

2019 OCTOBER

SATURDAY | SATURDAY | SATURDAY | SATURDAY | SATURDAY | SATURDAY | SATURDAY

29

30

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

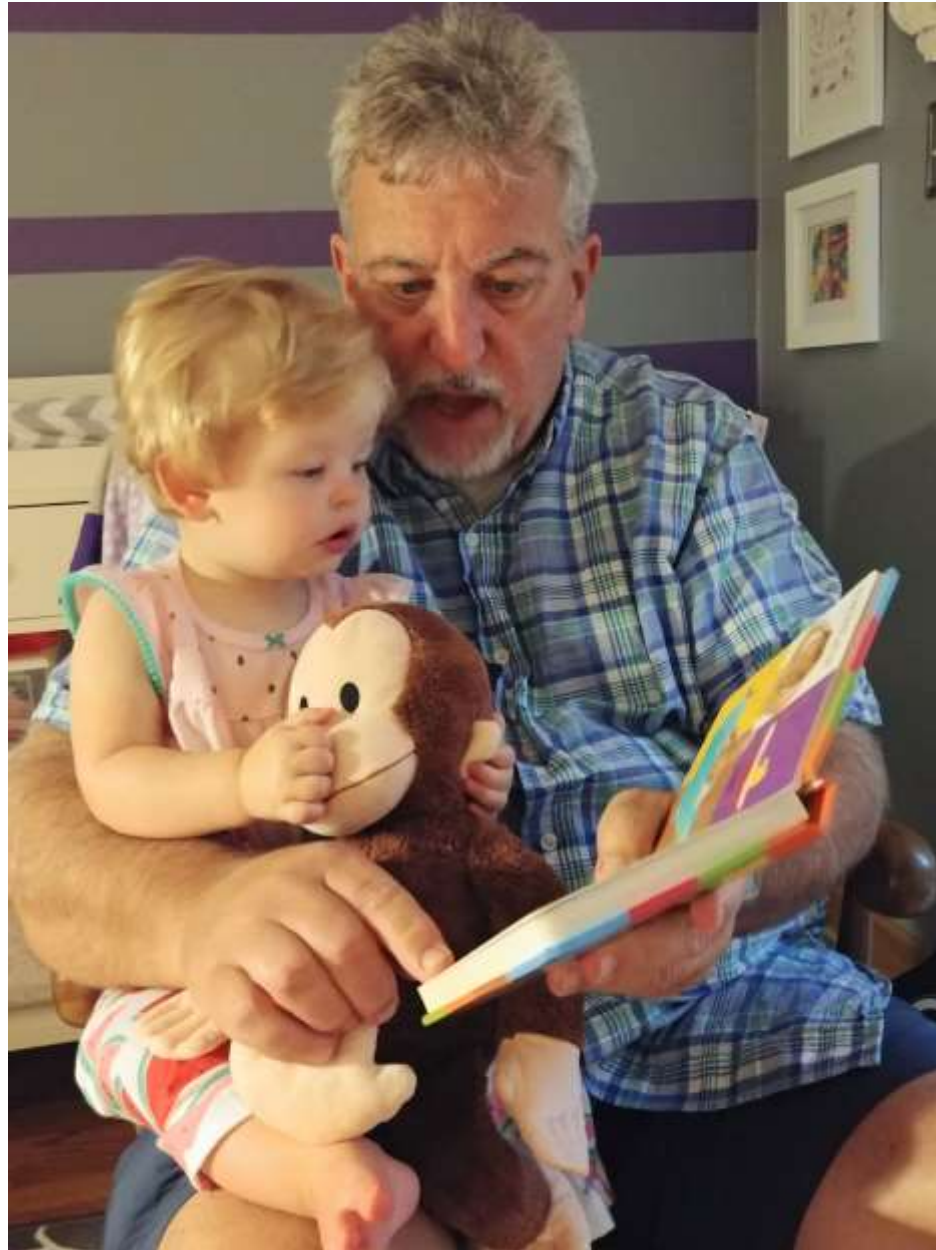
30

31

1

2

Gratuitous Grampa and Violet pic



Final NR 149 approval received

At the December 11-12 (2018) meeting of the Natural Resources Board, the changes to NR 149 (SS-22-12, Clearinghouse Rule CR 17-046) were approved for promulgation with an effective date of 9-1-2019.

Obviously...that didn't happen.

Will there be training sessions?

If so, **BEFORE** the rule takes effect?

SECTION 20. EFFECTIVE DATE. This rule takes effect on the first day of the month following publication in the Wisconsin Administrative Register as provided in s. 227.22 (2) (intro.), Stats.

Wait! This just gets better!

- So... in our last episode, the rule had to go through the Legislature and then the Governor.
- But now....with retirements and a new Administration, it has to go back through the Senate and the assembly.
- Each gets 30d to either let it go (passive adopt) or call a committee hearing within another 30d
- And that's where we are at!
- September 1 effective date is very unlikely!



**WE INTERRUPT
THIS PROGRAM**

...for some breaking news (well, not exactly “breaking”, but you get the idea

2008: BPA (Bisphenol A)

2010: Hexavalent chromium (the
“Erin Brockovich” chemical)

Both led to:

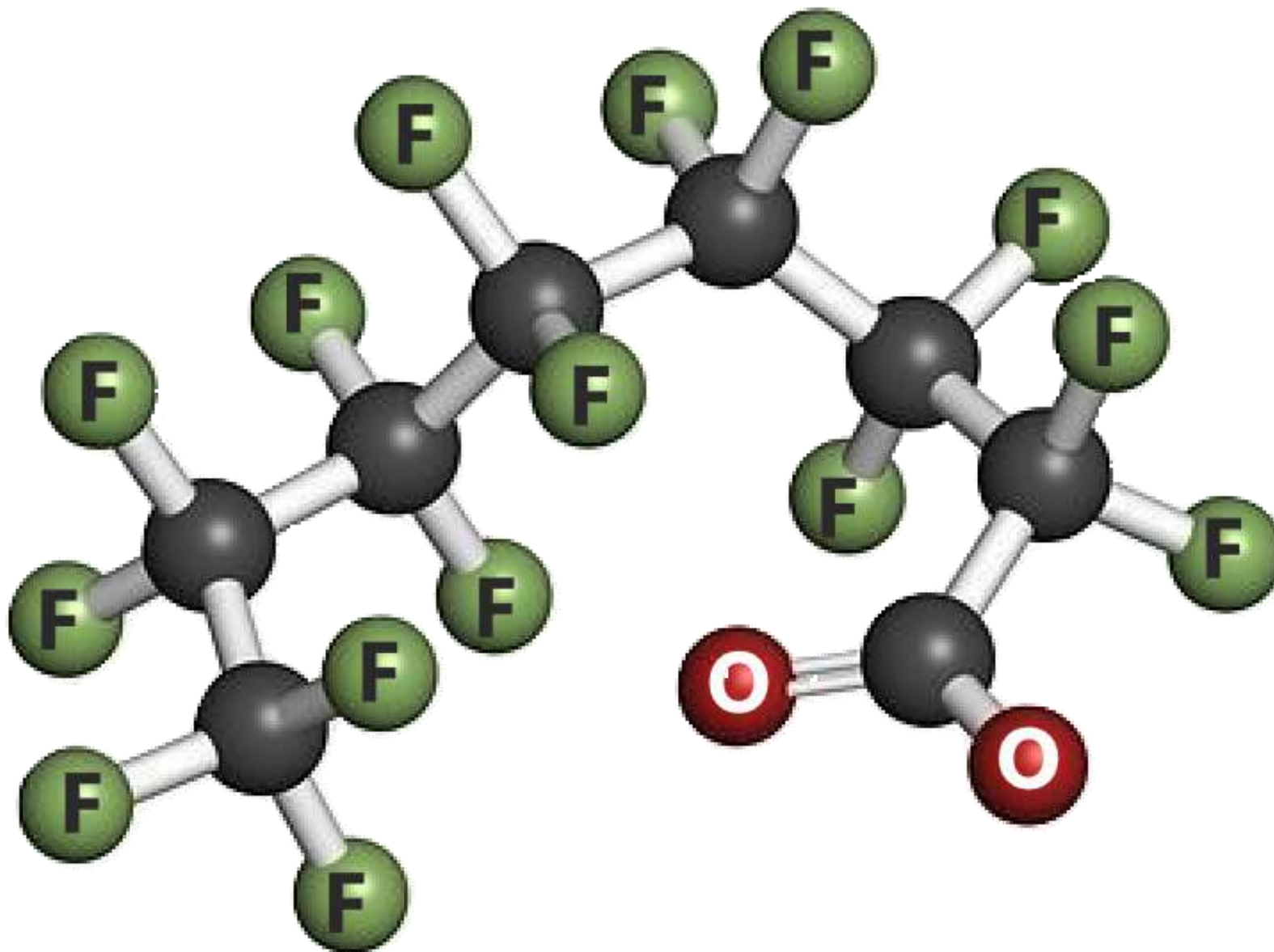
(A) Citizen groups pushing for clean water

(B) Were based on hazy, questionable data

(C) eventually died down as real, reliable
data were generated

So far...does PFAS pandemonium sound familiar?

And so now we deal with PFAS!!!



Introducing the “CLEAR Act”

Under this bill, DNR is required to add to 160.05 list PFOA, PFOS, PFHxS, PFNA, PFBS, PFHpA, **and all other PFAS that have a reasonable probability of entering the groundwater resources of the state and that** are shown to involve public health concerns.

In addition, the bill **requires DNR to set criteria for certifying laboratories to test for PFAS**, and to certify laboratories that meet these criteria. Before these criteria are set, the bill allows DNR to require testing for PFAS to be done according to nationally recognized standards.

(4) TESTING LABORATORIES; EMERGENCY RULES.

(a) The **DNR shall promulgate emergency rules** under s. 227.24 establishing criteria for certifying laboratories to test for any perfluoroalkyl or polyfluoroalkyl substances, including the standards and methods for such testing, **and shall certify laboratories that meet these criteria.** ...emergency rules promulgated under this subsection remain in effect until July 1, 2022, or the date on which permanent rules take effect, whichever is sooner.

No evidence required!!!

- (a)... **the DNR is not required to provide evidence that promulgating a rule under this subsection as an emergency rule is necessary for the preservation of public peace, health, safety, or welfare and is not required to provide a finding of emergency for a rule promulgated under this subsection.**
- b) Before emergency rules are promulgated under par. (a), the DNR may require testing for a perfluoroalkyl or polyfluoroalkyl substance to be done according to any nationally recognized procedures.

- **The testing for PFAS is NOT mandatory.** Yet the word “voluntary” does not appear anywhere in the DNR’s letter. *A facility cannot be penalized for opting NOT to perform the PFAS testing.*
- Based on similar testing in northeast Wisconsin, the DNR has “requested” WWTPs to cease landspreading their biosolids. **How long can a facility store its biosolids onsite? No Authority**
- While you may be interested in performing this testing for your own knowledge, without reporting it to the DNR, be advised that **some administrative code language may enable the DNR to demand that data be reported.**
- The letter indicates that the 125 included facilities were selected because they are more likely to receive wastewater from businesses that knowingly or unknowingly use PFAS. **To date I have already heard from several facilities on the list for which this is not the case.**

What exactly are PFAS? Why worry?

- PFAS widely used since the 1950s. Do you eat fast food (foam containers)? Have stain repellent carpeting or clothing? Use non-stick pots and pans for cooking? Then you have been exposed to PFAS. Also a component of fire-fighting foams.
- WWTPs are NOT producers of PFAS.
- PFAS are not currently regulated by either the federal EPA or Wisconsin. The EPA has set ADVISORY limits in drinking water for the sum of two: PFOA and PFOS. The advisory limit is equivalent to 0.07 ug/L (70 ppt). So why 36 compounds?
- The DNR letter indicates that studies have shown that 98% of the population has detectable levels of PFAS in their blood. This study is 15 years old, and shows a decline in blood PFAS.
- NO conclusive studies indicating any human health risks related to PFAS exposure. Merely some “links” or a “correlation”. The strongest correlation seems to be between presence of PFAS in the blood and cholesterol levels. But even that relationship has been refuted in other studies.

What is happening elsewhere?

Michigan looking to regulate **7 PFAS compounds** (6 ppt and 8 ppt respectively for PFOA and PFOS) AND “long chain PFAS” down to 6 ppt although they recognize that “**there is not enough information available at this time to support health-based values and drinking water standards for them**, these compounds are expected to produce similar health effects,” **PFOA 6 ppt** **PFOS 8 ppt**

Minnesota: The new health-based value for PFOS value of 15 parts per trillion (ppt) (previously 27 ppt. The new health-based value for PFHxS is 47 ppt. PFOA already set at 35 ppt.

PFOS 27→15 ppt **PFOA 35 ppt** **PFHxS 47 ppt**

What is happening elsewhere?

The **New Hampshire** standard limits PFOA to a maximum of 12 parts per trillion and 15 parts per trillion for another called PFOS.

Max limits: PFOA 12 ppt PFOS 15 ppt

Let's get a reference:

1 ppt = 0.001 ppb = 0.000001 ppm)

1 ppt is equivalent to about thirty seconds out of every million years.

So 20 ppt = 10 minutes/1,000,000 years

1 ppt represents about \$4.00 out of the entire US Federal budget....the cost of a pumpkin spice latte at Starbucks.

The magnitude of the problem

What products contain PFAS? Many products are made with



Burger King Chick-fil-A Jimmy John's Chipotle Mexican Grill Subway Panera Bread Dunkin'

Air

- Is it too late already?
- Been around for 70 yrs
- No one wants to give up their “stuff”
- And even if they did...where does it all go?
Landfills?

- And if [unclear] in our blood,
[unclear] remediation?

PFAS water contamination can be found across the U.S. as reported by Environmental Working Group (EWG). As

- of Oct. 4, 2018, there are a reported 192 pollution sites in 39 states.

- **Military bases and locations** where firefighting foams were used make up 62.5% of these cases.

- **What's the endgame?**

- With a battle cry of “Clean Water, NOW!”, are we missing the consequences of our actions?
- Rushing = questionable data
- Will facilities have to add expensive remediation measures/equipment?
- Will we just stuff landfills with PFAS materials? Have to open new landfills? NIMBY!
- PFAS are NOT regulated by the EPA.
- There's a HUGE difference between being a leader, and being first!
- There is no concrete evidence of PFAS being a health issue at nominal levels found.



Maybe its best if we just talk about what the FINAL REVISIONS to NR149 rule change entail!

- Fix what was broken
- Re-organize to a more logical sequence
- Remove what wasn't necessary
- Add what wasn't there (but should be)
- Establish fee equity
- Clearly specify requirements
- Simplify Quality Control samples
- Bulk up calibration section (*EPA has failed to do so*); and **quality data begins with calibration**
- Create a section that outlines minimal requirements for a given technology.

Re-organization

NR 149.04 **REMOVED** “Disclaimers”

NR149.07 **REMOVED** Transfer of
Cert/Reg

NR 149.155 ***NEW*** Required
notifications.

NR 149.16 **REMOVED** Notification
of relocation.

NR 149.17 **REMOVED** Lab name
change.

NR 149.24 **RENAMED** from
“Schedule of Analysis” to PT
samples for applications &
renewal.

NR 149.26 **RENAMED** from
“Submittals” Reporting PT
sample results.

NR 149.365 ***NEW*** Lab ethics.

NR 149.442 ***NEW*** Handling of
samples.

NR 149.444 ***NEW*** Initial
instrument calibration
requirements

NR 149.446 ***NEW*** Continuing
instrument calibration
requirements.

NR 149.46 **MOVED** Handling of
Samples

NR 149.47 **RENAMED / UPDATED**
from Test Reports ///Reporting
results.

NR 148.49 **REMOVED** QC for Eff
Toxicity

NR 149.50 ***NEW*** Technology
requirements

The existing NR 149 has 422 instances of “shall”

The 2019 revisions have 401 “shalls”.

That amounts to at **a 5% reduction in requirements!**

The moral of the story is that you DO need to pay attention to the “shalls” within the code.

Oh...and LabCert is now officially in the business of evaluating the “scientific validity” of method modifications”

(7) (c) When a laboratory incorporates a **procedure that is neither expressly permitted nor prohibited** by the method, the department **will assess the scientific validity of the procedure** to determine if the procedure is within the scope of the method. The underlying chemistry of the method * SHALL * remain unchanged. The department may seek the advice of the council in making determinations under this paragraph.

Note: For example, if a digestion time of 30 minutes is required, the laboratory is not to use less time for digestion.

(Lab) Evaluation procedures and appraisal

149.30 (2) If, in performing an on-site evaluation, the department finds that the laboratory is implementing a procedure that is neither allowed nor disallowed by method or this chapter, the department will assess the **scientific validity** of the procedure. The department may seek the advice of the council in making determinations under this paragraph.

Method selection

149.41 (4) The department will assess the **scientific validity** of method modifications to determine if the modification is within the scope of a method.

“Assess the scientific validity”???

24
of 118

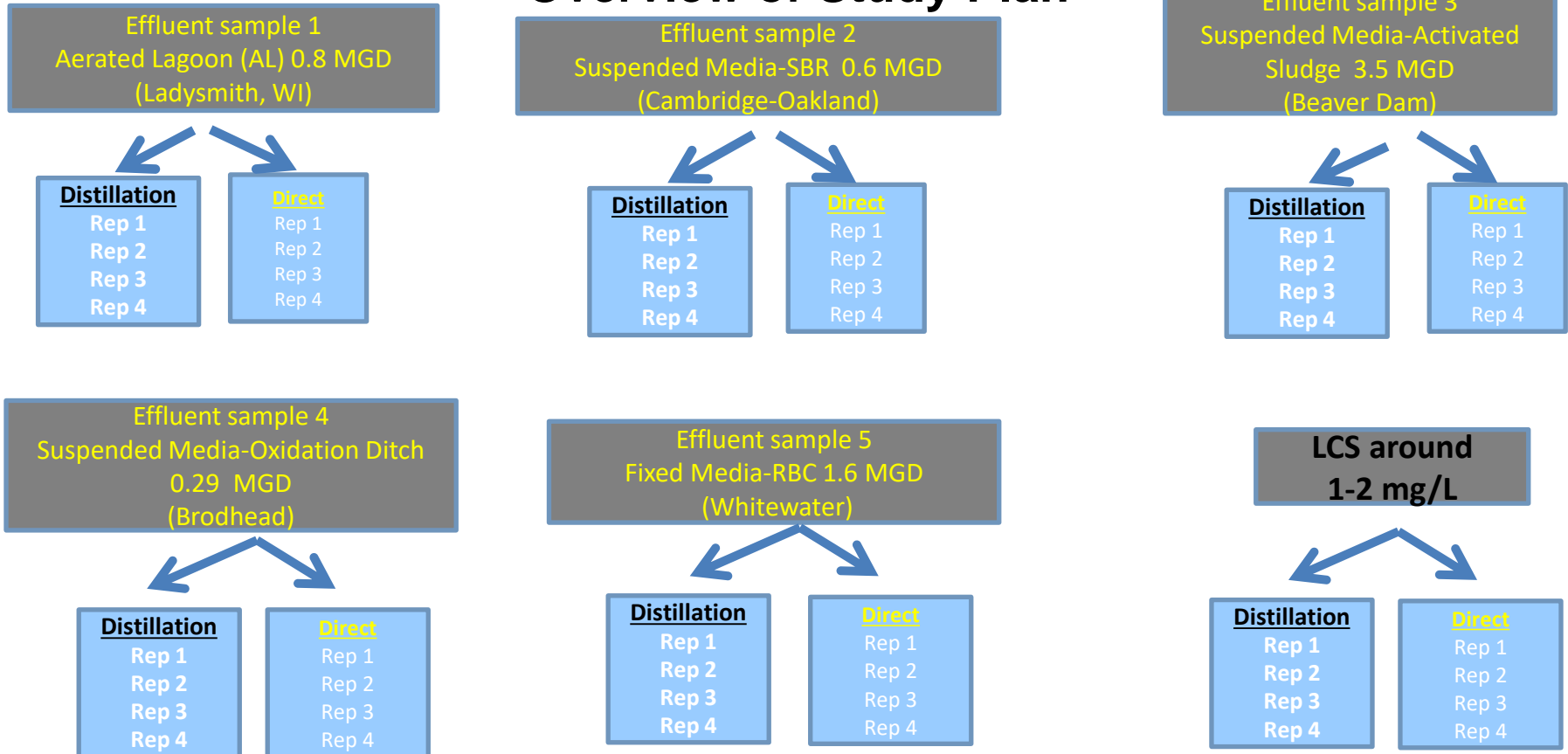
- How’s THAT gonna work?
- What protocol WILL be established (and followed) to “assess the validity”?
- What if you disagree with LabCert’s decision?
- It seems to provide absolute power...



What LabCert required HACH do for NH3 TNT

This is what it took to be able to grant the exemption from distillation

Overview of Study Plan



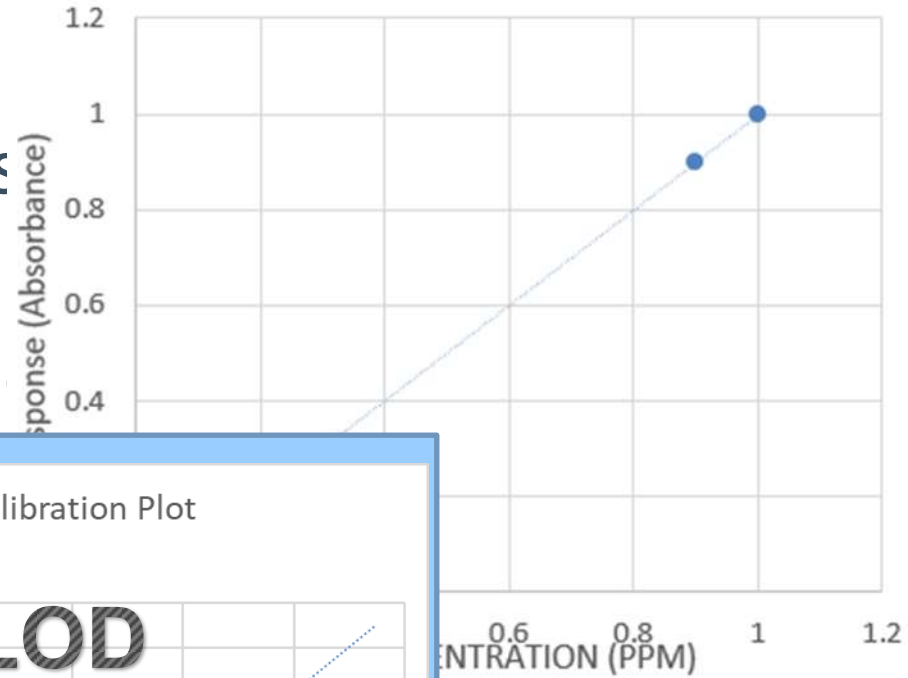
HACH Co. performed an equivalency study

This same approach was used several years back for an existing lab who wanted to vastly reduce prep time

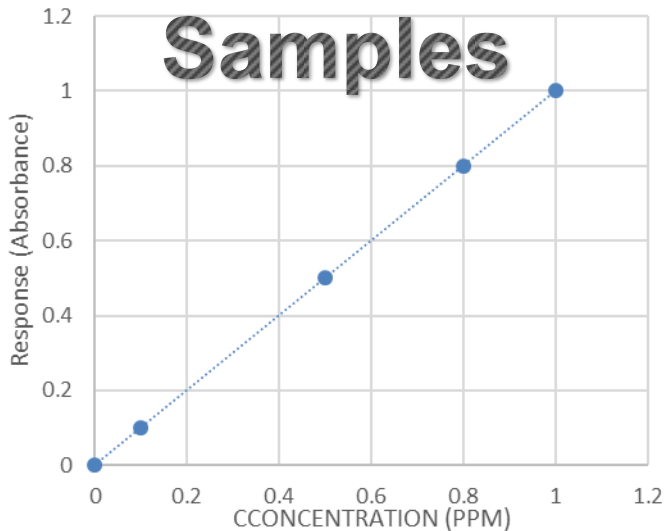
Real World Examples: Judges call?

- I use water downstream from a BOD seed source.
- To quickly warm my BOD samples in water.
- I prepare my own GGA and

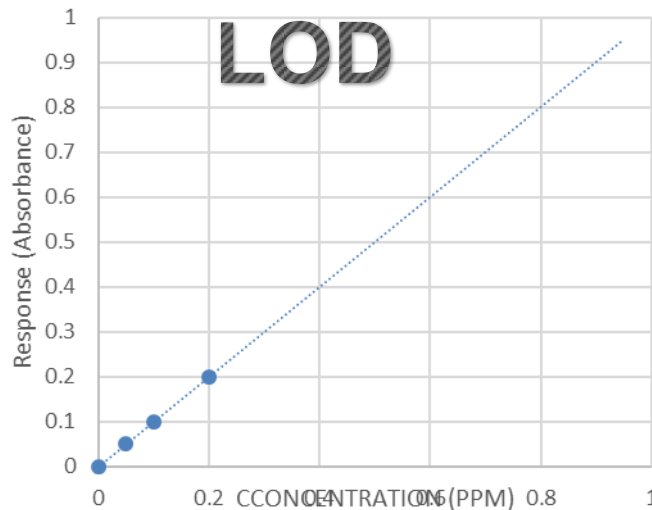
Calibration Plot



Calibration Plot



Calibration Plot



m.

1 to 1.0 ppm;
0, 0.05, 0.1,

A girl who loves her cars

27
of 118

1 yr old



2 yrs old



NR 149.04 Disclaimers. A laboratory may not claim or imply that data it generates has department approval solely on the basis of the laboratory's certification and registration status.

Note: *Certification or registration of a laboratory is not an endorsement by the department of the quality or validity of the data generated by a laboratory. Certification or registration does not guarantee the usability of data generated by a laboratory for an intended purpose. The covered programs under this chapter are the ultimate users of laboratory results and determine whether they accept or reject analytical data from any certified or registered laboratory.*

So...apparently, it could be argued that any data generated by a certified/registered lab now carries the DNR Seal of approval!



NR 149.07 Transfer of certification and registration.

(1) Laboratory certifications and registrations are not transferable to other entities unless the department expressly approves the transfer.

(2) Laboratories shall notify the department of any change of ownership as soon as practicable, but no later than 30 days after the change has occurred. **Note:** Requirements for initial and transfer applications are contained in s. [NR 149.14](#)

Existing code:

NR 149.15 (2)(a)2. Submit acceptable PT sample results as required in subch. V.:

NR 149.24(3)

(a) For renewal of certifications or registrations, which begin on September 1 of each calendar year, acceptable PT sample results shall have been reported by an approved PT provider no sooner than January 1 or **later than August 15** of the same calendar year.

NR 149.15 Period, renewal, and expiration of accreditation.

(2) RENEWAL PROCESS. Annually, each laboratory holding valid accreditations under this chapter and wishing to renew its accreditations ***SHALL*** do all the following:

(b) Submit acceptable PT sample results as required in subch. V. **no later than August 21**

-NR 149.16, 149.17; + NR 149.155

NR 149.16 REMOVED Notification of relocation.

NR 149.17 REMOVED Laboratory name change.

ADDED NR 149.155 Required notifications.

NR 149.155 Required Notifications. (1) LAB NAME CHANGE. A lab that changes its name without changing ownership shall notify the department, in writing, within 30 days of the effective date. ...

(2) LAB OWNERSHIP CHANGE. A lab that changes its ownership shall notify the department, in writing, within 30 days of the effective date...

NR 149.155 (3) LABORATORY RELOCATION. A laboratory relocating * SHALL * notify the department, in writing, at least 30 days prior to the relocation. Notification * SHALL * include the new address and any changes in contact information.

NR 149.155 (4) KEY PERSONNEL CHANGES. A lab making changes to key personnel, including **lab director, lab manager, QA manager**, or whole effluent toxicity technical expert, * SHALL * notify the department within 30 days of these changes.



- The program needs to know WHO to communicate with!!

- Current: NR149.21(4)(c)

Note: Considering base fees, matrix fees, analytical technology fee maximums, and the analytical class fee maximum, this effectively establishes a maximum annual fee “cap” of 100 RVUs for any laboratory.

In the last revision (2008), a “cap” on RVUs was instituted to control fees of labs performing many technologies.

22 RVUs for each of Aqueous and Solid matrices;
31 Drinking Water

- **FINAL 149.22(1)(c)4**

(language specifying maximum fees is removed)

How fees are calculated

- Cost per RVU = $\frac{\$595,000}{\text{Total \#RVU}}$

$$\begin{aligned} \text{Lab fee} &= \\ &\text{\#RVU} \\ &\times \text{\$/RVU} \end{aligned}$$

RVU Caps

Impact on cost/RVU

Bottom line

Projected fee changes

Fee INCREASES: Max fee increase: \$1,222

**6.8%
of
labs**

Category	Number of Labs	Projected Number of Labs with potential Fee increase	% of Projected Number of Labs with potential Fee increase	Average Fee Increase
Commercial	71	23	32%	\$ 948.00
Industrial	45	0	0%	-
Municipal	220	0	0%	-
Public Health	15	1	7%	\$ 894.00

149.22 PT Method Codes

37
of 118

FINAL NR 149.22 (1) (c) A lab *** SHALL *** report a proper **method code**, which matches the technology and analyte or analyte group for which accreditation is held, with results for PT samples.

Note: A link to the universal list of method codes for methods and technologies is available from the NELAC Institute (TNI) which can be found on the Wisconsin department of natural resources laboratory accreditation program website.

TNI LAMS <https://lams.nelac-institute.org/TestMethods>
National Environmental Laboratory Accreditation Management System



Home | Search | Help

AB Login



TEST METHODS

Part 136: All ▼

Part 141: All ▼

Active: Yes ▼

SW-846 Update III: All ▼

SW-846 Update IV: All ▼

SW-846 Update V: All ▼

PROGRAMS



1

2

3

4

5

6

7

8

9

10

...



Page size:

20 ▼

4449 items in 223 pages

- The EPA used to run the PT show.
- But ultimately, they allowed NELAC (TNI) to run that aspect of lab accreditation.
- That's why method codes (and analyte codes) come from TNI.
- Recommend downloading the current list of all codes (Save to Excel) before reporting annual PTs.
- All approved PT Providers must live by these codes (and analyte codes!). LabCert had to treat the State Lab the same as other Providers.
- No method code means you won't get credit for your PT results (*more on that to come*)

Example Method Codes

20109006	SM 4500-NH3 D	20th ED	1997	Ammonia
	Nitrogen by Selective Ion Probe	ISE		
20108809	SM 4500-NH3 D	19th ED	1994	Ammonia
	Nitrogen by Selective Ion Probe	ISE		
20108605	SM 4500-NH3 D	18th ED	1990	Ammonia
	Nitrogen by Phenate Method	UV-VIS		
20109211	SM 4500-NH3 D	22nd ED	2011	Ammonia
	Nitrogen by Selective Ion Probe	ISE		
20109404	SM 4500-NH3 D-1997		1997	Ammonia
	Nitrogen by Selective Ion Probe	ISE		
20109415	SM 4500-NH3 D-2011		2011	Ammonia
	Nitrogen by Selective Ion Probe	ISE		

Careful! Standard Method numbers were re-numbered after the 18th edition...which you shouldn't be reporting anyway!

1. PT Providers are required to upload PT results (*but you also have to give them permission to send it to us!*)
2. They also send us a PDF copy, but we get literally hundreds of these. Too difficult to look through.
3. The PT Provider uploads (“deposits”) PT results to a secure location outside the agency firewall.
4. At 6:30 every night (during renewal) LabCert software looks for any new “deposits and if there are, processes them.
5. It then attempts to play mailman...

6. If it finds results (A)with your address (PT ID) and for (B)tests you have active (accredited or application) and (C) you have provided a proper method code, it will “mail the results to your LabCert file.
7. And then, at about 6:38 each night, if the software was able to mail anything to your file, then it will generate an email to you (copy to LabCert mailbox) identifying what study was uploaded and your results.
8. But what if the email didn't include one or more tests? Or you didn't get an email?

NO EPA ID

SLH: Did you change methods?

No method code reported

Wrong analyte (SGT-HEM when HEM was needed)

Wrong method code (not 8 digits; some other state code)

Other method code issues

Wrong technology code

NH₃ by ISE when you actually do Hach Test N Tube (colorimetry)

Digestion method code vs. analytical method

*20123211 SM 4500-P B.5 22nd ED 2011 Phosphorus
by Persulfate Digestion Method PREP **instead of***

*20124225 SM 4500-P E-2011 2011 Phosphorus
by Ascorbic Acid Method UV-VIS*

Reporting a chloriNE method code for chloriDE

*20084611 SM 4500-Cl⁻ B-2011 2011 Chloride by
Argentometric Method TITR **instead of***

*20078426 SM 4500-Cl B-2011 2011 Chlorine
(Residual) by Iodometric Method I TITR*

NR 149.24 RENAMED from "Submittals" TO Proficiency testing sample results

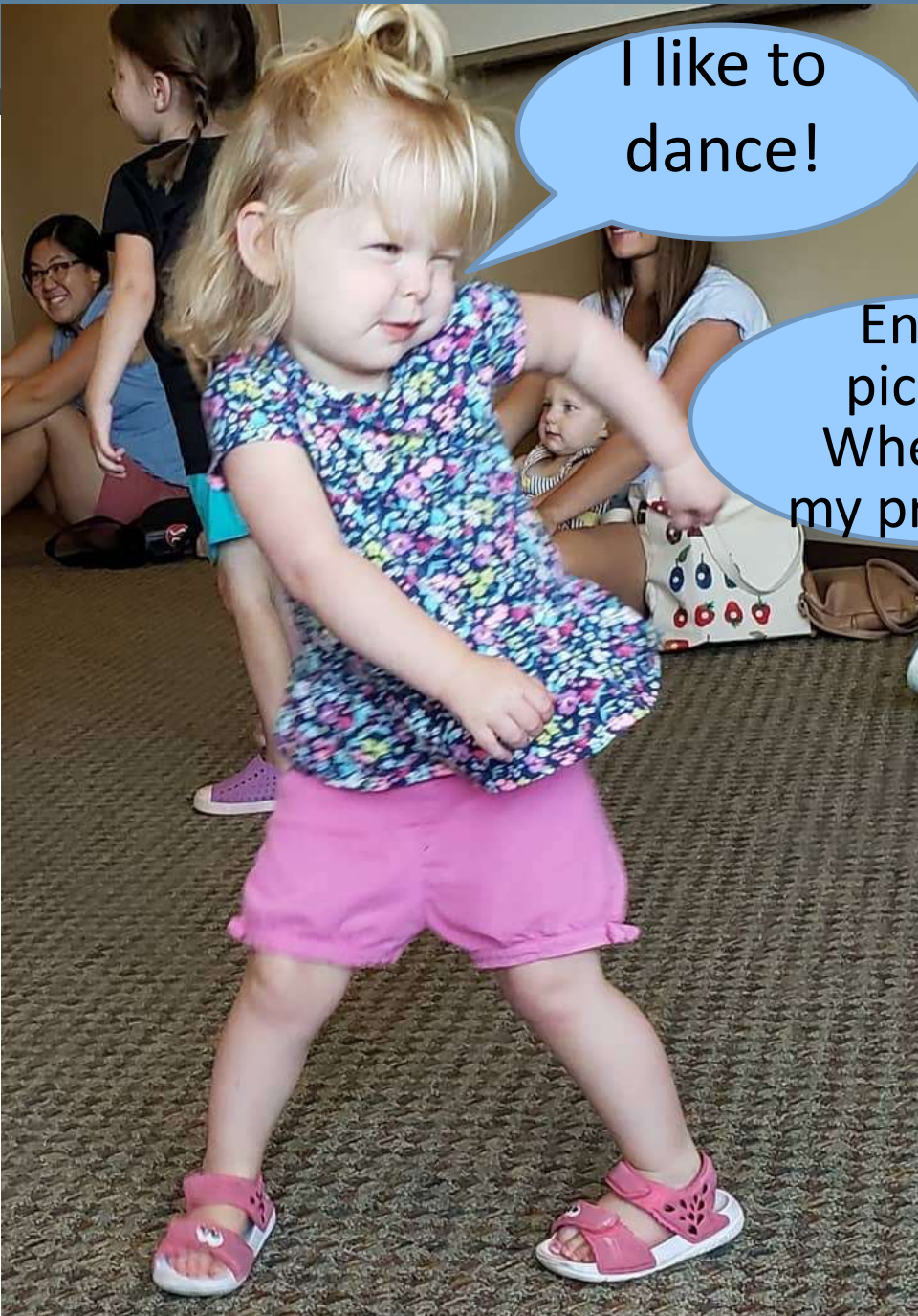
NR 149.26 RENAMED from "Submittals" to Reporting proficiency testing sample results.



LOST & FOUND

And PLEASE.... Make sure you report your "EPA Lab ID". If you have one, you know what it is, otherwise, you can ALWAYS use the 9 digit lab accreditation number.

If you do not report that, your PTs will NOT be recorded and you may not be renewed!



I like to dance!

Enough pictures. Where are my presents?



- **FINAL 149.28(1)(d)**

(d) When applying to have an analyte or analyte group reinstated after non-renewal for failing three consecutive PT samples, the laboratory * SHALL * provide acceptable results on two subsequent and consecutive PT sample studies for that analyte or analyte group. The consecutive PT samples * SHALL * be two unique studies received by the laboratory at least ten business days apart. The laboratory may not prepare or analyze the two PT samples in the same batch.

NR 149.365 Laboratory ethics.

All of the following practices are prohibited and may result in enforcement action as presented in s NR 149.10:

(4) Concealing or failing to report a known improper or unethical behavior or action associated with sample analysis.

If you see, or know something...SAY something

- **(3) CONTENT. Unless included in other standard operating procedures maintained under s. NR 149.40,** The quality manual shall include, address or refer to, at a minimum, the following elements:
 - ~~(a) Organization and management structure of the laboratory.~~
 - **(b)** Procedures for retention, control and maintenance of documents used in or associated with analyses.
 - **(c)** Procedures for achieving traceability of standards, reagents and reference materials used to derive any results or measurements.
 - **(d)** Procedures for handling samples

- ~~• (e) Lists of major analytical instruments and support equipment.~~
- (f) Procedures for calibration, verification and maintenance of major analytical instruments and support equipment.
- (g) Procedures for evaluating quality control samples, including, but not limited to, method blanks, laboratory control samples, matrix fortified samples and replicates.
- (h) Procedures for initiating, following up on and documenting corrective action addressing QA and QC failures, discrepancies or nonconformance.
- ~~• (i) Procedures for reviewing analytical data and reporting analytical results.~~

- (1) The
any no
(2) The
the mo
...verif
(3) The
(4) The
implem
correct
action
Note: Th
nonconf

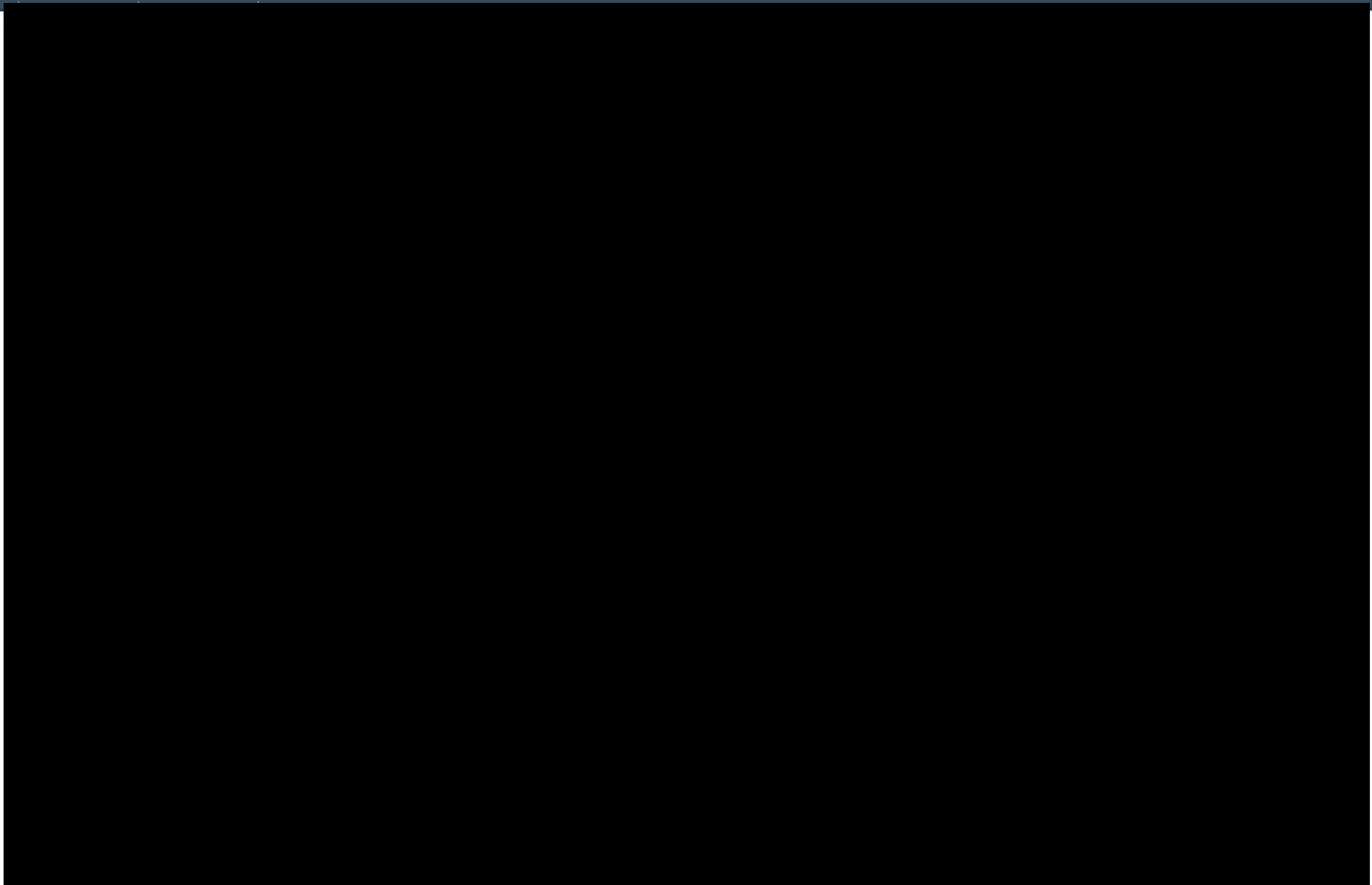
I LIKE USING
BIG WORDS
THAT I DONT
FULLY UNDERSTAND
TO MAKE MYSELF SOUND
more
PHOTOSYNTHESIS

to
nine
.
.
l
e
ated

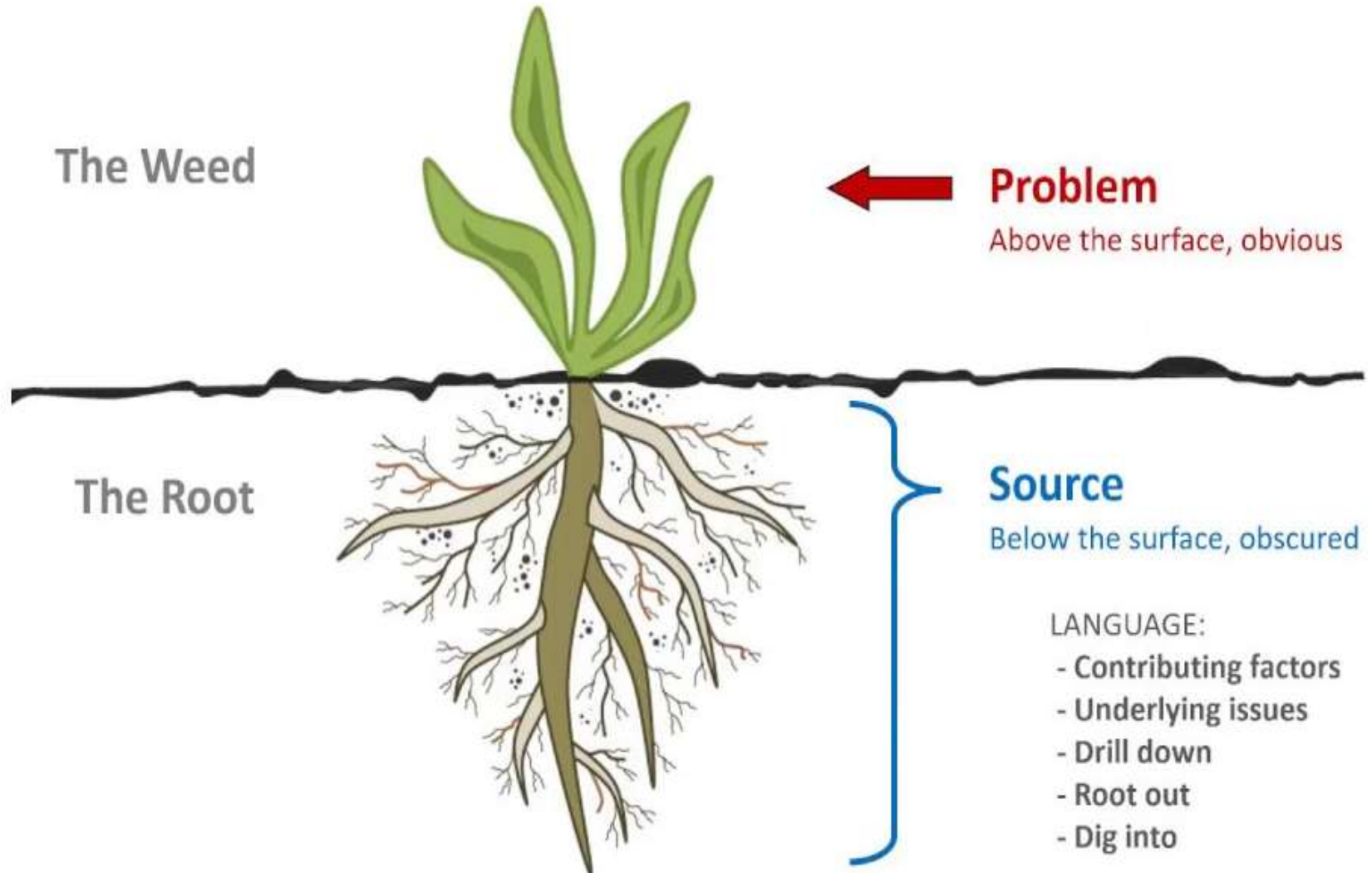
NEW

Root Cause???

52
of 118



Root Cause Analysis - The Concept



(1) The lab shall take corrective action in response to any nonconformances ...

(2) corrective action shall identify the problem, determine the most probable cause..., implement solutions..., and ...verify that the action has had the desired effect.

(4) The laboratory shall monitor the effectiveness of implemented corrective action changes and take additional **corrective action when initial or subsequent corrective action fails to resolve the nonconformance.**

Note: The analyst may not always be able to identify the cause of isolated nonconformance incidents.

Root Cause Analysis for Beginners

Root cause analysis (RCA) is a tool to help identify what, how, and why an event occurred so that steps can be taken to prevent future occurrences.

- (1) RECORDS AND DOCUMENTS RETENTION AND CONTROL.
- (2) ADMINISTRATIVE RECORDS.
- (3) REAGENT AND STANDARD RECORDS AND REFERENCE MATERIALS.
- (4) ANALYTICAL AND TECHNICAL RECORDS.

Formerly held the “list of 17 required records” ...
now removed

- (5) SAMPLE COLLECTION RECORDS.

- (c) Analytical and technical records retained by the laboratory shall allow access to information that includes:
 - 1. Collection, arrival, processing and analysis dates of samples received for analysis.
 - 2. Collection and analysis time for tests with holding time of 48 hours or less.
 - 3. Preservation status of samples on arrival at the laboratory.
 - 4. Identity of laboratory personnel preparing and testing samples.
 - 5. Identification of the analytes or analyte groups analyzed in samples.
 - 6. Preparatory techniques, such as digestions, extractions and clean-ups....
 - 7. Methods of analysis used for samples.
 - 8. Results of sample analysis.
 - 9. Traceability of standards and reagents used to perform analysis.
 - 10. Calibration verification info and measurements of lab support equipment....
 - 11. Initial and continuing calibration data associated with samples analyzed.
 - 12. Raw data for analytical instrument calibrations and samples.
 - 13. Results of quality control samples associated with samples analyzed.
 - 14. Corrective actions associated with samples analyzed.
 - 15. Maintenance performed on lab support equipment and analytical instruments.
 - 16. Environmental conditions crucial to tests performed at laboratory facilities....
 - 17. Reports of final results submitted to clients or the department

NR 149.40 SOPs



NR 149.41 Method selection.

Added “(4) The department will assess the scientific validity of method modifications to determine if the modification is within the scope of a method.”

NR 149.42 Alternative methods.

REMOVED 2) *On a case-by-case basis, the department may allow the use of methods other than those specified by programs covered under this chapter, for any of the following situations:*

(a) The EPA has granted approval for the alternative methods.

NR 149.43 Laboratory facilities. (NO changes)

- Current 149.44(3)(g)

Analytical balances that have been used at least once in a month shall be checked monthly with at least 2 certified weights, one weight in the gram range and one weight in the milligram range.

149.44 Laboratory equipment. (1) GENERAL PROVISIONS.

(3) CALIBRATION AND VERIFICATION OF SUPPORT EQUIPMENT. (a) The laboratory *** SHALL *** calibrate or verify all support equipment within that equipment's range of use using available reference materials traceable to NIST. ...

(d) Minimum verification frequencies include all the following:

1. Annually: devices used to measure atmospheric pressure and temperature.

2. **Quarterly:** mechanical and automatic volumetric dispensing devices, including pipettes.

3. Monthly: balances, with one weight in the expected range of use. Balance weights * SHALL * be all the following:

a. Handled and stored in a manner that protects the weights' integrity.

b. Traceable to NIST and of class 2 quality or better.

ANSI/ASTM **Class 1** - Can be used as a reference standard in calibrating other weights and is appropriate for calibrating high-precision analytical balances with a readability as low as 0.1 mg to 0.01 mg. ANSI/ASTM

Class 2 - Appropriate for calibrating high-precision top loading balances with a readability as low as 0.01 g to 0.001 g.

-- Source: Troemner

149.03 (75) "Support equipment" means devices that may not be analytical instruments, but that are necessary to support laboratory tests and operations. "Support equipment" includes autoclaves, **balances**, ovens, refrigerators, freezers, incubators, water baths, temperature measuring devices, sample preparation devices, and volumetric dispensing devices when quantitative results depend on the accuracy of the support equipment.



NOTICE



NO

WHINING

← Beyond This Point →

- (i) Demonstration of Capability (DOC);
- (ii) Method Detection Limit (MDL);
- (iii) Lab reagent blank (LRB), also referred to as method blank (MB);
- (iv) Lab spiked blank, or lab control sample (LCS);
- (v) Matrix spike (MS) and matrix spike duplicate (MSD), or lab fortified matrix (LFM) and LFM duplicate;
- (vi) Internal standards (for GC/MS analyses), surrogate standards (for organic analysis) or tracers (for radiochemistry);
- (vii) Initial calibration verification (ICV) and continuing calibration verification (CCV);
- (viii) Control charts (*or other trend analyses of quality control results*);
- (ix) Corrective action;
- (x) QC acceptance criteria;
- (xi) Definitions of preparation and analytical batches that may drive QC frequencies; and
- (xii) Minimum frequency for conducting all QC elements.

Anyone seen “Traceability (as it relates to calibration and data) around here?”

- Hmmmm...
- EPA Guidance For Quality Assurance Project Plans *includes it...*

Traceability — The ability to trace the history, application, or location of an entity by means of recorded identifications. In a calibration sense, **traceability** relates measuring equipment to national or international standards, primary standards, basic physical constants or properties, or reference materials. In a data collection sense, it relates calculations and data generated throughout the project back to the requirements for the quality of the project.

- EPA QA Handbook Vol II (Dec. 2008), *includes it...*
Calibration documentation should be maintained with each analyzer and also in a central backup file. Documentation should be readily available for review and should include calibration data, calibration equation(s) (and curve, if prepared), analyzer identification, calibration date, analyzer location, calibration standards used and their **traceability**, identification of calibration equipment used, and the person conducting the calibration.
- So how come 40 CFR Part 136 does NOT???



- If you cannot trace the calibration back to raw data, is the data defensible?
- Sample data must be “traceable”. So this is something HACH’s protocols lack.

- Current 149.44(4)(d)

When analytical instruments leave the direct control of the laboratory for maintenance or for any other reason, the laboratory shall ensure that the functional and **calibration status** of those analytical instruments are checked or demonstrated to be satisfactory before the instruments are returned to service.

- **FINAL 149.44(4)(d)**

(d) When analytical instruments leave the direct control of the laboratory for maintenance or for any other reason, the laboratory *** SHALL *** ensure that the instruments are functional **and that** a new initial calibration has passed to demonstrate that the instruments are in satisfactory working order before returned to service.

SURVEY:

Anyone here like being cited for not annually checking a carboy blank for each test?

- **Current 149.44(5)(a)**

All analytical instruments shall be calibrated at least once in any year in which they have been used, and be calibrated or their calibration verified before they are used to provide any quantitative results.

No more absolute time limit!

- **FINAL 149.444**

NR 149.444 Initial instrument calibration requirements. (1)

INITIAL CALIBRATION **GENERAL PROVISIONS.**

(c) The laboratory * SHALL * perform an initial calibration if any of the following apply:

1. After instruments undergo non-routine maintenance.
2. Conditions change the expected behavior of the instrument.
3. When a CCV standard fails and any of the following occur:
 - a. Corrective action taken does not result in a passing CCV standard.
 - b. A second consecutive (immediate) CCV standard is performed under the same conditions and it also fails **and** the corrective action taken does not result in two consecutive passing CCV standards.

Beefing up the calibration evaluation protocols

Calibration now.....**calibration should be**



Initial instrument calibration requirements.

- (1) GENERAL PROVISIONS
- (2) MINIMUM NUMBER OF STANDARDS
- (3) CONCENTRATION LEVELS OF STANDARDS
- (4) CALIBRATION MODELS.
- (5) EXCLUDING CALIBRATION POINTS.
- (6) EVALUATING ALGORITHM VALIDITY
- (7) VERIFYING ACCURACY.
- (8) EVALUATING SENSITIVITY.

Continuing instrument calibration requirements.

- (1) GENERAL PROVISIONS
- (2) FREQUENCY
- (3) MINIMUM NUMBER OF STANDARDS AND CONCENTRATION LEVELS.
- (4) VERIFYING ACCURACY
- (5) ACCURACY CORRECTIVE ACTION.
- (6) EVALUATING SENSITIVITY.

- **Current 149.44(6)(g,i,j)**

(g) The laboratory shall establish acceptability criteria for initial calibrations. The type of criteria chosen and the acceptance range shall be appropriate for the type of analytes to be quantitated, the calibration model selected and reduction technique or algorithm chosen.

- 1. If use average RF, RSD must be $< 20\%$, unless an approved method of analysis allows a larger percentage.
- 2. If use LSR, r must be ≥ 0.995 .

(i) Labs shall verify all initial calibrations before they are used ...with a 2nd source standard...

(j) Unless otherwise required ...the acceptance criteria for this 2nd source verification shall be that required... for CCVs

FINAL NR 149.444

(6) EVALUATING ALGORITHM VALIDITY. The lab * SHALL * establish acceptability criteria for initial calibrations.

(a) **When the x-intercept is used** to evaluate the calibration, then the value of the **x-intercept** of the calibration function for each analyte **may not exceed its LOD.** (NEW)

(b) Unless otherwise specified by the method, **when RSE is used** to evaluate the calibration, the **RSD may not exceed 15% for inorganics or 20% for organics.** (NEW)

NR 149.444 (6)

(c) Unless otherwise specified by the method, when residuals of each calibration standard are used to evaluate the calibration, ...recovery for all but the lowest calibration point * SHALL * fall within **90% to 110% for inorganics** or within 70% to 130% for organics. Recovery for the lowest calibration point * SHALL * be within **80% to 120% for inorganics** or 50% to 150% for organics.

(d) When average response factors (RF) are used to reduce calibration data, %RSD of the RFs may not exceed 20% unless the method allows a larger percentage.

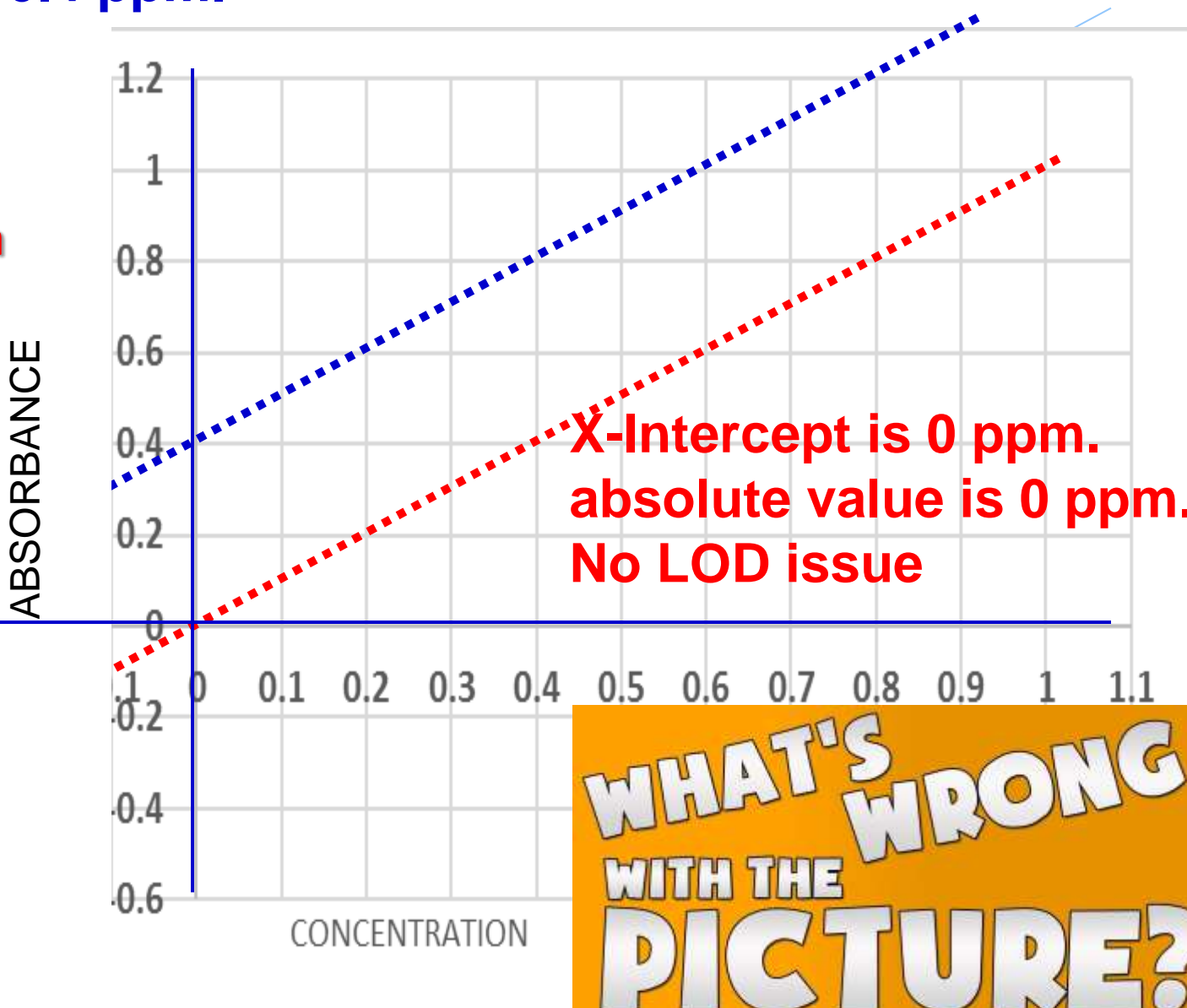
(e) When linear regression ...is used ..., the correlation coefficient (r) of the resultant calibration * SHALL * be at least 0.995 for inorganics or 0.99 for organics.

(f) When quadratic (2^{nd} order) or cubic (3^{rd} order) analysis is used ..., the coefficient of determination (r^2) of the resultant calibration * SHALL * be at least 0.995 for inorganics or 0.99 for organics.

Why the sudden fascination with X-intercept?

**X-Intercept is -0.4 ppm.
Concerned??**

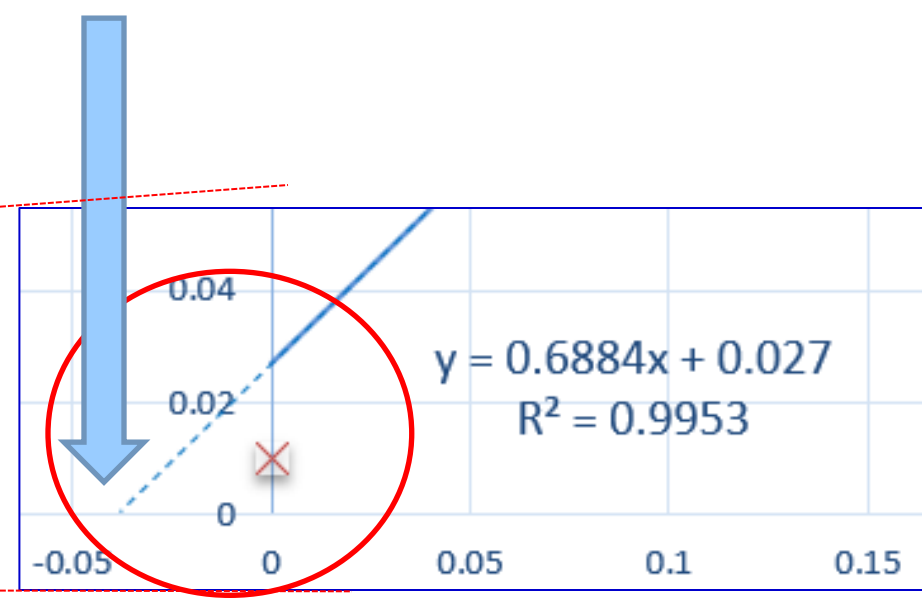
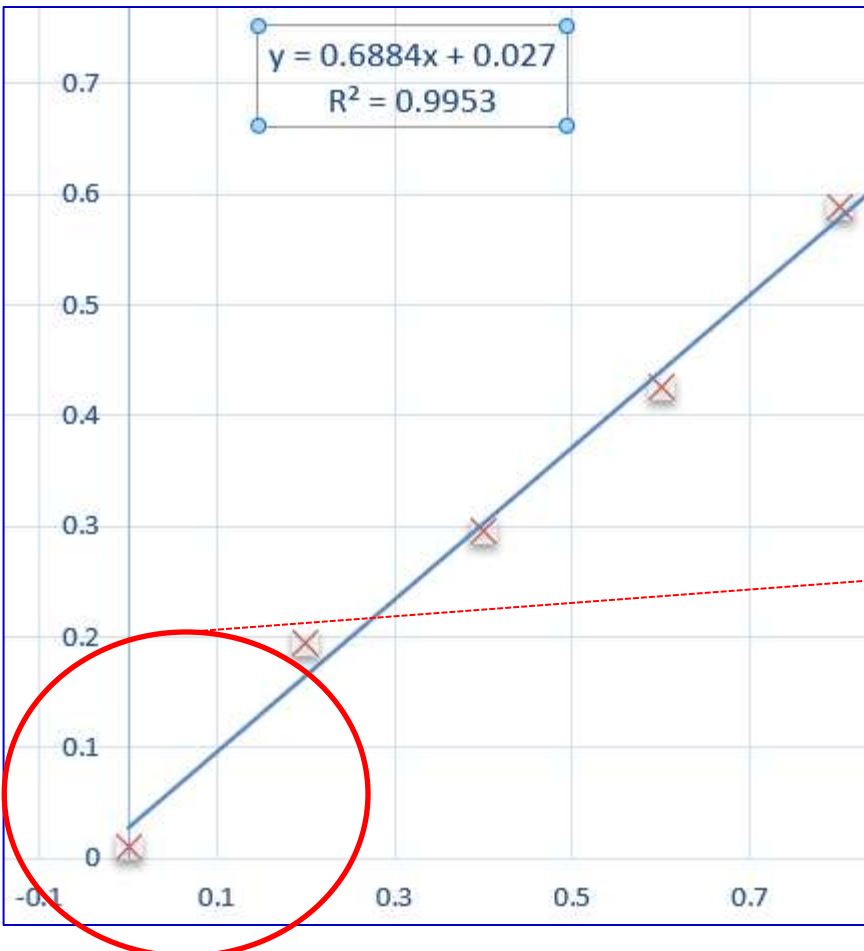
**A POSITIVE Y-
intercept means a
NEGATIVE X-
intercept
And vice versa**



**X-Intercept is 0 ppm.
absolute value is 0 ppm.
No LOD issue**

**WHAT'S
WRONG
WITH THE
PICTURE?**

Determining the X-intercept



- (7) VERIFYING ACCURACY. Except for calibrations generated using DO meters, pH meters, or conductivity meters, the lab shall verify all initial instrument calibrations after the calibrations are generated, but before the calibrations are used to quantitate any samples, with a second source standard, referred to as an ICV standard. ICV standards shall be treated in the same manner as the standards analyzed for the initial calibration.
- Unless otherwise required by method, regulation, or covered program, the acceptance criteria for the ICV standard shall be all the following:
 - (a) Obtaining concentrations within 10% of the theoretical concentrations of all reportable inorganics.
 - (b) Obtaining concentrations within 20% of the theoretical concentrations of all reportable organics.

- Proposed (and FINAL) 149.444(8)

When methods require an ICB be analyzed after the initial calibration, the ICB shall be treated in the same manner as the initial calibration standards. ~~The absolute value of the~~ concentration of an analyte in an ICB may not exceed its LOD.

When you perform an initial calibration, immediately analyze a blank (ICB, or initial calibration blank). It must be below your LOD....shouldn't it?

- **(1) GENERAL PROVISIONS.** When an initial instrument calibration is not performed on the day of analysis, the continuing validity of the initial calibration ***SHALL* be verified prior to analyzing any batch QC or environmental samples by the analysis of one or more CCV standards,** subject to all the following:
 - (a) ...CCV standards ***SHALL*** contain all analytes to be reported and may be prepared from the same standards used to generate the initial calibration.
 - (b) CCV standards ***SHALL*** be treated the same as the standards used in the initial calibration...CCV standards ***SHALL*** be performed with the associated batch so that the CCV standards and samples are all processed together.
 - (c) [No ICAL means no CCAL.]

- (2) FREQUENCY. (a) CCV *SHALL* be performed at least once on each analysis day when an ICAL is not performed and prior to sample analysis and batch QC analysis.
- (b) CCV *SHALL* be performed after the consecutive analysis of each group of 20 environmental samples, ...unless otherwise required by method, regs., or covered program.
- (3) MINIMUM #STANDARDS & CONCENTRATION LEVELS.
 - (a) For **linear ...functions**, the lab *SHALL* analyze at least a single CCV standard. The concentration of the standard shall be within the [ICAL] range....
 - (b) For **cubic or third order** polynomials, the lab *SHALL* analyze at least two CCV standards

- (4) VERIFYING ACCURACY.
- (a) Unless otherwise required by method, regulation, or covered program, the acceptance criteria for CCV standards *SHALL* be within **10% of the theoretical concentrations** of all reportable inorganic analytes from an initial calibration.
- (b) Unless otherwise required by method, regulation, or covered program, the acceptance criteria for CCV standards *SHALL* be within **20% of the theoretical concentrations** of all reportable organic analytes from an initial calibration.

- **Proposed 149.446(1)(d)**

If an LCS also serves as a CCV standard, the acceptance criteria of the CCV standard shall be used.

Wait...a CCV can also be an LCS?

You already have a calibration for Phosphorus.

When you run samples, you MUST run a CCV to verify the calibration remains valid.

You also must run an LCS.

But...what's the difference between an LCS and a CCV in this case?

Trick Question: NOTHING!

A single standard can be used to meet BOTH criteria, but if either criteria are not met, you have a problem.

- NR 149.446 Continuing Calibration Instrument Reqs. (5) ACCURACY CORRECTIVE ACTION. (a) When a CCV standard fails, the laboratory * SHALL * do any of the following:
 - 1. Perform corrective action and reanalyze the CCV standard. If the CCV standard does not pass, an initial calibration * SHALL * be performed.
 - 2. Perform a second consecutive (immediate) CCV standard under the same conditions. **If** the second CCV standard also fails, **THEN**
corrective action * SHALL * be performed **AND**
two consecutive CCV standards * SHALL * pass
OR an initial calibration * SHALL * be performed.

Excuse me? Can you simplify that?

CCV FAILS – OPTION 1

1. Perform corrective action
2. Re-analyze the CCV
3. Decision time

CCV PASSES

1. Good to go!!!

CCV FAILS

1. Must perform a new ICAL

Measurement traceability. The laboratory *** SHALL *** maintain all analytical and technical records containing raw and derived data or original observations necessary to allow historical reconstruction of all laboratory activities that contributed to generating reported results.

Added:

Observations, data, and calculations *** SHALL *** be recorded at the time they are made. At a minimum, the laboratory *** SHALL *** ensure that results of analyses can be linked to sample collection data, preparation records, calibration records, analytical records, test reports, corrective action, and any chemicals used.

NR 149.47 (2) Reporting

- (c) A lab that is operated by a facility whose function is to provide data to monitor the facility's compliance with covered programs ***SHALL*** retain and make available to the department, upon request, records that include the content elements specified in this section. Laboratory reports with all the content elements specified in this section **are not required** to be issued if any of the following apply:
 - 1. The lab is responsible for preparing regulatory reports in a specified format to the department.
 - 2. The lab provides information to another individual within the facility for preparation of regulatory reports in a specified format to the department.

NR 149.47 (2)(d) Reporting content elements 88 of 118

- 1. ~~The name, address, phone # and contact of~~ the lab where the tests were performed.
- 2. The laboratory's accreditation identification number.
~~The name and address of the client or entity whose samples were analyzed.~~
- 3. The sample identifying info provided by client/collector.
- 4. Identification of methods used for preparation & analysis.
- 5. The collection date of the samples.
- ~~The date of receipt of the samples~~
- 6. Collection, preparation, and analysis times for tests with holding times expressed in hours.
- 7. The dates of analysis, extraction, or digestion, when a holding time has been established for the prep. step.
~~The date of analysis~~

NR 149.47 (2)(d) Reporting content elements 89 of 118

- 8. When non-aqueous sample results are reported, the laboratory shall indicate whether the non-aqueous sample results were reported on a dry weight or wet weight basis.
- 9. The LOD and LOQ for tests which the department requires reporting to the LOD.
- 10. ...an indication of whether the LOD and LOQ have been adjusted accordingly.
- 11. The units of measurement.
- 12. The date of the test report.
- ~~Names and signatures of responsible parties authorizing reported results.~~
- 13. Any qualifiers with reported results.
- 14. The identity of the subcontract lab, for each reported result generated by a subcontract lab.

(4) SAMPLE REJECTION OR QUALIFICATION OF RESULTS.

- The lab * SHALL * handle results for samples
- received with **insufficient volume** to complete the requested analyses,
 - samples received **beyond holding time**,
 - samples received **improperly preserved**,
 - samples received in **inappropriate containers**, or
 - samples received showing evidence ...**not collected according to approved procedures**

as follows:

(b) Non-drinking water samples shall be rejected for analysis or appropriately qualified.

(5) SAMPLES REQUIRING REANALYSIS OR QUALIFICATION OF RESULTS.

Samples * SHALL * be re-analyzed, **or** the affected sample results qualified when any of the following occur:

- (a) The concentration of an analyte in the ICB exceeds its LOD.
- (b) A CCV standard exceeds limits.
- (c) The concentration of an analyte in the CCB or method blank exceeds the criteria specified in s. NR 149.48 (5) (d).
- (d) An LCS exceeds limits.

149.48 Limit of Detection (LOD) ⁹² of 118

- Current: 149.48(2)(d)

Limits of detection shall be determined at least **annually** ~~unless a laboratory can verify the continued applicability of a previously determined limit of detection by an established and defensible protocol.~~

- **FINAL: 149.48(2)(b-f)**

(b) A laboratory ***SHALL*** determine the LOD of an analyte annually by 40 CFR, Part 136, Appendix B. All sample processing steps of a method ***SHALL*** be included in the determination of a LOD.

*Note: Links to the 40 CFR Part 136, Appendix B can be found on the Wisconsin department of natural resources laboratory accreditation program website. **CAN they?***

- **FINAL: 149.48(2)(b-f)**

(c) The LOD *SHALL* meet the regulatory limits required by the covered programs.

Note: Exemptions to LOD requirements for specific compounds are provided on the Wisconsin department of natural resources laboratory accreditation program website.

(d) The LOD *SHALL* be adjusted when the sample amounts used are different than those used for the LOD determination.

(e) For tests exempted from performing an LOD under (a) above, the lab *SHALL* establish a reporting limit, or an estimate of a test's sensitivity based on the intended use of the data for a given application. **BOD, TSS, Titrations**

(f) The LOD *SHALL* be determined each time there is a change in a method or instrumentation that affects the sensitivity of an analysis.

Taking it Back: the LOQ



F
(c)

•

(b)
the
No
Wis
we

(c)
th
(c)

10/3

he

r at
ion.

LOQ – New Implications

...the LOQ shall be established as **EITHER** 10/3 the LOD **OR** the concentration of the lowest standard in the initial calibration.
Also must meet regulatory limits!

Let's assume your LOD= 0.04 mg/L

Then @ [10/3 x LOD]LOQ= 0.133 mg/L

If....lowest calibration std= 0.2 mg/L; then LOQ could be 0.2 mg/L

Which should you use? Use the higher of the two and save \$\$\$ on NR 101 fees.



Results between 0.04 and 0.2 mg/L could be effectively \emptyset for NR 101 fees. Save \$

NR 101.12 WPDES information reporting. The department shall calculate effluent quantities for those pollutants whose discharge is regulated by the WPDES permit:

(2) For the purposes of this section, an analytic result reported as < LOQ shall be applied as a zero result.

WPDES (DMRs):

- **Pollutant concentrations < LOD shall be reported as < LOD.** For example, if a substance is not detected at LOD of 0.1 mg/L, report the concentration as < 0.1 mg/L.
- Pollutant concentrations \geq LOD, but <LOQ, shall be reported **and the LOQ shall be specified.**
- For calculating NR 101 fees, the 2 mg/l RL for BOD5 and TSS shall be considered to be LOQs
- For reporting a calculated result, average or a mass discharge value, may substitute a 0 (zero) for any concentration that is <LOD.

LOQ VS. LOD

97
of 118

LOD

- **Proposed: 149.48(4) (FINAL)**

Reporting limits are reserved for those analytes for which LODs are ~~not appropriate.~~ **exempted under s. 149.48 (2) (a) and shall be based on a test's sensitivity and the intended use of the data.**

EXEMPT: (BOD, cBOD, Titrations, gravimetric tests other than HEM, Tests for which analyzing a [spike] is impossible or impractical.)

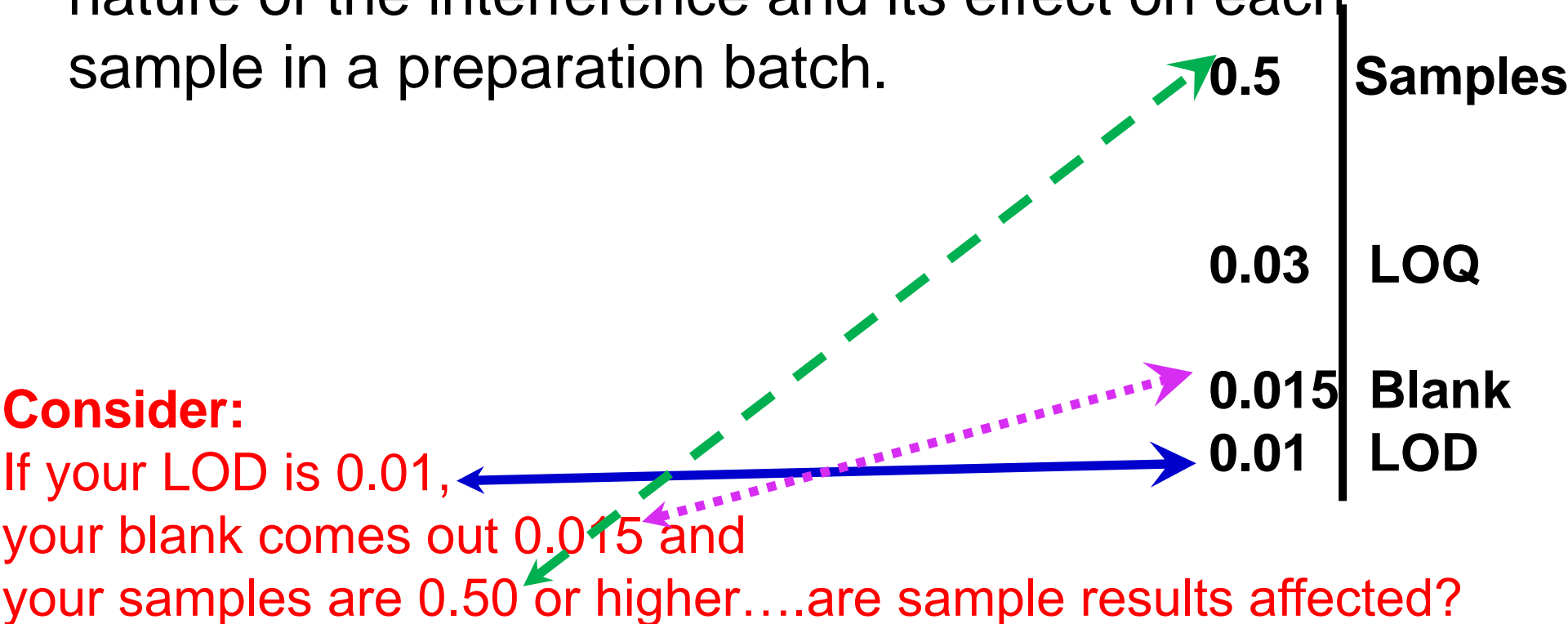
- **Final as proposed: 149.48(4)**

For **biochemical oxygen demand** and carbonaceous biochemical oxygen demand, the minimum reporting limit is **2 mg/L** which is based on a 300 mL sample volume. When no dilution is equal to 300 mL, the reporting limit shall be adjusted based on the lowest dilution reported.

For **total suspended solids**, the reporting limit shall be determined using the following formula: Reporting Limit (mg/L) = **1000 / (sample volume filtered in mL)**.

- **FINAL: 14**

Whenever the concentration of the method blank contains analytes of interest greater than the LOD, the lab shall evaluate the nature of the interference and its effect on each sample in a preparation batch.



Acceptance Criteria

- **Proposed: 149.48(6)(g,h) (added)**

For **biochemical oxygen demand** and carbonaceous biochemical oxygen demand, the LCS is prepared based on a mixture of 150 mg/L each, of glucose and glutamic acid. The acceptance criteria for the LCS shall be 198 plus or minus 30.5 mg/L or **167.5 to 228.5** mg/L.

When the method, regulation, or covered program do not specify acceptance limits, the laboratory shall evaluate LCS recoveries and generate control limits, following exclusion of outliers using a recognized statistical technique, using the **mean plus or minus 3 times the sample standard deviation**.

**No surprises, nothing you didn't already know;
just spelling it all out**

- **FINAL: 149.48(6)(f,g)**

(f) When the method, regulation, or covered program do not specify control limits, the lab * SHALL * evaluate LCS recoveries and generate in-house control limits, following exclusion of outliers with a ~~recognized~~ statistical technique and using the mean ± 3 times the sample standard deviation.

Annually, the lab * SHALL * review its generated in-house control limits and update those limits whenever the performance characteristics change.

(g) **In lieu of using generated in-house control limits for the LCS, the lab may opt to use the CCV standard limits.**

Advice: Use the CCV limits.

REMOVE:

- 149.48(5) Quality Control Standards
- 149.48(6) Matrix Spikes and Matrix Spike Duplicates
- 149.48(7) Sample Replicates
- 149.48(8) Surrogate Spikes (Organics only)

- **Quality control requirements for chemical testing.**

- **(1) GENERAL REQUIREMENTS.**

- (2) LOD.

- (3) LOQ.

- (4) REPORTING LIMITS.

- (5) **METHOD BLANK.**

- (6) **LCS.**

- (7) SELECTIVITY. (*organics only*)

- **No more:**

- Known standards
- QC Standards (QCS)
- Matrix spikes
- Matrix Spike Duplicates
- Replicates
- Surrogates



- Riding a jeep ride at the Walworth Co Fair

* NEW *

Minimum requirements for each technology

The purpose of this section is to establish minimum requirements that can significantly affect data quality but are not always clearly or consistently addressed in all approved methods.

- 1) OXYGEN DEMAND ASSAYS (BOD OR cBOD). (a) The environmental conditions for the analysis of BOD and cBOD * SHALL * be 17 to 23 °C.
- (b) When DO meters are calibrated using a water-saturated air or air-saturated water standard, the lab * SHALL * verify concentrations in mg/L of those standards by comparing those concentrations to the DO theoretical saturation point. The measured concentration * SHALL * be at or near the theoretical saturation point.
- "(c) The laboratory * SHALL * use the theoretical saturation point, based on temperature and barometric pressure, on each day of analysis to assess supersaturation.
- Note: When barometric pressure and temperature measurement features are available on the DO meter, they should be taken from the DO meter. "
- (d) The lab * SHALL * properly treat supersaturated samples before an initial DO measurement is performed.

BOD NR 149.50 (1)

- (e) When the lab uses pipets to deliver sample volumes, the tips *** SHALL *** be manufactured to be wide-bore.
- (f) When the lab analyzes multiple method blanks and GGA standards in an analytical batch, **each method blank and GGA standard analyzed** *** SHALL *** **be assessed individually** and associated to the entire analytical batch unless individual method blanks and individual GGA standards are clearly documented to be traceable to specific groups of 20 samples.
- (g) The lab *** SHALL *** seed disinfected samples and nitrogenous demand inhibited samples.
- (h) The lab may not add nitrogenous demand inhibitor to the GGA standard, to seed material, or method blanks.
- (i) The lab *** SHALL *** use sample volumes for dilutions that are sufficient to expect 2 mg/L depletion in at least one dilution.

- (j) When equipment with multiple DO probes is employed, the lab * SHALL * calibrate each probe. Sample records * SHALL * be traceable to the probe used.
- (k) The lab * SHALL * calibrate DO probes on each day of use.
- (l) The lab * SHALL * use local barometric pressure which has not been adjusted to sea level.
- (m) When determining residual chlorine, a minimum detection capability of 0.1 mg/L * SHALL * be met.

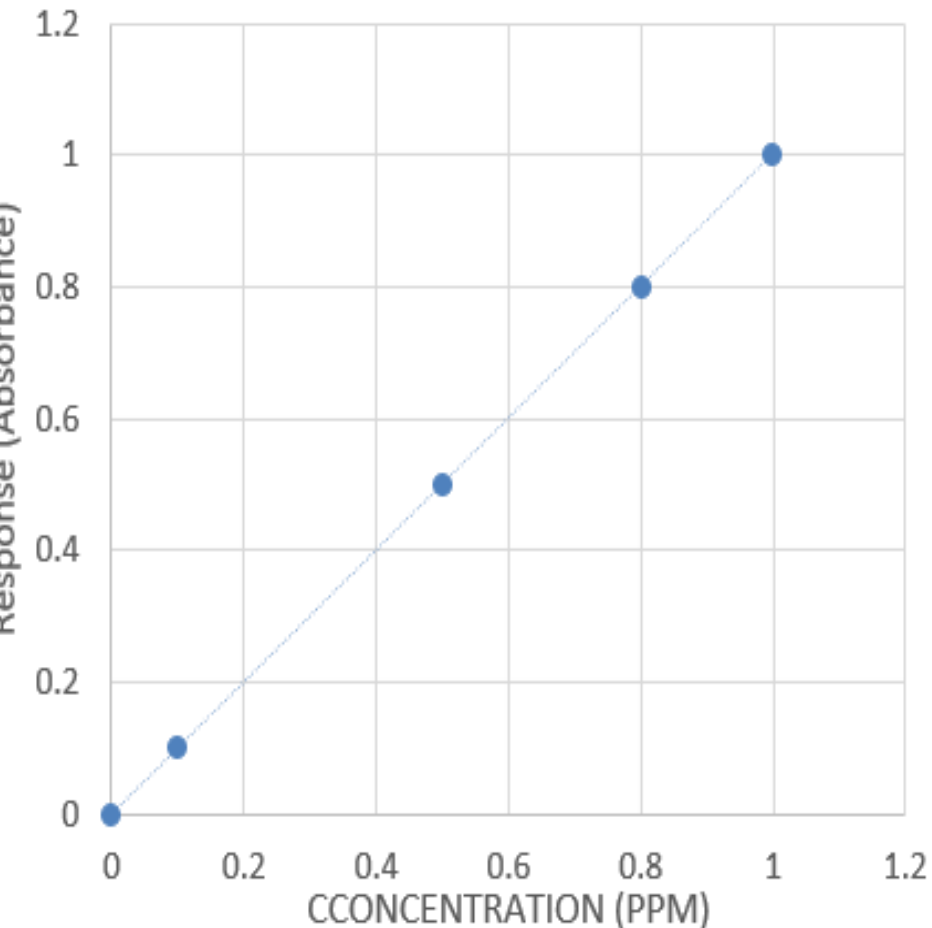
Colorimetry NR 149.50 (2)

- (a) Except for **inverse chemistries**, the lab *** SHALL *** use calibration blanks in the initial calibration of colorimetric or turbidimetric analyses, and those calibration blanks *** SHALL *** be assigned the measured response.

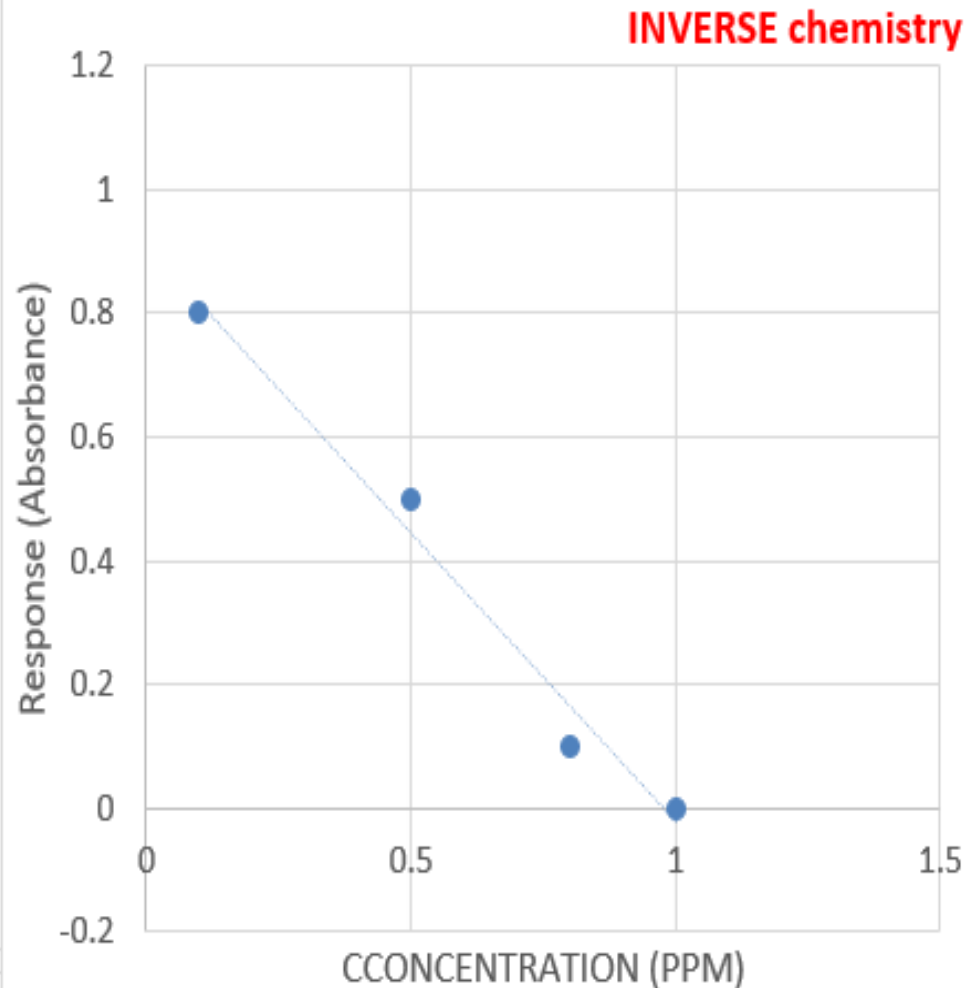
Note: High range chemical oxygen demand and hexavalent chromium are two tests where inverse chemistries are utilized."

- (b) When closed vials are digested using block digesters for total phosphorus, the lab *** SHALL *** perform the digestion at 150 ± 2 °C for a minimum of 30 minutes.
- (c) When the lab uses sulfide strips, the sulfide strips *** SHALL *** have a minimum detection capability of 10 mg/L.
- (d) The lab **may not** dilute samples after the color reagent has been added to the samples.
- (e) The lab *** SHALL *** process hexavalent chromium standards the same as samples.

Calibration Plot



Calibration Plot



- When the laboratory performs electrometric assays, the laboratory *** SHALL *** perform an initial calibration each day of analysis.
- ~~Use an Initial Calibration Verification to verify each Initial Calibration, except for pH~~
- ~~Except for chlorine, pH, and conductivity, the slope acceptance criterion, between every two standards, shall be 54 to 60 mV.~~
- ~~Slope criteria for high performance probes is 54-65 mV~~
- ~~Slope acceptance criterion, between every two standards for chlorine testing shall be 27-30 mV.~~
- ~~Conductivity determine cell constant annually~~

- (a) The laboratory may not use Buchner funnels or Gooch crucibles for determination of TSS or TDS.
- (b) When the lab uses pipets to deliver sample volumes for total solids and TSS, the pipet tips * SHALL * be manufactured to be wide-bore.

Titration 149.50(6)

- When standardization is required by method, the lab *** SHALL *** standardize all titrants monthly, unless all the following are met:
 - 1. Unused titrant is never poured back into the original container.
 - 2. Titrants *** SHALL *** always be protected from light.
 - 3. LCS recovery control limits *** SHALL *** be set at 90 to 110%, or tighter, and the recovery is achieved.

- Improves fee equity by removing cap on RVUs for calculating fees
- No more carboy police



- Balances – 1 weight in expected range
- Instrument calibration – verify prior to use, do not need to recalibrate yearly
- Do not use a method blank to zero your instrument

- A **new** section on laboratory ethics
- No pre-programmed instrument calibrations
- Many “tools” available for calibration evaluation
- Beware of the need to do “root cause analysis”
- A **new** section specifying specific requirements by technology.

- Don't have to change your LOD every year, if annual check is 0.5 – 2X current LOD
- LOQ is $10/3$ of the LOD **OR** LOQ = Calibration low standard – AND must meet regulatory limits
- A batch is defined as 20 samples. New method blank every 20 samples.
- Matrix spikes not required (unless incorporated into the method) . New emphasis on Laboratory Control Samples

- December 2018 - DNR Board authorization to adopt the revised rule

• **Who the heck knows???**

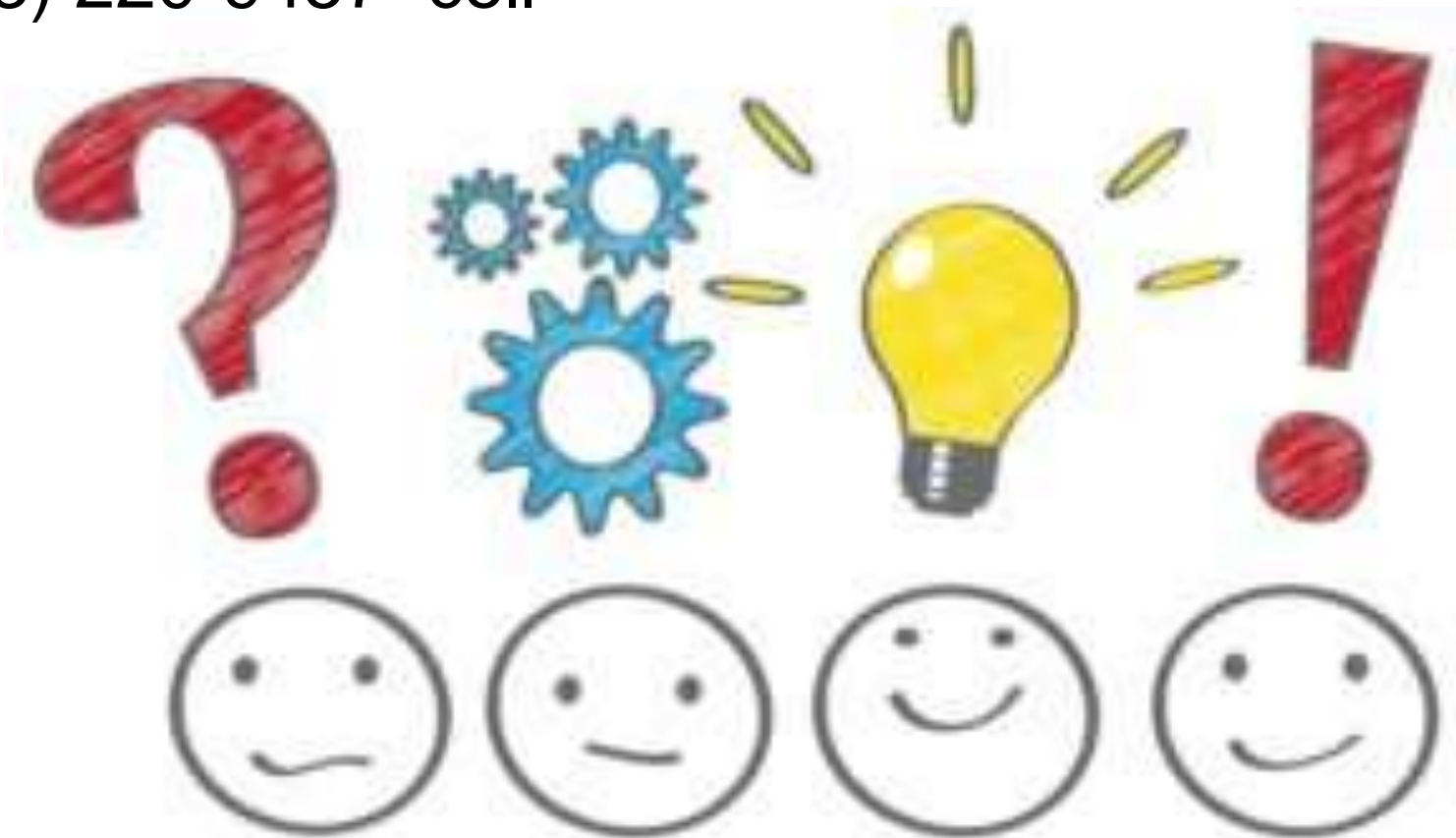
•

- Does it fix what was broken?
- Is it better organized to a more logical sequence?
- Does it remove what wasn't necessary?
- Does it add what wasn't there (but should be)?
- Does it establish fee equity?
- Does it clearly specify requirements?
- Does it simplify Quality Control samples?
- Does it bulk up calibration section (**quality data begins with calibration**)?
- Does the new section that outlines minimal requirements for a given technology help?

Rick Mealy, WWOA Board Retired DNR

RickMealy1@gmail.com

(608) 220-9457 cell



The fuel for a day's training...

120
Of 41



But it IS
“diet”!!!

Odd Thomas gets wedding day jitters

121
Of 41

Sprint 11:16 AM 98%



Odd Thomas >

9/28/2018

Today 10:53 AM

Im sooooo ner-
vous!!!!

Why the HELL
are YOU ner-
vous?

Because you are
doing it!!!!

Well we are NOT
going to "do it"
right there!
Good grief!

No one better
take my picture
when i cry