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January 12, 2016

RE: November 2015 Ambient Air Monitoring Monthly Reports

Attached are the monthly ambient air monitoring reports for the LICA Airshed Zone's Cold Lake South, Maskwa, St. Lina, and Elk Point continuous stations.

Should you have any questions, please don't hesitate to contact me directly at (780) 266-7068.

Respectfully,

A handwritten signature in blue ink that reads "Michael Bisaga".

Michael Bisaga

Airshed Program Manager
Lakeland Industry and Community Association

cc (email): LICA Office

AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
COLD LAKE SOUTH SITE

JOB #:2833-2015-11-01- C

NOVEMBER 2015


Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
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Attention: MIKE BISAGA

DATE: January 12, 2016

Prepared by:



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Reviewed by:



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SUMMARY

In NOVEMBER 2015, the Air Services Group of Maxxam Analytics conducted an ambient air monitoring program on the Cold Lake South Site at Lakeland Industry & Community Association, near Bonnyville, Alberta. Sampling was carried out to determine the concentrations of non-compliance parameters as requested by the Project Coordinator.

All data collected this month were within the objectives outlined in the AMD1989 and AMD2006.

The operational uptime for all analyzers and meteorological system was above the 90% requirement, except PM 2.5 (88.2%).

PM 2.5: Eighty-three hours of data were invalidated as the data were below -3 ug/m^3 this month. The operational uptime for the month is 88.2%. AE Reference number: 306982.

The summary of results is presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods are outlined in Section 1.0 Discussion. On this basis, Maxxam is issuing this completed report to Lakeland Industry & Community Association, Cold Lake South Site.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3677 or toll-free at 1-800-386-7247.

Monthly Continuous Data Summary

Lakeland Industry & Community Association Cold Lake South Site						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDENCES		MONTHLY AVERAGE	READING	DAY	1-HOUR			24-HOUR		
	1-HR	24-HR	1-HR	24-HR				HOUR	WIND SPEED (KPH)	WIND DIRECTION (DEGREES)	READING	DAY	
SO2 (PPB)	172	48	0	0	0	2	28	15	6.9	WSW	0.5	28	99.6
TRS (PPB)	-	-	-	-	0	0	ALL	ALL	VAR	VAR	0.0	ALL	100.0
THC (PPM)	-	-	-	-	2.2	3.2	30, 30	10, 11	1.3 3.9	WSW WSW	2.7	30	100.0
NO2 (PPB)	159	-	0	-	5.0	21.6	30	16	1.1	SSW	12.3	30	99.6
NO (PPB)	-	-	-	-	1.2	22.1	30	10	1.3	WSW	6.7		99.6
NOX (PPB)	-	-	-	-	6.2	35.4	30	10	1.3	WSW	18.9	30	99.6
O3 (PPB)	82	-	0	-	18	39	22	VAR	VAR	VAR	33.7	22	100.0
PM2.5 (UG/M3)	-	30	-	0	10.5	46.0	6	13	4.7	S	16.9	30	88.2
RELATIVE HUMIDITY (%)	-	-	-	-	75.6	99	3	VAR	VAR	VAR	94.5	3	100.0
AMBIENT TEMPERATURE (DEG C)	-	-	-	-	-3.0	7.6	7	14	2.5	W	2.7	7	100.0
VECTOR WS (KPH)	-	-	-	-	5.7	23.2	18	14	-	NW	14.4	18	100.0
VECTOR WD (DEG)	-	-	-	-	W	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

Exceedence Summary Report

SO₂ 1- Hour Exceedences

No Exceedences Recorded During the Month

SO₂ 24- Hour Exceedences

No Exceedences Recorded During the Month

NO₂ 1- Hour Exceedences

No Exceedences Recorded During the Month

PM_{2.5} 24- Hour Exceedences

No Exceedences Recorded During the Month

Passive Sampler Summary

	Sulphur Dioxide (in ppb)
Mean	0.3
Minimum	0.1
Maximum	1.4

Note: There was no access to stations #12 and #25. Samples collected at stations #16, #17, #18 and #19 were not analyzed due to a sampling error.

	Hydrogen Sulphide (in ppb)
Mean	0.17
Minimum	0.06
Maximum	0.75

Note: There was no access to stations #12 and #25.

	Nitrogen Dioxide (in ppb)
Mean	2.7
Minimum	0.7
Maximum	7.1

Note: There was no access to station #12.

	Ozone (in ppb)
Mean	20.60
Minimum	17.30
Maximum	26.30

Note: There was no access to station #12.

Volatile Organics (VOCs) Data Summary

Sample Collected Date	Maximum reading (PPB)	Volatile Organic Compound
NOVEMBER 2, 2015	3.8	NAPHTHALENE
NOVEMBER 8, 2015	3.8	N-DODECANE
NOVEMBER 14, 2015	2.33	N-BUTANE
NOVEMBER 20, 2015	1.0	ACETONE
NOVEMBER 26, 2015	1.44	N-BUTANE

Note: NA

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collected Date	Maximum reading (ug)	Semi-Volatile Organic
NOVEMBER 2, 2015	1.65	PHENANTHRENE
NOVEMBER 8, 2015	0.47	PHENANTHRENE
NOVEMBER 14, 2015	1.28	1-METHYLNAPHTHALENE
NOVEMBER 20, 2015	0.21	2-METHYLNAPHTHALENE
NOVEMBER 26, 2015	0.43	NAPHTHALENE

Note: NA

Partisol Sampler Summary

Sample Collected Date	Concentration (mg)
NOVEMBER 2, 2015	0.013
NOVEMBER 8, 2015	0.133
NOVEMBER 14, 2015	0.171
NOVEMBER 20, 2015	0.113
NOVEMBER 26, 2015	0.293

Note: NA

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
1.0 Discussion	4
2.0 Project Personnel	7
3.0 Plant Monthly Required AMD Summary	7
4.0 Calculations and Results	7
5.0 Methods and Procedures	8
Appendix I	Continuous Monitoring Data Results
	Sulphur Dioxide
	Total Reduced Sulphur
	Total Hydrocarbon
	Oxides of Nitrogen
	Nitric Oxides
	Nitrogen Dioxide
	Ozone
	Particulate Matter 2.5
	Wind Speed
	Wind Direction
	Standard Deviation Wind Direction
	Relative Humidity
	Ambient Temperature
Appendix II	Non-Continuous Monitoring Data Results
	Passive Results
	VOC Results
	PAH Results
	Partisol Results
Appendix III	Analyzer Calibration Results
	Sulphur Dioxide
	Total Reduced Sulphur
	Total Hydrocarbon
	Nitrogen Dioxide
	Ozone
	Particulate Matter
	Wind System
	Partisol Sampler
	Calibrators
	Calibration Gases
	Audit Report

Appendix IV

Analytical Results

Passive Samples

VOCs Samples

PAHs Samples

Partisol Samples

Chain of Custody

Appendix V

1.0 Discussion

This monthly report consists of data for parameters SO₂, TRS, THC, CH₄, NMHC, NO_x, NO, NO₂, O₃, PM_{2.5}, WS, WD, RH and Ambient Temperature. It also includes results for non-continuous parameters Passives, VOC, PAH and Partisol.

Sample filters for all continuous air monitors are changed before the calibration is started. The sample manifold is cleaned during the site visit on a monthly basis.

Control checks, consisting of zero and span of the analyzer are conducted on a daily basis on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinder) is used for zero checks and a known concentration of the pollutant being analyzed is used for span checks. These checks are controlled by automatic timers and valves. The total zero span cycle is completed within an hour, the commencement of the zero span cycle is at the beginning of the hour.

Multipoint calibration is done a minimum of once a month for each continuous air monitor. In addition calibration is required under the following conditions: 1) within three days after the initial start-up and stabilization of a newly installed instrument, 2) prior to shut-down or moving of an instrument which has been working to specification, and 3) when major repair has been done on the instrument.

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time (minimum), on a monthly basis.

All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.

Hourly/minute data have been reviewed based on daily zero/span results and multi-points calibration results. Data may be considered as invalid if a zero-corrected span check in excess of +/- 10% of the span concentration (established by the previous multi-point calibration) is encountered and/or significant differences in the calibration factor (greater than 15%).

Hourly data is corrected using daily zero information.

SULPHUR DIOXIDE (SO₂)

The routine monthly calibration was performed on November 5. The routine annual internal quality audit was attempted on November 17. Due to issues from the calibrator, the audit was aborted. The audit was repeated on November 18 using a different calibrator. The result was good. The audit report is included in this report.

TOTAL REDUCED SULPHUR (TRS)

The analyzer was working well throughout the month. The routine monthly calibration was performed on November 5. The routine annual internal quality audit was completed on November 17. The audit report is included in this report.

TOTAL HYDROCARBONS (THC)

The analyzer was working well throughout the month. The routine monthly calibration was performed on November 5. The routine annual internal quality audit was completed on November 17. The audit report is included in this report.

NITROGEN DIOXIDE (NO₂)

The analyzer was working well throughout the month. The routine monthly calibration was performed on November 5. The routine annual internal quality audit was completed on November 17. The audit report is included in this report. The analyzer was put into Maintenance mode for three hours on November 18 while the GPT reference points for the Ozone analyzer audit were being generated.

OZONE (O₃)

The analyzer was working well throughout the month. The routine monthly calibration was performed on November 5. The routine annual internal quality audit was completed on November 18. The audit report is included in this report.

PARTICULATE MATTER 2.5 (LESS THAN 2.5 MICRONS) (PM_{2.5})

Two Teom audits were performed this month: one was completed on November 3, and the other audit was performed on November 23. Both the sample filter and the FDMS filter were replaced on November 3. The routine annual internal quality audit was completed on November 18. The audit report is included in this report. The Teom unit recorded many negative readings after the audit on November 18. The sample filter was replaced on November 19 to improve the unit's stability. No further issues were identified. Data was corrected using Alberta air quality guideline. If the data was between 0 to -3 ug/m³, the data was corrected to 0 ug/m³. If the data was below -3ug/m³, the data was invalidated. Eighty-three hours of data were invalidated as the data were below -3 ug/m³ this month. The operational uptime for the month is 88.2%. AE Reference number: 306982.

WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)

The wind system is reported as vector wind speed and vector wind direction. The wind direction data included in this report represents where the wind was coming from.

The wind system was working well throughout the month.

RELATIVE HUMIDITY (RH)

The humidity sensor was working well throughout the month.

AMBIENT TEMPERATURE (TPX)

The temperature sensor was working well throughout the month.

PASSIVE SAMPLES

Samples were collected over the months of October and November. Samples were collected at all designated stations, except stations 12 and 25 as access documents were not provided by client. Analytical results are included in this report. Samples collected by the SO₂ samplers at stations #16, #17, #18 and #19 were not analyzed due to a sampling error.

VOC SAMPLES

The sampler was programmed to run for 24 hours, and, every 6 days per sample cycle. The values for the VOCs were reported in ppb.

Samples were collected on November 2, 8, 14, 20 and 26. Analytical results are included in this report.

PAH SAMPLES

The sampler was programmed to run for 24 hours, and, every 6 days per sample cycle. The values for the PAHs were reported in the unit of µg.

Samples were collected on November 2, 8, 14, 20 and 26. Analytical results are included in this report.

PARTISOL SAMPLES

The sampler was programmed to run for 24 hours, and, every 6 days per sample cycle. The values for the Partisol were reported in the unit of mg.

Samples were collected on November 2, 8, 14, 20 and 26. Analytical results are included in this report.

A shut-down audit was performed on the sampler prior to rebuilding the pump on November 17. The post-repair audit was then completed. The routine annual internal quality audit was completed on November 18. The audit report is included in this report. The AEMERA-owned partisol sampler, S/N: 2000A204009710, was replaced with the Maxxam-supplied sampler, S/N: 2000B206140102 on November 24 following a shut-down audit. The installation audit was performed afterwards. The AEMERA-owned sampler was returned to AEMERA in December 2015.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association, and the Maxxam field sampling team consisted of Alexander Yakupov and Limin Li.

3.0 Plant Monthly Required AMD Summary

All data collected this month were within the objectives outlined in the AMD1989 and AMD2006.

The operational uptime for all analyzers and meteorological system was above the 90% requirement, except PM 2.5 (88.2%).

4.0 Calculations and Results

All calculations and reporting of results follow the method described in the Air Monitoring Directive, 1989, and 2006 Amendments to the Air Monitoring Directive, 1989 (AMD 2006).

5.0 Methods and Procedures

The following methods and procedures were used to complete the test program:

- Maxxam AIR SOP-00208: RM Young Monitor Calibration
- Maxxam AIR SOP-00210: Ambient TRS Monitoring
- Maxxam AIR SOP-00211: Ambient SO₂ Monitoring
- Maxxam AIR SOP-00212: Ambient O₃ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00215: Teom Operation
- Maxxam AIR SOP-00225: The Collection of VOCs in Ambient Air Using Canister and Xontech

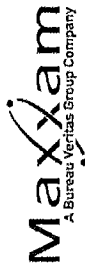
There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - Thermo 43i UV Fluorescent Analyzer
- Total Reduced Sulphur - Thermo 450i UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Oxides of Nitrogen - Thermo 42C Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - R&P 1405F Teom Unit
- Wind System - Met One Unit
- Relative Humidity - Met One Unit
- Ambient Temperature - Met One Unit
- Datalogger - ESC 8832
- Partisol - R&P 2000H Unit

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE



SULPHUR DIOXIDE (SO2) hourly averages in ppb

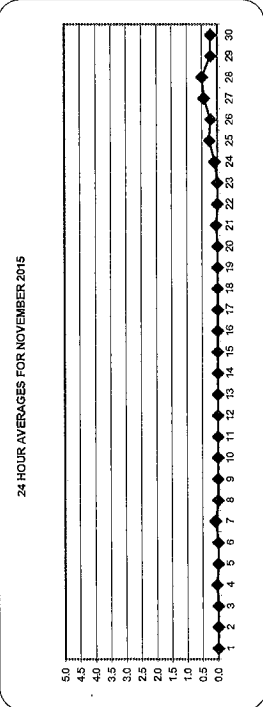
MST

DAY	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
HOURLY MAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STATUS FLAG CODES

- C - CALIBRATION
- Y - MAINTENANCE
- S - DAILY ZERO/SAMPLE CHECK
- P - POWER FAILURE
- G - OUT FOR REPAIR
- Q - QUALITY ASSURANCE
- R - RECOVERY
- X - MACHINE MALFUNCTION
- O - OPERATOR ERROR
- K - COLLECTION ERROR

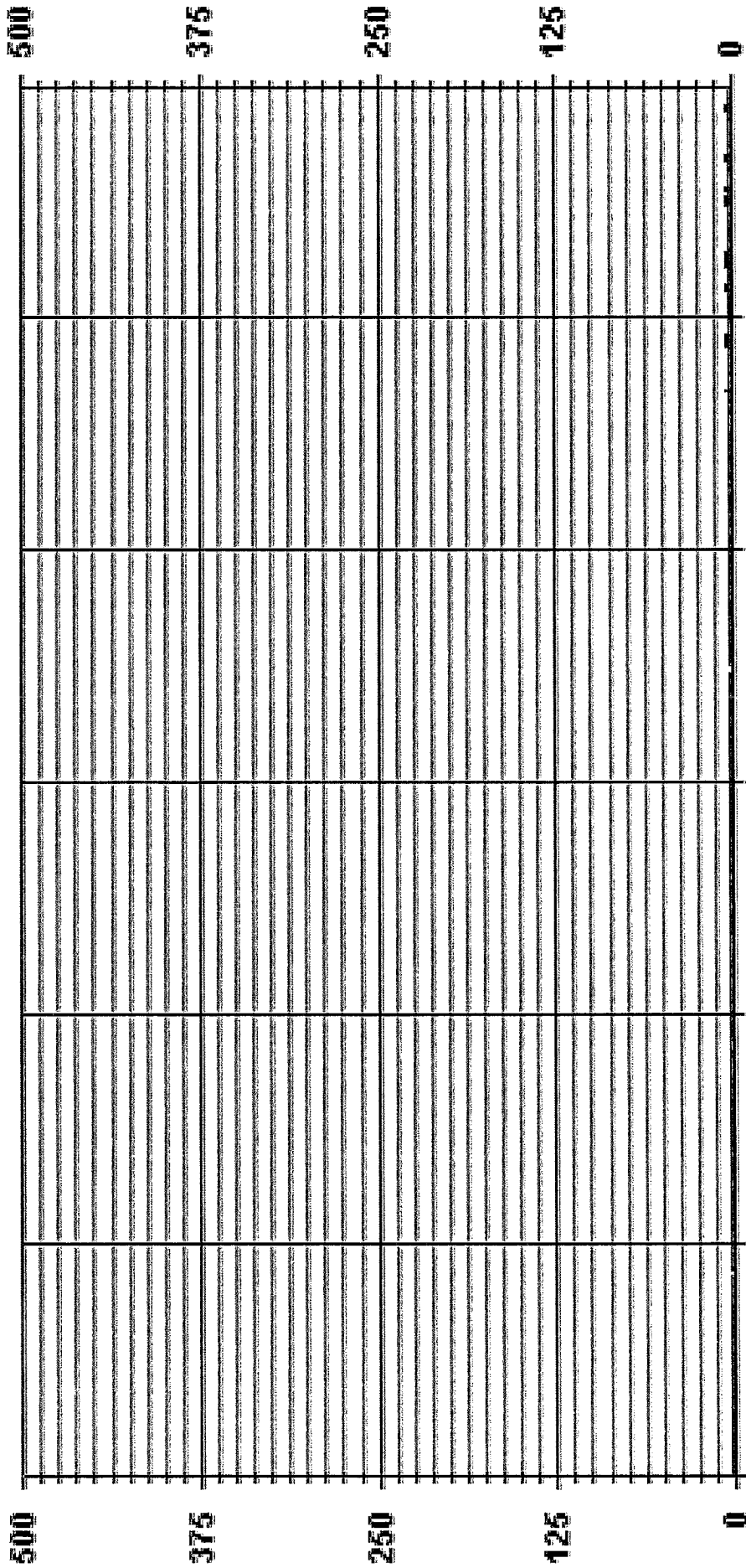
OBJECTIVE LIMIT: ALBERTA ENVIRONMENT: 1-HR: 172 PPB 24-HR: 38 PPB



MONTHLY SUMMARY

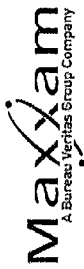
NUMBER OF 1-HR EXCEEDENCES:	0
NUMBER OF 24-HR EXCEEDENCES:	0
NUMBER OF NON-ZERO READINGS:	47
MAXIMUM 1-HR AVERAGE:	2 PPB @ HOUR(S) 15
MAXIMUM 24-HR AVERAGE:	0.5 PPB
IZS CALIBRATION TIME:	30 HRS
MONTHLY CALIBRATION TIME:	4 HRS
OPERATIONAL TIME:	717 HRS
AMT OPERATION UPTIME:	99.6 %
MONTHLY AVERAGE:	0 PPB

01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA S02_ PPB



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Site - NOVEMBER 2015
JOB # 2833-2015-11-01- C

SULPHUR DIOXIDE MAX instantaneous maximum in ppb

MST

DAY	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00
HR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
MAX	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
AVG	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
RDGS	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
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8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
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14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
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27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
HOURLY MAX	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
HOURLY AVG	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
DAILY MAX	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DAILY AVG	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
RDGS	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

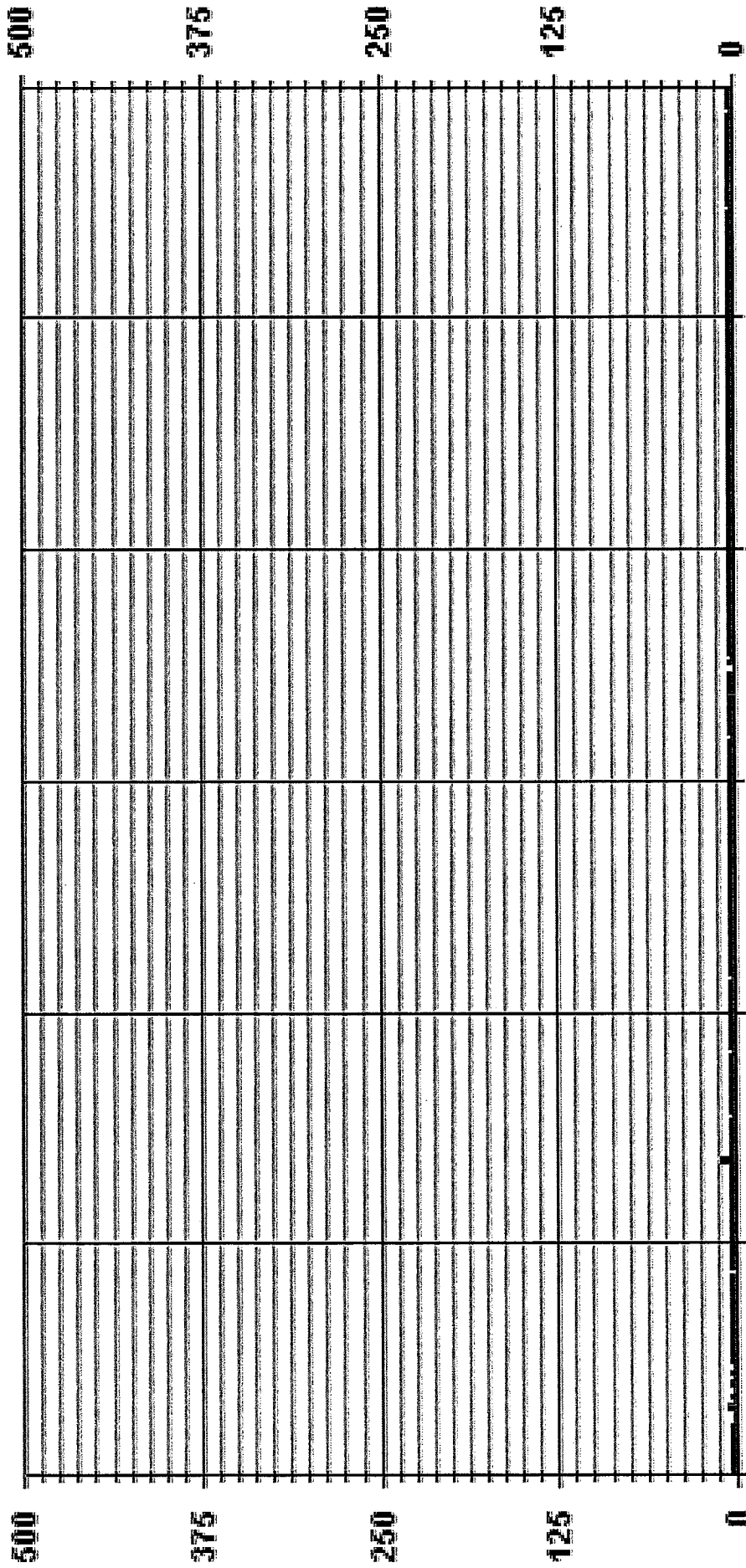
STATUS FLAG CODES

C	- CALIBRATION	Q	- QUALITY ASSURANCE
M	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	649
MAXIMUM INSTANTANEOUS VALUE:	8 PPB @ HOUR(S) 20 ON DAY(S) 7
IZS CALIBRATION TIME:	30 HRS
MONTHLY CALIBRATION TIME:	4 HRS
OPERATIONAL TIME:	717 HRS
STANDARD DEVIATION:	0.40
VAR-VARIOUS	

01 Hour Averages



— LICA SO2MAX PPB

LICA
SO2_ / WDR Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 01
Site Name : LICA
Parameter : SO2
Units : PPS

Wind Parameter : WDR
Instrument Height : 10 Meters

Limit	Direction																NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NW		
< 20	1.03	.73	2.80	3.53	7.22	2.65	8.70	3.09	2.94	4.86	11.06	22.56	12.68	6.04	5.60	4.42	100.00	
< 60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
< 110	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
< 170	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
< 340	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
>= 340	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
Totals	1.03	.73	2.80	3.53	7.22	2.65	8.70	3.09	2.94	4.86	11.06	22.56	12.68	6.04	5.60	4.42		

Calm : .00 %

Total # Operational Hours : 678

Distribution By Samples

Limit	Direction																NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NW		
< 20	7	5	19	24	49	18	59	21	20	33	75	153	86	41	38	30	678	
< 60																		
< 110																		
< 170																		
< 340																		
>= 340																		
Totals	7	5	19	24	49	18	59	21	20	33	75	153	86	41	38	30		

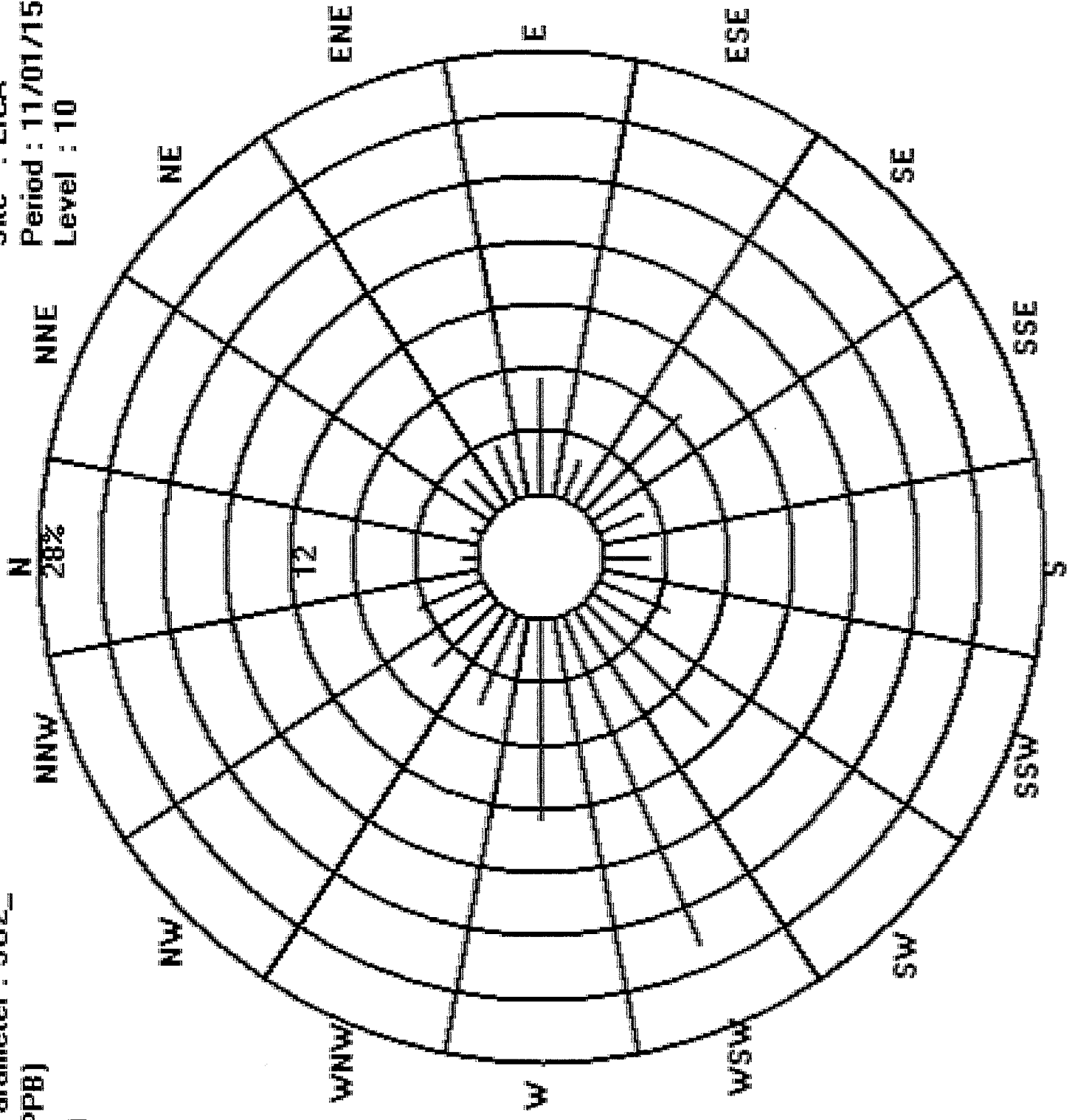
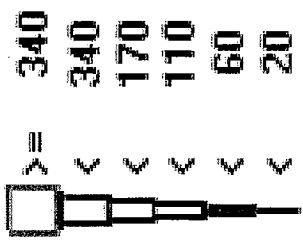
Calm : .00 %

Total # Operational Hours : 678

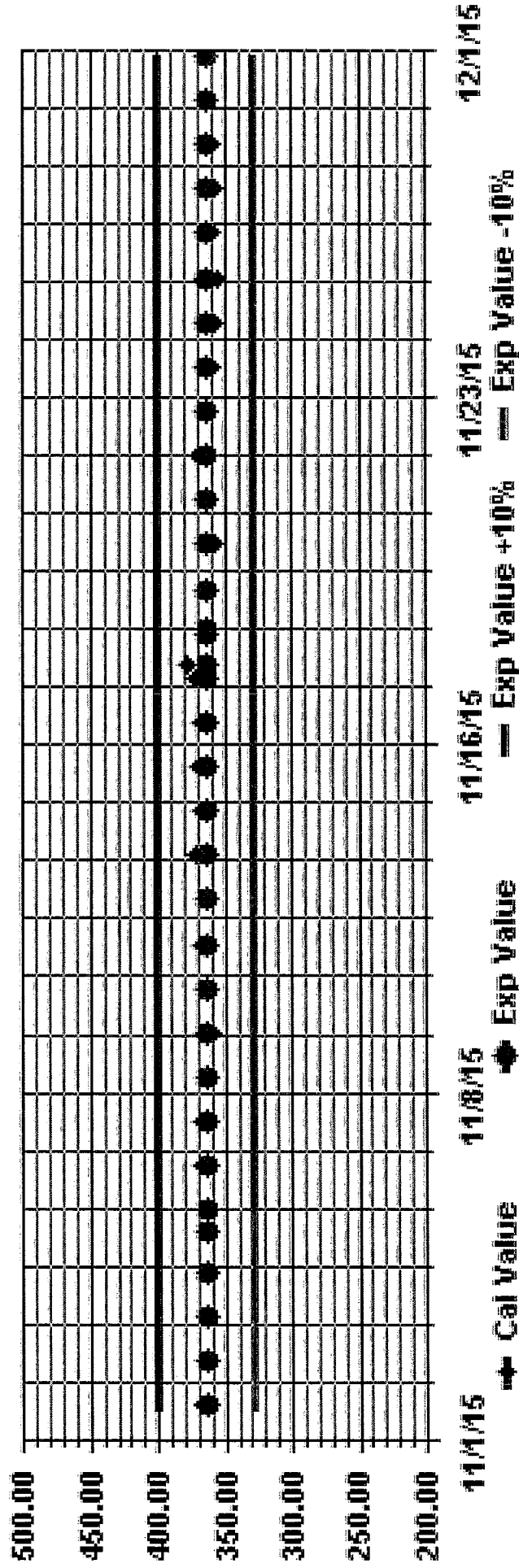
Site : LICA
 Period : 11/01/15-11/30/15
 Level : 10

Logger : 01 Parameter : SO2_

Class Limits (PPB)



Calibration Graph for Site: LICA Parameter: SO2_ Sequence: SO2 Phase: SPAN



TOTAL REDUCED SULPHUR

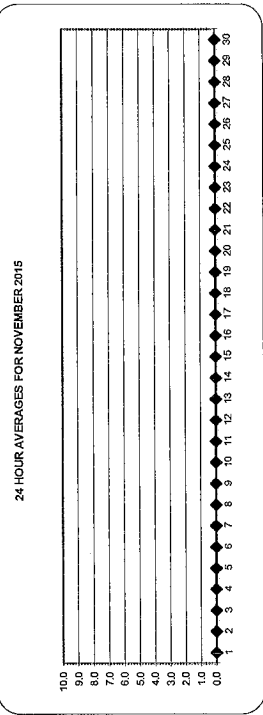
TOTAL REDUCED SULPHUR (TRS) hourly averages in ppb

MST

DAY	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
HOURLY MAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

STATUS FLAG CODES

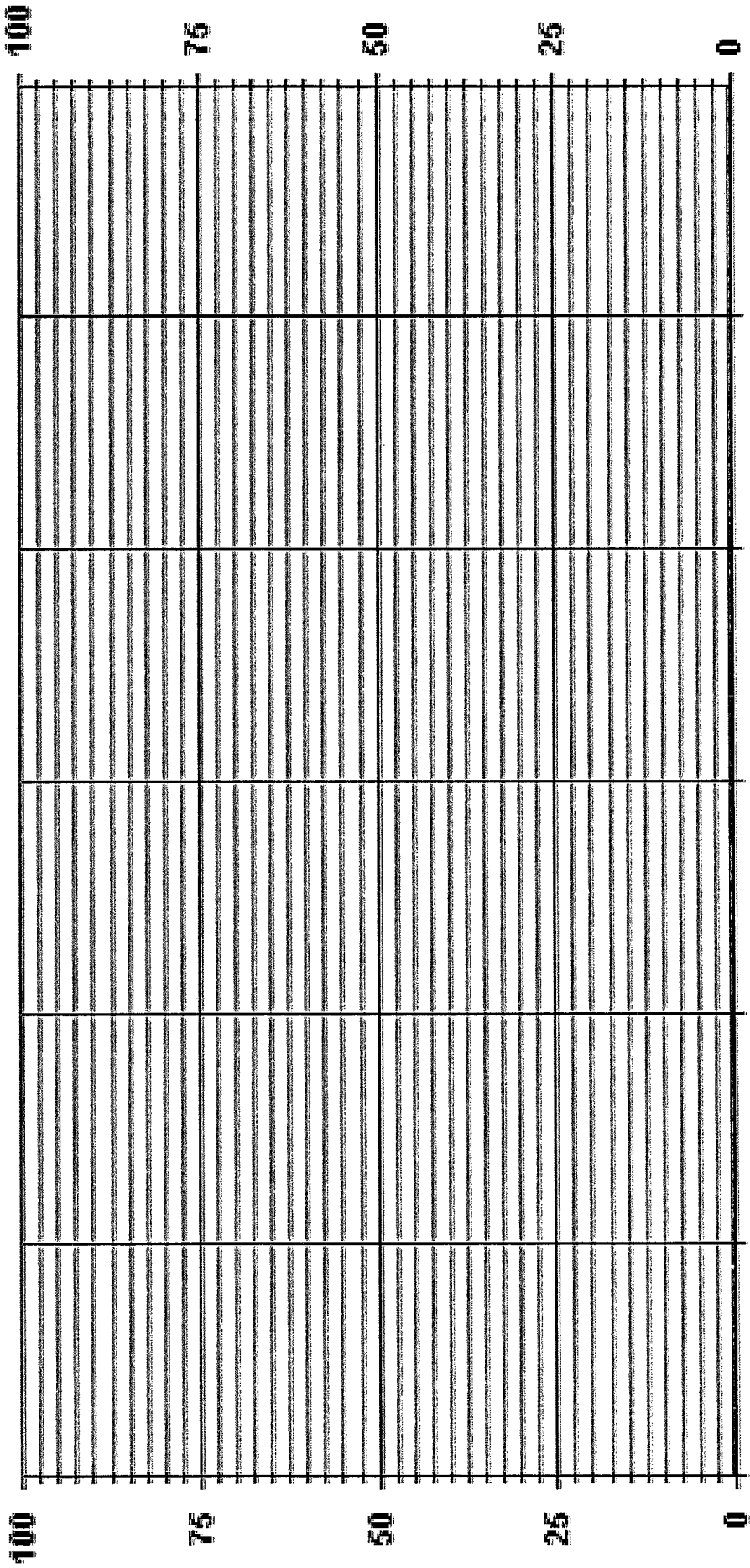
C - CALIBRATION
 Y - MAINTENANCE
 S - BATTERY/SPAN CHECK
 P - POWER FAILURE
 SG - OUT FOR REPAIR
 Q - QUALITY ASSURANCE
 R - RECOVERY
 X - MACHINE MALFUNCTION
 O - OPERATOR ERROR
 K - COLLECTION ERROR



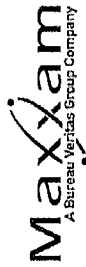
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	0
MAXIMUM 1-HR AVERAGE:	0 PPB
MAXIMUM 24-HR AVERAGE:	0.0 PPB
1ZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	4 HRS
STANDARD DEVIATION:	0.00
OPERATIONAL TIME:	720 HRS
AMD OPERATION UPTIME:	100.0 %
MONTHLY AVERAGE:	0 PPB

01 Hour Averages



— LICA TRS_ PPB



TOTAL REDUCED SULPHUR MAX instantaneous maximum in ppb

MST

HOUR START	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MAX	24-HOUR AVG	ROSS	
DAY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
HOURLY MAX	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	1.0
HOURLY AVG	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

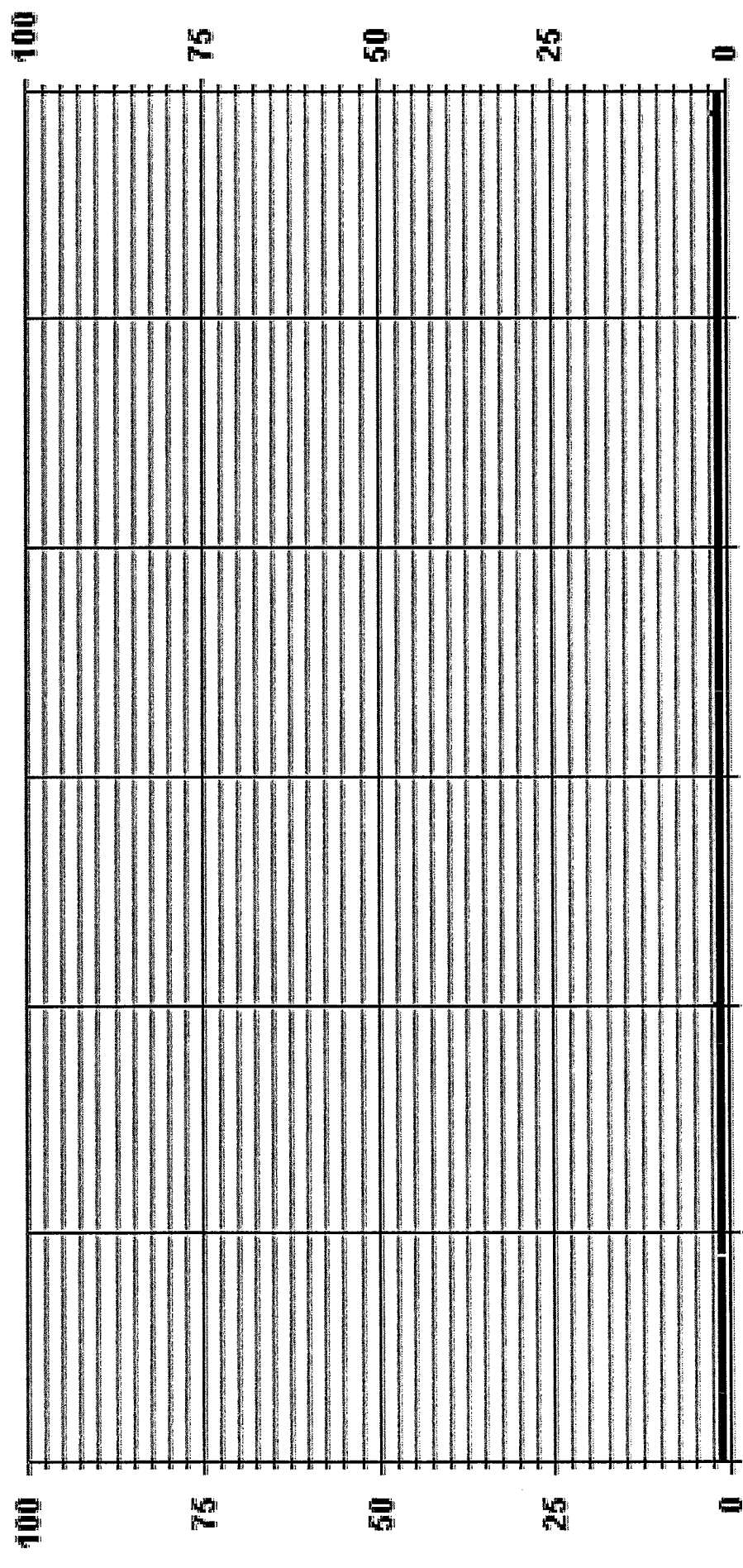
STATUS FLAG CODES

C	- CALIBRATION	O	- QUALITY ASSURANCE
Y	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	663
MAXIMUM INSTANTANEOUS VALUE:	2 PPB @ HOUR(S) 1 ON DAY(S) 11
OPERATIONAL TIME:	720 HRS
MONTHLY CALIBRATION TIME:	4 HRS
STANDARD DEVIATION:	0.05
VARIOUS	

01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA TRSMAX PPB

TRS_ / WDR Joint Frequency Distribution (Percent)

LICA

November 2015

Distribution By % Of Samples

Logger Id : 01
 Site Name : LICA
 Parameter : TRS
 Units : P25

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
< 3	1.02	.73	2.78	3.66	7.17	2.63	8.63	3.07	2.92	4.83	10.98	22.40	12.59	6.14	6.14	4.24	100.00	
< 10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
< 50	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
>= 50	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
Totals	1.02	.73	2.78	3.66	7.17	2.63	8.63	3.07	2.92	4.83	10.98	22.40	12.59	6.14	6.14	4.24		

Calm : .00 %

Total # Operational Hours : 683

Distribution By Samples

Direction





Limit	Direction																NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
< 3	7	5	19	25	49	18	59	21	20	33	75	153	86	42	42	29	683	
< 10																		
< 50																		
>= 50																		
Totals	7	5	19	25	49	18	59	21	20	33	75	153	86	42	42	29		

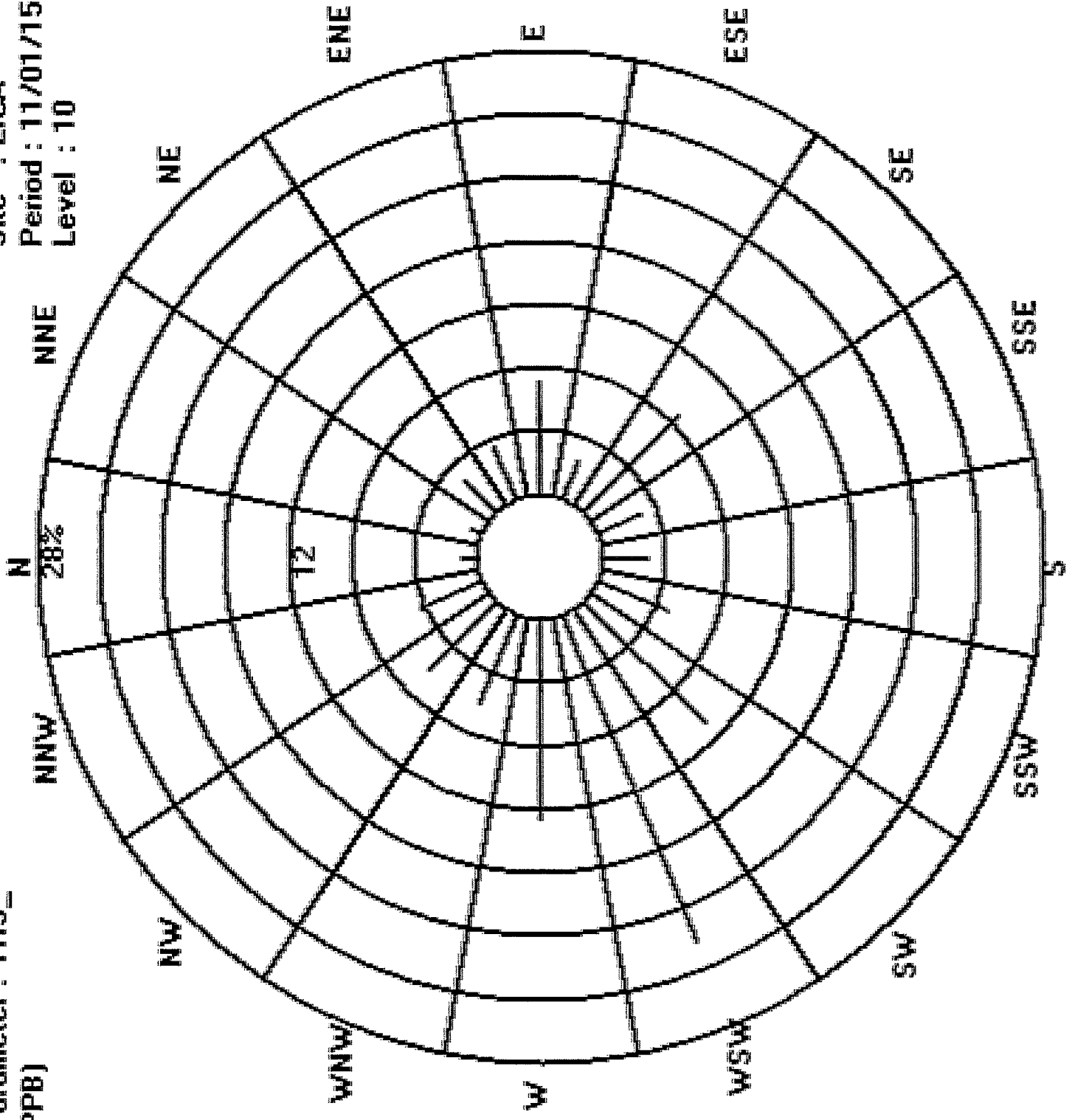
Calm : .00 %

Total # Operational Hours : 683

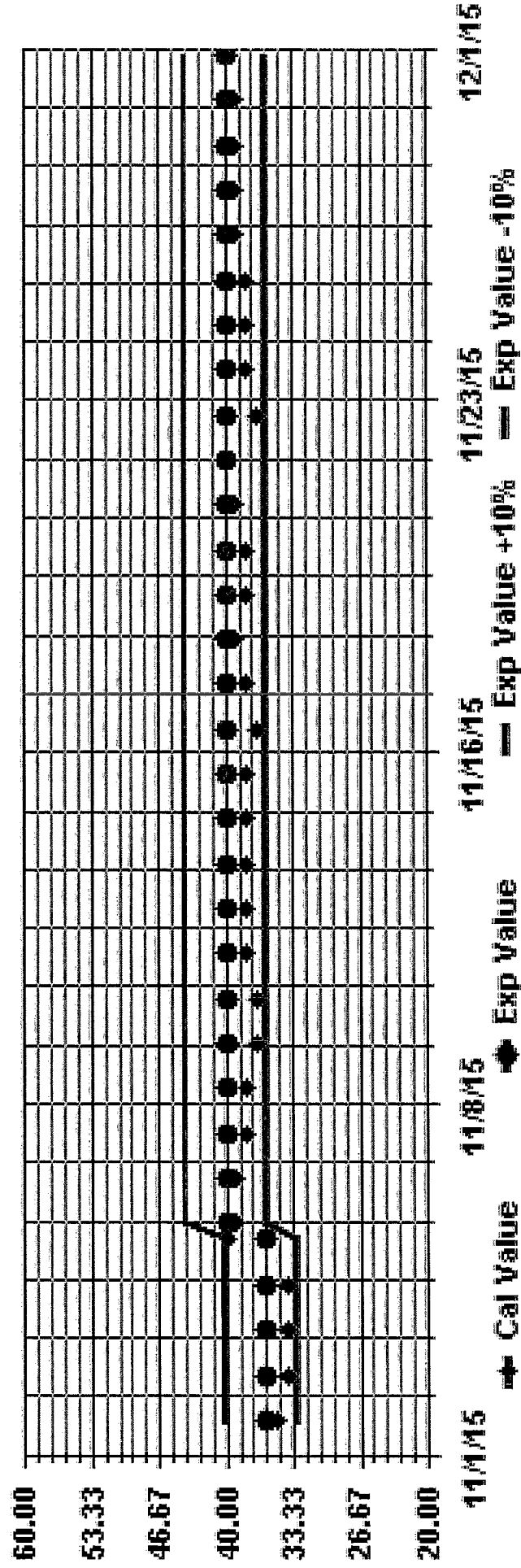
Site : LICA
Period : 11/01/15-11/30/15
Level : 10

Logger : 01 Parameter : TRS_
Class Limits (PPB)

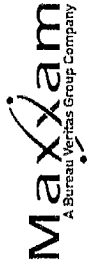
-  >= 50
-  < 50
-  < 10
-  < 3



Calibration Graph for Site: LICA Parameter: TRS_ Sequence: TRS Phase: SPAN



TOTAL HYDROCARBON



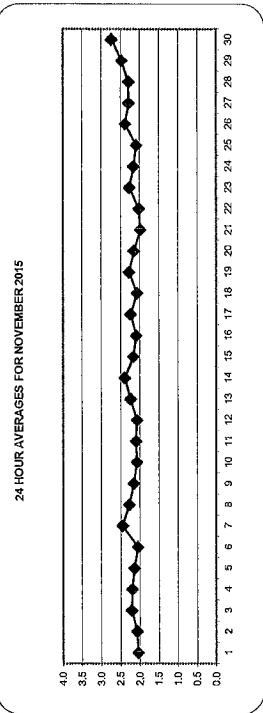
TOTAL HYDROCARBONS (THC) hourly averages in ppm

MST

DATE	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MAX	24-HOUR AVG	RDS	
1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1
2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
3	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.5	2.4	2.4	2.5	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2
4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
5	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
6	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
7	2.2	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
8	2.7	2.7	2.8	2.8	2.9	2.7	2.5	2.4	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
9	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
10	2.1	2.0	2.0	2.0	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
11	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
12	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
13	2.1	2.1	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
14	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
15	2.9	2.7	2.7	2.7	2.6	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
16	2.1	2.1	2.1	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
17	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
18	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
19	2.1	2.1	2.2	2.3	2.4	2.3	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
20	2.8	2.6	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
21	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
22	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
23	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
24	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
25	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
26	2.4	2.5	2.5	2.5	2.8	2.9	2.9	2.8	2.8	2.6	2.5	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
27	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
28	2.5	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
29	2.4	2.4	2.5	2.5	2.6	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
30	2.5	2.6	2.6	2.6	2.7	2.8	2.8	2.9	3.0	2.9	3.2	3.2	2.9	2.5	2.5	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
HOURLY MAX	2.9	2.7	2.8	2.8	2.9	2.9	2.8	2.9	3.0	2.9	3.2	3.2	2.9	2.5	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
HOURLY AVG	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2

STATUS FLAG CODES

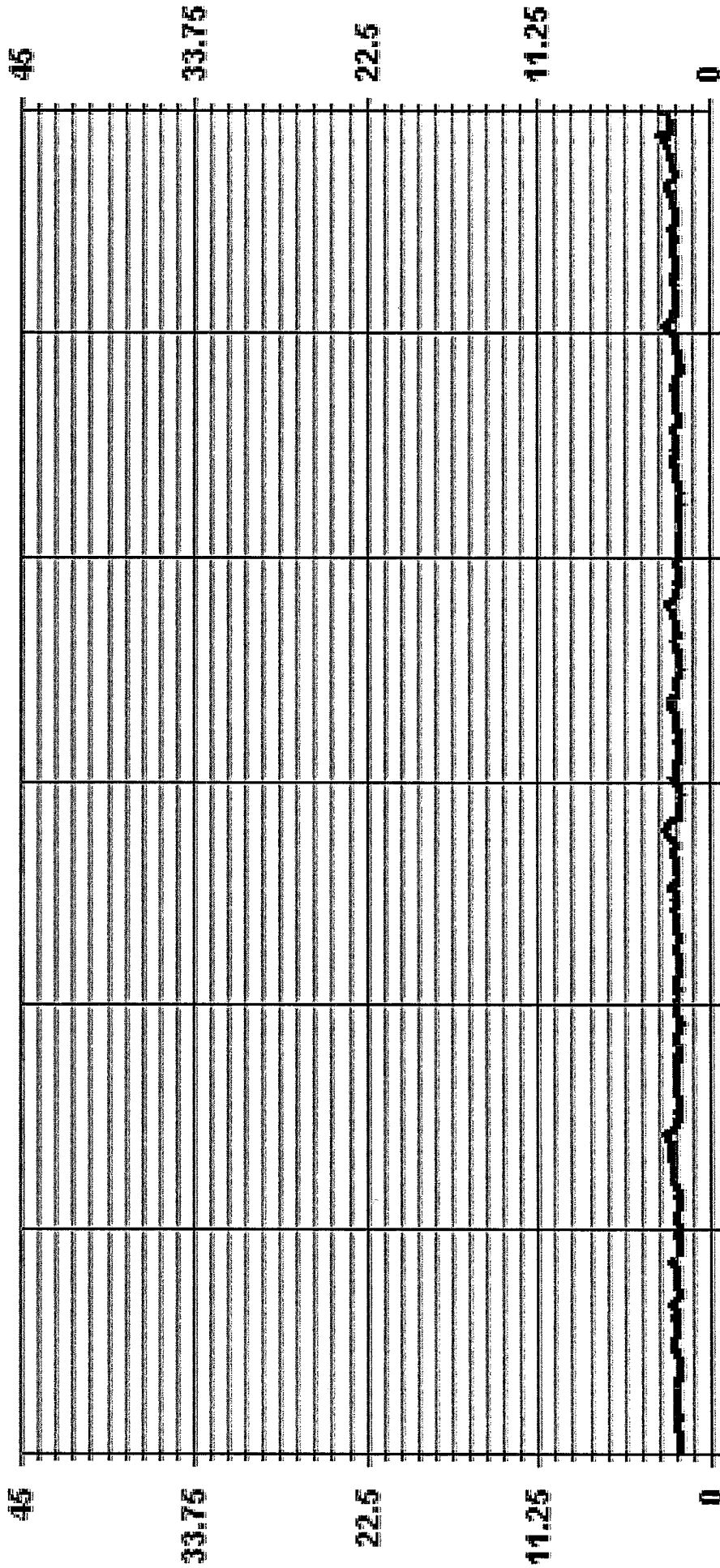
C	CALIBRATION	Q	QUALITY ASSURANCE
Y	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SRANGE CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR



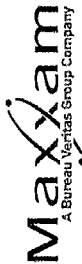
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	684
MAXIMUM 1-HR AVERAGE:	3.2 PPM
MAXIMUM 24-HR AVERAGE:	2.7 PPM
ISZ CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	4 HRS
STANDARD DEVIATION:	0.22
OPERATIONAL TIME:	720 HRS
AMD OPERATIONAL UPTIME:	100.0 %
MONTHLY AVERAGE:	2.2 PPM
ON DAY(S)	10, 11
ON DAY(S)	VAR-VARIOUS
ON DAY(S)	30, 30

01 Hour Averages



— LICA - - - THC . . . PPM



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Site - NOVEMBER 2015
JOB # 2833-2015-11-01-C

TOTAL HYDROCARBONS MAX instantaneous maximum in ppm

DAY	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
HOURLY MAX	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
HOURLY AVG	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	
DAILY MAX	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	
DAILY AVG	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	

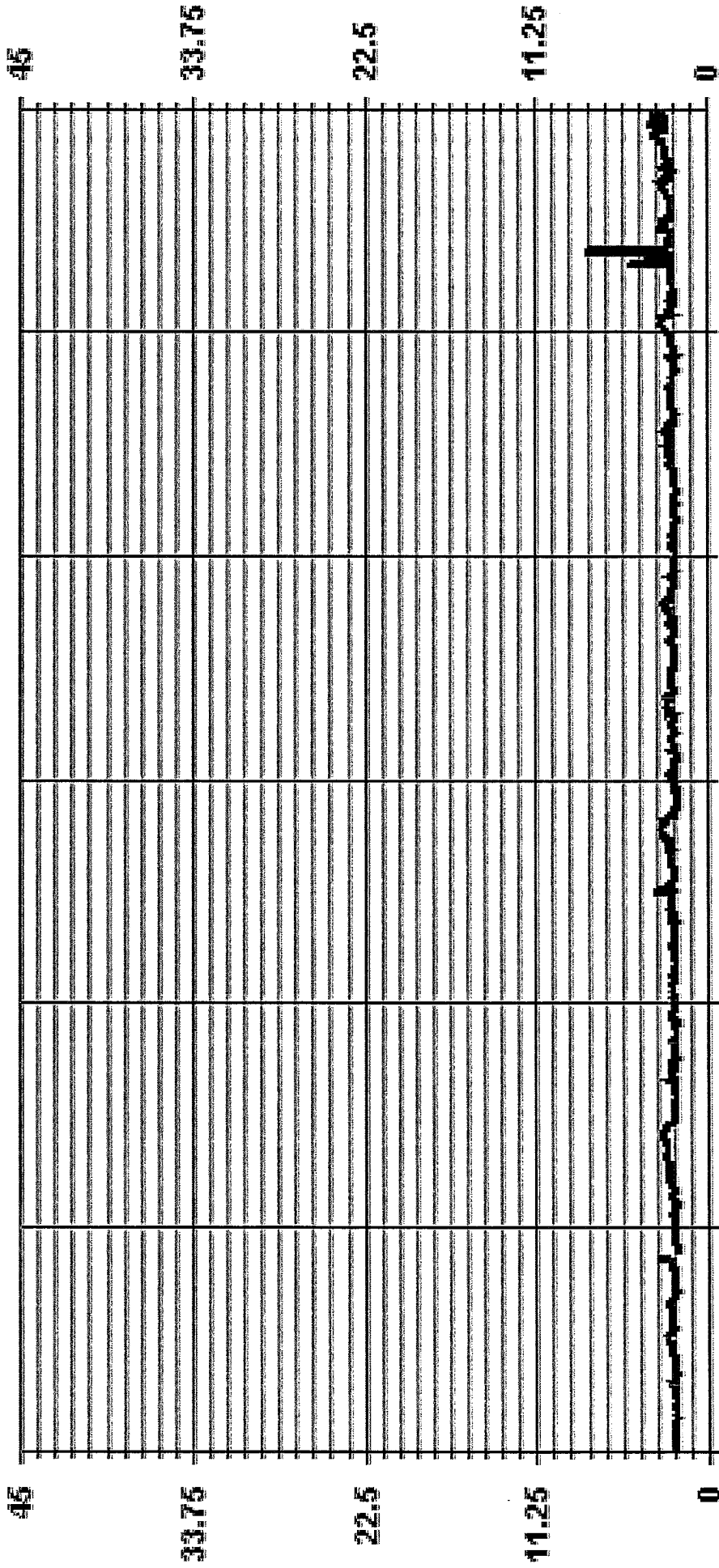
STATUS FLAG CODES

C	--- CALIBRATION	Q	--- QUALITY ASSURANCE
M	--- MAINTENANCE	R	--- RECOVERY
S	--- DAILY ZERO/SPAN CHECK	X	--- MACHINE MALFUNCTION
P	--- POWER FAILURE	O	--- OPERATOR ERROR
G	--- OUT FOR REPAIR	K	--- COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	683
MAXIMUM INSTANTANEOUS VALUE:	8.0 PPM @ HOUR(S) 20 ON DAY(S) 27
1ZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	4 HRS
STANDARD DEVIATION:	0.37
OPERATIONAL TIME:	VAR- VARIOUS
720 HRS	

01 Hour Averages



— LICA THCMAX PPM

LICA
 THC / WD Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 01
 Site Name : LICA
 Parameter : THC
 Units : PPM

Wind Parameter : WD
 Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 3.0	1.02	.87	2.77	3.50	7.16	2.63	8.62	3.07	2.92	4.82	10.96	22.07	12.42	6.14	5.99	4.38	99.41
< 10.0	.00	.00	.00	.00	.00	.00	.00	.14	.00	.00	.00	.29	.14	.00	.00	.00	.58
< 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.02	.87	2.77	3.50	7.16	2.63	8.62	3.21	2.92	4.82	10.96	22.36	12.57	6.14	5.99	4.38	

Calm : .00 %

Total # Operational Hours : 684

Distribution By Samples

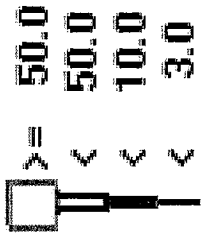
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 3.0	7	6	19	24	49	18	59	21	20	33	75	151	85	42	41	30	680
< 10.0							1				2		1				4
< 50.0																	
>= 50.0																	
Totals	7	6	19	24	49	18	59	22	20	33	75	153	86	42	41	30	

Calm : .00 %

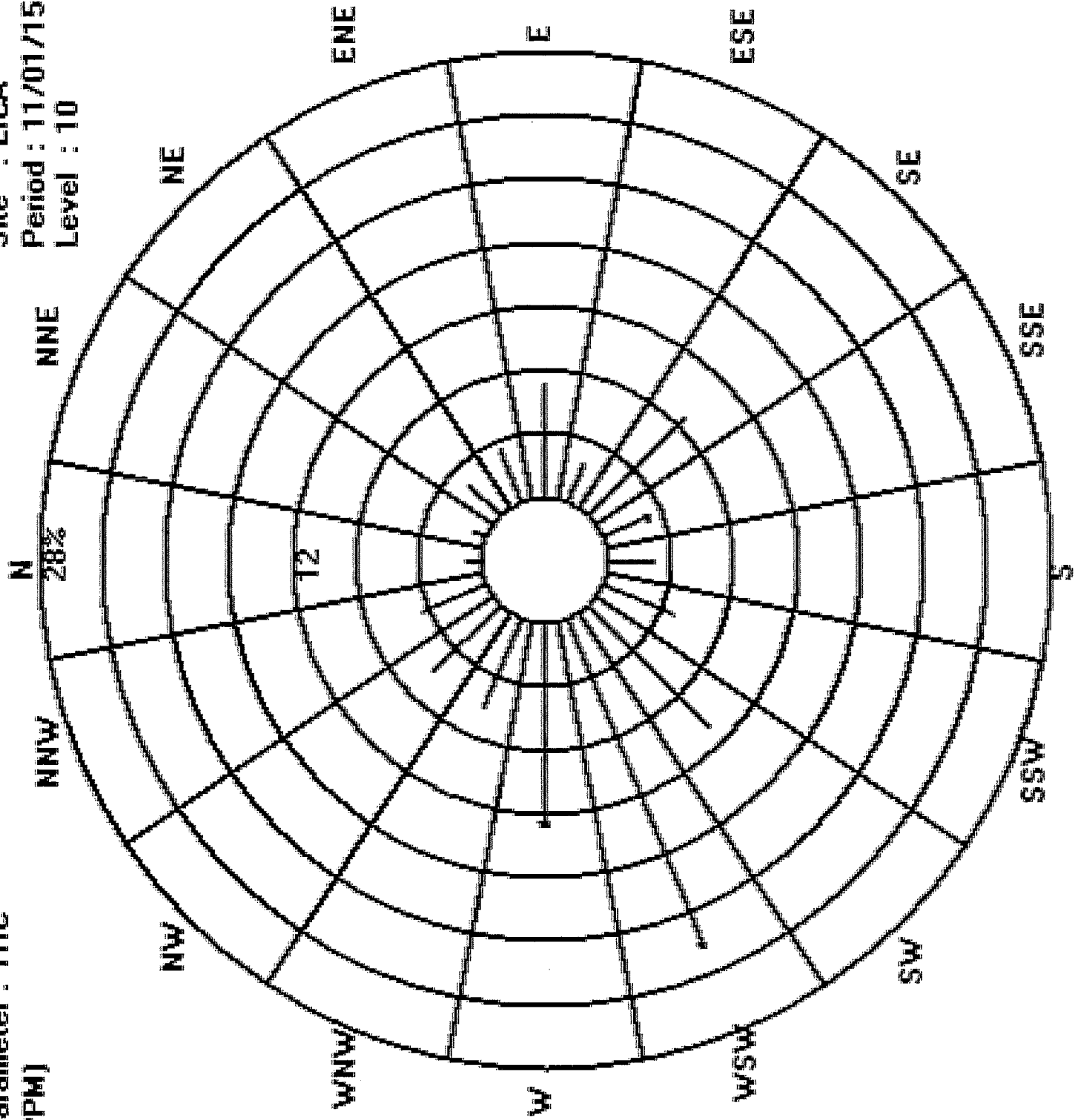
Total # Operational Hours : 684

Logger : 01 Parameter : THC

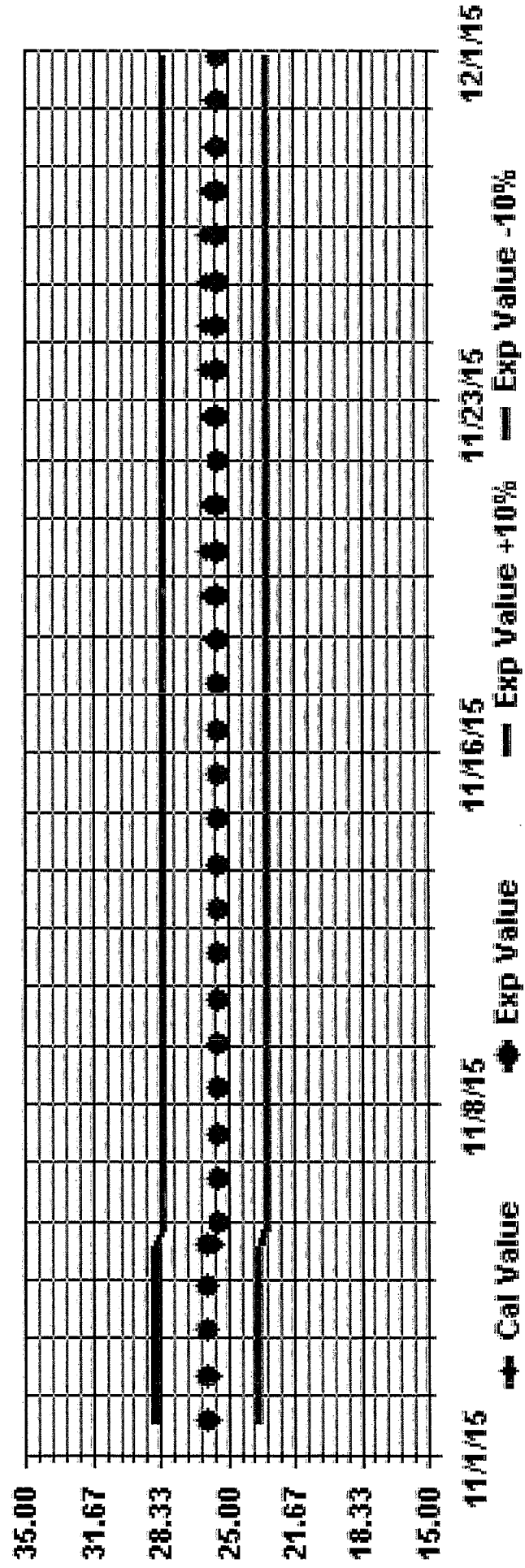
Class Limits (PPM)



Site : LICA
Period : 11/01/15-11/30/15
Level : 10



Calibration Graph for Site: LICA Parameter: THC Sequence: THC Phase: SPAN



OXIDES OF NITROGEN



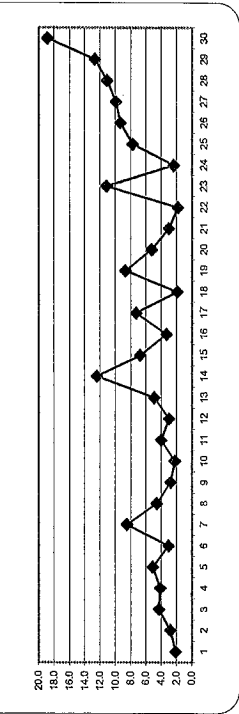
OXIDES OF NITROGEN (NOx) hourly averages in ppb

DAY	HOURS																								DAILY MAX	24-HOUR AVG	RDS.	
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				24:00
1	2.0	2.3	2.1	1.8	2.4	6.2	2.5	2.2	2.7	2.4	1.5	1.1	1.7	1.3	2.3	1.6	1.9	2.3	5	2.8	2.4	1.5	1.2	1.3	6.2	2.2	24	
2	1.3	1.2	2.2	1.8	1.9	3.3	2.7	3.2	4.8	3.3	3.5	3.6	4.7	3.9	3.7	4.7	2.9	5	2.3	2.0	1.6	2.4	1.9	2.0	4.8	2.8	24	
3	2.4	2.0	1.6	1.5	2.3	4.8	4.1	3.0	5.4	7.1	6.0	7.1	7.5	7.1	8.3	5.5	5	2.4	3.4	2.6	3.2	6.5	3.6	1.9	8.3	4.3	24	
4	2.8	2.9	2.6	3.1	2.5	3.5	9.3	11.2	9.3	7.4	3.7	3.3	3.5	3.1	5	2.6	2.6	2.8	2.8	2.5	2.7	2.9	3.1	11.2	4.2	24		
5	4.5	4.5	4.8	5.9	6.8	8.1	10.7	13.8	18.0	C	C	C	C	C	C	1.3	1.2	1.5	1.4	1.1	1.2	1.3	1.1	18.0	5.1	24		
6	2.0	2.5	1.7	1.8	1.4	2.5	4.1	7.4	4.2	3.3	3.3	2.8	1.7	3.0	1.8	2.6	4.1	3.9	3.2	2.9	3.4	4.0	5	2.9	7.4	3.1	24	
7	3.4	4.4	5.5	4.8	3.5	3.4	4.5	11.5	9.3	10.9	7.8	6.9	9.3	9.3	11.4	13.7	14.0	12.1	10.7	10.2	5	11.4	8.7	14.0	8.5	24		
8	9.4	8.3	8.9	10.4	8.9	10.1	6.4	4.4	4.4	5.1	4.1	2.3	2.4	2.1	1.8	2.5	3.8	2.5	2.3	2.3	5	1.5	1.1	0.8	10.4	4.5	24	
9	0.6	0.4	0.5	0.5	0.6	0.8	2.1	2.9	3.8	2.5	6.5	7.5	7.6	5.0	1.7	1.2	1.7	3.3	3.6	5	3.3	3.2	3.0	2.1	7.6	2.8	24	
10	1.3	0.6	0.5	1.0	2.3	2.5	1.8	1.7	1.9	1.5	1.5	1.5	1.7	1.5	1.6	1.6	1.9	4.5	5.5	5	2.9	4.1	3.8	2.5	3.3	5.5	2.2	24
11	2.9	2.3	1.9	2.3	3.5	5.3	2.9	4.1	3.5	3.7	3.5	3.7	2.7	2.1	2.1	2.8	5.0	5	3.7	3.1	2.5	2.1	2.1	1.9	1.7	7.3	3.0	24
12	2.4	2.5	2.1	1.9	2.5	2.7	4.0	4.6	7.3	3.5	3.7	2.7	2.1	2.1	2.1	2.8	5.0	5	3.7	3.1	2.5	2.1	2.1	1.9	1.7	7.3	3.0	24
13	2.0	2.1	3.1	2.2	2.4	3.0	3.4	5.6	4.8	3.5	6.1	5.1	6.0	9.5	8.1	9.2	11.9	6.8	5.2	3.4	3.0	3.9	3.2	11.9	4.9	24		
14	3.0	3.2	3.6	4.2	3.4	4.1	5.6	6.5	7.6	6.5	5.8	6.4	7.3	7.4	5	8.9	13.8	21.4	25.3	33.0	22.5	29.5	29.5	33.2	24.0	12.4	24	
15	21.8	18.3	15.5	15.3	14.7	8.2	3.6	2.3	2.2	2.3	2.6	1.9	2.4	5	2.6	3.4	5.1	3.0	3.6	4.1	7.2	4.5	5.5	6.0	21.8	6.8	24	
16	2.8	2.9	2.4	2.3	2.0	2.4	2.8	4.2	4.8	4.2	4.5	5	4.6	4.4	5.4	11.0	Q	Q	27.8	25.2	18.5	10.9	3.3	27.8	7.3	24		
17	3.2	4.0	1.6	1.8	0.9	0.6	0.7	1.1	1.2	Y	Y	Y	0.6	0.7	0.7	0.8	0.8	1.8	2.5	3.9	3.5	4.7	2.1	3.0	4.7	1.9	21	
18	2.5	3.6	6.8	6.5	9.3	10.4	8.0	10.8	9.5	S	13.0	6.2	6.8	5.5	5.0	6.6	11.8	6.6	8.2	10.1	11.7	14.9	12.4	14.0	14.9	8.7	24	
19	14.0	13.5	11.1	7.8	6.9	4.7	5.6	5.4	5	2.9	3.8	2.3	2.2	3.1	2.7	2.8	5.0	4.4	3.1	2.8	3.7	4.7	4.8	4.3	14.0	5.3	24	
20	3.6	2.9	3.1	3.9	4.3	3.8	5	3.8	2.9	2.7	2.0	2.3	2.0	1.8	2.0	2.0	1.8	2.2	2.0	2.6	3.9	3.5	3.6	4.3	3.0	24		
21	2.7	2.8	2.2	1.9	1.7	1.5	1.7	1.5	1.5	1.5	1.0	0.5	0.5	0.5	0.7	1.4	1.5	1.9	1.8	2.6	3.8	3.5	2.6	3.2	3.8	1.9	24	
22	4.9	2.4	3.1	3.3	3.1	5	9.8	22.2	30.2	18.3	17.7	10.9	6.8	5.9	7.0	7.7	10.1	9.6	12.8	15.1	17.2	18.1	16.5	4.6	30.2	11.2	24	
23	1.4	1.4	1.1	1.0	1.0	0.9	1.4	2.4	2.1	2.8	2.3	1.8	1.3	1.3	1.3	1.5	1.3	2.6	7.3	7.0	5.9	3.1	1.8	1.9	7.3	2.4	24	
24	1.4	0.8	0.7	5	2.4	2.2	1.9	2.9	2.4	2.0	3.1	5.4	6.9	8.6	7.7	8.0	8.6	8.7	7.9	7.4	7.6	8.0	8.3	8.6	8.8	18.3	9.4	24
25	8.4	9.5	10.7	10.5	8.5	10.8	18.3	13.4	11.9	6.7	8.7	8.7	8.6	7.7	8.0	8.6	8.7	7.9	7.4	7.6	8.0	8.3	8.6	8.8	18.3	9.4	24	
26	8.9	5	8.4	8.2	7.9	9.0	9.8	8.8	8.3	9.5	6.1	5.1	6.6	6.6	10.9	9.3	7.0	10.8	10.8	12.0	10.0	10.0	14.8	31.0	10.0	24		
27	S	18.8	11.9	7.1	7.4	3.4	6.3	14.9	17.0	25.0	10.2	8.9	9.0	7.9	7.5	7.5	9.1	12.7	10.2	9.5	9.9	9.6	20.8	5	25.0	11.1	24	
28	10.2	10.1	8.3	8.6	11.1	11.9	10.1	14.7	19.7	16.3	13.0	10.9	9.2	9.8	12.3	13.0	11.8	10.3	14.9	16.0	17.2	5	13.2	19.7	12.7	24		
29	11.8	8.1	7.5	7.2	6.5	8.6	10.5	18.4	28.6	30.8	35.4	27.0	19.2	18.4	16.6	21.4	31.2	25.6	20.7	19.8	23.5	5	22.6	15.5	35.4	18.9	24	
30	21.8	18.8	15.5	15.3	14.7	11.9	10.8	22.2	30.2	30.8	35.4	27.0	19.2	18.4	16.6	21.4	31.2	25.6	20.7	19.8	23.5	5	22.6	15.5	35.4	18.9	24	
HOURLY MAX	4.8	4.9	4.5	4.7	4.8	4.8	5.1	7.3	8.2	7.3	6.8	5.6	5.3	5.2	4.9	5.9	7.3	7.1	7.0	8.0	8.0	7.3	8.3	6.1				
HOURLY AVG																												

STATUS FLAG CODES

C	QUALITY ASSURANCE	Q	QUALITY ASSURANCE
Y	MAINTENANCE	R	RECOVERY
S	-DAILY ZERO/SPAN CHECK	X	-MACHINE MALFUNCTION
P	-POWER FAILURE	O	-OPERATOR ERROR
G	-OUT FOR REPAIR	K	-COLLECTION ERROR

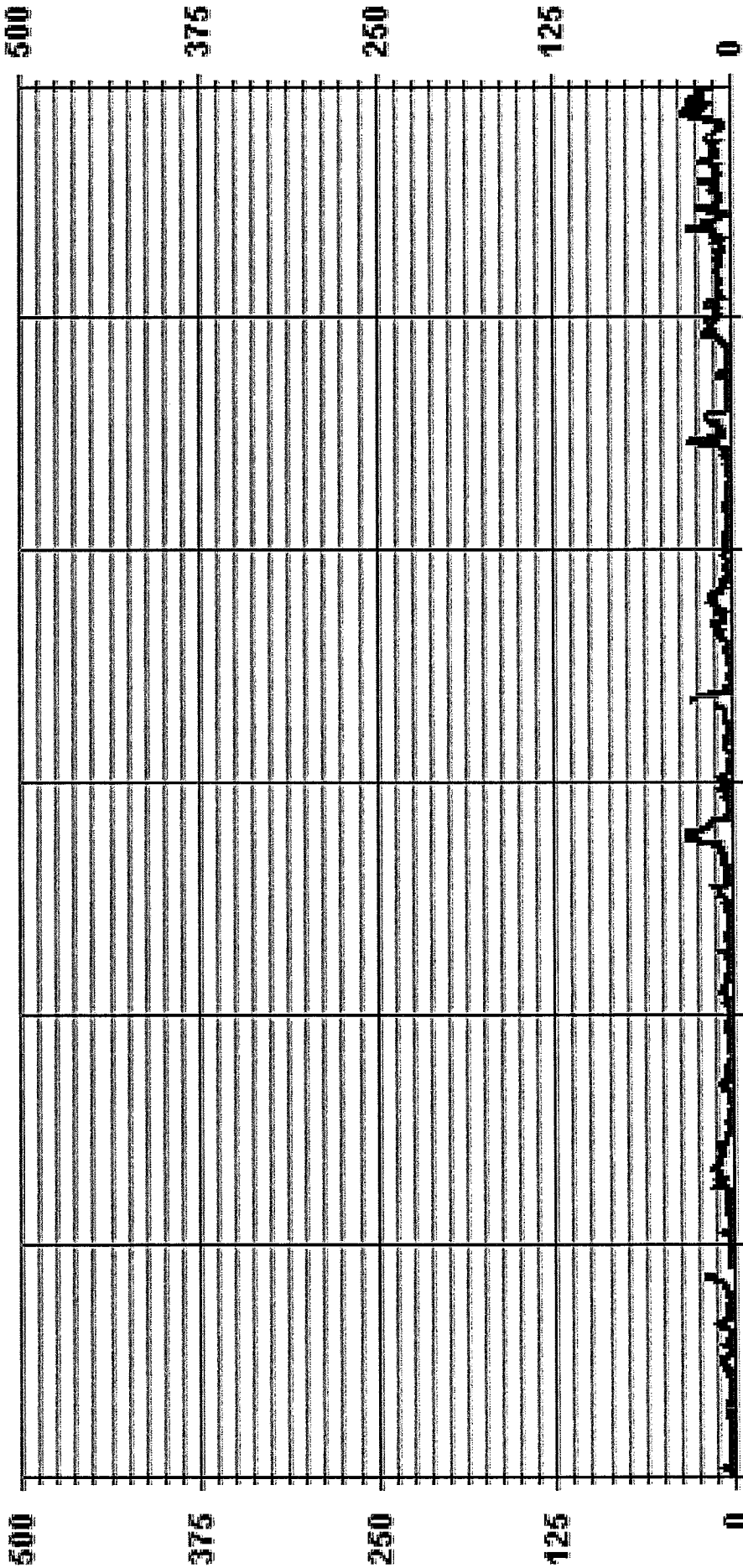
24 HOUR AVERAGES FOR NOVEMBER 2015



MONTHLY SUMMARY

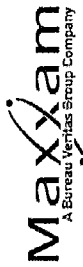
NUMBER OF NON-ZERO READINGS:	678	ON DAY(S)	30
MAXIMUM 1-HR AVERAGE:	35.4 PPB	ON DAY(S)	30
MAXIMUM 24-HR AVERAGE:	18.9 PPB	VAR-VARIOUS	
12S CALIBRATION TIME:	30 HRS	OPERATIONAL TIME:	717 HRS
MONTHLY CALIBRATION TIME:	6 HRS	AMID OPERATION UPTIME:	99.6 %
STANDARD DEVIATION:	5.82	MONTHLY AVERAGE:	6.2 PPB

01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA - - - NOX_ . . . PPB



OXIDES OF NITROGEN MAX instantaneous maximum in ppb

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MAX	24-HOUR AVG	RDSS
1	4.6	4.1	4.1	4.1	4.1	4.6	6.6	3.6	5.6	9.1	4.1	2.1	3.1	3.6	9.1	3.6	5.1	6.6	11.5	5.0	4.0	3.5	4.5	14.6	5.4	24	
2	5.0	3.5	4.5	3.5	5.5	5.0	7.0	8.5	7.5	6.0	6.5	7.5	45.4	6.0	6.9	9.0	7.0	5.0	11.5	3.0	6.0	6.0	3.5	45.4	7.5	24	
3	5.5	4.5	3.5	5.0	8.0	6.5	4.0	8.0	8.0	9.0	8.5	11.5	14.5	40.9	65.4	15.5	5.0	4.0	6.9	5.5	6.0	28.5	8.4	3.9	65.4	12.1	24
4	4.9	3.5	3.4	5.5	2.9	6.0	12.4	15.9	17.4	9.9	9.9	6.5	4.5	9.0	6.0	5.0	4.0	6.5	4.0	4.0	3.5	3.0	3.0	4.0	17.4	6.5	24
5	7.0	8.5	8.5	10.5	11.5	17.5	17.5	30.5	C	C	C	C	C	C	C	1.5	2.0	2.6	2.1	1.6	1.5	2.0	5.0	30.5	7.9	24	
6	2.4	5.0	5.5	4.4	2.9	6.9	7.9	102.9	6.0	4.9	4.4	5.4	17.4	2.9	8.4	25.4	10.4	4.4	3.9	6.5	4.9	5.0	3.5	102.9	10.9	24	
7	6.0	11.5	10.0	9.4	5.5	5.4	7.9	20.4	17.4	38.4	15.9	8.5	13.5	11.0	15.0	13.9	28.0	22.5	20.0	17.5	20.0	5.0	22.6	13.0	38.4	15.4	24
8	14.6	14.1	13.1	14.1	15.6	12.6	9.6	8.6	20.1	11.6	12.1	4.1	4.6	4.6	3.6	7.0	6.6	4.1	4.6	3.6	5.0	6.0	4.0	2.0	20.1	8.7	24
9	1.5	1.0	1.4	2.4	1.4	3.9	4.4	4.9	7.4	8.9	19.4	34.9	30.4	4.4	25.4	4.9	12.4	5.4	5.0	7.0	8.5	4.5	3.0	34.9	10.1	24	
10	2.5	1.0	1.0	1.5	3.0	3.0	2.5	2.0	3.0	1.5	2.0	14.0	2.5	2.0	2.5	3.5	8.0	22.5	5.0	10.4	7.4	3.9	4.5	22.5	5.0	24	
11	4.4	3.4	3.9	3.9	6.0	24.9	5.5	6.0	5.5	6.0	5.9	6.0	17.4	10.4	8.4	8.9	7.9	7.9	7.5	5.0	6.6	7.5	8.0	4.5	24.9	7.5	24
12	5.6	4.5	5.5	3.0	4.6	5.0	8.5	9.5	17.6	6.0	6.0	5.1	5.6	10.5	3.6	12.1	5.0	9.5	4.5	4.0	6.0	2.9	2.4	3.4	17.6	6.3	24
13	4.4	3.9	6.9	4.9	5.0	5.5	9.9	10.4	14.4	10.9	15.4	10.4	137.9	144.9	20.4	5.0	12.5	18.5	10.5	7.4	4.9	6.0	6.0	4.9	144.9	20.7	24
14	4.9	4.9	5.5	10.4	6.9	8.4	7.9	10.4	10.4	8.9	7.9	14.4	12.9	10.4	5.0	16.5	24.4	44.9	50.4	52.4	38.4	51.4	68.9	47.4	68.9	22.6	24
15	31.4	35.4	21.4	28.9	24.4	13.4	6.9	3.9	3.4	3.9	2.9	4.0	5.0	3.5	9.0	19.4	4.5	7.0	8.0	15.5	11.0	19.4	14.4	35.4	12.8	24	
16	4.9	9.4	9.9	11.9	10.4	4.9	3.4	4.4	4.4	4.9	2.4	2.9	5.0	2.4	0.9	2.9	8.4	13.4	7.4	7.4	9.4	7.9	4.9	5.5	13.4	6.3	24
17	4.0	3.9	2.9	2.9	2.9	3.9	8.9	6.9	9.9	6.0	6.0	5.0	9.1	6.6	8.6	21.6	Q	Q	38.5	39.1	27.1	16.6	5.6	39.1	11.6	24	
18	6.6	5.1	3.6	3.5	3.0	2.5	2.0	2.0	2.0	Y	Y	Y	1.0	1.0	1.5	1.5	2.5	3.5	4.5	6.5	8.0	4.0	5.0	8.0	3.4	20	
19	4.5	24.9	14.0	13.0	10.5	15.5	13.5	18.0	21.0	5.0	84.5	10.5	12.5	8.0	8.5	10.5	32.5	12.0	11.9	12.5	19.5	27.5	18.0	26.5	34.5	16.7	24
20	17.0	18.5	14.0	13.0	10.5	5.5	9.0	8.0	5.0	5.5	4.5	3.5	3.5	14.5	5.0	15.0	14.0	7.5	4.5	6.5	6.5	5.0	5.5	5.0	7.0	4.9	24
21	4.0	4.0	4.0	5.0	5.5	6.5	6.0	3.0	3.0	3.0	7.0	3.0	3.0	4.5	5.0	6.0	4.5	5.0	5.5	5.0	5.5	5.0	5.5	5.0	7.0	4.9	24
22	4.0	4.0	4.0	3.5	2.5	2.5	5.0	3.0	3.0	2.0	1.5	1.0	1.0	2.0	4.5	4.0	3.5	3.5	3.5	3.5	5.5	6.9	6.5	5.0	7.5	3.6	24
23	14.5	7.0	11.0	5.0	5.0	28.5	52.0	75.0	24.0	27.5	26.5	10.0	11.0	7.5	10.5	34.5	12.5	20.0	23.0	23.0	23.0	23.0	24.9	14.5	75.0	21.3	24
24	3.0	3.0	2.0	3.0	3.0	2.0	2.5	4.5	3.5	3.5	3.5	2.0	2.0	13.9	13.9	2.0	6.0	11.5	10.5	13.5	7.0	5.0	2.5	13.9	5.4	24	
25	3.5	3.0	2.0	3.0	4.0	5.5	4.5	4.5	4.5	4.5	10.0	11.5	9.0	11.5	12.5	63.0	63.5	41.4	22.0	24.5	19.0	26.4	20.5	16.0	63.5	16.7	24
26	13.0	15.5	5.0	19.0	25.0	13.4	14.5	30.5	21.5	20.5	8.5	12.0	9.5	16.5	11.5	11.0	9.5	11.5	8.5	9.0	13.0	10.5	11.0	13.5	30.5	14.3	24
27	11.0	5.0	10.5	10.0	17.5	13.5	13.4	11.5	14.0	16.0	7.5	6.0	8.0	8.0	25.9	16.0	10.0	22.0	29.5	18.5	76.9	29.5	76.9	17.9	24		
28	5.0	33.9	21.0	20.0	27.5	6.5	19.0	24.0	40.0	37.9	12.4	10.5	11.0	16.0	12.4	11.0	12.9	21.0	15.5	11.0	11.5	14.0	44.9	5.0	44.9	19.7	24
29	14.0	16.0	13.5	18.5	18.5	26.9	16.0	28.0	35.5	40.5	29.5	20.4	18.9	12.0	22.5	30.5	44.4	17.0	29.4	28.5	33.9	32.4	24.1	44.4	24.8	24	
30	16.6	11.1	12.6	13.5	7.6	12.0	16.6	28.0	53.1	39.6	44.5	37.1	29.6	36.1	32.5	45.6	124.5	43.6	51.5	27.1	63.0	5.0	33.1	26.0	124.5	35.0	24
HOURLY MAX	31.4	35.4	21.4	28.9	27.5	26.9	28.5	102.9	75.0	40.5	44.5	37.1	137.9	144.9	65.4	63.0	124.5	44.9	51.5	52.4	63.0	51.4	76.9	47.4			
HOURLY AVG	7.8	9.2	7.8	8.7	8.6	8.9	9.5	15.7	16.5	12.6	11.8	10.5	15.6	16.1	10.8	14.5	19.6	14.0	13.1	13.1	14.8	13.2	15.6	10.8			

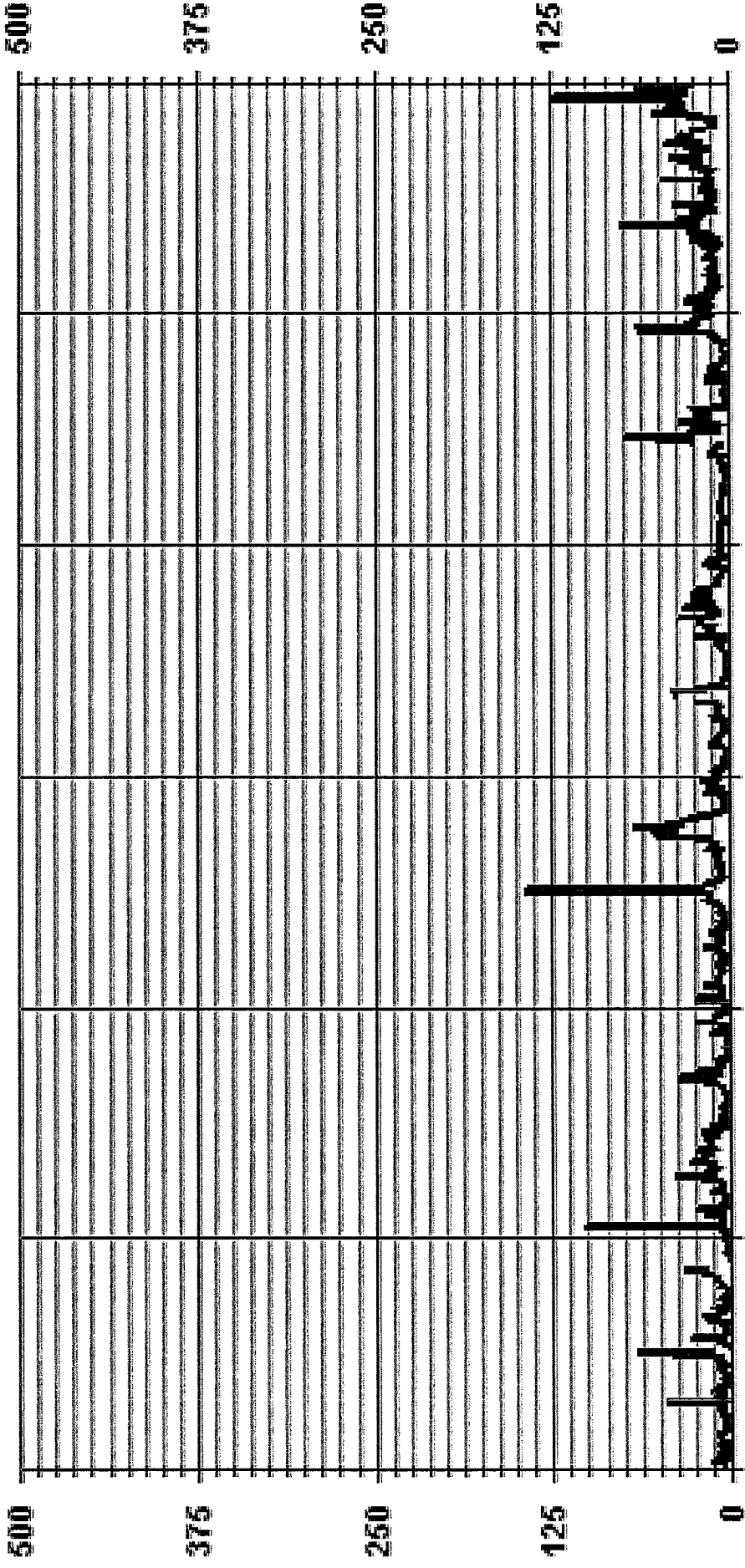
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
Y	MAINTENANCE	R	RECOVERY
S	DALY ZERO SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	677	ON DAY(S)	14
MAXIMUM INSTANTANEOUS VALUE:	144.9 PPB	@ HOUR(S)	13
IS CALIBRATION TIME:	30 HRS	OPERATIONAL TIME:	716 HRS
MONTHLY CALIBRATION TIME:	6 HRS	VAR- VARIOUS	
STANDARD DEVIATION:	14.59		

01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA NOXMAX PPB

LIICA
NO_x / WD Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 01
Site Name : LIICA
Parameter : NO_x
Units : PPS

Wind Parameter : WD
Instrument Height : 10 Meters

Limit	Direction													Freq			
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W		WNW	NW	NNW
< 50.0	1.03	.73	2.80	3.53	7.22	2.65	8.70	3.09	2.94	4.86	11.06	22.56	12.68	6.04	5.75	4.27	100.00
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.03	.73	2.80	3.53	7.22	2.65	8.70	3.09	2.94	4.86	11.06	22.56	12.68	6.04	5.75	4.27	

Calm : .00 %

Total # Operational Hours : 678

Distribution By Samples





Limit	Direction													Freq			
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W		WNW	NW	NNW
< 50.0	7	5	19	24	49	18	59	21	20	33	75	153	86	41	39	29	678
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	7	5	19	24	49	18	59	21	20	33	75	153	86	41	39	29	

Calm : .00 %

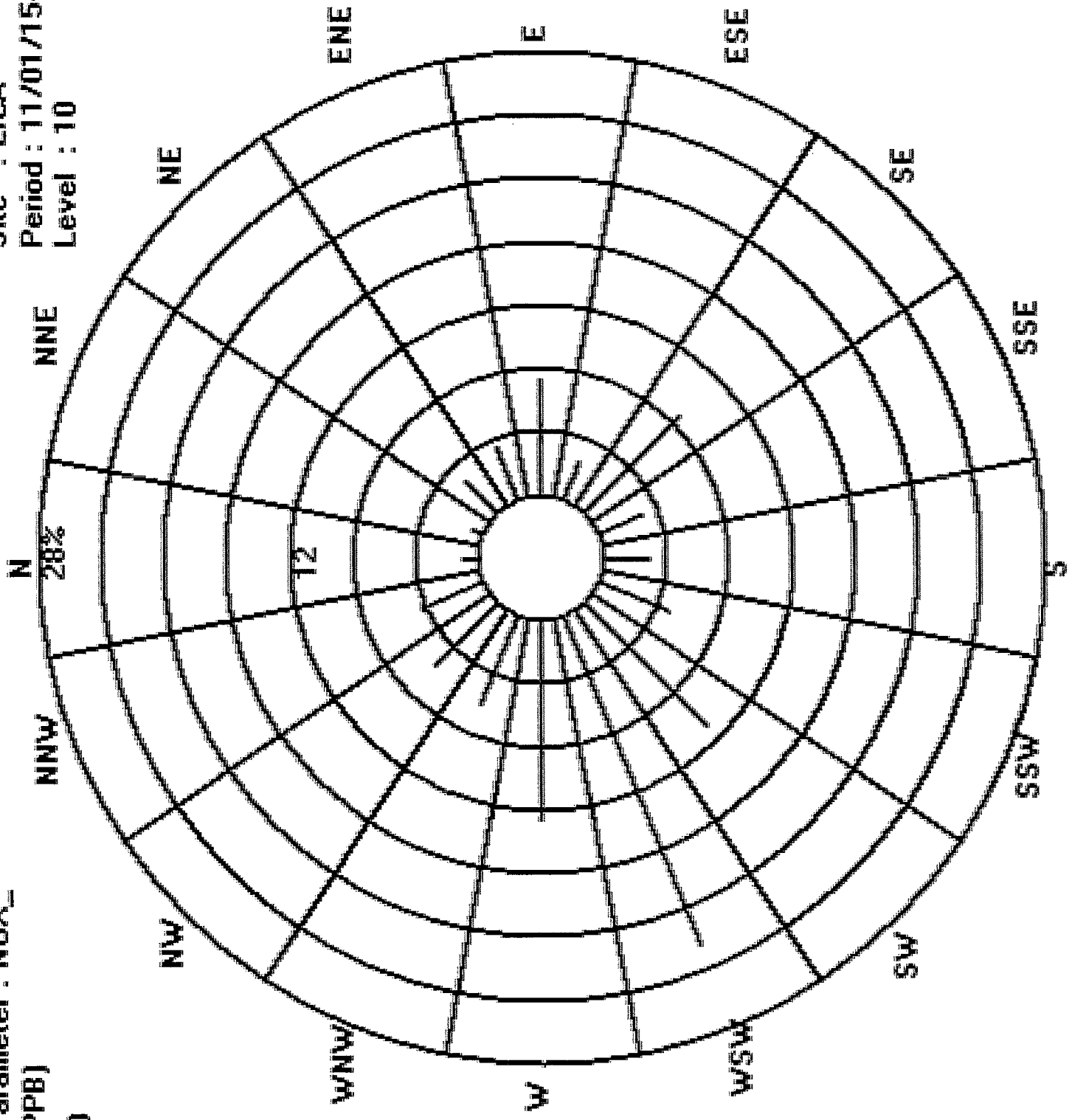
Total # Operational Hours : 678

Logger : 01 Parameter : NDX_

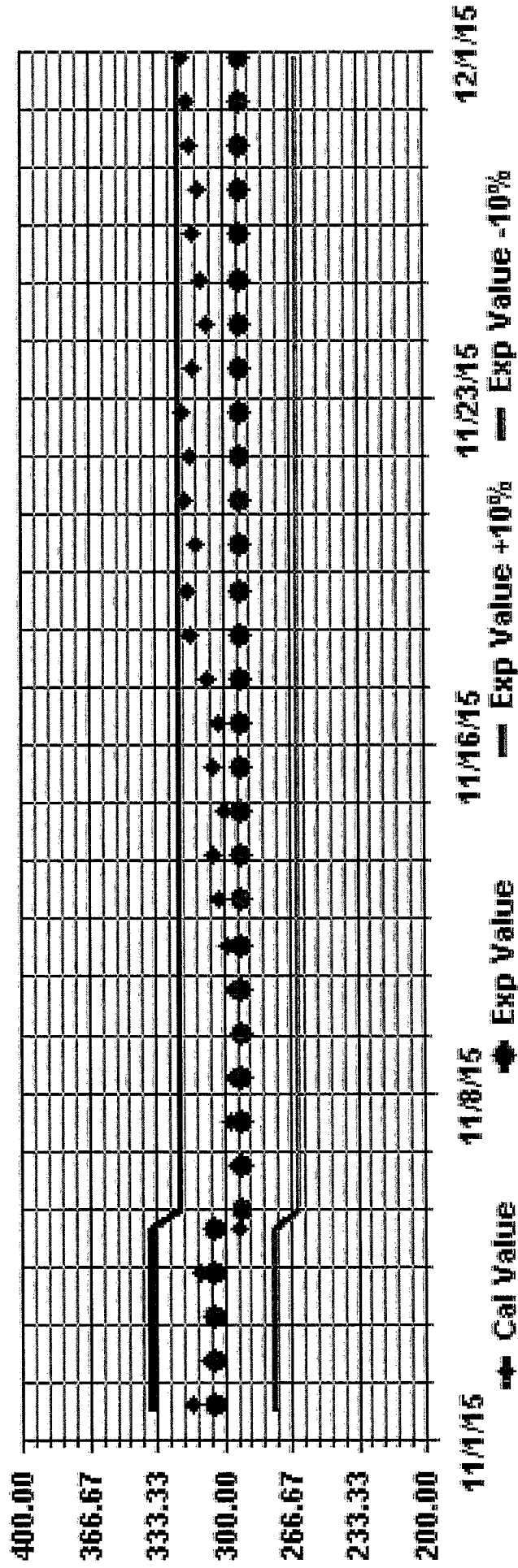
Class Limits (PPB)

-  >= 210.0
-  < 210.0
-  < 110.0
-  < 50.0

Site : LICA
 Period : 11/01/15-11/30/15
 Level : 10



Calibration Graph for Site: LICA Parameter: NOX_ Sequence: NO2 Phase: SPAN



NITRIC OXIDES



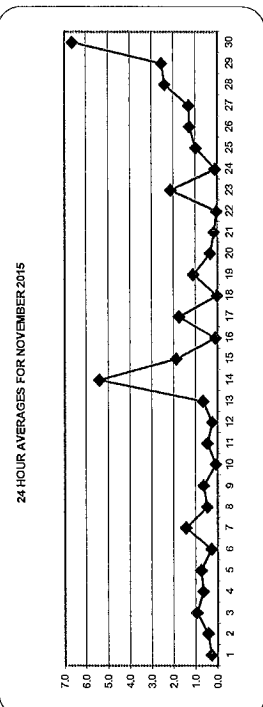
NITRIC OXIDE (NO) hourly averages in ppb

MST

HOURLY START	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MAX	24-HOUR AVG	RODS		
1	0.1	0.1	0.1	0.0	0.2	0.9	0.2	0.2	0.7	0.7	0.2	0.1	0.4	0.2	0.5	0.3	0.2	0.2	0.2	0.5	0.4	0.2	0.1	0.2	0.1	0.2	0.9	0.3	24
2	0.2	0.1	0.2	0.2	0.2	0.5	0.2	0.2	0.6	0.6	0.6	0.6	1.8	0.8	0.7	0.6	0.5	\$	0.4	0.3	0.2	0.4	0.3	0.1	0.2	1.8	0.5	24	
3	0.4	0.2	0.1	0.3	0.4	0.3	0.4	0.4	1.4	2.4	2.4	2.8	2.4	2.6	2.7	2.8	0.9	\$	0.0	0.1	0.0	0.3	2.3	0.2	0.0	2.8	1.0	24	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.9	4.2	3.6	2.8	0.9	0.7	0.6	0.3	\$	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	24	
5	0.1	0.1	0.1	0.1	0.3	0.2	1.0	3.4	7.7	C	C	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$	7.7	0.8	24	
6	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.5	0.2	0.4	0.2	0.7	0.2	0.2	0.2	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	\$	0.0	0.3	24	
7	0.0	0.1	0.2	0.2	0.0	0.1	0.1	2.5	2.6	4.9	2.1	1.3	1.7	2.2	1.8	2.1	1.9	2.1	1.9	2.1	0.9	1.4	\$	1.9	0.5	4.9	1.4	24	
8	0.7	0.4	1.3	1.9	1.8	1.3	0.3	0.1	0.5	0.8	0.7	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	\$	0.2	0.1	0.0	1.9	0.5	24	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	3.1	4.1	1.8	0.2	0.3	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	4.1	0.6	24	
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	1.0	\$	0.1	0.0	0.1	0.0	0.0	0.0	1.0	0.1	24	
11	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.3	0.5	1.0	2.4	2.1	1.5	0.9	0.4	\$	0.1	0.0	0.1	0.1	0.2	0.0	2.4	0.5	24	
12	0.1	0.1	0.2	0.0	0.1	0.1	0.3	0.2	0.7	0.6	0.8	0.5	0.4	0.5	0.4	0.6	\$	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.2	24	
13	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.8	0.8	0.3	1.6	1.8	3.5	1.7	\$	0.5	0.9	0.3	0.2	0.1	0.1	0.1	0.1	0.1	3.5	0.7	24	
14	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.4	0.9	1.4	1.4	1.9	2.1	1.6	\$	1.5	2.4	9.1	13.5	20.3	12.7	17.9	21.6	15.8	21.6	5.4	2.4	24	
15	14.3	8.1	5.1	3.7	0.8	0.3	0.1	0.2	0.3	0.4	0.3	0.7	\$	0.4	0.4	0.5	0.2	0.3	0.5	0.8	0.1	0.6	0.2	0.2	14.3	1.9	2.4	24	
16	0.0	0.1	0.2	0.3	0.3	0.1	0.0	0.1	0.2	0.1	0.0	0.1	\$	0.0	0.0	0.1	0.0	0.3	0.1	0.2	0.1	0.0	0.0	0.0	0.3	0.1	0.1	24	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.5	0.8	1.3	\$	1.3	0.8	0.9	1.9	Q	Q	13.2	10.5	3.2	0.5	0.0	13.2	1.8	2.4	24	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	Y	Y	Y	Y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.2	0.0	0.1	21	
19	1.3	0.8	0.3	1.0	0.3	0.4	0.6	0.5	0.8	1.2	\$	4.5	2.2	2.6	1.9	1.2	0.8	1.5	0.4	0.3	0.6	0.8	1.3	0.8	1.5	4.5	1.1	24	
20	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.2	0.1	0.5	0.5	0.3	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	24	
21	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.5	0.5	0.5	0.3	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.5	0.2	0.2	24	
22	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.2	0.0	0.2	24	
23	0.5	0.0	0.2	0.0	0.2	\$	1.0	6.1	15.1	7.7	6.4	3.1	1.3	0.8	0.6	0.4	0.3	0.1	0.4	0.6	1.3	1.7	1.0	0.5	15.1	2.1	2.4	24	
24	0.1	0.2	0.1	0.1	\$	0.2	0.2	0.2	0.1	0.1	0.2	0.7	1.5	2.2	2.4	1.9	1.8	2.3	1.5	0.9	0.2	0.2	0.1	0.0	0.4	0.1	0.1	24	
25	0.1	0.1	0.0	\$	1.1	1.7	0.7	1.4	3.6	3.6	1.3	2.0	2.0	1.2	1.0	0.5	0.1	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.7	2.8	1.0	24	
26	0.3	0.5	\$	0.4	0.3	0.8	0.6	0.6	1.1	1.6	1.1	0.9	1.1	0.8	0.8	0.2	0.1	0.2	0.9	1.0	0.5	13.6	2.2	13.6	1.3	2.4	24		
27	0.4	\$	6.4	2.3	0.8	1.5	0.1	1.1	5.1	7.1	12.9	2.8	2.1	1.5	1.0	0.4	0.2	0.4	0.5	0.3	0.3	0.2	3.9	\$	12.9	2.4	24		
28	\$	0.6	0.5	0.5	0.9	1.9	2.1	0.6	2.0	6.0	9.1	5.5	3.9	2.8	1.9	1.5	0.9	0.3	0.7	2.2	3.6	6.1	\$	3.8	9.1	2.6	24		
29	0.7	0.6	0.5	0.4	0.1	0.4	1.1	7.2	17.2	21.4	22.1	12.0	7.2	5.1	3.4	3.5	9.6	6.5	4.6	5.5	9.8	\$	9.4	3.8	22.1	6.7	24		
30	14.3	8.1	5.1	3.7	0.8	0.3	0.1	0.2	0.3	0.4	0.3	0.7	\$	0.4	0.4	0.5	0.2	0.3	0.5	0.8	0.1	0.6	0.2	14.3	1.9	2.4	24		
HOURLY MAX	14.3	8.1	5.1	3.7	0.8	0.3	0.1	0.2	0.3	0.4	0.3	0.7	\$	0.4	0.4	0.5	0.2	0.3	0.5	0.8	0.1	0.6	0.2	14.3	1.9	2.4	24		
HOURLY AVG	0.7	0.6	0.4	0.4	0.5	0.4	0.4	1.5	2.5	2.8	2.3	1.7	1.5	1.3	0.9	0.7	0.9	0.9	0.9	1.7	1.6	1.3	2.0	1.1	1.1	1.1	1.1	24	

STATUS FLAG CODES

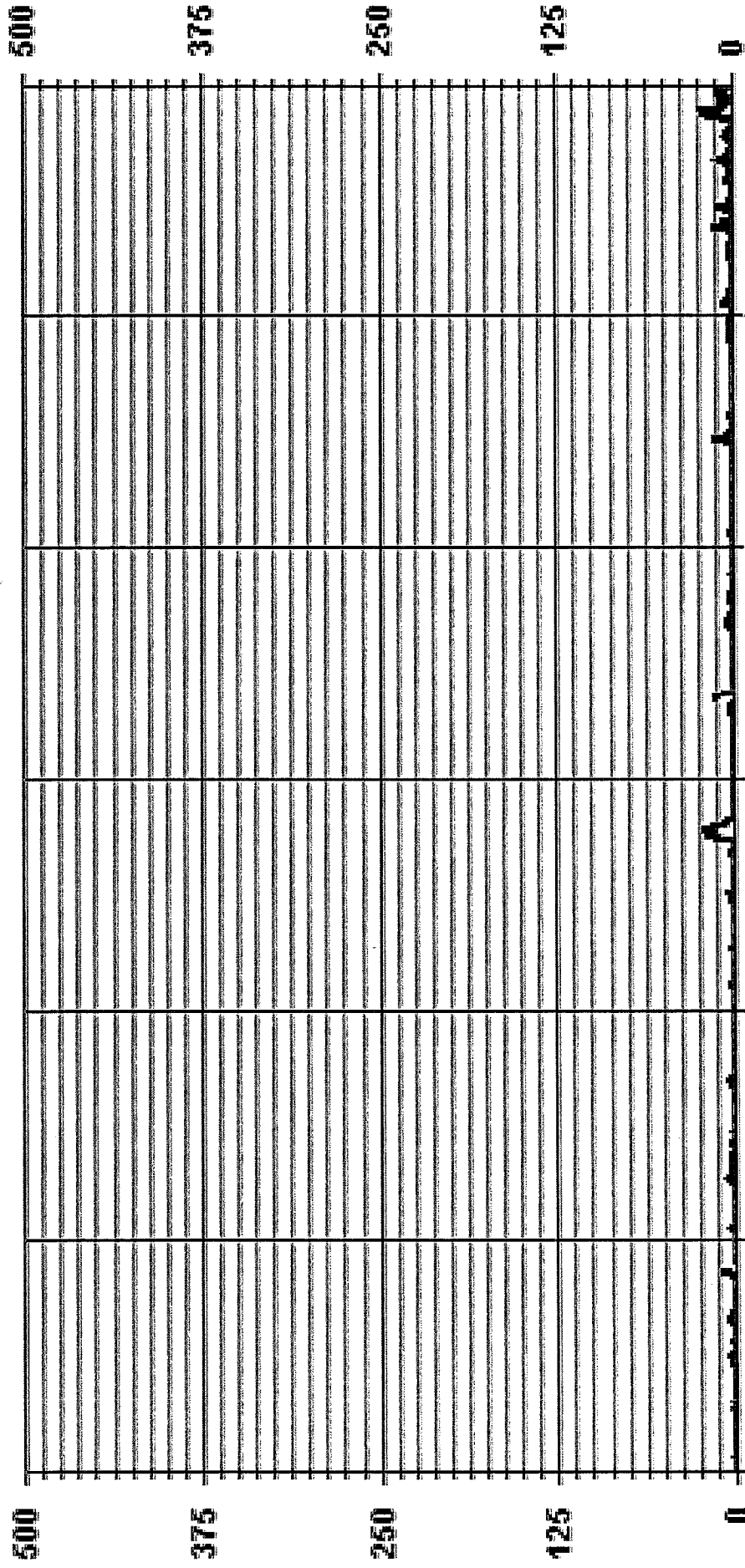
- C - CALIBRATION
- Y - MAINTENANCE
- S - DAILY ZERO/SPAN/CHECK
- P - POWER FAILURE
- G - OUT FOR REPAIR
- Q - QUALITY ASSURANCE
- R - RECOVERY
- X - MACHINER/MALFUNCTION
- O - OPERATOR ERROR
- K - COLLECTION ERROR



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	512	ON DAY(S)	10	ON DAY(S)	30
MAXIMUM 1-HR AVERAGE:	22.1	PPB @ HOUR(S)	10	ON DAY(S)	30
MAXIMUM 24-HR AVERAGE:	6.7	PPB		VAR-VARIOUS	
1/2S CALIBRATION TIME:	30	HRS		OPERATIONAL TIME:	717
MONTHLY CALIBRATION TIME:	6	HRS		AMTD OPERATION UPTIME:	99.6
STANDARD DEVIATION:	2.78			MONTHLY AVERAGE:	1.2
					PPB

01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA NO_ PPB



NITRIC OXIDE MAX instantaneous maximum in ppb

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MAX.	24-HOUR AVG.	RODS			
1	1.5	1.5	1.5	1.0	1.5	4.0	2.0	1.5	3.0	4.0	1.0	1.0	2.0	2.0	7.5	1.0	2.0	1.5	1.5	4.5	3.0	1.5	2.0	2.0	7.5	2.0	2.3	24		
2	2.0	1.5	2.0	1.5	1.5	2.0	4.0	1.0	3.0	2.0	2.0	2.5	39.0	2.0	3.0	1.5	6.5	5	6.0	2.5	1.5	2.5	2.0	1.5	39.0	4.0	24			
3	2.0	1.5	1.0	6.5	2.5	2.5	1.0	1.0	9.0	5.0	3.5	6.0	5.5	45.0	50.0	12.0	5	0.9	5.0	2.5	1.5	28.5	3.9	0.9	50.0	8.6	24			
4	0.9	0.4	0.4	1.4	0.0	0.9	4.4	6.9	9.4	4.4	4.4	2.4	4.0	2.5	5	0.5	2.5	0.5	0.0	0.0	0.5	0.4	0.4	5	19.5	2.8	24			
5	2.0	2.5	2.0	2.5	2.5	2.0	4.5	6.9	19.5	C	C	C	C	C	C	0.4	0.4	1.9	0.0	0.0	0.5	0.4	0.4	5	19.5	2.8	24			
6	0.0	1.4	2.4	0.9	0.9	1.9	2.9	92.4	1.4	1.4	1.9	1.9	1.4	3.9	0.9	2.9	13.4	8.4	0.9	0.4	1.9	0.4	5	92.4	6.3	24				
7	0.5	5.0	4.0	2.4	1.4	1.9	1.9	6.9	30.4	7.4	2.0	4.5	5.0	6.5	3.5	14.0	8.5	7.9	5.0	10.5	5	9.5	1.0	30.4	6.4	24				
8	4.0	5.5	4.5	4.0	8.0	3.0	1.0	1.0	14.5	3.5	4.0	0.5	1.0	1.0	1.0	2.0	1.5	1.0	2.0	5	4.0	1.5	0.5	14.5	3.0	24				
9	1.0	0.5	0.4	1.4	0.4	1.9	0.4	1.4	2.4	2.4	12.4	26.4	16.9	0.9	2.9	7.4	1.4	1.4	1.4	5	2.4	3.9	1.4	0.0	26.4	5.6	24			
10	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	5	4.4	3.9	1.4	0.4	14.4	1.6	24			
11	0.9	0.4	0.9	0.9	12.4	1.9	1.4	0.9	0.9	1.4	2.4	6.9	3.9	2.9	6.9	2.4	5	2.4	1.9	1.4	1.9	1.4	1.9	0.4	12.4	2.5	24			
12	2.4	1.4	2.4	0.9	2.4	0.9	1.4	4.4	2.4	1.4	1.9	1.4	1.9	6.5	0.5	3.5	5	0.9	0.5	0.5	0.9	0.4	0.4	0.4	6.5	1.7	24			
13	0.9	0.4	0.9	0.9	3.9	4.9	1.4	11.9	5.9	10.9	4.9	20.9	53.4	8.9	5	5.6	8.5	29.5	36.5	36.0	22.5	38.0	38.5	32.5	38.5	12.5	24			
14	0.9	2.4	0.9	1.4	1.4	1.9	0.9	4.9	1.9	2.4	2.9	6.9	7.9	2.4	5	5.6	4.0	12.9	1.5	2.5	2.5	6.0	3.0	6.9	1.9	24.0	6.3	24		
15	22.0	24.0	10.5	17.5	12.0	4.0	1.5	1.0	0.5	1.0	1.0	1.0	6.6	5	1.5	4.0	12.9	1.5	2.5	2.5	6.0	3.0	6.9	1.9	24.0	6.3	24			
16	0.9	1.9	2.4	1.9	2.4	1.9	1.4	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	3.4	1.4	2.4	2.4	0.9	0.9	0.4	3.4	1.4	1.4	24			
17	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1.4	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	3.4	1.4	2.4	2.4	0.9	0.9	0.4	3.4	1.4	24			
18	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	6.5	1.7	24		
19	0.5	10.5	5.5	3.5	3.0	3.5	5.0	3.5	4.5	5	17.0	4.0	10.0	5.0	3.0	4.0	7.4	Q	23.5	22.5	9.0	2.0	1.0	1.5	2.0	0.6	20			
20	4.0	6.5	2.5	3.0	1.5	0.5	2.5	1.0	5	2.0	1.0	2.0	9.5	3.0	10.5	4.0	1.5	1.0	2.5	1.0	2.5	1.0	0.5	3.0	0.5	10.5	2.8	24		
21	0.5	0.5	0.5	1.0	1.0	1.5	2.0	5	1.5	2.0	1.5	0.5	2.5	2.0	1.5	2.5	1.5	2.0	1.5	2.0	1.5	1.0	1.0	0.5	1.0	2.5	1.3	24		
22	0.9	0.9	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	3.5	0.9	24		
23	5.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	3.5	0.9	24		
24	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	3.5	0.9	24		
25	1.0	2.5	0.9	5	10.0	12.5	3.5	5.0	16.5	9.0	8.5	2.5	4.0	2.5	3.5	2.0	3.5	2.0	0.9	0.5	2.5	0.9	2.5	3.0	16.5	4.5	24			
26	3.5	4.5	5	2.0	1.0	15.0	2.0	2.5	1.5	4.5	3.0	1.5	1.5	2.0	1.5	4.5	1.4	2.0	4.5	16.0	13.9	3.0	48.5	10.5	48.5	6.4	24			
27	2.0	18.5	7.5	8.0	12.4	0.9	8.5	12.0	25.0	23.5	5.0	2.5	5.0	5.0	2.0	1.0	2.5	2.0	4.5	2.0	4.5	2.0	3.0	1.5	9.5	7.4	24			
28	4.0	4.0	3.0	6.5	12.9	4.0	11.0	20.5	25.5	12.4	9.5	11.5	4.5	4.5	12.9	16.5	2.5	9.0	10.5	16.5	18.5	5	10.5	25.5	10.3	24				
29	4.5	3.5	4.0	12.9	0.5	2.0	5.0	15.0	37.5	27.0	31.0	18.9	17.5	15.0	14.9	62.5	18.9	30.0	12.0	56.5	5	17.5	12.4	62.5	19.0	24				
30	22.0	24.0	10.5	17.5	12.5	15.0	15.5	92.4	60.5	30.4	31.0	24.4	39.0	53.4	50.0	34.5	62.5	29.5	36.5	36.0	12.0	56.5	5	17.5	12.4	62.5	19.0	24		
HOURLY MAX	22.0	24.0	10.5	17.5	12.5	15.0	15.5	92.4	60.5	30.4	31.0	24.4	39.0	53.4	50.0	34.5	62.5	29.5	36.5	36.0	12.0	56.5	5	17.5	12.4	62.5	19.0	24		
HOURLY AVG	2.4	3.6	2.4	3.3	2.8	3.1	3.0	8.0	9.0	6.5	5.3	4.6	6.8	7.4	4.6	5.9	8.4	5.2	5.1	5.3	7.0	5.1	6.3	3.8	6.3	3.8	7.0	5.1	6.3	3.8

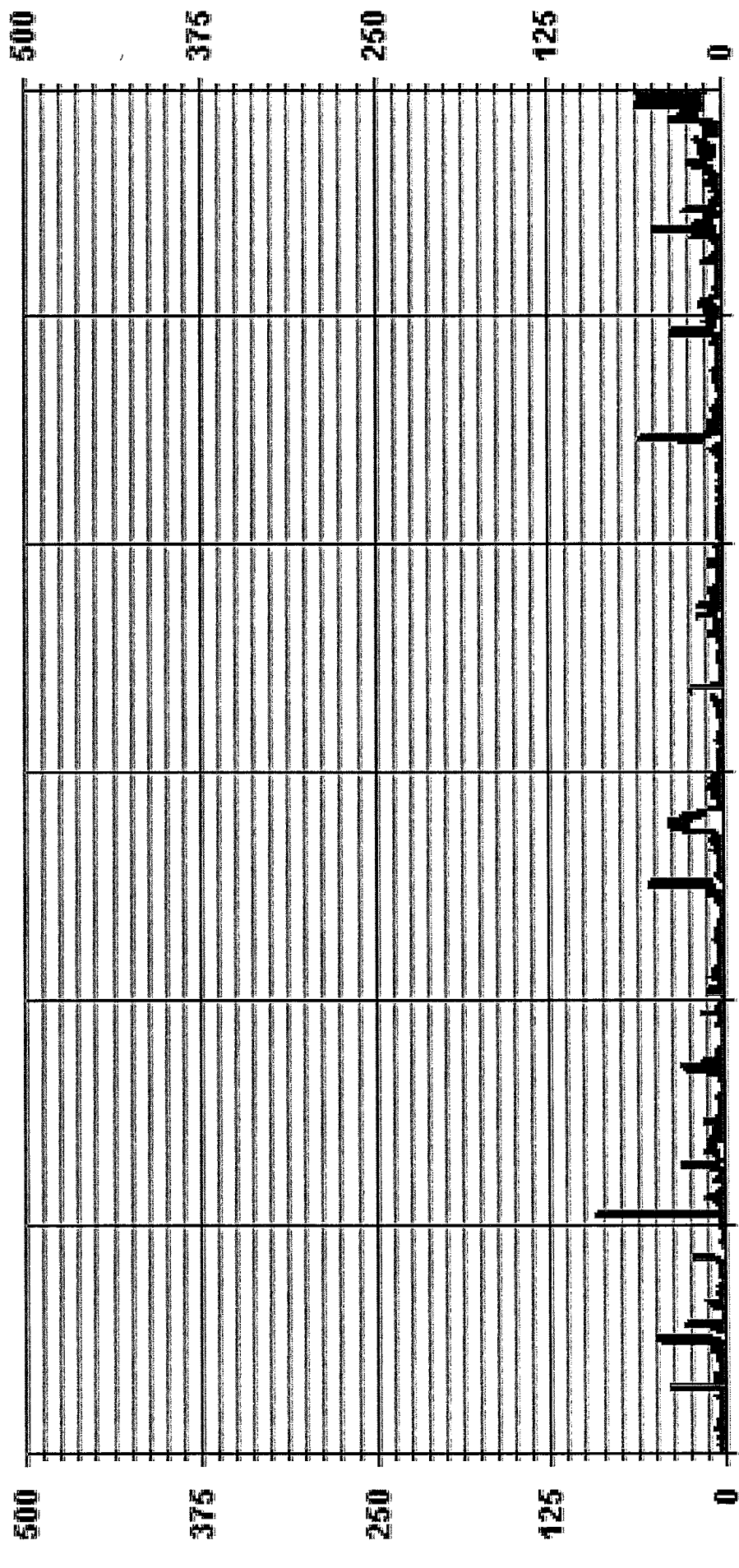
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
Y	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SKIP CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	655
MAXIMUM INSTANTANEOUS VALUE:	92.4 PPB @ HOUR(S)
OPERATIONAL TIME:	7 ON DAY(S)
OPERATIONAL TIME:	716 HRS
MONTHLY CALIBRATION TIME:	6 HRS
STANDARD DEVIATION:	8.89

01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA - - - NOMAX . . . PPB

LICA
NO_ / WD Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 01
Site Name : LICA
Parameter : NO
Units : PFB

Wind Parameter : WD
Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	1.03	.73	2.80	3.53	7.22	2.65	8.70	3.09	2.94	4.86	11.06	22.56	12.68	6.04	5.75	4.27	100.00
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.03	.73	2.80	3.53	7.22	2.65	8.70	3.09	2.94	4.86	11.06	22.56	12.68	6.04	5.75	4.27	

Calm : .00 %

Total # Operational Hours : 678

Distribution By Samples





Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	7	5	19	24	49	18	59	21	20	33	75	153	86	41	39	29	678
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	7	5	19	24	49	18	59	21	20	33	75	153	86	41	39	29	

Calm : .00 %

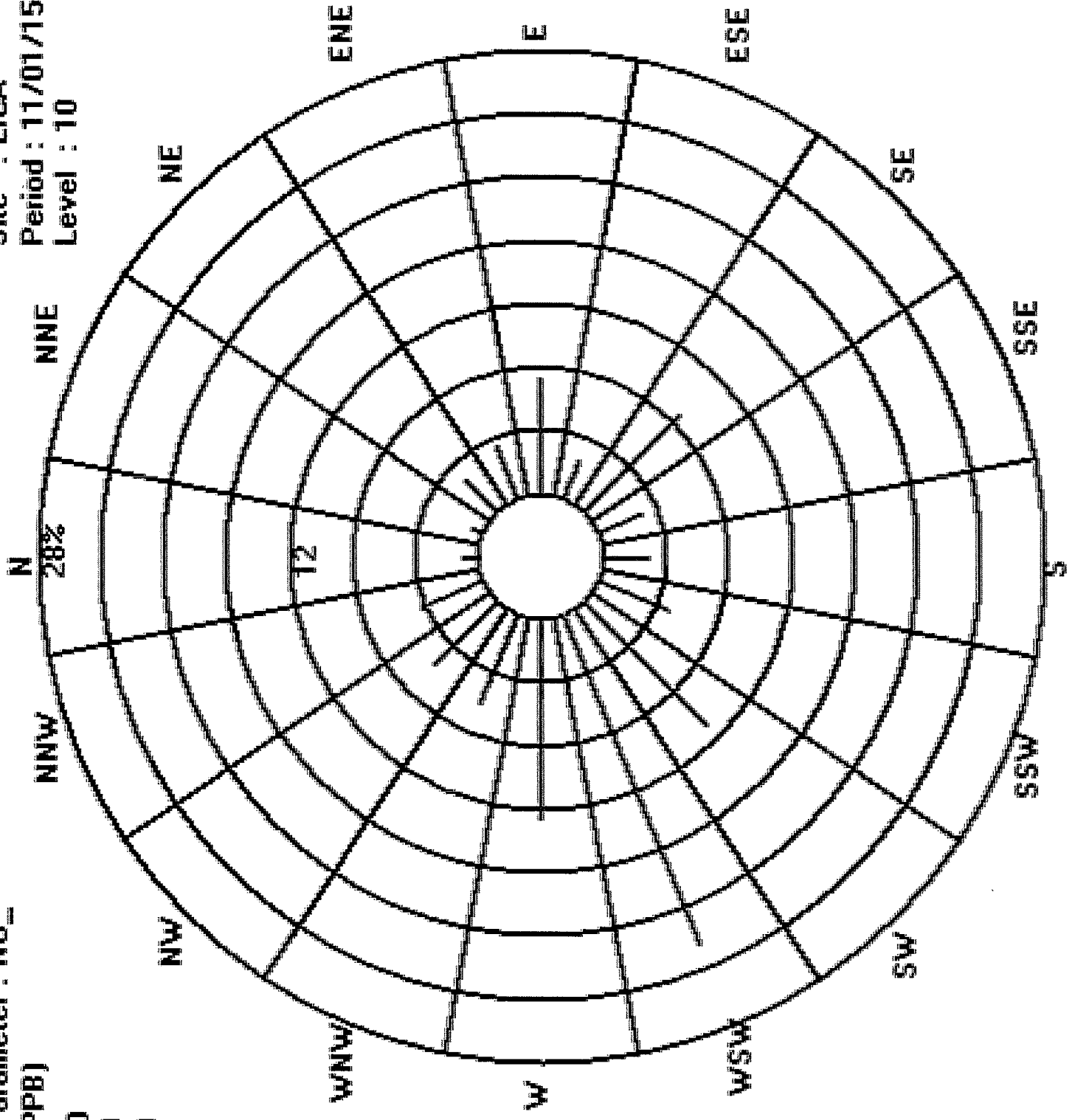
Total # Operational Hours : 678

Logger : 01 Parameter : NO₂

Class Limits (PPB)

-  >= 210.0
-  < 210.0
-  < 110.0
-  < 50.0

Site : LICA
Period : 11/01/15-11/30/15
Level : 10



NITROGEN DIOXIDE



NITROGEN DIOXIDE (NO2) hourly averages in ppb

MST	DAILY																								24-HOUR AVG.	RDGS.						
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00			24:00					
1	1.9	2.2	2.0	1.8	2.2	5.3	2.3	2.0	2.0	1.7	1.3	1.0	1.3	1.1	1.8	1.3	1.7	2.1	2.1	2.1	2.3	2.0	1.3	1.1	1.1	5.3	1.9	24				
2	1.1	1.1	1.0	1.6	1.7	2.8	2.5	3.0	4.2	2.7	2.9	2.9	3.1	3.0	4.1	2.4	2.4	2.4	2.4	2.4	1.7	1.4	2.0	1.6	1.9	4.2	2.4	24				
3	2.0	1.8	1.5	1.2	2.2	4.5	3.7	2.6	4.0	4.7	4.9	4.7	4.9	4.4	5.5	4.6	2.4	3.3	2.6	2.9	4.2	3.4	1.9	1.9	5.5	3.4	24					
4	2.8	2.9	2.6	3.1	2.5	3.5	5.0	7.4	7.0	5.7	4.6	2.8	2.6	2.9	2.8	2.6	2.6	2.8	2.8	2.5	2.7	2.9	3.1	7.4	3.5	24						
5	4.4	4.4	4.4	5.8	6.5	7.9	9.7	10.4	10.3	C	C	C	C	C	C	1.3	1.2	1.5	1.4	1.1	1.2	1.3	1.1	1.1	10.4	4.4	24					
6	2.0	2.5	1.7	1.8	1.4	2.3	3.9	4.6	3.8	2.8	3.1	2.4	1.5	2.3	1.6	2.4	3.7	3.7	3.2	2.9	3.4	4.0	S	2.9	4.6	2.8	24					
7	3.4	4.3	5.3	4.6	3.5	3.3	4.4	9.0	6.7	6.0	5.7	5.6	7.6	6.6	7.1	9.6	11.6	12.1	10.0	9.8	8.8	S	9.5	8.2	12.1	7.1	24					
8	8.7	7.9	7.6	8.5	7.1	8.8	6.1	4.3	3.9	4.3	3.4	3.4	3.4	3.5	3.2	1.5	2.4	3.6	2.4	2.2	2.1	S	1.3	1.0	0.8	8.8	4.1	24				
9	0.6	0.4	0.5	0.5	0.6	0.8	2.0	2.7	3.5	2.1	3.4	3.4	3.5	3.2	1.5	0.9	1.7	3.2	3.6	S	3.2	3.1	3.0	2.1	3.6	2.2	24					
10	1.3	0.6	0.5	1.0	2.3	2.5	1.8	1.7	1.9	1.5	1.5	1.6	1.5	1.5	1.5	1.8	4.3	4.5	S	2.8	3.9	3.7	2.5	3.3	4.5	2.2	24					
11	2.9	2.3	1.8	2.3	3.5	4.4	2.8	2.9	4.0	3.2	3.4	3.2	4.7	4.9	5.2	5.6	5.3	S	3.4	3.0	3.3	3.6	3.3	2.8	5.6	3.6	24					
12	2.3	2.4	1.9	1.9	2.4	2.6	3.7	4.4	6.6	2.9	2.9	2.2	1.7	1.6	2.4	4.4	S	3.6	3.1	2.5	2.1	2.1	1.9	1.7	6.6	2.8	24					
13	2.0	2.1	3.1	2.2	2.4	2.8	3.1	5.3	4.0	2.7	3.8	3.5	4.2	6.0	6.4	S	8.7	11.0	6.5	5.0	3.3	2.9	3.8	3.1	11.0	4.3	24					
14	3.0	3.1	3.6	4.1	3.4	4.1	5.5	6.1	6.7	5.1	4.4	4.5	5.2	5.8	S	7.4	11.4	12.3	11.8	12.7	9.8	11.6	11.6	8.2	12.7	7.0	24					
15	7.5	10.2	10.4	10.2	11.0	7.4	3.3	2.2	2.0	2.0	2.2	1.6	1.7	S	2.2	3.0	4.6	2.8	3.3	3.6	6.4	4.4	4.9	5.8	11.0	4.9	24					
16	2.8	4.5	4.2	7.9	5.3	2.1	1.5	2.7	3.2	2.3	1.3	1.1	S	0.9	0.4	1.1	2.8	4.9	4.5	4.9	4.3	3.9	2.8	4.3	7.9	3.2	24					
17	2.8	2.9	2.4	2.3	2.0	2.4	2.6	4.1	4.3	3.4	3.2	S	3.3	3.6	4.5	9.1	Q	0.6	0.7	0.7	0.8	0.8	1.8	2.5	3.9	3.3	4.5	2.1	2.9	4.5	1.9	21
18	3.2	4.0	1.6	1.8	0.9	0.6	0.7	1.1	1.1	Y	Y	Y	Y	Y	0.6	0.7	0.7	0.8	0.8	1.8	2.5	3.9	3.3	4.5	2.1	2.9	4.5	1.9	21			
19	2.5	3.3	5.8	6.2	8.9	9.8	7.5	10.0	8.3	S	8.5	4.0	4.2	3.6	3.8	5.8	10.3	6.2	7.9	9.5	10.9	13.6	11.6	12.5	13.6	7.6	24					
20	12.7	12.7	10.8	7.6	6.9	4.7	5.4	5.3	S	2.6	3.2	1.6	1.6	1.9	1.8	2.1	2.4	4.6	4.2	3.1	2.8	3.7	4.7	4.8	4.3	12.7	4.9	24				
21	3.6	2.9	3.1	3.9	4.1	4.0	3.5	S	3.3	2.4	2.2	1.7	1.9	1.9	1.8	1.7	1.9	2.6	2.2	2.0	2.5	3.8	3.4	3.8	3.6	4.1	2.9	24				
22	2.7	2.8	2.1	1.9	1.7	1.5	S	1.7	1.4	1.4	1.0	0.5	0.5	0.5	0.7	1.3	1.5	1.8	1.7	2.4	3.7	3.5	2.6	3.0	3.7	1.8	24					
23	4.4	2.4	2.9	3.3	2.9	S	8.8	16.1	15.1	10.6	11.3	7.8	5.5	5.1	6.4	7.3	9.8	9.5	12.4	14.5	15.9	16.4	15.5	4.1	16.4	9.0	24					
24	1.3	1.2	1.0	0.9	S	0.9	1.4	2.4	2.1	2.7	2.0	1.4	1.1	1.2	1.3	1.4	1.3	2.6	7.0	6.8	5.7	3.0	1.8	1.9	7.0	2.3	24					
25	1.3	0.7	0.7	S	2.2	2.0	1.7	2.8	2.3	1.8	2.4	3.9	4.7	6.2	7.0	10.3	16.9	12.7	11.9	13.8	12.5	13.2	14.7	10.4	16.9	6.8	24					
26	8.1	9.0	S	9.6	8.8	7.8	9.4	10.9	9.8	8.3	5.4	6.7	6.6	6.5	7.0	8.1	8.6	7.9	7.4	7.6	7.8	8.2	8.3	8.4	10.9	8.1	24					
27	8.5	S	8.0	7.8	7.6	8.2	9.2	9.2	8.2	7.2	7.9	5.0	4.2	5.5	5.8	10.1	9.1	6.9	10.6	9.9	11.0	9.5	17.4	12.6	17.4	8.7	24					
28	S	12.4	9.6	6.3	5.9	3.3	5.2	9.8	9.9	12.1	7.4	6.8	6.9	6.4	6.5	7.1	8.9	12.3	9.7	9.2	9.6	9.4	16.9	S	16.9	8.7	24					
29	9.6	9.6	7.8	7.7	9.2	9.8	9.5	12.7	13.7	10.6	10.8	9.1	8.1	7.3	8.3	10.8	12.1	11.5	9.6	12.7	12.4	11.1	S	9.4	13.7	10.1	24					
30	10.1	7.5	7.0	6.8	6.4	8.2	9.4	11.2	11.4	9.4	13.3	15.0	12.0	13.3	13.2	17.9	21.6	19.1	16.1	14.3	13.7	S	13.2	11.7	21.6	12.3	24					
HOURLY MAX	12.7	12.7	10.8	10.2	11.0	9.8	9.7	16.1	15.1	12.1	13.3	15.0	12.0	13.3	13.2	17.9	21.6	19.1	16.1	14.6	15.9	16.4	13.2	11.7	21.6	12.3	24					
HOURLY AVG	4.1	4.3	4.0	4.3	4.4	4.4	4.7	5.8	5.7	4.5	4.5	3.9	3.8	3.9	4.0	5.2	6.4	6.2	6.0	6.4	6.5	6.0	6.3	5.0	6.3	5.0	24					

STATUS FLAG CODES

C	CALIBRATION
G	CONTAMINANT SURVIVAL
Y	RECOVERY
M	MAINTENANCE
S	DAILY ZERO/SPAN CHECK
P	POWER FAILURE
O	OPERATOR ERROR
X	COLLECTION ERROR
R	RECOVER
A	MACHINE MALFUNCTION
N	NO DATA
Q	OUT OF RANGE
D	DATA ERROR
E	EXCESSIVE VARIATION
F	FLOW PROBLEM
H	HIGH PRESSURE
I	INSTRUMENT ERROR
J	JAMMED
K	KEYBOARD ERROR
L	LOW PRESSURE
V	VALVE ERROR
W	WATER PROBLEM
Z	ZERO ERROR

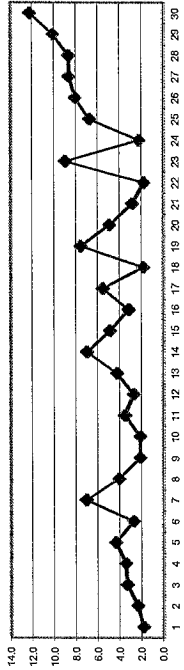
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 15 PPB

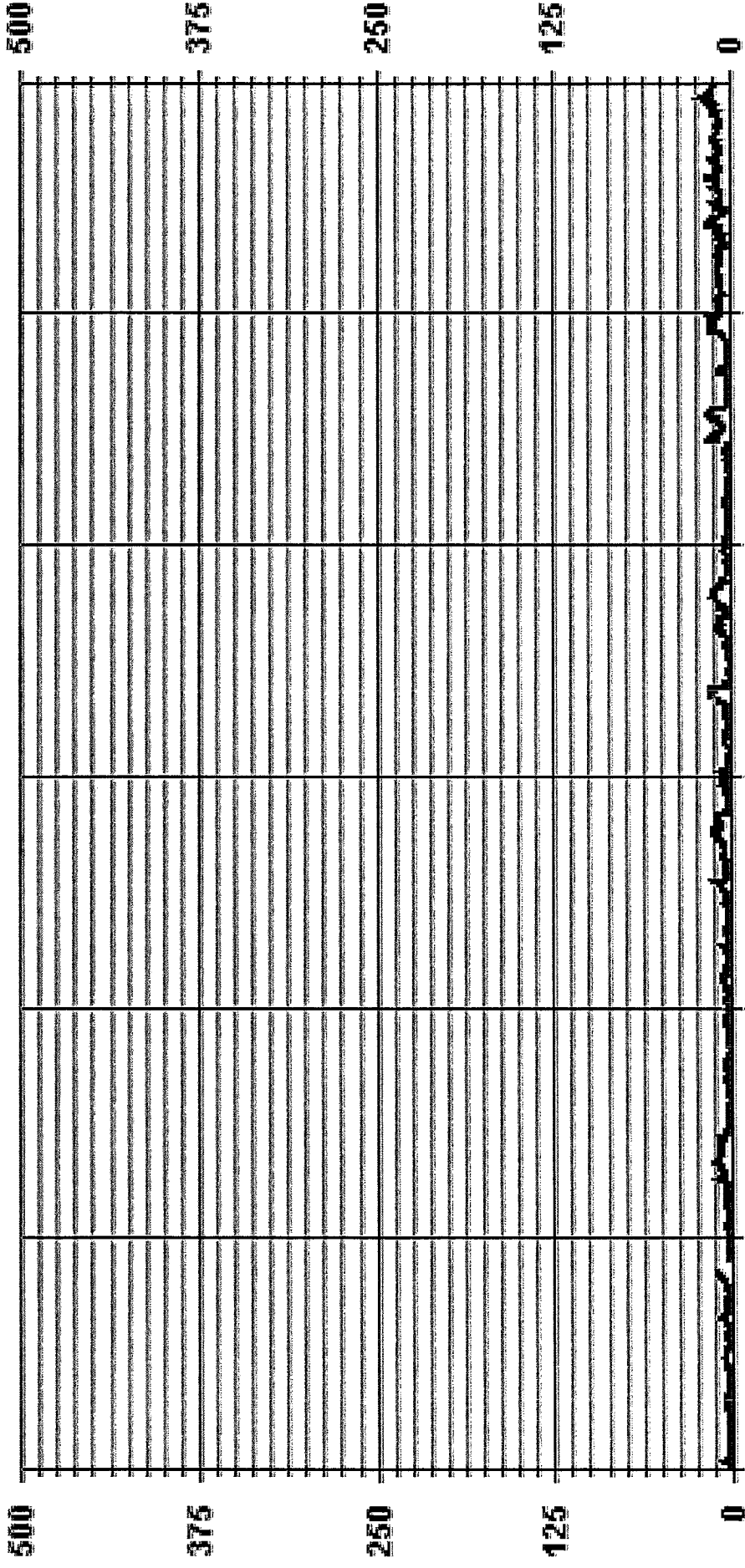
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:		678	ON DAY(S)	30	
MAXIMUM 1-HR AVERAGE:	21.6 PPB	@ HOUR(S)	16	ON DAY(S)	30
MAXIMUM 24-HR AVERAGE:	12.3 PPB			VAR-VARIOUS	
1/2S CALIBRATION TIME:	30 HRS	OPERATIONAL TIME:		717 HRS	
MONTHLY CALIBRATION TIME:	6 HRS	AMTD OPERATION UPTIME:		99.6 %	
STANDARD DEVIATION:	3.80	MONTHLY AVERAGE:		5.0 PPB	

24 HOUR AVERAGES FOR NOVEMBER 2015



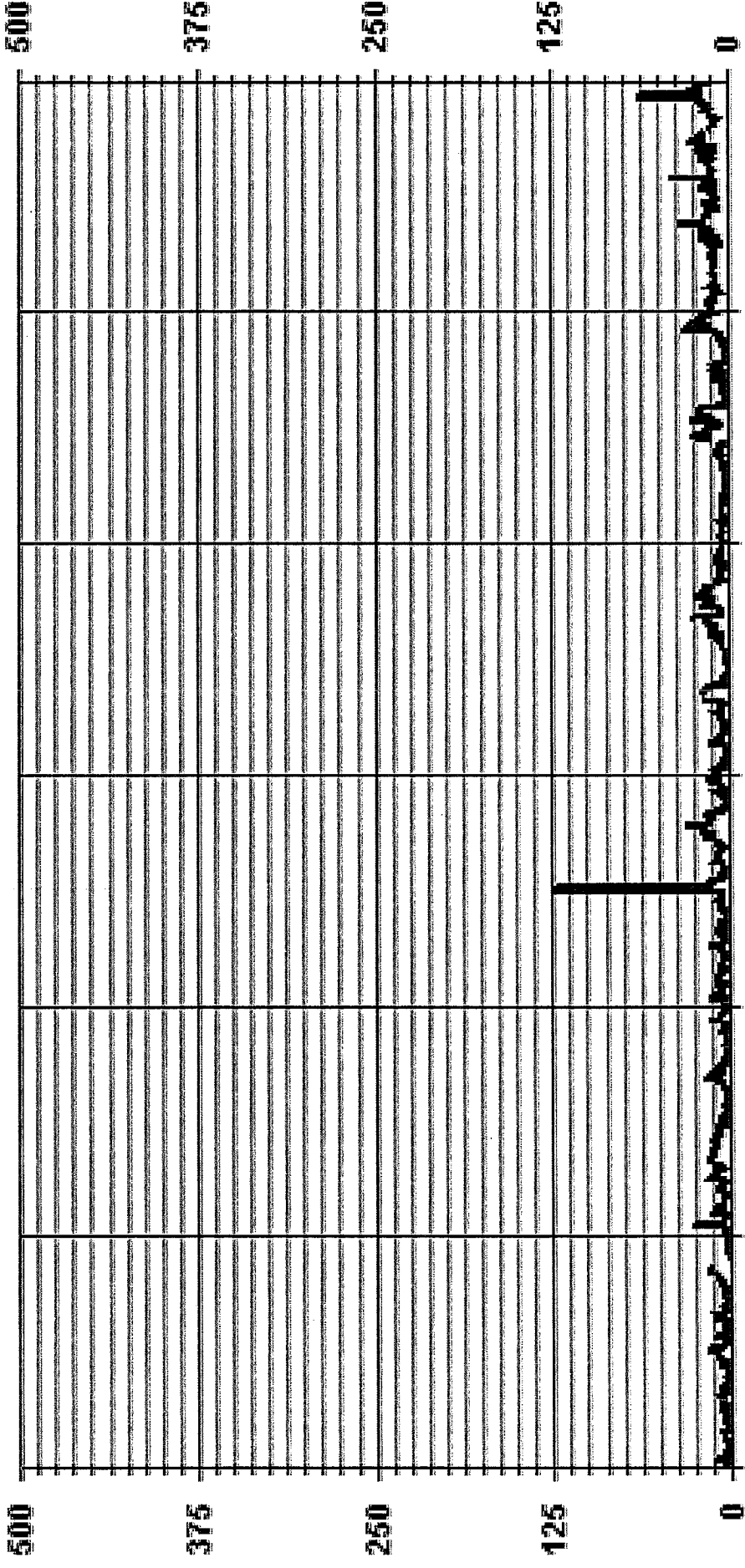
01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA NO2_ PPB

01 Hour Averages



11/04/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA NO2MAX PPB

LIICA
NO2_ / WD Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 01
 Site Name : LIICA
 Parameter : NO2
 Units : PPF

Wind Parameter : WD
 Instrument Height : 10 Meters

Limit	Direction																NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
< 50.0	1.03	.73	2.80	3.53	7.22	2.65	8.70	3.09	2.94	4.86	11.06	22.56	12.68	6.04	5.75	4.27	100.00	
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
Totals	1.03	.73	2.80	3.53	7.22	2.65	8.70	3.09	2.94	4.86	11.06	22.56	12.68	6.04	5.75	4.27		

Calm : .00 %

Total # Operational Hours : 678

Distribution By Samples





Limit	Direction																NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
< 50.0	7	5	19	24	49	18	59	21	20	33	75	153	86	41	39	29	678	
< 110.0																		
< 210.0																		
>= 210.0																		
Totals	7	5	19	24	49	18	59	21	20	33	75	153	86	41	39	29		

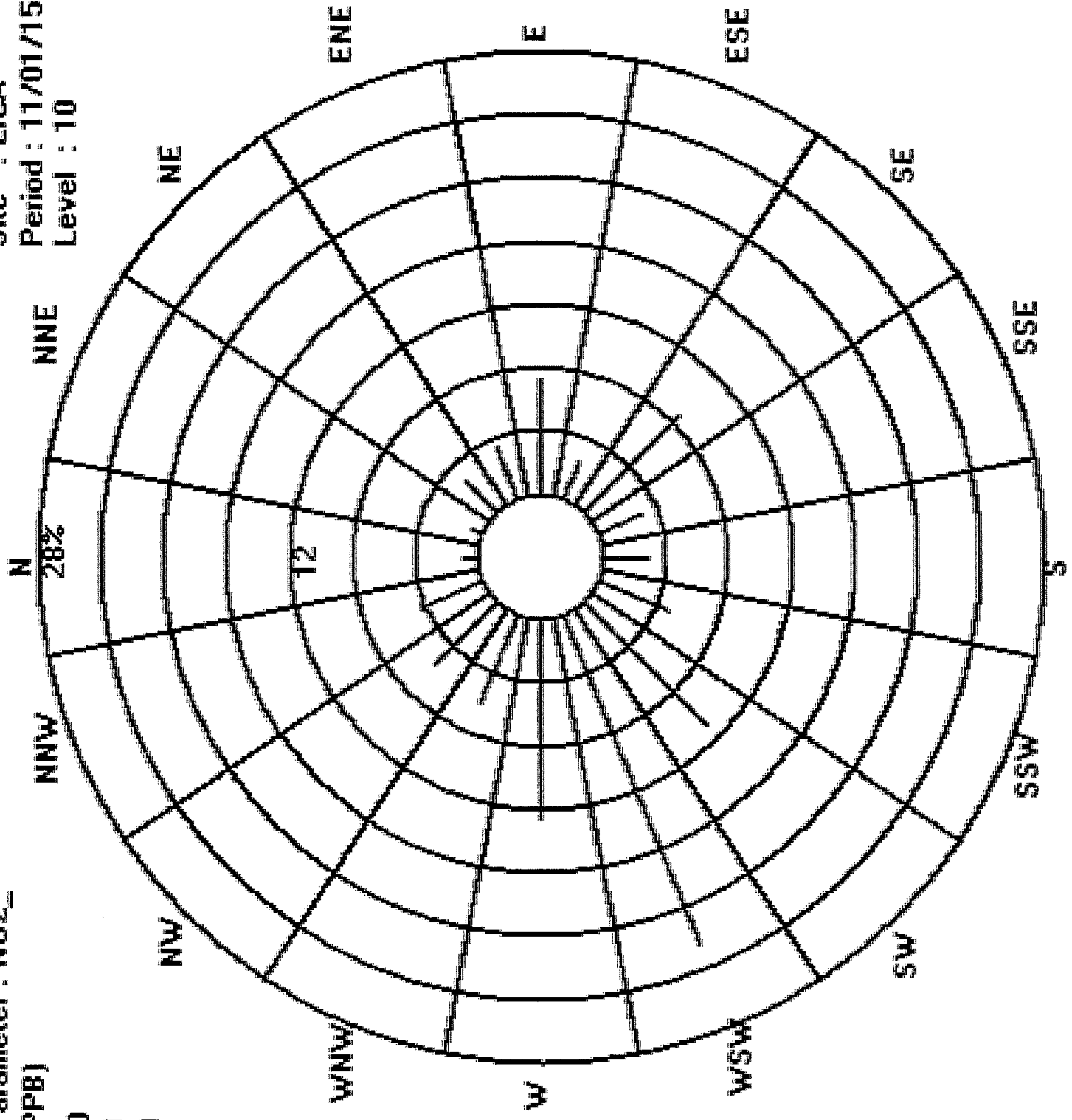
Calm : .00 %

Total # Operational Hours : 678

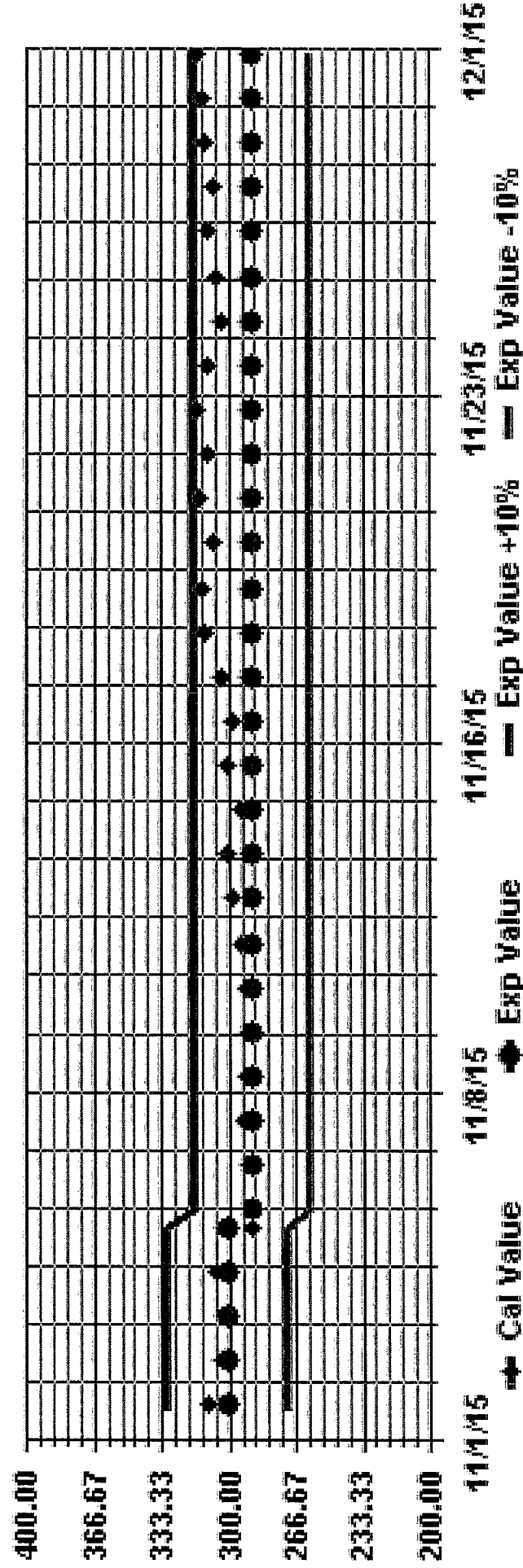
Site : LICA
 Period : 11/01/15-11/30/15
 Level : 10

Logger : 01 Parameter : NO2_
 Class Limits (PPB)

-  >= 210.0
-  < 210.0
-  < 110.0
-  < 50.0



Calibration Graph for Site: LICA Parameter: NO2_ Sequence: NO2_ Phase: SPAN



OZONE



OZONE (O3) hourly averages in ppb

MST

DAY	HOURS																								DAILY MAX	DAILY AVG	ROGS	
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				0:00
1	16	17	17	19	19	16	18	18	20	22	22	22	23	24	27	25	23	23	5	21	21	22	22	22	27	20.7	24	
2	22	21	19	20	23	22	19	20	21	22	22	22	22	21	20	18	19	5	18	17	17	16	14	13	23	19.3	24	
3	12	10	9	7	6	3	4	5	4	6	6	6	7	8	7	9	5	14	11	10	6	4	9	12	14	7.6	24	
4	12	12	11	11	12	12	9	5	6	15	23	26	27	30	5	29	27	25	25	25	25	23	21	30	18.3	24		
5	18	17	14	11	9	7	4	4	18	29	27	26	23	C	C	C	C	26	28	27	26	25	5	29	17.9	24		
6	25	23	23	22	21	19	17	14	16	19	20	21	25	26	27	25	23	21	21	21	18	16	5	19	27	20.9	24	
7	18	17	13	11	7	7	7	2	3	4	10	14	11	11	13	9	5	2	3	4	2	5	1	2	18	7.7	24	
8	3	3	1	1	0	5	10	11	12	20	25	26	26	29	30	32	29	28	30	24	5	25	22	32	17.9	24		
9	22	23	23	23	22	23	21	21	19	18	17	17	17	18	19	18	17	15	13	5	14	15	14	16	23	18.5	24	
10	22	28	28	29	25	24	27	27	26	26	27	27	27	28	27	26	22	21	5	22	20	18	20	19	29	24.6	24	
11	19	20	20	19	17	16	17	16	17	15	15	14	13	13	13	15	17	19	5	23	23	21	22	22	23	18.0	24	
12	23	25	26	26	24	24	24	22	21	25	26	28	30	31	31	27	5	30	29	29	30	29	27	26	31	26.7	24	
13	24	23	21	21	19	18	15	16	16	15	17	18	19	19	16	5	10	6	15	19	22	25	25	25	25	18.4	24	
14	25	24	22	19	14	17	15	12	12	16	17	17	18	18	5	15	5	1	0	0	1	0	1	0	25	11.7	24	
15	0	1	1	1	3	16	29	31	30	28	27	27	27	5	27	26	23	24	23	21	17	14	10	6	31	17.9	24	
16	6	9	12	10	14	18	19	18	17	20	23	25	5	27	31	32	29	26	26	21	20	22	24	23	32	20.5	24	
17	25	25	24	24	23	22	20	19	19	5	21	20	18	13	6	3	1	0	1	1	1	1	1	1	26	15.9	24	
18	29	28	29	25	24	24	24	23	23	Q	Q	Q	Q	Q	32	32	30	29	27	27	24	24	21	32	26.7	24		
19	18	17	14	13	11	12	17	12	17	5	19	23	22	23	24	22	13	17	12	7	6	3	3	1	24	14.2	24	
20	1	4	13	17	18	18	17	16	5	25	25	27	28	28	27	27	33	33	33	33	24	25	25	24	23	28	20.9	24
21	24	26	27	25	24	24	24	24	5	26	28	30	32	33	33	35	34	33	33	33	32	30	32	31	35	29.6	24	
22	32	32	33	34	34	35	34	34	35	36	38	38	39	39	39	37	36	35	34	33	29	27	26	24	39	33.7	24	
23	19	13	14	18	24	5	9	2	2	6	12	25	28	29	29	27	25	21	19	13	9	4	3	6	24	29	15.3	24
24	30	29	29	28	5	26	27	28	25	28	25	26	25	26	25	26	25	28	29	31	30	27	19	24	25	31	26.6	24
25	26	28	29	5	3	3	4	3	2	5	11	21	23	24	27	28	26	27	28	27	28	26	23	22	8	29	19.1	24
26	8	5	5	3	3	4	3	2	5	11	21	23	24	27	28	26	27	28	27	28	27	26	23	22	4	28	17.2	24
27	22	5	21	22	21	20	20	21	24	28	31	33	32	31	26	23	27	20	17	14	10	4	4	33	21.3	24		
28	5	3	4	8	6	8	5	2	4	4	18	25	26	29	28	28	24	14	19	20	19	13	5	5	29	14.2	24	
29	14	7	6	5	4	3	5	5	2	5	13	19	23	24	23	19	13	10	9	4	3	3	5	1	24	9.6	24	
30	1	3	3	4	3	3	2	0	1	2	15	20	18	13	4	3	2	1	1	1	1	1	1	1	20	5.2	24	
HOURLY MAX	32	32	33	34	34	35	29	34	34	35	36	38	39	39	39	37	36	35	34	33	30	32	31	31				
HOURLY AVG	17.8	17.0	17.5	16.4	15.6	16.3	16.1	14.8	15.3	17.5	20.5	22.9	23.5	24.1	24.9	23.4	20.3	19.3	18.6	17.7	16.3	16.8	15.9	16.3				

STATUS FLAG CODES

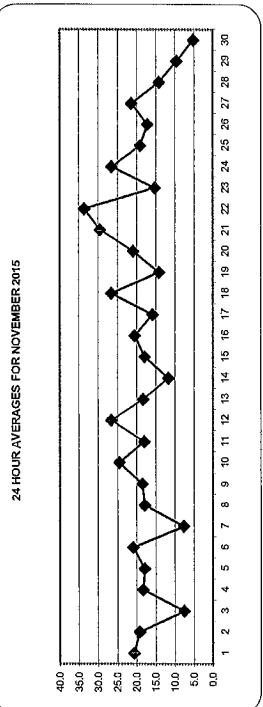
C	- CALIBRATION	Q	- QUALITY ASSURANCE
V	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT-OF-REPAIR	K	- COLLECTION ERROR

OBJECTIVE LIMIT:

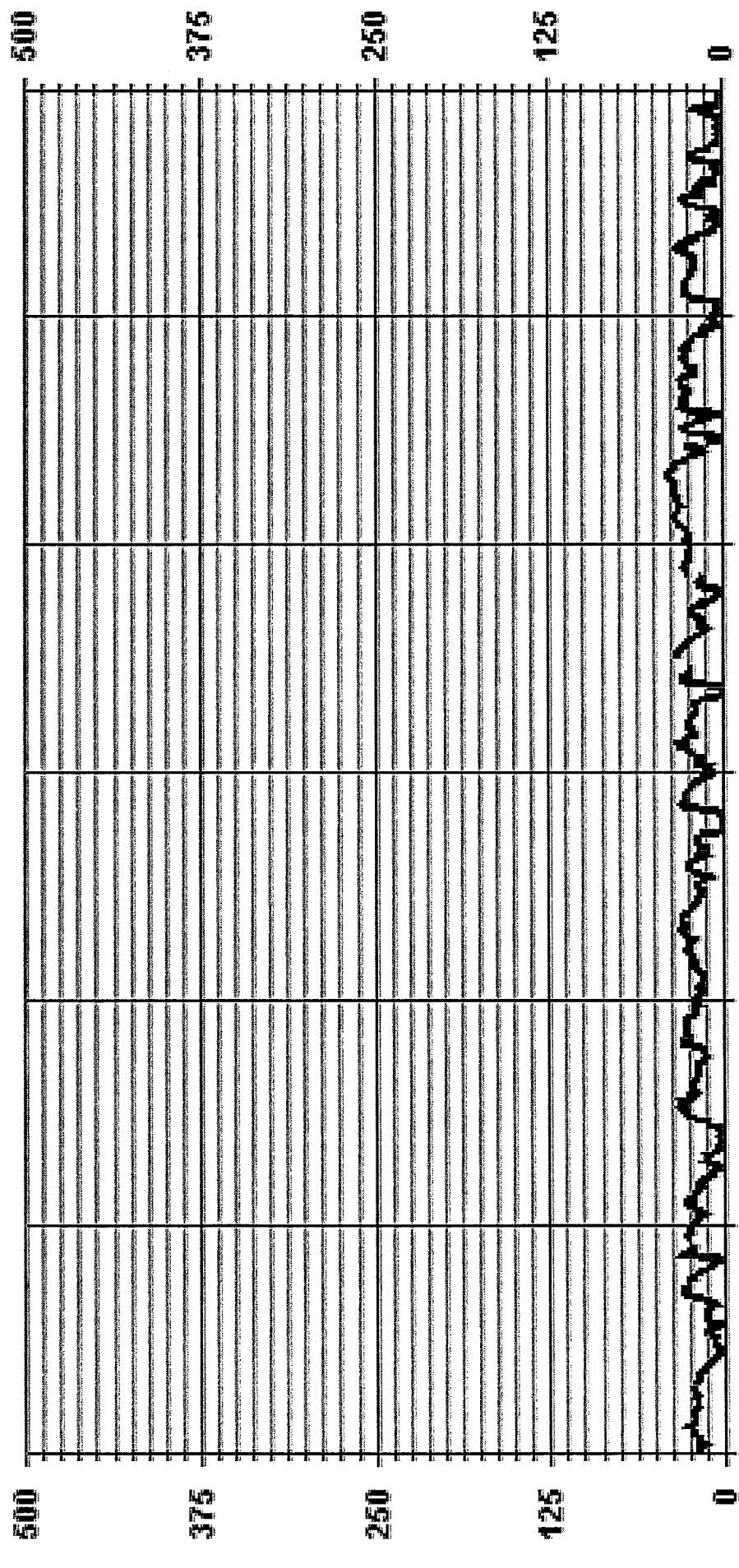
ALBERTA ENVIRONMENT: 1-HR: 32; 24-HR: 35

MONTHLY SUMMARY

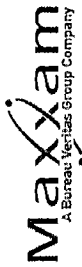
NUMBER OF 1-HR EXCEEDENCES:	0
NUMBER OF NON-ZERO READINGS:	673
MAXIMUM 1-HR AVERAGE:	39
MAXIMUM 24-HR AVERAGE:	33.7
ISZ CALIBRATION TIME:	30
MONTHLY CALIBRATION TIME:	4
STANDARD DEVIATION:	9.22
PPB @ HOUR(S)	VAR
PPB	VAR
OPERATIONAL TIME:	720
AMSD OPERATION UPTIME:	100.0
MONTHLY AVERAGE:	18
ON DAY(S)	22
ON DAY(S) VAR-VARIOUS	22
HRS	720
%	100.0
PPB	18



01 Hour Averages



— LICA 03_ PPB



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Site - NOVEMBER 2015
JOB # 2833-2015-11-01- C

OZONE MAX instantaneous maximum in ppb

MST

DAY	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	
17	18	19	20	20	20	21	20	20	21	22	23	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	
18	18.9	19.6	18.4	17.8	19.0	18.9	17.4	17.5	20.5	22.9	24.7	25.5	26.0	26.6	25.9	23.3	22.3	22.3	20.9	20.0	18.7	19.2	18.4	18.6								
19	19.8	18.9	19.6	18.4	17.8	19.0	18.9	17.4	17.5	20.5	22.9	24.7	25.5	26.0	26.6	25.9	23.3	22.3	20.9	20.0	18.7	19.2	18.4	18.6								
20	2	10	15	21	19	18	17	5	28	27	28	29	30	29	28	28	28	26	26	25	25	25	24	24	24	24	24	24	24	24	24	
21	26	27	28	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	
22	33	33	33	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	
23	24	16	20	25	25	19	8	4	13	14	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
24	31	30	30	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
25	28	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
26	9	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
27	22	5	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
28	5	8	11	13	11	10	5	9	11	25	26	29	30	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
29	17	12	10	8	7	12	11	5	11	16	21	25	26	25	23	19	16	12	7	7	7	7	7	7	7	7	7	7	7	7	7	7
30	3	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
31	33	33	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Hourly Max	33	33	35	35	35	35	35	35	35	38	39	40	40	40	39	37	43	35	35	31	32	32	32	32	32	32	32	32	32	32	32	32
Hourly Avg	19.8	18.9	19.6	18.4	17.8	19.0	18.9	17.4	17.5	20.5	22.9	24.7	25.5	26.0	26.6	25.9	23.3	22.3	20.9	20.0	18.7	19.2	18.4	18.6								

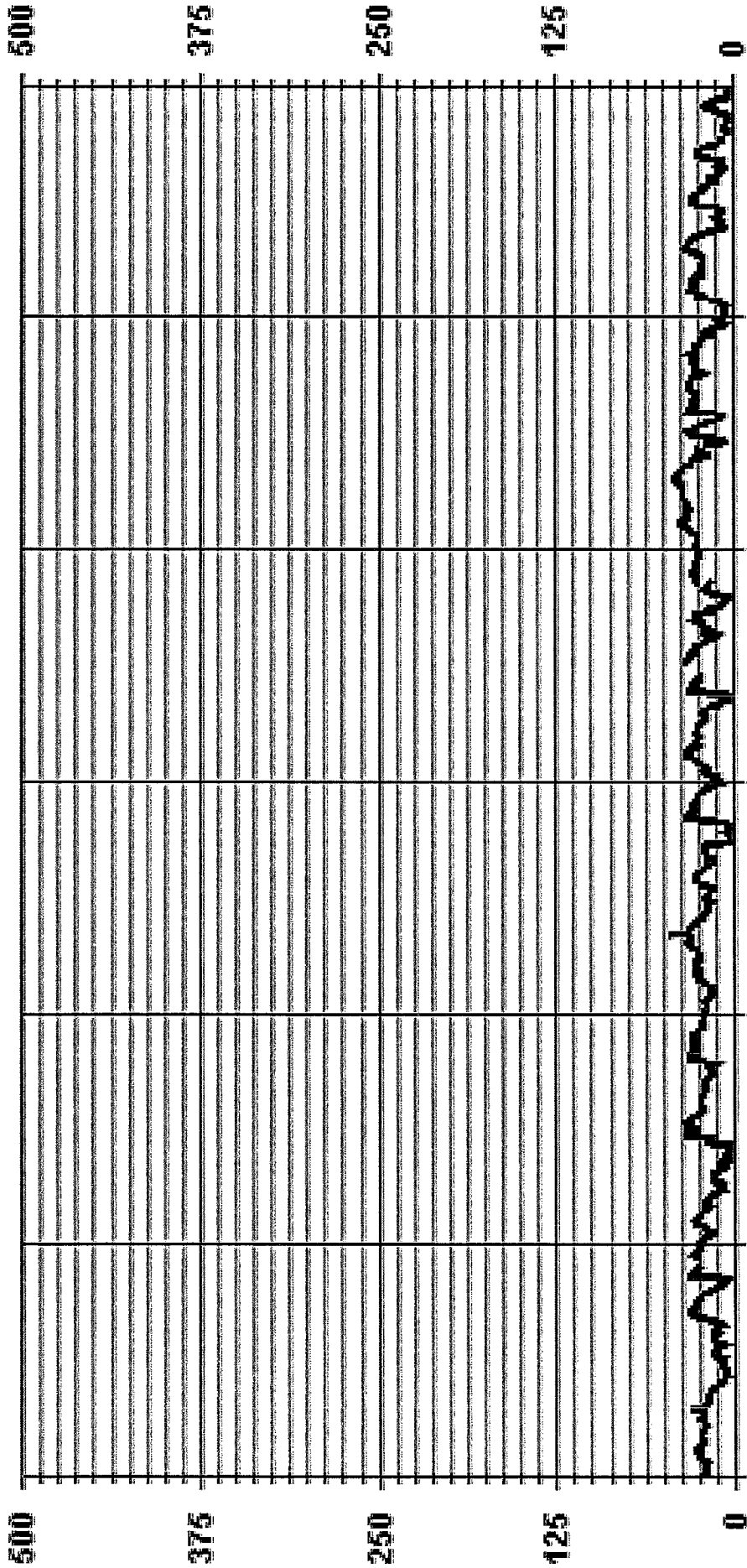
STATUS FLAG CODES

C	- CALIBRATION	Q	- QUALITY ASSURANCE
M	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	680
MAXIMUM INSTANTANEOUS VALUE:	43 PPB @ HOUR(S) 17 ON DAY(S) 12
IZS CALIBRATION TIME:	30 HRS
MONTHLY CALIBRATION TIME:	4 HRS
STANDARD DEVIATION:	8.79
OPERATIONAL TIME:	VAR-VARIOUS
	720 HRS

01 Hour Averages



— LICA O3MAX PPB

LICA
O3_ / WD Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 01
Site Name : LICA
Parameter : O3
Units : PPF

Wind Parameter : WD
Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50	1.02	.88	2.79	3.67	7.19	2.64	8.66	3.23	2.93	4.84	11.01	22.46	12.62	6.02	6.02	3.96	100.00
< 110	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 210	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.02	.88	2.79	3.67	7.19	2.64	8.66	3.23	2.93	4.84	11.01	22.46	12.62	6.02	6.02	3.96	

Calm : .00 %

Total # Operational Hours : 681

Distribution By Samples





Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50	7	6	19	25	49	18	59	22	20	33	75	153	86	41	41	27	681
< 110																	
< 210																	
>= 210																	
Totals	7	6	19	25	49	18	59	22	20	33	75	153	86	41	41	27	

Calm : .00 %

Total # Operational Hours : 681

Logger : 01 Parameter : O3_

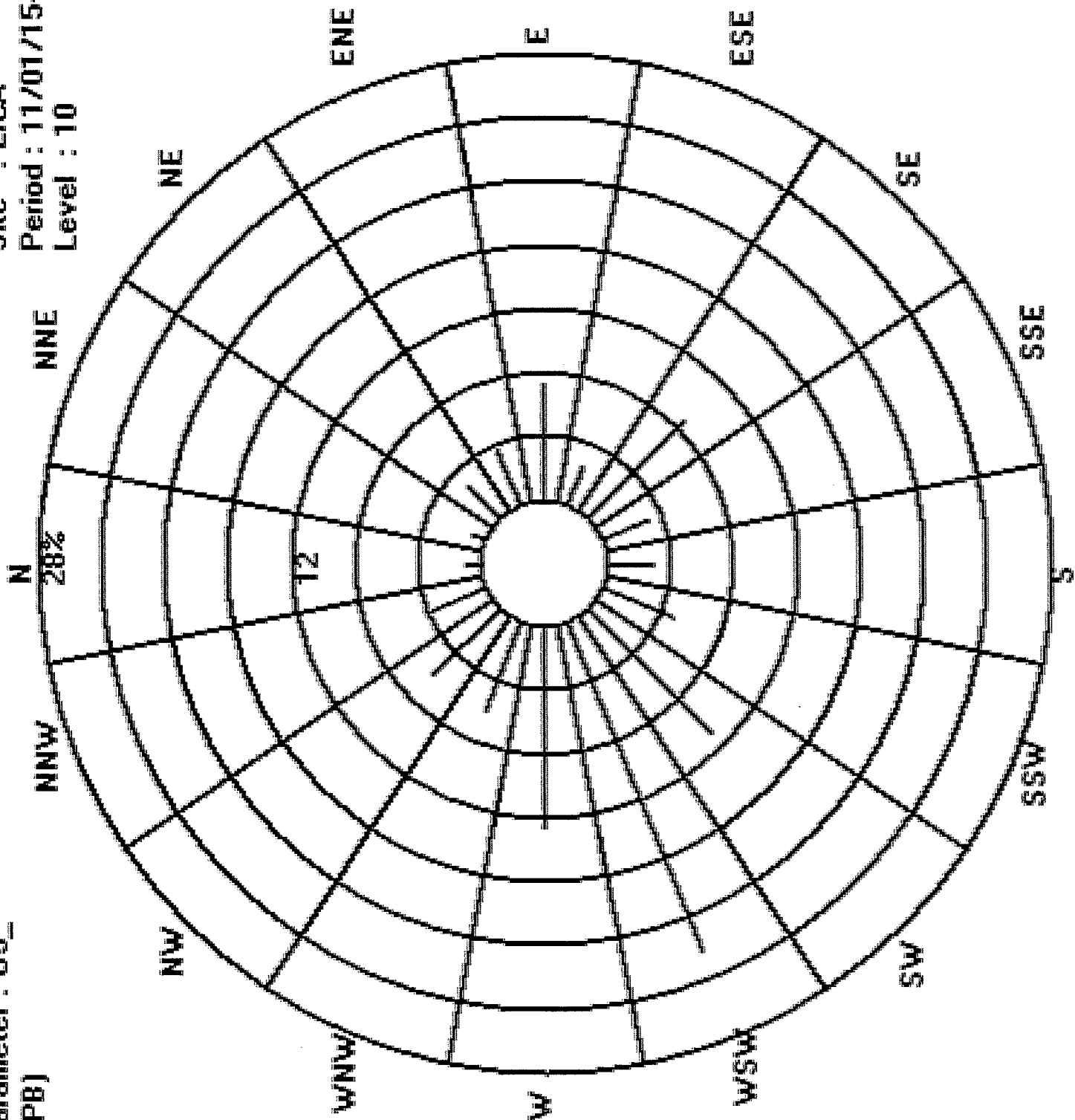
Class Limits (PPB)

-  >= 210
-  < 210
-  < 110
-  < 50

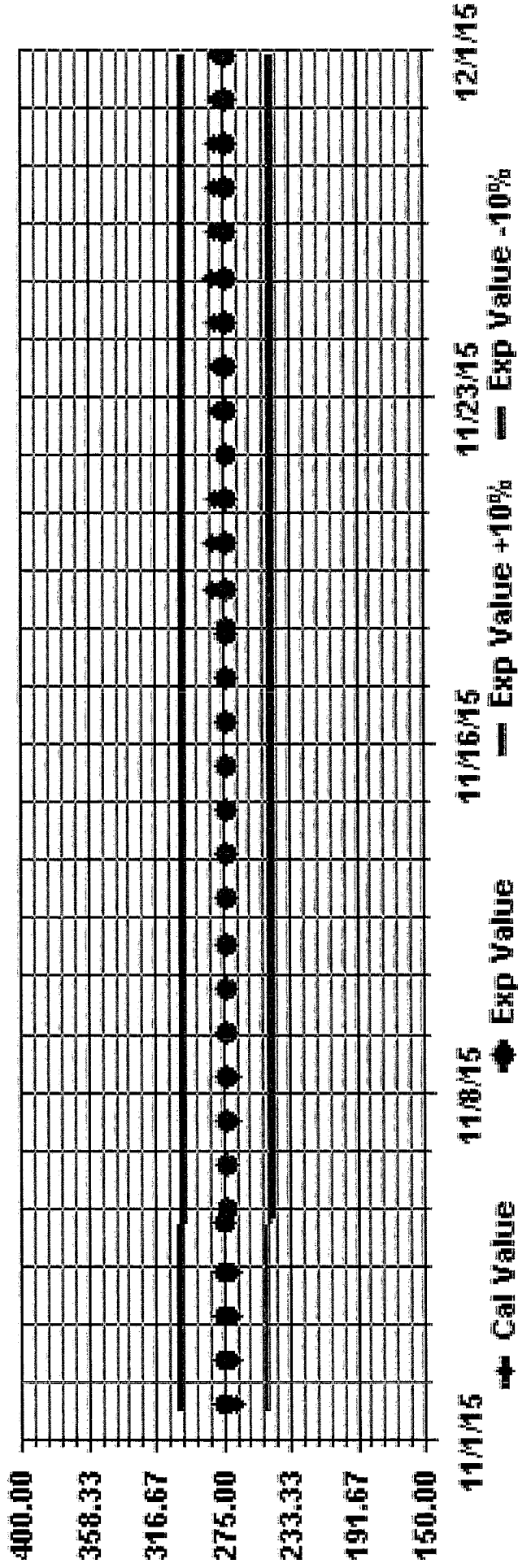
Site : LICA

Period : 11/01/15-11/30/15

Level : 10



Calibration Graph for Site: LICA Parameter: O3_ Sequence: O3 Phase: SPAN



PARTICULATE MATTER 2.5



PARTICULATE MATTER 2.5 (LESS THAN 2.5 MICRONS) (PM2.5) hourly averages in ug/m3

MST

DAY	HOURS																								DAILY MAX.	24-HOUR AVG.	RDGS.		
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				0:00	
1	4	3	0	2	X	X	1	4	X	0	0	X	0	2	X	0	0	0	X	0	1	X	X	X	0	4	1.3	15	
2	X	X	0	X	X	0	X	X	0	3	X	4	0	X	X	0	X	X	X	X	X	X	X	X	4	4	1.2	9	
3	0	0	X	X	X	0	X	X	0	X	1	C	0	6	15	6	0	3	6	X	4	X	5	10	15	4.0	15		
4	11	16	13	16	17	19	X	0	5	17	8	21	12	2	12	12	10	11	10	12	7	18	17	21	12.1	22	22		
5	10	11	16	16	21	19	12	11	0	4	12	6	4	5	8	6	0	5	9	5	7	8	8	21	8.8	24	24		
6	5	7	12	18	22	20	21	18	9	34	8	X	46	22	0	13	10	19	16	21	17	15	0	46	16.1	23	23		
7	0	2	9	7	9	10	7	12	16	12	13	8	0	X	8	0	X	19	33	23	35	27	27	27	48.2	23	23		
8	26	20	27	16	26	20	15	6	16	3	X	3	7	5	10	9	1	6	5	7	15	9	6	12	27	11.7	23		
9	9	6	4	6	1	3	3	10	8	3	3	2	11	7	7	8	8	3	7	11	15	10	13	14	15	7.2	24		
10	8	4	6	4	13	17	4	7	16	10	9	5	14	29	18	1	9	13	11	15	5	10	14	11	29	10.5	24		
11	11	11	11	10	9	14	14	14	0	16	12	24	24	12	22	13	18	12	12	13	12	17	9	12	24	13.3	24		
12	11	11	4	10	13	8	0	6	12	11	19	5	10	0	0	1	10	5	9	8	7	0	8	7	19	7.3	24		
13	10	8	9	9	8	10	7	7	7	16	23	40	42	6	9	21	9	13	6	12	4	10	10	42	12.6	24			
14	11	6	11	14	15	15	20	15	14	17	3	18	X	23	X	6	12	14	12	17	16	13	17	19	23	14.0	22		
15	10	15	15	16	18	12	9	0	15	7	X	6	18	X	27	X	5	1	13	15	11	10	6	6	27	11.2	21		
16	11	7	6	8	8	1	6	5	9	1	2	6	9	2	10	X	8	10	6	11	7	4	2	15	15	6.7	23		
17	11	5	14	14	8	2	6	2	23	26	0	29	0	0	3	6	3	2	4	5	10	6	2	2	29	7.6	24		
18	5	4	0	6	10	X	1	X	17	11	X	Q	X	X	X	X	X	X	X	X	X	X	X	X	17	6.8	9		
19	X	X	X	X	X	X	Y	3	9	15	10	2	11	1	6	20	11	15	10	11	12	14	12	13	20	10.3	17	17	
20	7	6	10	9	9	14	7	11	15	11	12	10	8	10	21	13	13	15	16	9	16	15	12	7	21	11.5	24		
21	12	17	5	9	20	13	25	20	12	7	4	16	7	21	22	11	5	8	2	4	5	10	5	5	25	11.0	24		
22	3	7	4	3	4	16	4	0	X	6	14	7	12	5	11	2	0	10	5	12	8	0	26	2	26	7.0	23		
23	21	19	12	7	9	8	19	28	14	10	7	3	9	10	7	C	X	X	X	X	X	X	X	X	28	12.2	16		
24	X	X	X	X	X	X	X	X	X	Y	3	0	2	0	5	2	3	2	1	4	2	1	2	1	5	2.0	14	14	
25	0	1	0	4	9	9	9	13	13	7	8	9	14	16	17	16	17	18	16	12	13	13	11	11	18	10.7	24		
26	11	15	14	16	19	18	18	15	12	17	17	10	14	13	8	10	8	10	12	14	15	13	14	19	19	13.3	24		
27	16	15	14	16	19	18	18	15	12	12	18	9	8	8	11	8	9	8	9	12	10	13	20	18	20	13.2	24		
28	17	15	16	13	14	13	12	12	11	11	15	13	14	13	12	8	9	12	10	12	11	12	17	12	17	12.7	24		
29	14	15	9	8	11	10	11	14	13	10	11	13	11	12	13	9	8	14	9	10	12	13	13	12	15	11.5	24		
30	15	16	16	16	17	17	17	17	21	17	24	21	18	14	16	15	16	17	17	17	17	17	16	18	15	13	24	16.9	24
HOURLY MAX	26	20	27	18	26	20	25	28	23	26	34	29	40	46	27	20	21	19	33	23	35	32	27	27	27	10.1			
HOURLY AVG	9.9	9.6	9.4	10.4	12.8	12.2	9.7	10.3	12.0	10.1	10.6	10.7	10.7	11.4	12.0	7.6	8.4	9.8	10.3	10.9	11.8	10.8	12.0	10.1	10.1	10.1			

OBJECTIVE LIMIT: ALBERTA ENVIRONMENT: 24-HR: 350 ug/m3

MONTHLY SUMMARY

NUMBER OF 24-HR EXCEEDENCES: 0

NUMBER OF NON-ZERO READINGS: 590

MAXIMUM 1-HR AVERAGE: 46 ug/m3 @ HOUR(S) 13 ON DAY(S) 6

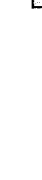
MAXIMUM 24-HR AVERAGE: 16.9 ug/m3 VAR-VARIOUS ON DAY(S) 30

MONTHLY CALIBRATION TIME: 2 HRS OPERATIONAL TIME: 635 HRS

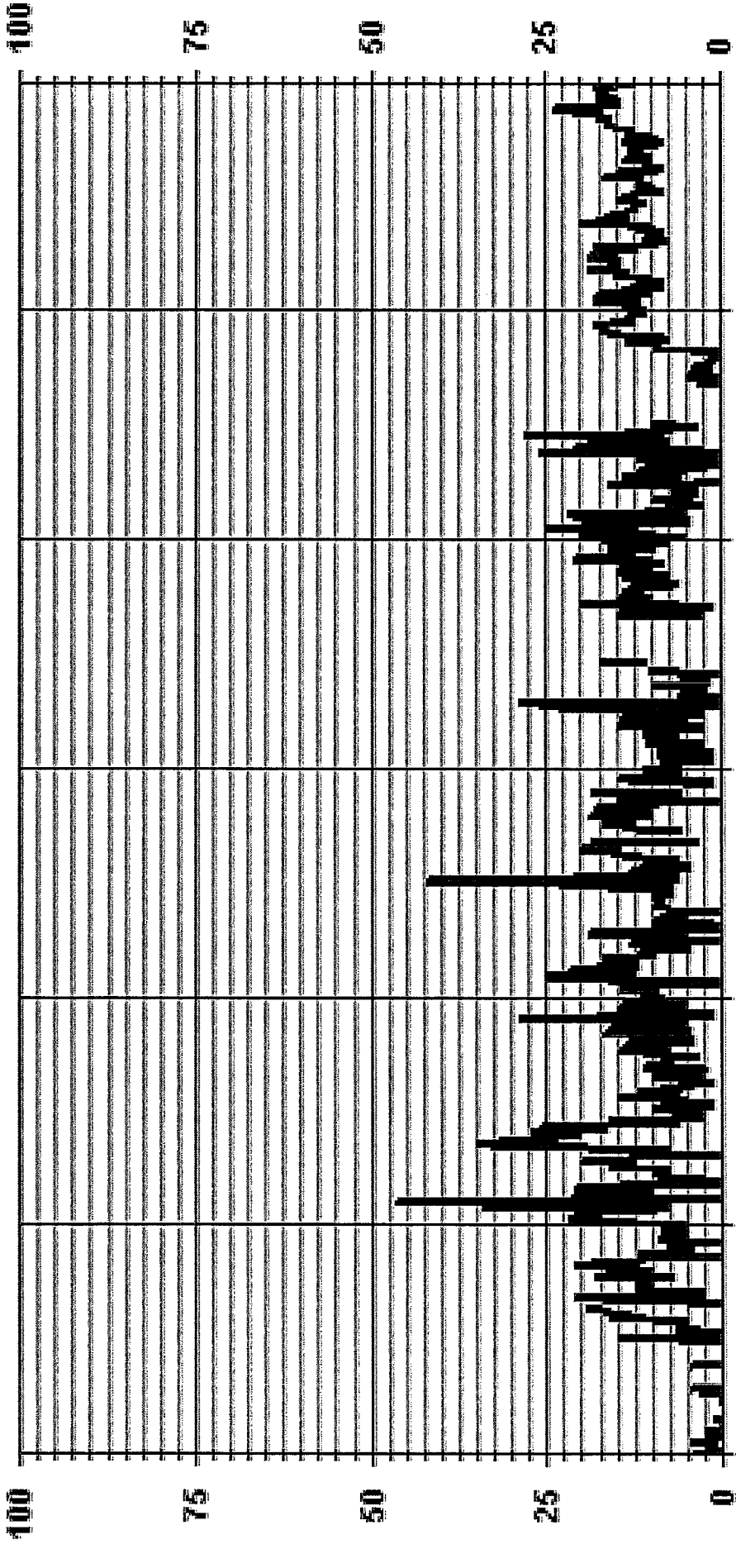
STANDARD DEVIATION: 6.76 MONTHLY AVERAGE: 10.5 ug/m3

STATUS FLAG CODES

- C - CALIBRATION
- Y - MAINTENANCE
- S - DAILY ZERO/SPAN CHECK
- P - POWER FAILURE
- G - OUT FOR REPAIR
- Q - QUALITY ASSURANCE
- R - RECOVERY
- X - MACHINE MALFUNCTION
- O - OPERATOR ERROR
- K - COLLECTION ERROR



01 Hour Averages



11/04/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA PM2 UGM3

LICA
 PM2 / WD Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 01
 Site Name : LICA
 Parameter : PM2
 Units : UG/M3

Wind Parameter : WD
 Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 30	.47	.94	2.21	2.84	5.69	1.58	9.81	3.79	3.00	4.58	11.70	24.20	12.34	5.85	5.37	4.43	98.89
< 60	.00	.00	.00	.00	.00	.00	.15	.00	.15	.47	.00	.15	.15	.00	.00	.00	1.10
< 80	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 120	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 240	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 240	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	.47	.94	2.21	2.84	5.69	1.58	9.96	3.79	3.16	5.06	11.70	24.36	12.50	5.85	5.37	4.43	

Calm : .00 %

Total # Operational Hours : 632

Distribution By Samples

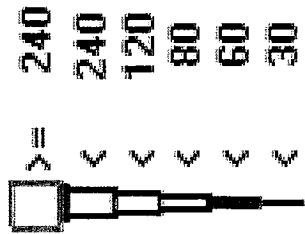
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 30	3	6	14	18	36	10	62	24	19	29	74	153	78	37	34	28	625
< 60						1			1	3		1					7
< 80																	
< 120																	
< 240																	
>= 240																	
Totals	3	6	14	18	36	10	63	24	20	32	74	154	79	37	34	28	

Calm : .00 %

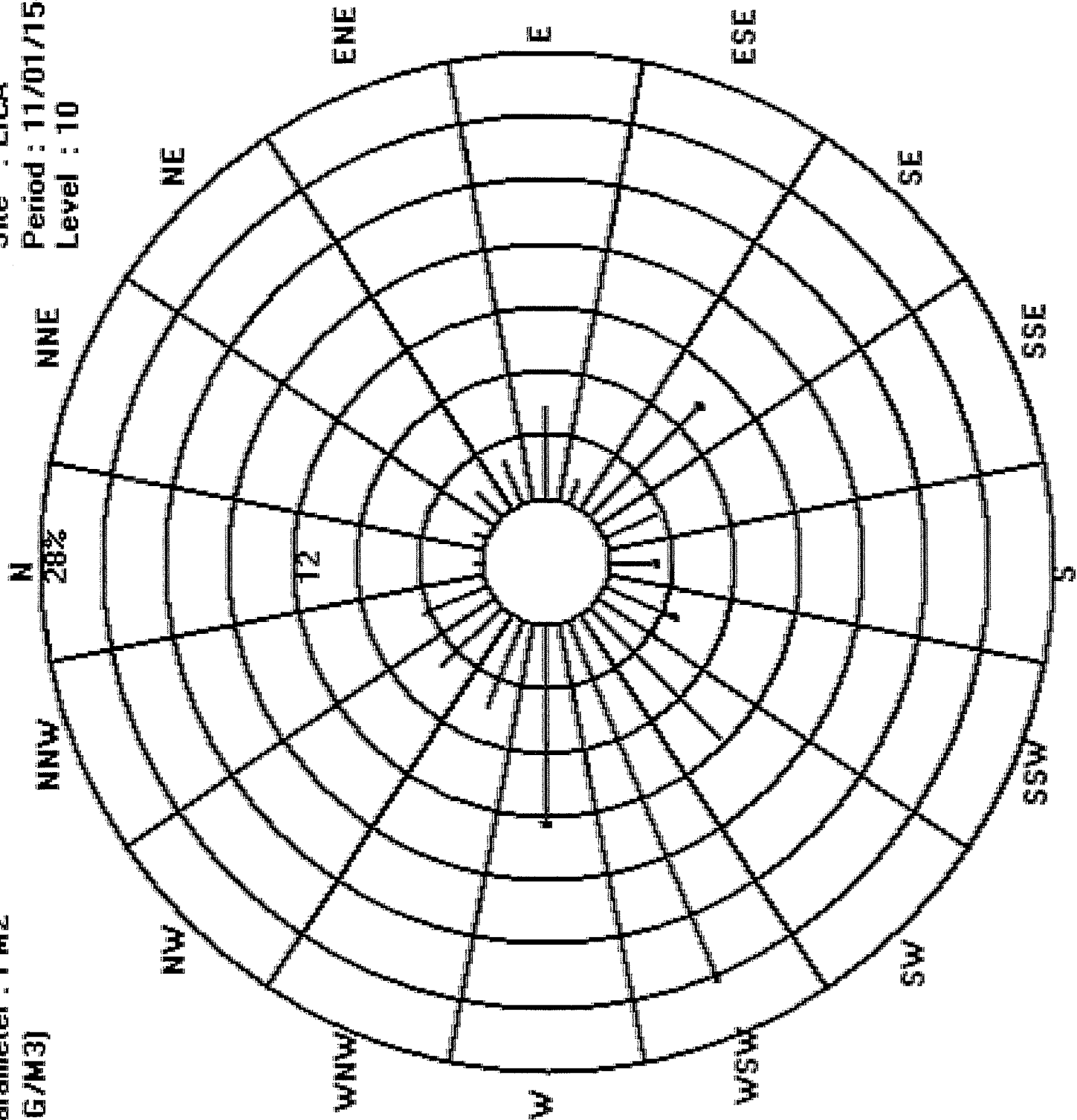
Total # Operational Hours : 632

Logger : 01 Parameter : PM2

Class Limits (UG/M3)



Site : LICA
Period : 11/01/15-11/30/15
Level : 10



WIND SPEED



WIND SPEED (WS) hourly averages in km/hr

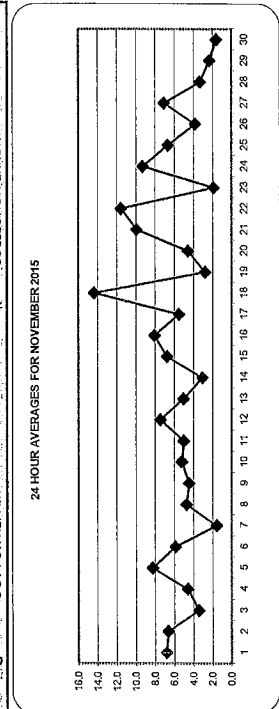
MST

DAY	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
HOURLY MAX	7.5	7.4	6.8	6.7	4.8	3.5	5.4	5.6	5.8	6.3	7.3	8.4	7.6	8.5	7.8	9.3	6.5	7.7	7.4	6.5	6.4	7.6	6.5	6.2	9.3	6.8	24			
HOURLY AVG	6.0	4.6	5.4	7.0	5.1	7.6	6.9	7.3	7.5	7.9	8.1	8.4	7.8	9.3	7.0	5.8	6.2	6.7	6.4	5.9	5.6	4.4	9.3	6.6	24					
DAILY MAX	4.3	4.1	2.6	2.0	1.7	1.4	2.8	3.3	4.3	4.6	4.3	5.1	3.6	3.2	3.9	4.4	6.0	5.1	4.4	2.1	2.4	1.9	2.5	2.4	6.0	3.4	24			
DAILY AVG	2.9	4.2	2.3	2.7	2.6	2.4	2.4	2.1	1.7	4.7	7.0	9.6	8.5	7.7	9.4	6.9	4.7	3.9	2.2	3.4	3.3	5.3	5.7	6.0	4.6	4.6	24			
DAILY MAX	6.7	6.3	5.7	5.9	4.8	3.5	2.7	2.4	4.0	7.8	11.9	12.2	8.8	10.4	12.1	10.6	13.9	7.3	9.5	11.0	11.3	12.4	9.0	8.4	13.9	8.3	24			
DAILY AVG	8.1	5.6	7.9	5.7	5.3	3.7	3.8	3.9	5.7	5.3	6.1	4.6	4.7	4.9	5.5	6.7	7.6	9.4	8.4	6.7	4.1	3.8	9.4	5.9	24					
DAILY MAX	4.6	3.6	1.0	1.3	1.3	1.6	2.5	0.4	0.7	1.1	1.6	4.3	2.1	1.4	2.5	2.6	1.0	0.7	1.5	0.3	0.2	0.5	1.2	0.6	4.6	1.6	24			
DAILY AVG	2.2	0.5	0.8	0.9	0.9	1.8	1.0	1.4	1.1	3.3	4.9	4.6	5.6	7.8	6.9	6.2	4.8	6.5	7.1	9.7	9.8	10.8	7.9	10.8	4.8	24				
DAILY MAX	9.4	8.3	7.1	6.8	6.6	7.5	5.4	3.8	1.6	1.4	6.1	5.9	5.1	3.4	3.2	3.0	2.8	2.9	2.6	2.5	4.3	3.0	2.4	2.6	9.4	4.5	24			
DAILY AVG	3.1	3.0	3.7	4.1	4.8	4.5	5.5	4.6	5.5	7.4	6.8	7.0	7.2	6.8	5.5	4.9	5.5	6.7	5.8	4.3	3.0	2.4	2.6	9.4	4.5	24				
DAILY MAX	5.4	6.0	5.5	4.3	2.8	3.7	3.3	2.1	1.4	3.7	4.6	4.7	4.3	5.5	7.0	6.4	7.7	5.8	6.5	6.0	5.3	5.9	6.6	6.2	7.7	5.0	24			
DAILY AVG	5.8	5.4	6.2	5.3	4.6	5.7	5.9	3.5	7.3	5.3	1.9	1.1	2.2	3.7	3.2	5.0	4.9	2.5	6.6	6.0	7.4	8.2	7.4	8.2	5.0	24				
DAILY MAX	7.5	6.3	6.2	3.4	3.7	5.5	5.0	4.5	5.1	4.8	3.8	0.5	2.3	3.0	2.9	1.9	1.3	0.5	0.9	1.1	1.1	1.4	0.8	0.0	7.5	3.1	24			
DAILY AVG	1.6	3.0	4.5	6.5	7.4	7.8	9.3	13.0	12.5	13.5	12.3	13.6	10.7	11.4	9.5	8.2	6.9	8.2	6.7	5.6	3.8	1.0	0.5	1.4	13.6	6.8	24			
DAILY MAX	12.2	14.5	17.3	17.2	14.8	16.3	13.6	13.8	14.6	15.2	19.6	21.5	21.2	21.3	23.2	20.7	19.1	12.2	11.0	8.2	6.8	4.1	3.1	3.0	23.2	14.4	24			
DAILY AVG	1.8	2.8	4.3	3.1	3.9	3.6	3.1	2.3	4.6	3.5	4.2	4.3	4.1	2.0	1.0	3.1	1.5	3.4	0.8	1.0	3.6	1.5	0.4	2.9	4.6	2.8	24			
DAILY MAX	3.1	5.0	4.5	4.6	0.8	2.0	1.1	1.8	6.0	6.2	8.4	9.6	8.1	9.3	9.7	7.1	4.7	2.2	2.0	2.7	2.9	2.4	2.5	2.9	9.7	4.6	24			
DAILY AVG	5.9	5.7	8.6	9.2	9.9	7.5	8.3	10.0	11.2	9.6	10.2	10.8	9.9	11.6	13.7	12.6	10.9	10.6	6.8	9.5	10.8	13.1	10.2	11.9	13.7	9.9	24			
DAILY MAX	12.3	11.2	12.0	13.7	15.1	14.8	12.5	10.4	10.8	11.7	14.3	17.1	17.1	17.4	17.3	14.6	10.5	7.9	7.5	7.8	6.5	5.6	5.2	4.8	17.4	11.6	24			
DAILY AVG	1.7	1.6	3.3	5.3	5.7	2.1	0.8	1.1	0.6	0.6	2.0	2.9	1.7	2.0	0.6	2.1	1.6	1.2	0.7	0.5	0.4	0.8	1.0	4.7	5.7	1.0	24			
DAILY MAX	8.2	9.8	8.7	9.0	8.2	11.3	12.4	12.1	13.6	13.5	12.4	14.1	12.3	12.2	12.7	11.0	8.3	4.6	3.2	2.6	4.6	3.8	7.1	7.1	14.1	9.3	24			
DAILY AVG	5.6	6.5	7.8	6.9	9.4	9.3	10.4	5.6	7.3	6.2	10.0	9.4	8.9	8.5	8.2	5.7	2.4	5.5	5.3	2.7	1.1	5.5	6.6	4.9	10.4	6.7	24			
DAILY MAX	2.2	1.7	0.5	0.7	0.2	0.7	0.8	1.3	1.5	1.8	2.8	3.7	4.2	9.5	7.7	3.7	4.8	7.1	3.5	4.1	1.6	2.8	0.3	1.4	15.3	7.1	24			
DAILY AVG	8.7	6.8	7.9	8.2	8.3	9.6	6.9	8.1	8.8	9.7	10.8	15.3	14.2	9.5	7.7	3.7	4.8	7.1	3.5	4.1	1.6	2.8	0.3	1.4	15.3	7.1	24			
DAILY MAX	2.8	0.1	1.0	0.8	0.2	1.0	0.6	0.3	1.4	0.5	3.2	5.1	5.9	8.7	6.9	6.9	5.9	2.5	5.9	8.5	5.6	0.3	0.6	4.7	8.7	3.3	24			
DAILY AVG	5.2	0.3	0.4	1.0	0.4	2.6	6.1	1.5	0.4	1.5	4.8	5.7	7.2	5.1	3.1	0.1	0.8	2.1	0.6	0.4	0.4	0.6	0.4	7.2	2.3	2.3	24			
DAILY MAX	0.5	0.4	0.9	0.8	0.7	0.3	0.6	0.4	0.9	1.0	1.3	3.9	4.8	5.0	6.3	3.6	1.1	1.0	1.1	0.3	0.9	0.6	1.2	0.9	6.3	1.6	24			
DAILY AVG	12.3	14.5	17.3	17.2	15.1	16.3	13.6	13.8	14.6	15.2	19.6	21.5	21.2	21.3	23.2	20.7	19.1	12.2	11.0	11.0	11.3	13.1	11.9	11.9	11.9	11.9	11.9	11.9	11.9	
DAILY MAX	5.3	5.3	5.4	5.4	5.2	5.2	5.4	5.0	5.6	5.9	7.4	8.1	7.5	7.6	7.7	6.6	5.6	5.0	5.1	4.7	4.6	4.4	4.5	4.9	4.9	4.9	4.9	4.9	4.9	

STATUS FLAG CODES

C	- CALIBRATION	Q	- QUALITY ASSURANCE
V	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SKIP CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

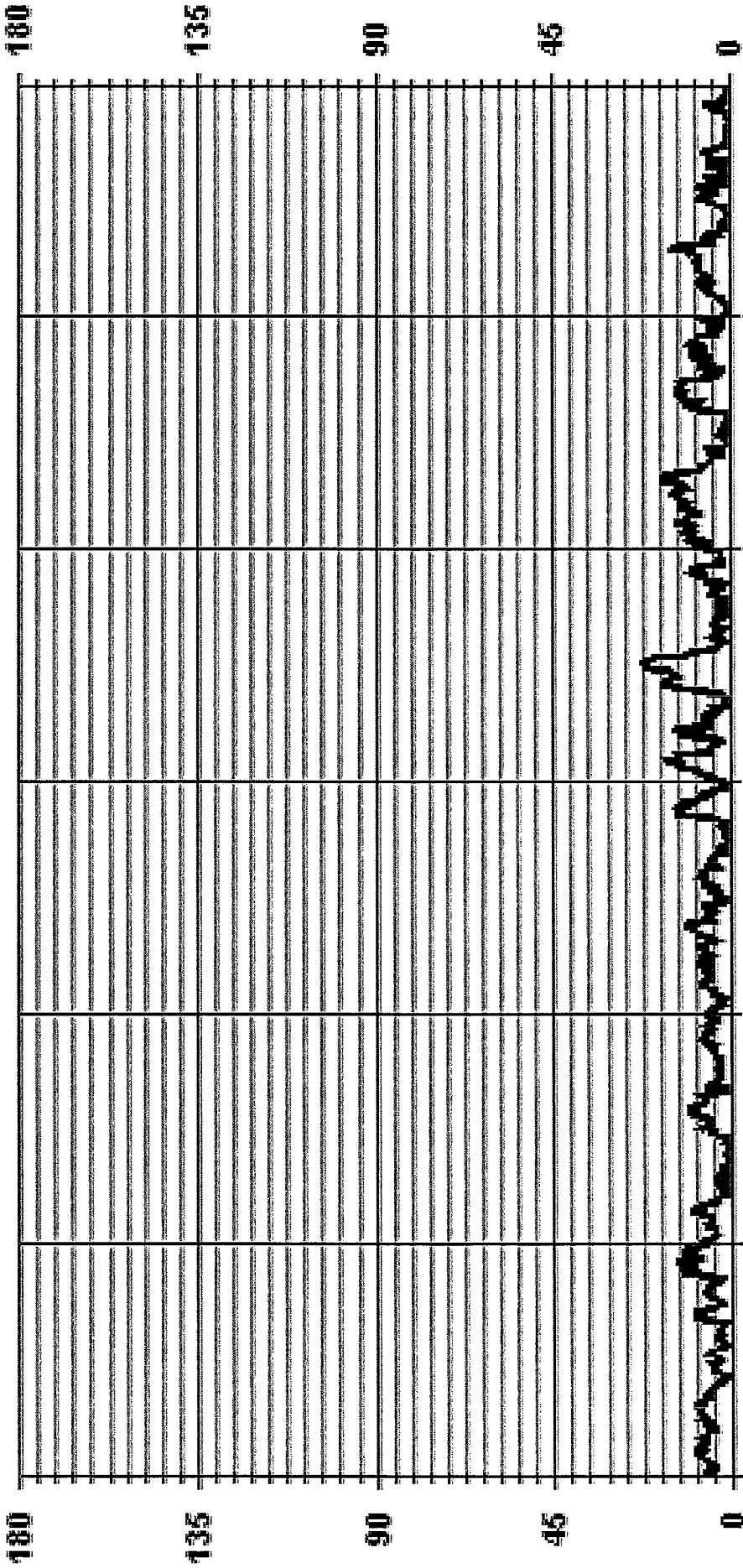
LAST CALIBRATION: April 1, 2015
DECLINATION: MAGNETIC DECLINATION 19 DEGREE EAST



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	719	OPERATIONAL TIME:	720 HRS
MAXIMUM 1-HR AVERAGE:	23.2 KPH	AMD OPERATION UPTIME:	100.0 %
MAXIMUM 24-HR AVERAGE:	14.4 KPH	MONTHLY AVERAGE:	5.7 KPH
MONTHLY CALIBRATION TIME:	0 HRS	ON DAY(S)	18
STANDARD DEVIATION:	4.04	VAR-VARIOUS	18

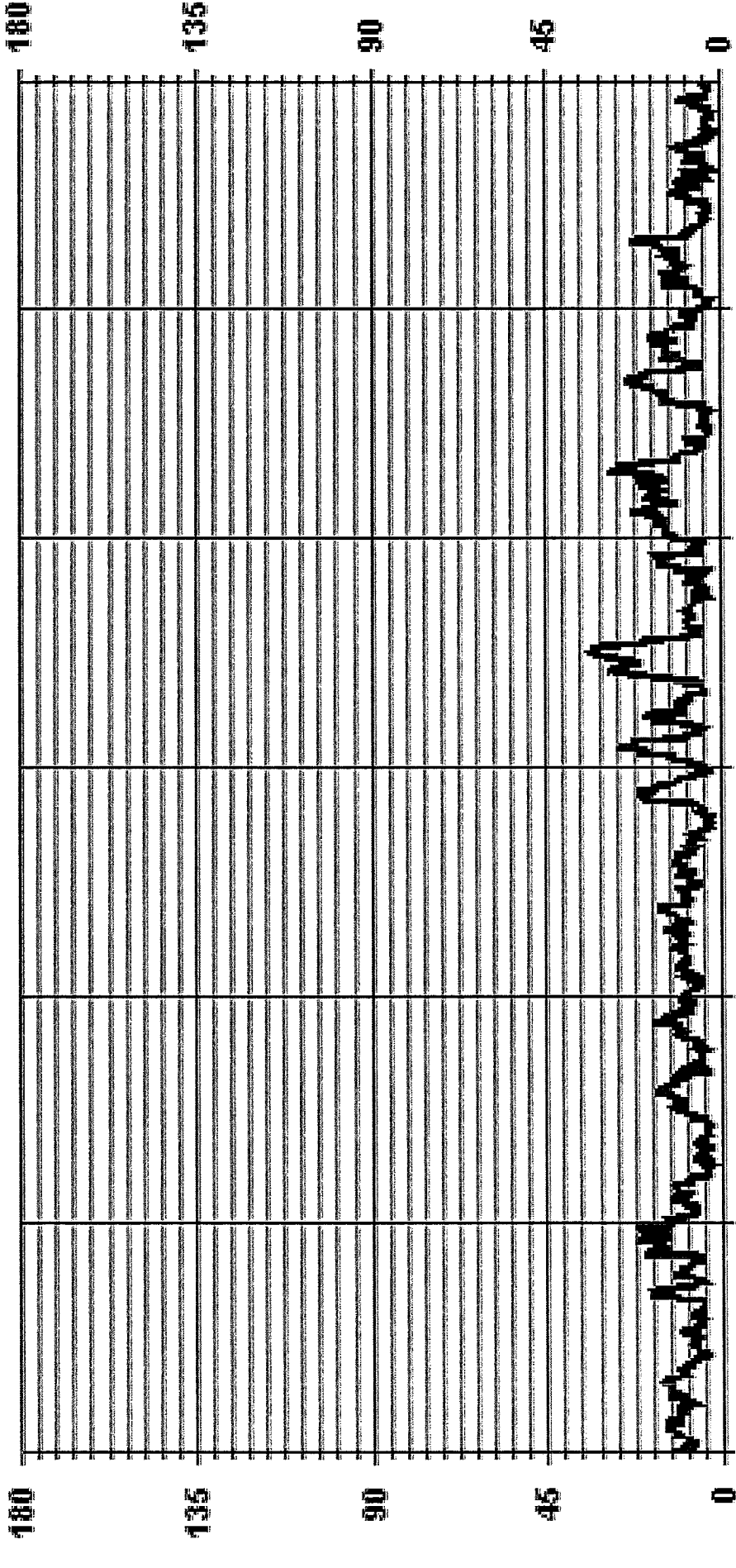
01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA - - - WSP . . . KPH

01 Hour Averages



— LICA WSMAX KPH

LICA
WSP / WD Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 01
Site Name : LICA
Parameter : WSP
Units : KPH
Wind Parameter : WD
Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 6.0	.55	.41	1.11	1.38	2.08	1.80	5.41	3.19	2.36	3.88	7.63	13.61	6.80	2.63	2.22	1.52	56.66
< 12.0	.41	.27	1.52	1.80	4.30	.83	3.19	.13	.13	.41	2.91	8.19	3.75	1.25	2.22	1.25	32.63
< 20.0	.13	.00	.00	.00	.69	.00	.41	.00	.00	.00	.00	.27	1.66	2.08	1.11	1.66	8.05
< 29.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.69	.00	.69
< 39.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 39.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.11	.69	2.63	3.19	7.08	2.63	9.02	3.33	2.50	4.30	10.55	22.08	12.22	5.97	6.25	4.44	

CalM : 1.94 %

Total # Operational Hours : 720

Distribution By Samples

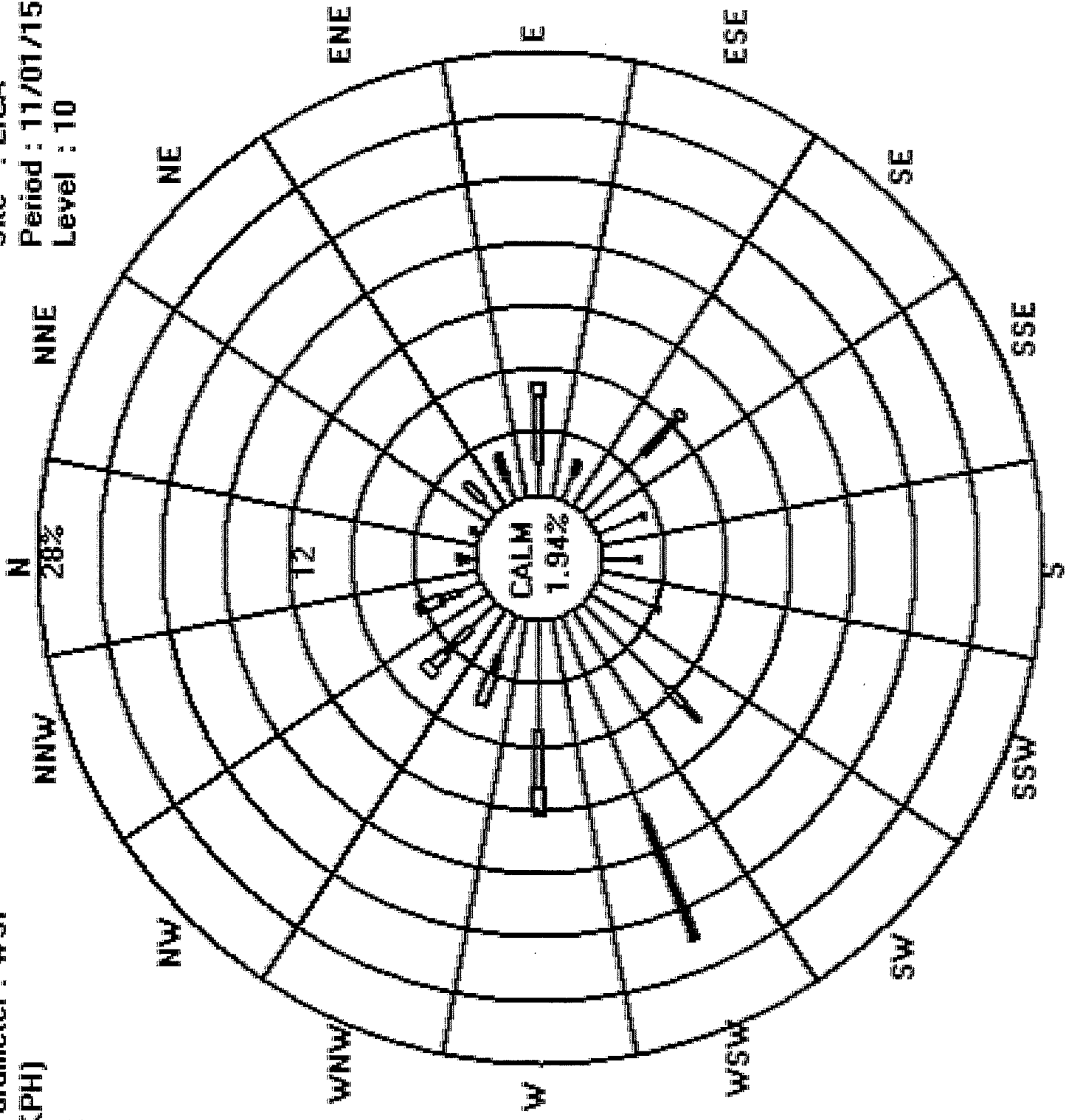
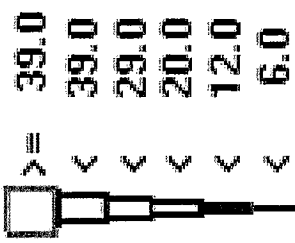
Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 6.0	4	3	8	10	15	13	39	23	17	28	55	98	49	19	16	11	408
< 12.0	3	2	11	13	31	6	23	1	1	3	21	59	27	9	16	9	235
< 20.0	1			5			3					2	12	15	8	12	58
< 29.0															5		5
< 39.0																	
>= 39.0																	
Totals	8	5	19	23	51	19	65	24	18	31	76	159	88	43	45	32	

CalM : 1.94 %

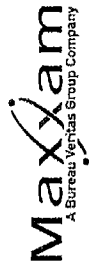
Total # Operational Hours : 720

Site : LICA
 Period : 11/01/15-11/30/15
 Level : 10

Logger : 01 Parameter : WSP
 Class Limits (KPH)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Site - NOVEMBER 2015
JOB # 2833-2015-11-01-C

WIND DIRECTION (WD) hourly averages

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	
1	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
2	ESE	ESE	SE	SE	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
3	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
4	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
5	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW
6	SE	SSE	SSE	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
7	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
8	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
9	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
10	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW
11	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
12	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
13	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
14	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
15	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
16	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
17	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
18	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW
19	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW
20	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
21	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
22	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW
23	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
24	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW
25	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW
26	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW
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28	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW
29	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW
30	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW

24-HOUR AVG
QUADRANT
ROGS.

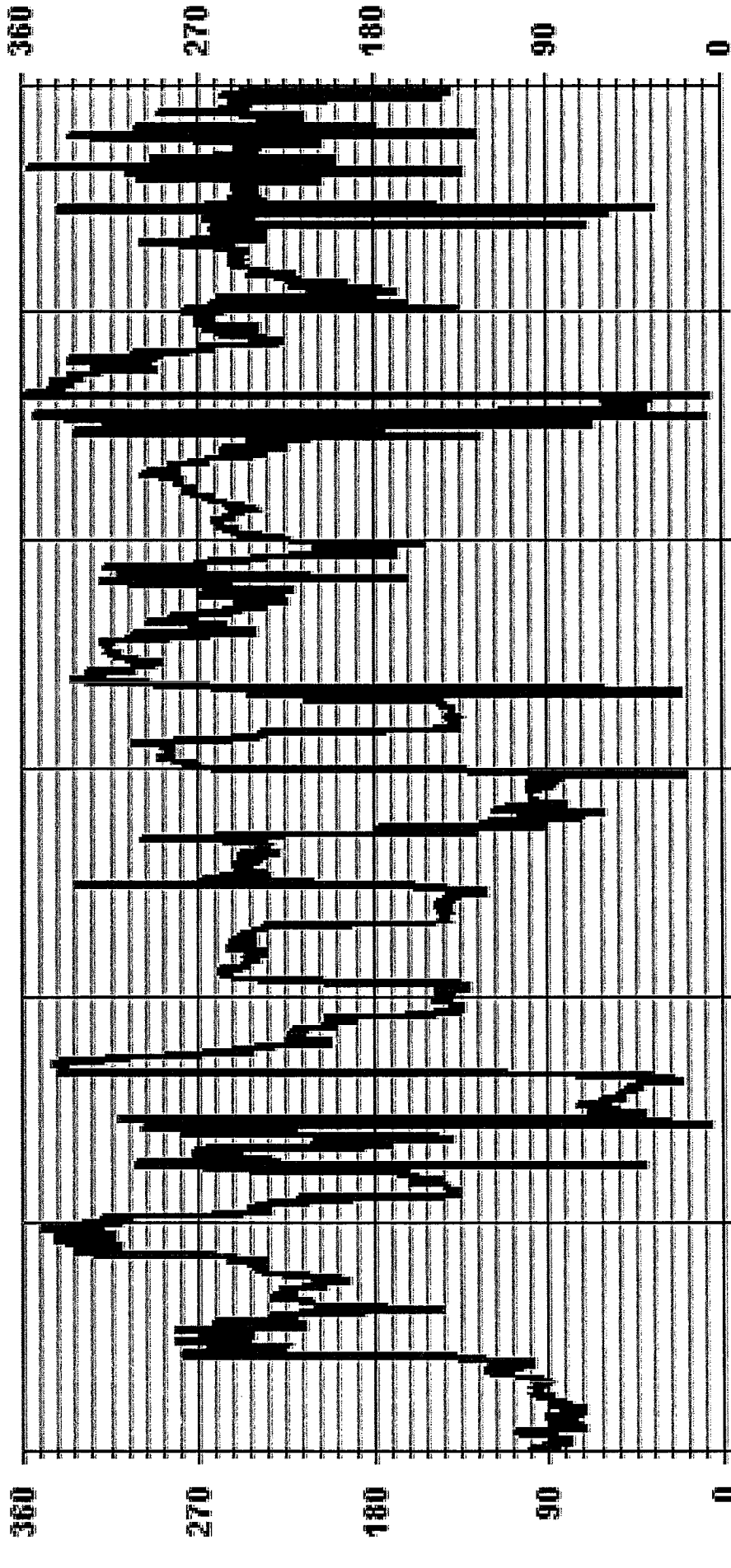
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
Y	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

LAST CALIBRATION: April 1, 2015
DECLINATION: MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	HRS	OPERATIONAL TIME:	720	HRS
STANDARD DEVIATION:	80.62		AMID OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	W	

01 Hour Averages



— LICA - - - WDR . . . DEG

STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Site - NOVEMBER 2015
JOB # 2833-2015-11-01-C

STANDARD DEVIATION WIND DIRECTION (STDWD) hourly averages in degrees

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	
1	19	18	20	18	18	17	20	20	20	22	22	23	22	19	18	21	21	24	18	18	18	20	18	20	19	19
2	19	20	19	18	18	17	19	19	18	18	18	18	18	21	20	22	17	20	20	19	22	18	22	18	22	21
3	22	23	23	30	27	34	29	25	21	22	23	21	28	29	24	22	21	18	15	29	26	44	32	26	44	32
4	24	22	31	23	35	35	32	33	33	54	27	25	32	31	23	30	35	35	46	48	39	30	27	18	30	
5	15	18	18	16	19	18	23	20	15	19	16	15	17	15	15	16	20	15	16	15	17	15	16	16	16	
6	16	16	17	17	19	22	21	20	16	19	21	24	36	43	31	22	11	11	12	13	15	23	25	42	42	
7	23	40	45	48	34	50	31	45	57	68	40	19	39	52	31	27	42	43	32	69	52	66	48	69	69	
8	23	59	36	32	54	47	63	46	60	20	22	20	19	19	18	19	16	17	15	18	17	17	19	20	20	
9	19	20	19	18	19	18	18	23	38	49	14	18	18	24	21	22	17	20	19	22	18	22	27	30	30	
10	36	36	31	26	23	31	30	31	35	41	37	38	38	37	33	26	13	13	13	14	24	43	32	23	23	
11	18	16	18	29	33	25	23	49	48	22	38	22	23	20	17	19	17	17	17	17	19	20	17	15	15	
12	18	18	18	16	17	17	16	14	16	21	20	20	21	27	38	21	13	16	13	15	16	15	13	17	17	
13	19	23	17	16	21	14	17	30	14	18	50	52	47	31	28	38	28	27	18	15	16	16	17	18	18	
14	16	18	17	44	24	14	13	14	13	24	31	70	32	28	27	28	39	62	49	27	49	30	46	54	54	
15	41	28	26	31	20	17	17	17	20	19	20	21	19	20	21	22	19	22	24	20	16	24	35	32	29	
16	33	16	18	18	19	20	19	20	20	21	19	20	21	22	19	22	24	20	16	24	35	32	29	12	14	
17	15	12	13	14	26	16	13	23	32	26	27	39	35	42	37	39	56	51	29	48	49	29	12	14	14	
18	14	13	14	19	20	21	22	23	25	23	35	31	35	41	45	59	21	41	22	61	58	17	34	53	17	
19	48	30	24	42	21	22	23	25	23	35	31	35	41	45	59	21	41	22	61	58	17	34	53	17	17	
20	33	15	25	21	50	40	46	38	18	20	16	22	26	21	19	16	19	28	57	50	41	35	29	34	34	
21	20	24	16	18	19	19	20	18	18	19	18	19	18	19	18	18	18	19	19	19	20	18	17	17	17	
22	19	18	20	18	18	19	19	20	18	20	21	20	21	21	21	20	19	20	19	16	17	14	13	13	9	9
23	41	27	22	15	14	27	47	32	50	58	24	28	40	42	57	19	31	54	52	61	45	51	36	15	15	
24	18	18	18	20	18	20	16	16	14	16	17	19	18	21	16	15	12	16	17	23	21	20	18	16	16	
25	20	20	21	22	19	20	21	18	15	23	19	21	21	23	21	19	27	14	14	50	46	16	12	12	12	
26	29	55	32	49	74	46	52	26	48	36	41	34	34	31	26	37	31	29	17	30	20	19	18	15	15	
27	16	17	17	16	16	16	15	15	15	16	17	18	19	20	19	20	19	14	10	31	25	38	22	48	42	
28	20	57	55	56	57	35	58	52	52	59	23	18	21	18	18	16	15	19	11	15	14	62	59	13	13	
29	14	79	47	62	31	31	8	58	60	36	20	24	19	21	19	17	53	53	40	40	65	54	45	58	58	
30	48	51	35	53	42	61	44	70	50	38	56	21	23	24	17	42	96	60	53	42	30	33	33	57	57	

STATUS FLAG CODES

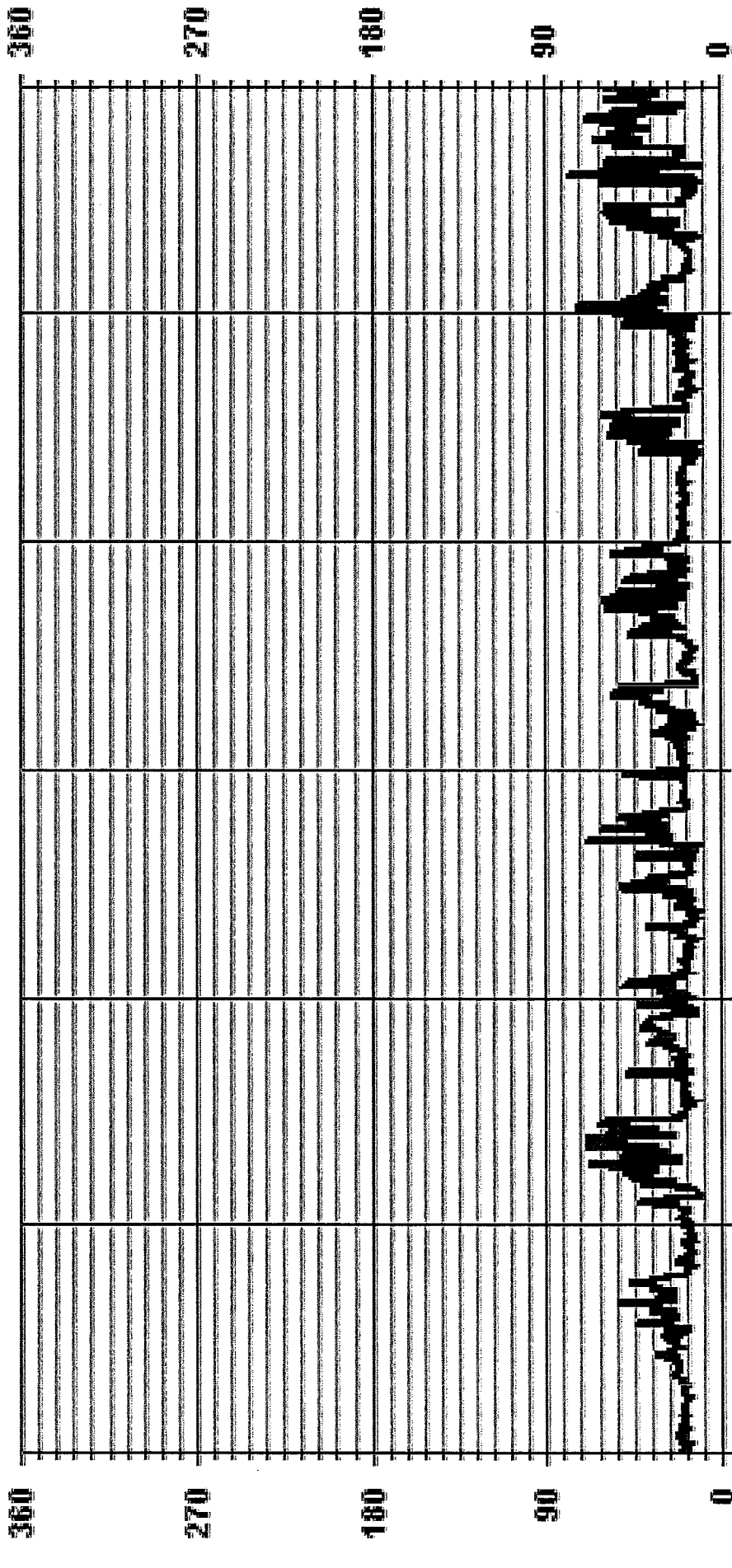
C	- CALIBRATION	Q	- QUALITY ASSURANCE
Y	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUTFOR REPAIR	K	- COLLECTION ERROR

LAST CALIBRATION:

April 1, 2015

CALIBRATION TIME: 0 HRS OPERATIONAL TIME: 720 HRS

01 Hour Averages



— LICA STDWDIR DEG

RELATIVE HUMIDITY



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Site - NOVEMBER 2015
JOB # 2833-2015-11-01- C

RELATIVE HUMIDITY (RH) hourly averages in %

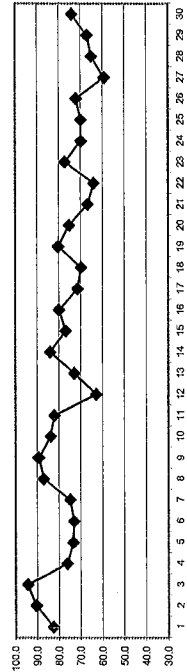
MST

DAY	HOUR START																								DAILY MAX.	24-HOUR AVG.	ROGS.	
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				0:00
1	88	88	90	90	92	91	90	90	89	85	81	80	75	71	68	72	78	83	84	78	77	79	82	84	92	82.7	24	
2	84	84	86	86	87	87	83	83	86	90	94	95	95	95	94	93	93	93	93	93	94	95	95	95	95	90.5	24	
3	95	96	97	98	98	98	98	98	99	99	99	97	92	88	87	87	89	93	92	92	94	95	94	92	99	94.5	24	
4	89	88	90	90	88	88	90	88	87	80	74	62	61	60	62	64	67	71	72	72	71	72	73	92	92	76.3	24	
5	76	77	80	84	85	86	87	89	91	80	68	68	67	65	61	63	65	66	65	67	71	72	71	91	91	73.6	24	
6	71	72	71	70	72	79	83	83	82	78	77	74	68	62	60	63	67	71	74	77	79	79	76	67	83	73.1	24	
7	68	67	75	76	82	83	83	81	82	81	68	62	63	63	60	63	69	73	79	83	84	84	84	84	84	74.9	24	
8	84	85	87	88	90	85	81	83	82	75	72	80	82	83	86	90	95	97	96	93	91	92	91	90	92	87.2	24	
9	89	89	89	89	91	89	89	88	88	88	90	89	88	86	87	89	90	91	91	92	92	90	91	90	90	89.4	24	
10	87	83	83	81	83	84	85	85	86	85	85	84	83	79	77	79	83	86	87	86	87	85	85	85	87	84.0	24	
11	85	85	87	85	86	88	87	87	86	85	83	81	78	76	77	78	80	79	79	79	80	78	77	88	82.1	24		
12	77	75	77	79	79	79	77	78	75	68	65	59	54	50	47	53	56	52	49	44	47	54	62	79	62.8	24		
13	67	68	71	74	77	79	79	78	79	79	72	65	63	59	63	68	72	76	77	78	81	78	74	81	73.0	24		
14	72	73	79	82	86	85	87	90	89	84	81	78	76	77	78	78	87	90	91	90	91	91	90	91	90	84.0	24	
15	90	91	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	76.9	24	
16	88	88	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	88	79.9	24	
17	83	78	75	74	76	76	76	77	74	69	66	60	53	56	59	61	69	74	78	79	78	77	68	83	71.4	24		
18	66	69	66	64	67	67	69	71	69	67	68	69	68	66	64	65	66	69	72	75	77	78	80	83	69.8	24		
19	83	82	82	81	83	83	81	85	86	85	86	85	81	75	67	64	67	77	78	83	84	85	85	84	86	80.3	24	
20	82	84	86	88	87	87	86	86	86	86	82	81	72	66	60	61	62	68	71	72	71	68	67	68	88	75.3	24	
21	70	81	79	74	71	74	77	77	74	71	64	61	60	61	59	61	62	61	62	60	60	59	62	64	81	66.8	24	
22	66	67	67	66	66	66	69	74	74	70	60	52	50	50	54	57	62	64	64	63	67	68	69	72	74	64.0	24	
23	77	82	82	80	80	80	80	80	80	80	77	75	74	67	63	61	65	71	72	75	76	79	81	80	77	87	77.3	24
24	75	77	77	80	80	80	80	80	80	80	77	75	74	67	63	61	65	71	72	72	72	72	68	67	66	80	69.8	24
25	67	67	66	67	67	68	69	73	76	72	69	67	62	59	59	60	69	70	73	78	80	80	80	79	80	69.9	24	
26	80	80	79	79	78	78	78	78	79	80	79	75	71	61	57	54	58	64	66	67	70	71	75	76	80	72.1	24	
27	74	73	71	70	71	70	70	69	66	60	49	42	35	35	36	41	49	47	53	60	64	70	72	76	76	59.3	24	
28	76	77	80	80	80	82	82	81	71	55	47	43	39	40	43	49	60	59	57	60	69	74	74	82	82	65.0	24	
29	66	73	78	80	80	81	81	76	79	73	58	49	41	40	39	44	56	63	67	71	75	79	80	81	81	67.1	24	
30	84	84	84	83	82	82	82	81	80	76	68	63	54	47	47	52	66	75	78	81	82	82	82	84	84	74.1	24	
HOURLY MAX	95	96	97	97	98	98	98	99	99	99	99	97	95	95	94	93	95	97	97	96	94	95	95	95	95	95		
HOURLY AVG	78.6	79.4	80.4	80.6	81.3	81.8	81.3	80.9	77.8	73.2	69.6	66.1	63.9	63.2	65.5	70.5	73.3	75.3	76.2	77.2	78.3	78.9	78.8	78.8	78.8			

STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
V	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/Span CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

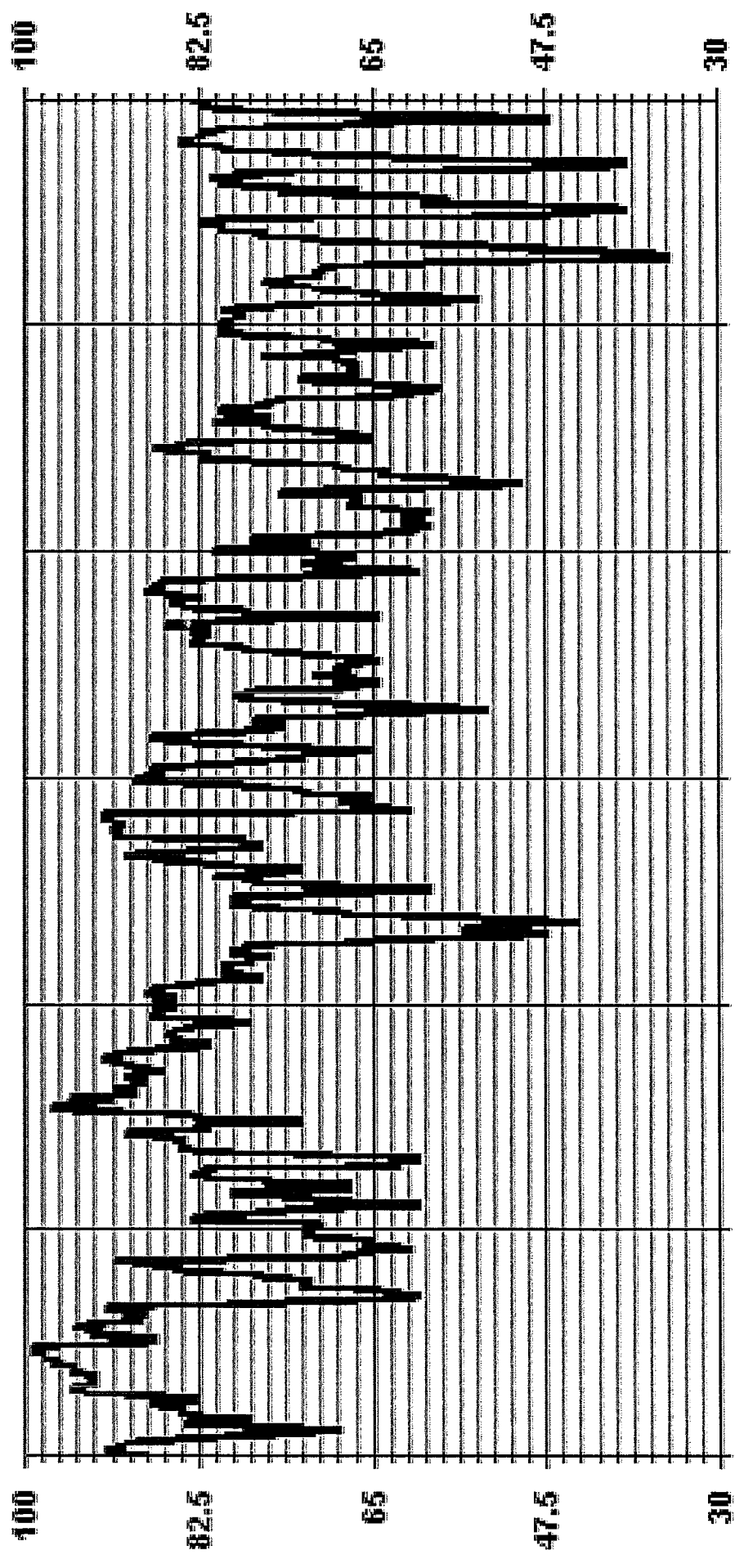
24 HOUR AVERAGES FOR NOVEMBER 2015



MONTHLY SUMMARY

MAXIMUM 1-HR AVERAGE:	99	%	@ HOURS(S)	VAR	ON DAY(S)	3
MAXIMUM 24-HR AVERAGE:	94.5	%			ON DAY(S)	3
STANDARD DEVIATION:	11.98				VAR-VARIOUS	
OPERATIONAL TIME:	720	HRS				
AMD OPERATION UPTIME:	100.0	%				
MONTHLY AVERAGE:	76	%				

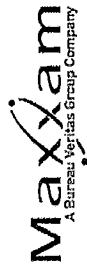
01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA - - - - RH %FS

AMBIENT TEMPERATURE



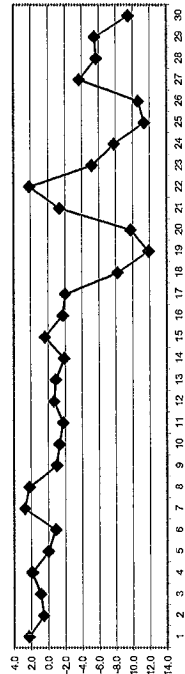
AMBIENT TEMPERATURE (TPX) hourly averages in Degrees Celsius

MST	HOUR START	HOUR END	SDAY																								DAILY MAX	DAILY AVG	24-HOUR AVG	RDGS
			0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				
1	2:9	2:9	2.9	2.9	2.6	2.2	2.0	2.0	2.0	1.9	2.4	2.8	2.9	3.3	3.3	3.4	3.2	2.5	1.9	1.4	1.5	1.5	1.4	1.3	1.3	3.4	2.3	24		
2	1.4	1.4	1.3	0.8	0.7	0.5	0.2	0.2	0.2	0.7	0.5	0.2	0.2	0.2	0.5	0.3	0.3	0.4	0.5	0.6	0.5	0.4	0.4	0.5	0.6	1.4	0.6	24		
3	0.8	0.8	0.8	0.8	0.7	0.5	0.6	0.7	0.8	0.7	0.8	1.0	1.4	1.8	2.3	2.7	2.7	2.4	1.2	0.8	0.9	0.5	-0.8	-1.3	-0.2	0.1	2.7	0.9	24	
4	0.2	0.3	0.0	0.0	0.2	-0.2	-0.7	-1.4	0.1	1.7	2.7	3.5	4.5	4.8	4.6	4.3	4.0	3.6	2.8	2.5	2.1	1.9	1.8	1.9	4.8	1.9	24			
5	1.4	1.3	0.9	0.6	0.3	0.2	-0.1	-0.6	-0.9	0.3	0.6	0.4	0.7	1.1	1.0	0.8	0.2	-0.1	-0.3	-0.5	-1.1	-1.9	-2.3	-2.4	1.4	0.0	24			
6	-2.5	-2.5	-2.7	-2.9	-2.8	-3.1	-3.2	-3.1	-3.0	-3.2	-3.1	-2.2	-1.7	-0.8	0.1	1.4	2.0	1.9	0.8	0.0	-0.5	-0.4	0.0	0.7	1.4	2.5	-0.9	24		
7	2.6	2.4	0.7	-0.1	-1.1	-1.9	-1.9	-1.9	-1.9	-1.9	0.7	3.6	4.8	5.5	6.5	7.6	6.2	5.4	3.7	2.5	2.1	2.3	2.8	3.0	7.6	2.7	24			
8	3.3	3.3	2.8	2.4	1.8	2.5	2.8	2.6	2.8	2.4	4.2	4.4	4.0	3.8	3.2	2.9	1.8	0.6	0.5	0.7	0.8	0.8	0.6	0.0	-0.2	4.4	2.2	24		
9	-0.6	-0.9	-1.0	-1.1	-1.4	-1.5	-1.6	-1.5	-1.3	-1.1	-1.2	-1.2	-1.2	-0.9	-0.4	-0.3	0.5	-0.6	-0.8	-0.9	-1.0	-1.1	-1.1	-1.1	-1.2	-0.3	-1.0	24		
10	-1.2	-1.1	-1.1	-1.0	-1.1	-1.2	-1.5	-1.6	-1.5	-1.4	-1.6	-1.3	-1.1	-0.4	0.1	0.0	-0.9	-1.7	-2.1	-2.3	-2.1	-2.2	-1.7	-1.9	0.1	-1.3	24			
11	-2.1	-2.3	-2.9	-2.6	-2.5	-2.7	-3.0	-2.7	-2.4	-2.1	-1.8	-1.2	-0.3	0.5	0.9	0.9	0.0	-1.0	-1.5	-1.8	-2.3	-3.0	-3.0	-3.1	0.9	-1.8	24			
12	-3.1	-2.5	-2.7	-3.3	-3.8	-4.3	-4.3	-4.3	-4.8	-4.1	-2.1	-0.5	1.0	2.3	3.6	4.0	2.6	1.2	1.2	0.8	0.8	0.8	0.2	-0.1	-0.4	4.0	-0.7	24		
13	-1.1	-0.8	-1.2	-2.0	-2.7	-3.3	-3.3	-3.0	-3.2	-3.4	-1.8	0.1	0.9	2.0	1.5	0.8	0.7	0.1	0.2	-0.3	-0.8	-0.6	0.0	-0.5	2.0	-0.9	24			
14	-0.7	-1.0	-1.7	-2.0	-4.1	-3.9	-4.1	-4.5	-3.5	-1.4	-0.2	1.3	2.2	2.1	2.1	1.8	-1.0	-2.5	-2.8	-3.0	-3.2	-4.2	-5.0	-5.6	2.2	-1.9	24			
15	-5.7	-4.7	-3.4	-2.7	-1.8	0.0	1.6	2.1	1.9	1.4	1.5	1.6	2.2	2.7	3.7	3.3	2.7	2.5	2.1	1.7	0.9	-0.6	-1.7	-2.2	3.7	0.4	24			
16	-1.8	-0.8	-0.2	0.1	0.7	0.7	0.9	0.5	0.2	0.1	-0.6	-1.1	-1.1	-1.0	-0.6	-0.5	-1.8	-2.8	-3.5	-5.4	-5.6	-6.0	-5.7	0.9	-1.7	24				
17	-5.5	-5.3	-4.9	-4.6	-4.0	-3.8	-4.1	-4.5	-4.0	-2.3	-0.9	1.0	2.9	2.3	1.4	1.0	-1.3	-1.9	-1.3	-2.0	-2.0	-1.9	-1.3	2.9	-2.0	-2.0	24			
18	-1.5	-2.1	-3.1	-4.9	-6.4	-7.3	-8.2	-8.7	-9.2	-8.9	-8.4	-8.2	-8.1	-7.9	-8.2	-8.4	-8.9	-9.7	-10.4	-10.9	-11.2	-11.5	-12.2	-13.0	-1.5	-8.2	24			
19	-13.3	-14.7	-15.0	-15.1	-14.7	-14.0	-13.6	-14.4	-13.8	-13.0	-12.6	-10.2	-9.5	-7.3	-6.8	-7.6	-9.1	-9.4	-11.2	-11.9	-11.4	-11.6	-11.9	-13.4	-6.8	-11.9	24			
20	-14.3	-13.4	-11.3	-11.1	-10.5	-10.2	-9.8	-9.8	-9.5	-9.0	-9.3	-8.8	-8.6	-8.1	-8.1	-9.1	-10.5	-10.9	-10.8	-9.9	-8.6	-7.9	-7.2	-7.2	-9.8	-24	24			
21	-6.5	-5.9	-5.1	-4.8	-4.5	-5.3	-6.1	-5.9	-4.9	-3.7	-1.8	-0.5	0.6	1.0	1.8	1.1	0.9	1.6	2.0	2.5	2.7	3.2	2.6	2.5	3.2	-1.4	24			
22	2.5	2.2	2.8	3.3	3.5	3.9	3.3	2.4	2.2	2.9	4.1	5.0	5.3	5.2	4.9	3.9	2.7	1.8	2.0	2.5	2.7	3.2	2.6	2.5	3.2	2.1	24			
23	-6.6	-8.0	-8.3	-7.5	-6.5	-8.0	-9.4	-10.1	-8.6	-5.0	-2.3	-1.7	-1.5	-1.7	-1.5	-1.7	-2.1	-2.6	-3.0	-3.3	-3.8	-4.2	-4.4	-4.0	-1.5	-5.2	24			
24	-3.2	-3.3	-3.7	-4.2	-4.5	-5.1	-5.7	-6.3	-7.2	-7.7	-7.9	-7.6	-7.6	-7.6	-8.3	-9.6	-10.7	-11.4	-12.1	-11.8	-11.3	-10.2	-10.0	-9.9	-3.2	-7.8	24			
25	-9.7	-9.9	-10.0	-9.8	-10.3	-10.7	-11.0	-11.9	-12.6	-11.7	-11.0	-9.9	-9.2	-8.5	-8.6	-8.8	-10.8	-11.1	-12.0	-13.7	-15.2	-15.8	-15.1	-15.7	-8.5	-11.4	24			
26	-16.1	-16.9	-17.0	-17.3	-17.8	-17.3	-16.8	-15.4	-12.8	-9.2	-6.2	-5.6	-4.2	-3.1	-3.4	-4.1	-6.0	-6.7	-6.8	-7.3	-7.3	-7.9	-7.7	-7.8	-3.1	-10.7	24			
27	-7.0	-6.7	-6.6	-6.3	-6.4	-6.1	-6.3	-6.2	-5.9	-4.2	-1.6	0.2	2.2	3.3	3.4	1.7	-0.9	-1.0	-2.7	-4.2	-5.2	-6.7	-7.2	-8.4	3.4	-3.7	24			
28	-8.6	-9.3	-10.1	-10.3	-10.6	-10.9	-11.2	-11.4	-11.1	-8.1	-3.5	-0.9	1.7	2.7	2.7	1.2	-1.1	-3.5	-3.8	-3.4	-4.2	-6.5	-8.1	-8.4	2.7	-5.7	24			
29	-6.5	-8.2	-9.3	-9.8	-10.1	-10.3	-9.9	-8.8	-9.3	-7.3	-3.0	-0.1	2.1	2.9	3.3	1.9	-1.5	-3.3	-4.6	-5.9	-7.2	-8.4	-9.2	-10.1	3.3	-5.5	24			
30	-11.1	-11.9	-12.7	-13.3	-13.7	-14.0	-14.4	-14.9	-15.1	-12.6	-7.5	-4.4	-1.3	1.1	1.1	-0.3	-4.1	-7.1	-9.1	-10.6	-11.7	-12.4	-13.5	-14.1	1.1	-9.5	24			
HOURLY MAX	3.3	3.3	2.8	3.3	3.5	3.9	3.3	2.6	2.8	4.2	4.4	5.0	5.5	6.5	7.6	7.4	6.2	5.4	3.7	2.5	2.7	3.2	2.8	3.0						
HOURLY AVG	-3.8	-3.9	-4.1	-4.2	-4.4	-4.5	-4.6	-4.7	-4.6	-3.6	-2.3	-1.3	-0.4	0.2	0.3	-0.3	-1.5	-2.2	-2.8	-3.2	-3.5	-3.9	-4.1	-4.3						

STATUS FLAG CODES

- C - CALIBRATION
- Y - MAINTENANCE
- S - DAILY ZERO/SRANGE CHECK
- P - POWER FAILURE
- G - OUT FOR REPAIR
- Q - QUALITY ASSURANCE
- R - RECOVERY
- X - MACHINE MALFUNCTION
- O - OPERATOR ERROR
- K - COLLECTION ERROR

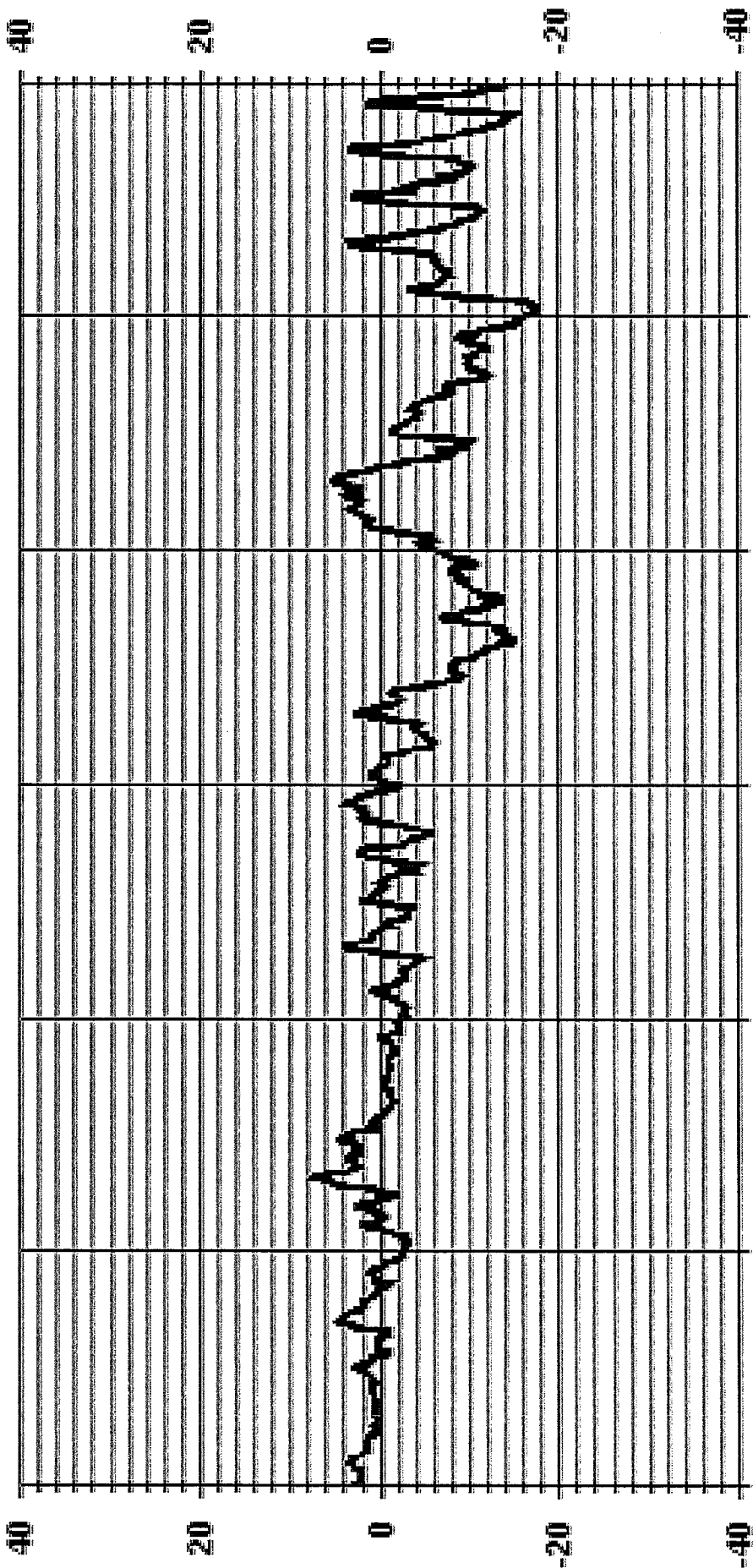
24-HOUR AVERAGES FOR NOVEMBER 2015



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-17.8	°C	@ HOUR(S)	4, 5	ON DAY(S)	26, 26
MAXIMUM 1-HR AVERAGE:	7.6	°C	@ HOUR(S)	14	ON DAY(S)	7
MAXIMUM 24-HR AVERAGE:	2.7	°C			VAR-VARIOUS	
STANDARD DEVIATION:	5.17					
OPERATIONAL TIME:	720	HRS				
AMID OPERATION UPTIME:	100.0	%				
MONTHLY AVERAGE:	-9.0	°C				

01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA TPX DGC

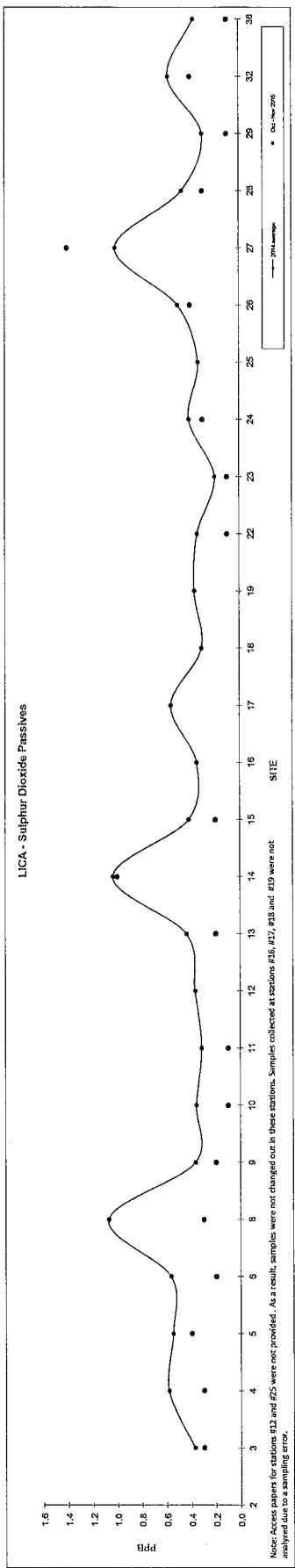
APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

PASSIVE RESULTS

Passive Summary Results for October - November 2015

Lakeland Industry & Community Association

Mean	2014																			October - November 2015									
	2	3	4	5	6	8	9	10	11	12	13	14	15	16	17	18	19	22	23	24	25	26	27	28	29	32	36	Reading	Site
NA	0.4	0.8	0.6	0.6	1.1	0.4	0.4	0.4	0.3	0.4	0.4	1.0	0.4	0.4	0.6	0.3	0.4	0.3	0.2	0.4	0.3	0.5	1.0	0.5	0.3	0.6	0.4	0.3	-
Minimum	NA	0.1	0.1	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	VPR
Maximum	NA	0.8	0.9	1.0	1.5	3.2	0.7	0.8	0.8	0.8	0.9	2.4	0.8	0.8	1.1	0.7	0.8	0.7	0.4	0.8	0.9	1.2	1.9	0.9	0.7	2.0	0.9	1.4	#27

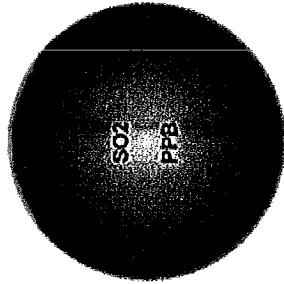


Note: Access papers for stations #12 and #25 were not provided. As a result, samples were not changed out in these stations. Samples collected at stations #15, #17, #18 and #19 were not analyzed due to a sampling error.

Lakeland Industry & Community Association SO₂ Passive Bubble Map

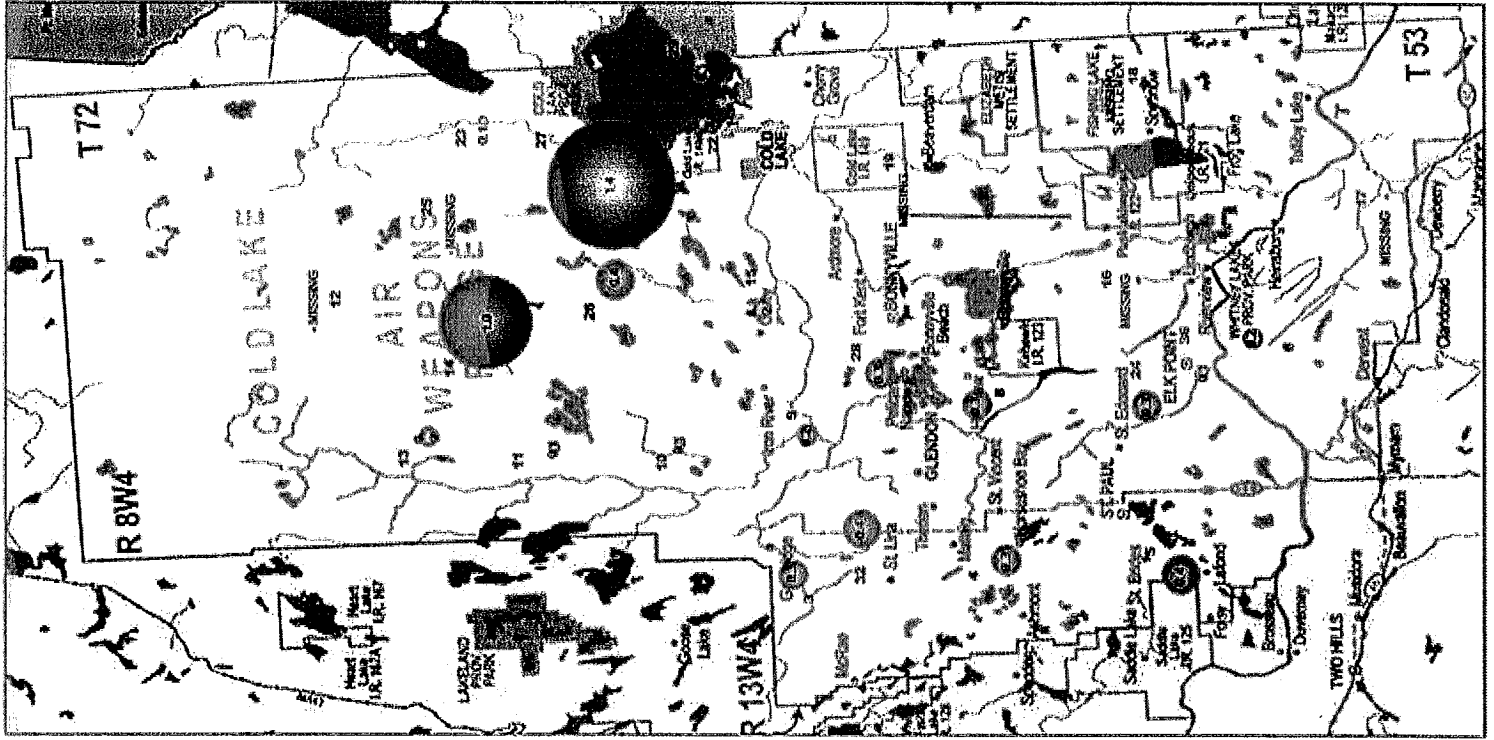
OCTOBER - NOVEMBER 2015

PASSIVE STATIONS	DUPLICATE
3 - Therien	0.3 PPB
4 - Flat Lake	0.3 PPB
5 - Lake Eliza	0.4 PPB
6 - Telegraph Creek	0.2 PPB
8 - Muriel-Kehewin	0.3 PPB
9 - Dupre	0.2 PPB
10 - La Corey	0.1 PPB
11 - Wolf Lake	0.1 PPB
12 - Foster Creek	MISSING
13 - Primrose	0.2 PPB
14 - Maskwa	1.0 PPB
15 - Ardmore	0.2 PPB
16 - Frog Lake	MISSING
17 - Clear Range	MISSING
18 - Fishing Lake	MISSING
19 - Beaverdam	MISSING
22 - Cold Lake South	0.1 PPB
23 - Medley-Martineau	0.1 PPB
24 - Fort George	0.3 PPB
25 - Burnt Lake	MISSING
26 - Mahikan	0.4 PPB
27 - Mahkases	1.4 PPB
28 - Town of Bonnyville	0.3 PPB
29 - Cold Lake South 2	0.1 PPB
32 - St. Lina	0.4 PPB
36 - Elk Point	0.1 PPB



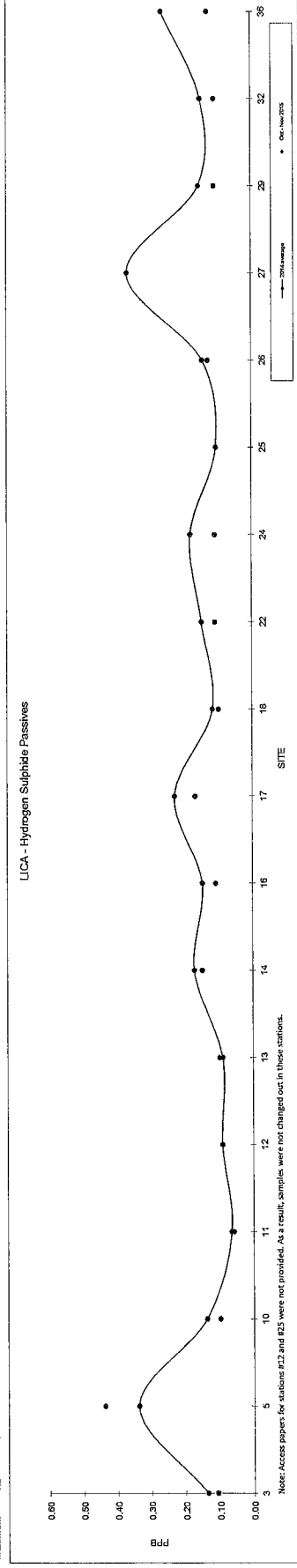
Summary

Minimum: 0.1 PPB - Various Stations
 Maximum: 1.4 PPB - Mahkases
 Average: 0.3 PPB *Includes Duplicates



Passive Summary Results for October - November 2015 Lakeland Industry & Community Association

Mean	Hydrogen Sulphide ppb																October - November 2015			
	3	5	10	11	12	13	14	16	17	18	22	24	25	26	27	29	32	36	Reading	Site
0.05	0.07	0.38	0.04	0.02	0.02	0.05	0.17	0.11	0.14	0.12	0.15	0.18	0.11	0.15	0.37	0.16	0.15	0.27	0.06	#11
0.24	0.29	0.31	0.11	0.20	0.16	0.30	0.29	0.44	0.44	0.17	0.32	0.32	0.19	0.21	1.23	0.33	0.26	1.36	0.75	#27

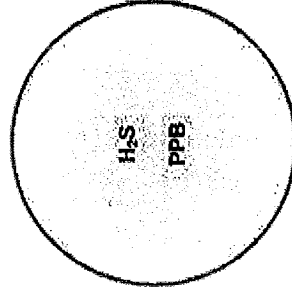


Lakeland Industry & Community Association H₂S Passive Bubble Map

OCTOBER - NOVEMBER 2015

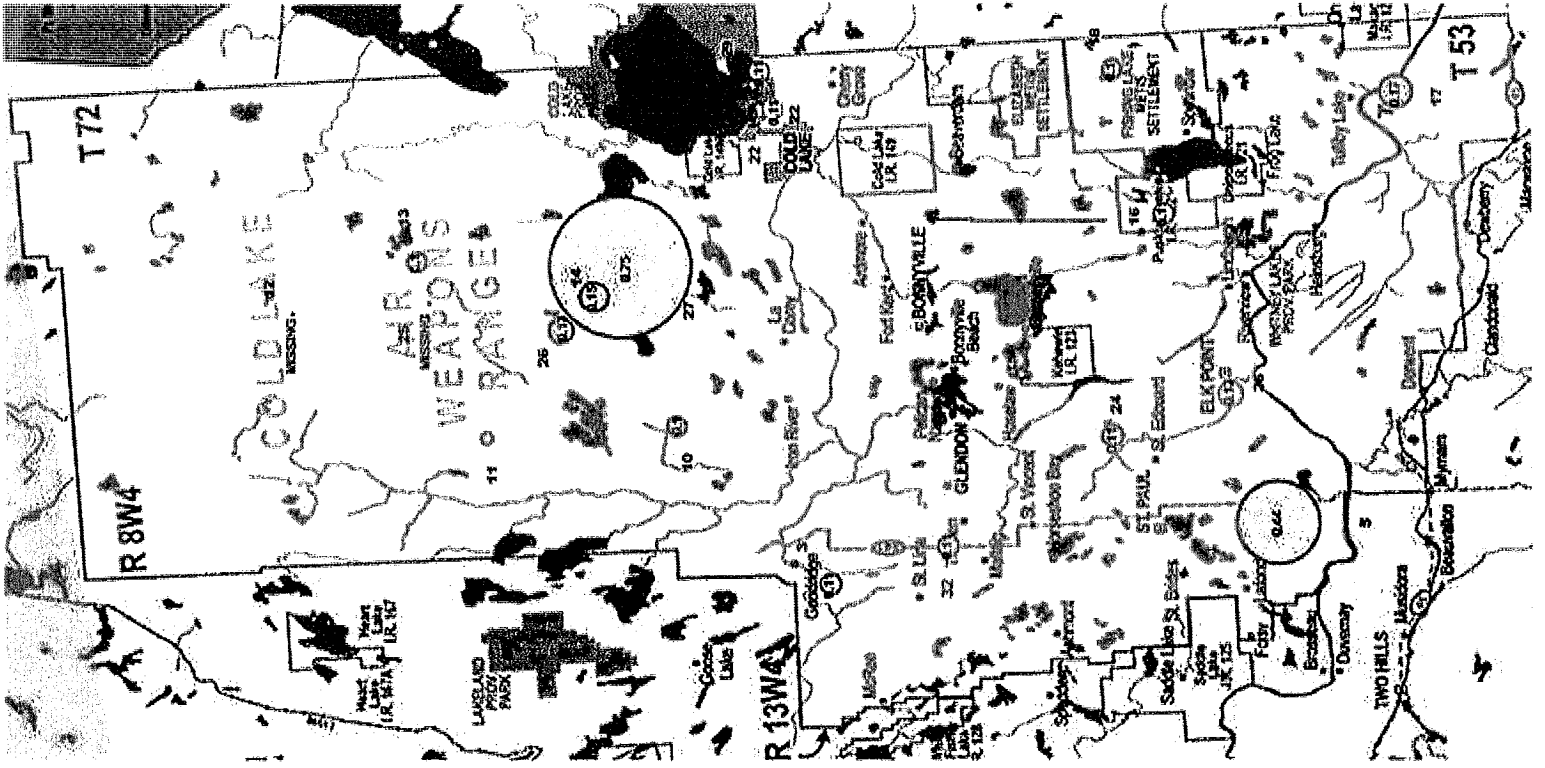
PASSIVE STATIONS

Station Name	Reading	Duplicate
3 - Therien	0.11 PPB	NA
5 - Lake Eliza	0.44 PPB	NA
10 - La Corey	0.10 PPB	NA
11 - Wolf Lake	0.06 PPB	NA
12 - Foster Creek	MISSING	NA
13 - Primrose	0.10 PPB	NA
14 - Maskwa	0.15 PPB	NA
16 - Frog Lake	0.12 PPB	0.09 PPB
17 - Clear Range	0.17 PPB	0.06 PPB
18 - Fishing Lake	0.10 PPB	0.09 PPB
22 - Cold Lake South	0.11 PPB	0.10 PPB
24 - Fort George	0.11 PPB	NA
25 - Burnt Lake	MISSING	NA
26 - Mahikhan	0.13 PPB	NA
27 - Mahkases	0.75 PPB	NA
29 - Cold Lake South 2	0.11 PPB	NA
32 - St. Lina	0.11 PPB	NA
36 - Elk Point	0.13 PPB	NA



Summary

Minimum : 0.06 PPB - Wolf Lake
 Maximum: 0.75 PPB - Mahkases
 Average: 0.17 PPB (includes Duplicates)



Passive Summary Results for October - November 2015

Lakeland Industry & Community Association

Nitrogen Dioxide
ppb

October - November 2015
Reading
2.7

Site
#23

#23

0.7

7.1

7.9

4.2

2.0

0.2

1.4

1.9

0.3

4.8

1.6

2.9

0.9

3.6

3.3

0.4

1.6

0.1

5.7

1.2

3.2

2.3

0.6

1.1

1.9

1.4

0.9

1.6

0.4

3.3

0.1

1.6

1.5

0.7

1.4

0.8

3.2

1.4

0.1

2.8

2.5

5.3

2.9

0.5

2.1

8.8

2.8

0.5

1.4

1.4

3.2

0.8

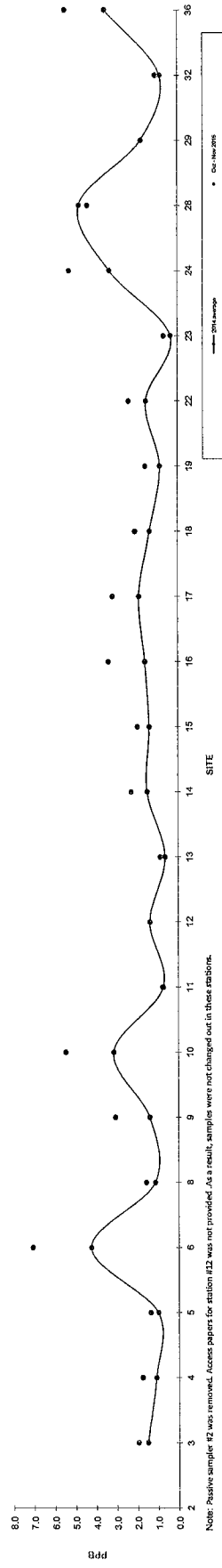
1.2

1.4

1.2

1.4

LICA - Nitrogen Dioxide Passives



Note: Passive sampler #2 was removed. Access permit for station #12 was not provided. As a result, samples were not changed out in these stations.

Lakeland Industry & Community Association NO₂ Passive Bubble Map

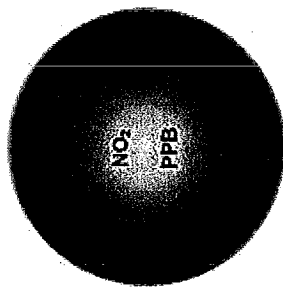
OCTOBER - NOVEMBER 2015

PASSIVE STATIONS

PASSIVE STATIONS	DUPLICATE
3 - Therien	2.0 PPB
4 - Flat Lake	1.8 PPB
5 - Lake Eliza	1.4 PPB
6 - Telegraph Creek	7.1 PPB
8 - Muriel-Kehewin	1.6 PPB
9 - Dupre	3.1 PPB
10 - La Corey	5.5 PPB
11 - Wolf Lake	0.8 PPB
12 - Foster Creek	MISSING
13 - Primrose	0.9 PPB
14 - Maskwa	2.2 PPB
15 - Ardmore	2.1 PPB
16 - Frog Lake	3.4 PPB
17 - Clear Range	3.2 PPB
18 - Fishing Lake	2.1 PPB
19 - Beaverdam	1.6 PPB
22 - Cold Lake South	2.4 PPB
23 - Medley-Martineau	0.7 PPB
24 - Fort George	5.3 PPB
28 - Town of Bonnyville	4.4 PPB
29 - Cold Lake South 2	1.8 PPB
32 - St. Lina	1.1 PPB
36 - Elk Point	5.5 PPB

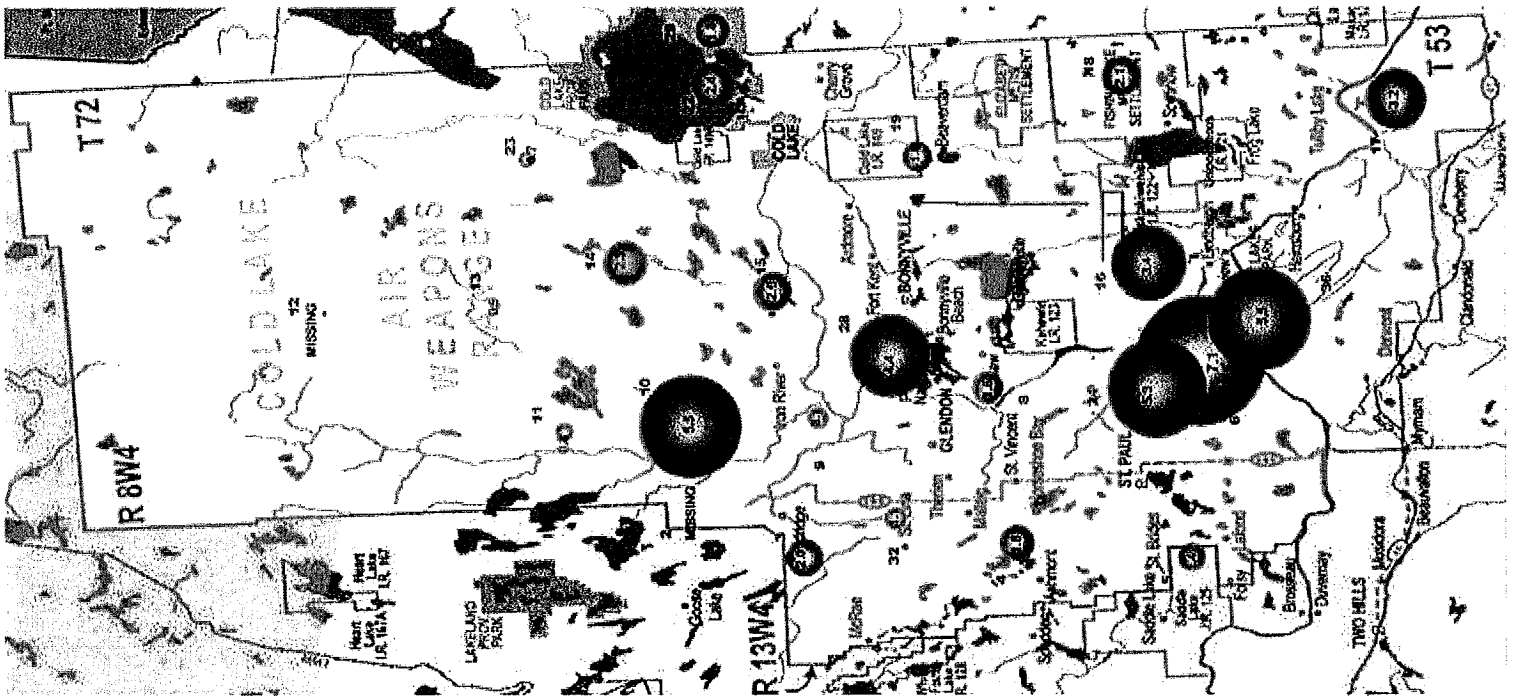
DUPLICATE

NA
NA
NA
NA
NA
NA
NA
NA
NA
2.4 PPB
1.9 PPB
NA
NA
NA
NA
NA
NA
NA
NA
NA
NA
NA
NA
NA
NA
NA
NA
NA



Summary

Minimum: 0.7 PPB - Medley-Martineau
 Maximum: 7.1 PPB - Telegraph Creek
 Average: 2.7 PPB *Includes Duplicates

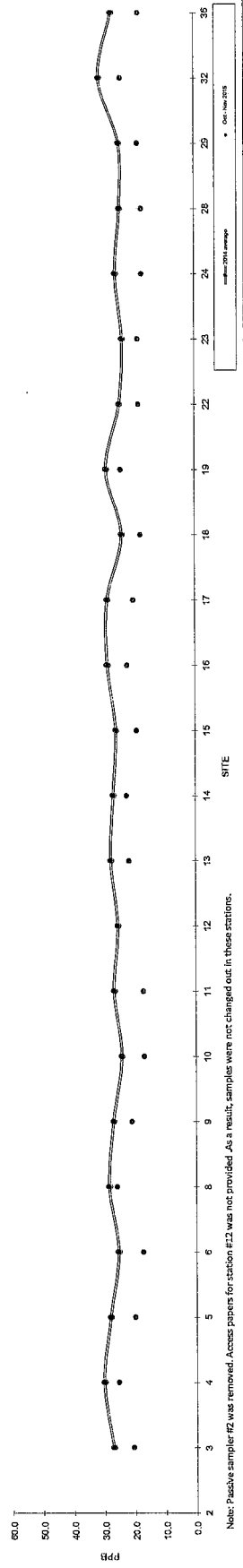


Passive Summary Results for October - November 2015

Lakeland Industry & Community Association

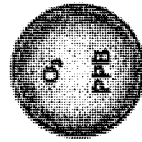
Mean	Ozone ppb																								October - November 2015		
	2	3	4	5	6	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	26	29	32	36	Reading
Minimum	NA	18.7	20.0	19.9	17.0	20.1	17.8	14.5	13.9	18.4	18.6	21.0	16.5	18.1	19.9	14.9	20.3	16.4	14.4	17.8	18.2	15.4	22.8	13.1	17.90	#10	
Maximum	NA	40.5	45.6	38.0	37.9	41.5	42.3	37.6	51.2	35.2	40.2	34.8	36.8	43.7	35.0	33.6	40.7	32.4	39.2	39.0	31.3	36.7	40.8	34.2	20.35	#0	

LICA - Ozone Passives



Lakeland Industry & Community Association O₃ Passive Bubble Map

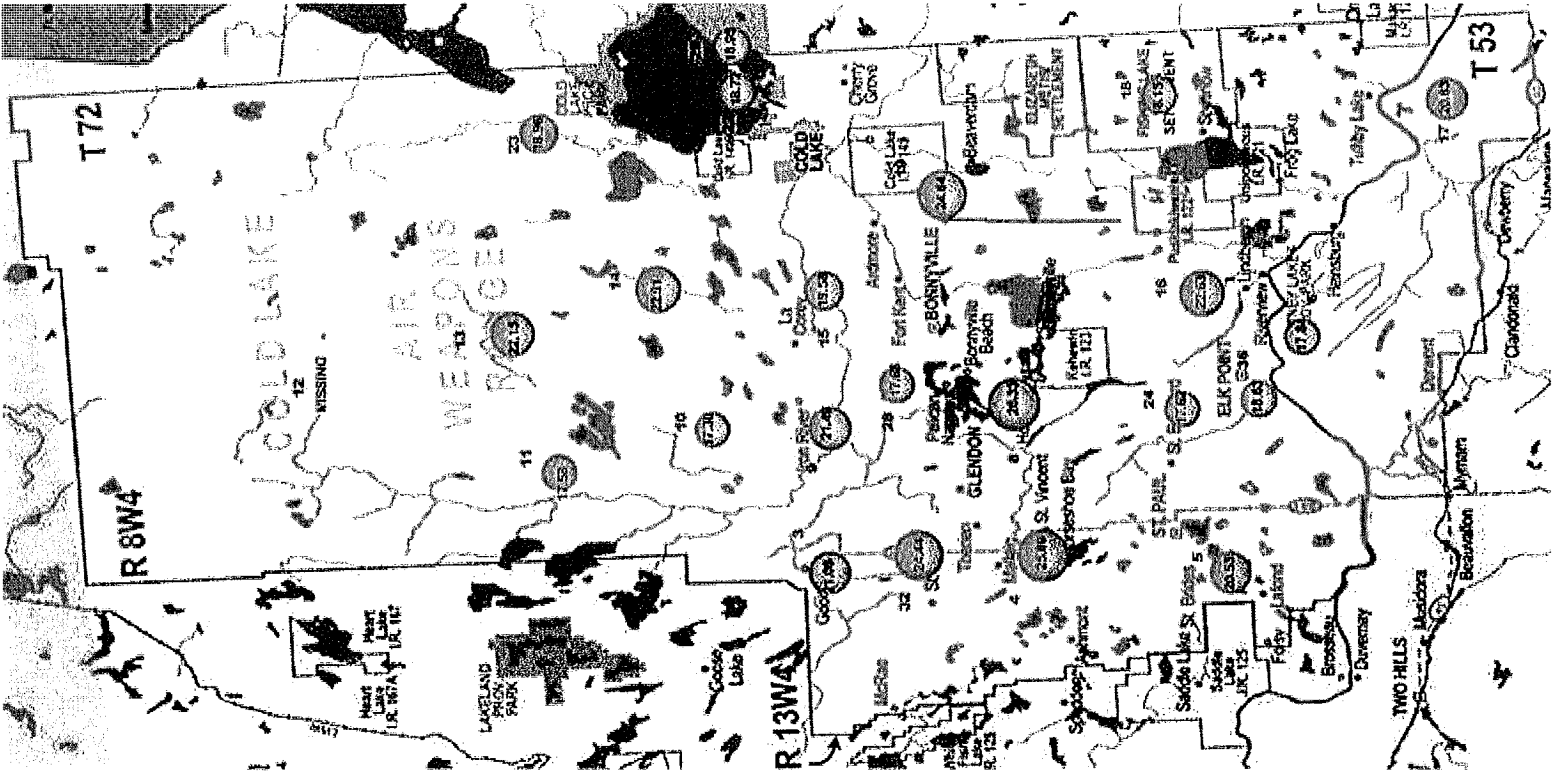
OCTOBER - NOVEMBER 2015



PASSIVE STATIONS	DUPLICATE
3 - Thierien	NA
4 - Flat Lake	21.06 PPB
5 - Lake Eliza	25.89 PPB
6 - Telegraph Creek	20.53 PPB
8 - Muriel-Kehewin	17.84 PPB
9 - Dupre	26.33 PPB
10 - La Corey	21.49 PPB
11 - Wolf Lake	17.30 PPB
12 - Foster Creek	17.58 PPB
13 - Primrose	MISSING
14 - Maskwa	22.15 PPB
15 - Ardmore	24.83 PPB
16 - Frog Lake	19.91 PPB
17 - Clear Range	22.63 PPB
18 - Fishing Lake	20.63 PPB
19 - Beavertdam	18.15 PPB
22 - Cold Lake South	24.64 PPB
23 - Medley-Mairineau	18.72 PPB
24 - Fort George	18.96 PPB
28 - Town of Bonnyville	17.62 PPB
29 - Cold Lake South 2	17.68 PPB
32 - St. Lina	18.95 PPB
36 - Elk Point	24.44 PPB
	18.63 PPB
	20.98 PPB
	19.24 PPB

Summary

Minimum : 17.30 PPB - La Corey
 Maximum: 26.33 PPB - Muriel-Kehewin
 Average: 20.60 PPB *includes Duplicates



Passive Sampler Data Sheet for LICA October-November 2015

ID	SAMPLER		START		END		NOTES
	SO ₂	NO _x	DATE	TIME	DATE	TIME	
2	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
3	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
4	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
5	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
6	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
7	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
8	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
9	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
10	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
11	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
12	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
13	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
14	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
15	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
16	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
17	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
18	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
19	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
20	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
21	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
22	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
23	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
24	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
25	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
26	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
27	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
28	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
29	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
30	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
31	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
32	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
33	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
34	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
35	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
36	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
DUPLICATES							
14	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
15	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
16	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
17	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
18	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
22	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	
24	H ₂ S	SO ₂	NO _x	NO _x	NO _x	NO _x	

No. 8 duplicate was used
 No. 8 duplicate was used (no SO₂ sampling probe)
 No. 8 duplicate was used (no SO₂ sampling probe)

VOC RESULTS

Sample ID: 15110054-001

Customer ID: LICA
 LICA/VOC/CLS/Nov 2, 2015
 Cust Samp ID: LICA/VOC/CLS/Nov 2, 2015
 Priority: Normal

Maxxam

VOC Sample Collection Data Sheet

Client: LICA
 Location: Pold Lake Sewer
 Station ID: LICA 01
 Field Sample ID: LICA/VOC/CLS/Nov 2, 2015
 Sampler S/N: 6167
 Canister ID: 1530
 Canister Installation Date/Time: Oct 28, 2015 @ 09:13
 Canister Removal Date/Time: Nov 6, 2015 @ 09:52

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Nov 2, 2015	00:00 Nov 2, 2015	00:00 Nov 3, 2015	24.0

Flow Settings		
Meter Reading (scm)	Pot Set Pt	Pump Pressure Setting (psig)
10.0	6.52	24

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
27.0	+ 25.0

Canister valve open prior to sampling?: YES / NO
 Timer set to 0.00 minutes prior to sampling? YES / NO
 Canister valve closed prior to disconnection?: YES / NO

Comments:

Technician Signature: Sample in - by Alex Yarkov
Sample out - by Alex Yarkov
 Date: Nov 6, 2015

Volatile Organics Data Results

Date: NOVEMBER 2 , 2015
Canister ID: 1530

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	0.04
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	0.05
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	0.9
1-Butene	< 0.02
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.03
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	0.02
2,4-Dimethylpentane	0.02
2-Methylheptane	0.01
2-Methylhexane	0.03
2-Methylpentane	0.08
3-Methylheptane	< 0.02
3-Methylhexane	0.04
3-Methylpentane	0.04
Acetone	1.5
Acrolein	< 0.3
Benzene	0.13
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.91
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.52
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	< 0.02
Cyclopentane	0.01
Dibromochloromethane	< 0.01
Ethanol	2.1
Ethyl acetate	< 0.4
Ethylbenzene	0.04
Freon-11	0.28

Volatile Organics Data Results

Date: NOVEMBER 2 , 2015
Canister ID: 1530

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.02
Freon-12	0.58
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.21
Isopentane	0.28
Isoprene	0.01
Isopropyl alcohol	0.5
Isopropylbenzene	< 0.01
m,p-Xylene	0.11
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	1.40
Methyl ethyl ketone	0.5
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.03
Methylcyclopentane	0.04
Methylene chloride	< 0.3
n-Butane	0.55
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.04
n-Hexane	0.05
n-Nonane	0.02
n-Octane	< 0.02
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	3.8
o-Ethyltoluene	0.01
o-Xylene	0.04
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	0.07
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.15
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

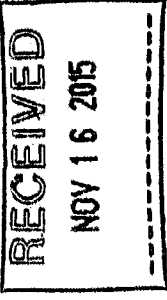
Sample ID: 15110089-001

Customer ID: LICA

Cust Samp ID: LICAVOC/CLS/Nov 8,

Priority: Normal

AIR FCD-01320/2



Maxxam

VOC Sample Collection Data Sheet

Client: LICA Sampler S/N: 6167
 Location: Cold Lake South Canister ID: 5677
 Station ID: LICA 01 Canister Installation Date/Time: Nov 6, 2015 @ 07:54
 Field Sample ID: LICA/VOC/CLS/NOV 8, 2015 Canister Removal Date/Time: Nov 10, 2015 @ 07:35

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
NOV 8, 2015	00:00 NOV 8, 2015	00:00 NOV 9, 2015	24.0

Flow Settings		
Meter Reading (sccm)	Pot Set Pt	Pump Pressure Setting (psig)
10.0	6.52	24

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
28	29.5

Canister valve open prior to sampling?: YES / NO
 Timer set to 0.00 minutes prior to sampling? YES / NO
 Canister valve closed prior to disconnection?: YES / NO

Comments:

Technician Signature:

Sample in - by Alex Yampor
Sample out - by Alex Yampor

Date: Nov 10, 2015

Volatile Organics Data Results

Date: NOVEMBER 8 , 2015
Canister ID: S5677

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	0.07
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.07
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.05
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	0.01
2,3-Dimethylbutane	0.08
2,3-Dimethylpentane	0.05
2,4-Dimethylpentane	0.04
2-Methylheptane	0.02
2-Methylhexane	< 0.01
2-Methylpentane	0.13
3-Methylheptane	< 0.02
3-Methylhexane	0.07
3-Methylpentane	0.09
Acetone	2.4
Acrolein	< 0.3
Benzene	0.22
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.02
Carbon tetrachloride	0.10
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.57
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.15
Cyclopentane	0.04
Dibromochloromethane	< 0.01
Ethanol	1.1
Ethyl acetate	< 0.4
Ethylbenzene	0.04
Freon-11	0.29

Volatile Organics Data Results

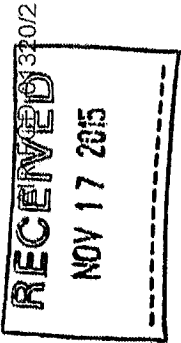
Date: NOVEMBER 8 , 2015
Canister ID: S5677

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.07
Freon-114	0.02
Freon-12	0.59
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.51
Isopentane	0.51
Isoprene	0.02
Isopropyl alcohol	0.6
Isopropylbenzene	< 0.01
m,p-Xylene	0.15
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.18
Methylcyclopentane	0.14
Methylene chloride	< 0.3
n-Butane	0.99
n-Decane	< 0.06
n-Dodecane	3.8
n-Heptane	0.07
n-Hexane	0.21
n-Nonane	0.04
n-Octane	0.03
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	1.6
o-Ethyltoluene	0.02
o-Xylene	0.05
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.44
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Sample ID: 15110105-003

Customer ID: LICA

Cust Samp ID: LICAVOC/CLS/Nov 14, 2014



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VOC Sample Collection Data Sheet

Client: LICA
 Location: Cold Lake South
 Station ID: LICA 01
 Field Sample ID: LICA/VOC/CLS/Nov 14, 2015

Sampler S/N: 6167
 Canister ID: 2843
 Canister Installation Date/Time: NOV 10, 2015 @ 07:36
 Canister Removal Date/Time: NOV 16, 2015 @ 09:40

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Nov 14, 2015	00:00 Nov 14, 2015	00:00 Nov 15, 2015	24.0

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
10.0	6.52	24

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
28.0	23.9

Canister valve open prior to sampling?: YES / NO
 Timer set to 0.00 minutes prior to sampling? YES / NO
 Canister valve closed prior to disconnection?: YES / NO

Comments:

Technician Signature: Sample in by Alex Yampor
Sample out by Alex Yampor

Date: Nov 16, 2015

Volatile Organics Data Results

Date: NOVEMBER 14 , 2015
Canister ID: 2643

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,1,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	< 0.02
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.11
2,2-Dimethylbutane	0.04
2,3,4-Trimethylpentane	0.03
2,3-Dimethylbutane	0.09
2,3-Dimethylpentane	0.08
2,4-Dimethylpentane	0.06
2-Methylheptane	0.04
2-Methylhexane	0.11
2-Methylpentane	0.31
3-Methylheptane	0.02
3-Methylhexane	0.12
3-Methylpentane	0.18
Acetone	< 0.4
Acrolein	< 0.3
Benzene	0.28
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.07
Carbon tetrachloride	0.10
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.56
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	0.02
Cyclohexane	0.15
Cyclopentane	0.06
Dibromochloromethane	< 0.01
Ethanol	1.9
Ethyl acetate	< 0.4
Ethylbenzene	0.06
Freon-11	0.35

Volatile Organics Data Results

Date: NOVEMBER 14 , 2015
Canister ID: 2643

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.02
Freon-12	0.63
Hexachloro-1,3-butadiene	< 0.50
Isobutane	1.19
Isopentane	1.31
Isoprene	0.03
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.21
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.19
Methylcyclopentane	0.18
Methylene chloride	< 0.3
n-Butane	2.33
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.11
n-Hexane	0.29
n-Nonane	0.02
n-Octane	0.05
n-Pentane	0.9
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	0.02
o-Xylene	0.07
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.39
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	0.04
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Sample ID: 15110230-001

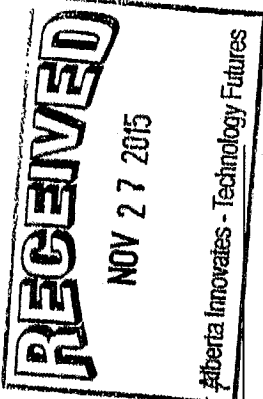
Customer ID: LICA

Cust Samp ID: LICAVOC/CLS/NOV 20, 2015

AIR FCD-01320/2

Maxxam

VOC Sample Collection Data Sheet



Client: LICA
 Location: Cold Lake South
 Station ID: LICA 01
 Field Sample ID: LICA/VOC/CLS/NOV 20, 2015

Sampler S/N: 610
 Canister ID: S 5673
 Canister Installation Date/Time: Nov 16, 2015 @ 09:41
 Canister Removal Date/Time: Nov 23, 2015 @ 14:58

Date and Time Information		
Sample Date	Start Time (MST)	End Time (MST)
NOV 20, 2015	00:00	00:00
	NOV 20, 2015	NOV 24, 2015
		24.0

Flow Settings		
Meter Reading (sccm)	Pot Set Pt	Pump Pressure Setting (psig)
10.0	6.52	24

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
28.0	24.0

Canister valve open prior to sampling? YES / NO
 Timer set to 0.00 minutes prior to sampling? YES / NO
 Canister valve closed prior to disconnection? YES / NO

Comments:

Technician Signature:

Sample in - by Alice Yauyupor
 Sample out - by Alice Yauyupor
 Date: Nov 23, 2015

Volatile Organics Data Results

Date: NOVEMBER 20 , 2015
Canister ID: S5673

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.04
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.04
2,3-Dimethylpentane	0.02
2,4-Dimethylpentane	0.02
2-Methylheptane	0.02
2-Methylhexane	0.04
2-Methylpentane	0.09
3-Methylheptane	< 0.02
3-Methylhexane	0.04
3-Methylpentane	0.05
Acetone	1.0
Acrolein	< 0.3
Benzene	0.15
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.03
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.56
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.09
Cyclopentane	0.03
Dibromochloromethane	< 0.01
Ethanol	0.5
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.34

Volatile Organics Data Results

Date: NOVEMBER 20 , 2015
Canister ID: S5673

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.07
Freon-114	0.02
Freon-12	0.59
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.33
Isopentane	0.33
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.04
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.12
Methylcyclopentane	0.07
Methylene chloride	< 0.3
n-Butane	0.65
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.04
n-Hexane	0.10
n-Nonane	0.01
n-Octane	0.02
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.02
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.10
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Sample ID: 15110237-001

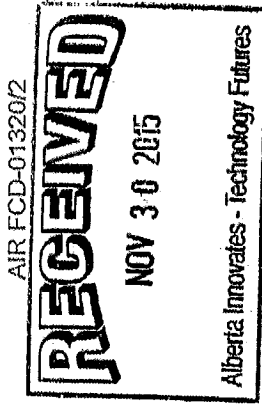
Customer ID: LICA
Cust Samp ID: LICAVOC/ELK/NOV 26, 2015

Maxxam

VOC Sample Collection Data Sheet

Client: LICA
 Location: Cold Lake South
 Station ID: LICA 01
 Field Sample ID: LICA/VOC/CLS/NOV 26, 2015

Sampler S/N: 6167
 Canister ID: S 5672
 Canister Installation Date/Time: NOV 23, 2015 @ 14:59
 Canister Removal Date/Time: NOV 27, 2015 @ 08:57



Date and Time Information		
Sample Date	Start Time (MST)	End Time (MST)
NOV 26, 2015	00:00	NOV 27, 2015
		Elapsed Time (Hours)
		24.0

Flow Settings		
Meter Reading (scm)	Pot Set Pt	Pump Pressure Setting (psig)
10.0	6.52	24

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
28.0	23.3

Canister valve open prior to sampling?: YES / NO
 Timer set to 0.00 minutes prior to sampling? YES / NO
 Canister valve closed prior to disconnection?: YES / NO

Comments:

Technician Signature: Sample in - by Alex Younison
Sample out - by Alex Younison
 Date: NOV 27, 2015

Volatile Organics Data Results

Date: NOVEMBER 26 , 2015
Canister ID: S5672

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.06
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.03
2,3,4-Trimethylpentane	0.02
2,3-Dimethylbutane	0.09
2,3-Dimethylpentane	0.06
2,4-Dimethylpentane	0.05
2-Methylheptane	0.04
2-Methylhexane	0.08
2-Methylpentane	0.20
3-Methylheptane	0.02
3-Methylhexane	0.08
3-Methylpentane	0.11
Acetone	1.0
Acrolein	< 0.3
Benzene	0.27
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	< 0.01
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.47
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.24
Cyclopentane	0.07
Dibromochloromethane	< 0.01
Ethanol	< 0.3
Ethyl acetate	< 0.4
Ethylbenzene	0.04
Freon-11	0.33

Volatile Organics Data Results

Date: NOVEMBER 26 , 2015
Canister ID: S5672

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.06
Freon-114	0.02
Freon-12	0.52
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.79
Isopentane	0.59
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.07
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.31
Methylcyclopentane	0.18
Methylene chloride	< 0.3
n-Butane	1.44
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.09
n-Hexane	0.21
n-Nonane	0.02
n-Octane	0.05
n-Pentane	0.5
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	0.01
o-Xylene	0.03
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.19
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

PAH RESULTS

Sample ID: 15110054-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Nov 2, 2015

Priority: Normal

AIR FCD-01321/2

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Hi-Vol PUF+ Sample Collection Data Sheet

Client: LICA
 Location: Cold Lake Seeths
 Station ID: LICA 01
 Field Sample ID: LICA/PUF/CLS/Nov 2, 2015

PUF+ S/N: TE-06
 Motor S/N: 1138 / 100-1020
 Installation Date/Time: Oct 28, 2015 @ 08:08
 Removal Date/Time: Nov 6, 2015 @ 09:05

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
NOV 2, 2015	00:00 NOV 2, 2015	00:00 NOV 3, 2015	24.0

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date
1/4	1/4	1/4	1/4

Set Flow Rate (slpm): 230
 Date of Last Calibration: 05-May-10

Sampling Data			
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (C)	Volume (Vstd m ³)
710	229	12.0	330.18

Time set correctly prior to sampling? YES / NO
 Timer set correctly prior to sampling? YES / NO
 Sampling data saved to memory card after sampling? YES / NO

Comments:

Technician Signature: Sample in - by Alex Yampor
Sample out by Alex Yampor
 Date: Nov 6, 2015

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: NOVEMBER 2 , 2015
PUF S/N: TE06

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.09
2-Methylnaphthalene	0.16
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.08
Acenaphthylene	0.41
Acridine	< 0.01
Anthracene	0.25
Benzo(a)anthracene	0.04
Benzo(a)pyrene	0.01
Benzo(b,j,k)fluoranthene	0.15
Benzo(c)phenanthrene	0.06
Benzo(e)pyrene	0.04
Benzo(ghi)perylene	0.05
Chrysene	0.12
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.49
Fluorene	0.38
Indeno(1,2,3-cd)pyrene	0.04
Naphthalene	0.17
Perylene	0.04
Phenanthrene	1.65
Pyrene	0.41
Retene	0.19

Sample ID: 15110089-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Nov 8, 2015

Priority: Normal

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NOV 16 2015

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Hi-Vol PUF+ Sample Collection Data Sheet

Client: LICA Puff S/N: P 13-01
 Location: Cold Lake South Motor S/N: 1138 / 100 - 1020
 Station ID: LICA 01 Installation Date/Time: -But A.Y. Nov 6, 2015 @ 09:06
 Field Sample ID: LICA / PUF / CLS / Nov 8, 2015 Removal Date/Time: Nov 10, 2015 @ 07:43

Date and Time Information		
Sample Date	Start Time (MST)	Elapsed Time (Hours)
Nov 8, 2015	00:00 Nov 8, 2015	24.0

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date
n/a	n/a	n/a	n/a

Set Flow Rate (slpm): 130

Date of Last Calibration: 05 - May - 10

Sampling Data			
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (C)	Volume (Vstd m ³)
708	229	3.3 ⁰	330.20

Time set correctly prior to sampling? YES NO
 Timer set correctly prior to sampling? YES NO
 Sampling data saved to memory card after sampling? YES NO

Comments:

Technician Signature: _____
 Sample in - by Alex Yavupov
 Sample out by Alex Yavupov
 Date: Nov 10, 2015

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: NOVEMBER 8 , 2015
PUF S/N: P1301

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.06
2-Methylnaphthalene	0.09
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.04
Acenaphthylene	0.07
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	0.01
Benzo(b,j,k)fluoranthene	0.09
Benzo(c)phenanthrene	0.03
Benzo(e)pyrene	0.04
Benzo(ghi)perylene	0.04
Chrysene	0.05
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.11
Fluorene	0.29
Indeno(1,2,3-cd)pyrene	0.03
Naphthalene	0.12
Perylene	0.04
Phenanthrene	0.47
Pyrene	0.09
Retene	0.11

Customer ID: LICA
 Cust Samp ID: LICA/PUF/CLS/Nov 14, 2014

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 NOV 17 2015

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Hi-Vol PUF+ Sample Collection Data Sheet

Client: LICA
 Location: Cold Lake South
 Station ID: LICA 01
 Field Sample ID: LICA/PUF/CLS/Nov 14, 2015
 Puf+ S/N: TE-08
 Motor S/N: 1138 / 100-1020
 Installation Date/Time: Nov 10, 2015 @ 07:44
 Removal Date/Time: Nov 16, 2015 @ 09:30

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Nov 14, 2015	00:00	00:00	24.0
	Nov 14, 2015	Nov 15, 2015	

Set Flow Rate (slpm): 230
 Date of Last Calibration: 05 - May - 10

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date
n/a	n/a	n/a	n/a

Sampling Data			
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (C)	Volume (Vstd m ³)
706	229	-1.10	330.20

Time set correctly prior to sampling? YES NO
 Timer set correctly prior to sampling? YES NO
 Sampling data saved to memory card after sampling? YES NO

Comments:

Technician Signature: Sample in - by Alex Yakupov
 Sample out - by Alex Yakupov
 Date: Nov 16, 2015

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: NOVEMBER 14 , 2015
PUFS/N: TE08

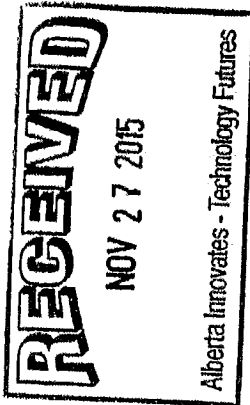
PARAMETERS	CONCENTRATION,(UG)
1-Methylnaphthalene	0.84
2-Methylnaphthalene	1.28
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.10
Acenaphthylene	0.34
Acridine	< 0.01
Anthracene	0.04
Benzo(a)anthracene	0.03
Benzo(a)pyrene	0.01
Benzo(b,j,k)fluoranthene	0.11
Benzo(c)phenanthrene	0.03
Benzo(e)pyrene	0.04
Benzo(ghi)perylene	0.05
Chrysene	0.07
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.14
Fluorene	0.33
Indeno(1,2,3-cd)pyrene	0.03
Naphthalene	1.10
Perylene	0.04
Phenanthrene	0.52
Pyrene	0.11
Retene	0.08

Sample ID: 15110230-001

Customer ID: LICA

Cust Samp ID: LICAVOC/CLS/NOV 20, 2015

AIR FCD-01321/2



Maxxam

Hi-Vol PUF+ Sample Collection Data Sheet

Client: LICA
 Location: Cold Lake South
 Station ID: LICA 01
 Field Sample ID: LICA/PUF/CLS/NOV 20, 2015

Puf+ S/N: TE-01
 Motor S/N: 1138 / 100 - 1020
 Installation Date/Time: NOV 16, 2015 @ 09:31
 Removal Date/Time: NOV 23, 2015 @ 14:51

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
NOV 20, 2015	20:00	00:00	24.0
	NOV 20, 2015	NOV 21, 2015	

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date
n/a	n/a	n/a	n/a

Set Flow Rate (slpm): 120

Date of Last Calibration: 05 - May - 10

Sampling Data		
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (C)
718	229	- 8.8 °
		Volume (Vstd m³)
		330.19

Time set correctly prior to sampling? YES/NO
 Timer set correctly prior to sampling? YES/NO
 Sampling data saved to memory card after sampling? YES/NO

Comments:

Technician Signature: Sample in - by Alex Yauyupov
Sample out - by Alex Yauyupov

Date: NOV 23, 2015

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: NOVEMBER 20 , 2015
PUF S/N: TE01

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.15
2-Methylnaphthalene	0.21
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.06
Acenaphthylene	0.03
Acridine	< 0.01
Anthracene	0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	0.01
Benzo(b,j,k)fluoranthene	0.03
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	0.02
Chrysene	< 0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	0.02
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.04
Fluorene	0.12
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.19
Perylene	< 0.01
Phenanthrene	0.18
Pyrene	0.03
Retene	0.06

Sample ID: 15110237-001

Customer ID: LICA

Cust Samp ID: LICAVOC/ELK/NOV 26, 2015

Maxxam

Hi-Vol PUF+ Sample Collection Data Sheet

Client: LICA

Location: Cold Lake South

Station ID: LICA 01

Field Sample ID: LICA/PUF/CLS/NOV 26, 2015

Puf+ S/N: TE-07

Motor S/N: 1138 / 100-1020

Installation Date/Time: Nov 23, 2015 @ 14:52

Removal Date/Time: Nov 27, 2015 @ 00:42

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Nov 26, 2015	00:00	00:00	24.0
	Nov 26, 2015	Nov 27, 2015	

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date
n/a	n/a	n/a	n/a

Set Flow Rate (slpm): 230

Date of Last Calibration: 05 - May - 10

Sampling Data			
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (C)	Volume (Vstd m ³)
722	229	-10.0°	330.17

Time set correctly prior to sampling? YES NO

Timer set correctly prior to sampling? YES NO

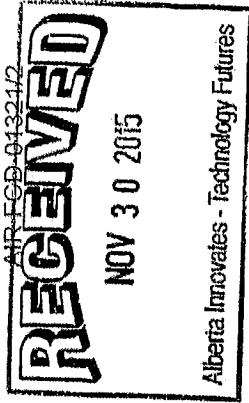
Sampling data saved to memory card after sampling? YES NO

Comments:

Technician Signature:

Sample in - by Alex Yakupov
Sample out - by Alex Yakupov

Date: Nov 27, 2015



Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: NOVEMBER 26 , 2015
PUF S/N: TE07

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.25
2-Methylnaphthalene	0.36
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	0.01
Acenaphthene	0.12
Acenaphthylene	0.05
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	0.02
Benzo(a)pyrene	0.03
Benzo(b,j,k)fluoranthene	0.09
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	0.03
Benzo(ghi)perylene	0.05
Chrysene	0.05
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	0.04
Dibenzo(ah)anthracene	0.01
Fluoranthene	0.13
Fluorene	0.27
Indeno(1,2,3-cd)pyrene	0.03
Naphthalene	0.43
Perylene	< 0.01
Phenanthrene	0.37
Pyrene	0.09
Retene	0.38

PARTISOL RESULTS

Sample ID: 15110053-001

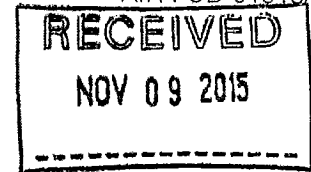
Customer ID: LICA

Cust Samp ID: LICA P5011870

Partisol Sample Data Sheet

Priority: Normal

AIR FCD-01318/2



Date Sampled: Nov 2, 2015

Location: Cole Lake South

Parameter: TSP PM10

PM2.5

Filter #: LICA P5011870

Start Time 00:00 NOV 2, 2015

End Time 00:00 NOV 3, 2015

Status OK

Std Vol 24.435

Valid Time 24:00

Total Time 24.0

Comments: Weather Conditions, etc.

Horizontal lines for handwritten comments.

Technician Signature:

Alex Yakupov

Date: Nov 6, 2015

Programming

- 1) Make sure system is in "Stop Mode"
- 2) "ESC" to Time Screen then "Program"
- 3) Enter Beg 1 0:00
- 4) Enter Dur 24:00:00
- 5) Enter Beg D dd-Aug
- 6) Enter End D dd-Aug
- 7) "Stop/Run"

Note: Beginning & End Date should be same date

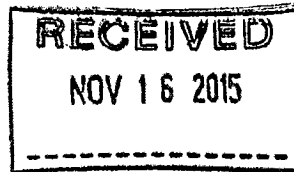
Sample ID: 15110086-001

Customer ID: LICA
Cust Samp ID: LICA P5011867

AIR FCD-01318/2

Partisol Sample Data Sheet

Priority: Normal



Date Sampled: Nov 8, 2015
Location: Cold Lake South
Parameter: TSP PM10
Filter #: LICA P5011867

PM2.5

Start Time 00:00 NOV 8, 2015
End Time 00:00 NOV 9, 2015
Status OK
Std Vol 24.241
Valid Time 24:00
Total Time 24.0

Comments: Weather Conditions, etc.

Technician Signature: Alex Yakupov

Date: Nov 10, 2015

Programming

- 1) Make sure system is in "Stop Mode"
- 2) "ESC" to Time Screen then "Program"
- 3) Enter Beg 1 0:00
- 4) Enter Dur 24:00:00
- 5) Enter Beg D dd-Aug
- 6) Enter End D dd-Aug
- 7) "Stop/Run"

Note: Beginning & End Date should be same date

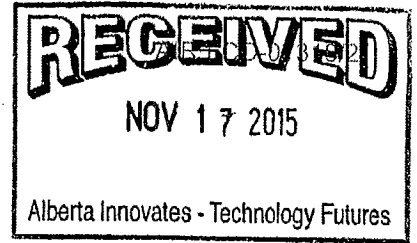
Sample ID: 15110104-001

Customer ID: LICA

Cust Samp ID: LICA P50011868

Partisol Sample Data Sheet

Priority: Normal



Date Sampled: Nov 14, 2015

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: LICA P50 011868

Start Time 00:00 Nov 14, 2015

End Time 00:00 Nov 15, 2015

Status OK

Std Vol 24.141

Valid Time 23:42

Total Time 24.0

Comments: Weather Conditions, etc.

Horizontal lines for handwritten comments.

Technician Signature: Alex Yakupov

Date : Nov 16, 2015

Programming

- 1) Make sure system is in "Stop Mode"
- 2) "ESC" to Time Screen then "Program"
- 3) Enter Beg 1 0:00
- 4) Enter Dur 24:00:00
- 5) Enter Beg D dd-Aug
- 6) Enter End D dd-Aug
- 7) "Stop/Run"

Note: Beginning & End Date should be same date

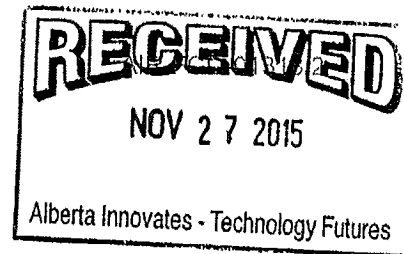
Sample ID: 15110229-001

Customer ID: LICA

Cust Samp ID: LICA 5011869

Priority: Normal

Partisol Sample Data Sheet



Date Sampled: Nov 20, 2015
 Location: Cold Lake South
 Parameter: TSP PM10
 Filter #: LICA 50 11 P69

PM2.5

Start Time 00:00 NOV 20, 2015
 End Time 00:00 NOV 21 2015
 Status OK
 Std Vol 25.794
 Valid Time 24:00
 Total Time 24.0

Comments: Weather Conditions, etc.

Technician Signature: Alex Yakupov

Date: Nov 23, 2015

Programming

- 1) Make sure system is in "Stop Mode"
- 2) "ESC" to Time Screen then "Program"
- 3) Enter Beg 1 0:00
- 4) Enter Dur 24:00:00
- 5) Enter Beg D dd-Aug
- 6) Enter End D dd-Aug
- 7) "Stop/Run"

Note: Beginning & End Date should be same date

Sample ID: 15110238-001

AIR FCD-01318/2

Customer ID: LICA

Cust Samp ID: LICA # P5012875

Partisol Sample Data Sheet

Priority: Normal

Date Sampled: Nov 26, 2015

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: LICA P5012875

Start Time 00:00 Nov 26, 2015

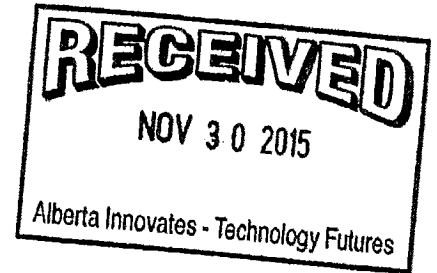
End Time 00:00 Nov 27, 2015

Status OK

Std Vol 25.736

Valid Time 24:00

Total Time 24.0



Comments: Weather Conditions, etc.

Horizontal lines for handwritten comments.

Technician Signature: Alex Yakupov

Date: Nov 27, 2015

Programming

- 1) Make sure system is in "Stop Mode"
- 2) "ESC" to Time Screen then "Program"
- 3) Enter Beg 1 0:00
- 4) Enter Dur 24:00:00
- 5) Enter Beg D dd-Aug
- 6) Enter End D dd-Aug
- 7) "Stop/Run"

Note: Beginning & End Date should be same date


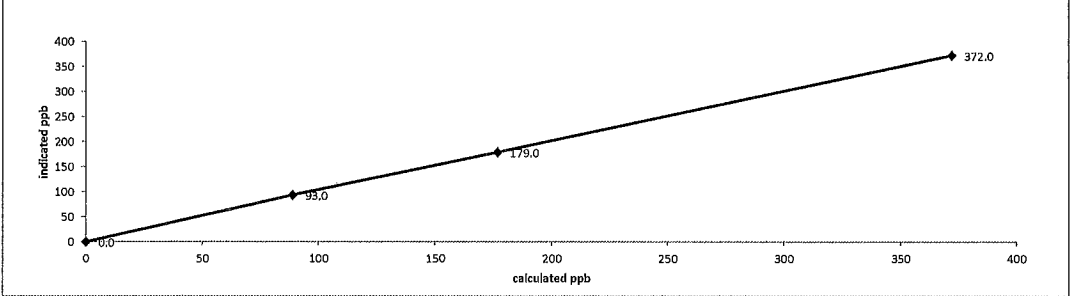


Partisol Sampler Results

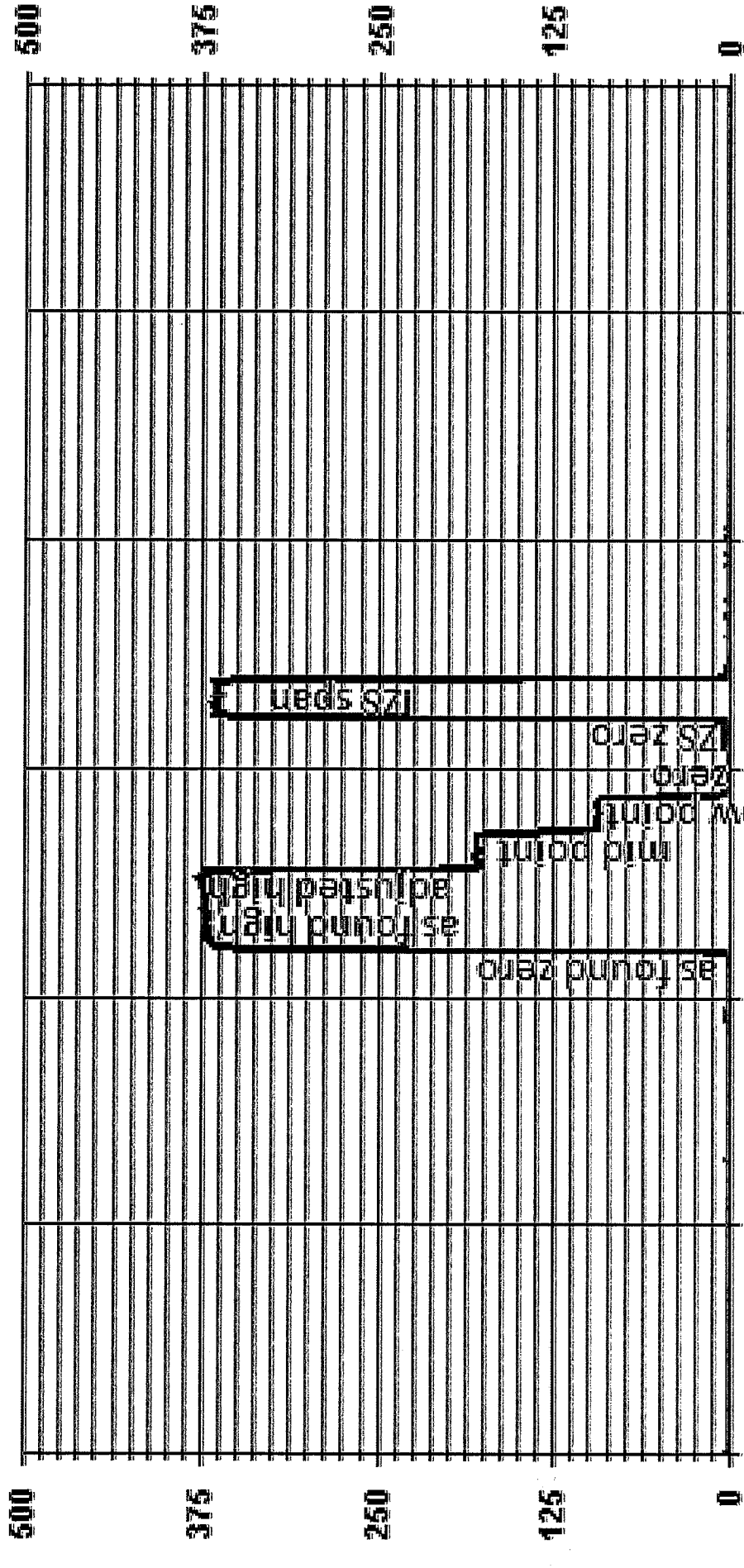
Date	Filter NO	Concentration (mg)
NOVEMBER 2	P5011870	0.013
NOVEMBER 8	P5011867	0.133
NOVEMBER 14	P50011868	0.171
NOVEMBER 20	P5011869	0.113
NOVEMBER 26	P5012875	0.293

APPENDIX III
ANALYZER CALIBRATION RESULTS

SULPHUR DIOXIDE


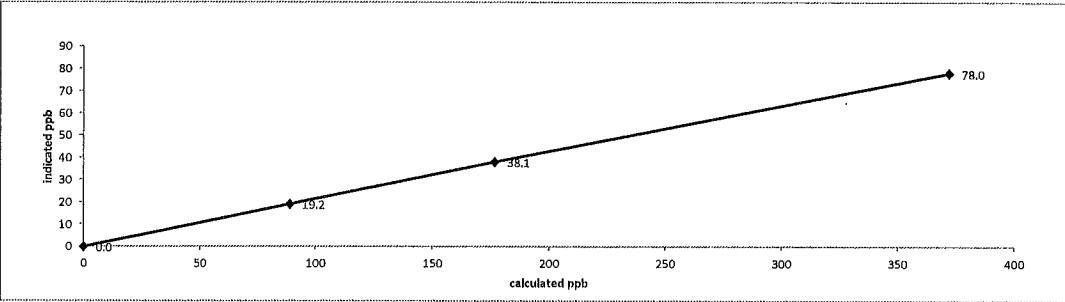
 Thermo 43i Sulphur Dioxide Analyzer Calibration																																																																
Date: November 5, 2015 Company/Airshed: LICA Location/Station Name: Cold Lake South Parameter: Sulphur Dioxide Start Time 24 hr. (mst): 9:36 End Time 24 hr. (mst): 12:41 Calibration Method: Gas Dilution	Barometric Pressure: 0.939 atm Station Temperature °C: 22 Weather Conditions: Mainly cloudy with sunny breaks Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: March 12, 2019 Converter Model & s/n (if applicable): n/a																																																															
Analyzer: Serial Number: 806528242 Range ppb: 500 Last Calibration Date: October 5, 2015 As Found C.F.: 1.006 Previous C.F.: 1.001 New C.F.: 1.001																																																																
Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: BLM002073 Cal Gas Conc. (ppm): 49.5																																																																
Standard Calibration Points for Ranges																																																																
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Sulphur Dioxide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>380</td> </tr> <tr> <td>Mid</td> <td>180</td> </tr> <tr> <td>Low</td> <td>90</td> </tr> </tbody> </table>		Point	Sulphur Dioxide Standard Calibration Points	High	380	Mid	180	Low	90																																																							
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01 Minute Averages

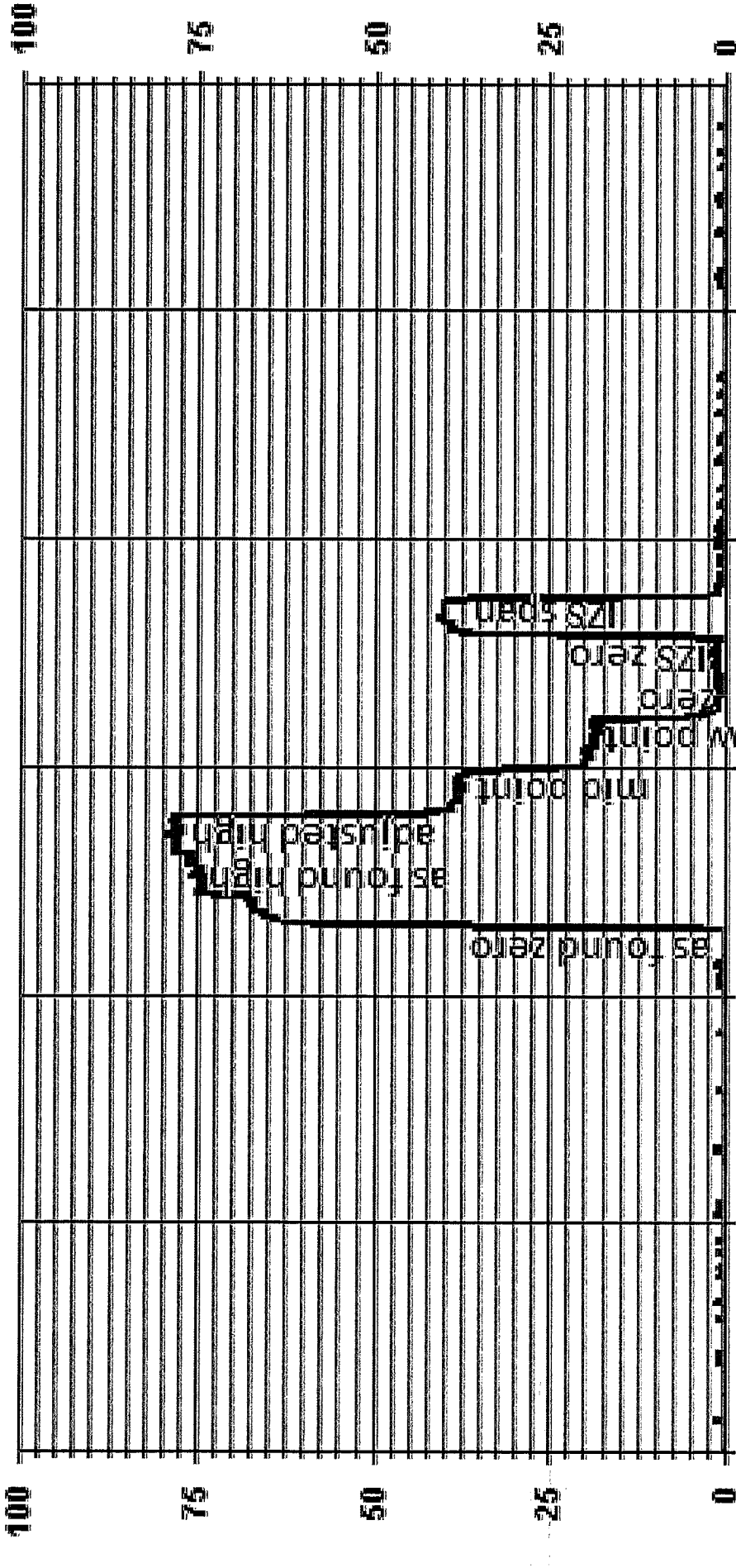


— LICA SO2- PPB

TOTAL REDUCED SULPHUR

 Thermo 450i Total Reduced Sulphur Analyzer Calibration																																																																
Date: November 5, 2015 Company/Alrshed: LICA Location/Station Name: Cold Lake South Parameter: Total Reduced Sulphur Start Time 24 hr. (mst): 12:07 End Time 24 hr. (mst): 15:34 Calibration Method: Gas Dilution	Barometric Pressure: 0.939 atm Station Temperature °C: 22 Weather Conditions: Mainly cloudy with sunny breaks Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: July 15, 2017 Converter Model & s/n (if applicable): CDNova CDN-101 #501																																																															
Analyzer: Serial Number: 812728560 Range ppb: 100 Last Calibration Date: October 6, 2015 As Found C.F.: 1.054 Previous C.F.: 0.999 New C.F.: 1.000																																																																
Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 830 Cal Gas Cylinder I.D. #: LL36837 Cal Gas Conc. (ppm): 10.0	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <thead> <tr> <th>Point</th> <th>Total Reduced Sulphur Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>78</td> </tr> <tr> <td>Mid</td> <td>38</td> </tr> <tr> <td>Low</td> <td>19</td> </tr> </tbody> </table>	Point	Total Reduced Sulphur Standard Calibration Points	High	78	Mid	38	Low	19																																																							
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As found: BKG: 13.1 COEF: 0.993 PMT: -650.8 FLASH: 741 INTERNAL: 33.0 CHAMBER: 45.0 CONVERTER TEMP: 324.7 CONVERTER SET: 325.0 PERM OVEN GAS: 45.0 PERM OVEN HTR: 44.38 PRESSURE: 651.7 SAMPLE FLOW: 0.508 LAMP INTENSITY: 92 Internal Span: 36.3	As left: BKG: 14.5 COEF: 1.037 PMT: -650.8 FLASH: 741 INTERNAL: 32.4 CHAMBER: 45.2 CONVERTER TEMP: 324.9 CONVERTER SET: 325.0 PERM OVEN GAS: 45.0 PERM OVEN HTR: 44.37 PRESSURE: 654.4 SAMPLE FLOW: 0.510 LAMP INTENSITY: 92 Internal Span: 40.0																																																															
Comments: <p style="text-align: center;">Sample filter changed. No ZERO adjustment made. High point starts at 12:54.</p>																																																																

01 Minute Averages

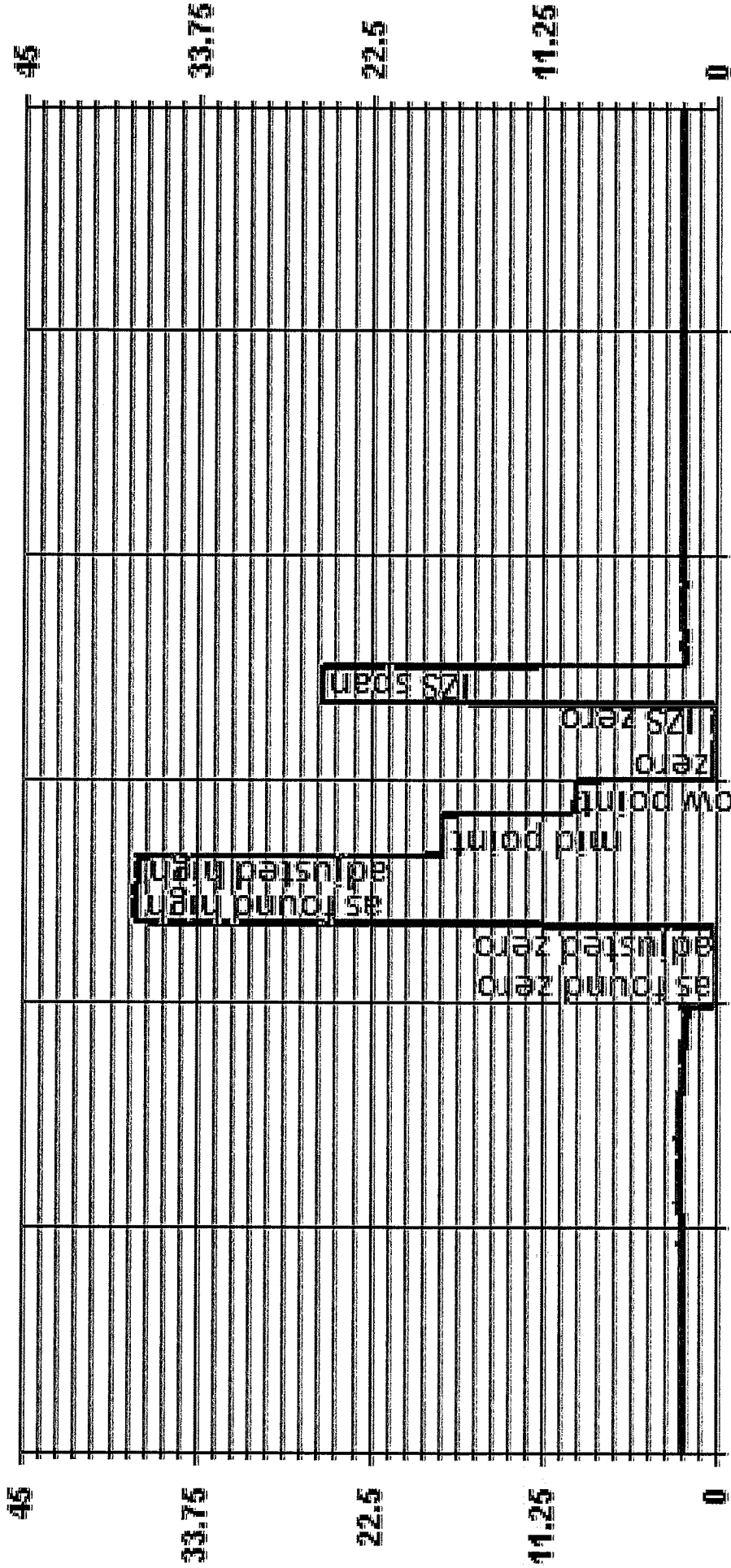


— LICA TRS_ PPB

TOTAL HYDROCARBON


Maxxam <small>ENVIRONMENTAL ENERGY</small>		Thermo 51C Total Hydrocarbon Analyzer Calibration																																																																
Date: November 5, 2015		Barometric Pressure: 0.939 atm																																																																
Company/Alrshed: LICA		Station Temperature °C: 22																																																																
Location/Station Name: Cold Lake South		Weather Conditions: Mainly cloudy with sunny breaks																																																																
Parameter: Total Hydrocarbon		Calibration Purpose: routine monthly																																																																
Start/End Time 24 hr. (mst): 9:36 / 12:56		Performed By/Reviewer: Alex Yakupov Triha Whitsitt																																																																
Calibration Method: Gas Dilution		Cal Gas Expiry Date: August 12, 2017																																																																
Analyzer:																																																																		
Serial Number: 427408718		Range ppm: 50																																																																
Last Calibration Date: October 5, 2015		As Found C.F.: 0.994																																																																
Previous Cal High Point C.F.: 1.004		New C.F.: 1.001																																																																
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Flow Meter ID's: n/a		Standard Calibration Points for a Range of: 60 ppm																																																																
Make & Model: API 700		<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target ppm</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>38</td> </tr> <tr> <td>Mld</td> <td>18</td> </tr> <tr> <td>Low</td> <td>9</td> </tr> </tbody> </table>		Point	Target ppm	High	38	Mld	18	Low	9																																																							
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CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm): 601.4 202.0																																																																		
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Point	Diluent	Cal Gas	Total	Calculated Concentration (ppm)	Indicated Concentration (ppm)	Correction Factors:																																																												
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as found high	1932	65.00	1997	37.66	37.70	0.994																																																												
adjusted zero	1999	0.00	1999	0.00	0.00	n/a																																																												
adjusted high	1932	65.00	1997	37.66	37.60	1.001																																																												
mld	1969	31.00	2000	17.93	17.83	1.006																																																												
low	1984	16.00	2000	9.26	9.20	1.006																																																												
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Slope = 1.001		.95-1.05																																																																
b (Intercept as % of full scale) = 0.07%		± 3% F.S.																																																																
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As found:		As left:																																																																
H2 cylinder (psi):	850	H2 cylinder (psi):	850																																																															
H2 cylinder reg set (psi):	22	H2 cylinder reg set (psi):	22																																																															
Span Cylinder (psi):	1800	Span Cylinder (psi):	1800																																																															
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Zero Air Gen Pressure:	34	Zero Air Gen Pressure:	34																																																															
measurement alarms:	None	measurement alarms:	None																																																															
service alarms:	None	service alarms:	None																																																															
cnt:	1353	cnt:	1376																																																															
rng:	1	rng:	1																																																															
try:	0	try:	0																																																															
flm:	182.9	flm:	183.2																																																															
det:	125.5	det:	125.4																																																															
Flame:	182	Flame:	183																																																															
Filter:	125	Filter:	125																																																															
Base:	125	Base:	125																																																															
Sample psi:	06.52	Sample psi:	06.51																																																															
Internal Air Pressure:	20	Internal Air Pressure:	20																																																															
Internal Fuel Pressure:	14	Internal Fuel Pressure:	14																																																															
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01 Minute Averages



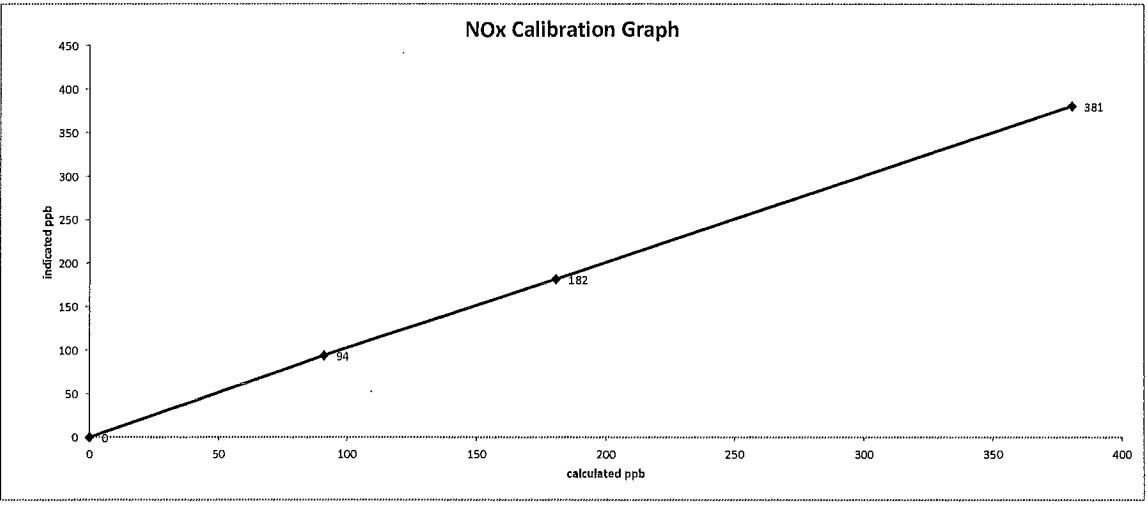
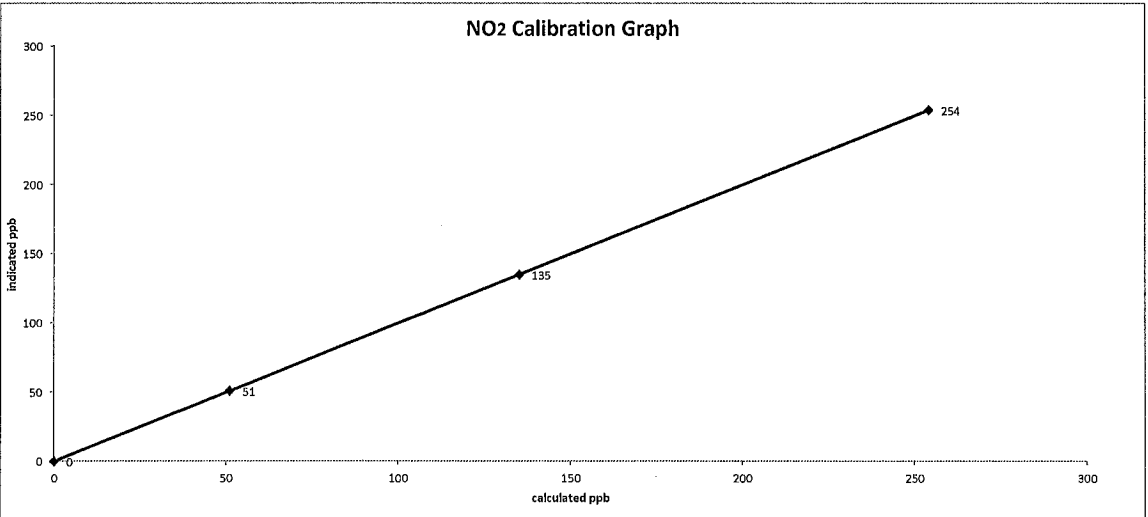
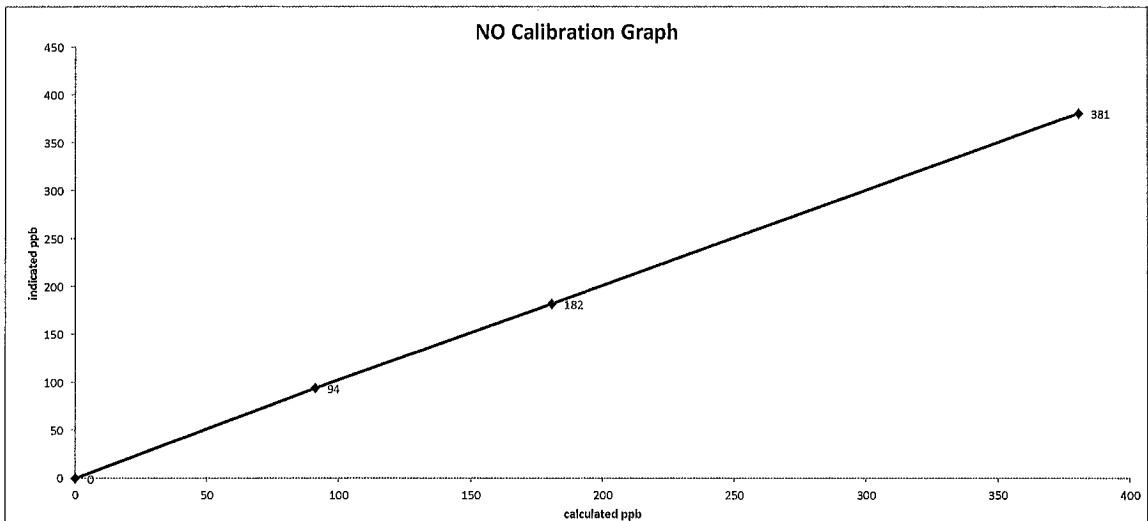
— LICA - - - - THC PPM

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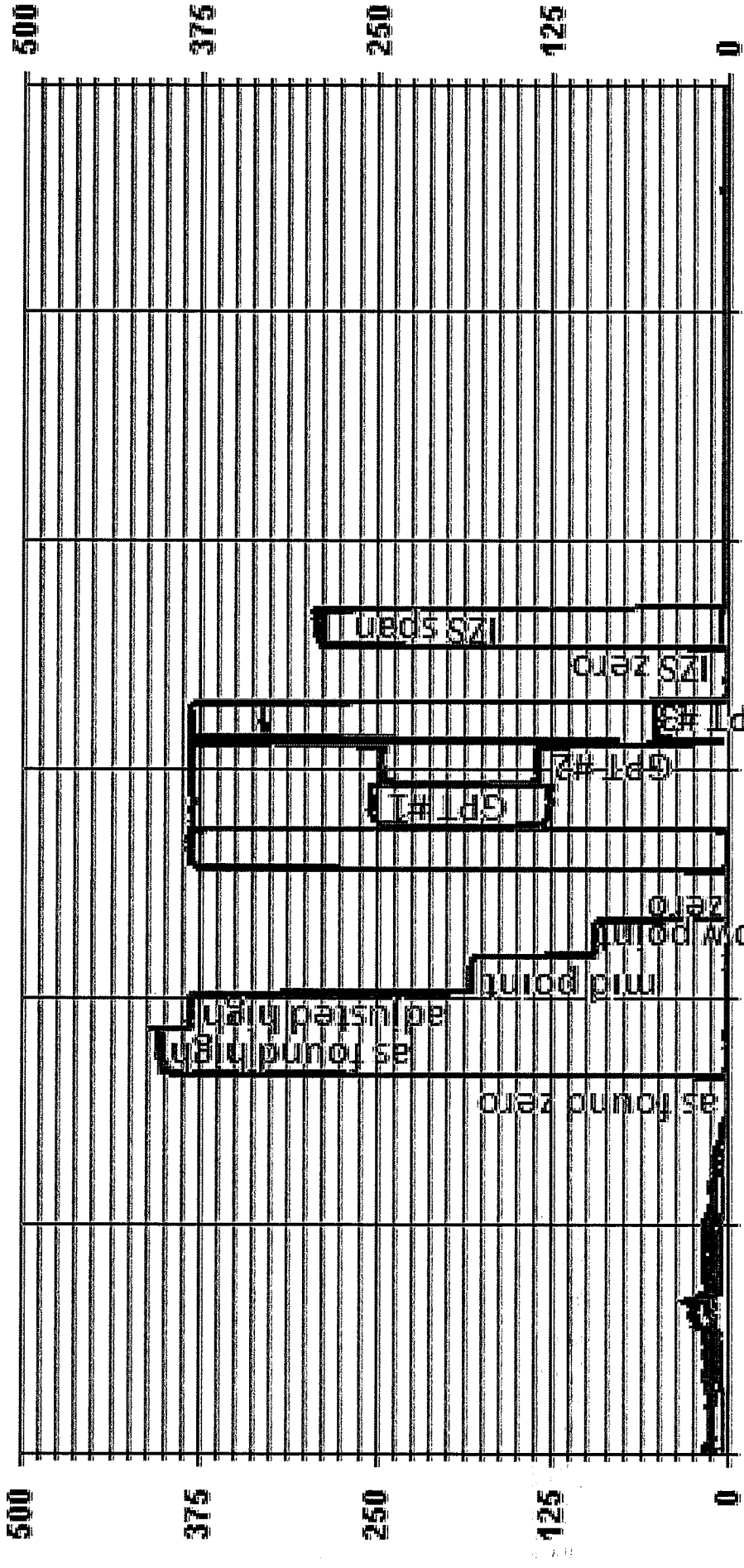
 Thermo 42C NO-NO2-NOx Analyzer Calibration																																																																																											
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Analyzer:																																																																																											
Serial Number: 427408716 Last Calibration Date: October 5, 2015 Range ppb: 500	Correction Factors: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>0.999</td> <td>0.946</td> <td>0.999</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>0.999</td> <td>0.946</td> <td>0.999</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	0.999	0.946	0.999	NO ₂ =	1.000	1.000	1.000	NOx =	0.999	0.946	0.999																																																																										
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Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: BLM002073 NO/NOx Gas Conc. (ppm): 50.6 50.6	Standard Calibration Points for a Range of: 500 ppb <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>380</td> <td>250</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>180</td> <td>146</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>90</td> <td>60</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	380	250	n/a	Mid	180	146	n/a	Low	90	60	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a																																																																		
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Date: November 5, 2015
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 9:36 / 14:19
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Varying UV Lamp Power



01 Minute Averages



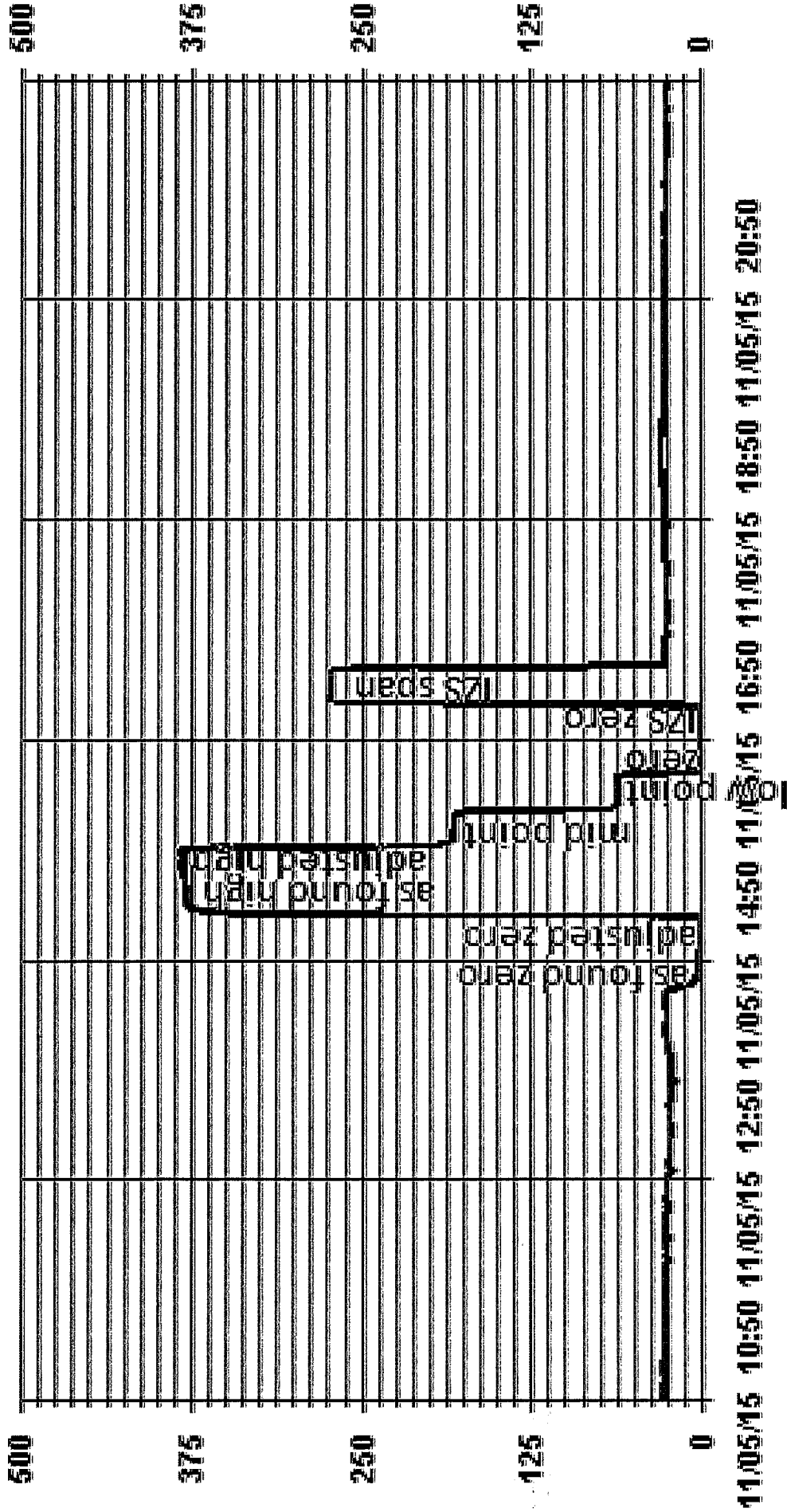
11/05/15 06:55 11/05/15 08:55 11/05/15 10:55 11/05/15 12:55 11/05/15 14:55 11/05/15 16:55

— LICA NOX_ PPB — LICA NO_ PPB — LICA NO2_ PPB

OZONE

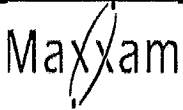
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Date: November 5, 2015 Company/Airshed: LICA Location/Station Name: Cold Lake South Start/End Time 24 hr. (mst): 14:30 / 17:34 Ozone Calibration Method: Varying UV Lamp Power G.P.T. Date: n/a-done by Varying UV Lamp Power	Barometric Pressure: 0.939 atm Station Temperature °C: 22 Weather Conditions: Mainly cloudy with sunny breaks Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: n/a																																																																						
Analyzer: Serial Number: 700419951 Last Calibration Date: October 6, 2015 Previous Cal High Point C.F.: 1.000	Ozone Range ppb: 500 As Found C.F.: 1.008 New C.F.: 1.000																																																																						
Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: n/a	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>AMD Required Range of Ozone Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>300-400 ppb</td> </tr> <tr> <td>Mld</td> <td>150-200 ppb</td> </tr> <tr> <td>Low</td> <td>50-75 ppb</td> </tr> </tbody> </table>	Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mld	150-200 ppb	Low	50-75 ppb																																																														
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<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="2">Calibrator Flow Rate (cc/min)</th> <th>Calculated Concentration:</th> <th>Corrected Calculated Concentration:</th> <th>Indicated Concentration:</th> <th>Correction Factors:</th> </tr> <tr> <th>Point</th> <th>Total Flow @ Point Start</th> <th>Total Flow @ Point Finish</th> <th>(ppb)</th> <th>(ppb)</th> <th>(ppb)</th> <th></th> </tr> </thead> <tbody> <tr> <td>as found zero</td> <td>5013</td> <td>5013</td> <td>0.0</td> <td>n/a</td> <td>1.0</td> <td>n/a</td> </tr> <tr> <td>as found high</td> <td>5013</td> <td>5013</td> <td>380.0</td> <td>380.0</td> <td>378.0</td> <td>1.008</td> </tr> <tr> <td>adjusted zero</td> <td>5013</td> <td>5013</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>n/a</td> </tr> <tr> <td>adjusted high</td> <td>5013</td> <td>5013</td> <td>380.0</td> <td>380.0</td> <td>380.0</td> <td>1.000</td> </tr> <tr> <td>mld</td> <td>5013</td> <td>5013</td> <td>180.0</td> <td>180.0</td> <td>181.0</td> <td>0.994</td> </tr> <tr> <td>low</td> <td>5013</td> <td>5013</td> <td>60.0</td> <td>60.0</td> <td>61.0</td> <td>0.984</td> </tr> <tr> <td>calibrator zero</td> <td>5013</td> <td>5013</td> <td>0.0</td> <td>n/a</td> <td>0.0</td> <td>n/a</td> </tr> <tr> <td colspan="6" style="text-align: right;">Average C.F.=</td> <td>0.993</td> </tr> </tbody> </table>			Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:	Point	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)		as found zero	5013	5013	0.0	n/a	1.0	n/a	as found high	5013	5013	380.0	380.0	378.0	1.008	adjusted zero	5013	5013	0.0	0.0	0.0	n/a	adjusted high	5013	5013	380.0	380.0	380.0	1.000	mld	5013	5013	180.0	180.0	181.0	0.994	low	5013	5013	60.0	60.0	61.0	0.984	calibrator zero	5013	5013	0.0	n/a	0.0	n/a	Average C.F.=						0.993
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LIMITS > or = 0.995 .95-1.05 ± 3% F.S. ± 10%																																																																							
Thermo 49i Ozone Analyzer Calibration 																																																																							
As found: O3 Bkg: -0.2 O3 Coef: 1.007 Photo Lamp: 8.7 O3 Lamp: 9.0 Bench: 28.3 Bench Lamp: 53.4 O3 Lamp: 67.4 Pressure: 699.2 Cell A lpm: 0.712 Cell B lpm: 0.750 O3 ppb: 0.7 Cell A ppb: 0.7 Cell B ppb: 0.7 Cell A int: 57750 Cell B int: 56314 Internal Span: 274	As left: O3 Bkg: 0.2 O3 Coef: 1.011 Photo Lamp: 8.7 O3 Lamp: 9.0 Bench: 28.3 Bench Lamp: 53.5 O3 Lamp: 67.3 Pressure: 700.2 Cell A lpm: 0.712 Cell B lpm: 0.750 O3 ppb: 0.8 Cell A ppb: -7.8 Cell B ppb: 9.5 Cell A int: 57742 Cell B int: 56320 Internal Span: 272																																																																						
Comments: <p style="text-align: center;">Sample filter changed.</p>																																																																							

01 Minute Averages



— LICA 03_ PPB

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: November 3, 2015
 Company: LICA
 Station Name/Location: Cold Lake South
 Previous Audit Date: October 26, 2015
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 11:03
 End Time (mst): 12:19
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: Fog

1400A Information and Status:

Serial Number: <u>1405A201620804</u>	As Found Filter Loading %: <u>24.30</u>
Ko Factor: <u>14578</u>	As Left Filter Loading %: <u>21.85</u>
Ambient Temperature °C: <u>4.14</u>	As Found Noise: <u>0.009</u>
Ambient Pressure atm: <u>0.936</u>	As Left Noise: <u>0.000</u>
Main Flow Reading lpm: <u>3.00</u>	Pump Vacuum: <u>0.31</u>
Aux Flow Reading lpm: <u>16.67</u>	Warnings: <u>None</u>

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>Fisher</u>
Model:	<u>475 Mark III</u>	<u>FB 1291</u>	<u>FB 1291</u>
Serial Number:	<u>n/a</u>	<u>130168457</u>	<u>130168457</u>
Calibration Date:	<u>n/a</u>	<u>18-Mar-15</u>	<u>18-Mar-15</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.03	0.15	0.02	0.16
	limit	0.15	X	0.15	X
Bypass Flow	actual	0.08	-0.09	0.06	-0.10
	limit	0.60	X	0.60	X

As left leak check (same as above if as found passes):

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.03	0.15	0.02	0.16
	limit	0.15	X	0.15	X
Bypass Flow	actual	0.08	-0.09	0.06	-0.10
	limit	0.60	X	0.60	X

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>4.1</u>	1405F pressure atm: <u>0.936</u>
reference temperature °C: <u>3.0</u>	reference pressure: <u>0.938</u>
difference °C: <u>-1.1</u>	difference : <u>-0.002</u>

As left temperature and pressure (same as above if as found adequate):

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>3.0</u>	1405F pressure atm: <u>0.938</u>
reference temperature °C: <u>3.0</u>	reference pressure: <u>0.938</u>
difference °C: <u>0.0</u>	difference : <u>0.000</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>3.00</u>	reference total/aux flow lpm: <u>16.76</u>
difference lpm: <u>0.00</u>	difference lpm: <u>0.09</u>

As left flows (same as above if as found adequate):

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>3.00</u>	reference total/aux flow lpm: <u>16.76</u>
difference lpm: <u>0.00</u>	difference lpm: <u>0.09</u>

K_o Audit:

Last K_o audit date: 3-Nov-15
 1405F K_o factor: 14578
 Measured K_o factor: 14764.1000
 % difference: 1.28

Comments:

^a TEOM sampling filter and 47 mm FDMS filter changed, Ko factor audited.



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: November 23, 2015
 Company: LICA
 Station Name/Location: Cold Lake South
 Previous Audit Date: November 3, 2015
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 15:30
 End Time (mst): 16:17
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: A few clouds

1400A Information and Status:

Serial Number: 1405A201620804 As Found Filter Loading %: 23.48
 Ko Factor: 14578 As Left Filter Loading %: 23.52
 Ambient Temperature °C: -1.03 As Found Noise: 0.004
 Ambient Pressure atm: 0.931 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.32
 Aux Flow Reading lpm: 16.66 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>Fisher</u>
Model:	<u>475 Mark III</u>	<u>FB 1291</u>	<u>FB 1291</u>
Serial Number:	<u>n/a</u>	<u>130168457</u>	<u>130168457</u>
Calibration Date:	<u>n/a</u>	<u>18-Mar-15</u>	<u>18-Mar-15</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.02	0.16	0.02	0.16
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.08	-0.09	0.05	-0.09
	limit	0.60	0.60	0.60	0.60

As left leak check (same as above if as found passes):

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.02	0.16	0.02	0.16
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.08	-0.09	0.05	-0.09
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C		tolerance +/- 0.01 atm	
1405F temperature °C:	<u>-1.0</u>	1405F pressure atm:	<u>0.931</u>
reference temperature °C:	<u>-1.7</u>	reference pressure:	<u>0.932</u>
difference °C:	<u>-0.7</u>	difference :	<u>-0.001</u>

As left temperature and pressure (same as above if as found adequate):

tolerance +/- 2.0°C		tolerance +/- 0.01 atm	
1405F temperature °C:	<u>-1.7</u>	1405F pressure atm:	<u>0.932</u>
reference temperature °C:	<u>-1.7</u>	reference pressure:	<u>0.932</u>
difference °C:	<u>0.0</u>	difference :	<u>0.000</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.66</u>
reference main flow lpm: <u>2.99</u>	reference total/aux flow lpm: <u>16.62</u>
difference lpm: <u>-0.01</u>	difference lpm: <u>-0.04</u>

As left flows (same as above if as found adequate):

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.66</u>
reference main flow lpm: <u>2.99</u>	reference total/aux flow lpm: <u>16.62</u>
difference lpm: <u>-0.01</u>	difference lpm: <u>-0.04</u>

K_o Audit:

Last K_o audit date: 3-Nov-15
 1405F K_o factor: 14578
 Measured K_o factor: 14764.1000
 % difference: 1.28

Comments:

47 mm FDMS filter changed

WIND SYSTEM



Met One Instruments
1600 NW Washington Blvd.
Grants Pass, Oregon 97526
Telephone 541-471-7111
Facsimile 541-471-7116

Regional Service
3206 Main St. Suite 106
Rowlett, Texas 75088
Telephone 972-412-4715
Facsimile 972-412-4716

Sonic Wind Sensor Certificate of Calibration

Sensor Model No: 50.5H Sonic Sensor Serial No: F1644
Customer: _____ P.O. No: _____ Sales Order: _____
Final Calibration By: Kevin Ricks Calibration Date: 04-01-15
Quality Control Inspected By: AJR Inspection Date: APR 03 2015

New Unit Repair/Adjust Re-Calibration As Found
Unit Within Tolerance as Found Unit Within Tolerance as Left

Calibration Equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal. Due
Digital Multimeter 1	Agilent/HP	34401A	MY41039534	4/11/2015
Digital Multimeter 2	Agilent/HP	34401A	US36094551	8/26/2015
Frequency Counter	Agilent/HP	53131A	MY40009285	5/22/2015
Standard Sensor	MOI	010C-1	P22383	7/11/2017
Temperature Probe	MOI	920005/PC8340	E3402	9/03/2015

Test 1: Average Wind Tunnel Speed: 3.08 Meters per Second Firmware Version: 3194-01 R2.62

WD Setting (Deg)	WD Output (Volts)	WD Indication (Deg)	WD Error (+/- 3 Deg)	WS Standard (m/s)	WS Output (Volts)	WS Indication (m/s)	WS Error (+/- .20 m/s)	Output Type:
30	.084	30.3	.3	3.06	.059	2.96	-.1	0 to 1 volt <input checked="" type="checkbox"/>
60	.165	59.3	-.7	3.07	.059	2.94	-.13	0 to 2.5 volt <input type="checkbox"/>
120	.334	120.2	.2	3.08	.059	2.94	-.14	0 to 5 volt <input type="checkbox"/>
150	.415	149.5	-.5	3.07	.059	2.94	-.13	RS-232 <input checked="" type="checkbox"/>
210	.583	210	0	3.08	.059	2.95	-.12	SDI-12 <input type="checkbox"/>
240	.668	240.3	.3	3.08	.06	2.98	-.1	RS-422 <input type="checkbox"/>
300	.834	300.4	.4	3.07	.06	3.02	-.04	RS-485 <input type="checkbox"/>
330	.916	329.8	-.2	3.09	.059	2.97	-.12	<input type="checkbox"/>

Test 2: Average Wind Tunnel Speed: 11.85 Meters per Second Output Range: 0-50 m/s

WD Setting (Deg)	WD Output (Volts)	WD Indication (Deg)	WD Error (+/- 3 Deg)	WS Standard (m/s)	WS Output (Volts)	WS Indication (m/s)	WS Error (+/- .24 m/s)	Test Items:
30	.081	29.3	-.7	11.79	.235	11.76	-.04	Army Alignment <input checked="" type="checkbox"/>
60	.165	59.5	-.5	11.85	.237	11.87	.01	Jumper Config <input checked="" type="checkbox"/>
120	.331	119.1	-.9	11.85	.236	11.81	-.03	Firmware Config <input checked="" type="checkbox"/>
150	.415	149.3	-.7	11.88	.236	11.8	-.08	Zero Calibration <input checked="" type="checkbox"/>
210	.582	209.5	-.5	11.81	.236	11.79	-.02	Low Speed Test OK <input checked="" type="checkbox"/>
240	.666	239.9	-.1	11.88	.235	11.73	-.16	High Speed Test OK <input checked="" type="checkbox"/>
300	.833	299.7	-.3	11.87	.235	11.73	-.13	Sensor Function <input checked="" type="checkbox"/>
330	.915	329.6	-.4	11.84	.238	11.9	.06	Physical Inspection <input checked="" type="checkbox"/>

The standards used for this calibration have accuracies equal to or greater than the instruments tested. These standards are on record and traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated hereon, all instruments are calibrated to meet the manufacturer's published specifications. The calibration system complies with MIL-STD-45662A. Calibration performed by direct comparison to the above standard following test procedure: 50.5-6100 Rev E

PARTISOL SAMPLER

PARTISOL 2000

Date:	November 17, 2015	Reference Standard:	Streamline FTS / 091001
Company:	LICA	Reference Standard s/n:	FB61291 / 130168457
Station:	Cold Lake South	Weather Conditions:	Clear
Parameter:	PM 2.5	Start/End Time (mst):	10:50/11:20
Calibration Purpose:	shut down	Performed By/Reviewer:	Alex Yakupov Trina Whatsitt

Sampler	Instrument Data
Make/Model: R & P	Temperature (°C): 4.3
Unit #: # 1517	Pressure (ATM): 0.92
S/N: 2000A204009710	Set Flow (l/min): 16.7

Item	Calculated		Offset		Span	
	Initial	Final	Initial	Final	Initial	Final
Analog Input	0.001	NA	0.0008	NA	0.9915	NA
Temperature	4.3	NA	0.0008	NA	1.0055	NA
Pressure	0.918	NA	0.0008	NA	0.9939	NA
Flow	-0.10	NA	-0.0436	NA	0.9989	NA

Interface Board Calibration			
Item	Acceptable	Pre Calibration	Post Calibration
R21	6.000 VDC (±0.05 V)	NA	NA
R44	10.000 VDC (±0.002 V)	NA	NA

Analog Input Calibration			
Item	Acceptable	Pre Calibration	Post Calibration
"AO" Offset	0.050 - 0.150 VDC (±0.005 V)	NA	NA
"AO" Span	4.800 - 4.900 VDC (±0.002 V)	NA	NA

Temperature/Pressure Calibration			
Reference Temperature: (±2 °C)	4.7	Δ °C	0.4
Reference Pressure: (±0.02 ATM)	0.919	Δ ATM	0.001

Leak Check				
Unit	Flow Controller Valve Closed (V1) in Hg	Pump Valve Closed after 10 Secs. (V2) in Hg	VL=1/2*V1 in Hg	Leakage Calculation (V2 > VL) After 10 Secs in Hg
Hub	14.0	13.5	7	6.75

Flow Calibration			
Item	Acceptable	Calculated	Actual
"Zero" Offset	0.1 lpm to -0.1 lpm	0.0	0.1
"Flow" Span	±7.0 % Adjust to 16.7 L	16.7	16.72

Other Checks:				
	Condition	Condition	Condition	Condition
Rubber Seals:	OK	Inlet:	OK	Inline Filter: OK
Status:	OK			

Comments:

Shutdown Audit performed to rebuild a sampling pump.

Calibration Performed By: Alex Yakupov

PARTISOL 2000						
Date: November 17, 2015		Reference Standard: Streamline FTS / 091001				
Company: LICA		Reference Standard s/n: FB61291 / 130168457				
Station: Cold Lake South		Weather Conditions: Clear				
Parameter: PM 2.5		Start/End Time (mst): 12:15/12:55				
Calibration Purpose: post repair		Performed By/Reviewer: Alex Yakupov		Trina Whitsitt		
Sampler			Instrument Data			
Make/Model: R & P		Temperature (°C): 6.4				
Unit #: # 1517		Pressure (ATM): 0.92				
S/N: 2000A204009710		Set Flow (l/min): 16.7				
Calibration Constants						
Item	Calculated		Offset		Span	
	Initial	Final	Initial	Final	Initial	Final
Analog Input	0.001	NA	0.0008	NA	0.9915	NA
Temperature	6.4	NA	0.0008	NA	1.0055	NA
Pressure	0.918	NA	0.0008	NA	0.9939	NA
Flow	-0.10	NA	-0.0436	NA	0.9989	NA
Interface Board Calibration						
Item	Acceptable		Pre Calibration		Post Calibration	
R21	6.000 VDC (±0.05 V)		NA		NA	
R44	10.000 VDC (±0.002 V)		NA		NA	
Analog Input Calibration						
Item	Acceptable		Pre Calibration		Post Calibration	
"AO" Offset	0.050 - 0.150 VDC (±0.005 V)		NA		NA	
"AO" Span	4.800 - 4.900 VDC (±0.002 V)		NA		NA	
Temperature/Pressure Calibration						
Reference Temperature: (±2 °C)		6.7	Δ °C	0.3		
Reference Pressure: (±0.02 ATM)		0.919	Δ ATM	0.001		
Leak Check						
Unit	Flow Controller Valve Closed (V1) in Hg	Pump Valve Closed after 10 Secs. (V2) in Hg	VL=1/2*V1 in Hg		Leakage Calculation (V2 > VL) After 10 Secs in Hg	
Hub	16.0	15.0	8		7.5	
Flow Calibration						
Item	Acceptable		Calculated		Actual	
"Zero" Offset	0.1 lpm to -0.1 lpm		0.0		0.1	
"Flow" Span	±7.0 % Adjust to 16.7 L		16.7		16.60	
Other Checks:						
Rubber Seals:	Condition OK	Inlet:	Condition OK	Inline Filter:	Condition OK	Status: OK
Comments: <p style="text-align: center;">Postrepair Audit: reason - sampling pump was rebuilt.</p>						
Calibration Performed By:			Alex Yakupov			

PARTISOL 2000

Date:	November 24, 2015	Reference Standard:	Streamline FTS / 091001
Company:	LICA	Reference Standard s/n:	FB61291 / 130168457
Station:	Cold Lake South	Weather Conditions:	Mainly cloudy with snow
Parameter:	PM 2.5	Start/End Time (mst):	09:26 / 10:17
Calibration Purpose:	shut down	Performed By/Reviewer:	Alex Yakupov Trina Whitsitt

Sampler		Instrument Data	
Make/Model:	R & P	Temperature (°C)	-9.4
Unit #	# 1517	Pressure (ATM)	0.95
S/N:	2000A204009710	Set Flow (l/min)	16.7

Calibration Constants						
Item	Calculated		Offset		Span	
	Initial	Final	Initial	Final	Initial	Final
Analog Input	0.001	NA	0.0008	NA	0.9915	NA
Temperature	-9.4	NA	0.0008	NA	0.9946	NA
Pressure	0.945	NA	0.0008	NA	0.9939	NA
Flow	-0.10	NA	-0.0436	NA	0.9989	NA

Interface Board Calibration			
Item	Acceptable	Pre Calibration	Post Calibration
R21	6.000 VDC (±0.05 V)	NA	NA
R44	10.000 VDC (±0.002 V)	NA	NA

Analog Input Calibration			
Item	Acceptable	Pre Calibration	Post Calibration
"AO" Offset	0.050 - 0.150 VDC (±0.005 V)	NA	NA
"AO" Span	4.800 - 4.900 VDC (±0.002 V)	NA	NA

Temperature/Pressure Calibration			
Reference Temperature: (±2 °C)	-8.8	Δ °C	0.6
Reference Pressure: (±0.02 ATM)	0.946	Δ ATM	0.001

Leak Check				
Unit	Flow Controller Valve Closed (V1) in Hg	Pump Valve Closed after 10 Secs. (V2) in Hg	VL=1/2*V1 in Hg	Leakage Calculation (V2 > VL) After 10 Secs in Hg
Hub	16.0	15.0	8	7.5

Flow Calibration			
Item	Acceptable	Calculated	Actual
"Zero" Offset	0.1 lpm to -0.1 lpm	0.0	0.1
"Flow" Span	±7.0 % Adjust to 16.7 L	16.7	16.73

Other Checks:							
	Condition	Condition	Condition	Condition			
Rubber Seals:	OK	Inlet:	OK	Inline Filter:	OK	Status:	OK

Comments:

Shutdown audit performed to replace the AEMERA Partisol sampler with a Maxxam's Partisol sampler.

Calibration Performed By: Alex Yakupov

PARTISOL 2000

Date:	November 24, 2015	Reference Standard:	Streamline FTS / 091001
Company:	LICA	Reference Standard s/n:	FB61291 / 130168457
Station:	Cold Lake South	Weather Conditions:	Mainly cloudy with snow
Parameter:	PM 2.5	Start/End Time (mst):	15:23 / 16:06
Calibration Purpose:	installation	Performed By/Reviewer:	Alex Yakupov Trina Whitsitt

Sampler		Instrument Data	
Make/Model:	R & P	Temperature (°C)	-9.7
Unit #	# 2873	Pressure (ATM)	0.94
S/N:	2000B206140102	Set Flow (l/min)	16.7

Item	Calculated		Offset		Span	
	Initial	Final	Initial	Final	Initial	Final
Analog Input	0.000	NA	-0.0019	NA	0.9987	NA
Temperature	-9.7	NA	NA	NA	0.9967	NA
Pressure	0.941	NA	NA	NA	0.9993	NA
Flow	0.10	NA	-0.0098	NA	1.0028	NA

Interface Board Calibration			
Item	Acceptable	Pre Calibration	Post Calibration
R21	6.000 VDC (±0.05 V)	NA	NA
R44	10.000 VDC (±0.002 V)	NA	NA

Analog Input Calibration			
Item	Acceptable	Pre Calibration	Post Calibration
"AO" Offset	0.050 - 0.150 VDC (±0.005 V)	NA	NA
"AO" Span	4.800 - 4.900 VDC (±0.002 V)	NA	NA

Temperature/Pressure Calibration			
Reference Temperature: (±2 °C)	-9.7	Δ °C	0.0
Reference Pressure: (±0.02 ATM)	0.941	Δ ATM	0.000

Leak Check				
Unit	Flow Controller Valve Closed (V1) in Hg	Pump Valve Closed after 10 Secs. (V2) in Hg	VL=1/2*V1 in Hg	Leakage Calculation (V2 > VL) After 10 Secs in Hg
Hub	23.5	23.5	11.75	11.75

Flow Calibration			
Item	Acceptable	Calculated	Actual
"Zero" Offset	0.1 lpm to -0.1 lpm	0.0	0.1
"Flow" Span	±7.0 % Adjust to 16.7 L	16.7	16.64

Other Checks:				
	Condition	Condition	Condition	Condition
Rubber Seals:	OK	Inlet: OK	Inline Filter: OK	Status: OK

Comments:

Installation performed to replace the AEMERA Partisol sampler.

Calibration Performed By: Alex Yakupov

CALBRATORS

Company: Maxxam Operator: Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010D</u>	Make/Model	<u>N/A</u>
Serial Number	<u>11900613</u>	Serial Number	<u>N/A</u>
Oven Temperature	<u>N/A</u>	Temperature (°C)	<u>N/A</u>
Last Verification Date	<u>N/A</u>	Barometric Pressure	<u>N/A</u>

Flow Measurements

Pt. No. 1 5000 Pt. No. 2 5000 Pt. No. 3 5000

Calibrator Flow (sccm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
5013	0.000	0.001		
5013	0.400	0.407	1%	± 10%
5013	0.200	0.204	1%	± 10%
5014	0.100	0.101	0%	± 10%
Absolute Average Percent Difference			1%	± 10%

LINEAR REGRESSION ANALYSIS
y=mx+b (where x=calculated concentration, y=indicated concentration)

<u>O₃</u>		<u>LIMITS</u>
Correlation=	1.0000	≥ 0.995
m (Slope)=	1.0163	0.90-1.10
b (Intercept % of FS)=	0.0800	± 3% F.S.

AENV Standards		Ozone Analyzer	
Audit Calibrator		Make/Model	<u>Teco 49i</u>
Make/Model	<u>Teco 49i PS</u>	Serial/AMU Number	<u>AMU 1843</u>
Serial/AMU Number	<u>AMU 1808</u>	Last Calibration Date	<u>May 21, 2015</u>
Ozone Standard	<u>Primary</u>	Full Scale (ppm)	<u>0.5</u>

COMMENTS: _____

Auditor: Al Clark Date: May 21, 2015
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton

Company: Maxxam

Operator: Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>N/A</u>
Serial Number	<u>830</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>Oct 2013</u>	Temperature (°C)	<u>N/A</u>
SO ₂ Cylinder Conc.	<u>50.3</u>	Barometric Pressure	<u>N/A</u>
SO ₂ Cylinder S/N	<u>LL42475</u>		

Flow Measurements

Pt. No. 1 79.5 Pt. No. 2 39.8 Pt. No. 3 19.9

Calibrator Flow (scm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
Zero Air	0.000	0.000		
4918	0.800	0.798	0%	± 10%
4960	0.400	0.398	-1%	± 10%
4977	0.200	0.200	0%	± 10%
Absolute Average Percent Difference			0%	± 10%

LINEAR REGRESSION ANALYSIS
y=mx+b (where x=calculated concentration, y=indicated concentration)

<u>SO₂</u>		<u>LIMITS</u>
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9971	0.90-1.10
b (Intercept % of FS)=	0.0000	± 3% F.S.

AENV Standards		SO ₂ Analyzer	
Audit Calibrator		Make/Model	<u>Teco 43C</u>
Make/Model	<u>R&R MFC 201</u>	Serial/AMU Number	<u>AMU 1623</u>
Serial/AMU Number	<u>AMU 1690</u>	Last Calibration Date	<u>Dec 15/14</u>
		Full Scale (ppm)	<u>1.0</u>

COMMENTS: H2S gas was slow to move through the calibrator. Check for contamination inside calibrator. SO2 moves through quickly.

Auditor: Al Clark Date: December 16, 2014

Operator Signature: _____ Location: McIntyre Center Edmonton

Company Maxxam Operator: Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>N/A</u>
Serial Number	<u>627</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>April 2014</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>BLM003914</u>	Barometric Pressure	<u>N/A</u>
NO/NOx Concentration	<u>50.8/50.8</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
Pt. #3	<u>5000</u>		
Gas Flow (sccm)			
Pt. #1	<u>80</u>	Pt. #2	<u>40</u>
Pt. #3	<u>20</u>		

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.000	0.000	0.000	0.001	0.001	Limit ± 10%	
4999	78.7	0.800	0.800	0.851	-0.016	0.835	6%	4%
5000	39.4	0.400	0.400	0.423	-0.008	0.416	6%	4%
5001	19.7	0.200	0.200	0.211	-0.003	0.208	5%	3%
Absolute Average Percent Difference							6%	4%

LINEAR REGRESSION ANALYSIS

$y=mx+b$ (where x=calculated concentration, y=indicated concentration)

<u>NO</u>		<u>LIMITS</u>		<u>NOx</u>	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	1.0641	0.90-1.10		m (Slope)=	1.0429
b (Intercept % of FS)=	-0.1200	± 3% F.S.		b (Intercept % of FS)=	0.0000

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4999	0.000	0.000	0.841	-0.015	0.831	NO ₂	% Diff. Limit
4999	0.520	0.562	0.279	0.518	0.797	-5%	± 10%
4999	0.280	0.308	0.533	0.286	0.818	-2%	± 10%
4999	0.100	0.108	0.733	0.095	0.828	2%	± 10%
Absolute Average Percent Difference						2%	± 10%


LINEAR REGRESSION ANALYSIS

$y=mx+b$ (where x=calculated concentration, y=indicated concentration)

<u>NO₂</u>		<u>LIMITS</u>	
Correlation=	0.9998	≥ 0.995	
m (Slope)=	0.9458	0.90-1.10	
b (Intercept % of FS)=	-1.0258	± 3% F.S.	

<u>AENV Standards</u>		<u>NO_x Analyzer</u>	
<u>Audit Calibrator</u>		Make/Model	<u>Teco 42i</u>
Make/Model	<u>Teco 146i</u>	Serial/AMU Number	<u>AMU 1868</u>
Serial/AMU Number	<u>AMU 1809</u>	Last Calibration Date	<u>April 1, 2015</u>
		Full Scale (ppm)	<u>1.0</u>

COMMENTS: Cylinder contains 49.7 ppm SO₂. System shows NOx drop when O₃ added. Also noisy during GPT phase for NO₂ and NOx.

Auditor: Al Clark Date: April 1, 2015
Operator Signature:  Location: McIntyre Center Edmonton



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-032A

Company Maxxam Operator: Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>N/A</u>
Serial Number	<u>17200415</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>New</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>BLM0027561</u>	Barometric Pressure	<u>N/A</u>
NO/NOX Concentration	<u>50.7/50.7</u>		

Dilution Flow (sccm)		
Pt. #1	<u>5000</u>	Pt. #3 <u>5000</u>
Pt. #2	<u>5000</u>	
Gas Flow (sccm)		
Pt. #1	<u>80</u>	Pt. #3 <u>20</u>
Pt. #2	<u>40</u>	

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5010	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5033	79.1	0.797	0.797	0.790	-0.011	0.779	-1%	-2%
5030	39.7	0.400	0.400	0.395	-0.005	0.390	-1%	-3%
5029	20.0	0.202	0.202	0.198	-0.003	0.195	-2%	-3%
Absolute Average Percent Difference							1%	3%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO	LIMITS	NOx
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 0.9920	0.90-1.10	m (Slope)= 0.9783
b (Intercept % of FS)= #DIV/0!	± 3% F.S.	b (Intercept % of FS)= #DIV/0!

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5033	0.000	0.000	0.787	-0.011	0.776	NO ₂	% Diff. Limit
5033	0.520	0.490	0.297	0.475	0.772	0	± 10%
5033	0.280	0.261	0.526	0.249	0.774	0	± 10%
5033	0.100	0.089	0.698	0.078	0.775	0	± 10%
Absolute Average Percent Difference						0	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO ₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9916	0.90-1.10
b (Intercept % of FS)= #DIV/0!	± 3% F.S.

AENV Standards Audit Calibrator	NO _x Analyzer
Make/Model <u>Teco 146i</u>	Make/Model <u>Teco 42i</u>
Serial/AMU Number <u>AMU 1809</u>	Serial/AMU Number <u>AMU 1868</u>
	Last Calibration Date <u>May 21, 2015</u>
	Full Scale (ppm) _____

COMMENTS: Contains 49.9 ppm SO2

Auditor: Al Clark
Operator Signature: *Limin Li*

Date: May 21, 2015
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-344CGA

Company: Maxxam Operator's Name: Limin Li
Cylinder #: BLM002073 Concentration PPM: 49.5 Tolerance(%) 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
Serial Number: AMU 1690
Last Verification Date: March 31, 2015
Gas Type: SO2 Conc. 98.57
Cylinder Number: CAL016720

Flow Measurement Device:

Make/Model: Bios DC2
Serial Number: AMU 1659
Temp. °C: 22.5 C
B.P. 690 mmhg

Reference Analyzer:

Make/Model: Teco 43C Serial/AMU Number: 1623
Instrument Settings: Zero: 7.9 Span: 1.028 Range: 1.0
Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	0.0000	0.0000	0.000
4976	82.6	0.801	0.01660	60.242	48.3
4993	41.0	0.396	0.00821	121.780	48.2
4977	20.2	0.193	0.00406	246.386	47.6
Average Cylinder Concentration:					48.0

Previous Stated Concentration PPM: 49.5

Percent variance from Stated: 3.0

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark
Operator Signature: *Al Clark*

Date: March 31, 2015
Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-342CGA

Company: Maxxam Operator's Name: Limin Li
 Cylinder #: BLM002756T Concentration PPM: 49.9 Tolerance(%): 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: March 31, 2015
 Gas Type: SO2 Conc. 98.57
 Cylinder Number: CAL016720

Flow Measurement Device:

Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 22.5 C
 B.P. 690 mmhg

Reference Analyzer:

Make/Model: Teco 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 7.9 Span: 1.028 Range: 1.0
 Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	0.0000	0.0000	0.0000
4976	82.6	0.821	0.01660	60.242	49.5
4993	41.0	0.410	0.00821	121.780	49.9
4977	20.2	0.202	0.00406	246.386	49.8
Average Cylinder Concentration:					49.7

Previous Stated Concentration PPM: 49.9

Percent variance from Stated: 0.4

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark
 Operator Signature: *Limin Li*

Date: March 31, 2015
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-338CGA

Company: Maxxam Operator's Name: Limin Li
 Cylinder #: BLM002508 Concentration PPM: 10.2 Tolerance(%) 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU1690
 Last Verification Date: March 31, 2015
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015106

Flow Measurement Device:

Make/Model: Blos DC2
 Serial Number: AMU 1659
 Temp. °C: 23.0 C
 B.P. 689 mmhg

Reference Analyzer:

Make/Model: Teco 450i Serial/AMU Number: 1980
 Instrument Settings: Zero: 14.5 Span: 1.035 Range: 0.1
 Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (scem)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	132.984	9.6
5080	38.2	0.0725	0.00752	132.984	9.6
5078	17.9	0.0340	0.00353	283.687	9.6
5066	9.1	0.0170	0.00180	556.703	9.5
Average Cylinder Concentration:					9.6

Previous Stated Concentration PPM: 10.2

Percent variance from Stated: 6.0

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____

<=5% Outside Manufacturer Tolerance. Use manufacturers concentration _____

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark

Date: March 31, 2015

Operator Signature: *Al Clark*

Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-251CGA

Company: Maxxam Operator's Name: Limin Li
 Cylinder #: LL36837 Concentration PPM: 10.0 Tolerance(%): 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: December 15, 2014
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015106

Flow Measurement Device:

Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 23.0 C
 B.P. 702 mmhg

Reference Analyzer:

Make/Model: Teco 45C Serial/AMU Number: 1624
 Instrument Settings: Zero: 6.4 Span: 1.160 Range: 0.1
 Last Calibration: Date: Dec15/14 C.F. 1.000 Done By: Al Clark

Calibrator Flows (scem)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	10.0	10.0
5099	38.5	0.0754	0.00755	132.442	10.0
5092	18.0	0.0349	0.00353	282.889	9.9
5066	9.2	0.0178	0.00182	550.652	9.8
Average Cylinder Concentration:					9.9

Previous Stated Concentration PPM: 10.0

Percent variance from Stated: 1.1

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark
 Operator Signature: *Al Clark*

Date: December 16, 2014
 Location: McIntyre Center Edmonton



Calibration Gas Audit

CH₄ / C₃H₈ Cylinder Gas

File No. 2015-027CGA

Company: Maxxam **Operators name:** Limin Li
Cylinder #: LL83638 **Conc CH₄ (PPM)** 582/203 **Tolerance (%)** 2 **Certified By:** Praxair

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>R&R MFC 201</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1691</u>			Serial Number	<u>AMU 1660</u>
Last Verification Date	<u>May 21, 2015</u>			Temp. °C	<u>24.0 C</u>
Gas Type	<u>CH₄</u>	Conc.	<u>999.2</u>	B.P.	<u>703 mmhg</u>
Cylinder Number	<u>D751932</u>				
Gas Type	<u>C₃H₈</u>	Conc.	<u>246.5</u>		
Cylinder Number	<u>XF0037998</u>				

Reference Analyzer:
Make/Model Teco 55C **Serial/AMU Number:** 1643
Instrument Settings **Zero:** N/A **Span:** N/A **Range:** 20
Last Calibration: **Date:** May 21/15 **C.F.** 1.000 **Done By:** Al Clark

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
		CH ₄	C ₃ H ₈			CH ₄	C ₃ H ₈
2800	0.0	0.00	0.00	0.02005	49.883	595	201
2569	51.5	11.92	11.08	0.02005	49.883	595	201
3549	22.3	3.76	3.49	0.00628	159.148	598	202
3523	10.4	1.76	1.66	0.00295	338.750	596	204
Average Cylinder Concentration:						596	202

	<u>CH₄</u>		<u>C₃H₈</u>
Previous Stated Concentration PPM:	<u>582</u>		<u>203</u>
Percent variance from Stated:	<u>2.5</u>		<u>0.3</u>

Cylinder gas tolerances based on CH₄ only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark **Date:** May 21, 2015
Operator Signature: *Praxair* **Location:** McIntyre Center Edmonton



Praxair Canada, Inc.
 5501-34th Street
 Edmonton, AB T6B 2X6
 Tel: 780-449-0778
 Fax: 780-449-5302

03/27/2014

MAXXAM ANALYTICS INC "NA"
 9372 49TH ST
 EDMONTON, AB T6B 2L7

Work Order No. 20248656
 Customer Reference No.

Product Lot/Batch No. Z582 4 085 02
 Product Part No. NI ME600P2P-AQ

CERTIFICATE OF ANALYSIS
 Primary Standard

Component	Requested Concentration	Certified Concentration	Analytical Principle	Analytical Accuracy
Methane	800.0ppm	801.4ppm	U	±1% rel
Propane	200.0ppm	202ppm	U	±1% rel
Nitrogen	Balance	Balance		

Analytical Instruments: Mettler-Toledo Analytical Balance-ID2ex/USA--
 Hewlett-Packard (Agilent)-6890--GC-FID

Cylinder Style: AQ
 Cylinder Pressure @70F: 2200 psig
 Cylinder Volume: 82.0 ft3
 Valve Outlet Connection: CGA-350
 Cylinder No(s): LL33574

Filling Method: Gravimetric
 Date of Fill: 03/26/2014
 Expiration Date: 03/26/2017

Analyst: Todd Hryniv

The gas calibration cylinder standard prepared by Praxair Canada, Inc. is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure techniques. The calibration standard provided is certified against Praxair Canada, Inc. Reference Materials which are either prepared by weight traceable to the National Institute of Standards and Technology (NIST), Montreal, Canada or by using NIST Standard Reference Materials where available.

Units: All concentrations for concentration in g / kg or ppm) are for gas phase by volume (v/v, ppmv) unless otherwise noted.

Area or Analytical Technique	Method	Method	Method
A. Flame Ionization with Methane	B. Gas Chromatography with Sulfuric Acid Detector	C. Gas Chromatography with Electrolytic Conductivity Detector	D. Gas Chromatography with Flame Ionization Detector
E. Gas Chromatography with Photoacoustic Cell Detector	F. Gas Chromatography with Thermal Conductivity Detector	G. Gas Chromatography with Methane Oxidation Detector	H. Gas Chromatography with Photoionization Detector
I. Gas Chromatography with Nitrogen Gas Analyzer	J. Gas Chromatography with Thermal Conductivity Detector	K. Binary Gas Analyzer with Thermal Conductivity Detector	L. Infrared - FTIR or 1630
M. Mass Spectrometry MS or GC/MS	N. Difference of Thermal Masses	O. Gravimetric	P. Spectroscopic Analyzer
Q. Total Hydrocarbon Analyzer	R. Gas Chromatography with Thermal Conductivity Detector	S. Gas Chromatography with Thermal Conductivity Detector	T. Other

IMPORTANT:
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Calibration Gas Audit

NO Cylinder Gas

File No. 2015-343CGA

Company: Maxxam **Operators name:** Limin Li
Cylinder #: BLM002756T **Conc (PPM)** 50.7/50.7 **Tolerance (%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model Teco 146i
 Serial Number AMU 1809
 Last Verification Date March 31, 2015
 Gas Type NO Conc. 48.79
 Cylinder Number CAL018024

Flow Measurement Device:

Make/Model Bios DC2
 Serial Number AMU 1659
 Temp. °C 22.5 C
 B.P. 690 mmhg

Reference Analyzer:

Make/Model Teco 42i Serial/AMU Number: 1868
 Instrument Settings Zero: 4.2 Span: 1.008 Range: 1.0
 Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000				
4976	82.6	0.842	0.822	0.01660	60.242	50.7	49.5
4993	41.0	0.420	0.410	0.00821	121.780	51.1	49.9
4977	20.2	0.208	0.205	0.00406	246.386	51.2	50.5
Average Cylinder Concentration:						51.0	50.0

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.7</u>	<u>50.7</u>
Percent variance from Stated: <u>0.7</u>	<u>1.4</u>

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration Contains 49.9 ppm SO2 in cylinder
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark Date: March 31, 2015
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2015-346CGA

Company: Maxxam Operators name: Limin Li
Cylinder #: BLM002073 Conc (PPM) 50.6/50.6 Tolerance (%) 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model Teco 146i
Serial Number AMU 1809
Last Verification Date March 31, 2015
Gas Type NO Conc. 48.79
Cylinder Number CAL018024

Flow Measurement Device:

Make/Model Bios DC2
Serial Number AMU 1659
Temp. °C 22.5 C
B.P. 690 mmhg

Reference Analyzer:

Make/Model Teco 42i Serial/AMU Number: 1868
Instrument Settings Zero: 4.2 Span: 1.008 Range: 1.0
Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000	0.01660	60.242	51.5	51.1
4976	82.6	0.855	0.848	0.01660	60.242	51.5	51.1
4993	41.0	0.427	0.421	0.00821	121.780	52.0	51.3
4977	20.2	0.213	0.209	0.00406	246.386	52.5	51.5
Average Cylinder Concentration:						52.0	51.3

NO NOx

Previous Stated Concentration PPM: 50.6 50.6

Percent variance from Stated: 2.8 1.4

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration Contains 49.5 ppm SO2 in cylinder

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark Date: March 31, 2015
Operator Signature: *Al Clark* Location: McIntyre Center Edmonton

AUDIT REPORT

COMPANY: LICA PLANT: CLS DATE: November 18, 2015

Station Location: UTM Coordinates: 54.41409N/110.23291W
 Elevation (m): 528m
 Declination: 13° 9'

GENERAL

	Yes	No	n/a	Comments:
Has site location changed from previous audit?		No		
Is site secure?	Yes			
Are station operating conditions adequate?	Yes			
Last twelve month's of calibrations available?	Yes			
All applicable SOP's available in station?		No		
Site documentation up to date?	Yes			

DATA ACQUISITION

	Yes	No	n/a	Comments:
Are strip charts in use?		No		
Is a digital data logger in use?		No		
Is a telemetry system for data acquisition in use?	Yes			

TRAILER COMPONENTS

	Yes	No	n/a	Comments:
Is a glass sampling manifold installed?	Yes			
Is sampling manifold clean and free of chips and cracks?	Yes			
Is a trap in place?	Yes			
Are spare manifold ports capped?	Yes			
Is manifold pump properly installed and operative?	Yes			
If horizontal, is the manifold mounted at a slight upward angle to prevent moisture from getting in to the lines?			n/a	
Do sample lines extend halfway into manifold?	Yes			
Are monitor sampling lines connected to manifold?	Yes			
Are sampling lines clean?		No		
Are monitors properly mounted and secure?	Yes			
Are monitors properly exhausted from room or scrubbed (NOx pump inlet scrubbed and dated)?	Yes			
Are zero and span systems operational?	Yes			


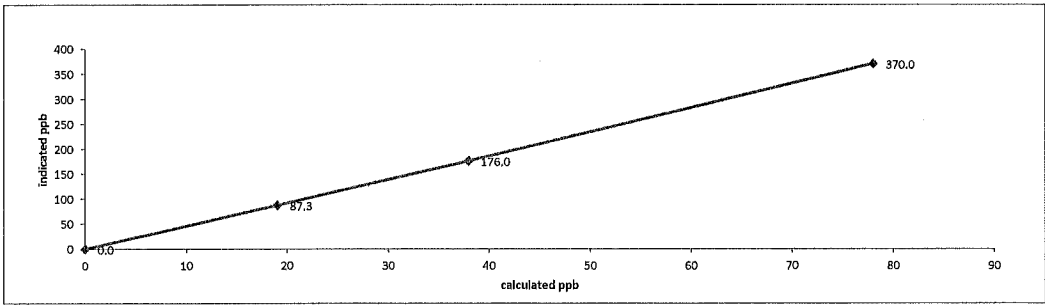
Meteorological

	Yes	No	n/a	Comments:
Is wind equipment properly oriented?	Yes			
Is the wind equipment functioning properly?	Yes			

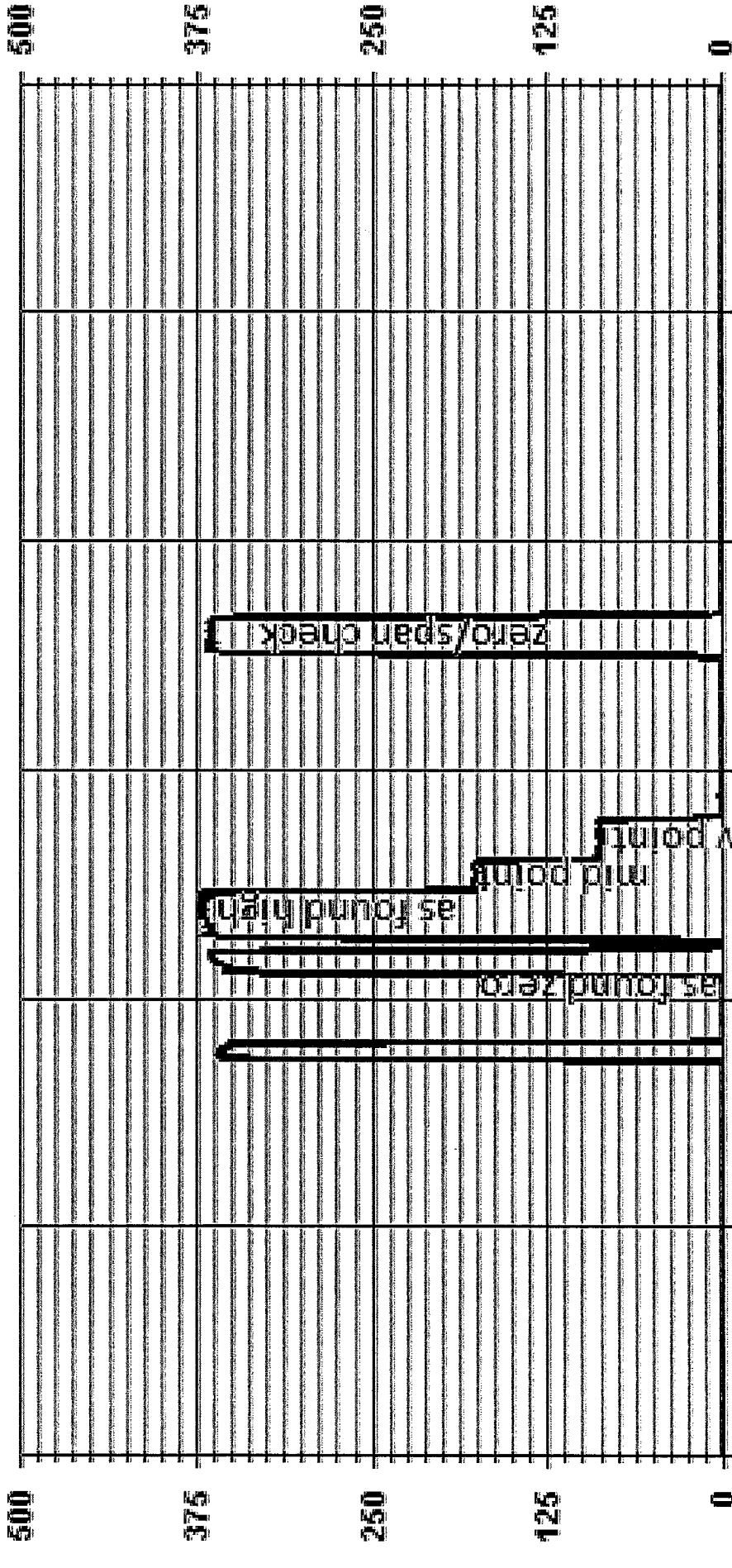
	Indicated Value:	Audit Value:	% Difference	Scalar Difference:
Station Temperature °C	24.76	24.2	-2.31	-0.56
Barometric Pressure	na	na		#VALUE!
Wind Speed (kph)	18	16	n/a	n/a
Wind Direction (Deg)	320	NW	n/a	n/a
Relative Humidity %	67	49	n/a	n/a
Ambient Temperature °C	-8.14	-8.2	0.73	-0.06
Solar Radiation kW/m ²	NA	NA	n/a	n/a
Precipitation (Tipping Bucket mm)	NA	NA	n/a	n/a

Recommendations:


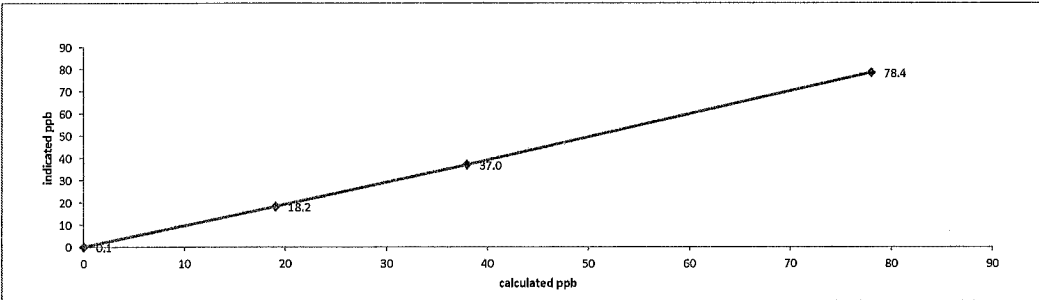
AUDITOR: Limin Li

		<h3>Thermo 43i Sulphur Dioxide Analyzer Audit</h3>									
Date: <u>November 18, 2015</u>		Barometric Pressure: <u>27.74 in. Hg</u>									
Company/Alrshed: <u>LICA</u>		Station Temperature °C: <u>23</u>									
Location/Station Name: <u>Cold Lake South</u>		Weather Conditions: <u>Mainly cloudy with clear breaks</u>									
Parameter: <u>Sulphur Dioxide</u>		Calibration Purpose: <u>Audit</u>									
Start Time 24 hr. (mst): <u>9:30</u>		Performed By/Reviewer: <u>Limin Li</u> <u>Tom Bourque</u>									
End Time 24 hr. (mst): <u>11:35</u>		Cal Gas Expiry Date: <u>December 25, 2018</u>									
Calibration Method: <u>Gas Dilution</u>		Converter Model & s/n (if applicable): <u>NA</u>									
Analyzer:											
Serial Number: <u>806528242</u>		Range ppb: <u>500</u>									
Last Calibration Date: <u>November 5, 2015</u>		As Found C.F.: <u>1.028</u>									
Previous C.F.: <u>1.001</u>		New C.F.: <u>n/a</u>									
Calibrator:											
Flow Meter ID's: <u>NA</u>		Standard Calibration Points for Ranges									
Make & Model: <u>API700</u>		<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Sulphur Dioxide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td style="text-align: center;">380</td> </tr> <tr> <td>Mid</td> <td style="text-align: center;">180</td> </tr> <tr> <td>Low</td> <td style="text-align: center;">90</td> </tr> </tbody> </table>		Point	Sulphur Dioxide Standard Calibration Points	High	380	Mid	180	Low	90
Point	Sulphur Dioxide Standard Calibration Points										
High	380										
Mid	180										
Low	90										
Serial #: <u>627</u>											
Cal Gas Cylinder I.D. #: <u>8LM00275GT</u>											
Cal Gas Conc. (ppm): <u>49.9</u>											
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015											
Calibrator Flow Rates (cc/min)											
Point	Diluent	Cal Gas	Total								
as found zero	5000	0.00	5000								
as found high	4962	38.10	5000								
mid	4982	18.00	5000								
low	4990	9.00	4999								
		Calculated Concentration: (ppb)	Indicated Concentration: (ppb)								
		0.0	0.0								
		380.2	370.0								
		179.6	176.0								
		89.8	87.3								
			Correction Factors (C.F.):								
			n/a								
			1.028								
			1.021								
			1.029								
			Average C.F.= 1.026								
Linear Regression/Calibration Results:											
Correlation Coefficient = <u>1.000</u>		LIMITS > or = 0.995									
Slope = <u>1.027</u>		0.90-1.10									
b (Intercept as % of full scale)= <u>-0.04%</u>		± 3% F.S.									
% change in C.F. from last cal= <u>-2.66%</u>		± 10%									
Thermo 43i Sulphur Dioxide Analyzer Audit											
											
As found:		As left:									
BKG: <u>7.1</u>		BKG: <u>7.1</u>									
COEF: <u>1.083</u>		COEF: <u>1.083</u>									
PMT: <u>-632</u>		PMT: <u>-632</u>									
FLASH: <u>706</u>		FLASH: <u>706</u>									
INTERNAL: <u>28.3</u>		INTERNAL: <u>28.3</u>									
CHAMBER: <u>45.1</u>		CHAMBER: <u>45.1</u>									
PERM OVEN HEATER: <u>45</u>		PERM OVEN HEATER: <u>45</u>									
PRESSURE: <u>662.3</u>		PRESSURE: <u>662.3</u>									
SAMPLE FLOW: <u>0.465</u>		SAMPLE FLOW: <u>0.465</u>									
LAMP INTENSITY: <u>77</u>		LAMP INTENSITY: <u>77</u>									
Recommendations:											
Change calibrator and reinstall gas regulator, then redo SO2 calibration. Pass. Calibrator flow rate (tested by Definer) High point: Total:4956CCM, Gas:76.37CCM; Mid point: Total:4970CCM, Gas:17.67. Low point: Total:5000CCM, Gas:8.97CCM.											

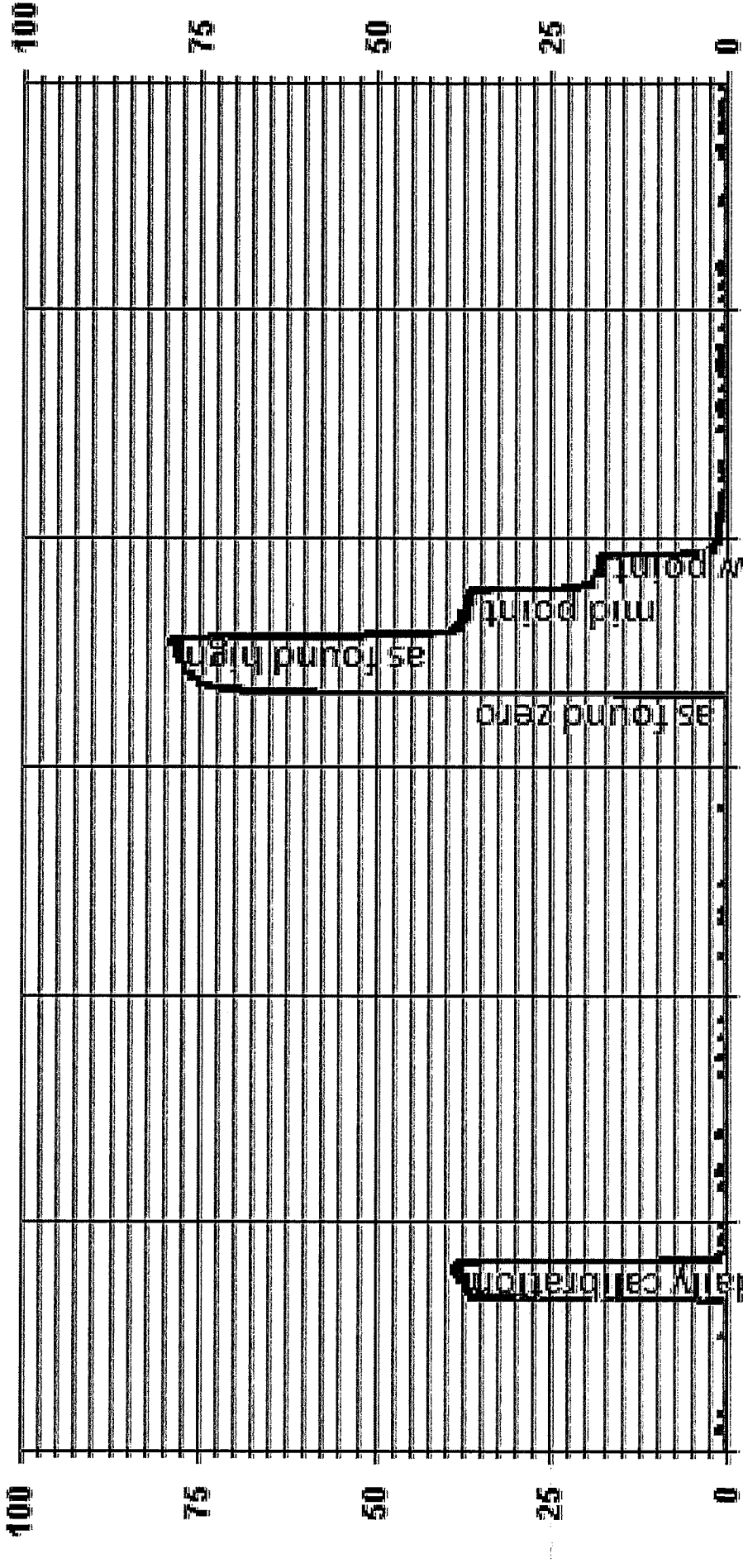
01 Minute Averages



— LICA SO2_ PPB

		Thermo 450i Total Reduced Sulphur Analyzer Audit									
Date: <u>November 17, 2015</u>		Barometric Pressure: <u>27.34 in. Hg</u>									
Company/Airshed: <u>LICA</u>		Station Temperature °C: <u>24</u>									
Location/Station Name: <u>Cold Lake South</u>		Weather Conditions: <u>Mainly cloudy with clear breaks</u>									
Parameter: <u>Total Reduced Sulphur</u>		Calibration Purpose: <u>Audit</u>									
Start Time 24 hr. (mst): <u>16:07</u>		Performed By/Reviewer: <u>Limin Li Tom Bourque</u>									
End Time 24 hr. (mst): <u>17:50</u>		Cal Gas Expiry Date: <u>January 6, 2018</u>									
Calibration Method: <u>Gas Dilution</u>		Converter Model & s/n (if applicable): <u>Internal</u>									
Analyzer:											
Serial Number: <u>812728560</u>		Range ppb: <u>100</u>									
Last Calibration Date: <u>November 5, 2015</u>		As Found C.F.: <u>0.997</u>									
Previous C.F.: <u>1.000</u>		New C.F.: <u>n/a</u>									
Calibrator:											
Flow Meter ID's: <u>NA</u>		Standard Calibration Points for Ranges									
Make & Model: <u>API700</u>		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:50%;">Point</th> <th style="width:50%;">Total Reduced Sulphur Calibration Points</th> </tr> <tr> <td>High</td> <td style="text-align: center;">78</td> </tr> <tr> <td>Mid</td> <td style="text-align: center;">38</td> </tr> <tr> <td>Low</td> <td style="text-align: center;">19</td> </tr> </table>		Point	Total Reduced Sulphur Calibration Points	High	78	Mid	38	Low	19
Point	Total Reduced Sulphur Calibration Points										
High	78										
Mid	38										
Low	19										
Serial #: <u>627</u>											
Cal Gas Cylinder I.D. #: <u>BLM002508</u>											
Cal Gas Conc. (ppm): <u>10.2</u>											
<i>ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015</i>											
Calibrator Flow Rates (cc/mln)											
Point	Diluent	Cal Gas	Total								
as found zero	7598	0.00	7598								
as found high	7446	57.40	7503								
mid	7473	27.90	7501								
low	7489	14.00	7503								
			Calculated Concentration: (ppb)								
			Indicated Concentration: (ppb)								
			Correction Factors (C.F.):								
			Average C.F.= <u>1.025</u>								
Linear Regression/Calibration Results:											
Correlation Coefficient = <u>1.000</u>		LIMITS > or = 0.995									
Slope = <u>0.993</u>		0.90-1.10									
b (Intercept as % of full scale)= <u>0.55%</u>		± 3% F.S.									
% change in C.F. from last cal= <u>0.35%</u>		± 10%									
Thermo 450i Total Reduced Sulphur Analyzer Audit											
											
As found:		As left:									
BKG:	<u>14.7</u>	BKG:	<u>14.7</u>								
COEF:	<u>1.037</u>	COEF:	<u>1.037</u>								
PMT:	<u>-650.8</u>	PMT:	<u>-650.8</u>								
FLASH:	<u>741</u>	FLASH:	<u>741</u>								
INTERNAL:	<u>32</u>	INTERNAL:	<u>32</u>								
CHAMBER:	<u>44.9</u>	CHAMBER:	<u>44.9</u>								
CONVERTER SET:	<u>810</u>	CONVERTER SET:	<u>810</u>								
PERM OVEN GAS:	<u>44.99</u>	PERM OVEN GAS:	<u>44.99</u>								
PERM OVEN HTR:	<u>44.38</u>	PERM OVEN HTR:	<u>44.38</u>								
PRESSURE:	<u>639.8</u>	PRESSURE:	<u>639.8</u>								
SAMPLE FLOW:	<u>0.499</u>	SAMPLE FLOW:	<u>0.499</u>								
LAMP INTENSITY:	<u>91</u>	LAMP INTENSITY:	<u>91</u>								
Recommendations:											
Calibrator flow rate (tested by Definer) High point: T:7360CCM, G:57.25CCM; Mid point: T:7358CCM, G:27.83. Low point: T:7354CCM, D:14.03CCM.											

01 Minute Averages

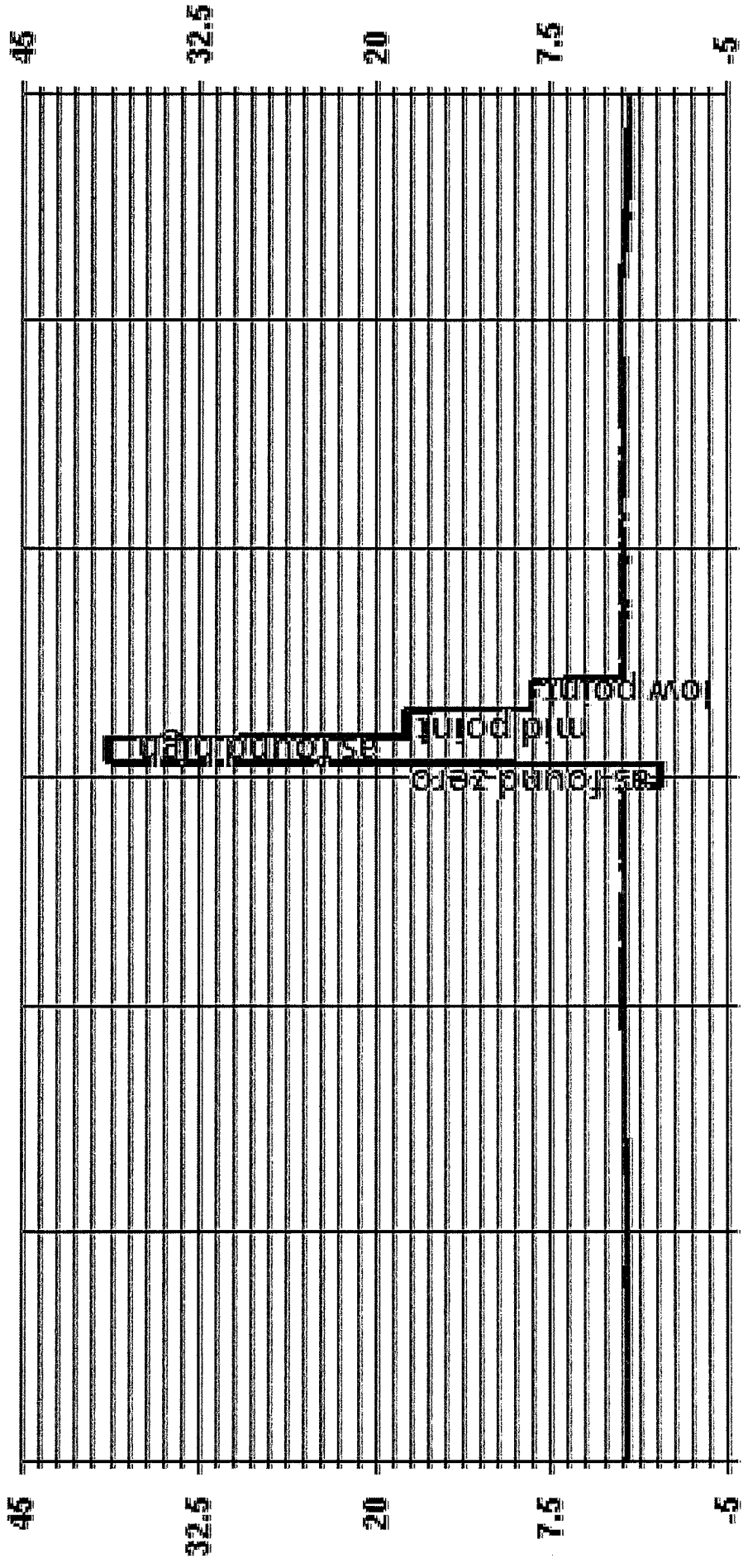


11/17/15 10:00 11/17/15 12:00 11/17/15 14:00 11/17/15 16:00 11/17/15 18:00 11/17/15 20:00


— LICA TRS_ PPB

Maxxam <small>Aerodyne Instrument Company</small>		Thermo 51C Total Hydrocarbon Analyzer Audit																																											
Date: November 17, 2015		Barometric Pressure: 27.34inHg																																											
Company/Alrshed: LICA		Station Temperature °C: 24																																											
Location/Station Name: Cold Lake South		Weather Conditions: Mainly cloudy with clear breaks																																											
Parameter: Total Hydrocarbon		Calibration Purpose: Audit																																											
Start/End Time 24 hr. (mst): 17:55 - 19:30		Performed By/Reviewer: Limin Li Tom Bourque																																											
Calibration Method: Gas Dilution		Cal Gas Expiry Date: July 7, 2022																																											
Analyzer:																																													
Serial Number: 427408718		Range ppm: 50																																											
Last Calibration Date: November 5, 2015		As Found C.F.: 0.970																																											
Previous Cal High Point C.F.: 1.001		New C.F.: n/a																																											
Callibrator:																																													
Flow Meter ID's: na		<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Standard Calibration Points for a Range of 60 ppm</th> </tr> <tr> <th style="text-align: center;">Point</th> <th style="text-align: center;">Target ppm</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">High</td> <td style="text-align: center;">38</td> </tr> <tr> <td style="text-align: center;">Mid</td> <td style="text-align: center;">18</td> </tr> <tr> <td style="text-align: center;">Low</td> <td style="text-align: center;">9</td> </tr> </tbody> </table>		Standard Calibration Points for a Range of 60 ppm		Point	Target ppm	High	38	Mid	18	Low	9																																
Standard Calibration Points for a Range of 60 ppm																																													
Point	Target ppm																																												
High	38																																												
Mid	18																																												
Low	9																																												
Make & Model: API700																																													
Serial #: 627																																													
Cal Gas Cylinder I.D. #: LL83638																																													
CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm): 582.0 203.0																																													
CH ₄ as propane/total CH ₄ equivalents (ppm): 558.3 1140.3																																													
<i>ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015</i>																																													
Callibrator Flow Rates (cc/min)																																													
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Diluent</th> <th>Cal Gas</th> <th>Total</th> <th>Calculated Concentration: (ppm)</th> <th>Indicated Concentration: (ppm)</th> <th>Correction Factors:</th> </tr> </thead> <tbody> <tr> <td>as found zero</td> <td>2000</td> <td>0.00</td> <td>2000</td> <td>0.0</td> <td>-0.30</td> <td>n/a</td> </tr> <tr> <td>as found high</td> <td>2000</td> <td>69.00</td> <td>2069</td> <td>38.03</td> <td>38.90</td> <td>0.970</td> </tr> <tr> <td>mid</td> <td>2000</td> <td>32.00</td> <td>2032</td> <td>17.96</td> <td>17.82</td> <td>0.991</td> </tr> <tr> <td>low</td> <td>2000</td> <td>16.00</td> <td>2016</td> <td>9.05</td> <td>8.76</td> <td>0.999</td> </tr> <tr> <td colspan="6" style="text-align: right;">Average C.F. =</td> <td>0.987</td> </tr> </tbody> </table>				Point	Diluent	Cal Gas	Total	Calculated Concentration: (ppm)	Indicated Concentration: (ppm)	Correction Factors:	as found zero	2000	0.00	2000	0.0	-0.30	n/a	as found high	2000	69.00	2069	38.03	38.90	0.970	mid	2000	32.00	2032	17.96	17.82	0.991	low	2000	16.00	2016	9.05	8.76	0.999	Average C.F. =						0.987
Point	Diluent	Cal Gas	Total	Calculated Concentration: (ppm)	Indicated Concentration: (ppm)	Correction Factors:																																							
as found zero	2000	0.00	2000	0.0	-0.30	n/a																																							
as found high	2000	69.00	2069	38.03	38.90	0.970																																							
mid	2000	32.00	2032	17.96	17.82	0.991																																							
low	2000	16.00	2016	9.05	8.76	0.999																																							
Average C.F. =						0.987																																							
Linear Regression/Calibration Results:																																													
Correlation Coefficient = 1.000		LIMITS > or = 0.995																																											
Slope = 0.968		.95-1.05																																											
b (Intercept as % of full scale) = 0.96%		± 3% F.S.																																											
% change in C.F. from last cal = 3.09%		± 10%																																											
Thermo 51C Total Hydrocarbon Analyzer Audit																																													
As found:		As left:																																											
H2 cylinder (psi):	500	H2 cylinder (psi):	1300																																										
H2 cylinder reg set (psi):	22	H2 cylinder reg set (psi):	25																																										
Span Cylinder (psi):	160	Span Cylinder (psi):	500																																										
Span Cylinder Reg Set (psi):	25	Span Cylinder Reg Set (psi):	25																																										
Zero Air Gen Pressure:	33	Zero Air Gen Pressure:	35																																										
measurement alarms:	NONE	measurement alarms:	NONE																																										
service alarms:	NONE	service alarms:	NONE																																										
cnt:	2300	cnt:	812																																										
rng:	1	rng:	1																																										
try:	0	try:	0																																										
flm:	180.5	flm:	178.8																																										
det:	125.6	det:	125																																										
Flame:	180	Flame:	178																																										
Filter:	125	Filter:	125																																										
Base:	125	Base:	125																																										
Sample psi:	6.5	Sample psi:	7.51																																										
Internal Air Pressure:	20	Internal Air Pressure:	21																																										
Internal Fuel Pressure:	14	Internal Fuel Pressure:	10																																										
Intenal Pressure Gauge psi:	27	Intenal Pressure Gauge psi:	27																																										
Comments:																																													

01 Minute Averages

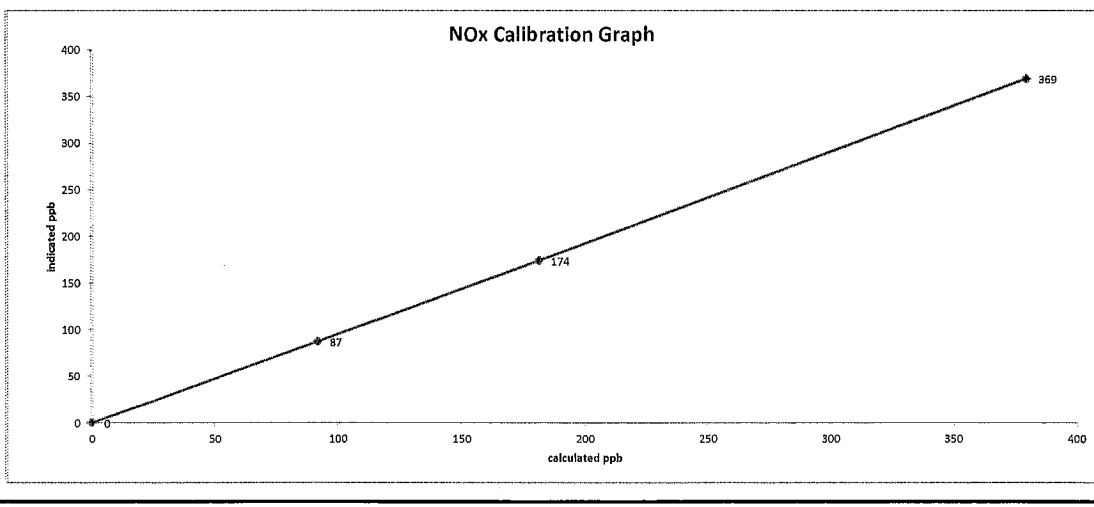
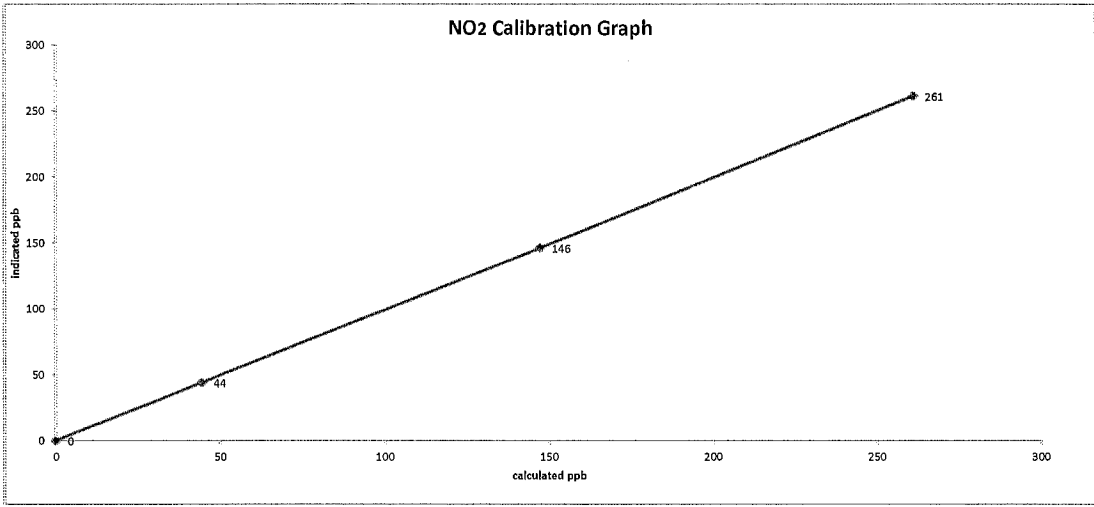
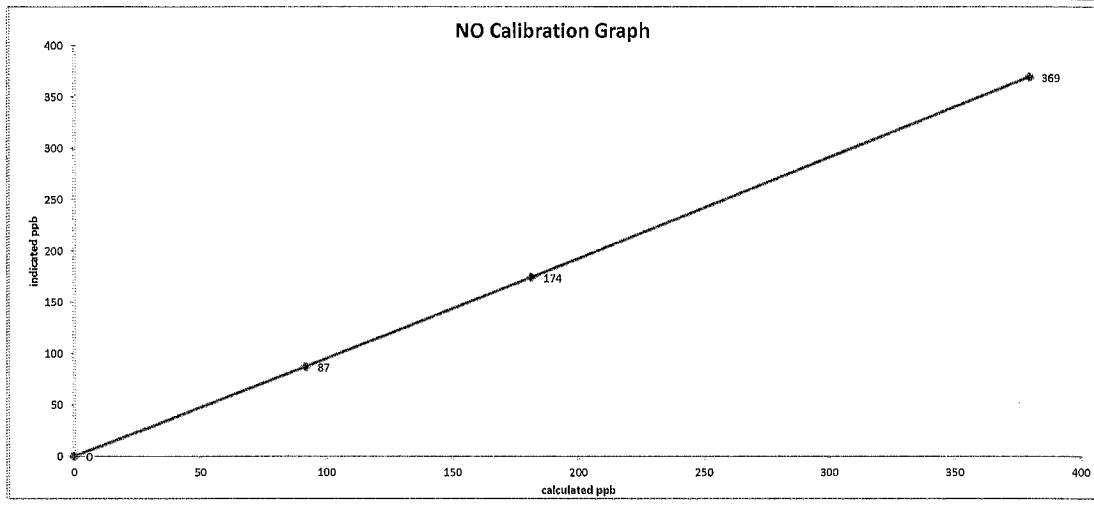


— LICA — THC — PPM

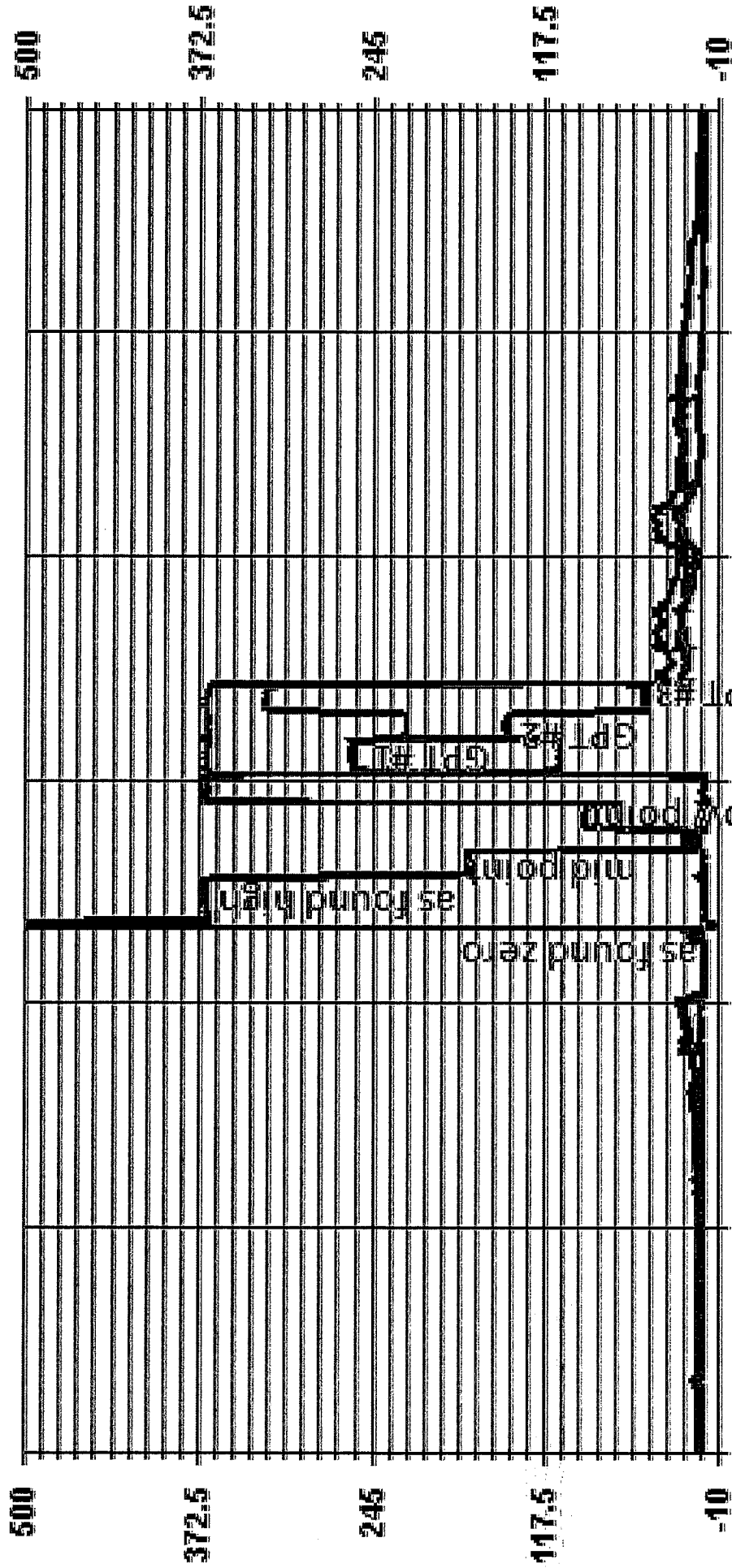
 Thermo 42C Analyzer Audit																																																																			
Date: <u>November 17, 2015</u> Company/Airshed: <u>LICA</u> Location/Station Name: <u>Cold Lake South</u> Start/End Time 24 hr. (mst): <u>16:07 18:52</u> G.P.T. to be used for Ozone? <u>Yes with 500 ppb NOx full scale</u> Calibration Method: <u>Gas Dilution & Gas Phase Titration</u>	Barometric Pressure: <u>27.34 in. Hg</u> Station Temperature °C: <u>24</u> Weather Conditions: <u>Mainly cloudy with clear breaks</u> Calibration Purpose: <u>Audit</u> Performed By/Reviewer: <u>Limin Li Tom Bourque</u> Cal Gas Expiry Date: <u>December 25, 2018</u>																																																																		
Analyzer: Serial Number: <u>427408716</u> Last Calibration Date: <u>November 5, 2015</u> Range ppb: <u>500</u>	Correction Factors: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>0.999</td> <td>1.030</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.001</td> <td>n/a</td> </tr> <tr> <td>NO_x =</td> <td>0.999</td> <td>1.030</td> <td>n/a</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	0.999	1.030	n/a	NO ₂ =	1.000	1.001	n/a	NO _x =	0.999	1.030	n/a																																																		
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Calibrator: Flow Meter ID's: <u>NA</u> Make & Model: <u>SABIO 2010</u> Serial #: <u>17200415</u> Cal Gas Cylinder I.D. #: <u>BLM002756T</u> NO/NO _x Gas Conc. (ppm): <u>50.7 50.7</u>	Standard Calibration Points for a Range of: <u>500 ppb</u> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>380</td> <td>330</td> <td><--high ozone</td> </tr> <tr> <td>Mid</td> <td>180</td> <td>245</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>90</td> <td>175</td> <td><--mid ozone</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>133</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>53</td> <td><--low ozone</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	380	330	<--high ozone	Mid	180	245	n/a	Low	90	175	<--mid ozone	Extra Point #1	n/a	133	n/a	Extra Point #2	n/a	53	<--low ozone																																										
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Date: November 17, 2015
Company/Alrshed: LICA
Location/Station Name: Cold Lake South


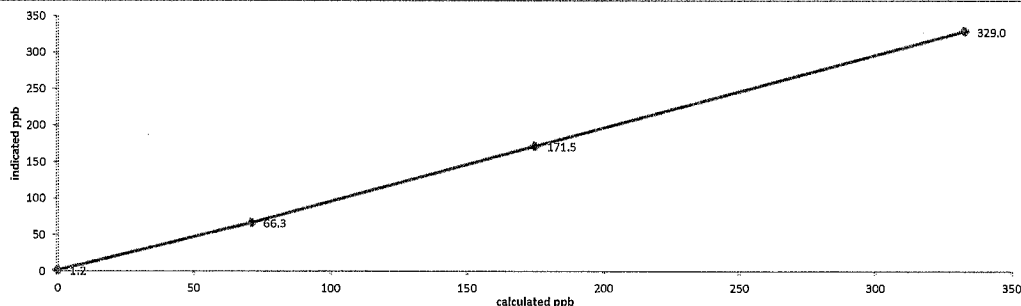
Start/End Time 24 hr. (mst): 16:07/18:52
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration



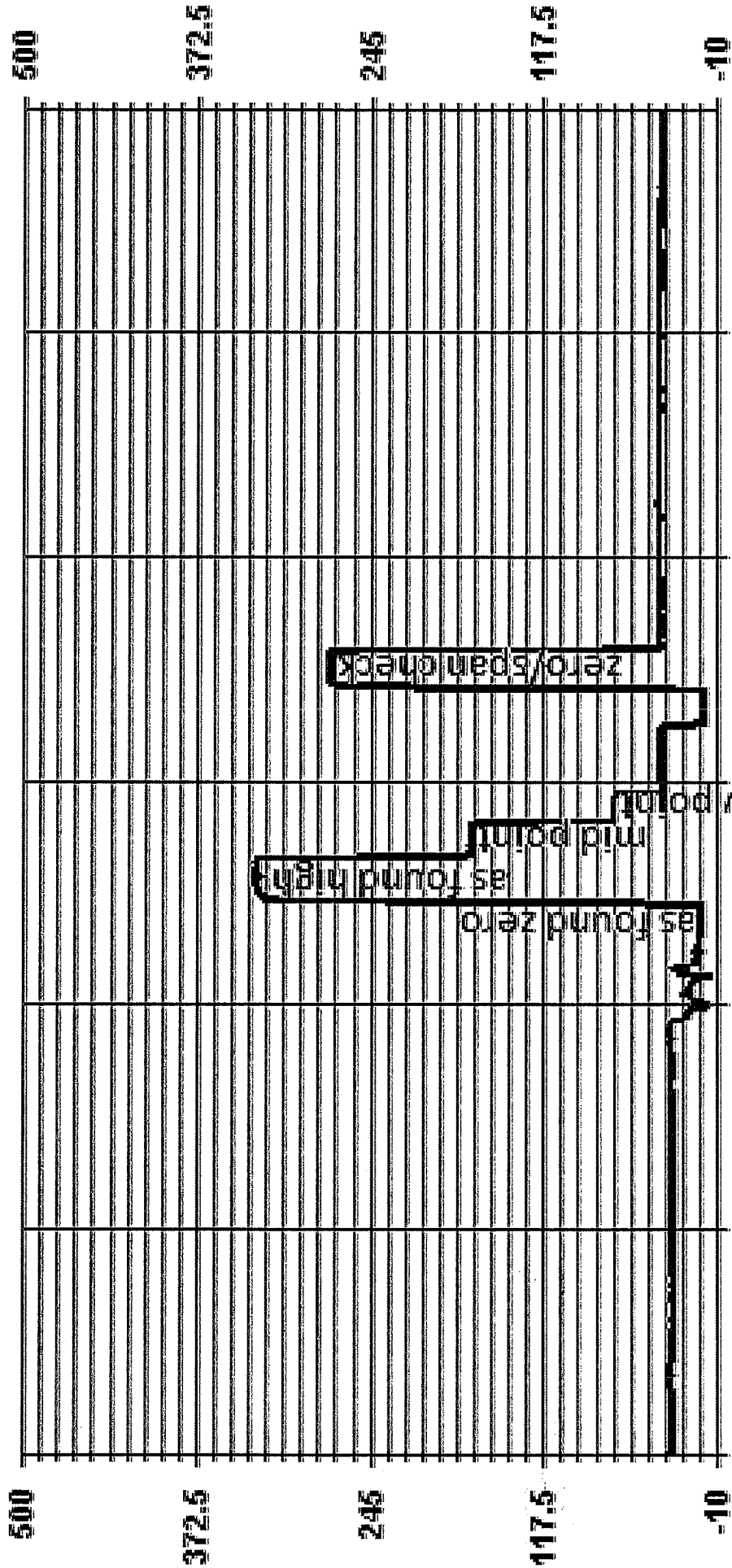
01 Minute Averages



— LICA NOX_ PPB — LICA NO_ PPB — LICA NO2_ PPB

 Thermo 49i Ozone Analyzer Audit																																											
Date: November 18, 2015 Company/Airshed: LICA Location/Station Name: Cold Lake South Start/End Time 24 hr. (mst): 9:52 - 11:55 Ozone Calibration Method: Direct G.P.T. G.P.T. Date: November 18, 2015	Barometric Pressure: 27.74inHg Station Temperature °C: 23 Weather Conditions: Mainly cloudy with clear breaks Calibration Purpose: Audit Performed By/Reviewer: Lmin Li Tom Bourque Cal Gas Expiry Date: December 25, 2018																																										
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<table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> As found: O3 Bkg: 0.4 O3 Coef: 1.011 Photo Lamp: 8.7 O3 Lamp: 9 Bench: 29.6 Bench Lamp: 53.5 O3 Lamp: 67.4 Pressure: 357.6 Cell A lpm: 0.424 Cell B lpm: 0.449 O3 ppb: 0.1 Cell A ppb: 11 Cell B ppb: -10.9 Cell A int: 57795 Cell B int: 56427 </td> <td style="width:50%; vertical-align: top;"> As left: O3 Bkg: 0.4 O3 Coef: 1.011 Photo Lamp: 8.7 O3 Lamp: 9 Bench: 29.6 Bench Lamp: 53.5 O3 Lamp: 67.4 Pressure: 700.5 Cell A lpm: 0.713 Cell B lpm: 0.751 O3 ppb: 0.1 Cell A ppb: 11 Cell B ppb: -10.9 Cell A int: 57795 Cell B int: 56427 </td> </tr> </table>		As found: O3 Bkg: 0.4 O3 Coef: 1.011 Photo Lamp: 8.7 O3 Lamp: 9 Bench: 29.6 Bench Lamp: 53.5 O3 Lamp: 67.4 Pressure: 357.6 Cell A lpm: 0.424 Cell B lpm: 0.449 O3 ppb: 0.1 Cell A ppb: 11 Cell B ppb: -10.9 Cell A int: 57795 Cell B int: 56427	As left: O3 Bkg: 0.4 O3 Coef: 1.011 Photo Lamp: 8.7 O3 Lamp: 9 Bench: 29.6 Bench Lamp: 53.5 O3 Lamp: 67.4 Pressure: 700.5 Cell A lpm: 0.713 Cell B lpm: 0.751 O3 ppb: 0.1 Cell A ppb: 11 Cell B ppb: -10.9 Cell A int: 57795 Cell B int: 56427																																								
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Comments: <p style="text-align: center;">PHOTO LAMP:8.7V, O3 LAMP:9.0V. Found that the sample filter was plugged, so the flow rate was low. Changed the sample filter, all ok.</p>																																											

01 Minute Averages



— LICA 03_ PPB

R & P 1405F TEOM PM 2.5 Analyzer Audit

Date: <u>November 18, 2015</u> Company: <u>LICA</u> Station Name/Location: <u>Cold Lake South</u> Previous Audit Date: <u>November 3, 2015</u> Parameter: <u>PM 2.5</u>	Performed By/Reviewer: <u>Limin Li Tom Bourque</u> Start Time (mst): <u>11:30</u> End Time (mst): <u>12:02</u> Calibration Purpose: <u>Audit</u> Weather Conditions: <u>Mainly cloudy with snow</u>
--	--

1400A Information and Status:

Serial Number: <u>1405A201620804</u>	As Found Filter Loading %: <u>25.00</u>
Ko Factor: <u>14578</u>	As Left Filter Loading %: <u>27.12</u>
Ambient Temperature °C: <u>-8.2</u>	As Found Noise: <u>0.006</u>
Ambient Pressure atm: <u>0.929</u>	As Left Noise: <u>NA</u>
Main Flow Reading lpm: <u>3.00</u>	Pump Vacuum: <u>0.33</u>
Aux Flow Reading lpm: <u>16.67</u>	Warnings: <u>none</u>

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>BRUNTON</u>	<u>Fluke</u>
Model:	<u>475 Mark III</u>	<u>n/a</u>	<u>1551A EX</u>
Serial Number:	<u>1868</u>	<u>n/a</u>	<u>2329070</u>
Calibration Date:	<u>n/a</u>	<u>2-Nov-15</u>	<u>2-Nov-15</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.03	0.15	0.02	0.15
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.06	-0.09	0.04	-0.09
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C 1405F temperature °C: <u>-7.1</u> reference temperature °C: <u>-8.2</u> difference °C: <u>-1.1</u>	tolerance +/- 0.01 atm 1405F pressure atm: <u>0.935</u> reference pressure: <u>0.929</u> difference : <u>0.006</u>
---	---

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm 1405F main flow lpm: <u>n/a</u> reference main flow lpm: <u>n/a</u> difference lpm: <u>n/a</u>	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7% 1400A total/aux flow lpm: <u>16.65</u> reference total/aux flow lpm: <u>17.28</u> difference lpm: <u>0.63</u>
---	---

K_o Audit:

Last K_o audit date: n/a
1405F K_o factor: 14578
Measured K_o factor: n/a
% difference: n/a

Comments:

PARTISOL 2000 Audit							
Date:	November 18, 2015	Reference Standard s/n:	475 Mark III/SN:1868				
Company:	LICA	Weather Conditions:	Cloudy				
Station:	Cold Lake South	Start Time (mst):	10:50				
Parameter:	PM 2.5	End Time (mst):	11:20				
Reference Standard:	Audit	Performed By/Reviewer:	Limin Li	Tom Bourque			
Sampler		Instrument Data					
Make/Model:	R & P	Temperature (°C)	-8.2				
Unit #	#1517	Pressure (ATM)	0.929				
S/N:	2000A204009710	Set Flow (l/min)	16.7				
Temperature/Pressure Calibration							
Reference Temperature: (±2 °C)	-9.9	Δ °C	-1.7				
Reference Pressure: (±0.02 ATM)	0.928	Δ ATM	-0.001				
Leak Check							
Unit	Flow Controller Valve Closed (V1) In Hg	Pump Valve Closed after 10 Secs. (V2) In Hg	VL=1/2*V1 in Hg	Leakage Calculation (V2 > VL) After 10 Secs in Hg			
Hub	17.0	17.0	8.5	8.5			
Flow Audit							
Partisol Flow:\	16.6	% Difference:	4.0				
Reference Flow:	17.3						
Other Checks:							
Rubber Seals:	Condition ok	Inlet:	Condition ok	Inline Filter:	Condition ok	Status:	Condition ok
Recommendations:							

APPENDIX IV
ANALYTICAL RESULTS

PASSIVE SAMPLES

Your Project #: 2015/09/29 - 2015/11/30

Site Location: LICA

Attention: MICHAEL BISAGA

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
PO BOX 8237
5107W- 50TH STREET
BONNYVILLE, AB
CANADA T9N 2J5

Report Date: 2015/12/14

Report #: R2096218

Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5A8522

Received: 2015/12/07, 10:36

Sample Matrix: Air
Samples Received: 33

Analyses	Quantity	Date		Laboratory Method	Analytical Method
		Extracted	Analyzed		
H2S Passive Analysis (1)	24	2015/12/14	2015/12/14	PTC SOP-00150	Tang, Passive H2S in
NO2 Passive Analysis (1)	17	2015/12/11	2015/12/14	PTC SOP-00148	Passive NO2 in ATM
NO2 Passive Analysis (1)	8	2015/12/12	2015/12/14	PTC SOP-00148	Passive NO2 in ATM
O3 Passive Analysis (1)	25	2015/12/11	2015/12/14	PTC SOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	22	2015/12/09	2015/12/14	PTC SOP-00149	Tang Passive SO2 in

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key **Levi Manchak**
Levi Manchak
15 Dec 2015 08:22:27 -07:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Levi Manchak, Customer Service

Email: LManchak@maxxam.ca

Phone# (780) 378-8500

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B5A8522
Report Date: 2015/12/14

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2015/09/29 - 2015/11/30
Site Location: LICA
Sampler Initials: WA

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		NU1839	NU1840	NU1841	NU1842	NU1843	NU1844	NU1845		
Sampling Date		2015/09/29 15:03	2015/09/29 10:24	2015/09/30 11:12	2015/09/30 12:50	2015/09/30 09:20	2015/09/29 17:10	2015/09/29 14:00		
	UNITS	3	4	5	6	8	9	10	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	0.11		0.44				0.10	0.02	8143558
Calculated NO2	ppb	2.0	1.8	1.4	7.1	1.6	3.1	5.5	0.1	8140963
Calculated O3	ppb	21.06	25.89	20.53	17.84	26.33	21.49	17.30	0.1	8141537
Calculated SO2	ppb	0.3	0.3	0.4	0.2	0.3	0.2	0.1	0.1	8138643
RDL = Reportable Detection Limit										

Maxxam ID		NU1846	NU1847	NU1848	NU1849	NU1850	NU1851	NU1852		
Sampling Date		2015/09/29 13:06		2015/09/29 11:17	2015/09/29 10:12	2015/09/29 17:49	2015/09/30 16:36	2015/09/30 13:56		
	UNITS	11	12	13	14	15	16	17	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	0.06	MISSING	0.10	0.15		0.12	0.17	0.02	8143558
Calculated NO2	ppb	0.8	MISSING	0.9	2.2	2.1	3.4	3.2	0.1	8140963
Calculated O3	ppb	17.58	MISSING	22.15	24.83	19.91	22.63	20.63	0.1	8141537
Calculated SO2	ppb	0.1	MISSING	0.2	1.0	0.2			0.1	8138643
RDL = Reportable Detection Limit										

Maxxam ID		NU1853	NU1854	NU1855		NU1856	NU1857	NU1858		
Sampling Date		2015/09/30 15:31	2015/09/30 17:14	2015/09/29 18:37		2015/09/29 08:34	2015/09/30 12:14			
	UNITS	18	19	22	QC Batch	23	24	25	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	0.10	0.13	0.11	8143558		0.11	MISSING	0.02	8143558
Calculated NO2	ppb	2.1	1.6	2.4	8140963	0.7	5.3		0.1	8142426
Calculated O3	ppb	18.15	24.64	18.72	8141537	18.96	17.62		0.1	8141551
Calculated SO2	ppb			0.1	8138643	0.1	0.3	MISSING	0.1	8138643
RDL = Reportable Detection Limit										

Maxxam ID		NU1859	NU1860	NU1861	NU1862	NU1863	NU1864	NU1867		
Sampling Date		2015/09/29 10:42	2015/09/29 09:49	2015/09/29 16:48	2015/09/29 18:37	2015/09/29 15:44	2015/09/30 12:02	2015/09/29 10:12		
	UNITS	26	27	28	29	32	36	14 DUP	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	0.13	0.75		0.11	0.11	0.13		0.02	8143558
Calculated NO2	ppb			4.4	1.8	1.1	5.5	2.4	0.1	8142426
Calculated O3	ppb			17.68	18.95	24.44	18.63	20.98	0.1	8141551
Calculated SO2	ppb	0.4	1.4	0.3	0.1	0.4	0.1		0.1	8138643
RDL = Reportable Detection Limit										

Maxxam Job #: B5A8522
Report Date: 2015/12/14

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2015/09/29 - 2015/11/30
Site Location: LICA
Sampler Initials: WA

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		NU1868	NU1869	NU1871	NU1872	NU1923	NU1924		
Sampling Date		2015/09/29 17:49	2015/09/30 16:36	2015/09/30 13:56	2015/09/30 15:31	2015/09/29 18:37	2015/09/30 12:14		
	UNITS	15 DUP	16 DUP	17 DUP	18 DUP	22 DUP	24 DUP	RDL	QC Batch
Passive Monitoring									
Calculated H2S	ppb		0.09	0.16	0.09	0.10	0.11	0.02	8143558
Calculated NO2	ppb	1.9						0.1	8142426
Calculated O3	ppb	19.24						0.1	8141551
RDL = Reportable Detection Limit									

Maxxam Job #: B5A8522
Report Date: 2015/12/14

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2015/09/29 - 2015/11/30
Site Location: LICA
Sampler Initials: WA

GENERAL COMMENTS

Sample NU1847-01 : No Access to Site.

Sample NU1858-01 : No Access to Site.

Results relate only to the items tested.

Maxxam Job #: B5A8522
Report Date: 2015/12/14

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2015/09/29 - 2015/11/30
Site Location: LICA
Sampler Initials: WA

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8138643	YL6	Spiked Blank	Calculated SO2	2015/12/09		99	%	90 - 110
8138643	YL6	Method Blank	Calculated SO2	2015/12/09	<0.1		ppb	
8140963	SS6	Spiked Blank	Calculated NO2	2015/12/11		99	%	90 - 110
8140963	SS6	Method Blank	Calculated NO2	2015/12/11	<0.1		ppb	
8141537	OZ	Spiked Blank	Calculated O3	2015/12/11		98.4	%	90 - 110
8141537	OZ	Method Blank	Calculated O3	2015/12/11	<0.1		ppb	
8141551	OZ	Spiked Blank	Calculated O3	2015/12/11		101.2	%	90 - 110
8141551	OZ	Method Blank	Calculated O3	2015/12/11	<0.1		ppb	
8142426	SS6	Spiked Blank	Calculated NO2	2015/12/12		99	%	90 - 110
8142426	SS6	Method Blank	Calculated NO2	2015/12/12	<0.1		ppb	
8143558	LCH	Spiked Blank	Calculated H2S	2015/12/14		100	%	N/A

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

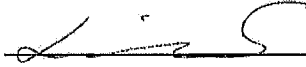
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Maxxam Job #: B5A8522
Report Date: 2015/12/14

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2015/09/29 - 2015/11/30
Site Location: LICA
Sampler Initials: WA

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Linda Lin, Supervisor, Centre for Passive Sampling Technology

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

VOCS SAMPLES



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Nov 2, 2015	1530	Ambient Air	02-Nov-15 0:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	15110054	REPORT CREATED:	05-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110054-001	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-001	1,1,2,2-Tetrachloroethane	I	0.04 ppbv	0.02	AC-058	17-Nov-15
15110054-001	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-001	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-001	1,1-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110054-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	17-Nov-15
15110054-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8 ppbv	0.8	AC-058	17-Nov-15
15110054-001	1,2,4-Trimethylbenzene	I	0.05 ppbv	0.03	AC-058	17-Nov-15
15110054-001	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-001	1,2-Dichlorobenzene	I	0.05 ppbv	0.03	AC-058	17-Nov-15
15110054-001	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	17-Nov-15
15110054-001	1,2-Dichloropropane	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-001	1,3,5-Trimethylbenzene	I	0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-001	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-001	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	17-Nov-15
15110054-001	1,4-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110054-001	1,4-Dioxane		0.9 ppbv	0.4	AC-058	17-Nov-15
15110054-001	1-Butene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-001	1-Hexene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-001	1-Pentene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-001	2,2,4-Trimethylpentane	I	0.03 ppbv	0.01	AC-058	17-Nov-15
15110054-001	2,2-Dimethylbutane	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-001	2,3,4-Trimethylpentane	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-001	2,3-Dimethylbutane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-001	2,3-Dimethylpentane	I	0.02 ppbv	0.02	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: January 5, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:	Analysis Date		
LJCA/VOC/CLS/Nov 2, 2015	1530	Ambient Air	02-Nov-15 0:00	Version 01			
DESCRIPTION:	Cold Lake South						
REPORT NUMBER:	15110054	REPORT CREATED:	05-Jan-16				
Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110054-001	2,4-Dimethylpentane	I	0.02	ppbv	0.01	AC-058	17-Nov-15
15110054-001	2-Methylheptane	I	0.01	ppbv	0.01	AC-058	17-Nov-15
15110054-001	2-Methylhexane	I	0.03	ppbv	0.01	AC-058	17-Nov-15
15110054-001	2-Methylpentane	I	0.08	ppbv	0.01	AC-058	17-Nov-15
15110054-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110054-001	3-Methylhexane	I	0.04	ppbv	0.02	AC-058	17-Nov-15
15110054-001	3-Methylpentane	I	0.04	ppbv	0.01	AC-058	17-Nov-15
15110054-001	Acetone		1.5	ppbv	0.4	AC-058	17-Nov-15
15110054-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	17-Nov-15
15110054-001	Benzene	I	0.13	ppbv	0.01	AC-058	17-Nov-15
15110054-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	17-Nov-15
15110054-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110054-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110054-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Nov-15
15110054-001	Carbon disulfide		0.91	ppbv	0.01	AC-058	17-Nov-15
15110054-001	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	17-Nov-15
15110054-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110054-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110054-001	Chloroform	I	0.02	ppbv	0.02	AC-058	17-Nov-15
15110054-001	Chloromethane		0.52	ppbv	0.02	AC-058	17-Nov-15
15110054-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Nov-15
15110054-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	17-Nov-15
15110054-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110054-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110054-001	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead
Date: January 5, 2016

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Inquiries: (780) 632 8455
E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Nov 2, 2015	1530	Ambient Air	02-Nov-15 0:00	Version 01		
DESCRIPTION:		Cold Lake South				
REPORT NUMBER:	15110054	REPORT CREATED:	05-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110054-001	Cyclopentane	I	0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-001	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-001	Ethanol		2.1 ppbv	0.3	AC-058	17-Nov-15
15110054-001	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110054-001	Ethylbenzene	I	0.04 ppbv	0.01	AC-058	17-Nov-15
15110054-001	Freon-11	I	0.28 ppbv	0.02	AC-058	17-Nov-15
15110054-001	Freon-113	I	0.08 ppbv	0.01	AC-058	17-Nov-15
15110054-001	Freon-114	I	0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-001	Freon-12		0.58 ppbv	0.02	AC-058	17-Nov-15
15110054-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50 ppbv	0.50	AC-058	17-Nov-15
15110054-001	Isobutane	I	0.21 ppbv	0.02	AC-058	17-Nov-15
15110054-001	Isopentane	I	0.28 ppbv	0.03	AC-058	17-Nov-15
15110054-001	Isoprene	I	0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-001	Isopropyl alcohol		0.5 ppbv	0.4	AC-058	17-Nov-15
15110054-001	Isopropylbenzene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-001	m,p-Xylene	I	0.11 ppbv	0.03	AC-058	17-Nov-15
15110054-001	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110054-001	m-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	17-Nov-15
15110054-001	Methyl butyl ketone		1.40 ppbv	0.50	AC-058	17-Nov-15
15110054-001	Methyl ethyl ketone		0.5 ppbv	0.3	AC-058	17-Nov-15
15110054-001	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110054-001	Methyl methacrylate	K, T, U	< 0.07 ppbv	0.07	AC-058	17-Nov-15
15110054-001	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	17-Nov-15
15110054-001	Methylcyclohexane	I	0.03 ppbv	0.01	AC-058	17-Nov-15
15110054-001	Methylcyclopentane	I	0.04 ppbv	0.02	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead

Date: January 5, 2016

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Nov 2, 2015	1530	Ambient Air	02-Nov-15 0:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	15110054	REPORT CREATED:	05-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110054-001	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	17-Nov-15
15110054-001	n-Butane		0.55 ppbv	0.03	AC-058	17-Nov-15
15110054-001	n-Decane	K, T, U	< 0.06 ppbv	0.06	AC-058	17-Nov-15
15110054-001	n-Dodecane	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110054-001	n-Heptane	I	0.04 ppbv	0.01	AC-058	17-Nov-15
15110054-001	n-Hexane	I	0.05 ppbv	0.01	AC-058	17-Nov-15
15110054-001	n-Octane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-001	n-Pentane	K, T, U	< 0.1 ppbv	0.1	AC-058	17-Nov-15
15110054-001	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	17-Nov-15
15110054-001	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	17-Nov-15
15110054-001	Naphthalene		3.8 ppbv	0.5	AC-058	17-Nov-15
15110054-001	n-Nonane	I	0.02 ppbv	0.01	AC-058	17-Nov-15
15110054-001	o-Ethyltoluene	I	0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-001	o-Xylene	I	0.04 ppbv	0.01	AC-058	17-Nov-15
15110054-001	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110054-001	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	17-Nov-15
15110054-001	Styrene	I	0.07 ppbv	0.04	AC-058	17-Nov-15
15110054-001	Tetrachloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110054-001	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110054-001	Toluene	I	0.15 ppbv	0.01	AC-058	17-Nov-15
15110054-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110054-001	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-001	trans-2-Pentene	I	0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-001	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15

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ENVIRONMENTAL ANALYTICAL SERVICES

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Nov 2, 2015	1530	Ambient Air	02-Nov-15 0:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	15110054					
REPORT CREATED:	05-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110054-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110054-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Nov 8, 2015	S5677	Ambient Air	08-Nov-15 0:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	15110089	REPORT CREATED:	05-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110089-001	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-001	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-001	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-001	1,1-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110089-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	17-Nov-15
15110089-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8 ppbv	0.8	AC-058	17-Nov-15
15110089-001	1,2,4-Trimethylbenzene	I	0.07 ppbv	0.03	AC-058	17-Nov-15
15110089-001	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-001	1,2-Dichlorobenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	17-Nov-15
15110089-001	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	17-Nov-15
15110089-001	1,2-Dichloropropane	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110089-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-001	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-001	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	17-Nov-15
15110089-001	1,4-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110089-001	1,4-Dioxane	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110089-001	1-Butene	I	0.07 ppbv	0.02	AC-058	17-Nov-15
15110089-001	1-Hexene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-001	1-Pentene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110089-001	2,2,4-Trimethylpentane	I	0.05 ppbv	0.01	AC-058	17-Nov-15
15110089-001	2,2-Dimethylbutane	I	0.02 ppbv	0.01	AC-058	17-Nov-15
15110089-001	2,3,4-Trimethylpentane	I	0.01 ppbv	0.01	AC-058	17-Nov-15
15110089-001	2,3-Dimethylbutane	I	0.08 ppbv	0.02	AC-058	17-Nov-15
15110089-001	2,3-Dimethylpentane	I	0.05 ppbv	0.02	AC-058	17-Nov-15

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:			
LICA/VOC/CLS/Nov 8, 2015	S5677	Ambient Air	08-Nov-15 0:00	Version 01			
DESCRIPTION: Cold Lake South							
REPORT NUMBER: 15110089	REPORT CREATED: 05-Jan-16						
Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110089-001	2,4-Dimethylpentane	I	0.04	ppbv	0.01	AC-058	17-Nov-15
15110089-001	2-Methylheptane	I	0.02	ppbv	0.01	AC-058	17-Nov-15
15110089-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Nov-15
15110089-001	2-Methylpentane	I	0.13	ppbv	0.01	AC-058	17-Nov-15
15110089-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110089-001	3-Methylhexane	I	0.07	ppbv	0.02	AC-058	17-Nov-15
15110089-001	3-Methylpentane	I	0.09	ppbv	0.01	AC-058	17-Nov-15
15110089-001	Acetone		2.4	ppbv	0.4	AC-058	17-Nov-15
15110089-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	17-Nov-15
15110089-001	Benzene	I	0.22	ppbv	0.01	AC-058	17-Nov-15
15110089-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	17-Nov-15
15110089-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110089-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110089-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Nov-15
15110089-001	Carbon disulfide	I	0.02	ppbv	0.01	AC-058	17-Nov-15
15110089-001	Carbon tetrachloride	I	0.10	ppbv	0.01	AC-058	17-Nov-15
15110089-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110089-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110089-001	Chloroform	I	0.03	ppbv	0.02	AC-058	17-Nov-15
15110089-001	Chloromethane		0.57	ppbv	0.02	AC-058	17-Nov-15
15110089-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Nov-15
15110089-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	17-Nov-15
15110089-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110089-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110089-001	Cyclohexane	I	0.15	ppbv	0.02	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Nov 8, 2015	S5677	Ambient Air	08-Nov-15 0:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	15110089	REPORT CREATED:	05-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110089-001	Cyclopentane	I	0.04 ppbv	0.01	AC-058	17-Nov-15
15110089-001	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110089-001	Ethanol		1.1 ppbv	0.3	AC-058	17-Nov-15
15110089-001	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110089-001	Ethylbenzene	I	0.04 ppbv	0.01	AC-058	17-Nov-15
15110089-001	Freon-11	I	0.29 ppbv	0.02	AC-058	17-Nov-15
15110089-001	Freon-113	I	0.07 ppbv	0.01	AC-058	17-Nov-15
15110089-001	Freon-114	I	0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-001	Freon-12		0.59 ppbv	0.02	AC-058	17-Nov-15
15110089-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50 ppbv	0.50	AC-058	17-Nov-15
15110089-001	Isobutane		0.51 ppbv	0.02	AC-058	17-Nov-15
15110089-001	Isopentane		0.51 ppbv	0.03	AC-058	17-Nov-15
15110089-001	Isoprene	I	0.02 ppbv	0.01	AC-058	17-Nov-15
15110089-001	Isopropyl alcohol		0.6 ppbv	0.4	AC-058	17-Nov-15
15110089-001	Isopropylbenzene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110089-001	m,p-Xylene	I	0.15 ppbv	0.03	AC-058	17-Nov-15
15110089-001	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110089-001	m-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	17-Nov-15
15110089-001	Methyl butyl ketone	K, T, U	< 0.50 ppbv	0.50	AC-058	17-Nov-15
15110089-001	Methyl ethyl ketone	K, T, U	< 0.3 ppbv	0.3	AC-058	17-Nov-15
15110089-001	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110089-001	Methyl methacrylate	K, T, U	< 0.07 ppbv	0.07	AC-058	17-Nov-15
15110089-001	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	17-Nov-15
15110089-001	Methylcyclohexane	I	0.18 ppbv	0.01	AC-058	17-Nov-15
15110089-001	Methylcyclopentane	I	0.14 ppbv	0.02	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Nov 8, 2015	S5677	Ambient Air	08-Nov-15 0:00	Version 01		
DESCRIPTION:		Cold Lake South				
REPORT NUMBER:	15110089	REPORT CREATED:	05-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110089-001	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	17-Nov-15
15110089-001	n-Butane		0.99 ppbv	0.03	AC-058	17-Nov-15
15110089-001	n-Decane	K, T, U	< 0.06 ppbv	0.06	AC-058	17-Nov-15
15110089-001	n-Dodecane		3.8 ppbv	0.4	AC-058	17-Nov-15
15110089-001	n-Heptane	I	0.07 ppbv	0.01	AC-058	17-Nov-15
15110089-001	n-Hexane	I	0.21 ppbv	0.01	AC-058	17-Nov-15
15110089-001	n-Octane	I	0.03 ppbv	0.02	AC-058	17-Nov-15
15110089-001	n-Pentane	K, T, U	< 0.1 ppbv	0.1	AC-058	17-Nov-15
15110089-001	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	17-Nov-15
15110089-001	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	17-Nov-15
15110089-001	Naphthalene		1.6 ppbv	0.5	AC-058	17-Nov-15
15110089-001	n-Nonane	I	0.04 ppbv	0.01	AC-058	17-Nov-15
15110089-001	o-Ethyltoluene	I	0.02 ppbv	0.01	AC-058	17-Nov-15
15110089-001	o-Xylene	I	0.05 ppbv	0.01	AC-058	17-Nov-15
15110089-001	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110089-001	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	17-Nov-15
15110089-001	Styrene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110089-001	Tetrachloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110089-001	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110089-001	Toluene		0.44 ppbv	0.01	AC-058	17-Nov-15
15110089-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110089-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110089-001	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110089-001	trans-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-001	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID LICA/VOC/CLS/Nov 8, 2015	CANISTER ID S5677	Matrix Ambient Air	DATE SAMPLED 08-Nov-15 0:00			
DESCRIPTION: Cold Lake South		REPORT CREATED: 05-Jan-16	VERSION: Version 01			
REPORT NUMBER: 15110089						
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110089-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110089-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead

Date: January 5, 2016

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Nov 14, 2014	2643	Ambient Air	14-Nov-15 0:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	15110105	REPORT CREATED:	05-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110105-003	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-003	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-003	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-003	1,1-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110105-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	17-Nov-15
15110105-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8 ppbv	0.8	AC-058	17-Nov-15
15110105-003	1,2,4-Trimethylbenzene	I	0.05 ppbv	0.03	AC-058	17-Nov-15
15110105-003	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-003	1,2-Dichlorobenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	17-Nov-15
15110105-003	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	17-Nov-15
15110105-003	1,2-Dichloropropane	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-003	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-003	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	17-Nov-15
15110105-003	1,4-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110105-003	1,4-Dioxane	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110105-003	1-Butene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-003	1-Hexene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-003	1-Pentene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-003	2,2,4-Trimethylpentane	I	0.11 ppbv	0.01	AC-058	17-Nov-15
15110105-003	2,2-Dimethylbutane	I	0.04 ppbv	0.01	AC-058	17-Nov-15
15110105-003	2,3,4-Trimethylpentane	I	0.03 ppbv	0.01	AC-058	17-Nov-15
15110105-003	2,3-Dimethylbutane	I	0.09 ppbv	0.02	AC-058	17-Nov-15
15110105-003	2,3-Dimethylpentane	I	0.08 ppbv	0.02	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: January 5, 2016

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:			
LICA/VOC/CLS/Nov 14, 2014	2643	Ambient Air	14-Nov-15 0:00	Version 01			
DESCRIPTION: Cold Lake South							
REPORT NUMBER: 15110105	REPORT CREATED: 05-Jan-16						
Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110105-003	2,4-Dimethylpentane	I	0.06	ppbv	0.01	AC-058	17-Nov-15
15110105-003	2-Methylheptane	I	0.04	ppbv	0.01	AC-058	17-Nov-15
15110105-003	2-Methylhexane	I	0.11	ppbv	0.01	AC-058	17-Nov-15
15110105-003	2-Methylpentane	I	0.31	ppbv	0.01	AC-058	17-Nov-15
15110105-003	3-Methylheptane	I	0.02	ppbv	0.02	AC-058	17-Nov-15
15110105-003	3-Methylhexane	I	0.12	ppbv	0.02	AC-058	17-Nov-15
15110105-003	3-Methylpentane	I	0.18	ppbv	0.01	AC-058	17-Nov-15
15110105-003	Acetone	K, T, U	< 0.4	ppbv	0.4	AC-058	17-Nov-15
15110105-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	17-Nov-15
15110105-003	Benzene	I	0.28	ppbv	0.01	AC-058	17-Nov-15
15110105-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	17-Nov-15
15110105-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110105-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110105-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Nov-15
15110105-003	Carbon disulfide	I	0.07	ppbv	0.01	AC-058	17-Nov-15
15110105-003	Carbon tetrachloride	I	0.10	ppbv	0.01	AC-058	17-Nov-15
15110105-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110105-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110105-003	Chloroform	I	0.03	ppbv	0.02	AC-058	17-Nov-15
15110105-003	Chloromethane	I	0.56	ppbv	0.02	AC-058	17-Nov-15
15110105-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	17-Nov-15
15110105-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	17-Nov-15
15110105-003	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15
15110105-003	cis-2-Pentene	I	0.02	ppbv	0.02	AC-058	17-Nov-15
15110105-003	Cyclohexane	I	0.15	ppbv	0.02	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead

Date: January 5, 2016

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Nov 14, 2014	2643	Ambient Air	14-Nov-15 0:00	Version 01		
DESCRIPTION: Cold Lake South						
REPORT NUMBER: 15110105	REPORT CREATED: 05-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110105-003	Cyclopentane	I	0.06 ppbv	0.01	AC-058	17-Nov-15
15110105-003	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-003	Ethanol		1.9 ppbv	0.3	AC-058	17-Nov-15
15110105-003	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110105-003	Ethylbenzene	I	0.06 ppbv	0.01	AC-058	17-Nov-15
15110105-003	Freon-11		0.35 ppbv	0.02	AC-058	17-Nov-15
15110105-003	Freon-113	I	0.08 ppbv	0.01	AC-058	17-Nov-15
15110105-003	Freon-114	I	0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-003	Freon-12		0.63 ppbv	0.02	AC-058	17-Nov-15
15110105-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50 ppbv	0.50	AC-058	17-Nov-15
15110105-003	Isobutane		1.19 ppbv	0.02	AC-058	17-Nov-15
15110105-003	Isopentane		1.31 ppbv	0.03	AC-058	17-Nov-15
15110105-003	Isoprene	I	0.03 ppbv	0.01	AC-058	17-Nov-15
15110105-003	Isopropyl alcohol	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110105-003	Isopropylbenzene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-003	m,p-Xylene	I	0.21 ppbv	0.03	AC-058	17-Nov-15
15110105-003	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110105-003	m-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	17-Nov-15
15110105-003	Methyl butyl ketone	K, T, U	< 0.50 ppbv	0.50	AC-058	17-Nov-15
15110105-003	Methyl ethyl ketone	K, T, U	< 0.3 ppbv	0.3	AC-058	17-Nov-15
15110105-003	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110105-003	Methyl methacrylate	K, T, U	< 0.07 ppbv	0.07	AC-058	17-Nov-15
15110105-003	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	17-Nov-15
15110105-003	Methylcyclohexane	I	0.19 ppbv	0.01	AC-058	17-Nov-15
15110105-003	Methylcyclopentane	I	0.18 ppbv	0.02	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead

Date: January 5, 2016

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/Nov 14, 2014	2643	Ambient Air	14-Nov-15 0:00	Version 01		
DESCRIPTION: Cojd Lake South						
REPORT NUMBER: 15110105	REPORT CREATED: 05-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110105-003	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	17-Nov-15
15110105-003	n-Butane		2.33 ppbv	0.03	AC-058	17-Nov-15
15110105-003	n-Decane	K, T, U	< 0.06 ppbv	0.06	AC-058	17-Nov-15
15110105-003	n-Dodecane	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110105-003	n-Heptane	I	0.11 ppbv	0.01	AC-058	17-Nov-15
15110105-003	n-Hexane	I	0.29 ppbv	0.01	AC-058	17-Nov-15
15110105-003	n-Octane	I	0.05 ppbv	0.02	AC-058	17-Nov-15
15110105-003	n-Pentane		0.9 ppbv	0.1	AC-058	17-Nov-15
15110105-003	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	17-Nov-15
15110105-003	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	17-Nov-15
15110105-003	Naphthalene	K, T, U	< 0.5 ppbv	0.5	AC-058	17-Nov-15
15110105-003	n-Nonane	I	0.02 ppbv	0.01	AC-058	17-Nov-15
15110105-003	o-Ethyltoluene	I	0.02 ppbv	0.01	AC-058	17-Nov-15
15110105-003	o-Xylene	I	0.07 ppbv	0.01	AC-058	17-Nov-15
15110105-003	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110105-003	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	17-Nov-15
15110105-003	Styrene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110105-003	Tetrachloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110105-003	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110105-003	Toluene		0.39 ppbv	0.01	AC-058	17-Nov-15
15110105-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110105-003	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-003	trans-2-Pentene	I	0.04 ppbv	0.02	AC-058	17-Nov-15
15110105-003	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: January 5, 2016

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID LICA/VOC/CLS/Nov 14, 2014	CANISTER ID 2643	Matrix Ambient Air	DATE SAMPLED 14-Nov-15 0:00			
DESCRIPTION: Cold Lake South		REPORT CREATED: 05-Jan-16	VERSION: Version 01			
REPORT NUMBER: 15110105						
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110105-003	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110105-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead

Date: January 5, 2016

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/NOV 20, 2015	S5673	Ambient Air	20-Nov-15 00:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	15110230	REPORT CREATED:	08-Jan-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110230-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Dec-15
15110230-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Dec-15
15110230-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	03-Dec-15
15110230-001	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Dec-15
15110230-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Dec-15
15110230-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	03-Dec-15
15110230-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Dec-15
15110230-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Dec-15
15110230-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Dec-15
15110230-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Dec-15
15110230-001	1-Butene	I	0.04	ppbv	0.02	AC-058	03-Dec-15
15110230-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Dec-15
15110230-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Dec-15
15110230-001	2,2-Dimethylbutane	I	0.02	ppbv	0.01	AC-058	03-Dec-15
15110230-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Dec-15
15110230-001	2,3-Dimethylbutane	I	0.04	ppbv	0.02	AC-058	03-Dec-15
15110230-001	2,3-Dimethylpentane	I	0.02	ppbv	0.02	AC-058	03-Dec-15

Report certified by: Graham Knox, Team Lead
On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/NOV 20, 2015	S5673	Ambient Air	20-Nov-15 00:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	15110230	REPORT CREATED:	08-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110230-001	2,4-Dimethylpentane	I	0.02 ppbv	0.01	AC-058	03-Dec-15
15110230-001	2-Methylheptane	I	0.02 ppbv	0.01	AC-058	03-Dec-15
15110230-001	2-Methylhexane	I	0.04 ppbv	0.01	AC-058	03-Dec-15
15110230-001	2-Methylpentane	I	0.09 ppbv	0.01	AC-058	03-Dec-15
15110230-001	3-Methylheptane	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110230-001	3-Methylhexane	I	0.04 ppbv	0.02	AC-058	03-Dec-15
15110230-001	3-Methylpentane	I	0.05 ppbv	0.01	AC-058	03-Dec-15
15110230-001	Acetone		1.0 ppbv	0.4	AC-058	03-Dec-15
15110230-001	Acrolein	K, T, U	< 0.3 ppbv	0.3	AC-058	03-Dec-15
15110230-001	Benzene	I	0.15 ppbv	0.01	AC-058	03-Dec-15
15110230-001	Benzyl chloride	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110230-001	Bromodichloromethane	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110230-001	Bromoform	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110230-001	Bromomethane	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110230-001	Carbon disulfide	I	0.03 ppbv	0.01	AC-058	03-Dec-15
15110230-001	Carbon tetrachloride	I	0.11 ppbv	0.01	AC-058	03-Dec-15
15110230-001	Chlorobenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110230-001	Chloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110230-001	Chloroform	I	0.03 ppbv	0.02	AC-058	03-Dec-15
15110230-001	Chloromethane		0.56 ppbv	0.02	AC-058	03-Dec-15
15110230-001	cis-1,2-Dichloroethene	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110230-001	cis-1,3-Dichloropropene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110230-001	cis-2-Butene	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110230-001	cis-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110230-001	Cyclohexane	I	0.09 ppbv	0.02	AC-058	03-Dec-15

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/NOV 20, 2015	S5673	Ambient Air	20-Nov-15 00:00	Version 01		
DESCRIPTION: Cold Lake South						
REPORT NUMBER: 15110230	REPORT CREATED: 08-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110230-001	Cyclopentane	I	0.03 ppbv	0.01	AC-058	03-Dec-15
15110230-001	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110230-001	Ethanol		0.5 ppbv	0.3	AC-058	03-Dec-15
15110230-001	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110230-001	Ethylbenzene	I	0.02 ppbv	0.01	AC-058	03-Dec-15
15110230-001	Freon-11		0.34 ppbv	0.02	AC-058	03-Dec-15
15110230-001	Freon-113	I	0.07 ppbv	0.01	AC-058	03-Dec-15
15110230-001	Freon-114	I	0.02 ppbv	0.02	AC-058	03-Dec-15
15110230-001	Freon-12		0.59 ppbv	0.02	AC-058	03-Dec-15
15110230-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50 ppbv	0.50	AC-058	03-Dec-15
15110230-001	Isobutane		0.33 ppbv	0.02	AC-058	03-Dec-15
15110230-001	Isopentane		0.33 ppbv	0.03	AC-058	03-Dec-15
15110230-001	Isoprene	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110230-001	Isopropyl alcohol	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110230-001	Isopropylbenzene	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110230-001	m,p-Xylene	I	0.04 ppbv	0.03	AC-058	03-Dec-15
15110230-001	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110230-001	m-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	03-Dec-15
15110230-001	Methyl butyl ketone	K, T, U	< 0.50 ppbv	0.50	AC-058	03-Dec-15
15110230-001	Methyl ethyl ketone	K, T, U	< 0.3 ppbv	0.3	AC-058	03-Dec-15
15110230-001	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110230-001	Methyl methacrylate	K, T, U	< 0.07 ppbv	0.07	AC-058	03-Dec-15
15110230-001	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	03-Dec-15
15110230-001	Methylcyclohexane	I	0.12 ppbv	0.01	AC-058	03-Dec-15
15110230-001	Methylcyclopentane	I	0.07 ppbv	0.02	AC-058	03-Dec-15

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/NOV 20, 2015	S5673	Ambient Air	20-Nov-15 00:00	Version 01		
DESCRIPTION: Cold Lake South						
REPORT NUMBER: 15110230	REPORT CREATED: 08-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110230-001	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	03-Dec-15
15110230-001	n-Butane		0.65 ppbv	0.03	AC-058	03-Dec-15
15110230-001	n-Decane	K, T, U	< 0.06 ppbv	0.06	AC-058	03-Dec-15
15110230-001	n-Dodecane	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110230-001	n-Heptane	I	0.04 ppbv	0.01	AC-058	03-Dec-15
15110230-001	n-Hexane	I	0.10 ppbv	0.01	AC-058	03-Dec-15
15110230-001	n-Octane	I	0.02 ppbv	0.02	AC-058	03-Dec-15
15110230-001	n-Pentane	K, T, U	< 0.1 ppbv	0.1	AC-058	03-Dec-15
15110230-001	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	03-Dec-15
15110230-001	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	03-Dec-15
15110230-001	Naphthalene	K, T, U	< 0.5 ppbv	0.5	AC-058	03-Dec-15
15110230-001	n-Nonane	I	0.01 ppbv	0.01	AC-058	03-Dec-15
15110230-001	o-Ethyltoluene	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110230-001	o-Xylene	I	0.02 ppbv	0.01	AC-058	03-Dec-15
15110230-001	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110230-001	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	03-Dec-15
15110230-001	Styrene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110230-001	Tetrachloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110230-001	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110230-001	Toluene	I	0.10 ppbv	0.01	AC-058	03-Dec-15
15110230-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110230-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110230-001	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110230-001	trans-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110230-001	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15

Report certified by: Graham Knox, Team Lead

Date: Friday, January 08, 2016

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID LICA/VOC/CLS/NOV 20, 2015 **CANISTER ID** S5673 **DATE SAMPLED** 20-Nov-15 00:00
DESCRIPTION: Cold Lake South **Matrix** Ambient Air
REPORT NUMBER: 15110230 **REPORT CREATED:** 08-Jan-16 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110230-001	Vinyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Dec-15
15110230-001	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15

Report certified by: Graham Knox, Team Lead **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, January 08, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/NOV 26, 2015	S5672	Ambient Air	26-Nov-15 00:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	15110237	REPORT CREATED:	08-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110237-003	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-003	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-003	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-003	1,1-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110237-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	03-Dec-15
15110237-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8 ppbv	0.8	AC-058	03-Dec-15
15110237-003	1,2,4-Trimethylbenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	03-Dec-15
15110237-003	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-003	1,2-Dichlorobenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	03-Dec-15
15110237-003	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	03-Dec-15
15110237-003	1,2-Dichloropropane	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110237-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-003	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-003	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	03-Dec-15
15110237-003	1,4-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110237-003	1,4-Dioxane	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110237-003	1-Butene	I	0.06 ppbv	0.02	AC-058	03-Dec-15
15110237-003	1-Hexene	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-003	1-Pentene	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110237-003	2,2,4-Trimethylpentane	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110237-003	2,2-Dimethylbutane	I	0.03 ppbv	0.01	AC-058	03-Dec-15
15110237-003	2,3,4-Trimethylpentane	I	0.02 ppbv	0.01	AC-058	03-Dec-15
15110237-003	2,3-Dimethylbutane	I	0.09 ppbv	0.02	AC-058	03-Dec-15
15110237-003	2,3-Dimethylpentane	I	0.06 ppbv	0.02	AC-058	03-Dec-15

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/NOV 26, 2015	S5672	Ambient Air	26-Nov-15 00:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	15110237	REPORT CREATED:	08-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110237-003	2,4-Dimethylpentane	I	0.05 ppbv	0.01	AC-058	03-Dec-15
15110237-003	2-Methylheptane	I	0.04 ppbv	0.01	AC-058	03-Dec-15
15110237-003	2-Methylhexane	I	0.08 ppbv	0.01	AC-058	03-Dec-15
15110237-003	2-Methylpentane	I	0.20 ppbv	0.01	AC-058	03-Dec-15
15110237-003	3-Methylheptane	I	0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-003	3-Methylhexane	I	0.08 ppbv	0.02	AC-058	03-Dec-15
15110237-003	3-Methylpentane	I	0.11 ppbv	0.01	AC-058	03-Dec-15
15110237-003	Acetone		1.0 ppbv	0.4	AC-058	03-Dec-15
15110237-003	Acrolein	K, T, U	< 0.3 ppbv	0.3	AC-058	03-Dec-15
15110237-003	Benzene	I	0.27 ppbv	0.01	AC-058	03-Dec-15
15110237-003	Benzyl chloride	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110237-003	Bromodichloromethane	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-003	Bromoform	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-003	Bromomethane	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110237-003	Carbon disulfide	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110237-003	Carbon tetrachloride	I	0.11 ppbv	0.01	AC-058	03-Dec-15
15110237-003	Chlorobenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-003	Chloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-003	Chloroform	I	0.03 ppbv	0.02	AC-058	03-Dec-15
15110237-003	Chloromethane		0.47 ppbv	0.02	AC-058	03-Dec-15
15110237-003	cis-1,2-Dichloroethene	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110237-003	cis-1,3-Dichloropropene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110237-003	cis-2-Butene	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-003	cis-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-003	Cyclohexane	I	0.24 ppbv	0.02	AC-058	03-Dec-15

Report certified by: Julius Pretorius, Portfolio Manager

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Friday, January 08, 2016

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID LICA/VOC/CLS/NOV 26, 2015 **CANISTER ID** S5672 **Matrix** Ambient Air **DATE SAMPLED** 26-Nov-15 00:00
DESCRIPTION: Cold Lake South
REPORT NUMBER: 15110237 **REPORT CREATED:** 08-Jan-16 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110237-003	Cyclopentane	I	0.07	ppbv	0.01	AC-058	03-Dec-15
15110237-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Dec-15
15110237-003	Ethanol	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Dec-15
15110237-003	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Dec-15
15110237-003	Ethylbenzene	I	0.04	ppbv	0.01	AC-058	03-Dec-15
15110237-003	Freon-11	I	0.33	ppbv	0.02	AC-058	03-Dec-15
15110237-003	Freon-113	I	0.06	ppbv	0.01	AC-058	03-Dec-15
15110237-003	Freon-114	I	0.02	ppbv	0.02	AC-058	03-Dec-15
15110237-003	Freon-12		0.52	ppbv	0.02	AC-058	03-Dec-15
15110237-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Dec-15
15110237-003	Isobutane		0.79	ppbv	0.02	AC-058	03-Dec-15
15110237-003	Isopentane		0.59	ppbv	0.03	AC-058	03-Dec-15
15110237-003	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Dec-15
15110237-003	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Dec-15
15110237-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Dec-15
15110237-003	m,p-Xylene	I	0.07	ppbv	0.03	AC-058	03-Dec-15
15110237-003	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Dec-15
15110237-003	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	03-Dec-15
15110237-003	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Dec-15
15110237-003	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Dec-15
15110237-003	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Dec-15
15110237-003	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Dec-15
15110237-003	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Dec-15
15110237-003	Methylcyclohexane		0.31	ppbv	0.01	AC-058	03-Dec-15
15110237-003	Methylcyclopentane	I	0.18	ppbv	0.02	AC-058	03-Dec-15

Report certified by: Julius Pretorius, Portfolio Manager **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, January 08, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/CLS/NOV 26, 2015	S5672	Ambient Air	26-Nov-15 00:00	Version 01		
DESCRIPTION:	Cold Lake South					
REPORT NUMBER:	15110237	REPORT CREATED:	08-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110237-003	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	03-Dec-15
15110237-003	n-Butane		1.44 ppbv	0.03	AC-058	03-Dec-15
15110237-003	n-Decane	K, T, U	< 0.06 ppbv	0.06	AC-058	03-Dec-15
15110237-003	n-Dodecane	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110237-003	n-Heptane	I	0.09 ppbv	0.01	AC-058	03-Dec-15
15110237-003	n-Hexane	I	0.21 ppbv	0.01	AC-058	03-Dec-15
15110237-003	n-Octane	I	0.05 ppbv	0.02	AC-058	03-Dec-15
15110237-003	n-Pentane		0.5 ppbv	0.1	AC-058	03-Dec-15
15110237-003	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	03-Dec-15
15110237-003	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	03-Dec-15
15110237-003	Naphthalene	K, T, U	< 0.5 ppbv	0.5	AC-058	03-Dec-15
15110237-003	n-Nonane	I	0.02 ppbv	0.01	AC-058	03-Dec-15
15110237-003	o-Ethyltoluene	I	0.01 ppbv	0.01	AC-058	03-Dec-15
15110237-003	o-Xylene	I	0.03 ppbv	0.01	AC-058	03-Dec-15
15110237-003	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110237-003	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	03-Dec-15
15110237-003	Styrene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110237-003	Tetrachloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110237-003	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110237-003	Toluene	I	0.19 ppbv	0.01	AC-058	03-Dec-15
15110237-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110237-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110237-003	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110237-003	trans-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-003	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/NOV 26, 2015	S5672	Ambient Air	26-Nov-15 00:00
DESCRIPTION: Cold Lake South			
REPORT NUMBER: 15110237	REPORT CREATED: 08-Jan-16		
VERSION: Version 01			
Lab ID	Parameter	Qualifier	Result Units RDL Method Analysis Date
15110237-003	Vinyl acetate	K, T, U	< 0.4 ppbv 0.4 AC-058 03-Dec-15
15110237-003	Vinyl chloride	K, T, U	< 0.02 ppbv 0.02 AC-058 03-Dec-15

Report certified by: Julius Pretorius, Portfolio Manager

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Friday, January 08, 2016

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8 INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	CLIENT SAMPLE ID CANISTER ID LICA/PUF/CLS/Nov 2, 2015 TE-06 DESCRIPTION: Cold Lake South DATE SAMPLED: 02-Nov-15 0:00 DATE RECEIVED: 09-Nov-15 REPORT CREATED: 05-Jan-16 REPORT NUMBER: 15110054 VERSION: Version 01
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Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110054-002	1-Methylnaphthalene		0.09	ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	2-Methylnaphthalene		0.16	ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Acenaphthene		0.08	ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Acenaphthylene		0.41	ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Anthracene		0.25	ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Benzo(a)anthracene		0.04	ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Benzo(a)pyrene		0.01	ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Benzo(b,j,k)fluoranthene		0.15	ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Benzo(c)phenanthrene		0.06	ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Benzo(e)pyrene		0.04	ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Benzo(ghi)perylene		0.05	ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Chrysene		0.12	ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Dibenzo(a,j)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Dec-15

Report certified by: Graham Knox, Team Lead
On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: January 5, 2016
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/PUF/CLS/Nov 2, 2015	TE-06	Air Filter	02-Nov-15 0:00	Version 01		
DESCRIPTION: Cold Lake South						
REPORT NUMBER: 15110054	REPORT CREATED: 05-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110054-002	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Fluoranthene		0.49 ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Fluorene		0.38 ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Indeno(1,2,3-cd)pyrene		0.04 ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Naphthalene		0.17 ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Perylene		0.04 ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Phenanthrene		1.65 ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Pyrene		0.41 ug/Filter	0.01	NA-017	08-Dec-15
15110054-002	Retene		0.19 ug/Filter	0.01	NA-017	08-Dec-15

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: January 5, 2016

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<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID CANISTER ID LICA/PUF/CLS/Nov 8, 2015 P13-01</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 08-Nov-15 0:00 DATE RECEIVED: 16-Nov-15</p> <p>REPORT CREATED: 05-Jan-16 REPORT NUMBER: 15110089</p> <p>VERSION: Version 01</p> <p>Matrix Air Filter</p> <p>Priority Normal</p>
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Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110089-002	1-Methylnaphthalene		0.06 ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	2-Methylnaphthalene		0.09 ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Acenaphthene		0.04 ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Acenaphthylene		0.07 ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Anthracene		0.02 ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Benzo(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Benzo(a)pyrene		0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Benzo(b,j,k)fluoranthene		0.09 ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Benzo(c)phenanthrene		0.03 ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Benzo(e)pyrene		0.04 ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Benzo(ghi)perylene		0.04 ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Chrysene		0.05 ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Dibenzo(a,j)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/CLS/Nov 8, 2015	P13-01	Air Filter	08-Nov-15 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	15110089	REPORT CREATED:	05-Jan-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110089-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Fluoranthene		0.11	ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Fluorene		0.29	ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Indeno(1,2,3-cd)pyrene		0.03	ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Naphthalene		0.12	ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Perylene		0.04	ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Phenanthrene		0.47	ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Pyrene		0.09	ug/Filter	0.01	NA-017	08-Dec-15
15110089-002	Retene		0.11	ug/Filter	0.01	NA-017	08-Dec-15

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: January 5, 2016

Inquiries: (780) 632 8455

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID LICA/PUF/CLS/Nov 14, 2014	CANISTER ID TE-08	Matrix Air Filter	Priority Normal
INVOICE: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DESCRIPTION: Cold Lake South	DATE SAMPLED: 14-Nov-15 0:00	DATE RECEIVED: 17-Nov-15	
	REPORT CREATED: 05-Jan-16	REPORT NUMBER: 15110105	VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110105-004	1-Methylnaphthalene		0.84	ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	2-Methylnaphthalene		1.28	ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Acenaphthene		0.10	ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Acenaphthylene		0.34	ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Anthracene		0.04	ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Benzo(a)anthracene		0.03	ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Benzo(a)pyrene		0.01	ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Benzo(b,j,k)fluoranthene		0.11	ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Benzo(c)phenanthrene		0.03	ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Benzo(e)pyrene		0.04	ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Benzo(ghi)perylene		0.05	ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Chrysene		0.07	ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Dec-15

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: January 5, 2016

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/PUF/CLS/Nov 14, 2014	TE-08	Air Filter	14-Nov-15 0:00	Version 01		
DESCRIPTION:		Cold Lake South				
REPORT NUMBER:	15110105	REPORT CREATED:	05-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110105-004	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Fluoranthene		0.14 ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Fluorene		0.33 ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Indeno(1,2,3-cd)pyrene		0.03 ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Naphthalene		1.10 ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Perylene		0.04 ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Phenanthrene		0.52 ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Pyrene		0.11 ug/Filter	0.01	NA-017	08-Dec-15
15110105-004	Retene		0.08 ug/Filter	0.01	NA-017	08-Dec-15

Report certified by: Graham Knox, Team Lead
Date: January 5, 2016

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE	CLIENT SAMPLE ID LICA/PUF/CLS/NOV 20, 2015	CANISTER ID TE-01	Matrix Air Filter	Priority Normal
Calgary AB T2E 6P8	DESCRIPTION: Cold Lake South			
INVOICE: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 20-Nov-15 00:00	DATE RECEIVED: 27-Nov-15	REPORT NUMBER: 15110230	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110230-002	1-Methylnaphthalene		0.15	ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	2-Methylnaphthalene		0.21	ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Acenaphthene		0.06	ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Acenaphthylene		0.03	ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Benzo(a)anthracene		< 0.01	ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Benzo(a)pyrene		0.01	ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Benzo(b,j,k)fluoranthene		0.03	ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Benzo(ghi)perylene		0.02	ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Chrysene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Dibenzo(a,l)pyrene		0.02	ug/Filter	0.01	NA-017	19-Dec-15

Report certified by: Julius Pretorius, Portfolio Manager
On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, January 08, 2016
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/PUF/CLS/NOV 20, 2015	TE-01	Air Filter	20-Nov-15 00:00	Version 01		
DESCRIPTION: Cold Lake South						
REPORT NUMBER: 15110230	REPORT CREATED: 08-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110230-002	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Fluoranthene		0.04 ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Fluorene		0.12 ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Naphthalene		0.19 ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Phenanthrene		0.18 ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Pyrene		0.03 ug/Filter	0.01	NA-017	19-Dec-15
15110230-002	Retene		0.06 ug/Filter	0.01	NA-017	19-Dec-15

Report certified by: Julius Pretorius, Portfolio Manager

Date: Friday, January 08, 2016

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE	CLIENT SAMPLE ID LICA/PUF/CLS/NOV 26, 2015	CANISTER ID TE-07	Matrix Air Filter	Priority Normal
Calgary AB T2E 6P8	DESCRIPTION: Cold Lake South			
INVOICE: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 26-Nov-15	00:00	DATE RECEIVED: 30-Nov-15	
	REPORT CREATED: 08-Jan-16		REPORT NUMBER: 15110237	
			VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110237-004	1-Methylnaphthalene		0.25 ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	2-Methylnaphthalene		0.36 ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	3-Methylcholanthrene	K, T, U	<0.01 ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	7,12-Dimethylbenz(a)anthracene		0.01 ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Acenaphthene		0.12 ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Acenaphthylene		0.05 ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Acridine	K, T, U	<0.01 ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Anthracene		0.02 ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Benzo(a)anthracene		0.02 ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Benzo(a)pyrene		0.03 ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Benzo(b,j,k)fluoranthene		0.09 ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Benzo(c)phenanthrene	K, T, U	<0.01 ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Benzo(e)pyrene		0.03 ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Benzo(ghi)perylene		0.05 ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Chrysene		0.05 ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Dibenzo(a,h)pyrene	K, T, U	<0.01 ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Dibenzo(a,i)pyrene	K, T, U	<0.01 ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Dibenzo(a,l)pyrene		0.04 ug/Filter	0.01	NA-017	19-Dec-15

Report certified by: Julius Pretorius, Portfolio Manager
On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Friday, January 08, 2016
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID: LICA/PUF/CLS/NOV 26, 2015 CANISTER ID: TE-07 Matrix: Air Filter DATE SAMPLED: 26-Nov-15 00:00
 DESCRIPTION: Cold Lake South
 REPORT NUMBER: 15110237 REPORT CREATED: 08-Jan-16 VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110237-004	Dibenzo(ah)anthracene		0.01	ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Fluoranthene		0.13	ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Fluorene		0.27	ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Indeno(1,2,3-cd)pyrene		0.03	ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Naphthalene		0.43	ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Phenanthrene		0.37	ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Pyrene		0.09	ug/Filter	0.01	NA-017	19-Dec-15
15110237-004	Retene		0.38	ug/Filter	0.01	NA-017	19-Dec-15

Report certified by: Julius Pretorius, Portfolio Manager On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
 Date: Friday, January 08, 2016 Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca

PARTISOL SAMPLES



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8 INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5		CLIENT SAMPLE ID CANISTER ID LICA P5011870		Matrix Air Filter		Priority Normal	
DESCRIPTION: Cold Lake South DATE SAMPLED: 02-Nov-15 0:00 REPORT CREATED: 03-Dec-15 DATE RECEIVED: 09-Nov-15 REPORT NUMBER: 15110053 VERSION: Version 01							
Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110053-001	Particulate Weight		0.013	mg	0.004	AC-029	16-Nov-15

Report certified by: Graham Knox, Team Lead

Date: Thursday, December 03, 2015

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID LICA P5011867</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 08-Nov-15 0:00</p> <p>REPORT CREATED: 03-Dec-15</p> <p>CANISTER ID</p> <p>MATRIX Air Filter</p> <p>DATE RECEIVED: 16-Nov-15</p> <p>REPORT NUMBER: 15110086</p> <p>VERSION: Version 01</p> <p>PRIORITY Normal</p>
---	---

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110086-001	Particulate Weight		0.133 mg	0.004	AC-029	23-Nov-15

Report certified by: Graham Knox, Team Lead

Date: Thursday, December 03, 2015

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Inquiries: (780) 632 8455 **E-mail:** EAS.Results@albertainnovates.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8 INVOICE: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5		CLIENT SAMPLE ID LICA P50011868 DESCRIPTION: Cold Lake South DATE SAMPLED: 14-Nov-15 0:00 REPORT CREATED: 03-Dec-15 DATE RECEIVED: 17-Nov-15 REPORT NUMBER: 15110104 VERSION: Version 01		CANISTER ID MATRIX Air Filter PRIORITY Normal			
Lab ID 15110104-001	Parameter Particulate Weight	Qualifier	Result 0.171 mg	Units mg	RDL 0.004	Method AC-029	Analysis Date 23-Nov-15
Report certified by: Graham Knox, Team Lead		On behalf of: PJ Pretorius, Manager, Analysis and Testing Services		Date: Thursday, December 03, 2015		E-mail: EAS.Results@albertainnovates.ca	



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8 INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5		CLIENT SAMPLE ID LICA 5011869 DESCRIPTION: Cold Lake South DATE SAMPLED: 20-Nov-15 0:00 REPORT CREATED: 03-Dec-15 DATE RECEIVED: 27-Nov-15 REPORT NUMBER: 15110229 VERSION: Version 01		MATRIX Air Filter PRIORITY Normal		
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110229-001	Particulate Weight		0.113 mg	0.004	AC-029	01-Dec-15
Report certified by: Graham Knox, Team Lead		On behalf of: PJ Pretorius, Manager, Analysis and Testing Services		Inquiries: (780) 632 8455		
Date: Thursday, December 03, 2015		E-mail: EAS.Results@albertainnovates.ca				



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID CANISTER ID LICA # P5012875</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 26-Nov-15 0:00 REPORT CREATED: 05-Jan-16</p> <p>DATE RECEIVED: 30-Nov-15 REPORT NUMBER: 15110238 VERSION: Version 01</p>
--	--

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110238-001	Particulate Weight		0.293 mg	0.004	AC-029	03-Dec-12

Report certified by: Graham Knox, Team Lead
Date: January 5, 2016
On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Inquiries: (780) 632 8455
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APPENDIX V
CHAIN OF CUSTODY



Maxxam Analytics - Air Services Group

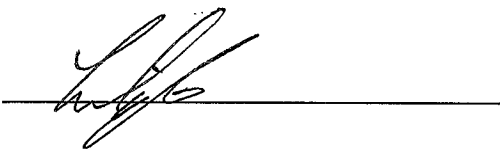
Project Chain of Custody

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2015-11-01- C</u>
Site: <u>Cold Lake South Site</u>	Contact: <u>Mike Bisaga</u>

QA Check Complete msdmbh Date 22 - Dec - 2015

QA Check Review msdmbh Date 22 - Dec - 2015

Report Complete msdmbh Date 12 - Jan - 2016

Report Reviewed  Date 13 - Jan - 16

Report Shipped _____ Date _____

Notes

**AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
ELK POINT AIRPORT SITE**

JOB #:2833-2015-11-35- C

NOVEMBER 2015

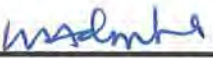
Prepared for:

**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
BOX 8237, 5107W - 50 STREET
BONNYVILLE, ALBERTA
T9N 2J5**

Attention: MIKE BISAGA

DATE: **January 11, 2016**

Prepared by:



Wunmi Adekanmbi, M.Sc.
Project Manager Assistant, Source Testing, Maxxam Analytics

Reviewed by:



Lily Lin, B.Sc.
Senior Project Manager, Air Services, Maxxam Analytics

SUMMARY

In NOVEMBER 2015, the Air Services Group of Maxxam Analytics conducted an ambient air monitoring program on the Elk Point Airport Site at Lakeland Industry & Community Association, near Bonnyville, Alberta. Sampling was carried out to determine the concentrations of non-compliance parameters as requested by the Project Coordinator.

All data collected this month were within the objectives outlined in the AMD1989 and AMD2006.

The operational uptime for all analyzers and meteorological system were above the 90% requirement.

PM 2.5: Five hours of data were invalidated this month as the data were below -3 ug/m^3 .

Wind System: The LICA-owned RM Young, S/N: 56589, unit was replaced with the Maxxam-supplied RM Young, S/N: 110980, unit on November 26 for maintenance purposes.

The summary of results is presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods are outlined in Section 1.0 Discussion. On this basis, Maxxam is issuing this completed report to Lakeland Industry & Community Association, Elk Point Airport Site.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3677 or toll-free at 1-800-386-7247.

Monthly Continuous Data Summary

Lakeland Industry & Community Association Elk Point Airport Site						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDENCES		MONTHLY AVERAGE	1-HOUR					24-HOUR		
	1-HR	24-HR	1-HR	24-HR		READING	DAY	HOUR	WIND SPEED (KPH)	WIND DIRECTION (DEGREES)	READING	DAY	
SO2 (PPB)	172	48	0	0	0	2	7	23	5.4	W	0.5	13, 30	100.0
H2S (PPB)	10	3	0	0	0	2	7, 9	23, 20	5.4 3.1	W W	1.0	29	100.0
THC (PPM)	-	-	-	-	2.6	8.5	7	23	5.4	W	5.5	30	100.0
CH4 (PPM)	-	-	-	-	2.6	8.4	7	23	5.4	W	5.4	30	100.0
NMHC (PPM)	-	-	-	-	0.01	0.30	19, 30	17, 23	2.8 1.4	W ESE	0.10	30	100.0
NO2 (PPB)	159	-	0	-	9.1	27.9	28	21	8.9	NW	20.7	28	100.0
NO (PPB)	-	-	-	-	3.9	87.8	7	23	5.4	W	39.2	30	100.0
NOX (PPB)	-	-	-	-	13.0	103.3	7	23	5.4	W	58.8	30	100.0
O3 (PPB)	82	-	0	-	13	32	22	VAR	VAR	VAR	24.5	22	100.0
PM2.5 (UG/M3)	-	30	-	0	6.1	25.0	25	17	11.9	W	15.3	30	99.3
VECTOR WS (KPH)	-	-	-	-	10.2	39.7	18	12	-	WNW	28.3	18	99.6
VECTOR WD (DEG)	-	-	-	-	W	-	-	-	-	-	-	-	99.6

NA-NOT AVAILABLE VAR-VARIOUS

Exceedence Summary Report

SO₂ 1- Hour Exceedences

No Exceedences Recorded During the Month

SO₂ 24- Hour Exceedences

No Exceedences Recorded During the Month

H₂S 1- Hour Exceedences

No Exceedences Recorded During the Month

H₂S 24- Hour Exceedences

No Exceedences Recorded During the Month

NO₂ 1- Hour Exceedences

No Exceedences Recorded During the Month

PM_{2.5} 24- Hour Exceedences

No Exceedences Recorded During the Month

Volatile Organics (VOCs) Data Summary

Sample Collected Date	Maximum reading (PPB)	Volatile Organic Compound
NOVEMBER 2, 2015	1.3	ACETONE
NOVEMBER 8, 2015	1.9	METHYLENE CHLORIDE
NOVEMBER 14, 2015	1.67	N-BUTANE
NOVEMBER 20, 2015	14.7	N-BUTANE
NOVEMBER 26, 2015	2.39	N-BUTANE

Note: NA

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collected Date	Maximum reading (ug)	Semi-Volatile Organic
NOVEMBER 2, 2015	0.18	2-METHYLNAPHTHALENE
NOVEMBER 8, 2015	0.27	PHENANTHRENE
NOVEMBER 14, 2015	0.42	2-METHYLNAPHTHALENE
NOVEMBER 26, 2015	0.99	PHENANTHRENE

Note: Sampling schedule for Nov 20 was cancelled as the filter was used to calibrate the PUF sampler.

Volatile Organics (VOCs) Data Summary - NMHC Canister System

Sample Collected Date	Maximum reading (PPB)	Volatile Organic Compound
NOVEMBER 19, 2015	2.9	ACETONE AND ETHANOL
NOVEMBER 30, 2015	8.14	N-BUTANE

Note: NA

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
1.0 Discussion	4
2.0 Project Personnel	7
3.0 Plant Monthly Required AMD Summary	7
4.0 Calculations and Results	7
5.0 Methods and Procedures	8
Appendix I	Continuous Monitoring Data Results
	Sulphur Dioxide
	Hydrogen Sulphide
	Total Hydrocarbon
	Methane
	Non-Methane Hydrocarbon
	Oxides of Nitrogen
	Nitric Oxides
	Nitrogen Dioxide
	Ozone
	Particulate Matter 2.5
	Wind Speed
	Wind Direction
	Standard Deviation Wind Direction
Appendix II	Non-Continuous Monitoring Data Results
	VOC Results
	PAH Results
	NMHC Canister Results
Appendix III	Analyzer Calibration Results
	Sulphur Dioxide
	Hydrogen Sulphide
	Total Hydrocarbon
	Nitrogen Dioxide
	Ozone
	Particulate Matter
	Wind System
	Calibrators
	Calibration Gases
	PUF Sampler
	Audit Report

Appendix IV

Analytical Results

VOCs Samples

PAHs Samples

NMHC Canister Samples

Appendix V

Chain of Custody

1.0 Discussion

This monthly report consists of data for parameters SO₂, H₂S, THC, CH₄, NMHC, NO_x, NO, NO₂, O₃, PM_{2.5}, WS and WD. It also includes results for non-continuous parameters VOC, PAH and NMHC canister.

Sample filters for all continuous air monitors are changed before the calibration is started. The sample manifold is cleaned during the site visit on a monthly basis.

Control checks, consisting of zero and span of the analyzer are conducted on a daily basis on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinder) is used for zero checks and a known concentration of the pollutant being analyzed is used for span checks. These checks are controlled by automatic timers and valves. The total zero span cycle is completed within an hour, the commencement of the zero span cycle is at the beginning of the hour.

Multipoint calibration is done a minimum of once a month for each continuous air monitor. In addition calibration is required under the following conditions: 1) within three days after the initial start-up and stabilization of a newly installed instrument, 2) prior to shut-down or moving of an instrument which has been working to specification, and 3) when major repair has been done on the instrument.

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time (minimum), on a monthly basis.

All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.

Hourly/minute data have been reviewed based on daily zero/span results and multi-points calibration results. Data may be considered as invalid if a zero-corrected span check in excess of +/- 10% of the span concentration (established by the previous multi-point calibration) is encountered and/or significant differences in the calibration factor (greater than 15%).

Hourly data is corrected using daily zero information.

A portable heater was installed in the trailer on November 25 in order to achieve temperature stability.

SULPHUR DIOXIDE (SO₂)

The analyzer was working well throughout the month. The routine monthly calibration was performed on November 10. The routine annual internal quality audit was completed on November 19. The audit report is included in this report.

HYDROGEN SULPHIDE (H₂S)

The analyzer was working well throughout the month. The routine monthly calibration was performed on November 10. The routine annual internal quality audit was completed on November 19. The audit report is included in this report.

TOTAL HYDROCARBONS (THC), METHANE (CH₄), and NON-METHANE HYDROCARBONS (NMHC)

The analyzer was working well throughout the month. The routine monthly calibration was performed on November 10. The Hydrogen gas cylinder was replaced on November 10. The routine annual internal quality audit was completed on November 19. The audit report is included in this report.

NITROGEN DIOXIDE (NO₂)

The analyzer was working well throughout the month. The routine monthly calibration was performed on November 10. The routine annual internal quality audit was completed on November 19. The audit report is included in this report.

OZONE (O₃)

The analyzer was working well throughout the month. The routine monthly calibration was performed on November 10. The routine annual internal quality audit was completed on November 19. The audit report is included in this report.

PARTICULATE MATTER 2.5 (LESS THAN 2.5 MICRONS) (PM_{2.5})

The Teom unit was working well throughout the month. Two routine audits were performed this month: one was completed on November 6, and the other audit was performed on November 23. The routine annual internal quality audit was completed on November 19. The audit report is included in this report. Data was corrected using Alberta air quality guideline. If the data was between 0 to -3 ug/m³, the data was corrected to 0 ug/m³. If the data was below -3ug/m³, the data was invalidated. Five hours of data were invalidated as the data were below -3 ug/m³ this month.

WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)

The wind system is reported as vector wind speed and vector wind direction. The wind direction data included in this report represents where the wind was coming from.

The annual audit was completed on November 19. The LICA-owned RM Young, S/N: 56589, unit was replaced with the Maxxam-supplied RM Young, S/N: 110980, unit on November 26 for maintenance purposes. The replacement was calibrated at Maxxam shop on November 23 before it was installed on site. The RM Young, S/N: 56589 was brought back to Maxxam shop for maintenance and it will be installed back on site when maintenance is completed.

VOC SAMPLES

The sampler was programmed to run for 24 hours, and, every 6 days per sample cycle. The values for the VOCs were reported in ppb.

Samples were collected on November 2, 8, 14, 20 and 26. Analytical results are included in this report.

PAH SAMPLES

The sampler was programmed to run for 24 hours, and, every 6 days per sample cycle. The values for the PAHs were reported in the unit of μg .

Samples were collected on November 2, 8, 14 and 26. Analytical results are included in this report. The sampling schedule for November 20 was cancelled as the sample filter was needed for the calibration of the PUF sampler which was completed on November 25.

NMHC CANISTER SAMPLES

The sampler was programmed to be triggered when the 5-minute average concentration of NMHC is above 0.3 ppm. Two canister events were recorded this month: concentrations of 2.0 ppm on November 19 at 17:05 and 0.3 ppm on November 30 at 19:35. Analytical results are included in this report.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association, and the Maxxam field sampling team consisted of Alexander Yakupov and Limin Li.

3.0 Plant Monthly Required AMD Summary

All data collected this month were within the objectives outlined in the AMD1989 and AMD2006.

The operational uptime for all analyzers and meteorological system were above the 90% requirement.

4.0 Calculations and Results

All calculations and reporting of results follow the method described in the Air Monitoring Directive, 1989, and 2006 Amendments to the Air Monitoring Directive, 1989 (AMD 2006).

5.0 Methods and Procedures

The following methods and procedures were used to complete the test program:

- Maxxam AIR SOP-00001 - Methane, Non-Methane Hydrocarbon Analyzer Monitoring
- Maxxam AIR SOP-00208: RM Young Monitor Calibration
- Maxxam AIR SOP-00209: Ambient H2S Monitoring
- Maxxam AIR SOP-00211: Ambient SO2 Monitoring
- Maxxam AIR SOP-00212: Ambient O3 Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO2/NOx Monitoring
- Maxxam AIR SOP-00215: Teom Operation
- Maxxam AIR SOP-00225: The Collection of VOCs in Ambient Air Using Canister and Xontech

There were no deviations from the prescribed methods.

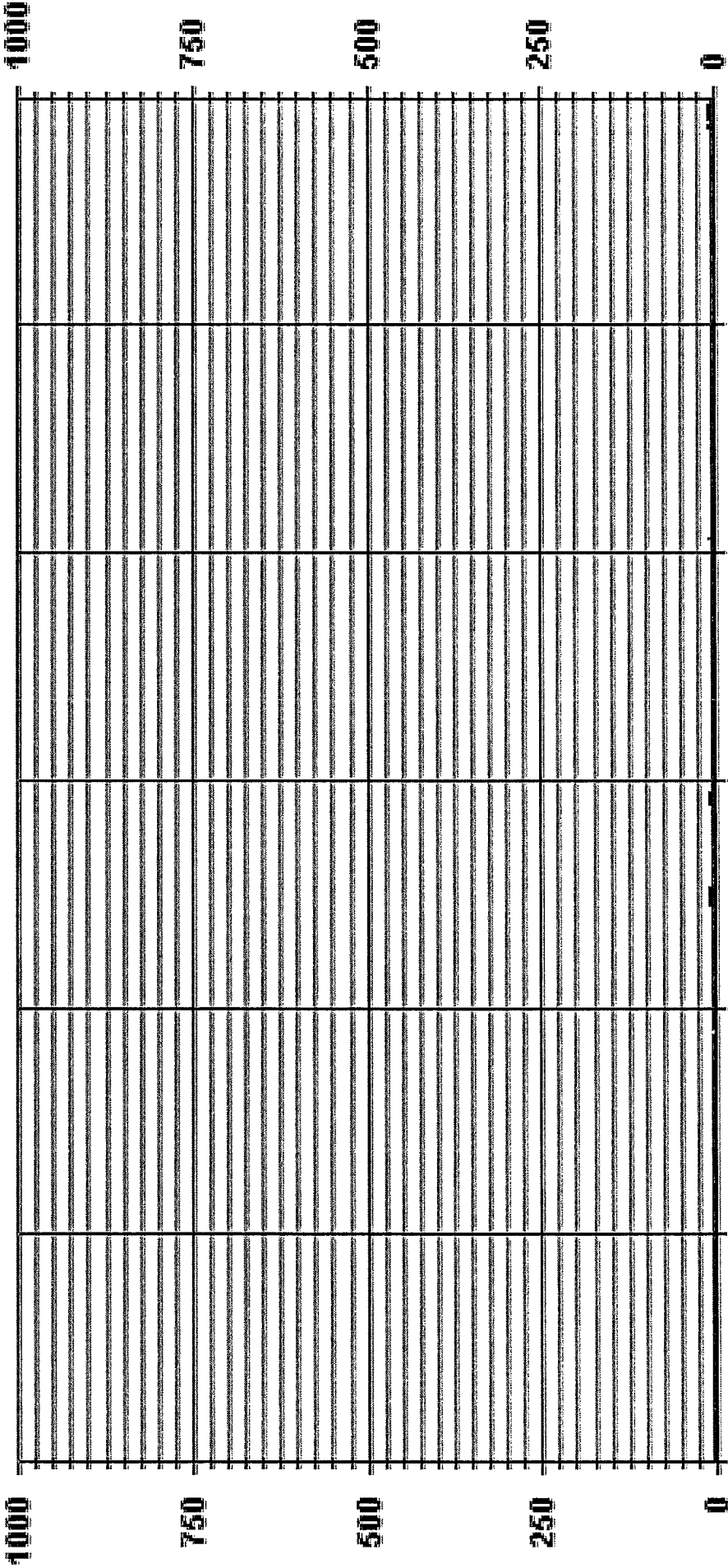
The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
- Methane, Non-Methane Hydrocarbon - Thermo 55i FID Analyzer
- Oxides of Nitrogen - API 200E Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM2.5) - R&P 1405F Teom Unit
- Wind System - RM Young Unit
- Datalogger - ESC 8832

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

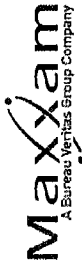
SULPHUR DIOXIDE

01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA35 S02_ PPB



SULPHUR DIOXIDE MAX instantaneous maximum in ppb

MST

DAY	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	ROGS.		
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MAX.	AVG.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.2	
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.5	
8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.5	
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5	
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2	
11	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0.9	
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.3	
13	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.9	
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.4	
16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	
17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	
18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.4	
19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	
20	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	
21	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.4	
22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5	
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	
24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	
27	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0.9	
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.5	
30	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2.0	
HOURLY MAX	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2.0
HOURLY AVG	1.0	1.0	0.9	0.9	0.8	0.9	0.9	1.0	1.0	1.0	1.0	0.9	1.0	1.0	0.8	0.9	0.9	0.9	0.9	1.0	0.8	0.9	0.9	0.8	0.9	0.8	

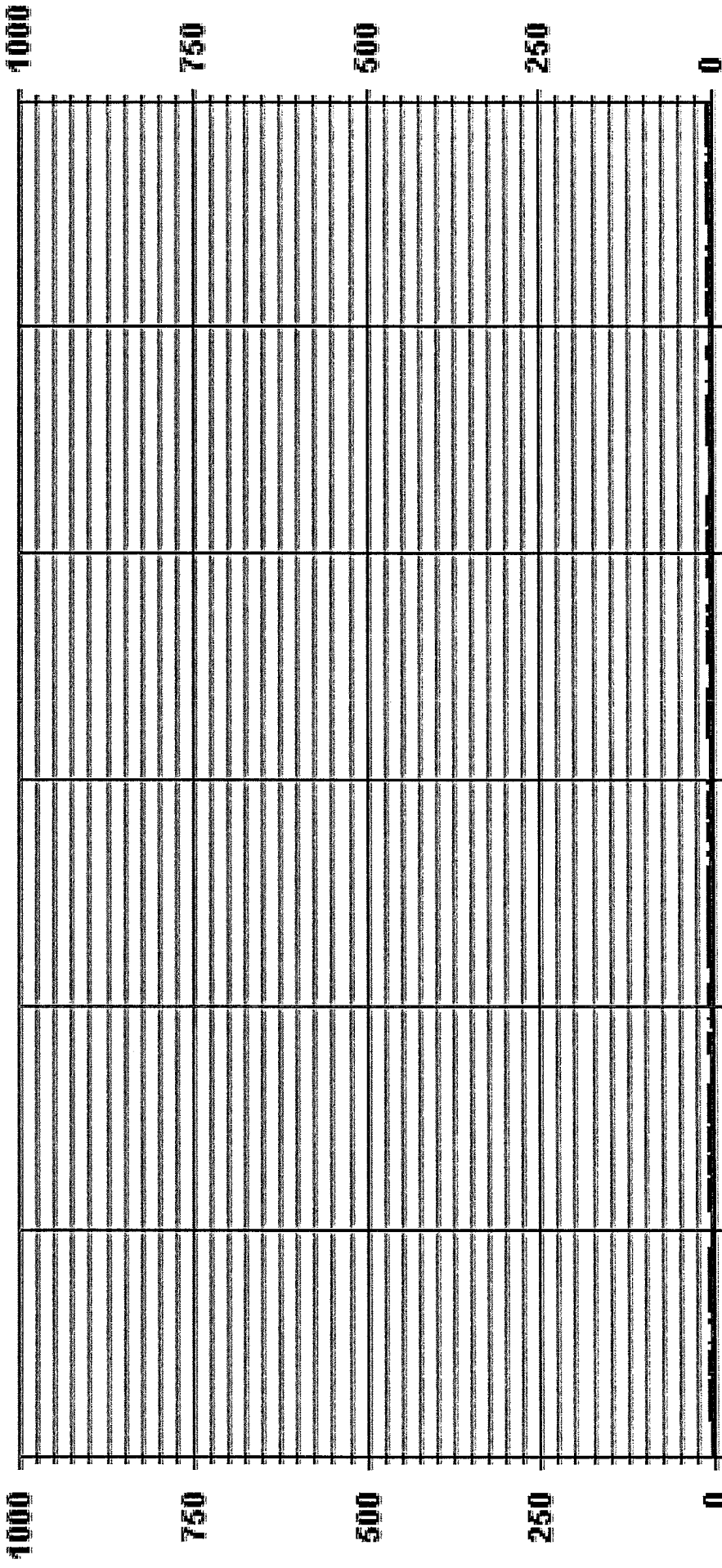
STATUS FLAG CODES

C	-CALIBRATION
D	-QUALITY ASSURANCE
E	-RECOVERY
F	-RECOVERY
G	-DAILY ZERO/SPAN CHECK
H	-MACHINE MALFUNCTION
I	-OPERATOR ERROR
J	-POWER FAILURE
K	-COLLECTION ERROR
L	-OUT FOR REPAIR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	488
MAXIMUM INSTANTANEOUS VALUE:	3 PPB @ HOUR(S)
OPERATIONAL TIME:	30 HRS
MONTHLY CALIBRATION TIME:	6 HRS
STANDARD DEVIATION:	0.70
ON DAY(S)	VAR
VAR	VAR-VARIOUS
OPERATIONAL TIME:	720 HRS

01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA35 SO2MAX PPB

LICA-FLK
SO2_ / WDR Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 35
Site Name : LICA-FLK
Parameter : SO2_
Units : PFB

Wind Parameter : WDR
Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 20	1.91	3.98	1.91	5.16	7.22	8.25	4.57	1.91	3.83	4.27	4.57	13.86	13.71	12.83	8.55	3.39	100.00
< 60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 110	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 170	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 340	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 340	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.91	3.98	1.91	5.16	7.22	8.25	4.57	1.91	3.83	4.27	4.57	13.86	13.71	12.83	8.55	3.39	

Calm : .00 %

Total # Operational Hours : 678

Distribution By Samples

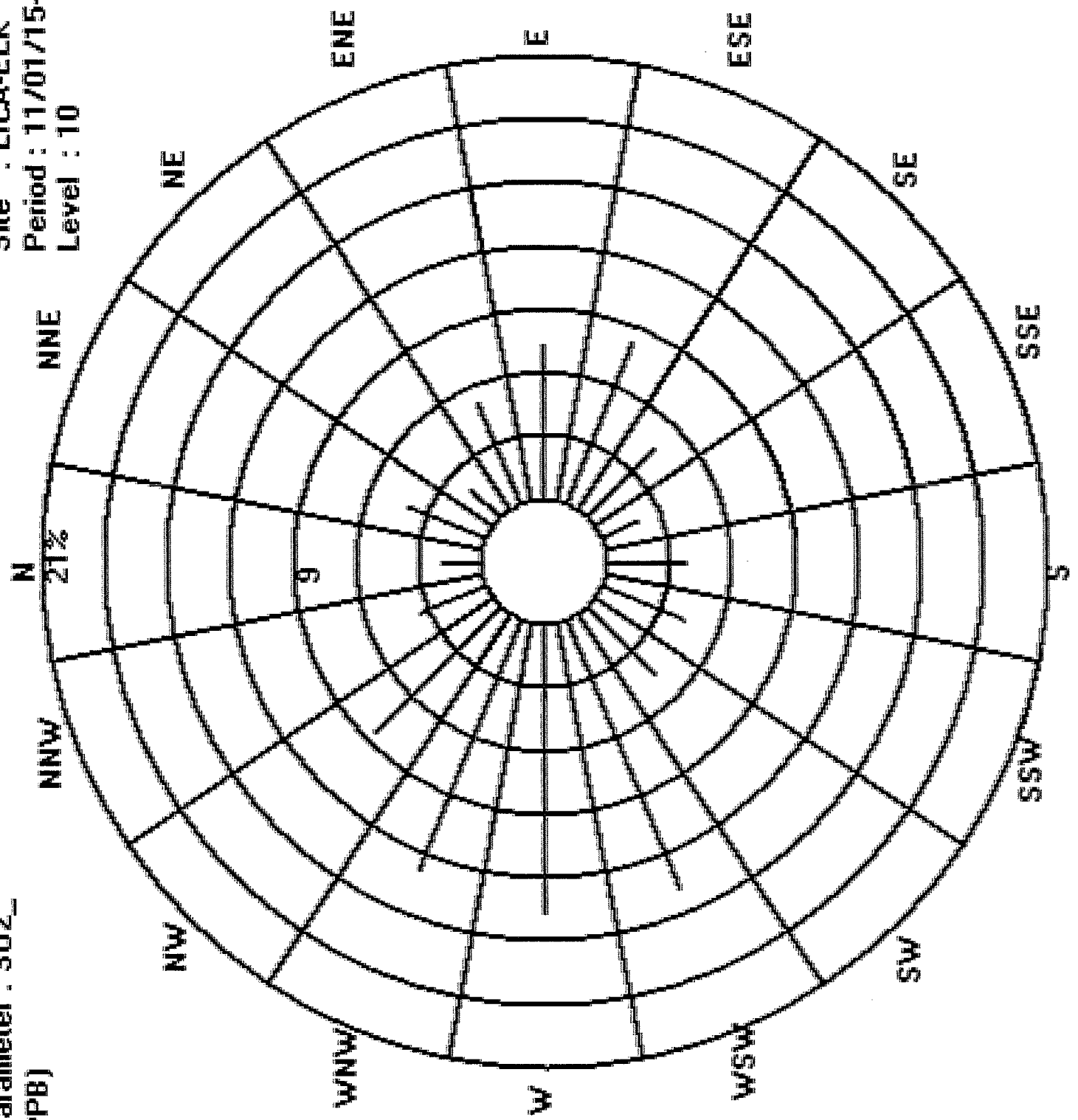
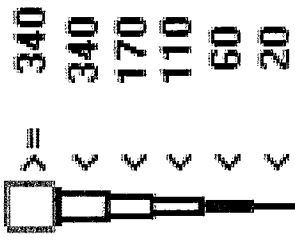
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 20	13	27	13	35	49	56	31	13	26	29	31	94	93	87	58	23	678
< 60																	
< 110																	
< 170																	
< 340																	
>= 340																	
Totals	13	27	13	35	49	56	31	13	26	29	31	94	93	87	58	23	

Calm : .00 %

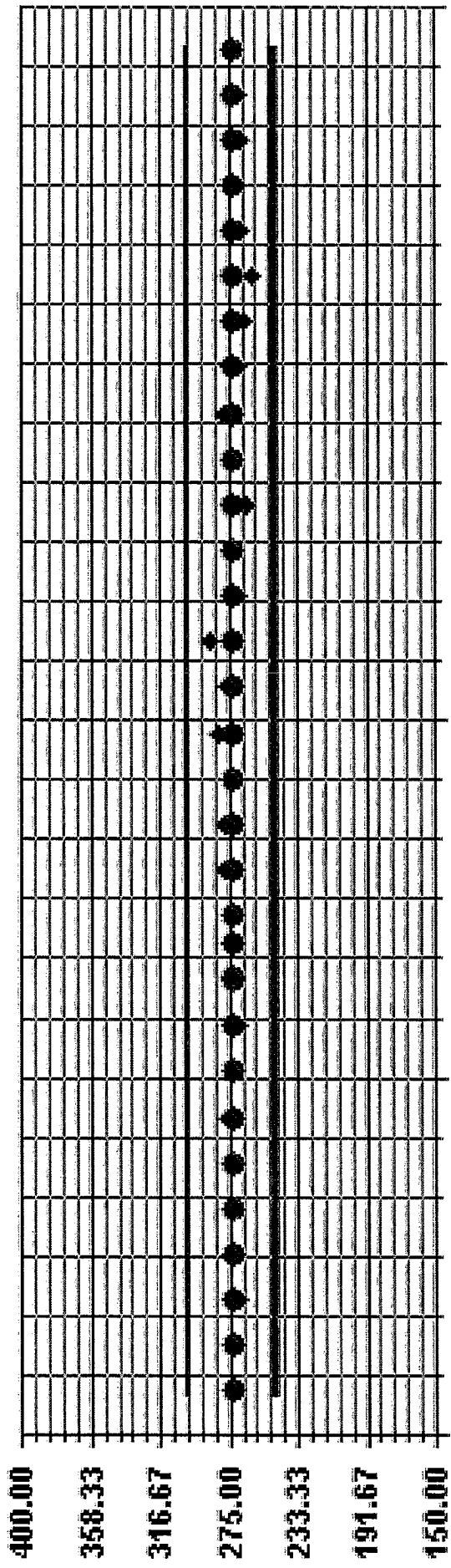
Total # Operational Hours : 678

Site : LICA-ELK
 Period : 11/01/15-11/30/15
 Level : 10

Logger : 35 Parameter : SO2_
 Class Limits (PPB)



Calibration Graph for Site: LICA35 Parameter: S02_ Sequence: S02 Phase: SPAN



11/1/15 11/8/15 11/16/15 11/23/15 12/1/15
 → Cal Value ● Exp Value — Exp Value +10% — Exp Value -10%

HYDROGEN SULPHIDE



HYDROGEN SULPHIDE (H2S) hourly averages in ppb

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	DAILY MAX	24-HOUR AVG.	RDGS.	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
3	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1	24	
4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1	24	
5	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0	24	
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0	24	
7	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.5	24	
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	0.4	24	
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.2	24	
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2	24	
11	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	24	
12	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	24	
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
27	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.4	24	
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	24	
HOURLY MAX	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
HOURLY AVG	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.3	0.1	0.3	0.2	0.2			

STATUS FLAG CODES

C	- CALIBRATION	O	- QUALITY ASSURANCE
Y	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

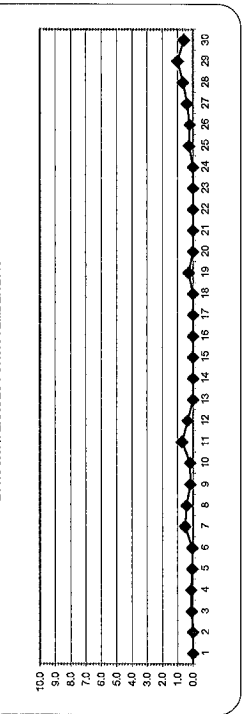
OBJECTIVE LIMIT:

1-HR	10	PPB	24-HR	3	PPB
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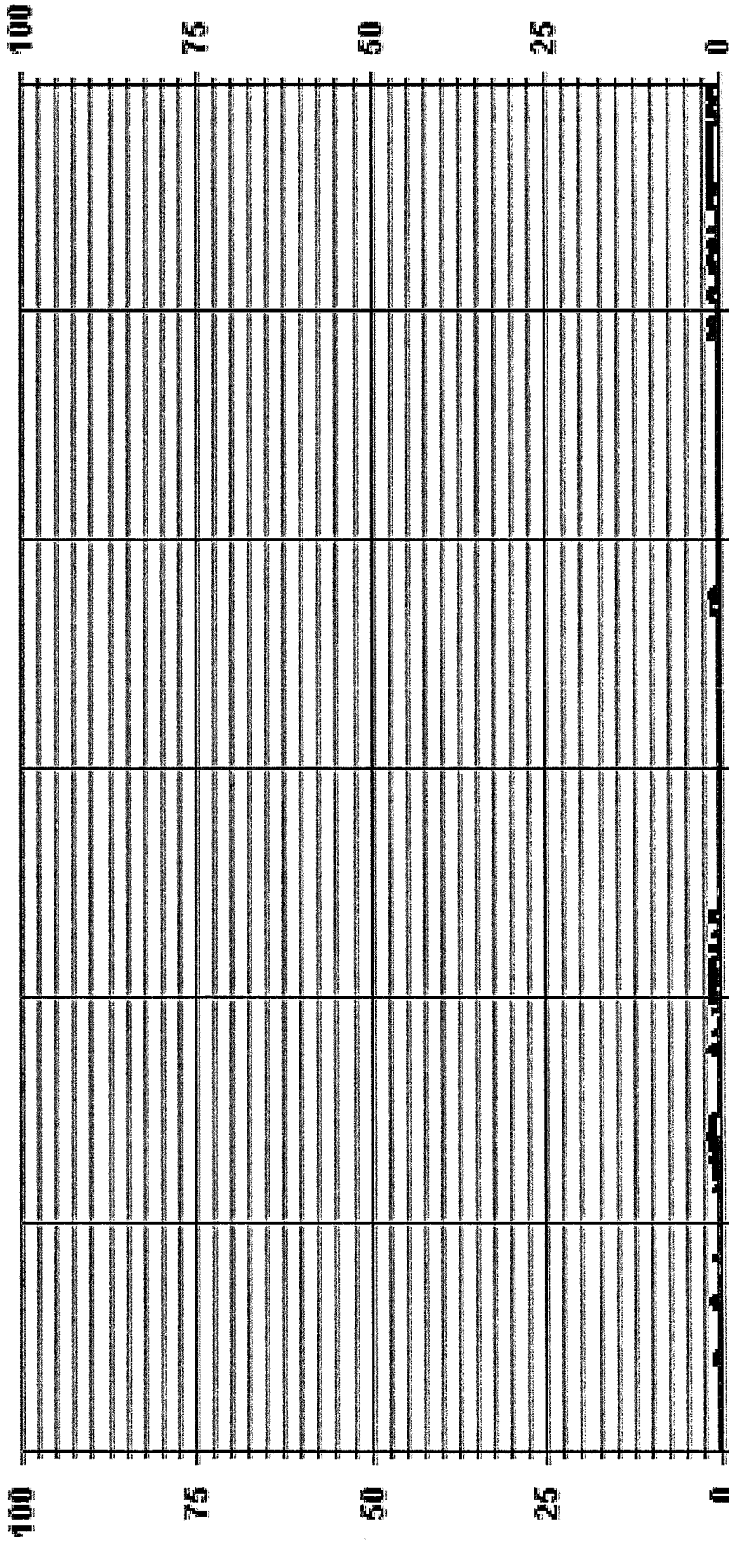
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES	0	NUMBER OF 24-HR EXCEEDENCES	0
NUMBER OF NON-ZERO READINGS	138	MAXIMUM 1-HR AVERAGE	2 PPB
MAXIMUM 1-HR AVERAGE	2 PPB	MAXIMUM 24-HR AVERAGE	1.0 PPB
IS CALIBRATION TIME	29 HRS	MONTHLY CALIBRATION TIME	3 HRS
MONTHLY CALIBRATION TIME	3 HRS	STANDARD DEVIATION	0.41
OPERATIONAL TIME	720 HRS	ON DAY(S)	7, 9
AMT OPERATION UPTIME	100.0 %	ON DAY(S) VAR-VARIOUS	23, 20
MONTHLY AVERAGE	0		

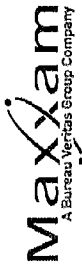
24 HOUR AVERAGES FOR NOVEMBER 2015



01 Hour Averages



— LICA35 H2S_ PPB



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Elk Point Airport Site - NOVEMBER 2015
JOB # 2833-2015-11-35-C

HYDROGEN SULPHIDE MAX instantaneous maximum in ppb

MST

HOUR START	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	ROGS.									
HOUR END	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00									
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
30	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
HOURLY MAX	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
HOURLY AVG	0.4	0.5	0.5	0.4	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
DAILY MAX	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DAILY AVG	0.6	0.3	0.6	0.8	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

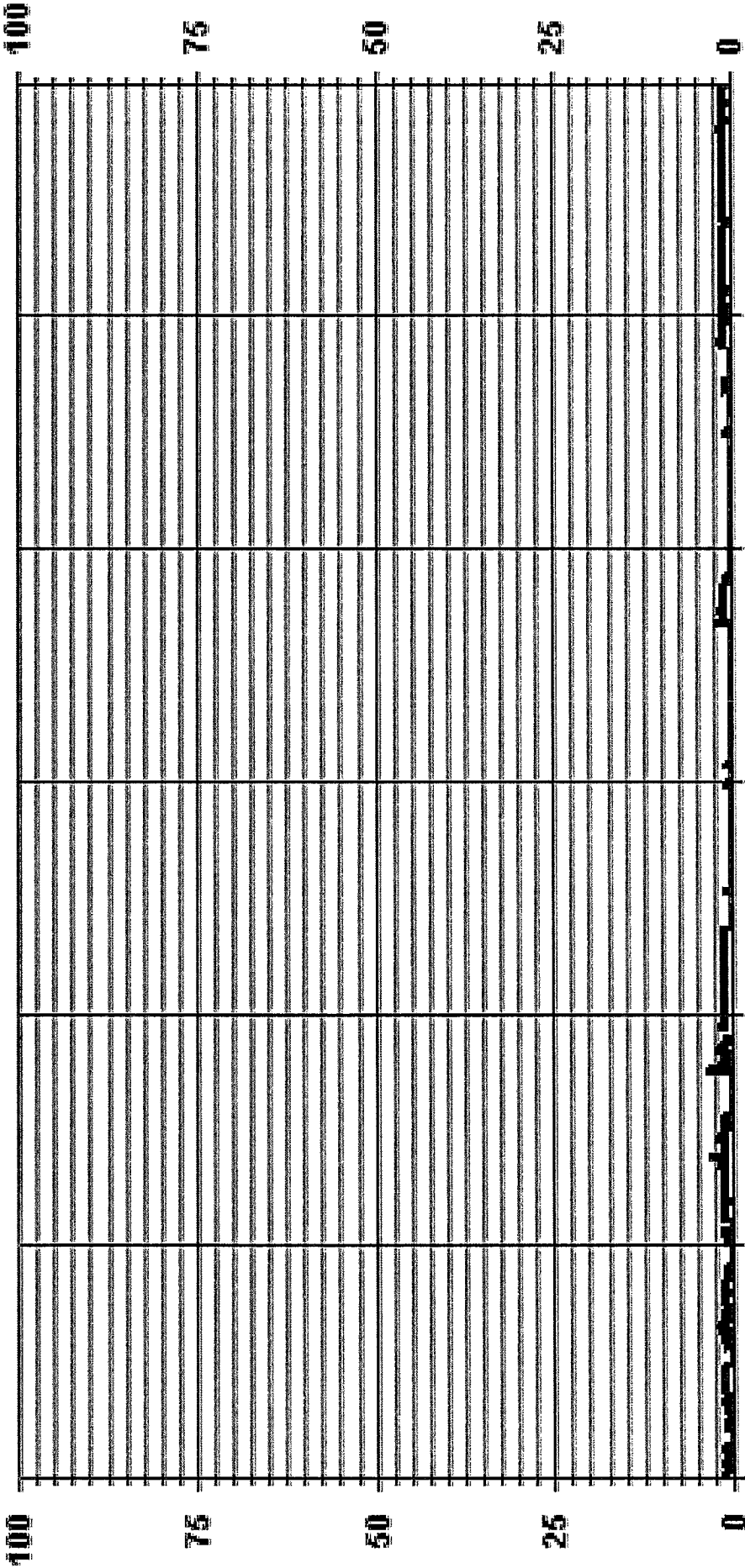
STATUS FLAG CODES

C	- CALIBRATION	O	- QUALITY ASSURANCE
Y	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	318
MAXIMUM INSTANTANEOUS VALUE:	3 PPB @ HOUR(S) VAR ON DAY(S) 7, 9
IZS CALIBRATION TIME:	29 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	0.57
OPERATIONAL TIME:	720 HRS

01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA35 H2SMAX PPB

H2S_ / WDR Joint Frequency Distribution (Percent)
 LICA-ELK
 November 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA-ELK
 Parameter : H2S
 Units : PPB

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3	1.90	3.96	1.90	5.28	7.19	8.22	4.55	1.90	4.11	4.25	4.55	13.80	13.65	12.77	8.51	3.37	100.00
< 10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 50	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 50	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.90	3.96	1.90	5.28	7.19	8.22	4.55	1.90	4.11	4.25	4.55	13.80	13.65	12.77	8.51	3.37	

Calm : .00 %

Total # Operational Hours : 681

Distribution By Samples


Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3	13	27	13	36	49	56	31	13	28	29	31	94	93	87	58	23	681
< 10																	
< 50																	
>= 50																	
Totals	13	27	13	36	49	56	31	13	28	29	31	94	93	87	58	23	

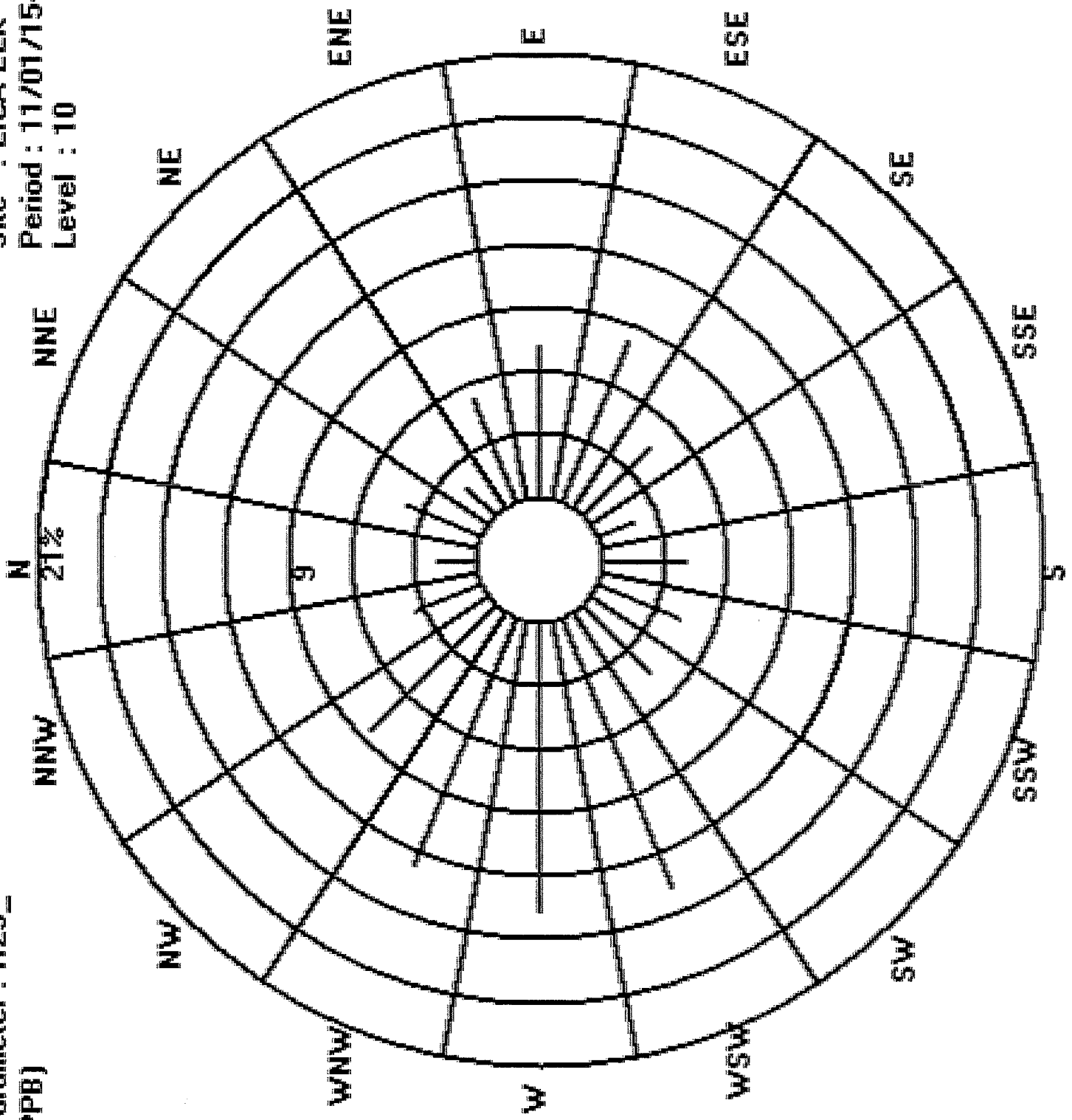
Calm : .00 %

Total # Operational Hours : 681

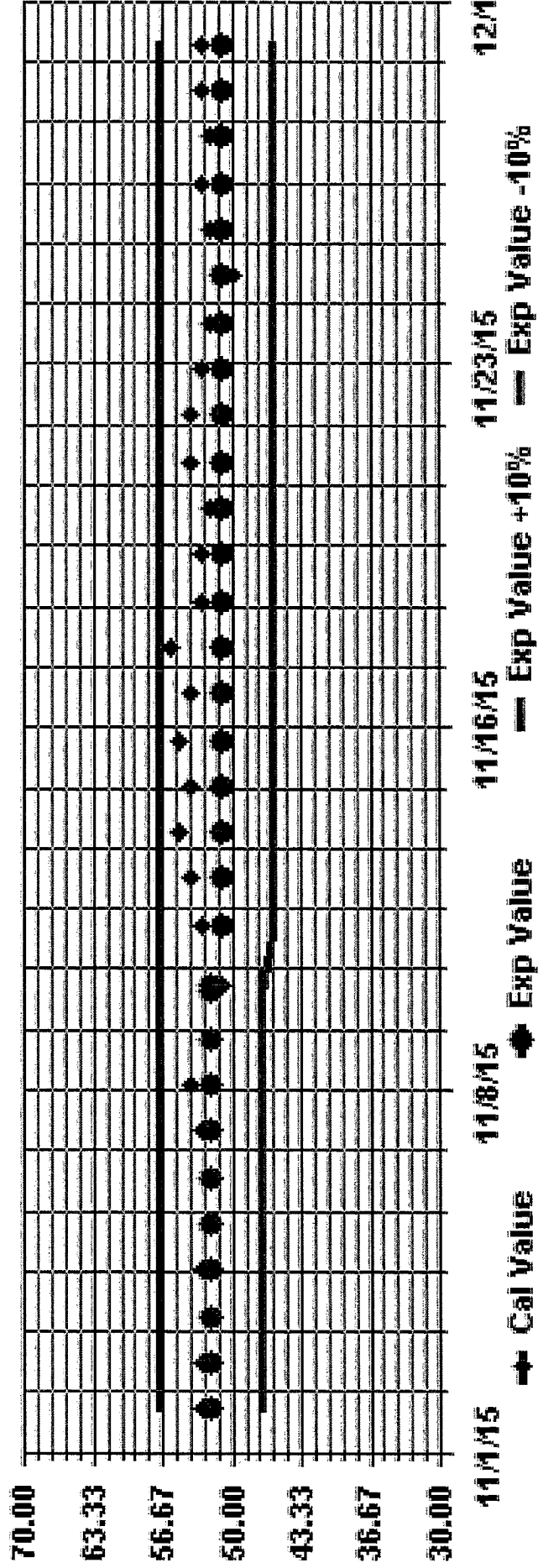
Site : LICA-ELK
Period : 11/01/15-11/30/15
Level : 10

Logger : 35 Parameter : H2S_
Class Limits (PPB)

-  >= 50
-  < 50
-  < 10
-  < 3



Calibration Graph for Site: LICA35 Parameter: H2S Sequence: H2S Phase: SPAN



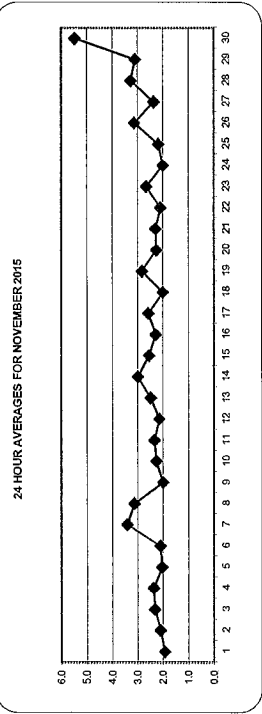
TOTAL HYDROCARBON

TOTAL HYDROCARBONS (THC) hourly averages in ppm

DAY	HOUR																								DAILY MAX	DAILY AVG	24-HOUR ROGS	
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				
1	2.1	2.0	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	1.9	2.4	
2	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	
3	2.2	2.3	2.2	2.3	2.6	2.5	2.4	2.7	2.5	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	
4	3.0	3.2	3.2	3.2	2.4	2.2	2.2	2.6	2.9	2.9	2.5	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.4		
5	2.3	2.1	2.0	2.1	2.3	2.2	2.5	2.3	2.2	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.4		
6	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.2	2.1	2.1	1.9	2.0	2.0	2.0	1.9	1.9	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5	2.1	2.4	
7	2.6	2.6	2.8	3.0	3.2	3.5	3.6	3.3	3.1	3.1	2.9	2.9	2.8	2.7	2.7	2.5	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5	2.5	2.1	2.4
8	4.7	5.1	4.5	4.6	3.8	4.8	4.0	4.2	6.1	4.3	2.5	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	6.1	3.1	2.4	
9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.4		
10	2.4	2.5	2.1	2.0	1.9	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.4	
11	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.4	2.3	2.4	2.8	2.8	2.7	2.5	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.4
12	2.0	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.3	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.4	
13	2.4	2.4	2.4	2.5	2.6	2.7	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.4	
14	2.2	2.4	2.5	2.7	2.6	2.5	2.5	2.5	2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.4	
15	3.7	3.8	3.7	3.1	2.5	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	
16	3.3	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	
17	2.8	2.6	2.4	2.3	2.3	2.5	2.6	2.5	2.6	2.5	2.6	2.5	2.9	3.1	2.9	2.8	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.4	
18	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	
19	2.1	2.3	2.4	2.8	2.5	2.4	2.9	3.3	4.0	3.7	3.5	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.4	
20	2.4	2.2	2.1	2.1	2.1	2.0	2.5	2.1	2.0	2.5	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	
21	2.9	3.1	3.0	2.5	2.3	2.6	2.4	2.1	2.0	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	
22	2.1	2.1	2.3	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	
23	2.0	2.1	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	
24	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	
25	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	
26	2.4	2.5	2.5	3.1	4.0	4.7	5.1	5.8	4.9	4.4	3.4	2.4	2.2	2.3	2.4	2.3	2.5	3.6	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.4	
27	2.8	2.7	2.6	2.7	2.8	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.4		
28	2.3	2.7	2.9	2.8	2.7	3.1	3.4	3.6	3.6	4.1	5.1	4.3	3.9	3.3	2.6	2.8	2.7	2.9	3.0	3.6	3.2	3.3	3.4	3.4	3.4	2.4		
29	3.6	4.4	5.0	4.6	5.1	5.0	4.7	4.8	5.3	5.2	6.2	6.3	6.1	5.8	5.4	6.3	6.3	6.0	6.7	6.4	6.2	6.2	6.2	6.2	6.2	2.4		
30	3.8	4.2	4.3	4.3	4.6	5.0	4.7	4.8	5.3	5.2	6.2	6.3	6.1	5.8	5.4	6.3	6.3	6.0	6.7	6.4	6.2	6.2	6.2	6.2	6.2	2.4		
HOURLY MAX	4.7	5.1	5.0	4.6	4.6	5.0	5.1	4.8	6.1	5.2	6.2	6.3	6.1	5.8	5.4	6.3	6.3	6.0	6.7	6.4	6.2	6.2	6.2	6.2	6.2	2.8		
HOURLY AVG	2.5	2.6	2.6	2.5	2.5	2.6	2.6	2.6	2.8	2.7	2.6	2.6	2.5	2.4	2.4	2.4	2.4	2.5	2.6	2.5	2.6	2.6	2.6	2.6	2.6	2.8		

STATUS FLAG CODES

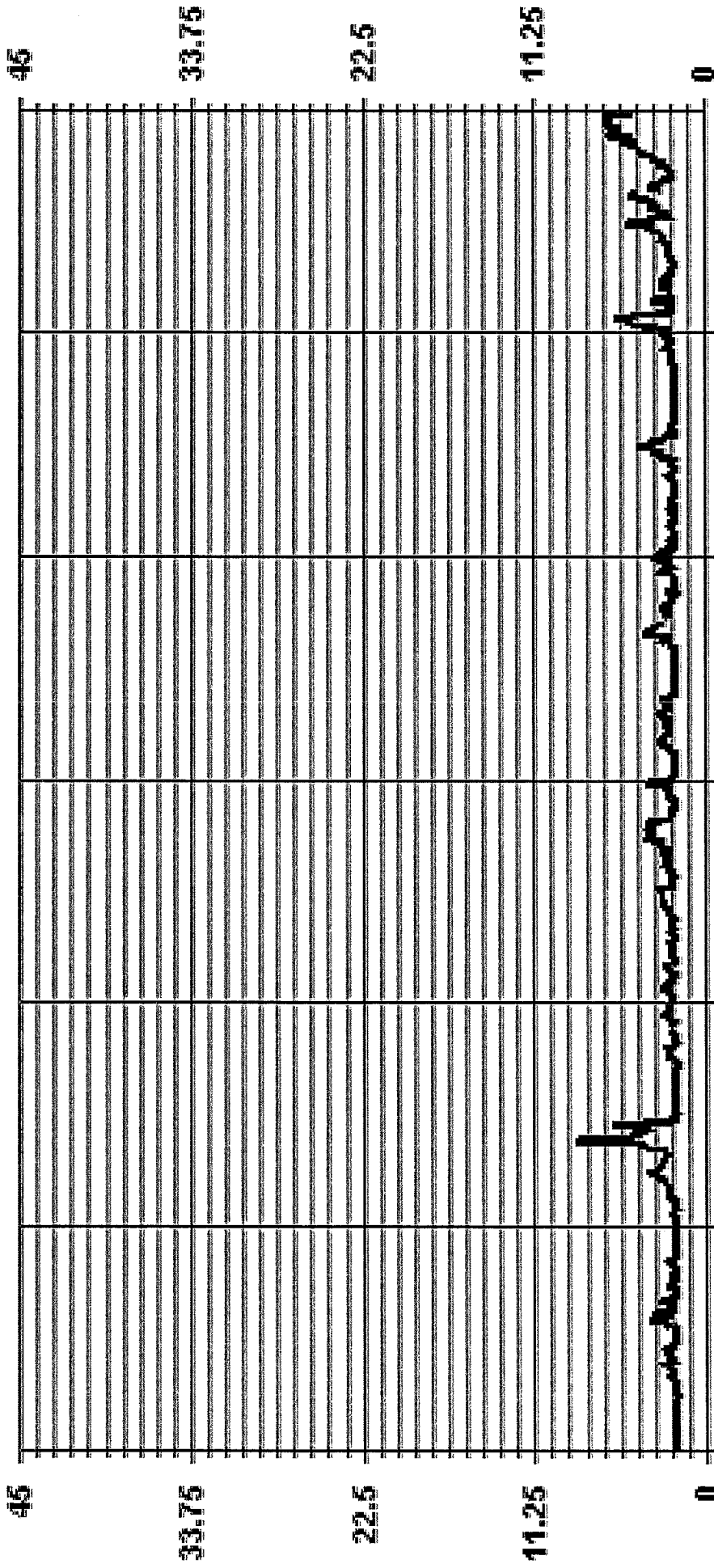
C	- CALIBRATION	Q	- QUALITY ASSURANCE
M	- MAINTENANCE	K	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	684	ON DAYS(S)	7
MAXIMUM 1-HR AVERAGE:	8.5 PPM	@ HOUR(S)	23
MAXIMUM 24-HR AVERAGE:	5.5 PPM	ON DAYS(S)	30
ISZ CALIBRATION TIME:	29 HRS	OPERATIONAL TIME:	720 HRS
MONTHLY CALIBRATION TIME:	4 HRS	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0.88	MONTHLY AVERAGE:	2.6 PPM

01 Hour Averages



— LICA35 - - - - - THC55 PPM



TOTAL HYDROCARBONS MAX instantaneous maximum in ppm

MST

DAY	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MAX.	24-HOUR AVG.	ROGS.		
1	2.2	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.0	1.9	1.9	1.9	1.9	1.9	2.2	2.0	24	
2	1.9	1.9	2.0	2.0	2.0	2.1	2.2	2.1	2.0	2.1	2.0	2.1	2.1	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.7	2.8	2.2	
3	2.5	2.4	2.3	2.6	2.7	2.6	2.8	2.8	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	4.6	4.6	6.8	
4	3.5	3.9	2.9	2.3	2.3	2.3	2.9	3.0	3.1	2.7	2.2	2.0	1.9	2.0	1.9	2.0	2.7	3.1	2.5	2.5	2.2	2.2	2.1	2.3	3.9	2.6	24	
5	2.3	2.2	2.1	2.2	2.3	2.2	2.8	2.5	2.0	1.9	2.2	2.2	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.8	2.1	24	
6	1.9	1.9	2.0	2.1	2.1	2.0	2.1	2.2	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.7	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.7	2.7	2.2	24	
7	2.8	2.7	3.1	3.2	3.7	4.4	3.9	3.4	3.3	3.3	3.1	3.0	2.9	3.0	2.6	2.6	3.0	3.1	4.8	4.6	5.0	6.2	11.2	3.9	3.9	24		
8	5.5	6.2	4.7	4.7	4.4	5.3	4.6	4.4	11.0	6.9	2.8	2.3	2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	11.0	3.7	24	
9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.8	2.0	24	
10	2.7	3.2	2.2	2.1	2.0	2.1	2.1	2.1	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	24	
11	2.4	2.4	2.4	2.3	2.2	2.5	2.4	2.5	3.1	3.1	2.8	2.7	2.3	2.1	2.1	2.1	2.1	2.1	2.4	2.5	2.7	2.7	2.7	2.7	2.1	3.1	24	
12	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.7	2.7	2.3	2.1	2.1	2.0	2.3	2.6	2.3	2.4	2.3	2.2	2.1	2.1	2.1	2.2	2.3	24	
13	2.4	2.5	2.4	2.6	2.7	2.7	2.8	2.8	3.0	2.9	2.9	2.9	3.0	3.2	3.0	3.2	4.0	5.6	3.9	2.5	2.2	2.3	2.3	2.3	2.2	2.6	24	
14	2.3	2.7	2.6	2.9	2.8	2.6	2.6	2.8	2.8	2.9	3.0	2.8	3.1	3.1	3.0	3.2	4.0	5.6	3.9	2.5	2.6	2.5	3.3	4.3	4.3	2.7	24	
15	3.8	3.9	3.8	3.8	2.7	2.4	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.4	2.5	2.6	2.5	2.5	3.3	4.3	4.3	2.7	24	
16	3.9	2.5	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	24
17	2.8	2.7	2.5	2.3	2.4	2.7	2.7	2.6	2.8	2.8	2.6	3.1	3.3	3.1	3.0	2.8	2.8	2.8	2.9	2.7	2.8	2.9	2.7	2.2	2.2	2.7	24	
18	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	24
19	2.2	2.4	2.8	3.0	2.6	2.6	3.0	3.7	4.4	4.0	3.6	3.7	4.0	3.6	3.7	4.0	3.6	3.7	4.0	3.6	3.7	4.0	3.6	3.7	4.0	3.6	2.4	24
20	2.6	2.4	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	24
21	3.1	3.3	3.2	2.9	2.6	2.6	2.5	2.2	2.1	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	24
22	2.2	2.2	2.3	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	24
23	2.1	2.3	2.4	2.3	2.2	2.9	3.0	3.7	3.7	3.2	2.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.4	24
24	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	24
25	1.9	1.9	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	24
26	2.5	2.6	2.8	3.2	4.6	6.3	6.5	2.4	5.1	4.8	3.8	2.8	2.3	2.5	2.5	2.4	2.7	4.8	2.7	2.3	2.5	2.5	2.5	2.5	2.5	2.5	2.4	24
27	3.0	2.9	2.7	2.9	2.9	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.4	24
28	2.6	2.8	3.0	3.1	3.0	3.2	3.8	3.8	3.8	3.8	5.0	5.4	4.6	4.2	3.6	2.8	2.9	2.8	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	2.4	24
29	3.8	4.9	5.1	5.0	5.1	5.0	5.1	5.0	5.1	5.0	5.1	5.0	5.1	5.0	5.1	5.0	5.1	5.0	5.1	5.0	5.1	5.0	5.1	5.0	5.1	5.0	2.4	24
30	4.5	5.0	4.8	5.1	5.3	5.1	5.6	5.6	5.7	6.9	6.5	6.3	6.3	6.1	6.9	6.4	6.3	7.4	6.6	6.7	6.6	6.6	6.6	6.6	6.6	6.6	2.4	24
HOURLY MAX	5.5	6.2	5.1	5.0	5.1	6.3	6.5	5.6	11.0	6.9	6.9	6.5	6.3	6.1	6.9	6.4	6.3	7.4	6.6	6.7	6.6	6.6	6.6	6.6	6.6	6.6	11.2	
HOURLY AVG	2.7	2.8	2.7	2.6	2.6	2.8	2.7	3.2	2.9	2.8	2.7	2.7	2.7	2.6	2.5	2.6	2.8	2.8	2.6	2.7	2.9	2.9	2.9	2.9	2.9	2.9	3.1	

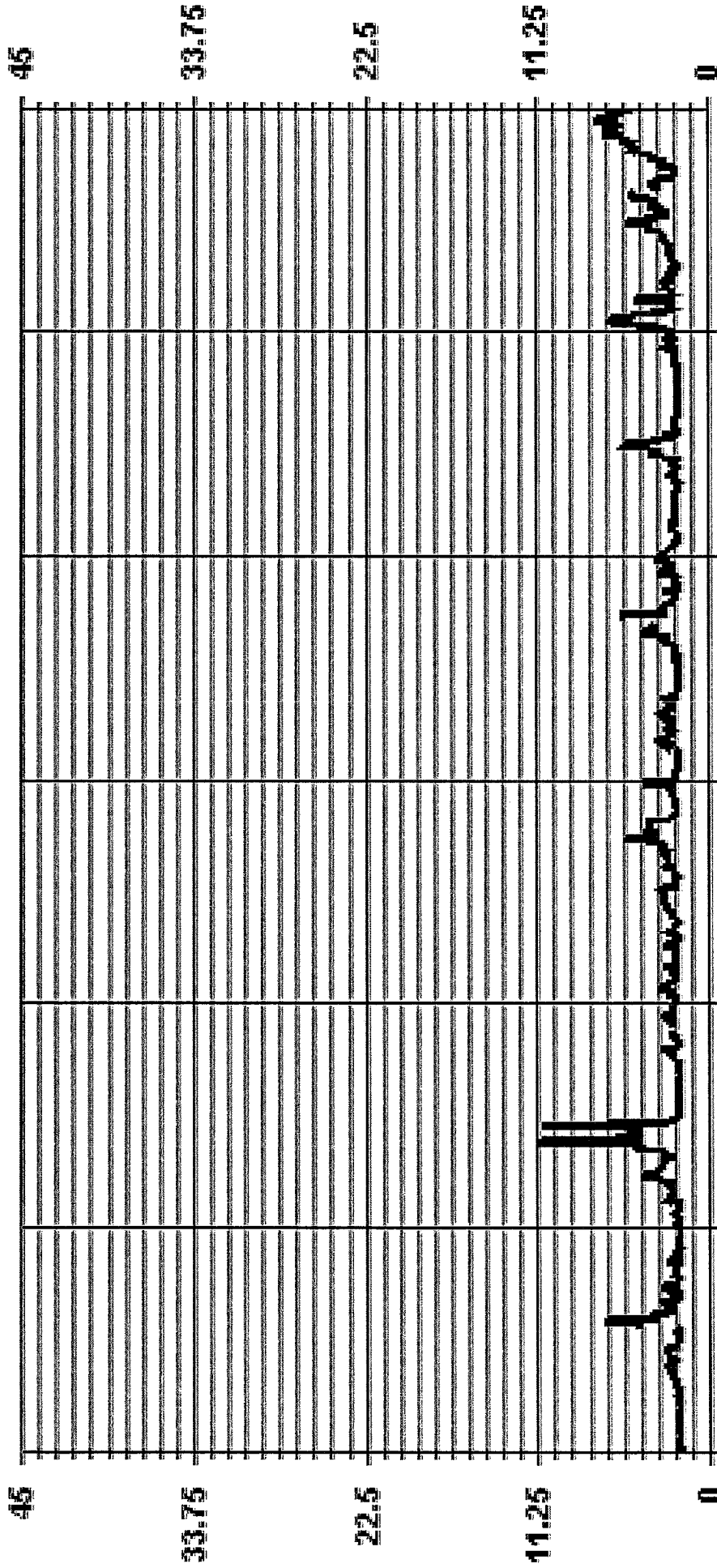
STATUS FLAG CODES

C	- CALIBRATION	Q	- QUALITY ASSURANCE
V	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPEECH CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	688
MAXIMUM INSTANTANEOUS VALUE:	11.2 PPM @ HOUR(S) 23 ON DAY(S) 7
OPERATIONAL TIME:	720 HRS
IZS CALIBRATION TIME:	29 HRS
MONTHLY CALIBRATION TIME:	4 HRS
STANDARD DEVIATION:	1.10
VAR- VARIOUS	

01 Hour Averages



— LICA35 THC55MAX PPM

LICA35
THC55 / WDR Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA35
 Parameter : THC55
 Units : PPM
 Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3.0	1.62	3.24	1.76	4.27	5.00	6.77	3.53	1.17	3.24	3.82	4.12	12.37	11.63	10.30	6.77	2.94	82.62
< 10.0	.29	.73	.14	1.03	2.20	1.47	1.03	.73	.73	.44	.58	1.47	1.91	2.35	1.76	.44	17.37
< 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.91	3.97	1.91	5.30	7.21	8.24	4.56	1.91	3.97	4.27	4.71	13.84	13.54	12.66	8.54	3.38	

Calm : .00 %

Total # Operational Hours : 679

Distribution By Samples

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3.0	11	22	12	29	34	46	24	8	22	26	28	84	79	70	46	20	561
< 10.0	2	5	1	7	15	10	7	5	5	3	4	10	13	16	12	3	118
< 50.0																	
>= 50.0																	
Totals	13	27	13	36	49	56	31	13	27	29	32	94	92	86	58	23	

Calm : .00 %

Total # Operational Hours : 679

Logger : 35 Parameter : THC55

Site : LICA35

Class Limits (PPM)

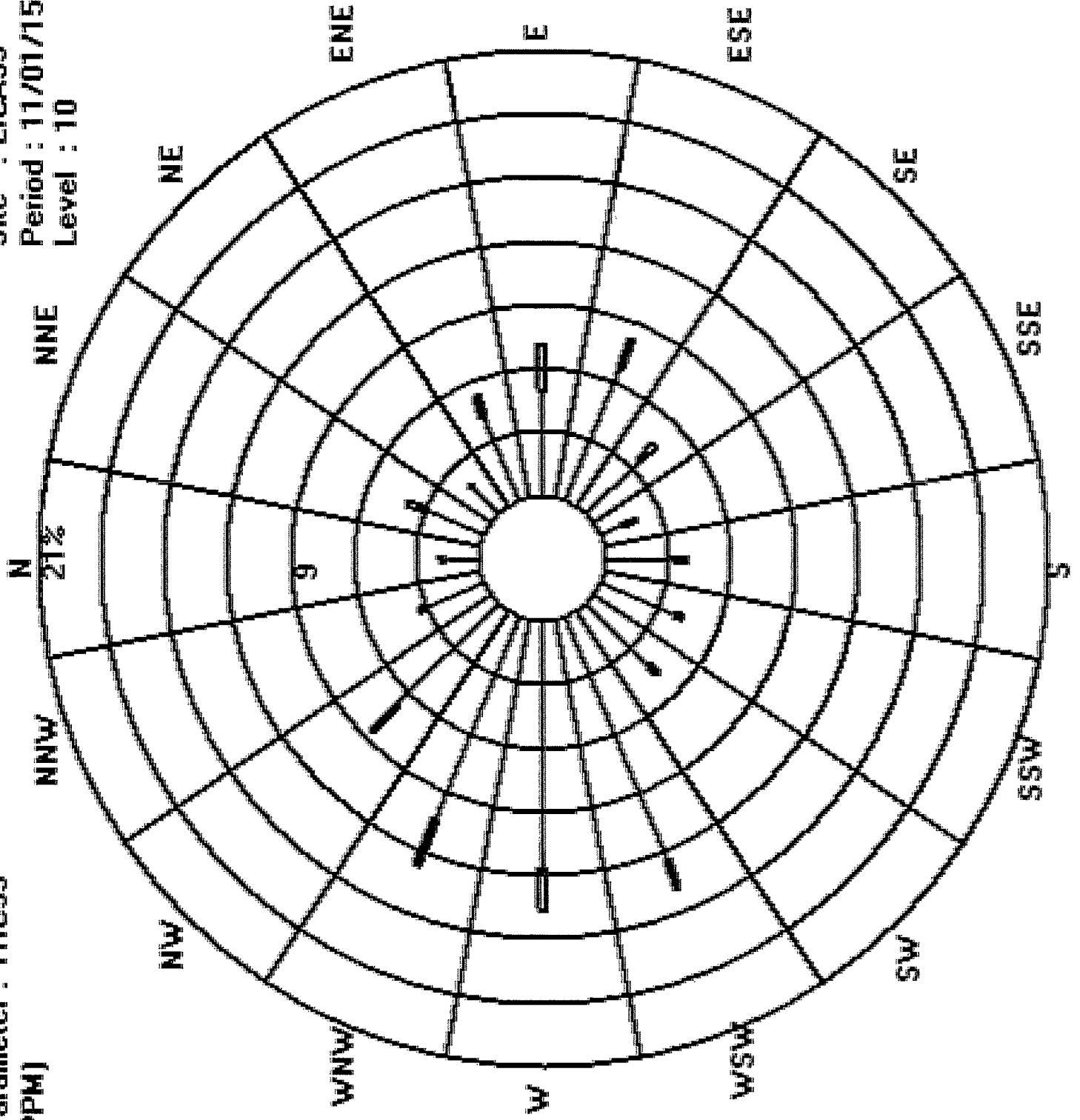
Period : 11/01/15-11/30/15

□ >= 50.0

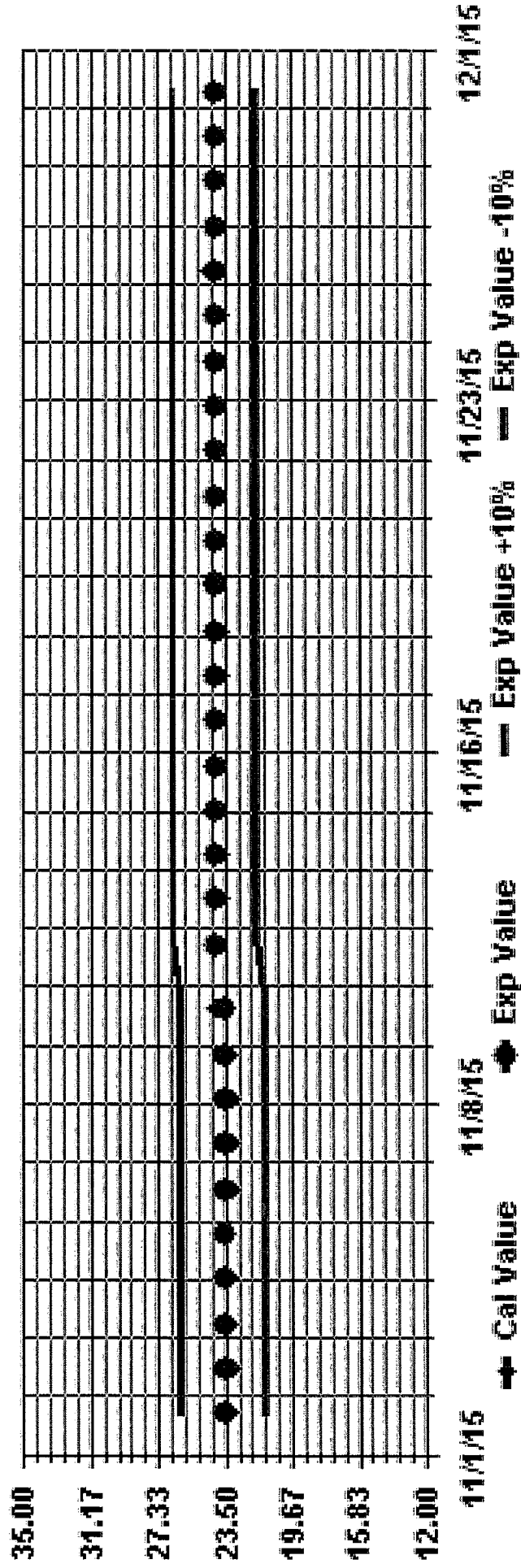
▤ < 50.0

▥ < 10.0

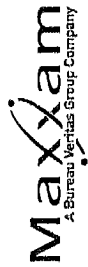
▧ < 3.0



Calibration Graph for Site: LICA35 Parameter: THC55 Sequence: THC55 Phase: SPAN



METHANE

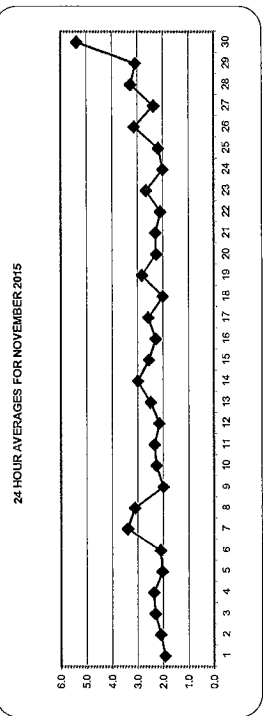


METHANE (CH4) hourly averages in ppm

DAY	METHANE (CH4) hourly averages in ppm																								DAILY MAX	DAILY AVG.	RDGS.		
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00					
1	2.1	2.0	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	1.9	24		
2	1.9	1.9	1.9	1.9	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	24	
3	2.2	2.3	2.2	2.3	2.6	2.5	2.4	2.7	2.5	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	24
4	3.0	3.2	3.2	3.2	2.4	2.2	2.2	2.6	2.9	2.9	2.5	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.4	24	
5	2.3	2.1	2.0	2.1	2.3	2.2	2.5	2.3	2.2	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	24	
6	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.2	2.1	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.5	24	
7	2.6	2.6	2.8	3.0	3.2	3.5	3.6	3.3	3.1	3.1	2.9	2.9	2.8	2.7	2.7	2.5	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.1	24	
8	4.7	5.1	4.5	4.5	3.8	4.7	4.0	4.2	4.0	4.3	2.5	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	3.1	24	
9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	24	
10	2.4	2.5	2.1	2.0	1.9	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	24	
11	2.3	2.3	2.3	2.2	2.2	2.3	2.4	2.3	2.4	2.8	2.8	2.7	2.5	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	24
12	2.0	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.3	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	24
13	2.4	2.4	2.4	2.5	2.6	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.4	24
14	2.2	2.4	2.5	2.7	2.6	2.5	2.5	2.5	2.5	2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.4	24
15	3.7	3.8	3.7	3.1	2.5	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.5	24	
16	3.3	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	24
17	2.8	2.6	2.4	2.3	2.3	2.5	2.6	2.5	2.6	2.5	2.6	2.5	2.9	3.1	2.9	2.8	2.5	2.5	2.6	2.7	2.8	2.4	2.4	2.5	2.5	2.5	2.4	2.6	24
18	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	24
19	2.1	2.3	2.4	2.8	2.5	2.4	2.9	3.3	4.0	3.7	3.5	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.4	24
20	2.4	2.2	2.1	2.1	2.1	2.0	2.5	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	24
21	2.9	3.1	3.0	2.5	2.3	2.6	2.4	2.1	2.0	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	24
22	2.1	2.1	2.3	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	24
23	2.0	2.1	2.3	2.2	2.1	2.4	2.9	3.1	3.5	2.9	3.0	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.4	24
24	2.1	2.0	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	24
25	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	24
26	2.4	2.5	2.5	3.1	4.0	4.7	5.0	5.8	4.9	4.4	3.4	2.4	2.2	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	24
27	2.8	2.7	2.6	2.7	2.8	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.4	24
28	2.3	2.7	2.9	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.4	24
29	3.5	4.3	4.9	4.5	3.1	3.3	3.6	3.1	3.0	2.8	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	24
30	3.7	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	2.4	24
HOURLY MAX	4.7	5.1	4.9	4.5	4.6	4.9	5.0	4.8	6.0	5.1	6.2	6.0	5.8	5.3	6.3	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	8.4	24
HOURLY AVG	2.5	2.6	2.6	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.8	24

STATUS FLAG CODES

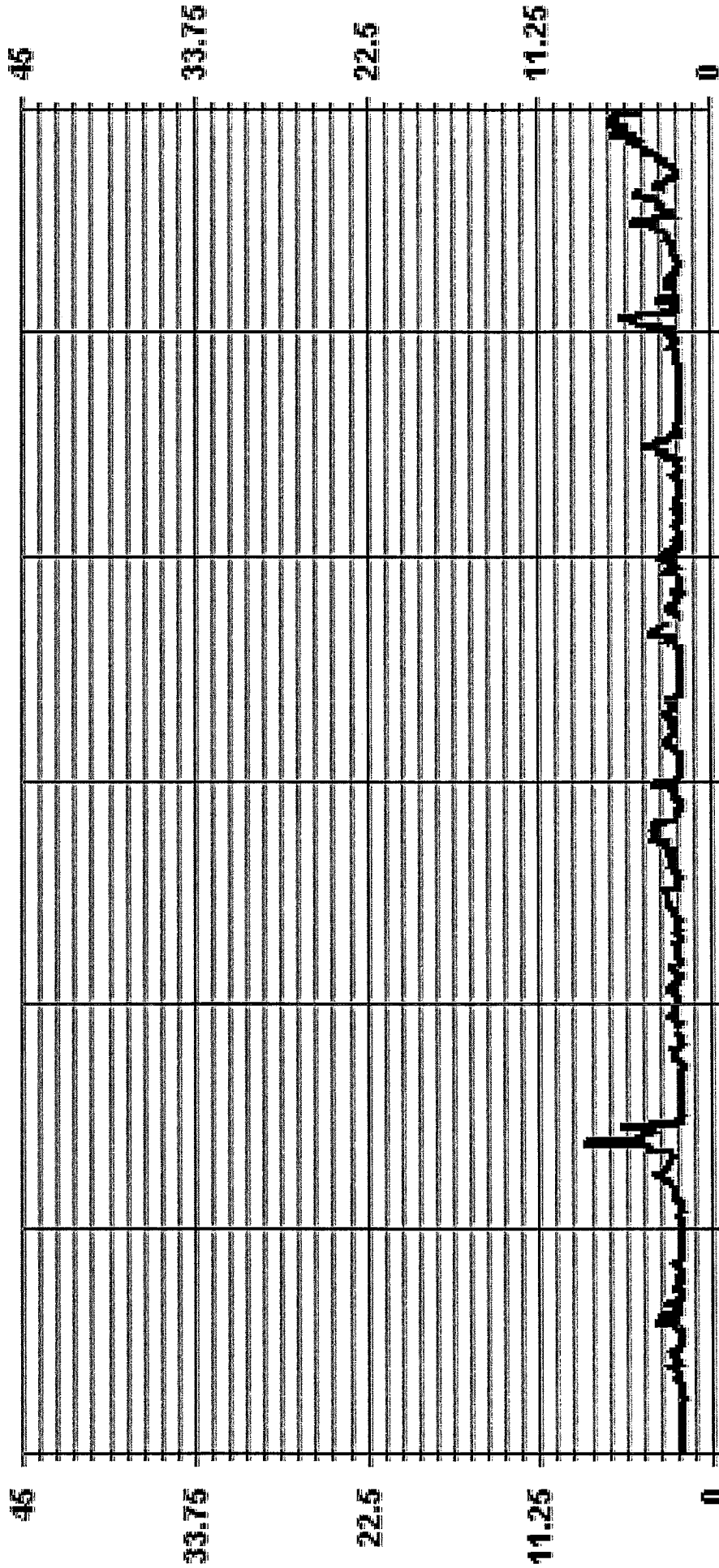
C	-CALIBRATION	Q	-QUALITY ASSURANCE
Y	-MAINTENANCE	R	-RECOVERY
S	-DAILY ZERO/SPAN CHECK	X	-MACHINE MALFUNCTION
P	-POWER FAILURE	O	-OPERATOR ERROR
G	-OUT-OF-REPAIR	K	-COLLECTION ERROR



MONTHLY SUMMARY

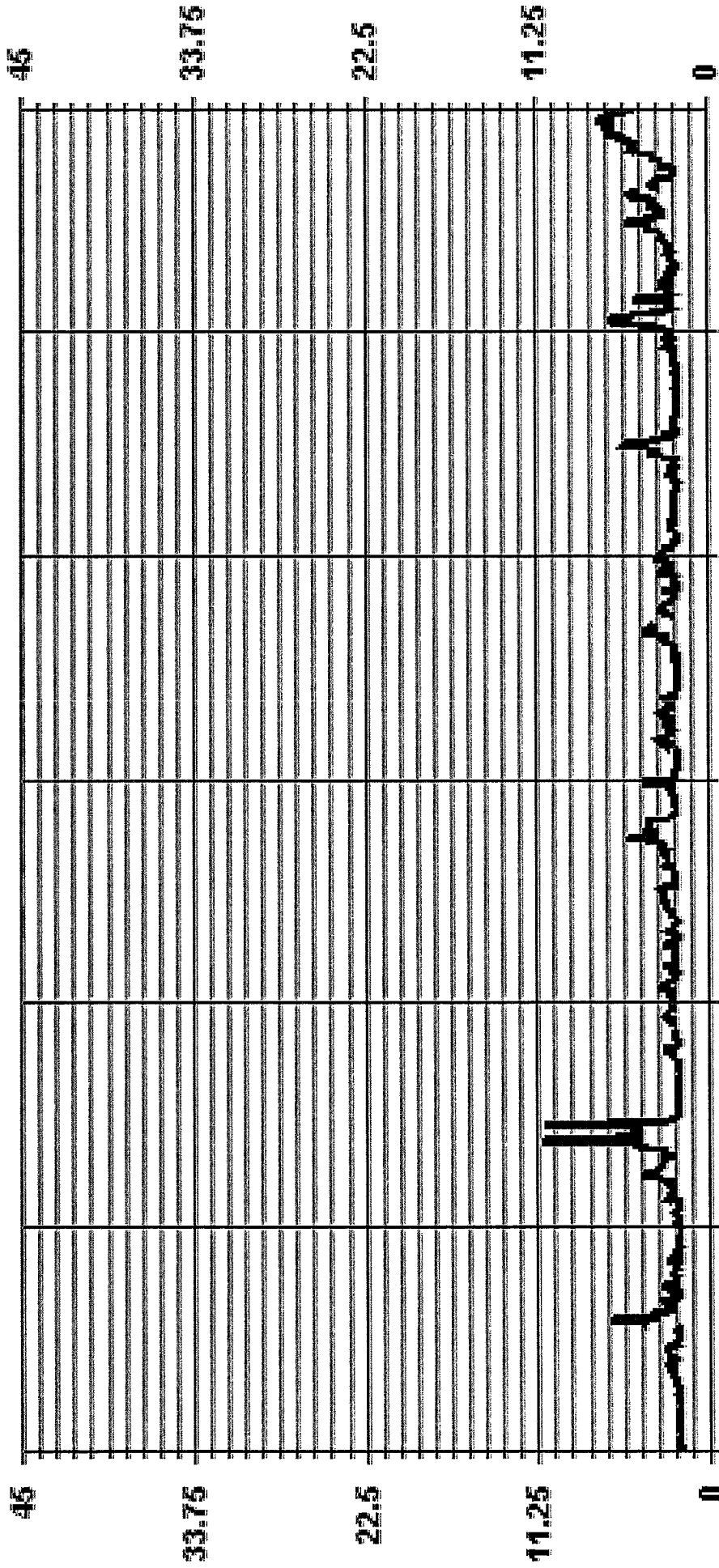
NUMBER OF NON-ZERO READINGS:	684	ON DAY(S)	7
MAXIMUM 1-HR AVERAGE:	8.4 PPM	ON DAY(S)	90
MAXIMUM 24-HR AVERAGE:	5.4 PPM	VAR-VARIOUS	
12S CALIBRATION TIME:	29 HRS	OPERATIONAL TIME:	720 HRS
MONTHLY CALIBRATION TIME:	4 HRS	AMID OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0.86	MONTHLY AVERAGE:	2.6 PPM

01 Hour Averages



— LIC-A35 METHANE PPM

01 Hour Averages



— LICA35 MATHMAX PPM

METHANE / WDR Joint Frequency Distribution (Percent)
 LICA35
 November 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA35
 Parameter : METHANE
 Units : PPM

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3.0	1.62	3.24	1.76	4.27	5.00	6.77	3.53	1.17	3.24	3.82	4.12	12.37	11.63	10.30	6.77	2.94	82.62
< 10.0	.29	.73	.14	1.03	2.20	1.47	1.03	.73	.73	.44	.58	1.47	1.91	2.35	1.76	.44	17.37
< 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.91	3.97	1.91	5.30	7.21	8.24	4.56	1.91	3.97	4.27	4.71	13.84	13.54	12.66	8.54	3.38	

Calm : .00 %

Total # Operational Hours : 679

Distribution By Samples

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3.0	11	22	12	29	34	46	24	8	22	26	28	84	79	70	46	20	561
< 10.0	2	5	1	7	15	10	7	5	5	3	4	10	13	16	12	3	118
< 50.0																	
>= 50.0																	
Totals	13	27	13	36	49	56	31	13	27	29	32	94	92	86	58	23	

Calm : .00 %

Total # Operational Hours : 679

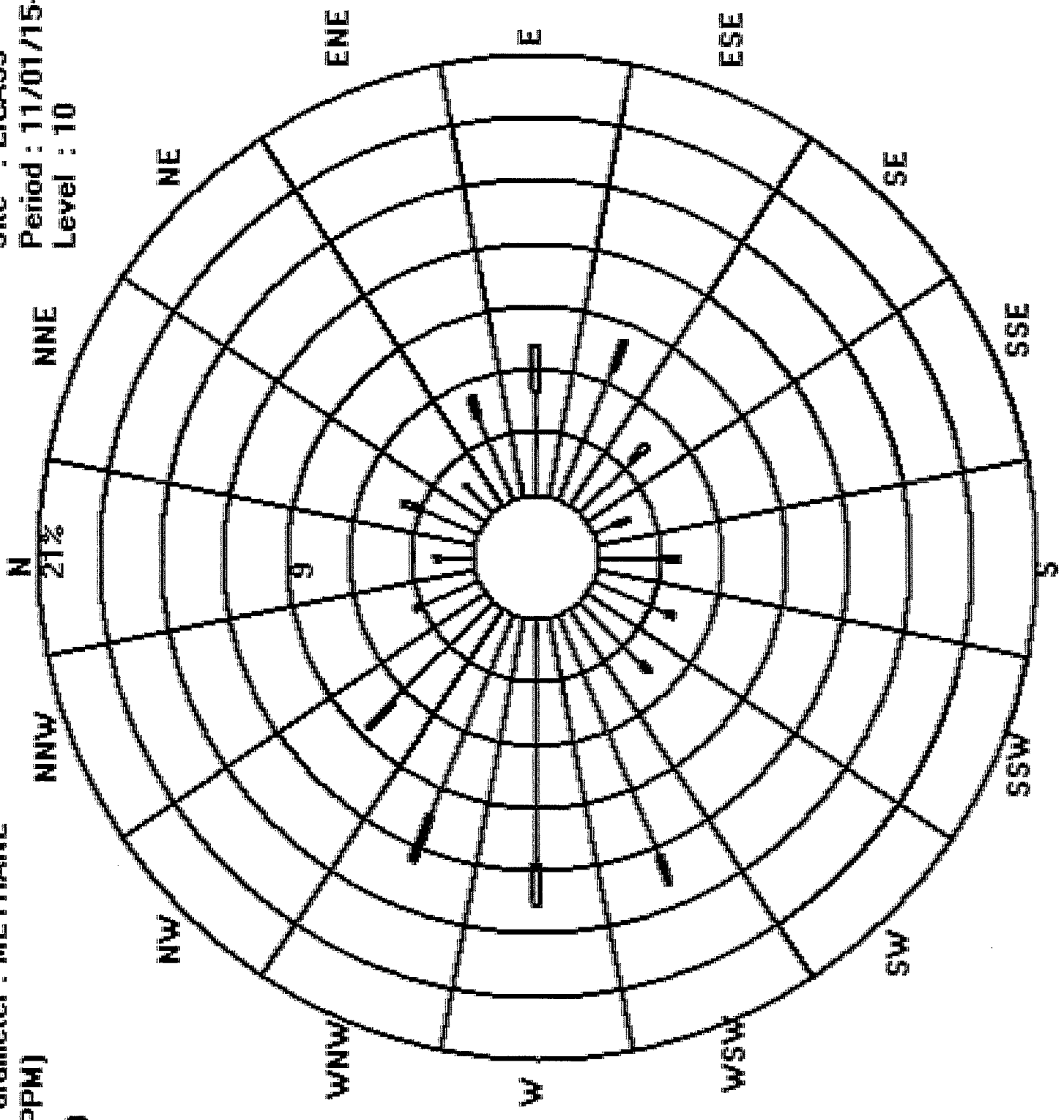
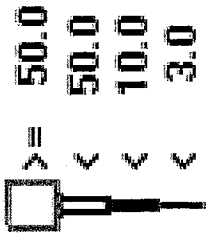
Logger : 35 Parameter : METHANE

Site : LICA35

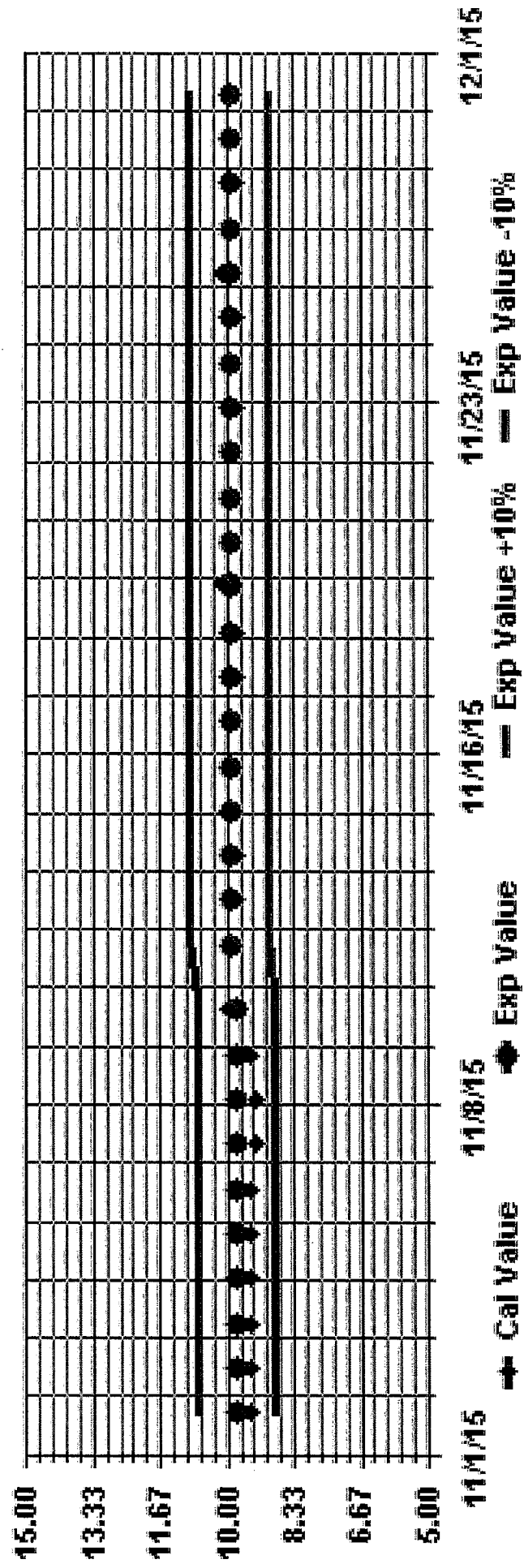
Class Limits (PPM)

Period : 11/01/15-11/30/15

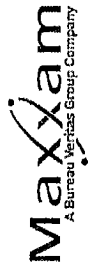
Level : 10



Calibration Graph for Site: LICA35 Parameter: METHANE Sequence: THC55 Phase: SPAN



NON-METHANE HYDROCARBON



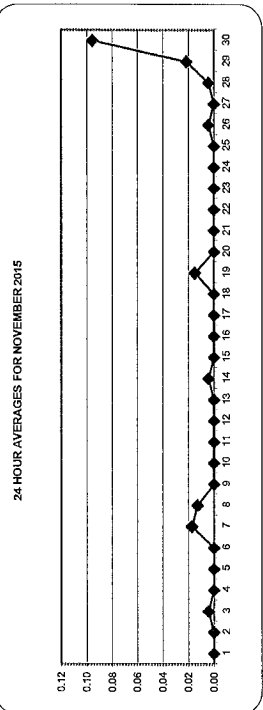
NON-METHANE HYDROCARBONS (NMHC) hourly averages in ppm

MST

DAY	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
HOURLY MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HOURLY AVG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DAILY MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DAILY AVG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24-HOUR AVG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROGS	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24

STATUS FLAG CODES

- C - CALIBRATION
- Y - MAINTENANCE
- S - DAILY ZERO/SPAN CHECK
- P - POWER FAILURE
- G - OUT FOR REPAIR
- Q - QUALITY ASSURANCE
- R - RECOVERY
- X - MACHINE MALFUNCTION
- O - OPERATOR ERROR
- K - COLLECTION ERROR



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	34	ON DAYS(S)	17, 23	ON DAYS(S)	19, 30
MAXIMUM 1-HR AVERAGE:	0.30	@ HOUR(S)		ON DAYS(S)	30
MAXIMUM 24-HR AVERAGE:	0.10	PPM		VARIOUS	
1ZS CALIBRATION TIME:	29	HRS		OPERATIONAL TIME:	720
MONTHLY CALIBRATION TIME:	4	HRS		AMD OPERATION UPTIME:	100.0
STANDARD DEVIATION:	0.03			MONTHLY AVERAGE:	0.01

01 Hour Averages

45						45
33.75						33.75
22.5						22.5
11.25						11.25
0						0

11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA35 NMHC PPM



NON-METHANE HYDROCARBONS MAX Instantaneous maximum in ppm

MST

HOURS START	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	DAILY	24-HOUR	RODG.	
HOURS END	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	1:00	MAX.	AVG.		
DAY																													
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
4	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
8	0.20	0.16	0.08	0.09	0.07	0.17	0.12	0.12	0.12	0.18	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
10	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	0.00	24
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
29	0.17	0.16	0.12	0.18	S	0.14	0.14	0.14	0.12	0.12	0.06	0.09	0.12	0.09	0.00	0.07	0.10	0.13	0.12	0.13	0.12	0.13	0.12	0.17	0.14	0.15	0.18	0.12	24
30	0.17	0.16	0.15	S	0.15	0.17	0.15	0.14	0.17	0.22	0.20	0.20	0.18	0.18	0.18	0.21	0.28	0.30	0.25	0.40	0.25	0.40	0.25	0.22	0.31	0.40	0.21	24	
HOURLY MAX	0.20	0.16	0.15	0.18	0.15	0.17	0.15	0.14	0.18	0.22	0.20	0.20	0.18	0.18	0.21	0.28	0.30	0.25	0.40	0.25	0.40	0.26	0.25	0.32	0.36	0.05			
HOURLY AVG	0.02	0.03	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.03	0.15	0.03	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.05		

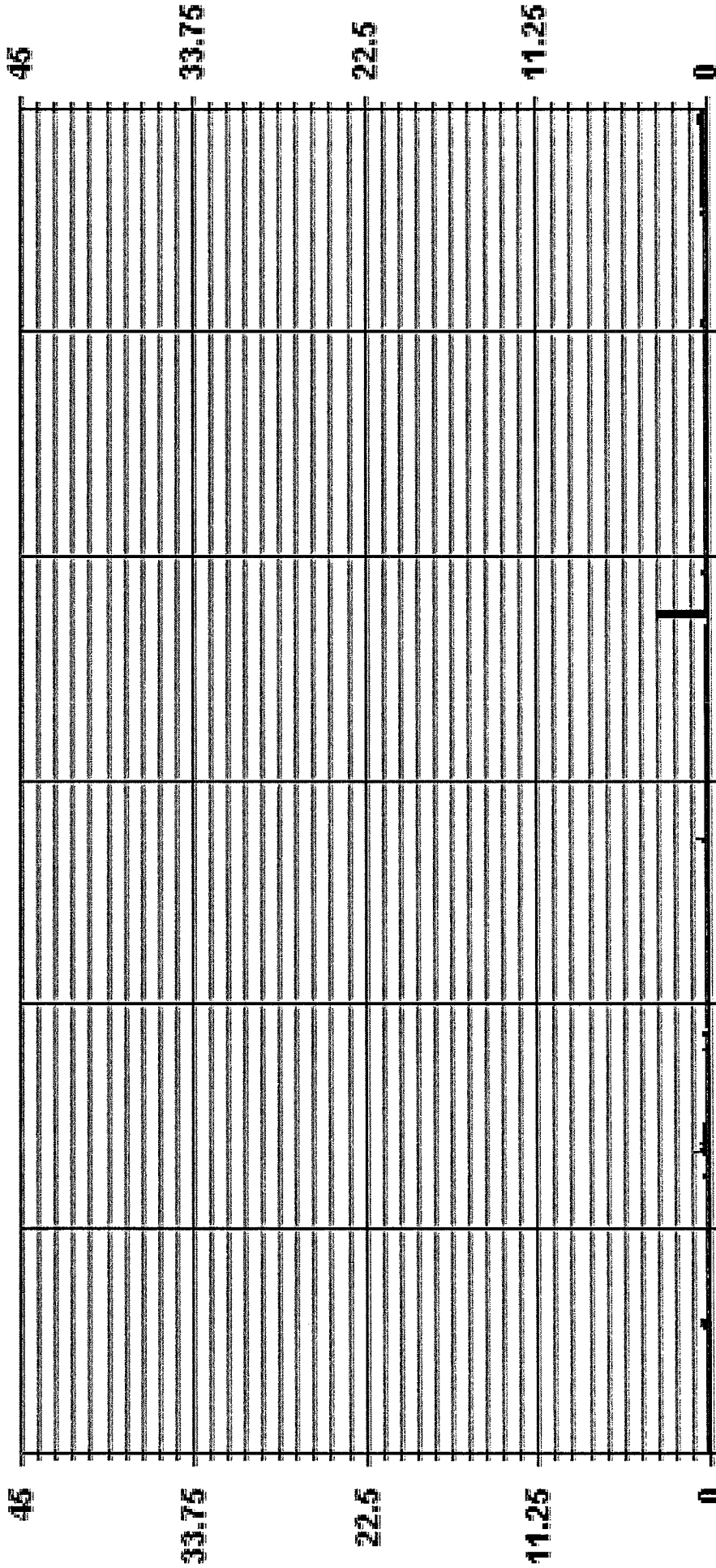
STATUS FLAG CODES

C	- CALIBRATION	O	- O	S	- QUALITY ASSURANCE
M	- MAINTENANCE	R	- RECOVERY		
D	- DAILY ZERO/Span CHECK	X	- MACHINE MALFUNCTION		
P	- POWER FAILURE	O	- OPERATOR ERROR		
G	- OUT FOR REPAIR	K	- COLLECTION ERROR		

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	100
MAXIMUM INSTANTANEOUS VALUE:	3.20 PPM @ HOUR(S) 17 ON DAY(S) 19
OPERATIONAL TIME:	720 HRS
MONTHLY CALIBRATION TIME:	4 HRS
STANDARD DEVIATION:	0.14

01 Hour Averages



— LICA35 NMHC MAX PPM

LICA35
 NMHC / WDR Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA35
 Parameter : NMHC
 Units : PPM

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< .2	1.91	3.97	1.91	5.30	7.21	8.10	4.56	1.91	3.97	4.27	4.71	13.84	13.40	12.66	8.54	3.38	99.70
< .5	.00	.00	.00	.00	.00	.14	.00	.00	.00	.00	.00	.00	.14	.00	.00	.00	.29
< 1.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 2.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 4.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 4.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.91	3.97	1.91	5.30	7.21	8.24	4.56	1.91	3.97	4.27	4.71	13.84	13.54	12.66	8.54	3.38	

Calm : .00 %

Total # Operational Hours : 679

Distribution By Samples

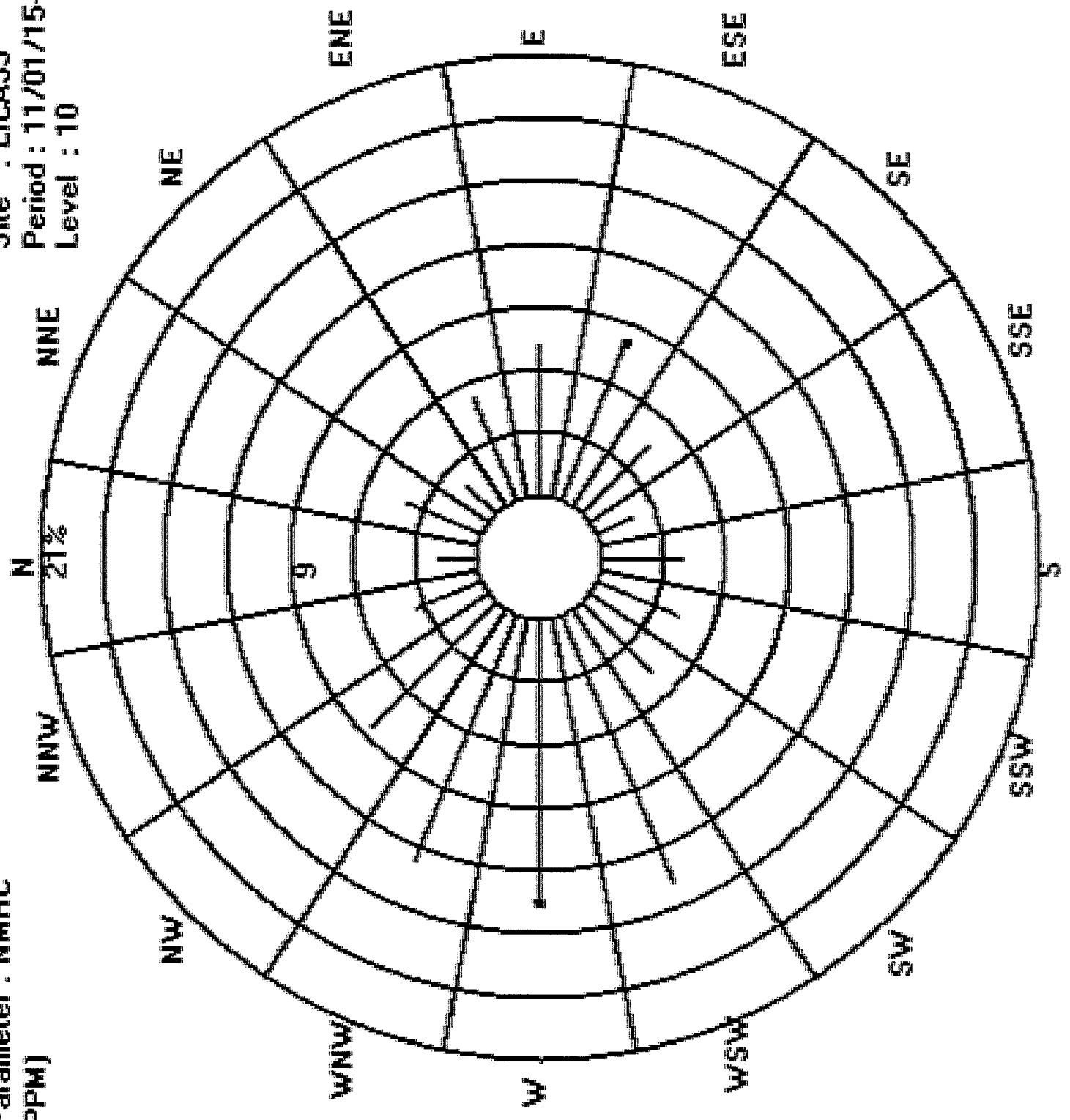
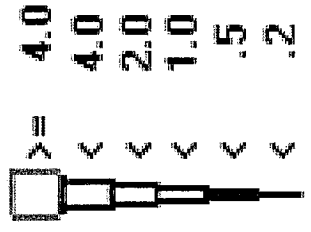
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< .2	13	27	13	36	49	55	31	13	27	29	32	94	91	86	58	23	677
< .5						1						1					2
< 1.0																	
< 2.0																	
< 4.0																	
>= 4.0																	
Totals	13	27	13	36	49	56	31	13	27	29	32	94	92	86	58	23	

Calm : .00 %

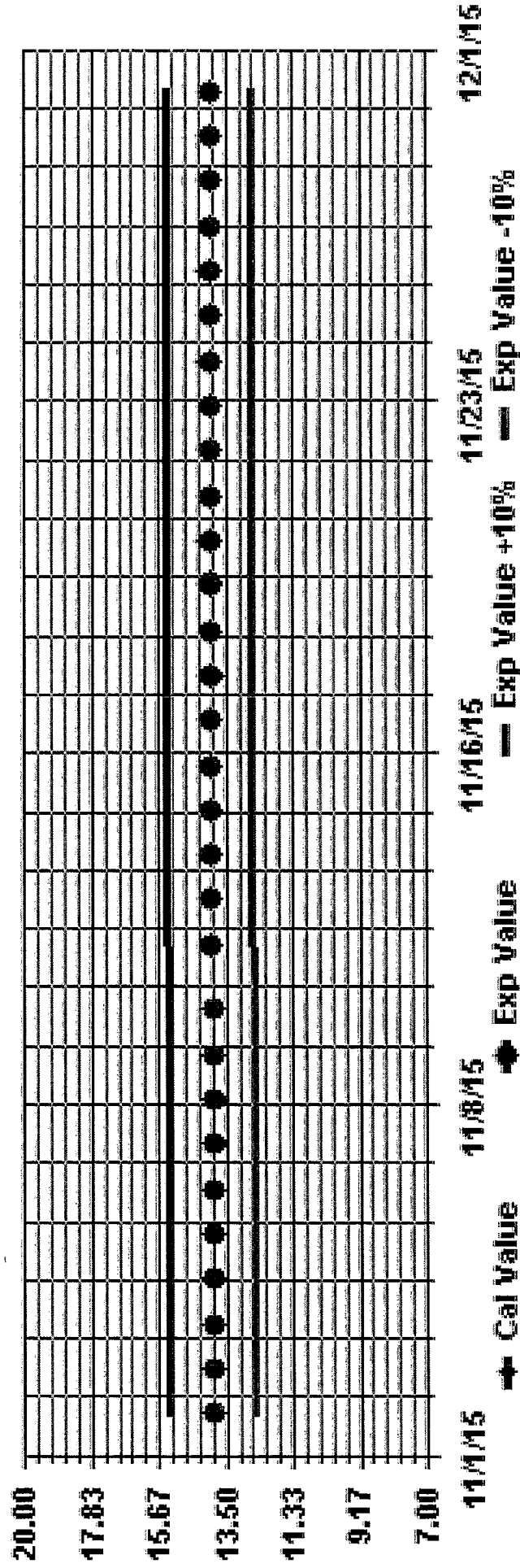
Total # Operational Hours : 679

Site : LICA35
 Period : 11/01/15-11/30/15
 Level : 10

Logger : 35 Parameter : NMHC
 Class Limits (PPM)



Calibration Graph for Site: LICA35 Parameter: NMHC Sequence: THC55 Phase: SPAN



OXIDES OF NITROGEN



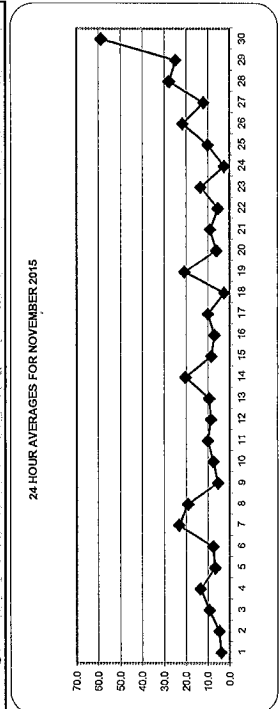
OXIDES OF NITROGEN (NOx) hourly averages in ppb

MST

DAY	HOURLY AVERAGE																								24-HOUR AVG.	RODS							
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00									
1	5.6	4.5	4.0	4.1	4.5	5.0	5.0	4.5	3.9	3.7	3.5	3.5	3.2	3.2	3.1	3.4	3.6	3.2	3.6	4.2	3.8	3.8	3.8	3.8	3.8	5.6	3.9	24					
2	2.4	2.2	2.9	2.5	2.8	2.3	2.3	2.5	2.7	2.4	2.3	2.2	2.6	3.9	6.1	6.4	6.9	8.0	8.8	7.6	5.4	5.4	5.4	5.4	5.4	10.8	14.0	4.8	24				
3	7.5	8.6	6.9	8.6	16.6	15.9	13.1	17.8	13.4	7.6	7.6	5.4	6.0	4.6	4.4	4.4	4.7	5.9	7.3	6.7	5.4	5.4	5.4	5.4	14.8	11.8	14.9	9.3	24				
4	19.9	28.9	24.5	11.2	9.8	9.8	12.5	29.3	47.6	28.3	10.2	5.3	4.2	3.8	3.5	4.4	7.8	13.2	9.4	5.4	6.0	6.0	6.0	6.0	6.0	4.9	5.1	9.7	47.6	13.4	24		
5	13.5	7.7	6.8	8.8	15.9	15.1	19.6	19.0	13.6	3.2	1.9	2.2	2.1	2.4	2.0	2.1	2.2	2.8	2.9	2.7	2.8	3.2	3.2	3.2	3.2	2.8	3.2	19.6	6.8	24			
6	3.1	3.1	3.0	4.5	4.5	4.1	7.4	16.5	14.5	8.1	5.6	5.3	4.6	4.0	4.2	8.9	9.7	5.4	12.2	13.1	10.7	9.5	9.5	9.5	9.8	16.5	7.7	24	24				
7	8.5	9.1	11.0	14.9	13.2	16.7	16.6	24.4	27.1	19.4	19.5	19.1	17.2	14.6	16.5	11.0	17.5	18.9	35.2	29.0	25.8	47.3	109.3	25.2	24	24	24	24	24	24			
8	58.3	36.1	32.4	26.8	28.8	40.3	38.9	45.5	57.9	34.9	8.5	4.7	4.4	5.0	3.7	5.4	2.5	2.2	1.8	1.9	1.6	2.2	2.6	2.9	58.3	19.3	24	24	24	24			
9	2.3	2.5	2.4	2.4	2.4	2.5	2.2	2.3	1.9	2.3	2.5	2.1	3.0	2.6	3.0	3.9	3.5	6.0	10.7	15.3	16.2	17.5	14.3	17.5	5.4	24	24	24	24	24	24		
10	10.8	9.6	3.7	3.1	2.9	3.3	3.5	4.2	4.6	4.5	C	C	C	C	C	C	C	13.0	18.9	18.4	10.3	5.2	5.0	5.7	18.9	7.5	24	24	24	24	24		
11	5.1	6.6	5.3	5.2	4.0	6.2	5.7	8.9	15.8	5.4	18.7	14.9	19.4	9.3	5.7	5.8	9.3	8.3	13.5	15.6	17.7	14.3	5.4	6.4	19.4	10.1	24	24	24	24	24		
12	6.4	9.0	10.0	7.8	8.5	8.8	9.7	15.7	19.6	13.9	10.3	6.6	5.2	3.9	4.3	9.0	6.4	11.2	8.3	6.0	6.1	5.4	5.4	5.4	6.7	19.6	8.6	24	24	24	24	24	
13	8.0	7.1	8.0	7.5	8.4	9.0	11.1	14.2	13.5	11.2	9.5	9.9	10.8	12.9	16.9	9.4	9.8	8.7	8.1	5.3	5.4	5.4	5.4	5.4	6.3	16.9	9.5	24	24	24	24	24	
14	8.4	11.8	12.8	13.9	12.8	14.8	14.8	17.6	21.7	27.7	31.5	18.8	17.8	17.0	15.1	16.3	32.5	41.4	40.0	20.1	20.6	21.4	20.1	41.4	20.4	24	24	24	24	24	24	24	
15	15.6	13.9	11.5	8.3	4.8	4.1	2.9	3.1	2.7	2.7	3.7	3.1	3.2	3.2	4.2	5.9	6.7	5.6	5.4	8.1	9.7	14.0	16.3	42.6	42.6	8.5	24	24	24	24	24	24	
16	23.0	6.6	3.4	2.6	2.7	2.3	2.3	2.7	2.2	2.0	2.1	2.4	1.8	1.4	1.7	2.2	4.2	4.2	2.2	2.2	4.2	4.2	4.2	10.6	23.5	7.0	24	24	24	24	24	24	
17	10.4	8.5	6.8	5.8	7.1	9.6	12.0	11.3	12.9	10.1	10.4	14.4	16.2	13.1	11.9	9.1	12.0	9.6	11.1	10.0	7.7	4.5	6.3	16.2	10.0	24	24	24	24	24	24	24	
18	3.9	2.8	2.7	2.5	2.1	2.0	1.8	2.3	2.4	2.1	1.9	2.0	2.1	2.1	1.7	1.7	2.1	2.8	3.1	1.6	2.8	3.9	3.6	3.1	3.9	2.5	24	24	24	24	24	24	
19	6.1	9.4	12.3	23.3	15.3	13.2	19.2	30.2	43.3	34.9	39.5	Q	Q	Q	Q	Q	Q	29.7	16.2	16.7	23.4	18.9	13.2	8.6	43.3	20.7	24	24	24	24	24	24	
20	7.3	2.9	1.7	1.6	2.0	0.9	5.8	2.9	1.3	0.8	0.9	1.4	1.7	1.7	1.7	1.7	1.7	4.5	8.8	16.4	15.7	9.4	8.1	7.7	10.6	11.8	16.6	6.1	24	24	24	24	24
21	14.1	19.4	15.8	13.1	12.4	12.6	10.3	7.1	5.8	8.7	7.6	6.0	5.7	6.1	8.1	8.1	9.3	8.4	9.3	6.8	5.7	5.2	5.2	4.7	19.4	9.0	24	24	24	24	24	24	
22	5.8	6.4	7.5	5.0	4.0	5.3	6.0	5.4	6.7	5.8	3.9	3.9	3.5	1.7	1.7	4.1	4.1	4.8	5.5	6.0	11.3	7.4	5.3	5.3	11.3	5.3	24	24	24	24	24	24	
23	5.4	7.7	12.7	10.1	8.6	12.1	17.5	24.3	31.1	20.9	32.1	35.1	21.3	14.0	11.6	10.8	10.9	3.4	2.8	3.4	4.4	3.4	3.4	35.1	13.3	24	24	24	24	24	24	24	
24	4.9	4.7	3.7	4.2	3.5	3.0	2.4	2.9	2.8	5.1	2.1	2.2	2.6	1.8	1.2	1.3	1.2	1.2	1.9	2.3	1.6	2.2	2.1	2.3	4.9	2.5	24	24	24	24	24	24	
25	1.8	1.6	2.7	3.0	2.9	2.6	4.9	9.1	5.1	12.6	11.0	8.5	8.7	7.9	8.8	8.5	16.3	19.6	16.1	16.0	14.2	17.5	19.1	18.6	19.6	10.1	24	24	24	24	24	24	
26	14.9	15.9	11.6	16.8	26.8	34.7	44.2	5.1	60.0	47.6	39.2	23.5	13.6	9.2	15.8	15.2	13.6	14.8	20.9	12.0	10.2	11.8	11.2	14.5	60.0	21.7	24	24	24	24	24	24	
27	15.9	16.6	16.3	19.6	19.2	15.6	5.1	9.8	12.8	8.9	7.8	8.1	6.1	5.0	4.3	5.7	6.1	14.7	20.2	17.8	18.6	11.8	9.5	7.7	20.2	12.1	24	24	24	24	24	24	
28	11.2	13.5	18.6	15.9	13.9	5.1	22.7	31.8	36.2	35.9	49.0	45.9	33.9	29.4	24.0	17.2	22.5	21.8	37.0	25.4	33.7	32.7	35.0	34.0	49.0	27.9	24	24	24	24	24	24	
29	30.2	35.8	39.5	43.9	5.1	30.8	31.3	45.0	32.7	24.6	20.4	12.9	11.9	11.7	10.3	12.6	15.8	20.6	29.3	24.0	19.9	25.3	23.0	21.6	45.0	24.9	24	24	24	24	24	24	
30	31.4	49.6	53.3	5.1	44.1	48.8	52.0	53.8	70.0	72.6	69.0	61.9	62.9	57.9	48.8	53.8	66.2	73.2	74.4	73.7	76.6	69.7	46.2	42.2	76.6	56.8	24	24	24	24	24	24	
HOURLY MAX	58.3	49.6	53.3	43.9	44.1	48.8	52.0	53.8	70.0	72.6	69.0	61.9	62.9	57.9	48.8	53.8	66.2	73.2	74.4	73.7	76.6	69.7	46.2	42.2	76.6	56.8	24	24	24	24	24	24	
HOURLY AVG	12.1	12.1	11.8	10.2	10.5	12.1	13.7	16.0	20.0	16.3	14.3	12.0	11.3	9.6	9.1	9.6	11.3	14.1	15.6	13.4	14.1	13.7	13.1	13.1	15.4	13.1	15.4	13.1	15.4	13.1	15.4	13.1	15.4

STATUS FLAG CODES

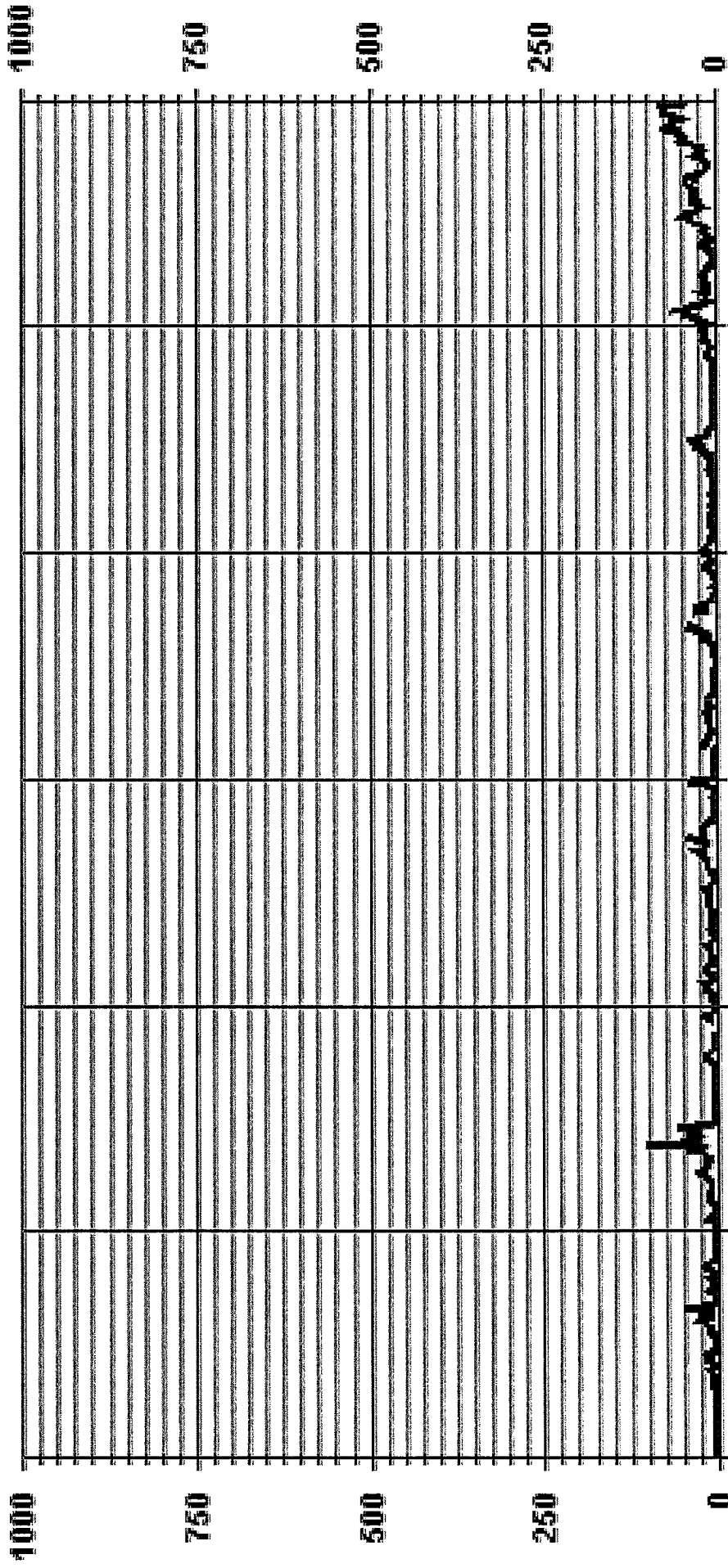
- C - CALIBRATION
- S - DAILY ZERO/SPAN/CHECK
- P - POWER FAILURE
- G - OUT FOR REPAIR
- Q - QUALITY ASSURANCE
- R - RECOVERY
- X - MACHINE MALFUNCTION
- O - OPERATOR ERROR
- K - COLLECTION ERROR



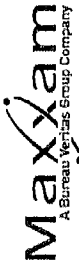
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	678	PPB @ HOUR(S)	23	ON DAY(S)	7
MAXIMUM 1-HR AVERAGE:	103.3	PPB	23	ON DAY(S)	30
MAXIMUM 24-HR AVERAGE:	58.8	PPB	23	VAR-VARIOUS	
ISZ CALIBRATION TIME:	29	HRS		OPERATIONAL TIME:	720
MONTHLY CALIBRATION TIME:	7	HRS		AMD OPERATION UPTIME:	100.0
STANDARD DEVIATION:	13.79			MONTHLY AVERAGE:	13.0

01 Hour Averages



— LICA35 NOX_ PPB



OXIDES OF NITROGEN MAX instantaneous maximum in ppb

MST

DAY	HOURS																								24-HOUR AVG.	RODGS.			
	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00			24:00		
1	6.9	5.3	5.1	5.1	5.5	6.0	6.1	5.7	5.2	5.0	4.7	4.5	4.5	3.9	4.1	4.3	5.1	4.2	4.4	5.8	4.8	4.8	4.8	4.4	6.9	5.0	24		
2	3.6	3.4	3.6	3.4	3.9	3.4	3.4	3.5	3.5	3.4	3.5	3.1	3.6	4.7	7.3	8.0	8.0	9.9	12.2	8.8	8.2	8.2	8.2	15.2	15.8	6.2	24		
3	10.6	9.9	8.3	16.7	18.7	17.5	15.0	20.8	20.8	9.1	9.3	9.2	7.2	5.6	5.3	5.6	5.5	8.2	8.9	8.4	8.4	8.4	8.4	18.7	18.7	20.8	12.1	24	
4	28.1	33.8	33.1	26.4	11.1	10.9	15.8	43.4	51.5	41.4	12.8	7.1	5.5	4.8	4.6	6.2	12.2	17.6	16.3	7.1	7.1	7.1	6.4	7.9	11.6	51.5	18.1	24	
5	15.4	12.6	8.9	10.6	17.6	16.7	25.9	20.9	5.4	2.8	2.5	3.1	3.0	3.0	3.3	2.8	2.8	2.8	2.8	2.8	2.8	2.8	3.3	3.3	3.8	25.9	8.8	24	
6	3.9	4.2	5.1	5.2	6.0	6.1	10.5	19.6	18.9	13.2	7.7	6.0	6.0	6.1	5.4	13.2	16.0	15.7	16.4	12.0	10.2	10.2	10.9	11.8	19.6	10.0	24		
7	9.5	9.9	20.0	20.3	14.7	19.5	18.5	38.1	38.0	21.2	20.9	21.8	21.0	17.0	20.6	13.9	13.9	24.2	23.2	41.0	35.6	37.9	67.4	111.3	111.3	28.9	24		
8	76.5	41.9	34.1	33.3	35.1	50.4	47.7	51.0	98.3	85.8	11.9	7.1	5.7	6.0	4.7	4.3	4.3	4.3	3.3	2.9	2.8	2.5	3.3	3.7	3.9	98.3	26.8	24	
9	3.6	3.3	3.1	3.5	3.6	3.2	2.9	3.2	3.2	3.2	3.2	3.2	3.2	4.3	4.3	4.3	4.3	4.3	4.3	4.3	10.0	14.9	19.9	19.1	19.7	19.3	19.9	7.1	24
10	13.8	14.4	4.9	4.0	3.8	4.3	4.4	5.3	6.1	5.9	C	C	C	C	C	C	C	C	C	19.4	31.6	27.9	14.1	7.6	7.3	6.7	31.6	10.7	24
11	7.0	7.5	7.2	6.4	5.2	8.3	7.6	19.8	S	24.4	18.1	23.7	14.9	7.1	6.7	12.0	9.7	17.5	17.7	21.1	20.9	S	7.8	24.4	12.9	24			
12	7.7	11.1	12.0	10.3	9.6	9.9	11.7	22.2	27.2	20.5	13.0	7.9	6.1	5.9	7.8	10.2	11.2	13.1	11.5	7.5	7.3	S	7.0	7.4	27.2	11.2	24		
13	9.1	8.6	9.0	9.0	9.6	10.0	12.8	17.0	17.3	16.4	11.0	11.9	12.8	17.3	19.1	15.9	12.7	16.1	13.6	7.1	S	7.4	9.9	7.9	19.1	12.2	24		
14	11.0	15.8	14.0	15.8	14.9	17.4	17.9	23.7	29.3	30.4	37.1	26.3	20.7	19.0	16.9	18.7	38.9	51.1	47.2	S	23.5	24.2	23.8	22.2	51.1	24.3	24		
15	18.1	16.2	12.4	12.3	6.0	5.1	4.2	4.1	3.4	3.8	4.9	4.3	4.6	4.1	7.1	9.3	9.1	6.8	S	14.9	12.6	23.3	34.2	51.0	51.0	11.8	24		
16	40.9	9.1	5.3	3.5	3.6	3.2	3.0	3.6	3.0	2.8	2.8	3.1	2.5	2.5	2.6	3.8	6.6	S	34.7	22.9	20.4	17.4	15.9	11.8	40.9	9.8	24		
17	11.6	9.3	8.4	7.8	8.4	15.9	13.9	14.1	14.6	11.3	11.7	15.8	19.7	17.4	16.3	14.9	S	17.4	11.1	12.2	10.8	9.8	5.8	7.5	19.7	12.4	24		
18	5.2	3.7	3.6	3.3	2.9	2.7	2.5	2.9	3.0	2.8	2.6	2.6	2.7	2.7	2.7	2.7	S	2.6	4.6	4.7	2.5	4.0	5.0	4.6	3.9	5.2	3.4	24	
19	8.8	10.6	20.8	26.7	19.5	14.8	23.8	32.3	50.2	39.4	45.7	Q	Q	Q	Q	Q	Q	Q	Q	64.1	24.9	23.0	32.3	26.7	16.0	12.9	64.1	27.4	24
20	9.8	6.5	3.2	2.9	3.7	1.8	11.9	6.2	2.6	1.8	1.7	2.6	3.3	S	5.6	11.9	19.4	19.6	14.9	9.5	9.0	12.8	16.3	18.0	19.6	8.5	24		
21	15.3	23.4	19.8	17.4	14.3	14.3	12.2	8.2	6.9	10.6	8.7	7.3	S	6.5	8.0	10.9	10.9	10.8	11.0	8.4	8.3	6.7	6.6	7.4	23.4	11.0	24		
22	8.0	8.7	8.5	7.6	4.9	7.6	7.6	8.3	9.6	9.4	7.9	S	4.9	2.9	2.9	7.3	5.8	5.7	7.9	9.9	19.8	8.6	8.3	7.1	19.8	7.8	24		
23	6.6	12.4	15.4	12.6	10.1	17.2	20.6	33.0	35.1	24.3	S	38.3	48.9	38.1	15.3	12.4	13.6	14.5	5.2	3.8	4.7	5.7	4.4	4.2	48.9	17.2	24		
24	5.9	5.6	4.5	5.1	4.7	4.0	3.1	3.7	3.5	S	2.9	3.1	4.9	3.8	1.9	1.9	2.0	1.8	3.7	3.7	3.7	2.2	3.7	3.2	3.3	5.9	3.6	24	
25	2.4	2.4	2.4	3.9	4.0	4.1	3.6	8.3	12.1	S	14.0	12.2	10.0	9.1	10.2	11.4	23.3	22.3	19.1	18.1	15.7	19.0	20.6	20.1	23.3	12.0	24		
26	15.7	20.8	15.5	18.6	34.4	41.5	48.9	S	63.8	50.0	50.0	27.0	18.3	10.4	21.0	18.8	15.6	16.4	29.6	16.3	11.5	14.2	16.1	16.9	63.8	25.8	24		
27	17.6	17.9	17.5	22.8	22.7	17.5	S	12.0	15.5	12.0	9.0	9.3	8.6	5.8	6.6	8.0	7.4	24.4	24.0	21.0	22.3	16.4	12.5	9.9	24.4	14.8	24		
28	14.8	15.5	21.6	17.5	20.0	S	27.8	46.4	47.1	44.5	52.6	50.3	38.3	32.7	26.8	21.8	26.2	32.4	44.6	28.7	37.3	36.8	41.2	39.6	52.6	33.2	24		
29	32.5	39.0	41.5	48.0	S	34.6	34.3	54.8	56.2	27.2	25.1	13.6	12.8	12.8	11.7	15.7	19.9	25.7	32.3	27.8	21.8	28.7	25.8	56.2	29.0	24			
30	45.2	71.5	66.2	S	49.5	51.2	59.0	69.6	75.7	78.4	74.4	63.3	65.9	63.7	55.7	58.9	78.1	78.7	79.9	79.6	82.0	80.1	60.3	45.4	82.0	66.6	24		
HOURLY MAX	76.5	71.5	66.2	48.0	49.5	51.2	59.0	69.6	75.7	78.4	74.4	63.3	65.9	63.7	55.7	58.9	78.1	78.7	79.9	79.6	82.0	80.1	60.3	45.4	82.0	66.6	24		
HOURLY AVG	15.5	15.1	14.6	13.1	12.7	14.4	16.6	21.1	26.1	21.2	16.9	14.1	13.7	12.0	11.1	12.2	14.4	18.9	20.1	16.6	16.9	17.1	17.4	18.0	111.3	72.0	72.0	18.0	

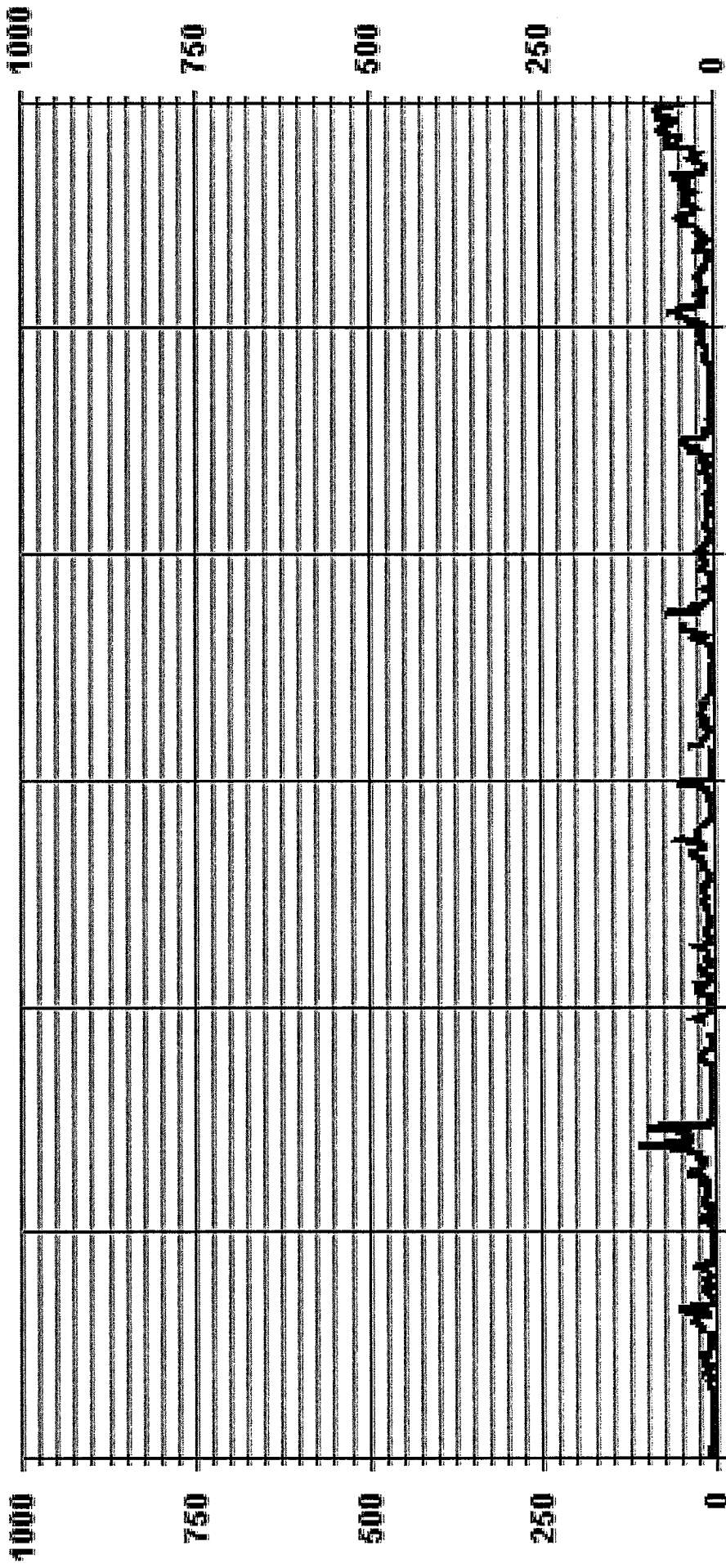
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	677	ON DAYS(S)	7
MAXIMUM INSTANTANEOUS VALUE:	111.3 PPB	@ HOUR(S)	23
VAR- VARIOUS			
I/ZS CALIBRATION TIME:	30 HRS	OPERATIONAL TIME:	720 HRS
MONTHLY CALIBRATION TIME:	7 HRS		
STANDARD DEVIATION:	16.32		

01 Hour Averages



— LICA35 NOXMAX PPB

LICA-ELK
NOX_ / WDR Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 35
Site Name : LICA-ELK
Parameter : NOX
Units : PPS

Wind Parameter : WDR
Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	1.93	3.71	1.93	5.20	6.68	8.02	4.16	1.78	3.86	4.16	4.60	13.96	13.37	12.33	8.02	3.26	97.02
< 110.0	.00	.29	.00	.14	.59	.29	.29	.00	.00	.14	.00	.00	.29	.29	.44	.14	2.97
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.93	4.01	1.93	5.34	7.28	8.32	4.45	1.78	3.86	4.30	4.60	13.96	13.67	12.63	8.46	3.41	

Calm : .00 %

Total # Operational Hours : 673

Distribution By Samples

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	13	25	13	35	45	54	28	12	26	28	31	94	90	83	54	22	653
< 110.0	2	2	2	4	4	2	2	2	2	1	2	2	2	2	3	1	20
< 210.0																	
>= 210.0																	
Totals	13	27	13	36	49	56	30	12	26	29	31	94	92	85	57	23	

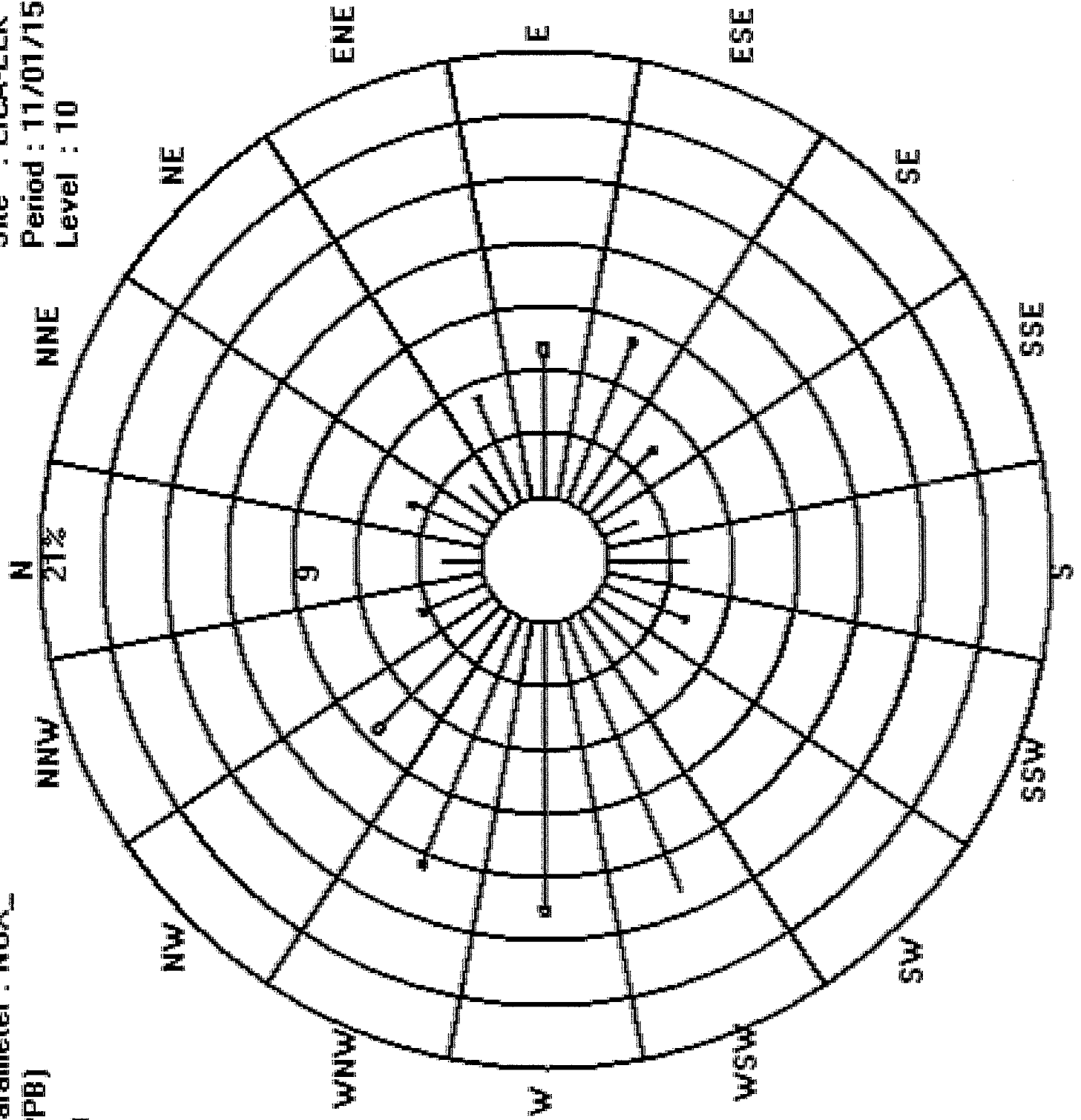
Calm : .00 %

Total # Operational Hours : 673

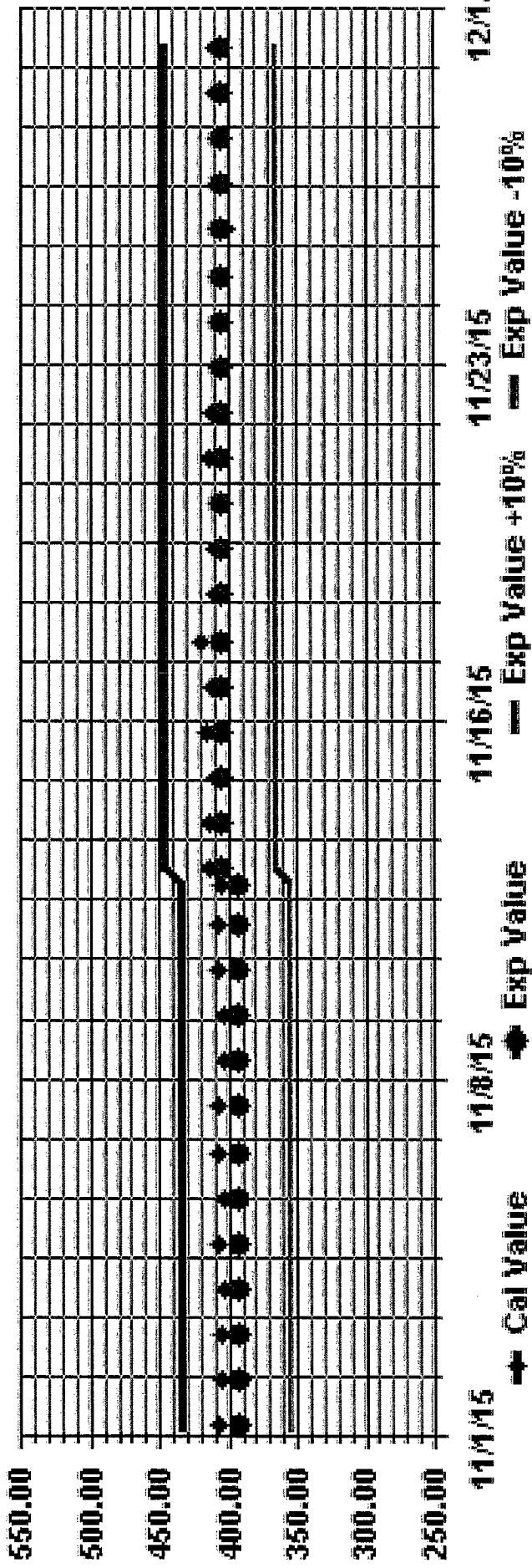
Site : LICA-ELK
Period : 11/01/15-11/30/15
Level : 10

Logger : 35 Parameter : NOX_x
Class Limits (PPB)

- ☐ >= 210.0
- ▬ < 210.0
- ▬ < 110.0
- ▬ < 50.0



Calibration Graph for Site: LICA30 Parameter: NOX_ Sequence: NO2 Phase: SPAN



NITRIC OXIDES



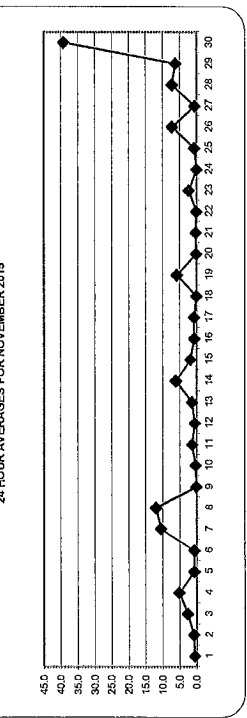
NITRIC OXIDE (NO) hourly averages in ppb

DAY	MST																								DAILY MAX	DAILY AVG	RDGS
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00			
1	1.2	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	1.2	0.6	24	
2	0.3	0.0	0.1	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.1	0.1	0.2	0.2	0.7	0.7	1.1	1.4	2.4	1.7	0.6	0.6	3.5	5.9	0.8	24	
3	1.4	2.3	1.1	2.6	10.1	8.6	6.2	10.5	6.6	2.3	1.8	0.8	0.7	0.3	0.1	0.0	0.0	0.1	0.2	0.1	0.1	2.2	1.3	2.6	10.5	2.7	24
4	6.7	14.6	11.1	1.6	0.7	1.0	2.7	19.0	37.6	17.3	1.7	0.3	0.1	0.2	0.1	0.2	0.7	0.8	0.5	0.5	0.5	0.0	0.0	0.2	37.6	5.1	24
5	0.8	0.1	0.1	0.4	2.5	1.3	4.6	4.0	2.5	0.4	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	4.6	0.8	24
6	0.1	0.2	0.1	0.1	0.2	0.4	0.4	1.9	2.1	0.5	0.5	0.7	0.5	0.4	0.3	1.1	0.7	0.5	1.3	2.3	0.7	0.6	0.7	0.5	2.3	0.7	24
7	0.4	0.4	1.0	1.8	1.2	3.5	3.3	10.8	12.9	6.0	6.2	6.7	5.9	3.8	4.4	1.4	0.5	4.2	5.4	18.3	13.6	10.7	32.7	87.8	10.5	24	
8	40.6	23.9	19.3	14.6	16.4	28.5	26.7	35.0	47.6	19.3	0.6	0.4	0.5	0.7	0.4	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.6	11.9	24
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	24
10	0.3	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	24
12	0.3	0.1	0.2	0.1	0.2	0.0	0.2	1.2	3.3	1.5	0.9	0.4	0.4	0.2	0.0	0.3	0.3	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.5	24
13	0.7	0.6	0.6	0.6	0.5	0.8	1.4	2.8	2.8	2.0	1.6	2.2	3.0	3.4	3.9	1.0	0.8	0.8	0.9	0.7	0.5	0.6	0.5	0.6	3.9	1.4	24
14	0.5	0.8	0.6	0.7	0.5	0.7	0.8	2.3	6.6	12.0	13.4	4.9	4.1	3.4	2.7	2.8	15.9	22.0	22.6	0.0	0.0	0.0	0.0	0.0	0.0	6.1	24
15	3.3	1.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	24
16	10.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	24
17	0.2	0.0	0.0	0.1	0.0	0.9	0.8	0.5	1.0	0.6	0.9	2.3	3.3	1.7	0.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	24
18	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4	0.1	0.1	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.4	24
19	0.1	0.1	0.8	5.8	1.2	1.0	5.1	15.0	26.5	17.6	18.7	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	0.0	24	
20	0.5	2.0	0.8	0.5	0.3	0.5	0.3	0.1	0.1	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	24	
21	0.5	2.0	0.8	0.5	0.3	0.5	0.3	0.1	0.1	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	24	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
23	0.1	0.2	0.5	0.3	0.4	0.4	1.0	3.8	10.4	3.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	1.8	2.0	1.2	1.2	0.9	0.6	0.2	1.5	1.1	0.8	0.7	0.3	1.0	1.3	2.0	24
26	0.7	0.6	0.0	1.4	9.1	18.2	27.4	42.1	30.3	20.5	5.8	1.1	0.5	1.1	0.9	0.5	0.4	1.6	0.5	0.3	0.3	0.3	0.3	0.3	42.1	7.1	24
27	0.5	0.6	0.7	1.1	1.0	0.8	0.8	0.7	0.7	0.4	0.4	0.4	0.2	0.0	0.1	0.0	0.1	0.0	0.8	0.9	0.8	0.9	0.1	0.4	0.2	1.1	24
28	0.3	0.4	0.9	0.5	0.5	0.5	2.1	11.6	15.8	14.9	25.5	23.2	10.6	6.4	2.6	0.6	1.6	1.6	11.6	1.6	6.8	4.8	9.8	10.8	25.5	7.2	24
29	9.1	17.2	19.8	24.3	0.0	8.3	8.5	22.4	10.8	4.1	3.0	0.6	0.5	0.5	0.3	0.1	0.1	0.4	2.7	1.0	0.4	1.8	2.1	3.8	24.3	6.2	24
30	12.4	29.3	30.5	0.0	28.5	31.0	34.4	38.9	55.1	55.3	48.1	40.5	40.6	34.7	25.7	31.4	45.5	52.8	55.7	52.3	55.9	50.5	27.2	25.0	55.9	39.2	24
HOURLY MAX	40.6	29.3	30.5	24.3	28.5	31.0	34.4	38.9	55.1	55.3	48.1	40.5	40.6	34.7	25.7	31.4	45.5	52.8	55.7	52.3	55.9	50.5	27.2	25.0	55.9	39.2	24
HOURLY AVG	5.0	3.2	3.0	2.0	2.6	3.7	4.4	6.3	10.1	6.8	5.4	4.0	3.6	2.3	1.7	1.7	2.7	3.6	4.1	3.1	3.3	3.2	3.3	3.3	3.3	5.8	24

STATUS FLAG CODES

C	- CALIBRATION	Q	- QUALITY ASSURANCE
Y	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

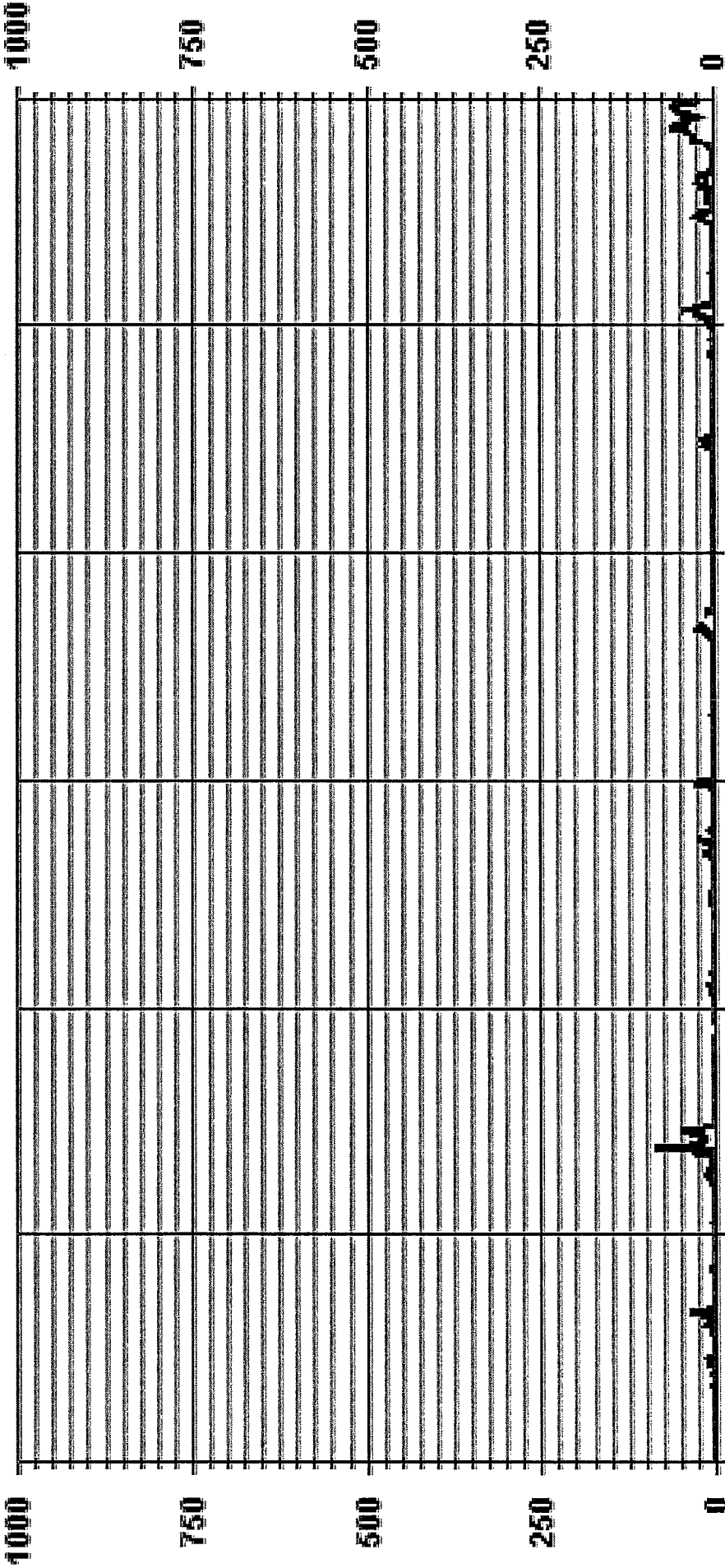
24 HOUR AVERAGES FOR NOVEMBER 2015



MONTHLY SUMMARY

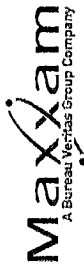
NUMBER OF NON-ZERO READINGS:	481	87.8	PPB	@ HOUR(S)	23	ON DAY(S)	7
MAXIMUM 1-HR AVERAGE:	39.2	PPB				ON DAY(S)	90
MAXIMUM 24-HR AVERAGE:						VAR-VARIOUS	
12S CALIBRATION TIME:	29	HRS	OPERATIONAL TIME:	720	HRS		
MONTHLY CALIBRATION TIME:	7	HRS	AMID OPERATION UPTIME:	100.0	%		
STANDARD DEVIATION:	9.73		MONTHLY AVERAGE:	3.9	PPB		

01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA35 NO_ PPB



NITRIC OXIDE MAX instantaneous maximum in ppb

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MAX	AVG	24-HOUR	RDSS	
1	2.0	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.8	1.3	2.0	1.3
2	1.0	0.6	0.7	0.6	0.6	0.7	0.8	0.7	1.0	0.7	0.8	0.7	0.9	1.8	1.6	2.1	2.6	5.2	7.7	1.8	2.4	2.4	2.4	2.4	2.4	6.8	7.7	7.7	1.8
3	3.1	3.3	1.8	10.8	12.6	10.2	7.6	12.8	12.6	3.2	2.7	2.4	1.5	1.0	0.8	0.8	0.6	0.7	0.8	0.7	3.4	3.4	3.4	3.4	3.4	9.4	5.1	12.8	4.4
4	13.4	18.3	17.4	11.7	1.4	1.9	5.8	33.7	40.8	31.3	3.5	1.1	0.9	0.9	0.9	0.9	2.3	1.7	1.2	5	1.6	0.7	0.8	1.0	40.8	8.4	24	24	
5	1.5	0.7	0.8	1.2	4.1	2.4	9.4	9.3	6.2	0.7	0.2	0.1	0.4	0.3	0.5	0.4	0.4	0.4	0.4	1.5	0.8	0.7	0.8	0.7	9.4	1.9	24	24	
6	0.8	0.8	0.6	0.8	0.8	1.0	1.3	3.9	3.7	1.3	1.2	1.7	1.4	1.1	1.2	2.1	1.9	5	2.8	4.4	1.4	1.3	1.8	1.4	4.4	1.7	24	24	
7	1.0	0.9	6.1	6.4	2.0	5.2	5.3	23.0	22.6	6.9	7.6	9.6	8.8	6.0	7.3	2.8	5	9.4	9.4	26.3	19.3	21.1	54.3	96.1	15.5	24	24		
8	56.6	28.1	22.7	19.1	23.1	37.7	35.0	39.1	86.3	71.0	1.3	1.1	1.3	1.3	1.2	1.2	1.3	0.7	0.6	1.1	1.6	2.2	1.5	1.4	2.2	0.8	24	24	
9	0.4	0.6	0.5	0.3	0.2	0.5	0.5	0.7	0.5	0.6	0.8	0.3	0.5	0.5	1.2	0.7	0.7	0.6	1.1	1.6	2.2	1.5	1.4	2.2	0.8	24	24		
10	1.0	1.0	0.7	0.5	0.6	0.7	0.7	0.9	0.5	0.7	C	C	C	C	C	C	C	3.3	12.3	8.4	0.0	0.0	0.0	0.0	12.3	1.8	24	24	
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	S	9.2	5.3	9.8	3.9	1.4	1.6	1.4	1.6	2.2	1.9	2.6	1.8	S	1.8	9.8	2.4	24	24	
12	1.0	0.9	1.3	0.8	0.9	0.7	0.8	3.7	7.1	3.4	2.5	1.6	1.1	0.8	0.5	1.0	1.0	1.0	1.2	0.7	0.7	S	2.4	1.3	7.1	1.6	24	24	
13	1.4	1.3	1.4	1.2	1.2	1.5	2.0	4.4	4.9	4.4	2.4	3.0	4.9	5.7	6.0	2.7	1.9	2.0	2.7	1.2	S	1.6	1.0	1.3	6.0	2.6	24	24	
14	5.2	3.3	0.8	0.7	0.3	0.4	0.3	0.6	0.5	0.3	0.5	0.5	0.5	0.7	0.6	1.2	0.8	1.0	0.4	S	7.6	1.6	2.4	1.6	1.1	0.7	26.2	2.2	
15	26.2	1.1	0.7	0.6	0.8	0.7	0.4	0.2	0.3	0.7	0.7	0.7	0.6	0.5	0.5	0.5	0.3	S	7.6	1.6	2.4	1.6	1.1	0.7	26.2	2.2	24	24	
16	0.9	0.6	0.7	0.6	0.6	2.5	1.8	1.2	2.2	1.4	2.0	3.2	5.5	3.4	2.3	1.3	S	5.2	1.2	1.3	1.1	0.8	0.7	0.8	5.5	1.8	24	24	
17	0.7	0.6	0.4	0.5	0.8	0.8	0.8	1.1	0.9	0.7	1.0	1.0	1.0	1.0	0.7	S	0.9	0.7	0.5	0.5	0.4	0.7	0.6	0.5	1.1	0.7	24	24	
18	0.6	0.7	3.7	8.5	4.2	1.7	9.4	17.1	33.5	21.8	20.3	Q	Q	Q	Q	Q	Q	40.6	2.0	2.2	7.3	2.0	0.0	0.0	40.6	9.8	24	24	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	1.5	1.1	1.9	1.8	0.9	1.1	1.1	1.3	1.9	0.5	24
20	1.1	4.5	1.7	1.5	1.0	1.1	1.0	0.8	0.9	1.1	1.0	0.9	S	1.3	0.6	0.5	0.7	0.2	0.7	0.5	0.1	0.3	0.2	0.1	4.5	0.9	24	24	
21	0.3	0.4	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.3	S	1.3	0.6	0.4	0.7	0.9	0.7	0.7	0.5	1.2	0.8	0.7	0.6	1.3	0.5	24	24
22	0.8	0.9	1.1	1.1	1.1	1.4	2.2	12.3	13.2	5.4	S	18.8	29.6	15.0	1.4	0.6	0.6	0.6	0.1	0.5	0.5	0.6	0.4	0.4	29.6	4.7	24	24	
23	0.5	0.4	0.2	0.5	0.4	0.6	0.4	0.4	0.1	S	1.2	0.7	1.1	0.5	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.3	0.8	0.4	1.2	0.5	24	24	
24	0.7	0.6	0.7	0.7	0.6	0.5	0.6	1.1	S	2.6	3.0	2.1	2.0	1.7	1.4	0.9	5.2	2.4	1.6	1.6	1.1	2.0	2.5	2.1	5.2	1.6	24	24	
25	1.7	2.2	0.9	2.8	16.0	24.0	33.1	S	46.2	32.1	31.6	8.9	2.6	1.4	1.9	3.0	1.1	1.1	4.9	1.4	1.1	1.3	1.1	1.2	46.2	9.6	24	24	
26	1.2	1.2	1.6	2.0	2.2	1.8	S	1.6	26.8	27.2	20.3	29.1	28.0	14.9	9.0	4.4	1.5	3.6	8.5	17.7	4.6	9.3	8.1	17.2	16.4	11.3	24	24	
27	1.0	1.3	2.0	1.3	1.1	S	6.9	26.8	27.2	20.3	29.1	28.0	14.9	9.0	4.4	1.5	3.6	8.5	17.7	4.6	9.3	8.1	17.2	16.4	11.3	24	24		
28	13.6	20.0	22.2	28.9	S	13.4	11.5	34.1	35.2	6.6	6.1	1.5	1.3	1.2	1.1	0.8	1.1	1.5	3.9	2.3	1.2	3.4	5.1	5.2	35.2	9.6	24	24	
29	23.9	49.7	43.6	S	34.5	33.6	41.0	55.0	60.5	62.1	54.0	41.4	43.8	40.2	32.3	36.2	57.2	58.3	63.2	60.4	61.4	60.5	42.8	27.1	63.2	47.1	24	24	
30	56.6	49.7	43.6	28.9	34.5	37.7	41.0	55.0	86.3	71.0	54.0	41.4	43.8	40.2	32.3	36.2	57.2	58.3	63.2	60.4	61.4	60.5	42.8	27.1	63.2	47.1	24	24	
HOURLY MAX	56.6	49.7	43.6	28.9	34.5	37.7	41.0	55.0	86.3	71.0	54.0	41.4	43.8	40.2	32.3	36.2	57.2	58.3	63.2	60.4	61.4	60.5	42.8	27.1	63.2	47.1	24	24	
HOURLY AVG	5.4	4.9	4.6	3.7	3.9	5.1	6.3	10.3	15.1	10.6	7.3	5.4	5.3	3.9	2.9	2.7	4.3	6.5	6.4	4.8	4.7	5.1	6.2	7.3	6.2	7.3	24	24	

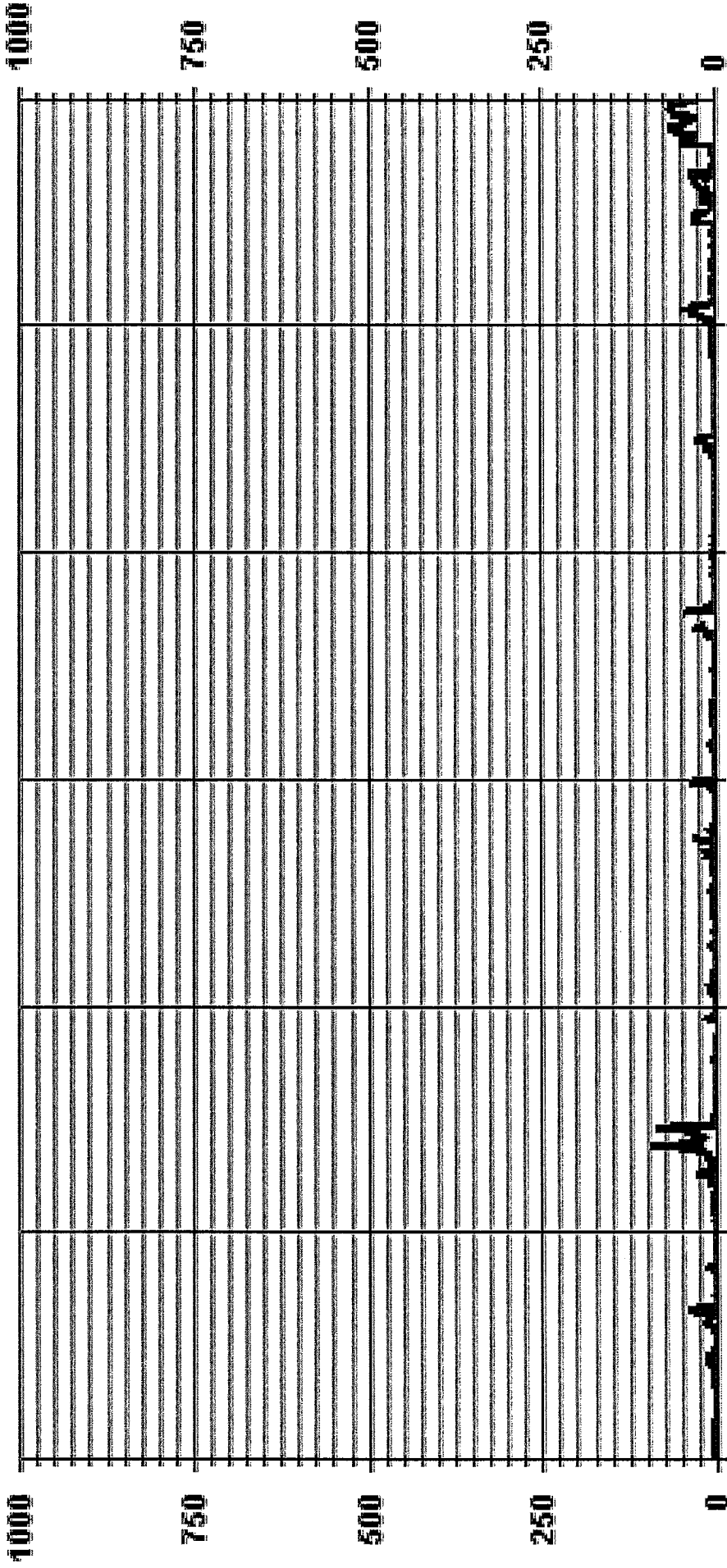
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
S	START/STOP	X	MACHINE/MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	651	PPB	23	ON DAY(S)	7
MAXIMUM INSTANTANEOUS VALUE:	96.1	PPB	23	ON DAY(S)	7
IZS CALIBRATION TIME:	30	HRS	OPERATIONAL TIME:	720	HRS
MONTHLY CALIBRATION TIME:	7	HRS	OPERATIONAL TIME:	720	HRS
STANDARD DEVIATION:	12.36		OPERATIONAL TIME:	720	HRS

01 Hour Averages



— LICA35 - - - NOMAX . . . PPB

LIICA-FLK
 NO_ / WDR Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LIICA-FLK
 Parameter : NO_
 Units : PFB

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	1.93	3.86	1.93	5.34	6.98	8.32	4.45	1.78	3.86	4.30	4.60	13.96	13.37	12.48	8.32	3.26	98.81
< 110.0	.00	.14	.00	.00	.29	.00	.00	.00	.00	.00	.00	.00	.29	.14	.14	.14	1.18
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.93	4.01	1.93	5.34	7.28	8.32	4.45	1.78	3.86	4.30	4.60	13.96	13.67	12.63	8.46	3.41	

Calm : .00 %

Total # Operational Hours : 673


Distribution By Samples

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	13	26	13	36	47	56	30	12	26	29	31	94	90	84	56	22	665
< 110.0		1			2								2	1	1	1	8
< 210.0																	
>= 210.0																	
Totals	13	27	13	36	49	56	30	12	26	29	31	94	92	85	57	23	

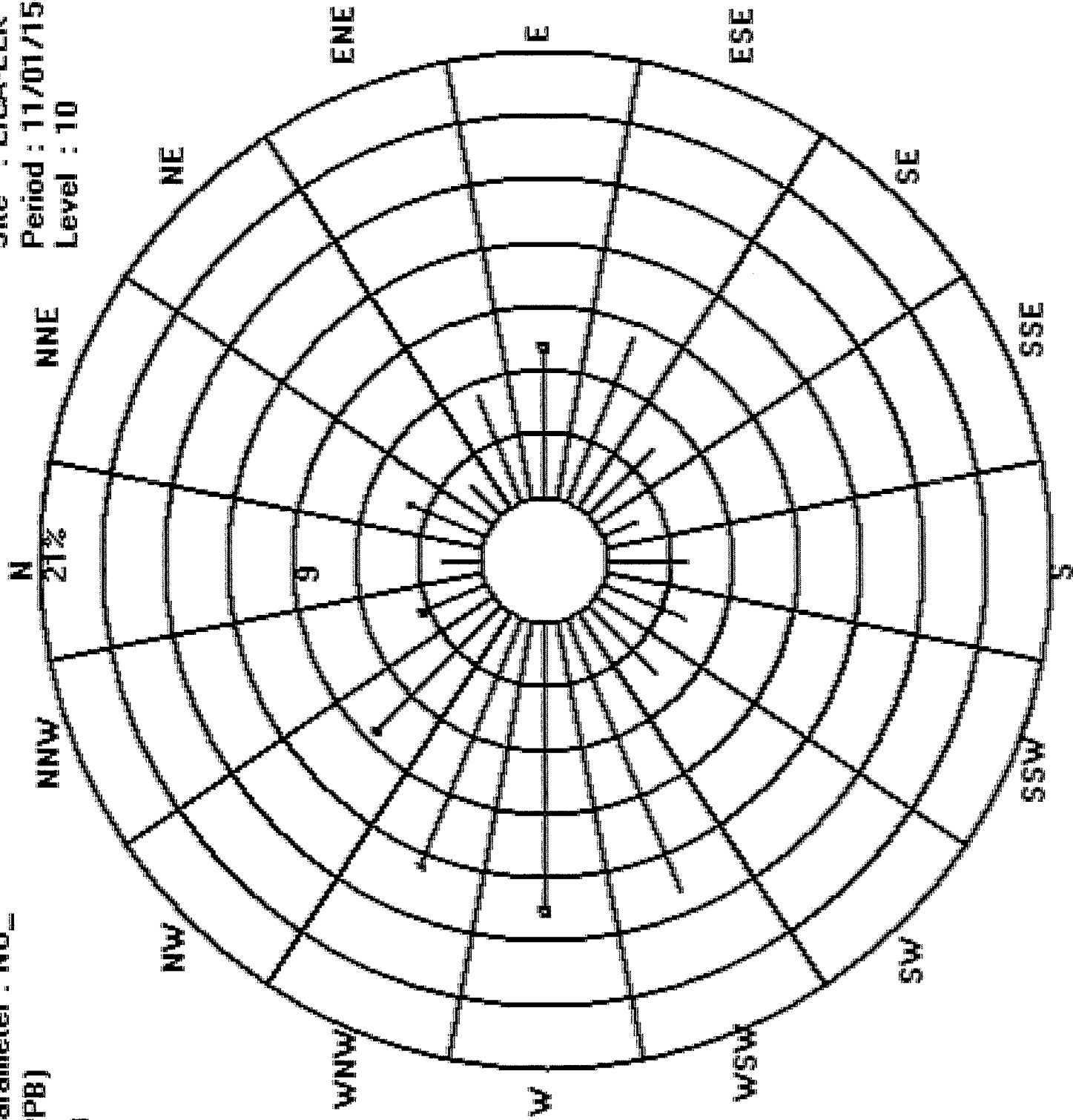
Calm : .00 %

Total # Operational Hours : 673

Logger : 35 Parameter : NO_x
Class Limits (PPB)

-  >= 210.0
-  < 210.0
-  < 110.0
-  < 50.0

Site : LICA-ELK
Period : 11/01/15-11/30/15
Level : 10



NITROGEN DIOXIDE

NITROGEN DIOXIDE (NO2) hourly averages in ppb

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MAX.	DAILY AVG.	24-HOUR AVG.	RDGS.		
1	4.4	3.9	3.4	3.4	3.8	4.3	4.4	3.9	3.3	3.1	3.0	2.9	2.7	2.7	2.6	2.8	3.1	2.9	3.1	3.7	3.3	3.2	3.2	3.2	3.2	3.2	4.4	3.3	2.3	24
2	2.1	2.2	2.8	2.5	2.8	2.3	2.2	2.5	2.5	2.4	2.2	2.1	2.4	3.7	5.4	5.7	5.8	6.6	6.4	5.9	4.8	5	4.8	5.1	4.8	8.1	3.9	8.1	3.9	24
3	6.1	6.3	5.8	6.0	6.5	7.3	6.9	7.3	6.8	5.3	5.8	4.6	5.3	4.3	4.3	4.4	4.7	5.8	7.1	6.6	5	12.6	10.5	12.3	12.6	6.6	6.6	6.6	24	
4	13.2	14.3	13.4	9.6	9.1	8.8	9.8	10.3	10.0	11.0	8.5	5.0	4.1	3.6	3.4	4.1	7.1	12.4	8.9	5	5.5	4.9	5.1	9.5	14.3	8.3	8.3	24		
5	12.7	7.6	6.7	8.4	13.4	13.8	15.0	11.1	3.2	1.9	1.8	2.2	2.1	2.4	3.0	2.1	2.2	2	2.6	2.6	2.6	2.6	2.6	2.6	2.6	15.0	6.0	2.4	24	
6	3.0	2.9	2.9	4.4	4.3	3.7	7.0	14.6	12.4	7.6	5.1	4.6	4.1	3.6	3.9	7.8	9.0	5	10.9	10.8	10.0	8.9	9.2	9.3	14.6	7.0	7.0	24		
7	8.1	8.7	10.0	13.1	12.0	13.2	13.3	13.6	14.2	13.4	13.3	12.4	11.3	10.8	12.1	9.6	5	13.3	13.5	14.9	15.4	15.1	14.6	15.5	15.5	15.5	12.7	24		
8	17.7	12.2	13.1	12.2	12.4	11.8	12.2	10.5	10.3	15.6	7.9	4.3	3.9	4.3	3.3	3	2.3	2.2	1.8	1.9	1.6	2.2	2.6	2.9	17.7	7.4	7.4	24		
9	2.3	2.5	2.4	2.4	2.4	2.5	2.2	2.3	1.9	2.3	2.5	2.1	3.0	2.6	2.6	2.6	2.6	3.8	3.5	6.0	10.3	14.5	15.1	16.7	13.7	16.7	5.2	24		
10	10.5	9.4	3.7	3.1	2.8	3.3	3.5	4.1	4.6	4.5	C	C	C	C	C	C	C	12.6	15.8	17.5	10.3	5.2	5.0	5.7	17.5	7.2	7.2	24		
11	5.1	6.6	5.3	5.2	4.0	6.2	5.7	8.9	9.3	5	13.5	11.5	13.1	8.0	5.1	5.0	8.6	7.5	12.4	14.5	16.3	13.3	5	5.9	16.3	8.7	24			
12	6.1	8.9	9.8	7.7	8.3	8.8	9.5	14.5	16.3	12.4	9.4	6.2	4.8	3.7	4.3	8.7	6.1	10.9	7.9	6.0	6.1	5	4.5	6.0	16.3	8.1	24			
13	7.3	6.5	7.4	6.9	7.9	8.2	9.7	11.4	10.7	9.2	7.9	7.7	7.8	9.5	13.0	8.4	9.0	7.9	7.2	4.6	5	4.8	6.6	5.7	13.0	8.1	8.1	24		
14	7.9	11.0	12.2	13.2	12.3	14.1	14.0	15.3	15.1	15.7	18.1	13.9	13.7	13.6	12.4	13.5	16.6	19.4	17.4	5	14.7	13.1	16.1	14.6	19.4	14.3	24			
15	12.3	12.4	11.2	8.3	4.8	4.1	2.9	3.1	2.7	2.7	3.7	3.1	3.2	3.2	4.2	5.9	6.7	5.6	5	7.2	9.0	10.1	10.9	15.1	15.1	6.6	24			
16	12.4	6.3	3.4	2.6	2.6	2.3	2.3	2.7	2.2	2.0	2.1	2.4	1.8	1.4	1.7	2.2	4.2	5	21.0	15.7	16.4	14.0	11.6	10.4	21.0	6.2	24			
17	10.2	8.5	6.8	5.7	7.1	8.7	11.2	10.8	11.9	9.5	9.5	12.1	12.9	11.4	11.1	8.9	5	9.9	9.1	10.5	9.6	7.4	4.5	6.1	12.9	9.3	24			
18	3.9	2.8	2.7	2.5	2.0	2.0	1.7	1.9	2.3	2.0	1.6	1.8	1.8	1.9	1.6	1.6	1.9	2.8	3.1	1.6	2.8	3.8	3.6	3.1	3.9	2.4	2.4	24		
19	6.0	9.3	11.5	17.5	14.1	12.2	14.1	15.2	16.8	17.3	20.8	Q	Q	Q	Q	Q	Q	Q	19.9	16.2	16.7	21.4	18.9	13.2	8.6	21.4	15.0	24		
20	7.3	2.9	1.7	1.6	2.0	0.9	5.8	2.9	1.3	0.8	7.4	5.9	5	5.7	6.1	8.1	9.3	8.4	9.3	6.8	5.7	5.2	5.2	4.7	17.4	8.8	24			
21	13.6	17.4	15.0	12.6	12.1	12.1	10.0	7.0	5.7	8.3	7.4	5.9	5	3.1	1.7	1.7	4.1	4.0	4.8	5.5	6.0	11.1	7.3	5.2	5.3	11.1	5.3	24		
22	5.8	6.4	7.5	5.0	4.0	5.3	6.0	5.4	6.7	5.8	3.9	5	18.9	19.6	18.1	13.5	11.6	10.8	10.9	3.4	2.8	3.4	4.4	3.4	20.7	11.0	24			
23	4.9	4.7	3.7	4.2	3.5	3.0	2.4	2.9	2.8	5	1.8	2.1	2.6	1.8	1.2	1.3	1.2	1.2	1.9	2.2	2.1	2.3	4.9	2.5	2.4	2.5	24			
24	1.8	1.6	2.7	3.0	2.9	2.6	4.9	8.8	5	10.8	9.0	7.3	7.5	7.0	8.2	8.3	14.8	18.5	15.3	13.9	16.5	17.8	17.3	18.5	9.4	24				
25	14.2	15.3	11.6	15.4	17.7	16.5	16.8	5	17.9	17.3	18.7	17.7	12.5	8.7	14.7	14.3	13.1	14.4	19.3	11.5	9.9	11.5	10.9	14.2	19.3	14.5	24			
26	15.4	16.0	15.6	18.5	18.2	14.8	5	9.0	12.1	8.2	7.4	7.7	5.7	4.8	4.3	5.6	6.1	13.9	19.3	17.0	17.7	11.7	9.1	7.5	19.3	11.5	24			
27	10.9	13.1	17.7	15.4	13.4	5	20.6	20.2	20.4	21.0	23.5	22.7	23.3	23.0	21.4	16.6	20.9	20.2	25.4	23.8	26.9	27.9	25.2	23.2	27.9	20.7	24			
28	21.1	18.6	19.7	19.6	5	22.5	22.8	22.6	21.9	20.5	17.4	12.3	11.4	11.2	10.0	12.5	15.7	20.2	26.6	23.0	19.5	23.5	20.9	17.8	26.6	18.8	24			
29	19.0	20.3	22.8	5	15.6	17.8	17.6	14.9	14.9	17.3	20.9	21.4	22.3	23.2	23.1	22.4	20.7	20.4	18.7	21.4	20.7	19.2	19.0	17.2	23.2	19.6	24			
30	21.1	20.3	22.8	19.6	18.2	22.5	22.8	22.6	21.9	21.0	23.5	22.7	23.3	23.2	23.1	22.4	20.9	20.4	26.6	23.8	26.9	27.9	25.2	23.2	23.2	19.6	24			
HOURLY MAX	9.0	8.9	8.8	8.3	7.9	8.4	9.3	9.7	10.0	9.5	8.8	8.0	7.7	7.2	7.4	7.9	8.6	10.5	11.5	10.3	10.8	10.5	9.8	9.6	9.6	9.6	9.6	9.6	9.6	

STATUS FLAG CODES

C	CALIBRATION	Q	QUANTITY ASSURANCE
Y	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MAGNETIC MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT-OF-REPAIR	K	COLLECTION ERROR

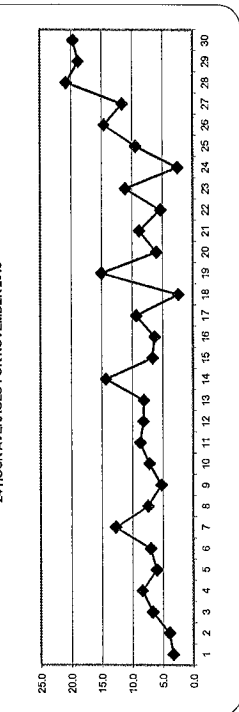
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 21-HR: 159; 24-HR: 232

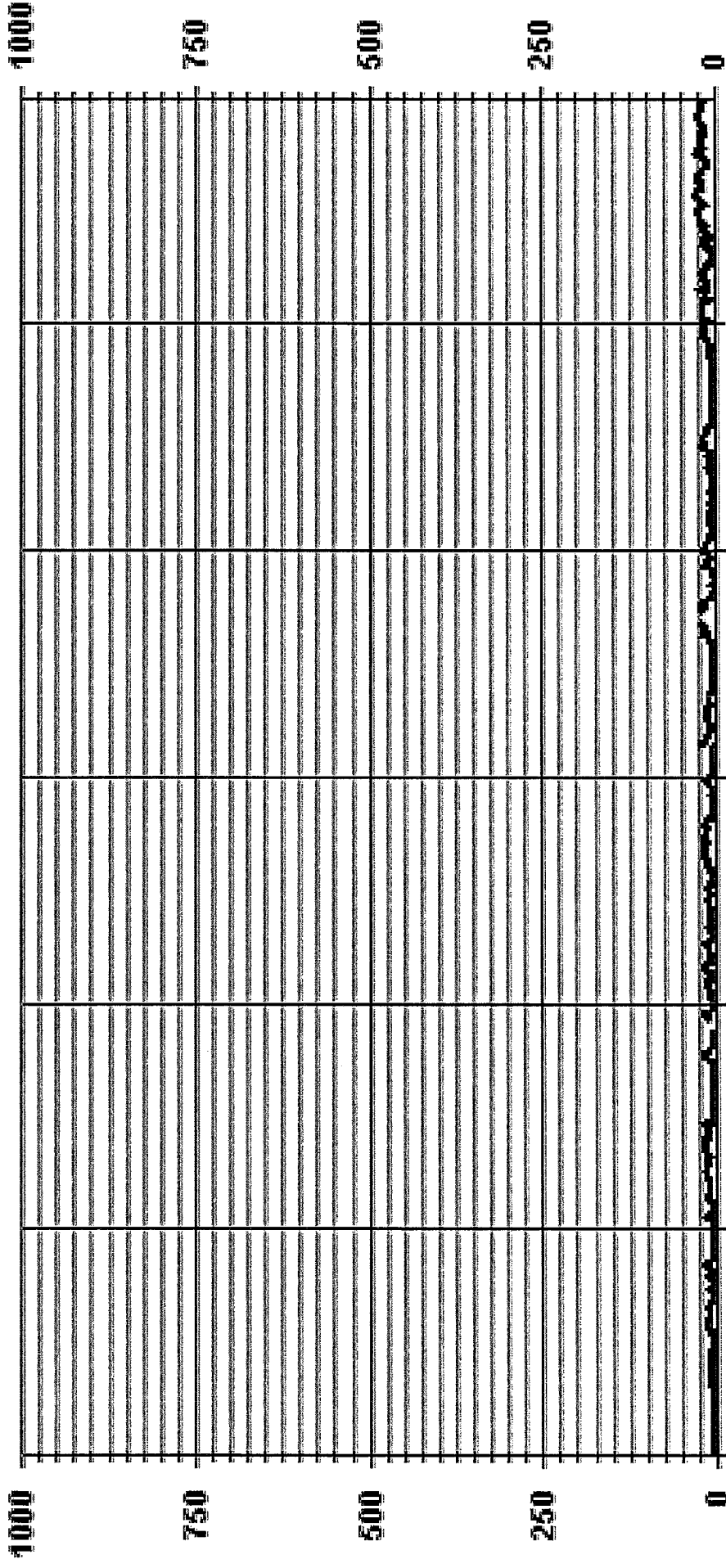
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES	0
NUMBER OF NON-ZERO READINGS	678
MAXIMUM 1-HR AVERAGE	27.9
MAXIMUM 24-HR AVERAGE	20.7
12S CALIBRATION TIME	29
MONTHLY CALIBRATION TIME	7
STANDARD DEVIATION	6.06
OPERATIONAL TIME	21
AMTD OPERATION UPTIME	28
MONTHLY AVERAGE	28
OPERATIONAL TIME	720
AMTD OPERATION UPTIME	100.0
MONTHLY AVERAGE	9.1
ON DAY(S)	28
ON DAY(S) VAR-VARIOUS	28
PPB	9.1
HRS	720
%	100.0

24 HOUR AVERAGES FOR NOVEMBER 2015



01 Hour Averages



— LICA35 NO2_ PPB



NITROGEN DIOXIDE MAX instantaneous maximum in ppb

MST

DAY	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	RDGS.				
1	6.4	5.4	5.1	4.9	5.3	5.6	6.0	5.6	4.9	4.5	4.9	4.3	4.3	4.1	4.1	4.3	4.7	4.5	4.5	5.4	4.8	4.9	\$	3.1	6.4	4.9	24		
2	3.2	2.9	3.4	3.4	3.9	3.2	3.1	3.2	3.2	3.3	3.0	2.7	3.4	4.4	6.4	7.0	6.8	7.7	7.8	7.2	6.6	\$	8.5	8.6	4.9	24			
3	7.5	6.9	6.5	6.6	7.1	8.1	7.9	8.3	8.4	6.2	6.8	7.0	5.2	5.1	5.3	5.5	7.6	8.3	8.1	\$	15.8	15.5	16.1	16.1	8.1	24			
4	15.7	16.4	16.5	15.1	10.1	9.6	10.7	11.3	11.0	12.7	9.8	6.6	5.3	4.7	4.5	6.0	11.7	16.1	15.5	\$	6.5	6.0	7.5	11.5	10.5	24			
5	14.3	12.3	8.4	9.6	15.2	14.7	16.7	17.0	15.4	4.8	2.8	2.4	3.1	3.0	3.5	3.7	2.9	2.9	\$	3.2	3.1	3.2	3.0	3.6	17.0	7.3	24		
6	3.7	3.8	4.5	5.1	5.5	5.2	9.6	16.4	15.6	11.9	6.9	5.7	5.5	5.9	5.1	12.4	14.2	\$	14.0	13.1	10.9	9.8	10.3	10.9	16.4	9.0	24		
7	9.4	9.5	14.0	15.7	13.5	15.2	14.7	15.5	16.0	15.3	15.2	15.0	14.1	13.4	13.8	11.5	\$	16.1	14.7	17.4	16.8	17.1	16.9	19.5	14.8	24			
8	20.4	14.9	14.9	14.8	14.0	13.5	13.7	12.3	14.9	18.6	11.2	6.4	5.1	5.6	4.2	\$	3.2	2.9	2.8	2.9	2.5	3.0	3.7	3.8	20.4	9.1	24		
9	3.2	3.2	3.0	3.6	3.5	3.2	2.9	2.9	3.3	3.2	3.0	4.3	4.3	\$	3.8	4.6	4.0	10.0	14.4	18.9	17.8	18.7	18.5	18.9	6.8	24			
10	13.2	13.8	4.9	4.0	3.7	4.4	4.4	5.3	6.1	5.8	C	C	C	C	C	C	C	C	C	16.9	20.5	20.1	15.7	10.2	9.6	9.1	20.5	9.9	24
11	9.4	10.0	9.8	9.0	7.9	10.7	10.1	14.9	\$	15.4	13.4	15.1	11.2	6.6	6.0	11.3	8.9	16.0	16.7	19.7	19.6	\$	7.4	19.7	11.9	24			
12	7.4	10.5	11.2	9.9	9.1	9.8	11.4	19.2	20.5	17.6	11.9	7.8	5.9	5.7	7.6	10.2	10.5	13.2	11.4	7.4	7.1	\$	5.6	7.0	20.5	10.3	24		
13	8.4	7.6	7.9	8.1	8.9	8.9	11.1	13.5	12.6	12.1	8.9	9.3	9.5	11.7	14.7	14.1	11.1	14.9	11.1	6.4	\$	6.8	9.4	7.6	14.9	10.2	24		
14	10.5	15.2	13.4	15.3	14.5	16.8	16.6	16.6	16.1	18.8	19.8	18.3	16.3	16.3	14.2	15.6	18.7	22.2	19.8	\$	15.9	14.0	17.8	16.4	22.2	16.5	24		
15	13.9	13.1	11.9	11.8	6.0	5.2	4.4	4.0	3.4	4.0	4.5	4.2	4.4	4.2	6.0	8.8	8.3	6.8	\$	12.0	11.4	13.2	15.7	16.5	16.5	8.4	24		
16	15.3	8.3	5.0	3.5	3.4	3.1	3.1	3.7	3.0	2.9	3.1	2.6	2.4	2.5	3.9	6.5	\$	27.7	19.0	16.7	15.6	11.7	27.7	8.1	24				
17	11.6	9.5	8.3	7.9	8.4	13.9	13.1	13.7	13.9	10.9	10.7	13.6	15.4	14.8	14.4	14.1	\$	12.6	10.6	11.8	10.5	9.5	5.3	7.3	15.4	11.4	24		
18	5.2	3.8	3.8	3.3	2.9	2.7	2.5	2.8	3.1	3.0	2.8	2.8	2.9	2.8	2.8	\$	2.5	4.5	4.7	2.3	4.0	4.8	4.6	3.9	5.2	3.4	24		
19	9.0	10.4	17.5	19.1	15.9	14.0	15.7	16.6	19.1	18.7	25.8	Q	Q	Q	Q	Q	Q	Q	Q	27.9	23.5	21.8	26.6	25.1	17.6	14.9	18.8	24	
20	12.1	9.1	6.1	5.6	6.7	4.6	14.1	9.1	5.6	4.7	4.2	5.1	5.5	\$	5.2	11.7	18.3	18.6	14.5	9.1	9.4	12.5	15.7	17.6	18.6	9.8	24		
21	15.2	20.0	18.8	16.5	14.3	13.7	12.1	8.0	7.1	10.2	8.5	6.8	\$	6.0	7.7	10.6	10.3	10.9	10.5	8.3	8.3	6.7	7.3	7.7	20.0	10.7	24		
22	8.3	8.4	8.3	7.6	5.0	7.6	7.5	8.3	9.6	9.3	7.7	\$	4.2	2.7	3.1	7.2	5.7	7.8	10.0	19.2	8.8	8.4	7.1	19.2	7.7	24			
23	6.5	11.9	15.0	12.6	9.7	16.3	19.1	23.1	22.9	19.9	\$	20.3	23.1	23.1	14.5	12.5	13.1	14.0	5.0	3.6	3.5	2.5	2.9	3.4	5.7	3.5	24		
24	5.7	5.5	4.5	4.8	4.7	3.6	3.1	3.7	3.8	\$	2.4	2.8	4.8	3.7	1.9	2.0	2.0	2.1	3.6	3.5	2.5	2.5	2.9	3.4	5.7	3.5	24		
25	2.4	2.4	4.0	4.2	4.0	3.7	8.4	11.6	\$	11.9	10.2	8.2	8.2	7.7	8.8	10.3	18.9	20.2	18.0	16.9	14.6	17.6	18.8	18.8	20.2	10.9	24		
26	15.1	18.5	14.4	15.9	18.3	19.0	18.1	\$	18.8	18.6	19.6	18.5	15.8	9.7	19.4	16.7	15.1	16.2	25.7	15.8	11.2	13.8	15.4	16.2	25.7	16.8	24		
27	17.1	17.4	16.9	21.5	21.1	16.8	\$	11.5	14.7	11.5	8.5	9.2	7.8	5.6	6.4	7.5	7.3	21.8	22.0	19.6	21.3	16.4	12.2	9.7	22.0	14.1	24		
28	14.9	15.6	20.2	16.8	19.5	\$	24.1	22.5	21.8	24.5	25.3	23.9	24.4	24.7	23.5	20.2	24.3	27.7	26.6	29.1	29.0	27.5	24.9	29.1	23.2	24			
29	22.9	19.7	21.3	23.4	\$	25.1	24.0	24.3	23.1	22.3	20.1	13.0	12.3	12.2	11.0	15.6	19.4	24.4	28.8	26.0	21.2	25.7	22.2	20.7	28.8	20.8	24		
30	22.0	22.8	23.7	\$	17.8	19.8	19.2	17.7	16.3	20.1	21.7	22.6	23.4	24.0	23.8	23.6	21.9	21.7	21.2	24.4	22.5	20.7	20.7	19.0	24.4	21.3	24		
HOURLY MAX	22.9	22.8	23.7	23.4	21.1	25.1	24.1	24.3	23.1	24.5	25.8	23.9	24.4	24.7	23.8	23.6	23.2	27.9	28.8	26.6	29.1	29.0	27.5	24.9	29.1	23.2	24		
HOURLY AVG	11.0	11.0	10.8	10.3	9.7	10.3	11.3	11.8	11.9	11.7	10.5	9.5	9.4	8.9	8.9	10.2	10.7	13.2	14.6	12.7	13.0	12.8	12.2	11.6	11.6	11.6	11.6	24	
DAILY MAX	6.4	4.9	4.9	4.9	5.3	6.0	6.0	5.6	4.9	4.5	4.9	4.3	4.3	4.1	4.1	4.3	4.7	4.5	4.5	5.4	4.8	4.9	\$	3.1	6.4	4.9	24		
DAILY AVG	8.6	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	24	

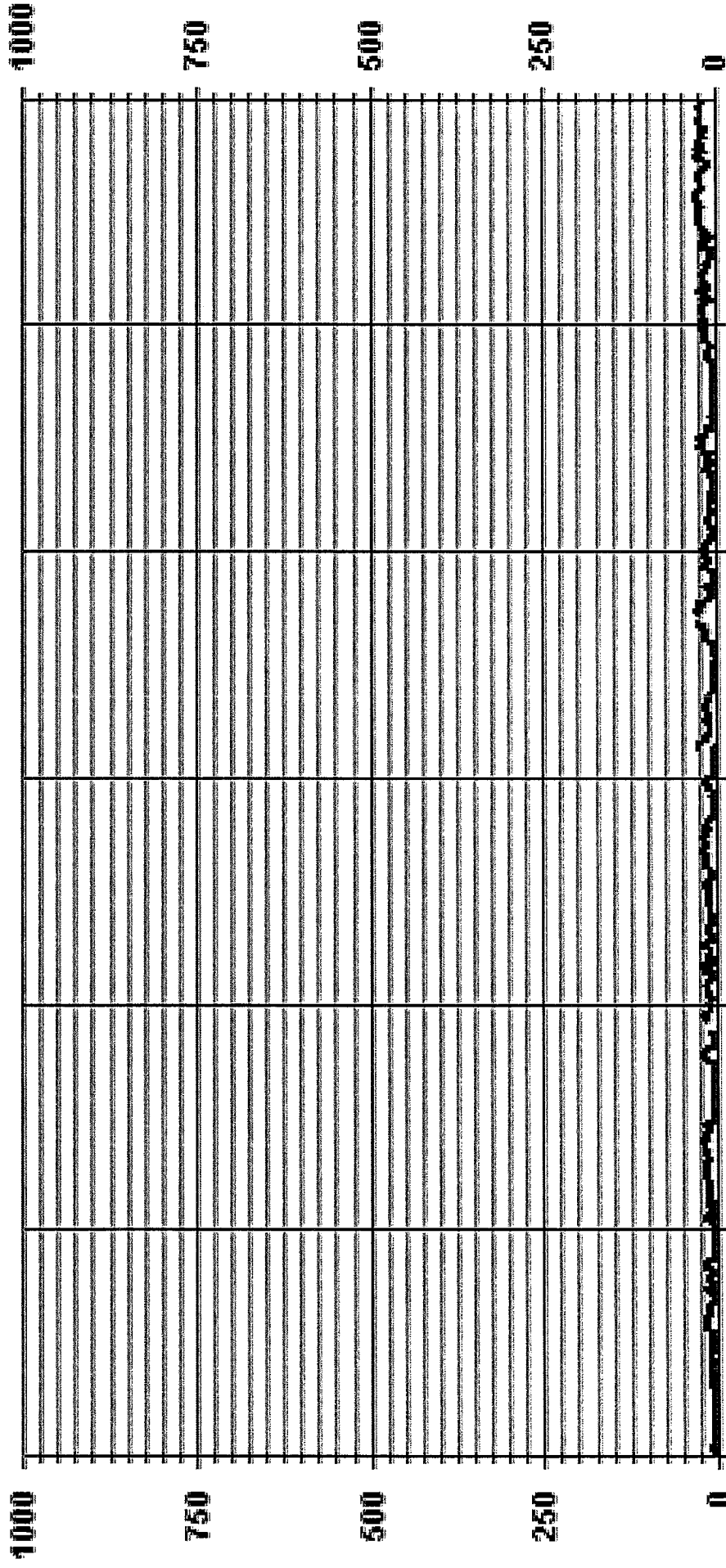
STATUS FLAG CODES

C	-CALIBRATION	Q	-QUALITY ASSURANCE
Y	-MAINTENANCE	R	-RECOVERY
S	-DAILY ZERO/SPAN CHECK	X	-MACHINE MALFUNCTION
P	-POWER FAILURE	O	-OPERATOR ERROR
G	-OUT FOR REPAIR	K	-COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	677	PPB	@ HOUR(S)	20	ON DAY(S)	28
MAXIMUM INSTANTANEOUS VALUE:	29.1	HRS	OPERATIONAL TIME:	720	HRS	720
1Z5 CALIBRATION TIME:	30	HRS	MONTHLY CALIBRATION TIME:	7	HRS	6.61
STANDARD DEVIATION:	6.61					

01 Hour Averages



--- LICA35 NO2MAX PPB

LICA-ELK
 NO2_ / WDR Joint Frequency Distribution (Percent)
 November 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA-ELK
 Parameter : NO2
 Units : PPF

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	1.93	4.01	1.93	5.34	7.28	8.32	4.45	1.78	3.86	4.30	4.60	13.96	13.57	12.63	8.46	3.41	100.00
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.93	4.01	1.93	5.34	7.28	8.32	4.45	1.78	3.86	4.30	4.60	13.96	13.57	12.63	8.46	3.41	

Calm : .00 %

Total # Operational Hours : 673

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	13	27	13	36	49	56	30	12	26	29	31	94	92	85	57	23	673
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	13	27	13	36	49	56	30	12	26	29	31	94	92	85	57	23	



Calm : .00 %

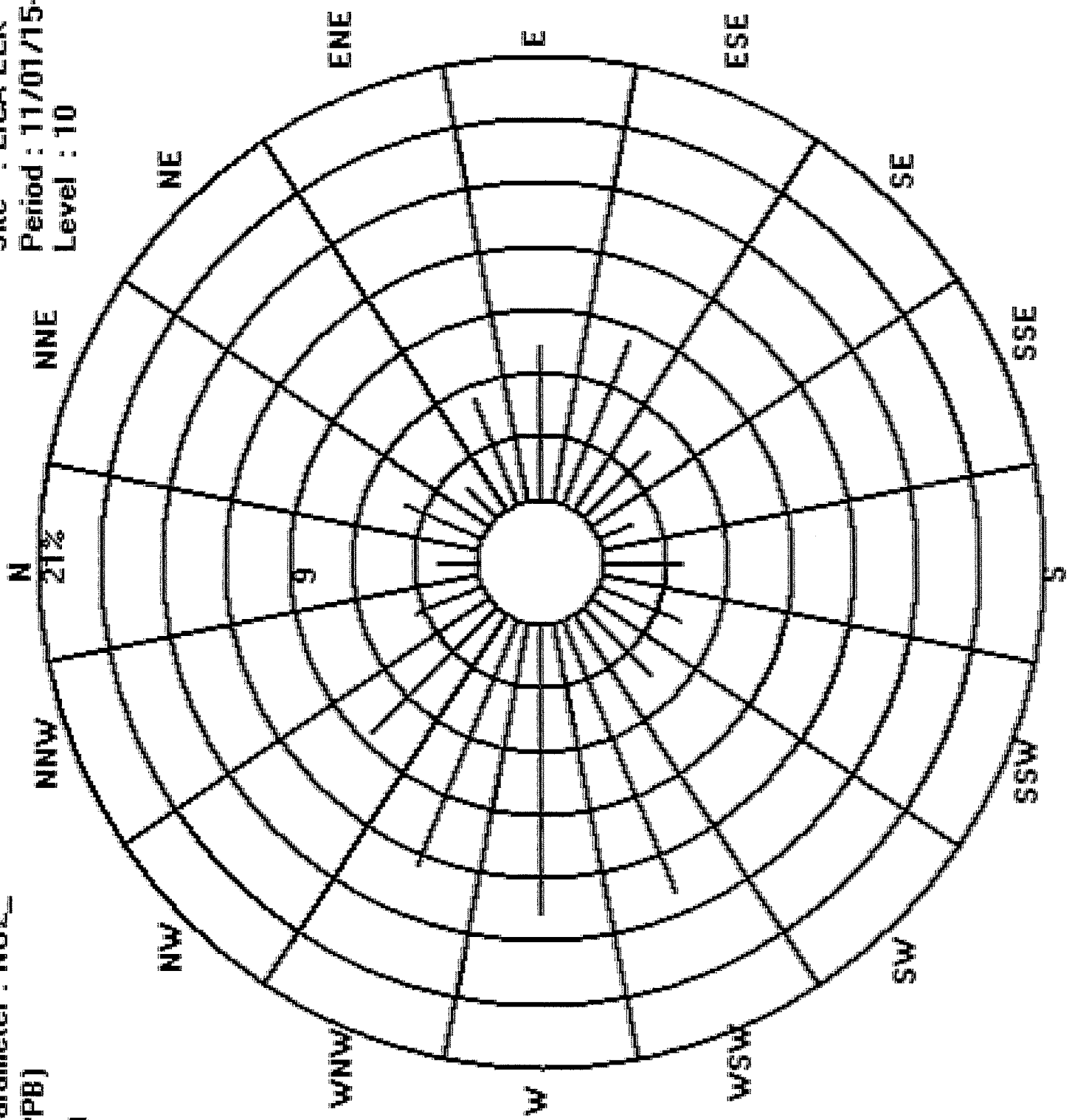
Total # Operational Hours : 673

Site : LICA-ELK
Period : 11/01/15-11/30/15
Level : 10

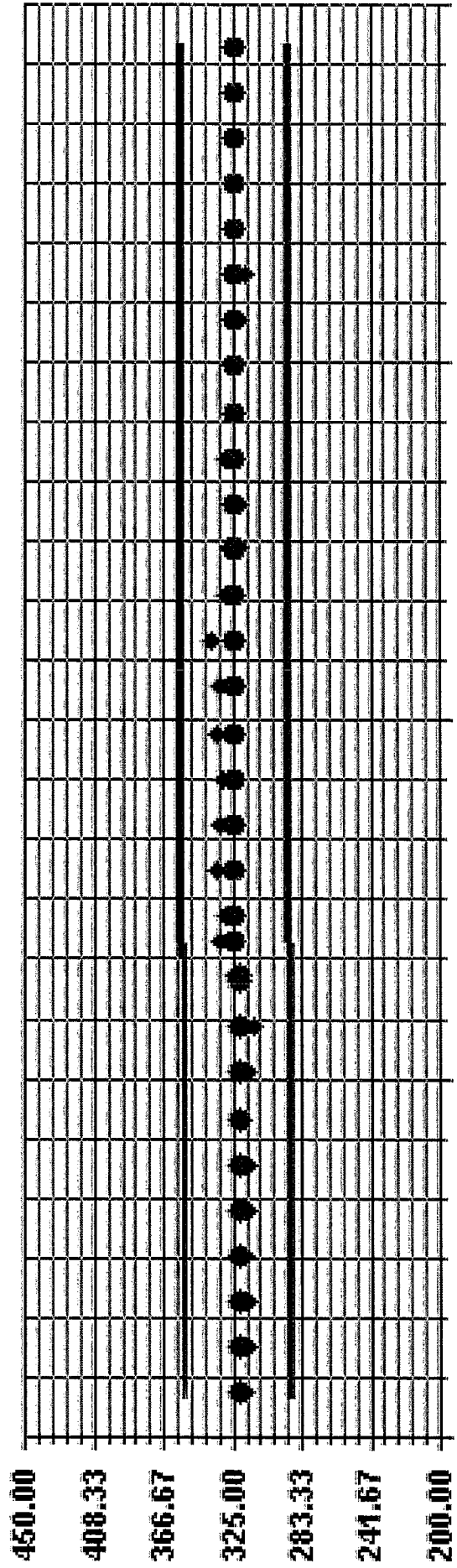
Logger : 35 Parameter : NO2_

Class Limits (PPB)

-  >= 210.0
-  < 210.0
-  < 110.0
-  < 50.0



Calibration Graph for Site: LICA35 Parameter: NO2_ Sequence: NO2 Phase: SPAN



11/1/15 11/8/15 11/16/15 11/23/15 12/1/15
 → Cal Value ◆ Exp Value — Exp Value +10% — Exp Value -10%

OZONE



OZONE (O3) hourly averages in ppb

DAY	OZONE (O3) hourly averages in ppb																								DAILY MAX.	DAILY AVG.	24-HOUR AVG.	ROGS.
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				
1	18	19	20	17	13	11	12	15	16	18	19	20	21	20	20	19	19	19	18	16	16	17	5	15	21	17.3	24	
2	16	15	14	14	13	13	12	12	12	12	12	11	10	8	5	5	4	3	3	3	4	4	5	1	0	16	8.8	24
3	1	1	1	1	1	0	0	0	0	0	2	3	7	8	11	11	13	12	11	12	5	5	7	4	13	5.3	24	
4	2	0	6	5	3	1	0	0	0	2	12	21	21	21	25	26	23	18	13	17	5	17	17	15	9	26	11.1	24
5	5	9	8	5	1	3	2	2	5	17	22	22	22	22	22	22	22	21	5	19	20	20	21	20	22	14.3	24	
6	20	19	18	16	15	16	12	3	5	11	16	18	17	20	20	20	14	11	7	4	4	5	5	5	20	12.2	24	
7	5	5	4	4	2	1	1	0	1	2	2	3	6	9	9	13	5	4	1	1	1	1	0	0	13	5.2	24	
8	0	0	0	0	0	0	0	5	4	13	24	24	24	24	24	18	5	22	24	27	25	26	23	20	18	27	12.7	24
9	18	16	15	15	15	16	17	17	18	17	17	17	17	19	23	23	23	20	17	14	9	5	4	2	6	23	15.0	24
10	8	14	23	24	24	23	22	21	21	17	13	15	17	13	17	17	13	17	C	C	C	8	13	12	11	24	16.7	24
11	11	9	10	10	8	7	6	3	4	3	6	5	15	18	19	17	19	14	11	8	10	5	19	19	10.5	24		
12	19	16	16	18	17	16	15	11	6	13	18	22	26	30	30	23	23	18	21	22	21	5	19	14	30	18.9	24	
13	11	10	9	9	7	6	5	4	4	5	7	8	8	8	6	19	20	24	24	25	5	23	21	20	25	12.3	24	
14	16	10	10	8	11	7	6	2	2	1	2	6	8	7	9	6	1	1	1	1	1	1	1	1	16	5.1	24	
15	1	2	5	11	20	22	24	24	23	23	22	23	23	23	20	18	16	15	5	12	8	4	2	1	24	14.9	24	
16	3	10	13	16	16	17	19	19	21	22	23	24	20	25	28	27	24	5	7	12	7	8	12	10	28	16.7	24	
17	11	12	14	15	13	9	6	8	6	9	8	6	5	7	9	10	5	8	8	6	11	21	21	21	9.9	24		
18	25	26	25	23	22	22	22	22	22	22	22	23	24	25	26	28	5	27	24	22	23	21	19	19	28	23.1	24	
19	15	11	8	1	5	5	1	1	1	1	1	2	4	9	5	Q	Q	8	9	7	2	6	9	14	15	5.7	24	
20	15	22	25	26	26	28	21	25	26	25	22	16	17	5	20	16	8	10	17	15	12	9	6	28	18.4	24		
21	7	3	6	12	13	12	14	19	20	18	20	23	20	23	24	24	23	21	22	23	25	25	25	26	26	18.5	24	
22	23	22	20	23	25	24	22	22	20	23	27	5	32	32	32	28	27	25	25	24	18	21	25	24	32	24.5	24	
23	22	18	13	17	16	11	8	3	1	4	5	2	2	2	8	13	14	15	16	27	28	26	24	25	28	14.7	24	
24	23	21	22	21	21	21	22	21	22	5	25	24	25	24	25	26	25	24	24	22	21	21	22	23	26	22.7	24	
25	24	25	23	23	23	24	20	15	5	12	10	10	10	10	10	13	12	7	7	7	8	5	5	6	25	13.2	24	
26	8	7	8	2	7	12	5	19	16	21	22	20	20	16	15	17	15	10	18	17	17	17	12	20	9.9	24		
27	9	10	8	5	7	12	5	19	16	21	22	20	23	28	29	26	24	16	12	15	13	19	21	22	29	17.3	24	
28	18	14	10	10	10	5	5	1	1	1	1	2	3	6	10	13	6	5	1	4	1	1	1	1	18	5.4	24	
29	1	1	1	1	1	5	2	1	1	3	4	8	15	16	18	19	16	13	9	3	6	7	4	2	1	19	6.6	24
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
HOURLY MAX	25	26	25	26	26	28	24	25	26	25	27	24	32	32	32	28	27	25	27	28	26	25	25	26	26	26	24	
HOURLY AVG	11.9	11.6	11.7	12.2	12.1	11.5	10.4	10.1	9.9	10.8	12.9	13.8	14.9	16.9	17.8	16.9	16.2	13.9	13.0	13.7	11.6	12.0	12.1	11.8	11.8	11.8		

STATUS FLAG CODES

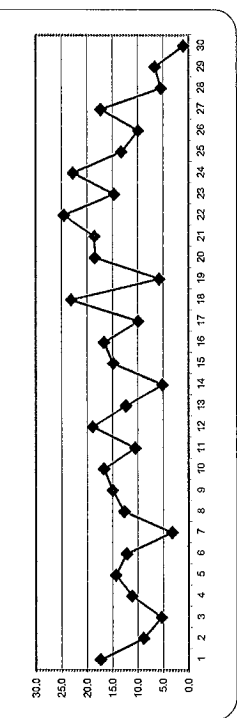
C	CALIBRATION	Q	QUALITY ASSURANCE
Y	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

OBJECTIVE LIMIT: ALBERTA ENVIRONMENT: 1-HR: 82 PPB

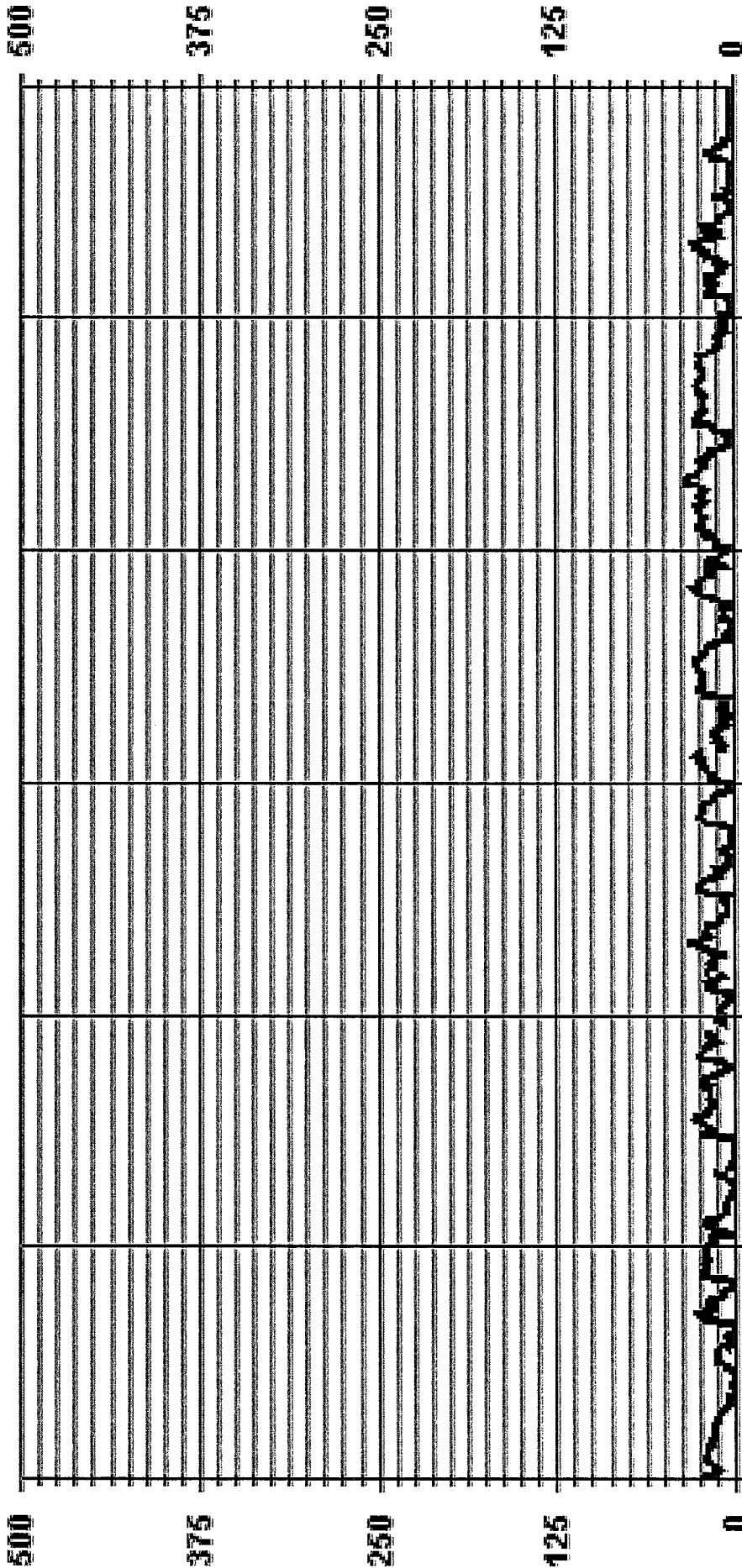
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0
NUMBER OF NON-ZERO READINGS:	663
MAXIMUM 1-HR AVERAGE:	32 PPB
MAXIMUM 24-HR AVERAGE:	24.5 PPB
OPS CALIBRATION TIME:	30 HRS
MONTHLY CALIBRATION TIME:	4 HRS
STANDARD DEVIATION:	8.47
OPERATIONAL TIME:	720 HRS
AMT OPERATION UPTIME:	100.0 %
MONTHLY AVERAGE:	13 PPB
ON DAY(S)	22
VAR- VARIOUS	22

24 HOUR AVERAGES FOR NOVEMBER 2015



01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA35 03_ PPB



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 Elk Point Airport Site - NOVEMBER 2015
 JOB # 2833-2015-11-35-C

OZONE MAX instantaneous maximum in ppb

MST

DAY	HOUR																								24-HOUR AVG.	RDGS.
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00		
1	21	22	22	19	15	13	15	18	20	21	22	23	24	22	21	22	22	21	18	18	19	19	18	19	18	24
2	18	18	17	16	15	16	15	14	15	15	14	13	12	10	9	7	6	4	5	4	5	5	5	2	1	18
3	1	1	2	2	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18
4	8	0	3	9	6	5	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
5	7	12	11	6	3	3	6	3	13	22	24	23	23	24	23	22	24	23	21	21	21	21	21	21	21	24
6	21	21	19	18	16	19	15	8	9	12	20	21	21	23	22	20	16	5	10	8	5	6	7	6	23	
7	7	7	7	6	4	3	2	1	3	4	4	5	9	12	13	14	5	9	4	1	3	4	1	1	14	
8	2	0	1	0	3	0	1	5	12	16	29	28	19	22	5	26	31	31	30	30	30	25	24	22	31	
9	20	19	18	18	18	18	19	20	20	19	20	24	21	29	5	26	23	20	20	13	11	8	5	11	29	
10	10	24	27	28	27	27	26	23	24	23	19	19	19	5	20	C	C	C	C	C	C	11	15	15	13	
11	14	10	12	12	11	10	9	12	7	8	6	10	9	19	20	22	22	24	19	16	10	13	5	22	24	
12	22	18	18	22	20	17	17	16	15	19	23	27	29	33	32	26	28	21	25	25	23	5	22	18	33	
13	13	13	10	10	9	7	6	5	5	7	10	11	11	10	9	26	23	30	28	29	5	25	24	24	30	
14	21	15	11	10	14	9	8	4	3	2	5	11	11	9	12	10	5	2	1	5	1	1	1	1	21	
15	2	6	7	19	23	25	28	27	26	25	24	25	25	24	23	21	18	19	5	16	12	11	6	1	28	
16	10	15	16	18	18	19	20	20	23	23	24	30	26	33	31	30	29	5	12	15	11	12	17	12	33	
17	12	13	15	16	14	14	8	9	9	10	9	8	7	9	11	11	5	7	10	9	7	21	23	25	25	
18	28	28	27	25	23	23	24	23	22	23	24	25	25	28	29	5	27	25	23	23	23	21	20	20	29	
19	19	13	12	3	6	7	2	1	1	3	2	4	7	13	5	Q	Q	Q	14	10	5	8	11	17	19	
20	18	25	26	27	27	29	27	26	28	26	26	23	21	5	21	19	13	12	19	19	18	15	13	7	29	
21	8	7	12	16	16	14	18	20	21	20	22	23	5	25	27	27	23	26	24	25	26	28	28	29	29	
22	26	25	21	27	27	27	23	22	24	31	5	34	34	34	33	30	28	27	25	25	22	28	28	34	24	
23	24	21	17	18	19	14	11	6	3	5	5	4	5	13	14	15	15	29	29	29	27	25	26	26	29	
24	24	22	23	21	22	22	23	22	23	5	26	25	26	27	27	26	25	24	23	22	22	22	23	24	27	
25	25	25	25	23	24	24	23	18	5	13	13	12	10	15	15	13	7	8	9	9	7	6	9	25		
26	10	9	11	4	2	1	1	5	1	1	3	12	20	21	19	18	17	20	19	18	18	13	21	21	24	
27	11	12	11	7	14	13	5	20	18	23	26	28	30	32	30	25	25	14	17	15	22	23	23	32	20.1	
28	22	18	14	14	13	5	7	1	2	2	3	4	11	15	16	9	6	4	5	2	2	2	2	2	22	
29	1	1	1	1	5	3	2	1	4	6	14	16	18	20	21	19	18	11	4	8	9	5	4	1	21	
30	1	1	1	5	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	
HOURLY MAX	28	28	27	28	27	29	28	27	28	26	31	30	34	34	34	33	30	31	31	30	30	28	28	29	13.9	
HOURLY AVG	14.2	14.0	13.9	14.3	14.1	13.2	12.4	12.3	12.2	13.2	15.6	16.8	17.8	19.9	20.2	19.8	19.2	17.5	15.9	16.0	13.9	14.5	14.3	13.9		

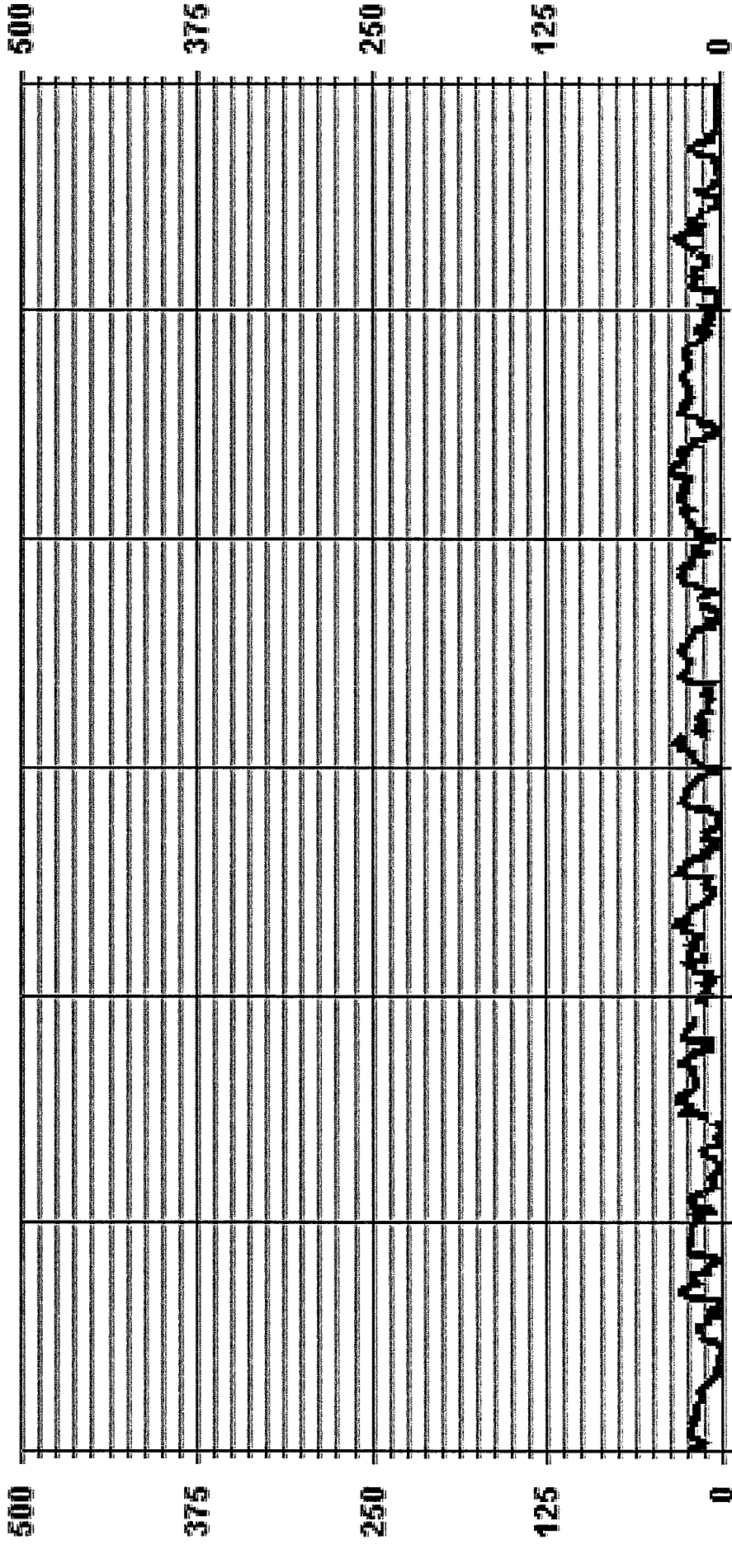
STATUS FLAG CODES

C	- CALIBRATION	Q	- QUALITY ASSURANCE
M	- MAINTENANCE	R	- RECOVER
S	- SALS/ZERO/SPAN CHECK	X	- MACHINE/AL FUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	672
MAXIMUM INSTANTANEOUS VALUE:	34
PPB	34
@ HOUR(S)	VAR
ON DAY(S)	22
OPERATIONAL TIME:	720 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	8.90

01 Hour Averages



— LICA35 O3MAX PPB

LICA-ELK
 O3_ / WDR Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA-ELK
 Parameter : O3
 Units : PPB

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50	1.91	3.97	1.91	5.30	7.21	8.10	4.12	2.06	4.41	4.27	4.71	13.84	13.54	12.66	8.54	3.38	100.00
< 110	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 210	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.91	3.97	1.91	5.30	7.21	8.10	4.12	2.06	4.41	4.27	4.71	13.84	13.54	12.66	8.54	3.38	

Calm : .00 %

Total # Operational Hours : 679

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50	13	27	13	36	49	55	28	14	30	29	32	94	92	86	58	23	679
< 110																	
< 210																	
>= 210																	
Totals	13	27	13	36	49	55	28	14	30	29	32	94	92	86	58	23	

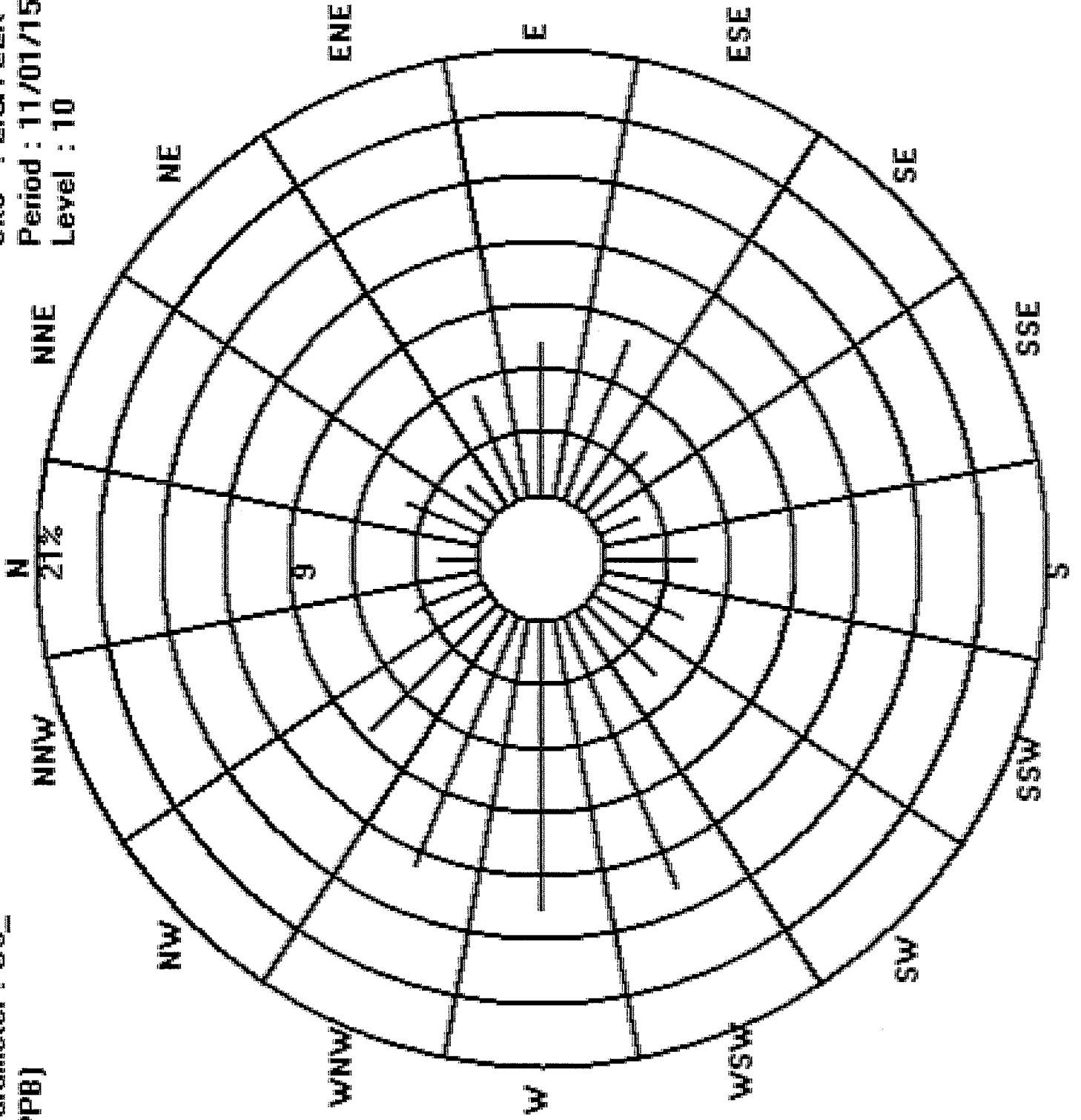
Calm : .00 %

Total # Operational Hours : 679

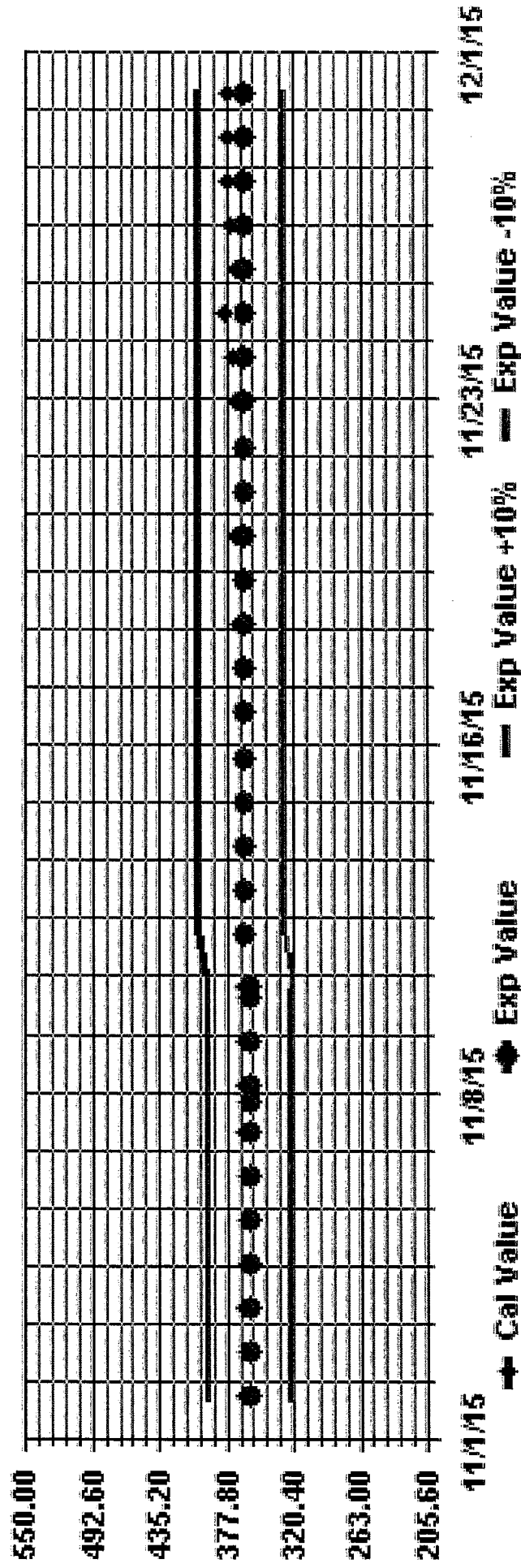
Site : LICA-ELK
Period : 11/01/15-11/30/15
Level : 10

Logger : 35 Parameter : O3_

Class Limits (PPB)



Calibration Graph for Site: LICA35 Parameter: O3_NEW Sequence: O3_NEW Phase: SPAN



PARTICULATE MATTER 2.5

PARTICULATE MATTER 2.5 (LESS THAN 2.5 MICRONS) (PM2.5) hourly averages in ug/m3

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	RDGS.										
1	0	4	5	5	5	4	5	2	0	0	3	3	0	4	6	3	3	1	2	6	1	2	6	1	2	0	8	3	24							
2	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6	6	1	23				
3	9	3	5	6	6	8	10	10	14	10	7	10	5	9	5	9	9	4	0	4	3	1	1	1	1	1	6	6	14	7	24					
4	5	5	4	15	14	14	13	14	17	18	2	10	6	16	12	11	7	8	3	6	4	3	6	4	4	13	10	18	10	24						
5	12	15	10	13	9	10	11	11	8	7	4	6	3	10	6	6	4	5	9	8	7	6	8	10	15	8	24	24	24	24	24					
6	9	12	16	14	15	14	14	13	18	13	12	11	C	0	6	14	13	10	24	15	10	13	8	7	24	12	24	24	24	24						
7	11	6	4	8	6	5	8	4	7	6	0	6	5	9	2	3	3	8	5	6	6	10	3	7	11	6	24	24	24	24	24					
8	5	3	7	10	6	5	5	8	10	4	0	X	11	4	4	4	X	7	4	1	0	0	1	0	6	11	5	22	24	24	24	24				
9	0	4	0	2	1	0	8	1	1	3	3	0	5	3	0	5	3	6	0	4	2	0	1	0	8	2	24	24	24	24	24	24				
10	2	2	1	3	2	0	0	3	1	8	2	0	6	6	7	4	6	3	4	7	5	6	4	8	4	24	24	24	24	24	24	24				
11	2	7	3	4	9	6	5	8	7	4	4	10	9	9	10	1	0	4	6	7	6	2	0	4	10	5	24	24	24	24	24	24				
12	4	0	4	8	10	7	4	5	7	7	2	2	0	0	0	5	2	0	2	0	0	2	1	6	10	3	24	24	24	24	24	24				
13	8	7	1	4	3	2	5	2	6	2	8	0	6	6	5	7	2	0	2	0	0	1	4	3	8	4	24	24	24	24	24	24				
14	2	2	0	5	3	4	5	0	2	3	4	4	5	9	2	5	6	4	5	0	1	4	5	7	9	4	24	24	24	24	24	24				
15	9	9	9	5	3	3	6	4	0	0	2	4	4	5	2	3	7	1	0	6	0	4	6	0	9	4	24	24	24	24	24	24				
16	3	7	9	8	8	9	4	4	3	0	1	5	4	5	4	2	3	0	0	0	0	0	0	2	1	9	3	24	24	24	24	24	24			
17	0	3	0	3	3	0	1	8	0	X	10	2	3	2	2	0	8	4	5	5	5	5	4	1	4	10	3	23	24	24	24	24	24			
18	5	7	8	0	6	3	0	0	4	2	0	2	2	6	0	0	0	2	1	1	2	4	5	1	8	3	24	24	24	24	24	24	24			
19	2	2	8	3	8	3	6	9	8	9	12	Q	0	7	1	4	8	7	11	11	12	11	6	12	7	24	24	24	24	24	24	24				
20	9	8	7	9	7	9	10	11	12	10	4	6	12	7	6	4	5	12	3	5	3	5	12	3	5	12	7	24	24	24	24	24	24			
21	4	7	3	6	6	5	6	7	5	2	3	2	2	3	3	0	5	5	3	7	4	11	2	7	11	5	24	24	24	24	24	24	24			
22	4	1	3	2	5	2	0	4	4	3	3	1	4	4	2	2	4	2	4	2	4	0	3	1	6	3	24	24	24	24	24	24	24			
23	5	2	6	3	6	4	4	6	5	6	3	C	0	4	4	1	3	0	3	2	0	4	1	X	6	3	23	24	24	24	24	24	24			
24	3	2	0	6	0	2	2	1	4	0	2	2	1	1	4	1	0	3	1	3	2	0	1	2	6	2	24	24	24	24	24	24	24			
25	0	0	1	3	1	2	9	8	8	5	10	12	10	10	17	11	14	25	19	17	8	14	13	11	25	10	24	24	24	24	24	24	24			
26	9	15	13	12	13	12	15	14	13	16	12	8	8	10	14	13	15	11	8	8	20	18	12	20	13	24	24	24	24	24	24	24	24			
27	16	19	17	18	13	13	9	11	9	5	8	7	8	7	8	6	4	7	5	6	6	5	6	19	9	24	24	24	24	24	24	24	24	24		
28	8	5	3	6	10	9	9	4	15	7	9	12	19	22	11	15	8	6	10	7	11	14	15	14	22	10	24	24	24	24	24	24	24			
29	17	16	13	13	18	17	12	19	19	8	10	12	12	15	9	13	9	7	7	7	7	9	10	13	11	19	12	24	24	24	24	24	24	24		
30	14	10	7	9	12	18	12	9	15	20	14	14	18	19	14	10	21	19	17	17	17	19	18	22	22	15	24	24	24	24	24	24	24	24		
HOURLY MAX	17	19	17	18	18	18	14	19	22	17	15	21	25	24	17	19	20	18	22																	
HOURLY AVG	5.9	6.1	5.6	6.7	7.1	6.3	6.5	6.7	7.5	6.0	5.8	5.6	6.0	6.5	6.0	5.4	5.7	6.3	5.6	5.6	5.6	4.6	6.2	5.6	6.6											

OBJECTIVE LIMIT: ALBERTA ENVIRONMENT: 25 ug/m3 24-HR; 30 ug/m3 24-HR

MONTHLY SUMMARY

NUMBER OF 24-HR EXCEEDENCES: 0

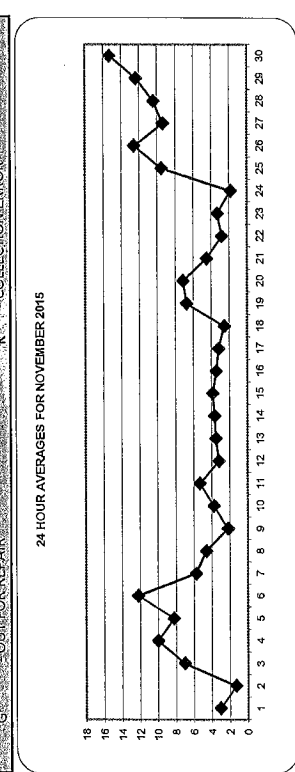
NUMBER OF NON-ZERO READINGS: 622

MAXIMUM 1-HR AVERAGE: 25 ug/m3 @ HOUR(S) 17 ON DAY(S) 25

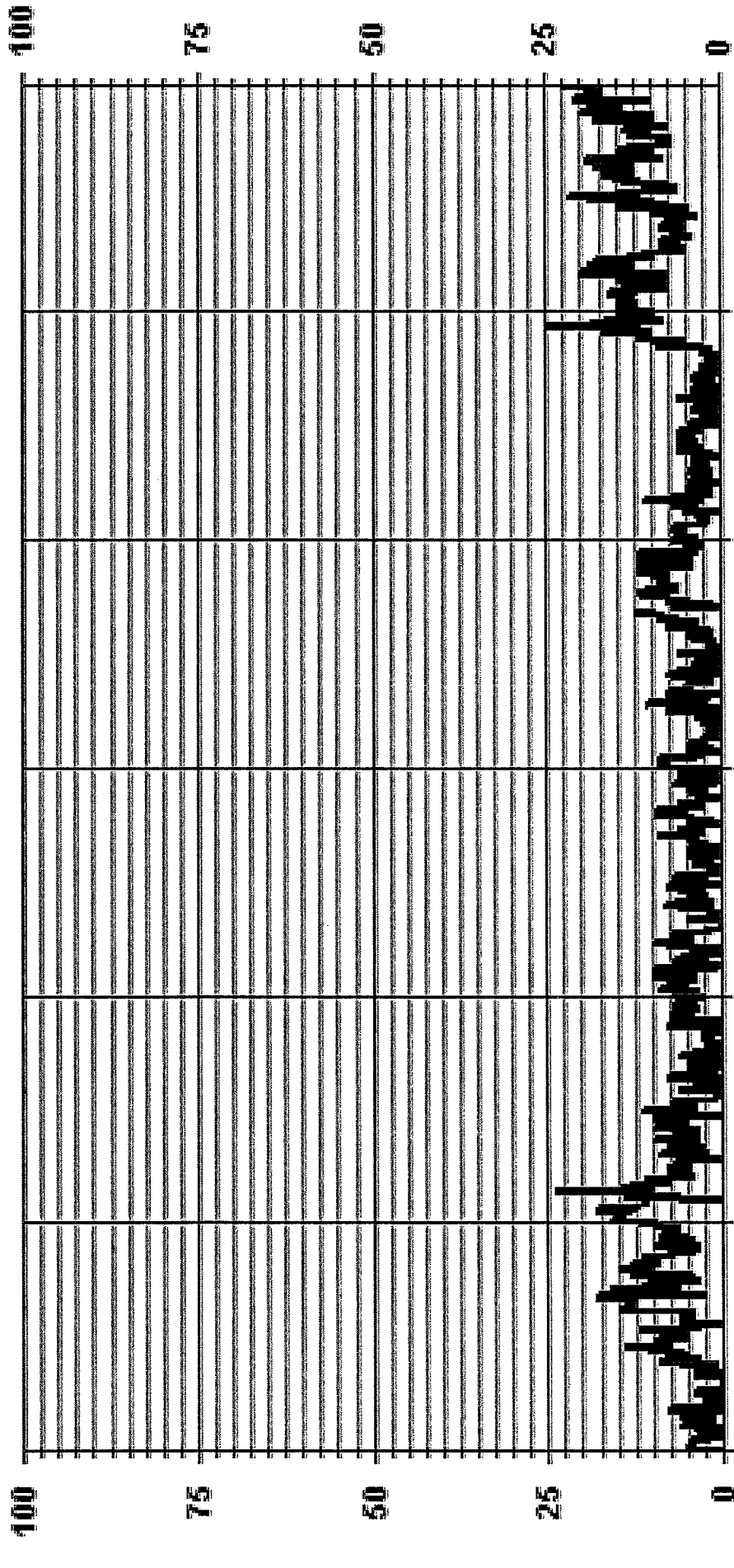
MAXIMUM 24-HR AVERAGE: 15.3 ug/m3 VAR-VARIOUS ON DAY(S) 30

MONTHLY CALIBRATION TIME: 2 HRS OPERATIONAL TIME: 715 HRS

STANDARD DEVIATION: 4.94 MONTHLY AVERAGE: 6.1 ug/m3



01 Hour Averages



— LICA35 PM2 UG/M3

LICA-ELK
 PM2 / WDR Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA-ELK
 Parameter : PM2
 Units : UG/M3

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																NNW	NW	NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NW				
< 30	1.84	3.68	1.98	5.24	7.08	7.93	4.81	1.98	4.53	4.24	4.39	14.02	13.45	12.60	8.49	3.68	100.00			
< 60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
< 80	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
< 120	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
< 240	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
>= 240	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			
Totals	1.84	3.68	1.98	5.24	7.08	7.93	4.81	1.98	4.53	4.24	4.39	14.02	13.45	12.60	8.49	3.68				

Calm : .00 %

Total # Operational Hours : 706

Distribution By Samples

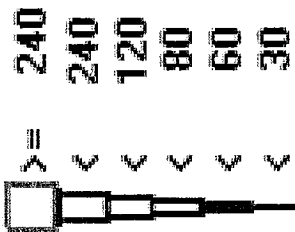
Limit	Direction																NNW	NW	NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NW				
< 30	13	26	14	37	50	56	34	14	32	30	31	99	95	89	60	26	706			
< 60																				
< 80																				
< 120																				
< 240																				
>= 240																				
Totals	13	26	14	37	50	56	34	14	32	30	31	99	95	89	60	26				

Calm : .00 %

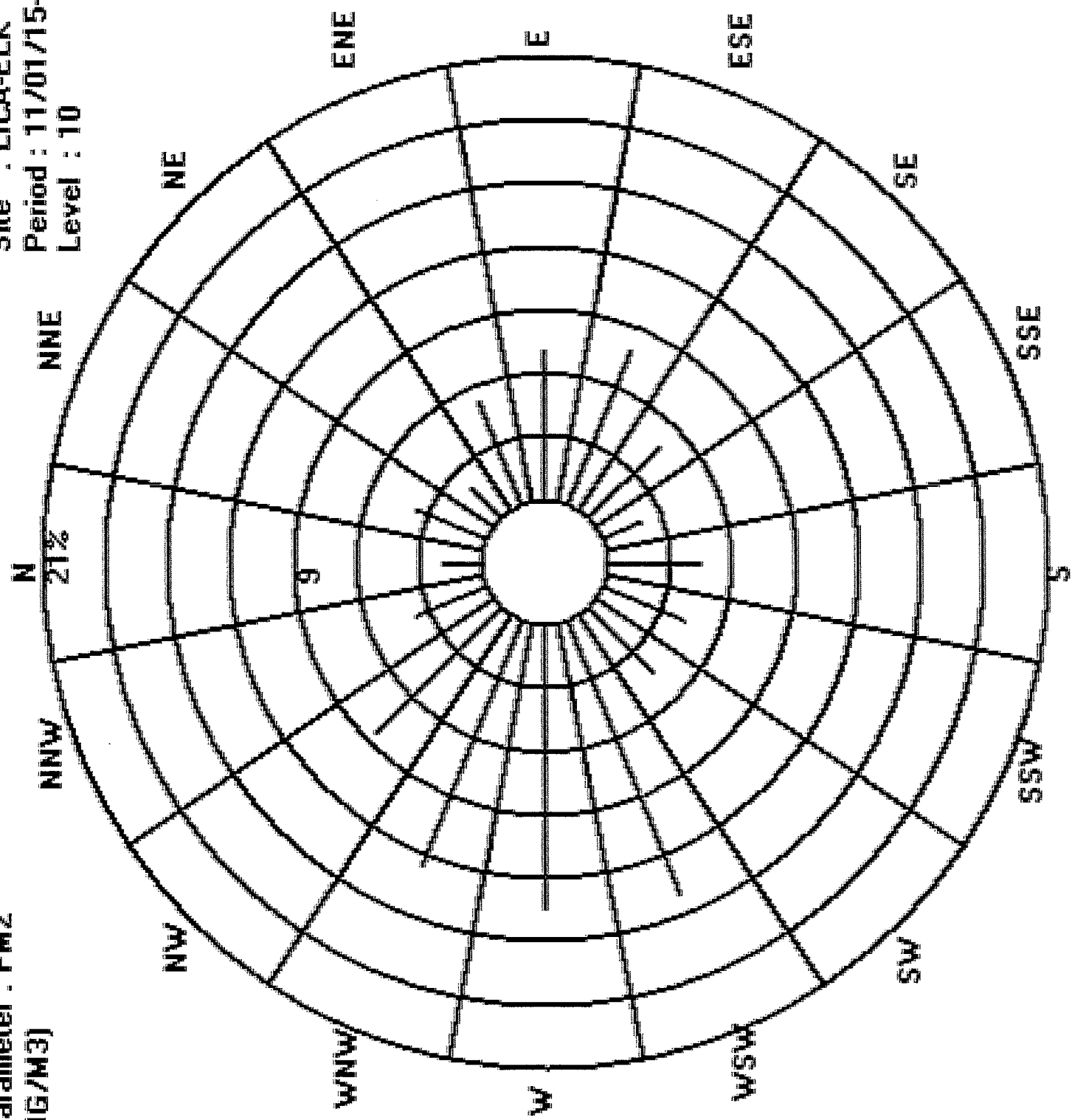
Total # Operational Hours : 706

Logger : 35 Parameter : PM2

Class Limits (UG/M3)



Site : LICA-ELK
Period : 11/01/15-11/30/15
Level : 10



WIND SPEED



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Elk Point Airport Site - NOVEMBER 2015
JOB # 2833-2015-11-35-C

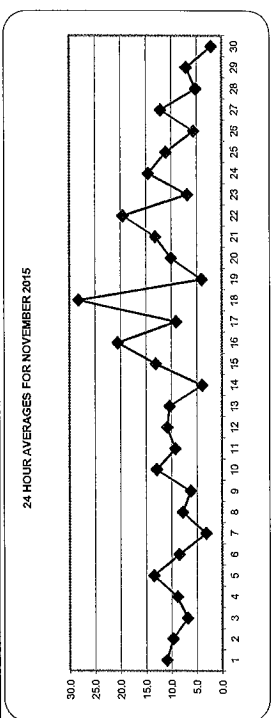
WIND SPEED (WS) hourly averages in km/hr

DAY	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	
HOURLY MAX	7.0	8.4	7.6	9.1	8.4	6.0	4.9	6.2	7.8	9.0	10.7	12.4	13.8	15.2	13.7	14.9	14.7	12.0	13.0	11.5	13.0	10.6	12.0	11.6	11.8	10.6	10.0	9.0	17.5	10.9	24
HOURLY AVG	3.4	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
DAILY MAX	18.4	27.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7
DAILY AVG	9.1	9.0	9.3	9.7	9.3	9.2	9.0	8.6	9.5	10.2	11.5	12.4	13.1	13.2	12.8	11.2	10.1	9.9	9.9	10.1	10.1	9.9	10.3	10.1	10.1	10.1	9.9	8.8	9.6	9.5	8.9

STATUS FLAG CODES

C	QUALITY ASSURANCE	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
D	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUTBEHIND REPAIR	X	COLLECTION ERROR

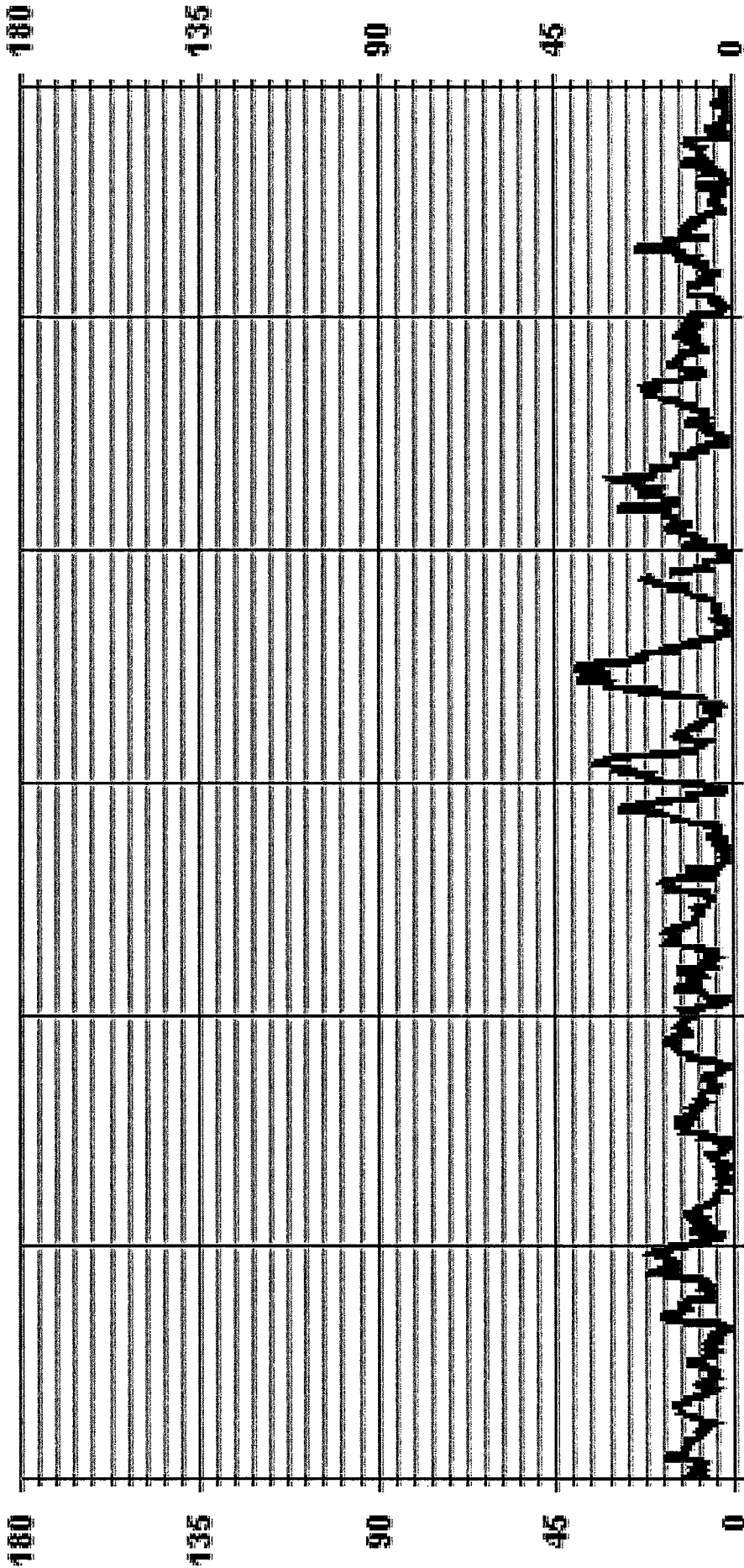
LAST CALIBRATION: November 23, 2015
DECLINATION: MAGNETIC DECLINATION 19 DEGREE EAST



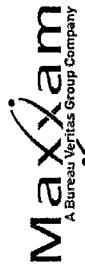
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	715	ON DAY(S)	12
MAXIMUM 1-HR AVERAGE:	39.7 KPH	ON DAY(S)	18
MAXIMUM 24-HR AVERAGE:	28.3 KPH	ON DAY(S)	18
MONTHLY CALIBRATION TIME:	2 HRS	OPERATIONAL TIME:	717 HRS
STANDARD DEVIATION:	7.13	AMT OPERATION UPTIME:	99.6 %
		MONTHLY AVERAGE:	10.2 KPH

01 Hour Averages



— LICA35 WSP KPH



VECTOR WIND SPEED MAX instantaneous maximum in km/hr

MST

HOUR START	24-HOUR AVG.																											
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00			
1	13.2	17.0	20.3	19.0	15.7	14.8	17.6	12.7	15.4	14.8	21.3	24.3	26.2	25.6	22.6	20.3	23.4	18.7	23.1	21.9	19.8	18.9	16.4	17.6	26.2	19.2	24	
2	17.5	13.1	16.4	16.5	10.5	9.3	10.5	15.0	15.3	17.5	21.1	21.1	23.4	21.8	22.5	24.2	17.7	19.5	18.8	17.6	13.5	10.3	9.3	10.5	24.2	15.9	24	
3	13.6	17.0	15.3	10.5	8.9	8.0	8.6	9.3	12.2	11.0	17.5	14.0	17.7	17.4	15.8	16.6	14.6	14.0	10.0	14.4	10.2	9.4	10.4	11.9	17.7	12.8	24	
4	10.5	7.4	9.9	12.4	7.7	5.9	5.6	3.6	6.2	11.0	25.4	29.6	33.2	31.8	28.5	23.6	20.4	17.5	23.0	23.7	23.1	23.8	15.3	17.9	33.2	17.4	24	
5	18.7	13.0	12.8	13.4	12.4	14.0	12.3	13.7	19.4	25.1	31.9	37.1	33.3	28.7	26.9	26.2	27.2	32.8	26.8	27.9	34.3	32.3	36.2	27.4	37.1	24.3	24	
6	30.1	24.5	17.8	14.8	11.9	9.4	8.8	4.4	17.2	20.2	13.8	16.1	16.8	19.1	19.6	14.1	19.1	21.0	18.3	12.2	13.4	15.0	11.4	30.1	16.2	24		
7	10.4	8.5	8.3	7.0	8.2	6.5	6.3	7.8	6.5	6.7	6.9	8.3	7.4	8.8	7.5	8.8	8.5	8.1	4.3	7.6	8.4	7.4	14.9	12.2	14.9	8.1	24	
8	10.3	6.6	6.8	4.1	7.3	4.6	6.1	4.9	9.8	12.1	13.2	17.6	24.1	25.4	23.6	25.4	29.2	27.2	26.7	22.1	18.1	23.0	21.0	20.6	29.2	16.2	24	
9	26.0	18.6	18.0	14.5	15.7	15.5	15.9	12.4	13.7	12.9	11.6	12.4	12.3	10.8	12.4	10.5	15.0	14.7	10.1	7.2	5.5	6.0	5.3	26.0	12.6	24		
10	9.4	15.9	20.9	22.8	23.0	23.3	22.9	26.1	25.4	29.3	30.4	29.2	30.1	27.2	27.3	20.8	19.2	17.2	18.9	20.0	23.6	27.2	26.1	23.6	30.4	23.3	24	
11	25.3	18.8	26.0	31.9	18.1	14.9	7.1	6.3	5.0	12.9	16.5	13.4	16.6	23.9	23.3	21.0	15.4	18.2	15.4	16.8	13.7	15.1	19.7	22.7	31.9	17.4	24	
12	26.3	13.4	13.4	13.4	15.5	12.4	11.3	9.0	9.1	7.6	8.8	15.4	15.9	21.3	27.4	30.7	25.0	23.3	25.1	32.0	32.2	31.7	28.0	25.0	17.1	32.2	19.9	24
13	15.3	14.7	14.7	14.3	11.2	10.7	12.9	12.7	14.2	14.1	10.9	10.9	9.7	10.5	17.9	27.3	20.0	26.6	26.5	30.2	24.8	28.6	25.7	26.1	30.2	17.9	24	
14	15.3	12.0	11.3	16.9	21.5	9.3	7.0	5.6	8.1	6.9	11.9	15.8	6.9	8.3	8.4	5.6	7.3	8.6	6.6	8.4	7.2	10.3	8.7	7.6	21.5	9.8	24	
15	6.9	7.2	6.3	16.6	19.9	21.7	24.6	25.4	32.6	31.0	43.0	45.5	43.4	37.1	35.5	28.2	20.1	14.8	18.3	12.4	8.8	5.2	17.7	10.9	45.5	22.2	24	
16	23.4	27.6	33.9	35.9	32.5	39.0	43.3	45.0	45.0	47.2	51.9	54.1	49.4	49.1	41.1	33.4	28.2	14.7	15.3	14.5	14.2	18.1	25.4	19.5	54.1	33.4	24	
17	19.8	23.3	23.6	25.3	20.2	13.2	10.9	14.0	11.9	12.2	12.8	10.8	9.5	16.5	17.9	12.0	9.3	9.2	13.0	13.3	11.4	28.4	32.7	37.8	37.8	17.0	24	
18	35.0	49.8	56.2	54.3	55.4	62.8	60.1	56.1	54.2	53.7	60.5	64.3	61.5	57.1	60.9	46.8	39.5	31.6	34.3	32.4	32.4	25.3	31.1	24.9	64.3	47.5	24	
19	18.7	18.0	14.6	11.2	12.9	8.6	3.9	3.7	2.9	4.2	5.3	9.8	9.4	6.2	7.7	7.1	7.3	5.1	8.3	9.6	9.7	8.7	8.8	10.1	18.7	8.8	24	
20	15.0	14.2	17.4	18.7	18.3	30.7	16.3	28.1	35.2	31.3	31.7	C	C	C	25.7	18.3	14.2	10.2	14.8	18.5	10.4	6.3	9.0	6.6	4.7	35.2	18.0	24
21	9.4	6.8	14.9	19.8	18.5	18.1	20.1	17.9	23.7	20.7	24.8	28.9	26.9	27.4	17.6	22.9	22.5	26.4	29.7	28.6	31.7	39.7	42.3	38.2	42.3	24.1	24	
22	24.9	19.0	24.4	30.3	30.9	36.5	30.9	25.8	29.2	33.3	35.8	36.7	44.0	50.1	46.2	34.3	37.1	30.4	30.9	23.1	17.3	21.9	22.6	24.4	50.1	30.8	24	
23	21.5	20.5	15.1	16.6	13.3	14.8	14.6	11.2	8.4	5.2	4.9	4.7	8.5	11.0	11.1	9.8	7.1	23.4	23.0	15.1	11.4	13.4	15.8	16.7	23.4	13.2	24	
24	15.6	17.7	17.0	22.1	25.0	27.0	30.4	41.9	39.7	42.3	34.5	34.6	33.9	34.2	31.2	25.2	25.7	13.4	11.5	16.0	21.9	25.5	20.3	42.3	26.5	24		
25	26.2	24.4	26.4	24.4	22.3	21.8	18.4	17.2	14.2	16.3	17.0	16.6	17.8	14.6	25.2	24.6	19.0	17.9	20.5	17.0	15.7	18.0	15.2	16.0	26.4	19.4	24	
26	15.8	17.0	15.1	6.5	6.3	7.6	5.3	8.3	8.5	6.9	12.3	16.4	19.9	Y	Y	20.8	13.8	15.7	12.3	13.6	15.7	12.9	9.0	20.8	12.4	21		
27	10.1	16.5	10.7	11.6	14.1	19.4	18.5	20.6	22.9	23.0	26.9	33.7	33.4	26.6	25.8	18.1	22.2	13.6	14.9	16.9	14.6	20.6	17.4	20.0	33.7	19.7	24	
28	15.4	14.5	18.1	11.7	10.0	11.5	8.9	7.3	7.1	7.0	12.4	10.4	9.2	11.1	9.7	9.0	10.2	6.1	7.8	10.1	10.8	12.9	5.5	8.0	18.1	10.2	24	
29	4.8	4.4	7.5	10.5	9.4	12.6	11.6	13.4	17.4	15.0	14.0	14.7	13.5	16.2	16.2	13.1	14.1	16.3	15.7	16.8	15.9	15.7	7.8	2.9	17.4	12.5	24	
30	9.9	9.8	9.7	5.3	6.6	6.1	4.7	2.0	5.0	2.9	3.9	4.5	4.9	4.6	9.1	8.6	3.1	4.2	6.2	3.1	3.0	6.2	8.8	4.0	9.9	5.7	24	
HOURLY MAX	35.0	49.8	56.2	54.3	55.4	62.8	60.1	56.1	54.2	53.7	60.5	64.3	61.5	57.1	60.9	46.8	39.5	31.6	34.3	32.4	32.4	25.3	31.1	24.9	64.3	47.5	24	
HOURLY AVG	17.1	16.4	17.4	17.8	16.7	17.0	15.7	15.5	17.9	18.4	21.5	22.5	22.9	23.2	22.9	20.3	18.4	17.8	18.3	17.2	16.0	17.8	18.2	16.6	16.6	16.6	16.6	24

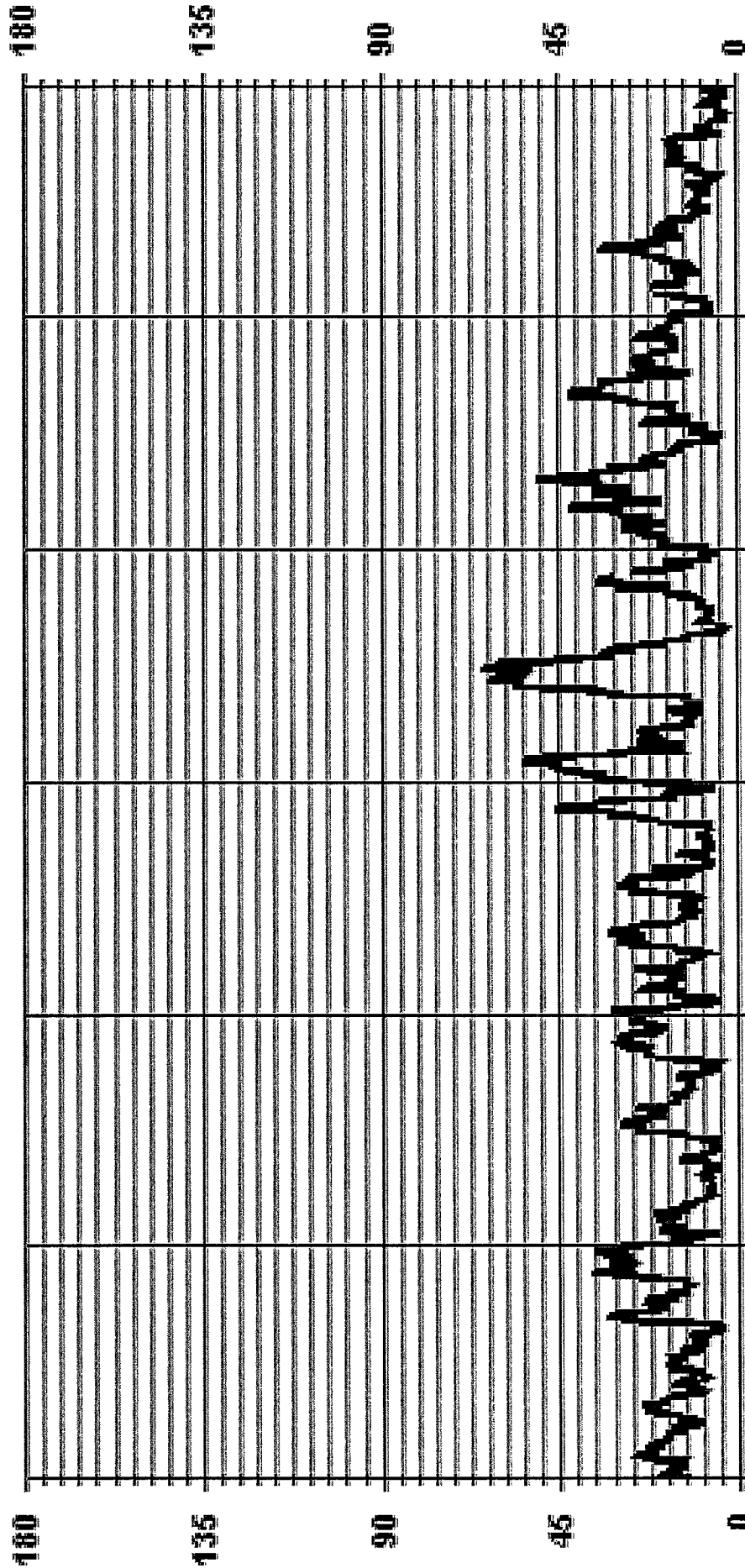
STATUS FLAG CODES

C	CALIBRATION	O	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	64.3	KPH	@ HOUR(S)	11	ON DAY(S)	18
OPERATIONAL TIME:			717 HRS			
VAR-VARIOUS			VAR-VARIOUS			

01 Hour Averages



— LICA35 WSMAX KPH

LICA-ELK
WSP / WDR Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 35
Site Name : LICA-ELK
Parameter : WSP
Units : KPH

Wind Parameter : WDR
Instrument Height : 10 Meters

Limit	Direction																NNW	NW	NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW				
< 6.0	.69	.83	.55	1.95	3.07	2.09	1.53	.83	1.25	1.53	2.23	3.91	3.07	3.21	1.67	1.25	29.79			
< 12.0	.55	2.23	1.39	2.37	2.51	4.05	1.53	.41	1.39	1.53	2.09	6.57	5.59	2.09	2.37	.69	37.48			
< 20.0	.41	.83	.13	.83	1.25	1.67	.69	.69	1.81	1.11	.27	3.35	3.63	2.09	3.07	.97	23.49			
< 29.0	.13	.00	.00	.00	.27	.69	.00	.00	.00	.00	.00	.00	.83	2.65	.83	.69	6.15			
< 39.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.13	2.09	.55	.00	2.79			
>= 39.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.27	.00	.00	.27			
Totals	1.81	3.91	2.09	5.17	7.13	8.11	4.75	1.95	4.47	4.19	4.61	13.84	13.28	12.44	8.53	3.63				

Calm : .00 %

Total # Operational Hours : 715

Distribution By Samples

Limit	Direction																NNW	NW	NNW	Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW				
< 6.0	5	6	4	14	22	15	11	6	9	11	16	28	22	23	12	9	213			
< 12.0	4	16	10	17	18	29	11	3	10	11	15	47	40	15	17	5	268			
< 20.0	3	6	1	6	9	9	12	5	13	8	2	24	26	15	22	7	168			
< 29.0	1			2	2	5						6	6	19	6	5	44			
< 39.0												1	1	15	4		20			
>= 39.0												2	2				2			
Totals	13	28	15	37	51	58	34	14	32	30	33	99	95	89	61	26				

Calm : .00 %

Total # Operational Hours : 715

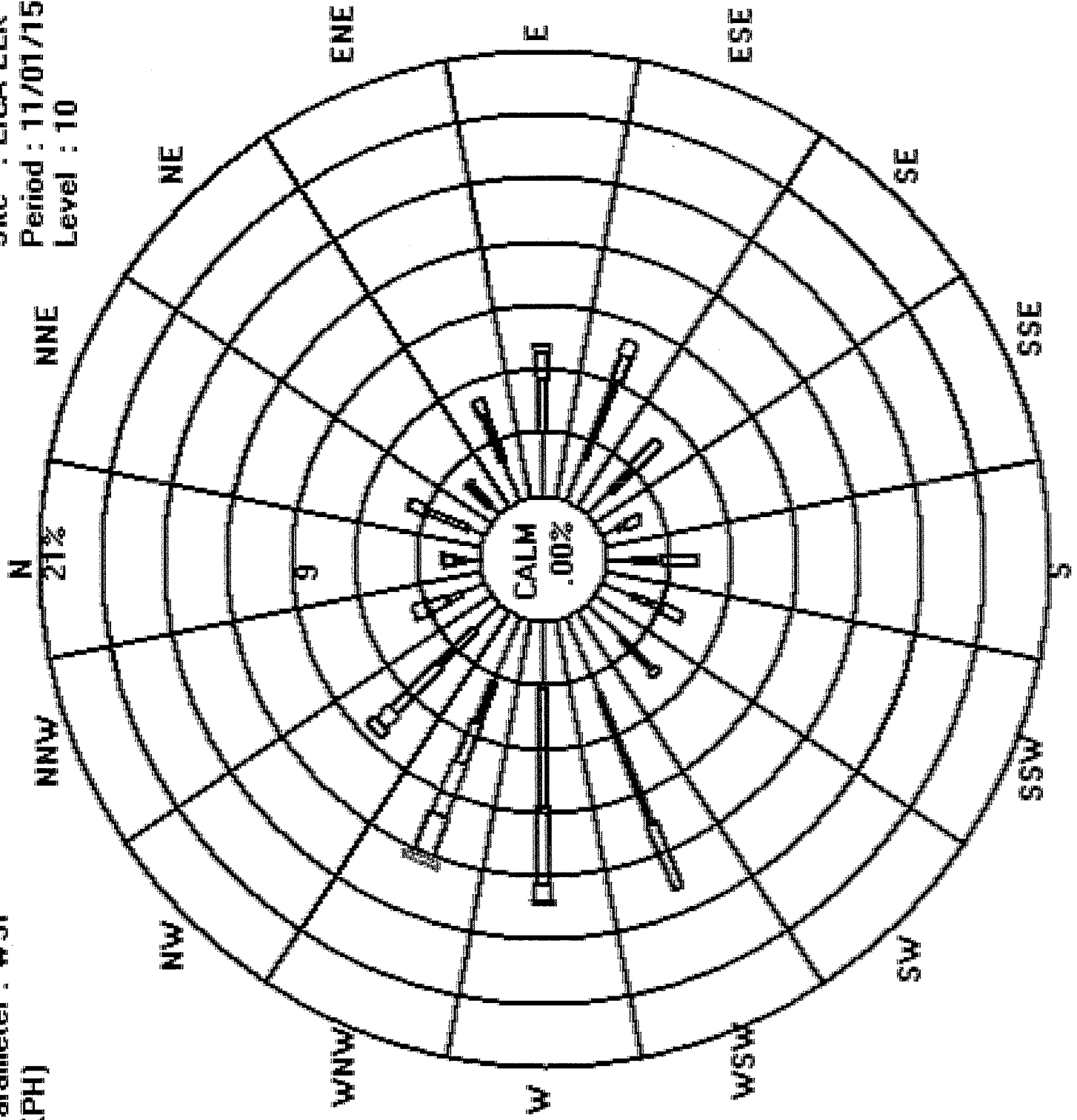
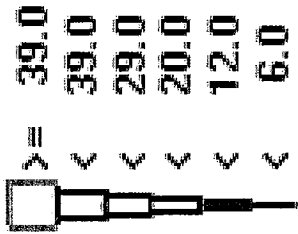
Logger : 35 Parameter : WSP

Site : LICA-ELK

Class Limits (KPH)

Period : 11/01/15-11/30/15

Level : 10



WIND DIRECTION



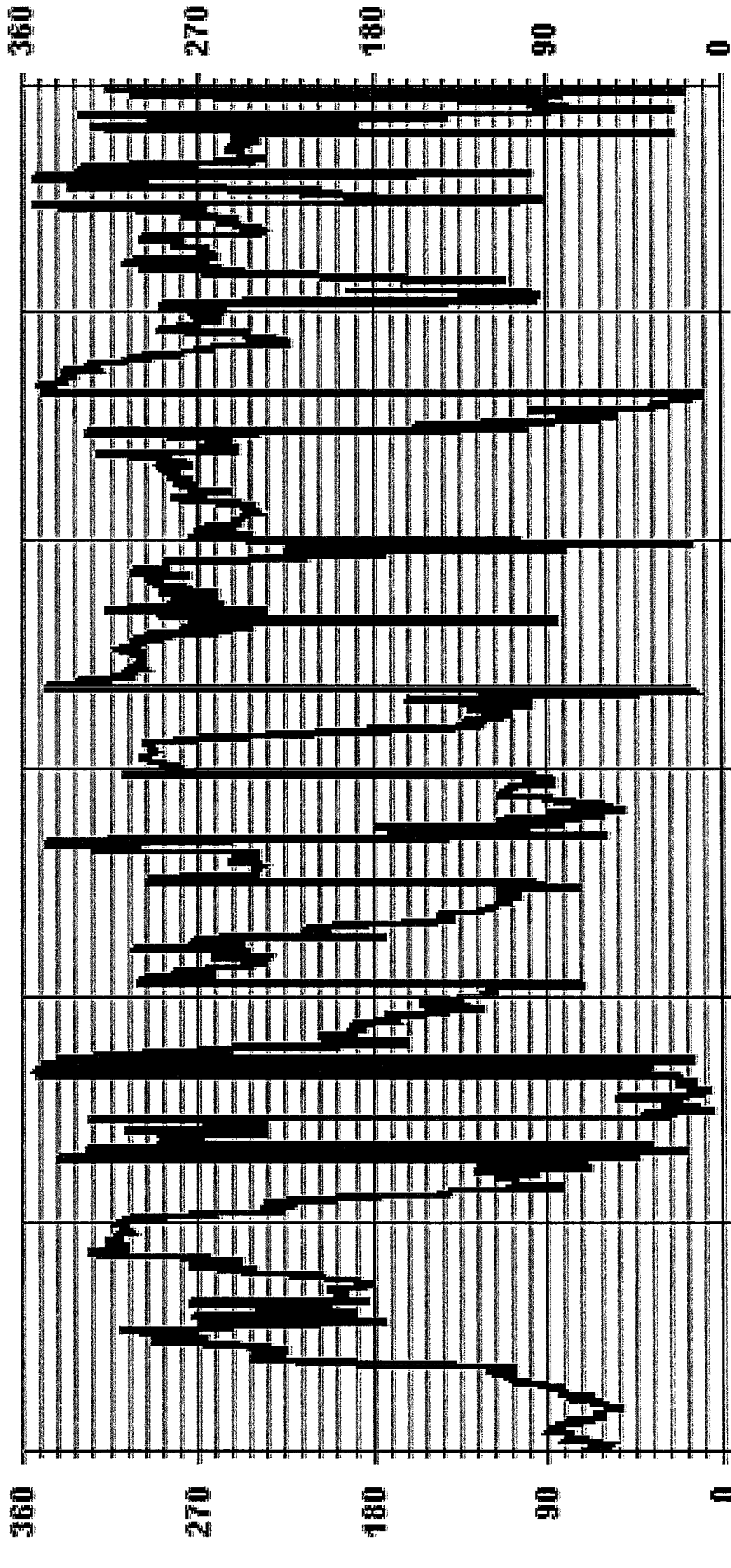
WIND DIRECTION (WD) hourly averages

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	
1	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	ENE
2	NE	ENE	ENE	ENE	ENE	ENE	ENE	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
3	SW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	WSW	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	WSW
4	W	WSW	S	SSW	SSW	SSW	SSW	W	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	SSW
5	WSW	WSW	WSW	W	WSW	WSW	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
6	NW	NW	NW	NW	NW	NW	NW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	W
7	ESE	ESE	E	ESE	ESE	ESE	ESE	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	ESE
8	W	SW	NW	WSW	WSW	W	SW	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	ENE
9	NNE	NNE	NNE	NNE	NNE	NNE	NNE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	NNE
10	SSE	SSW	S	SSW	SSW	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	N
11	SE	SE	ESE	ESE	ESE	ESE	ESE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
12	WSW	WSW	WSW	WSW	WSW	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	ENE
13	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ENE
14	WSW	WSW	WSW	SW	WSW	WSW	NW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	ENE
15	ENE	E	ENE	NE	ENE	NE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
16	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	ENE
17	ESE	SE	ESE	SE	ESE	SE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ENE
18	NW	WSW	NW	NW	NW	NW	NW	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	ENE
19	WSW	WSW	W	WSW	WSW	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	ENE
20	W	WSW	WSW	WSW	WSW	WSW	WSW	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	ENE
21	E	WSW	W	WSW	WSW	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	ENE
22	W	WSW	W	WSW	WSW	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	ENE
23	WSW	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	ENE
24	NNE	NNE	NNE	NNE	NNE	NNE	NNE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	ENE
25	WSW	WSW	WSW	W	WSW	WSW	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	ENE
26	W	WSW	WSW	WSW	WSW	WSW	WSW	E	ESE	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	ENE
27	WSW	W	NW	WSW	WSW	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	ENE
28	WSW	WSW	WSW	W	WSW	WSW	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	ENE
29	SSE	E	NNW	NW	NNW	W	NNW	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	ENE
30	NW	NNW	NW	S	WSW	NNW	SSW	SE	NNW	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	ENE

STATUTORY FLAG CODES	November 23, 2015	MAGNETIC DECLINATION 19 DEGREE EAST
G	-CALIBRATION	
O	-QUALITY ASSURANCE	
R	-RECOVERY	
X	-MACHINE/REFUNCTION	
D	-DAILY ZERO/SPAN/CHECK	
P	-POWER FAILURE	
K	-COLLECTION ERROR	
G	-OUT FOR REPAIR	

MONTHLY CALIBRATION TIME:	2 HRS	OPERATIONAL TIME:	717 HRS
STANDARD DEVIATION:	99.80	AMD OPERATION UPTIME:	99.6 %
		MONTHLY AVERAGE:	W

01 Hour Averages



— LICA35 WDR DEG

STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 Elk Point Airport Site - NOVEMBER 2015
 JOB # 2833-2015-11-35-C

STANDARD DEVIATION WIND DIRECTION (STDWD) hourly averages in degrees

DAY	MST																								
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	
1	10	10	10	10	10	10	11	9	11	12	12	9	8	8	10	10	10	10	11	9	12	11	11	12	11
2	12	10	11	12	10	12	7	6	6	7	7	8	8	8	8	7	7	7	8	7	8	7	7	8	8
3	11	10	9	11	10	10	9	8	11	12	9	14	15	8	8	13	14	9	16	12	11	7	7	5	
4	13	14	11	9	8	20	11	12	13	14	11	12	13	13	13	14	10	9	8	8	11	11	11	16	
5	11	16	15	6	8	8	10	13	13	10	9	11	9	11	10	8	9	9	8	9	9	9	10	9	
6	9	9	7	7	7	7	10	20	10	18	18	19	19	19	14	12	10	10	9	7	9	7	10	12	
7	21	43	16	24	7	29	28	31	15	19	38	55	52	23	24	49	15	33	37	8	18	27	19	17	
8	9	16	17	20	14	20	44	34	20	9	12	13	13	14	14	14	13	13	13	13	13	14	13	15	
9	14	12	13	13	12	12	12	13	7	14	14	24	17	18	19	14	13	7	11	27	12	18	31	27	
10	17	13	11	12	13	11	10	11	11	12	12	13	15	14	14	14	10	5	4	5	9	12	13	12	
11	9	9	9	11	8	9	13	31	28	10	15	16	12	7	10	12	12	4	4	9	16	10	10	10	
12	9	25	9	10	8	12	9	8	20	17	13	13	13	11	10	10	10	9	12	12	11	10	11	9	
13	7	5	7	10	5	6	7	7	14	11	14	15	30	19	12	19	38	7	7	8	7	8	7	7	
14	30	15	26	12	18	20	20	13	35	26	41	37	38	37	14	45	24	9	39	11	33	10	11	14	
15	31	6	29	11	9	9	10	8	7	8	7	8	9	8	7	6	5	7	5	8	28	47	6	13	
16	6	6	6	6	6	6	6	6	6	6	7	7	7	7	8	7	8	7	8	6	11	25	15	5	
17	5	8	9	29	10	11	7	6	10	18	49	14	15	45	23	12	32	27	13	13	7	8	8	9	
18	9	8	9	8	8	7	7	8	7	8	8	8	8	9	9	10	8	5	5	5	6	6	8	7	
19	12	7	9	20	48	41	59	51	28	14	20	25	17	22	15	7	7	14	9	11	13	10	7	7	
20	12	5	5	5	7	7	6	11	8	6	6	C	C	8	13	10	8	15	14	17	43	38	22	39	
21	42	25	40	8	13	17	14	14	14	11	11	11	9	10	9	9	8	10	8	9	10	8	6	6	
22	4	9	8	10	9	6	6	6	6	6	7	7	7	7	7	8	7	5	6	5	6	5	8	13	
23	8	13	9	6	9	6	8	9	16	17	54	43	15	11	10	13	11	12	10	7	13	12	9	8	
24	14	11	11	11	13	12	9	10	11	11	15	11	10	10	10	9	8	8	8	8	8	12	9	8	
25	7	9	9	9	11	13	9	9	14	13	13	16	16	15	10	6	4	5	7	11	9	7	8	6	
26	7	8	16	12	14	30	12	33	32	20	18	31	13	Y	Y	Y	14	11	15	11	19	18	9	22	
27	12	20	10	15	19	10	12	10	12	12	12	6	6	8	8	8	4	17	5	6	5	7	8	9	
28	6	17	9	6	8	11	28	28	15	45	15	15	12	34	14	8	12	42	18	9	7	6	16	33	
29	15	11	13	8	14	10	5	24	4	35	39	14	14	15	11	7	7	7	5	7	6	19	27	28	
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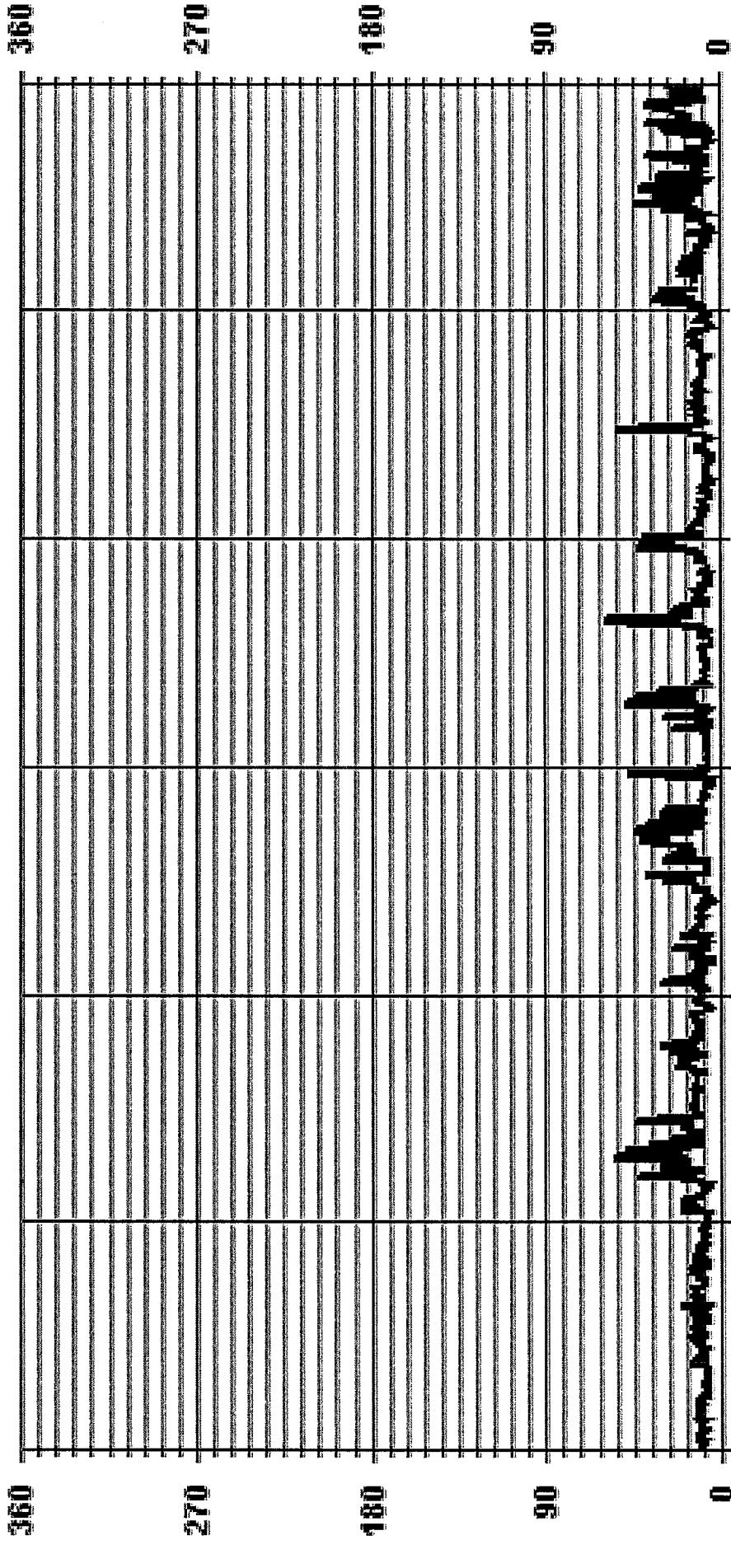
STATUS FLAG CODES

C	- CALIBRATION	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
S	SCALE/ZERO/SIGNAL CHECK	X	MACHINE MAINTENANCE
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

LAST CALIBRATION: November 23, 2015

CALIBRATION TIME: 2 HRS OPERATIONAL TIME: 715 HRS

01 Hour Averages



— LICA35 STDWDIR DEG

APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

VOC RESULTS

Sample ID: 15110054-003

Customer ID: LICA
Cust Samp ID: LICAVOC/ELK/Nov 2, 2015

AIR FCD-01320/2

Priority: Normal

Maxxam

VOC Sample Collection Data Sheet

Client: LICA
 Location: ELK Point Airport
 Station ID: LICA 25
 Field Sample ID: LICA/VOC/ELK/ Oct Nov 2, 2015
 A.Y.

Sampler S/N: 6200
 Canister ID: 17121
 Canister Installation Date/Time: Oct 29, 2015 @ 09:43
 Canister Removal Date/Time: Nov 06, 2015 @ 11:47

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Nov 2, 2015	00:00	00:00	24.0
	Nov 2, 2015	Nov 3, 2015	

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
10.0	4.94	26

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
28.0	18.7

Canister valve open prior to sampling?: YES / NO
 Timer set to 0.00 minutes prior to sampling? YES / NO
 Canister valve closed prior to disconnection?: YES / NO

Comments:

Technician Signature: _____
 Sample in - by Alex Yampov
 Sample out - by Alex Yampov
 Date: Nov 6, 2015

Volatile Organics Data Results

Date: NOVEMBER 2 , 2015
Canister ID: 17121

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	< 0.02
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.08
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	0.03
2,3-Dimethylbutane	0.08
2,3-Dimethylpentane	0.08
2,4-Dimethylpentane	0.04
2-Methylheptane	0.03
2-Methylhexane	0.03
2-Methylpentane	0.09
3-Methylheptane	< 0.02
3-Methylhexane	0.05
3-Methylpentane	0.05
Acetone	1.3
Acrolein	< 0.3
Benzene	0.13
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.22
Carbon tetrachloride	0.10
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	< 0.02
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.08
Cyclopentane	0.01
Dibromochloromethane	< 0.01
Ethanol	0.4
Ethyl acetate	< 0.4
Ethylbenzene	0.03
Freon-11	0.28

Volatile Organics Data Results

Date: NOVEMBER 2 , 2015
Canister ID: 17121

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.07
Freon-114	< 0.02
Freon-12	0.56
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.26
Isopentane	0.29
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.09
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.16
Methylcyclopentane	0.08
Methylene chloride	< 0.3
n-Butane	0.52
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.05
n-Hexane	0.10
n-Nonane	0.03
n-Octane	0.03
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	0.9
o-Ethyltoluene	< 0.01
o-Xylene	0.03
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.13
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Sample ID: 15110089-003

Customer ID: LICA

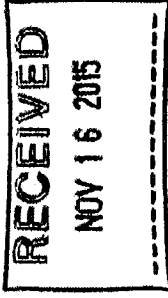
Cust Samp ID: LICAVOC/ELK/Nov 8, 2015

AIR FCD-01320/2

Priority: Normal

Maxxam

VOC Sample Collection Data Sheet



Client: LICA
 Location: Elk Point Airport
 Station ID: LICA 35
 Field Sample ID: LICA/VOC/ELK/NOV 8, 2015

Sampler S/N: 6200
 Canister ID: H 3282
 Canister Installation Date/Time: Nov 6, 2015 @ 11:48
 Canister Removal Date/Time: Nov 10, 2015 @ 11:37

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Nov 8, 2015	00:00	00:00	24.0
	Nov 8, 2015	Nov 9, 2015	

Flow Settings		
Meter Reading (sccm)	Pot Set Pt	Pump Pressure Setting (psig)
10.0	4.94	26

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
28.0	17.4

Canister valve open prior to sampling?: YES / NO
 Timer set to 0.00 minutes prior to sampling? YES / NO
 Canister valve closed prior to disconnection?: YES / NO

Comments:

Technician Signature: _____
 Sample in - by Alex Yanespor
 Sample out - by Alex Yanespor
 Date: Nov 10, 2015

Volatile Organics Data Results

Date: NOVEMBER 8 , 2015
Canister ID: H3282

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.04
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.20
2,2-Dimethylbutane	0.10
2,3,4-Trimethylpentane	0.05
2,3-Dimethylbutane	0.33
2,3-Dimethylpentane	0.25
2,4-Dimethylpentane	0.17
2-Methylheptane	0.05
2-Methylhexane	0.05
2-Methylpentane	0.23
3-Methylheptane	0.02
3-Methylhexane	0.10
3-Methylpentane	0.14
Acetone	1.5
Acrolein	< 0.3
Benzene	0.17
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.06
Carbon tetrachloride	0.10
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	< 0.02
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.28
Cyclopentane	0.05
Dibromochloromethane	< 0.01
Ethanol	0.8
Ethyl acetate	< 0.4
Ethylbenzene	0.03
Freon-11	0.29

Volatile Organics Data Results

Date: NOVEMBER 8 , 2015
Canister ID: H3282

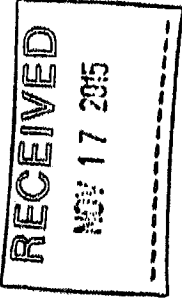
PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.09
Freon-114	< 0.02
Freon-12	0.58
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.99
Isopentane	1.02
Isoprene	0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.08
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.47
Methylcyclopentane	0.26
Methylene chloride	1.9
n-Butane	1.36
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.10
n-Hexane	0.27
n-Nonane	0.03
n-Octane	0.05
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.03
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.22
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Sample ID: 15110105-001

Customer ID: LICA

Cust Samp ID: LICAVOC/ELK/Nov 14, 2014

AIR FCD-01320/2



Maxxam

VOC Sample Collection Data Sheet

Client: LICA
 Location: ELK Point Airport
 Station ID: LICA 35
 Field Sample ID: LICH/VOC/ELK/Nov 14, 2015

Sampler S/N: 6200
 Canister ID: 8 12945
 Canister Installation Date/Time: Nov 10, 2015 @ 11:39
 Canister Removal Date/Time: Nov 16, 2015 @ 12:12

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Nov 14, 2015	00:00	00:00	24.0
	Nov 14, 2015	Nov 15, 2015	

Flow Settings		
Meter Reading (sccm)	Pot Set Pt	Pump Pressure Setting (psig)
10.0	4.94	26

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
28.0	19.0

Canister valve open prior to sampling?: YES / NO
 Timer set to 0.00 minutes prior to sampling? YES / NO
 Canister valve closed prior to disconnection?: YES / NO

Comments:

Technician Signiture: Sample in - by Alex Yampov
Sample out - by Alex Yampov
 Date: Nov 16, 2015

Volatile Organics Data Results

Date: NOVEMBER 14 , 2015
Canister ID: S12945

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	< 0.02
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.09
2,3,4-Trimethylpentane	0.03
2,3-Dimethylbutane	0.24
2,3-Dimethylpentane	0.14
2,4-Dimethylpentane	0.10
2-Methylheptane	0.06
2-Methylhexane	0.11
2-Methylpentane	0.27
3-Methylheptane	0.03
3-Methylhexane	0.14
3-Methylpentane	0.15
Acetone	< 0.4
Acrolein	< 0.3
Benzene	0.17
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.01
Carbon tetrachloride	0.10
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	< 0.02
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.26
Cyclopentane	0.05
Dibromochloromethane	< 0.01
Ethanol	0.4
Ethyl acetate	< 0.4
Ethylbenzene	0.04
Freon-11	0.29

Volatile Organics Data Results

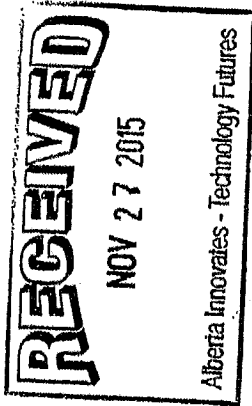
Date: NOVEMBER 14 , 2015
Canister ID: S12945

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	< 0.02
Freon-12	0.59
Hexachloro-1,3-butadiene	< 0.50
Isobutane	1.09
Isopentane	0.91
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.11
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.47
Methylcyclopentane	0.22
Methylene chloride	< 0.3
n-Butane	1.67
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.14
n-Hexane	0.30
n-Nonane	< 0.01
n-Octane	0.08
n-Pentane	0.6
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.03
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.22
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Sample ID: 15110230-001

Customer ID: LICA
Cust Samp ID: LICAVOC/ICLS/NOV 20, 2015

AIR FCD-01320/2



Maxxam

VOC Sample Collection Data Sheet

Client: LICA
 Location: Elk Point Airport
 Station ID: LICA 35
 Field Sample ID: LICA/VOC/ELK/NOV 20, 2015

Sampler S/N: 6200
 Canister ID: 1060
 Canister Installation Date/Time: NOV 16, 2015 @ 12:23
 Canister Removal Date/Time: NOV 23, 2015 @ 14:30

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
NOV 20, 2015	00:00	00:00	24.0
	NOV 20, 2015	NOV 21, 2015	

Flow Settings		
Meter Reading (sccm)	Pot Set Pt	Pump Pressure Setting (psig)
10.0	4.94	26

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
28.0	19.0

Canister valve open prior to sampling?: YES / NO
 Timer set to 0.00 minutes prior to sampling? YES / NO
 Canister valve closed prior to disconnection?: YES / NO

Comments:

Technician Signature: Sample in - by Alex Yakupov
Sample out - by Alex Yakupov
 Date: NOV 23, 2015

Volatile Organics Data Results

Date: NOVEMBER 20 , 2015
Canister ID: 1060

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	0.04
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.12
1-Hexene	0.06
1-Pentene	0.14
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.04
2,3,4-Trimethylpentane	0.03
2,3-Dimethylbutane	0.19
2,3-Dimethylpentane	0.10
2,4-Dimethylpentane	0.08
2-Methylheptane	0.04
2-Methylhexane	0.17
2-Methylpentane	0.49
3-Methylheptane	0.03
3-Methylhexane	0.16
3-Methylpentane	0.27
Acetone	2.6
Acrolein	< 0.3
Benzene	0.29
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.22
Carbon tetrachloride	0.12
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.60
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.20
cis-2-Pentene	0.12
Cyclohexane	0.11
Cyclopentane	0.08
Dibromochloromethane	< 0.01
Ethanol	2.5
Ethyl acetate	< 0.4
Ethylbenzene	0.04
Freon-11	0.32

Volatile Organics Data Results

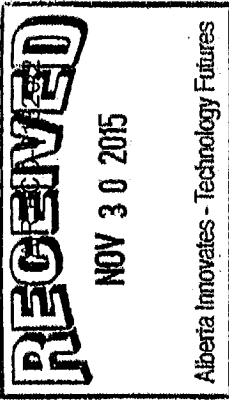
Date: NOVEMBER 20 , 2015
Canister ID: 1060

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	< 0.02
Freon-12	0.67
Hexachloro-1,3-butadiene	< 0.50
Isobutane	9.65
Isopentane	3.23
Isoprene	0.12
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.08
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.20
Methylcyclopentane	0.19
Methylene chloride	< 0.3
n-Butane	14.7
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.16
n-Hexane	0.29
n-Nonane	0.02
n-Octane	0.04
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	3.4
o-Ethyltoluene	0.01
o-Xylene	0.04
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.32
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.24
trans-2-Pentene	0.23
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Sample ID: 15110237-001

Customer ID: LICA

Cust Samp ID: LICAVOC/ELK/NOV 26, 2015



Maxxam

VOC Sample Collection Data Sheet

Client: LICA
 Location: Elk Point Airport
 Station ID: LICA 35
 Field Sample ID: LICA/VOC/ELK/NOV 26, 2015

Sampler S/N: 6280
 Canister S/N: AB A.Y H 2834
 Canister Installation Date/Time: NOV 23 2015 (B) 11:31
 Canister Removal Date/Time: NOV 27, 2015 (B) 12:10

Date and Time Information		
Sample Date	Start Time (MST)	End Time (MST)
Nov 26, 2015	00:00	00:00
	Nov 26, 2015	Nov 27, 2015
		24.0

Flow Settings		
Meter Reading (sccm)	Pot Set Pt	Pump Pressure Setting (psig)
10.0	4.94	2.6

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
28.0	19.5

Canister valve open prior to sampling?: YES / NO
 Timer set to 0.00 minutes prior to sampling? YES / NO
 Canister valve closed prior to disconnection?: YES / NO

Comments:

Technician Signature: Sample in - by Alex Yauyapov
Sample out - by Alex Yauyapov

Date: Nov 27, 2015

Volatile Organics Data Results

Date: NOVEMBER 26 , 2015
Canister ID: H2834

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	0.04
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.12
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.08
2,3,4-Trimethylpentane	0.03
2,3-Dimethylbutane	0.20
2,3-Dimethylpentane	0.12
2,4-Dimethylpentane	0.09
2-Methylheptane	0.08
2-Methylhexane	0.12
2-Methylpentane	0.31
3-Methylheptane	0.04
3-Methylhexane	0.13
3-Methylpentane	0.17
Acetone	1.7
Acrolein	< 0.3
Benzene	0.31
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.02
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.55
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.26
Cyclopentane	0.08
Dibromochloromethane	< 0.01
Ethanol	0.6
Ethyl acetate	< 0.4
Ethylbenzene	0.05
Freon-11	0.41

Volatile Organics Data Results

Date: NOVEMBER 26 , 2015
Canister ID: H2834

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.07
Freon-114	0.02
Freon-12	0.59
Hexachloro-1,3-butadiene	< 0.50
Isobutane	1.43
Isopentane	1.03
Isoprene	0.05
Isopropyl alcohol	< 0.4
Isopropylbenzene	0.01
m,p-Xylene	0.11
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.51
Methylcyclopentane	0.22
Methylene chloride	< 0.3
n-Butane	2.39
n-Decane	0.10
n-Dodecane	0.7
n-Heptane	0.19
n-Hexane	0.35
n-Nonane	0.07
n-Octane	0.10
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	1.9
o-Ethyltoluene	0.02
o-Xylene	0.04
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.44
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

PAH RESULTS

Sample ID: 15110054-004

Customer ID: LICA

Cust Samp ID: LICAPUF/ELK/Nov 2, 2015

Priority: Normal

AIR FCD-01321/2

Maxxam

Hi-Vol PUF+ Sample Collection Data Sheet

Client: LICA Puf+ S/N: A 13-02
 Location: Elk Point Airport Motor S/N: 1133/100-1015
 Station ID: LICA 35 Installation Date/Time: Oct 29, 2015 @ 08:37
 Field Sample ID: LICA/PUF/ELK/Nov 2, 2015 Removal Date/Time: Nov 6, 2015 @ 11:57

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
NOV 2, 2015	00:00	NOV 3, 2015	24.0

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date
n/a	n/a	n/a	n/a

Set Flow Rate (slpm): 230

Date of Last Calibration: Sept 25, 2011

Sampling Data		
Average Pressure (mmHg)	Average Flow (Gstd slpm)	Volume (Vstd m ³)
704	229	330.17

Time set correctly prior to sampling? YES NO

Timer set correctly prior to sampling? YES NO

Sampling data saved to memory card after sampling? YES NO

Comments:

Technician Signature: Sample in- by Alex Yampov

Sample Oct - by Alex Yampov

Date: Nov 6, 2015

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: NOVEMBER 2 , 2015
PUF S/N: A1302

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.12
2-Methylnaphthalene	0.18
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.03
Acenaphthylene	0.12
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(gh)perylene	< 0.01
Chrysene	0.02
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.05
Fluorene	0.09
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.12
Perylene	< 0.01
Phenanthrene	0.17
Pyrene	0.03
Retene	< 0.01

Sample ID: 15110089-004

Customer ID: LICA

Cust Samp ID: LICAPUFELK/Nov 8, 2015

Priority: Normal

Maxxam

Hi-Vol PUF+ Sample Collection Data Sheet

Client: LICA

Location: ELK Point Airport

Station ID: LICA 35

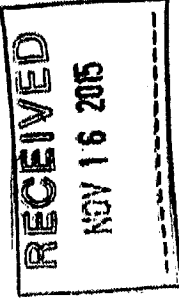
Field Sample ID: LICA/PUF/ELK/Nov 8, 2015

Puf+ S/N: 9702

Motor S/N: 1133 / 100-1015

Installation Date/Time: Nov 6, 2015 @ 11:58

Removal Date/Time: Nov 10, 2015 @ 11:40



Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Nov 8, 2015	00:00	00:00	24.0
	Nov 8, 2015	Nov 9, 2015	

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date
n/a	n/a	n/a	n/a

Set Flow Rate (slpm): 230

Date of Last Calibration: Sept 25, 2014

Sampling Data		
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (C)
703	229	0.80
		Volume (Vstd m ³)
		330.18

Time set correctly prior to sampling? YES/NO

Timer set correctly prior to sampling? YES/NO

Sampling data saved to memory card after sampling? YES/NO

Comments:

Technician Signature:

Sample in - by Alex Yampor

Sample out - by Alex Yampor

Date: Nov 10, 2015

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: NOVEMBER 8 , 2015
PUF S/N: 9702

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.05
2-Methylnaphthalene	0.08
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.03
Acenaphthylene	0.04
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.05
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	0.02
Benzo(ghi)perylene	0.03
Chrysene	0.04
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.07
Fluorene	0.20
Indeno(1,2,3-cd)pyrene	0.02
Naphthalene	0.11
Perylene	0.02
Phenanthrene	0.27
Pyrene	0.04
Retene	0.03

Sample ID: 15110105-002

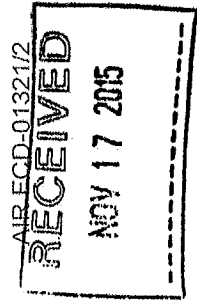
Customer ID: LICA
Cust Samp ID: LICA/PUF/ELK/Nov 14, 2014

Maxxam

Hi-Vol PUF+ Sample Collection Data Sheet

Client: LICA
 Location: Elk Point Airport
 Station ID: LICA 35
 Field Sample ID: LICA/PUF/ELK/Nov 14, 2015

Puf+ SIN: TE-02
 Motor SIN: 1139/100-1015
 Installation Date/Time: Nov 10, 2015 @ 11:21
 Removal Date/Time: Nov 16, 2015 @ 12:42



Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Nov 14, 2015	00:00 Nov 14, 2015	00:00 Nov 15, 2015	24.0

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date
n/a	n/a	n/a	n/a

Set Flow Rate (slpm): 230

Date of Last Calibration: Sept 25, 2011

Sampling Data			
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (C)	Volume (Vstd m ³)
702	229	-1.6°	330.20

Time set correctly prior to sampling? YES NO
 Timer set correctly prior to sampling? YES NO
 Sampling data saved to memory card after sampling? YES NO

Comments: _____

Technician Signature: Sample in - by Alex Younper
Sample out - by Alex Younper
 Date: Nov 16, 2015

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: NOVEMBER 14 , 2015
PUF S/N: TE02

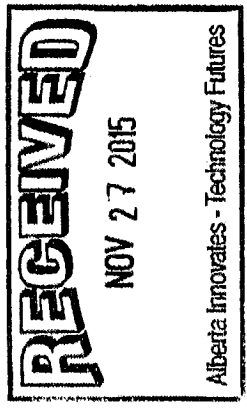
PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.26
2-Methylnaphthalene	0.42
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.06
Acenaphthylene	0.09
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.02
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.02
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.06
Fluorene	0.18
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.19
Perylene	< 0.01
Phenanthrene	0.20
Pyrene	0.03
Retene	0.02

Sample ID: 15110230-001

Customer ID: LICA

Cust Samp ID: LICAVOC/CLS/NOV 20, 2015

AIR FCD-01321/2



Maxxam

Hi-Vol PUF + Sample Collection Data Sheet

TE-11

Client: LICA
 Location: LICA
 Station ID: LICA
 Field Sample ID: _____

Puf+ S/N: _____
 Motor S/N: _____
 Installation Date/Time: _____
 Removal Date/Time: _____

Date and Time Information		
Sample Date	Start Time (MST)	End Time (MST)

PUF and QFF Information		
Date Received	Date Shipped	QFF Prep Date

Set Flow Rate (slpm): _____

Date of Last Calibration: _____

Sampling Data		
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (C)

Time set correctly prior to sampling? YES / NO
 Timer set correctly prior to sampling? YES / NO
 Sampling data saved to memory card after sampling? YES / NO

Comments: *PUF filter does NOT require anylysis.*
It was used to calibrate PUF sampler and needs to be rebuilt.

Technician Signature: _____
Thank you.

Alex Yaupeoc

Sample ID: 15110237-001

Customer ID: LICA

Cust Samp ID: LICAVOC/ELK/NOV 26, 2015

Maxxam

Hi-Vol PUF+ Sample Collection Data Sheet

Client: LICA

Location: Elk Point Airport

Station ID: LICA 35

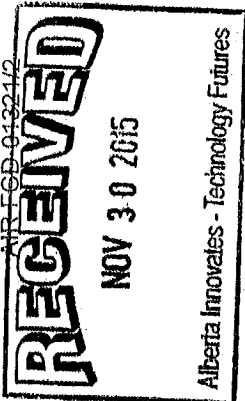
Field Sample ID: LICA/PUF/ELK/NOV 26, 2015

Puf+ SIN: TE-04

Motor SIN: 1139 / 100-1015

Installation Date/Time: Nov 25, 2015 @ 15:56

Removal Date/Time: Nov 27, 2015 @ 11:57



Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Nov 26, 2015	00:00	00:00	24.0
	Nov 26, 2015	Nov 27, 2015	

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date
n/a	n/a	n/a	n/a

Set Flow Rate (slpm): 230

Date of Last Calibration: Nov 25, 2015

Sampling Data		
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (C)
700	229	-11.3°
		Volume (Vstd m³)
		330.16

Time set correctly prior to sampling? YES / NO

Timer set correctly prior to sampling? YES / NO

Sampling data saved to memory card after sampling? YES / NO

Comments:

Technician Signature:

Sample in - by Alex Yanyukov
Sample out - by Alex Yanyukov

Date: Nov 27, 2015

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: NOVEMBER 26 , 2015
PUF S/N: TE04

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.39
2-Methylnaphthalene	0.55
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	0.01
Acenaphthene	0.18
Acenaphthylene	0.22
Acridine	< 0.01
Anthracene	0.08
Benzo(a)anthracene	0.05
Benzo(a)pyrene	0.05
Benzo(b,j,k)fluoranthene	0.13
Benzo(c)phenanthrene	0.02
Benzo(e)pyrene	0.05
Benzo(ghi)perylene	0.07
Chrysene	0.08
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	0.06
Dibenzo(ah)anthracene	0.02
Fluoranthene	0.32
Fluorene	0.52
Indeno(1,2,3-cd)pyrene	0.05
Naphthalene	0.53
Perylene	0.01
Phenanthrene	0.99
Pyrene	0.23
Retene	0.36

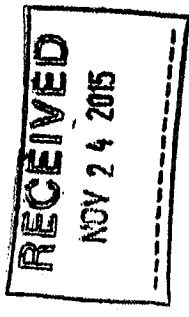
NMHC CANISTER RESULTS

Sample ID: 15110198-001

Customer ID: LICA

Cust Samp ID: LICA/VOC/ELK/Nov 19, 2015

AIR FCD-01320/2



Maxxam

VOC Sample Collection Data Sheet

Client: LICA
 Location: ELK Point Airport
 Station ID: LICA 35
 Field Sample ID: LICA/VOC/ELK/Nov 19, 2015

Sampler S/N: n/a
 Canister ID: 1840
 Canister Installation Date/Time: November 6, 2015 @ 11:35
 Canister Removal Date/Time: November 20, 2015 @ 10:40

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Nov 19, 2015	17:05	n/a	n/a

Flow Settings		
Meter Reading (sccm)	Pot Set Pt	Pump Pressure Setting (psig)
n/a	n/a	n/a

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
-28.0	-1.0

Canister valve open prior to sampling?: YES / NO
 Timer set to 0.00 minutes prior to sampling? YES / NO - n/a
 Canister valve closed prior to disconnection?: YES / NO

Comments: (N/AHC - canister)

Technician Signature: _____
 Sample in- by Alex Yousef
 Sample out - by Alex Yousef
 Date: Nov 20, 2015

Volatile Organics Data Results (NMHC Canister System)

Date: NOVEMBER 19 , 2015
Canister ID: 1840

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.05
1,2,3-Trimethylbenzene	0.26
1,2,4-Trichlorobenzene	< 1.0
1,2,4-Trimethylbenzene	0.94
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	0.03
1,2-Dichloropropane	0.01
1,3,5-Trimethylbenzene	0.32
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	1.45
1-Hexene	0.05
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.17
2,2-Dimethylbutane	0.05
2,3,4-Trimethylpentane	0.13
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	0.12
2,4-Dimethylpentane	0.10
2-Methylheptane	0.14
2-Methylhexane	0.20
2-Methylpentane	0.25
3-Methylheptane	0.13
3-Methylhexane	0.21
3-Methylpentane	0.22
Acetone	2.9
Acrolein	< 0.4
Benzene	1.50
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	< 0.01
Carbon tetrachloride	0.13
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.04
Chloromethane	< 0.02
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	0.13
cis-2-Pentene	0.04
Cyclohexane	0.13
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	2.9
Ethyl acetate	< 0.5
Ethylbenzene	0.58
Freon-11	0.33

Volatile Organics Data Results (NMHC Canister System)

Date: NOVEMBER 19 , 2015
Canister ID: 1840

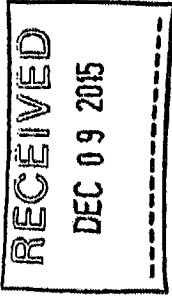
PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.11
Freon-114	< 0.02
Freon-12	0.38
Hexachloro-1,3-butadiene	< 0.62
Isobutane	0.67
Isopentane	0.97
Isoprene	0.14
Isopropyl alcohol	< 0.5
Isopropylbenzene	< 0.01
m,p-Xylene	1.70
m-Diethylbenzene	< 0.05
m-Ethyltoluene	0.73
Methyl butyl ketone	< 0.62
Methyl ethyl ketone	< 0.4
Methyl isobutyl ketone	< 0.5
Methyl methacrylate	< 0.09
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.24
Methylcyclopentane	0.22
Methylene chloride	2.0
n-Butane	2.67
n-Decane	0.07
n-Dodecane	< 0.5
n-Heptane	0.20
n-Hexane	0.49
n-Nonane	0.16
n-Octane	0.17
n-Pentane	< 0.1
n-Propylbenzene	0.13
n-Undecane	< 0.6
Naphthalene	< 0.6
o-Ethyltoluene	0.24
o-Xylene	0.80
p-Diethylbenzene	< 0.05
p-Ethyltoluene	0.23
Styrene	0.24
Tetrachloroethylene	< 0.05
Tetrahydrofuran	< 0.5
Toluene	2.10
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	0.19
trans-2-Pentene	0.07
Trichloroethylene	< 0.05
Vinyl acetate	< 0.5
Vinyl chloride	< 0.02

Sample ID: 15120089-006

Customer ID: LICA

Cust Stamp ID: LICAVOC/ELK/Nov 30, 2015

AIR FCD-01320/2



Maxxam

VOC Sample Collection Data Sheet

Client: LICA
 Location: Elk Point Airport
 Station ID: LICA 35
 Field Sample ID: LICAVOC/ELK/Nov 30, 2015

Sampler S/N: n/a
 Canister ID: 5835
 Canister Installation Date/Time: November 20, 2015 @ 10:41
 Canister Removal Date/Time: December 01, 2015 @ 12:55

Date and Time Information		
Sample Date	Start Time (MST)	End Time (MST)
Nov 30, 2015	19:35	n/a

Flow Settings		
Meter Reading (scm)	Pot Set Pt.	Pump Pressure Setting (psig)
n/a	n/a	n/a

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
-28.0	-1.0

Canister valve open prior to sampling?: YES / NO
 Timer set to 0.00 minutes prior to sampling? YES / NO - n/a
 Canister valve closed prior to disconnection?: YES / NO

(N/A - canister)

Comments: _____

Technician Signature: Sample in - by Alex Yaxson
Sample out - by Alex Yaxson
 Date: December 1, 2015

Volatile Organics Data Results (NMHC Canister System)

Date: NOVEMBER 30 , 2015
Canister ID: S5635

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.05
1,2,3-Trimethylbenzene	< 0.06
1,2,4-Trichlorobenzene	< 0.9
1,2,4-Trimethylbenzene	0.10
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.03
1,2-Dichloropropane	0.01
1,3,5-Trimethylbenzene	0.06
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	1.83
1-Hexene	0.06
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.40
2,3,4-Trimethylpentane	0.23
2,3-Dimethylbutane	1.19
2,3-Dimethylpentane	0.56
2,4-Dimethylpentane	0.46
2-Methylheptane	0.36
2-Methylhexane	0.58
2-Methylpentane	1.40
3-Methylheptane	0.22
3-Methylhexane	0.64
3-Methylpentane	1.31
Acetone	< 0.5
Acrolein	< 0.3
Benzene	0.59
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.06
Carbon tetrachloride	0.13
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.71
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	0.04
cis-2-Pentene	< 0.02
Cyclohexane	1.43
Cyclopentane	0.41
Dibromochloromethane	< 0.01
Ethanol	1.6
Ethyl acetate	< 0.5
Ethylbenzene	0.15
Freon-11	0.52

Volatile Organics Data Results (NMHC Canister System)

Date: NOVEMBER 30 , 2015
Canister ID: S5635

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.10
Freon-114	< 0.02
Freon-12	0.52
Hexachloro-1,3-butadiene	< 0.58
Isobutane	5.10
Isopentane	4.48
Isoprene	0.02
Isopropyl alcohol	< 0.5
Isopropylbenzene	0.03
m,p-Xylene	0.43
m-Diethylbenzene	< 0.05
m-Ethyltoluene	< 0.09
Methyl butyl ketone	< 0.58
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.5
Methyl methacrylate	< 0.08
Methyl tert butyl ether	< 0.03
Methylcyclohexane	2.51
Methylcyclopentane	1.63
Methylene chloride	0.4
n-Butane	8.14
n-Decane	0.07
n-Dodecane	0.9
n-Heptane	0.95
n-Hexane	4.47
n-Nonane	0.17
n-Octane	0.55
n-Pentane	< 0.1
n-Propylbenzene	< 0.06
n-Undecane	< 0.6
Naphthalene	1.8
o-Ethyltoluene	0.03
o-Xylene	0.15
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.08
Styrene	< 0.05
Tetrachloroethylene	< 0.05
Tetrahydrofuran	< 0.5
Toluene	0.99
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	< 0.01
trans-2-Pentene	0.04
Trichloroethylene	< 0.05
Vinyl acetate	< 0.5
Vinyl chloride	< 0.02

APPENDIX III
ANALYZER CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date:	November 10, 2015	Barometric Pressure:	0.931 atm
Company/Airshed:	LICA	Station Temperature °C:	20
Location/Station Name:	Elk Point	Weather Conditions:	Mix of sun and clouds
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly
Start Time 24 hr. (mst):	10:05	Performed By/Reviewer:	Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst):	15:07	Cal Gas Expiry Date:	March 12, 2019
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a

Analyzer:	Serial Number:	467	Range ppb:	1000
	Last Calibration Date:	October 7, 2015	As Found C.F.:	1.008
	Previous C.F.:	1.000	New C.F.:	1.000

Calibrator:	Flow Meter ID's:	n/a	Standard Calibration Points for Ranges	
	Make & Model:	SABIO 2010 D	Point	Sulphur Dioxide Standard Calibration Points
	Serial #:	11900613	High	780
	Cal Gas Cylinder I.D. #:	BLM002073	Mid	380
	Cal Gas Conc. (ppm):	49.5	Low	190

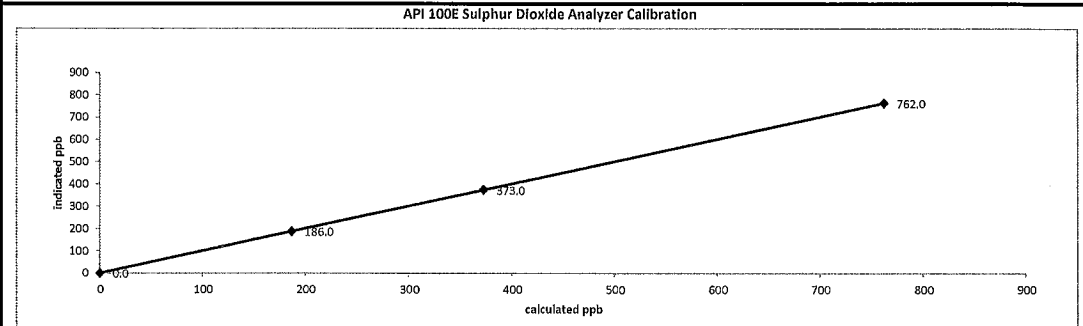
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5013	0.00	5013	0.0	1.0	N/A
as found high	4938	77.20	5015	762.0	757.0	1.008
adjusted zero	5013	0.00	5013	0.0	0.0	n/a
adjusted high	4938	77.20	5015	762.0	762.0	1.000
mid	4976	37.70	5014	372.2	373.0	0.998
low	4994	18.90	5013	186.6	186.0	1.003
calibrator zero	5013	0.00	5013	0.0	0.0	n/a

Average C.F.= 1.000

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		.95-1.05
b (Intercept as % of full scale) =	0.01%		± 3% F.S.
% change in C.F. from last cal =	-0.79%		± 10%

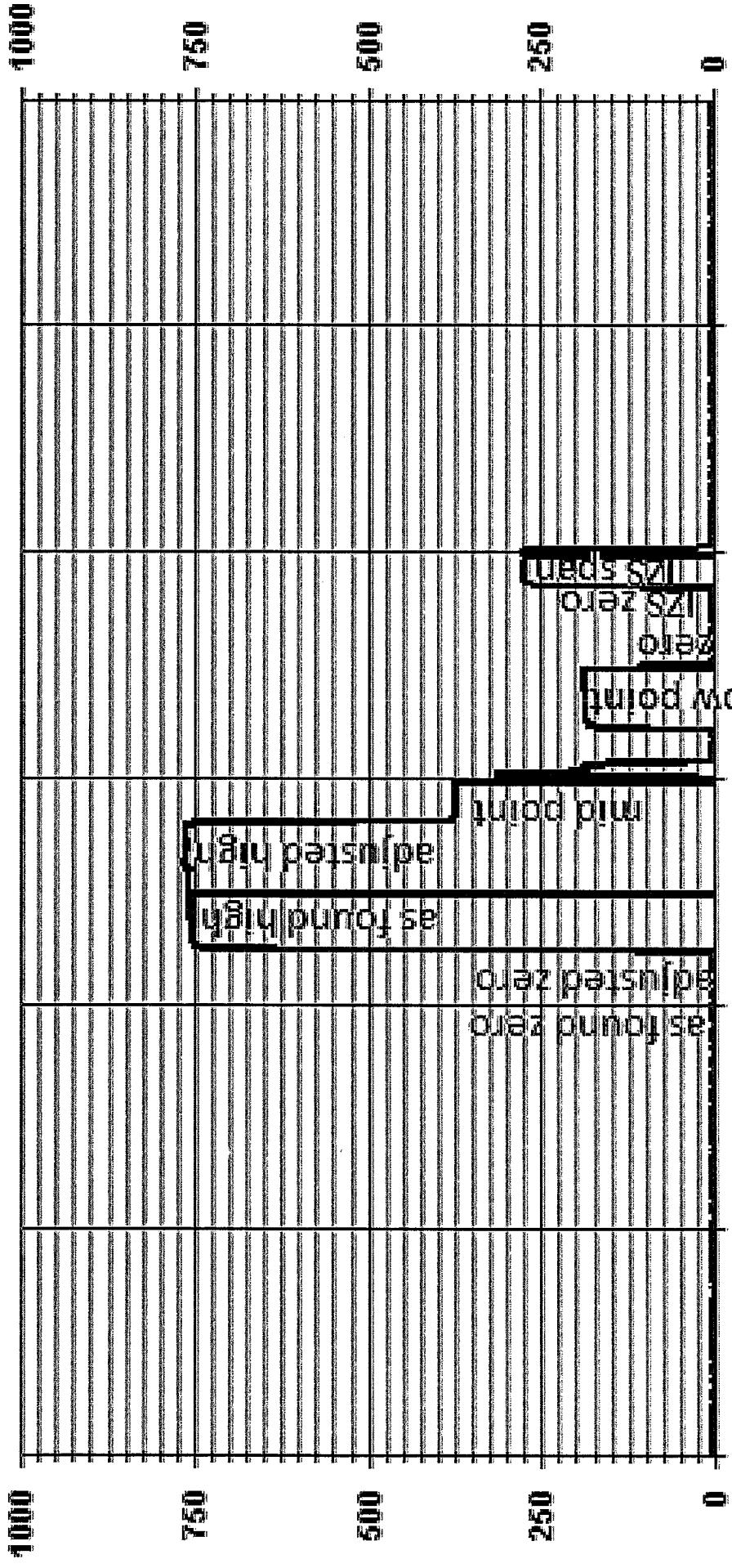


As found:		As left:	
SLOPE:	1.054	SLOPE:	1.059
OFFSET:	119.1	OFFSET:	119.0
HVPS:	512	HVPS:	512
RCCELL TEMP:	50.0	RCCELL TEMP:	50.0
BOX TEMP:	29.3	BOX TEMP:	29.5
PMT TEMP:	8.1	PMT TEMP:	8.1
IZS TEMP:	45.0	IZS TEMP:	45.0
PRES:	24.6	PRES:	24.5
SAMP FL:	621	SAMP FL:	620
NORM PMT:	115.4	NORM PMT:	116.3
UV LAMP:	3097.8	UV LAMP:	3098.0
LAMP RATIO:	103.1	LAMP RATIO:	103.0
STR. LGT:	62.7	STR. LGT:	63.0
DRK PMT:	13.5	DRK PMT:	13.5
DRK LMP:	2.7	DRK LMP:	2.8
Internal Span:	273	Internal Span:	273

Comments:

Sample filter changed. Low Point starts at 13:30, EV has not changed after calibration.

01 Minute Averages



— LICA35 SO2_ PPB

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date:	November 10, 2015	Barometric Pressure:	0.931 atm
Company/Airshed:	LICA	Station Temperature °C:	20
Location/Station Name:	Elk Point	Weather Conditions:	Mix of sun and clouds
Parameter:	Hydrogen Sulphide	Calibration Purpose:	routine monthly
Start Time 24 hr. (mst):	12:46	Performed By/Reviewer:	Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst):	16:11	Cal Gas Expiry Date:	July 15, 2017
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a

Analyzer:	
Serial Number:	510
Last Calibration Date:	October 8, 2015
Previous C.F.:	1.000
Range ppb:	100
As Found C.F.:	1.004
New C.F.:	1.000

Calibrator:		Standard Calibration Points for Ranges	
Flow Meter ID's:	n/a	Point	Hydrogen Sulphide Standard Calibration Points
Make & Model:	API 700	High	78
Serial #:	830	Mid	38
Cal Gas Cylinder I.D. #:	LL36837	Low	19
Cal Gas Conc. (ppm):	10.0		

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

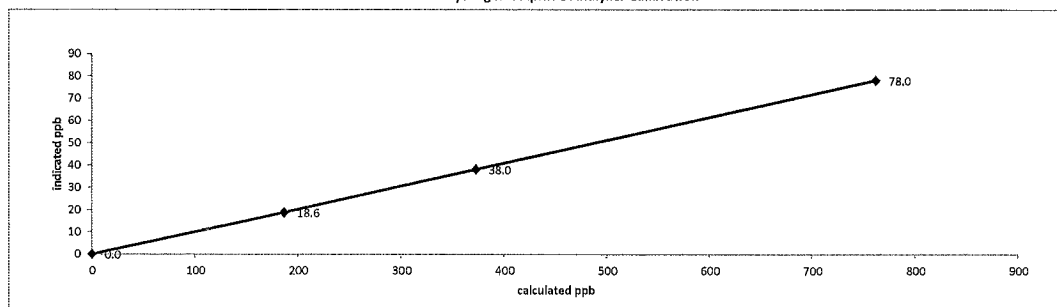
Calibrator Flow Rates (cc/min)			Calculated Concentration:		Indicated Concentration:		Correction Factors (C.F.):	
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)			
as found zero	7496	0.00	7496	0.0	-0.5			N/A
as found high	7441	58.50	7500	78.0	77.2			1.004
adjusted zero	7496	0.00	7496	0.0	0.0			n/a
adjusted high	7441	58.50	7500	78.0	78.0			1.000
mid	7472	28.50	7501	38.0	38.0			1.000
low	7486	14.30	7500	19.1	18.6			1.025
calibrator zero	7496	0.00	7496	0.0	0.0			n/a

Average C.F.= 1.008

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.998		.95-1.05
b (Intercept as % of full scale) =	0.19%		± 3% F.S.
% change in C.F. from last cal =	-0.39%		± 10%

API 101E Hydrogen Sulphide Analyzer Calibration

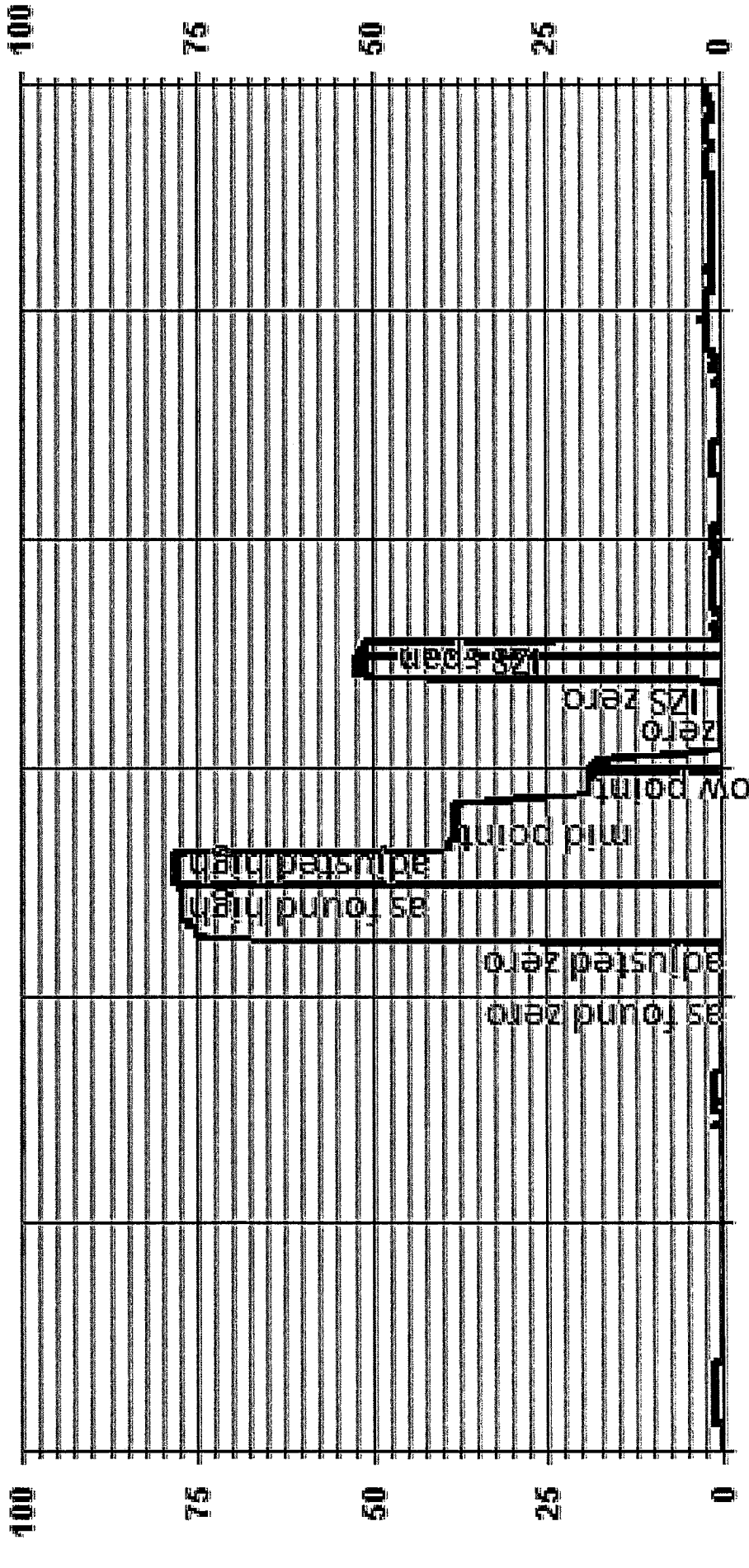


As found:		As left:	
SLOPE:	1.141	SLOPE:	1.130
OFFSET:	28.0	OFFSET:	26.2
HVPS:	526	HVPS:	526
RCELL TEMP:	50.0	RCELL TEMP:	50.0
BOX TEMP:	29.3	BOX TEMP:	31.1
PMT TEMP:	8.3	PMT TEMP:	8.3
IZS TEMP:	45.0	IZS TEMP:	45.0
Converter Temp:	315.1	Converter Temp:	314.9
PRES:	21.8	PRES:	21.7
SAMP FL:	569	SAMP FL:	567
UV LAMP:	2866.5	UV LAMP:	2862.3
LAMP RATIO:	90.4	LAMP RATIO:	90.2
STR. LGT	16.3	STR. LGT	16.4
DRK PMT:	35.6	DRK PMT:	37.5
DRK LMP:	-1.9	DRK LMP:	-2.0
Internal Span:	51.7	Internal Span:	51.49

Comments:

Sample filter changed.

01 Minute Averages

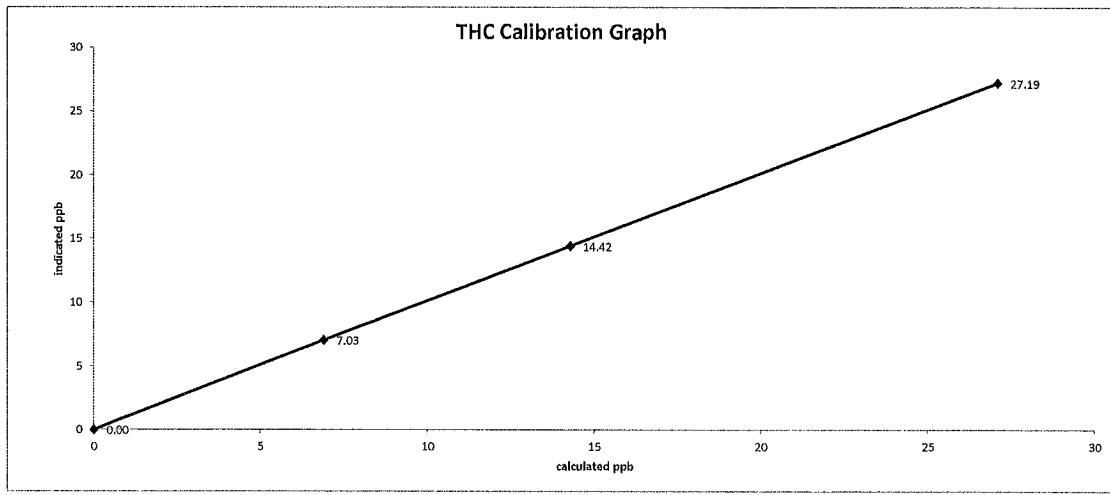
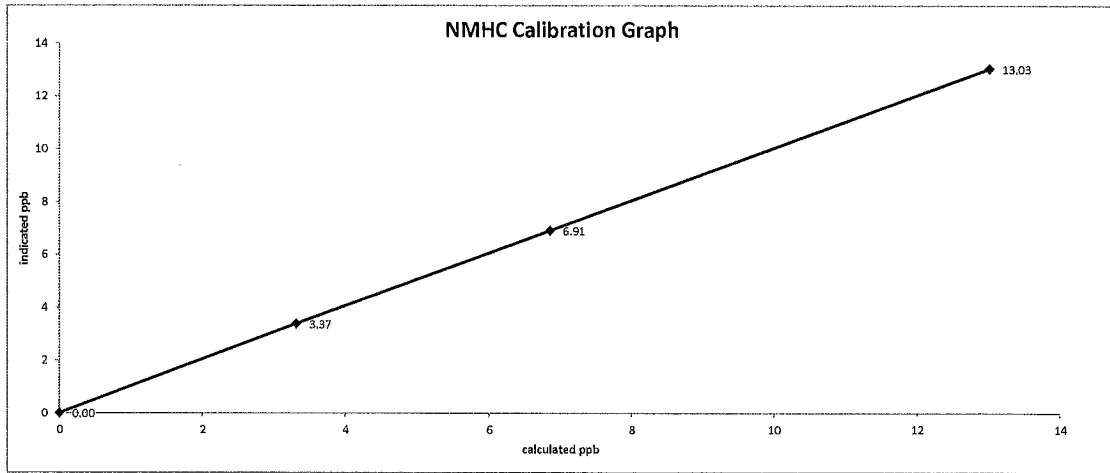
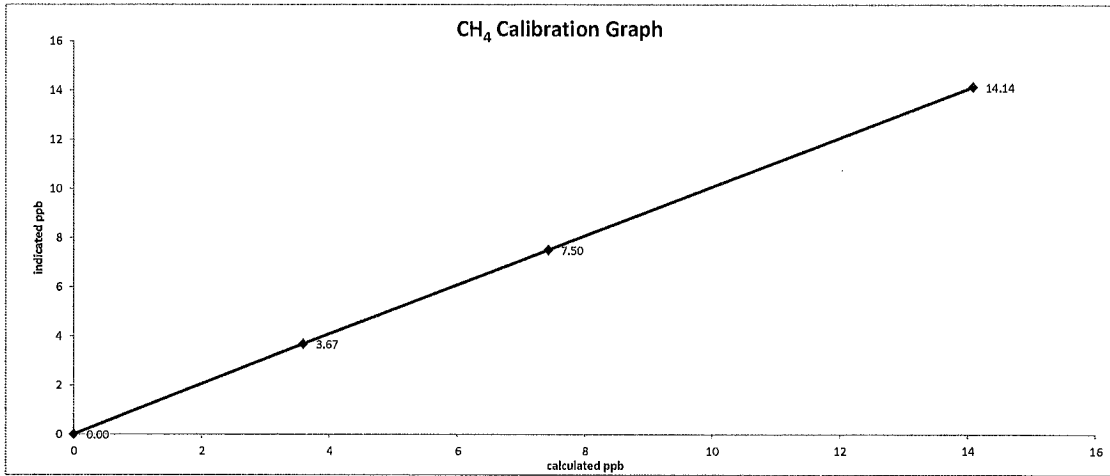


— LICA35 H2S_ PPB

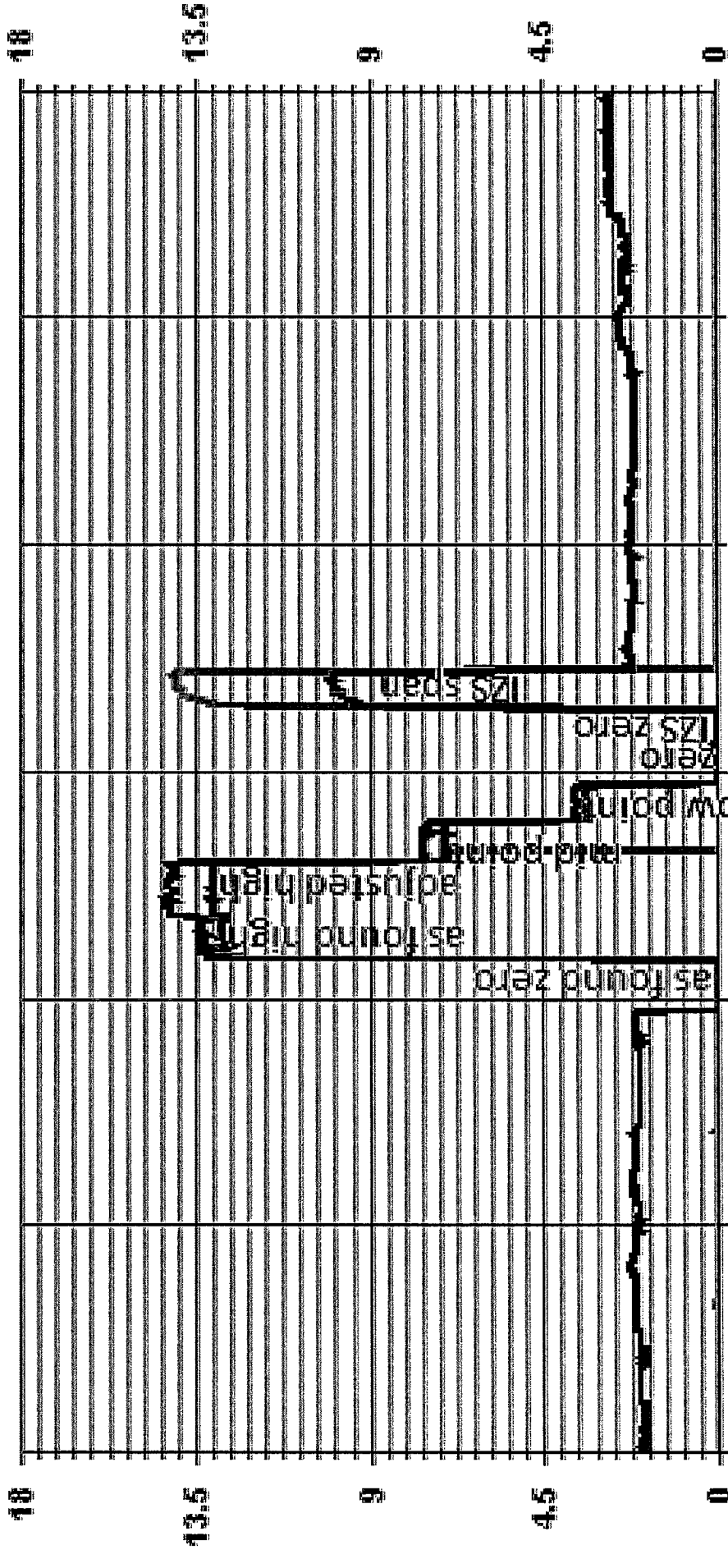
TOTAL HYDROCARBON

Thermo 55i Methane/Non-Methane Analyzer Calibration																																																																																																																						
Date: <u>November 10, 2015</u> Company/Airshed: <u>LICA</u> Location/Station Name: <u>Elk Point</u> Parameter: <u>CH₄ / NMHC / THC</u> Start/End Time 24 hr. (mst): <u>10:05 / 13:52</u> Calibration Method: <u>Gas Dilution</u>	Barometric Pressure: <u>0.931 atm</u> Station Temperature °C: <u>20</u> Weather Conditions: <u>Mix of sun and clouds</u> Calibration Purpose: <u>routine monthly</u> Performed By/Reviewer: <u>Alex Yakupov Trina Whitsitt</u> Cal Gas Expiry Date: <u>March 26, 2017</u>																																																																																																																					
Analyzer: Serial Number: <u>1236656107</u> Last Calibration Date: <u>October 7, 2015</u> Range ppm: <u>20 CH₄/20 NMHC/40 THC</u>																																																																																																																						
Correction Factors: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>CH₄ =</td> <td>1.003</td> <td>1.059</td> <td>0.997</td> </tr> <tr> <td>NMHC =</td> <td>1.002</td> <td>1.009</td> <td>0.999</td> </tr> <tr> <td>THC =</td> <td>1.004</td> <td>1.031</td> <td>0.997</td> </tr> </tbody> </table>			Previous C.F.:	As Found C.F.:	New C.F.:	CH ₄ =	1.003	1.059	0.997	NMHC =	1.002	1.009	0.999	THC =	1.004	1.031	0.997																																																																																																					
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Standard Calibration Points for Analyzer Range of 20/20/40 ppm																																																																																																																						
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Date:	November 10, 2015	Start/End Time 24 hr. (mst):	10:05 / 13:52
Company/Airshed:	LICA	Calibration Purpose:	routine monthly
Location/Station Name:	Elk Point	Calibration Method:	Gas Dilution




01 Minute Averages



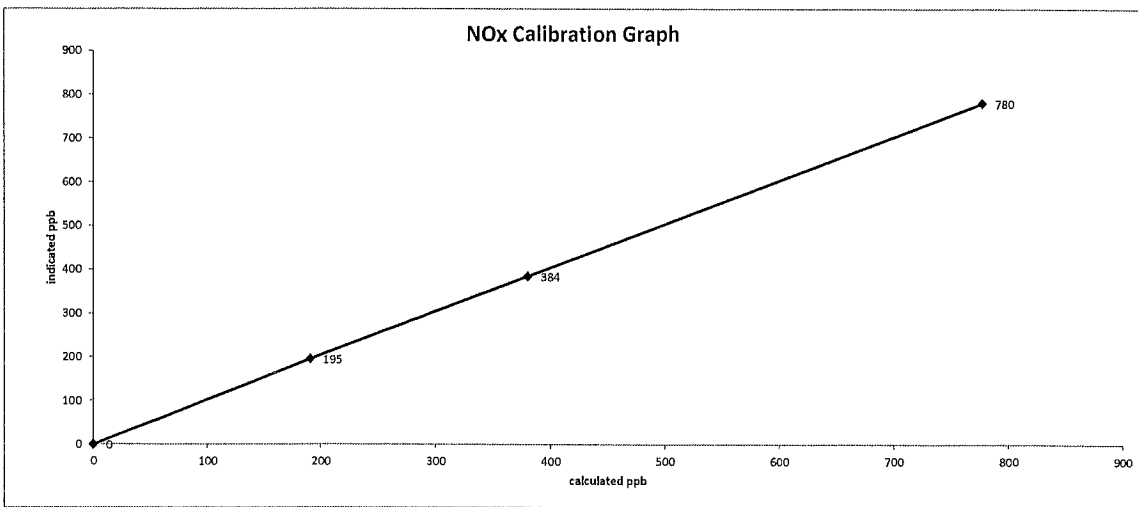
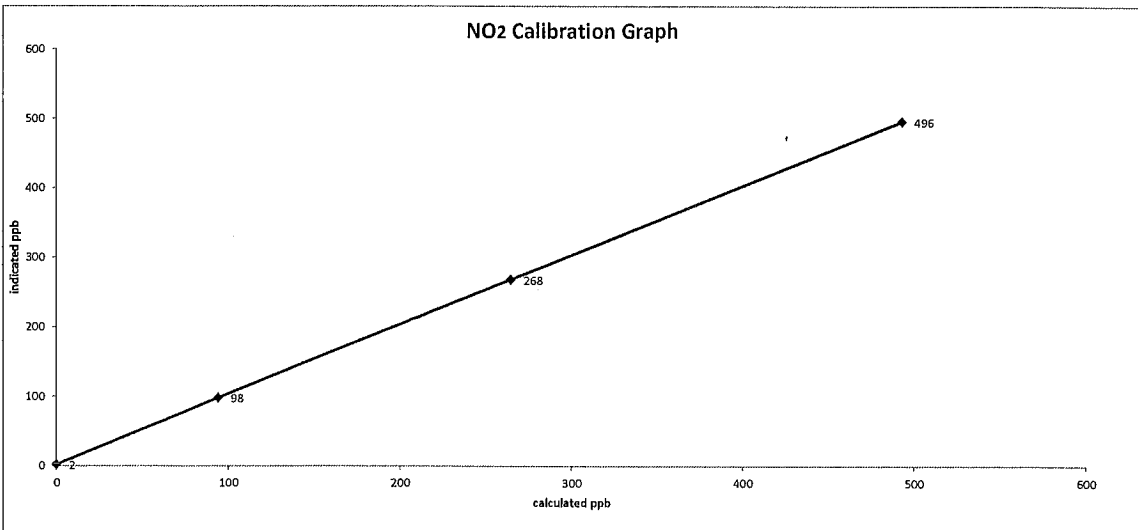
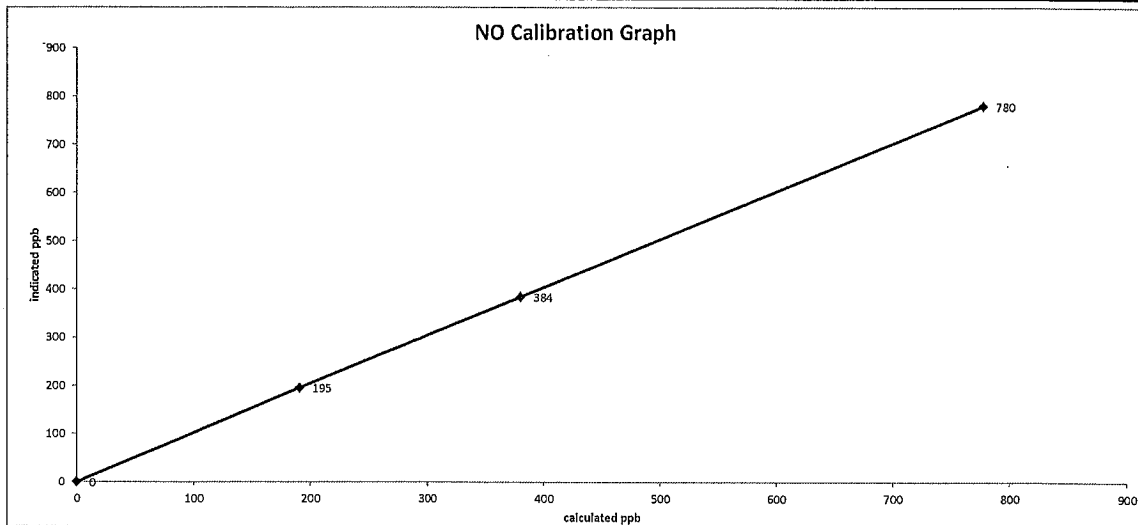
— LICA35 METHANE PPM - - - LICA35 NMHC PPM

NITROGEN DIOXIDE

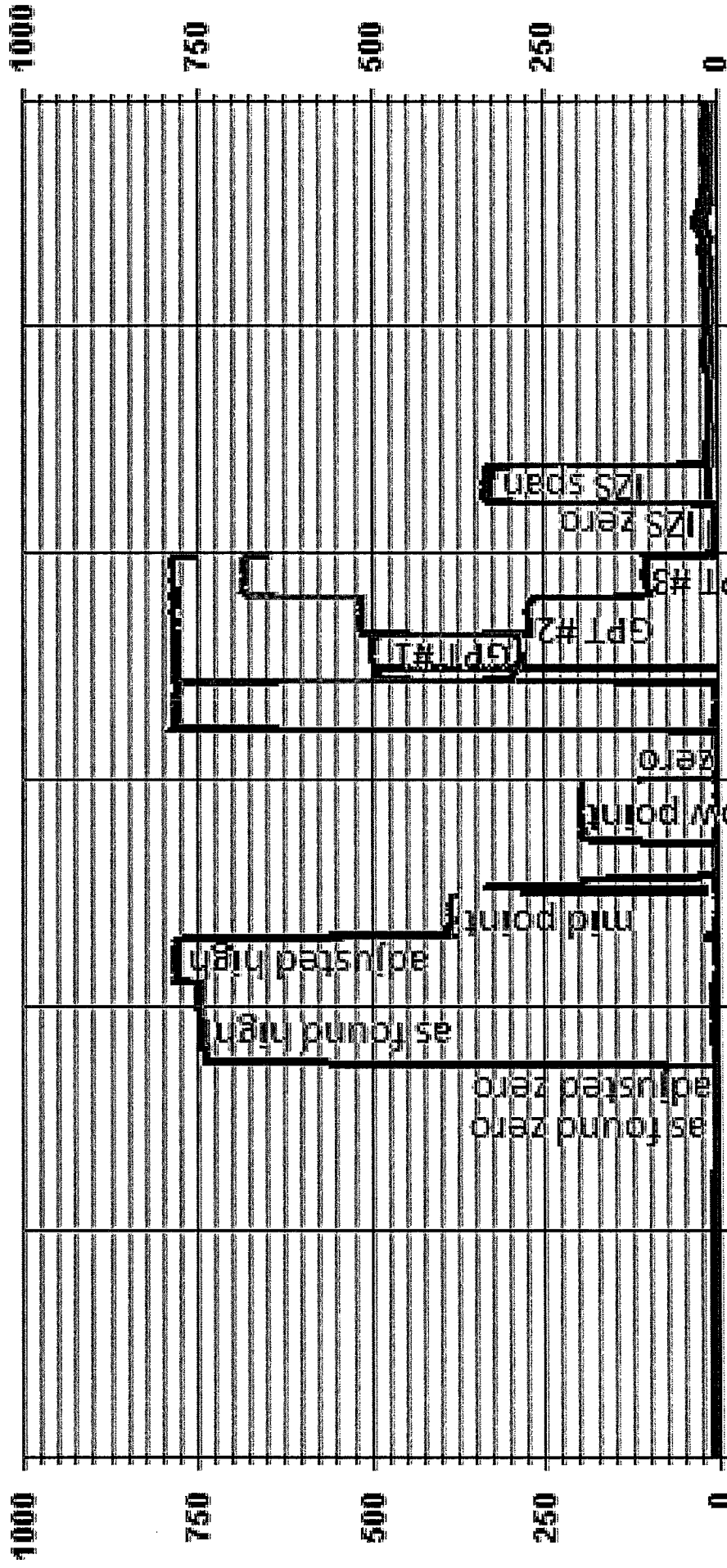
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Date: <u>November 10, 2015</u> Company/Alrshad: <u>LICA</u> Location/Station Name: <u>Elk Point</u> Start/End Time 24 hr. (mst): <u>10:05 / 16:51</u> G.P.T. to be used for Ozone? <u>No</u> Calibration Method: <u>Gas Dilution & Varying UV Lamp Power</u>	Barometric Pressure: <u>0.931 atm</u> Station Temperature °C: <u>20</u> Weather Conditions: <u>Mix of sun and clouds</u> Calibration Purpose: <u>routine monthly</u> Performed By/Reviewer: <u>Alex Yakupov Trina Whitsitt</u> Cal Gas Expiry Date: <u>March 12, 2019</u>																																																																																																				
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Date: November 10, 2015
Company/Airshed: LICA
Location/Station Name: Elk Point

Start/End Time 24 hr. (mst): 10:05 / 16:51
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Varying UV Lamp Power



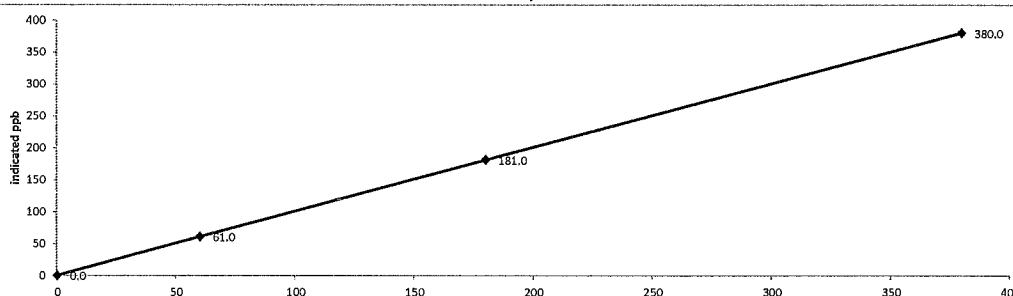
01 Minute Averages



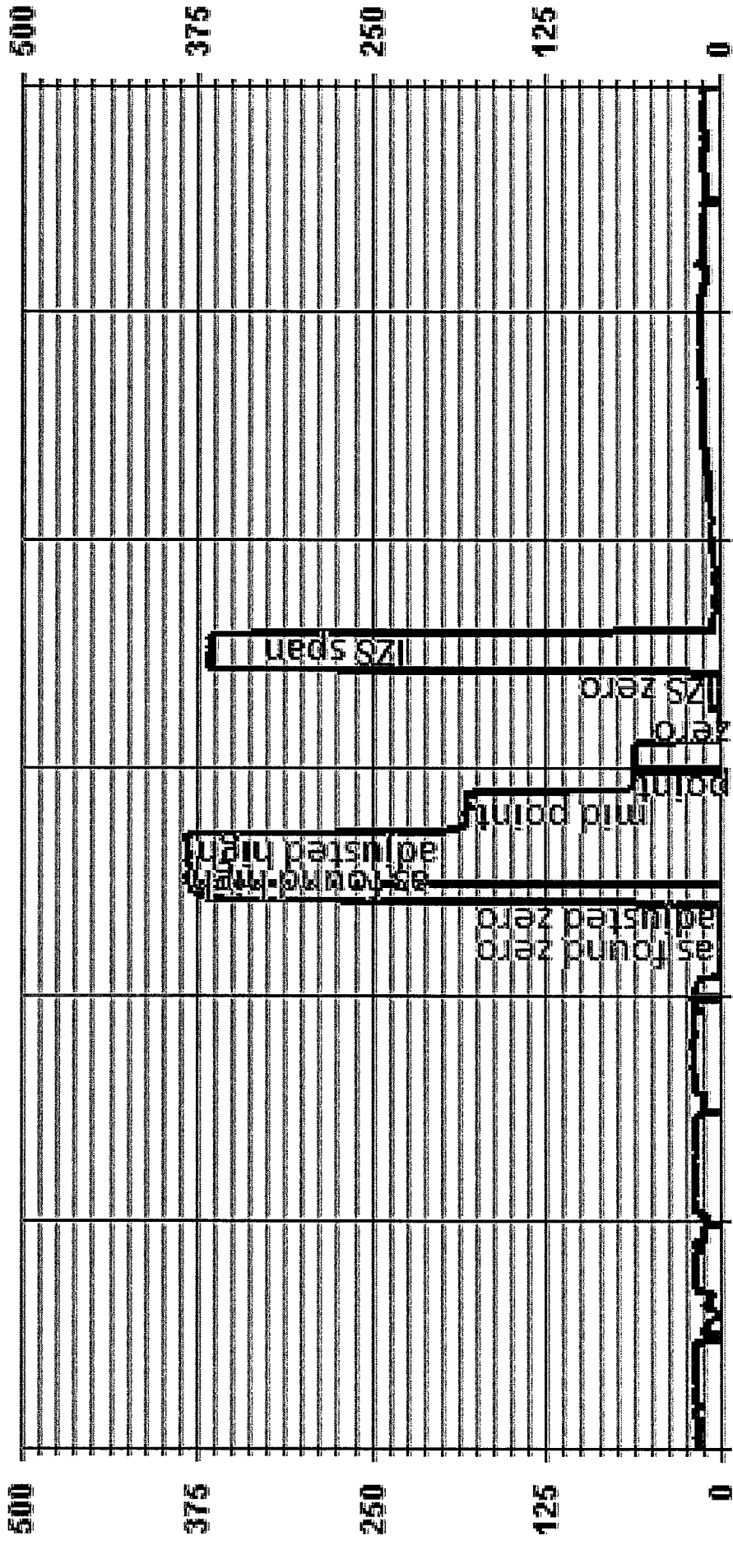
11/10/15 08:00 11/10/15 10:00 11/10/15 12:00 11/10/15 14:00 11/10/15 16:00 11/10/15 18:00

— LICA35 NOX_ PPB — LICA35 NO2_ PPB — LICA35 NO_ PPB — LICA35 NO2_ PPB

OZONE

Maxxam Thermo 49i Ozone Analyzer Calibration <small>A Bureau Veritas Group Company</small>																																																																					
Date: November 10, 2015 Company/Airshed: LICA Location/Station Name: Elk Point Start/End Time 24 hr. (mst): 15:47 / 19:16 Ozone Calibration Method: Varying UV Lamp Power G.P.T. Date: n/a-done by Varying UV Lamp Power	Barometric Pressure: 0.931 atm Station Temperature °C: 20 Weather Conditions: Mix of sun and clouds Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov / Trina Whitsitt Cal Gas Expiry Date: n/a																																																																				
Analyzer: Serial Number: 1002240372 Last Calibration Date: October 8, 2015 Previous Cal High Point C.F.: 1.000	Ozone Range ppb: 500 As Found C.F.: 1.001 New C.F.: 1.000																																																																				
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01 Minute Averages



— LICA35 03_ PPB

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: November 6, 2015
 Company: LICA
 Station Name/Location: Elk Point
 Previous Audit Date: October 22, 2015
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whatsitt
 Start Time (mst): 12:21
 End Time (mst): 13:22
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: Mainly clear

1400A Information and Status:

Serial Number: 1405A207691003 As Found Filter Loading %: 21.44
 Ko Factor: 15635 As Left Filter Loading %: 24.91
 Ambient Temperature °C: 3.12 As Found Noise: 0.006
 Ambient Pressure atm: 0.931 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.31
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>Fisher</u>
Model:	<u>475 Mark III</u>	<u>FB1291</u>	<u>FB 1291</u>
Serial Number:	<u>n/a</u>	<u>130168457</u>	<u>130168457</u>
Calibration Date:	<u>n/a</u>	<u>18-Mar-15</u>	<u>18-Mar-15</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	-0.01	0.58	0.01	0.56
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.72	0.00	-0.72
	limit	0.60	0.60	0.60	0.60

As left leak check (same as above if as found passes):

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	-0.01	0.58	0.01	0.56
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.72	0.00	-0.72
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C
 1405F temperature °C: 3.1
 reference temperature °C: 3.8
 difference °C: 0.7

tolerance +/- 0.01 atm
 1405F pressure atm: 0.931
 reference pressure: 0.932
 difference : -0.001

As left temperature and pressure (same as above if as found adequate):

tolerance +/- 2.0°C
 1405F temperature °C: 3.8
 reference temperature °C: 3.8
 difference °C: 0.0

tolerance +/- 0.01 atm
 1405F pressure atm: 0.932
 reference pressure: 0.932
 difference : 0.000

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm
 1405F main flow lpm: 3.00
 reference main flow lpm: 3.05
 difference lpm: 0.05

total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
 1400A total/aux flow lpm: 16.67
 reference total/aux flow lpm: 16.81
 difference lpm: 0.14

As left flows (same as above if as found adequate):

main flow tolerance 3.00 lpm +/- 0.20 lpm
 1405F main flow lpm: 3.00
 reference main flow lpm: 3.00
 difference lpm: 0.00

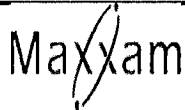
total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
 1400A total/aux flow lpm: 16.67
 reference total/aux flow lpm: 16.70
 difference lpm: 0.03

K_o Audit:

Last K_o audit date: 16-Jul-15
 1405F K_o factor: 15635
 Measured K_o factor: 15757.7000
 % difference: 0.79

Comments:

47 mm FDMS filter changed.



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: November 23, 2015
 Company: LICA
 Station Name/Location: Elk Point
 Previous Audit Date: November 6, 2015
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 11:44
 End Time (mst): 12:36
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: A few clouds

1400A Information and Status:

Serial Number: 1405A207691003 As Found Filter Loading %: 28.39
 Ko Factor: 15635 As Left Filter Loading %: 28.53
 Ambient Temperature °C: -3.28 As Found Noise: 0.004
 Ambient Pressure atm: 0.932 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.31
 Aux Flow Reading lpm: 13.68 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>Fisher</u>
Model:	<u>475 Mark III</u>	<u>FB1291</u>	<u>FB 1291</u>
Serial Number:	<u>n/a</u>	<u>130168457</u>	<u>130168457</u>
Calibration Date:	<u>n/a</u>	<u>18-Mar-15</u>	<u>18-Mar-15</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.53	0.01	0.53
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.72	0.00	-0.72
	limit	0.60	0.60	0.60	0.60

As left leak check (same as above if as found passes):

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.53	0.01	0.53
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.72	0.00	-0.72
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C		tolerance +/- 0.01 atm
1405F temperature °C: <u>-3.3</u>		1405F pressure atm: <u>0.932</u>
reference temperature °C: <u>-3.0</u>		reference pressure: <u>0.931</u>
difference °C: <u>0.3</u>		difference : <u>0.001</u>

As left temperature and pressure (same as above if as found adequate):

tolerance +/- 2.0°C		tolerance +/- 0.01 atm
1405F temperature °C: <u>-3.0</u>		1405F pressure atm: <u>0.931</u>
reference temperature °C: <u>-3.0</u>		reference pressure: <u>0.931</u>
difference °C: <u>0.0</u>		difference : <u>0.000</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm		total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>		1400A total/aux flow lpm: <u>16.68</u>
reference main flow lpm: <u>2.90</u>		reference total/aux flow lpm: <u>15.96</u>
difference lpm: <u>-0.10</u>		difference lpm: <u>-0.72</u>

As left flows (same as above if as found adequate):

main flow tolerance 3.00 lpm +/- 0.20 lpm		total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>		1400A total/aux flow lpm: <u>16.68</u>
reference main flow lpm: <u>2.97</u>		reference total/aux flow lpm: <u>16.45</u>
difference lpm: <u>-0.03</u>		difference lpm: <u>-0.23</u>

K_o Audit:

Last K_o audit date: 16-Jul-15
 1405F K_o factor: 15635
 Measured K_o factor: 15757.7000
 % difference: 0.79

Comments:

47 mm FDMS filter changed.

WIND SYSTEM



Meteorological Sensor Audit

Station Information

Company:	<u>LICA</u>	Performed By:	<u>Chris Wesson/Kevin Hope</u>
Location:	<u>Elk Point</u>	Reason:	<u>Bi-annual audit</u>
Audit Date:	<u>21-Feb-14</u>	Start Time (mst):	<u>15:10</u>
Previous Audit Date:	<u>24-Nov-11</u>	End Time (mst):	<u>15:40</u>

Wind Speed

Sensor make:	<u>RM Young</u>	Sensor height:	<u>10M</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>56589</u>
Calibrator:	<u>RM Young</u>	Variable speed motor:	<u>CA 03309</u>
Voltage range:	<u>0 - 1</u>	Output signal range:	<u>0 - 200 KPH</u>

Wind Speed Audit Data

RPM	Wind Speed Actual	Indicated WS - CW	Indicated WS-CCW	Correction Factor
0	0.0	0.02	0.03	-
1000	17.6	17.79	17.75	0.99
2000	35.28	35.54	35.53	0.99
3000	52.92	53.29	53.31	0.99
4000	70.56	71.08	71.08	0.99
5000	88.2	88.88	88.91	0.99
6000	105.84	106.6	106.7	0.99
7000	123.48	124.4	124.5	0.99
8000	141.12	142.2	142.2	0.99
9000	158.76	160	160.1	0.99
10000	176.4	177.8	177.8	0.99
Average Correction Factor:				0.99

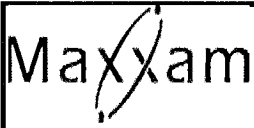
Wind Direction

Sensor make:	<u>RM Young</u>	Sensor height:	<u>10M</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>56589</u>
Calibrator:	<u>RM Young</u>	Variable speed motor:	<u>CA03309</u>
Voltage range:	<u>0 - 1</u>	Output signal range:	<u>0 - 360</u>

Wind Direction Audit Data

Wind Direction	Indicated	Correction Factor
0	355.0	NA
45	43.1	1.04
90	89.5	1.01
135	135.5	1.00
180	181.2	0.99
225	226.1	1.00
270	270.1	1.00
315	312.3	1.01
360	354.7	1.01
Average Correction Factor:		1.01

Remarks:



Meteorological Sensor Audit

Station Information

Company:	<u>LICA</u>	Performed By:	<u>Chris W / Alex Y</u>
Location:	<u>Elk Point</u>	Reason:	<u>Annual Calibration</u>
Audit Date:	<u>20-Nov-15</u>	Start Time (mst):	<u>11:14</u>
Previous Audit Date:	<u>Unknown</u>	End Time (mst):	<u>12:00</u>

Wind Speed

Sensor make:	<u>RM Young</u>	Sensor height:	<u>15</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>56589</u>
Calibrator:	<u>RM Young</u>	Variable speed motor:	<u>CA 03309</u>
Voltage range:	<u>0-1</u>	Output signal range:	<u>0-200 kph</u>

Wind Speed Audit Data

RPM	Wind Speed Actual	Indicated WS - CW	Indicated WS-CCW	Correction Factor
0	0.0	0.01	0.03	-
1000	17.6	17.81	17.73	0.99
2000	35.28	35.53	35.54	0.99
3000	52.92	53.27	53.32	0.99
4000	70.56	71.08	71.1	0.99
5000	88.2	88.86	88.88	0.99
6000	105.84	106.6	106.7	0.99
7000	123.48	124.4	124.4	0.99
8000	141.12	142.2	142.2	0.99
9000	158.76	160	160	0.99
10000	176.4	177.8	177.8	0.99
Average Correction Factor:				0.99

Wind Direction

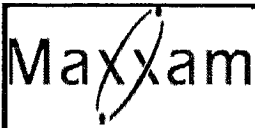
Sensor make:	<u>RM Young</u>	Sensor height:	<u>15</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>92412</u>
Calibrator:	<u>RM Young</u>	Variable speed motor:	<u>NA</u>
Voltage range:	<u>0-1</u>	Output signal range:	<u>0-360</u>

Wind Direction Audit Data

Wind Direction	Indicated	Correction Factor
0	355.1	NA
45	44.1	1.02
90	90.5	0.99
135	136.7	0.99
180	182.1	0.99
225	226.2	0.99
270	269.9	1.00
315	313.1	1.01
360	354.6	1.02
Average Correction Factor:		1.00

Remarks: Declination 13Deg 19'

Audit Performed by: Chris W / Alex Y



Meteorological Sensor Audit

Station Information

Company:	<u>Maxxam/LICA</u>	Performed By:	<u>Angie Noonan</u>
Location:	<u>Edmonton/Elk Point</u>	Reason:	<u>Pre-Installation</u>
Audit Date:	<u>23-Nov-15</u>	Start Time (mst):	<u>14:45</u>
Previous Audit Date:	<u>n/a</u>	End Time (mst):	<u>15:30</u>

Wind Speed

Sensor make:	<u>R. M. Young</u>	Sensor height:	<u>n/a</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>110980</u>
Calibrator:	<u>Young 18802</u>	Variable speed motor:	<u>CA 03309</u>
Voltage range:	<u>0-1</u>	Output signal range:	<u>200</u>

Wind Speed Audit Data

RPM	Wind Speed Actual	Indicated WS - CW	Indicated WS-CCW	Correction Factor
0	0.0	0.04747	0.04747	-
1000	17.6	17.67	17.65	1.00
2000	35.28	35.3	35.3	1.00
3000	52.92	52.93	52.91	1.00
4000	70.56	70.53	70.54	1.00
5000	88.2	88.18	88.18	1.00
6000	105.84	105.8	105.8	1.00
7000	123.48	123.4	123.4	1.00
8000	141.12	141.1	141.1	1.00
9000	158.76	158.7	158.7	1.00
10000	176.4	176.3	176.3	1.00
Average Correction Factor:				1.00

Wind Direction

Sensor make:	<u>R. M. Young</u>	Sensor height:	<u>n/a</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>110980</u>
Calibrator:	<u>Young 18802</u>	Variable speed motor:	<u>CA 03309</u>
Voltage range:	<u>0-1</u>	Output signal range:	<u>200</u>

Wind Direction Audit Data

Wind Direction	Indicated	Correction Factor
0	0.2	NA
45	44.9	1.00
90	89.4	1.01
135	134.3	1.01
180	179.5	1.00
225	224.3	1.00
270	269.6	1.00
315	315.1	1.00
360	354.8	1.01
Average Correction Factor:		1.00

Remarks: Pre-installation calibration.

Audit Performed by: Angie Noonan

CALIBRATORS

Company: Maxxam **Operator:** Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010D</u>	Make/Model	<u>N/A</u>
Serial Number	<u>11900613</u>	Serial Number	<u>N/A</u>
Oven Temperature	<u>N/A</u>	Temperature (°C)	<u>N/A</u>
Last Verification Date	<u>N/A</u>	Barometric Pressure	<u>N/A</u>

Flow Measurements

Pt. No. 1 5000 **Pt. No. 2** 5000 **Pt. No. 3** 5000

Calibrator Flow (sccm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
5013	0.000	0.001		
5013	0.400	0.407	1%	± 10%
5013	0.200	0.204	1%	± 10%
5014	0.100	0.101	0%	± 10%
Absolute Average Percent Difference			1%	± 10%

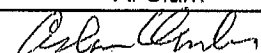
LINEAR REGRESSION ANALYSIS
y=mx+b (where x=calculated concentration, y=indicated concentration)

O_3		LIMITS
Correlation=	1.0000	≥ 0.995
m (Slope)=	1.0163	0.90-1.10
b (Intercept % of FS)=	0.0800	± 3% F.S.

AENV Standards		Ozone Analyzer	
Audit Calibrator		Make/Model	<u>Teco 49i</u>
Make/Model	<u>Teco 49i PS</u>	Serial/AMU Number	<u>AMU 1843</u>
Serial/AMU Number	<u>AMU 1808</u>	Last Calibration Date	<u>May 21, 2015</u>
Ozone Standard	<u>Primary</u>	Full Scale (ppm)	<u>0.5</u>

COMMENTS:

Auditor: Al Clark Date: May 21, 2015

Operator Signature:  Location: McIntyre Center Edmonton

Company: Maxxam

Operator: Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>N/A</u>
Serial Number	<u>830</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>Oct 2013</u>	Temperature (°C)	<u>N/A</u>
SO ₂ Cylinder Conc.	<u>50.3</u>	Barometric Pressure	<u>N/A</u>
SO ₂ Cylinder S/N	<u>LL42475</u>		

Flow Measurements

Pt. No. 1 79.5 Pt. No. 2 39.8 Pt. No. 3 19.9

Calibrator Flow (sccm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
Zero Air	0.000	0.000		
4918	0.800	0.798	0%	± 10%
4960	0.400	0.398	-1%	± 10%
4977	0.200	0.200	0%	± 10%
Absolute Average Percent Difference			0%	± 10%

LINEAR REGRESSION ANALYSIS
y=mx+b (where x=calculated concentration, y=indicated concentration)

SO ₂		LIMITS
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9971	0.90-1.10
b (Intercept % of FS)=	0.0000	± 3% F.S.

AENV Standards		SO ₂ Analyzer	
Audit Calibrator		Make/Model	<u>Teco 43C</u>
Make/Model	<u>R&R MFC 201</u>	Serial/AMU Number	<u>AMU 1623</u>
Serial/AMU Number	<u>AMU 1690</u>	Last Calibration Date	<u>Dec 15/14</u>
		Full Scale (ppm)	<u>1.0</u>

COMMENTS: H2S gas was slow to move through the calibrator. Check for contamination inside calibrator. SO2 moves through quickly.

Auditor: Al Clark

Operator Signature: _____

Date: December 16, 2014

Location: McIntyre Center Edmonton

Company Maxxam Operator: Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>N/A</u>
Serial Number	<u>17200415</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>New</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>BLM0027561</u>	Barometric Pressure	<u>N/A</u>
NO/NOX Concentration	<u>50.7/50.7</u>		

Dilution Flow (sccm)		
Pt. #1	<u>5000</u>	Pt. #3 <u>5000</u>
Pt. #2	<u>5000</u>	
Gas Flow (sccm)		
Pt. #1	<u>80</u>	Pt. #3 <u>20</u>
Pt. #2	<u>40</u>	

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5010	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5033	79.1	0.797	0.797	0.790	-0.011	0.779	-1%	-2%
5030	39.7	0.400	0.400	0.395	-0.005	0.390	-1%	-3%
5029	20.0	0.202	0.202	0.198	-0.003	0.195	-2%	-3%
Absolute Average Percent Difference							1%	3%

LINEAR REGRESSION ANALYSIS $y=mx+b$ (where x=calculated concentration, y=indicated concentration)

NO		LIMITS		NOx	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	0.9920	0.90-1.10		m (Slope)=	0.9783
b (Intercept % of FS)=	#DIV/0!	± 3% F.S.		b (Intercept % of FS)=	#DIV/0!

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5033	0.000	0.000	0.787	-0.011	0.776	NO ₂	% Diff. Limit
5033	0.520	0.490	0.297	0.475	0.772	0	± 10%
5033	0.280	0.261	0.526	0.249	0.774	0	± 10%
5033	0.100	0.089	0.698	0.078	0.775	0	± 10%
Absolute Average Percent Difference						0	± 10%

LINEAR REGRESSION ANALYSIS $y=mx+b$ (where x=calculated concentration, y=indicated concentration)

NO ₂		LIMITS	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	0.9916	0.90-1.10	
b (Intercept % of FS)=	#DIV/0!	± 3% F.S.	

AENV Standards Audit Calibrator		NO _x Analyzer	
Make/Model	<u>Teco 146i</u>	Make/Model	<u>Teco 42i</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
		Last Calibration Date	<u>May 21, 2015</u>
		Full Scale (ppm)	

COMMENTS: Contains 49.9 ppm SO2

Auditor: Al Clark
Operator Signature: *Al Clark*

Date: May 21, 2015
Location: McIntyre Center Edmonton

Company Maxxam Operator: Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>N/A</u>
Serial Number	<u>627</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>April 2014</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>BLM003914</u>	Barometric Pressure	<u>N/A</u>
NO/NOx Concentration	<u>50.8/50.8</u>		

Dilution Flow (sccm)
Pt. #1 5000 Pt. #2 5000 Pt. #3 5000
Gas Flow (sccm)
Pt. #1 80 Pt. #2 40 Pt. #3 20

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.000	0.000	0.000	0.001	0.001	Limit ± 10%	
4999	78.7	0.800	0.800	0.851	-0.016	0.835	6%	4%
5000	39.4	0.400	0.400	0.423	-0.008	0.416	6%	4%
5001	19.7	0.200	0.200	0.211	-0.003	0.208	5%	3%
Absolute Average Percent Difference							6%	4%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO		LIMITS		NOx	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	1.0641	0.90-1.10		m (Slope)=	1.0429
b (Intercept % of FS)=	-0.1200	± 3% F.S.		b (Intercept % of FS)=	0.0000

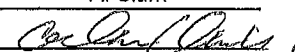
Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4999	0.000	0.000	0.841	-0.015	0.831	NO ₂	% Diff. Limit
4999	0.520	0.562	0.279	0.518	0.797	-5%	± 10%
4999	0.280	0.308	0.533	0.286	0.818	-2%	± 10%
4999	0.100	0.108	0.733	0.095	0.828	2%	± 10%
Absolute Average Percent Difference						2%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO₂		LIMITS
Correlation=	0.9998	≥ 0.995
m (Slope)=	0.9458	0.90-1.10
b (Intercept % of FS)=	-1.0258	± 3% F.S.

AENV Standards	NO_x Analyzer
Audit Calibrator	Make/Model <u>Teco 42i</u>
Make/Model <u>Teco 146i</u>	Serial/AMU Number <u>AMU 1868</u>
Serial/AMU Number <u>AMU 1809</u>	Last Calibration Date <u>April 1, 2015</u>
	Full Scale (ppm) <u>1.0</u>

COMMENTS: Cylinder contains 49.7 ppm SO₂. System shows NOx drop when O₃ added. Also noisy during GPT phase for NO₂ and NOx.

Auditor: Al Clark Date: April 1, 2015
Operator Signature:  Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-344CGA

Company: Maxxam Operator's Name: Limin Li
 Cylinder #: BLM002073 Concentration PPM: 49.5 Tolerance(%) 2 Certified By: Al Lique

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: March 31, 2015
 Gas Type: SO2 Conc. 98.57
 Cylinder Number: CAL016720

Flow Measurement Device:

Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 22.5 C
 B.P. 690 mmhg

Reference Analyzer:

Make/Model: Teco 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 7.9 Span: 1.028 Range: 1.0
 Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	0.01660	60.242	48.3
4976	82.6	0.801	0.01660	60.242	48.3
4993	41.0	0.396	0.00821	121.780	48.2
4977	20.2	0.193	0.00406	246.386	47.6
Average Cylinder Concentration:					48.0

Previous Stated Concentration PPM: 49.5

Percent variance from Stated: 3.0

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark
 Operator Signature: *Al Clark*

Date: March 31, 2015
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-342CGA

Company: Maxxam Operator's Name: Limin Li
 Cylinder #: BLM002756T Concentration PPM: 49.9 Tolerance(%) 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: March 31, 2015
 Gas Type: SO2 Conc. 98.57
 Cylinder Number: CAL016720

Flow Measurement Device:

Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 22.5 C
 B.P. 690 mmhg

Reference Analyzer:

Make/Model: Teco 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 7.9 Span: 1.028 Range: 1.0
 Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	0.01660	60.242	49.5
4976	82.6	0.821	0.01660	60.242	49.5
4993	41.0	0.410	0.00821	121.780	49.9
4977	20.2	0.202	0.00406	246.386	49.8
Average Cylinder Concentration:					49.7

Previous Stated Concentration PPM: 49.9

Percent variance from Stated: 0.4

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark
 Operator Signature: *Limin Li*

Date: March 31, 2015
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-251CGA

Company: Maxxam Operator's Name: Limin Li
 Cylinder #: LL36837 Concentration PPM: 10.0 Tolerance(%): 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: December 15, 2014
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015106

Flow Measurement Device:

Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 23.0 C
 B.P. 702 mmhg

Reference Analyzer:

Make/Model: Teco 45C Serial/AMU Number: 1624
 Instrument Settings: Zero: 6.4 Span: 1.160 Range: 0.1
 Last Calibration: Date: Dec15/14 C.F. 1.000 Done By: Al Clark

Calibrator Flows (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	10000.0	10.0
5099	38.5	0.0754	0.00755	132.442	10.0
5092	18.0	0.0349	0.00353	282.889	9.9
5066	9.2	0.0178	0.00182	550.652	9.8
Average Cylinder Concentration:					9.9

Previous Stated Concentration PPM: 10.0

Percent variance from Stated: 1.1

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark
 Operator Signature: *Al Clark*

Date: December 16, 2014
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-338CGA

Company: Maxxam **Operator's Name:** Limin Li
Cylinder #: BLM002508 **Concentration PPM:** 10.2 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU1690
 Last Verification Date: March 31, 2015
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015106

Flow Measurement Device:

Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 23.0 C
 B.P. 689 mmhg

Reference Analyzer:

Make/Model: Teco 450i Serial/AMU Number: 1980
 Instrument Settings: Zero: 14.5 Span: 1.035 Range: 0.1
 Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	0.0000	0.0000
5080	38.2	0.0725	0.00752	132.984	9.6
5078	17.9	0.0340	0.00353	283.687	9.6
5066	9.1	0.0170	0.00180	556.703	9.5
Average Cylinder Concentration:					9.6

Previous Stated Concentration PPM: 10.2

Percent variance from Stated: 6.0

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark
 Operator Signature: *Al Clark*

Date: March 31, 2015
 Location: McIntyre Center Edmonton



Praxair Canada, Inc.
 9501-34th Street
 Edmonton, AB T6B 2X8
 Tel: 780-449-0778
 Fax: 780-449-5302

03/27/2014

MAXXAM ANALYTICS INC "NA"
 9372 49TH ST
 EDMONTON, AB T6B 2L7

Work Order No. 20248656
 Customer Reference No.

Product Lot/Batch No. Z582 4 085 02
 Product Part No. NI-ME600P2P-AQ

CERTIFICATE OF ANALYSIS
Primary Standard

Component	Requested Concentration	Certified Concentration	Analytical Principle	Analytical Accuracy
Methane	600.0ppm	601.4ppm	U	±1% rel
Propane	200.0ppm	202ppm	U	±1% rel
Nitrogen	Balance	Balance		

Analytical Instruments: **Mettler-Toledo Analytical Balance-ID2ex/USA--**
Hewlett-Packard (Agilent)-6890--GC-FID

Cylinder Style: **AQ** Filling Method: **Gravimetric**
 Cylinder Pressure @70F: **2200 psig** Date of Fill: **03/26/2014**
 Cylinder Volume: **82.0 ft³** Expiration Date: **03/26/2017**
 Valve Outlet Connection: **CGA-350**
 Cylinder No(s): **LL33874**

Analyst: Todd Hryniv

This gas cylinder, cylinder markings provided by Praxair Canada, Inc. is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure techniques. The calibration standard provided is certified against Praxair Canada, Inc. Reference Materials which are either prepared by weight according to the National Institute of Standards and Technology (NIST), Massachusetts, Canada, or by other NIST Standards Reference Materials where available.

- Note: All concentrations are concentration (e.g. % or ppm) are for gas phase, by volume (e.g. percent unless otherwise noted)
- | | | | |
|--|---|---|--|
| 1) Gas Chromatography | 2) Gas Chromatography with Electrode Detector | 3) Gas Chromatography with Catalytic Converter | 4) Gas Chromatography with Flame Ionization Detector |
| 5) Gas Chromatography with Thermal Conductivity Detector | 6) Gas Chromatography with Infrared Spectroscopy | 7) Gas Chromatography with Mass Spectrometry | 8) Gas Chromatography with Photoacoustic Detector |
| 9) Gas Chromatography with Refractive Index Detector | 10) Gas Chromatography with Thermal Conductivity Detector | 11) Gas Chromatography with Thermal Conductivity Detector | 12) Infrared - FTIR or ATR |
| 13) Gas Chromatography with Mass Spectrometry | 14) Gas Chromatography with Thermal Conductivity Detector | 15) Gas Chromatography with Thermal Conductivity Detector | 16) Specific Vapor Analyzer |
| 17) Gas Chromatography with Mass Spectrometry | 18) Gas Chromatography with Thermal Conductivity Detector | 19) Gas Chromatography with Thermal Conductivity Detector | 20) Specific Vapor Analyzer |

IMPORTANT:
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Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-027CGA

Company: Maxxam **Operators name:** Limin Li
Cylinder #: LL8363B **Conc CH4 (PPM)** 582/203 **Tolerance (%)** 2 **Certified By:** Praxair

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>R&R MFC 201</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1691</u>			Serial Number	<u>AMU 1650</u>
Last Verification Date	<u>May 21, 2015</u>			Temp. °C	<u>24.0 C</u>
Gas Type	<u>CH4</u>	Conc.	<u>999.2</u>	B.P.	<u>703 mmhg</u>
Cylinder Number	<u>D751932</u>				
Gas Type	<u>C3H8</u>	Conc.	<u>246.5</u>		
Cylinder Number	<u>XF0037998</u>				

Reference Analyzer:
 Make/Model Teco 55C Serial/AMU Number: 1643
 Instrument Settings Zero: N/A Span: N/A Range: 20
 Last Calibration: Date: May 21/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (scm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2600	0.0	0.00	0.00	0.02005	49.883	595	201
2669	51.5	11.92	11.08	0.02005	49.883	595	201
3549	22.3	3.76	3.49	0.00628	159.148	598	202
3523	10.4	1.76	1.66	0.00295	338.750	596	204
Average Cylinder Concentration:						596	202

<u>CH4</u>	<u>C3H8</u>
Previous Stated Concentration PPM: <u>582</u>	Previous Stated Concentration PPM: <u>203</u>
Percent variance from Stated: <u>2.5</u>	Percent variance from Stated: <u>0.3</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark Date: May 21, 2015
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2015-345CGA

Company: Maxxam Operators name: Limin Li
 Cylinder #: BLM002073 Conc (PPM) 50.6/50.6 Tolerance (%) 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model Teco 146i
 Serial Number AMU 1809
 Last Verification Date March 31, 2015
 Gas Type NO Conc. 48.79
 Cylinder Number CAL018024

Flow Measurement Device:

Make/Model Bios DC2
 Serial Number AMU 1659
 Temp. °C 22.5 C
 B.P. 690 mmhg

Reference Analyzer:

Make/Model Teco 42i Serial/AMU Number: 1868
 Instrument Settings Zero: 4.2 Span: 1.008 Range: 1.0
 Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000	0.01660	60.242	51.5	51.1
4976	82.6	0.855	0.848	0.01660	60.242	51.5	51.1
4993	41.0	0.427	0.421	0.00821	121.780	52.0	51.3
4977	20.2	0.213	0.209	0.00406	246.386	52.5	51.5
Average Cylinder Concentration:						52.0	51.3

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.6</u>	<u>50.6</u>
Percent variance from Stated: <u>2.8</u>	<u>1.4</u>

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration Contains 49.5 ppm SO2 in cylinder
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder:

Auditor: Al Clark Date: March 31, 2015
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2016-343CGA

Company: Maxxam Operators name: Limin Li
 Cylinder #: BLM002756T Conc (PPM) 50.7/50.7 Tolerance (%) 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model Teco 146i
 Serial Number AMU 1809
 Last Verification Date March 31, 2015
 Gas Type NO Conc. 48.79
 Cylinder Number CAL018024

Flow Measurement Device:

Make/Model Bios DC2
 Serial Number AMU 1659
 Temp. °C 22.5 C
 B.P. 690 mmhg

Reference Analyzer:

Make/Model Teco 42i Serial/AMU Number: 1868
 Instrument Settings Zero: 4.2 Span: 1.008 Range: 1.0
 Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000	0.01660	60.242	50.7	49.5
4976	82.6	0.842	0.822	0.01660	60.242	50.7	49.5
4993	41.0	0.420	0.410	0.00821	121.780	51.1	49.9
4977	20.2	0.208	0.205	0.00406	246.386	51.2	50.5
Average Cylinder Concentration:						51.0	50.0

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.7</u>	<u>50.7</u>
Percent variance from Stated: <u>0.7</u>	<u>1.4</u>

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration Contains 49.9 ppm SO2 in cylinder
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark Date: March 31, 2015
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton

PUF SAMPLER

		TISCH PUF PLUS SAMPLER AUDIT	
Date: <u>November 25, 2015</u>		PUF PLUS Serial #: <u>100-1015</u>	
Company/Alrshed: <u>LICA</u>		Performed By/Reviewer: <u>Alex Yakupov</u> / <u>Trina Whitsitt</u>	
Location/Station Name: <u>Elk Point</u>		Weather Conditions: <u>Mainly sunny</u>	
Reference Standards:		Flow:	Pressure:
Make:	<u>Fisher Scientific</u>	<u>Fisher Scientific</u>	<u>Practical Instrument Electronics</u>
Model:	<u>FB61291</u>	<u>FB61291</u>	<u>PIE</u>
Serial Number:	<u>130168457</u>	<u>130168457</u>	<u>107216</u>
Calibration Date:	<u>March 18, 2015</u>	<u>March 18, 2015</u>	<u>January 24, 2015</u>
TISCH PUF PLUS PRESSURE AND TEMPERATURE AUDIT			
AS FOUND Reference Barometric Pressure (mmHg):	<u>708.06</u>	AS FOUND Reference Temperature (°C):	<u>n/a</u>
AS FOUND PUF PLUS Barometric Pressure (mmHg):	<u>n/a</u>	AS FOUND PUF PLUS Temperature (°C):	<u>n/a</u>
% Difference (+/- 2% max.):		% Difference (+/- 2 °C max.):	
IF THE PRESSURE DEVIATES BY MORE THAN +/- 2% A FLOW CALIBRATION IS REQUIRED		**IF THE TEMPERATURE DEVIATES BY MORE THAN +/- 2 °C A FLOW CALIBRATION IS REQUIRED**	
TISCH PUF PLUS FLOW AUDIT			
Flow Audit Calculations:			
Calibrated Orifice Certification Date:		<u>October 12, 2015</u>	
Enter Barometric Pressure from reference (InHg):		<u>27.88</u>	
Barometric Pressure (mmHg):		<u>708.1</u>	
Enter Ambient Temperature from reference °C:		<u>-3.8</u>	
Enter "m" variable from calibrated orifice:		<u>6.07570</u>	
Enter "b" variable from calibrated orifice:		<u>-0.03578</u>	
Enter Δp In. H ₂ O:		<u>1.82</u>	
Standardized Flow lpm=		<u>231.32</u>	
Flow Set Point lpm=		<u>230.00</u>	
% Difference (+/- 2% max.)=		<u>-0.57%</u>	
IF THE FLOW DEVIATES BY MORE THAN +/- 2% A FLOW CALIBRATION IS REQUIRED			
TISCH PUF PLUS PRESSURE CALIBRATION			
Reference Barometric Pressure AFTER CALIBRATION (mmHg):		<u>708.06</u>	
PUF Barometric Pressure AFTER CALIBRATION (mmHg):		<u>706</u>	
% Difference:		<u>0.29%</u> Max 2.0%	
Calibration Point (mmHg):	Δp (In. H ₂ O) required for target barometric pressure:	As Found barometric pressure (mmHg):	As Left barometric pressure (mmHg):
<u>748.06</u>	<u>1.57</u>	<u>789.0</u>	<u>741.0</u>
<u>728.06</u>	<u>0.79</u>	<u>775.0</u>	<u>730.0</u>
<u>708.06</u>	<u>0.00</u>	<u>750.0</u>	<u>706.0</u>
<u>688.06</u>	<u>-0.79</u>	<u>717.0</u>	<u>683.0</u>
<u>668.06</u>	<u>-1.57</u>	<u>703.0</u>	<u>674.0</u>
% Difference (+/- 2% max.)=			<u>0.16%</u>
TISCH PUF PLUS TEMPERATURE CALIBRATION			
Temperature Calibrator Certification Date:		<u>January 24, 2015</u>	
Reference Temperature AFTER CALIBRATION (°C):		<u>-2.0</u>	
TISCH PUF PLUS Temperature AFTER CALIBRATION (°C):		<u>-3.8</u>	
Difference (°C):		<u>1.8</u> Max 2.0 °C	
Calibration Point (°C):	As Found (°C)	As Left (°C)	+/- Difference (°C)
<u>20</u>	<u>20.5</u>	<u>20.3</u>	<u>-0.2</u>
<u>-20</u>	<u>-19.7</u>	<u>-19.7</u>	<u>0.0</u>
<u>40</u>	<u>40.6</u>	<u>40.2</u>	<u>-0.4</u>
<u>0</u>	<u>0.4</u>	<u>0.2</u>	<u>-0.2</u>
<u>-30</u>	<u>-29.7</u>	<u>-29.8</u>	<u>-0.1</u>
% Difference (+/- 2 °C max.)=			<u>-0.2</u>
TISCH PUF PLUS FLOW CALIBRATION			
Flow Calibration Calculations:			
Calibrated Orifice Certification Date:		<u>October 12, 2015</u>	
Enter Barometric Pressure from reference (InHg):		<u>27.88</u>	
Barometric Pressure (mmHg):		<u>708.1</u>	
Enter Ambient Temperature from reference °C:		<u>-3.8</u>	
Enter "m" variable from calibrated orifice:		<u>6.07570</u>	
Enter "b" variable from calibrated orifice:		<u>-0.03578</u>	
Enter Δp In. H ₂ O:		<u>1.80</u>	
Standardized Flow lpm=		<u>230.08</u>	
Flow Set Point lpm=		<u>230.00</u>	
% Difference (+/- 2% max.)=		<u>-0.03%</u>	
IF THE FLOW DEVIATES BY MORE THAN +/- 2% A FLOW CALIBRATION IS REQUIRED			
R, A1 and A0 Factors:			
	As Found/As Left Pressure:	As Found/As Left Temperature:	As Found/As Left Flow:
A0	<u>n/a / 15312.75</u>	<u>n/a / -11845.5546</u>	<u>n/a / -.2483</u>
A1	<u>n/a / 22.5779</u>	<u>n/a / 0.2999</u>	<u>n/a / 17.6252</u>
R	<u>n/a</u>	<u>n/a</u>	<u>n/a / 1.000</u>
Notes:			
R value as left or flow was 1.000			

AUDIT REPORT

COMPANY: LICA PLANT: ELK point DATE: November 19, 2015

Station Location: UTM Coordinates: 53.89134N/110.76418W
 Elevation (m): 598m
 Declination: 13° 22'

GENERAL	Yes	No	n/a	Comments:
Has site location changed from previous audit?		No		
Is site secure?	Yes			
Are station operating conditions adequate?	Yes			
Last twelve month's of calibrations available?	Yes			
All applicable SOP's available in station?		No		
Site documentation up to date?	Yes			

DATA ACQUISITION	Yes	No	n/a	Comments:
Are strip charts in use?		No		
Is a digital data logger in use?		No		
Is a telemetry system for data acquisition in use?	yes			


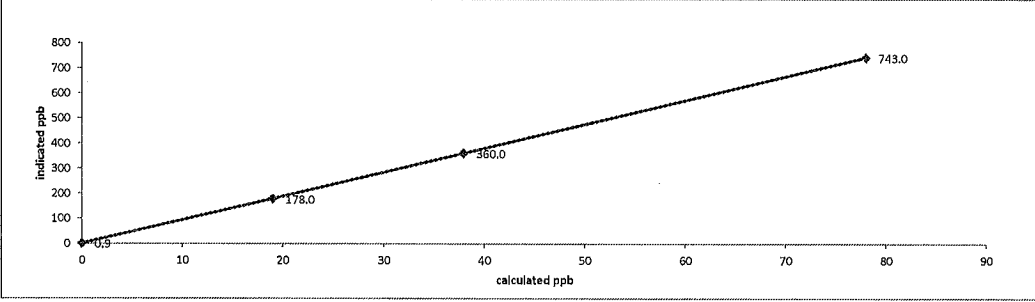
TRAILER COMPONENTS	Yes	No	n/a	Comments:
Is a glass sampling manifold installed?	Yes			
Is sampling manifold clean and free of chips and cracks?	Yes			
Is a trap in place?	Yes			
Are spare manifold ports capped?	Yes			
Is manifold pump properly installed and operative?	Yes			
If horizontal, is the manifold mounted at a slight upward angle to prevent moisture from getting in to the lines?			n/a	
Do sample lines extend halfway into manifold?		No		
Are monitor sampling lines connected to manifold?	Yes			
Are sampling lines clean?		No		
Are monitors properly mounted and secure?	Yes			
Are monitors properly exhausted from room or scrubbed (NOx pump inlet scrubbed and dated)?	Yes			
Are zero and span systems operational?	Yes			

Meteorological	Yes	No	n/a	Comments:
Is wind equipment properly oriented?	Yes			
Is the wind equipment functioning properly?	Yes			

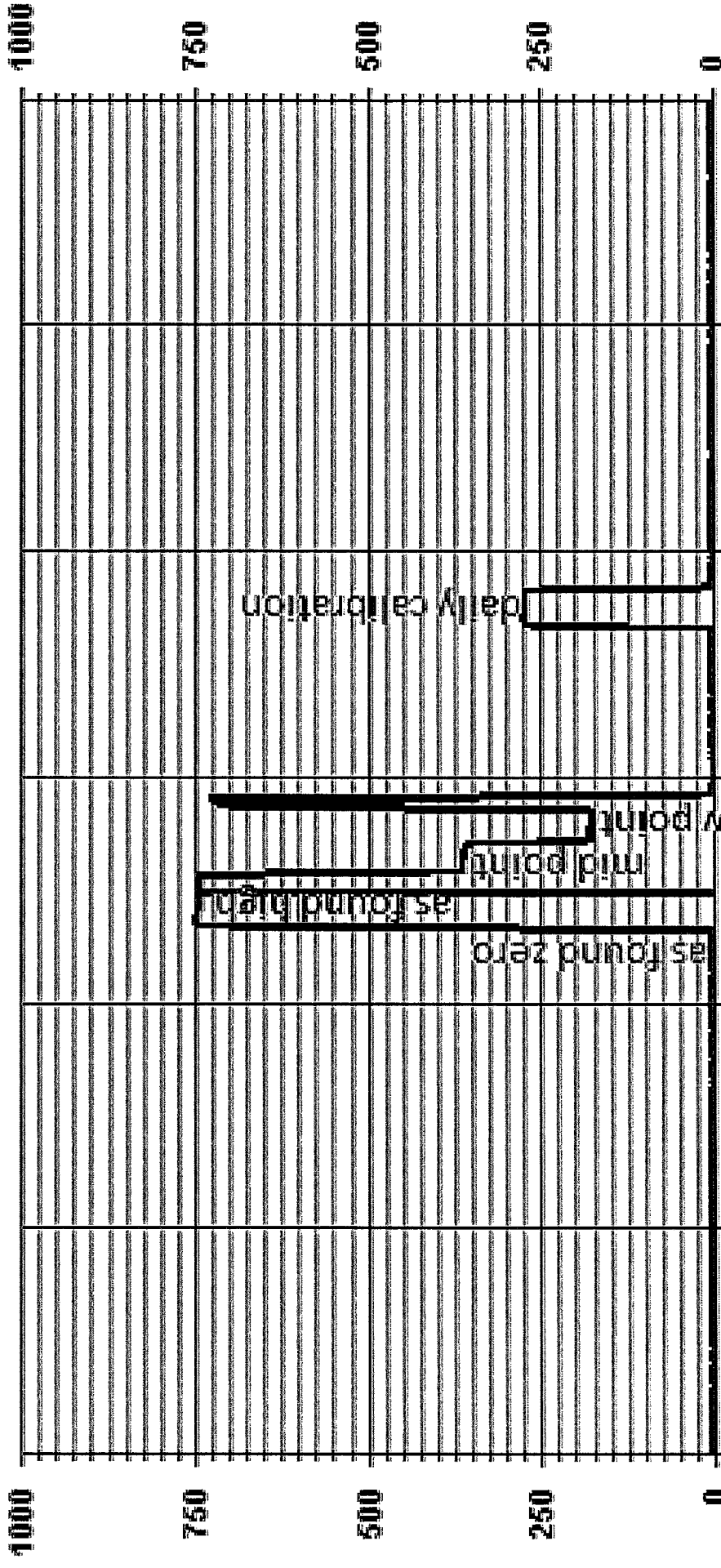
	Indicated Value:	Audit Value:	% Difference	Scalar Difference:
Station Temperature °C	21.1	20.1	-4.98	-1.00
Barometric Pressure	n/a	n/a	n/a	n/a
Wind Speed (kph)	4	3	n/a	-1.00
Wind Direction (Deg)	287	w	n/a	n/a
Relative Humidity %	n/a	n/a	n/a	n/a
Ambient Temperature °C	n/a	n/a	n/a	n/a
Solar Radiation kW/m ²	n/a	n/a	n/a	n/a
Precipitation (Tipping Bucket mm)	n/a	n/a	n/a	n/a

Recommendations: Need to pay more attention to cleaning the lines in to the manifold, also make sure they are halfway in to the manifold.

AUDITOR: Limin Li

		<h3>API 100E Sulphur Dioxide Analyzer Audit</h3>																																											
Date: November 19, 2015 Company/Airshed: LICA Location/Station Name: ELK point Parameter: Sulphur Dioxide Start Time 24 hr. (mst): 11:00 End Time 24 hr. (mst): 12:55 Calibration Method: Gas Dilution		Barometric Pressure: 27.83 in. Hg Station Temperature °C: 19 Weather Conditions: Mainly cloudy with light snow Calibration Purpose: Audit Performed By/Reviewer: Limin Li / Tom Bourque Cal Gas Expiry Date: December 25, 2018 Converter Model & s/n (if applicable): NA																																											
Analyzer: Serial Number: 467 Last Calibration Date: November 10, 2015 Previous C.F.: 1.000		Range ppb: 1000 As Found C.F.: 1.032 New C.F.: n/a																																											
Calibrator: Flow Meter ID's: NA Make & Model: SABIO 2010 Serial #: 17200415 Cal Gas Cylinder I.D. #: BLM002756T Cal Gas Conc. (ppm): 49.9		Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <thead> <tr> <th>Point</th> <th>Sulphur Dioxide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> </tr> <tr> <td>Mid</td> <td>380</td> </tr> <tr> <td>Low</td> <td>190</td> </tr> </tbody> </table>		Point	Sulphur Dioxide Standard Calibration Points	High	780	Mid	380	Low	190																																		
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As found: SLOPE: 1.059 OFFSET: 119.1 HVPS: 512 RCELL TEMP: 50 BOX TEMP: 29.9 PMT TEMP: 8.1 PRES: 24.6 SAMP FL: 620 NORM PMT: 114.8 UV LAMP: 3091 LAMP RATIO: 102.9 STR. LGT: 63 DRK PMT: 12.9 DRK LMP: 3.1		As left: SLOPE: 1.059 OFFSET: 119.1 HVPS: 512 RCELL TEMP: 50 BOX TEMP: 29.9 PMT TEMP: 8.1 PRES: 24.6 SAMP FL: 620 NORM PMT: 114.8 UV LAMP: 3091 LAMP RATIO: 102.9 STR. LGT: 63 DRK PMT: 12.9 DRK LMP: 3.1																																											
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IZS TEMP:45C. Calibrator flow rate (tested by Definer) High point : Total:4956CCM. Gas:76.37CCM; Mid point: Total:4973CCM, Gas:37.34. Low point:Total:4985CCM, Gas:18.73CCM. Need to calibrate analog output.																																													

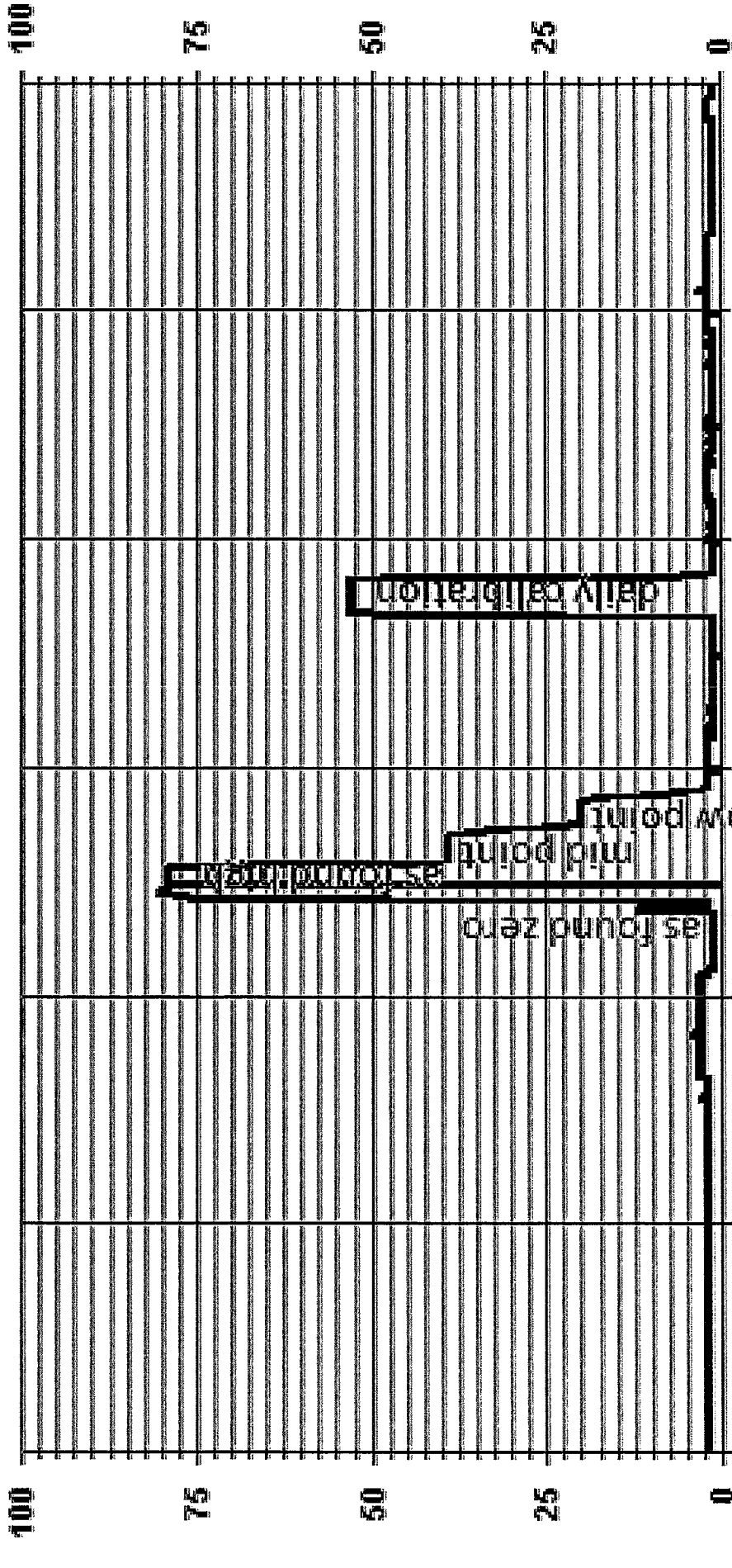
01 Minute Averages



— LICA35 SO2_ PPB


API 101E Hydrogen Sulphide Analyzer Audit																																							
<p>Date: November 19, 2015</p> <p>Company/Airshed: LICA</p> <p>Location/Station Name: ELK point</p> <p>Parameter: Hydrogen Sulphide</p> <p>Start Time 24 hr. (mst): 11:00</p> <p>End Time 24 hr. (mst): 12:50</p> <p>Calibration Method: Gas Dilution</p>	<p>Barometric Pressure: 27.83 in. Hg</p> <p>Station Temperature °C: 19</p> <p>Weather Conditions: Mainly cloudy with light snow</p> <p>Calibration Purpose: Audit</p> <p>Performed By/Reviewer: Limin Li / Tom Bourque</p> <p>Cal Gas Expiry Date: January 6, 2018</p> <p>Converter Model & s/n (if applicable): Internal</p>																																						
<p>Analyzer:</p> <p>Serial Number: 510</p> <p>Last Calibration Date: November 10, 2015</p> <p>Previous C.F.: 1.000</p>	<p>Range ppb: 100</p> <p>As Found C.F.: 0.998</p> <p>New C.F.: n/a</p>																																						
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<p>Flow Meter ID's: n/a</p> <p>Make & Model: API700</p> <p>Serial #: 627</p> <p>Cal Gas Cylinder I.D. #: BLM002508</p> <p>Cal Gas Conc. (ppm): 10.2</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Point</td> <td style="width: 50%;">Hydrogen Sulphide Calibration Points</td> </tr> <tr> <td>High</td> <td>78</td> </tr> <tr> <td>Mid</td> <td>38</td> </tr> <tr> <td>Low</td> <td>19</td> </tr> </table>	Point	Hydrogen Sulphide Calibration Points	High	78	Mid	38	Low	19																														
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<p>Linear Regression/Calibration Results:</p> <p>Correlation Coefficient = <u>1.000</u> LIMITS > or = 0.995</p> <p>Slope = <u>0.998</u> 0.90-1.10</p> <p>b (Intercept as % of full scale) = <u>-1.02%</u> ± 3% F.S.</p> <p>% change in C.F. from last cal = <u>0.23%</u> ± 10%</p>																																							
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<p>As found:</p> <p>SLOPE: <u>1.13</u></p> <p>OFFSET: <u>26.2</u></p> <p>HVPS: <u>526</u></p> <p>RCELL TEMP: <u>50</u></p> <p>BOX TEMP: <u>31.6</u></p> <p>PMT TEMP: <u>8.3</u></p> <p>Converter Temp: <u>314.9</u></p> <p>PRES: <u>22</u></p> <p>SAMP FL: <u>572</u></p> <p>UV LAMP: <u>2850</u></p> <p>LAMP RATIO: <u>89.8</u></p> <p>STR. LGT: <u>14.8</u></p> <p>DRK PMT: <u>32.7</u></p> <p>DRK LMP: <u>-1.5</u></p>	<p>As left:</p> <p>SLOPE: <u>1.13</u></p> <p>OFFSET: <u>26.2</u></p> <p>HVPS: <u>526</u></p> <p>RCELL TEMP: <u>50</u></p> <p>BOX TEMP: <u>31.6</u></p> <p>PMT TEMP: <u>8.3</u></p> <p>Converter Temp: <u>314.9</u></p> <p>PRES: <u>22</u></p> <p>SAMP FL: <u>572</u></p> <p>UV LAMP: <u>2850</u></p> <p>LAMP RATIO: <u>89.8</u></p> <p>STR. LGT: <u>14.8</u></p> <p>DRK PMT: <u>32.7</u></p> <p>DRK LMP: <u>-1.5</u></p>																																						
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<p>I/S TEMP:50C. PMT:52.3. Norm PMT:28.8. Calibrator flow rate (tested by Definer) High point : Total:7360CCM. Gas:57.25CCM; Mid point: Total:7358CCM, Gas:27.83. Low point: Total:7354CCM, Gas:14.03CCM.</p>																																							

01 Minute Averages



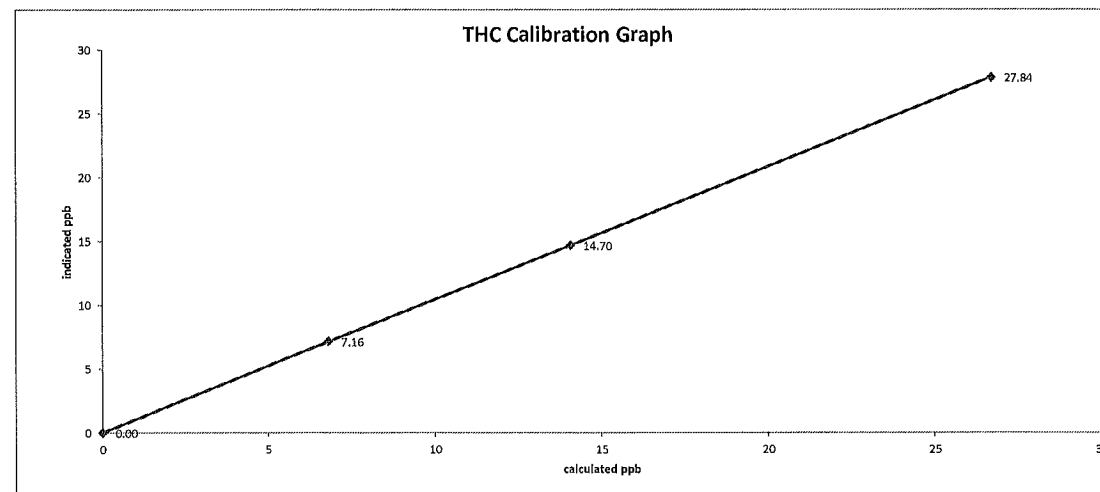
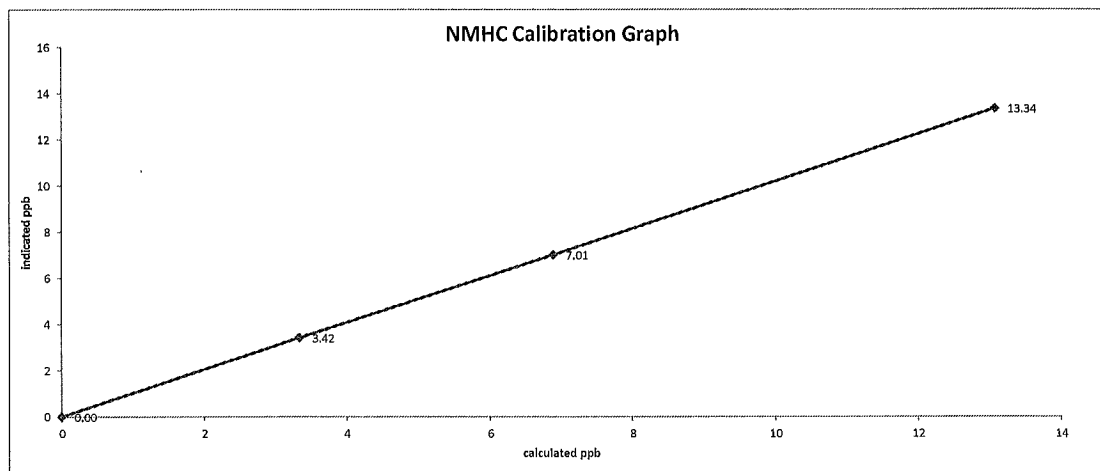
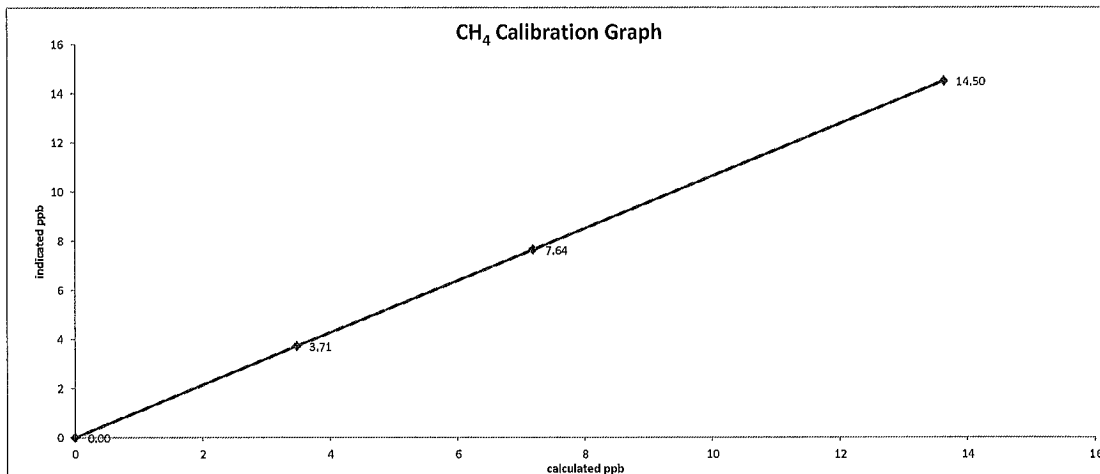
11/19/15 07:00 11/19/15 09:00 11/19/15 11:00 11/19/15 13:00 11/19/15 15:00 11/19/15 17:00

— LICA35 H2S_ PPB

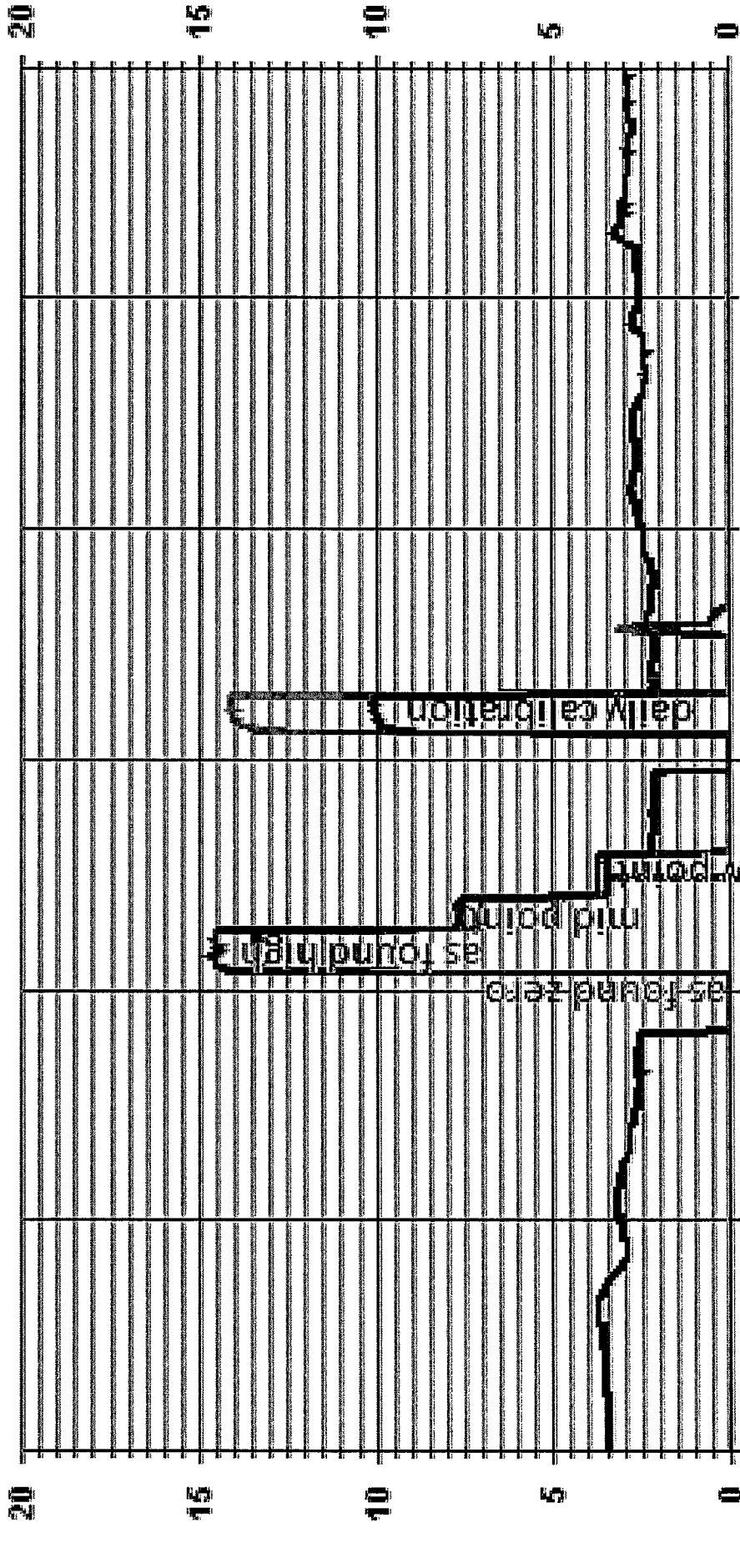
 Thermo 55i Methane/Non-Methane Analyzer Audit																																																																																					
Date: <u>November 19, 2015</u> Company/Alrshed: <u>LICA</u> Location/Station Name: <u>ELK point</u> Parameter: <u>CH₄ / NMHC / THC</u> Start/End Time 24 hr. (mst): <u>13:00 - 15:15</u> Calibration Method: <u>Gas Dilution</u>	Barometric Pressure: <u>27.83</u> Station Temperature °C: <u>19</u> Weather Conditions: <u>Mainly cloudy with light snow</u> Calibration Purpose: <u>Audit</u> Performed By/Reviewer: <u>Limin Li</u> <u>Tom Bourque</u> Cal Gas Expiry Date: <u>July 7, 2022</u>																																																																																				
Analyzer: Serial Number: <u>1236656107</u> Last Calibration Date: <u>November 10, 2015</u> Range ppm: <u>20 CH₄/20 NMHC/40 THC</u>																																																																																					
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Date: November 19, 2015
Company/Airshed: LICA
Location/Station Name: ELK point


Start/End Time 24 hr. (mst): 13:00 - 15:15
Calibration Purpose: shut down
Calibration Method: Gas Dilution



01 Minute Averages

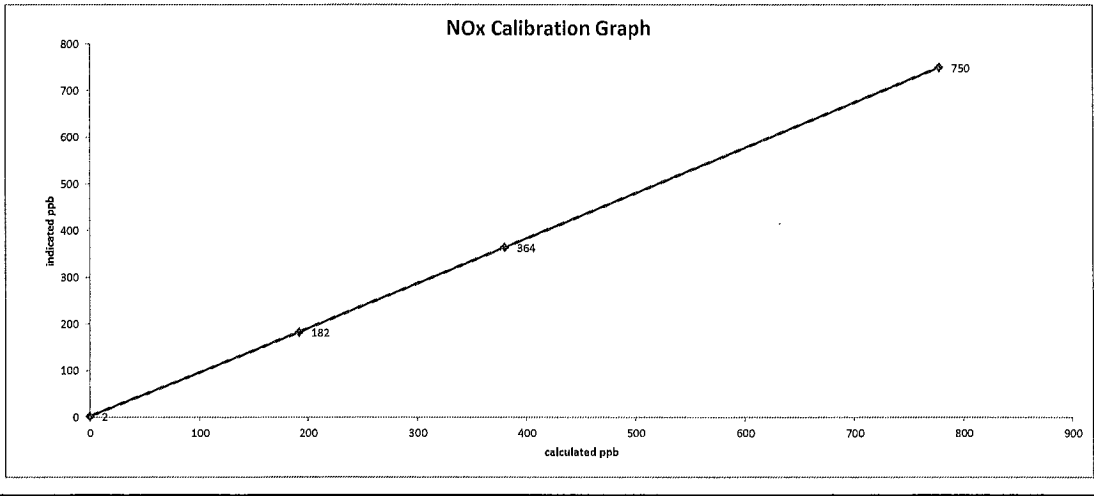
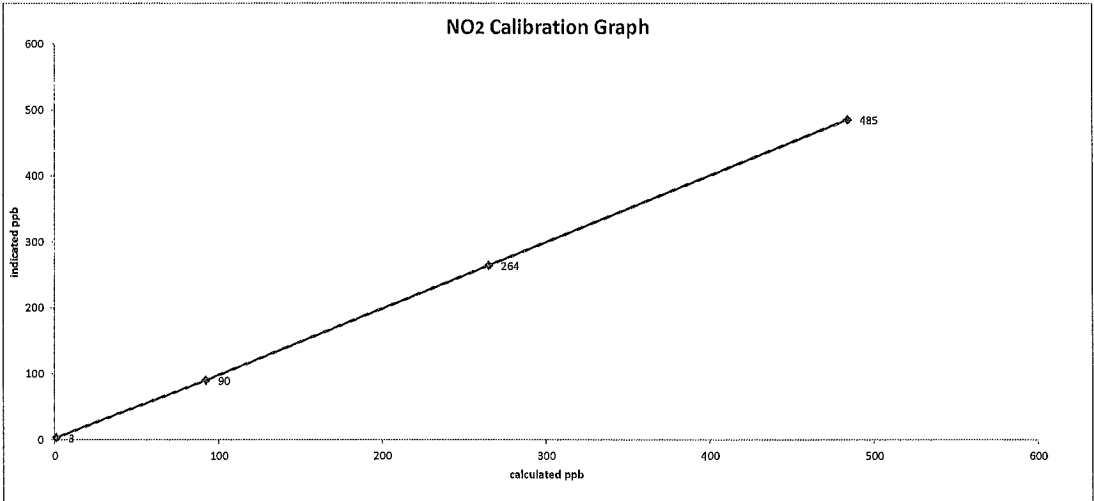
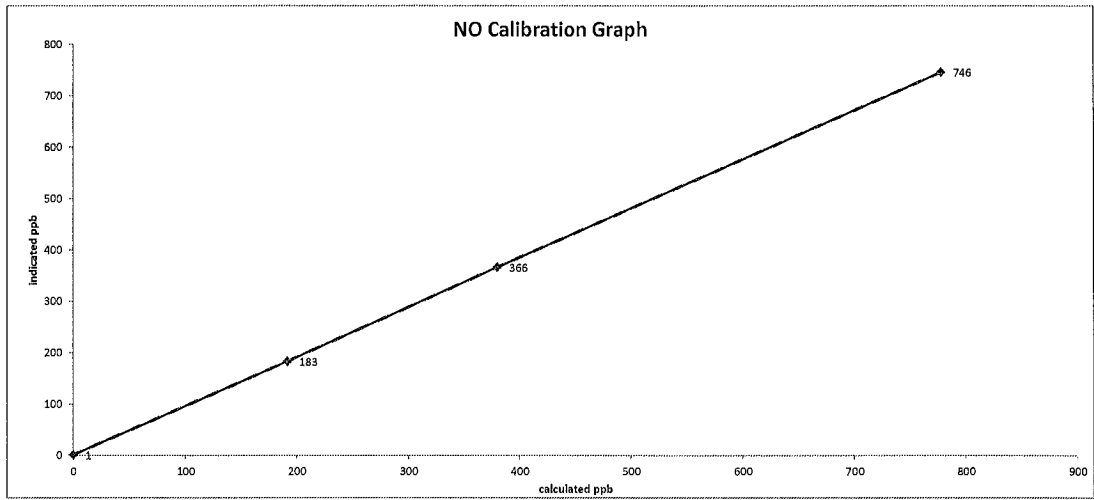


— LICA35 METHANE PPM - - - LICA35 NMHC PPM

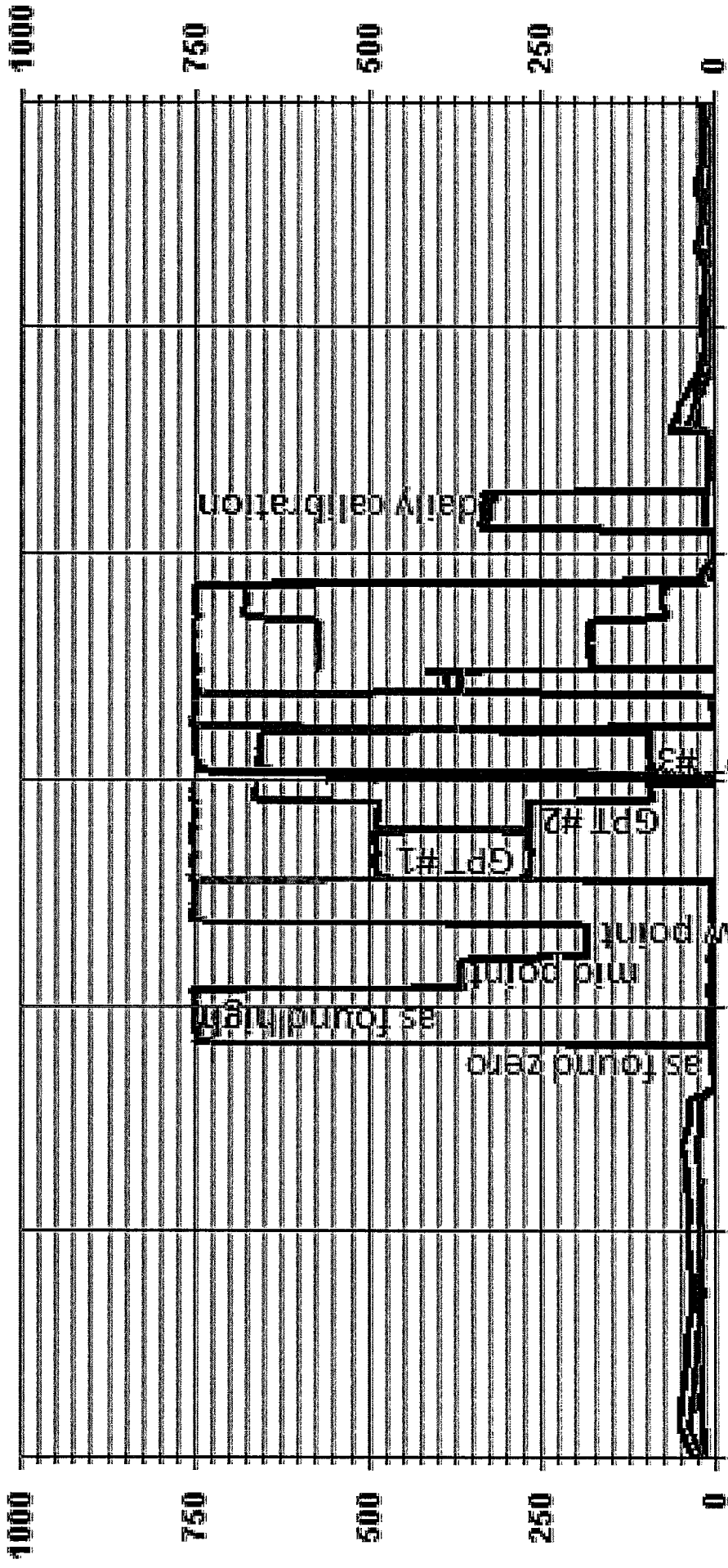
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Analyzer: Serial Number: <u>592</u> Last Calibration Date: <u>November 10, 2015</u> Range ppb: <u>1000</u>		Correction Factors: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>0.999</td> <td>1.044</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>0.996</td> <td>0.998</td> <td>n/a</td> </tr> <tr> <td>NOx =</td> <td>0.999</td> <td>1.040</td> <td>n/a</td> </tr> </tbody> </table>			Previous C.F.:	As Found C.F.:	New C.F.:	NO =	0.999	1.044	n/a	NO ₂ =	0.996	0.998	n/a	NOx =	0.999	1.040	n/a																																																												
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Date: November 19, 2015
Company/Airshed: LICA
Location/Station Name: ELK polnt

Start/End Time 24 hr. (mst): 11:00
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration


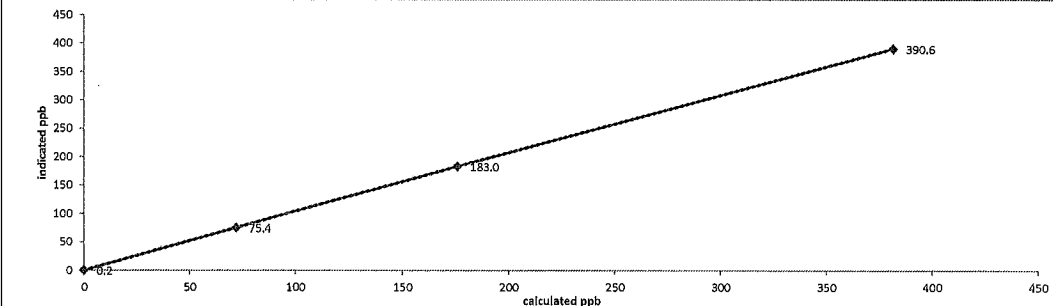


01 Minute Averages

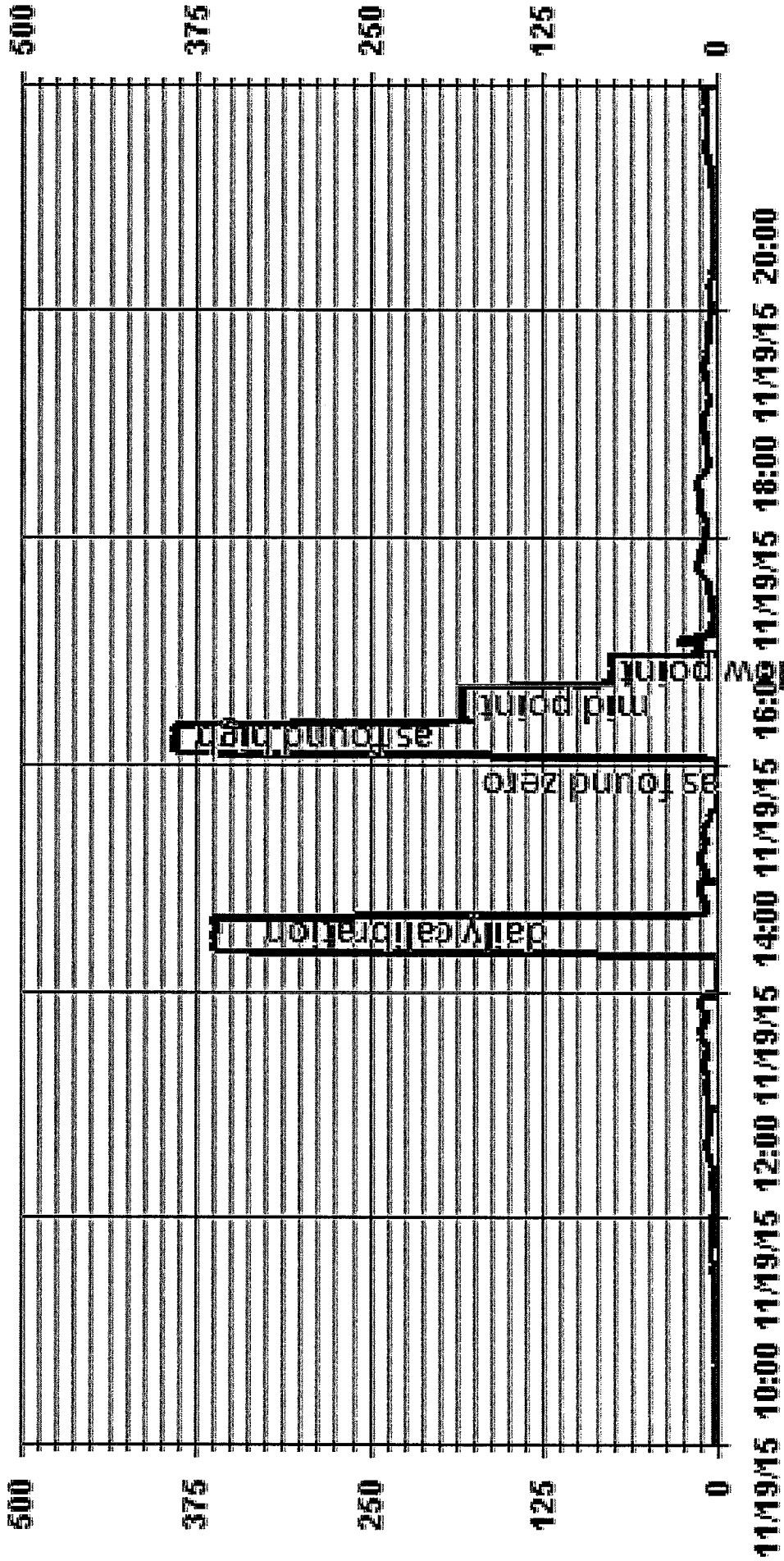


11/19/15 08:00 11/19/15 10:00 11/19/15 12:00 11/19/15 14:00 11/19/15 16:00 11/19/15 18:00

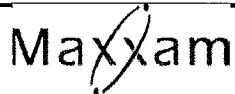
— LICA35 NOX_ PPB — LICA35 NO_ PPB — LICA35 NO2_ PPB

 Thermo 49i Ozone Analyzer Audit																																																
Date: <u>November 19, 2015</u> Company/Alrshed: <u>LICA</u> Location/Station Name: <u>ELK point</u> Start/End Time 24 hr. (mst): <u>15:35 - 17:00</u> Ozone Calibration Method: <u>Direct G.P.T.</u> G.P.T. Date: <u>November 18, 2015</u>	Barometric Pressure: <u>27.83InHg</u> Station Temperature °C: <u>20</u> Weather Conditions: <u>Mainly cloudy with snow</u> Calibration Purpose: <u>Audit</u> Performed By/Reviewer: <u>Limin Li Tom Bourque</u> Cal Gas Expiry Date: <u>December 25, 2018</u>																																															
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Average C.F.=						0.966																																										
Linear Regression/Calibration Results: <table style="width: 100%;"> <tr> <td style="width: 50%;"> Correlation Coefficient = <u>1.000</u> Slope = <u>0.979</u> b (Intercept as % of full scale) = <u>-0.29%</u> % change in C.F. from last cal = <u>2.15%</u> </td> <td style="width: 50%;"> LIMITS > or = 0.995 0.90-1.10 ± 3% F.S. ± 10% </td> </tr> </table>		Correlation Coefficient = <u>1.000</u> Slope = <u>0.979</u> b (Intercept as % of full scale) = <u>-0.29%</u> % change in C.F. from last cal = <u>2.15%</u>	LIMITS > or = 0.995 0.90-1.10 ± 3% F.S. ± 10%																																													
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Thermo 49i Ozone Analyzer Audit 																																																
<table style="width: 100%;"> <tr> <td style="width: 50%;"> As found: O3 Bkg: <u>-0.4</u> O3 Coef: <u>0.999</u> Photo Lamp: <u>14.2</u> O3 Lamp: <u>9.4</u> Bench: <u>29.5</u> Bench Lamp: <u>54.1</u> O3 Lamp: <u>68.1</u> Pressure: <u>702.4</u> Cell A lpm: <u>0.750</u> Cell B lpm: <u>0.956</u> O3 ppb: <u>360</u> Cell A ppb: <u>359</u> Cell B ppb: <u>361</u> Cell A Int: <u>102901</u> Cell B Int: <u>103901</u> </td> <td style="width: 50%;"> As left: O3 Bkg: <u>-0.4</u> O3 Coef: <u>0.999</u> Photo Lamp: <u>14.2</u> O3 Lamp: <u>9.4</u> Bench: <u>29.5</u> Bench Lamp: <u>54.1</u> O3 Lamp: <u>68.1</u> Pressure: <u>702.4</u> Cell A lpm: <u>0.750</u> Cell B lpm: <u>0.956</u> O3 ppb: <u>360</u> Cell A ppb: <u>359</u> Cell B ppb: <u>361</u> Cell A Int: <u>102901</u> Cell B Int: <u>103901</u> </td> </tr> </table>		As found: O3 Bkg: <u>-0.4</u> O3 Coef: <u>0.999</u> Photo Lamp: <u>14.2</u> O3 Lamp: <u>9.4</u> Bench: <u>29.5</u> Bench Lamp: <u>54.1</u> O3 Lamp: <u>68.1</u> Pressure: <u>702.4</u> Cell A lpm: <u>0.750</u> Cell B lpm: <u>0.956</u> O3 ppb: <u>360</u> Cell A ppb: <u>359</u> Cell B ppb: <u>361</u> Cell A Int: <u>102901</u> Cell B Int: <u>103901</u>	As left: O3 Bkg: <u>-0.4</u> O3 Coef: <u>0.999</u> Photo Lamp: <u>14.2</u> O3 Lamp: <u>9.4</u> Bench: <u>29.5</u> Bench Lamp: <u>54.1</u> O3 Lamp: <u>68.1</u> Pressure: <u>702.4</u> Cell A lpm: <u>0.750</u> Cell B lpm: <u>0.956</u> O3 ppb: <u>360</u> Cell A ppb: <u>359</u> Cell B ppb: <u>361</u> Cell A Int: <u>102901</u> Cell B Int: <u>103901</u>																																													
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Comments:																																																

01 Minute Averages



— LICA35 03_ PPB



R & P 1405F TEOM PM 2.5 Analyzer Audit

Date: November 19, 2015
 Company: LICA
 Station Name/Location: ELK point
 Previous Audit Date: November 6, 2015
 Parameter: PM 2.5

Performed By/Reviewer: Limin Li | Tom Bourque
 Start Time (mst): 11:00
 End Time (mst): 13:15
 Calibration Purpose: Audit
 Weather Conditions: Mainly cloudy with snow

1400A Information and Status:

Serial Number: 1405A207691003 As Found Filter Loading %: 27.77
 Ko Factor: 15635 As Left Filter Loading %: 27.57
 Ambient Temperature °C: -8.4 As Found Noise: n/a
 Ambient Pressure atm: 0.930 As Left Noise: n/a
 Main Flow Reading lpm: 3 Pump Vacuum: 0.31
 Aux Flow Reading lpm: 16.67 Warnings: none

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>BRUNTON</u>	<u>Fluke</u>
Model:	<u>475 Mark III</u>	<u>n/a</u>	<u>1551A EX</u>
Serial Number:	<u>1868</u>	<u>n/a</u>	<u>2329070</u>
Callibration Date:	<u>n/a</u>	<u>2-Nov-15</u>	<u>2-Nov-15</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.53	0.01	0.53
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.72	0.00	-0.72
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

	tolerance +/- 2.0°C		tolerance +/- 0.01 atm
1405F temperature °C:	<u>-6.8</u>	1405F pressure atm:	<u>0.931</u>
reference temperature °C:	<u>-7.2</u>	reference pressure:	<u>0.930</u>
difference °C:	<u>-0.4</u>	difference :	<u>0.001</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm/+/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.65</u>
reference main flow lpm: <u>3.10</u>	reference total/aux flow lpm: <u>15.97</u>
difference lpm: <u>0.10</u>	difference lpm: <u>-0.68</u>

K_o Audit:

Last K_o audit date: n/a
 1405F K_o factor: 15635
 Measured K_o factor: 15462.0000
 % difference: 1.11

Comments:

Measure flow with Definer: TOTAL:16.11LPM. MAIN:3.10LPM

APPENDIX IV
ANALYTICAL RESULTS

VOCS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Nov 2, 2015	17121	Ambient Air	02-Nov-15 0:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15110054	REPORT CREATED: 05-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110054-003	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	1,1-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110054-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	17-Nov-15
15110054-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8 ppbv	0.8	AC-058	17-Nov-15
15110054-003	1,2,4-Trimethylbenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	17-Nov-15
15110054-003	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	1,2-Dichlorobenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	17-Nov-15
15110054-003	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	17-Nov-15
15110054-003	1,2-Dichloropropane	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	17-Nov-15
15110054-003	1,4-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110054-003	1,4-Dioxane	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110054-003	1-Butene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	1-Hexene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	1-Pentene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-003	2,2,4-Trimethylpentane	I	0.08 ppbv	0.01	AC-058	17-Nov-15
15110054-003	2,2-Dimethylbutane	I	0.02 ppbv	0.01	AC-058	17-Nov-15
15110054-003	2,3,4-Trimethylpentane	I	0.03 ppbv	0.01	AC-058	17-Nov-15
15110054-003	2,3-Dimethylbutane	I	0.08 ppbv	0.02	AC-058	17-Nov-15
15110054-003	2,3-Dimethylpentane	I	0.08 ppbv	0.02	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead

Date: January 5, 2016

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Nov 2, 2015	17121	Ambient Air	02-Nov-15 0:00	Version 01		
DESCRIPTION:	Elk Point Airport					
REPORT NUMBER:	15110054					
REPORT CREATED:	05-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110054-003	2,4-Dimethylpentane	I	0.04 ppbv	0.01	AC-058	17-Nov-15
15110054-003	2-Methylheptane	I	0.03 ppbv	0.01	AC-058	17-Nov-15
15110054-003	2-Methylhexane	I	0.03 ppbv	0.01	AC-058	17-Nov-15
15110054-003	2-Methylpentane	I	0.09 ppbv	0.01	AC-058	17-Nov-15
15110054-003	3-Methylheptane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	3-Methylhexane	I	0.05 ppbv	0.02	AC-058	17-Nov-15
15110054-003	3-Methylpentane	I	0.05 ppbv	0.01	AC-058	17-Nov-15
15110054-003	Acetone		1.3 ppbv	0.4	AC-058	17-Nov-15
15110054-003	Acrolein	K, T, U	< 0.3 ppbv	0.3	AC-058	17-Nov-15
15110054-003	Benzene	I	0.13 ppbv	0.01	AC-058	17-Nov-15
15110054-003	Benzyl chloride	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110054-003	Bromodichloromethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	Bromoform	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	Bromomethane	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-003	Carbon disulfide	I	0.22 ppbv	0.01	AC-058	17-Nov-15
15110054-003	Carbon tetrachloride	I	0.10 ppbv	0.01	AC-058	17-Nov-15
15110054-003	Chlorobenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	Chloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	Chloroform	I	0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	Chloromethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	cis-1,2-Dichloroethene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-003	cis-1,3-Dichloropropene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110054-003	cis-2-Butene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	cis-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	Cyclohexane	I	0.08 ppbv	0.02	AC-058	17-Nov-15



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Nov 2, 2015	17121	Ambient Air	02-Nov-15 0:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15110054	REPORT CREATED: 05-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110054-003	Cyclopentane	I	0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-003	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-003	Ethanol		0.4 ppbv	0.3	AC-058	17-Nov-15
15110054-003	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110054-003	Ethylbenzene	I	0.03 ppbv	0.01	AC-058	17-Nov-15
15110054-003	Freon-11	I	0.28 ppbv	0.02	AC-058	17-Nov-15
15110054-003	Freon-113	I	0.07 ppbv	0.01	AC-058	17-Nov-15
15110054-003	Freon-114	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	Freon-12		0.56 ppbv	0.02	AC-058	17-Nov-15
15110054-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50 ppbv	0.50	AC-058	17-Nov-15
15110054-003	Isobutane	I	0.26 ppbv	0.02	AC-058	17-Nov-15
15110054-003	Isopentane	I	0.29 ppbv	0.03	AC-058	17-Nov-15
15110054-003	Isoprene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-003	Isopropyl alcohol	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110054-003	Isopropylbenzene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-003	m,p-Xylene	I	0.09 ppbv	0.03	AC-058	17-Nov-15
15110054-003	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110054-003	m-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	17-Nov-15
15110054-003	Methyl butyl ketone	K, T, U	< 0.50 ppbv	0.50	AC-058	17-Nov-15
15110054-003	Methyl ethyl ketone	K, T, U	< 0.3 ppbv	0.3	AC-058	17-Nov-15
15110054-003	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110054-003	Methyl methacrylate	K, T, U	< 0.07 ppbv	0.07	AC-058	17-Nov-15
15110054-003	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	17-Nov-15
15110054-003	Methylcyclohexane	I	0.16 ppbv	0.01	AC-058	17-Nov-15
15110054-003	Methylcyclopentane	I	0.08 ppbv	0.02	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: January 5, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Nov 2, 2015	17121	Ambient Air	02-Nov-15 0:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15110054	REPORT CREATED: 05-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110054-003	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	17-Nov-15
15110054-003	n-Butane		0.52 ppbv	0.03	AC-058	17-Nov-15
15110054-003	n-Decane	K, T, U	< 0.06 ppbv	0.06	AC-058	17-Nov-15
15110054-003	n-Dodecane	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110054-003	n-Heptane	I	0.05 ppbv	0.01	AC-058	17-Nov-15
15110054-003	n-Hexane	I	0.10 ppbv	0.01	AC-058	17-Nov-15
15110054-003	n-Octane	I	0.03 ppbv	0.02	AC-058	17-Nov-15
15110054-003	n-Pentane	K, T, U	< 0.1 ppbv	0.1	AC-058	17-Nov-15
15110054-003	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	17-Nov-15
15110054-003	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	17-Nov-15
15110054-003	Naphthalene	K, T, U	0.9 ppbv	0.5	AC-058	17-Nov-15
15110054-003	n-Nonane	I	0.03 ppbv	0.01	AC-058	17-Nov-15
15110054-003	o-Ethyltoluene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-003	o-Xylene	I	0.03 ppbv	0.01	AC-058	17-Nov-15
15110054-003	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110054-003	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	17-Nov-15
15110054-003	Styrene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110054-003	Tetrachloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110054-003	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110054-003	Toluene	I	0.13 ppbv	0.01	AC-058	17-Nov-15
15110054-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110054-003	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110054-003	trans-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110054-003	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID LICA/VOC/ELK/Nov 2, 2015 **CANISTER ID** 17121 **Matrix** Ambient Air **DATE SAMPLED** 02-Nov-15 0:00
DESCRIPTION: Elk Point Airport **REPORT CREATED:** 05-Jan-16 **VERSION:** Version 01
REPORT NUMBER: 15110054

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110054-003	Vinyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	17-Nov-15
15110054-003	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: January 5, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@albertainnovates.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Nov 8, 2015	H3282	Ambient Air	08-Nov-15 0:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15110089	REPORT CREATED: 05-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110089-003	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-003	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-003	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-003	1,1-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110089-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	17-Nov-15
15110089-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8 ppbv	0.8	AC-058	17-Nov-15
15110089-003	1,2,4-Trimethylbenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	17-Nov-15
15110089-003	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-003	1,2-Dichlorobenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	17-Nov-15
15110089-003	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	17-Nov-15
15110089-003	1,2-Dichloropropane	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110089-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-003	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-003	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	17-Nov-15
15110089-003	1,4-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110089-003	1,4-Dioxane	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110089-003	1-Butene	I	0.04 ppbv	0.02	AC-058	17-Nov-15
15110089-003	1-Hexene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-003	1-Pentene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110089-003	2,2,4-Trimethylpentane	I	0.20 ppbv	0.01	AC-058	17-Nov-15
15110089-003	2,2-Dimethylbutane	I	0.10 ppbv	0.01	AC-058	17-Nov-15
15110089-003	2,3,4-Trimethylpentane	I	0.05 ppbv	0.01	AC-058	17-Nov-15
15110089-003	2,3-Dimethylbutane	I	0.33 ppbv	0.02	AC-058	17-Nov-15
15110089-003	2,3-Dimethylpentane	I	0.25 ppbv	0.02	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead

Date: January 5, 2016

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:			
LICA/VOC/ELK/Nov 8, 2015	H3282	Ambient Air	08-Nov-15 0:00	Version 01			
DESCRIPTION: Elk Point Airport							
REPORT NUMBER: 15110089	REPORT CREATED: 05-Jan-16						
Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110089-003	2,4-Dimethylpentane	I	0.17	ppbv	0.01	AC-058	17-Nov-15
15110089-003	2-Methylheptane	I	0.05	ppbv	0.01	AC-058	17-Nov-15
15110089-003	2-Methylhexane	I	0.05	ppbv	0.01	AC-058	17-Nov-15
15110089-003	2-Methylpentane	I	0.23	ppbv	0.01	AC-058	17-Nov-15
15110089-003	3-Methylheptane	I	0.02	ppbv	0.02	AC-058	17-Nov-15
15110089-003	3-Methylhexane	I	0.10	ppbv	0.02	AC-058	17-Nov-15
15110089-003	3-Methylpentane	I	0.14	ppbv	0.01	AC-058	17-Nov-15
15110089-003	Acetone		1.5	ppbv	0.4	AC-058	17-Nov-15
15110089-003	Acrolein	K, T, U	<0.3	ppbv	0.3	AC-058	17-Nov-15
15110089-003	Benzene	I	0.17	ppbv	0.01	AC-058	17-Nov-15
15110089-003	Benzyl chloride	K, T, U	<0.4	ppbv	0.4	AC-058	17-Nov-15
15110089-003	Bromodichloromethane	K, T, U	<0.02	ppbv	0.02	AC-058	17-Nov-15
15110089-003	Bromoform	K, T, U	<0.02	ppbv	0.02	AC-058	17-Nov-15
15110089-003	Bromomethane	K, T, U	<0.01	ppbv	0.01	AC-058	17-Nov-15
15110089-003	Carbon disulfide	I	0.06	ppbv	0.01	AC-058	17-Nov-15
15110089-003	Carbon tetrachloride	I	0.10	ppbv	0.01	AC-058	17-Nov-15
15110089-003	Chlorobenzene	K, T, U	<0.02	ppbv	0.02	AC-058	17-Nov-15
15110089-003	Chloroethane	K, T, U	<0.02	ppbv	0.02	AC-058	17-Nov-15
15110089-003	Chloroform	I	0.02	ppbv	0.02	AC-058	17-Nov-15
15110089-003	Chloromethane	K, T, U	<0.02	ppbv	0.02	AC-058	17-Nov-15
15110089-003	cis-1,2-Dichloroethene	K, T, U	<0.01	ppbv	0.01	AC-058	17-Nov-15
15110089-003	cis-1,3-Dichloropropene	K, T, U	<0.04	ppbv	0.04	AC-058	17-Nov-15
15110089-003	cis-2-Butene	K, T, U	<0.02	ppbv	0.02	AC-058	17-Nov-15
15110089-003	cis-2-Pentene	K, T, U	<0.02	ppbv	0.02	AC-058	17-Nov-15
15110089-003	Cyclohexane	I	0.28	ppbv	0.02	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: January 5, 2016

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Nov 8, 2015	H3282	Ambient Air	08-Nov-15 0:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15110089	REPORT CREATED: 05-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110089-003	Cyclopentane	I	0.05 ppbv	0.01	AC-058	17-Nov-15
15110089-003	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110089-003	Ethanol		0.8 ppbv	0.3	AC-058	17-Nov-15
15110089-003	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110089-003	Ethylbenzene	I	0.03 ppbv	0.01	AC-058	17-Nov-15
15110089-003	Freon-11	I	0.29 ppbv	0.02	AC-058	17-Nov-15
15110089-003	Freon-113	I	0.09 ppbv	0.01	AC-058	17-Nov-15
15110089-003	Freon-114	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-003	Freon-12		0.58 ppbv	0.02	AC-058	17-Nov-15
15110089-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50 ppbv	0.50	AC-058	17-Nov-15
15110089-003	Isobutane		0.99 ppbv	0.02	AC-058	17-Nov-15
15110089-003	Isopentane		1.02 ppbv	0.03	AC-058	17-Nov-15
15110089-003	Isoprene	I	0.01 ppbv	0.01	AC-058	17-Nov-15
15110089-003	Isopropyl alcohol	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110089-003	Isopropylbenzene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110089-003	m,p-Xylene	I	0.08 ppbv	0.03	AC-058	17-Nov-15
15110089-003	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110089-003	m-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	17-Nov-15
15110089-003	Methyl butyl ketone	K, T, U	< 0.50 ppbv	0.50	AC-058	17-Nov-15
15110089-003	Methyl ethyl ketone	K, T, U	< 0.3 ppbv	0.3	AC-058	17-Nov-15
15110089-003	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110089-003	Methyl methacrylate	K, T, U	< 0.07 ppbv	0.07	AC-058	17-Nov-15
15110089-003	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	17-Nov-15
15110089-003	Methylcyclohexane		0.47 ppbv	0.01	AC-058	17-Nov-15
15110089-003	Methylcyclopentane	I	0.26 ppbv	0.02	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead

Date: January 5, 2016

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Nov 8, 2015	H3282	Ambient Air	08-Nov-15 0:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15110089	REPORT CREATED: 05-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110089-003	Methylene chloride		1.9 ppbv	0.3	AC-058	17-Nov-15
15110089-003	n-Butane		1.36 ppbv	0.03	AC-058	17-Nov-15
15110089-003	n-Decane	K, T, U	<0.06 ppbv	0.06	AC-058	17-Nov-15
15110089-003	n-Dodecane	K, T, U	<0.4 ppbv	0.4	AC-058	17-Nov-15
15110089-003	n-Heptane	I	0.10 ppbv	0.01	AC-058	17-Nov-15
15110089-003	n-Hexane	I	0.27 ppbv	0.01	AC-058	17-Nov-15
15110089-003	n-Octane	I	0.05 ppbv	0.02	AC-058	17-Nov-15
15110089-003	n-Pentane	K, T, U	<0.1 ppbv	0.1	AC-058	17-Nov-15
15110089-003	n-Propylbenzene	K, T, U	<0.05 ppbv	0.05	AC-058	17-Nov-15
15110089-003	n-Undecane	K, T, U	<0.5 ppbv	0.5	AC-058	17-Nov-15
15110089-003	Naphthalene	K, T, U	<0.5 ppbv	0.5	AC-058	17-Nov-15
15110089-003	n-Nonane	I	0.03 ppbv	0.01	AC-058	17-Nov-15
15110089-003	o-Ethyltoluene	K, T, U	<0.01 ppbv	0.01	AC-058	17-Nov-15
15110089-003	o-Xylene	I	0.03 ppbv	0.01	AC-058	17-Nov-15
15110089-003	p-Diethylbenzene	K, T, U	<0.04 ppbv	0.04	AC-058	17-Nov-15
15110089-003	p-Ethyltoluene	K, T, U	<0.07 ppbv	0.07	AC-058	17-Nov-15
15110089-003	Styrene	K, T, U	<0.04 ppbv	0.04	AC-058	17-Nov-15
15110089-003	Tetrachloroethylene	K, T, U	<0.04 ppbv	0.04	AC-058	17-Nov-15
15110089-003	Tetrahydrofuran	K, T, U	<0.4 ppbv	0.4	AC-058	17-Nov-15
15110089-003	Toluene	I	0.22 ppbv	0.01	AC-058	17-Nov-15
15110089-003	trans-1,2-Dichloroethylene	K, T, U	<0.01 ppbv	0.01	AC-058	17-Nov-15
15110089-003	trans-1,3-Dichloropropylene	K, T, U	<0.04 ppbv	0.04	AC-058	17-Nov-15
15110089-003	trans-2-Butene	K, T, U	<0.01 ppbv	0.01	AC-058	17-Nov-15
15110089-003	trans-2-Pentene	K, T, U	<0.02 ppbv	0.02	AC-058	17-Nov-15
15110089-003	Trichloroethylene	K, T, U	<0.04 ppbv	0.04	AC-058	17-Nov-15



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID LICA/VOC/ELK/Nov 8, 2015	CANISTER ID H3282	Matrix Ambient Air	DATE SAMPLED 08-Nov-15 0:00			
DESCRIPTION: Elk Point Airport	REPORT NUMBER: 15110089	REPORT CREATED: 05-Jan-16	VERSION: Version 01			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110089-003	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110089-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead

Date: January 5, 2016

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Nov 14, 2014	S12945	Ambient Air	14-Nov-15 0:00	Version 01		
DESCRIPTION:	Elk Point Airport					
REPORT NUMBER:	15110105	REPORT CREATED:	05-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110105-001	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	1,1-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110105-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	17-Nov-15
15110105-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8 ppbv	0.8	AC-058	17-Nov-15
15110105-001	1,2,4-Trimethylbenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	17-Nov-15
15110105-001	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	1,2-Dichlorobenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	17-Nov-15
15110105-001	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	17-Nov-15
15110105-001	1,2-Dichloropropane	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	17-Nov-15
15110105-001	1,4-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110105-001	1,4-Dioxane	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110105-001	1-Butene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	1-Hexene	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	1-Pentene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-001	2,2,4-Trimethylpentane	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-001	2,2-Dimethylbutane	I	0.09 ppbv	0.01	AC-058	17-Nov-15
15110105-001	2,3,4-Trimethylpentane	I	0.03 ppbv	0.01	AC-058	17-Nov-15
15110105-001	2,3-Dimethylbutane	I	0.24 ppbv	0.02	AC-058	17-Nov-15
15110105-001	2,3-Dimethylpentane	I	0.14 ppbv	0.02	AC-058	17-Nov-15

Report certified by: Graham Knox, Team Lead

Date: January 5, 2016

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Nov 14, 2014	S12945	Ambient Air	14-Nov-15 0:00	Version 01		
DESCRIPTION: Eik Point Airport						
REPORT NUMBER: 15110105	REPORT CREATED: 05-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110105-001	2,4-Dimethylpentane	I	0.10 ppbv	0.01	AC-058	17-Nov-15
15110105-001	2-Methylheptane	I	0.06 ppbv	0.01	AC-058	17-Nov-15
15110105-001	2-Methylhexane	I	0.11 ppbv	0.01	AC-058	17-Nov-15
15110105-001	2-Methylpentane	I	0.27 ppbv	0.01	AC-058	17-Nov-15
15110105-001	3-Methylheptane	I	0.03 ppbv	0.02	AC-058	17-Nov-15
15110105-001	3-Methylhexane	I	0.14 ppbv	0.02	AC-058	17-Nov-15
15110105-001	3-Methylpentane	I	0.15 ppbv	0.01	AC-058	17-Nov-15
15110105-001	Acetone	K, T, U	<0.4 ppbv	0.4	AC-058	17-Nov-15
15110105-001	Acrolein	K, T, U	<0.3 ppbv	0.3	AC-058	17-Nov-15
15110105-001	Benzene	I	0.17 ppbv	0.01	AC-058	17-Nov-15
15110105-001	Benzyl chloride	K, T, U	<0.4 ppbv	0.4	AC-058	17-Nov-15
15110105-001	Bromodichloromethane	K, T, U	<0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	Bromoform	K, T, U	<0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	Bromomethane	K, T, U	<0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-001	Carbon disulfide	I	0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-001	Carbon tetrachloride	I	0.10 ppbv	0.01	AC-058	17-Nov-15
15110105-001	Chlorobenzene	K, T, U	<0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	Chloroethane	K, T, U	<0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	Chloroform	I	0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	Chloromethane	K, T, U	<0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	cis-1,2-Dichloroethene	K, T, U	<0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-001	cis-1,3-Dichloropropene	K, T, U	<0.04 ppbv	0.04	AC-058	17-Nov-15
15110105-001	cis-2-Butene	K, T, U	<0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	cis-2-Pentene	K, T, U	<0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	Cyclohexane	I	0.26 ppbv	0.02	AC-058	17-Nov-15

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/WOC/ELK/Nov 14, 2014	S12945	Ambient Air	14-Nov-15 0:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15110105	REPORT CREATED: 05-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110105-001	Cyclopentane	I	0.05 ppbv	0.01	AC-058	17-Nov-15
15110105-001	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-001	Ethanol		0.4 ppbv	0.3	AC-058	17-Nov-15
15110105-001	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110105-001	Ethylbenzene	I	0.04 ppbv	0.01	AC-058	17-Nov-15
15110105-001	Freon-11	I	0.29 ppbv	0.02	AC-058	17-Nov-15
15110105-001	Freon-113	I	0.08 ppbv	0.01	AC-058	17-Nov-15
15110105-001	Freon-114	K, T, U	< 0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	Freon-12		0.59 ppbv	0.02	AC-058	17-Nov-15
15110105-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50 ppbv	0.50	AC-058	17-Nov-15
15110105-001	Isobutane		1.09 ppbv	0.02	AC-058	17-Nov-15
15110105-001	Isopentane		0.91 ppbv	0.03	AC-058	17-Nov-15
15110105-001	Isoprene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-001	Isopropyl alcohol	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110105-001	Isopropylbenzene	K, T, U	< 0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-001	m,p-Xylene	I	0.11 ppbv	0.03	AC-058	17-Nov-15
15110105-001	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	17-Nov-15
15110105-001	m-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	17-Nov-15
15110105-001	Methyl butyl ketone	K, T, U	< 0.50 ppbv	0.50	AC-058	17-Nov-15
15110105-001	Methyl ethyl ketone	K, T, U	< 0.3 ppbv	0.3	AC-058	17-Nov-15
15110105-001	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	17-Nov-15
15110105-001	Methyl methacrylate	K, T, U	< 0.07 ppbv	0.07	AC-058	17-Nov-15
15110105-001	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	17-Nov-15
15110105-001	Methylcyclohexane		0.47 ppbv	0.01	AC-058	17-Nov-15
15110105-001	Methylcyclopentane	I	0.22 ppbv	0.02	AC-058	17-Nov-15

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Nov 14, 2014	S12945	Ambient Air	14-Nov-15 0:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15110105	REPORT CREATED: 05-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110105-001	Methylene chloride	K, T, U	<0.3 ppbv	0.3	AC-058	17-Nov-15
15110105-001	n-Butane		1.67 ppbv	0.03	AC-058	17-Nov-15
15110105-001	n-Decane	K, T, U	<0.06 ppbv	0.06	AC-058	17-Nov-15
15110105-001	n-Dodecane	K, T, U	<0.4 ppbv	0.4	AC-058	17-Nov-15
15110105-001	n-Heptane	I	0.14 ppbv	0.01	AC-058	17-Nov-15
15110105-001	n-Hexane		0.30 ppbv	0.01	AC-058	17-Nov-15
15110105-001	n-Octane	I	0.08 ppbv	0.02	AC-058	17-Nov-15
15110105-001	n-Pentane		0.6 ppbv	0.1	AC-058	17-Nov-15
15110105-001	n-Propylbenzene	K, T, U	<0.05 ppbv	0.05	AC-058	17-Nov-15
15110105-001	n-Undecane	K, T, U	<0.5 ppbv	0.5	AC-058	17-Nov-15
15110105-001	Naphthalene	K, T, U	<0.5 ppbv	0.5	AC-058	17-Nov-15
15110105-001	n-Nonane	K, T, U	<0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-001	o-Ethyltoluene	K, T, U	<0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-001	o-Xylene	I	0.03 ppbv	0.01	AC-058	17-Nov-15
15110105-001	p-Diethylbenzene	K, T, U	<0.04 ppbv	0.04	AC-058	17-Nov-15
15110105-001	p-Ethyltoluene	K, T, U	<0.07 ppbv	0.07	AC-058	17-Nov-15
15110105-001	Styrene	K, T, U	<0.04 ppbv	0.04	AC-058	17-Nov-15
15110105-001	Tetrachloroethylene	K, T, U	<0.04 ppbv	0.04	AC-058	17-Nov-15
15110105-001	Tetrahydrofuran	K, T, U	<0.4 ppbv	0.4	AC-058	17-Nov-15
15110105-001	Toluene	I	0.22 ppbv	0.01	AC-058	17-Nov-15
15110105-001	trans-1,2-Dichloroethylene	K, T, U	<0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-001	trans-1,3-Dichloropropylene	K, T, U	<0.04 ppbv	0.04	AC-058	17-Nov-15
15110105-001	trans-2-Butene	K, T, U	<0.01 ppbv	0.01	AC-058	17-Nov-15
15110105-001	trans-2-Pentene	K, T, U	<0.02 ppbv	0.02	AC-058	17-Nov-15
15110105-001	Trichloroethylene	K, T, U	<0.04 ppbv	0.04	AC-058	17-Nov-15



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/ELK/Nov 14, 2014	S12945	Ambient Air	14-Nov-15 0:00
DESCRIPTION: Elk Point Airport			
REPORT NUMBER:	REPORT CREATED:	VERSION:	
15110105	05-Jan-16	Version 01	
Lab ID	Parameter	Qualifier	Result Units
15110105-001	Vinyl acetate	K, T, U	< 0.4 ppbv
15110105-001	Vinyl chloride	K, T, U	< 0.02 ppbv
		RDL	Method
		0.4	AC-058
		0.02	AC-058
			Analysis Date
			17-Nov-15
			17-Nov-15

Report certified by: Graham Knox, Team Lead

Date: January 5, 2016

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:	Analysis Date		
LICA/VOC/ELK/NOV 20, 2015	1060	Ambient Air	20-Nov-15 00:00	Version 01			
DESCRIPTION:	Elk Point Airport						
REPORT NUMBER:	15110230	REPORT CREATED:	08-Jan-16				
Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110230-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-003	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Dec-15
15110230-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Dec-15
15110230-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	03-Dec-15
15110230-003	1,2,4-Trimethylbenzene	I	0.04	ppbv	0.03	AC-058	03-Dec-15
15110230-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-003	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Dec-15
15110230-003	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	03-Dec-15
15110230-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Dec-15
15110230-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-003	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Dec-15
15110230-003	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Dec-15
15110230-003	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Dec-15
15110230-003	1-Butene	I	0.12	ppbv	0.02	AC-058	03-Dec-15
15110230-003	1-Hexene	I	0.06	ppbv	0.02	AC-058	03-Dec-15
15110230-003	1-Pentene	I	0.14	ppbv	0.01	AC-058	03-Dec-15
15110230-003	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Dec-15
15110230-003	2,2-Dimethylbutane	I	0.04	ppbv	0.01	AC-058	03-Dec-15
15110230-003	2,3,4-Trimethylpentane	I	0.03	ppbv	0.01	AC-058	03-Dec-15
15110230-003	2,3-Dimethylbutane	I	0.19	ppbv	0.02	AC-058	03-Dec-15
15110230-003	2,3-Dimethylpentane	I	0.10	ppbv	0.02	AC-058	03-Dec-15

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Friday, January 08, 2016

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:			
LICA/VOC/ELK/NOV 20, 2015	1060	Ambient Air	20-Nov-15 00:00	Version 01			
DESCRIPTION: Elk Point Airport							
REPORT NUMBER: 15110230	REPORT CREATED: 08-Jan-16						
Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110230-003	2,4-Dimethylpentane	I	0.08	ppbv	0.01	AC-058	03-Dec-15
15110230-003	2-Methylheptane	I	0.04	ppbv	0.01	AC-058	03-Dec-15
15110230-003	2-Methylhexane	I	0.17	ppbv	0.01	AC-058	03-Dec-15
15110230-003	2-Methylpentane	I	0.49	ppbv	0.01	AC-058	03-Dec-15
15110230-003	3-Methylheptane	I	0.03	ppbv	0.02	AC-058	03-Dec-15
15110230-003	3-Methylhexane	I	0.16	ppbv	0.02	AC-058	03-Dec-15
15110230-003	3-Methylpentane	I	0.27	ppbv	0.01	AC-058	03-Dec-15
15110230-003	Acetone		2.6	ppbv	0.4	AC-058	03-Dec-15
15110230-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Dec-15
15110230-003	Benzene	I	0.29	ppbv	0.01	AC-058	03-Dec-15
15110230-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Dec-15
15110230-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Dec-15
15110230-003	Carbon disulfide	I	0.22	ppbv	0.01	AC-058	03-Dec-15
15110230-003	Carbon tetrachloride	I	0.12	ppbv	0.01	AC-058	03-Dec-15
15110230-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110230-003	Chloroform	I	0.03	ppbv	0.02	AC-058	03-Dec-15
15110230-003	Chloromethane		0.60	ppbv	0.02	AC-058	03-Dec-15
15110230-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Dec-15
15110230-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Dec-15
15110230-003	cis-2-Butene	I	0.20	ppbv	0.02	AC-058	03-Dec-15
15110230-003	cis-2-Pentene	I	0.12	ppbv	0.02	AC-058	03-Dec-15
15110230-003	Cyclohexane	I	0.11	ppbv	0.02	AC-058	03-Dec-15

Report certified by: Graham Knox, Team Lead

On behalf of: PI Pretorius, Manager, Analysis and Testing Services

Date: Friday, January 08, 2016

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/NOV 20, 2015	1060	Ambient Air	20-Nov-15 00:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15110230	REPORT CREATED: 08-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110230-003	Cyclopentane	I	0.08 ppbv	0.01	AC-058	03-Dec-15
15110230-003	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110230-003	Ethanol		2.5 ppbv	0.3	AC-058	03-Dec-15
15110230-003	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110230-003	Ethylbenzene	I	0.04 ppbv	0.01	AC-058	03-Dec-15
15110230-003	Freon-11		0.32 ppbv	0.02	AC-058	03-Dec-15
15110230-003	Freon-113	I	0.08 ppbv	0.01	AC-058	03-Dec-15
15110230-003	Freon-114	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110230-003	Freon-12		0.67 ppbv	0.02	AC-058	03-Dec-15
15110230-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50 ppbv	0.50	AC-058	03-Dec-15
15110230-003	Isobutane		9.65 ppbv	0.02	AC-058	03-Dec-15
15110230-003	Isopentane		3.23 ppbv	0.03	AC-058	03-Dec-15
15110230-003	Isoprene	I	0.12 ppbv	0.01	AC-058	03-Dec-15
15110230-003	Isopropyl alcohol	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110230-003	Isopropylbenzene	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110230-003	m,p-Xylene	I	0.08 ppbv	0.03	AC-058	03-Dec-15
15110230-003	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110230-003	m-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	03-Dec-15
15110230-003	Methyl butyl ketone	K, T, U	< 0.50 ppbv	0.50	AC-058	03-Dec-15
15110230-003	Methyl ethyl ketone	K, T, U	< 0.3 ppbv	0.3	AC-058	03-Dec-15
15110230-003	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110230-003	Methyl methacrylate	K, T, U	< 0.07 ppbv	0.07	AC-058	03-Dec-15
15110230-003	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	03-Dec-15
15110230-003	Methylcyclohexane	I	0.20 ppbv	0.01	AC-058	03-Dec-15
15110230-003	Methylcyclopentane	I	0.19 ppbv	0.02	AC-058	03-Dec-15

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:			
LICA/VOC/ELK/NOV 20, 2015	1060	Ambient Air	20-Nov-15 00:00	Version 01			
DESCRIPTION: Elk Point Airport							
REPORT NUMBER: 15110230	REPORT CREATED: 08-Jan-16						
Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110230-003	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Dec-15
15110230-003	n-Butane		14.7	ppbv	0.03	AC-058	03-Dec-15
15110230-003	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	03-Dec-15
15110230-003	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Dec-15
15110230-003	n-Heptane	I	0.16	ppbv	0.01	AC-058	03-Dec-15
15110230-003	n-Hexane	I	0.29	ppbv	0.01	AC-058	03-Dec-15
15110230-003	n-Octane	I	0.04	ppbv	0.02	AC-058	03-Dec-15
15110230-003	n-Pentane	K, T, U	< 0.1	ppbv	0.1	AC-058	03-Dec-15
15110230-003	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Dec-15
15110230-003	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Dec-15
15110230-003	Naphthalene		3.4	ppbv	0.5	AC-058	03-Dec-15
15110230-003	n-Nonane	I	0.02	ppbv	0.01	AC-058	03-Dec-15
15110230-003	o-Ethyltoluene	I	0.01	ppbv	0.01	AC-058	03-Dec-15
15110230-003	o-Xylene	I	0.04	ppbv	0.01	AC-058	03-Dec-15
15110230-003	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Dec-15
15110230-003	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Dec-15
15110230-003	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Dec-15
15110230-003	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Dec-15
15110230-003	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Dec-15
15110230-003	Toluene		0.32	ppbv	0.01	AC-058	03-Dec-15
15110230-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Dec-15
15110230-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Dec-15
15110230-003	trans-2-Butene	I	0.24	ppbv	0.01	AC-058	03-Dec-15
15110230-003	trans-2-Pentene	I	0.23	ppbv	0.02	AC-058	03-Dec-15
15110230-003	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Dec-15

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Friday, January 08, 2016

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CLIENT SAMPLE ID: LICA/VOC/ELK/NOV 20, 2015 CANISTER ID: 1060 Matrix: Ambient Air DATE SAMPLED: 20-Nov-15 00:00
 DESCRIPTION: Elk Point Airport
 REPORT NUMBER: 15110230 REPORT CREATED: 08-Jan-16 VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110230-003	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110230-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/NOV 26, 2015	H2834	Ambient Air	26-Nov-15 00:00	Version 01		
DESCRIPTION:	Elk Point Airport					
REPORT NUMBER:	15110237	REPORT CREATED:	08-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110237-001	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-001	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-001	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-001	1,1-Dichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110237-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	03-Dec-15
15110237-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8 ppbv	0.8	AC-058	03-Dec-15
15110237-001	1,2,4-Trimethylbenzene	I	0.04 ppbv	0.03	AC-058	03-Dec-15
15110237-001	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-001	1,2-Dichlorobenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	03-Dec-15
15110237-001	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	03-Dec-15
15110237-001	1,2-Dichloropropane	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110237-001	1,3,5-Trimethylbenzene	I	0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-001	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-001	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	03-Dec-15
15110237-001	1,4-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110237-001	1,4-Dioxane	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110237-001	1-Butene	I	0.12 ppbv	0.02	AC-058	03-Dec-15
15110237-001	1-Hexene	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-001	1-Pentene	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110237-001	2,2,4-Trimethylpentane	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110237-001	2,2-Dimethylbutane	I	0.08 ppbv	0.01	AC-058	03-Dec-15
15110237-001	2,3,4-Trimethylpentane	I	0.03 ppbv	0.01	AC-058	03-Dec-15
15110237-001	2,3-Dimethylbutane	I	0.20 ppbv	0.02	AC-058	03-Dec-15
15110237-001	2,3-Dimethylpentane	I	0.12 ppbv	0.02	AC-058	03-Dec-15

Report certified by: Julius Pretorius, Portfolio Manager

Date: Friday, January 08, 2016

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:			
LICA/VOC/ELK/NOV 26, 2015	H2834	Ambient Air	26-Nov-15 00:00	Version 01			
DESCRIPTION: Elk Point Airport							
REPORT NUMBER: 15110237	REPORT CREATED: 08-Jan-16						
Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110237-001	2,4-Dimethylpentane	I	0.09	ppbv	0.01	AC-058	03-Dec-15
15110237-001	2-Methylheptane	I	0.08	ppbv	0.01	AC-058	03-Dec-15
15110237-001	2-Methylhexane	I	0.12	ppbv	0.01	AC-058	03-Dec-15
15110237-001	2-Methylpentane	I	0.31	ppbv	0.01	AC-058	03-Dec-15
15110237-001	3-Methylheptane	I	0.04	ppbv	0.02	AC-058	03-Dec-15
15110237-001	3-Methylhexane	I	0.13	ppbv	0.02	AC-058	03-Dec-15
15110237-001	3-Methylpentane	I	0.17	ppbv	0.01	AC-058	03-Dec-15
15110237-001	Acetone		1.7	ppbv	0.4	AC-058	03-Dec-15
15110237-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Dec-15
15110237-001	Benzene		0.31	ppbv	0.01	AC-058	03-Dec-15
15110237-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Dec-15
15110237-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110237-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110237-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Dec-15
15110237-001	Carbon disulfide	I	0.02	ppbv	0.01	AC-058	03-Dec-15
15110237-001	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	03-Dec-15
15110237-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110237-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110237-001	Chloroform	I	0.02	ppbv	0.02	AC-058	03-Dec-15
15110237-001	Chloromethane		0.55	ppbv	0.02	AC-058	03-Dec-15
15110237-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Dec-15
15110237-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Dec-15
15110237-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110237-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Dec-15
15110237-001	Cyclohexane	I	0.26	ppbv	0.02	AC-058	03-Dec-15

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/NOV 26, 2015	H2834	Ambient Air	26-Nov-15 00:00	Version 01		
DESCRIPTION:	Elk Point Airport					
REPORT NUMBER:	15110237	REPORT CREATED:	08-Jan-16			
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110237-001	Cyclopentane	I	0.08 ppbv	0.01	AC-058	03-Dec-15
15110237-001	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110237-001	Ethanol		0.6 ppbv	0.3	AC-058	03-Dec-15
15110237-001	Ethyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110237-001	Ethylbenzene	I	0.05 ppbv	0.01	AC-058	03-Dec-15
15110237-001	Freon-11		0.41 ppbv	0.02	AC-058	03-Dec-15
15110237-001	Freon-113	I	0.07 ppbv	0.01	AC-058	03-Dec-15
15110237-001	Freon-114	I	0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-001	Freon-12		0.59 ppbv	0.02	AC-058	03-Dec-15
15110237-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50 ppbv	0.50	AC-058	03-Dec-15
15110237-001	Isobutane		1.43 ppbv	0.02	AC-058	03-Dec-15
15110237-001	Isopentane		1.03 ppbv	0.03	AC-058	03-Dec-15
15110237-001	Isoprene	I	0.05 ppbv	0.01	AC-058	03-Dec-15
15110237-001	Isopropyl alcohol	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110237-001	Isopropylbenzene	I	0.01 ppbv	0.01	AC-058	03-Dec-15
15110237-001	m,p-Xylene	I	0.11 ppbv	0.03	AC-058	03-Dec-15
15110237-001	m-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110237-001	m-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	03-Dec-15
15110237-001	Methyl butyl ketone	K, T, U	< 0.50 ppbv	0.50	AC-058	03-Dec-15
15110237-001	Methyl ethyl ketone	K, T, U	< 0.3 ppbv	0.3	AC-058	03-Dec-15
15110237-001	Methyl isobutyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110237-001	Methyl methacrylate	K, T, U	< 0.07 ppbv	0.07	AC-058	03-Dec-15
15110237-001	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	03-Dec-15
15110237-001	Methylcyclohexane		0.51 ppbv	0.01	AC-058	03-Dec-15
15110237-001	Methylcyclopentane	I	0.22 ppbv	0.02	AC-058	03-Dec-15

Report certified by: Julius Pretorius, Portfolio Manager

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Friday, January 08, 2016

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/NOV 26, 2015	H2834	Ambient Air	26-Nov-15 00:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15110237	REPORT CREATED: 08-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110237-001	Methylene chloride	K, T, U	< 0.3 ppbv	0.3	AC-058	03-Dec-15
15110237-001	n-Butane		2.39 ppbv	0.03	AC-058	03-Dec-15
15110237-001	n-Decane	I	0.10 ppbv	0.06	AC-058	03-Dec-15
15110237-001	n-Dodecane		0.7 ppbv	0.4	AC-058	03-Dec-15
15110237-001	n-Heptane	I	0.19 ppbv	0.01	AC-058	03-Dec-15
15110237-001	n-Hexane		0.35 ppbv	0.01	AC-058	03-Dec-15
15110237-001	n-Octane	I	0.10 ppbv	0.02	AC-058	03-Dec-15
15110237-001	n-Pentane	K, T, U	< 0.1 ppbv	0.1	AC-058	03-Dec-15
15110237-001	n-Propylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	03-Dec-15
15110237-001	n-Undecane	K, T, U	< 0.5 ppbv	0.5	AC-058	03-Dec-15
15110237-001	Naphthalene		1.9 ppbv	0.5	AC-058	03-Dec-15
15110237-001	n-Nonane	I	0.07 ppbv	0.01	AC-058	03-Dec-15
15110237-001	o-Ethyltoluene	I	0.02 ppbv	0.01	AC-058	03-Dec-15
15110237-001	o-Xylene	I	0.04 ppbv	0.01	AC-058	03-Dec-15
15110237-001	p-Diethylbenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110237-001	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	03-Dec-15
15110237-001	Styrene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110237-001	Tetrachloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110237-001	Tetrahydrofuran	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110237-001	Toluene		0.44 ppbv	0.01	AC-058	03-Dec-15
15110237-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110237-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15
15110237-001	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	03-Dec-15
15110237-001	trans-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15
15110237-001	Trichloroethylene	K, T, U	< 0.04 ppbv	0.04	AC-058	03-Dec-15

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/ELK/NOV 26, 2015	H2834	Ambient Air	26-Nov-15 00:00
DESCRIPTION:	Elk Point Airport		
REPORT NUMBER:	15110237	REPORT CREATED:	08-Jan-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110237-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Dec-15
15110237-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Dec-15

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/PUF/ELK/Nov 2, 2015	A13-02	Air Filter	02-Nov-15 0:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15110054	REPORT CREATED: 05-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110054-004	1-Methylnaphthalene		0.12 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	2-Methylnaphthalene		0.18 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Acenaphthene		0.03 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Acenaphthylene		0.12 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Benzo(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Benzo(a)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Benzo(e)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Benzo(ghi)perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Chrysene		0.02 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Fluoranthene		0.05 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Fluorene		0.09 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Naphthalene		0.12 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Phenanthrene		0.17 ug/Filter	0.01	NA-017	08-Dec-15

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID LICA/PUF/ELK/Nov 2, 2015 **CANISTER ID** A13-02 **Matrix** Air Filter **DATE SAMPLED** 02-Nov-15 0:00
DESCRIPTION: Elk Point Airport
REPORT NUMBER: 15110054 **REPORT CREATED:** 05-Jan-16 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110054-004	Pyrene		0.03	ug/Filter	0.01	NA-017	08-Dec-15
15110054-004	Retene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Dec-15

Report certified by: Graham Knox, Team Lead **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/PUF/ELK/Nov 8, 2015	9702	Air Filter	08-Nov-15 0:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15110089	REPORT CREATED: 05-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110089-004	1-Methylnaphthalene		0.05 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	2-Methylnaphthalene		0.08 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Acenaphthene		0.03 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Acenaphthylene		0.04 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Benzo(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Benzo(a)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Benzo(e)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Benzo(ghi)perylene		0.02 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Chrysene		0.03 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Dibenzo(a,h)pyrene	K, T, U	0.04 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Fluoranthene		0.07 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Fluorene		0.20 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Indeno(1,2,3-cd)pyrene		0.02 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Naphthalene		0.11 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Perylene		0.02 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Phenanthrene		0.27 ug/Filter	0.01	NA-017	08-Dec-15

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: January 5, 2016

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID LICA/PUF/ELK/Nov 8, 2015	CANISTER ID 9702	Matrix Air Filter	DATE SAMPLED 08-Nov-15 0:00	VERSION: Version 01		
DESCRIPTION: Elk Point Airport		REPORT CREATED: 05-Jan-16				
REPORT NUMBER: 15110089						
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110089-004	Pyrene		0.04 ug/Filter	0.01	NA-017	08-Dec-15
15110089-004	Retene		0.03 ug/Filter	0.01	NA-017	08-Dec-15

Report certified by: Graham Knox, Team Lead
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/PUF/ELK/Nov 14, 2014	TE-02	Air Filter	14-Nov-15 0:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15110105	REPORT CREATED: 05-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110105-002	1-Methylnaphthalene		0.26 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	2-Methylnaphthalene		0.42 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Acenaphthene		0.06 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Acenaphthylene		0.09 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Benzo(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Benzo(a)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Benzo(c)phenanthrene	K, T, U	0.02 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Benzo(e)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Benzo(ghi)perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Chrysene	K, T, U	0.02 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Fluoranthene		0.06 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Fluorene		0.18 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Naphthalene		0.19 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Phenanthrene		0.20 ug/Filter	0.01	NA-017	08-Dec-15

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID LICA/PUF/ELK/Nov 14, 2014 **CANISTER ID** TE-02 **Matrix** Air Filter **DATE SAMPLED** 14-Nov-15 0:00
DESCRIPTION: Elk Point Airport **REPORT CREATED:** 05-Jan-16 **VERSION:** Version 01
REPORT NUMBER: 15110105

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110105-002	Pyrene		0.03	ug/Filter	0.01	NA-017	08-Dec-15
15110105-002	Retene		0.02	ug/Filter	0.01	NA-017	08-Dec-15

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/PUF/ELK/NOV 26, 2015	TE-04	Air Filter	26-Nov-15 00:00	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15110237						
REPORT CREATED: 08-Jan-16						
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110237-002	1-Methylnaphthalene		0.39 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	2-Methylnaphthalene		0.55 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	7,12-Dimethylbenz(a)anthracene		0.01 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Acenaphthene		0.18 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Acenaphthylene		0.22 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Anthracene		0.08 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Benzo(a)anthracene		0.05 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Benzo(a)pyrene		0.05 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Benzo(b,j,k)fluoranthene		0.13 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Benzo(c)phenanthrene		0.02 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Benzo(e)pyrene		0.05 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Benzo(ghi)perylene		0.07 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Chrysene		0.08 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Dibenzo(a,l)pyrene		0.06 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Dibenzo(ah)anthracene		0.02 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Fluoranthene		0.32 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Fluorene		0.52 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Indeno(1,2,3-cd)pyrene		0.05 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Naphthalene		0.53 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Perylene		0.01 ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Phenanthrene		0.99 ug/Filter	0.01	NA-017	19-Dec-15

Report certified by: Julius Pretorius, Portfolio Manager

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Friday, January 08, 2016

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID: LICA/PUF/ELK/NOV 26, 2015
 CANISTER ID: TE-04
 Matrix: Air Filter
 DATE SAMPLED: 26-Nov-15 00:00
 DESCRIPTION: Elk Point Airport
 REPORT NUMBER: 15110237
 REPORT CREATED: 08-Jan-16
 VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110237-002	Pyrene		0.23	ug/Filter	0.01	NA-017	19-Dec-15
15110237-002	Retene		0.36	ug/Filter	0.01	NA-017	19-Dec-15

Report certified by: Julius Pretorius, Portfolio Manager

Date: Friday, January 08, 2016

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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NMHC CANISTER SAMPLES



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID CANISTER ID LICA/VOC/ELK/Nov 19, 2015 1840</p> <p>DESCRIPTION: Elk Point Airport</p> <p>DATE SAMPLED: 19-Nov-15 17:05 DATE RECEIVED: 24-Nov-15</p> <p>REPORT CREATED: 27-Nov-15 REPORT NUMBER: 15110198</p> <p>VERSION: Version 01</p> <p>Matrix Ambient Air Priority Normal</p>
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Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110198-001	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	24-Nov-15
15110198-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	24-Nov-15
15110198-001	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	24-Nov-15
15110198-001	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	24-Nov-15
15110198-001	1,1-Dichloroethylene	K, T, U	< 0.05 ppbv	0.05	AC-058	24-Nov-15
15110198-001	1,2,3-Trimethylbenzene	I	0.26 ppbv	0.06	AC-058	24-Nov-15
15110198-001	1,2,4-Trichlorobenzene	K, T, U	< 1.0 ppbv	1.0	AC-058	24-Nov-15
15110198-001	1,2,4-Trimethylbenzene	K, T, U	0.94 ppbv	0.04	AC-058	24-Nov-15
15110198-001	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	24-Nov-15
15110198-001	1,2-Dichlorobenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	24-Nov-15
15110198-001	1,2-Dichloroethane	I	0.03 ppbv	0.01	AC-058	24-Nov-15
15110198-001	1,2-Dichloropropane	I	0.01 ppbv	0.01	AC-058	24-Nov-15
15110198-001	1,3,5-Trimethylbenzene	I	0.32 ppbv	0.02	AC-058	24-Nov-15
15110198-001	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	24-Nov-15
15110198-001	1,3-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	24-Nov-15
15110198-001	1,4-Dichlorobenzene	K, T, U	< 0.5 ppbv	0.5	AC-058	24-Nov-15
15110198-001	1,4-Dioxane	K, T, U	< 0.5 ppbv	0.5	AC-058	24-Nov-15
15110198-001	1-Butene	K, T, U	1.45 ppbv	0.02	AC-058	24-Nov-15

Report certified by: Graham Knox, Team Lead
Date: Friday, November 27, 2015
On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
_JCA/VOC/ELK/Nov 19, 2015	1840	Ambient Air	19-Nov-15 17:05	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15110198	REPORT CREATED: 27-Nov-15					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110198-001	1-Hexene	I	0.05 ppbv	0.02	AC-058	24-Nov-15
15110198-001	1-Pentene	K, T, U	< 0.01 ppbv	0.01	AC-058	24-Nov-15
15110198-001	2,2,4-Trimethylpentane	I	0.17 ppbv	0.01	AC-058	24-Nov-15
15110198-001	2,2-Dimethylbutane	I	0.05 ppbv	0.01	AC-058	24-Nov-15
15110198-001	2,3,4-Trimethylpentane	I	0.13 ppbv	0.01	AC-058	24-Nov-15
15110198-001	2,3-Dimethylbutane	K, T, U	< 0.02 ppbv	0.02	AC-058	24-Nov-15
15110198-001	2,3-Dimethylpentane	I	0.12 ppbv	0.02	AC-058	24-Nov-15
15110198-001	2,4-Dimethylpentane	I	0.10 ppbv	0.01	AC-058	24-Nov-15
15110198-001	2-Methylheptane	I	0.14 ppbv	0.01	AC-058	24-Nov-15
15110198-001	2-Methylhexane	I	0.20 ppbv	0.01	AC-058	24-Nov-15
15110198-001	2-Methylpentane	I	0.25 ppbv	0.01	AC-058	24-Nov-15
15110198-001	3-Methylheptane	I	0.13 ppbv	0.02	AC-058	24-Nov-15
15110198-001	3-Methylhexane	I	0.21 ppbv	0.02	AC-058	24-Nov-15
15110198-001	3-Methylpentane	I	0.22 ppbv	0.01	AC-058	24-Nov-15
15110198-001	Acetone		2.9 ppbv	0.5	AC-058	24-Nov-15
15110198-001	Acrolein	K, T, U	< 0.4 ppbv	0.4	AC-058	24-Nov-15
15110198-001	Benzene		1.50 ppbv	0.01	AC-058	24-Nov-15
15110198-001	Benzyl chloride	K, T, U	< 0.5 ppbv	0.5	AC-058	24-Nov-15
15110198-001	Bromodichloromethane	K, T, U	< 0.02 ppbv	0.02	AC-058	24-Nov-15
15110198-001	Bromoform	K, T, U	< 0.02 ppbv	0.02	AC-058	24-Nov-15
15110198-001	Bromomethane	I	0.01 ppbv	0.01	AC-058	24-Nov-15
15110198-001	Carbon disulfide	K, T, U	< 0.01 ppbv	0.01	AC-058	24-Nov-15
15110198-001	Carbon tetrachloride	I	0.13 ppbv	0.01	AC-058	24-Nov-15
15110198-001	Chlorobenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	24-Nov-15
15110198-001	Chloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	24-Nov-15

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Friday, November 27, 2015

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:			
JCA/VOC/ELK/Nov 19, 2015	1840	Ambient Air	19-Nov-15 17:05	Version 01			
DESCRIPTION: Elk Point Airport							
REPORT NUMBER: 15110198	REPORT CREATED: 27-Nov-15						
Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110198-001	Chloroform	I	0.04	ppbv	0.02	AC-058	24-Nov-15
15110198-001	Chloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Nov-15
15110198-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	24-Nov-15
15110198-001	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	24-Nov-15
15110198-001	cis-2-Butene	I	0.13	ppbv	0.02	AC-058	24-Nov-15
15110198-001	cis-2-Pentene	I	0.04	ppbv	0.02	AC-058	24-Nov-15
15110198-001	Cyclohexane	I	0.13	ppbv	0.02	AC-058	24-Nov-15
15110198-001	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	24-Nov-15
15110198-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	24-Nov-15
15110198-001	Ethanol		2.9	ppbv	0.4	AC-058	24-Nov-15
15110198-001	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	24-Nov-15
15110198-001	Ethylbenzene		0.58	ppbv	0.01	AC-058	24-Nov-15
15110198-001	Freon-11	I	0.33	ppbv	0.02	AC-058	24-Nov-15
15110198-001	Freon-113	I	0.11	ppbv	0.01	AC-058	24-Nov-15
15110198-001	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Nov-15
15110198-001	Freon-12		0.38	ppbv	0.02	AC-058	24-Nov-15
15110198-001	Hexachloro-1,3-butadiene	K, T, U	< 0.62	ppbv	0.62	AC-058	24-Nov-15
15110198-001	Isobutane		0.67	ppbv	0.02	AC-058	24-Nov-15
15110198-001	Isopentane		0.97	ppbv	0.04	AC-058	24-Nov-15
15110198-001	Isoprene	I	0.14	ppbv	0.01	AC-058	24-Nov-15
15110198-001	Isopropyl alcohol	K, T, U	< 0.5	ppbv	0.5	AC-058	24-Nov-15
15110198-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	24-Nov-15
15110198-001	m,p-Xylene		1.70	ppbv	0.04	AC-058	24-Nov-15
15110198-001	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	24-Nov-15
15110198-001	m-Ethyltoluene		0.73	ppbv	0.10	AC-058	24-Nov-15



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
_JCA/VOC/ELK/Nov 19, 2015	1840	Ambient Air	19-Nov-15 17:05
DESCRIPTION:	Elk Point Airport		
REPORT NUMBER:	15110198	REPORT CREATED:	27-Nov-15
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15110198-001	Methyl butyl ketone	K, T, U	< 0.62 ppbv	0.62	AC-058	24-Nov-15
15110198-001	Methyl ethyl ketone	K, T, U	< 0.4 ppbv	0.4	AC-058	24-Nov-15
15110198-001	Methyl isobutyl ketone	K, T, U	< 0.5 ppbv	0.5	AC-058	24-Nov-15
15110198-001	Methyl methacrylate	K, T, U	< 0.09 ppbv	0.09	AC-058	24-Nov-15
15110198-001	Methyl tert butyl ether	K, T, U	< 0.04 ppbv	0.04	AC-058	24-Nov-15
15110198-001	Methylcyclohexane	I	0.24 ppbv	0.01	AC-058	24-Nov-15
15110198-001	Methylcyclopentane	I	0.22 ppbv	0.02	AC-058	24-Nov-15
15110198-001	Methylene chloride		2.0 ppbv	0.4	AC-058	24-Nov-15
15110198-001	n-Butane		2.67 ppbv	0.04	AC-058	24-Nov-15
15110198-001	n-Decane	I	0.07 ppbv	0.07	AC-058	24-Nov-15
15110198-001	n-Dodecane	K, T, U	< 0.5 ppbv	0.5	AC-058	24-Nov-15
15110198-001	n-Heptane	I	0.20 ppbv	0.01	AC-058	24-Nov-15
15110198-001	n-Hexane		0.49 ppbv	0.01	AC-058	24-Nov-15
15110198-001	n-Octane	I	0.17 ppbv	0.02	AC-058	24-Nov-15
15110198-001	n-Pentane	K, T, U	< 0.1 ppbv	0.1	AC-058	24-Nov-15
15110198-001	n-Propylbenzene	I	0.13 ppbv	0.06	AC-058	24-Nov-15
15110198-001	n-Undecane	K, T, U	< 0.6 ppbv	0.6	AC-058	24-Nov-15
15110198-001	Naphthalene	K, T, U	< 0.6 ppbv	0.6	AC-058	24-Nov-15
15110198-001	n-Nonane	I	0.16 ppbv	0.01	AC-058	24-Nov-15
15110198-001	o-Ethyltoluene	I	0.24 ppbv	0.01	AC-058	24-Nov-15
15110198-001	o-Xylene		0.80 ppbv	0.01	AC-058	24-Nov-15
15110198-001	p-Diethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	24-Nov-15
15110198-001	p-Ethyltoluene	I	0.23 ppbv	0.09	AC-058	24-Nov-15
15110198-001	Styrene	I	0.24 ppbv	0.05	AC-058	24-Nov-15
15110198-001	Tetrachloroethylene	K, T, U	< 0.05 ppbv	0.05	AC-058	24-Nov-15

Report certified by: Graham Knox, Team Lead
Date: Friday, November 27, 2015
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID: .JCA/VOC/ELK/Nov 19, 2015
 CANISTER ID: 1840
 DATE SAMPLED: 19-Nov-15 17:05
 Matrix: Ambient Air
 DESCRIPTION: Elk Point Airport
 REPORT NUMBER: 15110198
 REPORT CREATED: 27-Nov-15
 VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
15110198-001	Tetrahydrofuran	K, T, U	< 0.5	ppbv	0.5	AC-058	24-Nov-15
15110198-001	Toluene		2.10	ppbv	0.01	AC-058	24-Nov-15
15110198-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	24-Nov-15
15110198-001	trans-1,3-Dichloropropylene	K, T, U	< 0.05	ppbv	0.05	AC-058	24-Nov-15
15110198-001	trans-2-Butene	I	0.19	ppbv	0.01	AC-058	24-Nov-15
15110198-001	trans-2-Pentene	I	0.07	ppbv	0.02	AC-058	24-Nov-15
15110198-001	Trichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	24-Nov-15
15110198-001	Vinyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	24-Nov-15
15110198-001	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	24-Nov-15

Report certified by: Graham Knox, Team Lead
 Date: Friday, November 27, 2015
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Nov 30, 2015	S5635	Ambient Air	30-Nov-15 19:35	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15120089	REPORT CREATED: 08-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120089-006	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-006	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-006	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-006	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-006	1,1-Dichloroethylene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15
15120089-006	1,2,3-Trimethylbenzene	K, T, U	< 0.06 ppbv	0.06	AC-058	10-Dec-15
15120089-006	1,2,4-Trichlorobenzene	K, T, U	< 0.9 ppbv	0.9	AC-058	10-Dec-15
15120089-006	1,2,4-Trimethylbenzene	I	0.10 ppbv	0.03	AC-058	10-Dec-15
15120089-006	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-006	1,2-Dichlorobenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	10-Dec-15
15120089-006	1,2-Dichloroethane	I	0.03 ppbv	0.01	AC-058	10-Dec-15
15120089-006	1,2-Dichloropropane	I	0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-006	1,3,5-Trimethylbenzene	I	0.06 ppbv	0.02	AC-058	10-Dec-15
15120089-006	1,3-Butadiene	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-006	1,3-Dichlorobenzene	K, T, U	< 0.3 ppbv	0.3	AC-058	10-Dec-15
15120089-006	1,4-Dichlorobenzene	K, T, U	< 0.5 ppbv	0.5	AC-058	10-Dec-15
15120089-006	1,4-Dioxane	K, T, U	< 0.5 ppbv	0.5	AC-058	10-Dec-15
15120089-006	1-Butene		1.83 ppbv	0.02	AC-058	10-Dec-15
15120089-006	1-Hexene	I	0.06 ppbv	0.02	AC-058	10-Dec-15
15120089-006	1-Pentene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-006	2,2,4-Trimethylpentane	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-006	2,2-Dimethylbutane		0.40 ppbv	0.01	AC-058	10-Dec-15
15120089-006	2,3,4-Trimethylpentane	I	0.23 ppbv	0.01	AC-058	10-Dec-15
15120089-006	2,3-Dimethylbutane		1.19 ppbv	0.02	AC-058	10-Dec-15
15120089-006	2,3-Dimethylpentane		0.56 ppbv	0.02	AC-058	10-Dec-15

Report certified by: Graham Knox, Team Lead

Date: Friday, January 08, 2016

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:	Version 01	
LICA/VOC/ELK/Nov 30, 2015	S5635	Ambient Air	30-Nov-15 19:35			
DESCRIPTION:	Elk Point Airport					
REPORT NUMBER:	15120089					
	REPORT CREATED:	08-Jan-16				
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120089-006	2,4-Dimethylpentane		0.46 ppbv	0.01	AC-058	10-Dec-15
15120089-006	2-Methylheptane		0.36 ppbv	0.01	AC-058	10-Dec-15
15120089-006	2-Methylhexane		0.58 ppbv	0.01	AC-058	10-Dec-15
15120089-006	2-Methylpentane		1.40 ppbv	0.01	AC-058	10-Dec-15
15120089-006	3-Methylheptane	I	0.22 ppbv	0.02	AC-058	10-Dec-15
15120089-006	3-Methylhexane		0.64 ppbv	0.02	AC-058	10-Dec-15
15120089-006	3-Methylpentane		1.31 ppbv	0.01	AC-058	10-Dec-15
15120089-006	Acetone	K, T, U	< 0.5 ppbv	0.5	AC-058	10-Dec-15
15120089-006	Acrolein	K, T, U	< 0.3 ppbv	0.3	AC-058	10-Dec-15
15120089-006	Benzene		0.59 ppbv	0.01	AC-058	10-Dec-15
15120089-006	Benzyl chloride	K, T, U	< 0.5 ppbv	0.5	AC-058	10-Dec-15
15120089-006	Bromodichloromethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-006	Bromoform	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-006	Bromomethane	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-006	Carbon disulfide	I	0.06 ppbv	0.01	AC-058	10-Dec-15
15120089-006	Carbon tetrachloride	I	0.13 ppbv	0.01	AC-058	10-Dec-15
15120089-006	Chlorobenzene	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-006	Chloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-006	Chloroform	I	0.03 ppbv	0.02	AC-058	10-Dec-15
15120089-006	Chloromethane		0.71 ppbv	0.02	AC-058	10-Dec-15
15120089-006	cis-1,2-Dichloroethene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-006	cis-1,3-Dichloropropene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15
15120089-006	cis-2-Butene	I	0.04 ppbv	0.02	AC-058	10-Dec-15
15120089-006	cis-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-006	Cyclohexane		1.43 ppbv	0.02	AC-058	10-Dec-15

Report certified by: Graham Knox, Team Lead

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Friday, January 08, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:	Analysis Date	
LICA/VOC/ELK/Nov 30, 2015	S5635	Ambient Air	30-Nov-15 19:35	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15120089	REPORT CREATED: 08-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120089-006	Cyclopentane		0.41 ppbv	0.01	AC-058	10-Dec-15
15120089-006	Dibromochloromethane	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-006	Ethanol		1.6 ppbv	0.3	AC-058	10-Dec-15
15120089-006	Ethyl acetate	K, T, U	< 0.5 ppbv	0.5	AC-058	10-Dec-15
15120089-006	Ethylbenzene	I	0.15 ppbv	0.01	AC-058	10-Dec-15
15120089-006	Freon-11		0.52 ppbv	0.02	AC-058	10-Dec-15
15120089-006	Freon-113	I	0.10 ppbv	0.01	AC-058	10-Dec-15
15120089-006	Freon-114	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Dec-15
15120089-006	Freon-12		0.52 ppbv	0.02	AC-058	10-Dec-15
15120089-006	Hexachloro-1,3-butadiene	K, T, U	< 0.58 ppbv	0.58	AC-058	10-Dec-15
15120089-006	Isobutane		5.10 ppbv	0.02	AC-058	10-Dec-15
15120089-006	Isopentane		4.48 ppbv	0.03	AC-058	10-Dec-15
15120089-006	Isoprene	I	0.02 ppbv	0.01	AC-058	10-Dec-15
15120089-006	Isopropyl alcohol	K, T, U	< 0.5 ppbv	0.5	AC-058	10-Dec-15
15120089-006	Isopropylbenzene	I	0.03 ppbv	0.01	AC-058	10-Dec-15
15120089-006	m,p-Xylene		0.43 ppbv	0.03	AC-058	10-Dec-15
15120089-006	m-Diethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15
15120089-006	m-Ethyltoluene	K, T, U	< 0.09 ppbv	0.09	AC-058	10-Dec-15
15120089-006	Methyl butyl ketone	K, T, U	< 0.58 ppbv	0.58	AC-058	10-Dec-15
15120089-006	Methyl ethyl ketone	K, T, U	< 0.3 ppbv	0.3	AC-058	10-Dec-15
15120089-006	Methyl isobutyl ketone	K, T, U	< 0.5 ppbv	0.5	AC-058	10-Dec-15
15120089-006	Methyl methacrylate	K, T, U	< 0.08 ppbv	0.08	AC-058	10-Dec-15
15120089-006	Methyl tert butyl ether	K, T, U	< 0.03 ppbv	0.03	AC-058	10-Dec-15
15120089-006	Methylcyclohexane		2.51 ppbv	0.01	AC-058	10-Dec-15
15120089-006	Methylcyclopentane		1.63 ppbv	0.02	AC-058	10-Dec-15

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	VERSION:		
LICA/VOC/ELK/Nov 30, 2015	S5635	Ambient Air	30-Nov-15 19:35	Version 01		
DESCRIPTION: Elk Point Airport						
REPORT NUMBER: 15120089	REPORT CREATED: 08-Jan-16					
Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
15120089-006	Methylene chloride		0.4 ppbv	0.3	AC-058	10-Dec-15
15120089-006	n-Butane		8.14 ppbv	0.03	AC-058	10-Dec-15
15120089-006	n-Decane	I	0.07 ppbv	0.07	AC-058	10-Dec-15
15120089-006	n-Dodecane		0.9 ppbv	0.5	AC-058	10-Dec-15
15120089-006	n-Heptane		0.95 ppbv	0.01	AC-058	10-Dec-15
15120089-006	n-Hexane		4.47 ppbv	0.01	AC-058	10-Dec-15
15120089-006	n-Octane		0.55 ppbv	0.02	AC-058	10-Dec-15
15120089-006	n-Pentane	K, T, U	< 0.1 ppbv	0.1	AC-058	10-Dec-15
15120089-006	n-Propylbenzene	K, T, U	< 0.06 ppbv	0.06	AC-058	10-Dec-15
15120089-006	n-Undecane	K, T, U	< 0.6 ppbv	0.6	AC-058	10-Dec-15
15120089-006	Naphthalene		1.8 ppbv	0.6	AC-058	10-Dec-15
15120089-006	n-Nonane	I	0.17 ppbv	0.01	AC-058	10-Dec-15
15120089-006	o-Ethyltoluene	I	0.03 ppbv	0.01	AC-058	10-Dec-15
15120089-006	o-Xylene	I	0.15 ppbv	0.01	AC-058	10-Dec-15
15120089-006	p-Diethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15
15120089-006	p-Ethyltoluene	K, T, U	< 0.08 ppbv	0.08	AC-058	10-Dec-15
15120089-006	Styrene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15
15120089-006	Tetrachloroethylene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15
15120089-006	Tetrahydrofuran	K, T, U	< 0.5 ppbv	0.5	AC-058	10-Dec-15
15120089-006	Toluene		0.99 ppbv	0.01	AC-058	10-Dec-15
15120089-006	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-006	trans-1,3-Dichloropropylene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15
15120089-006	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	10-Dec-15
15120089-006	trans-2-Pentene	I	0.04 ppbv	0.02	AC-058	10-Dec-15
15120089-006	Trichloroethylene	K, T, U	< 0.05 ppbv	0.05	AC-058	10-Dec-15

Report certified by: Graham Knox, Team Lead

Date: Friday, January 08, 2016

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/ELK/Nov 30, 2015	S5635	Ambient Air	30-Nov-15 19:35
DESCRIPTION: Elk Point Airport		REPORT CREATED:	VERSION: Version 01
REPORT NUMBER: 15120089	08-Jan-16		
Lab ID	Parameter	Qualifier	Result Units RDL Method Analysis Date
15120089-006	Vinyl acetate	K, T, U	< 0.5 ppbv 0.5 AC-058 10-Dec-15
15120089-006	Vinyl chloride	K, T, U	< 0.02 ppbv 0.02 AC-058 10-Dec-15

Report certified by: Graham Knox, Team Lead **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: Friday, January 08, 2016 **Inquiries:** (780) 632-8455 **E-mail:** EAS.Results@albertainnovates.ca

APPENDIX V
CHAIN OF CUSTODY



Maxxam Analytics - Air Services Group

Project Chain of Custody

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2015-11-35- C</u>
Site: <u>Elk Point Airport Site</u>	Contact: <u>Mike Bisaga</u>

QA Check Complete msdmbq Date 22 - Dec - 2015

QA Check Review msdmbq Date 22 - Dec - 2015

Report Complete msdmbq Date 11 - Jan - 2016

Report Reviewed [Signature] Date 12 - Jan - 16

Report Shipped _____ Date _____

Notes

AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
MASKWA SITE

JOB #:2833-2015-11-30- C

NOVEMBER 2015


Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
BOX 8237, 5107W - 50 STREET
BONNYVILLE, ALBERTA
T9N 2J5

Attention: MIKE BISAGA

DATE: **December 31, 2015**

Prepared by:



Wunmi Adekanmbi, M.Sc.
Project Manager Assistant, Source Testing, Maxxam Analytics

Reviewed by:



Lily Lin, B.Sc.
Senior Project Manager, Air Services, Maxxam Analytics

SUMMARY

In NOVEMBER 2015, the Air Services Group of Maxxam Analytics conducted an ambient air monitoring program on the Maskwa Site at Lakeland Industry & Community Association, near Bonnyville, Alberta. Sampling was carried out to determine the concentrations of non-compliance parameters as requested by the Project Coordinator.

All data collected this month were within the objectives outlined in the AMD1989 and AMD2006.

The operational uptime for all analyzers and meteorological system were above the 90% requirement.

THC: Eight hours of data were invalidated this month as the readings were below the background concentration of 1.5 ppm.

The summary of results is presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods are outlined in Section 1.0 Discussion. On this basis, Maxxam is issuing this completed report to Lakeland Industry & Community Association, Maskwa Site.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3677 or toll-free at 1-800-386-7247.

Monthly Continuous Data Summary

Lakeland Industry & Community Association Maskwa Site						MAXIMUM VALUES							OPERATIONAL TIME (%)
						1-HOUR				24-HOUR			
PARAMETER	OBJECTIVES		EXCEEDENCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (KPH)	WIND DIRECTION (DEGREES)	READING	DAY	
	1-HR	24-HR	1-HR	24-HR									
SO2 (PPB)	172	48	0	0	1	7	18	15	10.8	NW	2.3	18	100.0
H2S (PPB)	10	3	0	0	0	1	VAR	VAR	VAR	VAR	0.7	30	100.0
THC (PPM)	-	-	-	-	2.2	4.0	30	17	3	SW	3.3	30	98.9
NO2 (PPB)	159	-	0	-	4.2	29.8	30	17	3	SW	17.6	29	100.0
NO (PPB)	-	-	-	-	1.4	27.2	30	9	2.6	SW	7.9	30	100.0
NOX (PPB)	-	-	-	-	5.5	40.8	30	9	2.6	SW	25.4	30	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	74.6	91	VAR	VAR	VAR	VAR	87.9	3	100.0
BAROMETRIC PRESSURE (MILIBAR)	-	-	-	-	937	953	26	VAR	VAR	VAR	950	26	100.0
AMBIENT TEMPERATURE (DEG C)	-	-	-	-	-3.5	7.4	7	15	3.6	SSW	3.2	7	100.0
PRECIPITATION (MM)	-	-	-	-	0.0	2.6	17	10	5.4	S	0.4	8	100.0
VECTOR WS (KPH)	-	-	-	-	5.2	13.2	22	12	-	WNW	10.1	22	100.0
VECTOR WD (DEG)	-	-	-	-	SW	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

Exceedence Summary Report

SO₂ 1- Hour Exceedences

No Exceedences Recorded During the Month

SO₂ 24- Hour Exceedences

No Exceedences Recorded During the Month

H₂S 1- Hour Exceedences

No Exceedences Recorded During the Month

H₂S 24- Hour Exceedences

No Exceedences Recorded During the Month

NO₂ 1- Hour Exceedences

No Exceedences Recorded During the Month

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
<u>1.0 Discussion</u>	<u>3</u>
<u>2.0 Project Personnel</u>	<u>5</u>
<u>3.0 Plant Monthly Required AMD Summary</u>	<u>5</u>
<u>4.0 Calculations and Results</u>	<u>5</u>
<u>5.0 Methods and Procedures</u>	<u>6</u>
<u>Appendix I</u>	<u>Continuous Monitoring Data Results</u>
	Sulphur Dioxide
	Hydrogen Sulphide
	Total Hydrocarbon
	Oxides of Nitrogen
	Nitric Oxides
	Nitrogen Dioxide
	Wind Speed
	Wind Direction
	Relative Humidity
	Barometric Pressure
	Ambient Temperature
	Precipitation
<u>Appendix II</u>	<u>Analyzer Calibration Results</u>
	Sulphur Dioxide
	Hydrogen Sulphide
	Total Hydrocarbon
	Nitrogen Dioxide
	Wind System
	Calibrators
	Calibration Gases
	Audit Report
<u>Appendix III</u>	<u>Chain of Custody</u>

1.0 Discussion

This monthly report consists of data for parameters SO₂, H₂S, THC, NO_x, NO, NO₂, WS, WD, RH, BP, Precipitation and Ambient Temperature.

Sample filters for all continuous air monitors are changed before the calibration is started. The sample manifold is cleaned during the site visit on a monthly basis.

Control checks, consisting of zero and span of the analyzer are conducted on a daily basis on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinder) is used for zero checks and a known concentration of the pollutant being analyzed is used for span checks. These checks are controlled by automatic timers and valves. The total zero span cycle is completed within an hour, the commencement of the zero span cycle is at the beginning of the hour.

Multipoint calibration is done a minimum of once a month for each continuous air monitor. In addition calibration is required under the following conditions: 1) within three days after the initial start-up and stabilization of a newly installed instrument, 2) prior to shut-down or moving of an instrument which has been working to specification, and 3) when major repair has been done on the instrument.

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time (minimum), on a monthly basis.

All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.

Hourly/minute data have been reviewed based on daily zero/span results and multi-points calibration results. Data may be considered as invalid if a zero-corrected span check in excess of +/- 10% of the span concentration (established by the previous multi-point calibration) is encountered and/or significant differences in the calibration factor (greater than 15%).

Hourly data is corrected using daily zero information.

Trailer inspection was completed on November 12. No issues were identified.

SULPHUR DIOXIDE (SO₂)

The analyzer was working well throughout the month. The routine monthly calibration was performed on November 12. The routine annual internal quality audit was completed on November 17. The audit report is included in this report.

HYDROGEN SULPHIDE (H₂S)

The analyzer was working well throughout the month. The routine monthly calibration was performed on November 12. The routine annual internal quality audit was completed on November 17. The audit report is included in this report.

TOTAL HYDROCARBONS (THC)

The routine monthly calibration was performed on November 12. The routine annual internal quality audit was completed on November 17. The audit report is included in this report. Eight hours of data were invalidated this month as the readings were below the background concentration of 1.5 ppm.

NITROGEN DIOXIDE (NO₂)

The analyzer was working well throughout the month. The routine monthly calibration was performed on November 12. The routine annual internal quality audit was completed on November 17. The audit report is included in this report.

WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)

The wind system is reported as vector wind speed and vector wind direction. The wind direction data included in this report represents where the wind was coming from.

The wind system was working well throughout the month.

RELATIVE HUMIDITY (RH)

The humidity sensor was working well throughout the month.

BAROMETRIC PRESSURE (BP)

The pressure sensor was working well throughout the month. The routine annual internal quality audit was completed on November 17. The audit report is included in this report.

PRECIPITATION

Both the rain gauge system and heating system were working well throughout the month. The routine annual internal quality audit was completed on November 17. The audit report is included in this report.

AMBIENT TEMPERATURE (TPX)

The temperature sensor was working well throughout the month. The routine annual internal quality audit was completed on November 17. The audit report is included in this report.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association, and the Maxxam field sampling personnel was Alexander Yakupov.

3.0 Plant Monthly Required AMD Summary

All data collected this month were within the objectives outlined in the AMD1989 and AMD2006.

The operational uptime for all analyzers and meteorological system were above the 90% requirement.

4.0 Calculations and Results

All calculations and reporting of results follow the method described in the Air Monitoring Directive, 1989, and 2006 Amendments to the Air Monitoring Directive, 1989 (AMD 2006).

5.0 Methods and Procedures

The following methods and procedures were used to complete the test program:

- Maxxam AIR SOP-00208: RM Young Monitor Calibration
- Maxxam AIR SOP-00209: Ambient H₂S Monitoring
- Maxxam AIR SOP-00211: Ambient SO₂ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00242: Precipitation Collector Installation /Maintenance

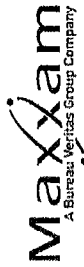
There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100A UV Flourescent Analyzer
- Hydrogen Sulphide - API 101E UV Flourescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Oxides of Nitrogen - API 200E Chemiluminescent Analyzer
- Wind System - Met One Unit
- Relative Humidity - Met One Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Met One Unit
- Precipitation - Met One Unit
- Datalogger - ESC 8832

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE



SULPHUR DIOXIDE (SO2) hourly averages in ppb

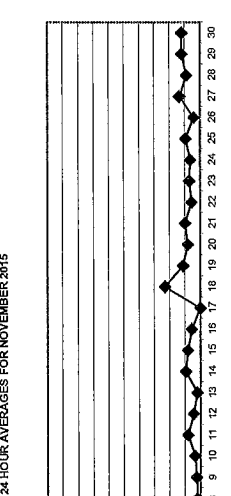
DAY	HOUR																								DAILY MAX	24-HOUR AVG	ROGS				
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00							
1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	1	0	0	0	1	0.5	24				
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24		
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24	
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	24	
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	24
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	24
8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0.2	24
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	24
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	24
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.3	24
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	24
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	24
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5	24
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.2	24
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.2	24
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	24
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	24
19	2	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.3	24
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24	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	24
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	24
27	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0.4	24
28	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.3	24
29	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	24
30	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2	24
HOURLY MAX	2	2	5	3	3	3	3	3	3	3	3	4	3	5	4	7	1	2	5	3	2	5	3	2	6	2	4	3	1.2	24	
HOURLY AVG	0.6	0.6	0.9	0.8	0.6	0.5	0.6	0.7	0.7	0.6	1.0	0.8	0.9	1.0	1.1	0.8	0.4	0.6	0.8	0.7	0.6	0.8	0.6	0.8	0.6	0.6	0.7	0.6	0.6	0.7	

OBJECTIVE LIMIT: ALBERTA ENVIRONMENT: 1-HR: 172 PPB 24-HR: 48 PPB

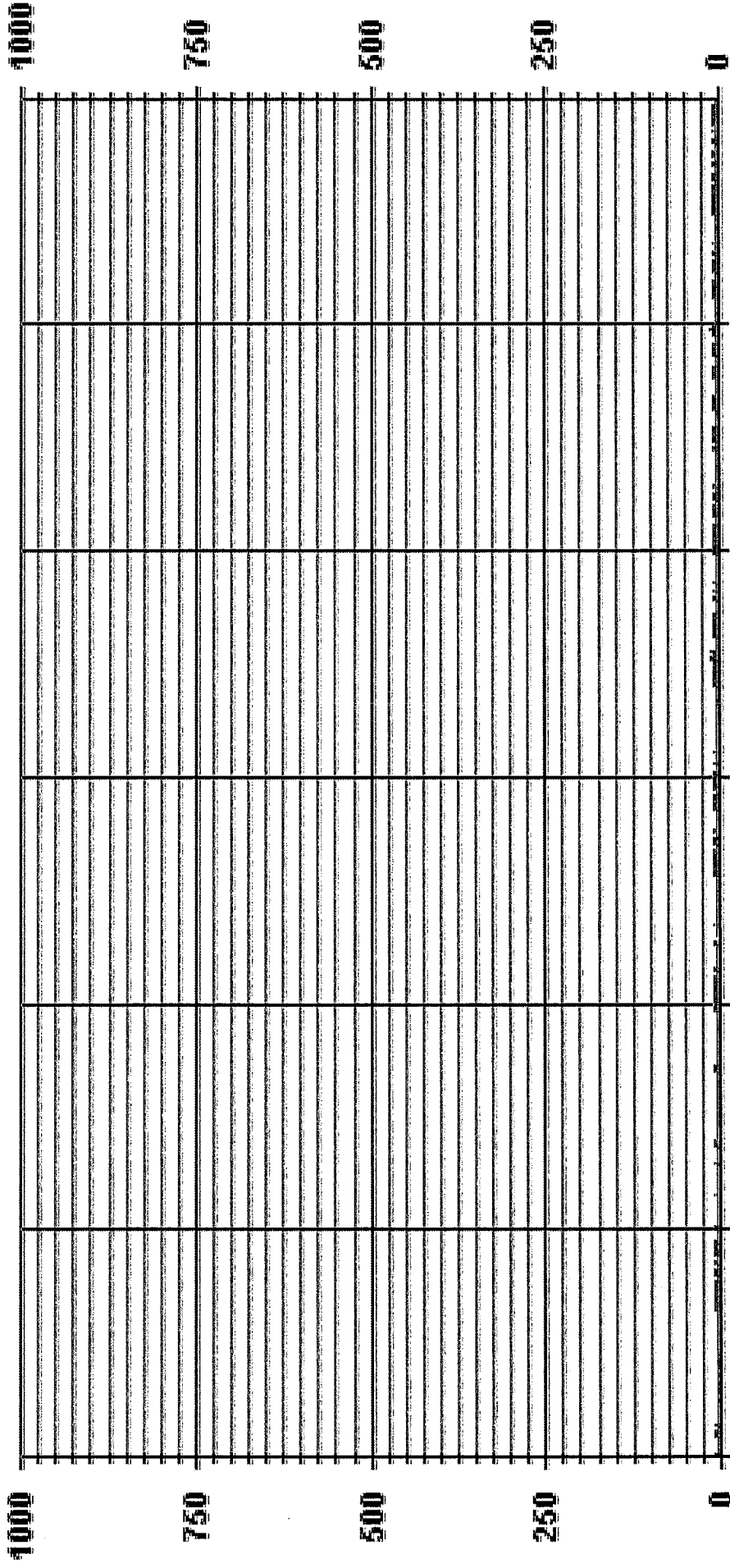
STATUS FLAG CODES: C - CALIBRATION, Q - QUALITY ASSURANCE, Y - MAINTENANCE, R - RECOVERY, S - DAILY ZERO/SPAN CHECK, X - MACHINE MALFUNCTION, P - POWER FAILURE, O - OPERATOR ERROR, G - OUT FOR REPAIR, K - COLLECTION ERROR

MONTHLY SUMMARY: NUMBER OF 1-HR EXCEEDENCES: 0, NUMBER OF 24-HR EXCEEDENCES: 0

NUMBER OF NON-ZERO READINGS:	360
MAXIMUM 1-HR AVERAGE:	7 PPB @ HOUR(S)
MAXIMUM 24-HR AVERAGE:	2.3 PPB
175 CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	3 HRS
STANDARD DEVIATION:	0.91
OPERATIONAL TIME:	720 HRS
AMD OPERATIONAL UPTIME:	100.0 %
MONTHLY AVERAGE:	1 PPB

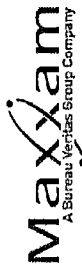


01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA30 SO2_ PPB



SULPHUR DIOXIDE MAX instantaneous maximum in ppb

MST

DAY	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	5	5	7	11	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	5	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	1	0	1	1	0	0	1	1	0	2	3	0	0	1	0	0	0	0	0	0	0	0	0	0
14	1	1	1	2	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	1	1	1	1	1	1	2	2	8	5	0	0	3	5	10	3	0	0	0	0	0	0	0	0
17	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	5	9	9	7	9	1	2	2	2	8	7	6	11	11	12	1	1	1	1	1	1	1	1
19	3	1	3	3	2	1	2	1	2	1	2	1	1	6	5	5	1	1	1	1	1	1	1	1
20	2	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
23	2	5	1	3	0	0	2	2	1	0	12	5	2	1	1	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
25	6	6	2	0	0	0	0	1	1	5	2	2	2	1	1	1	1	1	1	1	1	1	1	1
26	1	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
27	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
29	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
HOURLY MAX	6	6	9	11	7	9	10	13	9	4	12	8	6	11	11	12	2	4	13	10	7	12	7	8
HOURLY AVG	1.3	1.7	1.5	1.7	1.3	1.0	1.3	1.6	1.4	1.0	1.9	1.5	1.6	2.0	2.0	1.4	0.8	1.1	1.9	1.4	1.3	1.4	1.4	1.5

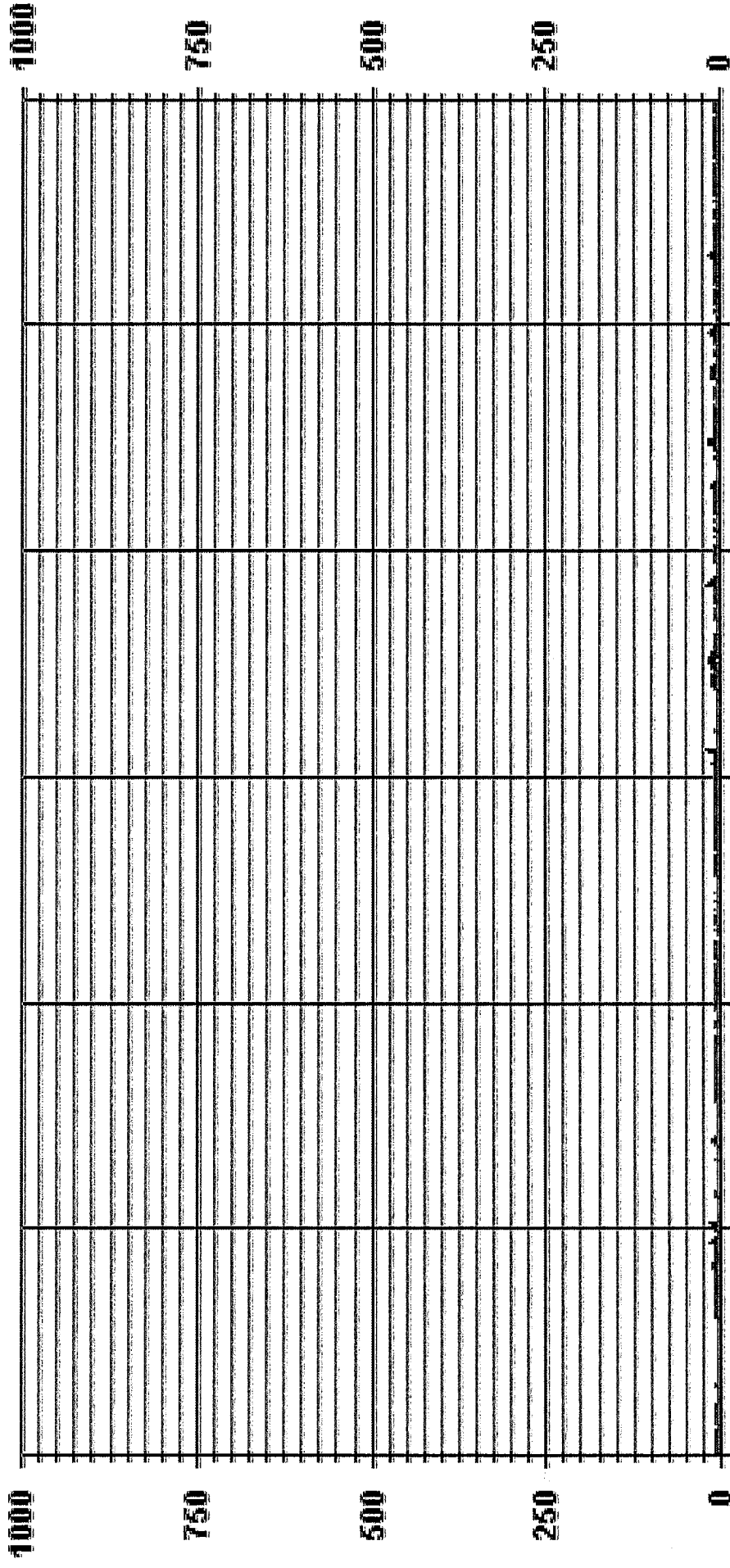
STATUS FLAG CODES

C	- CALIBRATION
Y	- MAINTENANCE
S	- DAILY ZERO/SPAN CHECK
P	- POWER FAILURE
G	- OUT FOR REPAIR
Q	- QUALITY ASSURANCE
R	- RECOVERY
X	- MACHINE MALFUNCTION
O	- OPERATOR ERROR
K	- COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	512
MAXIMUM INSTANTANEOUS VALUE:	13
PPB @ HOUR(S)	18, 7
ON DAY(S)	18, 20
OPERATIONAL TIME:	720 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	2.04
VAR-VARIOUS	

01 Hour Averages



— LICA30 SO2MAX PPB

LICA30
 SO2_ / WDR Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 30
 Site Name : LICA30
 Parameter : SO2
 Units : PFB

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 20	3.36	4.53	5.41	4.68	3.80	1.75	1.46	4.53	4.09	19.47	19.91	5.56	4.09	9.07	3.95	4.24	100.00
< 60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 110	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 170	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 340	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 340	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	3.36	4.53	5.41	4.68	3.80	1.75	1.46	4.53	4.09	19.47	19.91	5.56	4.09	9.07	3.95	4.24	

Calm : .00 %

Total # Operational Hours : 683

Distribution By Samples

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 20	23	31	37	32	26	12	10	31	28	133	136	38	28	62	27	29	683
< 60																	
< 110																	
< 170																	
< 340																	
>= 340																	
Totals	23	31	37	32	26	12	10	31	28	133	136	38	28	62	27	29	

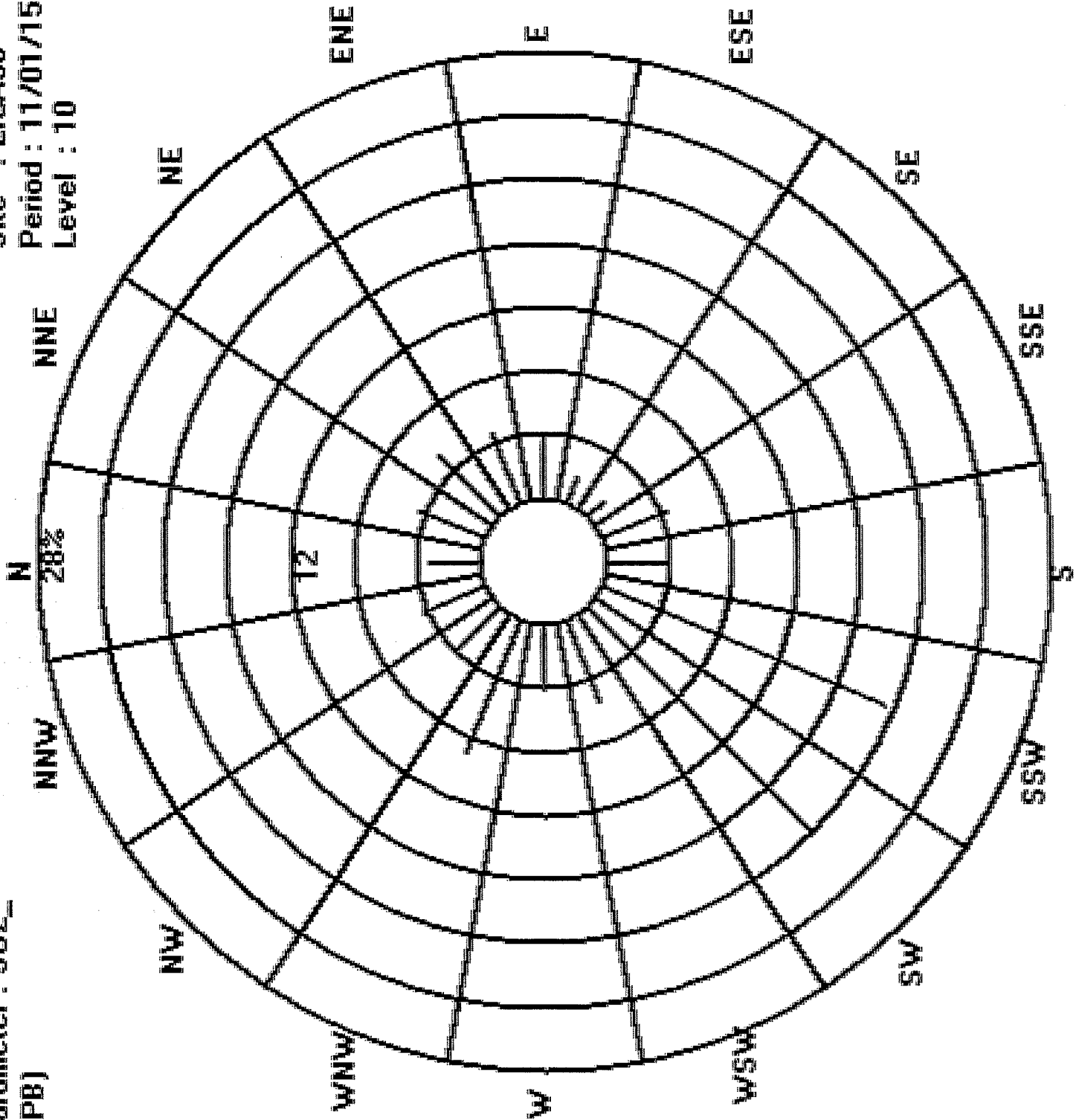
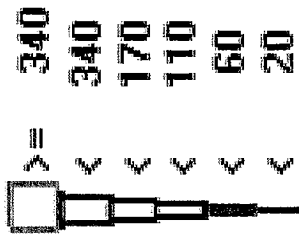
Calm : .00 %

Total # Operational Hours : 683

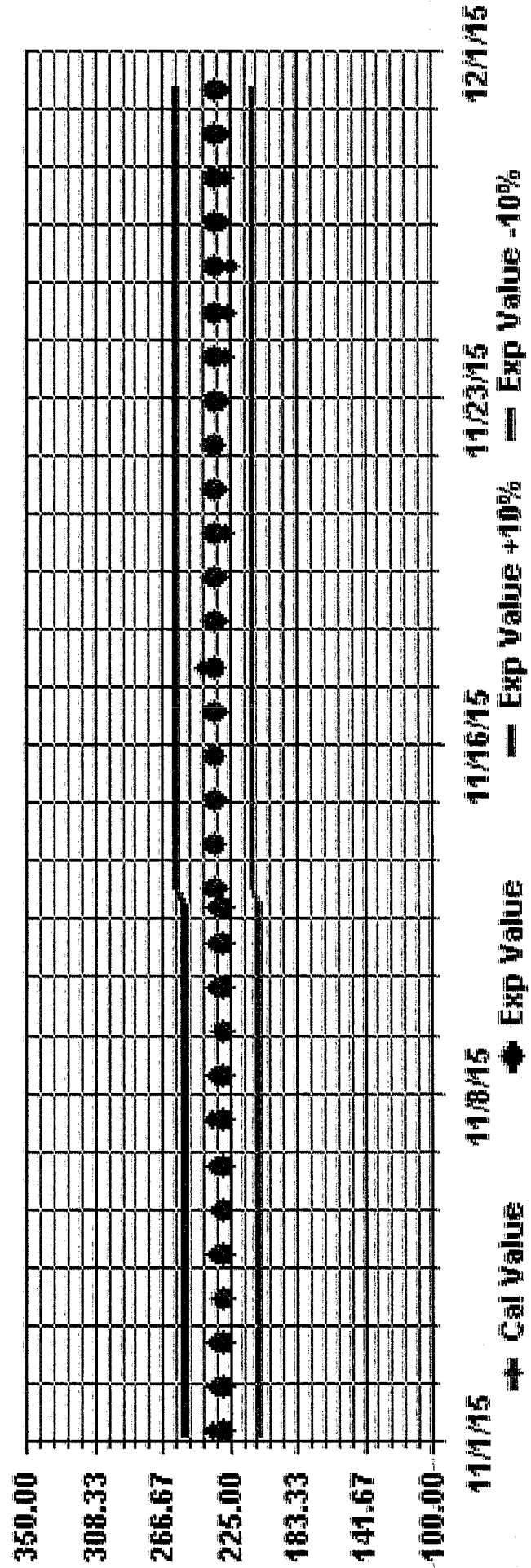
Site : LICA30
 Period : 11/01/15-11/30/15
 Level : 10

Logger : 30 Parameter : SO2_

Class Limits (PPB)

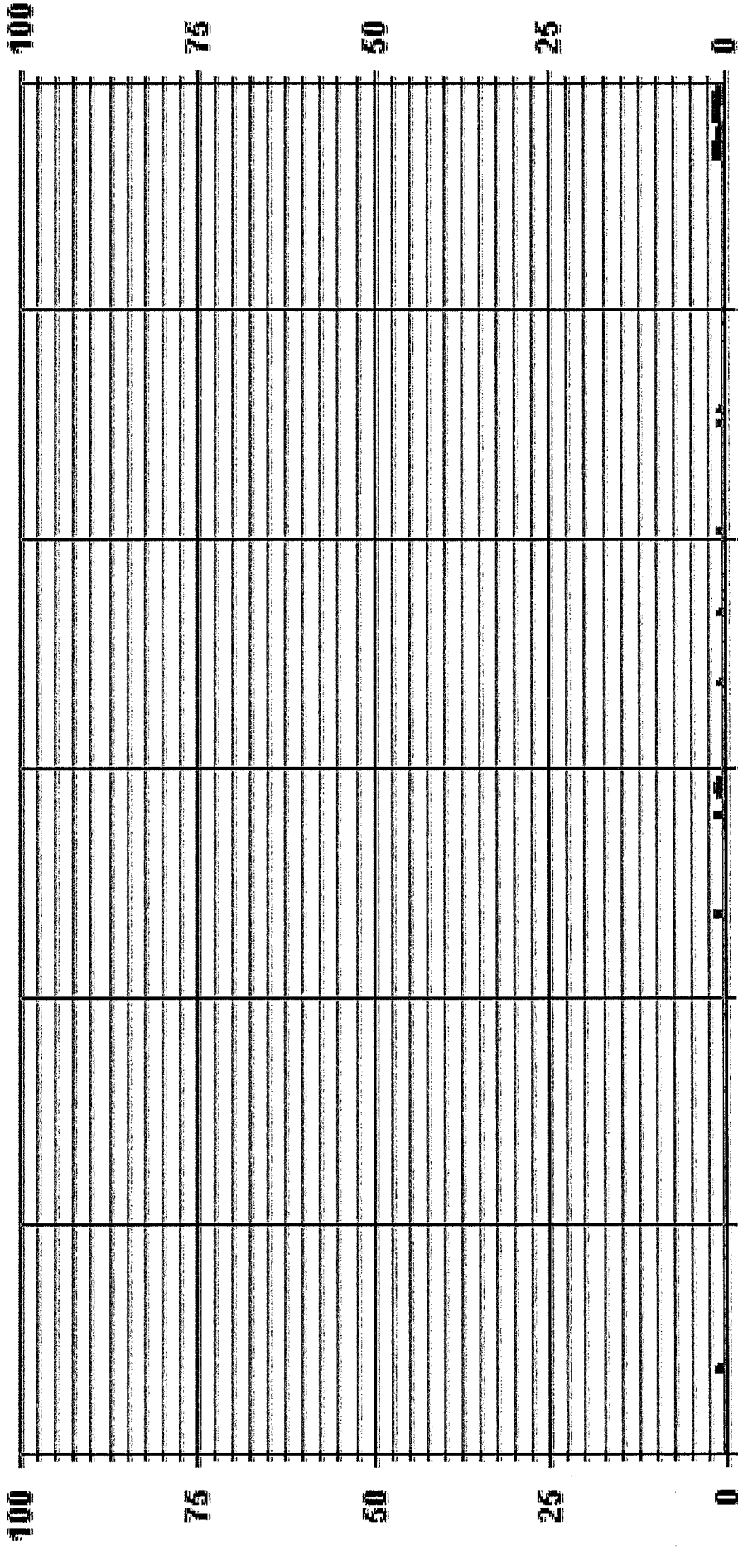


Calibration Graph for Site: LICA30 Parameter: SO2_ Sequence: S02 Phase: SPAN



HYDROGEN SULPHIDE

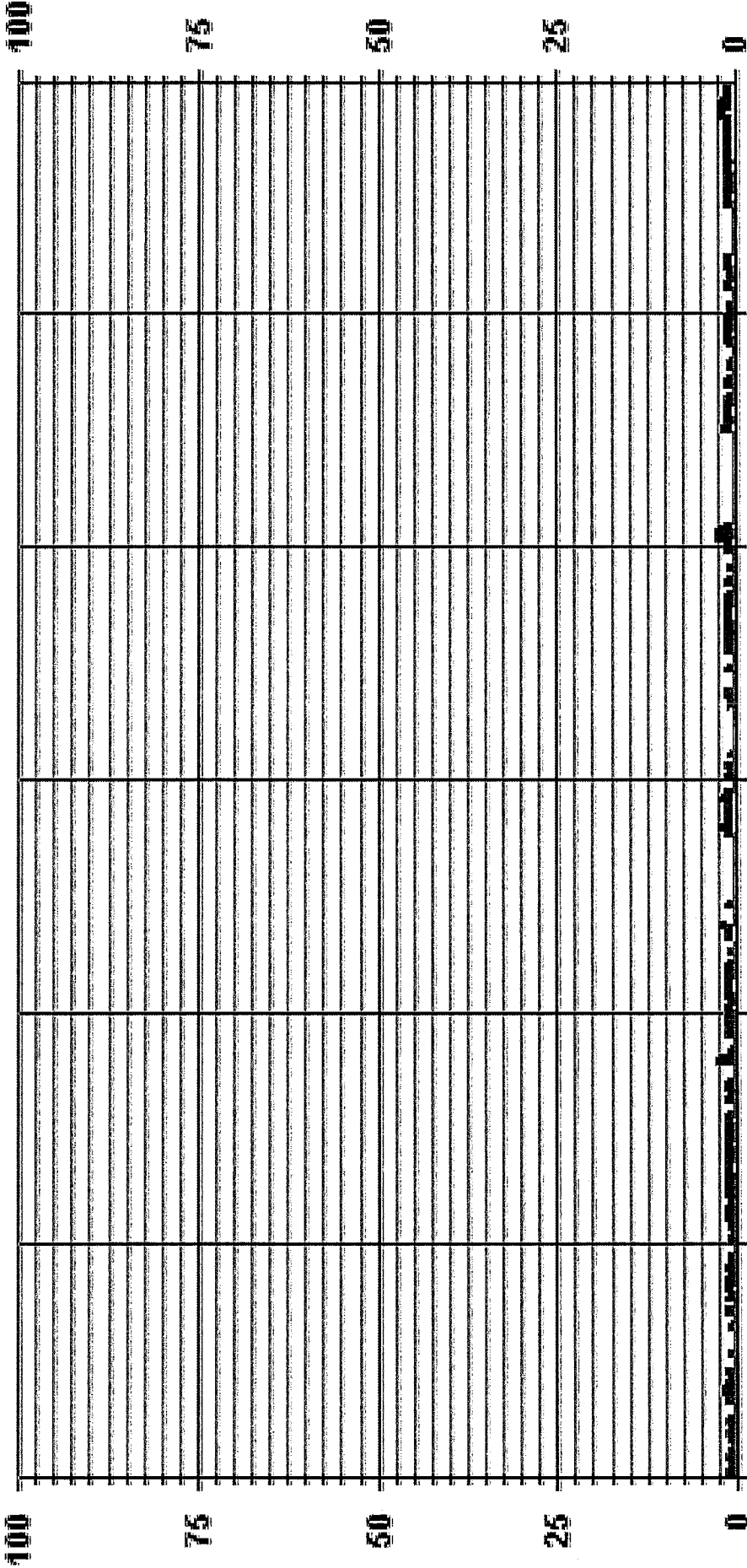
01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA30 H2S_ PPB

01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA30 H2SMAX PPB

LICA30
 HZS_ / WDR Joint Frequency Distribution (Percent)
 November 2015

Distribution By % Of Samples

Logger Id : 30
 Site Name : LICA30
 Parameter : HZS
 Units : PPS

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3	3.37	4.54	5.42	4.69	3.81	1.75	1.46	4.39	4.25	19.20	20.08	5.57	4.10	9.09	3.95	4.25	100.00
< 10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 50	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 50	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	3.37	4.54	5.42	4.69	3.81	1.75	1.46	4.39	4.25	19.20	20.08	5.57	4.10	9.09	3.95	4.25	

Calm : .00 %

Total # Operational Hours : 682

Distribution By Samples





Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 3	23	31	37	32	26	12	10	30	29	131	137	38	28	62	27	29	682
< 10																	
< 50																	
>= 50																	
Totals	23	31	37	32	26	12	10	30	29	131	137	38	28	62	27	29	

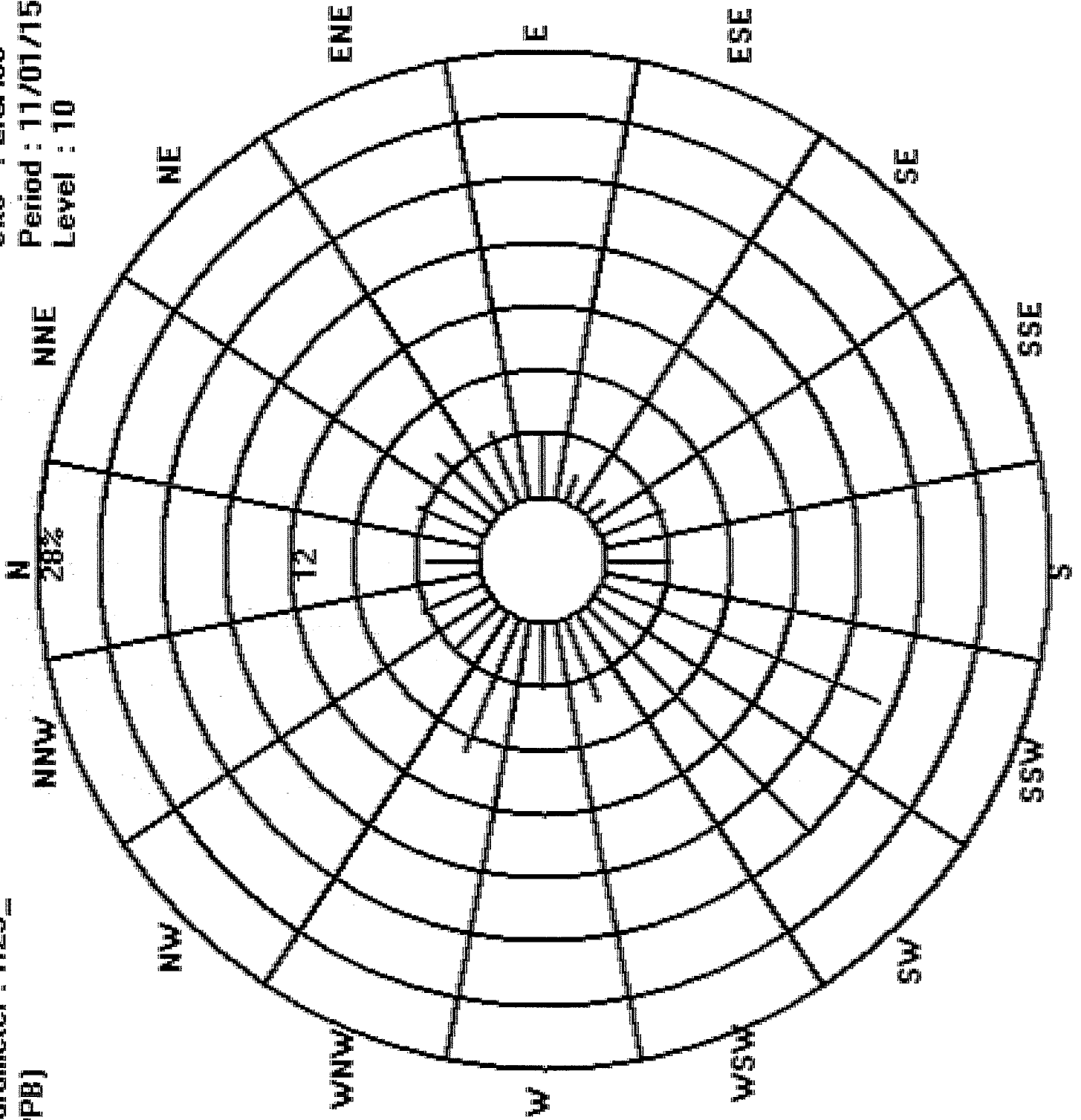
Calm : .00 %

Total # Operational Hours : 682

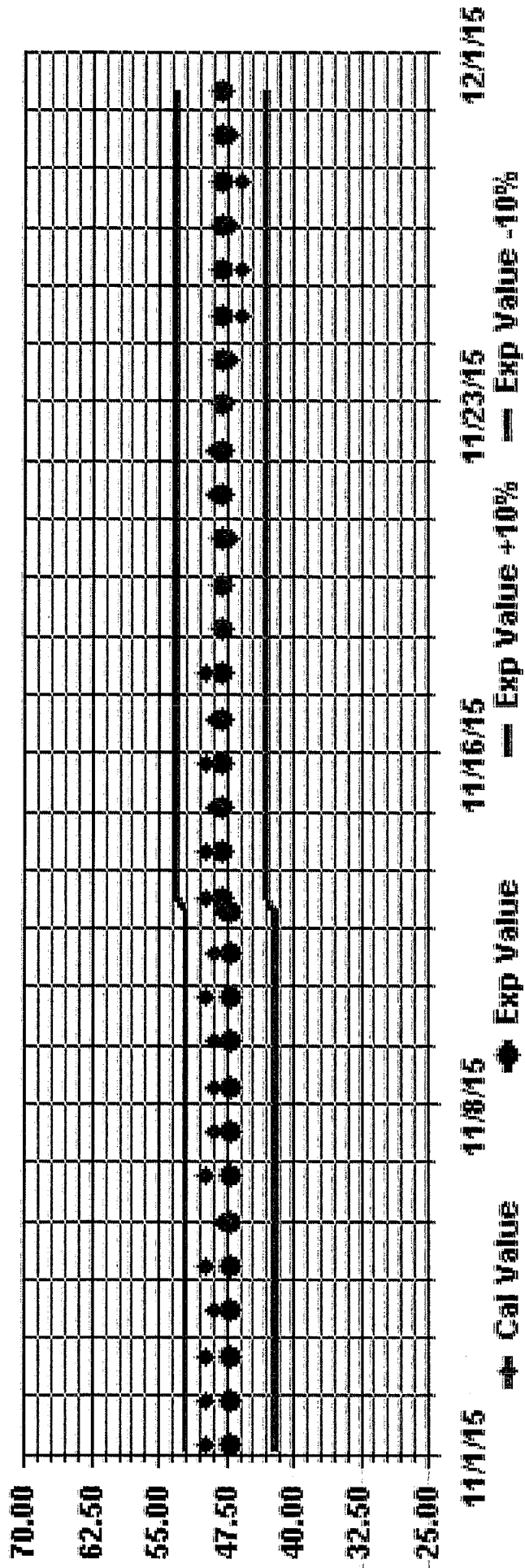
Site : LICA30
Period : 11/01/15-11/30/15
Level : 10

Logger : 30 Parameter : H25_
Class Limits (PPB)

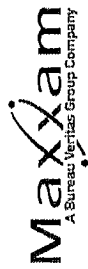
-  >= 50
-  < 50
-  < 10
-  < 3



Calibration Graph for Site: LICA30 Parameter: H2S_ Sequence: H2S Phase: SPAN



TOTAL HYDROCARBON



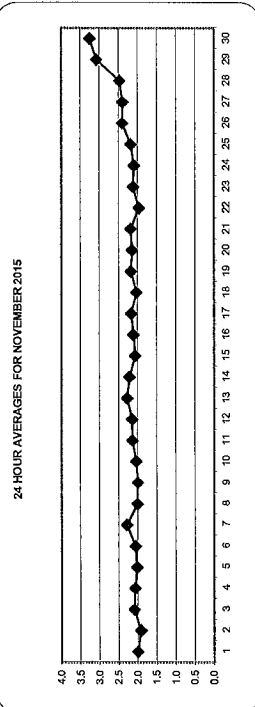
TOTAL HYDROCARBONS (THC) hourly averages in ppm

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	
1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
4	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
5	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
6	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
7	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
8	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
10	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
11	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
12	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.3	2.4	2.3	C	C	C	C	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
13	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
14	2.1	2.1	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
15	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
16	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
17	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
18	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
19	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
20	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
21	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
22	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
23	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
24	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
25	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
26	2.2	2.2	2.3	2.2	2.5	3.0	2.8	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
27	2.5	2.6	2.7	2.8	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
28	2.3	2.3	2.2	2.2	2.3	3.1	2.7	2.7	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
29	2.6	2.7	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
30	3.1	3.0	3.0	3.0	3.1	3.3	3.3	3.3	3.3	3.3	3.2	3.1	2.9	2.8	3.0	3.2	3.4	3.5	3.5	3.4	3.3	3.3	3.3	3.3	3.3	3.3
HOURLY MAX	3.1	3.0	3.0	3.1	2.9	3.3	3.3	3.3	3.3	3.3	3.1	3.0	3.1	3.0	3.2	3.6	3.6	3.6	3.9	4.0	3.6	3.3	3.3	3.4	3.2	3.3
HOURLY AVG	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2

STATUS FLAG CODES

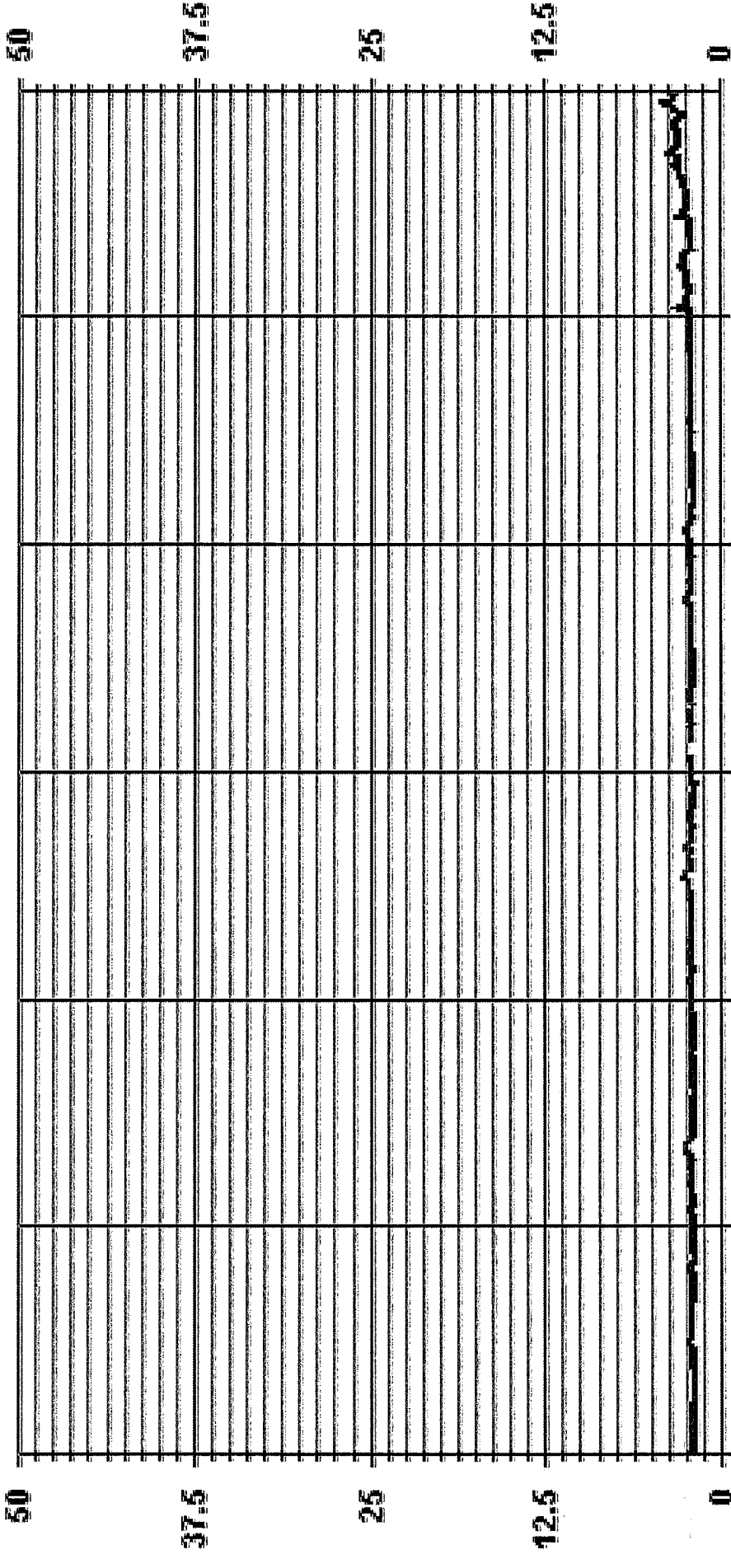
- C - CALIBRATION
- Y - MAINTENANCE
- S - DAILY ZERO/SPAN CHECK
- P - POWER FAILURE
- G - OUT FOR REPAIR
- Q - QUALITY ASSURANCE
- R - RECOVERY
- X - MACHINE MALFUNCTION
- O - OPERATOR ERROR
- K - COLLECTION ERROR



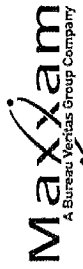
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	675	PPM @ HOUR(S)	17	ON DAY(S)	30
MAXIMUM 1-HR AVERAGE:	4.0	PPM	3.3	ON DAY(S)	VARIOUS
MAXIMUM 24-HR AVERAGE:	3.3	PPM		ON DAY(S)	VARIOUS
ISZ CALIBRATION TIME:	31	HRS		OPERATIONAL TIME:	712
MONTHLY CALIBRATION TIME:	3	HRS		AMD OPERATION UPTIME:	98.9
STANDARD DEVIATION:	0.32			MONTHLY AVERAGE:	2.2

01 Hour Averages



— LICA30 - - - THC . . . PPM



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 Maskwa Site - NOVEMBER 2015
 JOB # 2833-2015-11-30-C

TOTAL HYDROCARBONS MAX instantaneous maximum in ppm

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	DAILY MAX	24-HOUR AVG	RDS.
1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.0	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.4
2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4
3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4
4	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	
5	2.1	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	
6	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	
7	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	
8	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	
9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	
10	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	
11	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	
12	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	
13	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	
14	2.2	2.1	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	
15	2.2	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	
16	2.1	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	
17	2.3	2.3	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	
18	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	
19	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	
20	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	
21	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	
22	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	
23	2.2	2.2	2.1	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	
24	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	
25	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	
26	2.6	2.7	2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.4	
27	2.6	2.7	2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.4	
28	2.3	2.3	2.3	2.2	2.7	3.3	3.1	3.3	3.4	3.3	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	2.4	
29	2.7	2.8	2.8	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.4	
30	3.1	3.1	3.2	3.3	3.3	3.4	3.4	3.3	3.3	3.2	3.1	2.9	3.1	3.3	3.4	3.8	4.1	3.8	3.6	3.7	3.7	3.7	3.7	3.7	3.7	3.7	2.4	
HOURLY MAX	3.1	3.1	3.2	3.3	3.0	3.4	3.4	3.3	3.4	3.3	3.1	3.1	3.1	3.1	3.7	3.8	4.1	4.1	3.8	3.6	3.7	3.7	3.7	3.7	3.7	3.7	3.5	
HOURLY AVG	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	

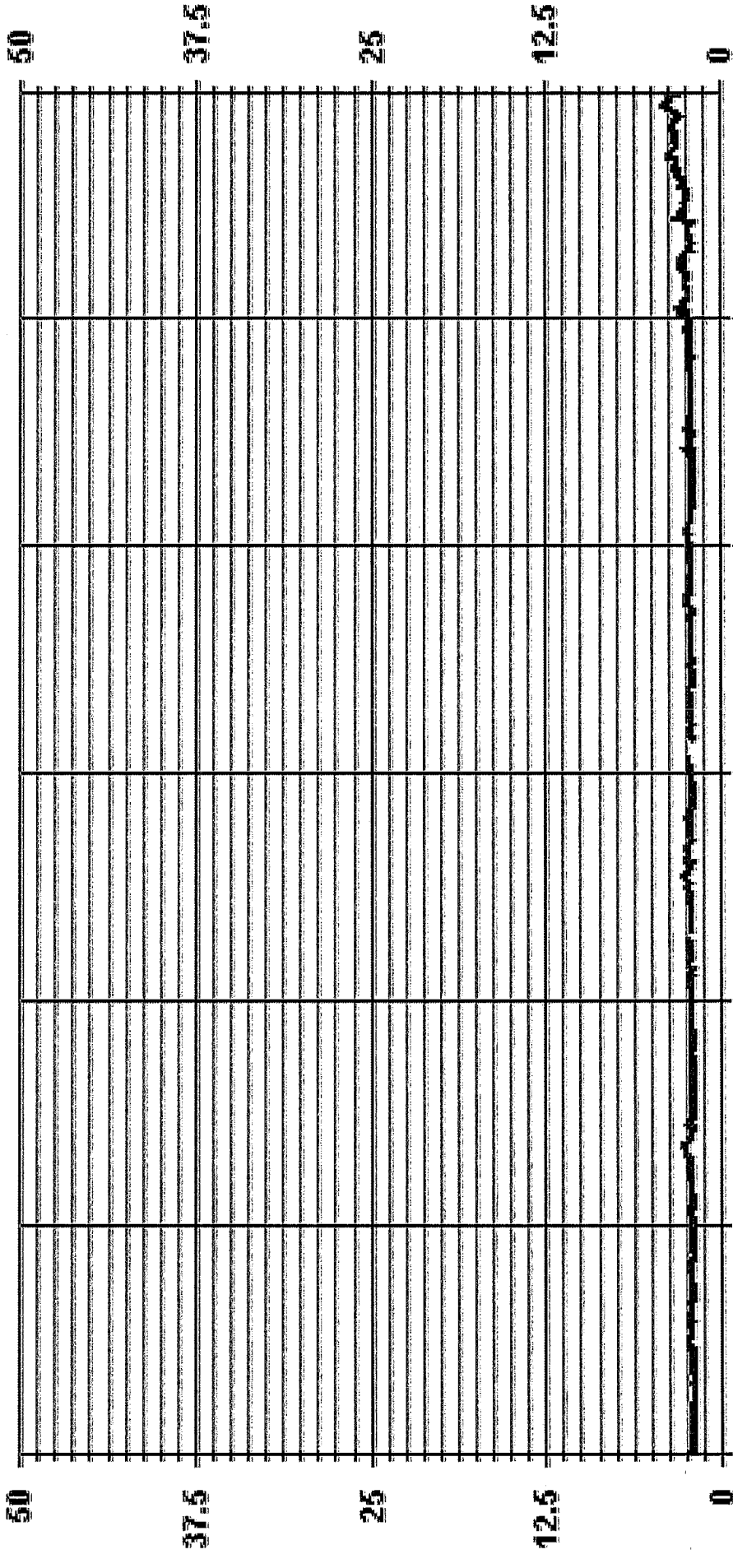
STATUS FLAG CODES

C	- CALIBRATION
Y	- MAINTENANCE
S	- DAILY ZERO/SPAN CHECK
P	- POWER FAILURE
G	- OUT FOR REPAIR
Q	- QUALITY ASSURANCE
R	- RECOVERY
X	- MACHINE MALFUNCTION
O	- OPERATOR ERROR
K	- COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	673
MAXIMUM INSTANTANEOUS VALUE:	4.1 PPM @ HOUR(S) 16, 17 ON DAY(S) 30, 30
IS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	0.35
OPERATIONAL TIME:	VAR-VARIOUS
HRS	712

01 Hour Averages



— LICA30 THC MAX PPM

LIICA30
 THC / WDR Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 30
 Site Name : LIICA30
 Parameter : THC
 Units : PPM

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 3.0	3.40	4.59	5.48	4.74	3.85	1.77	1.48	4.59	4.14	17.62	16.88	5.33	3.85	8.00	4.00	4.29	94.07
< 10.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.07	3.25	.14	.29	.14	.00	.00	5.92
< 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 50.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	3.40	4.59	5.48	4.74	3.85	1.77	1.48	4.59	4.14	19.70	20.14	5.48	4.14	8.14	4.00	4.29	

Calm : .00 %

Total # Operational Hours : 675

Distribution By Samples





Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 3.0	23	31	37	32	26	12	10	31	28	119	114	36	26	54	27	29	635
< 10.0										14	22	1	2	1			40
< 50.0																	
>= 50.0																	
Totals	23	31	37	32	26	12	10	31	28	133	136	37	28	55	27	29	

Calm : .00 %

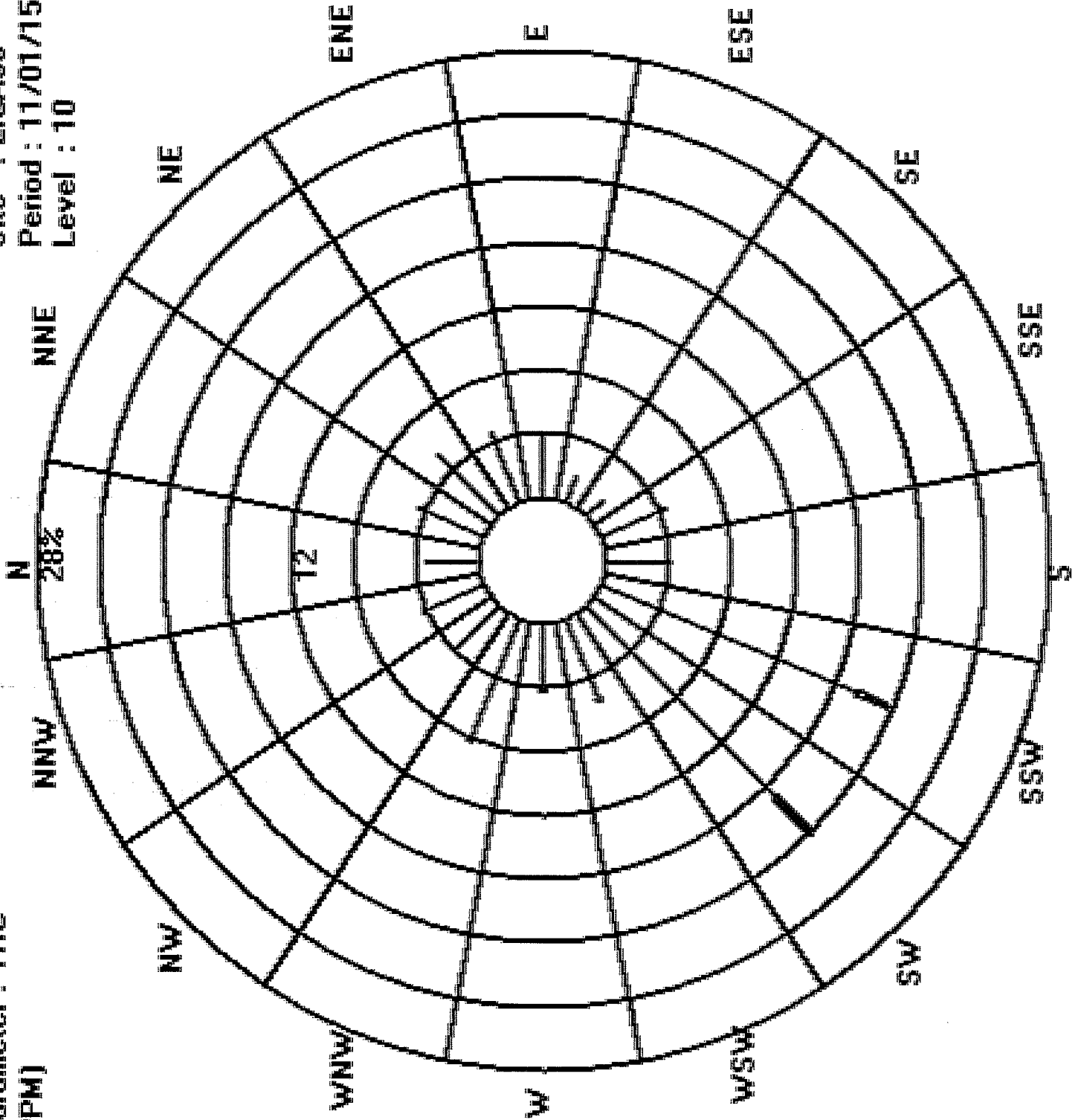
Total # Operational Hours : 675

Logger : 30 Parameter : THC

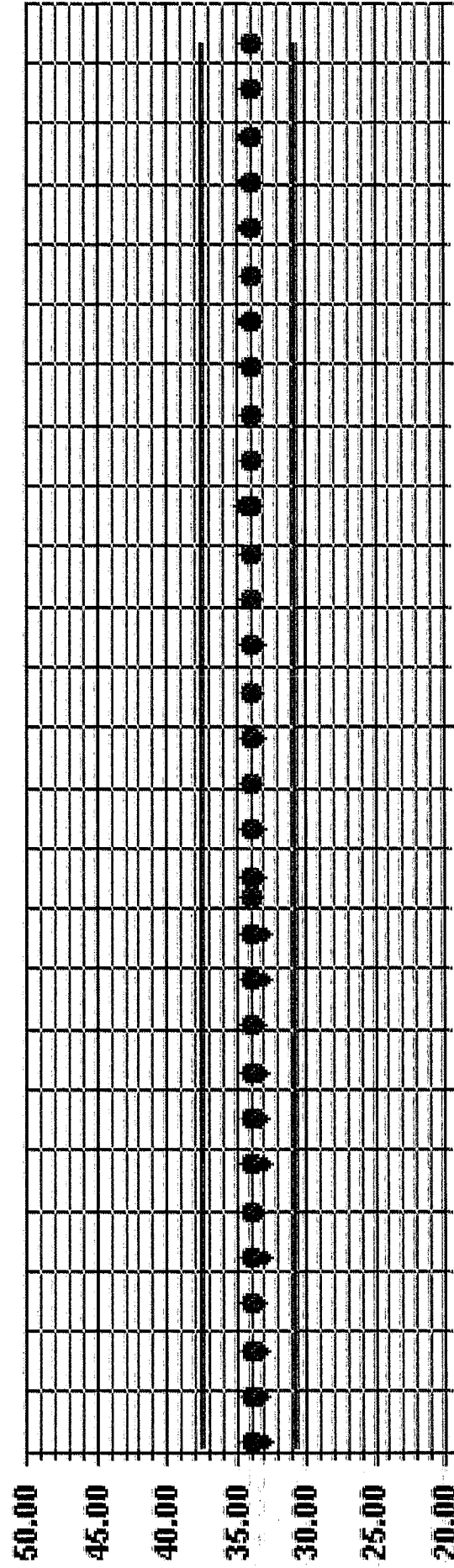
Class Limits (PPM)

-  >= 50.0
-  < 50.0
-  < 10.0
-  < 3.0

Site : LICA30
Period : 11/01/15-11/30/15
Level : 10

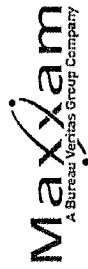


Calibration Graph for Site: LICA30 Parameter: THC Sequence: THC Phase: SPAN



11/1/15 11/8/15 11/16/15 11/23/15 12/1/15
+ Cal Value + Exp Value — Exp Value +10% — Exp Value -10%

OXIDES OF NITROGEN

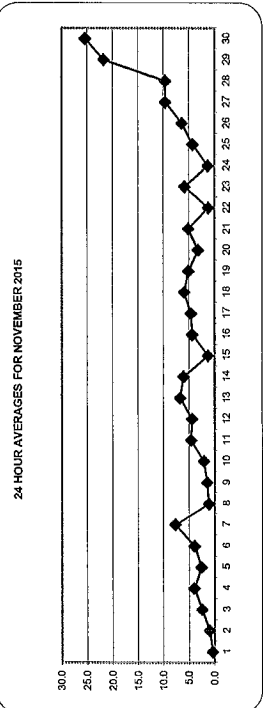


OXIDES OF NITROGEN (NOx) hourly averages in ppb

DAY	MST																								DAILY MAX	24-HOUR AVG	ROGS				
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00							
1	0.7	0.9	1.1	0.9	0.7	\$	1.1	0.4	0.4	0.3	0.3	0.3	0.3	1.3	0.0	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.4	24			
2	0.0	0.0	0.0	0.0	\$	0.8	0.3	0.1	0.2	0.2	0.1	0.8	0.1	1.2	3.0	6.0	4.1	0.3	0.1	0.2	1.1	1.7	2.0	1.5	6.0	1.0	24	24			
3	0.5	0.1	0.1	\$	1.3	0.8	1.0	4.1	2.3	1.9	3.4	6.5	6.6	4.8	2.8	1.7	1.6	1.3	1.4	2.8	2.9	4.6	3.6	6.6	2.5	24	24				
4	3.2	4.1	\$	4.8	3.3	3.4	4.9	7.0	8.8	8.0	8.1	5.7	2.9	2.9	2.4	2.5	2.6	2.5	2.2	3.1	2.5	2.2	3.0	8.8	4.0	24	24				
5	3.0	\$	8.2	7.1	6.5	5.8	11.6	1.3	2.5	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.4	6.2	7.3	0.3	0.0	0.0	0.0	11.6	2.7	24	24				
6	\$	5.7	12.0	7.6	2.7	0.4	1.0	2.9	4.9	5.6	7.6	4.8	2.0	1.4	1.4	1.3	2.1	2.6	3.4	5.1	5.4	4.7	3.3	\$	12.0	4.0	24	24			
7	4.8	4.1	3.7	3.7	3.7	4.0	4.6	9.2	7.8	7.2	8.9	7.6	8.7	9.5	9.0	11.2	11.0	11.4	10.8	9.0	7.7	\$	13.3	7.8	24	24	24				
8	8.9	6.9	1.7	1.2	0.9	0.7	0.5	0.6	1.0	0.7	0.7	0.6	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	\$	1.1	0.4	8.9	1.2	24	24			
9	0.1	0.6	0.5	0.9	0.0	0.2	0.3	0.1	0.1	0.0	0.5	0.3	0.0	0.1	1.5	2.7	3.4	4.3	4.1	1.9	4.2	\$	4.9	3.9	2.3	4.9	1.5	24	24		
10	0.7	0.6	0.5	0.9	0.0	0.7	1.1	1.5	1.9	2.3	2.7	2.4	2.4	2.4	2.7	2.5	2.1	5.1	4.4	5	4.4	3.3	2.8	2.1	5.1	2.2	24	24			
11	1.9	1.5	1.9	3.2	1.8	1.9	2.3	2.5	2.4	3.0	6.4	6.1	5.9	4.5	7.4	7.5	6.7	3.3	\$	8.2	9.9	8.6	6.6	3.7	9.9	4.7	24	24			
12	2.5	3.3	4.6	3.8	1.9	1.9	3.0	11.2	11.4	8.9	C	C	C	C	C	C	4.6	5.4	3.4	3.1	3.7	1.2	2.5	\$	4.5	11.4	4.5	24	24		
13	2.8	2.8	4.4	3.3	3.3	3.3	3.3	4.8	5.7	4.0	4.4	6.0	11.7	6.1	7.8	7.1	13.9	15.4	9.7	9.9	15.9	\$	5.7	4.4	15.9	6.8	24	24			
14	3.9	2.1	8.3	8.5	6.7	4.2	6.1	6.4	13.5	12.6	12.1	9.2	9.7	5.2	5.1	4.8	6.3	4.9	4.0	2.8	\$	2.4	1.8	1.4	13.5	6.2	24	24			
15	1.7	3.0	2.9	2.6	2.1	1.5	1.3	0.7	0.3	0.7	0.4	0.3	0.4	0.3	0.2	0.4	0.2	4.6	1.5	5	3.2	1.0	0.7	0.4	4.6	1.3	24	24			
16	0.4	1.4	4.2	3.8	1.8	9.3	6.0	6.2	10.3	2.2	1.6	1.5	6.4	9.0	11.8	5.9	1.6	2.3	\$	3.9	3.5	4.5	2.2	2.4	11.8	4.4	24	24			
17	4.4	3.8	2.8	2.0	2.1	2.9	3.0	3.6	3.9	3.5	Q	Q	Q	Q	7.8	10.0	\$	9.5	7.1	5.9	6.3	3.8	2.7	10.0	4.7	24	24	24			
18	0.5	1.0	11.0	7.4	10.3	9.2	2.7	8.7	4.7	9.9	15.0	10.2	6.4	10.2	7.8	11.9	\$	11	7.4	0.5	0.5	0.2	0.9	0.3	15.0	6.0	24	24	24		
19	2.4	0.0	2.1	3.4	1.5	1.5	2.5	2.9	4.4	7.0	5.0	3.1	1.4	6.2	11.0	\$	15.1	10.1	6.1	4.7	5.1	6.7	7.1	9.7	15.1	5.2	24	24	24		
20	2.0	7.0	4.7	4.1	3.6	2.7	3.2	7.1	5.1	2.2	4.2	0.3	0.2	0.4	\$	3.2	6.4	2.7	2.3	2.0	2.6	3.1	3.4	7.1	3.3	24	24	24			
21	4.0	3.9	4.3	4.8	5.8	8.6	11.6	10.3	11.0	10.7	6.0	7.2	7.4	\$	5.7	1.8	2.5	4.5	3.8	2.6	2.5	0.7	0.0	0.0	11.6	5.2	24	24	24		
22	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.1	0.4	0.1	4.8	6.8	\$	3.5	0.8	2.1	0.5	0.6	0.7	4.7	0.9	0.8	0.2	1.0	6.8	1.3	24	24	24		
23	1.6	16.0	5.4	12.5	3.8	0.4	11.4	18.4	14.7	7.4	7.8	\$	1.5	3.2	1.3	1.7	2.9	6.7	6.0	5.9	4.6	2.0	0.7	0.4	0.2	18.4	5.9	24	24	24	
24	0.1	0.2	0.5	0.7	0.6	1.1	2.4	1.6	2.4	1.8	\$	5.1	5.9	6.9	6.1	4.8	3.1	7.6	5.6	9.6	6.7	1.6	9.4	4.0	3.6	9.6	4.3	24	24	24	
25	2.9	3.6	2.8	0.5	0.9	0.4	1.1	5.0	2.5	\$	6.0	9.4	5.8	4.4	4.1	5.5	6.4	6.2	7.4	8.0	7.2	6.8	7.6	6.1	6.5	15.2	6.4	24	24	24	
26	8.5	11.3	15.7	17.3	19.5	18.3	20.3	\$	14.4	22.9	17.0	8.3	0.6	11.4	7.6	9.7	2.0	8.2	6.9	1.5	0.0	0.0	0.0	0.0	22.9	9.6	24	24	24		
27	0.0	0.0	0.4	2.1	1.0	19.2	\$	10.6	10.6	8.8	9.3	9.6	11.1	14.7	13.3	11.0	12.0	10.3	9.8	10.2	10.0	13.6	18.7	16.8	19.2	9.7	24	24	24		
28	14.1	17.1	19.0	23.2	21.1	\$	26.4	30.5	32.5	23.2	25.1	21.4	15.6	19.3	28.2	31.2	30.6	24.1	18.6	14.7	17.2	17.3	16.8	13.1	32.5	21.8	24	24	24		
29	13.2	11.4	11.9	9.4	\$	10.2	13.0	24.5	33.5	40.8	36.6	30.0	31.0	32.4	33.2	33.6	37.7	39.7	31.9	26.6	23.8	24.2	19.0	17.0	40.8	25.4	24	24	24		
30	14.1	17.1	19.0	23.2	21.1	19.2	26.4	30.5	33.5	40.8	36.6	30.0	31.0	32.4	33.2	33.6	37.7	39.7	31.9	26.6	23.8	24.2	19.0	17.0	40.8	25.4	24	24	24		
HOURLY MAX	5.1	3.9	4.7	4.8	4.0	4.6	5.6	6.7	7.4	7.0	7.4	5.9	5.5	6.0	6.6	6.6	6.3	6.9	6.3	6.1	5.5	5.0	4.9	4.3	4.2						
HOURLY AVG																															

STATUS FLAG CODES

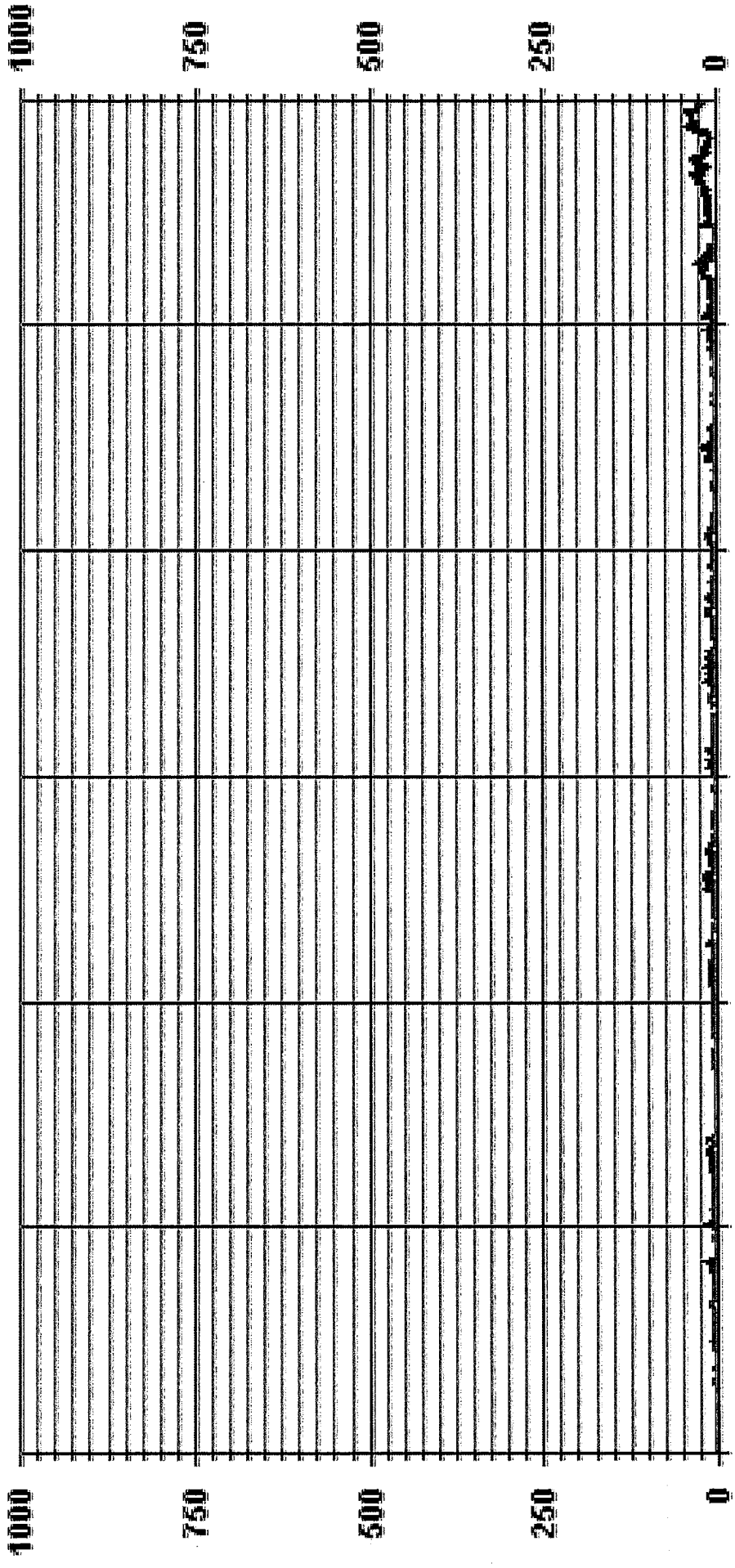
C	- CALIBRATION	Q	- QUALITY ASSURANCE
Y	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE/ALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR



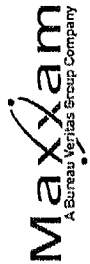
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	640				
MAXIMUM 1-HR AVERAGE:	40.8	PPB	@ HOUR(S)	9	ON DAY(S)
MAXIMUM 24-HR AVERAGE:	25.4	PPB			VAR- VARIOUS
1/25 CALIBRATION TIME:	31	HRS	OPERATIONAL TIME:		720 HRS
MONTHLY CALIBRATION TIME:	5	HRS	AMD OPERATION UPTIME:		100.0 %
STANDARD DEVIATION:	6.63		MONTHLY AVERAGE:		5.5

01 Hour Averages



— LICA30 NOX_ PPB



OXIDES OF NITROGEN MAX instantaneous maximum in ppb

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MAX	24-HOUR AVG	RDS5	
1	1.4	1.4	1.7	1.6	1.1	5	2.3	0.8	0.9	0.7	0.9	0.7	0.8	5.8	0.5	0.8	2.2	0.5	0.5	0.6	0.4	0.4	0.4	0.4	5.8	1.2	24	
2	0.3	0.3	0.3	0.4	5	1.9	0.8	0.7	0.7	0.8	0.6	0.6	3.1	0.6	4.5	10.4	9.9	7.6	1.2	0.6	0.7	2.7	3.7	4.0	2.7	10.4	2.5	24
3	1.5	0.7	0.7	5	2.4	1.4	2.4	5.0	6.6	5.8	3.1	4.2	9.6	9.2	6.9	4.2	3.7	2.1	2.1	2.1	3.7	4.7	5.4	5.4	9.6	4.1	24	
4	4.2	5.6	5	6.7	4.2	4.1	6.9	10.9	11.3	9.7	9.1	8.3	4.1	3.4	3.9	3.2	3.4	3.0	2.7	4.0	3.9	3.2	3.2	3.5	11.3	5.3	24	
5	3.9	5	12.6	8.5	7.2	8.7	30.2	2.4	7.0	0.6	0.7	0.9	1.5	1.3	0.9	1.1	1.3	5.8	27.9	9.8	0.9	1.1	0.0	30.2	6.9	24		
6	5	16.0	17.0	22.1	11.6	2.4	3.1	7.6	6.2	7.4	8.5	7.4	3.0	3.1	2.5	2.0	3.3	3.1	5.4	5.6	6.2	6.2	3.8	5	22.1	7.0	24	
7	5.8	4.9	4.3	4.3	4.2	4.8	5.8	20.6	10.2	8.1	10.2	9.0	12.8	11.6	11.3	10.0	13.8	12.1	13.0	12.6	10.6	9.3	5	19.8	20.6	10.0	24	
8	16.2	14.3	3.0	2.0	1.6	1.3	1.1	1.2	2.8	1.4	1.2	1.3	1.0	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	2.4	1.0	16.2	2.5	24	
9	0.7	0.4	0.4	0.4	0.8	0.8	0.7	0.6	0.6	1.9	0.8	0.4	1.3	2.7	3.7	4.0	6.4	10.6	2.8	5.6	5	5.9	4.9	4.0	10.6	2.6	24	
10	1.4	0.9	0.9	1.5	1.7	1.1	1.6	3.5	2.2	2.7	3.0	3.5	3.1	2.9	5.1	3.3	2.7	6.5	6.1	5	6.2	4.1	3.5	2.8	6.5	3.1	24	
11	2.6	2.0	4.0	4.0	2.8	2.8	6.2	4.0	3.9	4.1	8.8	8.8	9.0	6.7	59.2	12.4	48.8	4.9	5	9.5	11.4	10.9	7.8	5.9	59.2	10.5	24	
12	3.8	5.3	5.6	4.6	3.0	2.5	13.1	14.2	34.3	C	C	C	C	C	C	7.9	6.1	5.9	5.3	5.3	2.7	3.4	5	5.7	34.3	7.6	24	
13	3.7	3.6	5.5	4.1	4.1	4.2	5.9	9.9	5.4	5.2	5.1	11.1	16.8	8.9	11.7	9.6	18.4	17.6	12.5	14.2	17.8	5	7.6	7.4	18.4	9.1	24	
14	7.7	3.3	12.8	9.3	9.2	4.9	7.7	25.4	16.7	16.0	10.3	13.3	8.9	7.1	6.9	7.2	6.8	4.7	3.9	5	3.9	2.8	2.3	25.4	8.6	24		
15	2.8	3.6	3.4	3.1	2.6	2.1	1.9	1.6	0.9	3.5	2.2	0.9	1.9	1.5	0.7	2.6	1.6	11.4	3.5	5	10.6	1.5	1.3	0.9	11.4	2.9	24	
16	0.9	4.9	7.8	9.5	5.3	15.5	14.0	24.6	19.8	6.5	30.5	5.7	11.7	16.6	24.0	10.9	3.8	3.7	3	5.9	5.1	5.7	3.0	30.5	10.4	24		
17	7.0	6.3	3.5	2.7	2.5	3.8	3.7	4.3	4.8	4.4	Q	Q	Q	Q	8.7	17.2	5	12.1	8.0	6.8	7.4	7.0	4.7	17.2	6.4	24		
18	1.6	13.1	21.7	23.1	20.5	18.2	11.7	13.4	12.5	13.9	23.7	35.1	13.2	21.6	20.9	21.1	5	5.1	22.5	2.0	2.9	1.2	3.9	2.3	35.1	14.1	24	
19	6.5	0.5	6.4	6.4	3.4	2.4	3.7	4.6	7.0	10.0	5.9	5.6	2.7	15.3	14.6	5	49.5	21.2	7.3	5.6	6.3	9.2	15.1	15.0	49.5	9.7	24	
20	5.3	8.5	6.8	4.9	5.2	3.4	4.9	27.5	17.9	9.1	8.4	3.1	1.3	2.7	5	9.7	15.1	4.3	22.6	2.8	3.2	4.1	4.0	4.3	27.5	7.8	24	
21	4.8	4.5	4.9	5.5	6.9	10.2	64.3	12.4	20.9	37.0	9.7	11.0	9.1	5	43.0	5.0	3.5	6.7	6.6	5.6	3.4	1.6	0.6	0.5	64.3	12.1	24	
22	0.2	0.3	1.3	0.2	0.1	0.3	3.5	4.6	1.6	1.0	17.3	12.2	5	6.7	4.1	51.2	1.4	1.1	2.1	11.1	3.6	2.1	1.8	4.0	51.2	5.7	24	
23	13.9	28.7	13.6	18.2	13.6	1.5	20.9	29.1	16.0	14.1	16.9	5	6.0	2.2	2.8	6.9	8.1	6.8	7.1	5.7	3.5	1.3	0.9	0.7	29.1	10.4	24	
24	0.6	0.8	1.3	1.4	1.4	2.5	3.3	2.5	4.2	2.9	5	2.8	2.4	1.6	2.3	25.8	3.6	1.6	1.9	2.9	6.9	4.1	9.9	8.5	25.8	4.1	24	
25	8.8	8.8	7.1	1.2	1.4	0.9	6.0	9.3	4.2	5	7.6	7.3	10.0	30.2	34.6	9.2	28.6	10.5	13.6	13.1	2.4	19.3	5.7	5.1	34.6	10.6	24	
26	2.9	2.8	1.9	1.8	14.9	16.3	15.8	18.1	5	8.1	48.4	8.3	5.7	6.0	15.8	7.2	9.6	8.8	10.5	8.4	7.5	9.9	7.7	8.0	48.4	10.6	24	
27	10.2	13.1	17.7	18.0	21.0	19.0	22.6	5	12.7	12.8	11.7	10.5	10.9	13.2	17.4	14.5	13.0	21.2	13.0	10.6	10.8	11.0	17.4	27.5	28.4	12.9	24	
28	0.6	1.0	1.3	0.0	11.9	26.4	5	29.1	54.5	35.9	28.4	23.8	21.2	28.1	29.9	33.2	37.1	29.0	21.1	17.3	19.6	20.0	20.2	54.5	26.2	24		
29	17.0	18.9	20.4	25.6	22.5	5	11.5	25.5	39.6	63.0	404.2	69.4	32.1	34.0	34.1	37.9	39.1	42.6	42.8	35.5	28.7	26.4	28.2	21.3	19.1	104.2	34.5	24
30	15.4	14.3	16.3	11.4	5	11.5	25.5	39.6	63.0	404.2	69.4	32.1	34.0	34.1	37.9	39.1	42.6	42.8	35.5	28.7	26.4	28.2	21.3	19.1	104.2	34.5	24	
HOURLY MAX	17.0	28.7	21.7	25.6	22.5	26.4	64.3	54.5	63.0	104.2	69.4	35.1	34.0	34.1	37.9	39.1	42.6	42.8	35.5	28.7	26.4	28.2	27.5	28.4	6.4			
HOURLY AVG	5.2	6.5	7.0	7.0	6.7	6.2	11.0	12.0	12.3	12.6	13.7	9.0	7.8	10.2	14.9	13.1	13.0	9.2	9.5	8.0	7.0	6.8	6.3	6.4				

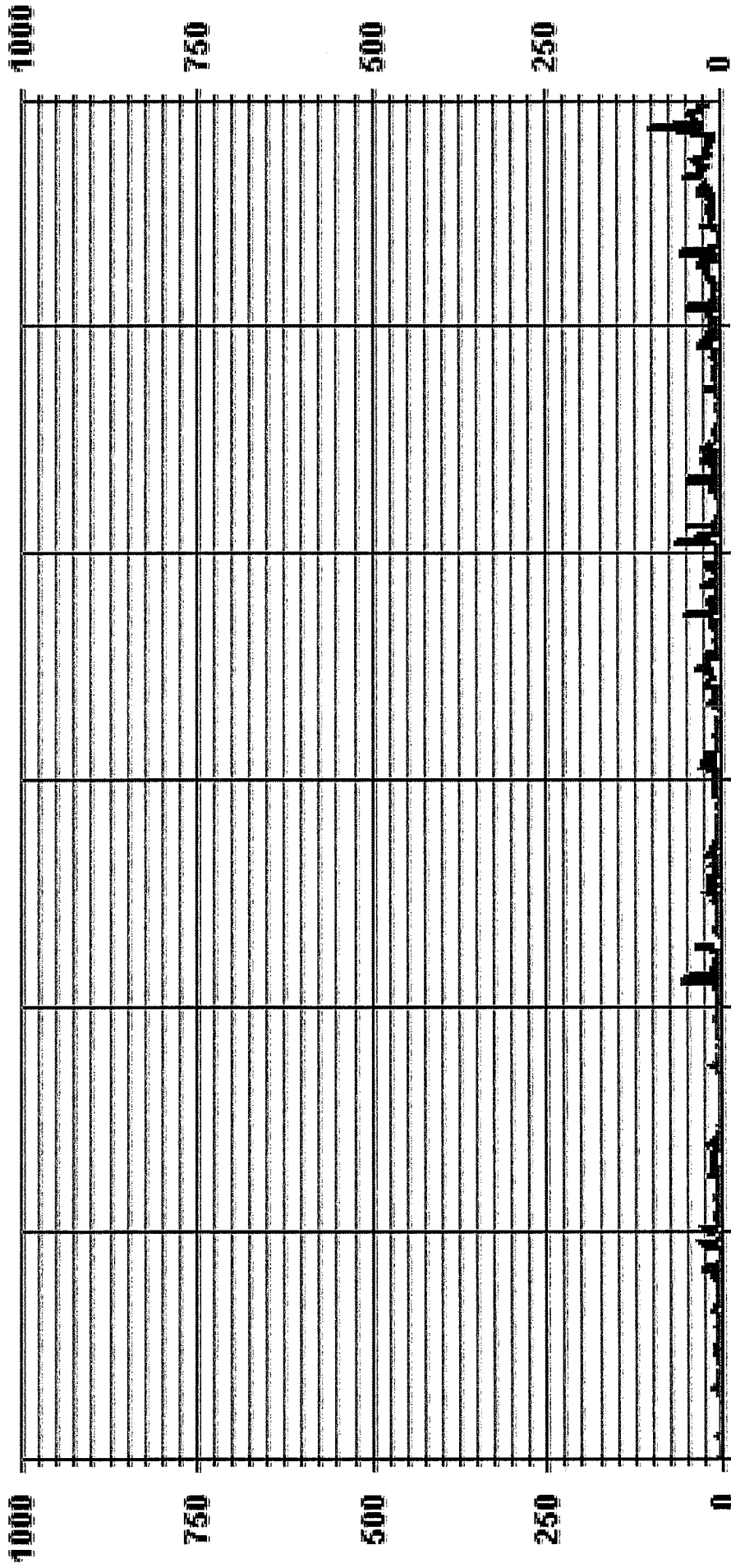
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
Y	MAINTENANCE	R	RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	676
MAXIMUM INSTANTANEOUS VALUE:	104.2
PPB @ HOUR(S)	9
ON DAY(S)	30
VAR- VARIOUS	
OPERATIONAL TIME:	720 HRS
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	6 HRS
STANDARD DEVIATION:	10.89

01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LIC-A30 NOXMAX PPB

LiCA30
 NOX_ / WDR Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 30
 Site Name : LiCA30
 Parameter : NOX
 Units : PPF

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	3.38	4.56	5.44	4.71	3.82	1.76	1.47	4.56	4.12	18.99	20.02	5.59	4.12	9.13	3.97	4.27	100.00
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	3.38	4.56	5.44	4.71	3.82	1.76	1.47	4.56	4.12	18.99	20.02	5.59	4.12	9.13	3.97	4.27	

Calm : .00 %

Total # Operational Hours : 679

Distribution By Samples





Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	23	31	37	32	26	12	10	31	28	129	136	38	28	62	27	29	679
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	23	31	37	32	26	12	10	31	28	129	136	38	28	62	27	29	

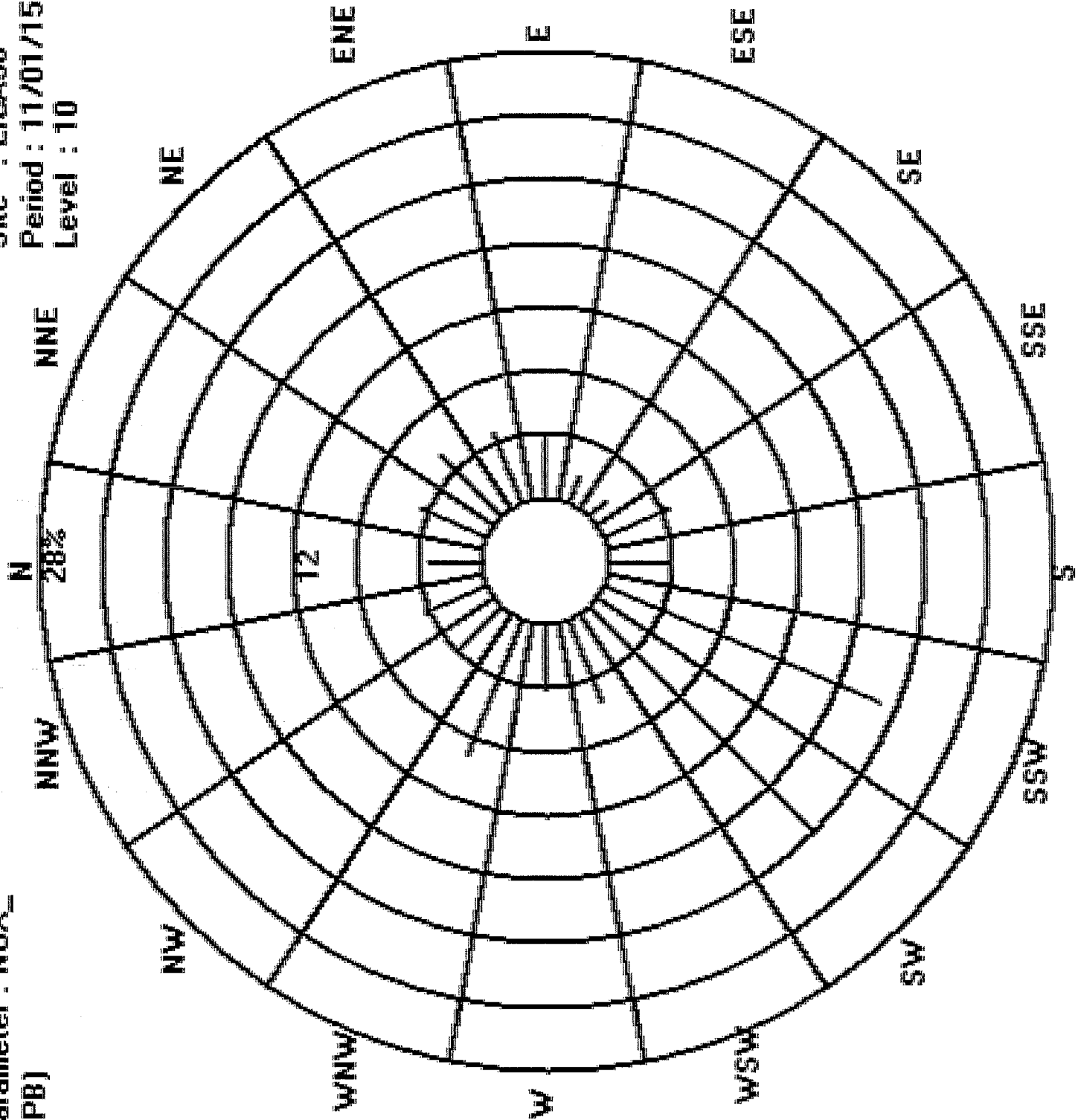
Calm : .00 %

Total # Operational Hours : 679

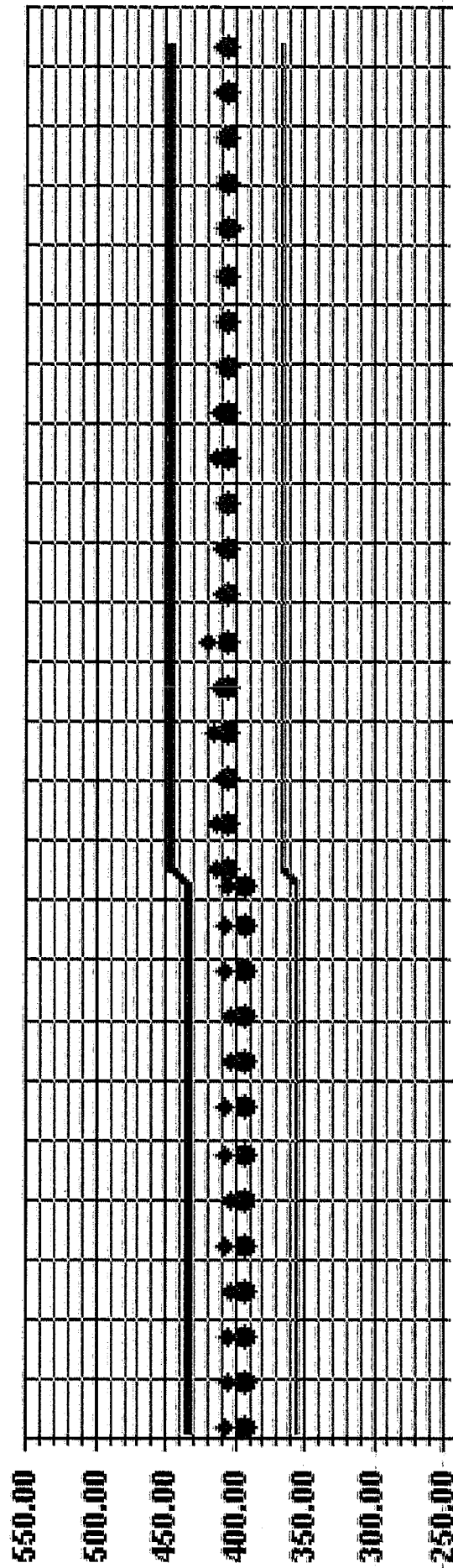
Site : LICA30
Period : 11/01/15-11/30/15
Level : 10

Logger : 30 Parameter : NOX_
Class Limits (PPB)

-  \geq 210.0
-  $<$ 210.0
-  $<$ 110.0
-  $<$ 50.0

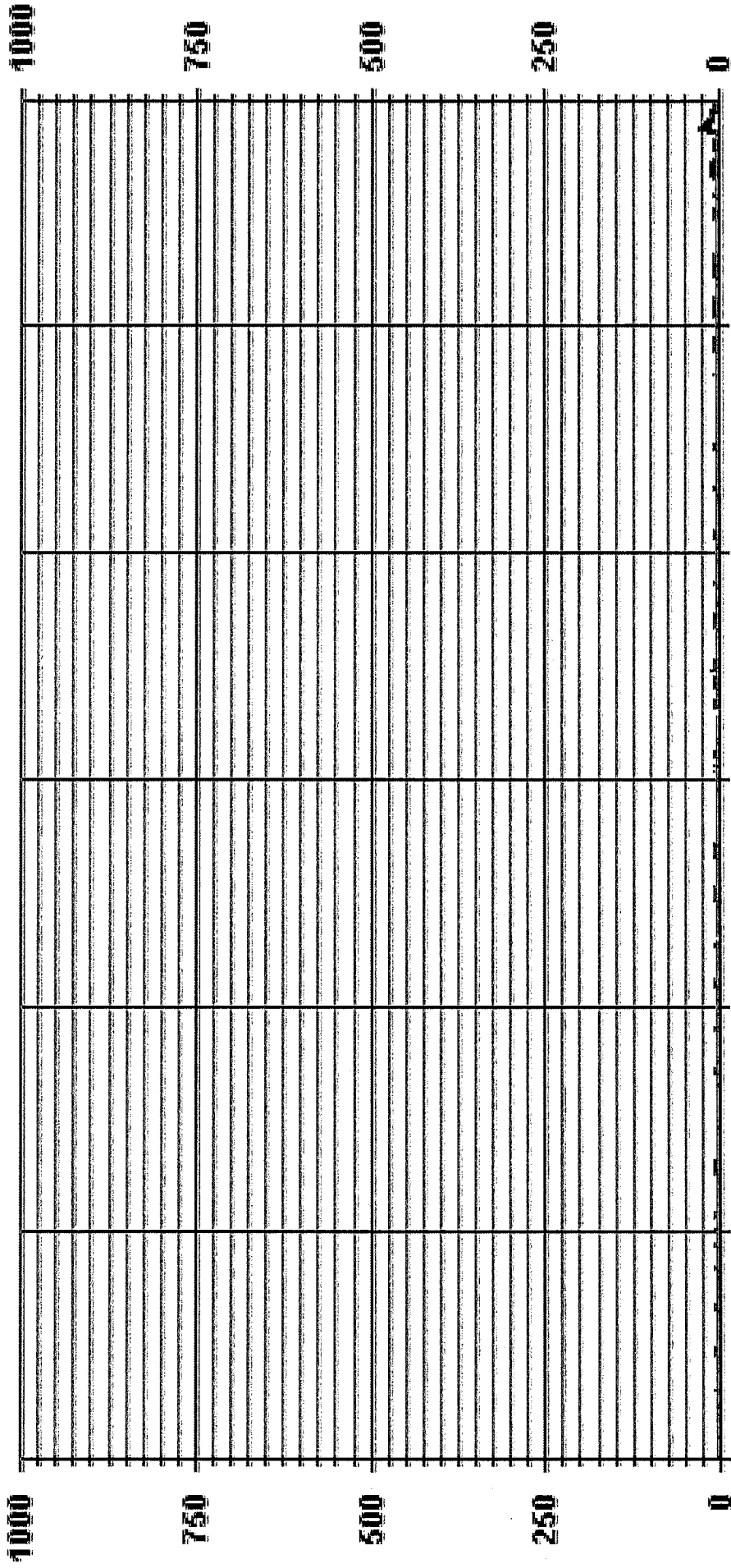


Calibration Graph for Site: LICA30 Parameter: NOX_ Sequence: NO2 Phase: SPAN



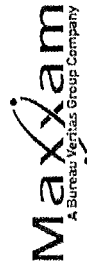
NITRIC OXIDES

01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA30 NO_ PPB



NITRIC OXIDE MAX instantaneous maximum in ppb

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MAX	24-HOUR AVG	ROSS		
1	1.2	1.2	0.9	0.9	0.8	S	1.4	1.3	1.2	1.2	1.2	1.2	1.1	2.1	1.1	1.1	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	2.1	1.1	24	
2	1.1	1.0	0.8	1.1	S	1.4	1.1	1.1	1.1	1.1	1.0	1.8	1.1	1.6	3.4	3.0	2.0	1.1	1.1	1.1	1.2	1.0	1.3	1.4	1.1	3.4	1.4	24	
3	1.0	1.0	1.0	1.2	S	1.5	1.2	1.8	1.6	2.7	4.9	1.8	2.3	4.3	3.9	2.4	1.7	1.8	1.0	1.1	0.8	1.0	1.1	1.1	1.2	4.9	1.8	24	
4	1.2	1.1	S	1.3	1.1	1.0	2.0	3.4	4.5	4.3	4.7	4.1	2.0	1.5	1.3	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	4.7	1.9	24		
5	1.0	S	3.9	1.3	1.4	1.9	1.6	3.0	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	24	
6	S	5.6	6.4	9.3	4.2	1.2	2.2	3.4	2.1	3.2	2.6	2.5	2.0	1.9	1.6	1.4	1.2	1.0	1.1	1.1	1.1	1.1	1.2	1.2	S	9.3	2.6	24	
7	1.5	1.2	1.3	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	24	
8	1.2	1.7	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	24	
9	1.1	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.4	1.0	1.0	1.4	1.7	1.7	1.6	2.2	4.3	1.1	1.1	S	1.3	1.2	1.2	4.3	1.4	24	
10	1.2	1.2	1.1	1.1	1.1	0.8	1.1	1.1	1.1	1.1	1.4	1.4	1.9	1.5	1.6	2.7	1.6	1.1	1.1	1.0	S	1.4	1.3	1.2	1.1	2.7	1.3	24	
11	1.1	1.1	1.1	1.1	1.0	1.0	2.4	2.1	1.8	1.8	3.5	3.5	4.8	3.5	4.8	3.5	4.8	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	24	
12	1.1	1.0	1.2	1.2	1.1	1.1	2.5	3.4	15.1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	1.4	15.1	2.3	24
13	1.1	1.2	1.2	1.1	1.0	1.1	1.0	1.1	1.1	1.1	2.4	2.0	2.3	2.8	5.3	4.2	5.2	1.6	2.6	2.3	1.1	1.4	1.4	S	1.5	1.1	8.5	2.3	24
14	1.2	1.0	1.1	1.0	1.1	1.1	1.1	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	2.6	24
15	1.2	1.2	1.1	1.2	1.1	1.0	1.2	1.0	1.4	1.0	1.4	1.0	1.2	1.4	1.3	1.1	1.3	1.1	2.0	1.2	S	1.6	1.1	1.1	1.1	2.0	1.2	24	
16	1.2	1.2	1.2	1.5	1.2	2.4	2.2	1.1	8.2	2.8	24.5	2.4	5.0	6.6	9.8	3.6	1.2	0.8	S	1.3	1.2	1.2	1.2	1.2	1.1	1.1	24.5	4.1	24
17	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.4	1.4	1.9	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	1.4	1.1	1.1	24
18	1.0	3.4	10.2	10.4	7.8	8.6	4.4	3.4	2.9	4.4	12.1	20.1	5.9	10.6	8.3	8.5	S	2.9	7.0	1.0	1.3	1.2	1.2	1.2	1.2	20.1	6.0	24	
19	1.3	1.1	1.4	1.1	1.1	1.1	1.1	1.2	1.2	1.4	10.4	6.4	4.2	4.0	1.5	1.4	2.5	S	4.7	7.3	1.1	1.1	1.1	1.1	1.1	1.1	4.0	1.5	24
20	1.2	1.2	1.2	1.4	1.2	1.2	1.4	1.2	1.4	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	24
21	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	24
22	0.8	1.0	1.0	1.2	1.0	1.2	2.8	1.0	1.0	1.0	6.3	4.5	S	2.1	1.4	4.5	1.1	1.0	0.9	1.1	1.0	1.1	1.0	1.1	1.0	1.1	45.0	3.5	24
23	1.7	2.6	1.2	1.8	1.3	1.2	1.9	7.6	2.4	3.7	6.2	S	2.4	1.3	1.2	1.3	1.3	1.4	1.2	1.2	1.2	1.2	1.2	1.2	1.2	7.6	2.1	24	
24	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	2.0	1.4	S	1.6	1.4	1.3	1.6	2.2	2.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	2.2	2.5	24	
25	2.7	2.6	1.3	1.3	1.2	1.2	1.9	3.0	1.6	S	3.8	3.6	4.7	22.0	23.4	3.8	14.3	3.6	3.1	4.3	1.2	3.1	1.2	1.2	1.2	23.4	4.8	24	
26	1.3	1.2	1.3	1.2	1.7	1.7	2.9	5.9	S	2.8	33.8	3.1	2.7	2.8	7.6	2.0	2.8	1.4	3.1	1.2	1.3	1.1	1.1	1.1	1.1	33.8	3.8	24	
27	1.4	1.5	1.7	1.7	1.7	1.6	3.1	S	4.3	12.4	7.7	6.1	2.0	7.6	13.7	33.6	1.4	4.5	1.2	1.1	1.1	1.1	1.1	1.1	1.1	33.6	4.9	24	
28	1.2	1.2	1.2	1.2	1.1	1.9	S	1.4	2.2	3.5	3.8	4.5	5.1	6.3	4.5	2.8	6.4	1.6	1.2	1.2	1.4	1.4	1.4	2.6	3.0	6.4	2.6	24	
29	1.3	1.4	1.4	2.3	1.6	S	2.9	28.7	10.5	9.8	13.1	10.7	8.8	12.9	12.9	11.3	11.5	5.8	1.8	1.4	1.7	1.5	1.9	1.8	28.7	6.8	24		
30	1.5	1.5	1.5	1.8	S	2.2	16.0	17.6	41.3	82.6	47.6	14.9	16.6	15.9	14.4	15.3	11.7	12.1	6.8	2.8	6.8	8.6	3.0	3.5	82.6	15.0	24		
HOURLY MAX	2.7	5.6	10.2	10.4	7.8	8.6	40.4	28.7	41.3	82.6	47.6	20.1	16.6	22.0	48.3	45.0	38.0	12.1	11.4	11.4	6.8	8.6	8.6	3.2	3.5				
HOURLY AVG	1.2	1.5	1.8	1.9	1.5	1.6	4.2	4.5	5.1	6.9	7.6	4.3	3.8	4.9	7.6	6.6	5.4	2.4	2.4	1.7	1.6	1.6	1.6	1.5	1.5				

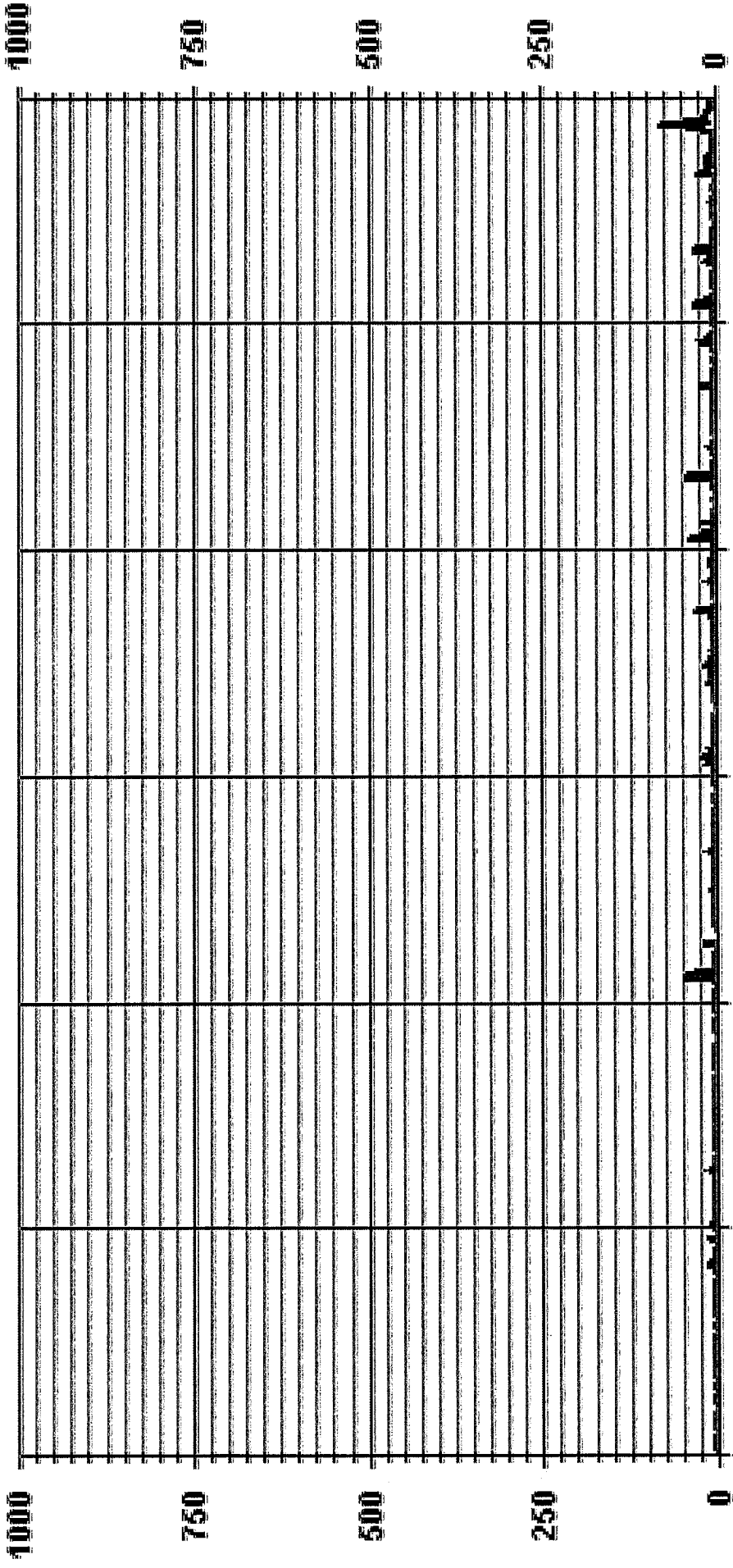
STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
Y	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE/MAINTENANCE
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	678	PPB	@ HOUR(S)	9	ON DAY(S)	30
MAXIMUM INSTANTANEOUS VALUE:	82.6	PPB	@ HOUR(S)	9	ON DAY(S)	30
VAR- VARIOUS						
12S CALIBRATION TIME:	31	HRS	OPERATIONAL TIME:	720	HRS	
MONTHLY CALIBRATION TIME:	6	HRS				
STANDARD DEVIATION:	6.37					

01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA30 - - - - NOMAX PPB

NO_ / WDR Joint Frequency Distribution (Percent)

LICA30

November 2015

Distribution By % Of Samples

Logger Id : 30
 Site Name : LICA30
 Parameter : NO
 Units : PPE

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	3.38	4.56	5.44	4.71	3.82	1.76	1.47	4.56	4.12	18.99	20.02	5.59	4.12	9.13	3.97	4.27	100.00
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	3.38	4.56	5.44	4.71	3.82	1.76	1.47	4.56	4.12	18.99	20.02	5.59	4.12	9.13	3.97	4.27	

Calm : .00 %

Total # Operational Hours : 679

Distribution By Samples

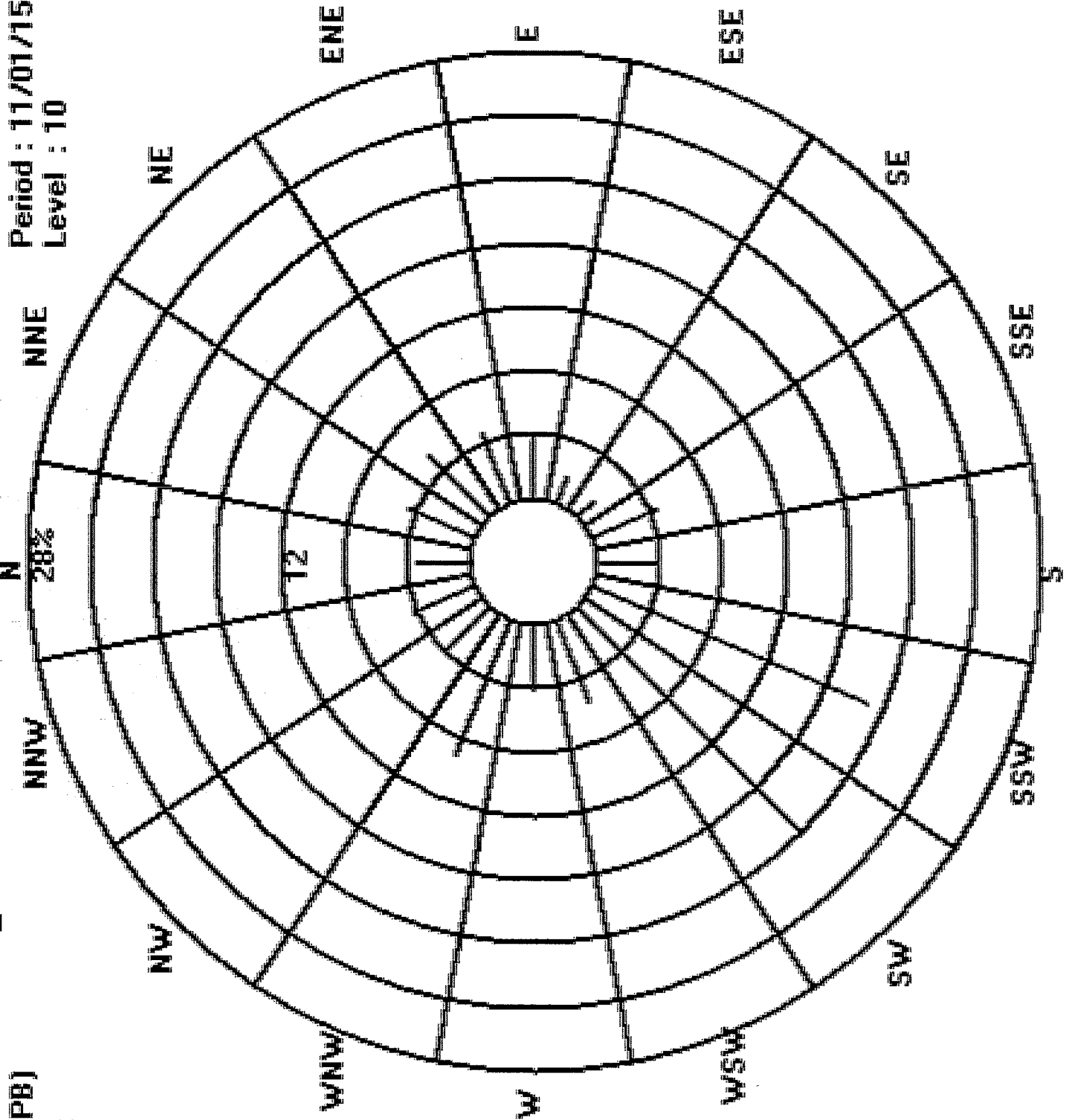
Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	23	31	37	32	26	12	10	31	28	129	136	38	28	62	27	29	679
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	23	31	37	32	26	12	10	31	28	129	136	38	28	62	27	29	

Calm : .00 %

Total # Operational Hours : 679

Logger : 30 Parameter : NO_

Site : LICA30
Period : 11/01/15-11/30/15
Level : 10



Legend:
□ >= 210.0
▤ < 210.0
▥ < 110.0
▦ < 50.0

NITROGEN DIOXIDE



NITROGEN DIOXIDE (NO2) hourly averages in ppb

MST

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	DAILY MAX	DAILY AVG	ROGS
1	0.1	0.4	0.7	0.5	0.3	\$	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.2	24
2	0.0	0.0	0.0	0.0	\$	0.0	0.3	0.1	0.2	0.2	0.1	0.0	0.1	0.5	1.8	4.3	3.0	0.3	0.1	0.2	0.6	1.1	1.3	0.9	4.3	0.7	24	
3	0.0	0.1	0.1	\$	0.3	0.1	0.3	1.2	2.6	0.9	0.8	1.7	3.6	4.2	3.6	1.9	0.9	1.1	0.8	1.0	2.3	2.3	3.9	2.9	4.2	1.6	24	
4	2.6	3.5	\$	3.9	2.7	2.7	4.1	5.7	5.8	4.5	4.2	3.1	1.6	1.9	1.3	2.1	2.0	1.7	2.3	2.4	1.9	1.6	2.5	5.8	2.9	24		
5	2.5	\$	7.0	6.3	5.7	5.0	7.1	0.6	1.4	0.0	0.0	0.0	0.5	0.3	0.2	0.1	0.0	0.4	3.6	4.3	0.3	0.0	0.0	0.0	7.1	2.0	24	
6	\$	3.8	8.0	4.8	1.8	0.4	0.1	2.0	3.7	3.8	5.7	3.1	0.9	0.4	0.5	0.5	1.5	2.0	2.8	4.4	4.8	4.0	2.7	\$	8.0	2.8	24	
7	3.9	3.3	2.9	3.1	3.1	3.3	3.9	7.2	6.4	5.4	5.9	6.1	6.6	6.4	9.8	10.3	10.7	10.0	8.3	7.0	\$	11.8	11.8	6.4	24			
8	8.1	6.0	1.1	0.7	0.4	0.2	0.5	0.0	0.3	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	\$	1.1	0.4	8.1	0.9	24		
9	0.1	0.0	0.0	0.0	0.2	0.3	0.1	0.1	0.0	0.5	0.3	0.0	0.1	0.4	1.5	2.3	3.3	3.0	1.4	3.5	\$	4.1	3.2	1.5	4.1	1.1	24	
10	0.0	0.6	0.5	0.2	0.4	0.3	0.5	0.8	1.0	1.4	1.6	1.4	1.3	1.5	1.6	1.6	1.6	1.6	4.6	3.9	\$	3.5	2.6	2.1	1.4	4.6	1.5	24
11	1.3	1.0	1.3	2.6	1.2	1.4	1.4	1.8	1.6	1.9	4.1	3.5	3.1	2.4	3.8	4.9	4.3	2.6	\$	7.2	9.0	7.9	6.0	3.0	9.0	3.4	24	
12	1.8	2.7	3.9	3.1	1.3	1.3	2.3	9.7	8.4	5.6	C	C	C	C	C	2.8	4.3	2.7	2.4	3.0	0.6	1.9	\$	3.7	9.7	3.4	24	
13	2.1	2.0	3.7	2.8	2.7	2.7	4.2	4.8	2.6	2.0	3.1	6.6	3.3	5.3	6.1	12.3	14.1	9.0	9.2	14.9	\$	4.9	3.8	14.9	5.5	24		
14	3.3	1.6	7.7	7.9	6.1	3.6	5.4	5.7	9.5	8.1	7.2	5.2	5.4	3.2	3.5	3.7	5.5	4.3	3.3	2.2	\$	1.7	1.2	0.8	9.5	4.6	24	
15	1.1	2.3	2.2	1.9	1.6	1.0	0.7	0.3	0.3	0.1	0.0	0.3	0.4	0.2	0.4	0.2	0.4	0.2	3.7	0.9	\$	2.4	0.3	0.1	0.4	3.7	0.9	24
16	0.4	0.7	3.5	3.1	1.2	8.2	5.0	3.6	7.9	1.3	0.2	0.5	4.0	6.0	7.6	4.4	1.1	1.9	\$	3.2	2.8	3.7	1.6	1.7	8.2	3.2	24	
17	3.7	3.2	2.2	1.4	1.5	2.3	2.4	2.9	3.0	2.4	Q	Q	Q	Q	Q	6.0	8.4	\$	8.4	6.1	5.2	5.6	3.2	2.1	8.4	3.9	24	
18	0.1	0.3	6.7	4.2	7.2	5.8	1.8	7.0	3.4	7.0	8.2	5.5	3.3	5.4	4.4	7.2	\$	0.2	4.9	0.5	0.5	0.2	0.1	0.3	8.2	3.7	24	
19	1.7	0.0	1.4	2.8	0.9	0.9	1.8	2.1	3.4	4.6	2.7	1.2	0.2	3.2	6.8	\$	9.8	8.3	5.3	3.9	4.4	6.0	6.1	8.3	9.8	3.7	24	
20	1.4	6.2	4.1	3.4	2.8	2.0	2.5	4.7	3.3	0.9	2.3	0.2	0.4	\$	1.8	4.4	2.1	1.4	1.4	1.9	2.4	2.6	2.7	6.2	2.4	24		
21	3.2	3.2	3.6	4.1	5.1	7.9	9.0	9.4	8.4	7.2	3.6	4.7	4.5	\$	3.8	1.1	1.9	3.9	3.1	1.9	1.8	0.2	0.0	0.0	9.4	4.0	24	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.4	0.1	2.9	4.3	\$	2.3	0.5	0.9	2.2	5.9	5.3	5.2	3.9	1.3	0.2	0.4	0.2	16.7	5.0	24
23	1.0	14.7	4.7	11.5	3.1	0.4	10.5	16.7	13.3	5.4	5.0	\$	2.3	0.5	0.9	2.2	5.9	5.3	5.2	3.9	1.3	0.2	0.4	0.2	16.7	5.0	24	
24	0.1	0.2	0.0	0.2	0.1	0.5	1.6	0.9	1.6	0.9	\$	0.5	0.4	0.1	0.2	0.7	0.1	0.6	0.3	0.5	0.0	0.2	1.9	3.1	3.1	0.6	24	
25	2.0	2.7	2.0	0.5	0.3	0.4	0.4	3.9	1.6	\$	2.9	3.1	3.7	3.4	2.6	1.8	5.7	4.4	8.2	5.0	0.8	8.1	3.2	2.8	8.2	3.0	24	
26	1.1	0.9	0.4	0.5	4.2	14.1	12.2	9.3	\$	3.9	5.2	3.3	2.4	2.3	3.7	5.0	6.6	7.0	6.5	6.0	6.9	5.4	5.7	14.1	5.1	24		
27	7.7	10.4	14.6	16.2	18.4	17.2	18.7	\$	12.4	15.8	11.2	4.7	0.6	7.4	5.0	7.3	1.2	7.0	6.2	0.9	0.0	0.0	0.0	0.0	18.7	8.0	24	
28	0.0	0.4	1.5	0.5	18.1	\$	9.7	9.3	6.4	6.1	5.9	6.9	9.7	9.3	10.2	9.5	9.0	9.5	9.2	12.6	17.6	15.6	18.1	8.1	24			
29	13.4	16.2	18.1	21.8	20.0	\$	24.5	26.5	25.1	15.6	14.1	12.5	9.7	11.2	16.9	21.8	24.3	21.8	17.6	13.9	16.3	15.6	11.8	26.5	17.6	24		
30	12.2	10.4	10.8	8.2	\$	8.6	8.5	11.6	17.6	13.6	18.5	16.1	16.4	18.4	20.9	24.6	29.4	29.8	27.9	25.0	21.4	20.2	17.2	14.6	29.8	17.5	24	
HOURLY MAX	13.4	16.2	18.1	21.8	20.0	18.1	24.5	26.5	25.1	15.8	18.5	16.1	16.4	18.4	20.9	24.6	29.4	29.8	27.9	25.0	21.4	20.2	17.2	14.6	29.8	17.5	24	
HOURLY AVG	2.6	3.3	3.8	4.0	3.3	3.9	4.5	5.1	5.3	4.1	4.3	3.3	3.1	3.5	4.2	4.5	5.4	5.3	5.2	4.8	4.3	4.2	4.2	3.7	3.5			

STATUS FLAG CODES

C	CALIBRATION
V	MAINTENANCE
S	DAILY ZERO/Span CHECK
P	POWER FAILURE
G	OUT FOR REPAIR
Q	QUALITY ASSURANCE
R	RECOVERY
X	MACHINE MALFUNCTION
O	OPERATOR ERROR
K	COLLECTION ERROR

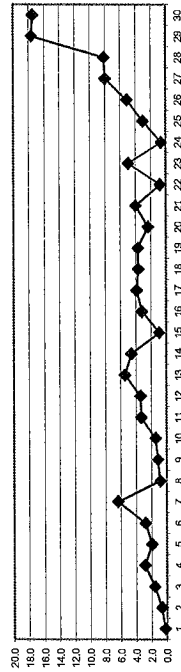
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 5.0 HR: 15.0 PPB

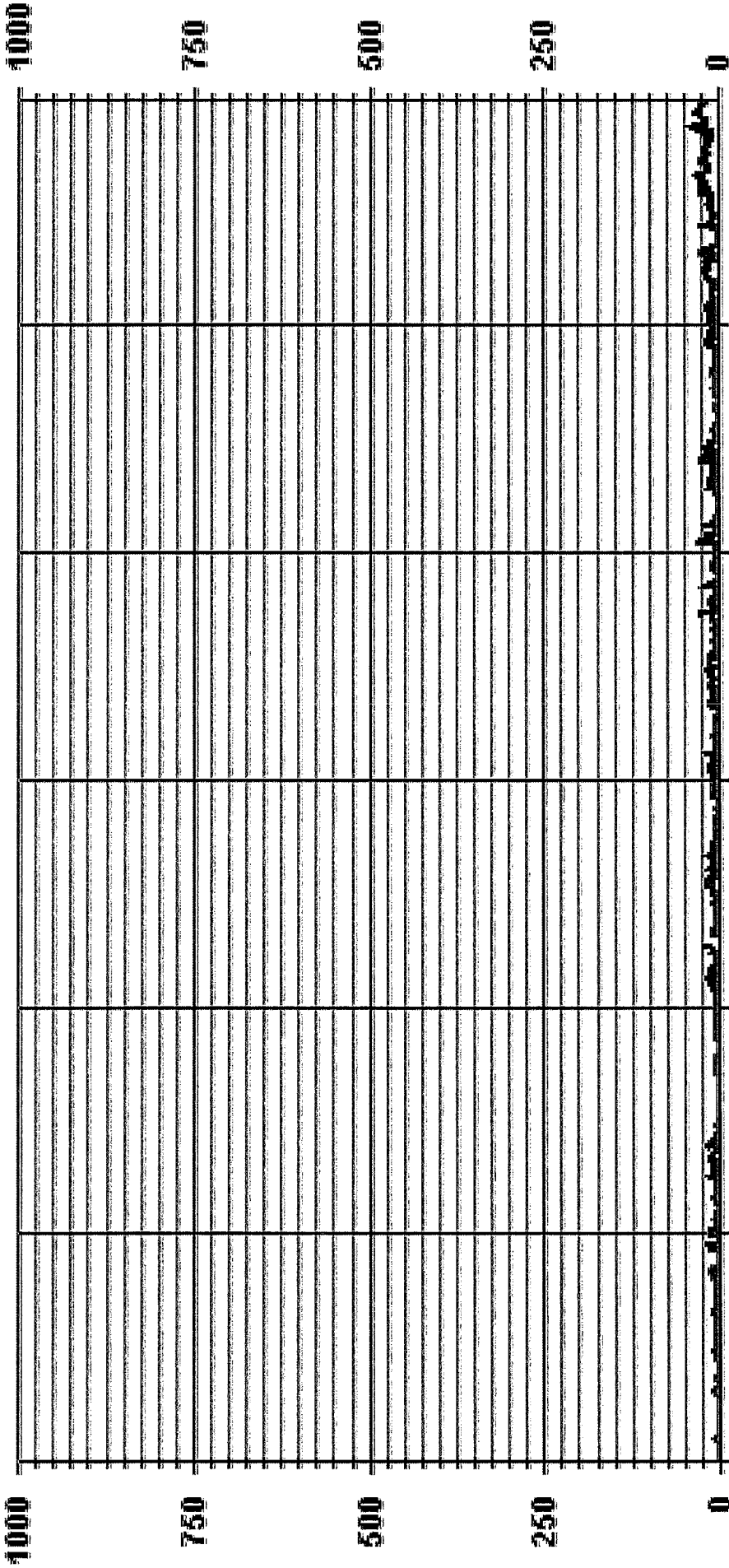
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES	0
NUMBER OF NON-ZERO READINGS:	629
MAXIMUM 1-HR AVERAGE:	29.8
MAXIMUM 24-HR AVERAGE:	17.6
IS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	5 HRS
STANDARD DEVIATION:	5.12
OPERATIONAL TIME:	720 HRS
AMD OPERATION UPTIME:	100.0 %
MONTHLY AVERAGE:	4.2
PPB	
ON DAY(S)	90
VAR- VARIOUS	29

24-HOUR AVERAGES FOR NOVEMBER 2015



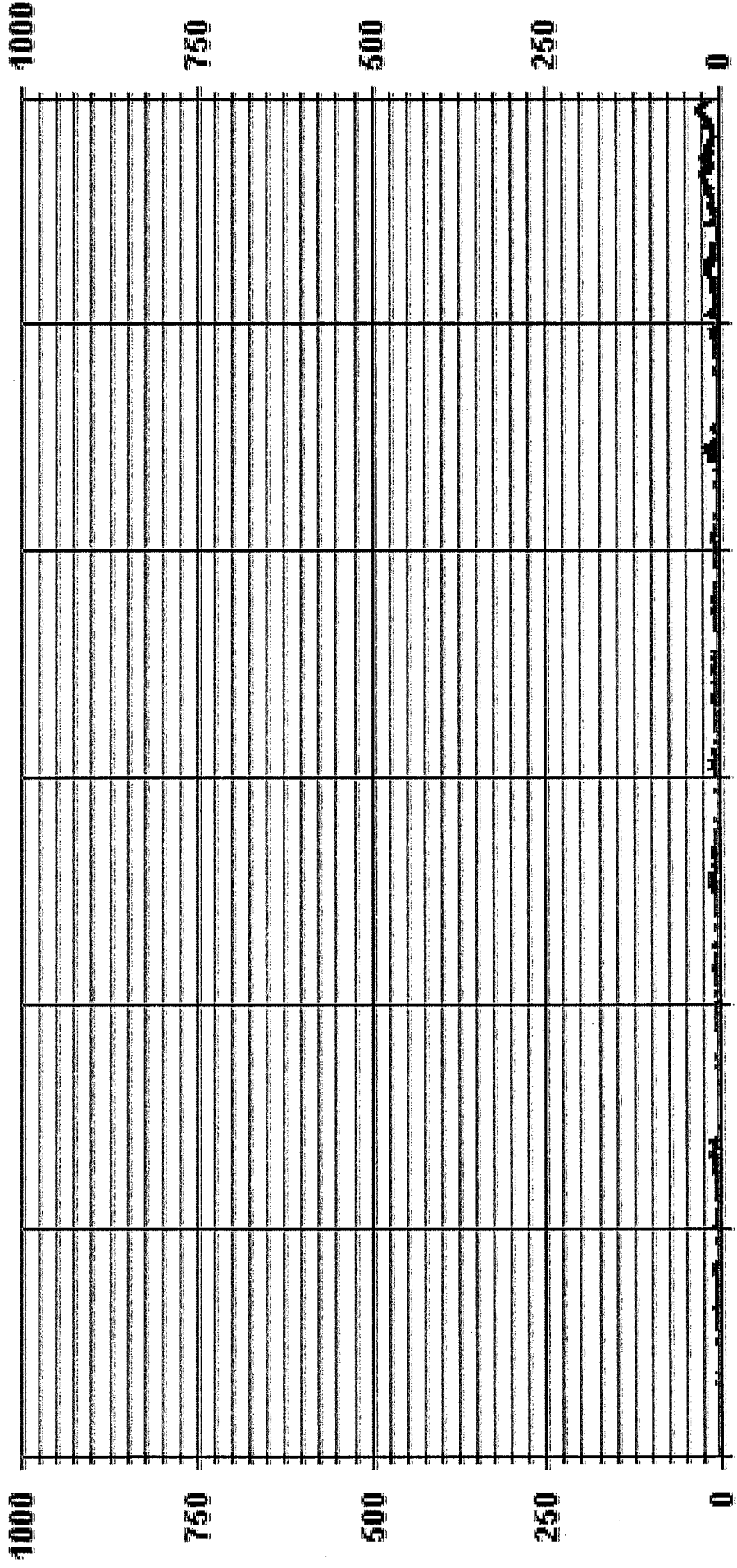
01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA30 NO2MAX PPB

01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA30 NO2_ PPB

NO2_ / WDR Joint Frequency Distribution (Percent)

LICA30

November 2015

Distribution By % Of Samples

Logger Id : 30
 Site Name : LICA30
 Parameter : NO2
 Units : PPM

Wind Parameter : WDR
 Instrument Height : 10 Meters

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	3.38	4.56	5.44	4.71	3.82	1.76	1.47	4.56	4.12	18.99	20.02	5.59	4.12	9.13	3.97	4.27	100.00
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 210.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	3.38	4.56	5.44	4.71	3.82	1.76	1.47	4.56	4.12	18.99	20.02	5.59	4.12	9.13	3.97	4.27	

Calm : .00 %

Total # Operational Hours : 679

Distribution By Samples

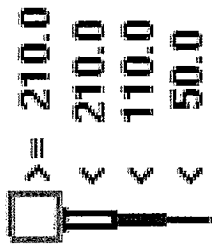
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	23	31	37	32	26	12	10	31	28	129	136	38	28	62	27	29	679
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	23	31	37	32	26	12	10	31	28	129	136	38	28	62	27	29	

Calm : .00 %

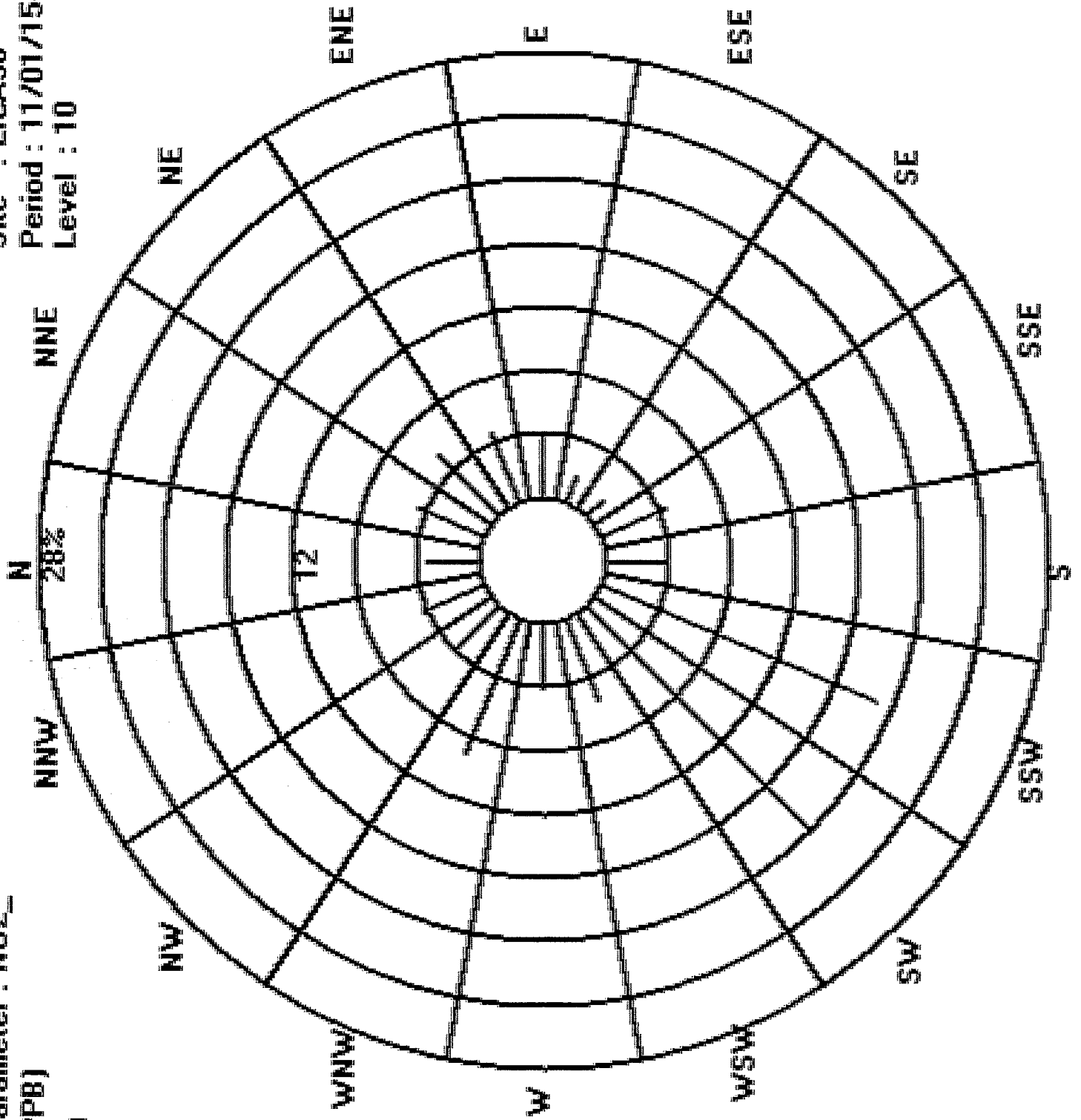
Total # Operational Hours : 679

Logger : 30 Parameter : NO2_

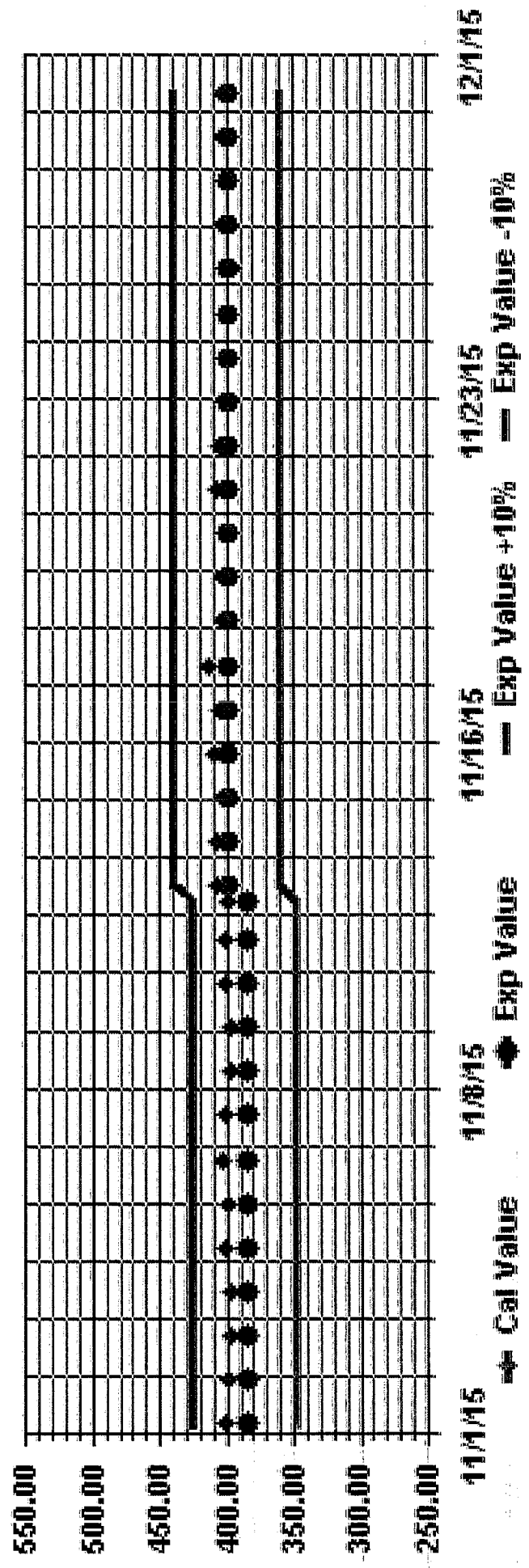
Class Limits (PPB)



Site : LICA30
Period : 11/01/15-11/30/15
Level : 10



Calibration Graph for Site: LICA30 Parameter: NO2_ Sequence: NO2 Phase: SPAN



WIND SPEED



WIND SPEED (WS) hourly averages in km/hr

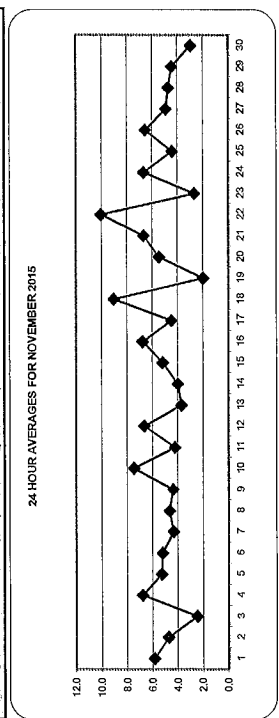
MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	
HR	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	24:59	
WS	4.2	5.2	5.8	5.6	5.7	5.8	6.5	6.0	6.1	7.2	6.8	6.5	6.0	6.2	6.4	6.8	5.2	6.2	6.2	6.2	4.2	5.7	5.9	5.5	5.3	7.2
AVG	4.8	4.9	5.1	5.0	4.6	5.0	5.3	5.0	5.1	5.4	5.2	5.3	5.9	5.1	6.3	5.8	4.4	3.9	4.5	3.9	4.5	3.3	4.3	4.4	3.5	6.3
MAX	10.7	11.0	11.9	10.7	11.1	11.9	12.5	11.7	12.5	11.2	11.5	12.0	10.2	11.5	11.9	13.2	11.1	10.0	8.9	8.8	8.4	8.1	5.0	6.2	6.2	10.1
ROGS	4.8	4.9	5.1	5.0	4.6	5.0	5.3	5.3	5.6	5.9	6.1	6.1	6.0	6.3	6.6	6.8	4.8	4.7	4.8	4.7	5.2	4.8	4.6	5.1	4.8	7.2
1	4.2	5.2	5.8	5.6	5.7	5.8	6.5	6.0	6.1	7.2	6.8	6.5	6.0	6.2	6.4	6.8	5.2	6.2	6.2	6.2	4.2	5.7	5.9	5.5	5.3	7.2
2	4.9	4.0	4.2	5.1	4.5	5.6	5.3	5.0	5.5	5.4	5.2	5.3	5.9	5.1	6.3	5.8	4.4	3.9	4.5	3.9	4.5	3.3	4.3	4.4	3.5	6.3
3	0.8	0.9	2.3	3.4	1.6	1.2	1.3	0.1	2.1	2.0	2.3	2.5	3.0	2.8	3.2	3.0	2.9	3.0	1.8	3.1	3.2	3.1	3.3	6.6	6.6	2.5
4	4.2	4.1	4.5	4.7	4.6	4.8	5.1	4.4	5.1	6.0	7.4	9.4	10.3	10.6	9.5	9.4	7.9	7.1	7.4	7.4	7.4	7.5	8.6	6.1	6.9	10.6
5	6.5	3.8	3.6	2.3	2.3	2.8	4.4	3.4	5.0	6.8	6.9	4.4	5.6	6.0	6.0	8.6	6.6	5.4	5.9	7.6	6.8	5.4	5.9	5.3	8.6	5.3
6	5.3	4.7	5.4	6.3	2.8	3.1	3.7	3.5	4.6	4.9	5.5	5.4	7.0	6.3	5.0	4.1	5.7	6.0	8.1	8.5	7.4	6.4	3.8	8.5	5.2	2.4
7	4.3	4.0	6.4	5.9	7.4	6.4	6.2	4.1	5.3	5.6	4.8	6.7	2.9	4.1	3.0	3.6	5.2	4.4	2.6	3.9	2.3	1.1	2.9	1.4	7.4	4.4
8	1.4	2.4	2.2	2.3	1.6	2.1	1.8	2.2	1.2	2.0	3.3	4.0	4.6	4.5	3.3	6.7	6.5	6.6	7.7	9.3	10.3	9.7	9.2	7.5	10.3	4.7
9	8.5	8.7	8.3	7.3	5.7	4.4	6.5	5.1	5.0	5.3	4.6	4.6	3.0	2.7	1.1	0.2	1.6	1.8	2.4	3.4	4.0	3.6	3.5	4.4	8.7	4.4
10	5.1	5.5	4.5	7.2	6.6	7.3	8.8	6.7	8.8	9.9	10.9	9.9	9.2	10.2	7.7	6.3	5.1	5.6	7.0	7.6	7.6	7.2	7.9	6.6	10.9	7.5
11	5.4	6.2	6.6	4.3	3.7	4.7	3.6	4.5	5.1	4.7	3.0	2.3	2.6	3.3	4.0	4.6	3.4	3.3	4.6	4.4	4.5	4.1	4.7	4.4	6.6	4.3
12	5.4	4.1	4.3	3.9	3.4	4.8	4.5	5.5	6.9	5.3	5.4	6.7	7.1	7.8	7.0	4.8	6.2	8.3	8.1	9.2	10.3	9.8	11.4	9.1	11.4	6.6
13	6.2	5.4	4.0	3.7	2.5	3.3	2.9	1.8	2.5	6.5	4.3	0.8	0.6	3.8	4.0	3.8	5.4	4.1	3.7	4.1	4.1	3.0	3.9	5.0	6.5	3.7
14	3.6	3.9	5.3	5.5	3.5	2.8	4.3	4.8	5.2	7.1	7.4	6.9	4.9	3.5	5.4	4.7	1.7	1.1	2.2	4.7	5.1	0.9	0.7	0.9	7.4	4.0
15	2.4	3.7	4.4	3.7	3.7	6.1	6.5	7.0	6.7	7.8	8.0	8.2	8.0	8.7	7.9	7.1	5.7	5.4	4.2	3.9	2.2	1.1	1.6	1.0	8.7	5.2
16	0.8	2.0	3.5	6.5	7.3	7.7	7.6	10.1	9.3	9.8	11.5	11.6	11.5	10.9	8.6	7.0	3.5	4.4	5.3	5.5	4.5	4.3	5.1	4.1	11.6	6.8
17	6.4	9.2	9.7	9.4	6.5	4.5	3.2	4.2	3.9	4.4	5.4	6.0	7.0	6.3	3.5	3.9	0.7	0.9	1.8	1.6	0.6	0.6	4.9	4.0	9.7	4.5
18	6.2	7.2	10.9	8.5	10.0	12.5	11.9	11.7	12.5	11.2	11.2	12.0	10.2	11.5	9.7	10.8	8.9	6.9	6.4	5.5	7.2	5.4	4.7	4.4	12.5	9.1
19	3.0	2.3	2.3	1.8	2.0	2.0	3.8	2.3	0.9	0.6	0.4	2.9	2.6	0.5	0.1	1.2	2.8	4.0	2.3	1.5	2.1	1.5	2.3	3.3	4.0	2.0
20	6.5	4.8	1.1	2.0	2.7	3.5	2.8	6.0	6.4	5.2	5.3	6.7	6.6	5.3	4.3	5.7	4.9	7.1	9.8	6.5	7.7	6.4	7.5	9.8	5.5	2.4
21	5.6	6.4	7.7	8.4	5.7	6.3	6.7	7.8	6.2	6.8	7.7	5.6	6.6	5.2	5.8	5.4	7.4	5.8	5.0	6.2	5.5	8.2	9.2	9.4	6.7	2.4
22	10.7	11.0	11.9	9.8	9.7	9.3	9.2	9.5	10.1	10.7	11.4	11.9	13.2	12.4	11.5	11.1	10.0	8.9	8.8	9.5	8.8	8.4	8.1	5.3	13.2	10.1
23	4.8	4.7	4.8	4.3	3.8	3.5	3.2	2.2	0.8	2.5	0.3	1.1	2.7	1.9	2.2	1.2	0.6	0.8	1.9	2.2	4.0	5.0	6.2	6.2	2.7	2.4
24	7.8	8.5	7.1	7.1	5.9	8.8	9.3	8.7	7.3	8.3	8.8	7.8	9.3	7.3	4.7	4.3	3.8	3.5	4.6	5.0	5.1	5.2	4.8	9.3	6.7	2.4
25	5.2	5.0	4.7	4.2	5.1	5.1	3.9	5.0	6.8	7.1	6.9	6.1	4.1	4.6	3.8	4.3	3.7	4.4	3.9	3.2	1.7	2.6	3.1	2.7	7.1	4.5
26	2.3	3.2	1.9	0.9	3.2	3.8	4.6	7.8	6.3	6.9	8.5	7.4	8.2	9.6	10.2	11.3	7.4	10.5	10.8	8.7	4.3	5.4	7.3	7.1	11.3	6.6
27	5.8	6.3	6.6	7.1	6.9	6.3	7.6	6.9	6.8	7.1	6.7	4.7	6.9	5.8	4.9	3.5	4.7	6.1	1.6	2.1	2.8	3.0	2.5	1.7	1.6	7.6
28	2.8	1.4	2.6	3.0	5.1	8.3	6.6	3.9	6.3	3.5	4.8	5.9	5.5	4.9	4.7	6.1	3.9	4.7	4.3	5.6	4.5	3.9	4.6	7.2	8.3	4.8
29	6.1	6.6	4.9	4.6	4.1	4.7	5.8	6.0	7.7	5.3	4.7	3.3	3.1	6.2	5.5	4.5	3.5	2.4	3.8	3.9	3.1	1.6	4.0	2.2	7.7	4.5
30	1.9	2.8	1.6	2.1	1.1	0.5	1.4	3.3	3.7	2.6	3.2	5.4	5.3	6.2	4.3	5.6	4.9	3.0	4.2	3.1	0.9	0.6	2.5	1.3	6.2	3.0
HOURLY MAX	10.7	11.0	11.9	9.8	10.0	12.5	11.9	11.7	12.5	11.2	11.5	12.0	13.2	12.4	11.5	11.1	10.0	10.5	10.8	9.8	10.3	9.8	11.4	9.4	13.2	10.1
HOURLY AVG	4.8	4.9	5.1	5.0	4.6	5.0	5.3	5.3	5.6	5.9	6.1	6.1	6.0	6.3	6.6	6.8	4.8	4.7	4.8	5.2	4.8	4.6	5.1	4.8	7.2	5.9

STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
Y	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

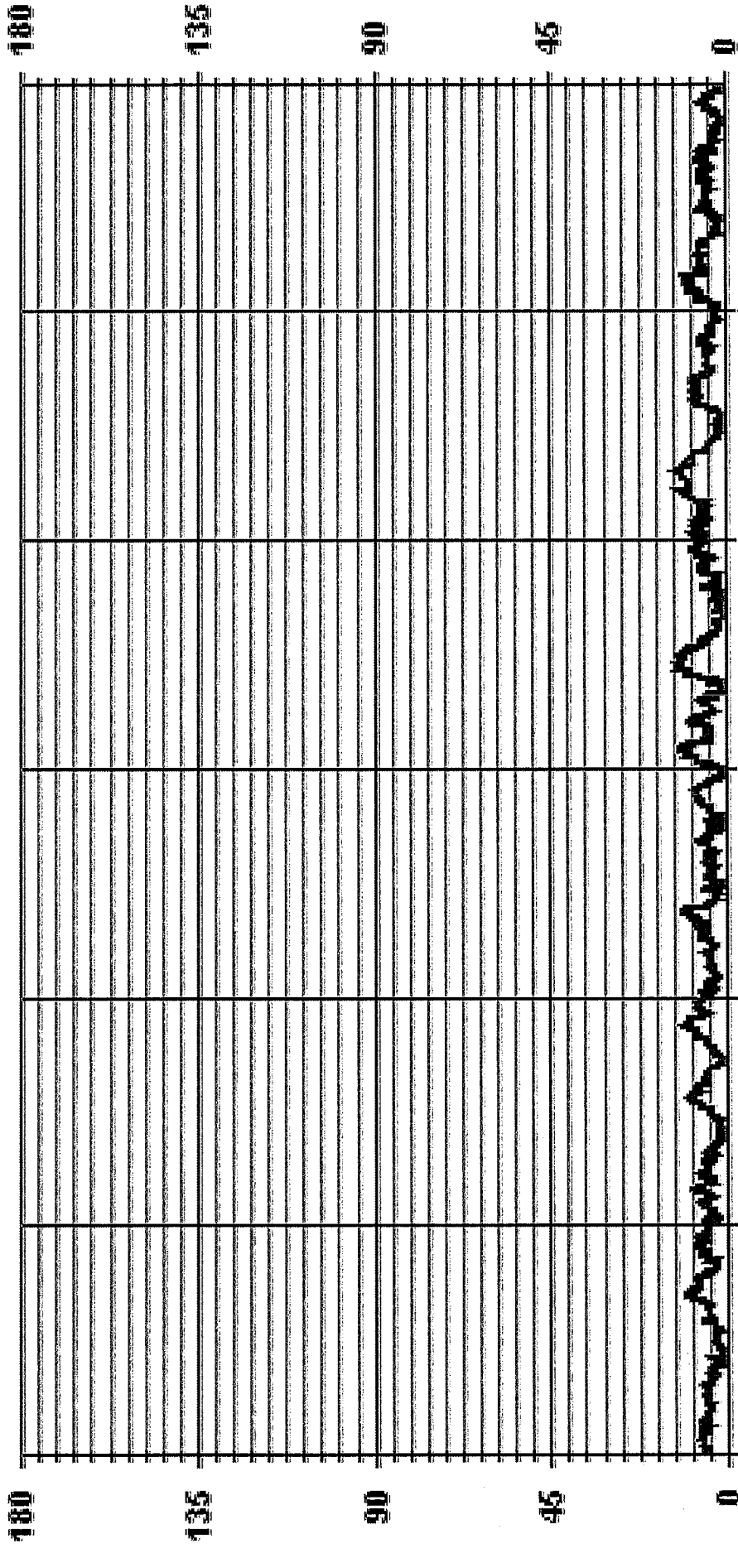
LAST CALIBRATION: March 4, 2014
DECLINATION: MAGNETIC DECLINATION 19 DEGREE EAST



MONTHLY SUMMARY

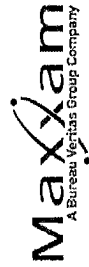
NUMBER OF NON-ZERO READINGS:	720	ON DAY(S)	22
MAXIMUM 1-HR AVERAGE:	13.2 KPH	@ HOUR(S)	12
MAXIMUM 24-HR AVERAGE:	10.1 KPH	ON DAY(S)	22
MONTHLY CALIBRATION TIME:	0 HRS	OPERATIONAL TIME:	720 HRS
STANDARD DEVIATION:	2.60	AMD OPERATION UPTIME:	100.0 %
		MONTHLY AVERAGE:	5.2 KPH

01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA30 WSP KPH



VECTOR WIND SPEED MAX instantaneous maximum in km/hr

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00			
HOURLY MAX	11.8	14.0	16.2	14.4	15.0	18.1	17.7	18.6	22.3	22.9	19.0	22.8	23.6	23.6	22.3	22.3	18.1	17.2	24.5	18.8	17.5	21.8	20.8	16.5	24.5	19.2		
HOURLY AVG	12.0	13.5	12.9	22.9	15.5	15.3	17.0	15.9	17.2	16.8	15.9	16.7	18.1	22.5	24.9	22.5	20.3	12.6	12.9	14.0	15.3	14.0	12.6	11.1	18.3	16.4		
ROSS	9.6	10.4	8.5	8.9	10.7	10.9	11.1	12.2	11.8	12.7	10.4	8.7	8.5	12.2	11.5	12.9	14.0	9.3	11.3	7.8	10.3	9.9	12.6	18.3	11.0	24		
	16.2	12.2	10.2	13.7	13.1	10.0	12.9	9.4	13.7	13.9	18.3	29.1	30.2	29.3	25.1	30.0	19.4	19.4	18.6	16.3	20.5	21.6	18.6	30.2	18.3	24		
	16.4	13.7	11.3	12.2	11.3	14.0	17.4	13.9	23.6	30.4	24.0	14.8	19.4	22.9	28.0	31.3	24.7	22.0	26.3	29.1	26.4	20.6	19.4	31.3	20.5	24		
	25.4	19.7	19.3	21.7	15.5	14.6	12.0	14.0	11.8	13.5	11.8	15.5	17.3	18.8	17.0	13.9	12.6	15.7	19.9	22.5	27.1	21.8	20.8	10.5	27.1	24		
	12.9	13.3	19.7	16.2	19.0	15.0	14.4	10.0	12.4	13.9	11.7	13.6	9.4	10.4	11.5	10.4	10.0	11.5	9.8	8.0	3.9	12.4	8.5	19.7	12.0	24		
	7.4	8.9	10.2	9.2	5.7	10.7	5.6	10.4	10.0	11.3	8.9	9.1	14.6	10.7	11.8	14.5	14.9	14.0	19.0	21.8	23.4	22.1	21.9	20.3	23.4	13.2	24	
	22.9	21.6	18.5	15.1	14.4	13.7	14.2	12.7	12.9	11.8	10.5	11.9	10.5	6.9	5.4	10.0	10.5	9.8	10.9	10.2	10.2	8.9	8.5	11.1	22.9	12.2	24	
	16.6	19.2	16.6	20.1	17.2	17.0	25.9	16.6	26.4	29.7	33.7	26.9	30.2	33.5	24.7	20.1	16.0	17.0	24.3	19.9	25.6	20.8	21.6	20.3	33.7	22.5	24	
	15.9	18.9	23.2	17.5	11.6	14.2	11.8	12.6	14.0	16.6	14.1	13.0	12.0	14.2	13.2	14.2	13.3	11.8	12.2	11.8	12.0	12.4	15.3	16.8	23.2	14.2	24	
	15.7	13.5	15.5	16.4	13.7	14.0	14.8	13.7	15.0	14.2	14.6	15.5	15.9	16.0	16.7	12.2	15.7	21.6	22.1	23.8	26.7	26.7	32.4	25.4	32.4	18.0	24	
	22.1	17.5	13.5	16.4	11.3	10.5	11.8	12.4	12.9	19.1	16.0	10.9	10.9	15.3	14.2	13.7	16.6	11.6	14.0	15.1	16.5	15.1	17.9	20.5	22.1	14.8	24	
	12.7	10.1	10.5	12.9	10.9	14.2	14.6	22.1	25.8	30.0	30.4	29.3	32.0	32.4	29.1	25.1	21.8	21.6	15.5	15.3	11.1	10.9	6.1	9.2	32.4	18.9	24	
	9.6	13.1	17.0	22.7	26.7	27.3	30.0	40.0	32.2	33.3	39.5	40.5	37.6	39.2	39.2	30.0	16.8	12.2	13.3	14.2	10.0	12.2	12.9	13.1	40.5	23.9	24	
	17.7	28.6	32.0	26.1	25.6	18.8	11.3	12.6	14.0	13.5	14.8	17.5	17.8	16.2	12.2	17.2	10.5	4.8	9.8	12.4	9.8	9.6	20.9	19.2	32.0	16.4	24	
	22.1	32.0	46.0	36.8	37.6	37.5	44.5	47.1	41.4	41.6	38.3	40.3	40.8	45.8	42.7	37.4	48.9	32.6	26.1	20.6	34.2	28.0	25.4	20.8	48.9	36.2	24	
	14.7	17.9	27.3	30.4	18.6	26.8	13.5	19.3	16.2	27.1	8.7	14.2	10.7	19.0	14.8	14.8	7.4	8.0	9.4	16.6	27.3	19.0	17.1	21.4	30.4	17.5	24	
	15.5	17.1	17.3	20.1	22.7	12.7	15.1	18.8	15.5	16.4	19.9	19.7	23.4	21.4	27.8	26.3	18.4	20.8	17.5	23.4	25.3	28.2	34.8	34.8	21.4	24		
	45.1	36.8	40.4	37.9	35.9	28.2	28.9	33.5	36.8	35.0	44.0	44.6	45.5	50.8	40.0	39.7	34.0	30.9	27.1	34.4	33.7	28.4	24.0	15.7	50.8	35.5	24	
	19.0	16.2	15.8	13.3	14.0	15.1	14.2	17.3	11.6	11.4	10.2	9.8	10.9	11.6	10.2	7.4	9.4	9.1	9.6	10.7	10.7	11.1	10.7	15.1	19.0	12.3	24	
	17.3	18.8	14.8	16.5	16.4	29.8	27.8	23.2	32.4	25.2	33.8	35.9	30.2	30.7	30.4	16.6	16.5	14.6	16.4	19.2	24.9	17.9	21.7	22.5	35.9	23.1	24	
	24.3	22.3	19.9	19.2	21.0	23.6	23.4	17.1	19.3	23.4	23.0	15.9	19.5	19.0	17.3	16.8	17.1	17.3	56.3	16.8	20.1	27.6	26.5	11.3	56.3	21.6	24	
	16.6	17.5	16.6	18.1	17.3	14.8	14.4	15.5	14.2	16.5	15.5	16.4	25.8	21.4	16.4	12.2	14.4	13.1	10.0	6.8	7.0	7.1	10.0	15.5	25.8	14.7	24	
	6.9	9.4	12.7	13.5	14.7	16.4	15.9	9.6	16.6	12.2	15.3	16.0	18.0	14.0	11.8	17.2	12.7	14.0	13.7	14.2	14.6	13.1	13.1	15.7	18.0	13.8	24	
	12.0	16.6	13.7	11.6	10.1	11.3	14.4	16.4	15.9	12.9	11.6	12.2	12.6	16.2	12.5	12.9	7.6	6.3	9.6	8.7	9.3	5.4	17.7	11.6	17.7	12.0	24	
	19.9	11.3	13.3	17.7	23.6	19.8	23.2	12.9	12.9	11.1	13.3	12.9	14.5	12.2	11.8	11.8	12.2	10.9	10.5	9.8	5.6	31.1	9.8	13.3	31.1	14.4	24	
HOURLY MAX	45.1	36.8	46.0	37.9	37.6	37.5	44.5	47.1	41.4	41.6	44.6	44.6	45.5	50.8	42.7	39.7	48.9	32.6	56.3	34.4	34.2	31.1	34.8	34.8	17.8	16.8	24	
HOURLY AVG	17.0	16.9	18.0	18.3	17.2	17.0	17.4	17.8	18.9	20.1	19.7	20.2	20.6	21.6	19.6	19.2	16.7	15.7	17.2	16.8	17.7	17.2	17.2	17.8	17.8	16.8	16.8	24

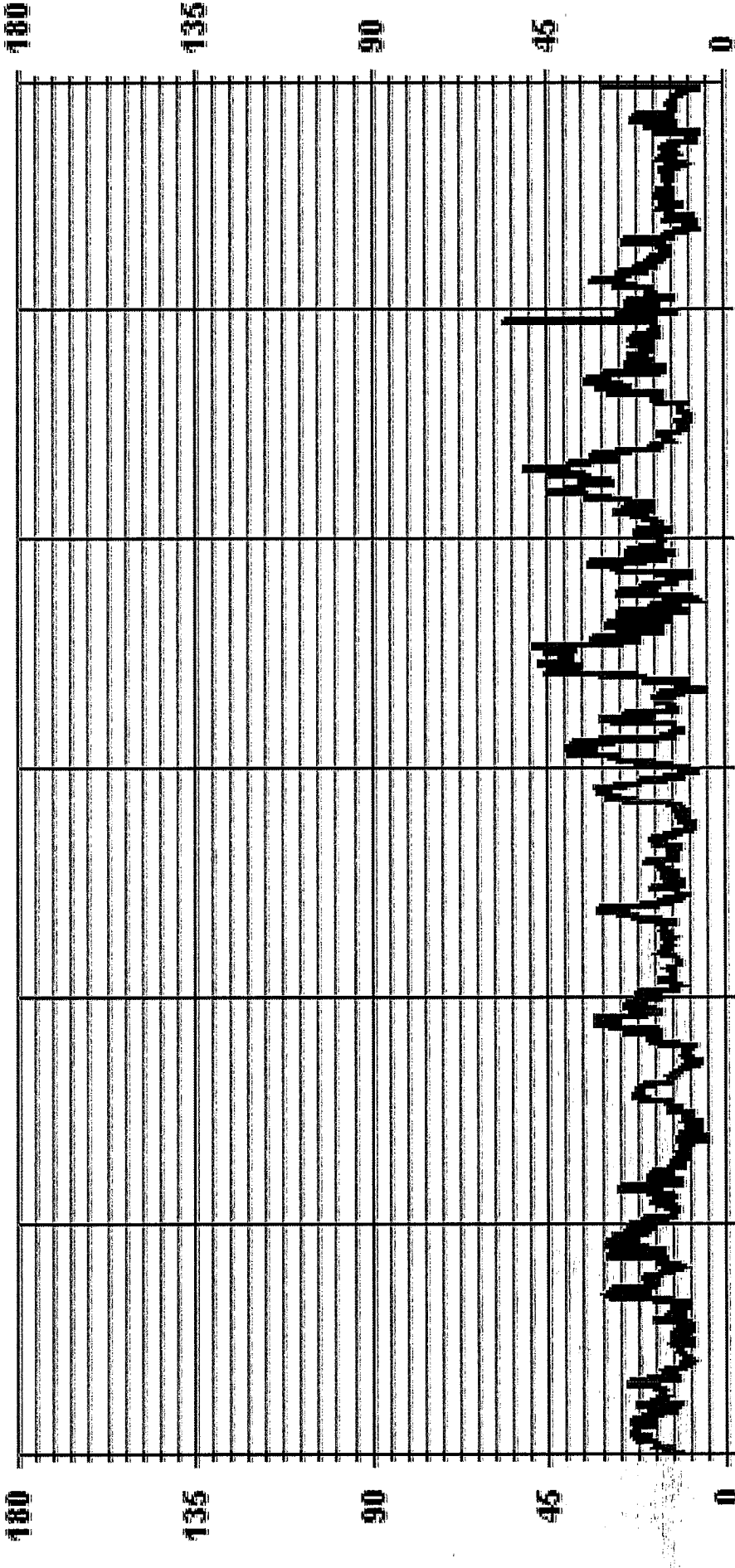
STATUS FLAG CODES

C	- CALIBRATION	R	- QUALITY ASSURANCE
Y	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	56.3	KPH	@ HOUR(S)	18	ON DAY(S)	25
OPERATIONAL TIME:	720	HRS	VAR-VARIOUS			

01 Hour Averages



— LICA30 WSMAX KPH

LrCA30
WSP / WDR Joint Frequency Distribution (Percent)

November 2015

Distribution By % Of Samples

Logger Id : 30
Site Name : LrCA30
Parameter : WSP
Units : KPH

Wind Parameter : WDR
Instrument Height : 10 Meters

Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 6.0	1.66	3.19	2.91	3.75	2.08	1.66	1.11	1.94	2.63	9.16	16.52	5.55	3.61	2.63	2.22	2.91	63.61
< 12.0	1.66	1.25	2.50	.83	1.66	.13	.27	2.63	1.52	10.69	3.47	.13	.41	5.69	1.66	1.11	35.69
< 20.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.55	.13	.00	.69
< 29.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
< 39.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
>= 39.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	3.33	4.44	5.41	4.58	3.75	1.80	1.38	4.58	4.16	19.86	20.00	5.69	4.02	8.88	4.02	4.02	4.02

Calm : .00 %

Total # Operational Hours : 720

Distribution By Samples

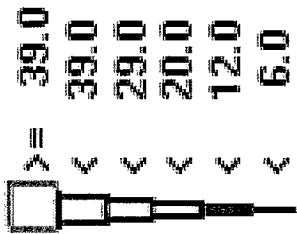
Limit	Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 6.0	12	23	21	27	15	12	8	14	19	66	119	40	26	19	16	21	458
< 12.0	12	9	18	6	12	1	2	19	11	77	25	1	3	41	12	8	257
< 20.0														4	1		5
< 29.0																	
< 39.0																	
>= 39.0																	
Totals	24	32	39	33	27	13	10	33	30	143	144	41	29	64	29	29	29

Calm : .00 %

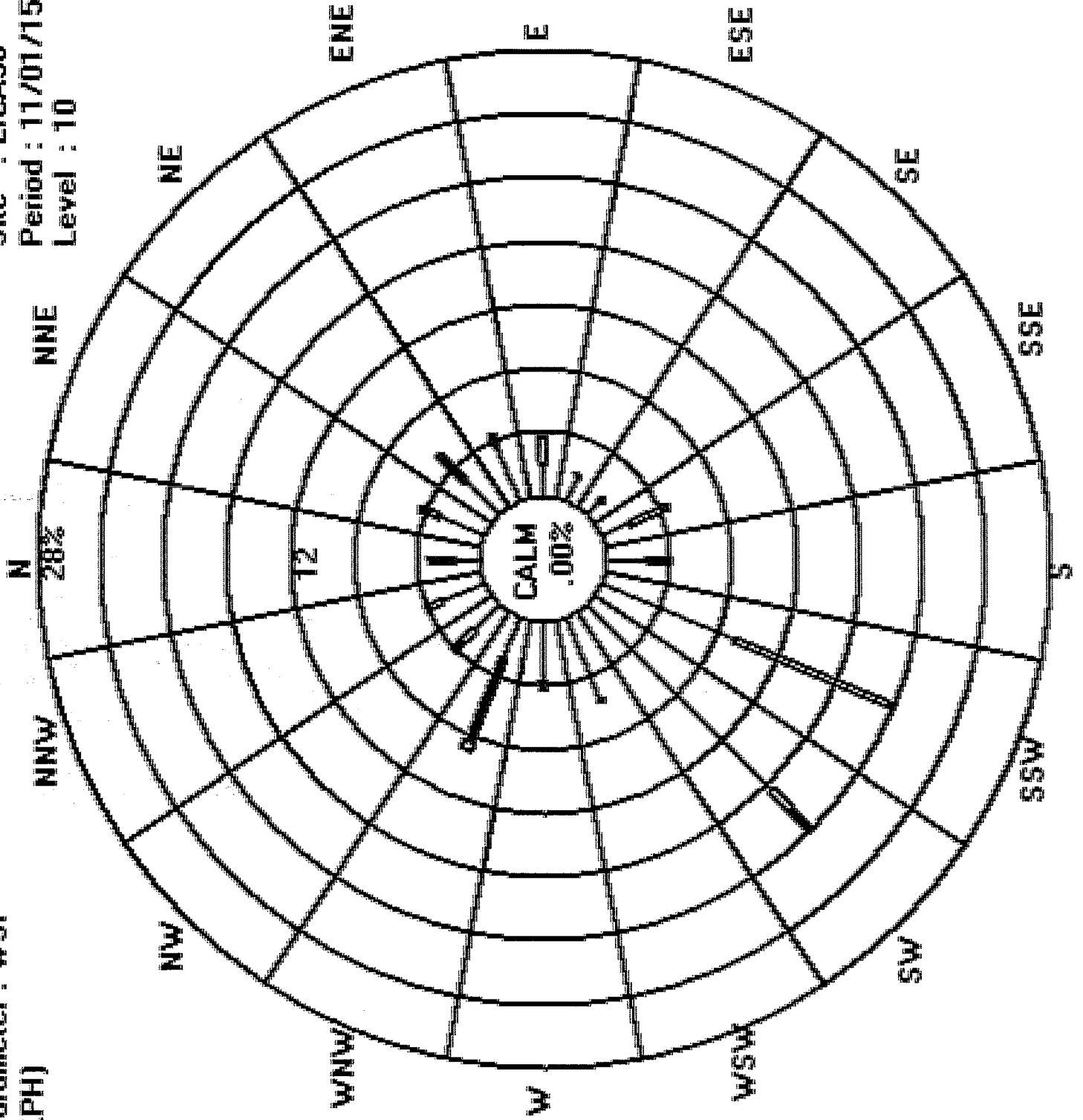
Total # Operational Hours : 720

Logger : 30 Parameter : WSP

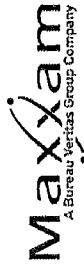
Class Limits (KPH)



Site : LICA30
Period : 11/01/15-11/30/15
Level : 10



WIND DIRECTION



WIND DIRECTION (WD) hourly averages

MST

HOUR START	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00			
HOUR END	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	25:00			
DAY	24-HOUR AVG																											
1	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE		
2	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		
3	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E		
4	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW			
5	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW			
6	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW			
7	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE			
8	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W			
9	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE			
10	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S			
11	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S			
12	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE			
13	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE			
14	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW			
15	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE			
16	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N			
17	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE			
18	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW			
19	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW			
20	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE			
21	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW			
22	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW			
23	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW			
24	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE			
25	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW			
26	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW			
27	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW			
28	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW			
29	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW			
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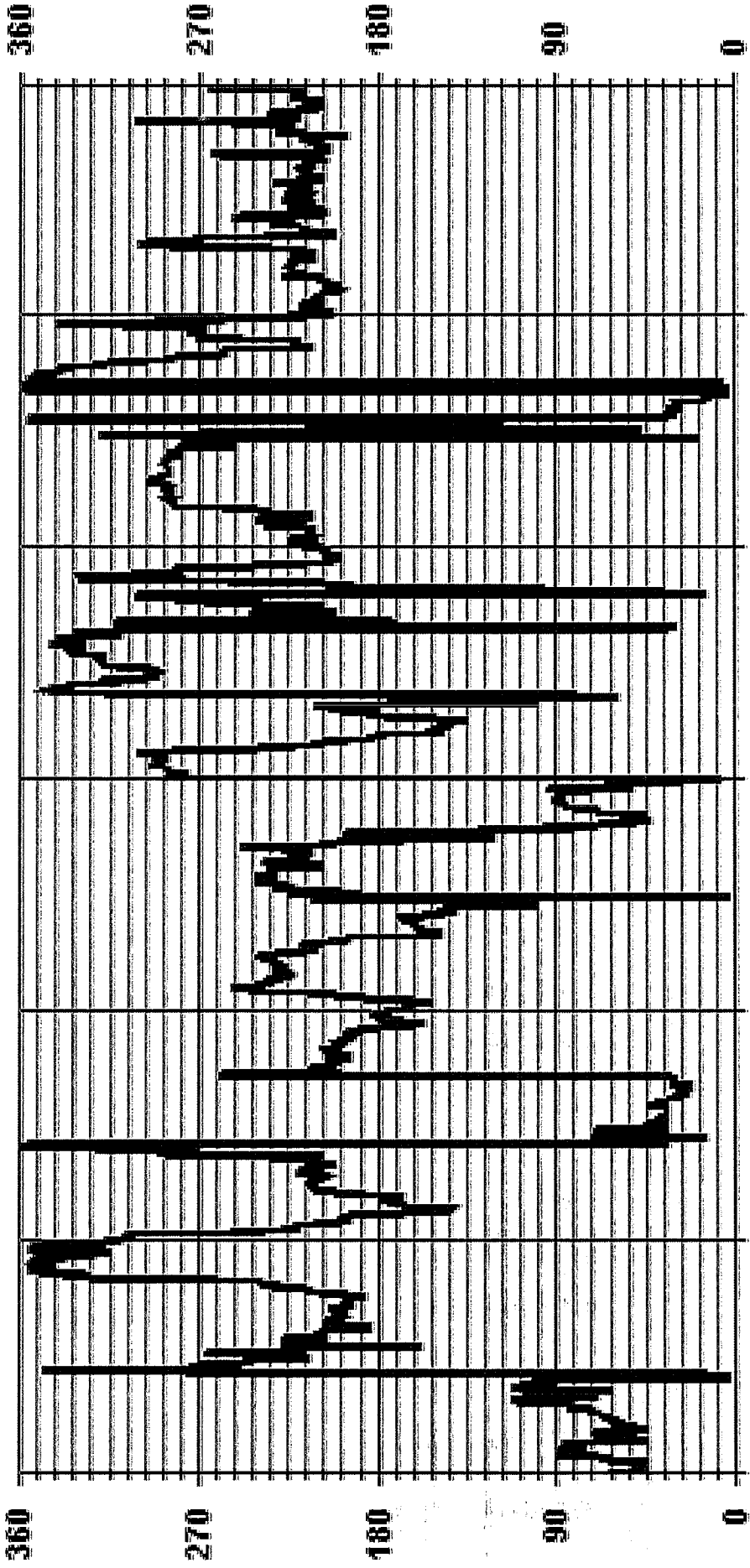
STATUS FLAG CODES

C	- CALIBRATION	O	- QUALITY ASSURANCE
V	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

LAST CALIBRATION: March 4, 2014
 DECLINATION: MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME: 0 HRS
 STANDARD DEVIATION: 87.64
 OPERATIONAL TIME: 720 HRS
 AMID OPERATION UPTIME: 100.0 %
 MONTHLY AVERAGE: SW

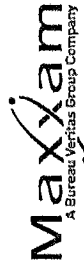
01 Hour Averages



11/01/15 00:00 11/06/15 00:00 11/11/15 00:00 11/16/15 00:00 11/21/15 00:00 11/26/15 00:00

— LICA30 WDR DEG

STANDARD DEVIATION WIND DIRECTION



STANDARD DEVIATION WIND DIRECTION (STDWVD) hourly averages in degrees

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	
1	23	21	21	20	20	23	22	24	27	25	30	28	33	26	27	27	25	20	20	32	26	27	24	24		
2	20	22	25	23	25	25	27	26	23	25	27	28	28	29	27	27	31	28	23	35	31	27	23	23		
3	38	30	30	18	34	41	50	55	37	39	34	39	35	30	33	36	27	19	43	20	24	27	29	19		
4	25	30	30	19	17	19	15	16	15	17	21	22	23	21	20	18	19	20	18	17	21	18	23	19		
5	18	32	28	37	33	32	39	39	40	35	30	38	34	36	34	30	35	43	38	34	37	32	34	36		
6	37	39	37	34	45	36	29	25	23	26	26	24	28	28	22	26	21	20	22	23	23	24	24	25		
7	24	25	19	18	17	17	19	20	16	18	18	15	30	19	32	21	13	29	31	18	36	47	33	49		
8	45	32	29	34	29	28	28	20	70	38	26	22	20	21	32	15	17	13	18	14	15	14	15	19		
9	18	15	14	14	18	16	17	17	18	18	18	21	21	23	37	46	72	39	51	38	25	21	19	18	19	
10	21	18	20	19	22	19	19	20	19	21	18	20	19	21	23	23	23	23	22	24	24	23	23	24	24	
11	22	20	25	33	27	25	30	24	21	22	38	46	31	29	25	26	28	27	19	18	17	20	22	28		
12	23	28	29	32	31	21	26	16	14	19	18	17	17	17	17	17	15	19	18	19	18	20	18	21		
13	28	25	25	31	45	34	26	56	28	22	42	61	63	36	39	29	23	24	29	35	34	31	32	28	31	
14	27	24	17	11	26	30	19	13	23	19	19	20	25	33	25	15	22	48	35	12	15	38	51	54		
15	30	18	15	19	19	19	19	22	25	25	29	27	29	29	26	27	25	25	27	24	25	24	24	42	42	
16	31	32	31	24	24	26	27	28	27	28	27	28	29	29	32	28	20	18	16	14	15	15	18	26	26	
17	20	19	22	25	31	28	26	20	39	32	27	21	19	20	36	26	40	35	24	51	63	52	34	33	33	
18	38	37	52	35	29	27	28	27	28	29	32	36	39	34	38	35	36	40	38	39	41	43	38	36	36	
19	37	41	44	42	51	36	24	28	41	60	73	35	59	69	38	15	13	22	32	30	34	32	27	18	18	
20	19	30	52	37	25	18	35	41	36	40	40	32	31	35	40	23	17	16	17	16	17	15	21	21	21	
21	20	17	17	17	21	13	14	16	17	17	20	33	25	33	33	31	19	31	36	36	36	27	26	26	26	
22	26	26	25	29	28	26	27	25	25	26	29	27	28	26	29	27	27	26	24	22	23	24	24	22	25	25
23	24	25	26	27	27	29	37	46	44	42	77	69	48	32	27	18	36	43	41	28	25	16	13	13	13	
24	13	12	15	12	19	20	22	26	26	34	29	31	30	26	30	38	38	33	38	37	39	39	41	43	43	
25	35	36	36	33	36	40	41	25	20	25	29	26	36	32	35	29	29	23	28	32	50	28	27	18	18	
26	23	24	35	56	40	20	21	17	19	18	18	18	18	16	16	17	18	16	15	22	29	22	20	24	24	
27	24	22	22	18	18	17	13	13	16	15	16	28	30	32	26	27	27	44	22	19	19	13	18	27	27	
28	15	26	26	24	13	12	16	17	21	30	33	25	29	24	21	24	25	22	24	17	24	23	19	13	13	
29	13	15	25	18	26	14	16	16	14	18	18	30	31	20	16	17	18	17	15	14	15	14	15	26	21	27
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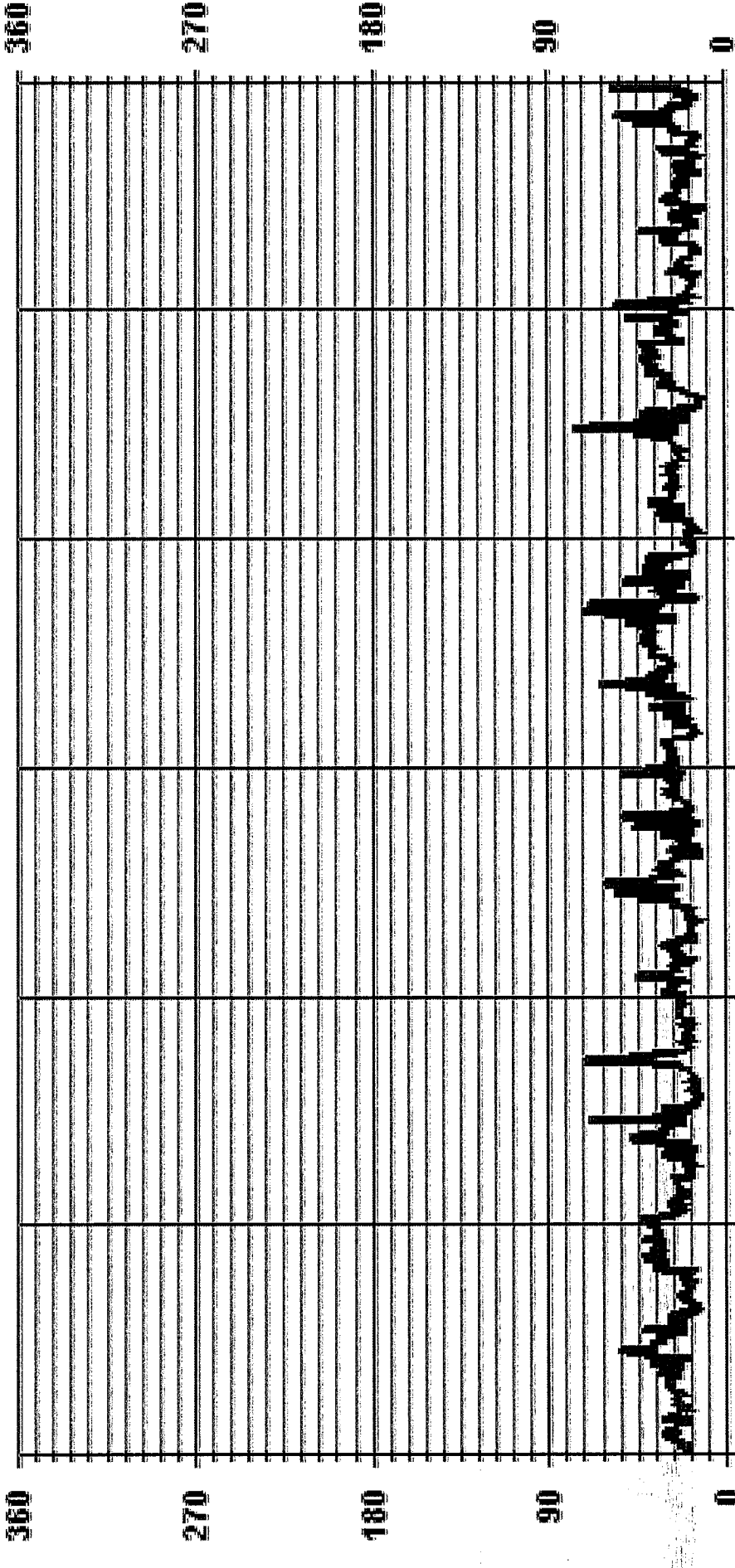
STATUS FLAG CODES

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Y	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

LAST CALIBRATION: March 4, 2014

CALIBRATION TIME: 0 HRS OPERATIONAL TIME: 720 HRS

01 Hour Averages



— LICA30 STDWDIR DEG

RELATIVE HUMIDITY



RELATIVE HUMIDITY (RH) hourly averages in %

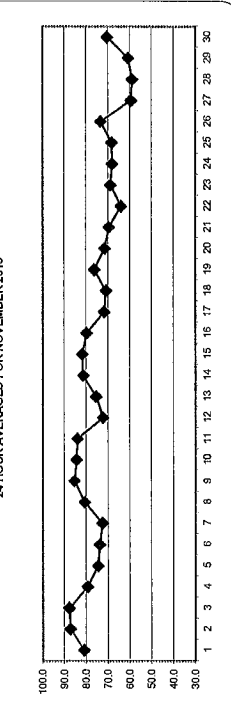
MST

DAY	HOUR START																								DAILY MAX	DAILY AVG	RDGS	
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00				
1	84	87	88	88	88	88	87	86	84	82	78	76	70	69	72	74	74	78	83	82	81	81	82	83	88	81.0	24	
2	84	84	84	84	84	84	84	84	84	89	88	88	88	88	88	88	88	89	89	89	89	89	89	91	91	87.5	24	
3	90	90	91	91	91	91	91	91	91	91	89	87	85	83	83	83	83	84	86	89	89	89	87	85	91	87.9	24	
4	86	87	86	86	86	86	86	85	85	86	82	74	68	67	68	68	69	72	72	75	77	79	79	79	90	79.4	24	
5	81	81	83	86	86	86	85	85	80	72	71	68	67	67	67	67	67	68	68	70	71	74	71	72	86	74.7	24	
6	73	72	72	72	72	72	75	75	77	79	77	78	68	66	66	67	72	73	76	77	78	79	77	76	79	73.9	24	
7	79	75	74	75	74	72	70	69	68	65	65	66	69	66	65	71	73	76	82	79	81	78	74	82	82	72.7	24	
8	72	69	73	74	74	76	78	76	73	72	75	82	84	89	90	91	91	91	91	90	89	89	89	89	91	80.8	24	
9	87	86	86	86	86	86	86	87	87	87	84	82	80	81	81	82	86	88	88	88	88	88	87	86	88	85.5	24	
10	84	84	85	84	85	85	85	86	86	85	84	84	83	82	82	83	86	87	86	85	84	84	85	85	87	84.5	24	
11	86	86	85	85	85	85	85	84	84	82	82	82	80	78	78	80	83	86	86	87	87	87	87	87	87	84.1	24	
12	82	81	82	83	84	83	82	82	82	75	71	69	66	64	65	70	75	68	66	64	60	60	61	64	84	72.5	24	
13	67	72	75	79	80	82	83	84	84	84	73	66	59	61	62	71	76	77	80	81	80	83	81	77	84	75.5	24	
14	79	77	78	82	83	84	83	83	83	77	80	78	72	66	67	75	86	89	89	89	89	89	88	87	90	81.5	24	
15	87	87	88	88	89	90	90	84	80	73	71	69	70	70	73	77	78	79	81	85	88	89	89	89	90	81.9	24	
16	88	87	85	84	84	83	85	81	79	78	76	73	71	71	68	70	75	77	80	82	85	86	86	84	88	79.9	24	
17	81	76	71	70	72	75	78	73	70	65	62	60	61	60	64	71	76	79	80	82	85	86	86	84	88	79.9	24	
18	72	68	70	69	69	70	70	70	70	71	72	69	68	67	66	67	68	71	74	75	76	77	78	78	82	71.0	24	
19	80	80	79	79	78	78	79	78	78	78	78	74	69	60	57	69	74	78	81	81	81	82	81	82	81	82	76.5	24
20	82	81	81	81	82	82	82	82	79	75	69	65	61	55	54	63	67	69	69	68	68	68	68	70	82	71.7	24	
21	72	76	77	77	77	80	80	79	79	76	68	66	63	61	60	63	66	66	66	64	64	64	65	66	80	69.8	24	
22	66	67	69	67	68	69	72	74	73	68	61	53	53	53	53	55	60	66	65	63	62	62	64	74	64.3	24		
23	64	63	63	65	66	70	72	76	80	75	64	59	59	59	60	63	64	68	71	74	76	75	78	80	69.0	24		
24	80	78	76	77	78	76	75	73	74	68	65	61	60	58	57	60	63	65	66	65	66	65	66	78	80	68.3	24	
25	66	66	67	68	68	69	71	74	76	72	69	64	58	55	55	61	66	69	72	71	74	77	77	77	77	68.4	24	
26	76	76	75	75	76	77	79	78	77	74	72	69	67	63	64	66	68	71	73	75	78	76	76	79	79	73.4	24	
27	76	74	74	73	72	72	71	68	60	49	37	33	34	42	45	48	53	56	58	61	63	62	76	63	59.5	24		
28	64	72	70	56	59	58	60	65	65	62	54	50	48	44	45	52	56	58	61	63	63	66	64	62	72	59.0	24	
29	67	66	67	69	69	64	61	63	63	62	52	43	35	38	44	49	56	62	66	64	68	76	77	77	77	60.8	24	
30	82	81	81	80	80	80	79	79	78	77	64	53	49	46	46	52	58	65	68	74	80	81	80	82	82	70.6	24	
HOURLY MAX	90	90	91	91	91	91	91	91	91	91	89	88	88	88	88	89	90	91	91	91	91	90	90	90	91			
HOURLY AVG	77.9	77.8	77.8	77.8	78.3	78.6	78.9	79.4	78.8	76.0	71.8	68.1	65.3	64.0	64.5	68.1	71.7	73.8	75.5	76.3	76.8	78.0	77.5	77.1				

STATUS FLAG CODES

C	- CALIBRATION	Q	- QUALITY ASSURANCE
V	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

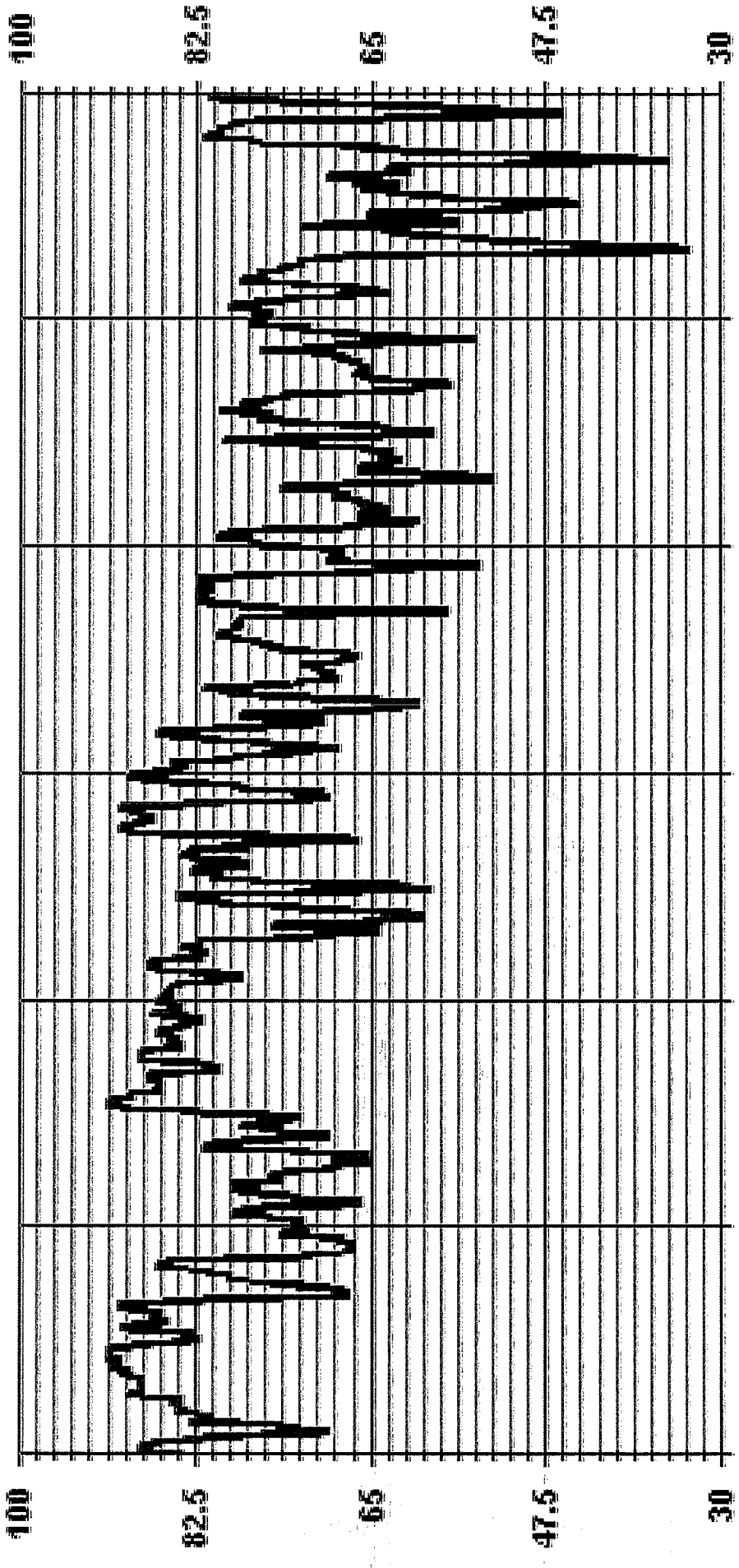
24 HOUR AVERAGES FOR NOVEMBER 2015



MONTHLY SUMMARY

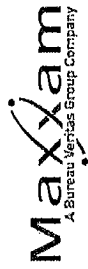
MAXIMUM 1-HR AVERAGE:	91	%	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 24-HR AVERAGE:	87.9	%			ON DAY(S)	3
					VAR-VARIOUS	
STANDARD DEVIATION:	10.51					
					OPERATIONAL TIME:	720 HRS
					AMID OPERATION UPTIME:	100.0 %
					MONTHLY AVERAGE:	75 %

01 Hour Averages



— LICA30 RH %

BAROMETRIC PRESSURE



BAROMETRIC PRESSURE (BP) hourly averages in millibar

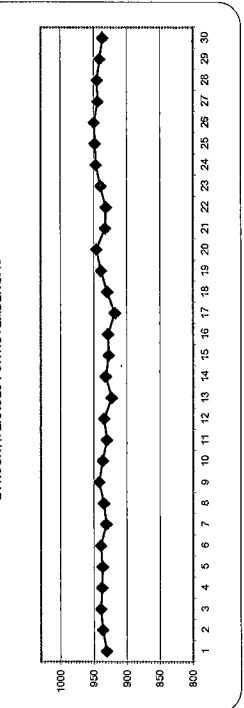
MST

DAY	HR	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	DAILY MAX	DAILY MIN	24-HOUR AVG	RDS.
1	1	927	927	927	928	928	928	929	930	930	931	931	932	932	932	932	932	933	933	933	933	934	934	934	935	935	935	931	24	
2	2	935	936	936	936	936	936	937	937	937	937	938	938	938	938	937	937	937	937	937	937	938	938	937	937	937	938	937	24	
3	3	937	937	937	938	938	938	938	939	939	940	940	940	940	940	941	941	941	942	942	942	942	942	942	942	942	942	940	24	
4	4	942	941	941	941	940	940	940	940	940	940	939	939	939	938	938	938	938	938	938	938	938	938	938	938	938	938	940	24	
5	5	934	934	933	933	933	934	934	935	935	936	936	936	937	938	938	939	940	940	941	941	941	941	942	942	942	942	937	24	
6	6	942	942	942	942	942	942	942	942	942	942	941	941	941	941	940	940	939	938	938	937	937	936	935	934	933	942	940	24	
7	7	933	932	932	931	931	931	931	931	931	931	932	932	932	931	931	931	931	931	931	931	931	931	931	932	932	932	931	24	
8	8	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	931	24	
9	9	940	940	940	941	941	941	941	942	942	942	943	943	943	943	943	943	943	943	943	943	943	943	943	942	942	942	942	24	
10	10	942	942	941	941	940	940	940	940	939	939	938	938	937	937	936	935	934	933	933	933	933	932	931	931	930	942	942	24	
11	11	930	929	929	928	928	928	928	928	928	929	929	929	930	930	931	931	931	932	932	932	932	932	932	932	932	932	935	931	24
12	12	935	936	936	937	937	937	938	938	938	938	938	938	938	938	937	936	935	934	933	932	931	930	928	927	926	925	939	934	24
13	13	925	925	924	923	923	922	922	922	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	923	924	24
14	14	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	928	932	24
15	15	934	934	934	934	934	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	933	932	924	24
16	16	923	924	924	925	925	925	926	926	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	929	929	24
17	17	927	925	925	923	923	922	922	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	919	919	24
18	18	916	918	920	922	924	925	925	926	927	928	929	930	930	931	933	934	935	936	936	936	937	937	937	937	937	937	937	930	24
19	19	937	937	938	938	938	937	938	938	938	938	938	939	939	939	940	940	940	940	941	941	941	941	941	941	941	941	940	940	24
20	20	940	940	939	939	938	937	937	937	937	937	936	936	936	935	934	933	932	931	929	928	928	927	926	926	926	926	940	946	24
21	21	940	940	939	939	938	937	937	937	937	937	936	936	936	935	934	933	932	931	929	928	928	927	926	926	926	926	933	933	24
22	22	926	927	927	927	927	927	928	929	929	930	931	932	932	932	933	933	934	934	935	935	936	936	937	937	937	938	932	932	24
23	23	938	938	939	939	939	939	940	940	940	940	941	941	941	941	941	941	941	941	941	941	941	941	941	941	941	941	940	940	24
24	24	942	943	944	944	945	945	946	946	946	947	947	948	948	948	948	948	948	948	948	948	949	949	949	949	949	950	947	947	24
25	25	949	949	949	949	949	949	949	949	948	948	948	948	947	947	947	947	947	947	948	948	948	949	949	949	949	949	949	949	24
26	26	952	953	953	953	953	953	953	953	953	952	952	952	952	952	952	952	952	952	952	952	952	952	952	952	952	952	950	950	24
27	27	944	943	943	942	942	942	942	942	942	942	943	943	943	944	945	945	945	946	946	946	946	946	946	946	946	946	944	944	24
28	28	948	947	947	947	947	947	947	947	947	947	947	947	947	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	24
29	29	943	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	941	941	24
30	30	939	939	939	938	938	938	938	937	937	937	937	937	937	937	937	936	936	936	936	936	936	936	936	936	936	936	939	939	24
HOURLY MAX		952	953	953	953	953	953	953	953	953	952	952	952	952	951	950	949	949	949	949	949	949	949	949	949	949	951	951	952	
HOURLY AVG		936	936	936	936	936	936	936	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	937	936	936	936	

STATUS FLAG CODES

C	- CALIBRATION	Q	- QUALITY ASSURANCE
Y	- MAINTENANCE	R	- RECOVERY
S	- DAILY ZERO/SPAN CHECK	X	- MACHINE MALFUNCTION
P	- POWER FAILURE	O	- OPERATOR ERROR
G	- OUT FOR REPAIR	K	- COLLECTION ERROR

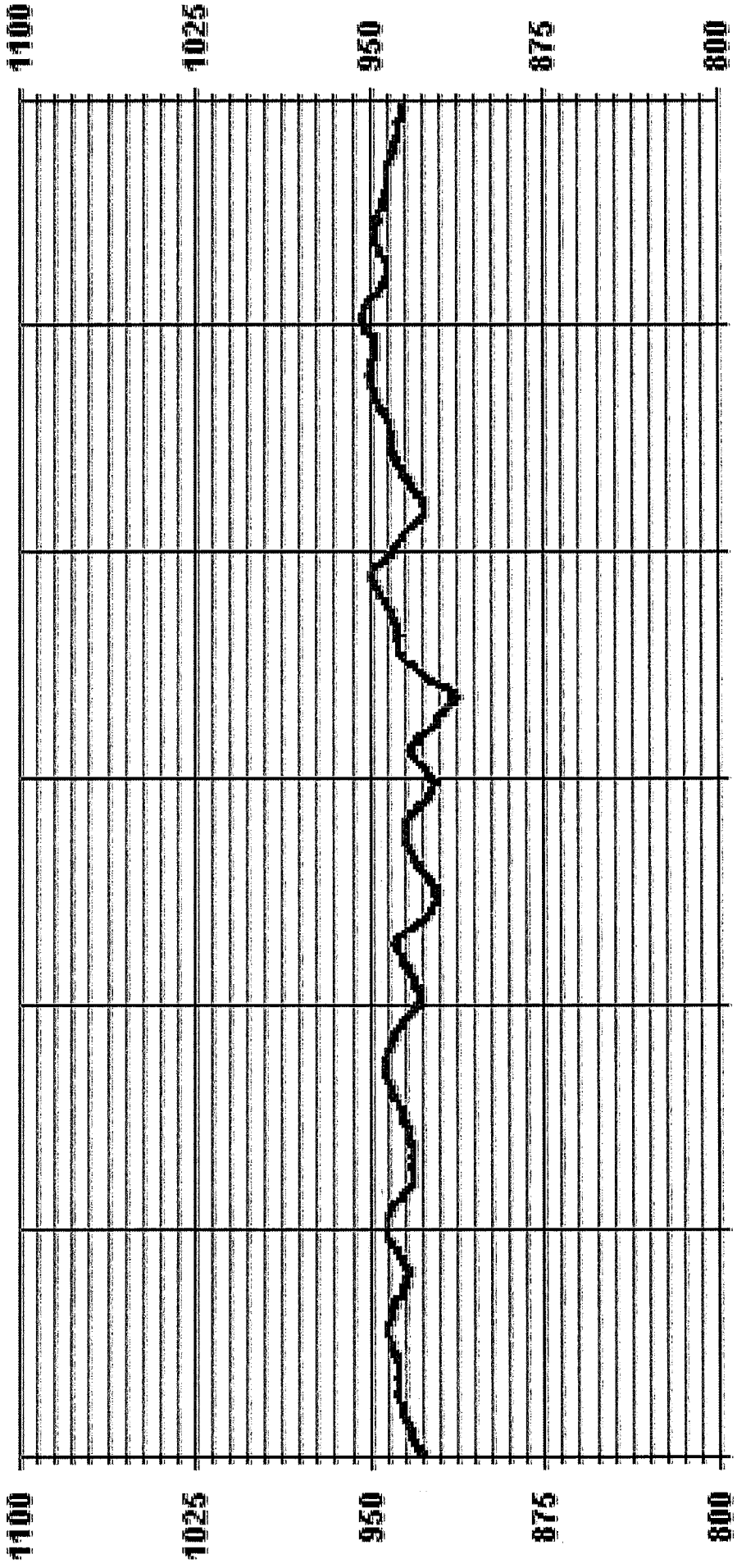
24 HOUR AVERAGES FOR NOVEMBER 2015



MONTHLY SUMMARY

MAXIMUM 1-HR AVERAGE:	953	MB	@ HOUR(S)	VAR	ON DAY(S)	26
MAXIMUM 24-HR AVERAGE:	950	MB			ON DAY(S)	26
					VAR-VARIOUS	
STANDARD DEVIATION:	7.84				OPERATIONAL TIME:	720 HRS
					AMID OPERATION UPTIME:	100.0 %
					MONTHLY AVERAGE:	937 MB

01 Hour Averages



— LICA30 BP MB

AMBIENT TEMPERATURE

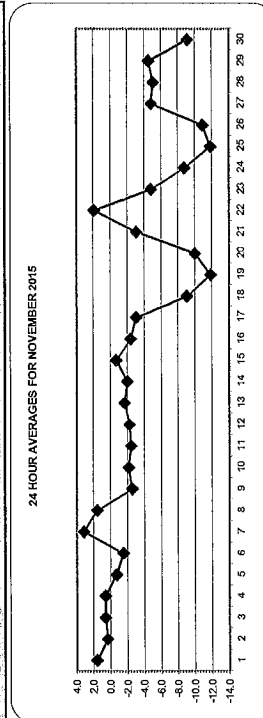
AMBIENT TEMPERATURE (TPX) hourly averages in Degrees Celsius

MST

DAY	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00	DAILY MAX.	DAILY AVG.	RDGS.	
1	2.5	2.3	1.8	1.5	1.4	1.2	1.1	1.1	1.5	2.0	2.6	2.7	3.1	3.0	2.8	2.6	2.0	1.3	0.0	0.3	0.6	0.6	0.6	0.6	0.6	3.1	1.6	24	
2	0.5	0.6	0.5	0.6	0.6	0.6	0.5	0.0	-0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.4	0.2	0.1	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	24	
3	0.9	0.9	0.6	0.3	0.5	0.5	0.6	0.4	0.7	0.9	1.3	1.8	2.0	2.2	2.0	1.6	0.9	0.6	0.1	-1.5	-1.1	-0.4	-0.2	-0.3	-0.2	0.6	24	24	
4	-0.9	-0.7	-0.4	-0.3	-1.3	-2.1	-2.0	-2.6	-2.1	-0.3	1.0	2.4	3.5	3.6	3.3	3.2	2.8	2.3	2.1	1.5	1.0	0.4	0.5	0.6	0.6	3.6	0.6	24	
5	0.3	0.2	-0.1	-0.4	-0.3	-0.3	-0.4	-0.5	-0.2	-0.1	0.4	0.5	0.5	0.2	-0.3	-0.6	-1.1	-1.6	-2.6	-3.1	-3.2	-3.4	0.5	-0.7	24	24	24		
6	-3.4	-3.5	-3.7	-3.7	-3.7	-3.7	-3.5	-3.6	-3.4	-2.3	-2.4	-1.7	-0.1	1.0	1.0	1.0	-0.2	-0.6	-1.1	-0.2	0.1	0.2	0.8	1.1	1.1	-1.5	24	24	
7	0.8	0.9	1.1	0.7	0.4	0.4	0.7	1.3	1.6	2.3	3.6	4.0	4.5	6.1	7.0	7.4	5.7	5.1	3.8	2.9	3.6	3.2	4.2	4.6	7.4	3.2	24	24	
8	4.6	4.8	3.6	2.8	2.4	1.9	1.5	1.6	2.0	2.1	2.7	3.1	2.9	2.5	2.3	0.4	0.2	0.2	0.1	0.0	-0.3	-0.6	-0.9	-1.6	4.8	1.6	24	24	
9	-2.2	-2.5	-2.8	-3.1	-3.4	-4.0	-4.2	-4.2	-4.1	-3.8	-3.0	-2.2	-1.4	-1.2	-0.8	-1.2	-1.8	-2.4	-2.1	-2.1	-2.0	-2.1	-2.1	-2.1	-2.1	-0.8	-2.5	24	24
10	-2.3	-2.5	-2.5	-2.2	-2.2	-2.2	-2.3	-2.4	-2.3	-2.0	-1.9	-1.7	-1.4	-1.2	-0.9	-1.6	-2.6	-2.8	-2.4	-2.2	-2.0	-2.4	-2.3	-2.6	-2.6	-0.9	-2.1	24	24
11	-3.1	-3.2	-2.9	-3.1	-3.4	-3.0	-3.0	-3.0	-3.0	-3.0	-2.6	-1.8	-0.7	0.6	1.0	1.0	-0.1	-1.5	-2.7	-3.0	-3.4	-4.1	-4.5	-4.2	1.0	-2.4	24	24	
12	-3.8	-3.6	-4.1	-4.6	-5.4	-5.6	-5.6	-6.1	-6.0	-3.4	-1.4	-0.1	0.9	1.8	1.7	0.1	-1.5	-0.7	-0.7	-0.9	-1.1	-1.2	-0.9	-1.6	1.8	-2.2	24	24	
13	-1.1	-1.9	-2.5	-3.5	-4.2	-4.8	-5.2	-5.0	-5.4	-2.0	0.1	2.2	2.1	2.8	1.2	0.2	0.4	-1.1	-1.5	-1.2	-1.4	-2.8	-2.3	-2.0	2.8	-1.7	24	24	
14	-3.0	-3.2	-3.3	-4.1	-4.6	-4.5	-3.6	-3.5	-3.5	-0.8	-1.0	0.1	2.1	4.3	4.2	1.9	-1.4	-2.9	-3.2	-2.4	-1.3	-3.3	-4.8	-5.5	4.3	-2.0	24	24	
15	-5.8	-5.3	-4.2	-3.6	-3.0	-1.8	-1.3	-0.7	-0.2	0.9	1.6	2.0	2.7	2.8	2.9	2.3	1.5	1.3	0.8	0.4	-1.1	-2.1	-3.3	-2.8	2.9	-0.7	24	24	
16	-1.9	-1.2	-0.6	0.0	0.1	0.1	0.1	-0.1	-0.6	-0.7	-1.3	-1.7	-1.6	-1.4	-0.8	-1.7	-3.2	-3.8	-4.6	-5.2	-6.3	-7.3	-6.6	-6.6	0.1	-2.4	24	24	
17	-6.2	-5.3	-4.2	-3.8	-3.7	-4.1	-5.2	-5.4	-3.7	-2.9	-0.9	0.2	1.2	1.0	0.6	-0.2	-1.7	-3.1	-4.0	-4.2	-4.7	-5.3	-4.0	-3.4	1.2	-3.0	24	24	
18	-3.4	-3.8	-4.9	-6.8	-7.4	-8.4	-9.2	-9.7	-10.1	-9.8	-8.8	-8.4	-8.1	-8.2	-8.6	-8.8	-9.7	-10.8	-11.4	-11.8	-11.8	-11.9	-12.1	-12.7	-3.4	-9.0	24	24	
19	-13.0	-14.0	-13.8	-13.9	-14.1	-14.6	-14.3	-14.9	-14.9	-14.0	-12.2	-9.9	-8.5	-5.5	-4.9	-8.4	-9.4	-10.4	-11.7	-11.5	-12.1	-12.4	-12.9	-12.8	-4.9	-11.8	24	24	
20	-12.2	-12.2	-11.7	-11.2	-10.7	-10.4	-10.3	-9.8	-10.2	-10.5	-9.8	-8.6	-7.8	-6.6	-7.2	-10.1	-11.7	-11.4	-11.1	-10.3	-10.0	-9.0	-8.3	-8.3	-6.6	-10.0	24	24	
21	-8.3	-7.9	-6.9	-6.7	-7.4	-8.4	-8.4	-8.1	-7.8	-6.6	-3.9	-2.7	-1.1	0.1	1.3	0.4	-0.3	0.4	1.2	1.2	1.7	2.2	2.4	2.4	2.4	-3.1	24	24	
22	2.5	2.4	3.0	2.9	2.7	2.8	2.3	1.8	1.7	3.0	4.0	5.1	5.2	5.3	4.8	2.8	1.8	1.0	0.0	-0.4	-1.0	-1.6	-2.0	-3.0	5.3	2.0	24	24	
23	-3.9	-4.3	-4.6	-5.3	-5.6	-6.7	-7.0	-8.1	-9.1	-7.9	-3.7	-1.5	-1.5	-1.7	-2.2	-2.7	-3.3	-4.1	-4.6	-5.3	-5.6	-5.4	-5.3	-5.6	-1.5	-4.8	24	24	
24	-5.7	-5.9	-6.0	-6.4	-6.5	-6.6	-7.4	-8.3	-8.8	-8.8	-8.7	-8.0	-8.0	-8.9	-9.3	-10.5	-11.2	-10.8	-10.8	-10.9	-10.5	-10.5	-10.4	-10.4	-5.7	-8.7	24	24	
25	-10.7	-10.8	-10.8	-10.9	-11.2	-11.6	-12.8	-13.7	-14.1	-13.0	-11.8	-10.6	-8.8	-7.5	-7.2	-9.3	-11.0	-11.9	-12.8	-12.7	-14.5	-14.9	-15.1	-15.9	-7.2	-11.8	24	24	
26	-17.0	-17.7	-18.3	-18.4	-17.6	-15.8	-14.3	-13.0	-12.1	-10.4	-9.2	-7.3	-6.0	-4.3	-4.6	-5.2	-6.5	-7.5	-8.0	-8.7	-9.3	-8.5	-8.4	-8.4	-4.3	-10.9	24	24	
27	-8.7	-8.7	-8.4	-8.6	-8.5	-8.4	-8.6	-8.8	-8.5	-7.1	-4.9	-0.8	2.9	4.2	4.0	0.6	-1.0	-2.1	-3.9	-4.9	-5.6	-6.1	-6.9	-6.9	4.2	-4.8	24	24	
28	-7.2	-9.5	-9.1	-6.3	-7.1	-6.2	-6.7	-8.1	-8.1	-6.9	-4.2	-2.4	-1.3	0.4	0.5	-1.5	-3.0	-3.5	-4.3	-4.6	-4.9	-6.1	-5.8	-5.4	0.5	-5.1	24	24	
29	-6.4	-6.5	-6.9	-7.5	-7.7	-6.8	-6.0	-6.6	-6.4	-5.9	-2.8	0.9	3.7	3.8	2.2	0.2	-2.1	-4.0	-5.3	-5.1	-6.1	-8.6	-8.6	-9.9	3.8	-4.5	24	24	
30	-11.5	-11.6	-12.2	-13.2	-13.9	-14.5	-15.0	-15.2	-12.8	-11.8	-5.2	-2.2	-1.3	-0.2	-0.1	-2.6	-4.1	-6.0	-6.3	-8.2	-8.2	-11.2	-12.6	-13.9	-0.1	-9.1	24	24	
HOURLY MAX	4.6	4.8	3.6	2.9	2.7	2.8	2.3	1.8	2.0	3.0	4.0	5.1	5.2	6.1	7.0	7.4	5.7	5.1	3.8	2.9	3.6	3.2	4.2	4.6	4.6	7.4	3.1	24	24
HOURLY AVG	-4.3	-4.5	-4.5	-4.6	-4.8	-4.9	-5.0	-5.2	-5.1	-4.1	-2.8	-1.6	-0.7	0.0	-0.1	-1.3	-2.4	-3.0	-3.5	-3.7	-4.1	-4.5	-4.5	-4.5	-4.5	-3.1	1.6	24	24

STATUS FLAG CODES

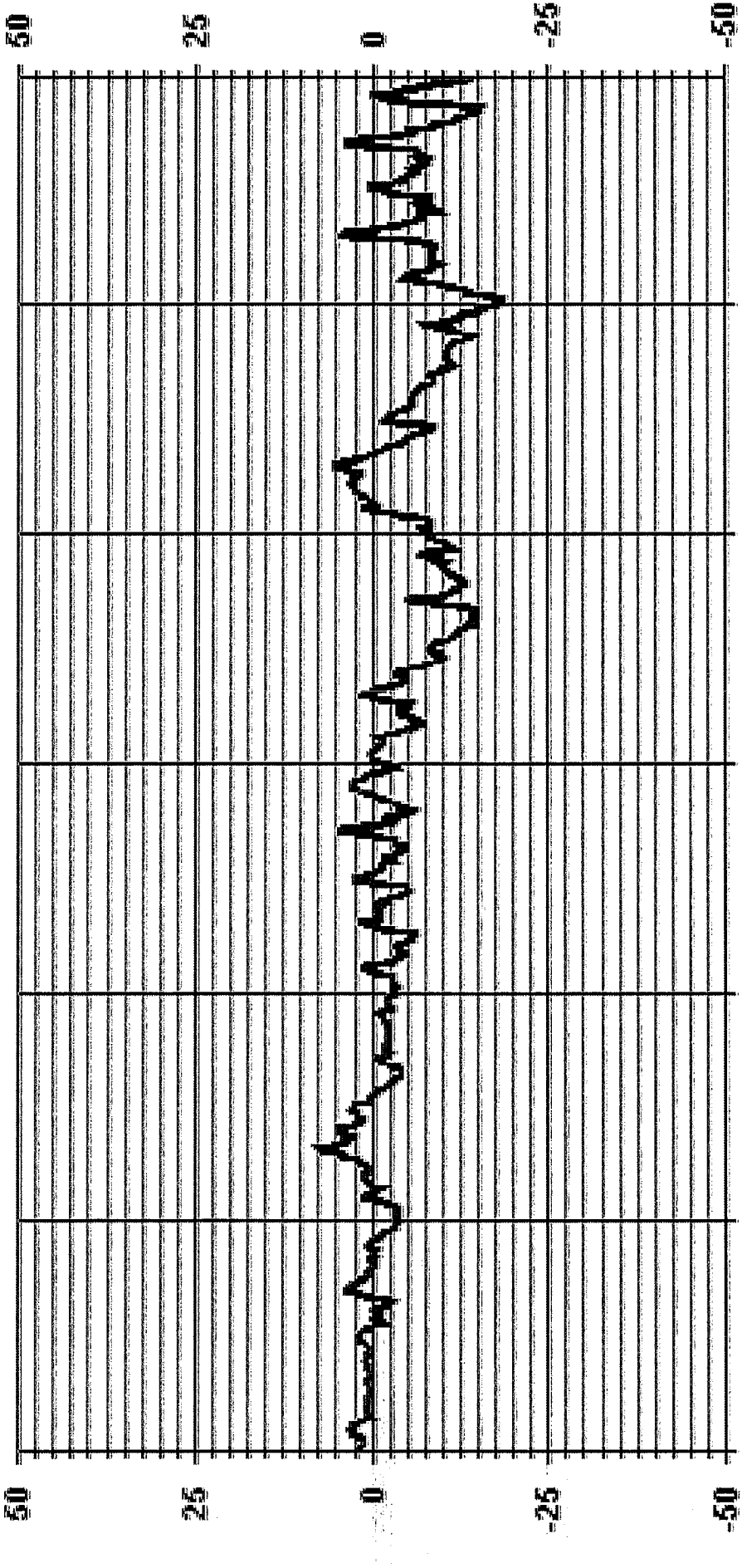
C	CALIBRATION	Q	QUALITY ASSURANCE
Y	MAINTENANCE	R	RECOVERY
S	DAILY ZERO / SPAN CHECK	X	MACHINE MALFUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-18.4	°C	@ HOUR(S)	3	ON DAY(S)	26
MAXIMUM 1-HR AVERAGE:	7.4	°C	@ HOUR(S)	15	ON DAY(S)	7
MAXIMUM 24-HR AVERAGE:	3.2	°C			ON DAY(S)	7
					VAR- VARIOUS	
STANDARD DEVIATION:	4.95					
OPERATIONAL TIME:						720 HRS
AMTD OPERATION UPTIME:						100.0 %
MONTHLY AVERAGE:						-3.5 °C

01 Hour Averages



— LICA30 TPX DGC

PRECIPITATION



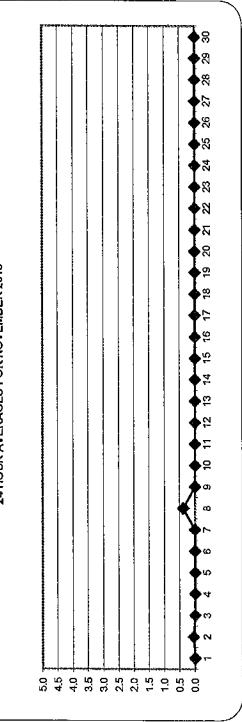
PRECIPITATION hourly averages (mm)

DAY	PRECIPITATION (mm)																								DAILY MAX.	DAILY AVG.	24-HOUR AVG.	ROGS.	
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00					
1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	24	
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	24
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
9	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
HOURLY MAX	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STATUS FLAG CODES

C	CALIBRATION	Q	QUALITY ASSURANCE
M	MAINTENANCE	R	RECOVERY
S	DAILY ZERO/SPAN CHECK	X	MACHINE/FAULT FUNCTION
P	POWER FAILURE	O	OPERATOR ERROR
G	OUT FOR REPAIR	K	COLLECTION ERROR

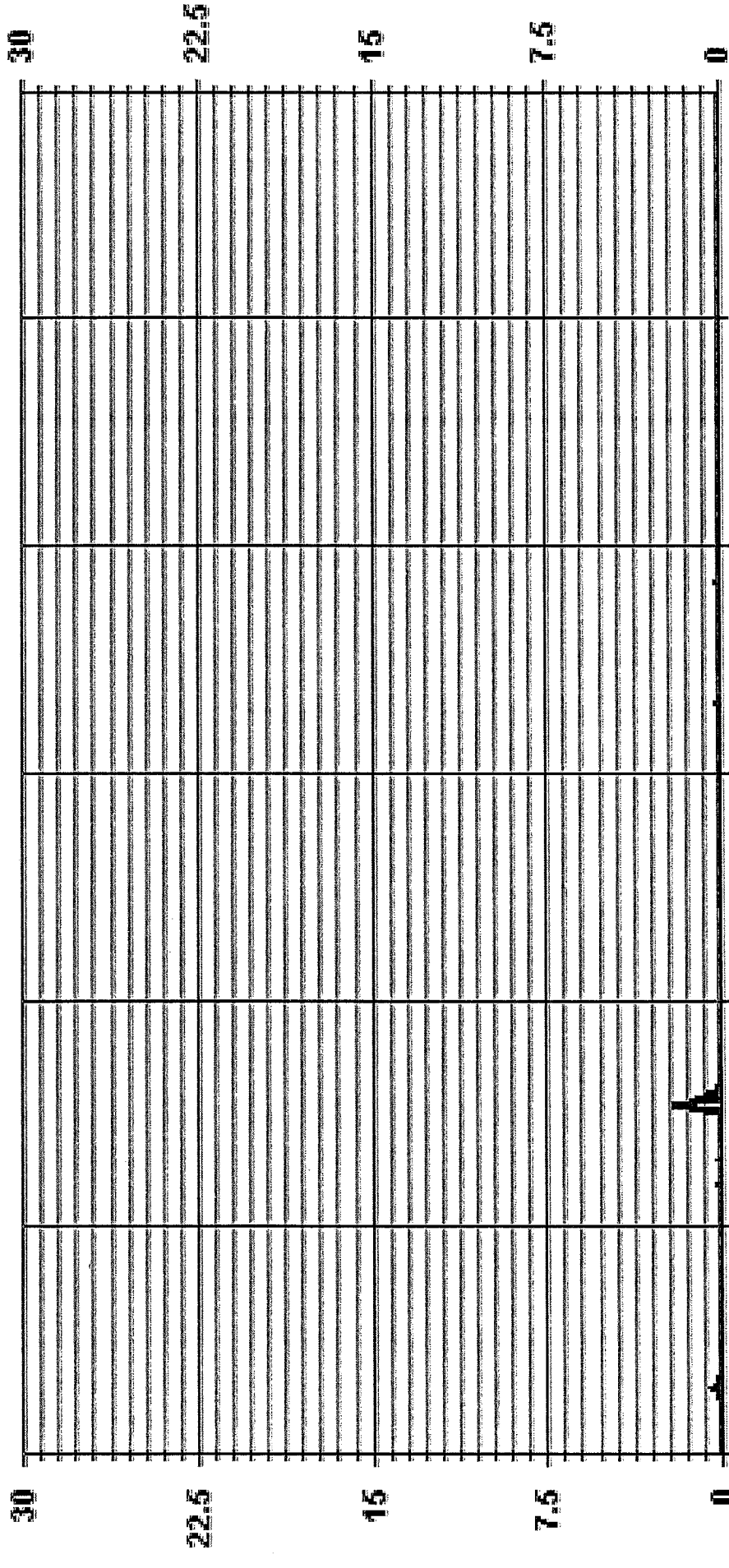
24 HOUR AVERAGES FOR NOVEMBER 2015



MONTHLY SUMMARY

MAXIMUM 1-HR AVERAGE:	2.1	MM	@ HOUR(S)	17	ON DAY(S)	8
MAXIMUM 24-HR AVERAGE:	0.4	MM			ON DAY(S)	8
MONTHLY TOTAL	11.4	MM			VAR-VARIOUS	
STANDARD DEVIATION:	0.13					
OPERATIONAL TIME:						720 HRS
AMD OPERATION UPTIME:						100.0 %
MONTHLY AVERAGE:						0.0 MM


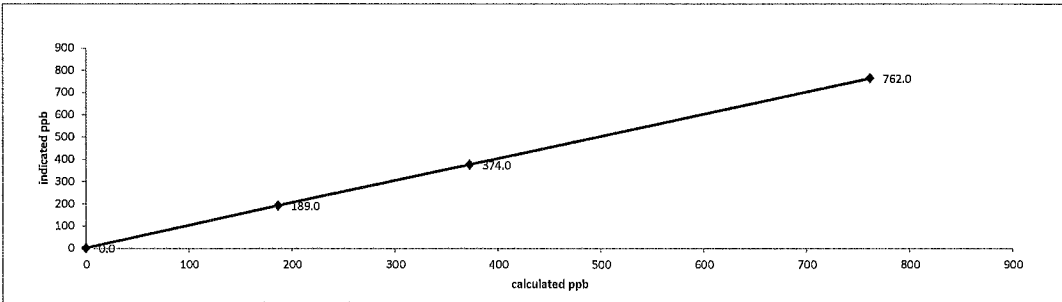
01 Hour Averages



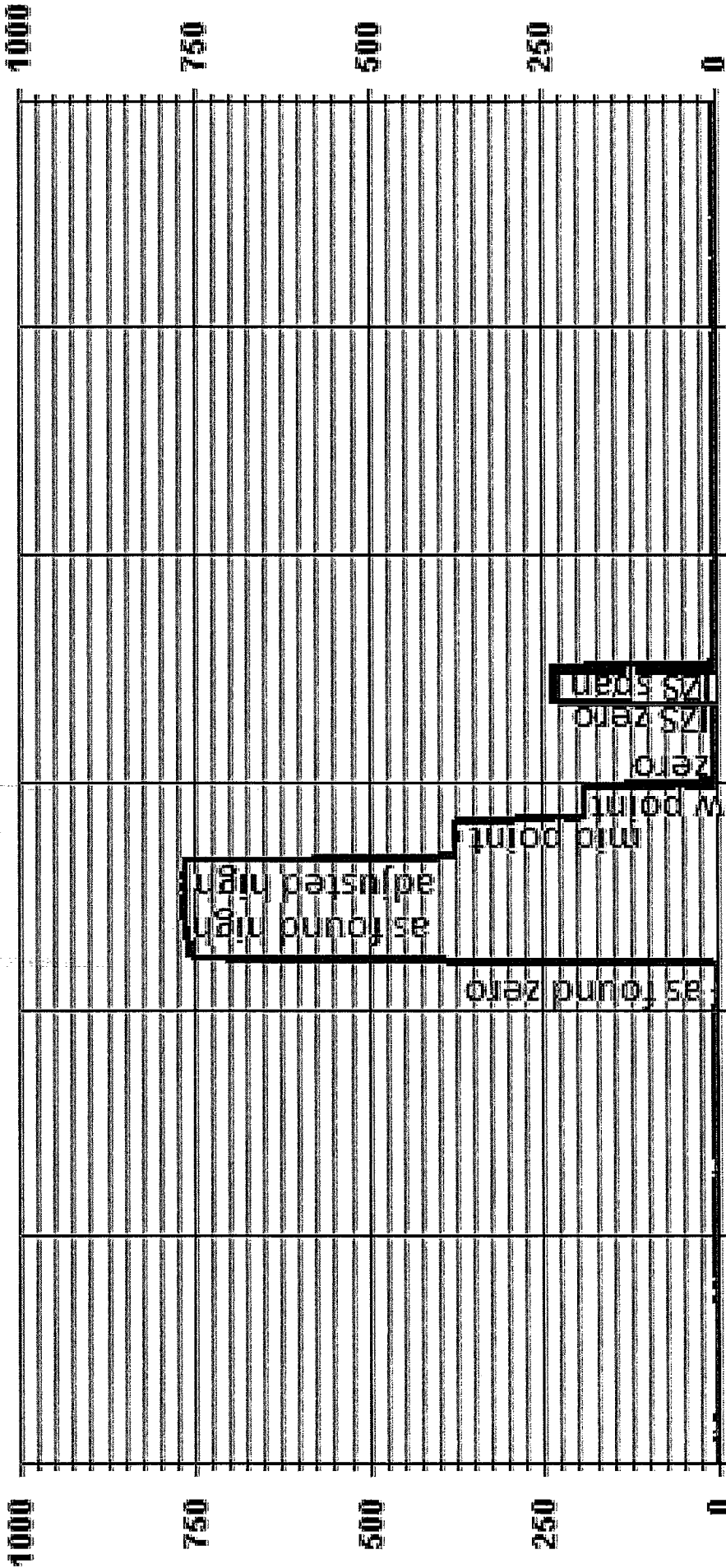
— LICA30 PRECIP MM

APPENDIX II
ANALYZER CALIBRATION RESULTS

SULPHUR DIOXIDE


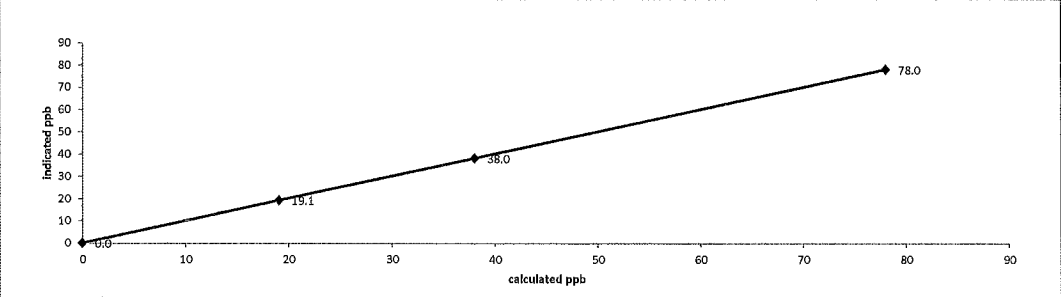
 API 100A Sulphur Dioxide Analyzer Calibration																																																																
Date: <u>November 12, 2015</u> Company/Alrshed: <u>LICA</u> Location/Station Name: <u>Maskwa</u> Parameter: <u>Sulphur Dioxide</u> Start Time 24 hr. (mst): <u>9:48</u> End Time 24 hr. (mst): <u>13:06</u> Calibration Method: <u>Gas Dilution</u>	Barometric Pressure: <u>0.920 atm</u> Station Temperature °C: <u>20</u> Weather Conditions: <u>Mix of sun and clouds</u> Calibration Purpose: <u>routine monthly</u> Performed By/Reviewer: <u>Alex Yakupov</u> / <u>Trina Whitsitt</u> Cal Gas Expiry Date: <u>March 12, 2019</u> Converter Model & s/n (if applicable): <u>n/a</u>																																																															
Analyzer: Serial Number: <u>1124</u> Range ppb: <u>1000</u> Last Calibration Date: <u>October 15, 2015</u> As Found C.F.: <u>0.997</u> Previous C.F.: <u>1.000</u> New C.F.: <u>1.000</u>																																																																
Calibrator: Flow Meter ID's: <u>n/a</u> Make & Model: <u>SABIO 2010 D</u> Serial #: <u>11900613</u> Cal Gas Cylinder I.D. #: <u>BLM002073</u> Cal Gas Conc. (ppm): <u>49.5</u>																																																																
Standard Calibration Points for Ranges																																																																
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Sulphur Dioxide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> </tr> <tr> <td>Mid</td> <td>380</td> </tr> <tr> <td>Low</td> <td>190</td> </tr> </tbody> </table>		Point	Sulphur Dioxide Standard Calibration Points	High	780	Mid	380	Low	190																																																							
Point	Sulphur Dioxide Standard Calibration Points																																																															
High	780																																																															
Mid	380																																																															
Low	190																																																															
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																																																																
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API 100A Sulphur Dioxide Analyzer Calibration																																																																
																																																																
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Comments: Sample filter changed. No ZERO adjustment made.																																																																

01 Minute Averages

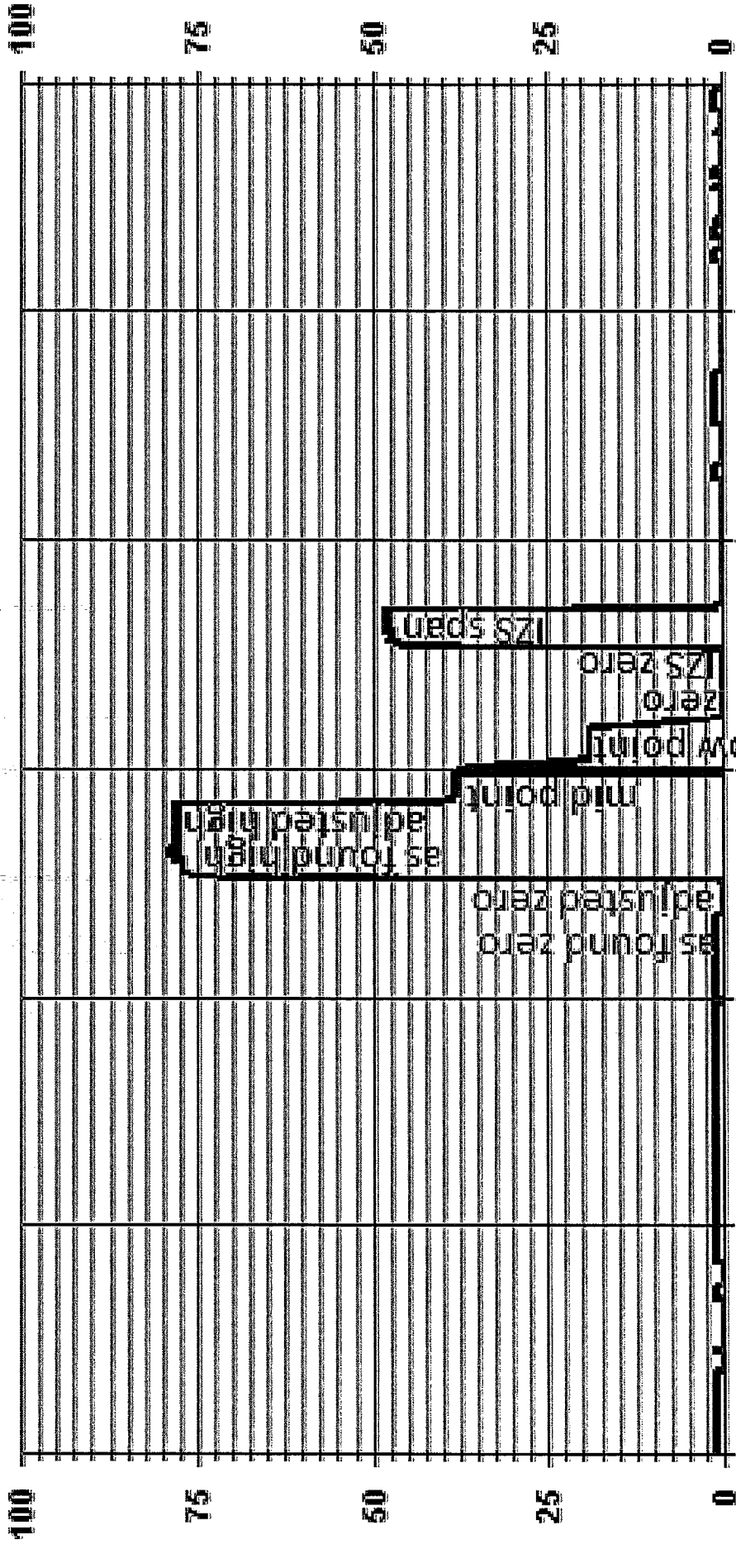


— LICA30 SO2_ PPB

HYDROGEN SULPHIDE

		<h3>API 101E Hydrogen Sulphide Analyzer Calibration</h3>									
Date: November 12, 2015 Company/Atshed: LICA Location/Station Name: Maskwa Parameter: Hydrogen Sulphide Start Time 24 hr. (mst): 12:16 End Time 24 hr. (mst): 15:29 Calibration Method: Gas Dilution		Barometric Pressure: 0.920 atm Station Temperature °C: 20 Weather Conditions: Mix of sun and clouds Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Trina Whitsitt Cal Gas Expiry Date: July 15, 2017 Converter Model & s/n (if applicable): n/a									
Analyzer: Serial Number: 511 Last Calibration Date: October 15, 2015 Previous C.F.: 1.000		Range ppb: 100 As Found C.F.: 1.005 New C.F.: 1.000									
Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 830 Cal Gas Cylinder I.D. #: LL36837 Cal Gas Conc. (ppm): 10.0		Standard Calibration Points for Ranges									
		<table border="1" style="width: 100%;"> <thead> <tr> <th>Point</th> <th>Hydrogen Sulphide Standard Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>78</td> </tr> <tr> <td>Mid</td> <td>38</td> </tr> <tr> <td>Low</td> <td>19</td> </tr> </tbody> </table>		Point	Hydrogen Sulphide Standard Calibration Points	High	78	Mid	38	Low	19
Point	Hydrogen Sulphide Standard Calibration Points										
High	78										
Mid	38										
Low	19										
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015											
Callibrator Flow Rates (cc/min)											
Point	Diluent	Cal Gas	Total	Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):					
as found zero	7497	0.00	7497	0.0	0.9	N/A					
as found high	7442	58.50	7501	78.0	78.5	1.005					
adjusted zero	7497	0.00	7497	0.0	0.0	n/a					
adjusted high	7442	58.50	7501	78.0	78.0	1.000					
mid	7472	28.50	7501	38.0	38.0	1.000					
low	7486	14.30	7500	19.1	19.1	0.998					
calibrator zero	7497	0.00	7497	0.0	0.0	n/a					
Average C.F.=						0.999					
Linear Regression/Calibration Results:											
Correlation Coefficient =			1.000		LIMITS > or = 0.995						
Slope =			1.000		.95-1.05						
b (Intercept as % of full scale)=			-0.01%		± 3% F.S.						
% change in C.F. from last cal=			-0.51%		± 10%						
API 101E Hydrogen Sulphide Analyzer Calibration											
											
As found: SLOPE: 0.843 OFFSET: 50.1 HVPS: 616 RCELL TEMP: 50.0 BOX TEMP: 30.1 PMT TEMP: 7.9 IZS TEMP: 45.0 Converter Temp: 314.5 PRES: 28.8 SAMP FL: 650 UV LAMP: 2559.5 LAMP RATIO: 82.3 STR. LGT: 21.1 DRK PMT: 32.8 DRK LMP: 5.4 Internal Span: 47.1			As left: SLOPE: 0.837 OFFSET: 51.6 HVPS: 616 RCELL TEMP: 50.0 BOX TEMP: 30.9 PMT TEMP: 7.9 IZS TEMP: 45.0 Converter Temp: 314.5 PRES: 28.7 SAMP FL: 647 UV LAMP: 2557.7 LAMP RATIO: 82.3 STR. LGT: 21.6 DRK PMT: 33.3 DRK LMP: 5.3 Internal Span: 47.85								
Comments: <p style="text-align: center;">Sample filter changed.</p>											

01 Minute Averages

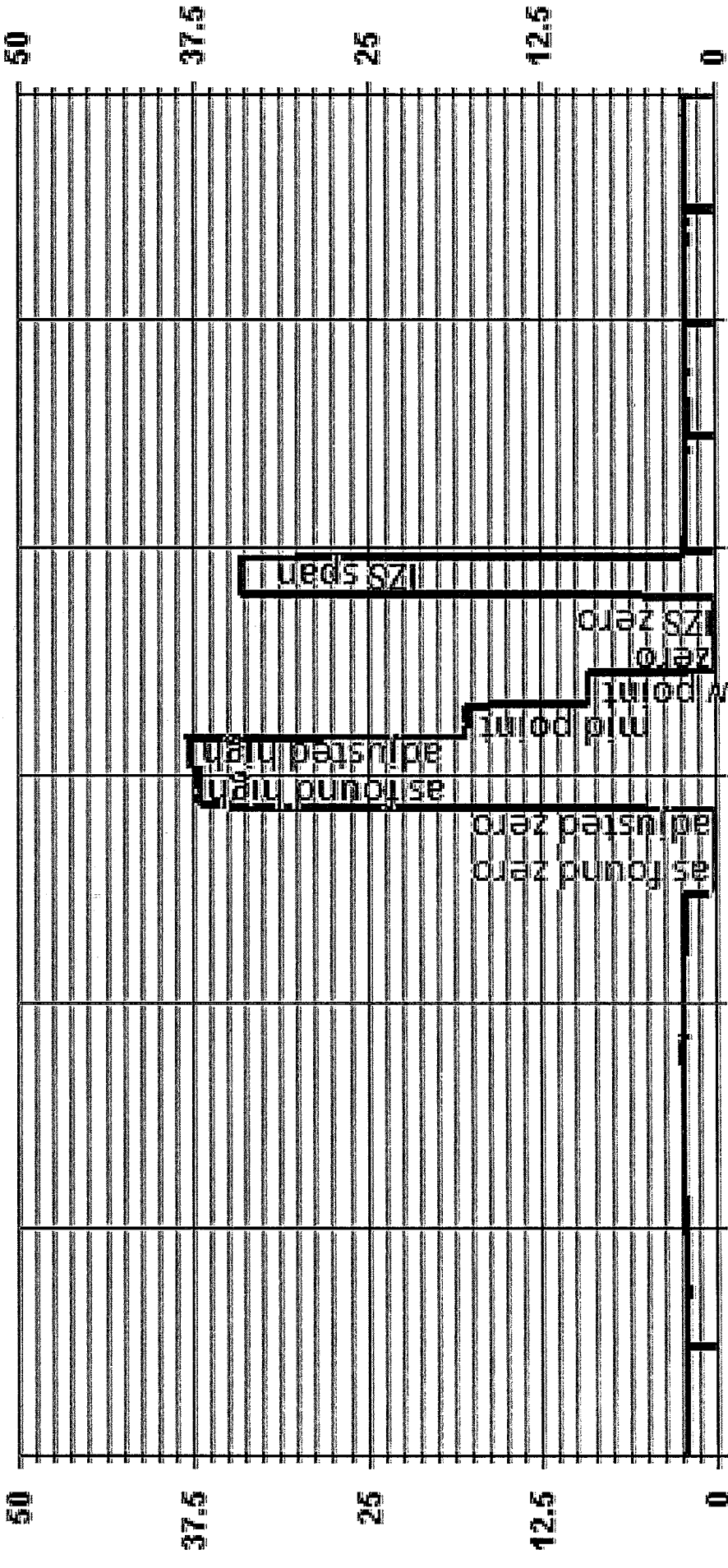


— LICA30 H2S_ PPB

TOTAL HYDROCARBON


Maxxam <small>A Division of Emerson Energy</small>		Thermo 51C Total Hydrocarbon Analyzer Calibration																																																											
Date: November 12, 2015		Barometric Pressure: 0.920 atm																																																											
Company/Alrshed: LICA		Station Temperature °C: 20																																																											
Location/Station Name: Maskwa		Weather Conditions: Mix of sun and clouds																																																											
Parameter: Total Hydrocarbon		Calibration Purpose: routine monthly																																																											
Start/End Time 24 hr. (mst): 9:48 / 13:00		Performed By/Reviewer: Alex Yakusov / Trina Whitsitt																																																											
Calibration Method: Gas Dilution		Cal Gas Expiry Date: March 26, 2017																																																											
Analyzer:																																																													
Serial Number: 436609738		Range ppm: 50																																																											
Last Calibration Date: October 15, 2015		As Found C.F.: 1.018																																																											
Previous Cal High Point C.F.: 1.001		New C.F.: 1.000																																																											
Calibrator:																																																													
Flow Meter ID's: n/a		Standard Calibration Points for a Range of 50 ppm																																																											
Make & Model: API 700																																																													
Serial #: 830		<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target ppm</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>38</td> </tr> <tr> <td>Mid</td> <td>18</td> </tr> <tr> <td>Low</td> <td>9</td> </tr> </tbody> </table>		Point	Target ppm	High	38	Mid	18	Low	9																																																		
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High	38																																																												
Mid	18																																																												
Low	9																																																												
Cal Gas Cylinder I.D. #: LL33674																																																													
CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm): 601.4 / 202.0																																																													
CH ₄ as propane/total CH ₄ equivalents (ppm): 555.5 / 1156.9																																																													
<i>ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015</i>																																																													
Calibrator Flow Rates (cc/min)																																																													
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Point	Diluent	Cal Gas	Total					Calculated	Indicated		Correction Factors:																																																		
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Thermo 51C Total Hydrocarbon Analyzer Calibration																																																													
As found:				As left:																																																									
H2 cylinder (psi): 1000				H2 cylinder (psi): 1000																																																									
H2 cylinder reg set (psi): 25				H2 cylinder reg set (psi): 25																																																									
Span Cylinder (psi): 600				Span Cylinder (psi): 600																																																									
Span Cylinder Reg Set (psi): 22				Span Cylinder Reg Set (psi): 22																																																									
Zero Air Gen Pressure: 35				Zero Air Gen Pressure: 35																																																									
measurement alarms: None				measurement alarms: None																																																									
service alarms: None				service alarms: None																																																									
cnt: 863				cnt: 901																																																									
rng: 1				rng: 1																																																									
try: 0				try: 0																																																									
flm: 181.2				flm: 180.6																																																									
det: 125.0				det: 125.6																																																									
Flame: 181				Flame: 180																																																									
Filter: 125				Filter: 125																																																									
Base: 125				Base: 125																																																									
Sample psi: 07.53				Sample psi: 07.53																																																									
Internal Air Pressure: 21				Internal Air Pressure: 21																																																									
Internal Fuel Pressure: 10				Internal Fuel Pressure: 10																																																									
Internal Pressure Gauge psi: 27				Internal Pressure Gauge psi: 27																																																									
Internal Span: 34				Internal Span: 34																																																									
Comments:																																																													
Sample filter changed. EV has not changed after calibration.																																																													

01 Minute Averages



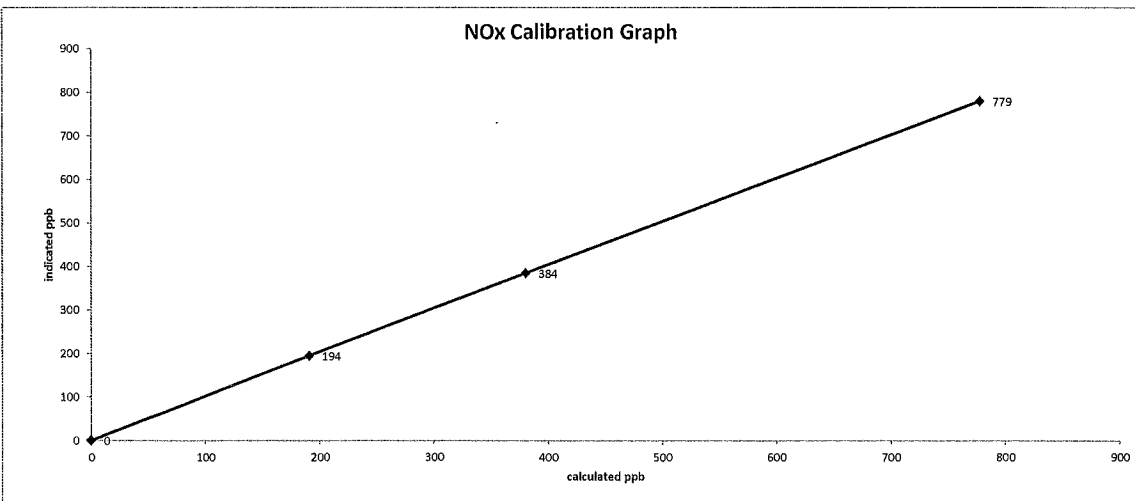
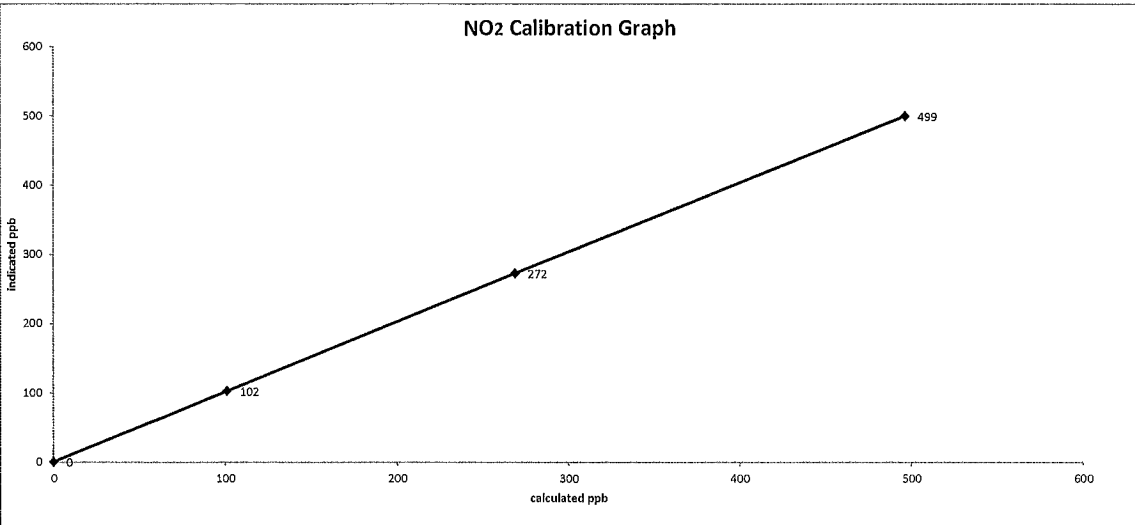
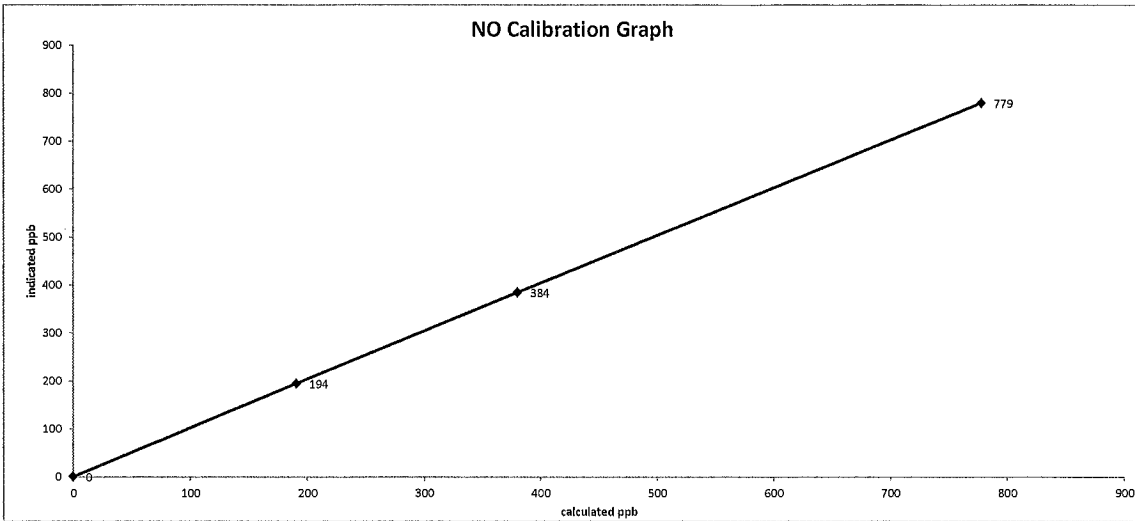
— LICA30 - - - - - THC PPM

NITROGEN DIOXIDE

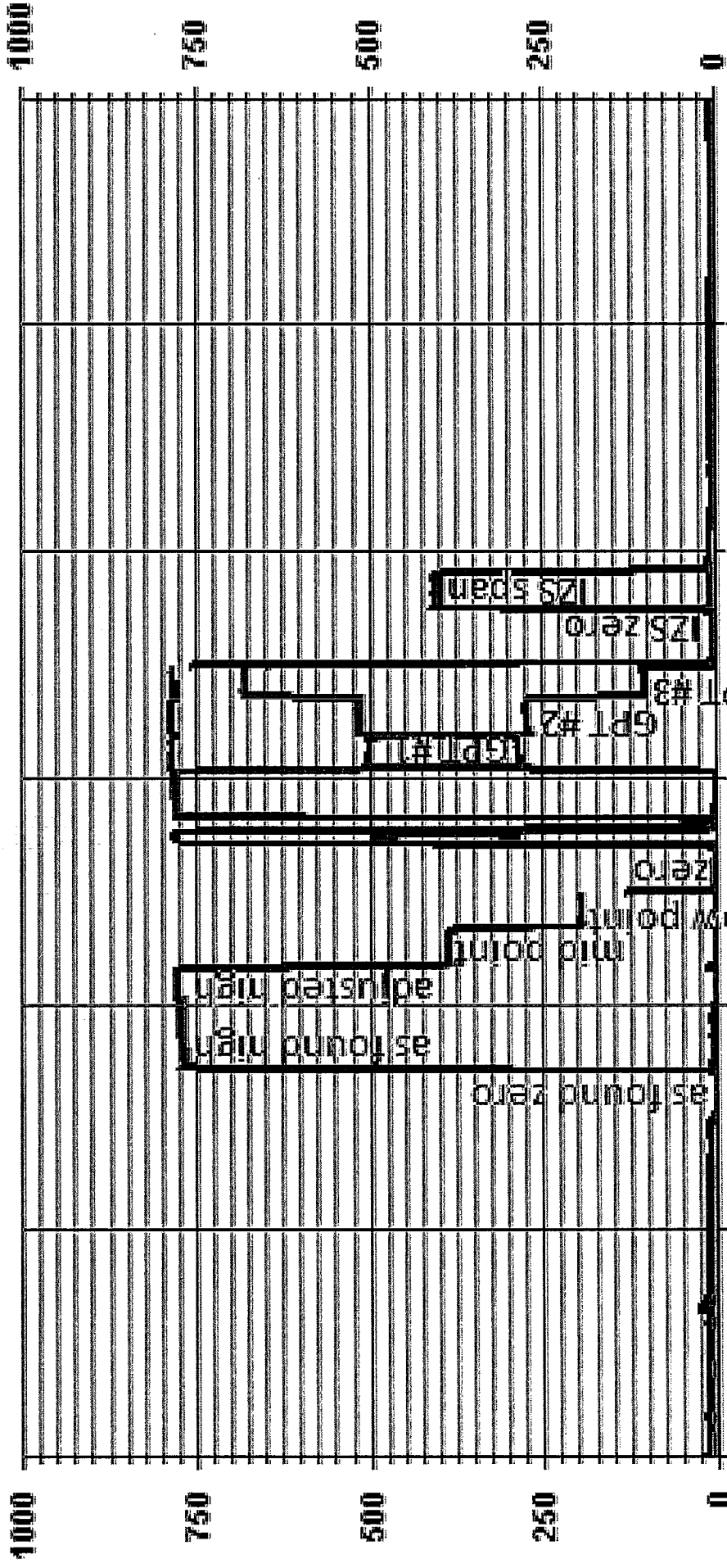
		<h2 style="margin: 0;">API 200E NO-NO2-NOx Analyzer Calibration</h2>																									
Date: <u>November 12, 2015</u>		Barometric Pressure: <u>0.920 atm</u>																									
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Location/Station Name: <u>Maskwa</u>		Weather Conditions: <u>Mix of sun and clouds</u>																									
Start/End Time 24 hr. (mst): <u>9:48 / 14:54</u>		Calibration Purpose: <u>routine monthly</u>																									
G.P.T. to be used for Ozone? <u>No</u>		Performed By/Reviewer: <u>Alex Yakupov</u> <u>Trina Whitsitt</u>																									
Calibration Method: <u>Gas Dilution & Varying UV Lamp Power</u>		Cal Gas Expiry Date: <u>March 12, 2019</u>																									
Analyzer: Serial Number: <u>593</u> Last Calibration Date: <u>October 15, 2015</u> Range ppb: <u>1000</u>		Correction Factors: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td style="text-align: center;">1.000</td> <td style="text-align: center;">1.013</td> <td style="text-align: center;">1.000</td> </tr> <tr> <td>NO₂ =</td> <td style="text-align: center;">1.000</td> <td style="text-align: center;">0.996</td> <td style="text-align: center;">0.996</td> </tr> <tr> <td>NOx =</td> <td style="text-align: center;">1.000</td> <td style="text-align: center;">1.009</td> <td style="text-align: center;">1.000</td> </tr> </tbody> </table>			Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.013	1.000	NO ₂ =	1.000	0.996	0.996	NOx =	1.000	1.009	1.000								
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NO ₂ =	1.000	0.996	0.996																								
NOx =	1.000	1.009	1.000																								
Calibrator: Flow Meter ID's: <u>n/a</u> Make & Model: <u>SABIO 2010 D</u> Serial #: <u>11900613</u> Cal Gas Cylinder I.D. #: <u>BLM002073</u> NO/NOx Gas Conc. (ppm): <u>50.6</u> <u>50.6</u>		Standard Calibration Points for a Range of: <u>1000 ppb</u> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td style="text-align: center;">780</td> <td style="text-align: center;">600</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Mid</td> <td style="text-align: center;">380</td> <td style="text-align: center;">275</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Low</td> <td style="text-align: center;">190</td> <td style="text-align: center;">100</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Extra Point #1</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Extra Point #2</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> </tr> </tbody> </table>		Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	600	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																								
High	780	600	n/a																								
Mid	380	275	n/a																								
Low	190	100	n/a																								
Extra Point #1	n/a	n/a	n/a																								
Extra Point #2	n/a	n/a	n/a																								
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																											
Calibrator Flow Rates (cc/min)																											
Point	Diluent	Cal Gas	Total Flow	Calculated NO (ppb)	Calculated NOx (ppb)	Indicated NO (ppb)	Indicated NOx (ppb)	NO C.F.	NOx C.F.																		
as found zero	5013	0.0	5013	0	0	0.0	0.0	n/a	n/a																		
as found high	4938	77.2	5015	778.9	778.9	769.0	772.0	1.013	1.009																		
adjusted high	4938	77.20	5015	778.9	778.9	779.0	779.0	1.000	1.000																		
mid	4975	37.70	5014	380.5	380.5	384.0	384.0	0.991	0.991																		
low	4994	18.90	5013	190.8	190.8	194.0	194.0	0.983	0.983																		
calibrator zero	5013	0.00	5013	0	0	0.0	0.0	n/a	n/a																		
Average C.F.=								0.991	0.991																		
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																											
Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.																	
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)																	
NOx reference	4938	77.20	5015	0.0	781.0	781.0	0.0	0.0	0.0	n/a																	
as found high NO2	4938	77.20	5015	520.0	284.0	784.0	499.0	497.0	499.0	0.996																	
gpt mid	4938	77.20	5015	275.0	512.0	784.0	272.0	269.0	272.0	0.989																	
gpt low	4938	77.20	5015	100.0	680.0	782.0	102.0	101.0	102.0	0.990																	
Average NO ₂ C.F.=								0.992	0.992																		
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015																											
Linear Regression/Calibration Results:																											
				NO	NOx	NO ₂	LIMITS																				
Correlation Coefficient =				1.000	1.000	1.000	> or = 0.995																				
Slope =				1.001	1.001	0.996	.95-1.05																				
b (Intercept as % of full scale) =				0.20%	0.20%	0.06%	± 3% F.S.																				
% change in C.F. from last cal =				-1.29%	-0.89%	0.40%	± 10%																				
NO2 converter efficiency				n/a	n/a	0.99	0.96 to 1.04																				
As found:		As left:																									
NOx SLOPE:	<u>0.972</u>	NOx SLOPE:	<u>0.980</u>																								
NOx OFFS:	<u>0.0</u>	NOx OFFS:	<u>0.0</u>																								
NO SLOPE:	<u>0.976</u>	NO SLOPE:	<u>0.987</u>																								
NO OFFS:	<u>-0.3</u>	NO OFFS:	<u>-0.3</u>																								
SAMP FLW:	<u>477</u>	SAMP FLW:	<u>476</u>																								
OZONE FL:	<u>78</u>	OZONE FL:	<u>78</u>																								
PMT:	<u>6.0</u>	PMT:	<u>4.2</u>																								
NORM PMT:	<u>-1.0</u>	NORM PMT:	<u>-0.5</u>																								
AZERO:	<u>7.4</u>	AZERO:	<u>7.5</u>																								
HVPS:	<u>662</u>	HVPS:	<u>662</u>																								
RCELL TEMP:	<u>50.0</u>	RCELL TEMP:	<u>50.0</u>																								
BOX TEMP:	<u>27.6</u>	BOX TEMP:	<u>28.6</u>																								
PMT TEMP:	<u>6.7</u>	PMT TEMP:	<u>6.7</u>																								
IZS TEMP:	<u>38.5</u>	IZS TEMP:	<u>38.6</u>																								
MOLY TEMP:	<u>314.6</u>	MOLY TEMP:	<u>315.1</u>																								
RCEL:	<u>4.3</u>	RCEL:	<u>4.3</u>																								
SAMP:	<u>26.8</u>	SAMP:	<u>27.1</u>																								
Internal Span NO:	<u>7.5</u>	Internal Span NO:	<u>6.6</u>																								
Internal Span NO2:	<u>385.9</u>	Internal Span NO2:	<u>398.6</u>																								
Internal Span NOx:	<u>393.5</u>	Internal Span NOx:	<u>404.9</u>																								
Comments:																											
Sample filter changed. No NO2 adjustment made. NO ZERO adjustment made. GPT reference point starts at 12:39.																											

Date: November 12, 2015
Company/Alrshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 9:48 / 14:54
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Varying UV Lamp Power



01 Minute Averages



11/12/15 07:00 11/12/15 09:00 11/12/15 11:00 11/12/15 13:00 11/12/15 15:00 11/12/15 17:00

— LICA30 NOX_ PPB — LICA30 NO2_ PPB — LICA30 NO_ PPB — LICA30 NO2_ PPB

WIND SYSTEM

**Met One Instruments Inc.
Certificate of Calibration**

Instrument: **Sonic Wind Sensor** Model No.: **50.5H**
 Manufacturer: **Met One Instruments Inc.** Serial No.: **H10703**
 Sales Order No.: **101530**

Customer: **Maxxam Analytics** Tested per P.O. No.: **35-54786**

Instrument Condition Within Tolerance: As Found () As Left (X)
 Corrective Action: No Adjustment () Adjust (X) Repair ()
 Preventative Maintenance ()

Quality Control Manual Revision: September 16, 2013 MP42201Rev. G
 All Work Performed per Customers Purchase Order Requirements
 Calibration Document No. **50.5-6100**

Date (As Found): **n/a** Date (As Left Test): **3/4/2014**

Calibrated by: *David Fuchs* Date: *3/4/14*

Test Equipment Used for Calibration of Instruments

Description	Manufacturer	Model No.	Serial No.	Cal Date	Cal Due	Accuracy
Digital Multimeter	Keithley	197A	490833	3/8/2013	3/8/2014	+/- .02% of input
Counter	Hewlett Packard	5245L	71616181	3/8/2013	3/8/2014	+/- 0.0001%
Standard Cup Assembly	Met One Instruments	170.41	3309	4/24/2012	4/24/2017	<.15mph or 1% ws

Environmental Data: Temperature 65 to 80 DegF Humidity 20 to 70 %
 Vibration none Radiation none

The standards used for calibration have accuracies equal to or greater than the instruments tested. These standards are on record and are traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated hereon, all instruments are calibrated to meet the manufacturer's published specifications. The calibration system complies with MIL-STD-45662A (8/1/88). Instrument's accuracy meets the requirements of Regulatory Guide 1.23 (2/72). Compliant with ISO 9001:2008 requirements.

QC inspection by: *Ben Foster* Date: *3/10/14*

CALIBRATORS

Company Maxxam Operator: Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>N/A</u>
Serial Number	<u>17200415</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>New</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>BLM0027561</u>	Barometric Pressure	<u>N/A</u>
NO/NOX Concentration	<u>50.7/50.7</u>		

Dilution Flow (sccm)		
Pt. #1	<u>5000</u>	Pt. #2 <u>5000</u> Pt. #3 <u>5000</u>
Gas Flow (sccm)		
Pt. #1	<u>80</u>	Pt. #2 <u>40</u> Pt. #3 <u>20</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5010	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5033	79.1	0.797	0.797	0.790	-0.011	0.779	-1%	-2%
5030	39.7	0.400	0.400	0.395	-0.005	0.390	-1%	-3%
5029	20.0	0.202	0.202	0.198	-0.003	0.195	-2%	-3%
Absolute Average Percent Difference							1%	3%

LINEAR REGRESSION ANALYSIS $y=mx+b$ (where x=calculated concentration, y=indicated concentration)

NO		LIMITS		NOx	
Correlation=	1.0000	≥	0.990	Correlation=	1.0000
m (Slope)=	0.9920		0.90-1.10	m (Slope)=	0.9783
b (Intercept % of FS)=	#DIV/0!	±	3% F.S.	b (Intercept % of FS)=	#DIV/0!

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5033	0.000	0.000	0.787	-0.011	0.776	NO ₂	% Diff. Limit
5033	0.520	0.490	0.297	0.475	0.772	0	± 10%
5033	0.280	0.261	0.526	0.249	0.774	0	± 10%
5033	0.100	0.089	0.698	0.078	0.775	0	± 10%
Absolute Average Percent Difference						0	± 10%

LINEAR REGRESSION ANALYSIS $y=mx+b$ (where x=calculated concentration, y=indicated concentration)

NO ₂		LIMITS	
Correlation=	1.0000	≥	0.995
m (Slope)=	0.9916		0.90-1.10
b (Intercept % of FS)=	#DIV/0!	±	3% F.S.

AENV Standards Audit Calibrator		NO _x Analyzer	
Make/Model	<u>Teco 146I</u>	Make/Model	<u>Teco 42I</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
		Last Calibration Date	<u>May 21, 2015</u>
		Full Scale (ppm)	

COMMENTS: Contains 49.9 ppm SO2

Auditor: Al Clark
Operator Signature: *Limin Li*

Date: May 21, 2015
Location: McIntyre Center Edmonton

Company <u>Maxxam</u>		Operator: <u>Limin Li</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>N/A</u>
Serial Number	<u>627</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>April 2014</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>BLM003914</u>	Barometric Pressure	<u>N/A</u>
NO/NOx Concentration	<u>50.8/50.8</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
Pt. #3	<u>5000</u>		
Gas Flow (sccm)			
Pt. #1	<u>80</u>	Pt. #2	<u>40</u>
Pt. #3	<u>20</u>		

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.000	0.000	0.000	0.001	0.001	Limit ± 10%	
4999	78.7	0.800	0.800	0.851	-0.016	0.835	6%	4%
5000	39.4	0.400	0.400	0.423	-0.008	0.416	6%	4%
5001	19.7	0.200	0.200	0.211	-0.003	0.208	5%	3%
Absolute Average Percent Difference							6%	4%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO	LIMITS	NOx
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0641	0.90-1.10	m (Slope)= 1.0429
b (Intercept % of FS)= -0.1200	± 3% F.S.	b (Intercept % of FS)= 0.0000

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
4999	0.000	0.000	0.841	-0.015	0.831	NO ₂	% Diff. Limit
4999	0.520	0.562	0.279	0.518	0.797	-5%	± 10%
4999	0.280	0.308	0.533	0.286	0.818	-2%	± 10%
4999	0.100	0.108	0.733	0.095	0.828	2%	± 10%
Absolute Average Percent Difference						2%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO₂	LIMITS
Correlation= 0.9998	≥ 0.995
m (Slope)= 0.9458	0.90-1.10
b (Intercept % of FS)= -1.0258	± 3% F.S.

AENV Standards	NO_x Analyzer
Audit Calibrator	
Make/Model <u>Teco 146I</u>	Make/Model <u>Teco 42I</u>
Serial/AMU Number <u>AMU 1809</u>	Serial/AMU Number <u>AMU 1868</u>
	Last Calibration Date <u>April 1, 2015</u>
	Full Scale (ppm) <u>1.0</u>

COMMENTS: Cylinder contains 49.7 ppm SO₂. System shows NOx drop when O₃ added. Also noisy during GPT phase for NO₂ and NOx.

Auditor: Al Clark Date: April 1, 2015
 Operator Signature: *Al Clark* Location: Molntyre Center Edmonton

Company: Maxxam **Operator:** Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010D</u>	Make/Model	<u>N/A</u>
Serial Number	<u>11900613</u>	Serial Number	<u>N/A</u>
Oven Temperature	<u>N/A</u>	Temperature (°C)	<u>N/A</u>
Last Verification Date	<u>N/A</u>	Barometric Pressure	<u>N/A</u>

Flow Measurements

Pt. No. 1 5000 Pt. No. 2 5000 Pt. No. 3 5000

Calibrator Flow (sccm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
5013	0.000	0.001		
5013	0.400	0.407	1%	± 10%
5013	0.200	0.204	1%	± 10%
5014	0.100	0.101	0%	± 10%
Absolute Average Percent Difference			1%	± 10%

LINEAR REGRESSION ANALYSIS
y=mx+b (where x=calculated concentration, y=indicated concentration)

O₃		LIMITS
Correlation=	1.0000	≥ 0.995
m (Slope)=	1.0163	0.90-1.10
b (Intercept % of FS)=	0.0800	± 3% F.S.

AENV Standards		Ozone Analyzer	
Audit Calibrator		Make/Model	<u>Teco 49i</u>
Make/Model	<u>Teco 49i PS</u>	Serial/AMU Number	<u>AMU 1843</u>
Serial/AMU Number	<u>AMU 1808</u>	Last Calibration Date	<u>May 21, 2015</u>
Ozone Standard	<u>Primary</u>	Full Scale (ppm)	<u>0.5</u>

COMMENTS: _____

Auditor: Al Clark Date: May 21, 2015
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton

Company: Maxxam Operator: Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>N/A</u>
Serial Number	<u>830</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>Oct 2013</u>	Temperature (°C)	<u>N/A</u>
SO ₂ Cylinder Conc.	<u>50.3</u>	Barometric Pressure	<u>N/A</u>
SO ₂ Cylinder S/N	<u>LL42475</u>		

Flow Measurements

Pt. No. 1 79.5 Pt. No. 2 39.8 Pt. No. 3 19.9

Calibrator Flow (sccm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
Zero Air	0.000	0.000		
4918	0.800	0.798	0%	± 10%
4960	0.400	0.398	-1%	± 10%
4977	0.200	0.200	0%	± 10%
Absolute Average Percent Difference			0%	± 10%

LINEAR REGRESSION ANALYSIS
y=mx+b (where x=calculated concentration, y=indicated concentration)

SO ₂		LIMITS
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9971	0.90-1.10
b (Intercept % of FS)=	0.0000	± 3% F.S.

AENV Standards		SO ₂ Analyzer	
Audit Calibrator		Make/Model	<u>Teco 43C</u>
Make/Model	<u>R&R MFC 201</u>	Serial/AMU Number	<u>AMU 1623</u>
Serial/AMU Number	<u>AMU 1690</u>	Last Calibration Date	<u>Dec 15/14</u>
		Full Scale (ppm)	<u>1.0</u>

COMMENTS: H2S gas was slow to move through the calibrator. Check for contamination inside calibrator. SO2 moves through quickly.

Auditor: Al Clark Date: December 16, 2014
Operator Signature: _____ Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

NO Cylinder Gas

File No. 2015-343CGA

Company: Maxxam Operators name: Limin Li
Cylinder #: BLM002758T Conc (PPM) 50.7/50.7 Tolerance (%) 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model Teco 146i
Serial Number AMU 1809
Last Verification Date March 31, 2015
Gas Type NO Conc. 48.79
Cylinder Number CAL018024

Flow Measurement Device:

Make/Model Bios DC2
Serial Number AMU 1659
Temp. °C 22.5 C
B.P. 690 mmhg

Reference Analyzer:

Make/Model Teco 42i Serial/AMU Number: 1868
Instrument Settings Zero: 4.2 Span: 1.008 Range: 1.0
Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000	0.01660	60.242	50.7	49.5
4976	82.6	0.842	0.822	0.01660	60.242	50.7	49.5
4993	41.0	0.420	0.410	0.00821	121.780	51.1	49.9
4977	20.2	0.208	0.205	0.00406	246.386	51.2	50.5
Average Cylinder Concentration:						51.0	50.0

	<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM:	<u>50.7</u>	<u>50.7</u>
Percent variance from Stated:	<u>0.7</u>	<u>1.4</u>

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration Contains 49.9 ppm SO2 in cylinder
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark Date: March 31, 2015
Operator Signature: *Al Clark* Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2015-345CGA

Company: Maxxam **Operators name:** Limin Li
Cylinder #: BLM002073 **Conc (PPM)** 50.6/50.6 **Tolerance (%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model Teco 146I
Serial Number AMU 1809
Last Verification Date March 31, 2015
Gas Type NO **Conc.** 48.79
Cylinder Number CAL018024

Flow Measurement Device:

Make/Model Bios DC2
Serial Number AMU 1659
Temp. °C 22.5 C
B.P. 690 mmhg

Reference Analyzer:

Make/Model Teco 42I **Serial/AMU Number:** 1868
Instrument Settings **Zero:** 4.2 **Span:** 1.008 **Range:** 1.0
Last Calibration: **Date:** Mar 31/15 **C.F.** 1.000 **Done By:** Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000	0.00000	0.00000	0.000	0.000
4976	82.6	0.855	0.848	0.01660	60.242	51.5	51.1
4993	41.0	0.427	0.421	0.00821	121.780	52.0	51.3
4977	20.2	0.213	0.209	0.00406	246.386	52.5	51.5
Average Cylinder Concentration:						52.0	51.3

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.6</u>	<u>50.6</u>
Percent variance from Stated: <u>2.8</u>	<u>1.4</u>

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration **Contains 49.5 ppm SO2 in cylinder**
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark **Date:** March 31, 2015
Operator Signature: *Limin Li* **Location:** Mcintyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-342CGA

Company: Maxxam Operator's Name: Limin Li
Cylinder #: BLM002756T Concentration PPM: 49.9 Tolerance(%) 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
Serial Number: AMU 1690
Last Verification Date: March 31, 2015
Gas Type: SO2 Conc. 98.57
Cylinder Number: CAL016720

Flow Measurement Device:

Make/Model: Bios DC2
Serial Number: AMU 1659
Temp. °C: 22.5 C
B.P. 690 mmhg

Reference Analyzer:

Make/Model: Teco 43C Serial/AMU Number: 1623
Instrument Settings: Zero: 7.9 Span: 1.028 Range: 1.0
Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	0.0000	0.0000	0.000
4976	82.6	0.821	0.01660	60.242	49.5
4993	41.0	0.410	0.00821	121.780	49.9
4977	20.2	0.202	0.00406	246.386	49.8
Average Cylinder Concentration:					49.7

Previous Stated Concentration PPM: 49.9

Percent variance from Stated: 0.4

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark
Operator Signature: *Al Clark*

Date: March 31, 2015
Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-344CGA

Company: Maxxam Operator's Name: Limin Li
Cylinder #: BLM002073 Concentration PPM: 49.5 Tolerance(%) 2 Certified By: Alr Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
Serial Number: AMU 1690
Last Verification Date: March 31, 2015
Gas Type: SO2 Conc. 98.57
Cylinder Number: CAL016720

Flow Measurement Device:

Make/Model: Blos DC2
Serial Number: AMU 1659
Temp. °C: 22.5 C
B.P. 690 mmhg

Reference Analyzer:

Make/Model: Teco 43C Serial/AMU Number: 1623
Instrument Settings: Zero: 7.9 Span: 1.028 Range: 1.0
Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (scem)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	0.01660	60.242	48.3
4976	82.6	0.801	0.01660	60.242	48.3
4993	41.0	0.396	0.00821	121.780	48.2
4977	20.2	0.193	0.00406	246.386	47.6
Average Cylinder Concentration:					48.0

Previous Stated Concentration PPM: 49.5

Percent variance from Stated: 3.0

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark
Operator Signature: *Al Clark*

Date: March 31, 2015
Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-338CGA

Company: Maxxam Operator's Name: Limin Li
Cylinder #: BLM002508 Concentration PPM: 10.2 Tolerance(%) 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
Serial Number: AMU1690
Last Verification Date: March 31, 2015
Gas Type: H2S Conc. 20.43
Cylinder Number: CAL015106

Flow Measurement Device:

Make/Model: Bios DC2
Serial Number: AMU 1659
Temp. °C: 23.0 C
B.P. 689 mmhg

Reference Analyzer:

Make/Model: Teco 450i Serial/AMU Number: 1980
Instrument Settings: Zero: 14.5 Span: 1.035 Range: 0.1
Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	0.0000	0.0
5080	38.2	0.0725	0.00752	132.984	9.6
5078	17.9	0.0340	0.00363	283.687	9.6
5066	9.1	0.0170	0.00180	566.703	9.5
Average Cylinder Concentration:					9.8

Previous Stated Concentration PPM: 10.2

Percent variance from Stated: 6.0

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark
Operator Signature: *Al Clark*

Date: March 31, 2015
Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-251CGA

Company: Maxxam Operator's Name: Limin Li
Cylinder #: LL36837 Concentration PPM: 10.0 Tolerance(%) 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
Serial Number: AMU 1690
Last Verification Date: December 15, 2014
Gas Type: H2S Conc. 20.43
Cylinder Number: CAL015106

Flow Measurement Device:

Make/Model: Bios DC2
Serial Number: AMU 1659
Temp. °C: 23.0 C
B.P. 702 mmhg

Reference Analyzer:

Make/Model: Teco 45C Serial/AMU Number: 1624
Instrument Settings: Zero: 6.4 Span: 1.160 Range: 0.1
Last Calibration: Date: Dec15/14 C.F. 1.000 Done By: Al Clark

Calibrator Flows (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	132.442	10.0
5099	38.5	0.0754	0.00755	132.442	10.0
5092	18.0	0.0349	0.00353	282.889	9.9
5066	9.2	0.0178	0.00182	550.652	9.8
Average Cylinder Concentration:					9.9

Previous Stated Concentration PPM: 10.0

Percent variance from Stated: 1.1

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark
Operator Signature: *Al Clark*

Date: December 16, 2014
Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-0270GA

Company: Maxxam **Operators name:** Limin Li
Cylinder #: LL83638 **Conc CH4 (PPM)** 582/203 **Tolerance (%)** 2 **Certified By:** Praxair

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>R&R MFC 201</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1691</u>			Serial Number	<u>AMU 1660</u>
Last Verification Date	<u>May 21, 2015</u>			Temp. °C	<u>24.0 C</u>
Gas Type	<u>CH4</u>	Conc.	<u>999.2</u>	B.P.	<u>703 mmhg</u>
Cylinder Number	<u>D751932</u>				
Gas Type	<u>C3H8</u>	Conc.	<u>246.5</u>		
Cylinder Number	<u>XF0037998</u>				

Reference Analyzer:
 Make/Model Teco 55C Serial/AMU Number: 1643
 Instrument Settings Zero: N/A Span: N/A Range: 20
 Last Calibration: Date: May 21/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (scm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2600	0.0	0.00	0.00	0.02005	49.883	595	201
2569	51.5	11.92	11.08	0.02005	49.883	595	201
3549	22.3	3.76	3.49	0.00628	159.148	598	202
3523	10.4	1.76	1.66	0.00295	338.750	596	204
Average Cylinder Concentration:						596	202

	<u>CH4</u>		<u>C3H8</u>
Previous Stated Concentration PPM:	<u>582</u>		<u>203</u>
Percent variance from Stated:	<u>2.5</u>		<u>0.3</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark Date: May 21, 2015
 Operator Signature: Location: McIntyre Center Edmonton



Praxair Canada, Inc.
 9501-34th Street
 Edmonton, AB T6B 2X6
 Tel: 780-440-0770
 Fax: 780-440-5302

03/27/2014

MAXAM ANALYTICS INC "NA"
 9372 49TH ST
 EDMONTON, AB T6B 2L7

Work Order No. 20248656
 Customer Reference No.

Product Lot/Batch No. Z582 4 085 02
 Product Part No. NI ME600P2P-AQ

CERTIFICATE OF ANALYSIS
Primary Standard

Component	Requested Concentration	Certified Concentration	Analytical Principle	Analytical Accuracy
Methane	600.0ppm	601.4ppm	U	±1% rel
Propane	200.0ppm	202ppm	U	±1% rel
Nitrogen	Balance	Balance		

Analytical Instruments: Mettler-Toledo Analytical Balance-ID2sx/USA--
 Hewlett-Packard (Agilent)-6690--GC-FID

Cylinder Style: AQ
 Cylinder Pressure @ 70F: 2200 psig
 Cylinder Volume: 82.0 fl3
 Valve Outlet Connection: CGA-350
 Cylinder No(s): LL33874

Filling Method: Gravimetric
 Date of Fill: 03/28/2014
 Expiration Date: 03/26/2017

Analyst: Todd Hryniv

The gas contained in this standard prepared by Praxair Canada, Inc. is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure techniques. The calibration standard is based on certified gas from Praxair Canada, Inc. Reference Materials used are either prepared by weights traceable to the National Institute of Standards and Technology (NIST), Measurement Canada or by using NIST Standard Reference Materials where available.

Typical tolerances for concentrations (in a % or ppm) are for gas phase, by volume (v/v), (ppmv) unless otherwise noted.

1. Gas Chromatography with Mass Spectrometry	2. Gas Chromatography with Charge Transfer Detector	3. Gas Chromatography with Electrolytic Conductivity Detector	4. Gas Chromatography with Flame Ionization Detector
5. Gas Chromatography with Photo Ionization Detector	6. Gas Chromatography with Thermal Conductivity Detector	7. Gas Chromatography with Thermal Conductivity Detector	8. Infrared (FTIR) or NMR
9. Gas Chromatography with Reduced Gas Analysis	10. Gas Chromatography with Thermal Conductivity Detector	11. By Difference of Typical Impurities	12. Gas Chromatography with Thermal Conductivity Detector
13. Gas Chromatography with Thermal Conductivity Detector	14. Gas Chromatography with Thermal Conductivity Detector	15. Gas Chromatography with Thermal Conductivity Detector	16. Gas Chromatography with Thermal Conductivity Detector
17. Gas Chromatography with Thermal Conductivity Detector	18. Gas Chromatography with Thermal Conductivity Detector	19. Gas Chromatography with Thermal Conductivity Detector	20. Gas Chromatography with Thermal Conductivity Detector

IMPORTANT

The information contained herein has been prepared at your request by personnel within Praxair Canada, Inc. When we believe the information is not reliable within the limits of the analytical methods employed and is contrary to the results of the accurate analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is being made available for your planning. The only use of the information is at the sole discretion and risk of the user. In no event shall liability of Praxair Canada, Inc. arising out of the use of the information be limited, reduced, or waived for providing such information.

AUDIT REPORT

COMPANY: LICA PLANT: Maskwa DATE: November 17, 2015

Station Location: UTM Coordinates: 54.60517N/110.45270W
 Elevation (m): 605m
 Declination: 13° 19'

GENERAL

	Yes	No	n/a	Comments:
Has site location changed from previous audit?		No		
Is site secure?	Yes			
Are station operating conditions adequate?	Yes			
Last twelve month's of calibrations available?	Yes			
All applicable SOP's available in station?		No		
Site documentation up to date?	Yes			

DATA ACQUISITION

	Yes	No	n/a	Comments:
Are strip charts in use?		No		
Is a digital data logger in use?		No		
Is a telemetry system for data acquisition in use?	Yes			

TRAILER COMPONENTS

	Yes	No	n/a	Comments:
Is a glass sampling manifold installed?	Yes			
Is sampling manifold clean and free of chips and cracks?	Yes			
Is a trap in place?	Yes			
Are spare manifold ports capped?	Yes			
Is manifold pump properly installed and operative?	Yes			
If horizontal, is the manifold mounted at a slight upward angle to prevent moisture from getting in to the lines?			n/a	
Do sample lines extend halfway into manifold?	Yes			
Are monitor sampling lines connected to manifold?	Yes			
Are sampling lines clean?		No		
Are monitors properly mounted and secure?	Yes			
Are monitors properly exhausted from room or scrubbed (NOx pump inlet scrubbed and dated)?	Yes			
Are zero and span systems operational?	Yes			


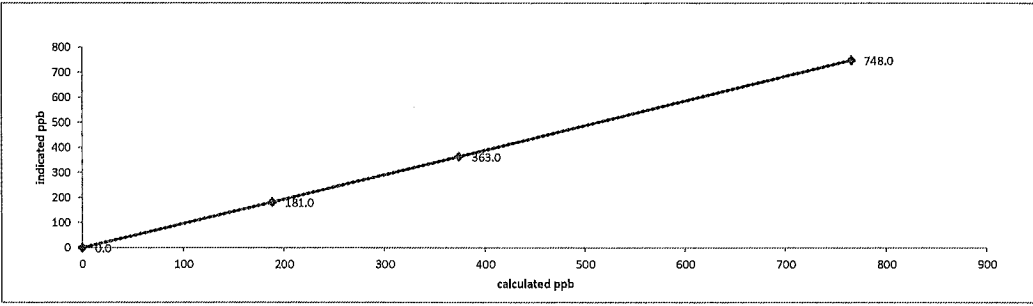
Meteorological

	Yes	No	n/a	Comments:
Is wind equipment properly oriented?	Yes			
Is the wind equipment functioning properly?	Yes			

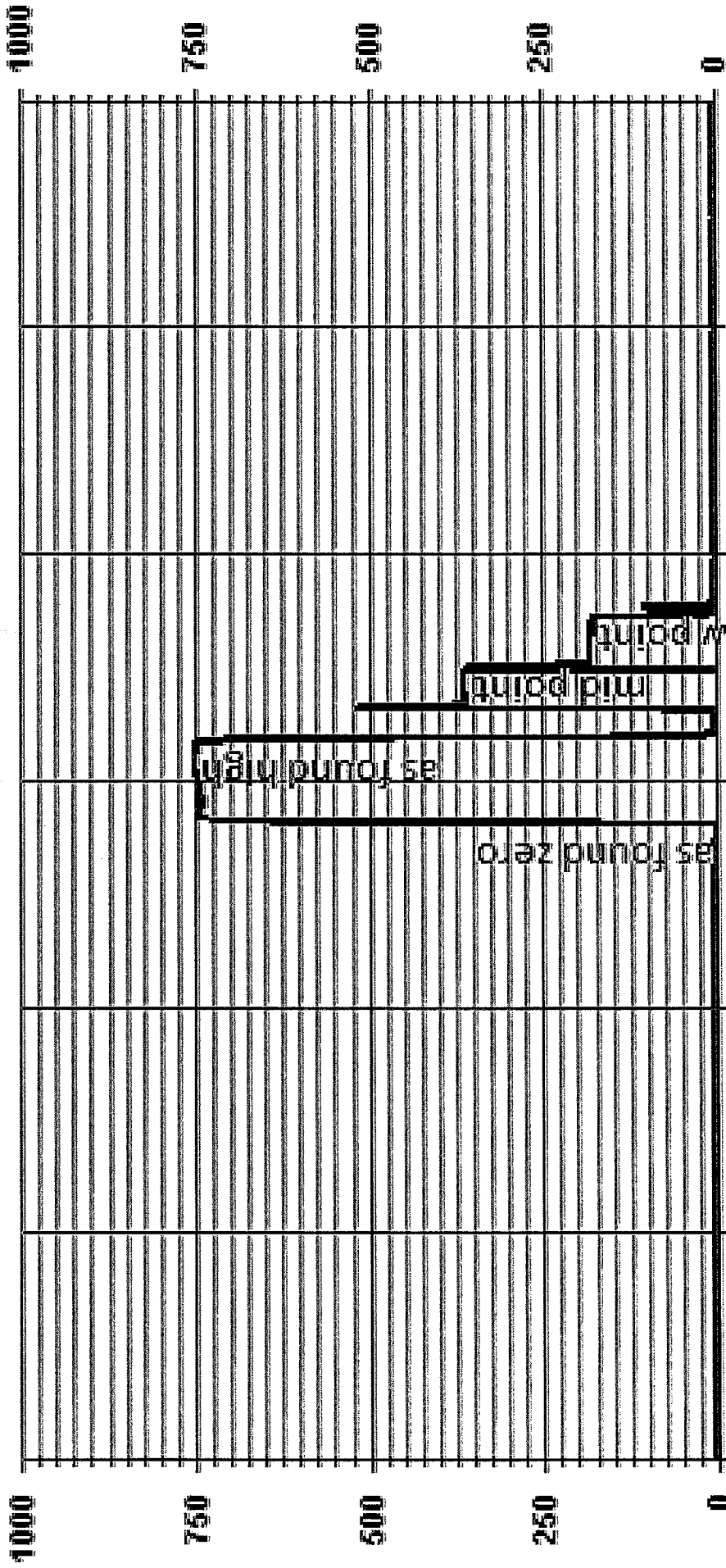
	Indicated Value:	Audit Value:	% Difference	Scalar Difference:
Station Temperature °C	21.39	20.97	-2.00	-0.42
Barometric Pressure	918.2	919.74	0.17	1.54
Wind Speed (kph)	5	n/a	n/a	n/a
Wind Direction (Deg)	210	n/a	n/a	n/a
Relative Humidity %	59.7	n/a	n/a	n/a
Ambient Temperature °C	1.37	1.15	n/a	-0.22
Solar Radiation kW/m ²	n/a	n/a	n/a	n/a
Precipitation (Tipping Bucket mm)	1	1	n/a	n/a

Recommendations: Clean sampling lines between analyzer and manifold.

AUDITOR: Limin Li


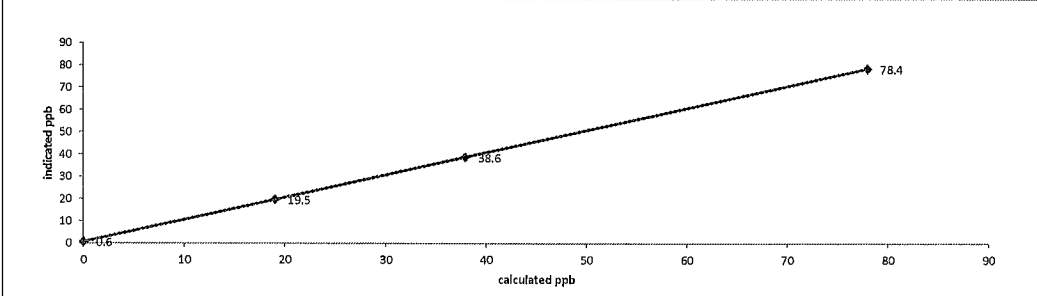
		API 100A Sulphur Dioxide Analyzer Audit									
Date: <u>November 17, 2015</u>		Barometric Pressure: <u>27.24 In. Hg</u>									
Company/Airshed: <u>LICA</u>		Station Temperature °C: <u>19</u>									
Location/Station Name: <u>Maskwa</u>		Weather Conditions: <u>Mainly sunny</u>									
Parameter: <u>Sulphur Dioxide</u>		Calibration Purpose: <u>Audit</u>									
Start Time 24 hr. (mst): <u>10:00</u>		Performed By/Reviewer: <u>Limin Li</u> <u>Tom Bourque</u>									
End Time 24 hr. (mst): <u>12:30</u>		Cal Gas Expiry Date: <u>December 25, 2018</u>									
Calibration Method: <u>Gas Dilution</u>		Converter Model & s/n (if applicable): <u>NA</u>									
Analyzer:											
Serial Number: <u>1124</u>		Range ppb: <u>1000</u>									
Last Calibration Date: <u>November 12, 2015</u>		As Found C.F.: <u>1.024</u>									
Previous C.F.: <u>1.000</u>		New C.F.: <u>n/a</u>									
Calibrator:											
Flow Meter ID's: <u>n/a</u>		Standard Calibration Points for Ranges									
Make & Model: <u>SABIO 2010</u>		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>Sulphur Dioxide Standard Calibration Points</th> </tr> <tr> <td>High</td> <td>780</td> </tr> <tr> <td>Mid</td> <td>380</td> </tr> <tr> <td>Low</td> <td>190</td> </tr> </table>		Point	Sulphur Dioxide Standard Calibration Points	High	780	Mid	380	Low	190
Point	Sulphur Dioxide Standard Calibration Points										
High	780										
Mid	380										
Low	190										
Serial #: <u>17200415</u>											
Cal Gas Cylinder I.D. #: <u>BLM002756T</u>											
Cal Gas Conc. (ppm): <u>49.9</u>											
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015											
Calibrator Flow Rates (cc/min)											
Point	Diluent	Cal Gas	Total								
as found zero	5029	0.00	5029								
as found high	4953	77.20	5030								
mid	4991	37.70	5029								
low	5011	19.00	5030								
Calculated Concentration: (ppb)											
Indicated Concentration: (ppb)											
Correction Factors (C.F.):											
Average C.F.= <u>1.032</u>											
Linear Regression/Calibration Results:											
Correlation Coefficient = <u>1.000</u>		LIMITS > or = 0.995									
Slope = <u>1.023</u>		0.90-1.10									
b (Intercept as % of full scale)= <u>0.18%</u>		± 3% F.S.									
% change in C.F. from last cal= <u>-2.38%</u>		± 10%									
API 100A Sulphur Dioxide Analyzer Audit											
											
As found: SLOPE: <u>0.957</u> OFFSET: <u>23.5</u> HVPS: <u>782</u> DCPS: <u>2565</u> RCELL TEMP: <u>50</u> BOX TEMP: <u>28.5</u> IZS TEMP: <u>45</u> Converter Temp: <u>NA</u> PRES: <u>24.5</u> SAMP FL: <u>657</u> PMT: <u>1622</u> UV LAMP: <u>2444</u> LAMP RATIO: <u>122.6</u> STR. LGT <u>11.2</u>		As left: SLOPE: <u>0.957</u> OFFSET: <u>23.5</u> HVPS: <u>782</u> DCPS: <u>2565</u> RCELL TEMP: <u>50</u> BOX TEMP: <u>28.5</u> IZS TEMP: <u>45</u> Converter Temp: <u>NA</u> PRES: <u>24.5</u> SAMP FL: <u>657</u> PMT: <u>1622</u> UV LAMP: <u>2444</u> LAMP RATIO: <u>122.6</u> STR. LGT <u>11.2</u>									
Recommendations:											
PMT:7.2C, Dark PMT:34. DRK LMP:-12. Calibrator flow rate (tested by Definer) High point : Total:4956CCM, Gas:76.37CCM; Mid point: Total:4973CCM, Gas:37.34. Low point: Total:4985CCM, Gas:18.73CCM.											

01 Minute Averages

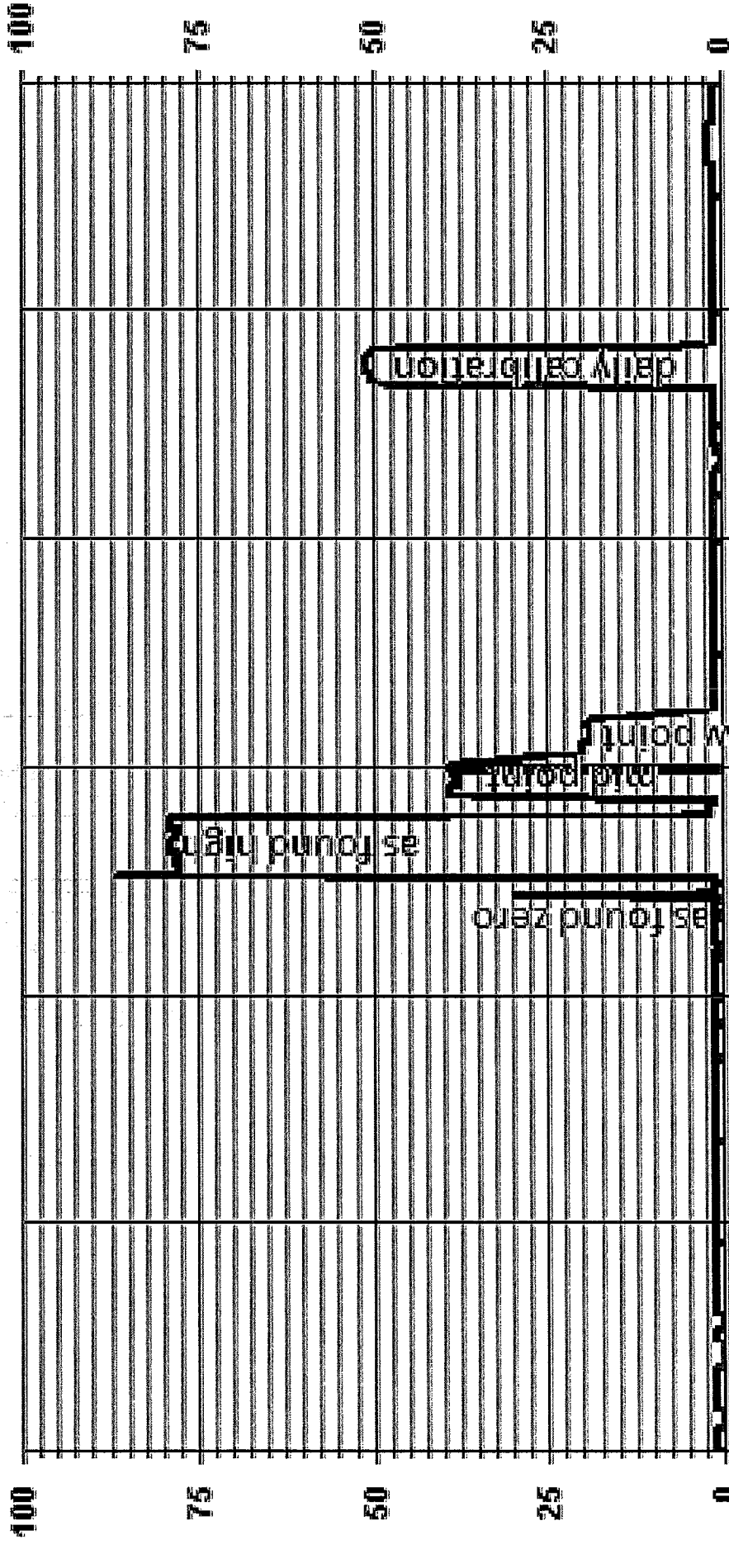


11/17/15 05:00 11/17/15 07:00 11/17/15 09:00 11/17/15 11:00 11/17/15 13:00 11/17/15 15:00

— LICA30 SO2_ PPB

 API 101E Hydrogen Sulphide Analyzer Audit																																														
Date: <u>November 17, 2015</u> Company/Alrshed: <u>LICA</u> Location/Station Name: <u>Maskwa</u> Parameter: <u>Hydrogen Sulphide</u> Start Time 24 hr. (mst): <u>12:15</u> End Time 24 hr. (mst): <u>14:30</u> Calibration Method: <u>Gas Dilution</u>	Barometric Pressure: <u>27.24 in. Hg</u> Station Temperature °C: <u>19</u> Weather Conditions: <u>Sunny</u> Calibration Purpose: <u>Audit</u> Performed By/Reviewer: <u>Limin Li</u> <u>Tom Bourque</u> Cal Gas Expiry Date: <u>January 6, 2018</u> Converter Model & s/n (if applicable): <u>Internal</u>																																													
Analyzer: Serial Number: <u>511</u> Range ppb: <u>100</u> Last Calibration Date: <u>November 12, 2015</u> As Found C.F.: <u>1.003</u> Previous C.F.: <u>1.005</u> New C.F.: <u>n/a</u>																																														
Calibrator: Flow Meter ID's: <u>n/a</u> Standard Calibration Points for Ranges Make & Model: <u>API700</u> <table border="1" style="display: inline-table; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Hydrogen Sulphide Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>78</td> </tr> <tr> <td>Mid</td> <td>38</td> </tr> <tr> <td>Low</td> <td>19</td> </tr> </tbody> </table> Serial #: <u>627</u> Cal Gas Cylinder I.D. #: <u>BLM002508</u> Cal Gas Conc. (ppm): <u>10.2</u>		Point	Hydrogen Sulphide Calibration Points	High	78	Mid	38	Low	19																																					
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Recommendations: IZS TEMP:45C. PMT:72.1. NORM PMT:53.3. Calibrator flow rate (tested by Definer) High point : Total:7360CCM. Gas:57.25CCM; Mid point: Total:7358CCM, Gas:27.83. Low point: Total:7354CCM, Gas:14.03CCM.																																														

01 Minute Averages



— LICA30 H2S_ PPB



Thermo 51C Total Hydrocarbon Analyzer Audit

Date:	November 17, 2015	Barometric Pressure:	27.24inHg
Company/Airshed:	LICA	Station Temperature °C:	19
Location/Station Name:	Maskwa	Weather Conditions:	Mainly sunny
Parameter:	Total Hydrocarbon	Calibration Purpose:	Audit
Start/End Time 24 hr. (mst):	10:10 - 12:00	Performed By/Reviewer:	Limin Li Tom Bourque
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	July 7, 2022

Analyzer:	Serial Number:	436609738	Range ppm:	50
	Last Calibration Date:	November 12, 2015	As Found C.F.:	0.986
	Previous Cal High Point C.F.:	1.018	New C.F.:	n/a

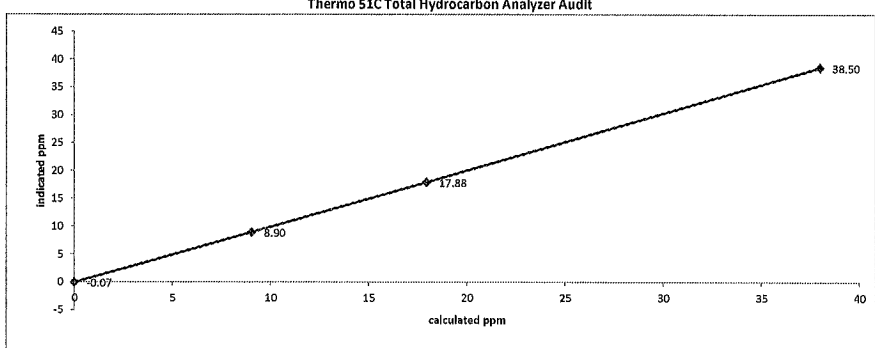
Calibrator:	Flow Meter ID's:	n/a	Standard Calibration Points for a Range of 50 ppm
	Make & Model:	API700	
	Serial #:	627	
	Cal Gas Cylinder I.D. #:	LL83638	
	CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	582.0 203.0	
	CH ₄ as propane/total CH ₄ equivalents (ppm):	558.3 1140.3	

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Callibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppm)	(ppm)	
as found zero	2000	0.00	2000	0.0	-0.07	n/a
as found high	2000	69.00	2069	38.03	38.50	0.986
mild	2000	32.00	2032	17.96	17.88	1.000
low	2000	16.00	2016	9.05	8.90	1.009
Average C.F.=						0.998

Linear Regression/Calibration Results:

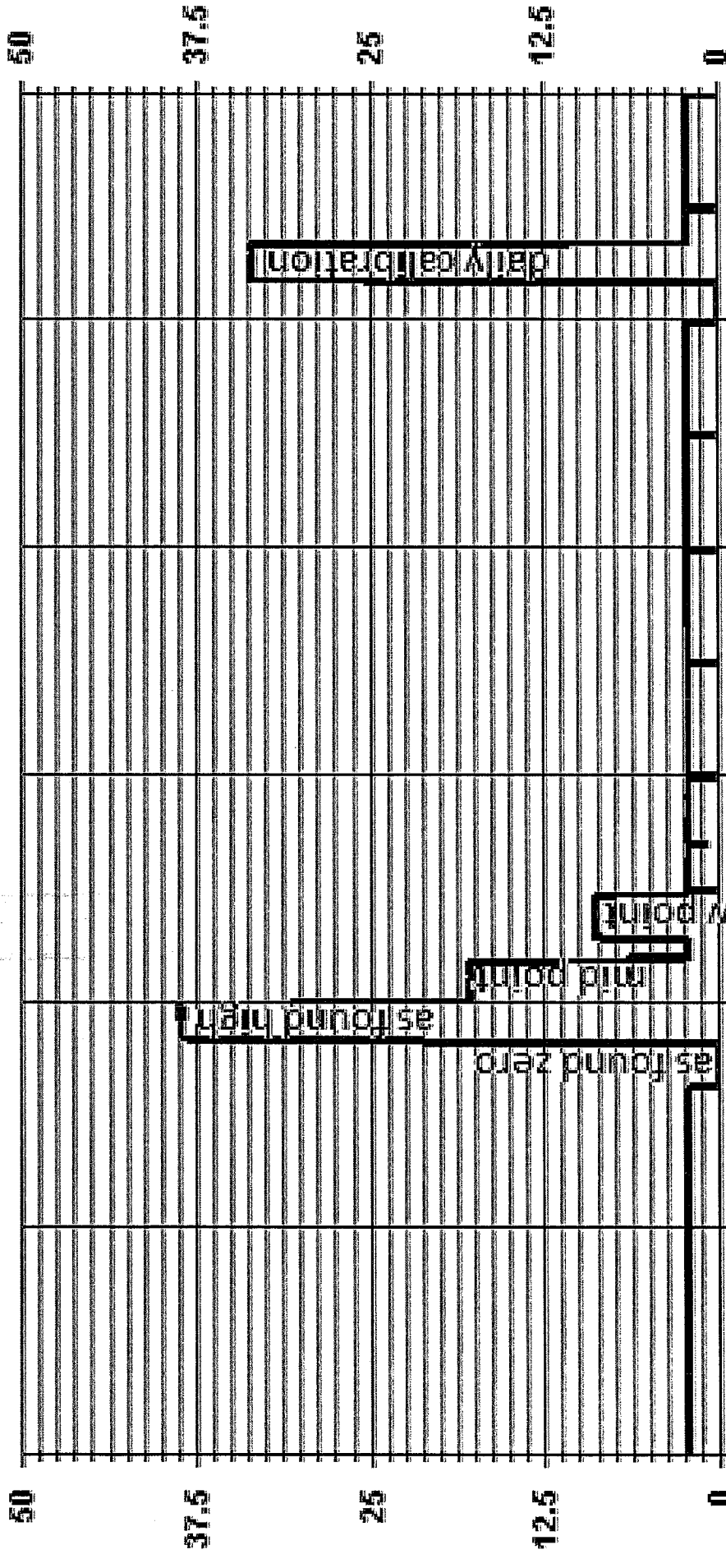
Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.985		.95-1.05
b (intercept as % of full scale) =	0.42%		± 3% F.S.
% change in C.F. from last cal =	3.15%		± 10%



As found:	As left:
H2 cylinder (psi): 1300	H2 cylinder (psi): 1300
H2 cylinder reg set (psi): 25	H2 cylinder reg set (psi): 25
Span Cylinder (psi): 500	Span Cylinder (psi): 500
Span Cylinder Reg Set (psi): 25	Span Cylinder Reg Set (psi): 25
Zero Air Gen Pressure: 35	Zero Air Gen Pressure: 35
measurement alarms: YES	measurement alarms: none
service alarms: Flow REG FAIL	service alarms: none
cnt: 812	cnt: 812
rng: 1	rng: 1
try: 0	try: 0
flm: 178.8	flm: 178.8
det: 125	det: 125
Flame: 178	Flame: 178
Filter: 125	Filter: 125
Base: 125	Base: 125
Sample psi: 7.51	Sample psi: 7.51
Internal Air Pressure: 21	Internal Air Pressure: 21
Internal Fuel Pressure: 10	Internal Fuel Pressure: 10
Intenal Pressure Gauge psi: 27	Intenal Pressure Gauge psi: 27


Comments:
Alarm: Flow REG FAIL. Turn off then turn on analyzer to remove the alarm. Sample flow rate: 0.84 LPM. Need to rebuild pump next month.

01 Minute Averages

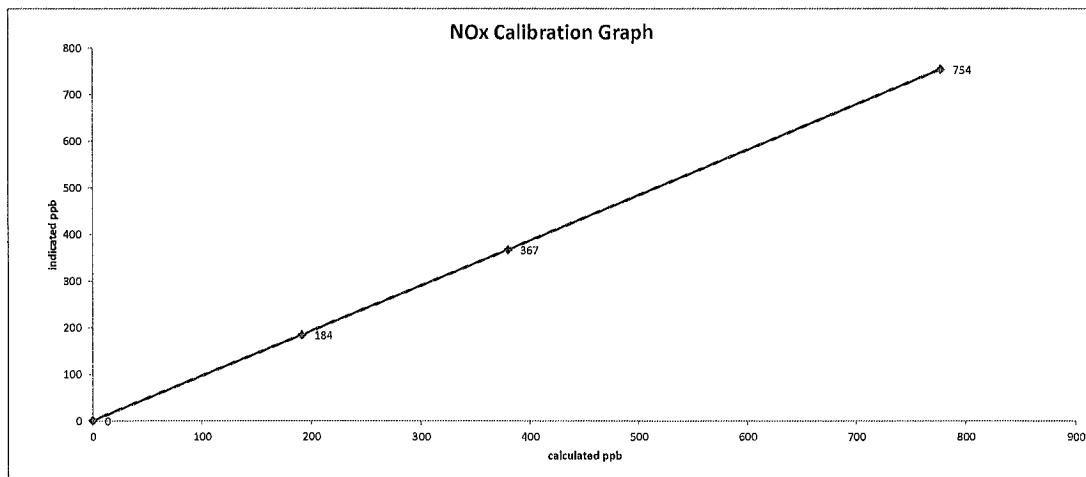
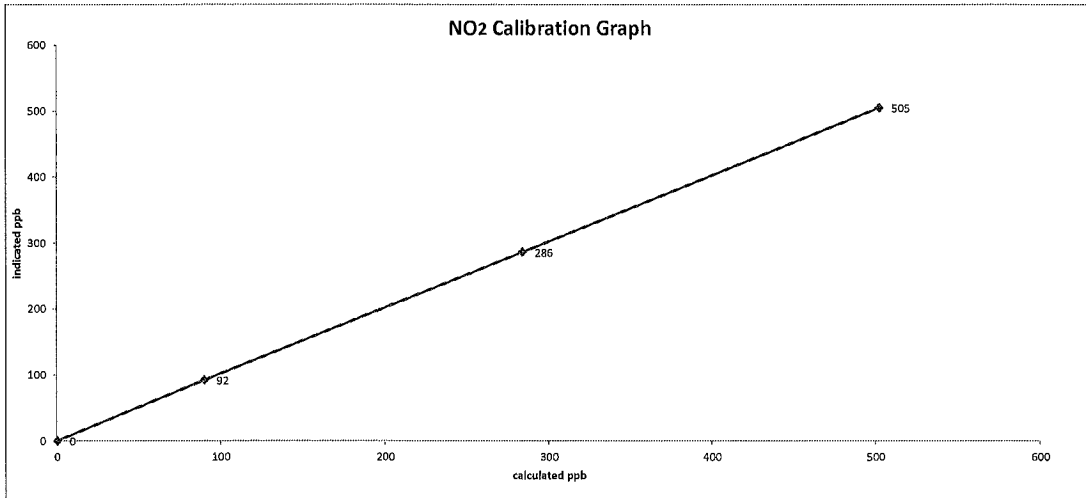
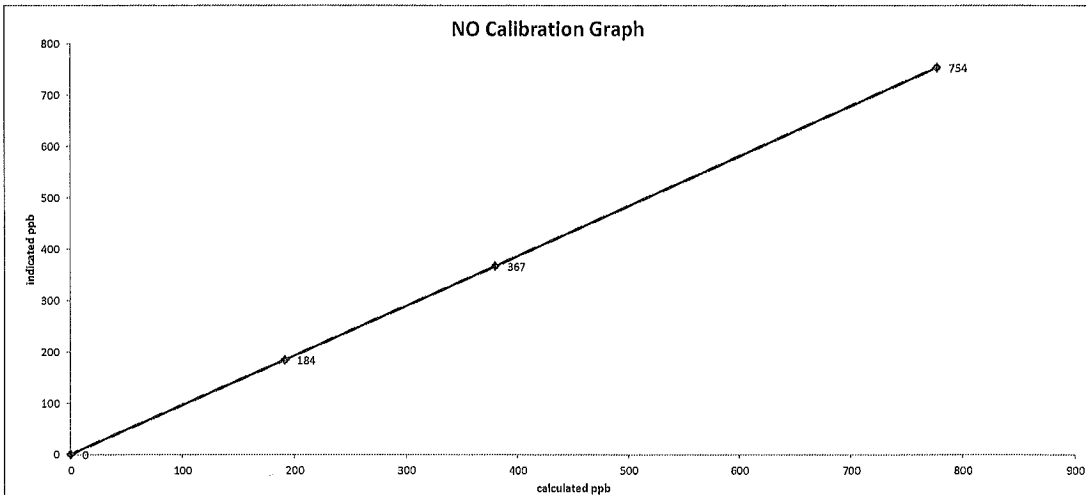


11/17/15 07:00 11/17/15 09:00 11/17/15 11:00 11/17/15 13:00 11/17/15 15:00 11/17/15 17:00

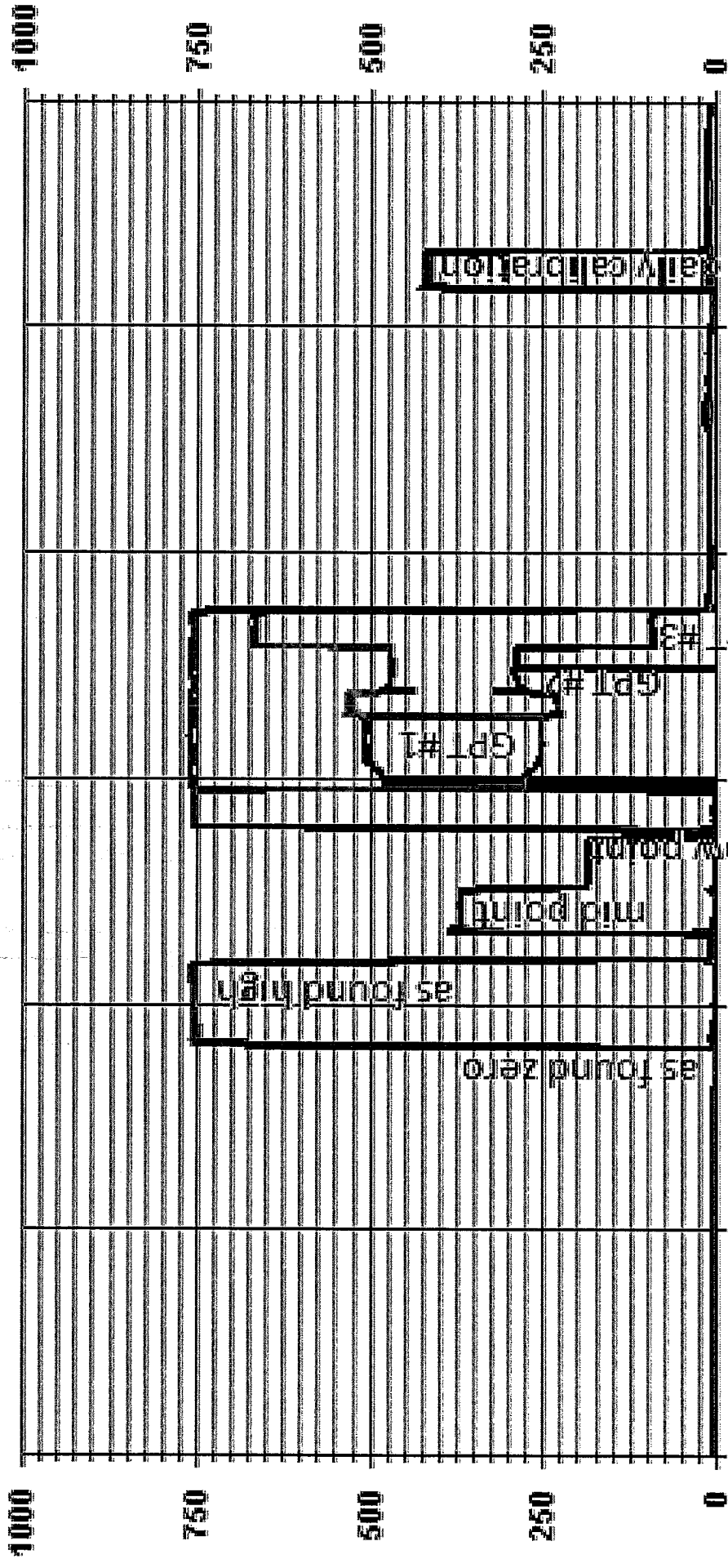
— LICA30 - - - - - THC PPM

 API 200E NOx Analyzer Audit																																																																														
Date: November 17, 2015 Company/Airshed: LICA Location/Station Name: Maskwa Start/End Time 24 hr. (mst): 10:00 14:30 G.P.T. to be used for Ozone?: No Calibration Method: Gas Dilution & Gas Phase Titration	Barometric Pressure: 27.24 In. Hg Station Temperature °C: 19 Weather Conditions: Mainly cloudy with sunny breaks Calibration Purpose: Audit Performed By/Reviewer: Limin Li Tom Bourque Cal Gas Expiry Date: December 25, 2018																																																																													
Analyzer: Serial Number: 593 Last Calibration Date: November 12, 2015 Range ppb: 1000	Correction Factors: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.000</td> <td>1.033</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>0.996</td> <td>0.996</td> <td>n/a</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.033</td> <td>n/a</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.033	n/a	NO ₂ =	0.996	0.996	n/a	NOx =	1.000	1.033	n/a																																																													
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Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 Serial #: 17200415 Cal Gas Cylinder I.D. #: BLM002756T NO/NOx Gas Conc. (ppm): 50.7 50.7	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a																																																					
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Absolute NO ₂ converter efficiency =	n/a	AMD tolerance = 96%-104%																																																																												
<table style="width:100%;"> <tr> <td style="width: 50%; vertical-align: top;"> As found: NOx SLOPE: 0.98 NOx OFFS: 0 NO SLOPE: 0.987 NO OFFS: -0.3 SAMP FLW: 466 OZONE FL: 76 PMT: 6 NORM PMT: -1 AZERO: 7.5 HVPS: 662 RCELL TEMP: 50 BOX TEMP: 28.7 PMT TEMP: 6.7 MOLY TEMP: 314.4 RCEL: 4.2 SAMP: 26.6 </td> <td style="width: 50%; vertical-align: top;"> As left: NOx SLOPE: 0.98 NOx OFFS: 0 NO SLOPE: 0.987 NO OFFS: -0.3 SAMP FLW: 466 OZONE FL: 76 PMT: 6 NORM PMT: -1 AZERO: 7.5 HVPS: 662 RCELL TEMP: 50 BOX TEMP: 28.7 PMT TEMP: 6.7 MOLY TEMP: 314.4 RCEL: 4.2 SAMP: 26.6 </td> </tr> </table>		As found: NOx SLOPE: 0.98 NOx OFFS: 0 NO SLOPE: 0.987 NO OFFS: -0.3 SAMP FLW: 466 OZONE FL: 76 PMT: 6 NORM PMT: -1 AZERO: 7.5 HVPS: 662 RCELL TEMP: 50 BOX TEMP: 28.7 PMT TEMP: 6.7 MOLY TEMP: 314.4 RCEL: 4.2 SAMP: 26.6	As left: NOx SLOPE: 0.98 NOx OFFS: 0 NO SLOPE: 0.987 NO OFFS: -0.3 SAMP FLW: 466 OZONE FL: 76 PMT: 6 NORM PMT: -1 AZERO: 7.5 HVPS: 662 RCELL TEMP: 50 BOX TEMP: 28.7 PMT TEMP: 6.7 MOLY TEMP: 314.4 RCEL: 4.2 SAMP: 26.6																																																																											
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Recommendations:																																																																														
Calibrator flow rate (tested by Definer) High point : Total:4956CCM, Gas:76.37CCM; Mid point: Total:4973CCM, Gas:37.34. Low point: Total:4985CCM, Gas:18.73CCM.																																																																														

Date:	November 17, 2015	Start/End Time 24 hr. (mst):	10:00
Company/Airshed:	LICA	Calibration Purpose:	shut down
Location/Station Name:	Maskwa	Calibration Method:	Gas Dilution & Gas Phase Titration



01 Minute Averages



11/17/15 07:00 11/17/15 09:00 11/17/15 11:00 11/17/15 13:00 11/17/15 15:00 11/17/15 17:00

— LICA30 NOX_ PPB — LICA30 NO_ PPB — LICA30 NO2_ PPB

APPENDIX III
CHAIN OF CUSTODY



Maxxam Analytics - Air Services Group

Project Chain of Custody

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2015-11-30- C</u>
Site: <u>Maskwa Site</u>	Contact: <u>Mike Bisaga</u>

QA Check Complete	<u>mselmha</u>	Date	<u>22-Dec-2015</u>
QA Check Review	<u>mselmha</u>	Date	<u>22-Dec-2015</u>
Report Complete	<u>mselmha</u>	Date	<u>31-Dec-2015</u>
Report Reviewed	<u>[Signature]</u>	Date	<u>31-Dec-2015</u>
Report Shipped	_____	Date	_____

Notes