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Understanding NELAC and NEFAP Certifications: Ensuring Data Integrity and Ethics in Industrial Pretreatment

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Overview of Environmental Certifications

- Importance in ensuring reliable and accurate environmental data
 - The role in public health, safety, and environmental protection

Background

- Environmental data is generated from
 - Testing Laboratories
 - Fixed or Mobile Establishments
 - Chemistry, Microbiology, Radiochemistry, Whole Effluent Toxicity
 - Field Sampling Measurement Organizations
 - Field measurements and/or sampling (any matrix of sample)
 - Mobile laboratories
 - Sampling design and collection
 - Air monitoring, stream monitoring, and other research studies of the environment



Key Definitions

- Accreditation
 - Third-party assessments
- Accreditation Body (AB)
 - Authoritative body that performs accreditation
- Certification of Laboratory/Field Sampling and Measurement Organizations (FSMO)
 - Certified by the Administrator, capable of performing analytical measurements
- Certification Authority (CA)
- Assessment
 - Process to determine the competence
- Audit
 - Systematic, independent, documented process for obtaining records, statements of fact
- Evaluation
 - Peer assessment process used to measure performance

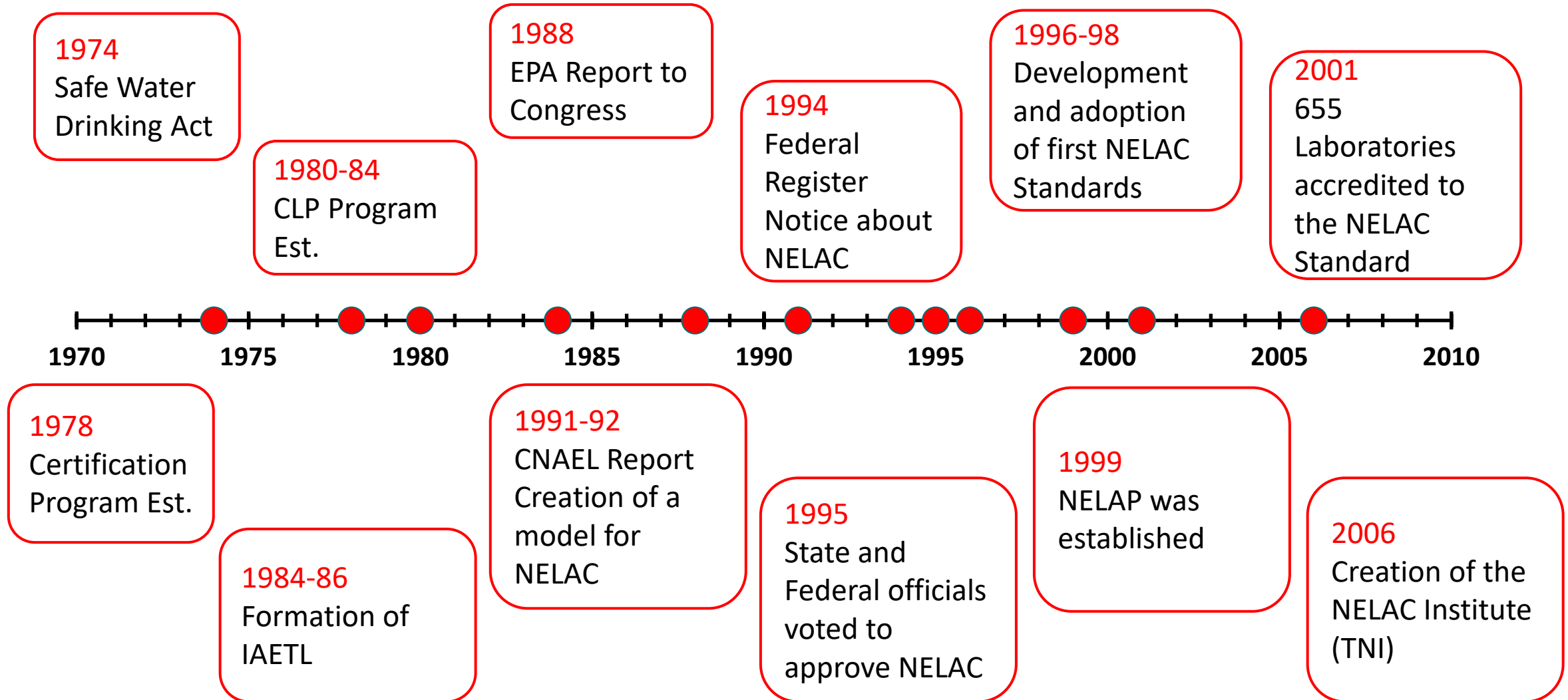


What is NELAC Certification

- National Environmental Laboratory Accreditation Conference (NELAC)
- Focuses on accrediting environmental laboratories
 - Set of Standards and accreditation guidelines
 - Standardized Laboratory Procedures
 - Quality Management Systems
 - Proficiency Testing
 - On-site Assessments
 - Document Control and Recordkeeping
 - Compliance with Legal and Regulatory Standards
 - Employee Competency and Training



Origins of NELAC Certification



Environmental Monitoring Pre-EPA (1970)

- No EPA Methods
 - No analyte list
 - No cleanup limits
 - No compliance monitoring
- Testing Performed
 - Academic Research
 - Some wastewater testing for operational parameters
 - Some ambient water quality monitoring
- First Computer GC/MS



Virtually No Quality Control in 1970

- Calibration (Typically single point with no control criteria)
- No Blanks
- No LCS
- No Matrix Spikes
- No Replicates
- No MDLs
- No Reporting Limits

Origin of National Program

- Drinking water certification programs established in 1978
 - Mainly micro, wet chem, and metals
 - THMs in mid 1970s
- EPA QC Handbook for Wastewater – 1978
- First GC/MS methods – 1974 (600s)
 - Beginning to see some QC



EPA Contract Laboratory Program (CLP)

- Developed for Superfund testing
 - Applicable to RCRA
- First National program to include soil and water
- First National program to include organics
- First National program to require comprehensive QC
- First National program to require raw data packages and data validation
- First National program to include a laboratory audit



The Beginnings of NELAC

- Committee of National Accreditation of Environmental Laboratories (CNAEL)
 - July 1991 to July 1992
- State – EPA Focus Group
 - January 1993 – September 1994
- IAETL Accreditation Committee
 - April 1990 – December 1995



**The Quality of the Data Can Only be as Good
as the Quality of the Sample**

What is NEFAP Certification

- National Environmental Field Activities Program (NEFAP)
- Focuses on accrediting the field activities
 - Quality Assurance in Field Data
 - Minimizing Variability
 - Field Sampling
 - In-Field Measurements
 - Monitoring Programs

Origins of NEFAP Certification

2006

Creation of
The NELAC
Institute (TNI)

2009

Initial
Discussions of
FSMOs

2011

First NEFAP
Accreditation
Bodies Recognized

2015

Revision of
NEFAP Standards

2020

Increase Adoption

2004

2006

2008

2010

2012

2014

2016

2018

2020

2022

2024

2007

Initial
Discussions of
FSMOs

2012

First FSMOs
Accredited

2018

Expansion of
NEFAP Scope

2023

Ongoing
Improvements

2010

First NEFAP
Standards
Adopted



Key Components of TNI FSMO Standard

- NEFAP based on the TNI FSMO Standards
 - ISO/IEC 17025
 - ISO/IEC 17011
- Competency of Personnel
- Documentation and Traceability
- Equipment Calibration and Maintenance
- Quality Control Procedures

Accreditation Process

- Application
- On-Site Assessment Coordination
- On-Site Assessments
- Documentation Review
- Performance Evaluation
- Continuous Monitoring and Renewal

Difference Between NEFAP and NELAC

- Accreditation process not required by regulations in states for sample collection
 - Louisiana has adopted NEFAP accreditation for stack testing
- State or Federal agencies do not oversee the accreditation process
 - TNI oversees the accreditation process as implemented by the recognized Abs
- There are three Accreditation Bodies (Abs)
 - ANSI-ASQ National Accreditation Board
 - American Association for Laboratory Accreditation (A2LA)
 - Perry Johnson Laboratory Accreditation Inc. (PJLA)



Benefits of NELAC/NEFAP Certification

- For the public
 - Promotes Confidence
- For data users
 - Consumer protection
- For the profession
 - Advances in standards of practice
- For government agencies
 - Basis to make data-driven decisions
- For the laboratory
 - Demonstrates a commitment to improvement and accountability



Things we have been doing

- Created Field Logbooks
 - Sampling Sheets
- Created Standard Operation Procedures (SOPs)
- Calibration worksheets for field instrumentation
 - Multi parameter sondes
 - pH meters
- QCS services
 - Record keeping
- Quality Assurance Manual (QAM)
- Flow Based Sampling
- Flow Monitoring within the Collection System



FSMO Challenges in the Early Years

- Biosolid Sampling and Storage
 - No using proper containers
 - Lack of SOPs
- Flow-based sampling within the collection system
 - No sampling documentation
 - Lack of SOPs or pacing instructions
- Lack of Documentation of Calibration of Ambient Water Quality
 - No records whatsoever
 - No standard tracking



Biosolids Sampling Problems

- No clear method of sample collection
 - No sampling sheets
 - No SOPs
 - Had limited supplies

Biosolids Sampling Solutions

- Created in-depth SOPs that detail how to sample
 - Clear documentation of which sample belongs to which pile
 - Increased sterilization checks
 - Sampling Handling updated

Flow-Based sampling

- No clear method of sample collection
 - No sampling sheets
 - No SOPs
 - Had limited supplies

Corrosion Studies with the Collection System

- Developed pH tracing
 - Septic to Sewer Project
 - Industrial Users
- No sampling sheets
- No SOPs
- Had limited supplies
- Used ISCO samplers that had the pH module
- Upgraded to the Duratracker that has the functional ability



PFAS Sampling Techniques

- The City of Bend Drinking water well hit on 4 different PFAS compounds
- Created a comprehensive SAP
- Over 30 samples were taken at different sampling intervals and points of the distribution system
- Found that all compounds were not detected after 24 hours of flushing

Why is this important to Pretreatment

- NEFAP and NELAC are both crucial to environmental testing and decision-making by creating competency to perform field activities or laboratory analytical analysis.
 - Reliable and accurate test results
 - Standardization among all FSMOs and Laboratories
 - Prevents cost associated with data integrity issues and resampling or testing

Summary

- NEFAP – The only independent national or international program to accredit field sampling and measurement organizations
- Benefits to FSMOs in becoming accredited
 - Increase data reliability
 - Reduce risk
 - Reduce cost
 - Marketing advantages
- NEFAP Future Vision
 - Continue education on the standard and market NEFAP value
 - Increase recognized Abs and FSMOs
 - Increase regulator recognition of the program



Questions/Comments

