

NELAC FoPT Tables

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What are FoPT Tables?

- **NELAC Fields of Proficiency Testing Tables**
- **List of the analytes that NELAC accredited labs are required to analyze in PT samples**
- **Include concentration ranges and acceptance limit criteria to be used by PT providers**

FoPT Table Example

NELAC PT for Accreditation									
Fields of Proficiency Testing with PTRLs									
<i>Drinking Water</i>									
<i>Effective June 1, 2005</i>									
Matrix	EPA Analyte Code	NELAC Analyte Code	Analyte	Conc Range	Acceptance Criteria ^{3,4,5,6}				NELAC PTRL ⁸
					a	b	c	d	
			Microbiology	CFU/ml					CFU/ml
Drinking Water	0254	2500	Total Coliform		Nine out of ten with no false negatives				Not Applicable
Drinking Water	0255	2530	Fecal Coliform/E.Coli		Nine out of ten with no false negatives				Not Applicable
Drinking Water	0258	2555	Heterotrophic Plate Count ¹⁰	5 to 500	Log transform Mean ± 2 SD				1
			Trace Metals	µg/L					µg/L
Drinking Water	0235	1000	Aluminum	130 to 2500	0.9794	7.3294	0.0560	9.0443	100
Drinking Water	0140	1005	Antimony	6 to 50	±30% fixed acceptance limit				4.2
Drinking Water	0001	1010	Arsenic	25 to 150	±30% fixed acceptance limit				20.0
Drinking Water	0002	1015	Barium	500 to 3000	±15% fixed acceptance limit				420
Drinking Water	0141	1020	Beryllium	1 to 10	±15% fixed acceptance limit				0.85
Drinking Water	0226	1025	Boron	800 to 2000	0.9815	13.9870	0.0603	3.4879	700

Information in FoPTs

- **Matrix**
- **EPA Analyte Code**
- **NELAC Analyte Code**
- **Analyte**
- **Concentration Range**
- **Acceptance Criteria**
- **NELAC PTRL**
- **Footnotes**

FOR MORE INFO...

NELAC FoPT Tables available online

<http://www.epa.gov/nerlesd1/land-sci/nelac/pttables.html>

Matrix

- NPW (Non-potable water) - WP
- Drinking Water - WS
- RCRA Solid - Soil

Analyte Codes

- **EPA Analyte Codes**
 - Artifact of the USEPA WP/WS studies
- **NELAC Analyte Codes**
 - Replacement for USPEA Analyte Codes

Analyte

- **Analyte name**

Concentration Range

- Range of concentrations at which PT providers can spike PT samples
- Some organic analytes can also be unspiked with an assigned value of zero

Acceptance Criteria

- **Criteria to be used by PT providers for determining acceptable/not acceptable status**
 - Fixed limits (e.g. assigned value $\pm 15\%$)
 - Regression equations (expected mean ± 2 or 3 times expected standard deviation)
 - Study mean ± 3 standard deviations

PTRLs

- **Proficiency Testing Reporting Limits**
 - Lowest possible acceptable value for a spiked analyte
- **WS Benzene example**
 - Manufacturing range = 2.5 – 20 µg/L or 0
 - Acceptance limits = ±40%
 - $PTRL = 2.50 - (2.50 * 0.4) = 1.50 \text{ µg/L}$
 - Any value >0 to <1.50 will always be “Not Acceptable”

Footnotes

- **Include some design criteria**
- **Contain explanations of acceptance criteria**
- **Definition of PTRLs**
- **Some important changes**

Why Were Tables Reviewed and Revised?

- **Regular review of PT tables intended from inception of NELAC**
- **Average failure rates ranged from 1 to 30%**
- **Source of many acceptance limits was undocumented**
- **Analytes/concentrations did not cover all programs/methods**

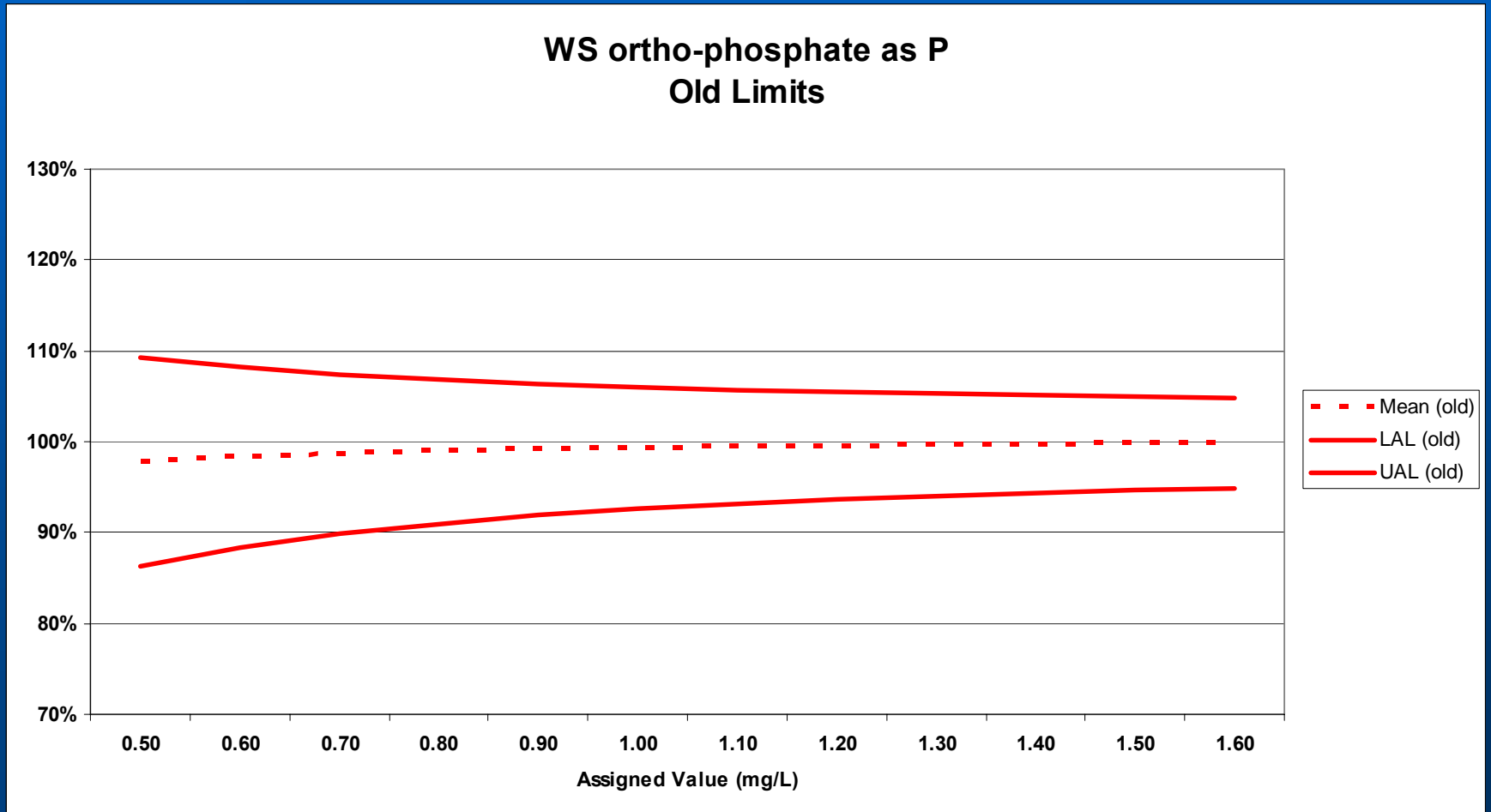
FoPT Subcommittee

- **Commissioned by the NELAC PT Committee**
- **Consisted of:**
 - NELAC AAs
 - Non-NELAC state representatives
 - EPA Office of Water
 - Commercial labs
 - PT Providers
 - PTOB/PTPA Statistician

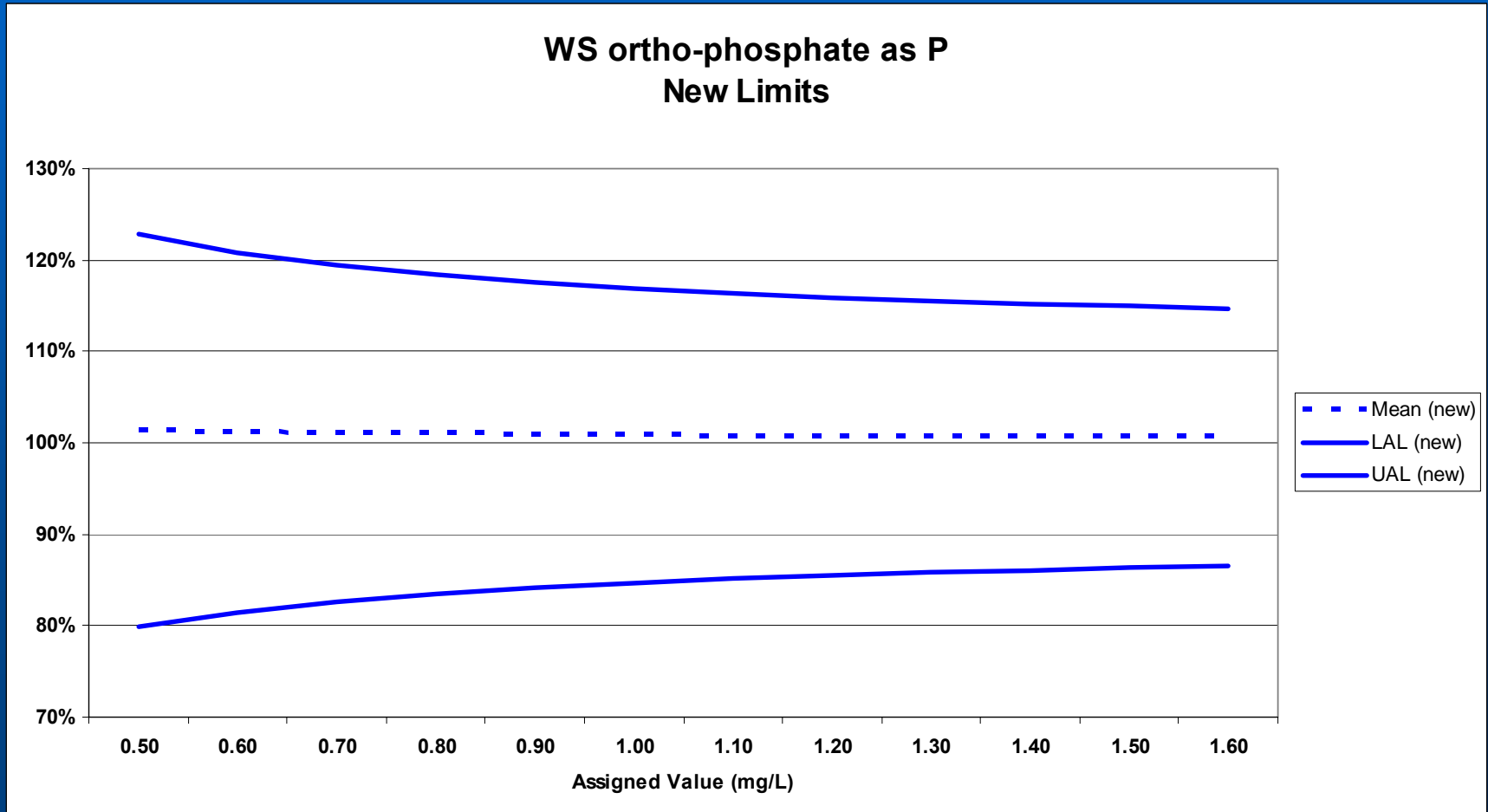
The Review Process

- **Collect PT study data from providers**
 - Studies from 1999-2003
 - Almost half of providers submitted data
 - Nearly 800,000 data points
- **Develop censoring scheme**
 - Removal of outliers
- **Develop acceptance limits that are effective, fair, and realistic**
 - Regression equations versus fixed limits
 - New limits must be at least as wide as method QC criteria

The Review Process cont.

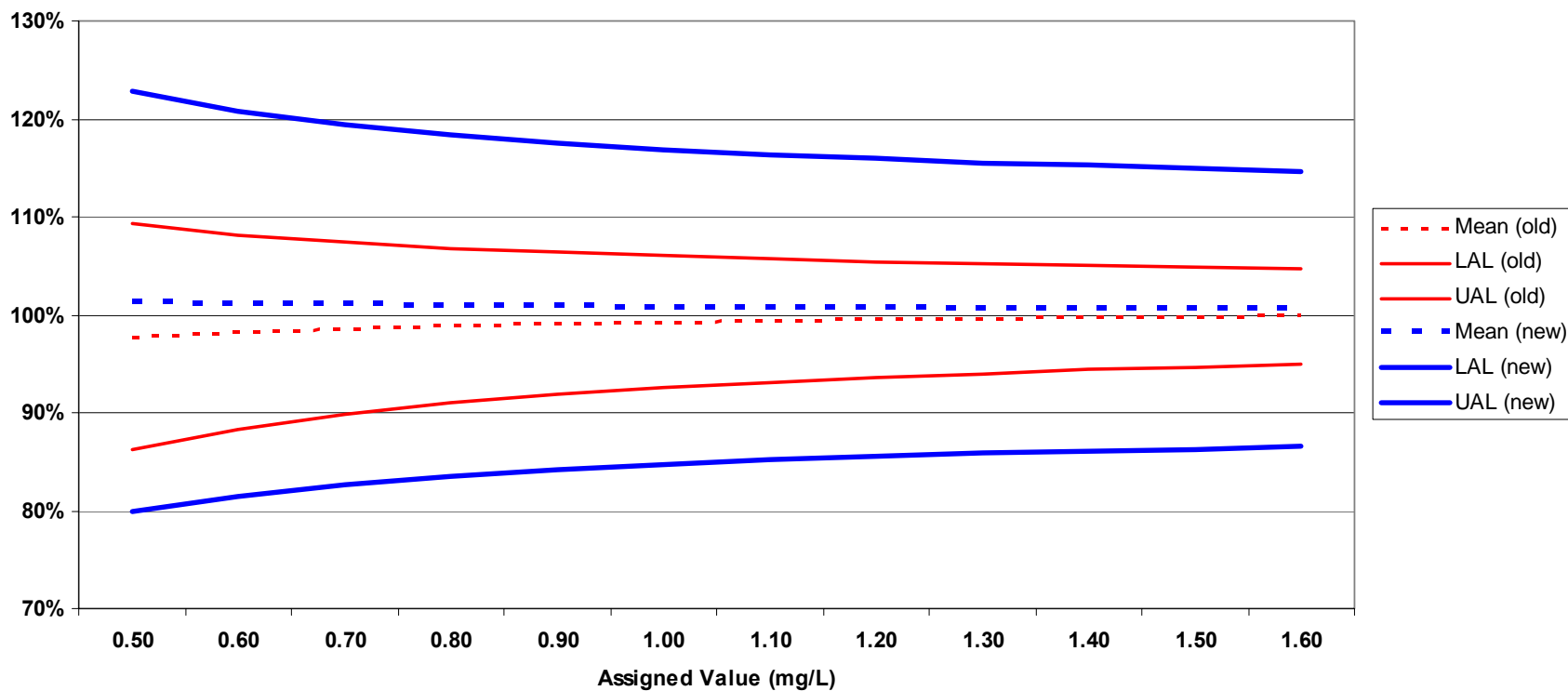


The Review Process cont.



The Review Process cont.

WS ortho-phosphate as P
New vs. Old Limits



The Review Process cont.

- **Evaluate impact of limits on failure rates**
 - Apply new limits to past studies
 - Ortho-phosphate
 - ERA's WS103 study
 - 89 Participants
 - Assigned Value = 1.47 mg/L
 - Old limits: 1.39 – 1.54 mg/L
 - 13 failures = 14.6%
 - New limits: 1.27 – 1.69 mg/L
 - 3 failures = 3.4%

The Review Process cont.

- **Adjust concentration levels to match method capabilities**
 - NPDES permit levels
 - Laboratory reporting limits
 - WP PAHs: “Low Level” = HPLC
 - Dichlorobenzenes now included on Volatiles as well as Semivolatiles lists

The Review Process cont.

- **Add analytes requested by AAs and labs**
 - California ELAP
 - NJDEP
- **Accreditation versus Experimental**
 - NELAC Chapter 2, Appendix C, section C.1.1.3

How to Read the New Tables

Blue Text =
Addition

References to
Footnotes

NPW	0027	1505	Minerals	mg/L					mg/L
NPW	0027	1505	Alkalinity, total (CaCO ₃)	10 to 120	0.9775	1.2668	0.0223	1.1905	6.8
NPW	0023	1035	Calcium	3.5 to 110	1.0135	0.0036	0.0377	0.1333	2.7
NPW	0028	1575	Chloride	35 to 275	0.9941	0.5826	0.0415	0.5513	29
NPW	0029	1730	Fluoride	0.3 to 4	1.0029	-0.0032	0.0423	0.0401	0.13
NPW		1550	Calcium hardness as CaCO ₃	8.7 to 275	1.0135	0.0090	0.0377	0.3328	6.8
NPW	0022	1755	Hardness, total (CaCO ₃)	17 to 440		See footnote 8			8.4
NPW	0024	1085	Magnesium	2.0 to 40	1.0056	-0.0744	0.0483	0.0094	1.6
NPW	0026	1125	Potassium	4.0 to 40	1.0104	-0.0582	0.0569	0.1131	3.0
NPW	0025	1155	Sodium	6.0 to 100	0.9949	0.2127	0.0487	0.0668	5.1
NPW	0020	1610	Spec. Cond. (25°C)	200 to 930 µmhos/cm	study mean		0.0263	3.5534	170
NPW	0030	2000	Sulfate	5.0 to 125	0.9854	0.0483	0.0471	0.4629	2.8
NPW		2005	Sulfide	1.0 to 10	0.9657	-0.1271	0.1205	0.2816	0.10
NPW	0021	1955	Total Dissolved Solids at 180°C	140 to 650	study mean		0.0686	4.3676	98

Red Text =
Change

Overview of Changes

- **Only WP and WS at this time**
- **55 new WS analytes, 72 new WP analytes**
- **Concentration ranges changed for 71 WS and 126 WP analytes**
- **Acceptance limits changed for 49 WS and 118 WP analytes**
- **PTRLs changed for most analytes**
- **Several footnotes revised or added**
- **Creation of Experimental Tables**

Experimental Analytes

- **Separate table from “Accreditation” analytes**
- **Analytes that AAs, other states, or labs requested to be included**
- **FoPT Subcommittee determined that not enough data was available to set binding acceptance limits**

Experimental Analytes cont.

- **NELAC labs are required to analyze PTs for experimental analytes twice per year**
- **Evaluation is not taken into account**
- **Experimental analytes will be reevaluated in the future and likely added to the accreditation tables**

Drinking Water Changes

- **12 Analytes added to Accreditation Table**
 - Nitrate + Nitrite
 - Total Hardness
 - Total Residual Chlorine
 - MTBE
 - Pesticides (3)
 - Carbamates (2)
 - Herbicides (2)
 - PCB Aroclor identification

Drinking Water Changes

- **43 Analytes added to Experimental Table**
 - Corrosivity
 - MBAS
 - Silica
 - Perchlorate
 - UV254 Absorbance
 - DOC
 - Hexavalent Chromium
 - Volatiles (5) – gasoline additives
 - PAHs/Phthalates (20)
 - Pesticides (2)
 - Herbicides (6)
 - Carbamates (2)

Drinking Water Changes

- **Increase from 156 to 205 analytes**
 - 55 analytes added
 - 6 method-specific coliform “analytes” removed from the list
- **Revisions to concentration ranges of 71 analytes**
- **Acceptance limits for 49 analytes have been changed**

Non-potable Water Changes

- **22 Analytes added to Accreditation Table**
 - Enterococci (MF and MPN)
 - Boron
 - Calcium Hardness
 - Sulfide
 - Nitrate + Nitrite
 - Nitrite
 - TPH
 - MBAS
 - Pesticides (2)
 - PCBs (2 Aroclors)
 - Volatiles (2)
 - BNAs (7)

Non-potable Water Changes

- **52 Analytes added to Experimental Table**
 - Acidity
 - Bromide
 - Color
 - Settleable Solids, Volatile Solids
 - Silica
 - TOX
 - Turbidity
 - Volatiles (5)
 - Pesticides (5)
 - Herbicides (1)
 - Acids (1)
 - DRO, GRO
 - Low-level PAHs (16)
 - Low-level Nitroaromatics and Nitramines (14)

Non-potable Water Changes

- **Increase from 170 to 243 analytes**
 - 74 analytes added
 - Aroclors 1016/1242 are now separate
- **Revisions to concentration ranges of 126 analytes**
- **Acceptance limits for 118 analytes have been changed**

What the Changes Mean to Labs

- **May have to report more analytes**
 - **Check the revised tables**
 - **Contact AA for guidance and schedule**
 - **Over half of “new” analytes are already included in PT samples with other NELAC analytes**

What the Changes Mean to Labs

cont.

- **Take note of revised concentrations**
 - Compare to linear range of your methods
 - PTRL should be \geq your detection limit

What the Changes Mean to Labs

cont.

- **Revised acceptance limits**
 - **Transparent to laboratories**
 - **Will correct problems with many bad limits**
 - **Provide more realistic evaluations**

What the Changes Mean to Labs

cont.

- **Footnotes**

If the lower acceptance limit generated using the criteria contained in this table is less than (<) 10% of the assigned value, the lower acceptance limits are set at 10% of the assigned value.

- Currently not uncommon for some organic analytes to have lower acceptance limits of zero even though the analyte was spiked

Status of Changes at USEPA

- **April 25, 2005 letter from Gregory Carroll accepting the new NELAC PT tables for WS**
- **May 24, 2005 letter from Richard Redding accepting the new NELAC PT tables for WP**
- **Requirement to use the new NELAC PT criteria included in DMR-QA 25 announcement letter from Michael Stahl**

Thank you!!!!

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