	6.2				
pH Meter	6.3.3				
0.45 µm filter disks, 7.3 cm diameter	6.3.4				

Notes/Comments

Determination of Dissolved Hexavalent Chromium by Ion Chromatography **EPA 218.6 Revision 3.3 (1994)**

Additional QC requirements for this method: ______________________________

Laboratory SOP Number/ Revision/ Date: ______________________________

Facility Name: ______________________________ ELAP Cert. #: ______________

ELAP Inspector: ______________ Analyst Name: ______________ Inspection Date: ______________

Item to be Evaluated:	Method Reference	Y	N	N/A	Comments
Reagents: (All chemicals are ACS grade unless otherwise noted)					
Helium Gas (high purity - 99.995%)	6.1.2				
Ammonium Hydroxide	7.1.1				
Ammonium Sulfate	7.1.2				
1,5- Diphenylcarbazide	7.1.3				
Methanol (**HPLC grade**)	7.1.4				
Sulfuric Acid, concentrated	7.1.5				
Reagent Water - ASTM Type I	7.2				
Cr (VI) Stock Standard Solution	7.3				
Laboratory Reagent Blank (LRB)	7.4				
Laboratory Fortified Blank (LFB)	7.5				
Quality Control Sample (QCS) with a minimum concentration of 10 µg/L	7.6				
Was QCS obtained from an outside laboratory?	7.6				
Is Post-Column Reagent prepared only as needed and kept for only 4 or 5 days?	7.8				
Buffer Solution	7.9				
Interferences:					
A trace amount of Cr is **sometimes** found in reagent grade salt, which are used to make the buffer solution. Was reagent blanks analyzed to asses for potential Cr (VI) contamination?	4.1.1				
Reduction of CR (VI) to CR (III) can occur in the presence of reducing species in an acidic medium of less than pH 6.5	4.1.2				
Samples should contain no more than 5% sodium sulfate or 2% sodium chloride to avoid overloading the column and avoid loss of Cr (VI)	4.1.3				

Notes/Comments

Determination of Dissolved Hexavalent Chromium by Ion Chromatography **EPA 218.6 Revision 3.3 (1994)**

Additional QC requirements for this method: ______________________

Laboratory SOP Number/ Revision/ Date: ______________________

Facility Name: ______________________ ELAP Cert. #: ______________________

ELAP Inspector: ______________ Analyst Name: ______________________ Inspection Date: ______________

Item to be Evaluated:	Method Reference	Y	N	N/A	Comments
Procedure:					
Was calibration performed using a minimum of three calibration standards that bracket the anticipated concentration range of the samples before the samples were analyzed?	11.3				
Was the coefficient of correlation for the calibration curve 0.999 or greater?	11.4				
Inject a volume of sample that is 10X the volume of the sample loop using an unused syringe	11.5				
Sample concentration exceeding the calibration range must be diluted and reanalyzed	11.5				
Quality Control:					
The Multilaboratory Method Detection Limit was determined to be 0.4 µg/L	1.3				
Initial Demonstration of Performance is mandatory	9.2				
Is the method detection limit (MDL) sufficient to detect Cr (VI) at the required level according to compliance monitoring regulation?	9.2.2				
Was the MDL determined by analyzing seven replicate aliquots of fortified reagent water (with concentrations of two to five times the estimated detection limit)?	9.2.2				
Was the Linear dynamic range determined by analyzing a minimum of seven calibration standards ranging in concentration from 1-5,000 µg/L across all sensitivity settings of the spectrophotometer?	9.2.3				

Notes/Comments

Determination of Dissolved Hexavalent Chromium by Ion Chromatography **EPA 218.6 Revision 3.3 (1994)**

Additional QC requirements for this method: ______________________

Laboratory SOP Number/ Revision/ Date: ______________________

Facility Name: ______________________ ELAP Cert. #: ______________________

ELAP Inspector: ____________ Analyst Name: ______________________ Inspection Date: ____________

Item to be Evaluated:	Method Reference	Y	N	N/A	Comments
Quality Control (Continued)					
Did the laboratory analyze at least one LRB with each set of samples? If LRB exceeds MDL, was source of contamination corrected and samples reanalyzed?	9.3.1				
Did the laboratory analyze at least one LFB with each set of samples? If LFB % recovery is outside 90-110%, was source of problem resolved before continuing analysis?	9.3.2				
Does the laboratory verify that the instrument is properly calibrated on a continuing basis by running an LRB and instrument performance check solution after every 10 analyses? If the result of the IPC is ±5% of the known concentration, was the instrument recalibrated and the previous 10 samples reanalyzed?	9.3.4				
Has one ore more QCS been analyzed each quarter? If QCS results are not within ±10% of the stated value was corrective action taken and documented?	9.3.5				
Does the laboratory add a known amount of Cr (VI) to a minimum of 10% of samples and calculate the % recovery?	9.4				
If % recovery (Section 9.4) is outside 90-110%, and the recovery obtained for the LFB was in control (Section 9.3), was the unfortified sample labelled as 'suspect matrix'?	9.4.3				

<u>Notes/Comments</u>

METHOD 218.6

DETERMINATION OF DISSOLVED HEXAVALENT CHROMIUM IN DRINKING WATER, GROUNDWATER, AND INDUSTRIAL WASTEWATER EFFLUENTS BY ION CHROMATOGRAPHY

Revision 3.3
EMMC Version

E.J. Arar, S.E. Long (Technology Applications, Inc.), and J.D. Pfaff - Method 218.6, Revision 3.2 (1991)

E.J. Arar, J.D. Pfaff, and T.D. Martin - Method 218.6, Revision 3.3 (1994)

ENVIRONMENTAL MONITORING SYSTEMS LABORATORY
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OHIO 45268

METHOD 218.6

**DETERMINATION OF DISSOLVED HEXAVALENT CHROMIUM IN DRINKING WATER,
GROUNDWATER, AND INDUSTRIAL WASTEWATER EFFLUENTS BY ION CHROMATOGRAPHY**

1.0 SCOPE AND APPLICATION

1.1 This method provides procedures for determination of dissolved hexavalent chromium (as CrO_4^{2-}) in drinking water, groundwater, and industrial wastewater effluents.

Analyte	Chemical Abstracts Service Registry Number (CASRN)
Hexavalent Chromium (as CrO_4^{2-})	11104-59-9

1.2 For reference where this method is approved for use in compliance monitoring programs [e.g., Clean Water Act (NPDES) or Safe Drinking Water Act (SDWA)] consult both the appropriate sections of the Code of Federal Regulation (40 CFR Part 136 Table 1B for NPDES, and Part 141 § 141.23 for drinking water), and the latest Federal Register announcements.

1.3 The method detection limits (MDL) obtained by a single laboratory for hexavalent chromium (Cr (VI)) in the above matrices are listed in Table 1. The MDL obtained by an individual laboratory for a specific matrix may differ from those listed depending on the nature of the sample and the instrumentation used. A multilaboratory method detection limit (MMDL) in reagent water was determined to be 0.4 µg/L. The IMDL was based upon the within-laboratory standard deviation (s_r) of thirteen paired analyses of samples by thirteen laboratories at an average analyte concentration of 1.4 µg/L.

1.4 Samples containing high levels of anionic species such as sulphate and chloride may cause column overload. Samples containing high levels of organics or sulfides cause rapid reduction of soluble Cr (VI) to Cr (III). Samples must be stored at 4°C and analyzed within 24 hours of collection.

1.5 This method should be used by analysts experienced in the use of ion chromatography.

2.0 SUMMARY OF METHOD

2.1 An aqueous sample is filtered through a 0.45 µm filter and the filtrate is adjusted to a pH of 9-9.5 with a concentrated buffer solution. A measured volume of the sample (50-250 µL) is introduced into the ion chromatograph. A guard column removes organics from the sample before the Cr (VI), as CrO_4^{2-}, is separated on a high capacity anion exchange separator column. Post-column derivatization of the Cr (VI) with diphenylcarbazide is followed by detection of the colored complex at 530 nm.

3.0 DEFINITIONS

3.1 **Calibration Standard (CAL)** - A solution prepared from the dilution of stock standard solutions. The CAL solutions are used to calibrate the instrument response with respect to analyte concentration (Section 7.9).

3.2 **Dissolved Analyte** - The concentration of analyte in an aqueous sample that will pass through a 0.45 µm membrane filter assembly prior to sample acidification.

3.3 **Instrument Performance Check (IPC) Solution** - A solution of the method analyte, used to evaluate the performance of the instrument system with respect to a defined set of method criteria.

3.4 **Laboratory Duplicates (LD1 and LD2)** - Two aliquots of the same sample taken in the laboratory and analyzed separately with identical procedures. Analyses of LD1 and LD2 indicates precision associated with laboratory procedures, but not with sample collection, preservation, or storage procedures.

3.5 **Laboratory Fortified Blank (LFB)** - An aliquot of LRB to which known quantities of the method analytes are added in the laboratory. The LFB is analyzed exactly like a sample, and its purpose is to determine whether the methodology is in control and whether the laboratory is capable of making accurate and precise measurements.

3.6 **Laboratory Fortified Sample Matrix (LFM)** - An aliquot of an environmental sample to which a known quantity of the method analyte is added in the laboratory. The LFM is analyzed exactly like a sample, and its purpose is to determine whether the sample matrix contributes bias to the analytical results. The background concentration of the analyte in the sample matrix must be determined in a separate aliquot and the measured value in the LFM corrected for background concentration.

3.7 **Laboratory Reagent Blank (LRB)** - An aliquot of reagent water or other blank matrices that are treated exactly as a sample including exposure to all glassware, equipment, solvents, reagents, and internal standards that are used with other samples. The LRB is used to determine if the method analyte or other interferences are present in the laboratory environment, reagents, or apparatus.

3.8 **Linear Dynamic Range (LDR)** - The concentration range over which the instrument response to an analyte is linear.

3.9 **Method Detection Limit (MDL)** - The minimum concentration of an analyte that can be identified, measured, and reported with 99% confidence that the analyte concentration is greater than zero.

3.10 **Quality Control Sample (QCS)** - A solution of the method analyte of known concentration which is used to fortify an aliquot of LRB or sample matrix. The QCS is obtained from a source external to the laboratory and different from the source of calibration standards. It is used to check either laboratory or instrument performance.

3.11 **Stock Standard Solution** - A concentrated solution containing one or more method analytes prepared in the laboratory using assayed reference materials or purchased from a reputable commercial source.

4.0 INTERFERENCES

4.1 Interferences which affect the accurate determination of Cr (VI) may come from several sources.

4.1.1 Contamination - A trace amount of Cr is sometimes found in reagent grade salts. Since a concentrated buffer solution is used in this method to adjust the pH of samples, reagent blanks should be analyzed to assess for potential Cr (VI) contamination. Contamination can also come from improperly cleaned glassware or contact of caustic or acidic reagents or samples with stainless steel or pigmented material.

4.1.2 Reduction of Cr (VI) to Cr (III) can occur in the presence of reducing species in an acidic medium. At pH 6.5 or greater, however, CrO_4^{2-} which is less reactive than $HCrO_4^-$ is the predominant species

4.1.3 Overloading of the analytical column capacity with high concentrations of anionic species, especially chloride and sulphate, will cause a loss of Cr (VI). The column specified in this method can handle samples containing up to 5% sodium sulphate or 2% sodium chloride[2]. Poor recoveries from fortified samples and tailing peaks are typical manifestations of column overload.

5.0 SAFETY

5.1 Hexavalent chromium is toxic and a suspected carcinogen and should be handled with appropriate precautions. Extreme care should be exercised when weighing the salt for preparation of the stock standard. Each laboratory is responsible for maintaining a current awareness file of OSHA regulations regarding the safe handling of chemicals specified in this method. A reference file of material safety data sheets should also be available to all personnel involved in the chemical analysis.[3,4]

6.0 EQUIPMENT AND SUPPLIES

6.1 Ion Chromatograph

6.1.1 Instrument equipped with a pump capable of withstanding a minimum backpressure of 2000 psi and of delivering a constant flow in the range of 1-5 mL/min. and containing no metal parts in the sample, eluent or reagent flow path.

6.1.2 Helium gas supply (High purity, 99.995%).

6.1.3 Pressurized eluent container, plastic, 1 L or 2 L size.

6.1.4 Sample loops of various sizes (50-250µL).

6.1.5 A pressurized reagent delivery module with a mixing tee and beaded mixing coil.

6.1.6 Guard Column - A column placed before the separator column and containing a sorbent capable of removing strongly absorbing organics and particles that would otherwise damage the separator column (Dionex IonPac NG1 or equivalent).

6.1.7 Separator Column - A column packed with a high capacity anion exchange resin capable of separating CrO_4^{2-} from other sample constituents (Dionex IonPac AS7 or equivalent).

6.1.8 A low-volume flow-through cell, visible lamp detector containing no metal parts in contact with the eluent flow path. Detection wavelength is at 530 nm.

6.1.9 Recorder, integrator or computer for receiving analog or digital signals for recording detector response (peak height or area) as a function of time.

6.2 Labware - All reusable labware (glass, quartz, polyethylene, Teflon, etc.), including the sample containers, should be soaked overnight in laboratory grade detergent and water, rinsed with water, and soaked for four hours in a mixture of dilute nitric and hydrochloric acid (1+2+9) followed by rinsing with tap water and ASTM Type I water.

Note: Chromic acid must not be used for cleaning glassware.

6.2.1 Glassware - Class A volumetric flasks and a graduated cylinder.

6.2.2 Assorted Class A calibrated pipettes.

6.2.3 10 mL male luer-lock disposable syringes.

6.2.4 0.45 µm syringe filters.

6.2.5 Storage bottle - High density polypropylene, 1 L capacity.

6.3 Sample Processing Equipment

6.3.1 Liquid sample transport containers - High density polypropylene, 125 mL capacity.

6.3.2 Supply of dry ice or refrigerant packing and styrofoam shipment boxes.

6.3.3 pH meter - To read pH range 0-14 with accuracy ±0.03 pH units.

6.3.4 0.45 µm filter discs, 7.3 cm diameter (Gelman Acro 50A, Mfr. No. 4262 or equivalent).

6.3.5 Plastic syringe filtration unit (Baxter Scientific, Cat. No. 1240 IN or equivalent).

7.0 REAGENTS AND STANDARDS

7.1 Reagents - All chemicals are ACS grade unless otherwise indicated.

7.1.1 Ammonium hydroxide, NH_4OH, (sp.gr. 0.902), (CASRN 1336-21-6).

7.1.2 Ammonium sulphate, $(NH_4)_2SO_4$, (CASRN 7783-20-2).

7.1.3 1,5-Diphenylcarbazide, (CASRN 140-22-7).

7.1.4 Methanol, HPLC grade.

7.1.5 Sulfuric acid, concentrated (sp.gr. 1.84).

7.2 Reagent Water - For all sample preparations and dilutions, ASTM Type I water (ASTM D1193) is required. Suitable water may be obtained by passing distilled water through a mixed bed of anion and cation exchange resins.

7.3 Cr (VI) Stock Standard Solution - To prepare a 1000 mg/L solution, dissolve 4.501 g of $Na_2CrO_4 \cdot 4H_2O$ in ASTM Type I water and dilute to 1 L. Transfer to a polypropylene storage container.

7.4 Laboratory Reagent Blank (LRB) - Aqueous LRBs can be prepared by adjusting the pH of ASTM Type I water to 9-9.5 with the same volume of buffer as is used for samples.

7.5 Laboratory Fortified Blank (LFB) - To an aliquot of LRB add an aliquot of stock standard (Section 7.3) to produce a final concentration of 100 µg/L of Cr (VI). The LFB must be carried through the entire sample preparation and analysis scheme.

7.6 Quality Control Sample (QCS) - A quality control sample must be obtained from an outside laboratory. Dilute an aliquot according to instructions and analyze with samples. A recommended minimum concentration for the QCS is 10 µg/L.

7.7 Eluent - Dissolve 33 g of ammonium sulphate in 500 mL of ASTM Type I water and add 6.5 mL of ammonium hydroxide. Dilute to 1 L with ASTM Type I water.

7.8 Post-Column Reagent - Dissolve 0.5 g of 1,5-diphenylcarbazide in 100 mL of HPLC grade methanol. Add to about 500 mL of ASTM type I water containing 28 mL of 98% sulfuric acid while stirring. Dilute with ASTM Type I water to 1 L in a volumetric flask. Reagent is stable for four or five days but should be prepared only as needed.

7.9 Buffer Solution - Dissolve 33 g of ammonium sulphate in 75 mL of ASTM Type I water and add 6.5 mL of ammonium hydroxide. Dilute to 100 mL with ASTM Type I water.

8.0 SAMPLE COLLECTION, PRESERVATION, AND STORAGE

8.1 Prior to sample collection, consideration should be given to the type of data required so that appropriate preservation and pretreatment steps can be taken. Filtration and pH adjustment should be performed at the time of sample collection or as soon thereafter as practically possible.

8.2 For determination of dissolved Cr (VI), the sample should be filtered through a 0.45 µm filter. Use a portion of the sample to rinse the syringe filtration unit and filter and then collect the required volume of filtrate. Adjust the pH of the sample to 9-9.5 by adding dropwise a solution of the buffer, periodically checking the pH with the pH meter. Approximately 10 mL of sample are sufficient for three IC analyses.

8.3 Ship and store the samples at 4°C. Bring to ambient temperature prior to analysis. Samples must be analyzed within 24 hours of collection.

9.0 QUALITY CONTROL

9.1 Each laboratory using this method is required to operate a formal quality control (QC) program. The minimum requirements of this program consist of an initial demonstration of laboratory capability, and the analysis of laboratory reagent blanks, and fortified blanks and samples as a continuing check on performance. The laboratory is required to maintain performance records that define the quality of the data thus generated.

9.2 Initial Demonstration of Performance (mandatory)

9.2.1 The initial demonstration of performance is used to characterize instrument performance (MDLs and linear dynamic range) and laboratory performance prior to sample analyses.

9.2.2 Method detection limit (MDL) -- A MDL should be established using reagent water fortified at a concentration of two to five times the estimated detection limit. To determine the MDL value, take seven replicate aliquots of the fortified reagent water and process through the entire analytical method. Perform all calculations defined in the method and report the concentration values in the appropriate units. Calculate the MDL as follows:

$$MDL = (t) \times (s)$$

where:

t = Student's t value for n-1 degrees of freedom at the 99% confidence level; t = 3.143 for six degrees of freedom

s = standard deviation of the replicate analyses

The MDL must be sufficient to detect Cr (VI) at the required level according to compliance monitoring regulation (Section 1.2). The MDL should be determined annually, when a new operator begins work or whenever there is a change in instrument analytical hardware or operating conditions.

9.2.3 Linear dynamic range (LDR) -- The LDR should be determined by analyzing a minimum of seven calibration standards ranging in concentration from 1-5,000 µg/L across all sensitivity settings of the spectrophotometer. Normalize responses by dividing the response by the sensitivity setting multiplier. Perform the linear regression of normalized response vs. concentration and obtain the constants m and b, where m is the slope of the line and b is the y-intercept. Incrementally analyze standards of higher concentration until the measured absorbance response, R, of a standard no longer yields a calculated concentration, C_c, that is ±10% of the known concentration, C, where $C_c = (R - b)/m$. That concentration defines the upper limit of the LDR for your instrument and analytical operating conditions. Samples having a concentration that is $\geq$ 90% of the upper limit of the LDR must be diluted to fall within the bounds of the current calibration curve concentration range and reanalyzed.

9.3 Assessing Laboratory Performance (mandatory)

9.3.1 The laboratory must analyze at least one LRB (Section 7.4) with each set of samples. Reagent blank data are used to assess contamination from a laboratory environment. If the Cr (VI) value in the reagent blank exceeds the determined MDL, then laboratory or reagent contamination should be suspected. Any determined source of contamination should be corrected and the samples reanalyzed.

9.3.2 The laboratory must analyze at least one LFB (Section 7.5) with each set of samples. Calculate accuracy as percent recovery (Section 9.4.2). If the recovery of Cr (VI) falls outside the control limits (Section 9.3.3), then the procedure is judged out of control, and the source of the problem should be identified and resolved before continuing the analysis.

9.3.3 Until sufficient data become available (usually a minimum of 20-30 analyses), assess laboratory performance against recovery limits of 90-110%. When sufficient internal performance data becomes available, develop control limits from the percent mean recovery (x) and the standard deviation(s) of the mean recovery. These data are used to establish upper and lower control limits as follows:

UPPER CONTROL LIMIT = x + 3s
LOWER CONTROL LIMIT = x - 3s

9.3.4 To verify that the instrument is properly calibrated on a continuing basis, run a LRB and a IPC (Section 3.3) after every 10 analyses. The results of analyses of standards will indicate whether the calibration remains valid. If the measured concentration of the IPC (a midpoint calibration standard) deviates from the true concentration by more than ±5%, perform another analysis of the LPC. If the discrepancy is still ±5% of the known concentration then the instrument must be recalibrated and the previous 10 samples reanalyzed. The instrument response from the calibration check may be used for recalibration purposes.

9.3.5 Quality control sample (QCS) - Each quarter, the laboratory should analyze one or more QCS. If criteria provided with the QCS are not within ±10% of the stated value, corrective action must be taken and documented.

9.4 Assessing Analyte Recovery and Data Quality

9.4.1 The laboratory must add a known amount of Cr (VI) to a minimum of 10% of samples. The concentration level can be the same as that of the laboratory fortified blank (Section 7.5).

9.4.2 Calculate the percent recovery for Cr (VI) corrected for background concentration measured in the unfortified sample, and compare this value to the control limits established in Section 9.3.3 for the analysis of LFBs. Fortified recovery calculations are not required if the concentration of Cr (VI) added is less than 2X the sample background concentration. Percent recovery may be calculated in units appropriate to the matrix, using the following equation:

$$R = \frac{C_F - C}{F} \times 100$$

where:

R = percent recovery
C_F = fortified sample concentration
C = sample background concentration
F = concentration equivalent of Cr (VI) added to sample

9.4.3 If the recovery of Cr (VI) falls outside control limits established in Section 9.3.3 and the recovery obtained for the LFB was shown to be in control (Section 9.3), the recovery problem encountered with the fortified sample is judged to be matrix related, not system related. The result for Cr (VI) in the unfortified sample must be labelled 'suspect matrix'.

10.0 CALIBRATION AND STANDARDIZATION

10.1 Establish IC operating conditions as indicated in Table 2. The flow rate of the eluent pump is set at 1.5 mL/min. and the pressure of the reagent delivery module adjusted so that the final flow rate of the post column reagent (Section 7.8) from the detector is 2.0 mL/min. This requires manual adjustment and measurement of the final flow rate using a graduated cylinder and a stop watch. A warm up period of approximately 30 minutes after the flow rate has been adjusted is recommended and the flow rate should be checked prior to calibration and sample analysis.

10.2 Injection sample loop size should be chosen based on anticipated sample concentrations and the selected sensitivity setting of the spectrophotometer. A 250 µL loop was used to establish the method detection limits in Table 1. A 50 µL loop is normally sufficient for higher concentrations. The sample volume used to load the sample loop should be at least 10 times the loop size so that all tubing in contact with sample is thoroughly flushed with new sample to minimize cross-contamination.

10.3 Before using the procedure (Section 11.0) to analyze samples, there must be data available documenting initial demonstration of performance. The required data and procedure is described in Section 9.2. This data must be generated using the same instrument operating conditions and calibration routine to be used for sample analysis. These documented data must be kept on file and be available for review by the data user.

10.4 The recommended calibration routine is given in Section 11.3.

11.0 PROCEDURE

11.1 Filtered, pH adjusted samples at 4°C should be brought to ambient temperature prior to analysis.

11.2 Initiate instrument operating configuration described in Section 10.0 and Table 2.

11.3 Calibration - Before samples are analyzed a calibration should be performed using a minimum of three calibration solutions that bracket the anticipated concentration range of the samples. Calibration standards should be prepared from the stock standard (Section 7.3) by appropriate dilution with ASTM Type I water (Section 7.2) in volumetric flasks. The solution should be adjusted to pH 9-9.5 with the buffer solution (Section 7.9) prior to final dilution.

11.4 Construct a calibration curve of analyte response (peak height or area) versus analyte concentration over a concentration range of one or two orders of magnitude. The calibration range should bracket the anticipated concentration range of samples. The coefficient of correlation (r) for the curve should be 0.999 or greater.

11.5 Draw into a new, unused syringe (Section 6.2.3) approximately 3 mL of sample. Inject 10X the volume of the sample loop into the injection valve of the IC. Sample concentrations that exceed the calibration range must be diluted and reanalyzed.

11.6 During the analysis of samples, the laboratory must comply with the required quality control described in Sections 9.3 and 9.4.

12.0 DATA ANALYSIS AND CALCULATIONS

12.1 The sample concentration can be calculated from the calibration curve. Report values in µg/L. Sample concentrations must be corrected for any Cr (VI) contamination found in the LRB.

12.2 The QC data obtained during sample analyses provide an indication of the quality of sample data and should be reported with sample results.

13.0 METHOD PERFORMANCE

13.1 Instrumental operating conditions used for single-laboratory testing of the method are summarized in Table 2. MDLs for dissolved Cr (VI) in five matrix waters are listed in Table 1.

13.2 Single-analyst precision and accuracy data for five matrix waters, drinking water, deionized water, groundwater, treated municipal sewage wastewater, and treated electroplating wastewater are listed in Table 3.

13.3 Pooled Precision and Accuracy: This method was tested by 21 volunteer laboratories in a joint study by the USEPA and the American Society for Testing and Materials (ASTM). Mean recovery and accuracy for Cr (VI) (as CrO_4^{2-}) was determined from the retained data of 13 laboratories in reagent water, drinking water, ground water, and various industrial wastewaters. For reagent water, the mean recovery and the overall, and single-analyst relative standard deviations were 105%, 7.8% and 3.9%, respectively. For the other matrices combined, the same values were 96.7%, 11.9% and 6.3%, respectively. Table 4 contains the linear equations that describe the single-analyst standard deviation, overall standard deviation and mean recovery of Cr (VI) in reagent water and matrix water.

14.0 POLLUTION PREVENTION

14.1 Pollution prevention encompasses any technique that reduces or eliminates the quantity or toxicity of waste at the point of generation. Numerous opportunities for pollution prevention exist in laboratory operation. The EPA has established a preferred hierarchy of environmental management techniques that places pollution prevention as the management option of first choice. Whenever feasible, laboratory personnel should use pollution prevention techniques to address their waste generation. When wastes cannot be feasibly reduced at the source, the Agency recommends recycling as the next best option.

14.2 For information about pollution prevention that may be applicable to laboratories and research institutions, consult "Less is Better: Laboratory Chemical Management for Waste Reduction", available from the American Chemical Society's Department of Government Relations and Science Policy, 1155 16th Street N.W., Washington D.C. 20036, (202)872-4477.

15.0 WASTE MANAGEMENT

15.1 The Environmental Protection Agency requires that laboratory waste management practices be conducted consistent with all applicable rule and regulations. The Agency urges laboratories to protect the air, water, and land by minimizing and controlling all releases from hoods and bench operations, complying with the letter and spirit of any sewer discharge permits and regulations, and by complying with all solid and hazardous waste regulations, particularly the hazardous waste identification rules and land disposal restrictions. For further information on waste management consult "The Waste Management Manual for Laboratory Personnel", available from the American Chemical Society at the address listed in the Sectoion 14.2.

16.0 REFERENCES

1. Glaser, J.A., Foerst, D.L., McKee, G.D., Quave, S.A. and Budde, W.L. "Trace Analyses for Wastewaters", Environ. Sci. and Technol., Vol.15, No.12, 1981, pp.1426-1435.

2. Dionex Technical Note No. 26, May 1990.

3. "Proposed OSHA Safety and Health Standards, Laboratories," Occupational Safety and Health Administration, Federal Register, July 24, 1986.

4. "OSHA Safety and Health Standards, General Industry," (29 CFR 1910), Occupational Safety and Health Administration, OSHA 2206, revised January 1976.

17.0 TABLES, DIAGRAMS, FLOWCHARTS AND VALIDATION DATA

TABLE 1. METHOD DETECTION LIMIT FOR CR (VI)

Maxtrix Type	Conc. Used to Compute MDL µg/L	MDL µg/L
Reagent Water	1	0.4
Drinking Water	2	0.3
Ground Water	2	0.3
Primary Sewage Wastewater	2	0.3
Electroplating Wastewater	2	0.3

TABLE 2. ION CHROMATOGRAPHIC CONDITIONS

Columns:	Guard Column - Dionex IonPac NG1 Separator Column - Dionex IonPac AS7
Eluent:	250 mM $(NH_4)_2SO_4$ 100 mM NH_4OH Flow rate = 1.5 mL/min.
Post-Column Reagent:	2 mM Diphenylcarbohydrazide 10% v/v CH_3OH 1 N H_2SO_4 Flow rate = 0.5 mL/min.
Detector:	Visible 530 nm
Retention Time:	3.8 minutes

TABLE 3. SINGLE ANALYST PRECISION AND ACCURACY

Sample Type	Cr (VI) (µg/L)[a]	Mean Recovery (%)	RPD[b]
Reagent Water	100	100	0.8
	1000	100	0.0
Drinking Water	100	105	6.7
	1000	98	1.5
Ground Water	100	98	0.0
	1000	96	0.8
Primary Sewage	100	100	0.7
Wastewater Effluent	1000	104	2.7
Electroplating	100	99	0.4
Wastewater Effluent	1000	101	0.4

[a]Sample fortified at this concentration level.
[b]RPD - relative percent difference between duplicates.

TABLE 4. SINGLE-ANALYST PRECISION, OVERALL PRECISION AND RECOVERY FROM MULTILABORATORY STUDY

	Reagent Water (6-960 µg/L)	**Matrix Water (6-960 µg/L)**
Mean Recovery	$X = 1.020C + 0.592$	$X = 0.989C - 0.411$
Overall Standard Deviation	$S_R = 0.035X + 0.893$	$S_R = 0.059X + 1.055$
Single-Analyst Standard Deviation	$S_r = 0.021X + 0.375$	$S_r = 0.041X + 0.393$

X Mean concentration, µg/L, exclusive of outliers.
C True value, µg/L.
S_R Overall standard deviation.
S_r Single-analyst standard deviation.

Developed by ELTAC
Turbidity by EPA 180.1, SM 2130B-2001

Lab Name: Certificate # Auditor: Date

Laboratory Response		References	ELAP Evaluation
	1. Sample Collection and Storage		
	1.1 P, G, FP sample containers	SM1060	
	1.2 Cool ≤6°Cfor 48H	SM1060	
	2. Instrument & Equipment		
	2.1 Turbidimeter, with detector 400 nm-600nm		
	2.2 Sample tubes clear, colorless glass or plastic		
	2.3 Class A volumetric flasks & pipets as required		
	3. Standards and Reagents		
	3.1 Reagent water- turbidity free (<RL) 3.2 Primary Formazin standard, prepared in the lab or purchased 3.3 Secondary calibration standards, prepared in the lab or purchased		
	4. Procedures/Calibration		
	4.1 The instrument is calibrated according to manufacturer's specifications		
	4.2 Calibrate the instrument with standards covering the range of interest		
	4.3 Mix samples thoroughly, wait till air bubbles disappear, pour into sample tube		
	4.4 Sample turbidity>40NTU, dilute the samples with reagent water		
	5. Quality Control		
	5.1 IDC	SM2020	
	5.2 MDL	SM2020	
	5.3 Operational Range	SM2020	
	5.4 QCS	SM2020	

Turbidity **SM 2130 B**

Additional QC requirements for this method: ____________________

Laboratory SOP Number/ Revision/ Date: ____________________

Facility Name: ____________________ ELAP Cert. #: ____________________

ELAP Inspector: ______________ Analyst Name: ____________________ Inspection Date: ______________

Item to be Evaluated:	Method Reference	Y	N	N/A	Comments
Sample Collection and Storage:					
Stored for no longer then 48 hrs, in a dark place, at a temp of 6 °C					
Samples must be collected into plastic, glass or fluoroploymer container					
Apparatus:					
Turbidimeter w/ detector 400 nm - 600 nm					
Must be able detect differences of 0.02 NTU or less for waters with turbidity of 1 NTU or less					
Sample tubes must be clear, colorless glass or plastic					
Reagents: (All chemicals are ACS grade unless otherwise noted)					
Dilution water must be turbidity free					
Stock primary standard formazine suspension (stable for 1year)					Date expired_________
Secondary standards					Date expired_________
Procedure:					
Calibrate instrument per manufactures instructions					
Run at least one sample in each range to be used					
Agitate sample, wait until air bubbles disappear before running					
Dilute samples with greater than 40 NTU with reagent water					
Quality Control:					
LCR must be determined and verified every six months, must not exceed initial values by +/-10%					

Notes/Comments

Turbidity **SM 2130 B**

Additional QC requirements for this method: ______________________

Laboratory SOP Number/ Revision/ Date: ______________________

Facility Name: ______________________ ELAP Cert. #: ______________

ELAP Inspector: __________ Analyst Name: ______________ Inspection Date: __________

Item to be Evaluated:	Method Reference	Y	N	N/A	Comments
Quality Control (Continued):					
QCS must be performed quarterly. Concentrations must be within 10%					
LRB must be performed with each batch					
IPC solution must be performed following daily calibration, after every 10 samples and at the end of the sample run. Must be within +/-10% of calibration					

Notes/Comments

tristimulus (ordinate) values, preferably by using the weighted-ordinate method.* Calibrate calculation algorithm software against platinum-cobalt standard reference.

b. Spectrophotometer cells, 1 cm.

c. Filtering apparatus and filter: See 2120B.2*c*.

3. Procedure

a. Sample collection: See 2120B.5*a*.

b. Sample preparation: Prepare two 100-mL sample portions, one at the original pH and one at pH 7.0. Filter turbid samples according to 2120B.5*b*.

c. Spectrophotometric measurement: Let spectrophotometer warm up in accordance with the manufacturer's instruction. Set instrument to pre-programmed calibration curve for ADMI Weighted Ordinate Method. Zero instrument and take measurements of original and pH-adjusted samples according to manufacturer's directions. Express results as prescribed in 2120C.6*c* for both original and pH-adjusted samples.

Alternatively, obtain ADMI weighted-ordinate values for color by a published computation method.[2]

* Hach DR/4000 Spectrophotometer, Program No. 1660, or equivalent.

4. Quality Control

See Section 2120B.7.

5. References

1. McLaren, K. 1970. The Adams-Nickerson colour-difference formula. *J. Soc. Dyers Colorists* 86:354.
2. Allen, W., W.B. Prescott, R.E. Derby, C.E. Garland, J.M. Peret & M. Saltzman. 1973. Determination of color of water and wastewater by means of ADMI color values. *Proc. 28th Ind. Waste Conf.*, Purdue Univ., Eng. Ext. Ser. No. 142:661.

6. Bibliography

Hach Company. 1999. Hach DR/4000 Spectrophotometer Procedures Manual, 9th ed. Hach Co., Loveland, Colo.

2130 TURBIDITY*

2130 A. Introduction

1. Sources and Significance

Clarity of water is important in producing products destined for human consumption and in many manufacturing operations. Beverage producers, food processors, and potable water treatment plants drawing from a surface water source commonly rely on fluid-particle separation processes such as sedimentation and filtration to increase clarity and insure an acceptable product. The clarity of a natural body of water is an important determinant of its condition and productivity.

Turbidity in water is caused by suspended and colloidal matter such as clay, silt, finely divided organic and inorganic matter, and plankton and other microscopic organisms. Turbidity is an expression of the optical property that causes light to be scattered and absorbed rather than transmitted with no change in direction or flux level through the sample. Correlation of turbidity with the weight or particle number concentration of suspended matter is difficult because the size, shape, and refractive index of the particles affect the light-scattering properties of the suspension. When present in significant concentrations, particles consisting of light-absorbing materials such as activated carbon cause a negative interference. In low concentrations these particles tend to have a positive influence because they contribute to turbidity. The presence of dissolved, color-causing substances that absorb light may cause a negative interference. Some commercial instruments may have the capability of either correcting for a slight color interference or optically blanking out the color effect.

2. Selection of Method

Historically, the standard method for determination of turbidity has been based on the Jackson candle turbidimeter; however, the lowest turbidity value that can be measured directly on this device is 25 Jackson Turbidity Units (JTU). Because turbidities of water treated by conventional fluid-particle separation processes usually fall within the range of 0 to 1 unit, indirect secondary methods were developed to estimate turbidity. Electronic nephelometers are the preferred instruments for turbidity measurement.

Most commercial turbidimeters designed for measuring low turbidities give comparatively good indications of the intensity of light scattered in one particular direction, predominantly at right angles to the incident light. Turbidimeters with scattered-light detectors located at 90° to the incident beam are called nephelometers. Nephelometers are relatively unaffected by small differences in design parameters and therefore are specified as the standard instrument for measurement of low turbidities. Instruments of different make and model may vary in response.† However, interinstrument variation may be effectively negligible

* Approved by Standard Methods Committee, 2001.
Joint Task Group: 20th Edition—Raymond D. Letterman (chair), John A. Arrington, Alvin Lieberman, Kemon J. Papacosta, Theodore S. Tanaka, Brannon H. Wilder.

† Nephelometers that instrument manufacturers claim meet the design specifications of this method may not give the same reading for a given suspension, even when each instrument has been calibrated using the manufacturer's manual. This differential performance is especially important when measurements are made for regulatory purposes. Consult regulatory authorities when selecting a nephelometer to be used for making measurements that will be reported for regulatory purposes.

if good measurement techniques are used and the characteristics of the particles in the measured suspensions are similar. Poor measurement technique can have a greater effect on measurement error than small differences in instrument design. Turbidimeters of nonstandard design, such as forward-scattering devices, may be more sensitive than nephelometers to the presence of larger particles. While it may not be appropriate to compare their output with that of instruments of standard design, they still may be useful for process monitoring.

An additional cause of discrepancies in turbidity analysis is the use of suspensions of different types of particulate matter for instrument calibration. Like water samples, prepared suspensions have different optical properties depending on the particle size distributions, shapes, and refractive indices. A standard reference suspension having reproducible light-scattering properties is specified for nephelometer calibration.

Its precision, sensitivity, and applicability over a wide turbidity range make the nephelometric method preferable to visual methods. Report nephelometric measurement results as nephelometric turbidity units (NTU).

3. Storage of Sample

Determine turbidity as soon as possible after the sample is taken. Gently agitate all samples before examination to ensure a representative measurement. Sample preservation is not practical; begin analysis promptly. Refrigerate or cool to 4°C, to minimize microbiological decomposition of solids, if storage is required. For best results, measure turbidity immediately without altering the original sample conditions such as temperature or pH.

2130 B. Nephelometric Method

1. General Discussion

a. Principle: This method is based on a comparison of the intensity of light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. The higher the intensity of scattered light, the higher the turbidity. Formazin polymer is used as the primary standard reference suspension. The turbidity of a specified concentration of formazin suspension is defined as 4000 NTU.

b. Interference: Turbidity can be determined for any water sample that is free of debris and rapidly settling coarse sediment. Dirty glassware and the presence of air bubbles give false results. “True color,” i.e., water color due to dissolved substances that absorb light, causes measured turbidities to be low. This effect usually is not significant in treated water.

2. Apparatus

a. Laboratory or process nephelometer consisting of a light source for illuminating the sample and one or more photoelectric detectors with a readout device to indicate intensity of light scattered at 90° to the path of incident light. Use an instrument designed to minimize stray light reaching the detector in the absence of turbidity and to be free from significant drift after a short warmup period. The sensitivity of the instrument should permit detecting turbidity differences of 0.02 NTU or less in the lowest range in waters having a turbidity of less than 1 NTU. Several ranges may be necessary to obtain both adequate coverage and sufficient sensitivity for low turbidities. Differences in instrument design will cause differences in measured values for turbidity even though the same suspension is used for calibration. To minimize such differences, observe the following design criteria:

1) Light source—Tungsten-filament lamp operated at a color temperature between 2200 and 3000°K.

2) Distance traversed by incident light and scattered light within the sample tube—Total not to exceed 10 cm.

3) Angle of light acceptance by detector—Centered at 90° to the incident light path and not to exceed ±30° from 90°. The detector and filter system, if used, shall have a spectral peak response between 400 and 600 nm.

b. Sample cells: Use sample cells or tubes of clear, colorless glass or plastic. Keep cells scrupulously clean, both inside and out, and discard if scratched or etched. Never handle them where the instrument’s light beam will strike them. Use tubes with sufficient extra length, or with a protective case, so that they may be handled properly. Fill cells with samples and standards that have been agitated thoroughly and allow sufficient time for bubbles to escape.

Clean sample cells by thorough washing with laboratory soap inside and out followed by multiple rinses with distilled or deionized water; let cells air-dry. Handle sample cells only by the top to avoid dirt and fingerprints within the light path.

Cells may be coated on the outside with a thin layer of silicone oil to mask minor imperfections and scratches that may contribute to stray light. Use silicone oil with the same refractive index as glass. Avoid excess oil because it may attract dirt and contaminate the sample compartment of the instrument. Using a soft, lint-free cloth, spread the oil uniformly and wipe off excess. The cell should appear to be nearly dry with little or no visible oil.

Because small differences between sample cells significantly impact measurement, use either matched pairs of cells or the same cell for both standardization and sample measurement.

3. Reagents

a. Dilution water: High-purity water will cause some light scattering, which is detected by nephelometers as turbidity. To obtain low-turbidity water for dilutions, nominal value 0.02 NTU, pass laboratory reagent-grade water through a filter with pore size sufficiently small to remove essentially all particles larger than 0.1 μm;* the usual membrane filter used for bacteriological examinations is not satisfactory. Rinse collecting flask at least twice with filtered water and discard the next 200 mL.

Some commercial bottled demineralized waters have a low turbidity. These may be used when filtration is impractical or a good grade of water is not available to filter in the laboratory. Check turbidity of bottled water to make sure it is lower than the level that can be achieved in the laboratory.

b. Stock primary standard formazin suspension:

1) Solution I—Dissolve 1.000 g hydrazine sulfate, $(NH_2)_2 \cdot H_2SO_4$, in distilled water and dilute to 100 mL in a volumetric flask. CAUTION: *Hydrazine sulfate is a carcinogen; avoid inhalation, ingestion, and skin contact. Formazin suspensions can contain residual hydrazine sulfate.*

2) Solution II—Dissolve 10.00 g hexamethylenetetramine, $(CH_2)_6N_4$, in distilled water and dilute to 100 mL in a volumetric flask.

3) In a flask, mix 5.0 mL Solution I and 5.0 mL Solution II. Let stand for 24 h at 25 ± 3°C. This results in a 4000-NTU suspension. Transfer stock suspension to an amber glass or other UV-light-blocking bottle for storage. Make dilutions from this stock suspension. The stock suspension is stable for up to 1 year when properly stored.

c. Dilute turbidity suspensions: Dilute 4000 NTU primary standard suspension with high-quality dilution water. Prepare immediately before use and discard after use.

d. Secondary standards: Secondary standards are standards that the manufacturer (or an independent testing organization) has certified will give instrument calibration results equivalent (within certain limits) to the results obtained when the instrument is calibrated with the primary standard, i.e., user-prepared formazin. Various secondary standards are available including: commercial stock suspensions of 4000 NTU formazin, commercial suspensions of microspheres of styrene-divinylbenzene copolymer,† and items supplied by instrument manufacturers, such as sealed sample cells filled with latex suspension or with metal oxide particles in a polymer gel. The U.S. Environmental Protection Agency[1] designates user-prepared formazin, commercial stock formazin suspensions, and commercial styrene-divinylbenzene suspensions as "primary standards," and reserves the term "secondary standard" for the sealed standards mentioned above.

Secondary standards made with suspensions of microspheres of styrene-divinylbenzene copolymer typically are as stable as concentrated formazin and are much more stable than diluted formazin. These suspensions can be instrument-specific; therefore, use only suspensions formulated for the type of nephelometer being used. Secondary standards provided by the instrument manufacturer (sometimes called "permanent" standards) may be necessary to standardize some instruments before each reading and in other instruments only as a calibration check to determine when calibration with the primary standard is necessary.

All secondary standards, even so-called "permanent" standards, change with time. Replace them when their age exceeds the shelf life. Deterioration can be detected by measuring the turbidity of the standard after calibrating the instrument with a fresh formazin or microsphere suspension. If there is any doubt about the integrity or turbidity value of any secondary standard, check instrument calibration first with another secondary standard and then, if necessary, with user-prepared formazin. Most secondary standards have been carefully prepared by their manufacturer and should, if properly used, give good agreement with formazin. Prepare formazin primary standard only as a last resort. Proper application of secondary standards is specific for each make and model of nephelometer. Not all secondary standards have to be discarded when comparison with a primary standard shows that their turbidity value has changed. In some cases, the secondary standard should be simply relabeled with the new turbidity value. Always follow the manufacturer's directions.

4. Procedure

a. General measurement techniques: Proper measurement techniques are important in minimizing the effects of instrument variables as well as stray light and air bubbles. Regardless of the instrument used, the measurement will be more accurate, precise, and repeatable if close attention is paid to proper measurement techniques.

Measure turbidity immediately to prevent temperature changes and particle flocculation and sedimentation from changing sample characteristics. If flocculation is apparent, break up aggregates by agitation. Avoid dilution whenever possible. Particles suspended in the original sample may dissolve or otherwise change characteristics when the temperature changes or when the sample is diluted.

Remove air or other entrained gases in the sample before measurement. Preferably degas even if no bubbles are visible. Degas by applying a partial vacuum, adding a nonfoaming-type surfactant, using an ultrasonic bath, or applying heat. In some cases, two or more of these techniques may be combined for more effective bubble removal. For example, it may be necessary to combine addition of a surfactant with use of an ultrasonic bath for some severe conditions. Any of these techniques, if misapplied, can alter sample turbidity; *use with care*. If degassing cannot be applied, bubble formation will be minimized if the samples are maintained at the temperature and pressure of the water before sampling.

Do not remove air bubbles by letting sample stand for a period of time because during standing, turbidity-causing particulates may settle and sample temperature may change. Both of these conditions alter sample turbidity, resulting in a nonrepresentative measurement.

Condensation may occur on the outside surface of a sample cell when a cold sample is being measured in a warm, humid environment. This interferes with turbidity measurement. Remove all moisture from the outside of the sample cell before placing the cell in the instrument. If fogging recurs, let sample warm slightly by letting it stand at room temperature or by partially immersing it in a warm water bath for a short time. Make sure samples are again well mixed.

b. Nephelometer calibration: Follow the manufacturer's operating instructions. Run at least one standard in each instrument range to be used. Make certain the nephelometer gives stable readings in all sensitivity ranges used. Follow techniques out-

* Nuclepore Corp., 7035 Commerce Circle, Pleasanton, CA, or equivalent.
† AMCO-AEPA-1 Standard, Advanced Polymer Systems, 3696 Haven Ave., Redwood City, CA, or equivalent.

lined in ¶s 2*b* and 4*a* for care and handling of sample cells, degassing, and dealing with condensation.

c. Measurement of turbidity: Gently agitate sample. Wait until air bubbles disappear and pour sample into cell. When possible, pour well-mixed sample into cell and immerse it in an ultrasonic bath for 1 to 2 s or apply vacuum degassing, causing complete bubble release. Read turbidity directly from instrument display.

d. Calibration of continuous turbidity monitors: Calibrate continuous turbidity monitors for low turbidities by determining turbidity of the water flowing out of them, using a laboratory-model nephelometer, or calibrate the instruments according to manufacturer's instructions with formazin primary standard or appropriate secondary standard.

5. Interpretation of Results

Report turbidity readings as follows:

Turbidity Range *NTU*	Report to the Nearest *NTU*
0–1.0	0.05
1–10	0.1
10–40	1
40–100	5
100–400	10
400–1000	50
>1000	100

When comparing water treatment efficiencies, do not estimate turbidity more closely than specified above. Uncertainties and discrepancies in turbidity measurements make it unlikely that results can be duplicated to greater precision than specified.

6. Reference

1. U.S. ENVIRONMENTAL PROTECTION AGENCY. 1993. Methods for Determination of Inorganic Substances in Environmental Samples. EPA-600/R/93/100 - Draft. Environmental Monitoring Systems Lab., Cincinnati, Ohio.

7. Bibliography

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BUCKLIN, K.E., G.A. MCFETERS & A. AMIRTHARAJAH. 1991. Penetration of coliform through municipal drinking water filters. *Water Res.* 25:1013.

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LECHEVALLIER, M.W. & W.D. NORTON. 1992. Examining relationship between particle counts and *Giardia*, *Cryptosporidium*, and turbidity. *J. Amer. Water Works Assoc.* 84(12):54.

2150 ODOR*

2150 A. Introduction

1. Discussion

Odor, like taste, depends on contact of a stimulating substance with the appropriate human receptor cell. The stimuli are chemical in nature and the term "chemical senses" often is applied to odor and taste. Water is a neutral medium, always present on or at the receptors that perceive sensory response. In its pure form, water is odor-free. Man and other animals can avoid many potentially toxic foods and waters because of adverse sensory response. These senses often provide the first warning of potential hazards in the environment.

Odor is recognized[1] as a quality factor affecting acceptability of drinking water (and foods prepared with it), tainting of fish and other aquatic organisms, and esthetics of recreational waters. Most organic and some inorganic chemicals contribute taste or odor. These chemicals may originate from municipal and industrial waste discharges, from natural sources such as decomposition of vegetable matter, or from associated microbial activity, and from disinfectants or their products.

The potential for impairment of the sensory quality of water has increased as a result of expansion in the variety and quantity of waste materials, demand for water disposal of captured air pollutants, and increased reuse of available water supplies by a growing population. Domestic consumers and process industries such as food, beverage, and pharmaceutical manufacturers require water essentially free of tastes and odors.

* Approved by Standard Methods Committee, 1997.
Joint Task Group: 20th Edition—Irwin H. Suffet, (chair), John A. Arrington, Larry D. Benefield, Larry David Cole, Thomas S. Gittelman, James P. Kizer, Shundar Lin, Gerald L. Mahon, Morten C. Meilgaard, James R. Nugent.

Developed by ELTAC

Residue, Settleable SM 2540F

Lab Name: Certificate # Auditor: Date

Laboratory Response		References	ELAP Evaluation
	1. Sample Collection and Storage		
	1.1 Plastic or glass sample containers, Cool ≤6 ºC for 7d	SM 1060:I	
	2. Instrument & Equipment		
	2.1 Imhoff Cone	SM 2540 F	
	3. Procedures/Calibration		
	3.1 Fill Imhoff cone to 1-l mark	SM 2540 F	
	3.2 Settle for 45 minutes	SM 2540 F	
	3.3 Agitate sample near the side of the cone and settle for 15 more minutes	SM 2540 F	
	4.0 Quality Control		
	Sample Duplicate		

Settleable Solids **2540 F 20th Edition 1997**

Additional QC requirements for this method: ______________________________

Laboratory SOP Number/ Revision/ Date: ______________________________

Facility Name: ______________________________ ELAP Cert. #: ______________

ELAP Inspector: ______________ Analyst Name: ______________________ Inspection Date: ______________

Item to be Evaluated:	Method Reference	Y	N	N/A	Comments
Sample Collection and Storage:					
Was the sample refrigerated at 4°C?	2540 A 3				
Was the sample analyzed within 24 hours of collection? Discarded within 7 days?	2540 A 3				
Was the sample brought to room temperature before being analyzed?	2540 A 3				
Apparatus:					
Porcelain, Platinum, or High-silica glass dish	2540 B 2				
Muffle furnace for operation at 550°C Was the muffle furnace calibrated to run at 550°C ?	2540 B 2				
Aluminum weighing dishes.	2540 D 2				
Desiccator	2540 B 2				
Analytical Balance 0.1 mg capability	2540 B 2				
Drying oven for operation at 103°C to 105°C . Was the drying oven calibrated to run at 103°C to 105°C?	2540 B 2				
Filtration Apparatus	2540 C 2				
Imhoff Cone	2540 F 2				
Ensure all instrumentation is calibrated. Check the calibration documents as well as any SOPs.					
Interferences:					
Highly mineralized water may be hygroscopic and require prolonged drying, desiccation and rapid weighing.	2540 B 1				
Exclude large floating or submerged particles from the sample.	2540 B 1				
Disperse visible floating oil and grease with a blender.	2540 B 1				

Notes/Comments

Settleable Solids **2540 F 20th Edition 1997**

Additional QC requirements for this method: ______________________

Laboratory SOP Number/ Revision/ Date: ______________________

Facility Name: ______________________ ELAP Cert. #: ______________

ELAP Inspector: ____________ Analyst Name: ______________ Inspection Date: __________

Item to be Evaluated:	Method Reference	Y	N	N/A	Comments
Procedure:					
Volumetric: Fill Imhoff cone to the 1L mark with well-mixed sample. Let settle for 45 minutes agitate sample near the sides of cone and let settle for 15 minutes. Record the volume of Settleable Solids.	2540 F 3				
Gravimetric: First determine the total suspended solids in Method 2540 D.	2540 F 3				
Was the sample poured into a glass vessel consisting of not less than 9cm in diameter and not less than 1L sufficient to give a depth of 20	2540 F 3				
After letting sit for 1 hour was 250 mL of solution siphoned from the center of the container at a point halfway between the surface of the solid material and the surface of the liquid?	2540 F 3				
Using Method 2540 D determine Total Suspended Solids of this supernatant liquid.	2540 F 3				
Quality Control:					
10% of all Samples will be analyzed in duplicate, with no more than 5% deviation of their average weight.	2540 E 3				

Notes/Comments

2540 SOLIDS*

2540 A. Introduction

Solids refer to matter suspended or dissolved in water or wastewater. Solids may affect water or effluent quality adversely in a number of ways. Waters with high dissolved solids generally are of inferior palatability and may induce an unfavorable physiological reaction in the transient consumer. For these reasons, a limit of 500 mg dissolved solids/L is desirable for drinking waters. Highly mineralized waters also are unsuitable for many industrial applications. Waters high in suspended solids may be esthetically unsatisfactory for such purposes as bathing. Solids analyses are important in the control of biological and physical wastewater treatment processes and for assessing compliance with regulatory agency wastewater effluent limitations.

1. Definitions

"Total solids" is the term applied to the material residue left in the vessel after evaporation of a sample and its subsequent drying in an oven at a defined temperature. Total solids includes "total suspended solids," the portion of total solids retained by a filter, and "total dissolved solids," the portion that passes through the filter.

The type of filter holder, the pore size, porosity, area, and thickness of the filter and the physical nature, particle size, and amount of material deposited on the filter are the principal factors affecting separation of suspended from dissolved solids. "Dissolved solids" is the portion of solids that passes through a filter of 2.0 μm (or smaller) nominal pore size under specified conditions. "Suspended solids" is the portion retained on the filter.

"Fixed solids" is the term applied to the residue of total, suspended, or dissolved solids after heating to dryness for a specified time at a specified temperature. The weight loss on ignition is called "volatile solids." Determinations of fixed and volatile solids do not distinguish precisely between inorganic and organic matter because the loss on ignition is not confined to organic matter. It includes losses due to decomposition or volatilization of some mineral salts. Better characterization of organic matter can be made by such tests as total organic carbon (Section 5310), BOD (Section 5210), and COD (Section 5220).

"Settleable solids" is the term applied to the material settling out of suspension within a defined period. It may include floating material, depending on the technique (2540F.3*b*).

2. Sources of Error and Variability

Sampling, subsampling, and pipeting two-phase or three-phase samples may introduce serious errors. Make and keep such samples homogeneous during transfer. Use special handling to insure sample integrity when subsampling. Mix small samples with a magnetic stirrer. If suspended solids are present, pipet with wide-bore pipets. If part of a sample adheres to the sample container, consider this in evaluating and reporting results. Some samples dry with the formation of a crust that prevents water evaporation; special handling is required to deal with this. Avoid using a magnetic stirrer with samples containing magnetic particles.

The temperature at which the residue is dried has an important bearing on results, because weight losses due to volatilization of organic matter, mechanically occluded water, water of crystallization, and gases from heat-induced chemical decomposition, as well as weight gains due to oxidation, depend on temperature and time of heating. Each sample requires close attention to desiccation after drying. Minimize opening desiccator because moist air enters. Some samples may be stronger desiccants than those used in the desiccator and may take on water.

Residues dried at 103 to 105°C may retain not only water of crystallization but also some mechanically occluded water. Loss of CO_2 will result in conversion of bicarbonate to carbonate. Loss of organic matter by volatilization usually will be very slight. Because removal of occluded water is marginal at this temperature, attainment of constant weight may be very slow.

Residues dried at 180 $\pm$ 2°C will lose almost all mechanically occluded water. Some water of crystallization may remain, especially if sulfates are present. Organic matter may be lost by volatilization, but not completely destroyed. Loss of CO_2 results from conversion of bicarbonates to carbonates and carbonates may be decomposed partially to oxides or basic salts. Some chloride and nitrate salts may be lost. In general, evaporating and drying water samples at 180°C yields values for dissolved solids closer to those obtained through summation of individually determined mineral species than the dissolved solids values secured through drying at the lower temperature.

To rinse filters and filtered solids and to clean labware use Type III water. Special samples may require a higher quality water; see Section 1080.

Results for residues high in oil or grease may be questionable because of the difficulty of drying to constant weight in a reasonable time.

To aid in quality assurance, analyze samples in duplicate. Dry samples to constant weight if possible. This entails multiple drying-cooling-weighing cycles for each determination.

Analyses performed for some special purposes may demand deviation from the stated procedures to include an unusual constituent with the measured solids. Whenever such variations of technique are introduced, record and present them with the results.

3. Sample Handling and Preservation

Use resistant-glass or plastic bottles, provided that the material in suspension does not adhere to container walls. Begin analysis as soon as possible because of the impracticality of preserving the sample. Refrigerate sample at 4°C up to the time of analysis to minimize microbiological decomposition of solids. Preferably do not hold samples more than 24 h. In no case hold sample more than 7 d. Bring samples to room temperature before analysis.

* Approved by Standard Methods Committee, 1997.
Joint Task Group: 20th Edition—Brannon H. Wilder (chair), Harold S. Costa, Christine M. Kosmowski, William E. Purcell.

4. Selection of Method

Methods B through F are suitable for the determination of solids in potable, surface, and saline waters, as well as domestic and industrial wastewaters in the range up to 20 000 mg/L.

Method G is suitable for the determination of solids in sediments, as well as solid and semisolid materials produced during water and wastewater treatment.

5. Bibliography

THERIAULT, E.J. & H.H. WAGENHALS. 1923. Studies of representative sewage plants. *Pub. Health Bull.* No. 132.

U.S. ENVIRONMENTAL PROTECTION AGENCY. 1979. Methods for Chemical Analysis of Water and Wastes. Publ. 600/4-79-020, rev. Mar. 1983. Environmental Monitoring and Support Lab., U.S. Environmental Protection Agency, Cincinnati, Ohio.

2540 B. Total Solids Dried at 103–105°C

1. General Discussion

a. Principle: A well-mixed sample is evaporated in a weighed dish and dried to constant weight in an oven at 103 to 105°C. The increase in weight over that of the empty dish represents the total solids. The results may not represent the weight of actual dissolved and suspended solids in wastewater samples (see above).

b. Interferences: Highly mineralized water with a significant concentration of calcium, magnesium, chloride, and/or sulfate may be hygroscopic and require prolonged drying, proper desiccation, and rapid weighing. Exclude large, floating particles or submerged agglomerates of nonhomogeneous materials from the sample if it is determined that their inclusion is not desired in the final result. Disperse visible floating oil and grease with a blender before withdrawing a sample portion for analysis. Because excessive residue in the dish may form a water-trapping crust, limit sample to no more than 200 mg residue (see 2540A.2).

2. Apparatus

a. Evaporating dishes: Dishes of 100-mL capacity made of one of the following materials:

1) Porcelain, 90-mm diam.
2) Platinum—Generally satisfactory for all purposes.
3) High-silica glass.*

b. Muffle furnace for operation at 550°C.

c. Steam bath.

d. Desiccator, provided with a desiccant containing a color indicator of moisture concentration or an instrumental indicator.

e. Drying oven, for operation at 103 to 105°C.

f. Analytical balance, capable of weighing to 0.1 mg.

g. Magnetic stirrer with TFE stirring bar.

h. Wide-bore pipets.†

i. Graduated cylinder.

j. Low-form beaker.‡

3. Procedure

a. Preparation of evaporating dish: If volatile solids are to be measured ignite clean evaporating dish at 550°C for 1 h in a muffle furnace. If only total solids are to be measured, heat clean dish to 103 to 105°C for 1 h. Store and cool dish in desiccator until needed. Weigh immediately before use.

b. Sample analysis: Choose a sample volume that will yield a residue between 2.5 and 200 mg. Pipet a measured volume of well-mixed sample, during mixing, to a preweighed dish. For homogeneous samples, pipet from the approximate midpoint of the container but not in the vortex. Choose a point both middepth and midway between wall and vortex. Evaporate to dryness on a steam bath or in a drying oven. Stir sample with a magnetic stirrer during transfer. If necessary, add successive sample portions to the same dish after evaporation. When evaporating in a drying oven, lower temperature to approximately 2°C below boiling to prevent splattering. Dry evaporated sample for at least 1 h in an oven at 103 to 105°C, cool dish in desiccator to balance temperature, and weigh. Repeat cycle of drying, cooling, desiccating, and weighing until a constant weight is obtained, or until weight change is less than 4% of previous weight or 0.5 mg, whichever is less. When weighing dried sample, be alert to change in weight due to air exposure and/or sample degradation. Analyze at least 10% of all samples in duplicate. Duplicate determinations should agree within 5% of their average weight.

4. Calculation

$$\text{mg total solids/L} = \frac{(A - B) \times 1000}{\text{sample volume, mL}}$$

where:

A = weight of dried residue + dish, mg, and
B = weight of dish, mg.

5. Precision

Single-laboratory duplicate analyses of 41 samples of water and wastewater were made with a standard deviation of differences of 6.0 mg/L.

6. Bibliography

SYMONS, G.E. & B. MOREY. 1941. The effect of drying time on the determination of solids in sewage and sewage sludges. *Sewage Works J.* 13:936.

* Vycor, product of Corning Glass Works, Corning, NY, or equivalent.
† Kimble Nos. 37005 or 37034B, or equivalent.
‡ Class B or better.

2540 C. Total Dissolved Solids Dried at 180°C

1. General Discussion

a. Principle: A well-mixed sample is filtered through a standard glass fiber filter, and the filtrate is evaporated to dryness in a weighed dish and dried to constant weight at 180°C. The increase in dish weight represents the total dissolved solids. This procedure may be used for drying at other temperatures.

The results may not agree with the theoretical value for solids calculated from chemical analysis of sample (see above). Approximate methods for correlating chemical analysis with dissolved solids are available.[1] The filtrate from the total suspended solids determination (Section 2540D) may be used for determination of total dissolved solids.

b. Interferences: See 2540A.2 and 2540B.1. Highly mineralized waters with a considerable calcium, magnesium, chloride, and/or sulfate content may be hygroscopic and require prolonged drying, proper desiccation, and rapid weighing. Samples high in bicarbonate require careful and possibly prolonged drying at 180°C to insure complete conversion of bicarbonate to carbonate. Because excessive residue in the dish may form a water-trapping crust, limit sample to no more than 200 mg residue.

2. Apparatus

Apparatus listed in 2540B.2*a-h* is required, and in addition:

*a. Glass-fiber filter disks** without organic binder.

b. Filtration apparatus: One of the following, suitable for the filter disk selected:

1) *Membrane filter funnel.*

2) *Gooch crucible,* 25-mL to 40-mL capacity, with Gooch crucible adapter.

3) *Filtration apparatus* with reservoir and coarse (40- to 60-μm) fritted disk as filter support.†

c. Suction flask, of sufficient capacity for sample size selected.

d. Drying oven, for operation at 180 ± 2°C.

3. Procedure

a. Preparation of glass-fiber filter disk: If pre-prepared glass fiber filter disks are used, eliminate this step. Insert disk with wrinkled side up into filtration apparatus. Apply vacuum and wash disk with three successive 20-mL volumes of reagent-grade water. Continue suction to remove all traces of water. Discard washings.

b. Preparation of evaporating dish: If volatile solids are to be measured, ignite cleaned evaporating dish at 550°C for 1 h in a muffle furnace. If only total dissolved solids are to be measured, heat clean dish to 180 ± 2°C for 1 h in an oven. Store in desiccator until needed. Weigh immediately before use.

c. Selection of filter and sample sizes: Choose sample volume to yield between 2.5 and 200 mg dried residue. If more than 10 min are required to complete filtration, increase filter size or decrease sample volume.

d. Sample analysis: Stir sample with a magnetic stirrer and pipet a measured volume onto a glass-fiber filter with applied vacuum. Wash with three successive 10-mL volumes of reagent-grade water, allowing complete drainage between washings, and continue suction for about 3 min after filtration is complete. Transfer total filtrate (with washings) to a weighed evaporating dish and evaporate to dryness on a steam bath or in a drying oven. If necessary, add successive portions to the same dish after evaporation. Dry evaporated sample for at least 1 h in an oven at 180 ± 2°C, cool in a desiccator to balance temperature, and weigh. Repeat drying cycle of drying, cooling, desiccating, and weighing until a constant weight is obtained or until weight change is less than 4% of previous weight or 0.5 mg, whichever is less. Analyze at least 10% of all samples in duplicate. Duplicate determinations should agree within 5% of their average weight. If volatile solids are to be determined, follow procedure in 2540E.

4. Calculation

$$\text{mg total dissolved solids/L} = \frac{(A - B) \times 1000}{\text{sample volume, mL}}$$

where:

A = weight of dried residue + dish, mg, and
B = weight of dish, mg.

5. Precision

Single-laboratory analyses of 77 samples of a known of 293 mg/L were made with a standard deviation of differences of 21.20 mg/L.

6. Reference

1. SOKOLOFF, V.P. 1933. Water of crystallization in total solids of water analysis. *Ind. Eng. Chem.,* Anal. Ed. 5:336.

7. Bibliography

HOWARD, C.S. 1933. Determination of total dissolved solids in water analysis. *Ind. Eng. Chem.,* Anal. Ed. 5:4.

U.S. GEOLOGICAL SURVEY. 1974. Methods for Collection and Analysis of Water Samples for Dissolved Minerals and Gases. Techniques of Water-Resources Investigations, Book 5, Chap. A1. U.S. Geological Surv., Washington, D.C.

* Whatman grade 934AH; Gelman type A/E; Millipore type AP40; E-D Scientific Specialties grade 161; Environmental Express Pro Weigh; or other products that give demonstrably equivalent results. Practical filter diameters are 2.2 to 12.5 cm.
† Gelman No. 4201 or equivalent.

2540 D. Total Suspended Solids Dried at 103–105°C

1. General Discussion

a. Principle: A well-mixed sample is filtered through a weighed standard glass-fiber filter and the residue retained on the filter is dried to a constant weight at 103 to 105°C. The increase in weight of the filter represents the total suspended solids. If the suspended material clogs the filter and prolongs filtration, it may be necessary to increase the diameter of the filter or decrease the sample volume. To obtain an estimate of total suspended solids, calculate the difference between total dissolved solids and total solids.

b. Interferences: See 2540A.2 and 2540B.1. Exclude large floating particles or submerged agglomerates of nonhomogeneous materials from the sample if it is determined that their inclusion is not representative. Because excessive residue on the filter may form a water-entrapping crust, limit the sample size to that yielding no more than 200 mg residue. For samples high in dissolved solids thoroughly wash the filter to ensure removal of dissolved material. Prolonged filtration times resulting from filter clogging may produce high results owing to increased colloidal materials captured on the clogged filter.

2. Apparatus

Apparatus listed in Sections 2540B.2 and 2540C.2 is required, except for evaporating dishes, steam bath, and 180°C drying oven. In addition:

Aluminum weighing dishes.

3. Procedure

a. Preparation of glass-fiber filter disk: If pre-prepared glass fiber filter disks are used, eliminate this step. Insert disk with wrinkled side up in filtration apparatus. Apply vacuum and wash disk with three successive 20-mL portions of reagent-grade water. Continue suction to remove all traces of water, turn vacuum off, and discard washings. Remove filter from filtration apparatus and transfer to an inert aluminum weighing dish. If a Gooch crucible is used, remove crucible and filter combination. Dry in an oven at 103 to 105°C for 1 h. If volatile solids are to be measured, ignite at 550°C for 15 min in a muffle furnace. Cool in desiccator to balance temperature and weigh. Repeat cycle of drying or igniting, cooling, desiccating, and weighing until a constant weight is obtained or until weight change is less than 4% of the previous weighing or 0.5 mg, whichever is less. Store in desiccator until needed.

b. Selection of filter and sample sizes: Choose sample volume to yield between 2.5 and 200 mg dried residue. If volume filtered fails to meet minimum yield, increase sample volume up to 1 L. If complete filtration takes more than 10 min, increase filter diameter or decrease sample volume.

c. Sample analysis: Assemble filtering apparatus and filter and begin suction. Wet filter with a small volume of reagent-grade water to seat it. Stir sample with a magnetic stirrer at a speed to shear larger particles, if practical, to obtain a more uniform (preferably homogeneous) particle size. Centrifugal force may separate particles by size and density, resulting in poor precision when point of sample withdrawal is varied. While stirring, pipet a measured volume onto the seated glass-fiber filter. For homogeneous samples, pipet from the approximate midpoint of container but not in vortex. Choose a point both middepth and midway between wall and vortex. Wash filter with three successive 10-mL volumes of reagent-grade water, allowing complete drainage between washings, and continue suction for about 3 min after filtration is complete. Samples with high dissolved solids may require additional washings. Carefully remove filter from filtration apparatus and transfer to an aluminum weighing dish as a support. Alternatively, remove the crucible and filter combination from the crucible adapter if a Gooch crucible is used. Dry for at least 1 h at 103 to 105°C in an oven, cool in a desiccator to balance temperature, and weigh. Repeat the cycle of drying, cooling, desiccating, and weighing until a constant weight is obtained or until the weight change is less than 4% of the previous weight or 0.5 mg, whichever is less. Analyze at least 10% of all samples in duplicate. Duplicate determinations should agree within 5% of their average weight. If volatile solids are to be determined, treat the residue according to 2540E.

4. Calculation

$$\text{mg total suspended solids/L} = \frac{(A - B) \times 1000}{\text{sample volume, mL}}$$

where:

A = weight of filter + dried residue, mg, and
B = weight of filter, mg.

5. Precision

The standard deviation was 5.2 mg/L (coefficient of variation 33%) at 15 mg/L, 24 mg/L (10%) at 242 mg/L, and 13 mg/L (0.76%) at 1707 mg/L in studies by two analysts of four sets of 10 determinations each.

Single-laboratory duplicate analyses of 50 samples of water and wastewater were made with a standard deviation of differences of 2.8 mg/L.

6. Bibliography

DEGEN, J. & F.E. NUSSBERGER. 1956. Notes on the determination of suspended solids. *Sewage Ind. Wastes* 28:237.

CHANIN, G., E.H. CHOW, R.B. ALEXANDER & J. POWERS. 1958. Use of glass fiber filter medium in the suspended solids determination. *Sewage Ind. Wastes* 30:1062.

NUSBAUM, I. 1958. New method for determination of suspended solids. *Sewage Ind. Wastes* 30:1066.

SMITH, A.L. & A.E. GREENBERG. 1963. Evaluation of methods for determining suspended solids in wastewater. *J. Water Pollut. Control Fed.* 35:940.

WYCKOFF, B.M. 1964. Rapid solids determination using glass fiber filters. *Water Sewage Works* 111:277.

NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT. 1975. A Preliminary Review of Analytical Methods for the Determination of Suspended Solids in Paper Industry Effluents for Compliance with EPA-NPDES Permit Terms. Spec. Rep. No. 75-01. National Council of the Paper Industry for Air & Stream Improvement, New York, N.Y.

NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT. 1977. A Study of the Effect of Alternate Procedures on

Effluent Suspended Solids Measurement. Stream Improvement Tech. Bull. No. 291, National Council of the Paper Industry for Air & Stream Improvement, New York, N.Y.

TREES, C.C. 1978. Analytical analysis of the effect of dissolved solids on suspended solids determination. *J. Water Pollut. Control Fed.* 50: 2370.

2540 E. Fixed and Volatile Solids Ignited at 550°C

1. General Discussion

a. Principle: The residue from Method B, C, or D is ignited to constant weight at 550°C. The remaining solids represent the fixed total, dissolved, or suspended solids while the weight lost on ignition is the volatile solids. The determination is useful in control of wastewater treatment plant operation because it offers a rough approximation of the amount of organic matter present in the solid fraction of wastewater, activated sludge, and industrial wastes.

b. Interferences: Negative errors in the volatile solids may be produced by loss of volatile matter during drying. Determination of low concentrations of volatile solids in the presence of high fixed solids concentrations may be subject to considerable error. In such cases, measure for suspect volatile components by another test, for example, total organic carbon (Section 5310). Highly alkaline residues may react with silica in sample or silica-containing crucibles.

2. Apparatus

See Sections 2540B.2, 2540C.2, and 2540D.2.

3. Procedure

Ignite residue produced by Method 2540B, C, or D to constant weight in a muffle furnace at a temperature of 550°C. Ignite a blank glass fiber filter along with samples. Have furnace up to temperature before inserting sample. Usually, 15 to 20 min ignition are required for 200 mg residue. However, more than one sample and/or heavier residues may overtax the furnace and necessitate longer ignition times. Let dish or filter disk cool partially in air until most of the heat has been dissipated. Transfer to a desiccator for final cooling in a dry atmosphere. Do not overload desiccator. Weigh dish or disk as soon as it has cooled to balance temperature. Repeat cycle of igniting, cooling, desiccating, and weighing until a constant weight is obtained or until weight change is less than 4% or 0.5 mg, whichever is less. Analyze at least 10% of all samples in duplicate. Duplicate determinations should agree within 5% of their average weight. Weight loss of the blank filter is an indication of unsuitability of a particular brand or type of filter for this analysis.

4. Calculation

$$\text{mg volatile solids/L} = \frac{(A - B) \times 1000}{\text{sample volume, mL}}$$

$$\text{mg fixed solids/L} = \frac{(B - C) \times 1000}{\text{sample volume, mL}}$$

where:

A = weight of residue + dish before ignition, mg,
B = weight of residue + dish or filter after ignition, mg, and
C = weight of dish or filter, mg.

5. Precision

The standard deviation was 11 mg/L at 170 mg/L volatile total solids in studies by three laboratories on four samples and 10 replicates. Bias data on actual samples cannot be obtained.

2540 F. Settleable Solids

1. General Discussion

Settleable solids in surface and saline waters as well as domestic and industrial wastes may be determined and reported on either a volume (mL/L) or a weight (mg/L) basis.

2. Apparatus

The volumetric test requires only an Imhoff cone. The gravimetric test requires all the apparatus listed in Section 2540D.2 and a glass vessel with a minimum diameter of 9 cm.

3. Procedure

a. Volumetric: Fill an Imhoff cone to the 1-L mark with a well-mixed sample. Settle for 45 min, gently agitate sample near the sides of the cone with a rod or by spinning, settle 15 min longer, and record volume of settleable solids in the cone as milliliters per liter. If the settled matter contains pockets of liquid between large settled particles, estimate volume of these and subtract from volume of settled solids. The practical lower limit of measurement depends on sample composition and generally is in the range of 0.1 to 1.0 mL/L. Where a separation of settleable and floating materials occurs, do not estimate the floating material as settleable matter. Replicates usually are not required.

Where biological or chemical floc is present, the gravimetric method (3*b*) is preferred.

b. Gravimetric:

1) Determine total suspended solids as in Section 2540D.

2) Pour a well-mixed sample into a glass vessel of not less than 9 cm diam using not less than 1 L and sufficient sample to

give a depth of 20 cm. Alternatively use a glass vessel of greater diameter and a larger volume of sample. Let stand quiescent for 1 h and, without disturbing the settled or floating material, siphon 250 mL from center of container at a point halfway between the surface of the settled material and the liquid surface. Determine total suspended solids (milligrams per liter) of this supernatant liquor (Section 2540D). These are the nonsettleable solids.

4. Calculation

mg settleable solids/L

= mg total suspended solids/L − mg nonsettleable solids/L

5. Precision and Bias

Precision and bias data are not now available.

6. Bibliography

FISCHER, A.J. & G.E. SYMONS. 1944. The determination of settleable sewage solids by weight. *Water Sewage Works* 91:37.

2540 G. Total, Fixed, and Volatile Solids in Solid and Semisolid Samples

1. General Discussion

a. Applicability: This method is applicable to the determination of total solids and its fixed and volatile fractions in such solid and semisolid samples as river and lake sediments, sludges separated from water and wastewater treatment processes, and sludge cakes from vacuum filtration, centrifugation, or other sludge dewatering processes.

b. Interferences: The determination of both total and volatile solids in these materials is subject to negative error due to loss of ammonium carbonate and volatile organic matter during drying. Although this is true also for wastewater, the effect tends to be more pronounced with sediments, and especially with sludges and sludge cakes. The mass of organic matter recovered from sludge and sediment requires a longer ignition time than that specified for wastewaters, effluents, or polluted waters. Carefully observe specified ignition time and temperature to control losses of volatile inorganic salts if these are a problem. Make all weighings quickly because wet samples tend to lose weight by evaporation. After drying or ignition, residues often are very hygroscopic and rapidly absorb moisture from the air. Highly alkaline residues may react with silica in the samples or silica-containing crucibles.

2. Apparatus

All the apparatus listed in Section 2540B.2 is required except that a magnetic stirrer and pipets are not used and a balance capable of weighing to 10 mg may be used.

3. Procedure

a. Total solids:

1) Preparation of evaporating dish—If volatile solids are to be measured, ignite a clean evaporating dish at 550°C for 1 h in a muffle furnace. If only total solids are to be measured, heat dish at 103 to 105°C for 1 h in an oven. Cool in desiccator, weigh, and store in desiccator until ready for use.

2) Sample analysis

a) Fluid samples—If the sample contains enough moisture to flow more or less readily, stir to homogenize, place 25 to 50 g in a prepared evaporating dish, and weigh. Evaporate to dryness on a water bath, dry at 103 to 105°C for 1 h, cool to balance temperature in an individual desiccator containing fresh desiccant, and weigh. Repeat heating, cooling, desiccating, and weighing procedure until the weight change is less than 4% or 50 mg, whichever is less. Analyze at least 10% of all samples in duplicate. Duplicate determinations should agree within 5% of their average weight.

b) Solid samples—If the sample consists of discrete pieces of solid material (dewatered sludge, for example), take cores from each piece with a No. 7 cork borer or pulverize the entire sample coarsely on a clean surface by hand, using rubber gloves. Place 25 to 50 g in a prepared evaporating dish and weigh. Place in an oven at 103 to 105°C overnight. Cool to balance temperature in a desiccator and weigh. Repeat drying (1 h), cooling, weighing, and desiccating steps until weight change is less than 4% or 50 mg, whichever is less. Analyze at least 10% of all samples in duplicate. Duplicate determinations should agree within 5% of their average weight.

b. Fixed and volatile solids: Transfer the dried residue from 2)a) above to a cool muffle furnace, heat furnace to 550°C, and ignite for 1 h. (If the residue contains large amounts of organic matter, first ignite it over a gas burner and under an exhaust hood in the presence of adequate air to lessen losses due to reducing conditions and to avoid odors in the laboratory.) Cool in desiccator to balance temperature and weigh. Repeat igniting (30 min), cooling, desiccating and weighing steps until the weight change is less than 4% or 50 mg, whichever is less. Analyze at least 10% of all samples in duplicate. Duplicate determinations should agree within 5% of their average weight.

4. Calculation

$$\%\text{ total solids} = \frac{(A - B) \times 100}{C - B}$$

$$\%\text{ volatile solids} = \frac{(A - D) \times 100}{A - B}$$

$$\%\text{ fixed solids} = \frac{(D - B) \times 100}{A - B}$$

where:

A = weight of dried residue + dish, mg,
B = weight of dish,
C = weight of wet sample + dish, mg, and
D = weight of residue + dish after ignition, mg.

5. Precision and Bias

Precision and bias data are not now available.

6. Bibliography

GOODMAN, B.L. 1964. Processing thickened sludge with chemical conditioners. Pages 78 et seq. *in* Sludge Concentration, Filtration and Incineration. Univ. Michigan Continued Education Ser. No. 113, Ann Arbor.

GRATTEAU, J.C. & R.I. DICK. 1968. Activated sludge suspended solids determinations. *Water Sewage Works* 115:468.

2550 TEMPERATURE*

2550 A. Introduction

Temperature readings are used in the calculation of various forms of alkalinity, in studies of saturation and stability with respect to calcium carbonate, in the calculation of salinity, and in general laboratory operations. In limnological studies, water temperatures as a function of depth often are required. Elevated temperatures resulting from discharges of heated water may have significant ecological impact. Identification of source of water supply, such as deep wells, often is possible by temperature measurements alone. Industrial plants often require data on water temperature for process use or heat-transmission calculations.

* Approved by Standard Methods Committee, 2000.

2550 B. Laboratory and Field Methods

1. Laboratory and Other Non-Depth Temperature Measurements

Normally, temperature measurements may be made with any good mercury-filled Celsius thermometer. As a minimum, the thermometer should have a scale marked for every 0.1°C, with markings etched on the capillary glass. The thermometer should have a minimal thermal capacity to permit rapid equilibration. Periodically check the thermometer against a precision thermometer certified by the National Institute of Standards and Technology (NIST, formerly National Bureau of Standards)* that is used with its certificate and correction chart. For field operations use a thermometer having a metal case to prevent breakage.

A total immersion thermometer is designed to indicate temperatures correctly when the bulb and the entire liquid column are exposed to the temperature being measured, except for a minimal emergent length. A partial-immersion thermometer has a line around it at the immersion distance from the bottom. It indicates correctly when the bulb and the liquid column to that line are exposed to the temperature being measured and the emergent stem is at ambient temperature.

* Some commercial thermometers may be as much as 3°C in error.

2. Depth Temperature Measurements

Depth temperature required for limnological studies may be measured with a reversing thermometer, thermophone, or thermistor. The thermistor is most convenient and accurate; however, higher cost may preclude its use. Calibrate any temperature measurement devices with a NIST-certified thermometer before field use. Make readings with the thermometer or device immersed in water long enough to permit complete equilibration. Report results to the nearest 0.1 or 1.0°C, depending on need.

The thermometer commonly used for depth measurements is of the reversing type. It often is mounted on the sample collection apparatus so that a water sample may be obtained simultaneously. Correct readings of reversing thermometers for changes due to differences between temperature at reversal and temperature at time of reading. Calculate as follows:

$$\Delta T = \left[\frac{(T^1 - t)\,(T^1 + V_0)}{K}\right] \times \left[1 + \frac{(T^1 - t)\,(T^1 + V_0)}{K}\right] + L$$

where:

ΔT = correction to be added algebraically to uncorrected reading,
T^1 = uncorrected reading at reversal,

Laboratories Currently Certified for Each FOT

Field of Testing	Number of Laboratories
101 - Microbiology of Drinking Water	312
102 - Inorganic Chemistry of Drinking Water	225
103 - Toxic Chemical Elements of Drinking Water	142
104 - Volatile Organic Chemistry of Drinking Water	115
105 - Semi-volatile Organic Chemistry of Drinking Water	67
106 - Radiochemistry of Drinking Water	32
107 - Microbiology of Wastewater	278
108 - Inorganic Chemistry of Wastewater	427
109 - Toxic Chemical Elements of Wastewater	183
110 - Volatile Organic Chemistry of Wastewater	100
111 - Semi-volatile Organic Chemistry of Wastewater	105
112 - Radiochemistry of Wastewater	13
113 - Whole Effluent Toxicity of Wastewater	68
114 - Inorganic Chemistry of Hazardous Waste	163
115 - Extraction Test of Hazardous Waste	129
116 - Volatile Organic Chemistry of Hazardous Waste	143
117 - Semi-volatile Organic Chemistry of Hazardous Waste	147
118 - Radiochemistry of Hazardous Waste	13
119 - Toxicity Bioassay of Hazardous Waste	13
120 - Physical Properties of Hazardous Waste	94
121 - Bulk Asbestos Analysis of Hazardous Waste	57
123 - Inorganic Chemistry and Toxic Chemical Elements of Pesticides Residues in Food	0
124 - Organic Chemistry of Pesticide Residues in Food by GC/MS	5
125 - Organic Chemistry of Pesticide Residues in Food (excluding GC/MS)	11
126 - Microbiology of Recreational Water	5
127 - Shellfish Sanitation	9
129 - Cryptosporidium and Giardia	11

Laboratories Currently Receiving ELAP Accreditation Services

Type of Laboratory	Number of Laboratories
In-State	603
Out-Of-State	117
Total	720

Fee Exempt Laboratories

32 Total Labs	$48,384.00
103 FOTs	$70,173.00
Total Exemptions	$118,557.00
ELAP Budget Authority	$3,300,000.00
Exemption % of budget authority	3.59%

*amounts based on current fee structure as of June 9, 2016 (Base fee = $1512, FOT fee = $681)

California State
Environmental Laboratory Accreditation Program
ELAP Exempt Lab FOT List by Lab Index Name

Lab Name and Cert No	*Street*	*City*	*State*	*Zip*	*Phone*
Alameda County Public Health Laboratory 2252	**2901 Peralta Oaks Ct. 2nd Floor**	**Oakland**	**CA**	**94605**	**(510) 268-2700**

FOT101	Microbiology of Drinking Water
FOT126	Microbiology of Recreational Water

Alameda County Public Health Laboratory is certified for 2 FOT's. Exempt fees = $ 2874

CA Dept of Fish & Fish and Wildlife, Fish & Wildlife Pollution Control Lab 1622	**2005 Nimbus Road**	**Rancho Cordova**	**CA**	**95670**	**(916) 358-2858**

FOT108	Inorganic Chemistry of Wastewater
FOT109	Toxic Chemical Elements of Wastewater
FOT111	Semi-volatile Organic Chemistry of Wastewater
FOT116	Volatile Organic Chemistry of Hazardous Waste
FOT117	Semi-volatile Organic Chemistry of Hazardous Waste

CA Dept of Fish & Fish and Wildlife, Fish & Wildlife Pollution Control Lab is certified for 5 FOT's. Exempt fees = $ 4917

CA Dept of Water Resources - Bryte Lab 1244	**1450 Riverbank Road**	**West Sacramento**	**CA**	**95605**	**(916) 375-6008**

FOT102	Inorganic Chemistry of Drinking Water
FOT103	Toxic Chemical Elements of Drinking Water
FOT104	Volatile Organic Chemistry of Drinking Water
FOT105	Semi-volatile Organic Chemistry of Drinking Water
FOT108	Inorganic Chemistry of Wastewater
FOT109	Toxic Chemical Elements of Wastewater
FOT111	Semi-volatile Organic Chemistry of Wastewater

CA Dept of Water Resources - Bryte Lab is certified for 7 FOT's. Exempt fees = $ 6279

El Dorado County Public Health Department 1968	**931 Spring Street**	**Placerville**	**CA**	**95667**	**(530) 621-6115**

FOT101	Microbiology of Drinking Water
FOT126	Microbiology of Recreational Water

El Dorado County Public Health Department is certified for 2 FOT's. Exempt fees = $ 2874

Fresno County Public Health Laboratory 1888	**1221 Fulton Mall**	**Fresno**	**CA**	**93721**	**(559) 600-6389**

FOT101	Microbiology of Drinking Water
FOT102	Inorganic Chemistry of Drinking Water
FOT103	Toxic Chemical Elements of Drinking Water
FOT104	Volatile Organic Chemistry of Drinking Water
FOT105	Semi-volatile Organic Chemistry of Drinking Water
FOT106	Radiochemistry of Drinking Water
FOT107	Microbiology of Wastewater
FOT108	Inorganic Chemistry of Wastewater
FOT109	Toxic Chemical Elements of Wastewater
FOT126	Microbiology of Recreational Water

Fresno County Public Health Laboratory is certified for 10 FOT's. Exempt fees = $ 8322

Humboldt County Public Health Laboratory 2033	**529 "I" Street**	**Eureka**	**CA**	**95501**	**(707) 268-2179**

Report Criteria: Program = ELAP; Lab Status = Active; Certificate Status = Active and Pending; Lab has certified FOT subgroups; Exempt Status = Exempt

Lab Name and Cert No	Street	City	State	Zip	Phone
FOT101 Microbiology of Drinking Water					
Humboldt County Public Health Laboratory is certified for 1 FOT's. Exempt fees = $ 2193					
Imperial County Public Health Laboratory 1773	**935 Broadway**	**El Centro**	**CA**	**92243**	**(760) 482-4437**
FOT101 Microbiology of Drinking Water					
FOT107 Microbiology of Wastewater					
Imperial County Public Health Laboratory is certified for 2 FOT's. Exempt fees = $ 2874					
Kern County Public Health Laboratory 1978	**1800 Mt. Vernon Avenue, Third Floor**	**Bakersfield**	**CA**	**93306**	**(661) 868-0505**
FOT101 Microbiology of Drinking Water					
FOT126 Microbiology of Recreational Water					
Kern County Public Health Laboratory is certified for 2 FOT's. Exempt fees = $ 2874					
Kings County Public Health Laboratory 1786	**330 Campus Drive**	**Hanford**	**CA**	**93230**	**(559) 584-1401**
FOT101 Microbiology of Drinking Water					
FOT107 Microbiology of Wastewater					
Kings County Public Health Laboratory is certified for 2 FOT's. Exempt fees = $ 2874					
Long Beach Public Health Laboratory 2368	**2525 Grand Avenue, Room 260**	**Long Beach**	**CA**	**90815**	**(562) 570-4075**
FOT101 Microbiology of Drinking Water					
FOT103 Toxic Chemical Elements of Drinking Water					
FOT109 Toxic Chemical Elements of Wastewater					
FOT126 Microbiology of Recreational Water					
Long Beach Public Health Laboratory is certified for 4 FOT's. Exempt fees = $ 4236					
Los Angeles County Public Health Laboratory 1398	**12750 Erickson Avenue**	**Downey**	**CA**	**90242**	**(562) 658-1334**
FOT101 Microbiology of Drinking Water					
FOT107 Microbiology of Wastewater					
FOT126 Microbiology of Recreational Water					
Los Angeles County Public Health Laboratory is certified for 3 FOT's. Exempt fees = $ 3555					
Madera County Public Health Laboratory 1380	**14215 Road 28**	**Madera**	**CA**	**93638**	**(559) 675-7893**
FOT101 Microbiology of Drinking Water					
Madera County Public Health Laboratory is certified for 1 FOT's. Exempt fees = $ 2193					
Merced County Public Health Laboratory 1757	**260 East 15th Street**	**Merced**	**CA**	**95341**	**(209) 381-1290**
FOT101 Microbiology of Drinking Water					
FOT107 Microbiology of Wastewater					
Merced County Public Health Laboratory is certified for 2 FOT's. Exempt fees = $ 2874					
Monterey County Consolidated Environmental Laboratory 1395	**1270 Natividad Road, Room 118**	**Salinas**	**CA**	**93906**	**(831) 755-4516**
FOT101 Microbiology of Drinking Water					
FOT102 Inorganic Chemistry of Drinking Water					
FOT103 Toxic Chemical Elements of Drinking Water					
FOT107 Microbiology of Wastewater					

Report Criteria: Program = ELAP; Lab Status = Active; Certificate Status = Active and Pending; Lab has certified FOT subgroups; Exempt Status = Exempt

Lab Name and Cert No	Street	City	State	Zip	Phone

FOT108	Inorganic Chemistry of Wastewater
FOT109	Toxic Chemical Elements of Wastewater
FOT126	Microbiology of Recreational Water

Monterey County Consolidated Environmental Laboratory is certified for 7 FOT's. Exempt fees = $ 6279

Lab Name and Cert No	Street	City	State	Zip	Phone
Napa -Solano-Yolo-Marin County Public Health Laboratory 2396	**2201 Courage Drive, MS 9-200**	**Fairfield, Ca**	**CA**	**94533**	**(707) 784-4410**

FOT101	Microbiology of Drinking Water
FOT107	Microbiology of Wastewater
FOT126	Microbiology of Recreational Water

Napa -Solano-Yolo-Marin County Public Health Laboratory is certified for 3 FOT's. Exempt fees = $ 3555

Lab Name and Cert No	Street	City	State	Zip	Phone
Orange County Public Health Laboratory 1275	**1729 West 17th Street**	**Santa Ana**	**CA**	**92706**	**(714) 834-8439**

FOT102	Inorganic Chemistry of Drinking Water
FOT103	Toxic Chemical Elements of Drinking Water
FOT108	Inorganic Chemistry of Wastewater
FOT109	Toxic Chemical Elements of Wastewater
FOT114	Inorganic Chemistry of Hazardous Waste
FOT116	Volatile Organic Chemistry of Hazardous Waste
FOT117	Semi-volatile Organic Chemistry of Hazardous Waste
FOT120	Physical Properties of Hazardous Waste

Orange County Public Health Laboratory is certified for 8 FOT's. Exempt fees = $ 6960

Lab Name and Cert No	Street	City	State	Zip	Phone
Orange County Public Health Laboratory 2545	**600 Shellmaker Road, Bldg A**	**Newport Beach**	**CA**	**92660**	**(949) 219-0424**

FOT101	Microbiology of Drinking Water
FOT107	Microbiology of Wastewater
FOT126	Microbiology of Recreational Water

Orange County Public Health Laboratory is certified for 3 FOT's. Exempt fees = $ 3555

Lab Name and Cert No	Street	City	State	Zip	Phone
Placer County Public Health Laboratory 2004	**11475 C Avenue**	**Auburn**	**CA**	**95603**	**(530) 889-7205**

FOT101	Microbiology of Drinking Water
FOT102	Inorganic Chemistry of Drinking Water
FOT107	Microbiology of Wastewater

Placer County Public Health Laboratory is certified for 3 FOT's. Exempt fees = $ 3555

Lab Name and Cert No	Street	City	State	Zip	Phone
Sacramento County Public Health Laboratory 1748	**4600 Broadway, Suite 2300**	**Sacramento**	**CA**	**95820**	**(916) 874-9231**

FOT101	Microbiology of Drinking Water

Sacramento County Public Health Laboratory is certified for 1 FOT's. Exempt fees = $ 2193

Lab Name and Cert No	Street	City	State	Zip	Phone
San Bernardino County Public Health Laboratory 1628	**799 East Rialto Avenue**	**San Bernardino**	**CA**	**92415-0011**	**(909) 383-3000**

FOT101	Microbiology of Drinking Water

San Bernardino County Public Health Laboratory is certified for 1 FOT's. Exempt fees = $ 2193

Lab Name and Cert No	Street	City	State	Zip	Phone
San Diego County Public Health Laboratory 1730	**3851 Rosecrans Street, Suite 716**	**San Diego**	**CA**	**92110**	**(619) 692-8500**

FOT101	Microbiology of Drinking Water
FOT107	Microbiology of Wastewater
FOT126	Microbiology of Recreational Water

Report Criteria: Program = ELAP; Lab Status = Active; Certificate Status = Active and Pending; Lab has certified FOT subgroups; Exempt Status = Exempt

Lab Name and Cert No	*Street*	*City*	*State*	*Zip*	*Phone*

San Diego County Public Health Laboratory is certified for 3 FOT's. Exempt fees = $ 3555

San Joaquin County Public Health Laboratory 1892	**1601 East Hazelton Avenue**	**Stockton**	**CA**	**95205**	**(209) 468-3460**

FOT101	Microbiology of Drinking Water
FOT107	Microbiology of Wastewater
FOT126	Microbiology of Recreational Water

San Joaquin County Public Health Laboratory is certified for 3 FOT's. Exempt fees = $ 3555

San Luis Obispo County Public Health Laboratory 2114	**2191 Johnson Avenue**	**San Luis Obispo**	**CA**	**93401**	**(805) 781-5507**

FOT101	Microbiology of Drinking Water
FOT107	Microbiology of Wastewater
FOT126	Microbiology of Recreational Water
FOT127	Shellfish Sanitation

San Luis Obispo County Public Health Laboratory is certified for 4 FOT's. Exempt fees = $ 4236

San Mateo County Public Health Laboratory 1591	**225 West 37th Avenue, Room 113**	**San Mateo**	**CA**	**94403**	**(650) 573-2500**

FOT101	Microbiology of Drinking Water
FOT102	Inorganic Chemistry of Drinking Water
FOT107	Microbiology of Wastewater
FOT108	Inorganic Chemistry of Wastewater
FOT126	Microbiology of Recreational Water

San Mateo County Public Health Laboratory is certified for 5 FOT's. Exempt fees = $ 4917

Santa Barbara County Public Health Laboratory 1818	**315 Camino Del Remedio, Room 262**	**Santa Barbara**	**CA**	**93110**	**(805) 681-5255**

FOT101	Microbiology of Drinking Water
FOT126	Microbiology of Recreational Water

Santa Barbara County Public Health Laboratory is certified for 2 FOT's. Exempt fees = $ 2874

Santa Clara County Public Health Lab 1905	**2220 Moorpark Avenue, 2nd Floor**	**San Jose**	**CA**	**95128**	**(408) 885-4272**

FOT101	Microbiology of Drinking Water

Santa Clara County Public Health Lab is certified for 1 FOT's. Exempt fees = $ 2193

Santa Cruz County - Health Services Agency Laboratory 2394	**1080 Emeline Avenue**	**Santa Cruz**	**CA**	**95060**	**(831) 454-5445**

FOT101	Microbiology of Drinking Water
FOT126	Microbiology of Recreational Water

Santa Cruz County - Health Services Agency Laboratory is certified for 2 FOT's. Exempt fees = $ 2874

Shasta County Public Health Laboratory 2156	**2650 Breslauer Way**	**Redding**	**CA**	**96001**	**(530) 225-5072**

FOT101	Microbiology of Drinking Water

Shasta County Public Health Laboratory is certified for 1 FOT's. Exempt fees = $ 2193

Sonoma County Public Health Laboratory 1736	**3313 Chanate Road**	**Santa Rosa**	**CA**	**95404**	**(707) 565-4711**

FOT101	Microbiology of Drinking Water
FOT107	Microbiology of Wastewater
FOT126	Microbiology of Recreational Water

Report Criteria: Program = ELAP; Lab Status = Active; Certificate Status = Active and Pending; Lab has certified FOT subgroups; Exempt Status = Exempt

Lab Name and Cert No		Street	City	State	Zip	Phone
FOT127	Shellfish Sanitation					
		Sonoma County Public Health Laboratory is certified for 4 FOT's. Exempt fees = $ 4236				
Stanislaus County Public Health Laboratory 1771		**820 Scenic Drive**	**Modesto**	**CA**	**95350**	**(209) 558-7356**
FOT101	Microbiology of Drinking Water					
FOT107	Microbiology of Wastewater					
FOT126	Microbiology of Recreational Water					
		Stanislaus County Public Health Laboratory is certified for 3 FOT's. Exempt fees = $ 3555				
Tulare County Public Health Laboratory 1285		**1062 South K Street**	**Tulare**	**CA**	**93274**	**(559) 685-5750**
FOT101	Microbiology of Drinking Water					
FOT107	Microbiology of Wastewater					
FOT126	Microbiology of Recreational Water					
		Tulare County Public Health Laboratory is certified for 3 FOT's. Exempt fees = $ 3555				
Ventura County Health Department Laboratory 1910		**2240 East Gonzales Road, Suite 160**	**Oxnard**	**CA**	**93036**	**(805) 981-5131**
FOT101	Microbiology of Drinking Water					
FOT107	Microbiology of Wastewater					
FOT126	Microbiology of Recreational Water					
		Ventura County Health Department Laboratory is certified for 3 FOT's. Exempt fees = $ 3555				

Total FOT's per Report = 103

Report Criteria: Program = ELAP; Lab Status = Active; Certificate Status = Active and Pending; Lab has certified FOT subgroups; Exempt Status = Exempt

Method Name	# of Certified Labs	FOT #
AOAC	2	127.03
AOAC	4	127.030
APHA	1	127.001
APHA	4	127.01
APHA	6	127.010
APHA	2	127.03
APHA	5	127.030
ASTM D1067-92	1	108.730
ASTM D1067-92	1	108.731
ASTM D1125-95A	1	108.741
ASTM D1126-86(92)	2	108.750
ASTM D1252-95A	4	108.782
ASTM D1252-95A	1	108.999
ASTM D1253-86	1	108.785
ASTM D1293-84	2	108.791
ASTM D1889-94	2	108.811
ASTM D2036-98A	1	108.822
ASTM D2036-98B	1	108.823
ASTM D2460-90	1	106.410
ASTM D3454-91	1	106.430
ASTM D3649-91	1	106.440
ASTM D3972-90	2	106.450
ASTM D3972-90	1	112.390
ASTM D4107-91	1	106.460
ASTM D4327-97	3	108.867
ASTM D4658-03	1	108.676
ASTM D4785-88	1	106.470
ASTM D512-89B	1	108.681
ASTM D512-89C	1	108.682
ASTM D515-88A	1	108.690
ASTM D515-88A	2	108.691

Method Name	# of Certified Labs	FOT #
ASTM D515-88B	1	108.692
ASTM D516-90	16	108.700
ASTM D516-90	1	108.99
ASTM D5174-97	2	106.480
ASTM D6919-03	14	108.868
ASTM D6919-09	7	108.868
ASTM E1218-04	5	113.071
ASTM E1218-04	1	113.140
ASTM E1218-04	3	113.141
CCR Chapter11, Article 5, Appendix II	121	115.030
Colitag	1	101.100
Colitag	33	101.115
DOE 4.5.2.3	3	106.250
DOE 4.5.2.3	3	112.490
DOE 4.5.2.3	3	118.200
DOE Pu-02	1	118.230
DOE Pu-03	1	118.231
DOE Pu-10	1	118.240
DOE Ra-05	1	106.200
DOE Sr-01	1	106.210
DOE Sr-01	2	112.500
DOE Sr-01	3	118.270
DOE Sr-02	2	112.510
DOE Sr-02	4	118.271
DOE Th-01	1	106.240
DOE U-02	2	106.230
DOE U-02	2	112.520
DOE U-02	2	118.290
DOE U-04	1	112.530
E*Colite	2	101.060
E*Colite	1	101.100
Enterolert	3	101.170

Method Name	# of Certified Labs	FOT #
Enterolert	32	101.310
Enterolert	104	107.242
Enterolert	1	107.262
Enterolert	1	107.999
Enterolert	48	126.080
EPA (March, 1979), p19	1	106.190
EPA (March, 1979), p19	1	112.110
EPA (March, 1979), p19	1	118.040
EPA (March, 1979), p33	2	106.190
EPA (March, 1979), p33	2	112.110
EPA (March, 1979), p33	1	112.190
EPA (March, 1979), p33	1	118.040
EPA (March, 1979), p33	2	118.070
EPA (March, 1979), p65	1	106.190
EPA (March, 1979), p87	1	106.190
EPA (March, 1979), p92	1	106.190
EPA 00-02	2	106.120
EPA 00-07	1	106.130
EPA 100.1	13	103.300
EPA 100.1	9	109.001
EPA 100.1	3	119.020
EPA 100.2	14	103.301
EPA 100.2	1	103.310
EPA 100.2	9	109.002
EPA 100.2	2	119.030
EPA 100.3	2	119.040
EPA 100.4	2	119.050
EPA 1000 (EPA/600/4-91/002)	16	113.040
EPA 1000 (EPA-821-R-02-013)	23	113.041
EPA 1002 (EPA/600/4-91/002)	15	113.050
EPA 1002 (EPA-821-R-02-013)	23	113.051
EPA 1003 (EPA/600/4-91/002)	14	113.060
EPA 1003 (EPA-821-R-02-013)	18	113.061

Method Name	# of Certified Labs	FOT #
EPA 1004 (EPA/600/4-91/003)	2	113.075
EPA 1004 (EPA-821-R-02-014)	2	113.076
EPA 1006 (EPA/600/4-91/003)	10	113.080
EPA 1006 (EPA-821-R-02-014)	10	113.081
EPA 1007 (EPA/600/4-91/003)	7	113.090
EPA 1007 (EPA-821-R-02-014)	10	113.091
EPA 1008 (EPA-821-R-02-014)	1	113.101
EPA 1010	90	120.010
EPA 1020A	21	120.020
EPA 1110	17	120.030
EPA 120.1	138	108.020
EPA 120.1	1	108.100
EPA 130.1	15	108.030
EPA 1310A	25	115.010
EPA 1311	110	115.020
EPA 1311	114	115.021
EPA 1311	72	115.022
EPA 1311	68	115.023
EPA 1312	71	115.040
EPA 150.1	27	102.015
EPA 150.1	4	102.212
EPA 150.2	5	102.016
EPA 150.2	69	108.051
EPA 160.4	183	108.090
EPA 1600	3	101.160
EPA 1600	4	101.309
EPA 1600	1	107.099
EPA 1600	21	107.244
EPA 1600	1	107.999
EPA 1600	1	126.061
EPA 1600	22	126.070
EPA 1602	2	101.200
EPA 1603	3	101.120

Method Name	# of Certified Labs	FOT #
EPA 1603	4	101.240
EPA 1604	2	101.112
EPA 1604	2	101.130
EPA 1604	3	101.250
EPA 1613	3	111.110
EPA 1613B	7	105.230
EPA 1613B	16	111.111
EPA 1622	3	129.010
EPA 1623	2	129.02
EPA 1623	7	129.020
EPA 1623.1	6	129.030
EPA 1625B	7	111.120
EPA 1631E	28	109.361
EPA 1650	3	111.123
EPA 1664	111	108.380
EPA 1664	3	108.381
EPA 1664 Rev. B	52	108.381
EPA 1664A	1	108.380
EPA 1664A	145	108.381
EPA 1680	1	107.248
EPA 1681	1	107.249
EPA 180.1	41	102.020
EPA 180.1	146	108.110
EPA 200.5	4	102.025
EPA 200.5	6	102.515
EPA 200.5	16	103.125
EPA 200.5	4	108.111
EPA 200.5	3	109.009
EPA 200.7	1	
EPA 200.7	47	102.026
EPA 200.7	101	102.520
EPA 200.7	107	103.130
EPA 200.7	142	108.112

Method Name	# of Certified Labs	FOT #
EPA 200.7	12	108.267
EPA 200.7	1	108.99
EPA 200.7	148	109.010
EPA 200.7	1	109.0109.010
EPA 200.7	1	109.101
EPA 200.8	101	103.140
EPA 200.8	30	106.092
EPA 200.8	76	108.113
EPA 200.8	1	108.113.003
EPA 200.8	1	108.999
EPA 200.8	119	109.020
EPA 200.8	1	c
EPA 200.9	65	103.150
EPA 200.9	22	109.025
EPA 2000 (EPA-821-R-02-012), Continuous Flow	26	113.021
EPA 2000 (EPA-821-R-02-012), Static	23	113.021
EPA 2000 (EPA-821-R-02-012), Static Renewal	29	113.021
EPA 2002 (EPA-821-R-02-012), Continuous Flow	1	113.023
EPA 2002 (EPA-821-R-02-012), Static	14	113.023
EPA 2002 (EPA-821-R-02-012), Static Renewal	20	113.023
EPA 2004 (EPA-821-R-02-012), Continuous Flow	1	113.026
EPA 2004 (EPA-821-R-02-012), Static	3	113.026
EPA 2004 (EPA-821-R-02-012), Static Renewal	3	113.026
EPA 2006 (EPA-821-R-02-012), Continuous Flow	1	113.025
EPA 2006 (EPA-821-R-02-012), Static	9	113.025

Method Name	# of Certified Labs	FOT #
EPA 2006 (EPA-821-R-02-012), Static Renewal	11	113.025
EPA 2007 (EPA-821-R-02-012), Continuous Flow	1	113.027
EPA 2007 (EPA-821-R-02-012), Static	10	113.027
EPA 2007 (EPA-821-R-02-012), Static Renewal	16	113.027
EPA 2019 (EPA-821-R-02-012), Continuous Flow	30	113.022
EPA 2019 (EPA-821-R-02-012), Static	20	113.022
EPA 2019 (EPA-821-R-02-012), Static Renewal	29	113.022
EPA 2021 (EPA-821-R-02-012), Continuous Flow	1	113.024
EPA 2021 (EPA-821-R-02-012), Static	9	113.024
EPA 2021 (EPA-821-R-02-012), Static Renewal	9	113.024
EPA 206.5	1	109.052
EPA 218.6	62	103.310
EPA 218.6	71	109.104
EPA 218.7	2	103.310
EPA 218.7	26	103.311
EPA 231.2	4	109.131
EPA 235.2	1	109.141
EPA 245.1	92	103.160
EPA 245.1	3	103.161
EPA 245.1	126	109.190
EPA 245.1	1	109.191
EPA 245.2	25	103.161
EPA 245.2	30	109.191
EPA 245.7	12	109.192
EPA 253.2	2	109.231
EPA 255.2	2	109.241
EPA 279.2	40	109.311

Method Name	# of Certified Labs	FOT #
EPA 283.2	9	109.331
EPA 289.2	12	109.351
EPA 300.0	1	
EPA 300.0	153	102.030
EPA 300.0	1	102.030`
EPA 300.0	175	108.120
EPA 300.1	67	102.040
EPA 300.1	33	108.121
EPA 302.0	11	102.041
EPA 310.2	1	108.140
EPA 310.2	36	108.141
EPA 314.0	1	-------------
EPA 314.0	78	102.045
EPA 314.1	14	102.046
EPA 317.0	15	102.044
EPA 317.0	8	102.545
EPA 321.8	11	102.051
EPA 326.0	13	102.052
EPA 326.0	3	102.546
EPA 327.0	1	102.053
EPA 327.0	1	102.548
EPA 331.0	9	102.047
EPA 332.0	6	102.048
EPA 334.0	2	102.056
EPA 334.0	1	102.575
EPA 335.4	1	
EPA 335.4	35	102.050
EPA 335.4	56	108.183
EPA 350.1	1	108.20
EPA 350.1	73	108.200
EPA 350.1	44	108.209
EPA 351.1	18	108.210
EPA 351.2	38	108.211

Method Name	# of Certified Labs	FOT #
EPA 352.1	6	108.220
EPA 353.2	35	102.060
EPA 353.2	36	102.061
EPA 353.2	37	108.232
EPA 365.1	38	102.070
EPA 365.1	39	108.260
EPA 365.1	36	108.261
EPA 365.3	45	108.264
EPA 365.3	42	108.265
EPA 365.4	30	108.266
EPA 370.1	14	108.270
EPA 375.2	5	102.080
EPA 375.2	6	108.283
EPA 410.3	12	108.322
EPA 410.4	83	108.323
EPA 413.1	50	108.330
EPA 415.1	18	102.090
EPA 415.3	4	102.085
EPA 415.3	14	102.555
EPA 415.3 Rev. 1.2	3	102.086
EPA 415.3 Rev. 1.2	3	102.555
EPA 418.1	47	108.350
EPA 418.1	60	117.017
EPA 420.1	81	108.360
EPA 420.4	26	108.362
EPA 502.2	22	104.010
EPA 502.2	21	104.015
EPA 502.2	10	104.020
EPA 504.1	1	
EPA 504.1	56	104.030
EPA 505	27	105.010
EPA 506	6	105.020
EPA 507	22	105.030

Method Name	# of Certified Labs	FOT #
EPA 508	3	105.035
EPA 508	20	105.040
EPA 508.1	21	105.050
EPA 508A	4	105.060
EPA 515.1	16	105.070
EPA 515.2	6	105.080
EPA 515.3	17	105.082
EPA 515.4	9	105.083
EPA 524.2	95	104.040
EPA 524.2	89	104.045
EPA 524.2	84	104.050
EPA 524.2	1	c
EPA 524.3	17	104.055
EPA 524.3	5	104.056
EPA 524.3	6	104.057
EPA 524.4	2	104.058
EPA 524.4	2	104.059
EPA 524.4	2	104.061
EPA 525.2	42	105.090
EPA 525.3	4	105.091
EPA 531.1	26	105.100
EPA 531.2	6	105.101
EPA 547	27	105.120
EPA 548.1	24	105.140
EPA 549.2	24	105.150
EPA 550	8	105.160
EPA 550.1	7	105.161
EPA 551.1	1	104.060
EPA 551.1	10	105.170
EPA 551.1	10	105.175
EPA 552.1	10	105.180
EPA 552.2	38	105.200
EPA 552.3	16	105.201

Method Name	# of Certified Labs	FOT #
EPA 555	3	105.210
EPA 557	1	102.090
EPA 557	2	105.215
EPA 600/2-87/082, p22	2	106.630
EPA 600/4-90/027F	1	113.010
EPA 600/4-90/027F, Continuous Flow	31	113.010
EPA 600/4-90/027F, Static	31	113.010
EPA 600/4-90/027F, Static Renewal	34	113.010
EPA 600/8-78-017, p114	1	107.170
EPA 600/8-78-017, p132	1	107.190
EPA 600/8-78-017, p136	1	107.200
EPA 600/M4-82-020	61	121.010
EPA 600/R-94/025, EPA 100.4	10	113.210
EPA 600/R-95/136	17	113.120
EPA 600/R-95/136, Development Test	9	113.120
EPA 600/R-95/136, Fertilization Test	1	
EPA 600/R-95/136, Fertilization Test	14	113.120
EPA 600/R-99/064, EPA 100.1	8	113.160
EPA 600/R-99/064, EPA 100.2	6	113.170
EPA 600/R-99/064, EPA 100.3	3	113.180
EPA 600/R-99/064, EPA 100.4	5	113.190
EPA 600/R-99/064, EPA 100.5	3	113.200
EPA 601	3	110.010
EPA 6010B	1	
EPA 6010B	136	114.010
EPA 6010B	1	114.99
EPA 6010B	1	114.990
EPA 602	14	110.020
EPA 6020	2	114.010
EPA 6020	96	114.020

Method Name	# of Certified Labs	FOT #
EPA 6020	1	114.99
EPA 6020	1	114.990
EPA 6020A	39	114.025
EPA 603	11	110.030
EPA 604	13	111.010
EPA 605	4	111.020
EPA 606	4	111.030
EPA 607	2	111.040
EPA 608	23	111.170
EPA 609	1	111.050
EPA 610	24	111.060
EPA 611	2	111.070
EPA 612	3	111.080
EPA 613	2	111.090
EPA 614	5	111.091
EPA 615	4	111.093
EPA 624	117	110.040
EPA 625	38	111.100
EPA 625	79	111.101
EPA 625	28	111.103
EPA 632	3	105.220
EPA 632	18	111.210
EPA 7040	17	114.030
EPA 7041	36	114.031
EPA 7060A	53	114.040
EPA 7061A	9	114.041
EPA 7062	5	114.050
EPA 7062	10	114.051
EPA 7080A	16	114.060
EPA 7081	11	114.061
EPA 7090	17	114.070
EPA 7091	21	114.071
EPA 7130	27	114.080

Method Name	# of Certified Labs	FOT #
EPA 7131A	35	114.081
EPA 7190	25	114.090
EPA 7191	27	114.091
EPA 7195	5	114.102
EPA 7196A	103	114.103
EPA 7197	1	114.104
EPA 7199	49	114.106
EPA 7200	16	114.110
EPA 7201	14	114.111
EPA 7210	26	114.120
EPA 7211	21	114.121
EPA 7420	65	114.130
EPA 7421	57	114.131
EPA 7470A	132	114.140
EPA 7471A	135	114.141
EPA 7480	15	114.150
EPA 7481	18	114.151
EPA 7520	26	114.160
EPA 7521	21	114.161
EPA 7740	49	114.170
EPA 7741A	10	114.171
EPA 7742	12	114.172
EPA 7760A	20	114.180
EPA 7761	28	114.181
EPA 7840	18	114.190
EPA 7841	40	114.191
EPA 7910	17	114.200
EPA 7911	16	114.201
EPA 7950	28	114.210
EPA 7951	12	114.211
EPA 8011	40	116.010
EPA 8015B	65	116.020
EPA 8015B	109	116.030

Method Name	# of Certified Labs	FOT #
EPA 8015B	121	117.010
EPA 8021B	84	116.040
EPA 8031	2	116.050
EPA 8041	9	117.020
EPA 8061A	3	117.030
EPA 8070A	1	117.040
EPA 8081A	50	117.210
EPA 8082	117	117.220
EPA 8091	1	117.050
EPA 8100	7	117.060
EPA 8111	1	117.070
EPA 8120A	3	117.080
EPA 8121	3	117.090
EPA 8141A	47	117.240
EPA 8151A	61	117.250
EPA 8260B	147	116.080
EPA 8260B	1	116.08040
EPA 8270C	106	117.110
EPA 8270C	49	117.111
EPA 8280A	7	117.120
EPA 8290	18	117.130
EPA 8310	35	117.140
EPA 8315A	16	117.150
EPA 8316	7	116.090
EPA 8318	9	117.270
EPA 8321A	13	117.280
EPA 8321A	1	117.290
EPA 8330	23	117.170
EPA 8330A	20	117.171
EPA 8331	3	117.180
EPA 8332	1	117.190
EPA 8410	3	117.200
EPA 900.0	8	106.010

Method Name	# of Certified Labs	FOT #
EPA 900.0	7	112.010
EPA 901.0	1	106.020
EPA 901.0	1	106.030
EPA 901.0	1	112.130
EPA 901.1	10	106.030
EPA 901.1	6	112.140
EPA 9012A	14	114.221
EPA 9014	65	114.222
EPA 902.0	2	106.040
EPA 903.0	11	106.050
EPA 903.0	10	112.020
EPA 903.1	11	106.051
EPA 903.1	8	112.021
EPA 9034	60	114.230
EPA 904.0	11	106.060
EPA 904.0	6	112.160
EPA 9040B	97	120.070
EPA 9045C	103	120.080
EPA 905.0	9	106.070
EPA 905.0	5	112.170
EPA 9056	66	114.250
EPA 906.0	13	106.080
EPA 906.0	7	112.180
EPA 908.0	7	106.090
EPA 908.0	3	112.190
EPA 908.1	1	106.091
EPA 9213	11	114.260
EPA 9214	32	114.270
EPA 9215	12	114.231
EPA 9310	14	118.010
EPA 9315	10	118.020
EPA 9320	9	118.030
EPA H-02	1	106.140

Method Name	# of Certified Labs	FOT #
EPA Ra-03	1	106.150
EPA Ra-04	1	106.160
EPA Ra-04	1	118.140
EPA Ra-05	3	106.170
EPA Ra-05	2	112.210
EPA Ra-05	1	118.150
EPA Sr-01	1	118.160
EPA Sr-04	1	106.180
EPA-821-R-02-012	2	113.021
EPA-821-R-02-012	3	113.022
EPA-821-R-02-012	1	113.023
EPA-821-R-02-012	1	113.025
EPA-821-R-02-012	1	113.027
EPA-821-R-02-012	1	113.028
EPA-821-R-02-012, Continuous Flow	1	113.028
EPA-821-R-02-012, Continuous Flow	1	113.029
EPA-821-R-02-012, Static	9	113.028
EPA-821-R-02-012, Static	3	113.029
EPA-821-R-02-012, Static Renewal	18	113.028
EPA-821-R-02-012, Static Renewal	3	113.029
Fast Phage	1	101.210
HACH 10206	4	102.300
HACH10360	11	108.677
HACH8000	124	108.660
HACH8048	9	108.672
HACH8190	39	108.675
HACH8507	15	108.670
HML 938-M	7	114.281
HML 939-M	17	114.280
Kelada-01	3	102.563
Kelada-01	1	102.564

Method Name	# of Certified Labs	FOT #
Kelada-01	3	108.924
LUFT	83	116.110
LUFT	85	117.016
LUFT GC/MS	99	116.100
LUFT GC/MS	36	117.015
m-ColiBlue24	1	101.070
m-ColiBlue24	5	101.110
MS	7	124.01
MS	7	124.02
MS	7	124.03
non-MS	6	125.01
non-MS	5	125.02
non-MS	5	125.03
non-MS	6	125.04
OIA-1677, DW	1	
OIA-1677, DW	8	102.565
OIA-1677-09	7	108.927
Polisini & Miller (CDFG 1988)	21	119.010
Quickchem 10-204-00-1-X	13	102.564
Quickchem 10-204-00-1-X	1	102.565
Quickchem 10-204-00-1-X	5	108.926
ReadyCult	7	101.113
Section 7.3 SW-846	48	120.040
Section 7.3 SW-846	48	120.050
SimPlate	1	
SimPlate	1	101.010
SimPlate	86	101.011
SimPlate	25	101.196
SM 3125 B	5	108.438
SM 9221 B,E	5	101.020
SM 9221 B,E	1	101.130
SM 9221 B,F	3	101.020
SM2120B-2001	59	108.385

Method Name	# of Certified Labs	FOT #
SM2130B-2001	87	102.095
SM2130B-2001	190	108.390
SM2310B-1997	40	108.400
SM2320B-1997	105	102.100
SM2320B-1997	158	108.410
SM2330B	7	102.110
SM2340B-1997	52	102.120
SM2340B-1997	77	108.420
SM2340C-1997	67	102.121
SM2340C-1997	100	108.421
SM2510B-1997	109	102.130
SM2510B-1997	198	108.430
SM2540B-1997	171	108.440
SM2540C-1997	86	102.140
SM2540C-1997	198	108.441
SM2540D-1997	247	108.442
SM2540E-1997	76	108.439
SM2540E-1997	1	108.99
SM2540F-1997	191	108.443
SM2550B-2000	85	108.444
SM3111B	58	102.500
SM3111B	50	103.010
SM3111B-1999	14	102.146
SM3111B-1999	16	108.445
SM3111B-1999	4	109.370
SM3111C	8	109.380
SM3111D	18	103.020
SM3111D	23	109.390
SM3112B	36	103.030
SM3112B	2	103.040
SM3112B-2009	13	109.400
SM3113B	59	103.040
SM3113B-2004	10	109.410

Method Name	# of Certified Labs	FOT #
SM3114B	11	103.050
SM3114B-2009	5	109.420
SM3114C-2009	2	109.421
SM3120B	29	102.510
SM3120B	23	103.060
SM3120B-1999	8	102.147
SM3120B-1999	20	108.447
SM3120B-1999	15	109.430
SM3125B-2009	1	106.391
SM3125B-2009	9	109.430
SM3125B-2009	3	109.431
SM3500-Ca B (20th)	21	102.540
SM3500-Ca B (20th)	7	108.909
SM3500-Ca B-1997	28	102.148
SM3500-Ca B-1997	20	108.449
SM3500-Ca D	24	102.530
SM3500-Ca D (18th/19th)	33	108.904
SM3500-Cr B-2009	52	109.445
SM3500-Cr B-2009	1	109.809
SM3500-Cr C-2009	10	109.446
SM3500-Fe B-1997	12	109.449
SM3500-K B-1997	4	108.449
SM3500-K C-1997	1	108.449
SM3500-K D	4	102.532
SM3500-K D (18th/19th)	7	108.906
SM3500-Mg B-1997	7	102.149
SM3500-Mg B-1997	6	102.541
SM3500-Mg D	5	108.905
SM3500-Mg E	19	102.531
SM3500-Na B-1997	4	108.449
SM3500-Na D (18th/19th)	9	108.907
SM3500-Ni D (17th)	1	109.840
SM3500-Pb B (20th)	1	109.846

Method Name	# of Certified Labs	FOT #
SM3500-Zn B (20th)	1	109.854
SM4110B	54	102.150
SM4110B or C-2000	3	108.448
SM4110B, C, D-2000	1	108.448
SM4110B, C, D-2000	2	108.449
SM4140B-1997	1	108.454
SM4500-B B	36	108.903
SM4500-B B-2000	11	108.466
SM4500-Chloride C-1997	23	108.451
SM4500-Chloride D-1997	1	102.556
SM4500-Chloride D-1997	4	108.453
SM4500-Chloride E-1997	8	108.452
SM4500-ChlorideB-1997	24	108.450
SM4500-Cl- B-1997	19	102.170
SM4500-Cl B-2000	10	108.460
SM4500-Cl C-2000	23	108.461
SM4500-Cl D	18	102.549
SM4500-Cl- D	28	102.171
SM4500-Cl D-2000	11	102.172
SM4500-Cl D-2000	27	108.462
SM4500-Cl E	1	102.161
SM4500-Cl E	3	102.552
SM4500-Cl E-2000	6	102.173
SM4500-Cl E-2000	5	108.463
SM4500-Cl F	15	102.550
SM4500-Cl F-2000	17	102.174
SM4500-Cl F-2000	24	108.464
SM4500-Cl F-OO	1	102.557
SM4500-Cl G	46	102.551
SM4500-Cl G-2000	85	102.175
SM4500-Cl G-2000	104	108.465
SM4500-Cl G-OO	6	102.558
SM4500-ClO2 D	18	102.180

Method Name	# of Certified Labs	FOT #
SM4500-ClO2 E	8	102.182
SM4500-CN B or C-1999	65	108.470
SM4500-CN D-1999	7	108.471
SM4500-CN E	61	102.190
SM4500-CN E-1999	41	108.472
SM4500-CN F	16	102.191
SM4500-CN F-1999	5	108.474
SM4500-CN G	40	102.192
SM4500-CN G-1999	48	108.473
SM4500-F B,C-1997	33	108.480
SM4500-F B,D-1997	1	108.481
SM4500-F C	101	102.200
SM4500-F D	19	102.201
SM4500-H+ B-2000	86	102.203
SM4500-H+ B-2000	279	108.490
SM4500-NH3 B,C-1997	50	108.500
SM4500-NH3 B,D -1997	25	108.502
SM4500-NH3 B,D-1997	14	108.503
SM4500-NH3 B,E-1997	31	108.502
SM4500-NH3 C-1997	30	108.501
SM4500-NH3 F-1997	6	108.504
SM4500-NH3 F-1997	5	108.505
SM4500-NH3 G-1997	22	108.506
SM4500-NH3 G-1997	7	108.507
SM4500-NH3 G-1997	5	108.508
SM4500-NO2- B-2000	8	102.220
SM4500-NO2- B-2000	57	108.514
SM4500-NO3 D	21	108.526
SM4500-NO3- D-2000	3	102.230
SM4500-NO3- D-2000	9	108.527
SM4500-NO3- E-2000	24	108.528
SM4500-NO3- F-2000	5	102.234
SM4500-NO3- F-2000	24	108.529

Method Name	# of Certified Labs	FOT #
SM4500-NO3 H	3	108.525
SM4500-Norg B- 1997	12	108.511
SM4500-Norg C-1997	13	108.512
SM4500-Norg D-1997	8	108.513
SM4500-O C-2001	34	108.532
SM4500-O D-2001	1	108.533
SM4500-O F-2001	1	108.535
SM4500-O G-2001	166	108.536
SM4500-P E	13	102.240
SM4500-P E-1999	22	108.540
SM4500-P E-1999	62	108.541
SM4500-P F	3	102.241
SM4500-P F	3	108.542
SM4500-P F	23	108.543
SM4500-P G-1999	1	108.544
SM4500-P H-1999	2	108.545
SM4500-S= D-2000	61	108.584
SM4500-S= F-2000	32	108.585
SM4500-S= G-2000	1	108.586
SM4500-Si D	9	102.533
SM4500-Si E	12	102.534
SM4500-Si F	3	102.535
SM4500-SiO2 C-1997	8	102.242
SM4500-SiO2 C-1997	2	102.542
SM4500-SiO2 C-1997	10	108.552
SM4500-SiO2 D-1997	5	102.243
SM4500-SiO2 D-1997	8	102.543
SM4500-SiO2 E-1997	2	102.244
SM4500-SiO2 E-1997	3	108.553
SM4500-SiO2 F-1997	3	108.554
SM4500-SO3 B-2000	10	108.560
SM4500-SO4 C	18	108.570
SM4500-SO4 C,D-1997	21	102.250

Method Name	# of Certified Labs	FOT #
SM4500-SO4 D	21	108.571
SM4500-SO4 F	2	102.252
SM4500-SO4= E-1997	8	102.251
SM4500-SO4= E-1997	1	108.099
SM4500-SO4= E-1997	4	108.572
SM5210B	276	108.590
SM5210B-2001	3	108.590
SM5210B-2001	3	108.591
SM5210B-2001	203	108.592
SM5220B-1997	3	108.593
SM5220C-1997	14	108.594
SM5220D-1997	73	108.595
SM5220D-1997	1	108.602
SM5310B	55	102.260
SM5310B	51	102.261
SM5310B-2000	40	108.596
SM5310C	54	102.262
SM5310C	44	102.263
SM5310C-2000	38	108.597
SM5310C-OO	2	102.267
SM5310D	7	102.264
SM5310D	7	102.265
SM5310D-2000	2	108.598
SM5320B	10	108.620
SM5520B (20th)	72	108.630
SM5520B-2001	19	108.603
SM5520F-2001	4	108.604
SM5530 B-2005	8	108.625
SM5530 D-2005	3	108.626
SM5540C	83	102.270
SM5540C-2000	66	108.605
SM5540C-2000	3	108.640
SM5550B (18th/19th)	17	108.650

Method Name	# of Certified Labs	FOT #
SM5910B	63	102.280
SM5910B-00	1	102.281
SM6200B	3	110.051
SM6251B	8	105.190
SM6251B (20th)	4	105.191
SM6410B	2	111.130
SM6410B	5	111.131
SM6420B	4	111.140
SM6630B	9	111.230
SM6630C	8	111.240
SM6640B	4	111.250
SM6651	1	105.130
SM7110B	1	106.260
SM7110C	4	106.270
SM7120	2	106.280
SM7120	1	112.260
SM7500-3H B	4	106.300
SM7500-Cs B	1	106.290
SM7500-I B	1	106.310
SM7500-I C	1	106.320
SM7500-Ra B	5	106.340
SM7500-Ra B	2	112.040
SM7500-Ra C	4	106.350
SM7500-Ra C	3	112.050
SM7500-Ra D	4	106.360
SM7500-Rn	12	106.610
SM7500-Sr B	2	106.370
SM7500-U B	3	106.380
SM7500-U C	2	106.390
SM7500-U C	1	112.350
SM9215B	11	
SM9215B	241	101.010
SM9215B	1	101.011

Method Name	# of Certified Labs	FOT #
SM9215B	62	101.195
SM9215B	172	107.010
SM9215B	1	c
SM9215B	1	x
SM9221B	208	101.020
SM9221B	1	101.120
SM9221B,C	6	101.020
SM9221B,C	192	101.120
SM9221B,C-2006	15	107.030
SM9221B,C-2006	41	126.010
SM9221B,E-2006	19	107.020
SM9221B,E-2006	38	126.030
SM9221B,F-2006	8	107.247
SM9221C,E-2006	20	107.040
SM9221C,E-2006	75	107.050
SM9221D	33	101.030
SM9222B	1	101.040
SM9222B	19	101.050
SM9222B	19	101.140
SM9222B + B.5c-1997	21	107.070
SM9222B-1997	7	107.060
SM9222B-1997	12	126.020
SM9222C	1	101.040
SM9222C	1	101.054
SM9222D	44	101.150
SM9222D-1997	5	107.080
SM9222D-1997	20	107.090
SM9222D-1997	13	126.040
SM9222G	1	101.040
SM9222G	18	101.055
SM9222G	8	101.306
SM9223B (Colilert 18 Quantity Tray)	2	101.050

Method Name	# of Certified Labs	FOT #
SM9223B (Colilert 18)	2	101.050
SM9223B (Colilert 18)	1	107.245
SM9223B (Colilert)	9	101.050
SM9223B (Colilert)	125	101.060
SM9223B (Colilert)	1	101.160
SM9223B (Colilert)	4	101.200
SM9223B (Colilert)	71	101.300
SM9223B (Colilert)	17	107.245
SM9223B (Colilert/Quanti-Tray)	5	101.050
SM9223B (Colilert/Quanti-Tray)	65	101.160
SM9223B (Colilert/Quanti-Tray)	53	101.200
SM9223B (Colilert/Quanti-Tray)	53	126.050
SM9223B (Colisure)	1	101.050
SM9223B (Colisure)	26	101.070
SM9223B (Colisure)	20	101.160
SM9223B (Colisure)	25	101.301
SM9230B	1	101.140
SM9230B	11	101.307
SM9230B-2007	26	107.100
SM9230C	3	101.308
SM9230C-2007	12	107.110
SM9230C-2007	3	126.060
SM9230C-2007	3	126.070
SRL 524M-TCP	31	104.035
SRL 525M-TCP	13	104.036
Technicon 380-75WE	1	102.410
USGS I-1187-85	1	108.99
USGS I-1230-85	1	109.999
USGS I-3750-85	1	108.99
USGS I-3753-85	1	108.99
USGS I-3765-85	1	108.99
USGS I-4540-85	1	108.999
USGS R-1140-76	1	106.520

Method Name	# of Certified Labs	FOT #
USGS R-1141-76	1	106.530
USGS R-1142-76	1	106.540
USGS R-1160-76	1	106.550
USGS R-1171-76	1	106.560
USGS R-1182-76	1	106.590
WPCF	1	127.040

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California ELAP ELTAC FOT Subcommittee Report

June 15, 2016

Committee Members

Rich Gossett- Chairperson

Andy Eaton

David Kimbrough

Guilda Neshvad

Jill Brodt

Gail Cho

The ELTAC FOT Subcommittee has completed their review process via email. Our goal was to review the existing FOT spreadsheets and structure to recommend possible changes to the program. As result of our discussion the FOT Subcommittee is presenting the following questions and recommendations for the full ELTAC committee's review and approval. We have organized the outstanding decisions and recomendations into six items.

1) The ELTAC FOT Subcommittee is recommending the format in attachment 1 for all the FOT spreadsheets. This example presents each FOT listed by analyte however in question three below the option to use analytical group has been suggested (to be discussed later as part of item 3). Using either option this recommendation would still be applicable using either ana;yte or analytical group. We request that this format be approved by the ELTAC committee.

   Andy- Yes
   Guilda- Yes
   Jill- Yes
   David- Yes
   Rich- Yes
   Gail- Yes

2) FOT 102 contains an example where there is confusion regarding analytes such as Color, Odor, pH, Temperature, disinfection residuals, and alkalinity that are analyzed by trained operators without ELAP certification but where a laboratory is required to have certification.

Andy- Require certification for all analytes but not for certified operators. Missing analytes should be added to the FOT if it is being performed by an ELAP certified laboratory.

Guilda- Yes

Jill- Yes but be consistent

David- David expressed some confusion based on my original working. I believe Davids vote would be to have all the analytes on the list for the laboratories which means adding the analytes not presently on the list. But do not require certification by the operators.

Rich- I agree with the group, add missing parameters but do not require certification by the operators.

Gail- FOT 102: Require labs for ELAP, operators not required: No. I would like to see the ELAP requirement dropped for the parameters listed for all.

3) One major question is the option between certification by program (i.e. Wastewater, Hazardous Waste, Drinking Water etc) vs method. At this point, the Fields of Accreditation/Testing are set in statute and cannot be changed without changing the statute but the existing system has created issues related to matrix/method combinations as well as requiring additional effort to manage. For example, NPDES regulatory monitoring is based on Clean Water Act 600 Series Methods. But these methods are not applicable for solid matrices which are often included in NPDES permits and laboratories must use other methods such as SW846 8000 series methods yet these methods are not approved for reporting for NPDES regulatory purposes. Moreover, if a laboratory only works in the NPDES field, does the laboratory have to get certified for Hazardous Waste analysis even though the results will not be used for regulatory reporting in the Hazardous Waste Field. The ELTAC FOT Subcommittee suggests that it may be possible to the laboratory community and ELAP if this issue could be resolved in the statutes. Our recommendation is that the FOTs remain based on program and that changes in the fee structure be instituted that accommodates the situation described above.

Andy- Maintain FOTs by program and not groups and make changes to the fee structure to accommodate the issues.

Guilda- Agrees with Andy

Jill- FOTs should be based analyte

David- By program

Rich- Yes since the statues require it be done by program but make changes to the fee structure to accommodate the issues ie I agree with Andy.

Gail- Yes, but I want to make sure I understand the intent of this bullet. ie A lab will certify by ICPMS and would be approved to cite methods 200.8, 6020 for DW, WW, HW programs.

4) This item refers to whether FOTs should be based on individual analytes and/or analytical group e.g. organochlorine pesticides PAHs Acid Extractables etc. This issue is more applicable to organics but could apply in other areas as well while other groups such as metals can easily be accommodated by individual analyte. Also, will laboratories be required to be certified for all analytes within a method/group or can they choose individual parameters? Finally the FOT subcommittee requests that an easy process be created for adding or removing analytes from a certificate.

Andy- Analytes and not groups because groups become too difficult to define. We need a mechanism to easily add analytes once one has DOC/PTs

Guilda- Yes for discussion. My comment - FOTs organized by analytical group for non-drinking water are fine. Maybe for ease of PT reporting sub-groups can be added to the organic non-drinking water FOTs. Additional compounds belonging to a certain group that behave the same way should be reportable as long the method QC requirements such as calibration, CCVs, MDLs, etc. are established and met.

Jill- Analyte

David- Anayte

Rich- I agree with Guilda but I also like analytes if it allows laboratories to customize the list of analytes they want to be certified for and run their PT samples on.

Gail- Agreed, additional discussion needed.

5) Should old methods be removed from the FOTs? The FOT Subcommittee is asking ELTAC to decide which option will be used.

Andy- Agrees with David ie if the method is dropped from the Federal Register by the method update rule then it should be dropped from the FOT. Older methods that are still written into permits can be accommodated using the X99 option. If methods are still approved but old and there is no indication that they are currently used by anyone they should be dropped.

Guilda- Yes for discussion. My comment - Old method should be offered in FOTs. Also, do we want to bring up the discontinued methods that are still requested by agencies and clients?

Jill- My aswer is "no", old methods should not be removed, unless, as David stated, "...the method is dropped from the Federal Register by the Method Update Rule but there permits that still require it, then X99 is the appropriate approach". But I do not think they should be removed just because we think they are "old". If they are still approved methods then they should be included.

David- If the method is dropped from the Federal Register by the Method Update Rule but there permits that still require it, then X99 is the appropriate approach.

Rich- I agree with the group.

Gail- Yes, old methods removed. Any antiques would be listed as 99.

6) Should methods with separate sample prep methods list those separately or should the FOT list only include the analytical method. The FOT Subcommittee is asking ELTAC to decide which option will be used.

Andy- Certify for Prep/Method combo. Do not certify for prep separately.

Guilda- Yes for discussion.

Jill- leave for discussion: my opinion; only include the analytical method. Sample prep can be dealt with during on-site audits.

David- Yes for discussion.

Rich- I agree with Jill.

Gail- I agree with Andy that we should leave prep out unless we treat just like bullet 3 ie separatory funnel extraction technique, continuous liquid-liquid, pressurized fluid extraction, solid phase extraction, etc.

ATTACHMENT 1

Analyte	Method	EPA	UoA	Yes/No	ASTM	UoA	Yes/No	SM (18th, 19th ed.)	UoA	Yes/No	SM (20th ed.)	UoA	Yes/No	SM Online	UoA	Yes/No	USGS	UoA	Yes/No	DOE	UoA	Yes/No
Gamma Emitters	**Gamma Ray Spectrometry**	901.1	112.01	**No**	D3649-91, 98a	112.22	**No**	7120	112.31	**No**	7120	112.38	**No**	7120-1997	112.45	**No**	R-1110-76	112.52	**No**	4.5.2.3	112.59	**No**
Gross Alpha	**Evaporation**				D1943-90	112.23	**No**	7110 B	112.32	**No**	7110 B	112.39	**No**	7110 B-2000	112.46	**No**	R-76-177	112.53	**No**			
Gross Beta	**Evaporation**	900	112.02	**No**	D1890-90	112.23	**No**	7110 B	112.32	**No**	7110 B	112.39	**No**	7110 B-2000	112.46	**No**	R-76-177	112.53	**No**			
Radioactive Cesium	**Radiochemical**	901.0	112.03	**No**	D2459-72	112.24	**No**	7500-Cs B	112.33	**No**	7500-Cs B	112.40	**No**	7500-Cs B-2000	112.47	**No**	R-1111-76	112.54	**No**			
	Gamma Ray Spectrometry	901.1	112.04	**No**	D3649-91	112.24	**No**	7120	112.33	**No**	7120	112.40	**No**	7120	112.47	**No**	R-1110-76	112.54	**No**	4.5.2.3	112.60	**No**
	Gamma Ray Spectrometry	EMSL LV 053917	112.05	**No**																		
Radioactive Iodine	**Radiochemical**	902.0	112.06	**No**	D3649-91, 98a	112.25	**No**															
	Gamma Ray Spectrometry	901.1	112.07	**No**	D4785-93, 00a	112.26	**No**	7500-I C	112.34	**No**	7500-I C	112.41	**No**	7500-I C 2000	112.48	**No**				4.5.2.3	112.61	**No**
	Gamma Ray Spectrometry	EMSL LV 053917	112.08	**No**				7120	112.35	**No**	7120	112.42	**No**	7120	112.49	**No**						
Radium-226	**Radon emanation**	903.1	112.09	**No**	D3454-91	112.27	**No**	7500-Ra C	112.35	**No**	7500-Ra C	112.42	**No**	7500-Ra C 2001	112.49	**No**	R-76-177	112.55	**No**			
Radium-228	**Radiochemical**	904.0	112.10	**No**													R-1142-76	112.56	**No**			
	Radiochemical	EPA 600/4-75-008	112.11	**No**																		
	Radiochemical	Ra-05	112.12	**No**																		
Strontium	**Radiochemical**	905.0	112.13	**No**													R-1160-76	112.56	**No**	SR-01	112.62	**No**
	Radiochemical	EMSL LV 053917	112.14	**No**																		
	Radiochemical	SR-04	112.15	**No**																		
Total Alpha Radium	**Radiochemical**	903.0	112.16	**No**	D2460-90	112.28	**No**	7500-Ra B	112.36	**No**	7500-Ra B	112.43	**No**	7500-Ra B	112.50	**No**						
	Radiochemical	EPA 600/4-75-008	112.17	**No**																		
Tritium	**Liquid Scintillation**	906.0	112.18	**No**																		
Uranium	**Radiochemical**	908.0	112.19	**No**													R-1181-76	112.57	**No**	U-02	112.63	**No**
	Radiochemical	EPA 600/4-75-008	112.20	**No**	D2907-97	112.29	**No**										R-1171-76	112.58	**No**	U-04	112.64	**No**
	Alpha Spectrometry	00-07	112.21	**No**	D3972-90	112.30	**No**	7500-U C	112.37	**No**	7500-U C	112.44	**No**	7500-U C	112.51	**No**						

EMSL LV 053917 “Radiochemical Analytical Procedures for Analysis of Environmental Samples,” March 1979.
ASTM Annual Book of ASTM Standards, Vol. 11.01 and 11.02, 2002; ASTM International; any year containing the cited version of the method may be used
SM Standard Methods for the Examination of Water and Wastewater
USGS “Methods for Determination of Radioactive Substances in Water and Fluvial Sediments,” Chapter A5 in Book 5 of Techniques of Water-Resources Investigations of the United States Geological Survey, 1977.
DOE “EML Procedures Manual,” 28th (1997) or 27th (1990)

PROPOSED ELTAC CALENDAR

Key

Proposed Meeting Dates	(yellow)
Event	(orange)
Lab Accreditation Standard	
FOT Worksheets	
Fee Structure	
Communications Update	
Enforcement Briefing	
Other	

MARCH

S	M	T	W	Th	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	**23**	24	25	26
27	28	29	30	31		

23 ELTAC Meeting
Lab Accreditation Standard
FOT Worksheets

APRIL

S	M	T	W	Th	F	S
					1	2
3	4	**5**	6	**7**	8	9
10	11	12	13	14	15	16
17	18	**19**	20	21	22	23
24	25	26	27	28	29	30

5 TNI Workshop – Nor. Cal
7 TNI Workshop – So. Cal
19 SWRCB Board Meeting on Training Contract Funds

MAY

S	M	T	W	Th	F	S
1	2	3	4	5	6	7
8	9	10	**11**	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	**27**	28
29	30	31				

11 ELTAC Meeting
Lab Accreditation Standard
FOT Worksheets
Fee Structure

JUNE

S	M	T	W	Th	F	S
			1	2	3	4
5	6	**7**	8	9	10	11
12	13	14	**15**	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

7 ERP Quarterly Progress Webinar
15 ELTAC Meeting
Lab Accreditation Standard
FOT Worksheets
Fee Structure
Other: Checklists

JULY

S	M	T	W	Th	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	**27**	28	29	30
31						

27 ELTAC Meeting
Lab Accreditation Standard
Fee Structure

AUGUST

S	M	T	W	Th	F	S
	1	2	3	4	5	6
7	8	9	**10**	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

10 ELAP Session at TNI Conference

SEPTEMBER

S	M	T	W	Th	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	**21**	22	23	24
25	26	27	28	29	30	

21 Tentative ELTAC Meeting
Communications Update
Fee Structure
Other: Checklists

OCTOBER

S	M	T	W	Th	F	S
						1
2	3	4	**5**	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

5 Board Meeting – ELTAC Briefing
24-27 CANV AWWA meeting

NOVEMBER

S	M	T	W	Th	F	S
		1	**2**	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

2 Tentative ELTAC Meeting
Fee Structure

DECEMBER

S	M	T	W	Th	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31