FROM RESULTS TO REPORT
– IH CHEMISTRY –

February 22, 2021

Presenter: Andy Teague, CIH
Analytics Corporation

1

GENERAL INFO

Particularly check received date

ANALYTICS

Analytics Corporation
10329 Stony Run Lane
Ashland, Va 23005
Phone: (804) 355-3000 Fax: (804) 355-3002
AIHA-LAP, LLC Accreditation ID 100531

Preliminary Report

Work Order Z020024

Industrial Hygiene Company
123 Main Street
Anywhere, KY 12345

Customer: 12345678
Attention: John Hygienist
PO Number 123 PO

Date Received: 01/20/21
Client Project ID IH PROJECT

Lab ID	Sample ID		Media	Sample Date	Sampling Time
Z020024001	1	JOE SMITH	Charcoal Tube 50/100mg	1/19/2021	

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Total Hydrocarbons as Hexane	NIOSH Method 1550	01/21/21	96	L	20 ug	434 ug	ND	434 ug	4.52 mg/M3	1.28 ppm

Lab ID	Sample ID		Media	Sample Date	Sampling Time
Z020024002	2	JOE SMITH	5um Preweighed PVC Filter	1/19/2021	

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Respirable Dust	NIOSH 0600	01/21/21	796.8	L	.05 mg			0.834 mg	1.05 mg/M3	

Lab ID	Sample ID		Media	Sample Date	Sampling Time
Z020024003	3	JOE SMITH	Anasorb 747, 226-82 (2)	1/19/2021	

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Methanol	OSHA Method 91	01/21/21	5.1	L	40 ug	340 ug	51 ug	391 ug	77 mg/M3	59 ppm

Lab ID	Sample ID		Media	Sample Date	Sampling Time
Z020024004	4	JOE SMITH	Silica Gel (2,4-Dinitrophenylhy	1/19/2021	

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Formaldehyde	NIOSH 2016	01/21/21	254.40	L	0.10 ug	< 0.1 ug	8.52 ug	8.52 ug	0.034 mg/M3	0.0273 ppm

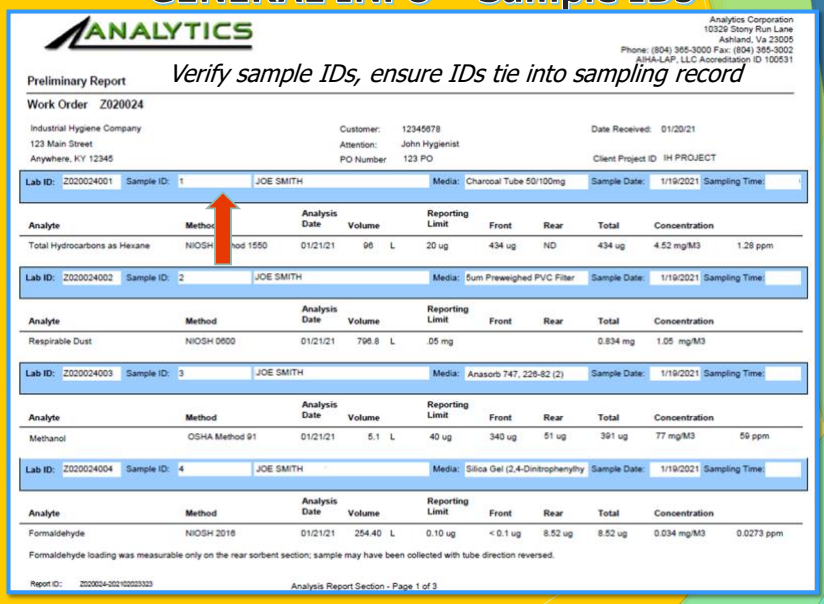
Formaldehyde loading was measurable only on the rear sorbent section; sample may have been collected with tube direction reversed.

Report ID: Z020024-202102023323

Analysis Report Section - Page 1 of 3

GENERAL INFO – Sample IDs

Verify sample IDs, ensure IDs tie into sampling record



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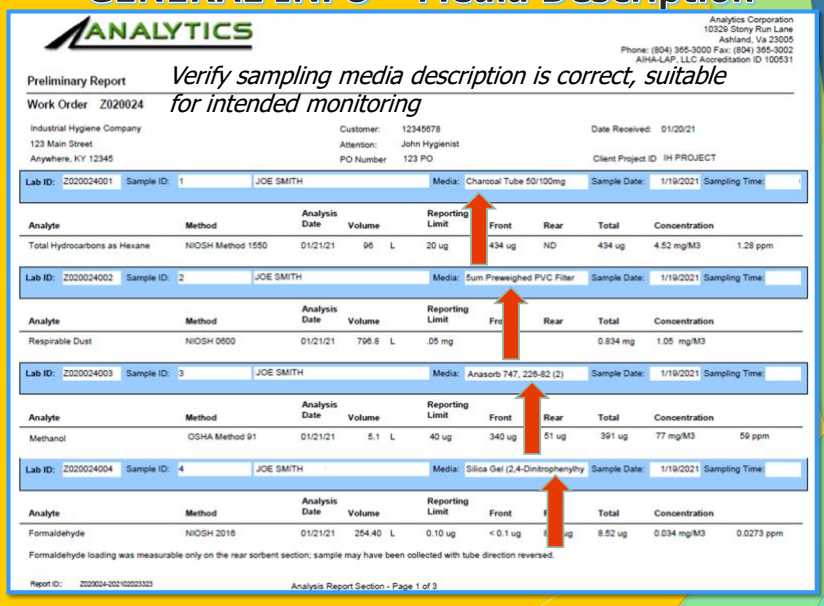
Analysis Report Section - Page 1 of 3

GENERAL INFO – Media Description

Verify sampling media description is correct, suitable for intended monitoring



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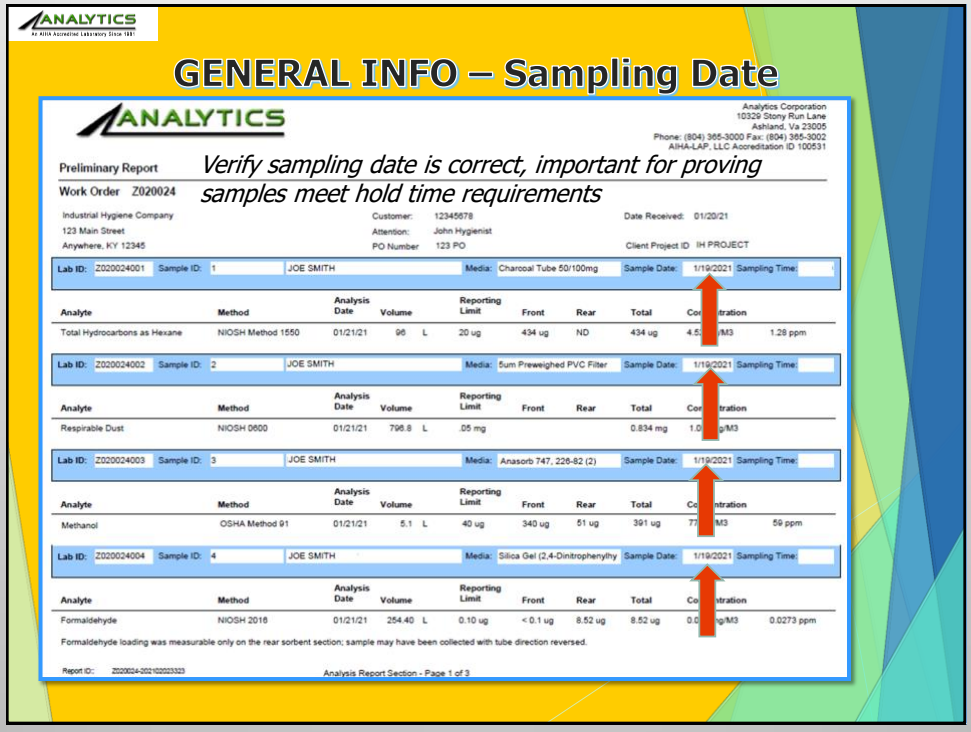
Analysis Report Section - Page 1 of 3

GENERAL INFO – Sampling Date



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Verify sampling date is correct, important for proving samples meet hold time requirements

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Lab ID: Z020024002 Sample ID: 2 JOE SMITH Media: 5um Preweighed PVC Filter Sample Date: 1/19/2021 Sampling Time:

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Respirable Dust	NIOSH 0600	01/21/21	796.8	L	.05 mg			0.834 mg	1.05 mg/M3	

Lab ID: Z020024003 Sample ID: 3 JOE SMITH Media: Anasorb 747, 226-82 (2) Sample Date: 1/19/2021 Sampling Time:

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Methanol	OSHA Method 91	01/21/21	5.1	L	40 ug	340 ug	51 ug	391 ug	77 mg/M3	59 ppm

Lab ID: Z020024004 Sample ID: 4 JOE SMITH Media: Silica Gel (2,4-Dinitrophenylhy Sample Date: 1/19/2021 Sampling Time:

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Formaldehyde	NIOSH 2016	01/21/21	254.40	L	0.10 ug	< 0.1 ug	8.52 ug	8.52 ug	0.034 mg/M3	0.0273 ppm

Formaldehyde loading was measurable only on the rear sorbent section; sample may have been collected with tube direction reversed.

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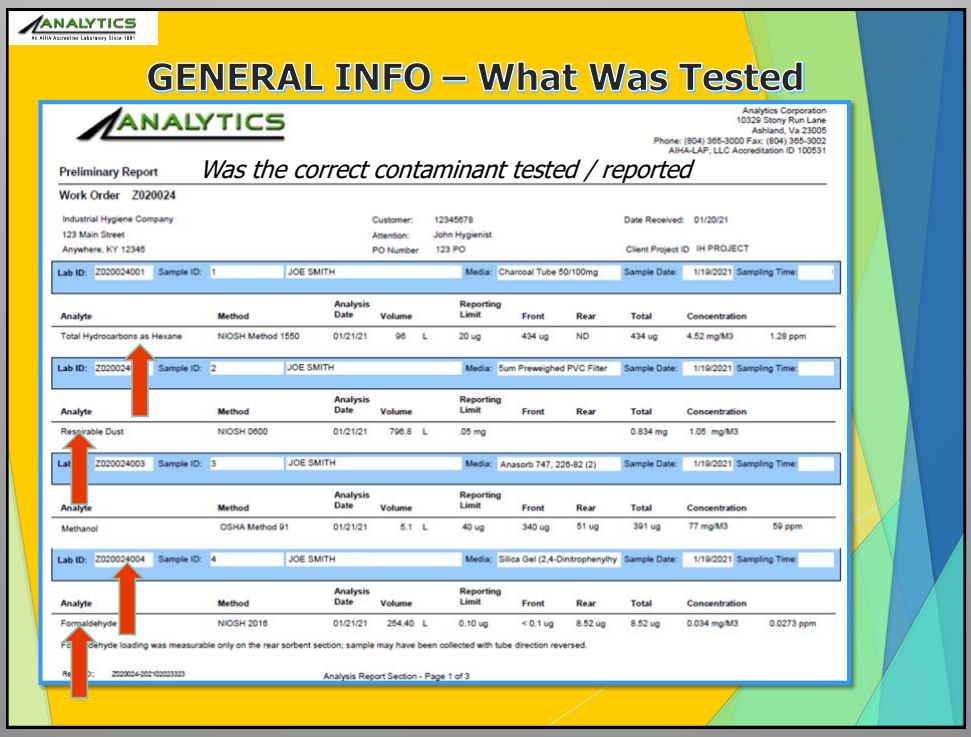
Analysis Report Section - Page 1 of 3

GENERAL INFO – What Was Tested



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Preliminary Report

Was the correct contaminant tested / reported

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Date Received: 01/20/21
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Lab ID: Z020024001 Sample ID: 1 JOE SMITH Media: Charcoal Tube 50/100mg Sample Date: 1/19/2021 Sampling Time:

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Total Hydrocarbons as Hexane	NIOSH Method 1550	01/21/21	96	L	20 ug	434 ug	ND	434 ug	4.52 mg/M3	1.28 ppm

Lab ID: Z020024 Sample ID: 2 JOE SMITH Media: 5um Preweighed PVC Filter Sample Date: 1/19/2021 Sampling Time:

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Respirable Dust	NIOSH 0600	01/21/21	796.8	L	.05 mg			0.834 mg	1.05 mg/M3	

Lat Z020024003 Sample ID: 3 JOE SMITH Media: Anasorb 747, 226-82 (2) Sample Date: 1/19/2021 Sampling Time:

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Methanol	OSHA Method 91	01/21/21	5.1	L	40 ug	340 ug	51 ug	391 ug	77 mg/M3	59 ppm

Lab ID: Z020024004 Sample ID: 4 JOE SMITH Media: Silica Gel (2,4-Dinitrophenylhy Sample Date: 1/19/2021 Sampling Time:

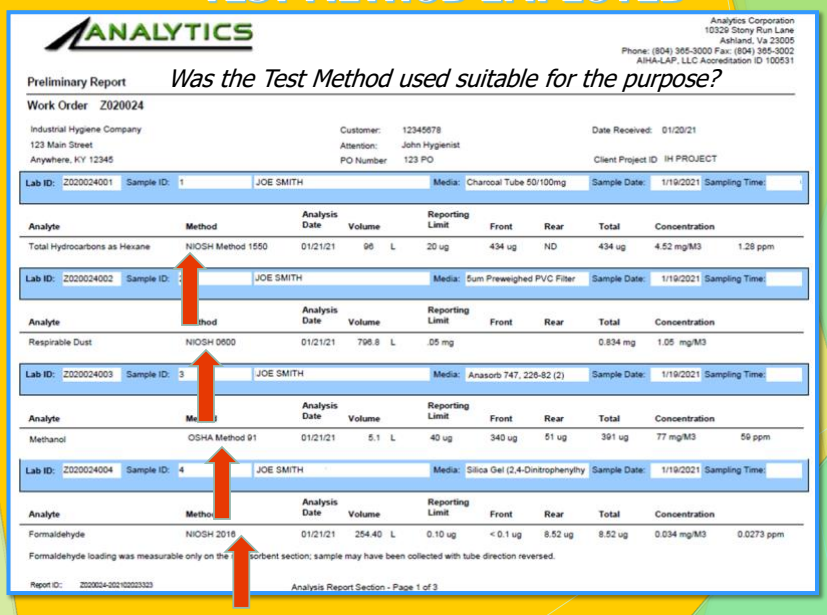
Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Formaldehyde	NIOSH 2016	01/21/21	254.40	L	0.10 ug	< 0.1 ug	8.52 ug	8.52 ug	0.034 mg/M3	0.0273 ppm

Fo dehyde loading was measurable only on the rear sorbent section; sample may have been collected with tube direction reversed.

Re : Z020024-20210202323

Analysis Report Section - Page 1 of 3

TEST METHOD EMPLOYED



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Preliminary Report

Was the Test Method used suitable for the purpose?

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Total Hydrocarbons as Hexane	NIOSH Method 1550	01/21/21	96	L	20 ug	434 ug	ND	434 ug	4.52 mg/M3	1.28 ppm

Lab ID: Z020024002 Sample ID: 2 JOE SMITH Media: 5um Preweighed PVC Filter Sample Date: 1/19/2021 Sampling Time:

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration
Respirable Dust	NIOSH 0600	01/21/21	796.8	L	.05 mg			0.834 mg	1.05 mg/M3

Lab ID: Z020024003 Sample ID: 3 JOE SMITH Media: Anasorb 747, 226-82 (2) Sample Date: 1/19/2021 Sampling Time:

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Methanol	OSHA Method 91	01/21/21	5.1	L	40 ug	340 ug	51 ug	391 ug	77 mg/M3	59 ppm

Lab ID: Z020024004 Sample ID: 4 JOE SMITH Media: Silica Gel (2,4-Dinitrophenylhy Sample Date: 1/19/2021 Sampling Time:

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Formaldehyde	NIOSH 2016	01/21/21	254.40	L	0.10 ug	< 0.1 ug	8.52 ug	8.52 ug	0.034 mg/M3	0.0273 ppm

Formaldehyde loading was measurable only on the [illegible] sorbent section; sample may have been collected with tube direction reversed.

Report ID: Z020024-20210202323

Analysis Report Section - Page 1 of 3

TEST METHOD EMPLOYED

Was the Test Method used suitable for the purpose? ***This is really a pre-sampling decision, based on various considerations:***

- *Method validation – available, complete, partial, defensible?*
- *OSHA doesn't require an OSHA method be used, but for some reasons a specific method may be preferred (side-by-side sampling)*
- *Non-agency method might not be viewed as sufficient*

8

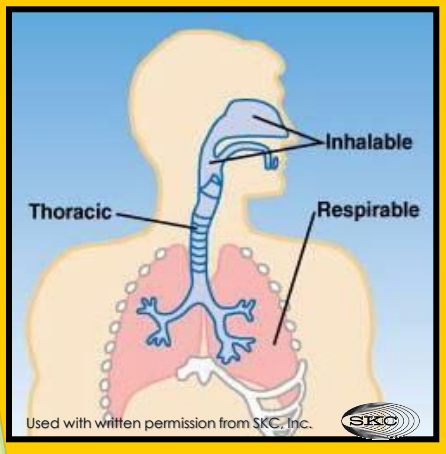
TEST METHOD EMPLOYED

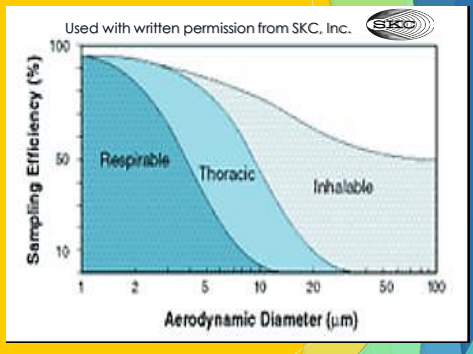
Was the Test Method used suitable for the purpose? ***This is really a pre-sampling decision, based on various considerations:***

- *Sampling approach must be consistent with the use to be made of the results*
- *ACGIH TLVs, with increasing frequency, require a different sampling/analysis approach versus PELs because they are:*
  - *Size-selective where PELs are not*
  - *Much lower than PELs*
- *Use of non-validated methods may be required*

9

IH Aerosol Size Fractions





10

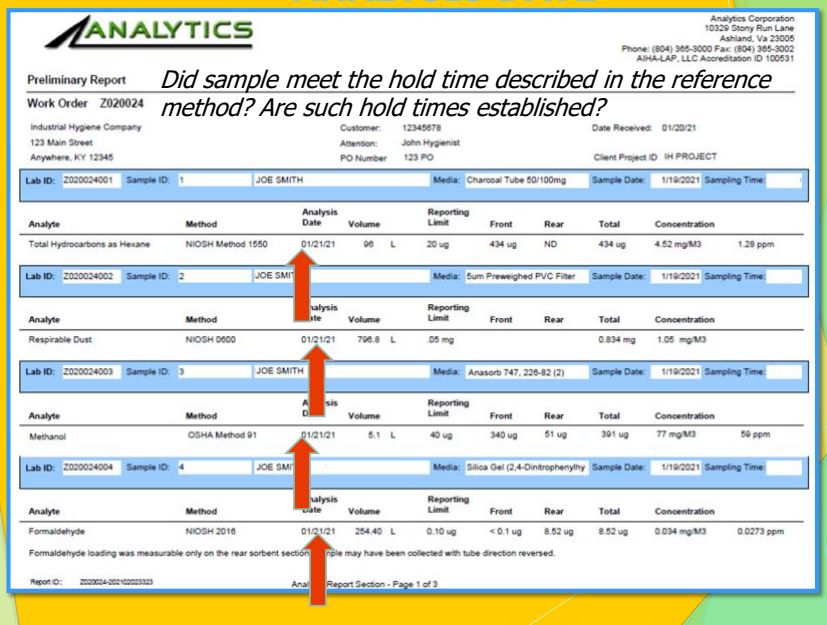
TEST METHOD EMPLOYED

Was the Test Method used suitable for the purpose? ***This is really a pre-sampling decision, based on various considerations:***

- *Testing sensitivity needed might require a specific approach, for example ICP-OES vs. ICP-MS*
- *Interferences potentially present might dictate the method/chemistry choice – acid vs. anhydride, CrIII vs. CrVI*
- *Sample stability may be improved using a specific method/media*

ANALYSIS DATE

Did sample meet the hold time described in the reference method? Are such hold times established?



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Lab ID: Z020024002 Sample ID: 2 JOE SMITH Media: 5um Preweighed PVC Filter Sample Date: 1/19/2021 Sampling Time:

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration
Respirable Dust	NIOSH 0600	01/21/21	796.8	L	.05 mg			0.834 mg	1.05 mg/M3

Lab ID: Z020024003 Sample ID: 3 JOE SMITH Media: Anasorb 747, 226-82 (2) Sample Date: 1/19/2021 Sampling Time:

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Methanol	OSHA Method 91	01/21/21	5.1	L	40 ug	340 ug	51 ug	391 ug	77 mg/M3	59 ppm

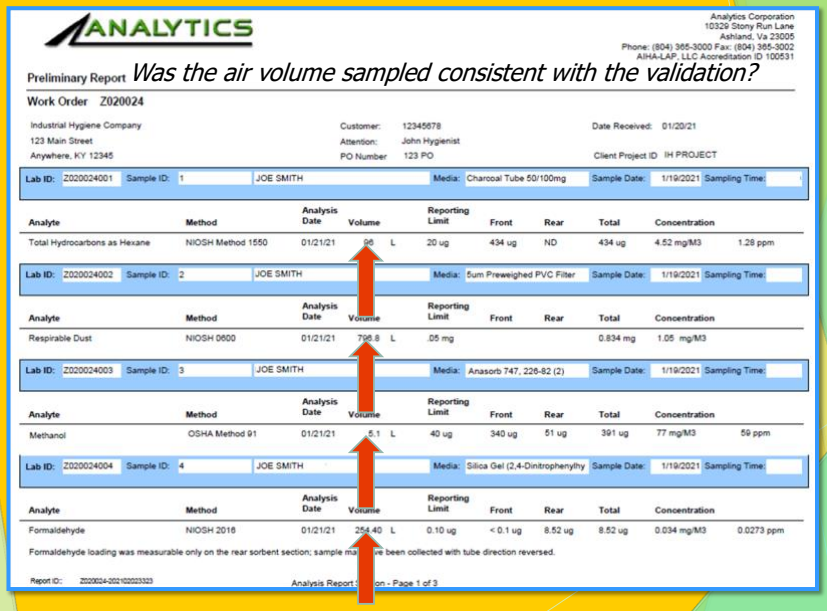
Lab ID: Z020024004 Sample ID: 4 JOE SMITH Media: Silica Gel (2,4-Dinitrophenylhy Sample Date: 1/19/2021 Sampling Time:

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Formaldehyde	NIOSH 2016	01/21/21	254.40	L	0.10 ug	< 0.1 ug	8.52 ug	8.52 ug	0.034 mg/M3	0.0273 ppm

Formaldehyde loading was measurable only on the rear sorbent section. Sample may have been collected with tube direction reversed.

Report ID: Z020024-20210203323 Analytical Report Section - Page 1 of 3

AIR VOLUME SAMPLED



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Preliminary Report

Was the air volume sampled consistent with the validation?

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Analysis Report S on - Page 1 of 3

AIR VOLUME SAMPLED

Was the sample collected consistent with the test method? ***This is another pre-sampling consideration, impacting:***

- *Collection efficiency – sample too fast and efficiency may suffer*
- *Air volume sampled – test sensitivity requires adequate air volume*
- *Air volume sampled – too much volume can invalidate the sample (breakthrough, stability, etc.)*

14

AIR VOLUME SAMPLED

Is the sample volume you provided to the lab defensible? Considerations include:

- *Did you volumetrically calibrate pumps on-site the day of sampling?*
- *Did you calibrate with a primary standard?*
- *What's the traceability of your secondary standard?*
- *When was your calibration standard last calibrated?*
- *Did you calibrate with media in-line?*

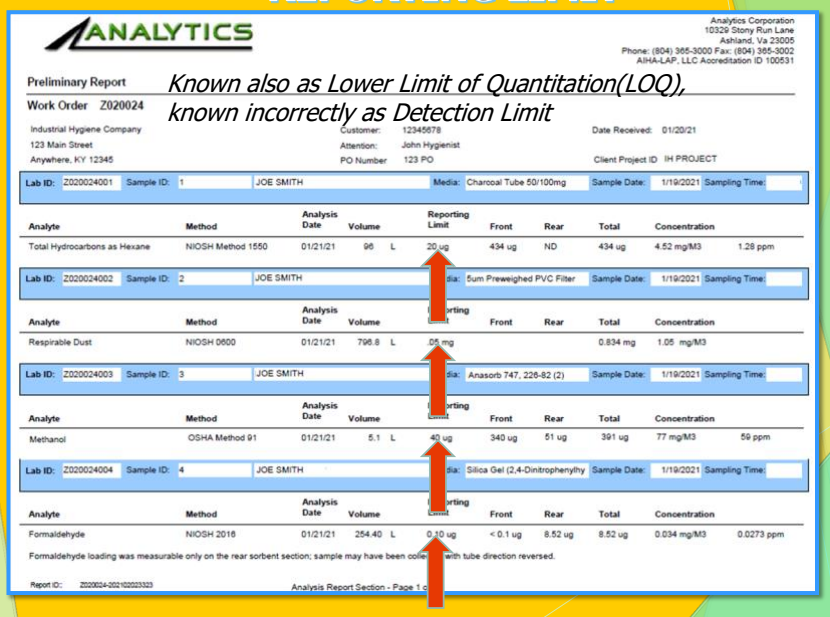
15

AIR VOLUME SAMPLED

Is the sample volume you provided to the lab defensible? Considerations include:

- *Air volume sampled is the denominator in calculating air concentrations*
- *AIHA requires pretty tight documentation for testing performed by an accredited lab.*
- *Lab data may not be the most easily disputed aspect of exposure monitoring*

REPORTING LIMIT



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Known also as Lower Limit of Quantitation(LOQ), known incorrectly as Detection Limit

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Formaldehyde loading was measurable only on the rear sorbent section; sample may have been colle... with tube direction reversed.

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REPORTING LIMIT

- *The smallest analyte loading that is reported as a "hit"*
- *Samples measured with loading below the Reporting Limit are reported as "<" values*
- *Verified annually for that analyte/media/method combination*
- *May not be set at the lowest possible value, for numerous reasons*

18

REPORTING LIMIT

- *Not typically the level at which method performance is optimum*
- *Not equivalent to "detection limit", which typically refers to the smallest loading that can be discerned above background.*

19

ANALYTE LOADING MEASURED

ANALYTICS

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How is measurement made? What's the purpose of reporting as Front / Rear / Total?

Preliminary Report

Work Order Z020024

Industrial Hygiene Company
123 Main Street
Anywhere, KY 12345

Customer: 12345678
Attention: John Hygienist
PO Number 123 PO

Date Received: 01/20/21
Client Project ID IH PROJECT

Lab ID	Sample ID		Media	Sample Date	Sampling Time
Z020024001	1	JOE SMITH	Charcoal Tube 50/100mg	1/19/2021	

Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration	
Total Hydrocarbons as Hexane	NIOSH Method 1550	01/21/21	96 L	20 ug	434 ug	ND	434 ug	4.52 mg/M3	1.28 ppm

Lab ID	Sample ID		Media	Sample Date	Sampling Time
Z020024002	2	JOE SMITH	5um Preweighed PVC Filter	1/19/2021	

Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration	
Respirable Dust	NIOSH 0600	01/21/21	796.8 L	.05 mg			0.834 mg	1.05 mg/M3	

Lab ID	Sample ID		Media	Sample Date	Sampling Time
Z020024003	3	JOE SMITH	Anasorb 747, 226-82 (2)	1/19/2021	

Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration	
Methanol	OSHA Method 91	01/21/21	5.1 L	40 ug	340 ug	51 ug	391 ug	77 mg/M3	59 ppm

Lab ID	Sample ID		Media	Sample Date	Sampling Time
Z020024004	4	JOE SMITH	Silica (2,4-Din henylhy	1/19/2021	

Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration	
Formaldehyde	NIOSH 2016	01/21/21	254.40 L	0.10 ug	< 0.1 ug	8.52 ug	8.52 ug	0.034 mg/M3	0.0273 ppm

Formaldehyde loading was measurable only on the rear sorbent section; sample may have been collected with tube direction reversed.

Report ID: Z020024-20210203323

Analysis Report Section - Page 1 of 3

ANALYE LOADING MEASURED

- *Samples are not typically lab tested directly in terms of air concentration; rather, measurement is made for the mass of analyte in the sampler (whole air samples such as canisters and bags are an exception)*
- *IH chemical analysis techniques typically require the analyte to be in solution (crystalline silica is an exception)*

21

ANALYE LOADING MEASURED

- *Contaminants collected on filters and tubes are typically extracted, desorbed, dissolved, digested, etc.*
- *Testing in solution facilitates measurement, sample introduction into instruments, etc.*

22

ANALYE LOADING MEASURED

- *Dissolution of the analyte assures homogeneity for testing*

23

ANALYE LOADING MEASURED

- *Reporting for multi-bed sorbent samplers for vapors/gases*
  - Front and rear sorbents are tested separately in the lab
  - Consider the front sorbent to be the sampler
  - Consider the rear sorbent to be validation for the collection of that sample, under those exact sampling conditions

24

ANALYE LOADING MEASURED

- *Multi-bed sorbent samplers for vapors/gases*
  - *The presence of analyte on the rear sorbent indicates "breakthrough" – exhaustion of capacity on the front sorbent bed under those sampling conditions*

Lab ID:	Z020024003	Sample ID:	3	JOE SMITH	Media:	Anasorb 747, 226-82 (2)	Sample Date:	1/19/2021	Sampling Time:	

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Methanol	OSHA Method 91	01/21/21	5.1	L	40 ug	340 ug	51 ug	391 ug	77 mg/M3	59 ppm

25

ANALYE LOADING MEASURED

- *Multi-bed sorbent samplers for vapors/gases*
  - *The proportion of loading on the rear bed provides an estimate of the risk a sample is invalid due to analyte loss*
  - *It's typical to build a safety factor into determination of significant breakthrough.*

26

ANALYE LOADING MEASURED

- *Multi-bed sorbent samplers for vapors/gases*
  - *You need to establish your own acceptance criteria for breakthrough and sample validity*
  - *A typical approach is this: when rear bed size/capacity is ½ that of the front bed, and using a 2X safety factor, significant breakthrough is indicated when rear bed loading reaches 25% of front bed loading.*

27

CONCENTRATION REPORTING – mg/M³

How is mg/M³ concentration calculated?

ANALYTICS

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Preliminary Report

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Date Received: 01/20/21
Client Project ID IH PROJECT

Lab ID	Sample ID		Media	Sample Date	Sampling Time
Z020024001	1	JOE SMITH	Charcoal Tube 50/100mg	1/19/2021	

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
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Z020024002	2	JOE SMITH	5um Preweighed PVC Filter	1/1 21	

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration
Respirable Dust	NIOSH 0600	01/21/21	796.8	L	.05 mg			0.834 mg	1.05 mg/M3

Lab ID	Sample ID		Media	Sample Date	Sampling Time
Z020024003	3	JOE SMITH	Anasorb 747, 226-82 (2)	1/1 21	

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Methanol	OSHA Method 91	01/21/21	5.1	L	40 ug	340 ug	51 ug	391 ug	77 mg/M3	59 ppm

Lab ID	Sample ID		Media	Sample Date	Sampling Time
Z020024004	4	JOE SMITH	Silica Gel (2,4-Dinitrophenylhy	1/1 21	

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Formaldehyde	NIOSH 2016	01/21/21	254.40	L	0.10 ug	< 0.1 ug	8.52 ug	8.52 ug	0.034 mg/M3	0.0273 ppm

Formaldehyde loading was measurable only on the rear sorbent section; sample may have been collected with tube direction reversed.

Report ID:: Z020024-202102023323

Analysis Report Section - Page 1 of 3

Concentration Reporting – mg/M³

- *Sample is tested for mass of contaminant, typically expressed in micrograms (µg)*
- *Sampler provides lab info for air volume sampled (Liters, or minutes samples plus sampling rate, or minutes sampled for diffusive sampler)*
- *Concentration is calculated in mass per volume units:*

µg/Liter = mg/M3

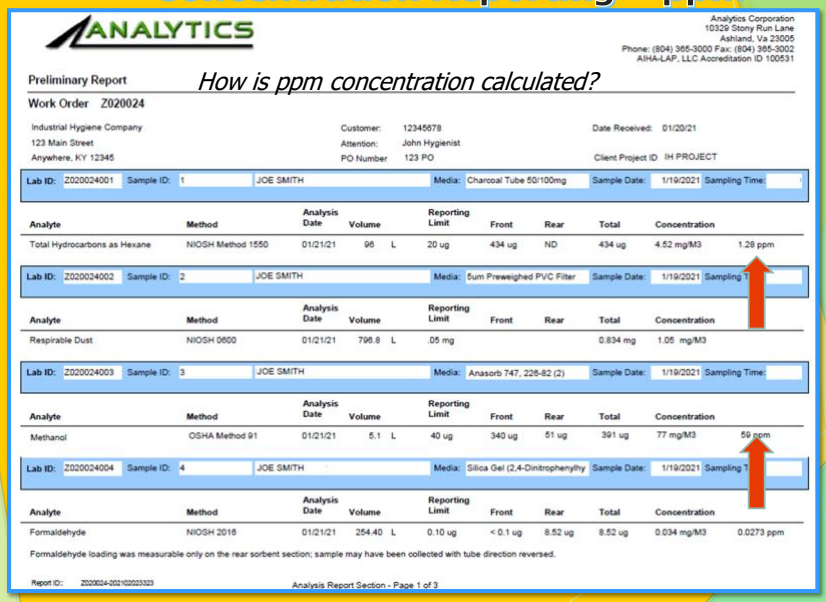
29

Concentration Reporting – mg/M³

- *The reported concentration is a Time-Weighted Average (TWA) for the period monitored.*
- *8-hour TWA calculations (or other interval) typically require separate calculation, for comparison to TWA OELs*

30

Concentration Reporting – ppm



ANALYTICS

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Preliminary Report

How is ppm concentration calculated?

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Customer: 12345678
Attention: John Hygienist
PO Number 123 PO

Date Received: 01/20/21
Client Project ID IH PROJECT

Lab ID	Sample ID		Media	Sample Date	Sampling Time
Z020024001	1	JOE SMITH	Charcoal Tube 50/100mg	1/19/2021	

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Total Hydrocarbons as Hexane	NIOSH Method 1550	01/21/21	96	L	20 ug	434 ug	ND	434 ug	4.52 mg/M3	1.28 ppm

Lab ID	Sample ID		Media	Sample Date	Sampling T
Z020024002	2	JOE SMITH	5um Preweighed PVC Filter	1/19/2021	

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration
Respirable Dust	NIOSH 0600	01/21/21	796.8	L	.05 mg			0.834 mg	1.05 mg/M3

Lab ID	Sample ID		Media	Sample Date	Sampling Time
Z020024003	3	JOE SMITH	Anasorb 747, 226-82 (2)	1/19/2021	

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration
Methanol	OSHA Method 91	01/21/21	5.1	L	40 ug	340 ug	51 ug	391 ug	77 mg/M3 59 ppm

Lab ID	Sample ID		Media	Sample Date	Sampling T
Z020024004	4	JOE SMITH	Silica Gel (2,4-Dinitrophenylhy	1/19/2021	

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Formaldehyde	NIOSH 2016	01/21/21	254.40	L	0.10 ug	< 0.1 ug	8.52 ug	8.52 ug	0.034 mg/M3	0.0273 ppm

Formaldehyde loading was measurable only on the rear sorbent section; sample may have been collected with tube direction reversed.

Report ID: Z020024-202102023323

Analysis Report Section - Page 1 of 3

Concentration Reporting – ppm

- *Only appropriate if contaminant behaves as a vapor or gas (not applicable to aerosols)*
- *Not measured directly (whole-air methods are an exception)*
- *Calculated mg/M³ is mathematically converted to an equivalent volume-per-volume concentration*
- *Conversion assumes Normal Temperature and Pressure (NTP) of 25°C and 760 torr*

32

ANALYTICS

Concentration Reporting – ppm

***Equation M-1**

***ppm(NTP)=mg/m3(24.46)/MW**

Where: 24.46 = molar volume at 25°C (298°K) and 760 mm Hg

MW = compound Molecular Weight

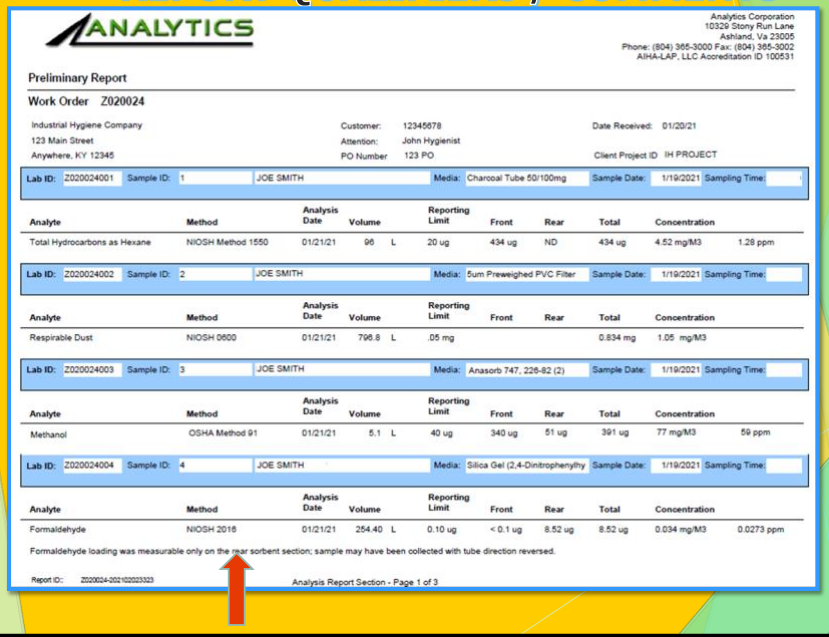
NTP = Normal Temperature and Pressure, 25°C and 760 mm Hg.

*OSHA Technical Manual Section II: Chapter 1, Appendix M

33

ANALYTICS

REPORT QUALIFIERS / COMMENTS



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Attention: John Hygienist
PO Number 123 PO

Date Received: 01/20/21
Client Project ID IH PROJECT

Lab ID: Z020024001 Sample ID: 1 JOE SMITH Media: Charcoal Tube 50/100mg Sample Date: 1/19/2021 Sampling Time:

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Total Hydrocarbons as Hexane	NIOSH Method 1550	01/21/21	96	L	20 ug	434 ug	ND	434 ug	4.52 mg/M3	1.28 ppm

Lab ID: Z020024002 Sample ID: 2 JOE SMITH Media: 5um Preweighed PVC Filter Sample Date: 1/19/2021 Sampling Time:

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Respirable Dust	NIOSH 0600	01/21/21	796.8	L	.05 mg			0.834 mg	1.05 mg/M3	

Lab ID: Z020024003 Sample ID: 3 JOE SMITH Media: Anasorb 747, 226-82 (2) Sample Date: 1/19/2021 Sampling Time:

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Methanol	OSHA Method 91	01/21/21	5.1	L	40 ug	340 ug	51 ug	391 ug	77 mg/M3	59 ppm

Lab ID: Z020024004 Sample ID: 4 JOE SMITH Media: Silica Gel (2,4-Dinitrophenylhy Sample Date: 1/19/2021 Sampling Time:

Analyte	Method	Analysis Date	Volume		Reporting Limit	Front	Rear	Total	Concentration	
Formaldehyde	NIOSH 2016	01/21/21	254.40	L	0.10 ug	< 0.1 ug	8.52 ug	8.52 ug	0.034 mg/M3	0.0273 ppm

Formaldehyde loading was measurable only on the rear sorbent section; sample may have been collected with tube direction reversed.

Report ID: Z020024-202102023323 Analysis Report Section - Page 1 of 3

REPORT QUALIFIERS / COMMENTS

The lab is trying to communicate important information regarding the testing performed. Issues that might be addressed include:

- *Sample integrity as received (exceeding hold time, partial damage, etc.)*
- *Sample validity (breakthrough indicating sample loss, sample collected backwards, impact of interferences on test sensitivity, etc.)*
- *Sample loss during testing*

35

ITEMS NOT ON THE REPORT (BUT OFTEN USEFUL)

36

Calculating Confidence Limits for Exposure Severity

- *SAE = Sampling and Analytical Error (contact lab for SAEs)*
- *CVT = Square Root [CVA2 + CVS2]*
  - *CVT = Coefficient of Variation, Total*
  - *CVA = Coefficient of Variation, Analytical*
  - *CVS = Coefficient of Sampling (often assumed to be 0.05)*
- *SAE = CVT x 1.645*

37

Statistics 2 – Confidence Limits

- *Full-period sampling result = X*
- *Exposure severity = Y = X/PEL*
- *UCL95%=Y+SAE*
- *LCL95%=Y-SAE*
- *If the UCL < 1, a violation does not exist.*
- *If LCL < 1 and the UCL > 1, classify as possible overexposure.*
- *If LCL > 1, a violation exists.*

38

Statistics 3 – Confidence Limits Calculation Example

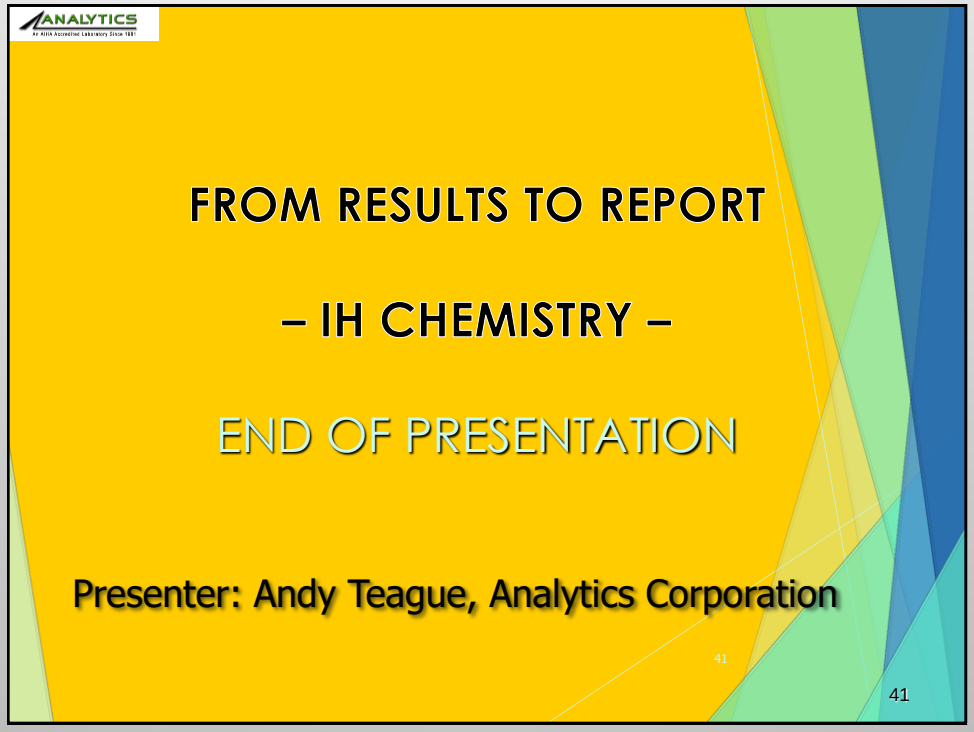
- TWA Measured concentration = 55 ppm
- PEL = 50 ppm
- SAE (from lab) = 0.12
- Exposure Severity = 55 ppm / 50 ppm = 1.1
- UCL 95% = 1.1 + 0.12 = 1.22
- LCL 95% = 1.1 – 0.12 = 0.98
- LCL < 1, UCL > 1, possible overexposure

39

ASK QUESTIONS OF YOUR LAB

- The methods employed are not perfect, and may be impacted by interferences or other limitations
- Asking questions before sampling can often prevent a lot of grief
- Request discussion or review of results if you have questions – this is preferable to a lack of confidence in results.

40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FROM RESULTS TO REPORT
– IH CHEMISTRY –
END OF PRESENTATION
Presenter: Andy Teague, Analytics Corporation
41
41