

# How to Review and Interpret a Laboratory Report

Pretreatment Industrial Exchange Conference  
May 13, 2022

John Weisman  
Suburban Testing Labs



# Agenda

- Components of Laboratory Reports
- Reporting Limits and Quantitation Ranges
- Qualifiers
- Data Packages



# Components of Laboratory Reports

1. Client
2. Project
3. Samples
4. Analysis
5. Results
6. Signature
7. COC
8. Qualifiers



# Components of Reports (Client, Project, Sample)

- Client
- Project
  - Used to identify and group samples
  - Historical data (Trends)
  - Scheduling (samples / analysis)
- Sample
  - Identify the specific location / date / time / collector / sample type

**SUBURBAN TESTING LABS**

Results Report  
Order ID: 2D12345

**Client Info.**  
John Weisman  
1037 F MacArthur Road  
Reading, PA 19605  
Attn: John Weisman

**Project Info.**  
Project: Biweekly NPDES  
Regulatory ID: PA0123456

**Sample Info.**  
Sample Number: 2D00651-01  
Site: Effluent  
Collector: Client  
Collect Date: 04/21/2022 9:00 am  
Sample ID:  
Sample Type: 8 HC

Department / Test / Parameter	Result	Units	Method	R.L.	DF	Prep Date	By	Analysis Date	By
<b>Inorganics</b>									
Ammonia as N	< 0.10	mg/L	ASTM D6919-09	0.10	1	04/23/22	ZJH	04/23/22 9:01	ZJH
Carbonaceous BOD (5 Day CBOD)	< 2.0	mg/L	SM 5210-B	2.0	1	04/22/22	LEZ	04/22/22 13:09	LMW
Total Phosphorus as P	0.12	mg/L	SM 4500-P-B/F	0.10	1	04/25/22	ZJH	04/25/22 19:02	ZJH
Total Suspended Solids (TSS)	< 4.0	mg/L	SM 2540-D	4.0	1	04/26/22	TLB	04/26/22 20:39	LMW

Sample Number: 2D00651-02  
Site: Effluent - Grab  
Collector: Client  
Collect Date: 04/21/2022 9:00 am  
Sample ID:  
Sample Type: Grab

Department / Test / Parameter	Result	Units	Method	R.L.	DF	Prep Date	By	Analysis Date	By
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# Components of Reports (Analysis and Results)

- Analysis or Test
- Method
- Analysis Date / Time
- Analyst
- Result
- Units of Measure

**SUBURBAN TESTING LABS**

**Results Report**  
Order ID: 2D12345

Client Info: John Weisman  
1037 F MacArthur Road  
Reading, PA 19605  
Attn: John Weisman

Project Info: Project: Biweekly NPDES  
Regulatory ID: PA0123456

Sample Info: Sample Number: 2D00651-01  
Collector: Client  
Site: Effluent  
Collect Date: 04/21/2022 9:00 am  
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Department / Test / Parameter	Result	Units	Method	R.L.	DF	Prep Date	By	Analysis Date	By
<b>Inorganics</b>									
Ammonia as N	< 0.10	mg/L	ASTM D6919-09	0.10	1	04/23/22	ZJH	04/23/22 9:01	ZJH
Carbonaceous BOD (5 Day CBOD)	< 2.0	mg/L	SM 5210-B	2.0	1	04/22/22	LEZ	04/22/22 13:09	LMW
Total Phosphorus as P	0.12	mg/L	SM 4500-P-B/F	0.10	1	04/25/22	ZJH	04/25/22 19:02	ZJH
Total Suspended Solids (TSS)	< 4.0	mg/L	SM 2540-D	4.0	1	04/26/22	TLB	04/26/22 20:39	LMW

Sample Number: 2D00651-02  
Collector: Client  
Site: Effluent - Grab  
Collect Date: 04/21/2022 9:00 am  
Sample ID:  
Sample Type: Grab

Department / Test / Parameter	Result	Units	Method	R.L.	DF	Prep Date	By	Analysis Date	By
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# Components of Reports

- Qualifiers
- Signature
- COC

**SUBURBAN TESTING LABS**

The test *pH Lab* is performed in the Laboratory as soon as possible. These results are not appropriate for compliance with NPDES, SDWA, or other regulatory programs that require analysis within 15 minutes of sample collection and should be considered for informational purposes only.

\**pH Final* for ASTM leachate is performed by method SM 4500-H.8.

All results meet the requirements of STL's TNI (NELAC) Accredited Quality System unless otherwise noted. If your results contain any data quality comments, you should evaluate usability relative to your needs.

If collectors initials include "STL", samples have been collected in accordance with STL SOP SLO015.

All results reported on an As Received (Wet Weight) basis unless otherwise noted.

This laboratory report may not be reproduced, except in full, without the written approval of STL.

Results are considered Preliminary unless report is signed by authorized representative of STL.

Reviewed and Released By:  
Lauren Uffe  
Project Manager I

*Lauren Uffe*

**Data Qualifiers:**  
H Hold time was exceeded for this analysis.

**Sample Receipt Conditions:**  
Sample(s) received outside of the holding time for one or more analyses. Affected analyses are reported with the (H) qualifier.

Units PIA = Present/Absent  
Units PIF = Pass/Fail

**Qualifier Translation**

Report Generated On: 04/29/2022 2:54 pm 2D00651  
STL\_Results Revision #2.0 Effective: 04/20/2022

**SUBURBAN TESTING LABS**  
1037F MacArthur Road, Reading, PA 19605 Phone: 610-375-TEST Fax: 610-375-4090 suburbantestinglabs.com

PA DEP # 06-00208  
NJDEP# PA031

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**SUBURBAN TESTING LABS**

**Chain of Custody Record**  
1037F MacArthur Road, Reading, PA 19605  
Phone: 610-375-8378 Fax: 610-375-4090 suburbantestinglabs.com

ORDER ID: 2D00651

TAT (Circle One) Standard - 24hr - 48hr - 72hr - Other  
(Additional charges may apply for each TAT. If not specified, standard TAT will apply.)

Client Name / Address: [Redacted] Phone: [Redacted] Project Name / Address: [Redacted]  
Fax: [Redacted]  
Client Project Manager: [Redacted] Payment / P.O. Info: [Redacted] Regulatory ID (SDWA/Permit #): [Redacted]

Project Description: [Redacted]  
Order Comments: Added via by LAR 03/10/2022 10:14

Sample Number	Sample Description - Site ID	Sampling Location	Collect Date/Time	Sampler's Initials	Matrix	Sample Type	Composite Start Date / Time
2D00651-01	Effluent	4711C	4/29/22	LU	Non-potable	8 HC	
Container Type / Preservation		Preservation Check		Analysis - Method		Field Results	
600mL P & H2SO4	pH 4.2 4-21-22 CTB	A		Inorganics			
1L P BOD		B		Ammonia as N - ASTM D919-09			
600mL P		C		CIBOD - SM 5210-B			
				TSM Phosphorus as P - SM 4500-P-BF			
				TSS - SM 2540-D			
2D00651-02	Effluent - Grab	4711C	4/29/22	LU	Non-potable	Grab	
Container Type / Preservation		Preservation Check		Analysis - Method		Field Results	
120mL Sterile PP & Na2S2O3	*	A		Microbiology			
				Fecal Coliform - SM 9222-D			

\* = Sample received in lab out of hold time 4-21-22 CTB.



# Example Report



**SUBURBAN**  
TESTING LABS

## Results Report

Order ID: 2D12345

Client Info.

Project Info.

John Weisman  
1037 F MacArthur Road  
Reading, PA 19605

Project: Biweekly NPDES

Analysis/Results  
Info.

Sample Info.

Attn: John Weisman

Regulatory ID: PA0123456

Sample Number: 2D00651-01  
Collector: Client

Site: Effluent  
Collect Date: 04/21/2022 9:00 am

Sample ID:  
Sample Type: 8 HC

Department / Test / Parameter	Result	Units	Method	R.L.	DF	Prep Date	By	Analysis Date	By
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### Inorganics

Ammonia as N	< 0.10	mg/L	ASTM D6919-09	0.10	1	04/23/22	ZJH	04/23/22 9:01	ZJH
Carbonaceous BOD (5 Day CBOD)	< 2.0	mg/L	SM 5210-B	2.0	1	04/22/22	LEZ	04/22/22 13:09	LMW
Total Phosphorus as P	0.12	mg/L	SM 4500-P-B/F	0.10	1	04/25/22	ZJH	04/25/22 19:02	ZJH
Total Suspended Solids (TSS)	< 4.0	mg/L	SM 2540-D	4.0	1	04/26/22	TLB	04/26/22 20:39	LMW

Sample Number: 2D00651-02  
Collector: Client

Site: Effluent - Grab  
Collect Date: 04/21/2022 9:00 am

Sample ID:  
Sample Type: Grab

Department / Test / Parameter	Result	Units	Method	R.L.	DF	Prep Date	By	Analysis Date	By
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# Example Report

Sample Number: 2D00651-02      Site: Effluent - Grab      Sample ID:  
 Collector: Client      Collect Date: 04/21/2022 9:00 am      Sample Type: Grab

Department / Test / Parameter	Result	Units	Method	R.L.	DF	Prep Date	By	Analysis Date	By	
<b>Microbiology</b>										
Fecal Coliform	< 1	H	cfu/100ml	SM 9222-D	1	1	04/21/22	RMB	04/21/22 19:34	RMB

Sample Number: 2D00651-03      Site: Influent      Sample ID:  
 Collector: Client      Collect Date: 04/21/2022 9:00 am      Sample Type: 8 HC

Department / Test / Parameter	Result	Units	Method	R.L.	DF	Prep Date	By	Analysis Date	By
<b>Inorganics</b>									
Biochemical Oxygen Demand (5 day BOD)	129	mg/L	SM 5210-B	2.0	1	04/22/22	BEI	04/22/22 16:50	TLB
Total Suspended Solids (TSS)	214	mg/L	SM 2540-D	4.0	1	04/26/22	TLB	04/26/22 20:39	LMW

**Data Qualifiers:**  
 H      Hold time was exceeded for this analysis.

**Sample Receipt Conditions:**  
 - Sample(s) received outside of the holding time for one or more analyses. Affected analyses are reported with the (H) qualifier.

Units P/A = Present/Absent  
 Units P/F = Pass/Fail

Qualifier Translation



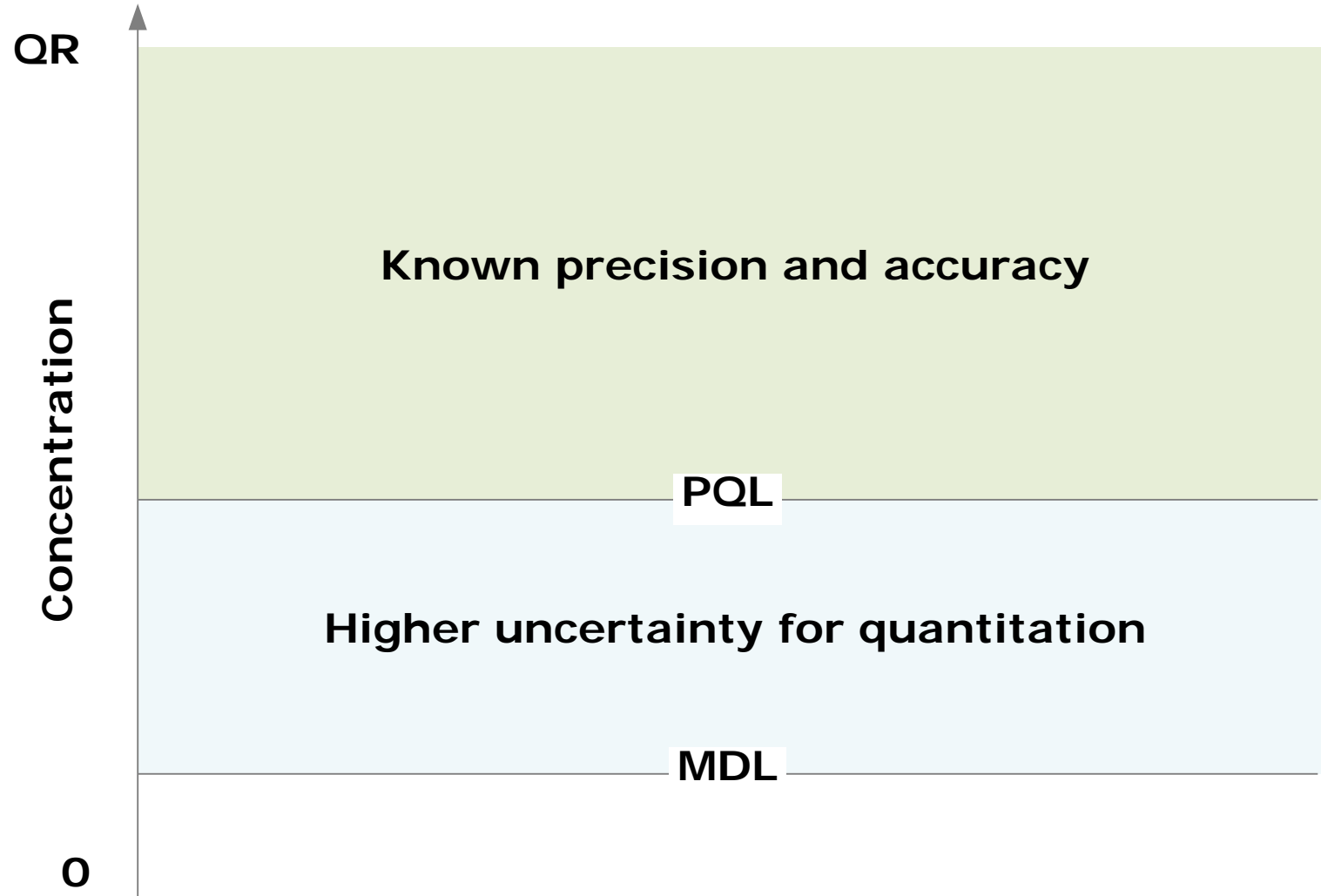


# Reporting Limits and Quantitation Ranges

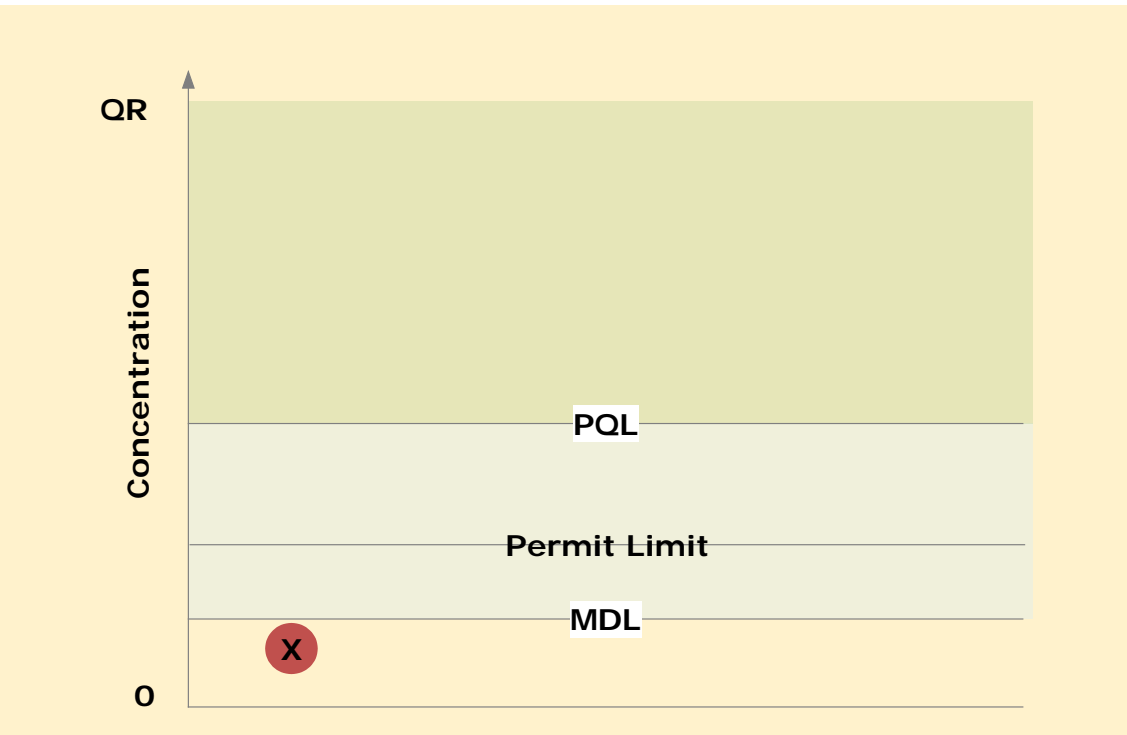
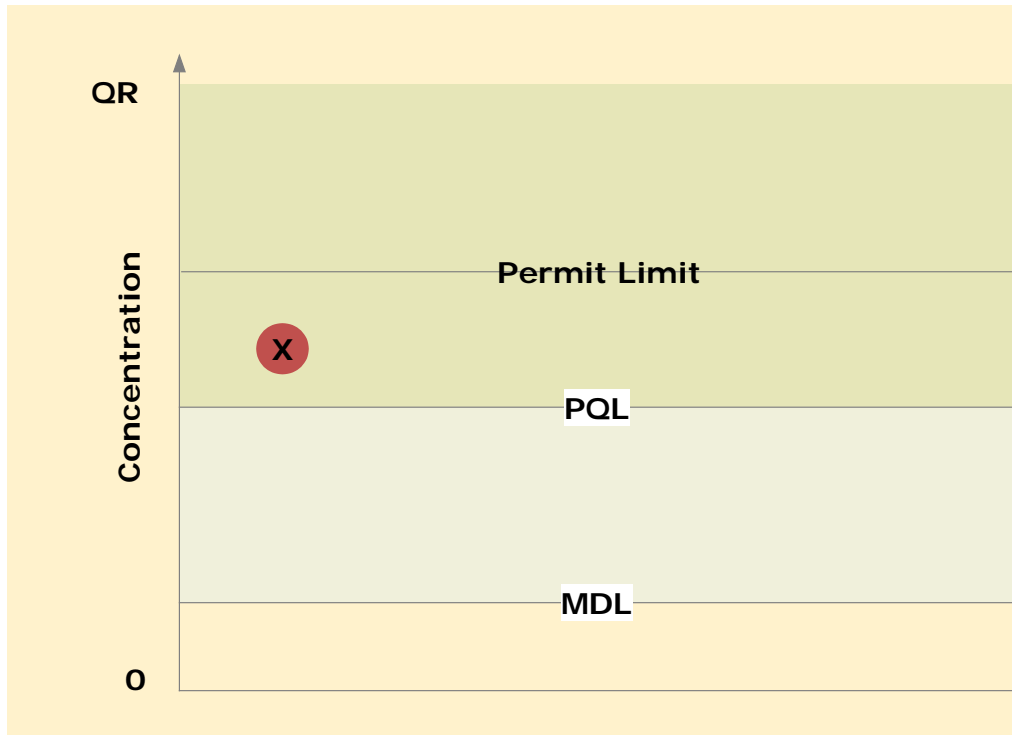
- Uncertainty is acceptable
- Chemists don't want to be wrong
- PQL or RL vs. MDL



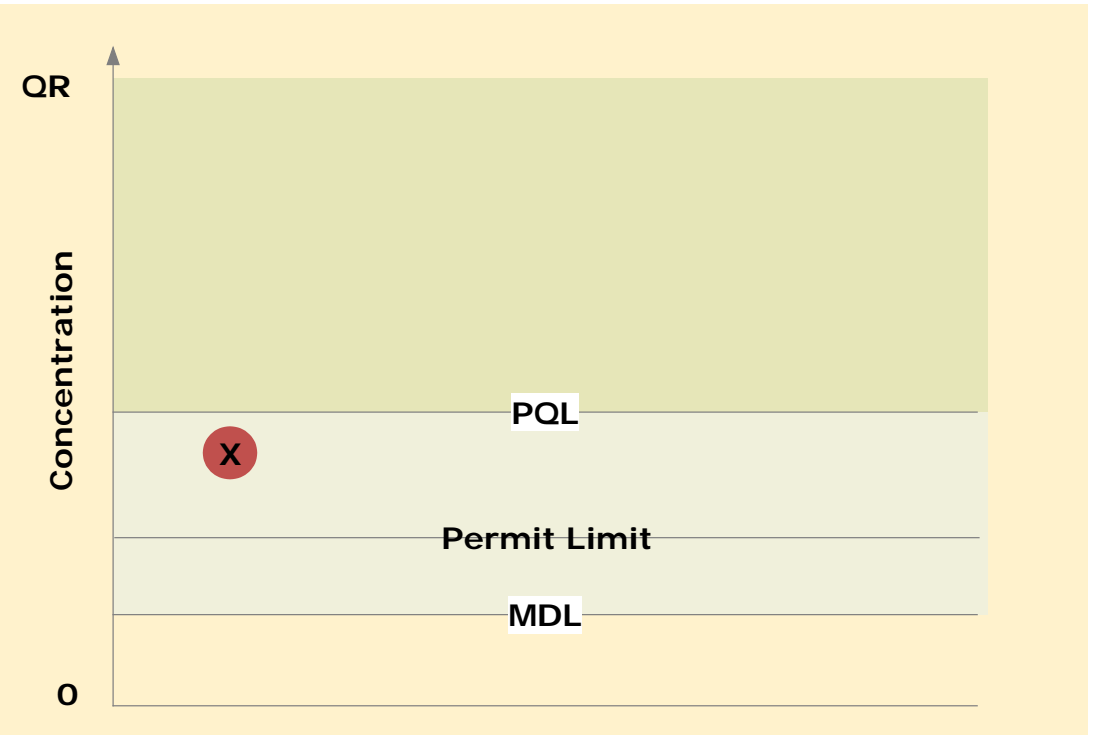
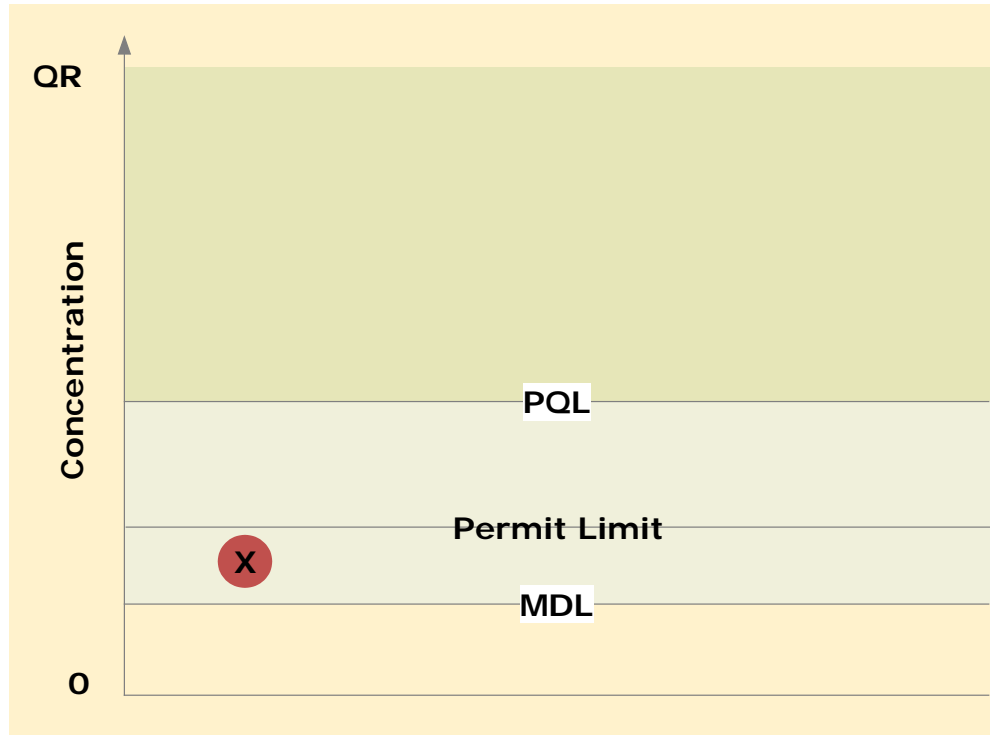
# MDL vs. PQL



# Compliance Examples



# Compliance Examples



# Reporting Limits

- Why not go as low as possible all the time?
  - Analyte is commonly detected in samples
  - Data qualifiers
- Where do limits come from
  - Statistical determination
  - Methods
  - Instrument manufacturers



> Or <

Less than, greater than, what do you mean?!

Permit limit of 9 mg/L

- Lab A < 10 mg/L
- Suburban Testing Labs 7 mg/L

Which one is acceptable?



# Data Qualifiers

- Science
- Accreditation
- Compliance



# Data Qualifiers – Common Examples

- Method Blank
- Matrix Spike
- Temperature
- Hold time
- Preservation





# Data Qualifiers – Known poor performers

- Some analytes are very difficult to recover from samples
- Semivolatiles – some don't extract well, degraded in instrument
- Volatiles – some don't purge well, degrade very quickly, evaporate
- NJ DKQP program has a list of poor performers, others found in methods



# Data Packages

- Results summary
- Level 2 – Batch QC summary
- Level 3 – adds, iCal summaries, raw data for samples
- Level 4 – adds raw data for iCal and QC



# Quiz

1. How many main components are there to a lab report?
2. Which has higher precision – RL or MDL?
3. What is a common data qualifier found on reports?
4. What is the site and collection time noted on the example report?
5. Which data is qualified on the example report?



# Questions?

John Weisman

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