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March 20, 2015

RE: January 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". The signature is written in a cursive style.

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 #:2833-2015-01-01- C

JANUARY 2015


Prepared for:

**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
BOX 8237, 5107W - 50 STREET
BONNYVILLE, ALBERTA
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Attention: MIKE BISAGA

DATE: **March 13, 2015**

Prepared by:



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Project Manager Assistant, Source Testing, Maxxam Analytics

Reviewed by:



Lily Lin, B.Sc.
Customer Service Supervisor, Air Services, Maxxam Analytics

SUMMARY

In JANUARY 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 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.

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						MAXIMUM VALUES							OPERATIONAL TIME (%)
Cold Lake South Site						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	0	4	1	22	4	NE	0.8	6	100.0
TRS (PPB)	-	-	-	-	0	1	VAR	VAR	VAR	VAR	0.2	7	100.0
THC (PPM)	-	-	-	-	2.3	3.9	12	11	2.3	WNW	3.0	12	98.0
NO2 (PPB)	159	-	0	-	7.8	33.3	18	16	1	E	21.7	12	100.0
NO (PPB)	-	-	-	-	2.0	52.8	12	9	0.7	WNW	17.0	12	100.0
NOX (PPB)	-	-	-	-	9.8	78	12	9	0.7	WNW	28.4	12	100.0
O3 (PPB)	82	-	0	-	25	43	25	16	10.4	WNW	37.3	17	98.0
PM2.5 (UG/M3)	-	30	-	0	7.1	36.0	13	14	2.6	SW	20.1	12	96.2
RELATIVE HUMIDITY (%)	-	-	-	-	74.2	98	24	5	7	WSW	88.1	27	100.0
AMBIENT TEMPERATURE (DEG C)	-	-	-	-	-11.6	10.1	25	15	12.5	WNW	4.1	22	100.0
VECTOR WS (KPH)	-	-	-	-	4.9	17.6	8	11	-	NW	10.7	8	100.0
VECTOR WD (DEG)	-	-	-	-	W	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

Passive Results

	Sulphur Dioxide (in ppb)
Mean	0.7
Minimum	0.3
Maximum	1.7

Note: N/A

	Hydrogen Sulphide (in ppb)
Mean	0.12
Minimum	0.08
Maximum	0.16

Note: N/A

	Nitrogen Dioxide (in ppb)
Mean	3.6
Minimum	1.0
Maximum	8.8

Note: N/A

	Ozone (in ppb)
Mean	27.89
Minimum	21.39
Maximum	33.82

Note: N/A

Volatilic Organics (VOCs) Data Summary

Sample Collected Date	Maximum reading (PPB)	Volatilic Organic Compound
JANUARY 6, 2015	2.00	n-butane
JANUARY 12, 2015	3.73	n-butane
JANUARY 18, 2015	4.11	Acetone
JANUARY 24, 2015	6.72	Acetone
JANUARY 30, 2015	1.21	Acetone

Note: NA

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collected Date	Maximum reading (ug)	Semi-Volatile Organic
JANUARY 6, 2015	1.94	Naphthalene
JANUARY 12, 2015	0.09	Naphthalene
JANUARY 18, 2015	4.01	2-Methylnaphthalene
JANUARY 24, 2015	0.20	Phenanthrene and Naphthalene
JANUARY 30, 2015	0.46	Naphthalene

Note: NA

Partisol Sampler Summary

Sample Collected Date	Concentration (mg)
JANUARY 6, 2015	0.022
JANUARY 12, 2015	0.304
JANUARY 18, 2015	0.128
JANUARY 24, 2015	0.042
JANUARY 30, 2015	0.094

Note: NA

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

TSP 24- Hour Exceedences

No Exceedences Recorded During the Month

PM_{2.5} 24- Hour Exceedences

No Exceedences Recorded During the Month

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Analytical Results

Passive Samples

VOCs Samples

PAHs Samples

Partisol Samples

1.0 Discussion

This monthly report consists data for parameters of SO₂, TRS, THC, NO_x, NO, NO₂, PM_{2.5}, WS, WD, RH, Temperature and O₃.

Sample filters for all continuous air monitors were changed before the calibration was started. The sample manifold was 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 is to be operational 90% of the time (minimum), on a monthly basis.

All data was within Provincial objectives for the month.

SULPHUR DIOXIDE (SO₂)

The analyzer was working well throughout the month. The routine monthly calibration was performed on January 6. The inlet filter was changed before the calibration was started.

TOTAL REDUCED SULPHUR (TRS)

The analyzer was working well throughout the month. The routine monthly calibration was performed on January 6. The inlet filter was changed before the calibration was started.

TOTAL HYDROCARBONS (THC)

The routine monthly calibration was performed on January 6. The inlet filter was changed before the calibration was started. On January 21, the analyzer was put into maintenance mode for the hydrogen cylinder change out. An as found points check was performed on January 26. The analyzer was put into maintenance mode overnight to ascertain its stability. A full calibration was performed on January 27.

NITROGEN DIOXIDE (NO₂)

The routine monthly calibration was performed on January 6. The inlet filter was changed before the calibration was started. The analyzer spanned high on January 12. An as found points check was performed on January 13 and the result was within acceptance limits. Maintenance was performed following the as found points check on January 13. The charcoal for zero air supply was renewed and the daily zero/span system was rebuilt. A post repair calibration was completed on the same day. As the analyzer passed the as found points check, no data was discarded due to this event. The expected value was adjusted on January 16.

OZONE (O₃)

The routine monthly calibration was performed on January 6. The inlet filter was changed before the calibration was started. On January 9, the analyzer did not span due to the valve for the zero system getting stuck. Maintenance was performed on January 10, including the disconnection, cleaning and reconnection of the pump and the air valve. A zero-span check was done after the maintenance on January 10. The zero/span system was functioning properly after the maintenance. 15 hours of data were discarded due to this event. The expected span value was changed on January 12. An as found points check was performed on January 13 to ensure the analyzer's functionality, and the result was within the acceptable range.

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

Two Teom audits were performed on this month: one was completed on January 6, and the other audit was performed on January 26. Both the inlet filter and the FDMS filter were replaced on January 26. 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. 28 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 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 MONITORING

Samples were collected at all designated stations, except station 11 and station 18. Samples installed at station 11 was not changed as access to the station was blocked by snow. SO₂ sample installed at station 18 is missing. Samples were sent to the lab for analysis. Results are included in this report.

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 as ppb in 2 decimal places.

Samples were collected on January 6, 12, 18, 24 and 30. They were sent to the lab for analysis. 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 as ppb in 2 decimal places.

Samples were collected on January 6, 12, 18, 24 and 30. They were sent to the lab for analysis. 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 as mg in 2 decimal places.

Samples were collected on January 6, 12, 18, 24 and 30. They were sent to the lab for analysis. 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, Tom Bourque, 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 90% requirements.

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.

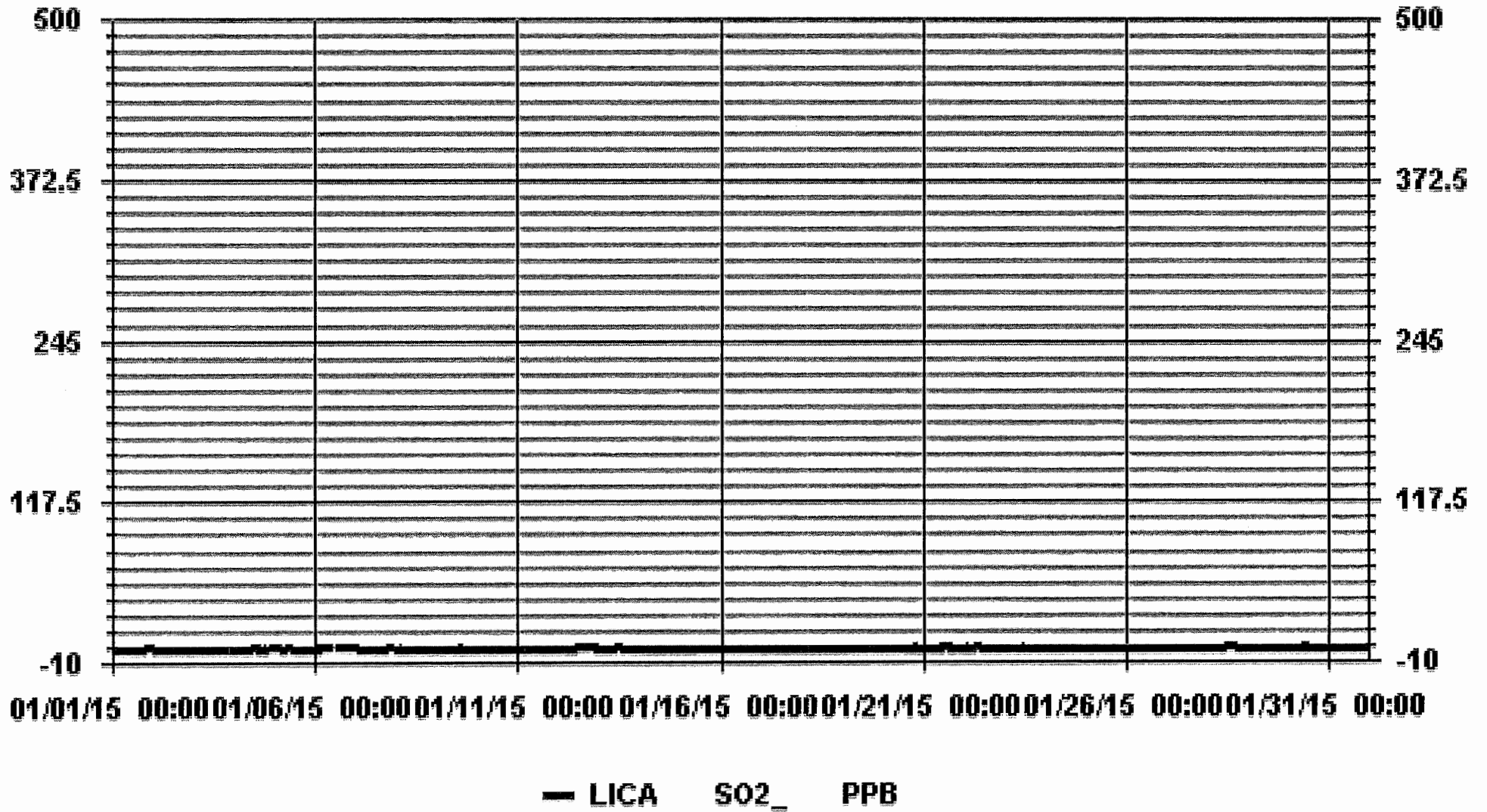
The following instruments were used to perform the test program:

- 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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

01 Hour Averages





SULPHUR DIOXIDE 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	24-HOUR	RDGS.	
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	0:00	MAX.	AVG.		
DAY 1	1	0	0	0	0	0	0	0	S	0	0	0	1	0	0	0	0	0	1	1	2	5	5	3	5	0.8	24	
2	3	2	1	0	1	0	0	S	1	1	1	1	1	1	1	0	0	0	1	2	1	0	0	0	3	0.8	24	
3	0	0	0	0	0	0	S	0	0	0	0	1	1	2	1	0	0	0	0	0	0	0	0	0	2	0.2	24	
4	0	0	0	1	0	S	1	1	1	1	1	1	1	2	2	2	1	1	1	1	2	2	2	2	2	1.1	24	
5	2	2	2	2	S	1	1	2	2	3	2	2	1	1	0	0	1	1	1	1	1	1	1	1	3	1.3	24	
6	1	0	1	S	2	1	2	1	1	C	C	C	C	C	C	2	2	1	1	2	2	2	1	1	2	1.4	24	
7	2	2	S	0	0	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	2	2	3	3	1.1	24	
8	2	S	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	3	1.0	24	
9	S	1	0	0	1	0	0	0	0	0	1	1	1	2	2	2	2	0	1	1	0	1	1	S	2	0.8	24	
10	0	0	1	0	1	0	1	0	1	1	1	1	1	0	1	1	1	1	0	0	1	0	S	0	1	0.6	24	
11	1	1	0	0	0	0	1	0	1	1	1	1	1	1	1	1	0	1	0	0	0	S	0	1	1	0.6	24	
12	0	1	1	0	0	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	S	2	2	1	2	1.3	24
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	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	S	1	1	S	1	1	1	1	1	1	1	1.0	24
15	0	1	0	1	0	0	0	0	0	0	0	1	0	1	1	1	1	S	0	1	0	0	1	0	1	0.4	24	
16	1	0	1	1	0	0	0	1	0	0	1	0	0	0	0	0	S	1	1	1	1	0	1	0	1	0.4	24	
17	1	0	1	1	0	0	0	1	1	1	0	0	1	1	0	S	0	1	0	1	0	1	1	1	1	0.6	24	
18	2	1	0	0	0	0	0	0	0	0	0	1	1	1	S	1	1	1	0	1	1	0	1	0	2	0.6	24	
19	0	1	1	1	0	1	1	0	0	1	1	1	1	S	1	1	1	0	1	1	1	1	1	1	1	0.8	24	
20	1	1	1	1	1	1	0	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
21	1	1	1	1	1	1	1	1	0	1	1	S	2	2	1	1	1	1	1	1	1	1	1	1	2	1.0	24	
22	0	1	1	1	1	1	1	1	1	1	S	0	1	0	1	0	0	1	1	1	1	1	0	0	1	0.7	24	
23	1	1	1	0	0	0	0	1	1	S	1	2	1	1	1	1	1	0	1	1	1	1	1	1	2	0.8	24	
24	1	1	1	0	0	1	1	1	S	1	1	1	0	0	0	1	1	0	0	1	1	0	0	0	1	0.6	24	
25	0	0	1	0	0	1	1	S	1	1	1	1	1	1	0	0	0	0	0	0	1	0	0	0	1	0.4	24	
26	1	0	1	0	0	0	S	1	1	1	0	0	1	1	1	1	0	1	1	1	1	1	0	0	1	0.6	24	
27	1	0	0	1	0	S	1	1	1	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0.3	24	
28	1	0	0	0	S	0	0	0	1	1	1	2	1	1	1	1	2	2	P	1	1	0	0	1	2	0.8	23	
29	1	1	0	S	0	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	S	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	2	1.0	24	
31	1	S	1	1	1	1	0	0	1	1	1	0	0	1	1	0	1	0	0	1	0	1	1	0	1	0.6	24	
HOURLY MAX	3	2	3	2	2	1	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	5	5	3			
HOURLY AVG	0.9	0.7	0.8	0.6	0.4	0.5	0.7	0.7	0.8	0.8	0.8	0.9	0.9	1.0	0.9	0.8	0.8	0.8	0.7	0.9	0.9	0.9	0.9	0.8				

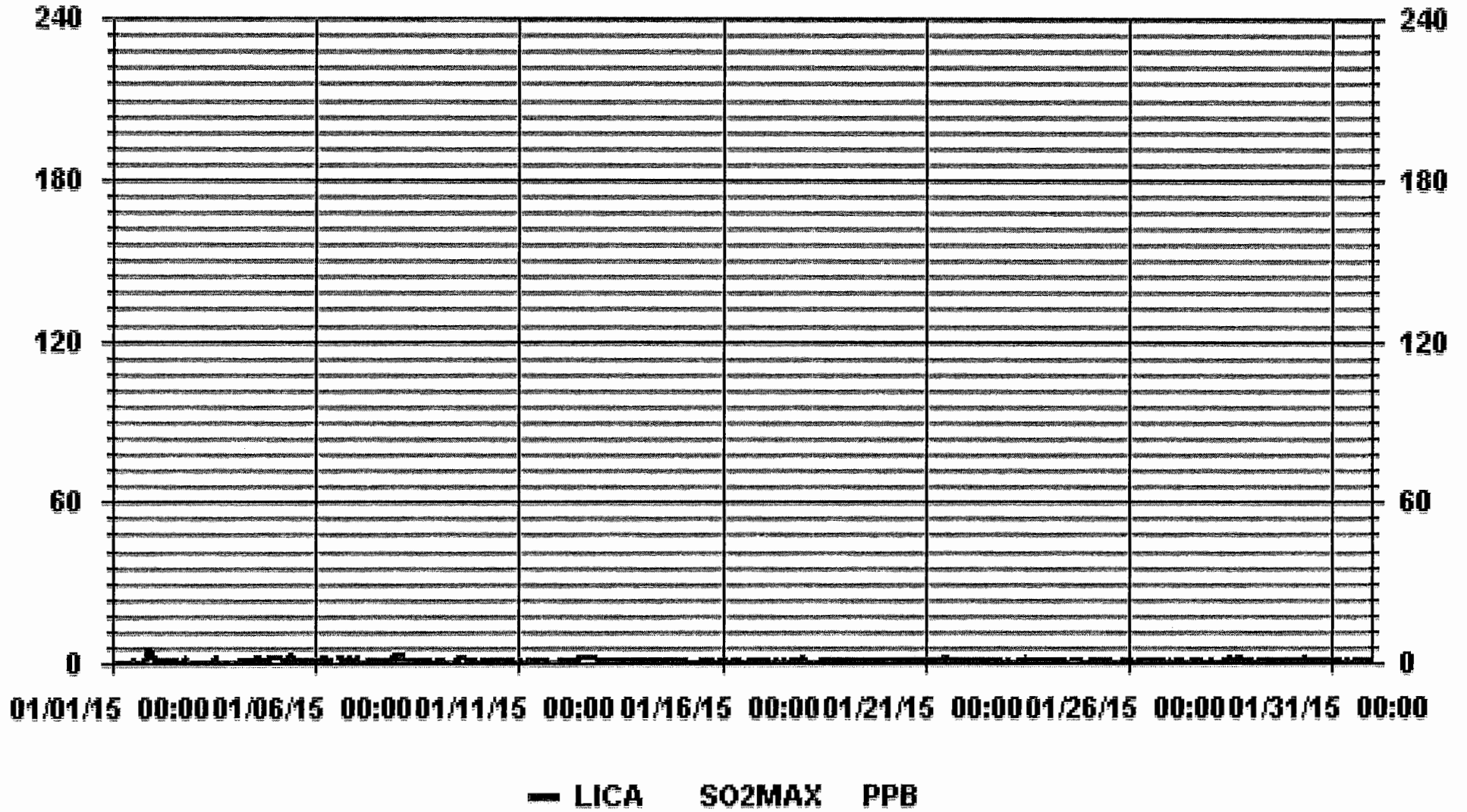
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	482
MAXIMUM INSTANTANEOUS VALUE:	5 PPB @ HOUR(S) 21, 22 ON DAY(S) 1, 1
	VAR-VARIOUS
IZS CALIBRATION TIME:	33 HRS
MONTHLY CALIBRATION TIME:	6 HRS
OPERATIONAL TIME:	743 HRS
STANDARD DEVIATION:	0.65

01 Hour Averages



LICA
 SO2_ / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 01
 Site Name : LICA
 Parameter : SO2_
 Units : PPB

Wind Parameter : WDR
 Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 20	1.56	3.12	10.35	.99	2.83	1.41	5.95	2.69	2.12	2.97	6.66	28.22	18.15	5.53	5.39	1.98	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	1.56	3.12	10.35	.99	2.83	1.41	5.95	2.69	2.12	2.97	6.66	28.22	18.15	5.53	5.39	1.98	

Calm : .00 %

Total # Operational Hours : 705

Distribution By Samples

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 20	11	22	73	7	20	10	42	19	15	21	47	199	128	39	38	14	705
< 60																	
< 110																	
< 170																	
< 340																	
>= 340																	
Totals	11	22	73	7	20	10	42	19	15	21	47	199	128	39	38	14	

Calm : .00 %

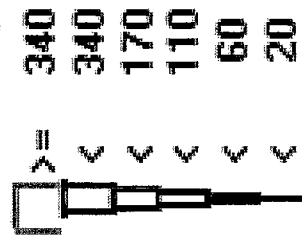
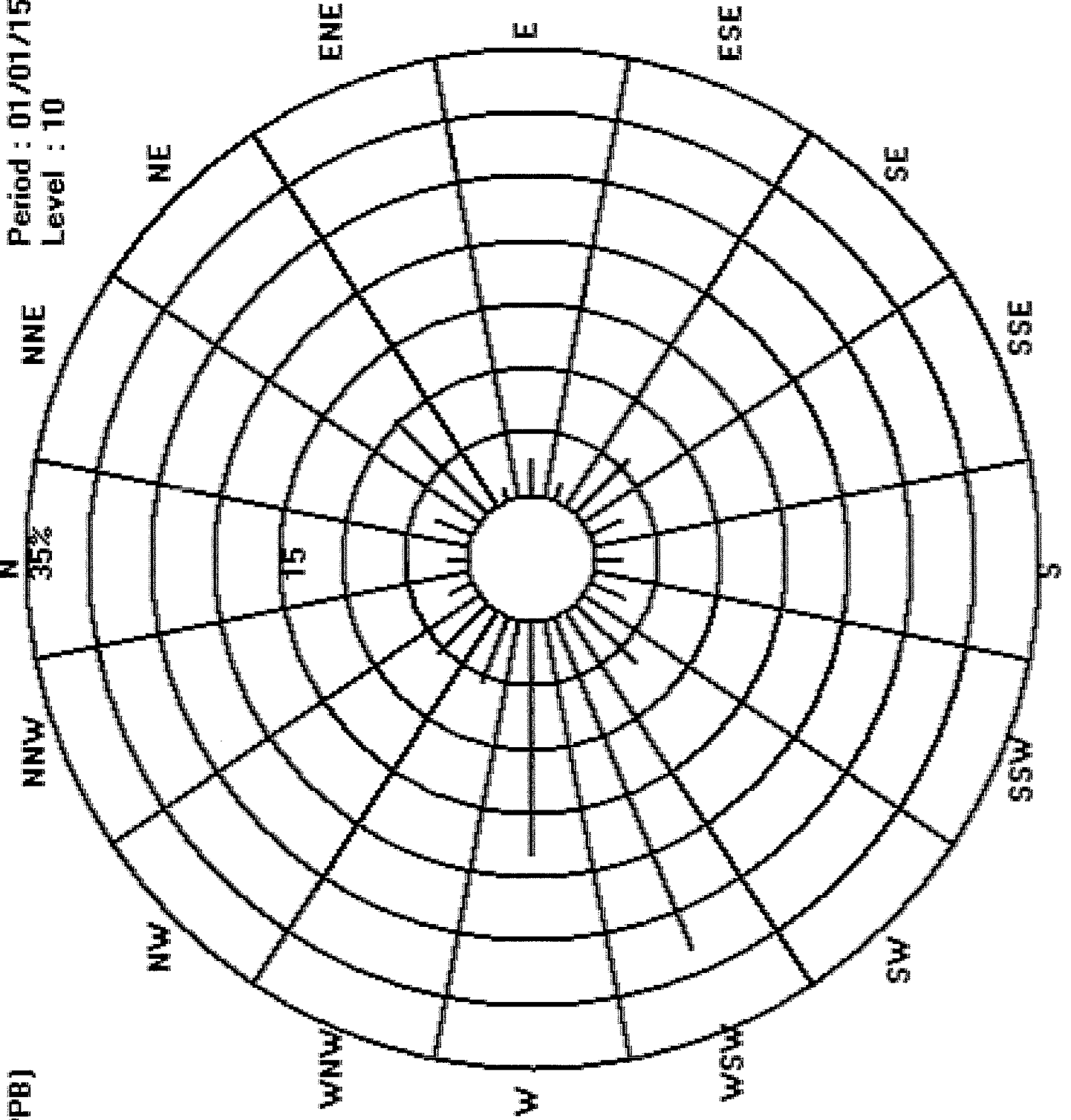
Total # Operational Hours : 705

Logger : 01 Parameter : SO2_

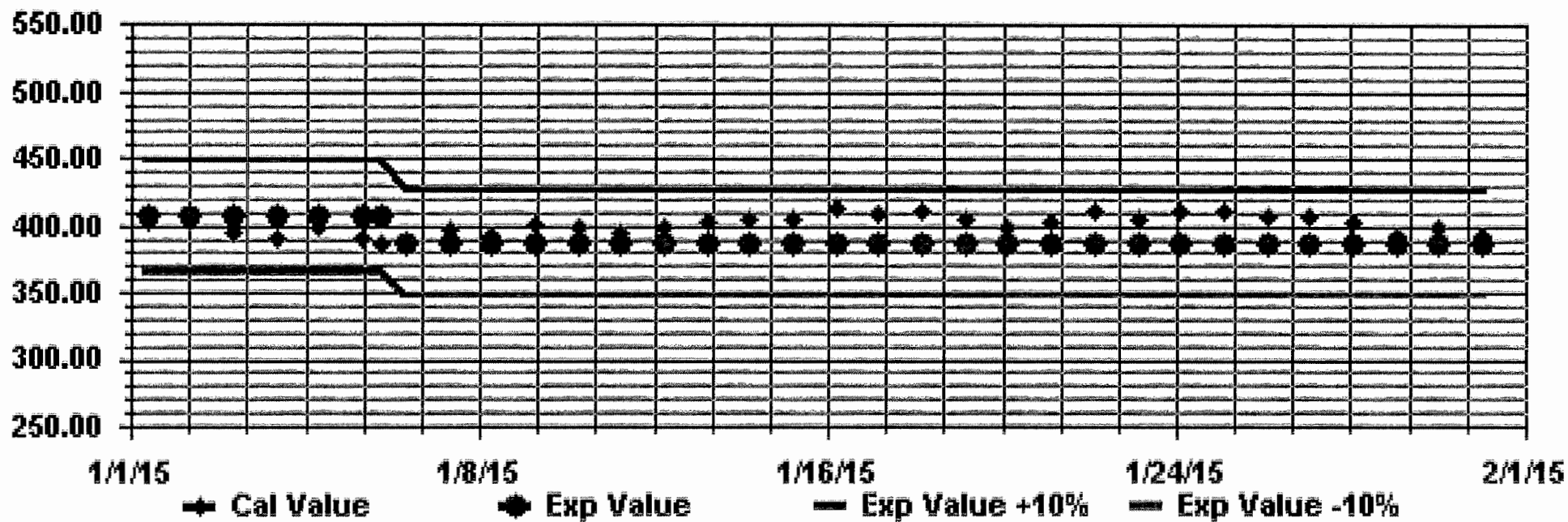
Site : LICA

Period : 01/01/15-01/31/15

Level : 10



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



TOTAL REDUCED SULPHUR



TOTAL REDUCED SULPHUR (TRS) hourly averages in ppb

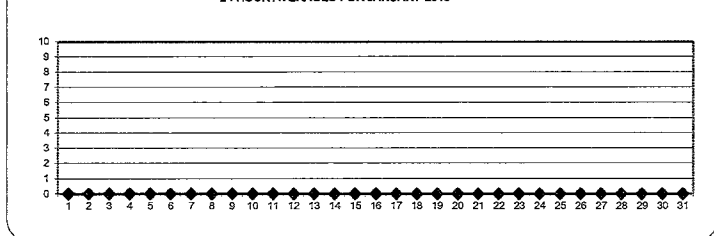
MST

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	24-HOUR	RDGS.	
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	0:00	MAX	AVG.		
DAY																												
1	0	0	0	0	0	0	0	0	0	S	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	S	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	S	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	S	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	S	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	S	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
7	0	0	S	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2	24
8	0	S	0	0	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	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	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	S	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	S	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	S	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	S	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	S	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	S	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	S	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	S	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	S	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	S	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	S	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	S	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	S	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	S	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	S	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	S	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	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0.0	24
27	0	0	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1	24
28	0	0	0	0	S	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	S	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	S	0	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
31	0	S	0	0	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	0	1	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	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			

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 JANUARY 2015



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	7
MAXIMUM 1-HR AVERAGE:	1 PPB @ HOUR(S) VAR ON DAY(S) VAR
MAXIMUM 24-HR AVERAGE:	0.2 PPB VAR-VARIOUS ON DAY(S) 7
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	5 HRS
OPERATIONAL TIME:	744 HRS
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0.10
MONTHLY AVERAGE:	0 PPB



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Site - JANUARY 2015

JOB # 2833-2015-01-01 - C

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	24-HOUR	
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	0:00	MAX	AVG.	RDGS.
DAY																											
1	0	0	0	0	0	0	0	0	S	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	1	0.1	24
2	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0.1	24
3	0	1	0	0	0	1	S	0	0	1	1	0	1	0	1	0	0	1	0	1	0	0	1	0	1	0.4	24
4	0	0	0	0	0	S	0	0	0	0	0	0	0	1	1	0	0	1	1	1	1	1	0	1	1	0.3	24
5	1	1	1	0	S	1	0	0	1	1	1	1	1	0	1	1	1	0	0	0	0	1	1	1	1	0.7	24
6	0	0	0	S	0	1	0	0	1	C	C	C	C	C	1	1	1	1	1	1	1	1	1	1	1	0.6	24
7	1	1	S	1	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1.1	24
8	1	S	1	1	0	1	1	1	1	1	1	0	0	1	0	0	1	1	1	1	1	1	1	1	1	0.8	24
9	S	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	S	2	1.0	24
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	S	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	S	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	S	1	1	1	1.0	24
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	S	0	1	0	1	1	0.9	24
14	1	1	1	0	1	0	1	1	1	0	1	1	1	1	0	0	0	1	S	1	1	1	1	1	1	0.7	24
15	1	0	1	0	1	1	0	1	1	0	1	1	1	1	0	1	1	S	1	1	1	0	1	1	1	0.7	24
16	0	1	0	1	1	0	0	0	1	0	1	0	1	1	1	1	S	1	1	0	1	0	1	1	1	0.6	24
17	0	0	1	0	0	1	1	1	1	0	1	1	1	1	0	S	1	1	1	0	1	1	1	1	1	0.7	24
18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	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	S	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	S	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
21	1	1	1	1	1	1	1	1	0	1	1	S	1	1	1	1	1	1	0	1	1	1	1	1	1	0.9	24
22	1	1	1	1	1	1	1	1	1	S	0	1	0	1	0	0	0	0	1	1	1	1	1	1	1	0.8	24
23	0	1	0	1	1	1	1	1	1	S	1	1	1	1	0	1	0	1	0	1	1	1	1	1	1	0.8	24
24	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	0.9	24
25	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1.0	24
26	1	1	1	0	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24
27	1	1	2	1	1	S	1	0	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	1	1	0.9	24
28	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P	1	1	1	1	1	1.0	23
29	1	1	1	S	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	S	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	0.9	24
31	1	S	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	0.9	24
HOURLY MAX	1	1	2	1	2	3	2	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1		
HOURLY AVG	0.7	0.8	0.8	0.7	0.7	0.9	0.8	0.8	0.9	0.8	0.9	0.8	0.9	0.8	0.7	0.7	0.8	0.9	0.7	0.8	0.8	0.8	0.8	0.9	0.9		

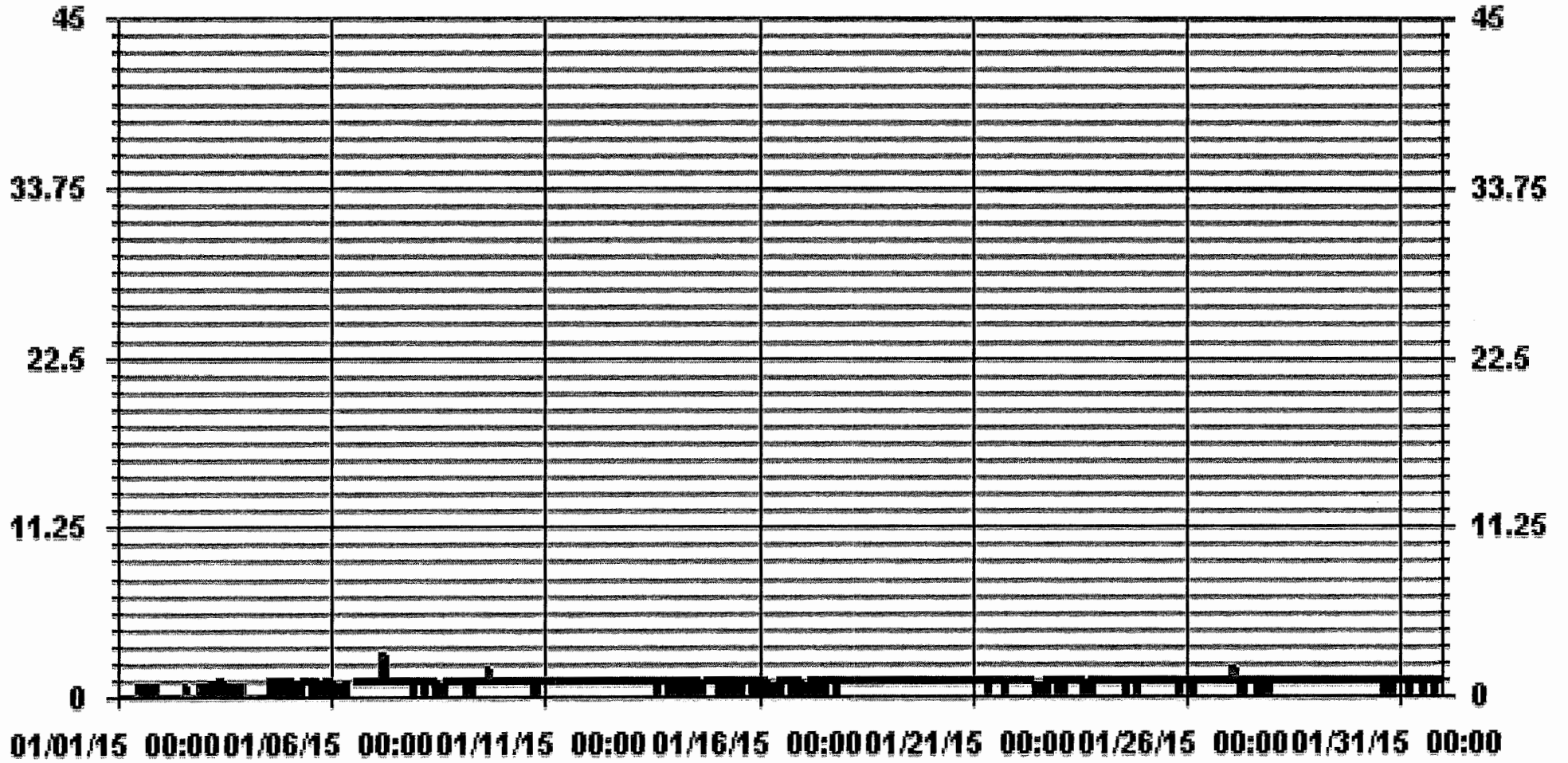
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	556
MAXIMUM INSTANTANEOUS VALUE:	3 PPB @ HOUR(S) 5 ON DAY(S) 7
VAR-VARIOUS	
I/SZ CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	6 HRS
OPERATIONAL TIME:	743 HRS
STANDARD DEVIATION:	0.43

01 Hour Averages



— LICA TRSMAX PPB

LICA
 TRS_ / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 01
 Site Name : LICA
 Parameter : TRS_
 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	
< 3	1.55	3.11	10.32	.99	2.82	1.41	5.94	2.68	2.12	2.97	6.64	28.14	18.38	5.51	5.37	1.98	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	1.55	3.11	10.32	.99	2.82	1.41	5.94	2.68	2.12	2.97	6.64	28.14	18.38	5.51	5.37	1.98	

Calm : .00 %

Total # Operational Hours : 707

Distribution By Samples

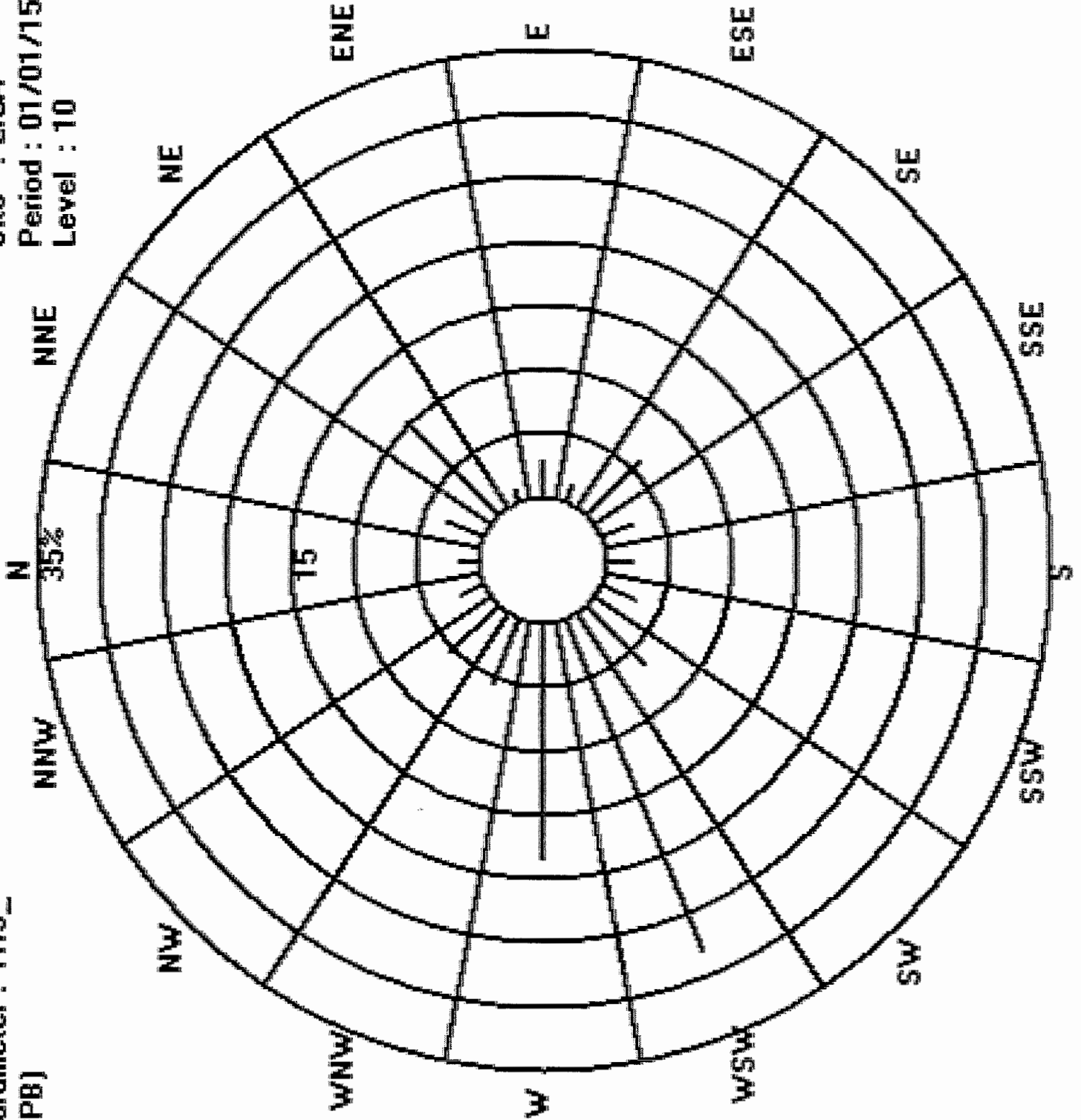
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 3	11	22	73	7	20	10	42	19	15	21	47	199	130	39	38	14	707
< 10																	
< 50																	
>= 50																	
Totals	11	22	73	7	20	10	42	19	15	21	47	199	130	39	38	14	

Calm : .00 %

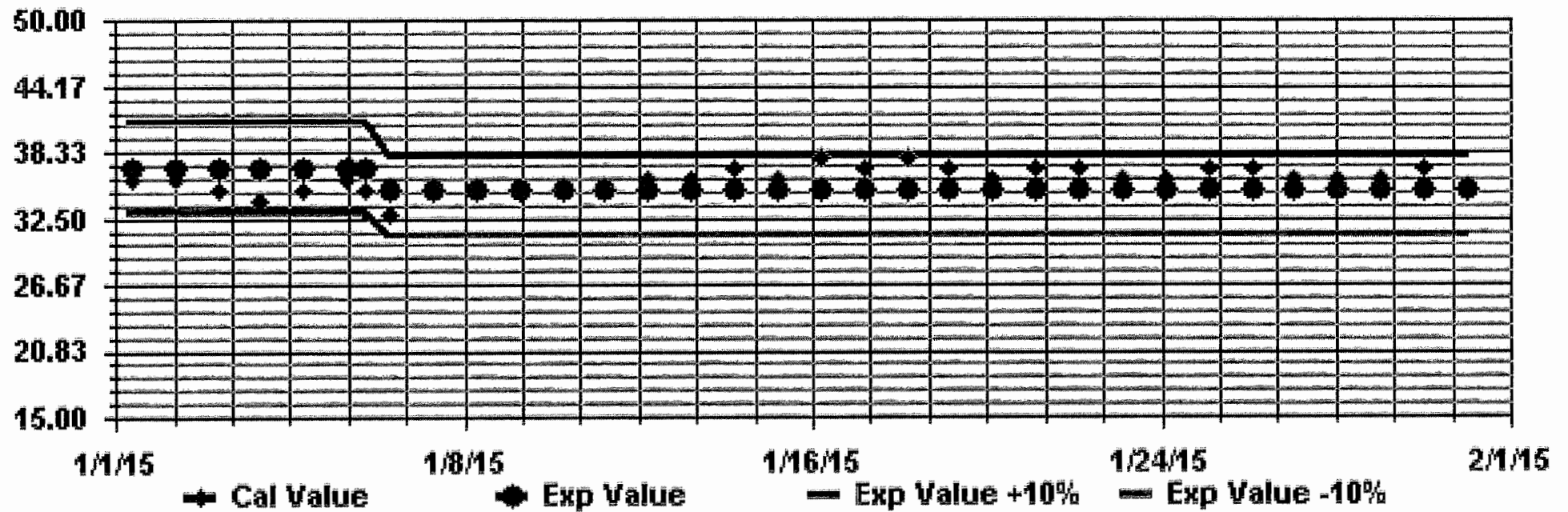
Total # Operational Hours : 707

Logger : 01 Parameter : TRS_
Class Limits (PPB)

Site : LICA
Period : 01/01/15-01/31/15
Level : 10

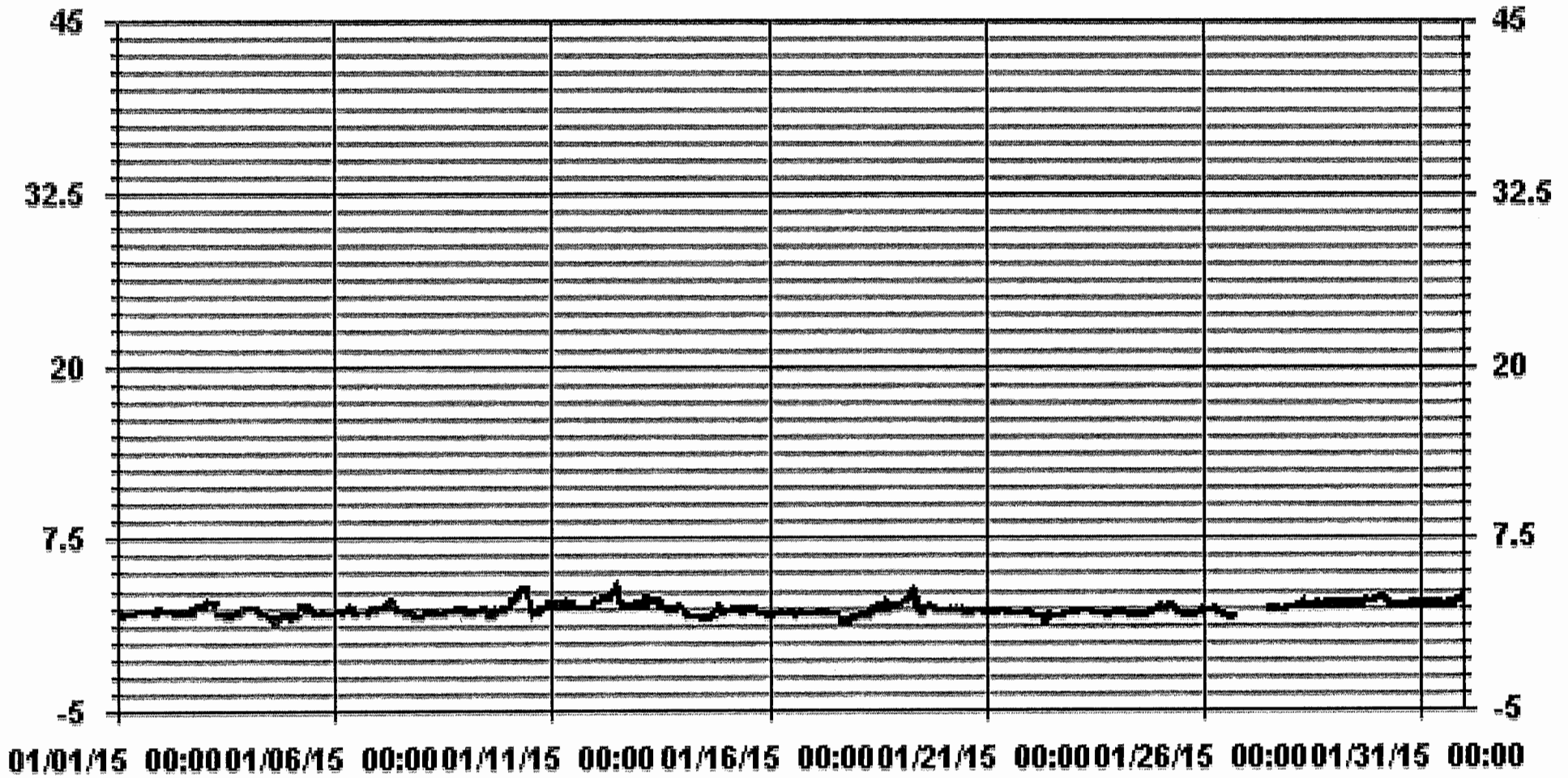


Calibration Graph for Site: LICA Parameter: TRS_ Sequence: TRS Phase: SPAN



TOTAL HYDROCARBON

01 Hour Averages



— LICA THC PPM



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Site - JANUARY 2015

JOB # 2833-2015-01-01- C

TOTAL HYDROCARBONS MAX instantaneous maximum in ppm

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	DAILY	24-HOUR	
		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	MAX	AVG.	RDGS.
DAY	1	2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.1	S	2.2	2.3	2.3	2.5	2.4	2.3	2.8	2.3	2.4	2.4	2.3	2.4	2.3	2.3	2.4	2.8	2.3	24
2	2.4	2.4	2.3	2.3	2.3	2.3	2.4	S	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.5	2.7	2.4	2.7	2.6	2.6	2.6	2.7	2.7	2.4	24	
3	2.9	3.0	3.0	3.1	3.1	3.1	S	2.1	2.1	2.3	2.2	2.1	2.1	2.0	2.2	2.0	2.1	2.3	2.2	2.3	2.4	2.5	2.5	2.6	3.1	2.4	24	
4	2.5	2.6	2.5	2.5	2.5	S	2.3	2.2	2.2	2.1	2.3	2.2	2.3	1.8	2.0	1.7	2.7	1.8	1.9	2.2	2.0	2.0	2.0	2.0	2.7	2.2	24	
5	1.9	2.0	2.0	2.1	S	2.6	2.6	2.6	2.6	2.6	3.3	2.6	2.6	2.3	2.5	2.5	2.5	2.2	2.3	2.2	2.2	2.1	2.2	2.2	3.3	2.4	24	
6	2.3	2.3	2.4	S	2.2	2.3	2.4	2.6	3.3	3.0	2.7	3.3	2.2	C	C	C	C	C	2.9	3.0	2.4	2.4	2.5	2.5	3.3	2.6	24	
7	2.6	2.5	S	2.7	2.9	2.9	3.1	3.2	3.1	2.7	2.7	2.6	2.4	2.4	2.4	2.3	2.4	2.3	2.2	2.0	1.9	1.9	1.9	1.9	3.2	2.5	24	
8	1.9	S	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.4	2.3	2.3	2.4	2.4	2.4	2.5	2.4	2.4	2.5	2.3	24	
9	S	2.2	2.2	2.3	2.3	2.4	2.3	2.4	5.0	2.4	2.5	2.5	2.3	2.6	2.2	2.5	5.9	2.3	2.8	2.3	2.5	2.4	2.5	S	5.9	2.7	24	
10	2.7	3.0	3.5	3.4	3.6	3.6	3.7	3.8	3.8	3.9	3.9	3.7	2.7	2.6	2.4	2.3	2.3	5.1	2.4	2.6	2.6	2.8	S	2.9	5.1	3.2	24	
11	2.9	2.9	3.0	2.9	2.9	2.9	2.8	2.9	3.0	3.1	3.8	3.1	3.4	2.6	2.6	2.4	2.5	2.6	2.6	2.6	2.6	S	3.2	3.3	3.8	2.9	24	
12	3.1	3.2	3.2	3.5	3.4	3.5	3.3	3.4	3.9	4.1	4.2	5.0	4.1	3.3	3.0	2.9	3.0	3.7	3.4	2.6	S	3.1	2.9	2.9	5.0	3.4	24	
13	2.9	2.9	2.9	3.0	4.1	5.1	3.2	3.1	3.0	3.2	3.5	3.2	3.0	2.7	2.6	2.5	2.8	2.6	2.5	S	2.6	2.7	2.7	2.8	5.1	3.0	24	
14	2.7	2.4	2.0	2.0	2.1	2.1	1.9	1.9	2.0	2.0	2.0	1.9	1.8	1.8	1.8	2.5	2.3	2.5	S	2.4	2.5	2.5	2.5	2.2	2.7	2.2	24	
15	2.2	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.5	S	2.1	2.1	2.1	2.1	2.0	2.1	2.5	2.3	24	
16	2.1	2.0	2.1	2.0	2.1	2.1	2.2	2.2	2.1	2.4	2.2	2.3	2.6	2.4	2.3	2.2	S	2.4	2.2	2.0	2.0	2.0	2.1	2.1	2.6	2.2	24	
17	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.4	2.2	2.2	2.1	2.1	2.6	S	2.1	1.6	1.6	1.6	1.6	1.7	1.7	1.9	2.6	2.0	24	
18	1.9	1.9	2.1	2.1	2.1	2.2	2.5	2.9	2.7	2.5	2.5	7.4	3.1	2.7	S	2.8	8.3	4.5	2.7	2.8	2.7	2.8	2.7	2.6	8.3	3.1	24	
19	2.8	2.8	3.0	3.1	3.2	3.4	3.9	4.1	3.6	3.5	3.2	2.7	2.7	S	2.9	2.7	2.6	2.7	2.7	2.9	2.4	2.3	2.3	2.3	4.1	2.9	24	
20	2.3	2.6	2.3	2.3	2.3	2.3	2.4	2.5	2.8	3.2	2.7	2.7	S	2.1	2.2	2.2	2.2	2.3	2.3	2.4	2.2	2.3	2.3	3.2	2.4	2.4	24	
21	2.2	2.5	2.5	2.3	2.3	2.2	2.4	2.4	2.7	2.3	2.4	S	2.2	2.3	2.5	2.1	2.0	2.3	2.1	2.2	Y	2.3	2.4	2.9	2.9	2.3	23	
22	2.7	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.7	S	2.0	2.0	1.8	1.9	1.9	1.9	1.9	2.0	2.1	2.0	2.3	2.3	2.7	2.0	2.4	24	
23	2.2	2.2	2.2	3.6	2.2	2.2	2.3	2.3	2.4	S	2.6	2.6	2.3	2.6	2.3	2.2	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.3	3.6	2.3	24	
24	2.4	2.5	2.3	2.2	2.6	2.1	2.1	1.9	S	2.1	2.3	2.0	2.0	2.0	2.0	2.1	2.2	2.6	2.2	2.2	2.3	2.3	2.4	2.6	2.6	2.2	24	
25	2.9	2.7	2.6	2.7	2.8	2.9	2.9	S	2.4	2.5	2.2	2.1	2.3	2.2	2.1	2.0	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.3	2.9	2.3	24	
26	2.7	2.6	2.3	2.4	2.5	3.0	S	2.4	2.4	2.2	2.8	2.3	1.9	2.1	1.9	1.8	2.3	Y	Y	Y	Y	Y	Y	Y	3.0	2.4	17	
27	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	2.5	2.8	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.4	2.8	2.5	17	
28	2.9	2.4	2.5	2.5	S	2.6	2.7	2.9	2.9	2.8	2.7	2.6	2.7	3.1	2.8	2.9	2.7	2.8	P	2.9	3.0	3.0	2.8	2.9	3.1	2.8	23	
29	2.9	3.0	3.0	S	2.9	2.9	3.4	2.7	2.7	3.1	2.8	2.9	2.9	2.9	3.3	3.0	3.1	3.1	3.1	3.1	3.5	3.7	3.0	3.1	3.7	3.0	24	
30	3.3	3.2	S	3.2	3.3	3.1	2.9	2.7	2.7	2.7	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.8	2.7	2.8	2.8	2.8	3.4	3.4	2.9	24
31	2.8	S	2.8	2.9	2.9	2.9	2.9	2.9	2.9	3.2	2.9	2.9	2.9	2.9	2.8	2.8	2.8	2.9	3.0	3.0	3.0	3.0	3.2	3.2	3.2	3.2	2.9	24
HOURLY MAX	3.3	3.2	3.5	3.6	4.1	5.1	3.9	4.1	5.0	4.1	4.2	7.4	4.1	3.3	3.3	3.0	8.3	5.1	3.4	3.1	3.5	3.7	3.2	3.4				
HOURLY AVG	2.5	2.5	2.5	2.6	2.6	2.7	2.6	2.6	2.8	2.7	2.7	2.8	2.5	2.4	2.4	2.4	2.7	2.6	2.4	2.4	2.4	2.5	2.5	2.5				

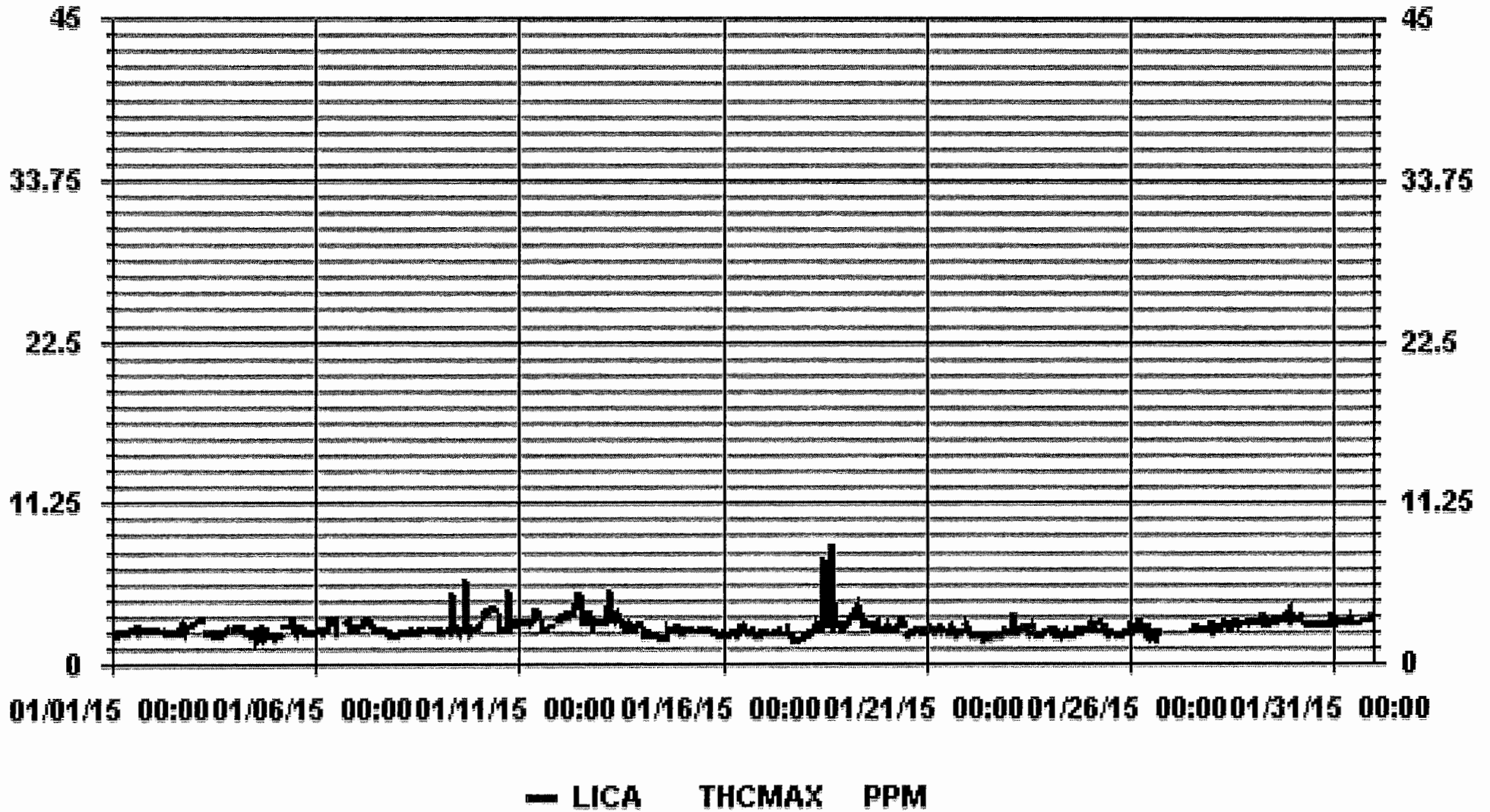
STATUS FLAG CODES

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:	686
MAXIMUM INSTANTANEOUS VALUE:	8.3 PPM @ HOUR(S) 16 ON DAY(S) 18
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 HRS
MONTHLY CALIBRATION TIME:	11 HRS
OPERATIONAL TIME:	728 HRS
STANDARD DEVIATION:	0.58

01 Hour Averages



LICA
 THC / WD Joint Frequency Distribution (Percent)

January 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	1.45	3.05	9.17	.87	2.76	1.31	5.67	2.32	1.89	2.76	5.96	26.20	16.44	5.53	5.38	1.89	92.72
< 10.0	.14	.14	.29	.14	.14	.14	.43	.29	.29	.29	.58	1.45	2.32	.29	.14	.14	7.27
< 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	1.60	3.20	9.46	1.01	2.91	1.45	6.11	2.62	2.18	3.05	6.55	27.65	18.77	5.82	5.53	2.03	

Calm : .00 %

Total # Operational Hours : 687

Distribution By Samples

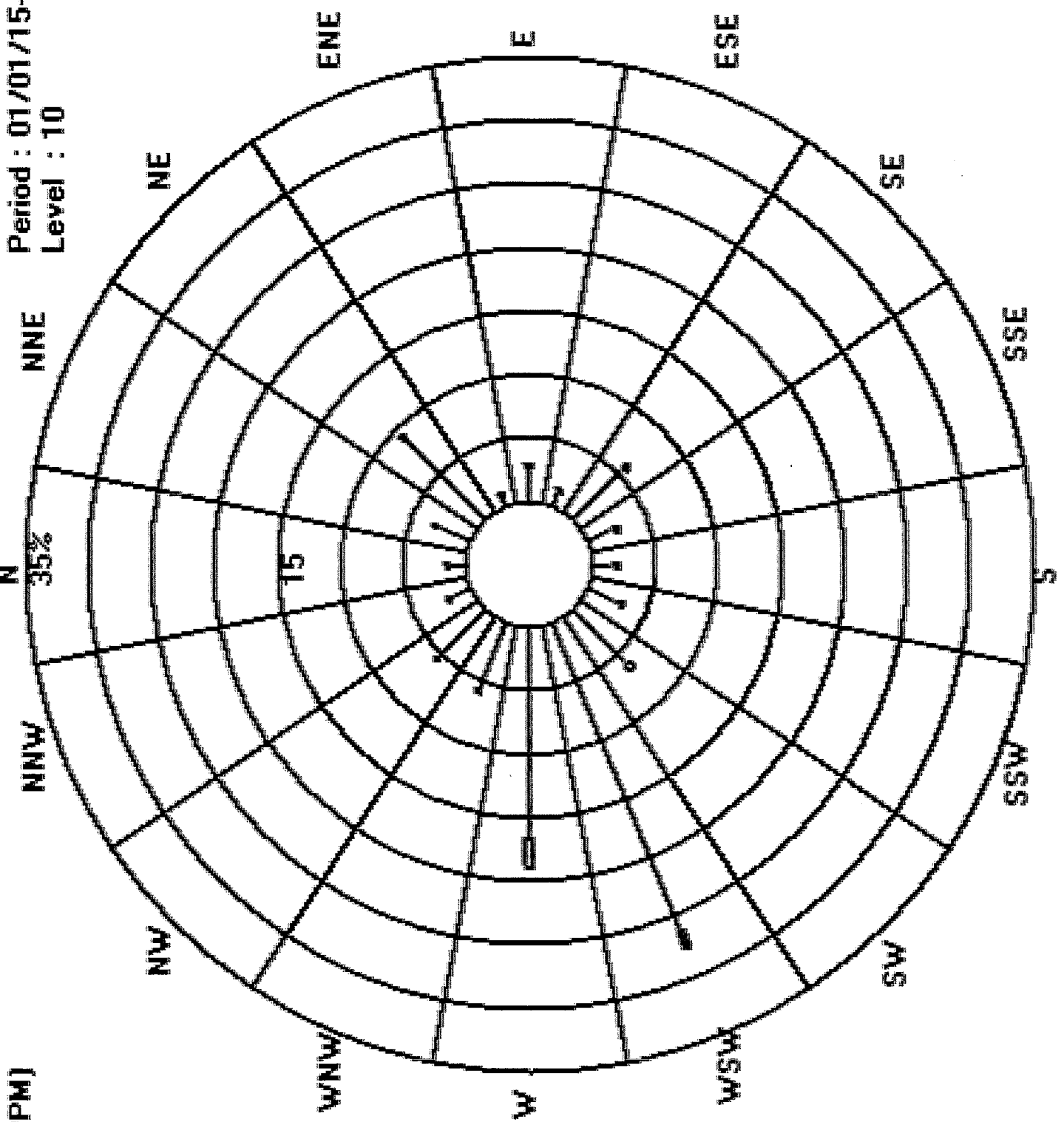
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 3.0	10	21	63	6	19	9	39	16	13	19	41	180	113	38	37	13	637
< 10.0	1	1	2	1	1	1	3	2	2	2	4	10	16	2	1	1	50
< 50.0																	
>= 50.0																	
Totals	11	22	65	7	20	10	42	18	15	21	45	190	129	40	38	14	

Calm : .00 %

Total # Operational Hours : 687

Logger : 01 Parameter : THC

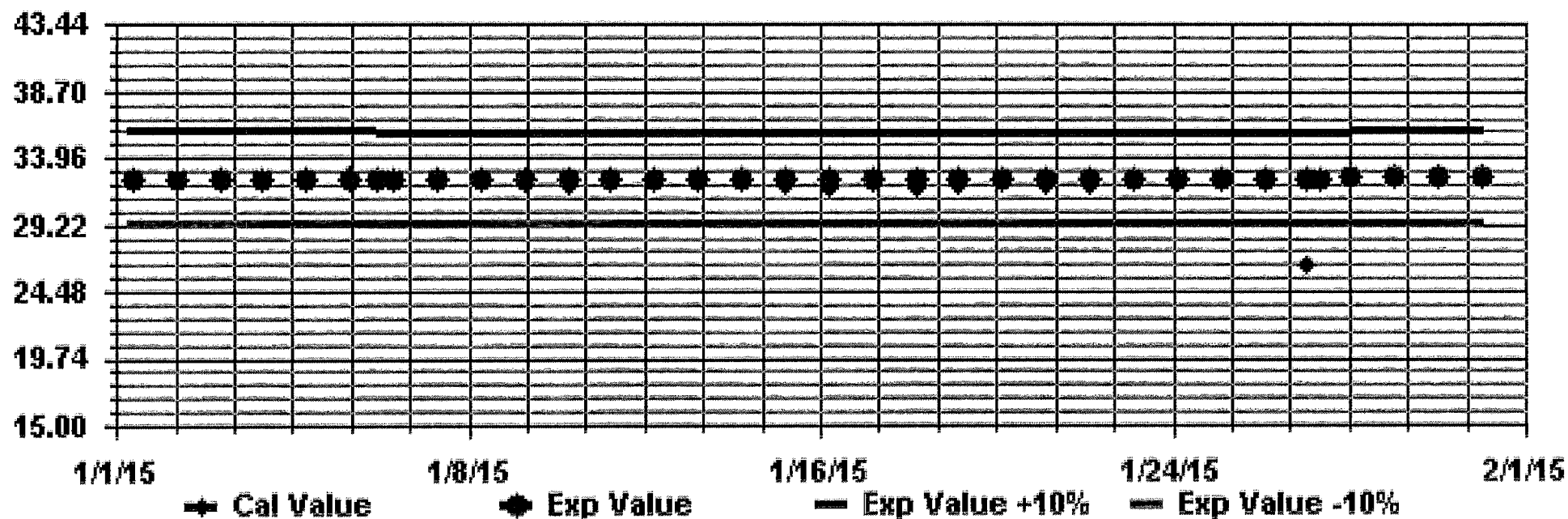
Site : LICA
Period : 01/01/15-01/31/15
Level : 10



Class Limits (PPM)

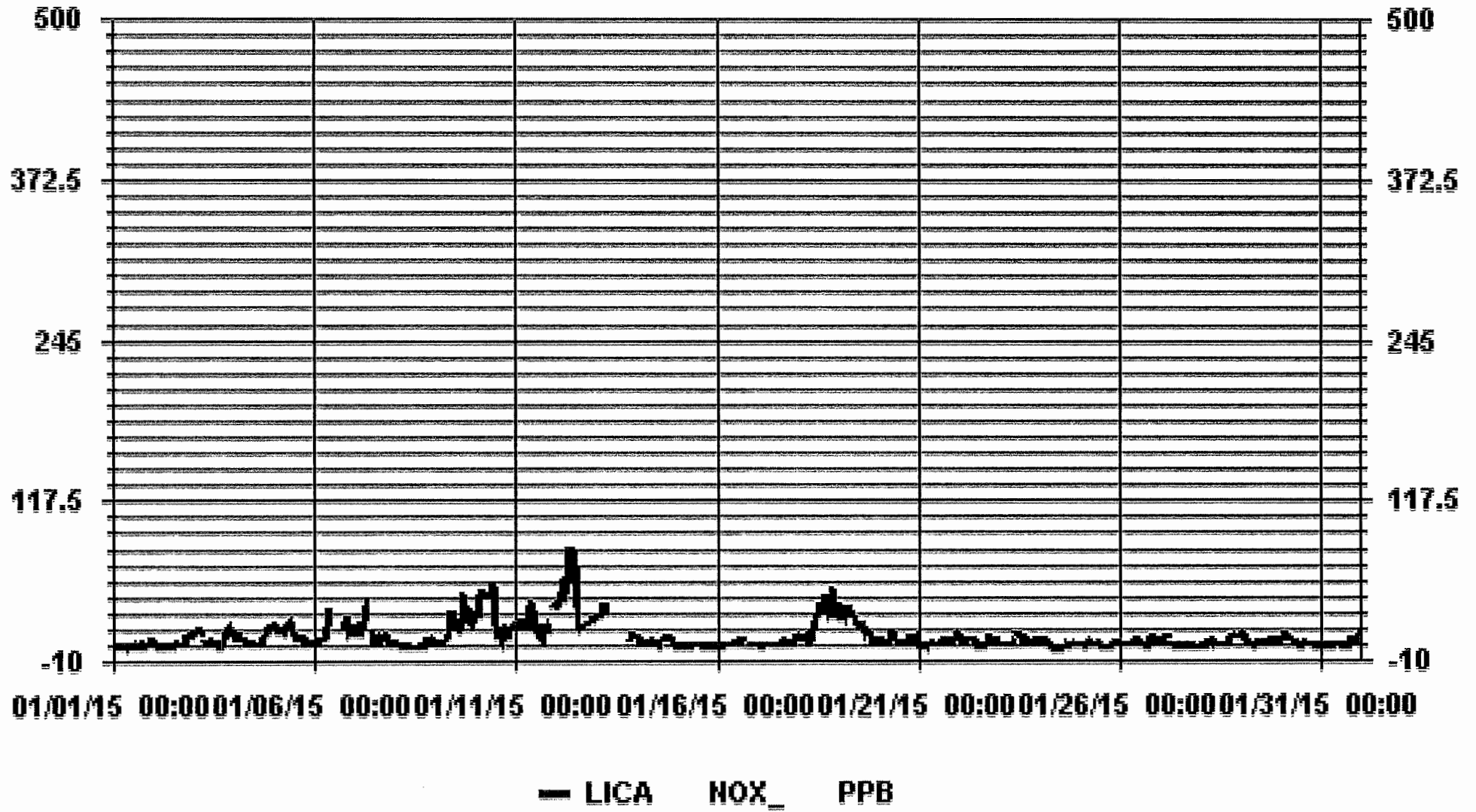
□	>=	50.0
▤	<	50.0
▥	<	10.0
▧	<	3.0

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



OXIDES OF NITROGEN

01 Hour Averages





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Site - JANUARY 2015

JOB # 2833-2015-01-01 - C

OXIDES OF NITROGEN 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	24-HOUR	
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	0:00	MAX.	AVG.	RDGS.
DAY 1	6	4.5	6	5.5	3.5	7.5	5	5.5	S	5.5	23	4.5	6.5	21	6.5	5	6	7.5	4	3.5	6.5	6	7.5	13	23	7.4	24
2	8.5	8	3	3.5	5	4	4.5	S	6.5	4	5	6	4.5	9.5	11.5	7.5	8	6	6	14	15	15	13.5	13	15	7.9	24
3	17	17	23.5	24	17.5	17	S	6.5	8.5	8.5	9	5.5	7	6	7	4.5	5	10.5	14	14.5	22.5	25.5	18	20	25.5	13.4	24
4	20	14	13	14.5	12	S	12	7.5	6.5	7	6	31.5	6.5	7	4	5	47.5	7.6	12.5	14.5	17.5	19	22	20.5	47.5	14.2	24
5	21.5	20	16	17	5	18.3	20.8	20.3	21.8	26.3	18.8	22.3	13.8	13.3	13.8	14.3	15.3	10.8	8.8	5.3	4.3	4.8	5.3	6.8	26.3	14.8	24
6	9.8	9.3	9.3	S	10	9.5	14.5	27.5	41.5	C	C	C	C	C	C	C	C	36.7	20.2	39.7	23.2	37.7	15.7	16.2	41.5	21.4	24
7	24.2	21.7	S	13.5	19	29.5	45	46	S	S	21.1	14.1	8.1	8.6	14.1	13.1	11.1	16.6	12.1	9.6	7.1	5.7	3.1	3.7	46	16.5	24
8	4.7	S	5.9	3.8	2.3	2.3	2.8	2.3	2.3	2.3	1.3	1.3	1.3	1.3	1.8	2.3	2.8	7.8	20.8	12.8	10.3	11.3	10.8	8.3	20.8	5.3	24
9	S	5.2	5.7	6.7	7.2	9.2	14.2	19.2	69.2	54.7	30.2	34.7	22.2	22.7	34.7	28.7	338.7	47.2	40.2	32.7	31.7	28.2	26.2	S	338.7	41.3	24
10	37	37	49.5	45	59	46.5	50	47	43.5	53.5	72.5	69.5	32	17.5	16.5	11	18	124.5	20	15.5	38.5	28	S	21.5	124.5	41.4	24
11	24	23	28.5	23	27.5	24	21.5	34	48.5	66.5	47.5	22.5	31.5	14.5	15	14	25	29.5	49	20	20.5	S	45.5	47.5	66.5	30.5	24
12	44.5	41.5	49.5	50	62	55.5	80	81	104	99	90.5	87.5	57	23	18.5	20.5	20	53	21	21.5	S	34	25.5	26	104	50.7	24
13	28	28.5	30.5	33	47.5	52.5	36	S	S	S	C	C	C	C	C	C	C	C	10.9	S	9.9	12.9	11.9	12.4	52.5	26.2	24
14	13.4	13.4	6.5	8	8	6	5.5	9	7	10.5	10	7	7.4	5.5	8.5	10	8.5	17	S	15.5	12	11.5	10	4.5	17	9.3	24
15	3.5	3	3.5	3	5.4	4.9	4.9	5.4	3.4	5.4	9.4	5.9	5.4	4.9	4.4	5.4	3.9	5	3.4	4.4	4.9	5	1.4	2.4	9.4	4.5	24
16	2.4	1.4	2.9	2.4	2.4	4.9	4.9	S	S	8.9	12.9	5.4	6.9	7	8.9	13.9	S	10.6	S	4.7	3.7	3.7	5.7	6.2	13.9	6.0	24
17	4.7	4.7	5.7	4.7	3.7	4.7	S	S	4.7	5.2	3.2	3.7	4.2	3.7	4.2	S	13.7	12.2	5.2	5.2	4.7	7.2	8.7	10.6	13.7	5.9	24
18	11.2	11.1	9.6	20.1	15.6	28.6	16.1	11.1	21.6	36.6	22.1	32.1	36.6	53.6	S	42.5	59.5	50.5	38	43.5	66	54	38.5	33	66	32.7	24
19	36	40.5	32	44	41	41.5	73.5	42	40	39	28	23	19.5	S	24.5	19.5	18.5	17.6	16.1	14.6	10.5	9.1	11	9.5	73.5	28.3	24
20	7	21	7.5	8.5	5	5	17	17	21	19.5	16.5	5	S	9.2	5.7	7.7	7.2	6.7	13.7	15.7	6.7	7.7	14.2	5.7	21	10.9	24
21	2.7	3.2	2.2	4.8	4.8	1.7	3.7	5.7	6.2	5.2	4.7	S	7.6	15.6	7.1	9.6	9.1	15.1	8.1	7.1	8.6	9	23.5	24	24	8.2	24
22	20	10	9.5	7.1	7.6	10.1	9.1	8.6	9.1	13.6	S	3.8	3.3	1.8	2.3	2.8	2.3	9.3	19.8	10.8	8.8	8.8	11.8	6.3	20	8.5	24
23	4.3	3.8	3.3	7.3	3.8	4.3	4.8	5.8	41.7	S	19	18	18	8.5	33	12.5	9.5	8	6	7.5	8.5	8	10	12	41.7	11.2	24
24	9.5	9.5	8.5	7	6	7	7	3.5	S	1.6	1.1	0.6	0.1	0.6	1.1	17.6	8.6	5.1	3.6	4.1	4.6	5.1	5.1	10.6	17.6	5.5	24
25	9.6	8.6	8.1	4.1	10.6	13.6	5.1	S	4.5	5.5	4.5	5	6	8.5	1.5	2	1.5	1.5	3.5	3	5	5.5	6.5	6.5	13.6	5.7	24
26	5	5.5	5	5	4.5	4	S	9	42.5	65	31.5	7	8.5	7	5	11	11	12	12	12	9	10.5	9	65	13.0	24	
27	7	7.5	8.5	13.5	14.5	5	4.8	4.8	4.3	3.3	2.8	2.3	5.7	4.7	5.2	3.7	4.7	3.2	3.2	6.2	3.7	4.2	2.2	3.2	14.5	5.4	24
28	5.7	7.8	3.2	3.7	S	8.5	7.1	10	8.5	4.5	4	5.1	4	4	3.5	4.5	7	9.5	S	12.5	14	16.5	12.5	12	16.5	7.6	24
29	15	14	16.5	S	7	5	13.4	3.4	3.9	6.9	8.9	16.4	10.9	24.9	10.9	9.4	8.9	8.9	6.9	7.4	5.9	7.5	7	7	24.9	9.8	24
30	9.9	11.9	S	14.5	11.5	10	8.5	7.5	13	6	8	5	5	8	7.5	13	6.5	4.5	7	5.5	4.5	4	5.5	5	14.5	7.9	24
31	4.5	S	5	4.5	4	3.5	4	11.5	4	7	5.5	9.5	4.5	4.5	3	3.5	7.5	9	29.5	10	9	14	10	17	29.5	8.0	24
HOURLY MAX	44.5	41.5	49.5	50	62	55.5	80	81	104	99	90.5	87.5	57	53.6	34.7	42.5	338.7	124.5	49	43.5	66	54	45.5	47.5			
HOURLY AVG	13.9	14.0	13.0	13.9	14.8	15.1	17.7	17.4	21.3	20.3	19.7	17.1	12.2	11.4	10.1	11.0	24.5	19.2	14.8	13.1	13.3	13.9	13.3	13.1			

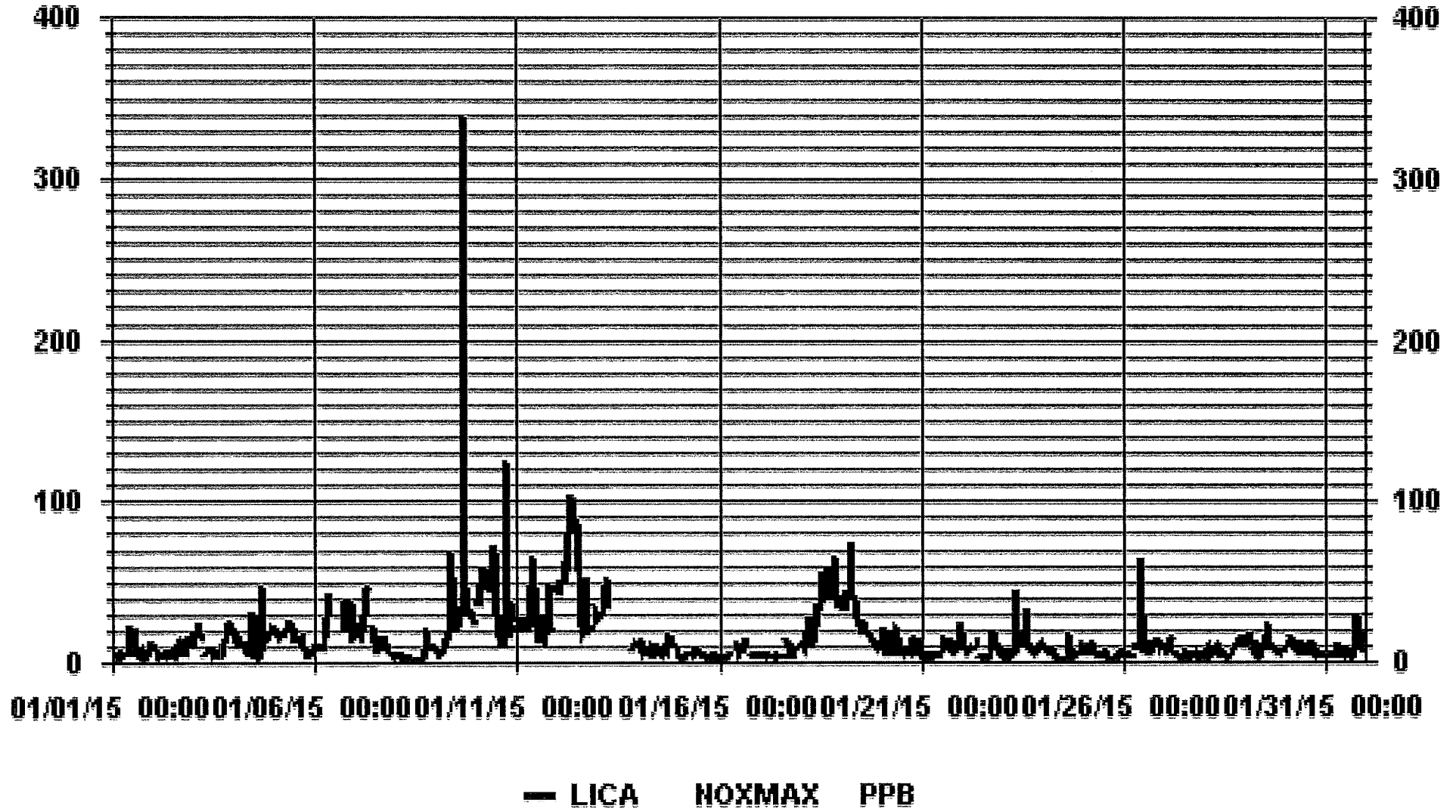
STATUS FLAG CODES

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

NUMBER OF NON-ZERO READINGS:	685
MAXIMUM INSTANTANEOUS VALUE:	338.7 PPB @ HOUR(S) 16 ON DAY(S) 9
	VAR-VARIOUS
IZS CALIBRATION TIME:	43 HRS
MONTHLY CALIBRATION TIME:	16 HRS
OPERATIONAL TIME:	744 HRS
STANDARD DEVIATION:	19.99

01 Hour Averages



LICA
NOX_ / WD Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 01
Site Name : LICA
Parameter : NOX_
Units : PPB

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	1.45	3.19	10.44	1.01	2.75	1.30	5.66	2.61	2.17	2.90	6.67	27.86	17.85	5.37	5.51	1.88	98.69
< 110.0	.14	.00	.14	.00	.00	.00	.00	.14	.00	.14	.00	.14	.14	.29	.00	.14	1.30
< 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	1.59	3.19	10.59	1.01	2.75	1.30	5.66	2.75	2.17	3.04	6.67	28.01	17.99	5.66	5.51	2.03	

Calm : .00 %

Total # Operational Hours : 689

Distribution By Samples





Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	10	22	72	7	19	9	39	18	15	20	46	192	123	37	38	13	680
< 110.0	1		1					1		1		1	1	2		1	9
< 210.0																	
>= 210.0																	
Totals	11	22	73	7	19	9	39	19	15	21	46	193	124	39	38	14	

Calm : .00 %

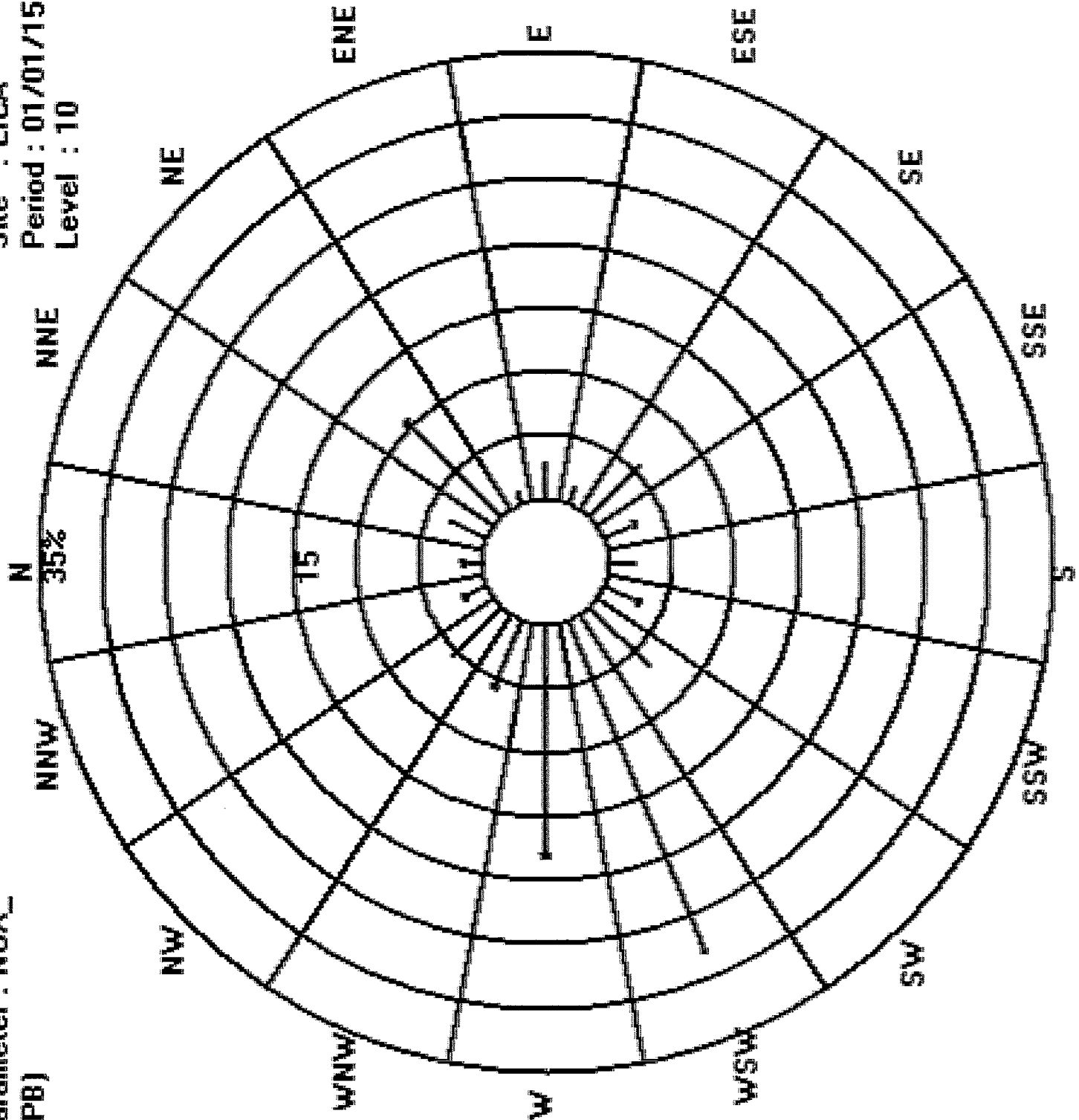
Total # Operational Hours : 689

Logger : 01 Parameter : NDX_

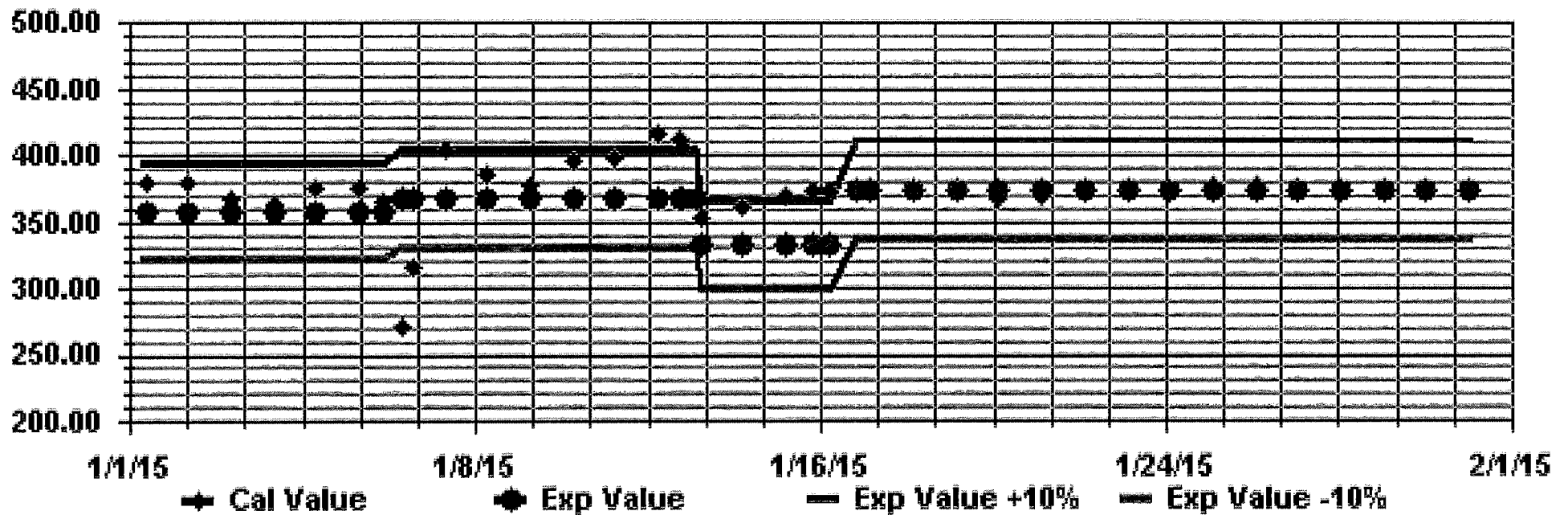
Class Limits (PPB)

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

Site : LICA
Period : 01/01/15-01/31/15
Level : 10



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



NITRIC OXIDES

NITRIC OXIDE (NO) hourly averages in ppb

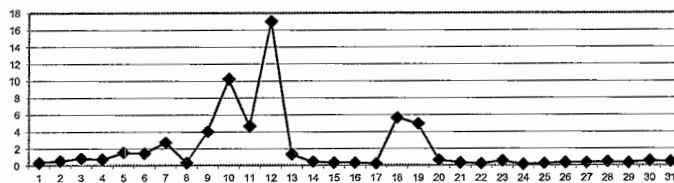
MST

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	24-HOUR	RDGS.	
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	0:00	MAX	AVG.		
DAY																												
1	0.3	0.2	0.6	0.5	0.3	0.3	0.3	0.4	S	0.1	0.2	0.4	0.7	0.8	0.3	0	0.2	0.1	0	0	0.4	0.2	0.4	0.3	0.8	0.3	24	
2	0.3	0.2	0.2	0.1	0.4	0.5	0.6	S	0.7	0.5	0.7	1.1	0.7	1	1.4	0.4	0.1	0	0	0.3	0.1	0.3	0.5	0.5	1.4	0.5	24	
3	0.3	0.5	0.3	1	0.8	1	S	0.1	0.4	1.1	1.9	1.2	1.3	1.5	1.1	0.2	0.1	0.3	0.4	0.8	1.4	1.5	1.2	1.1	1.9	0.8	24	
4	0.7	0.7	0.8	0.8	0.5	S	0.7	0.5	0.4	0.8	1	1.8	1.4	1.2	0.6	0.4	1.3	0.2	0.6	0.5	0.4	0.3	0.4	0.6	1.8	0.7	24	
5	0.7	0.7	0.4	0.7	S	0.5	0.9	1.2	1.5	4.9	4.2	4.8	4.2	2.9	2.2	1.5	0.9	0.4	0.2	0.2	0.1	0	0	0.4	4.9	1.5	24	
6	0.4	0.5	0.4	S	0.4	0.6	0.8	1.5	5.4	C	C	C	C	C	C	C	1.3	2.5	0.9	4.1	0.9	1.8	0.7	0.8	5.4	1.4	24	
7	2.4	1	S	0.7	2.1	5.5	14.3	19.2	S	3.1	1.6	1.8	1.5	1.2	1.7	0.8	0.7	0.7	0.6	0.1	0	0	0.1	0	19.2	2.7	24	
8	0.1	S	0.1	0	0	0	0	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.4	0.3	0.3	0.8	0.8	0.5	0.7	0.7	0.5	0.4	0.8	0.3	24	
9	S	0.4	0.5	0.1	0.3	0.6	0.5	0.6	6.7	11.5	7.6	9.5	7	5.2	6	2.6	15.6	3.4	3.2	1.9	1.9	1.3	1.4	S	15.6	4.0	24	
10	5.4	5.1	15.5	13.9	19.9	16.9	16	15.3	17.3	25.1	31.4	25.8	7.2	2.9	3.2	1.3	0.7	7.6	0.7	0.5	1.3	0.9	S	0.7	31.4	10.2	24	
11	1.1	0.8	1.4	1.4	2.5	1.2	0.9	1.2	10.3	18.4	16.5	9	6.6	4.8	3.6	1.8	1.5	0.9	2.7	0.6	0.6	S	7.9	10.5	18.4	4.6	24	
12	9.9	11.9	18.2	13.4	24.7	23.8	31.1	24.8	50.7	52.8	52.5	40.7	16.6	6.7	4	2.6	1.2	1.7	0.6	0.8	S	1.4	0.8	0.8	52.8	17.0	24	
13	1.1	1	0.9	1	3.9	4.6	2.1	S	S	S	C	C	C	S	S	S	S	0	S	0	S	0.1	0.2	0.2	0.1	4.6	1.3	24
14	0.3	0.5	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.5	1.2	1.1	1.1	0.7	0.8	0.7	0.2	0.5	S	0.2	0.2	0.1	0.2	0.1	1.2	0.4	24	
15	0	0.2	0.3	0.2	0.2	0.4	0.2	0.2	0.3	0.5	0.6	0.6	0.6	0.6	0.4	0.6	0.3	S	0	0	0.3	0.1	0	0	0.6	0.3	24	
16	0	0	0	0	0	0	0	S	S	0.1	0.6	0.5	1	0.9	0.8	0.8	S	0.2	S	0.1	0.1	0.2	0.3	0.2	1	0.3	24	
17	0.3	0.2	0.2	0.2	0.2	0.1	S	S	0	0.2	0.4	0.5	0.6	0.4	0.4	S	0.2	0.2	0.1	0	0	0.1	0.1	0.1	0.6	0.2	24	
18	0.1	0.1	0	0.2	0.3	1	0.3	0.1	0.8	7.7	5.5	11.5	10.5	13.3	S	7.1	9.7	3.6	2.5	4.5	20.7	15.4	10.4	3.5	20.7	5.6	24	
19	8.5	14.3	4.1	9.3	7.6	10.5	12.3	5.3	5.6	8.8	7.2	6.5	5.1	S	3.5	1.9	0.7	0.5	0.6	0.2	0	0	0.1	0	14.3	4.9	24	
20	0	1.2	0	0.2	0	0	0.2	0.3	1.4	2.8	2.5	0.8	S	0.9	0.7	0.5	0.2	0.1	0.2	0.3	0.1	0	0.3	0	2.8	0.6	24	
21	0	0	0	0	0	0	0.1	0	0.1	0.4	0.7	S	1	1.1	0.7	0.5	0.1	0.3	0.2	0	0.1	0.1	0.4	0.5	1.1	0.3	24	
22	0.9	0.3	0.3	0.1	0.3	0.3	0.3	0.2	0.2	0.8	S	0.5	0.3	0	0	0	0	0	0.1	0.2	0.2	0.1	0.1	0	0.9	0.2	24	
23	0.1	0.1	0	0	0.2	0	0.1	0	1	S	1.7	1.9	2.5	1.4	2	0.6	0.3	0.2	0	0.1	0.1	0.2	0	0	2.5	0.5	24	
24	0	0.1	0	0	0	0.1	0.1	0.1	S	0	0	0	0	0	0	0.4	0.2	0	0.1	0.2	0.1	0.1	0.4	0.4	0.4	0.1	24	
25	0.1	0	0.2	0	0.1	0.2	0	S	0	0.3	0.5	0.7	1.1	0.7	0	0	0	0	0	0	0.1	0.1	0.1	0.1	1.1	0.2	24	
26	0	0.1	0	0.1	0	0	S	0.1	0.2	1.1	1.9	1.4	0.5	1	0.6	0.2	0	0	0	0.1	0.1	0	0.1	0	1.9	0.3	24	
27	0	0	0.3	0.1	0.3	S	0.1	0.2	0.2	0.3	0.3	0.1	0.6	0.3	0.6	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0	0.2	0.6	0.3	24	
28	0.5	0.3	0	0	S	0.1	0.3	0.2	0	0.6	1	1.6	1.2	1.1	0.9	0.6	0.2	0.1	0.2	0.1	0.2	0.3	0.1	0.1	1.6	0.4	24	
29	0	0	0.2	S	0	0	0.4	0	0	0.5	0.9	0.9	1	1	1	0.8	0.5	0	0	0	0	0	0	0	1	0.3	24	
30	0.1	0.1	S	0.5	0.1	0.1	0.2	0.3	0.5	0.8	1.2	0.6	1	1.4	1.2	0.8	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.7	1.4	0.5	24	
31	0.5	S	0.6	0.6	0.7	0.3	0.1	0.9	0.1	0.9	0.7	0.8	0.6	0.5	0.3	0.2	0.1	0	0	0	0	0.2	0	0.4	0.9	0.4	24	
HOURLY MAX	9.9	14.3	18.2	13.9	24.7	23.8	31.1	24.8	50.7	52.8	52.5	40.7	16.6	13.3	6	7.1	15.6	7.6	3.2	4.5	20.7	15.4	10.4	10.5				
HOURLY AVG	1.1	1.4	1.6	1.6	2.3	2.4	3.0	2.8	4.0	5.2	5.2	4.5	2.7	1.9	1.4	1.0	1.3	0.9	0.5	0.6	1.0	0.9	0.9	0.8				

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

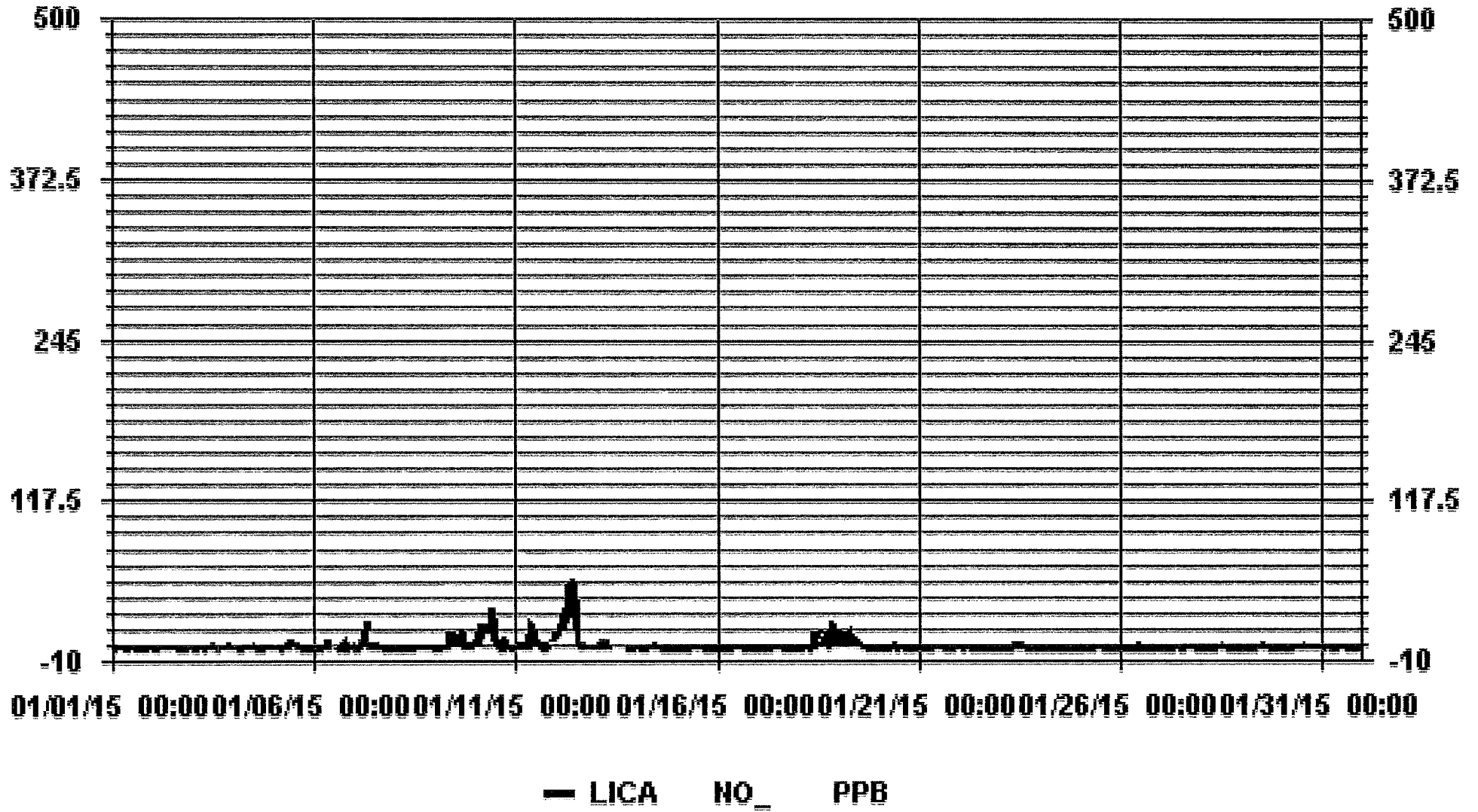
24 HOUR AVERAGES FOR JANUARY 2015



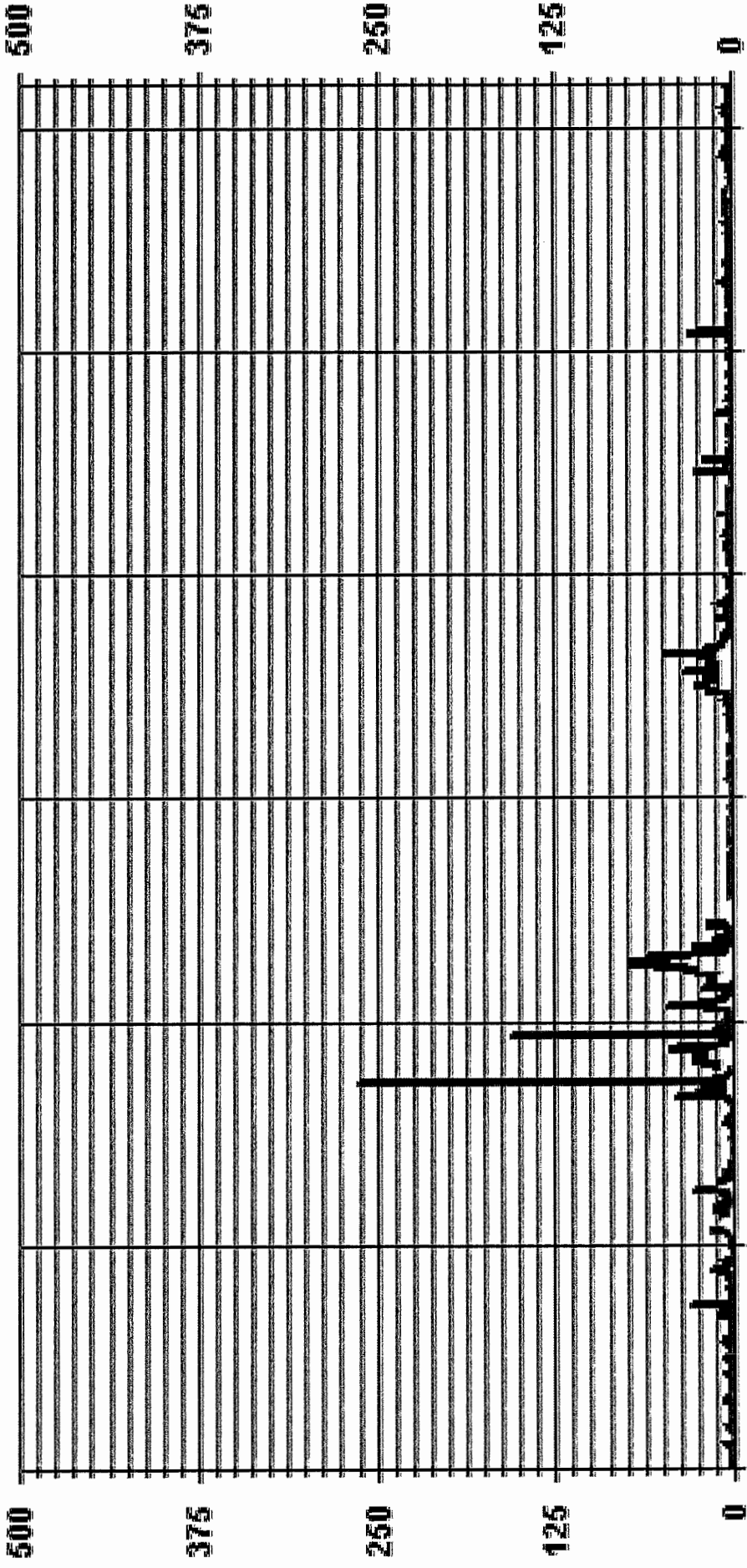
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	573					
MAXIMUM 1-HR AVERAGE:	52.8	PPB	@ HOUR(S)	9	ON DAY(S)	12
MAXIMUM 24-HR AVERAGE:	17.0	PPB			ON DAY(S)	12
					VAR-VARIOUS	
IZS CALIBRATION TIME:	46	HRS	OPERATIONAL TIME:	744	HRS	
MONTHLY CALIBRATION TIME:	10	HRS	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	5.46		MONTHLY AVERAGE:	2.0	PPB	

01 Hour Averages



01 Hour Averages



01/01/15 00:00 01/06/15 00:00 01/11/15 00:00 01/16/15 00:00 01/21/15 00:00 01/26/15 00:00 01/31/15 00:00

— LICA - - - - NOMAX PPB

LICA
NO_ / WD Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 01
Site Name : LICA
Parameter : NO_
Units : PPB

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	1.59	3.19	10.59	1.01	2.75	1.30	5.66	2.61	2.17	3.04	6.67	28.01	17.85	5.51	5.51	2.03	99.56
< 110.0	.00	.00	.00	.00	.00	.00	.00	.14	.00	.00	.00	.00	.14	.14	.00	.00	.43
< 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	1.59	3.19	10.59	1.01	2.75	1.30	5.66	2.75	2.17	3.04	6.67	28.01	17.99	5.66	5.51	2.03	

Calm : .00 %

Total # Operational Hours : 689

Distribution By Samples

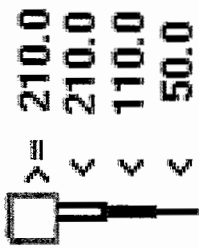
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	11	22	73	7	19	9	39	18	15	21	46	193	123	38	38	14	686
< 110.0								1					1	1			3
< 210.0																	
>= 210.0																	
Totals	11	22	73	7	19	9	39	19	15	21	46	193	124	39	38	14	

Calm : .00 %

Total # Operational Hours : 689

Logger : 01 Parameter : NO_

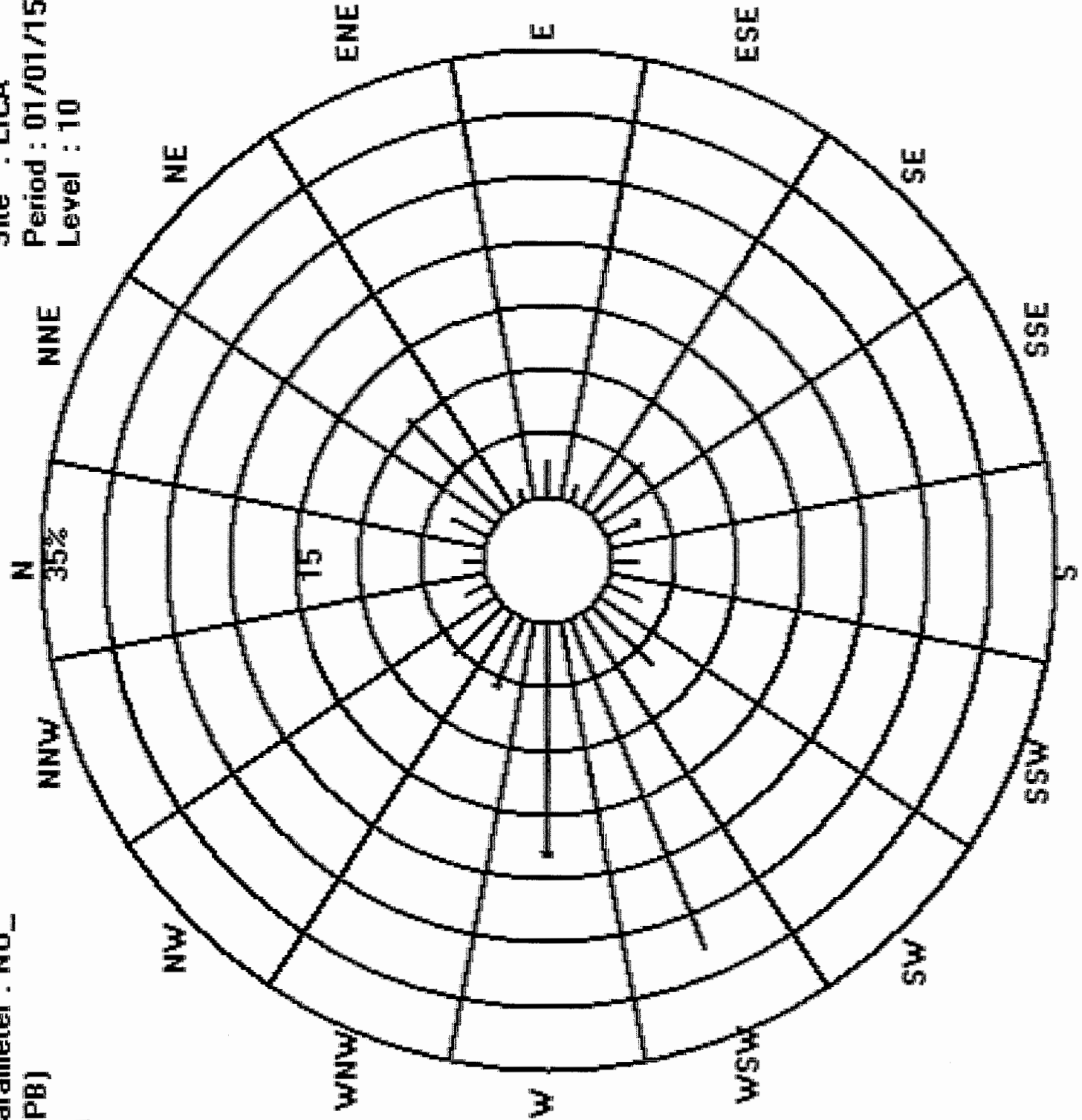
Class Limits (PPB)



Site : LICA

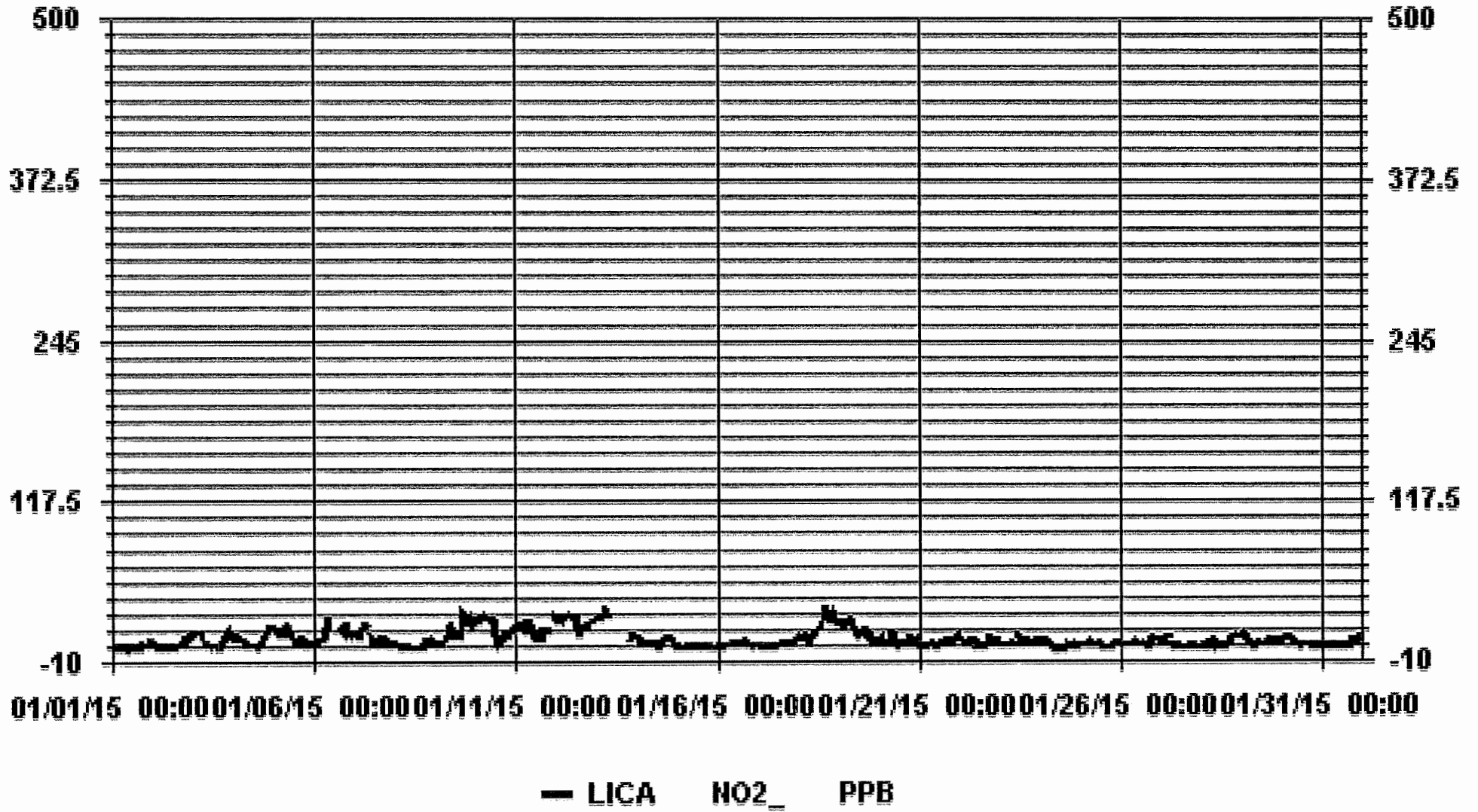
Period : 01/01/15-01/31/15

Level : 10



NITROGEN DIOXIDE

01 Hour Averages





NITROGEN DIOXIDE 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	24-HOUR	RDGS.	
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	0:00	MAX	AVG.		
DAY																									MAX	AVG.	RDGS.	
1	4.5	3.5	4.5	4	3	6	3.5	4	S	2.5	20	3.5	5	16	5.5	3.5	4.5	7	3.5	3	4	5	7	9.5	20	5.8	24	
2	8	7.5	2.5	2	3.5	3	3.5	S	4.5	2.5	3.5	4	2.5	5	7.5	4.5	6	5.5	6	12	12.5	14.5	12	11.5	14.5	6.3	24	
3	15	15	19.5	19	16	14	S	6	6.5	6.5	6	4	4	4	4.5	3.5	4	9	12.5	14	17	22	14	19	22	11.1	24	
4	19	11.5	11.5	13	10	S	10	6	5.5	5	4.5	20	4.5	4.5	3	4.5	20.5	7	12	13.5	16.5	18.5	20.5	18.5	20.5	11.3	24	
5	20.5	18.5	15.5	15.5	S	16.1	18.1	18.6	19.1	18.6	13.6	12.6	8.6	8.1	9.6	10.6	12.1	9.6	7.6	4.1	3.6	4.1	4.6	5.6	20.5	12.0	24	
6	8.6	7.6	7.6	S	8	8.5	12	23.5	29	C	C	C	C	C	C	C	C	28.8	17.8	28.8	20.3	22.8	13.8	14.3	29	16.8	24	
7	17.3	17.8	S	12.9	15.9	19.4	20.9	22.9	S	S	13.1	11.1	6.1	7.1	11.1	7.6	8.6	13.6	10.6	9.1	6.6	5.6	3.1	3.6	22.9	11.6	24	
8	4.1	S	5.1	3.6	2.1	1.6	2.1	2.1	2.1	0.6	0.6	0.6	0.6	1.1	1.6	2.1	5.1	13.1	12.1	8.1	9.1	9.6	7.1	13.1	4.2	24		
9	S	4.1	4.6	6.1	5.6	7.1	13.1	18.1	31.1	25.6	17.6	19.1	13.6	15.1	25.1	24.1	167.5	34.6	32.1	28.6	28.1	25.6	23.6	S	167.5	25.9	24	
10	26.1	26.1	28.1	27.6	32.6	26.6	27.1	27.1	26.1	25.6	28.1	29.1	19.1	11.1	11.6	9.1	17.1	35.6	17.1	14.6	25.1	22.1	S	19.1	35.6	23.1	24	
11	22.6	22.1	22.6	20.1	23.1	20.1	18.6	23.6	28.1	23.1	21.1	13.1	18.6	8.6	10.6	12.1	22.1	25.1	27.6	19.1	19.1	S	30.6	30.6	30.6	21.0	24	
12	27.6	27.1	27.6	25.6	28.6	27.1	30.6	32.6	32.1	29.6	27.1	36.1	26.6	14.1	14.6	16.1	19.1	29.1	20.1	20.6	S	25.1	23.6	24.1	NA	NA	24	
13	25.1	26.1	27.6	30.1	35.1	36.1	30.6	S	S	S	C	C	C	C	C	C	C	C	9.6	S	9.6	11.6	11.6	11.6	36.1	22.1	24	
14	12.6	12.1	5.7	7.6	7.1	5.2	5.2	7.6	5.7	8.2	7.1	5.2	5.7	3.7	7.1	8.2	7.7	15.1	S	13.5	11.1	10.6	10.1	3.1	15.1	8.1	24	
15	2.5	2.1	2.1	2.1	3.5	4	3.5	3.5	2.5	4	9	4	4	4	3.5	4.5	4	S	2.5	3	4	3.5	1	1.5	9	3.4	24	
16	2	1	2.5	2	2	3.5	4	S	S	7	8.5	4	4.5	5.5	7	10.5	S	10	S	4.1	3.1	2.6	5.1	5.1	10.5	4.7	24	
17	4.1	4.1	5	4.1	3.6	4.1	S	S	4.1	4.6	2.5	3	3	2.5	3	S	13.5	10.5	5.1	5.1	4.6	6.1	8	10	13.5	5.3	24	
18	10	10.5	9.5	14	15	22.5	12.5	9.5	16	20.5	12.5	16	21.5	29	S	31	40.5	35.5	29.5	31	28	25	25	40.5	21.5	24		
19	22.5	24	22	25.5	23.5	24	27.5	24.5	27	21.5	17.5	15.5	13.5	S	19.5	17	15.5	16	15	13.5	10	8.5	10	9	27.5	18.4	24	
20	6.5	12	6.5	6	4.5	4.5	14.5	15	16	15.5	11.5	3.5	S	8	4.5	6.5	6.5	6.5	13	14.5	6	7	12	5.5	16	9.0	24	
21	2.5	2.5	1.5	4.5	4.5	1.5	3.5	5	5.5	4	3.5	S	5.8	12.3	6.3	7.7	7.7	9.3	6.8	6.8	8.2	8.2	18.2	20.2	20.2	6.8	24	
22	16.2	9.2	8.2	5.8	6.8	8.2	7.7	8.2	8.2	6.8	S	2.9	2.4	1.9	2.4	2.4	2.4	9.4	19.4	9.9	8.9	8.9	11.4	5.8	19.4	7.5	24	
23	3.9	3.9	3.4	6.9	3.4	3.9	4.4	5.4	19.3	S	15.6	14.6	13	6.1	14.1	10.6	8.6	7.1	5.1	6.6	7.1	6.6	9.6	11.1	19.3	8.3	24	
24	9.1	7.6	7.6	6.6	5.5	6.1	6.1	2.6	S	2	1	1	0.5	0.5	1.5	8	7	5	3.5	4	5	5	4	8.5	9.1	4.7	24	
25	8	8	8	4.5	10	12.4	S	S	4.4	4.9	3.9	3.9	4.4	6.4	1.4	1.4	1.4	1.4	2.9	2.9	4.4	4.9	5.9	5.9	12.4	5.1	24	
26	4.9	4.9	4.4	4.4	3.9	3.9	S	8.3	8.3	21.7	37.8	9.8	5.3	6.3	5.3	3.3	8.3	8.3	11.8	11.8	11.3	8.8	10.3	8.3	37.8	9.2	24	
27	6.3	7.3	8.3	12.3	12.7	S	4.2	3.7	3.2	2.2	1.7	1.7	2.6	2.6	2.6	2.6	2.6	2.6	2.1	2.6	3.6	2.1	3.1	1.1	2.1	12.7	4.1	24
28	4.6	5.6	3.1	3.1	S	7.5	6.5	9.5	8.5	3.5	3	3	2.5	2.5	2.5	3	7	9	S	11.5	11.5	12.5	11.5	12	12.5	6.5	24	
29	14.5	14	12	S	6.3	4.8	12.8	2.8	3.8	5.3	5.8	13.8	7.3	21.8	6.8	6.3	7.8	7.8	6.8	6.8	5.8	6.3	6.8	7.3	21.8	8.4	24	
30	8.8	10.8	S	11.8	11.3	9.8	7.8	5.8	7.3	4.3	4.3	2.8	3.3	4.3	4.8	8.8	4.8	2.8	6.3	2.8	3.3	2.3	2.8	2.8	11.8	5.8	24	
31	2.3	S	3.3	2.8	2.3	2.8	2.8	8.3	3.3	5.3	3.3	4.8	1.8	2.8	1.3	2.8	4.8	8.3	26.8	9.3	8.3	13.3	9.3	12.8	26.8	6.2	24	
HOURLY MAX	28	27	28	30	35	36	31	33	32	30	38	36	27	29	25	31	168	36	32	30	31	28	31	31				
HOURLY AVG	11.3	11.3	10.0	10.5	10.7	10.8	11.4	11.7	12.6	10.5	10.8	9.4	7.5	7.7	7.1	8.3	15.5	12.9	12.4	11.3	10.5	11.1	11.2	11.0				

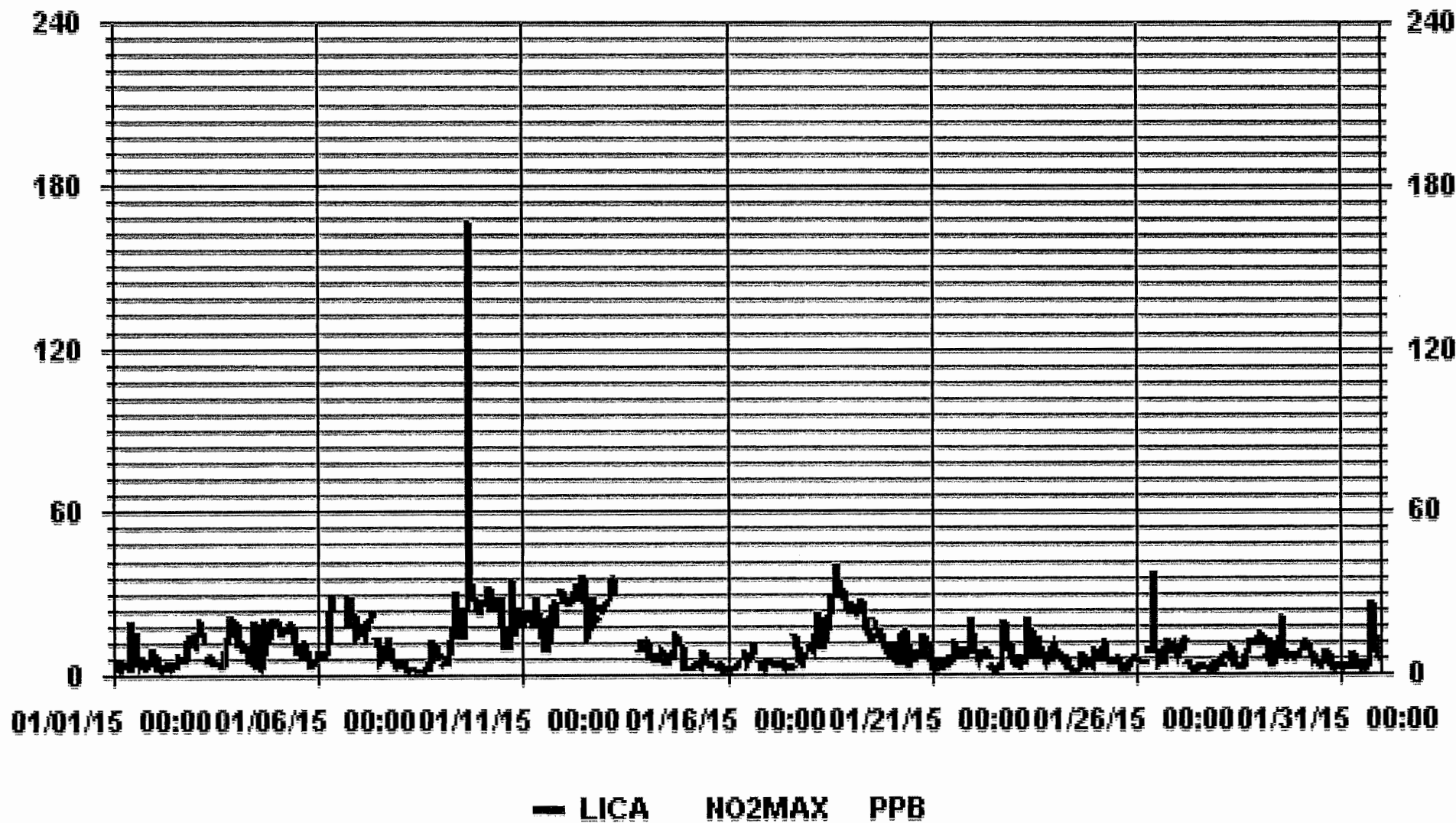
STATUS FLAG CODES

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:	685					
MAXIMUM INSTANTANEOUS VALUE:	167.5	PPB	@ HOUR(S)	16	ON DAY(S)	9
				VAR-VARIOUS		
125 CALIBRATION TIME:	43	HRS	OPERATIONAL TIME:	744	HRS	
MONTHLY CALIBRATION TIME:	16	HRS				
STANDARD DEVIATION:	10.24					

01 Hour Averages



LICA
 NO2_ / WD Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 01
 Site Name : LICA
 Parameter : NO2_
 Units : PPB

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	1.59	3.19	10.59	1.01	2.75	1.30	5.66	2.75	2.17	3.04	6.67	28.01	17.99	5.66	5.51	2.03	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	1.59	3.19	10.59	1.01	2.75	1.30	5.66	2.75	2.17	3.04	6.67	28.01	17.99	5.66	5.51	2.03	

Calm : .00 %

Total # Operational Hours : 689

Distribution By Samples





Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	11	22	73	7	19	9	39	19	15	21	46	193	124	39	38	14	689
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	11	22	73	7	19	9	39	19	15	21	46	193	124	39	38	14	

Calm : .00 %

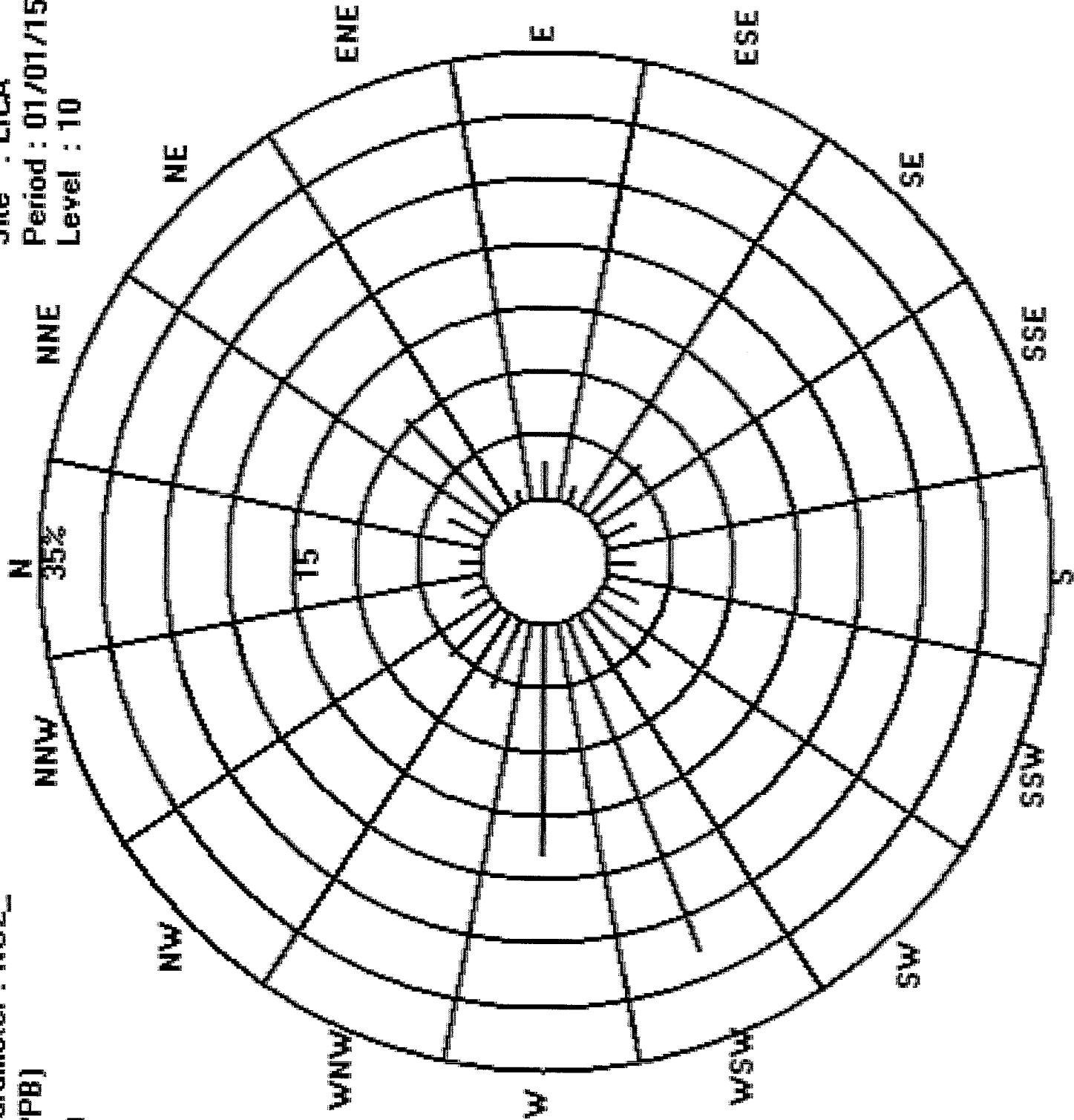
Total # Operational Hours : 689

Logger : 01 Parameter : ND2_

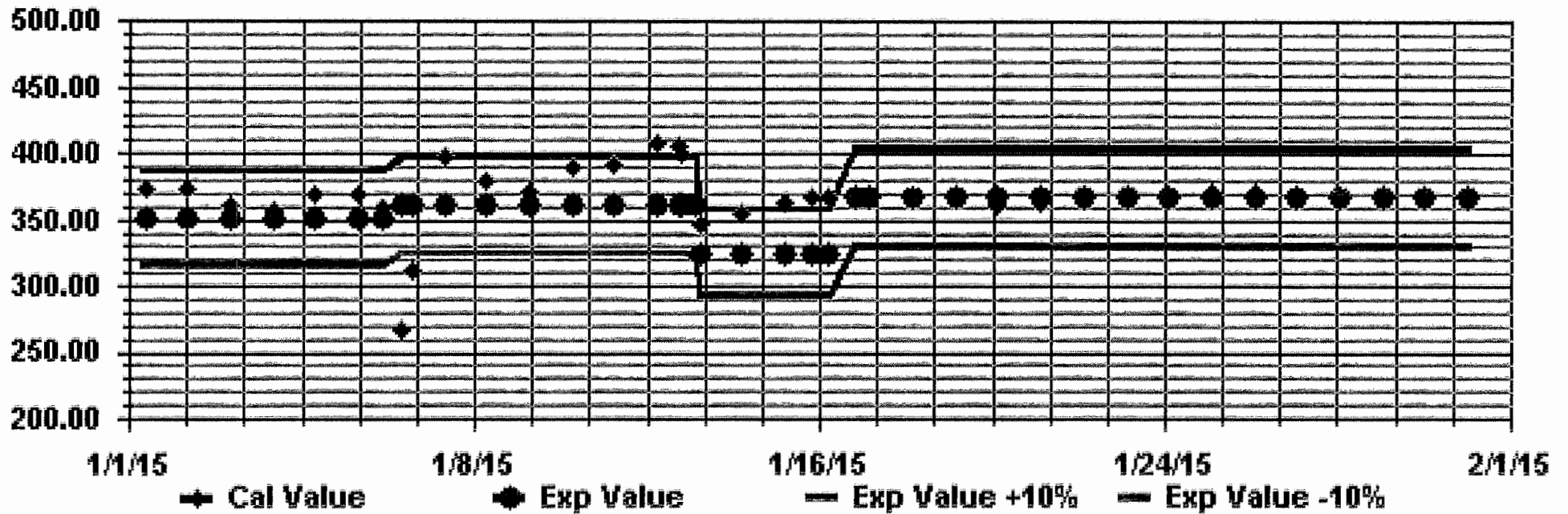
Class Limits (PPB)

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

Site : LICA
Period : 01/01/15-01/31/15
Level : 10



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



OZONE

OZONE (O3) hourly averages 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	24:00	DAILY	24-HOUR	RDGS.
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	0:00	MAX.	AVG.		
DAY 1	35	36	36	37	36	35	35	35	S	37	37	36	36	35	35	36	34	32	34	34	33	31	28	28	37	34.4	24	
2	27	32	38	39	38	39	38	S	36	34	34	34	36	37	36	36	34	32	33	27	22	21	23	21	39	32.5	24	
3	19	17	18	16	15	20	S	29	28	29	28	30	30	30	31	30	26	20	21	16	15	19	18	31	23.3	24		
4	21	22	21	20	22	S	24	27	27	28	29	30	31	32	32	31	30	28	25	22	19	16	15	15	32	24.7	24	
5	15	15	17	17	S	16	12	14	13	15	20	24	27	29	29	28	29	29	31	32	33	32	30	30	33	23.3	24	
6	28	28	26	S	26	25	24	16	S	S	19	29	31	30	28	C	C	C	C	C	10	8	9	10	31	21.7	24	
7	6	8	S	6	2	1	1	1	1	S	23	29	30	31	31	28	30	28	25	27	27	30	32	33	33	20.7	24	
8	35	S	33	37	39	39	38	39	39	39	39	39	39	39	39	S	S	36	33	31	32	30	30	32	39	36.0	24	
9	S	35	33	29	29	29	23	23	16	11	22	26	28	30	30	26	12	7	4	S	S	X	X	X	35	22.9	21	
10	X	X	X	X	X	X	X	X	X	X	Y	Y	S	32	30	31	25	19	17	16	13	10	S	9	32	20.2	12	
11	7	7	5	6	4	8	9	8	2	6	13	19	22	24	25	25	15	15	13	12	9	S	2	1	25	11.2	24	
12	S	1	1	1	1	1	1	1	S	3	5	12	16	21	22	19	16	15	14	13	S	9	9	8	22	9.0	24	
13	7	7	7	5	2	2	6	8	10	8	14	17	20	20	21	22	C	C	C	C	21	19	18	15	22	12.5	24	
14	16	22	28	28	27	29	30	30	29	29	29	32	32	34	32	31	29	27	S	25	23	22	23	26	34	27.5	24	
15	29	30	31	30	32	34	36	35	35	34	34	36	38	38	36	32	32	S	33	33	32	32	33	32	38	33.3	24	
16	32	34	35	35	34	33	32	33	32	31	31	31	31	31	30	29	28	S	27	31	34	36	38	39	39	32.8	24	
17	39	38	37	38	38	38	38	38	37	38	39	40	39	40	39	S	36	37	38	38	37	35	32	29	40	37.3	24	
18	26	26	20	17	13	11	12	12	13	8	14	12	19	22	S	16	6	7	5	3	1	1	0	1	26	11.5	24	
19	0	0	1	0	1	0	1	1	3	8	13	18	21	S	21	21	22	17	16	16	21	22	19	18	22	11.3	24	
20	18	15	24	24	23	21	16	11	9	14	18	24	S	26	28	26	25	26	23	18	27	28	25	30	30	21.7	24	
21	33	33	34	31	30	32	31	31	29	30	32	S	36	35	36	36	36	35	34	32	30	29	19	13	36	31.2	24	
22	12	28	31	30	29	29	28	29	29	32	S	39	40	41	41	40	39	38	32	34	35	33	31	34	41	32.8	24	
23	35	36	35	32	35	35	34	33	33	S	30	29	32	35	34	33	33	34	35	34	32	31	29	28	36	32.9	24	
24	22	20	20	19	23	25	26	28	S	34	36	38	39	38	37	36	32	35	36	36	35	34	34	30	39	31.0	24	
25	25	19	25	26	20	25	30	S	32	32	32	29	29	36	40	42	43	42	41	40	38	37	37	33	43	33.7	24	
26	32	32	33	33	32	24	S	28	29	34	38	40	40	39	40	41	42	39	34	29	29	28	24	18	42	32.0	24	
27	15	13	20	14	16	S	29	24	21	24	27	28	28	28	27	26	27	27	26	27	27	27	28	29	29	24.3	24	
28	27	27	27	26	S	22	23	17	21	23	24	24	25	26	27	27	26	21	19	18	15	14	12	12	27	21.9	24	
29	9	10	14	S	17	20	23	25	25	24	25	29	29	28	28	27	26	24	23	22	21	20	18	16	29	21.9	24	
30	14	13	S	12	11	13	16	20	19	21	23	25	25	23	24	27	28	30	31	31	34	34	33	34	34	23.5	24	
31	35	S	35	35	35	34	33	32	33	33	33	34	34	34	34	34	32	26	24	22	20	18	17	13	35	29.6	24	
HOURLY MAX	39	38	38	39	39	39	38	39	39	39	39	39	40	40	41	41	42	43	42	41	40	38	38	39				
HOURLY AVG	22.1	21.6	24.5	23.0	22.5	22.9	23.2	22.4	24.0	24.4	26.4	28.8	30.5	31.4	31.3	30.0	28.4	27.0	26.1	25.9	25.1	24.3	23.0	21.8				

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

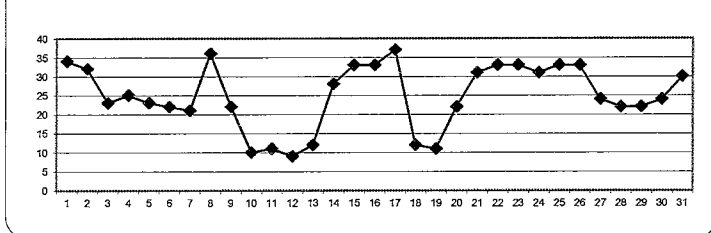
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 12 HR 82 PPB

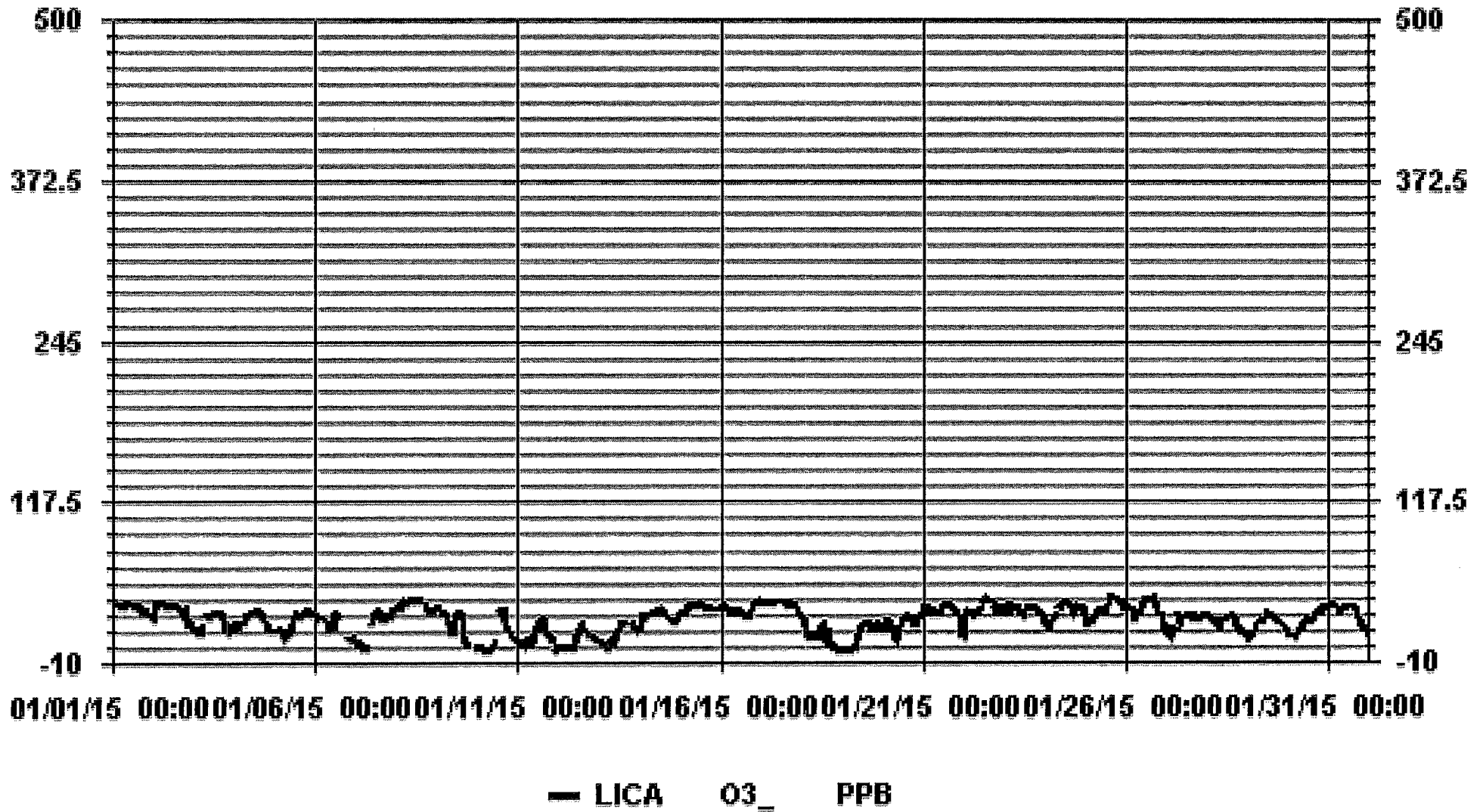
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0		
NUMBER OF NON-ZERO READINGS:	675		
MAXIMUM 1-HR AVERAGE:	43 PPB	@ HOUR(S)	16
MAXIMUM 24-HR AVERAGE:	37.3 PPB	ON DAY(S)	25
		ON DAY(S)	17
		VAR-VARIOUS	
IZS CALIBRATION TIME:	40 HRS	OPERATIONAL TIME:	729 HRS
MONTHLY CALIBRATION TIME:	9 HRS	AMD OPERATION UPTIME:	98.0 %
STANDARD DEVIATION:	10.18	MONTHLY AVERAGE:	25 PPB

24 HOUR AVERAGES FOR JANUARY 2015



01 Hour Averages





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Site - JANUARY 2015

JOB # 2833-2015-01-01- C

OZONE 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	24-HOUR	RDGS.	
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	0:00	MAX	AVG.		
DAY																									MAX	AVG.	RDGS.	
1	36	37	37	38	38	37	37	36	S	38	38	37	38	37	37	37	36	35	35	35	34	34	30	29	38	35.9	24	
2	30	38	40	40	39	39	39	S	38	35	34	35	38	39	37	37	36	34	34	31	25	24	28	23	40	34.5	24	
3	23	20	21	20	20	25	S	31	30	30	30	31	31	31	32	32	31	29	24	24	18	18	21	21	32	25.8	24	
4	25	24	22	23	23	S	26	28	28	29	30	32	32	33	33	33	31	30	27	23	21	17	16	16	33	26.2	24	
5	16	16	18	18	S	18	14	15	16	18	22	27	29	31	31	30	30	30	33	33	33	33	31	31	33	24.9	24	
6	30	29	29	S	27	27	26	23	S	S	25	31	31	31	29	C	C	C	C	C	14	12	12	13	31	24.3	24	
7	12	13	S	11	3	1	2	2	S	S	30	30	32	32	30	32	30	28	27	27	28	31	33	35	35	22.3	24	
8	36	S	34	40	39	39	39	40	39	40	40	40	39	39	S	S	37	37	34	33	32	32	33	40	37.2	24		
9	S	35	34	32	31	31	26	29	27	17	31	30	29	32	31	29	19	14	S	S	X	X	X	35	28.1	21		
10	X	X	X	X	X	X	X	X	X	X	Y	Y	S	S	32	32	30	24	22	19	17	12	S	11	32	22.1	12	
11	9	11	9	9	7	12	12	11	4	10	19	21	24	25	27	27	21	20	20	15	12	S	6	S	27	15.0	24	
12	S	1	1	3	1	1	1	1	S	S	7	17	20	23	23	21	18	16	15	14	S	10	10	9	23	10.6	24	
13	8	8	7	6	4	S	8	11	11	12	17	18	21	21	24	24	C	C	C	C	C	23	20	19	18	24	14.3	24
14	20	27	29	29	28	31	32	30	31	31	33	34	35	34	33	32	31	S	28	26	23	25	29	35	29.7	24		
15	31	31	31	31	35	36	37	37	36	35	36	39	40	39	37	34	33	S	34	34	33	33	33	33	40	34.7	24	
16	33	35	36	36	35	34	33	34	33	32	32	32	32	32	30	30	S	30	32	35	38	39	39	41	41	34.0	24	
17	42	40	39	40	39	39	39	39	38	39	40	40	41	41	S	39	39	39	38	38	36	35	31	42	38.8	24		
18	27	27	23	20	18	17	15	16	18	11	18	19	23	28	S	20	11	13	9	6	2	2	1	4	28	15.1	24	
19	1	1	2	1	2	1	2	4	S	13	15	20	23	S	24	23	24	19	18	17	27	27	22	22	27	13.6	24	
20	21	21	26	25	24	22	20	15	12	17	22	26	S	28	28	29	26	28	27	27	29	30	29	32	32	24.5	24	
21	34	35	35	33	33	33	32	32	31	31	34	S	36	36	37	37	37	36	35	41	32	30	26	19	41	33.3	24	
22	20	31	32	31	32	30	29	30	32	35	S	53	41	42	41	41	40	40	37	36	36	34	34	53	35.3	24		
23	36	37	37	35	37	37	35	35	34	S	32	32	34	36	36	35	35	35	36	36	34	33	32	31	37	34.8	24	
24	26	24	23	22	25	27	28	29	S	35	38	39	39	39	38	38	36	36	37	37	37	35	36	35	39	33.0	24	
25	30	24	30	32	23	28	32	S	33	33	33	31	32	40	42	44	44	43	43	41	40	39	39	36	44	35.3	24	
26	35	33	36	35	34	32	S	32	32	37	40	41	41	41	42	43	44	41	39	32	31	30	28	25	44	35.8	24	
27	18	16	22	19	28	S	30	26	23	26	28	29	29	29	28	28	27	28	28	28	28	29	29	30	30	26.3	24	
28	29	28	28	28	S	24	25	19	23	25	25	25	26	28	28	28	28	23	S	20	17	17	15	14	29	23.8	24	
29	12	13	15	S	18	22	25	27	26	25	28	30	30	30	29	28	28	26	25	23	22	22	19	19	30	23.6	24	
30	16	14	S	13	12	16	20	21	20	23	25	27	27	24	28	28	30	31	32	32	34	34	34	35	35	25.0	24	
31	36	S	36	36	35	35	34	34	34	34	34	35	35	35	34	33	29	27	24	23	22	20	15	36	31.1	24		
HOURLY MAX	42	40	40	40	39	39	39	40	39	40	40	53	41	42	42	44	44	43	43	41	40	39	39	41				
HOURLY AVG	24.7	23.9	26.1	25.2	24.6	25.0	24.9	24.6	26.1	27.3	28.8	31.0	32.0	32.9	32.8	31.7	30.7	29.5	29.7	28.2	27.1	26.1	25.3	25.0				

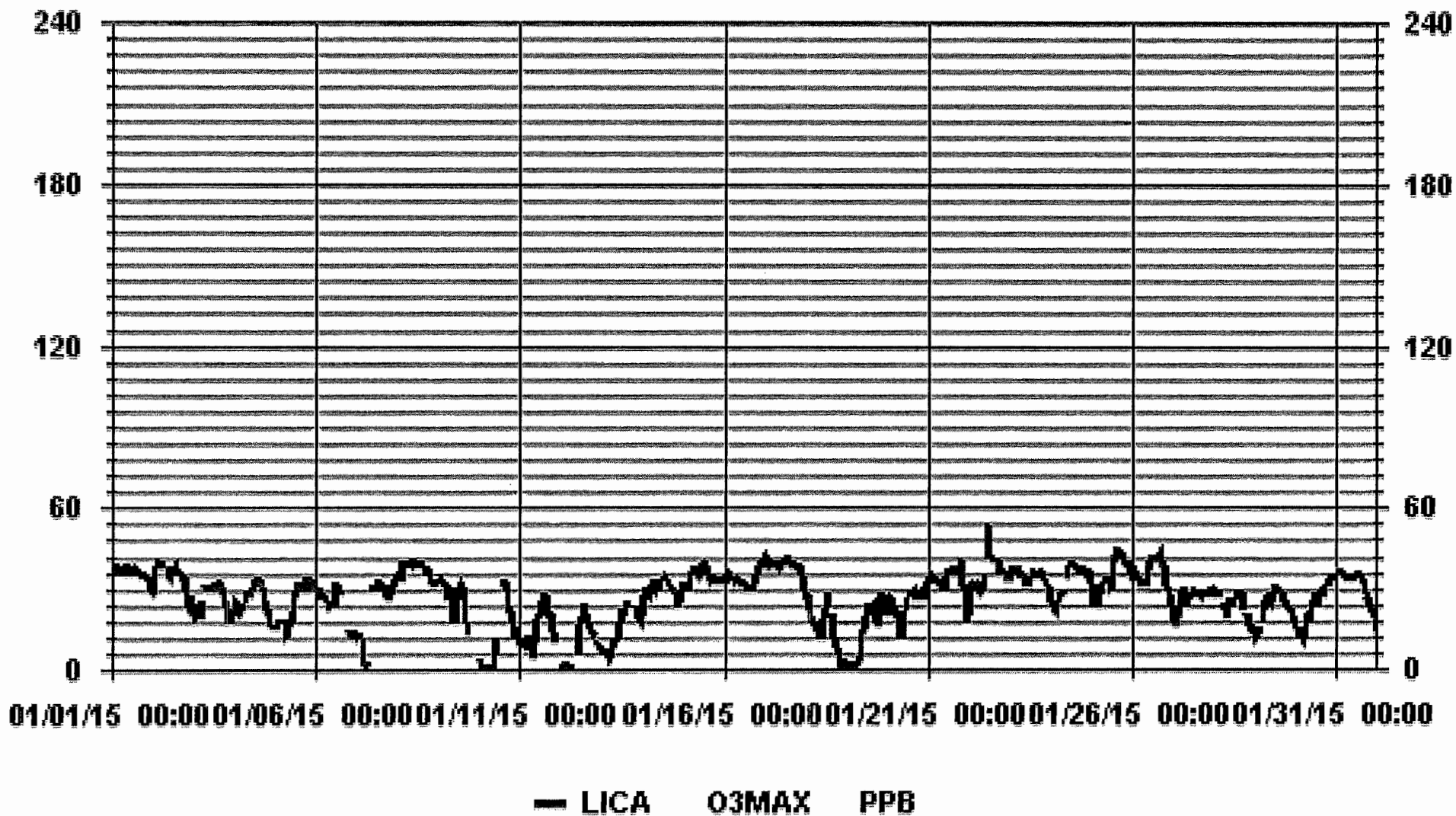
STATUS FLAG CODES

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:	674					
MAXIMUM INSTANTANEOUS VALUE:	53	PPB	@ HOUR(S)	0	ON DAY(S)	0
				VAR-VARIOUS		
IZS CALIBRATION TIME:	46	HRS	OPERATIONAL TIME:	729	HRS	
MONTHLY CALIBRATION TIME:	9	HRS				
STANDARD DEVIATION:	9.72					

01 Hour Averages



LICA
 O3_ / WD Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 01
 Site Name : LICA
 Parameter : O3_
 Units : PPF

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	1.58	3.17	10.54	1.01	2.74	1.30	5.63	2.60	2.16	2.89	6.50	28.17	18.78	5.49	5.34	2.02	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	1.58	3.17	10.54	1.01	2.74	1.30	5.63	2.60	2.16	2.89	6.50	28.17	18.78	5.49	5.34	2.02	

Calm : .00 %

Total # Operational Hours : 692

Distribution By Samples

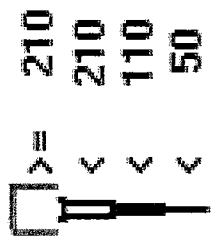
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50	11	22	73	7	19	9	39	18	15	20	45	195	130	38	37	14	692
< 110																	
< 210																	
>= 210																	
Totals	11	22	73	7	19	9	39	18	15	20	45	195	130	38	37	14	

Calm : .00 %

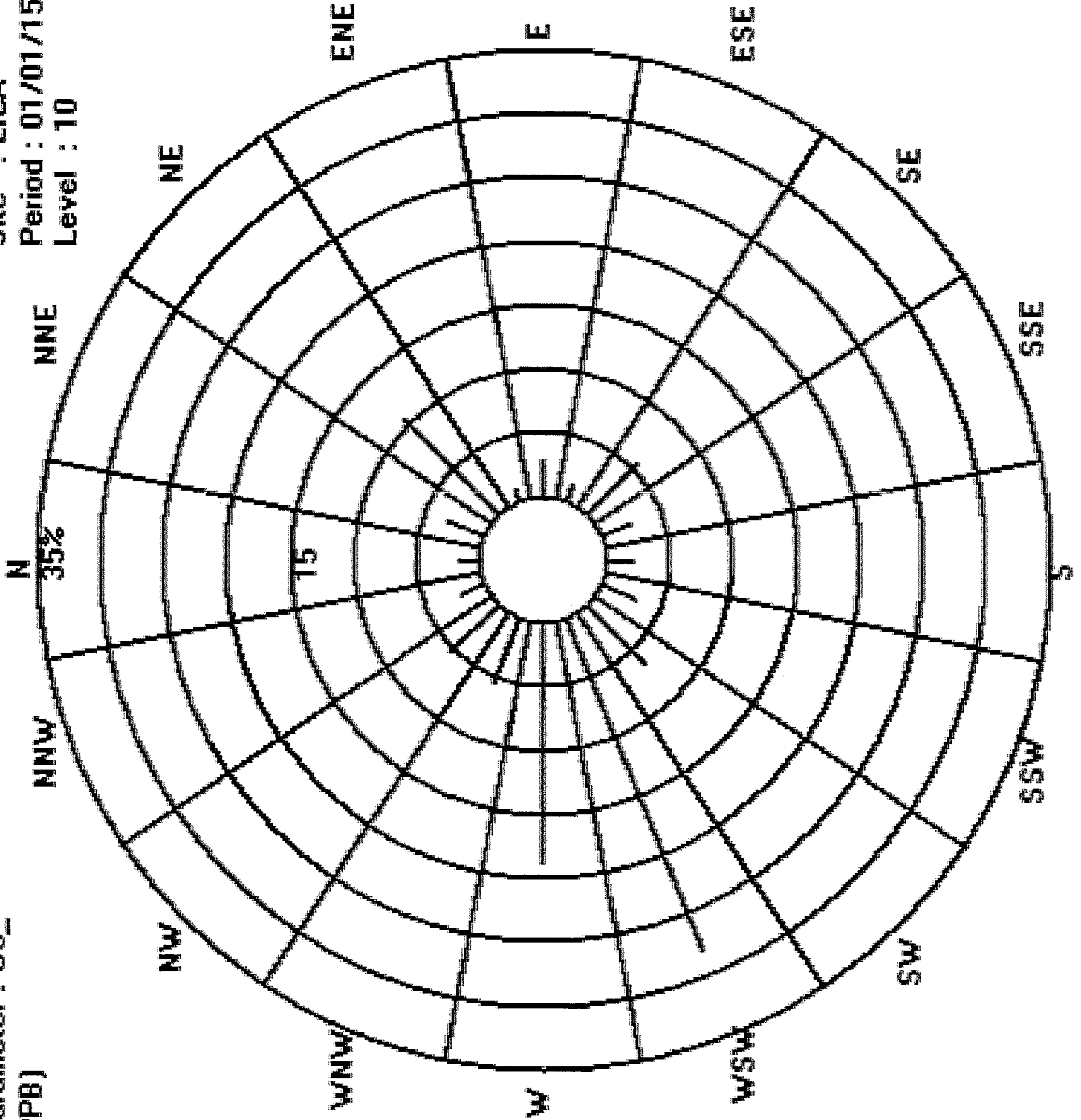
Total # Operational Hours : 692

Logger : 01 Parameter : O3_

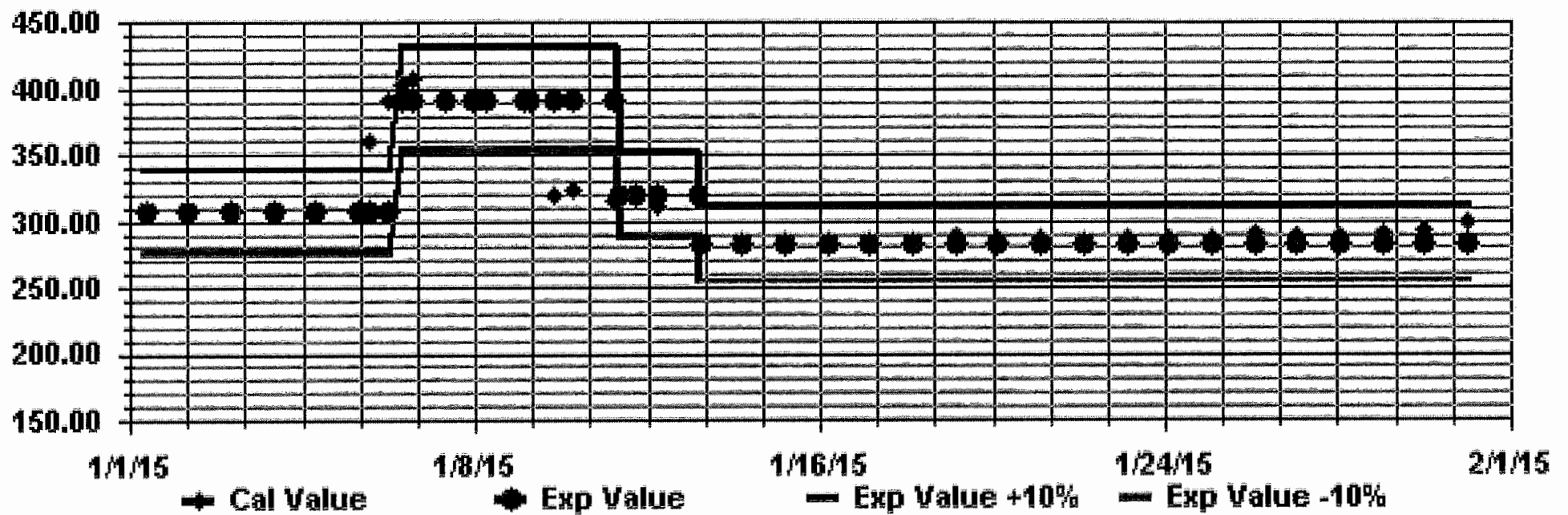
Class Limits (PPB)



Site : LICA
Period : 01/01/15-01/31/15
Level : 10



Calibration Graph for Site: LICA Parameter: 03_ Sequence: 03 Phase: SPAN



PARTICULATE MATTER 2.5

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

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	DAILY	24-HOUR	RDGS.
DAY	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	0:00	MAX.	AVG.	
1	1	4.0	3.0	1.0	2.0	2.0	3.0	1.0	3.0	0.0	1.0	2.0	5.0	6.0	1.0	1.0	0.0	0.0	7.0	5.0	1.0	4.0	7.0	8.0	6.0	8.0	3.0	24
2	2	6.0	5.0	3.0	5.0	3.0	4.0	5.0	6.0	3.0	6.0	3.0	3.0	0.0	2.0	3.0	1.0	4.0	4.0	5.0	4.0	4.0	4.0	5.0	4.0	6.0	3.8	24
3	3	4.0	5.0	4.0	3.0	6.0	5.0	3.0	5.0	2.0	1.0	1.0	0.0	1.0	2.0	1.0	3.0	5.0	6.0	7.0	3.0	5.0	5.0	5.0	5.0	7.0	3.6	24
4	4	4.0	3.0	5.0	5.0	6.0	4.0	5.0	5.0	3.0	5.0	4.0	7.0	3.0	5.0	8.0	7.0	8.0	12.0	12.0	16.0	19.0	20.0	18.0	18.0	20.0	8.4	24
5	5	19.0	16.0	15.0	13.0	12.0	11.0	12.0	11.0	17.0	15.0	14.0	12.0	8.0	10.0	4.0	6.0	3.0	5.0	2.0	2.0	0.0	0.0	0.0	1.0	19.0	8.7	24
6	6	0.0	2.0	3.0	4.0	2.0	5.0	4.0	6.0	X	0.0	3.0	3.0	1.0	2.0	C	C	0.0	8.0	8.0	0.0	X	X	0.0	6.0	8.0	3.0	21
7	7	9.0	2.0	8.0	5.0	6.0	8.0	10.0	8.0	5.0	2.0	1.0	11.0	8.0	8.0	7.0	7.0	4.0	14.0	9.0	10.0	11.0	4.0	6.0	6.0	14.0	7.0	24
8	8	6.0	3.0	8.0	11.0	5.0	5.0	3.0	3.0	7.0	4.0	4.0	1.0	2.0	5.0	1.0	9.0	10.0	2.0	5.0	9.0	4.0	3.0	4.0	3.0	11.0	4.9	24
9	9	8.0	4.0	7.0	6.0	5.0	6.0	5.0	5.0	5.0	7.0	7.0	20.0	16.0	13.0	5.0	6.0	13.0	13.0	11.0	12.0	13.0	12.0	11.0	14.0	20.0	9.3	24
10	10	15.0	13.0	19.0	16.0	13.0	11.0	11.0	11.0	9.0	7.0	15.0	14.0	11.0	5.0	6.0	10.0	7.0	7.0	7.0	4.0	6.0	8.0	15.0	8.0	19.0	10.3	24
11	11	10.0	10.0	12.0	10.0	10.0	12.0	14.0	13.0	13.0	7.0	16.0	13.0	13.0	11.0	12.0	12.0	9.0	10.0	11.0	12.0	12.0	16.0	17.0	23.0	23.0	12.4	24
12	12	18.0	15.0	15.0	11.0	17.0	10.0	18.0	16.0	17.0	20.0	11.0	24.0	18.0	19.0	13.0	27.0	27.0	26.0	25.0	27.0	25.0	30.0	28.0	30.0	30.0	20.1	24
13	13	27.0	22.0	27.0	28.0	22.0	24.0	15.0	13.0	19.0	17.0	11.0	16.0	12.0	X	36.0	18.0	10.0	21.0	14.0	5.0	6.0	8.0	11.0	23.0	36.0	17.6	23
14	14	14.0	4.0	5.0	8.0	7.0	10.0	8.0	X	2.0	2.0	6.0	6.0	0.0	0.0	1.0	5.0	X	2.0	9.0	9.0	10.0	8.0	9.0	2.0	14.0	5.8	22
15	15	5.0	2.0	X	6.0	6.0	1.0	8.0	3.0	7.0	3.0	2.0	6.0	0.0	4.0	4.0	3.0	11.0	4.0	5.0	16.0	12.0	12.0	0.0	6.0	16.0	5.5	23
16	16	1.0	3.0	4.0	6.0	4.0	6.0	7.0	9.0	5.0	8.0	1.0	11.0	14.0	15.0	13.0	16.0	4.0	2.0	0.0	1.0	6.0	0.0	4.0	4.0	16.0	6.3	24
17	17	3.0	5.0	3.0	5.0	3.0	4.0	2.0	6.0	0.0	5.0	4.0	9.0	4.0	4.0	3.0	8.0	4.0	1.0	5.0	3.0	2.0	3.0	5.0	10.0	10.0	4.2	24
18	18	9.0	8.0	7.0	3.0	6.0	7.0	0.0	X	1.0	16.0	6.0	7.0	9.0	10.0	0.0	5.0	12.0	16.0	11.0	3.0	16.0	10.0	13.0	7.0	16.0	7.9	23
19	19	8.0	10.0	13.0	8.0	8.0	13.0	11.0	12.0	13.0	17.0	20.0	20.0	19.0	20.0	14.0	9.0	7.0	9.0	6.0	17.0	6.0	9.0	6.0	5.0	20.0	11.7	24
20	20	5.0	7.0	7.0	6.0	5.0	7.0	5.0	7.0	11.0	7.0	9.0	4.0	0.0	5.0	7.0	5.0	3.0	0.0	3.0	5.0	5.0	0.0	3.0	5.0	11.0	5.0	24
21	21	1.0	7.0	0.0	0.0	1.0	2.0	5.0	7.0	5.0	1.0	3.0	7.0	2.0	1.0	7.0	0.0	4.0	3.0	10.0	0.0	X	6.0	4.0	4.0	10.0	3.5	23
22	22	4.0	5.0	10.0	8.0	5.0	5.0	1.0	8.0	6.0	4.0	7.0	1.0	3.0	4.0	12.0	7.0	X	X	1.0	1.0	7.0	11.0	7.0	8.0	12.0	5.7	22
23	23	0.0	4.0	3.0	3.0	0.0	2.0	0.0	8.0	11.0	16.0	6.0	11.0	9.0	3.0	6.0	1.0	1.0	6.0	15.0	12.0	11.0	16.0	20.0	13.0	20.0	7.4	24
24	24	12.0	13.0	15.0	23.0	19.0	7.0	15.0	4.0	8.0	8.0	21.0	4.0	0.0	X	11.0	X	X	5.0	0.0	X	X	X	X	0.0	23.0	9.7	17
25	25	4.0	1.0	7.0	18.0	21.0	11.0	14.0	10.0	9.0	13.0	10.0	8.0	8.0	2.0	5.0	X	X	X	0.0	0.0	X	X	0.0	21.0	7.4	19	
26	26	0.0	2.0	1.0	0.0	5.0	4.0	7.0	11.0	19.0	11.0	7.0	10.0	8.0	5.0	12.0	2.0	X	C	C	0.0	5.0	0.0	X	X	19.0	5.7	21
27	27	3.0	5.0	10.0	10.0	8.0	1.0	0.0	0.0	X	0.0	1.0	X	0.0	2.0	0.0	2.0	4.0	5.0	1.0	5.0	3.0	4.0	10.0	0.0	10.0	3.4	22
28	28	5.0	2.0	6.0	6.0	2.0	1.0	4.0	2.0	0.0	4.0	2.0	4.0	4.0	4.0	6.0	2.0	9.0	5.0	2.0	3.0	6.0	3.0	2.0	3.0	9.0	3.6	24
29	29	5.0	4.0	3.0	5.0	5.0	2.0	3.0	6.0	4.0	4.0	6.0	1.0	2.0	1.0	3.0	4.0	6.0	6.0	4.0	5.0	3.0	6.0	8.0	4.0	8.0	4.2	24
30	30	14.0	6.0	11.0	10.0	12.0	15.0	12.0	7.0	4.0	8.0	2.0	8.0	0.0	9.0	9.0	0.0	6.0	2.0	6.0	6.0	3.0	4.0	1.0	3.0	15.0	6.6	24
31	31	1.0	7.0	6.0	2.0	0.0	6.0	10.0	6.0	5.0	6.0	7.0	2.0	4.0	2.0	5.0	5.0	5.0	5.0	5.0	8.0	6.0	6.0	4.0	6.0	10.0	5.0	24
HOURLY MAX		27.0	22.0	27.0	28.0	22.0	24.0	18.0	16.0	19.0	20.0	21.0	24.0	19.0	20.0	36.0	27.0	27.0	26.0	25.0	27.0	25.0	30.0	28.0				
HOURLY AVG		7.2	6.4	7.9	7.9	7.3	6.8	7.0	7.3	7.2	7.3	6.8	8.3	5.9	6.0	7.2	6.3	7.2	7.4	6.9	6.6	7.3	7.7	7.9	7.5			

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

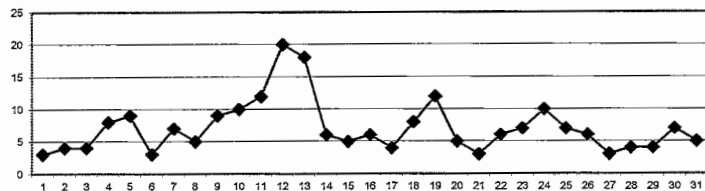
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 24-HR 30 ug/m3

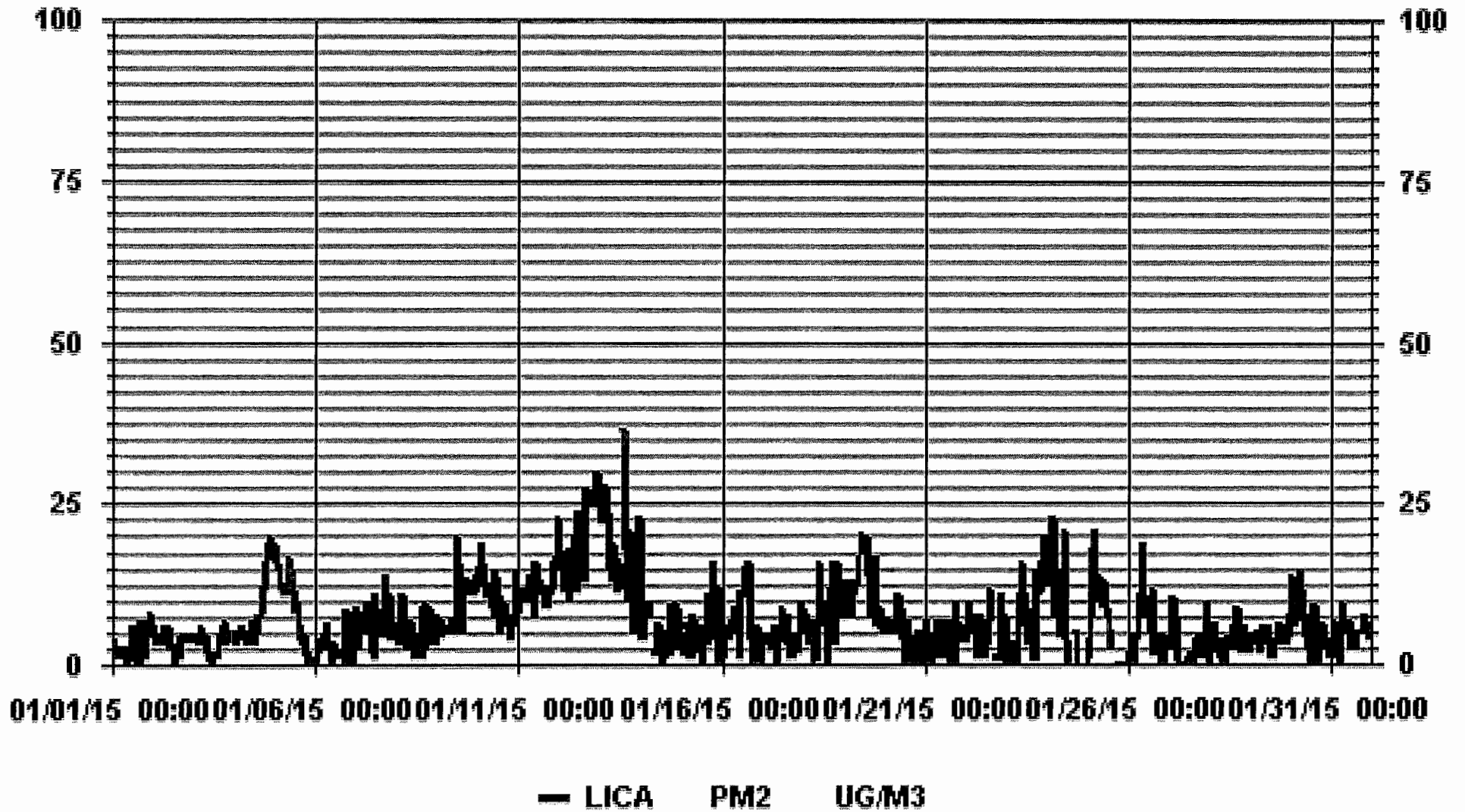
MONTHLY SUMMARY

NUMBER OF 24-HR EXCEEDENCES:	0		
NUMBER OF NON-ZERO READINGS:	659		
MAXIMUM 1-HR AVERAGE:	36.0 ug/m3 @ HOUR(5)	14	ON DAY(S) 13
MAXIMUM 24-HR AVERAGE:	20.1 ug/m3		ON DAY(S) 12
			VAR-VARIOUS
MONTHLY CALIBRATION TIME:	4 HRS	OPERATIONAL TIME:	716 HRS
STANDARD DEVIATION:	5.79	AMD OPERATION UPTIME:	96.2 %
		MONTHLY AVERAGE:	7.1 ug/m3

24 HOUR AVERAGES FOR JANUARY 2015



01 Hour Averages



LICA
PM2 / WD Joint Frequency Distribution (Percent)

January 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	1.54	3.08	10.25	.98	2.80	1.82	6.17	2.66	2.24	2.94	6.46	27.24	18.25	5.75	5.33	2.10	99.71
< 60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.14	.14	.00	.00	.00	.00	.28
< 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	1.54	3.08	10.25	.98	2.80	1.82	6.17	2.66	2.24	2.94	6.60	27.38	18.25	5.75	5.33	2.10	

Calm : .00 %

Total # Operational Hours : 712

Distribution By Samples

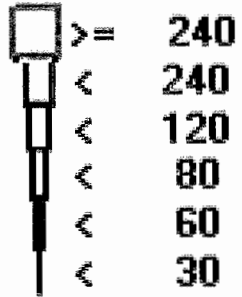
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 30	11	22	73	7	20	13	44	19	16	21	46	194	130	41	38	15	710
< 60											1	1					2
< 80																	
< 120																	
< 240																	
>= 240																	
Totals	11	22	73	7	20	13	44	19	16	21	47	195	130	41	38	15	

Calm : .00 %

Total # Operational Hours : 712

Logger : 01 Parameter : PM2

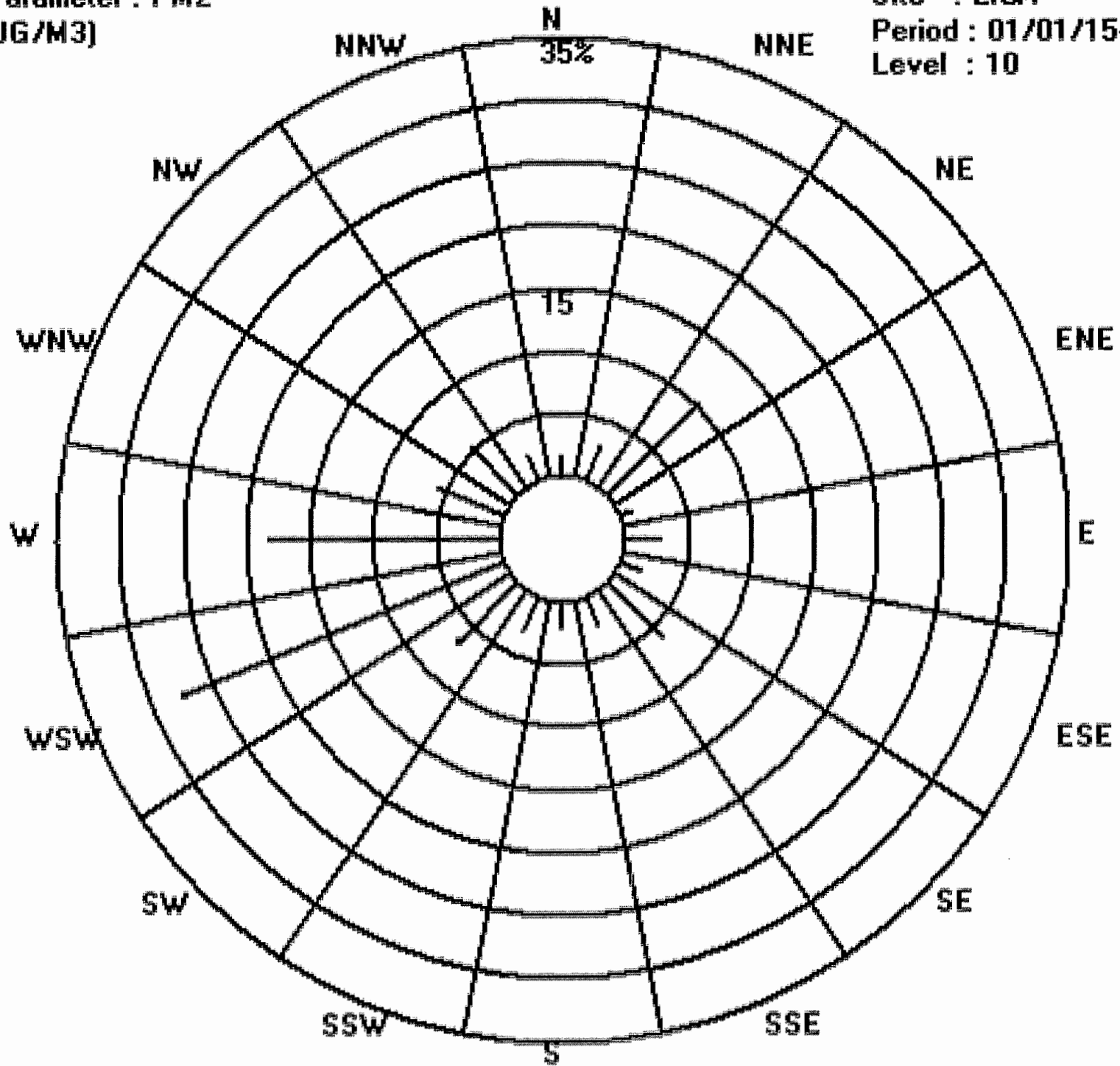
Class Limits (UG/M3)



Site : LICA

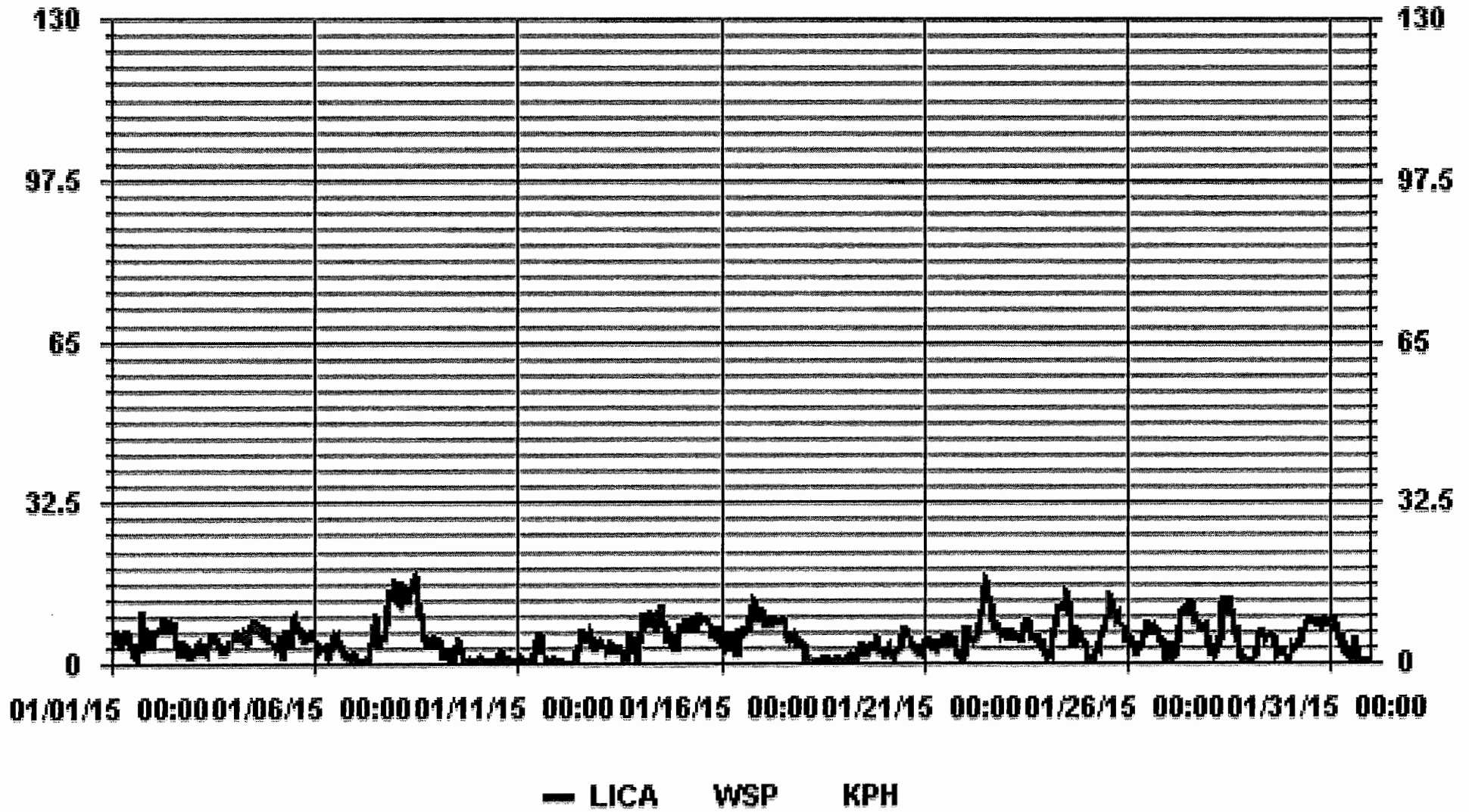
Period : 01/01/15-01/31/15

Level : 10



WIND SPEED

01 Hour Averages





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Site - JANUARY 2015

JOB # 2833-2015-01-01- C

VECTOR WIND SPEED MAX instantaneous maximum in km/hr

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	24-HOUR		
HOURLY 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	MAX	AVG.	RDGS.	
DAY																												
1	9.3	7.7	11.4	10.6	7.8	9.4	7.5	9.8	11.6	12.1	11.2	8.7	6.9	4.2	6.6	6.6	6.8	7.2	18.1	13.0	14.9	11.6	6.8	5.8	18.1	9.4	24	
2	8.7	12.0	10.5	10.4	11.9	11.6	10.4	15.2	13.6	11.8	12.0	12.0	12.2	15.7	9.3	5.7	2.8	5.9	8.4	3.5	2.8	4.5	4.9	5.1	15.7	9.2	24	
3	3.6	4.1	4.3	3.7	4.3	6.2	6.1	5.4	3.8	6.6	7.3	12.0	10.0	9.7	9.8	7.5	6.2	5.2	3.6	5.5	5.2	6.7	6.3	7.5	12.0	6.3	24	
4	6.9	9.5	9.2	9.3	7.8	7.5	10.5	9.7	6.9	9.3	10.3	11.7	12.9	13.0	14.4	10.9	12.2	12.7	10.3	11.0	7.4	6.8	6.1	7.1	14.4	9.7	24	
5	6.2	4.8	5.7	7.6	8.1	3.4	5.9	10.0	7.4	8.9	12.3	13.6	16.3	12.9	12.5	10.4	11.3	9.0	7.8	9.7	9.7	10.1	10.6	9.0	16.3	9.3	24	
6	7.5	8.4	3.7	5.0	6.5	5.4	5.8	4.7	3.1	4.1	6.5	9.8	9.0	9.5	9.9	6.5	4.4	4.8	3.8	3.9	3.3	2.5	5.0	4.9	9.9	5.8	24	
7	2.5	2.6	1.8	0.9	0.9	1.2	2.3	1.7	3.3	8.9	9.5	12.1	16.6	7.4	6.7	9.2	9.3	8.4	11.0	21.2	17.9	24.1	19.3	25.9	25.9	9.4	24	
8	26.8	21.3	20.7	26.0	19.0	21.0	21.9	19.9	21.1	24.4	26.9	28.1	24.1	23.3	15.9	14.9	8.9	6.8	6.7	7.6	5.2	6.3	7.9	8.2	28.1	17.2	24	
9	7.9	7.7	6.8	2.7	7.3	6.7	5.8	5.5	4.6	1.4	5.5	6.0	6.2	8.8	7.2	5.7	3.0	1.6	2.9	3.5	1.8	1.9	1.8	2.3	8.8	4.8	24	
10	2.4	3.7	4.0	3.5	3.6	2.8	2.7	2.0	1.6	0.8	2.0	1.4	2.0	5.6	6.7	4.6	2.4	2.3	3.3	2.5	1.6	1.5	0.9	1.0	6.7	2.7	24	
11	3.0	3.8	2.2	1.3	2.1	1.4	1.5	2.5	5.1	4.4	4.2	8.3	7.7	11.6	8.4	5.1	1.3	2.5	1.4	2.1	1.9	3.2	2.5	1.9	11.6	3.7	24	
12	0.9	2.5	2.3	2.6	1.8	1.6	1.6	1.0	0.4	3.2	1.5	6.4	8.1	8.5	9.9	8.2	6.6	10.9	11.7	9.0	7.3	5.6	7.7	5.7	11.7	5.2	24	
13	5.8	5.8	6.7	6.6	6.0	5.7	6.8	7.2	6.5	4.1	4.4	6.9	6.0	6.3	6.3	4.8	3.3	4.7	9.6	10.3	10.2	6.4	3.9	5.3	10.3	6.2	24	
14	8.3	9.6	16.4	12.8	12.7	15.3	15.9	12.7	11.1	11.1	9.5	11.0	16.8	17.7	13.4	11.2	6.2	9.1	9.4	5.8	4.7	5.2	7.9	11.9	17.7	11.1	24	
15	11.3	12.5	13.6	13.0	15.1	10.3	12.9	13.4	13.2	10.3	15.2	18.9	17.7	15.5	14.8	15.2	14.4	13.2	11.9	11.6	9.1	9.3	12.3	10.7	18.9	13.1	24	
16	7.4	10.2	7.3	9.1	11.7	9.9	9.3	6.8	7.5	4.8	5.2	10.8	12.4	11.4	10.6	11.7	11.8	12.8	16.9	16.6	16.4	17.1	12.2	15.7	17.1	11.1	24	
17	15.4	16.8	12.3	12.5	14.6	13.3	11.9	13.1	12.0	13.5	13.7	12.2	13.6	14.3	9.8	9.5	7.6	8.6	8.1	9.0	8.5	7.6	6.5	7.0	16.8	11.3	24	
18	6.3	5.9	3.1	2.7	2.5	2.1	2.6	2.4	2.7	2.9	3.3	2.7	2.8	3.0	2.3	5.1	5.5	3.5	4.5	2.3	3.2	2.5	2.7	2.5	6.3	3.3	24	
19	2.4	4.0	3.2	1.9	4.4	4.7	5.8	5.7	3.1	9.4	5.6	9.2	5.8	3.8	6.1	6.2	6.0	5.9	5.2	5.4	10.9	9.2	3.0	5.4	10.9	5.5	24	
20	2.8	4.4	5.4	6.2	5.0	3.5	2.4	3.0	3.5	4.8	6.7	8.5	12.1	10.3	11.4	10.7	7.6	7.7	5.5	8.0	7.4	7.0	5.9	5.8	12.1	6.5	24	
21	7.2	12.3	9.4	7.8	6.2	5.3	6.3	8.1	5.9	6.8	7.4	12.8	9.3	7.4	9.6	13.4	7.9	9.5	10.4	4.5	4.3	3.3	1.9	1.8	13.4	7.5	24	
22	4.9	11.3	10.9	7.1	8.8	6.7	6.7	8.0	11.4	15.2	19.7	19.7	25.0	24.9	21.8	18.2	12.8	11.7	8.9	10.9	10.4	8.3	8.7	9.4	25.0	12.6	24	
23	9.4	9.5	9.0	9.8	9.7	9.0	9.0	8.9	8.1	8.7	9.5	11.7	12.9	13.5	11.0	9.2	9.3	8.2	8.1	8.0	6.8	7.2	11.0	7.7	13.5	9.4	24	
24	4.0	6.5	6.1	4.9	8.4	13.2	14.0	17.2	15.9	18.1	21.4	22.6	22.1	17.5	16.9	16.3	10.4	10.1	10.6	10.1	8.9	7.7	6.1	4.9	22.6	12.2	24	
25	3.0	2.1	4.6	5.3	3.7	5.3	6.2	6.2	9.7	11.3	11.3	16.1	21.4	23.9	19.6	20.7	18.7	14.2	13.6	13.0	11.4	10.8	7.3	6.6	23.9	11.1	24	
26	7.3	9.0	7.4	6.0	6.0	3.6	5.8	5.4	5.9	11.9	9.3	10.5	12.8	11.0	11.4	11.6	11.7	10.5	9.8	8.0	7.5	5.3	4.5	4.2	12.8	8.2	24	
27	2.1	2.9	6.3	4.9	5.5	6.8	14.4	14.3	15.2	17.5	16.9	13.8	15.9	18.1	17.0	16.1	11.9	17.6	12.7	10.5	12.7	16.9	12.1	12.2	18.1	12.3	24	
28	6.1	6.6	5.4	4.2	4.9	6.6	9.5	7.7	22.5	19.4	21.1	20.9	17.4	17.3	15.3	11.5	10.3	6.3	P	3.1	3.4	2.0	2.4	2.7	22.5	9.9	23	
29	2.1	4.1	2.8	5.3	4.6	7.1	9.2	10.7	9.2	7.4	10.6	11.7	11.8	11.2	10.4	6.1	5.6	6.0	5.1	6.1	3.7	3.6	1.9	3.2	11.8	6.6	24	
30	5.1	6.9	5.3	6.3	6.8	9.5	8.8	10.7	11.5	11.9	14.7	14.4	18.8	14.4	13.7	12.4	12.4	14.1	11.1	13.4	14.4	12.3	13.1	12.7	18.8	11.4	24	
31	12.7	12.6	12.2	13.8	10.6	9.4	7.6	9.6	4.9	6.5	5.2	5.4	7.1	6.2	8.7	7.8	5.3	1.4	2.6	1.1	1.6	1.8	2.1	0.4	13.8	6.5	24	
HOURLY MAX	26.8	21.3	20.7	26.0	19.0	21.0	21.9	19.9	22.5	24.4	26.9	28.1	25.0	24.9	21.8	20.7	18.7	17.6	18.1	21.2	17.9	24.1	19.3	25.9				
HOURLY AVG	6.8	7.8	7.4	7.2	7.4	7.3	8.0	8.3	8.5	9.4	10.3	11.9	12.7	12.2	11.2	10.1	8.2	8.1	8.4	8.1	7.6	7.4	6.6	6.9				

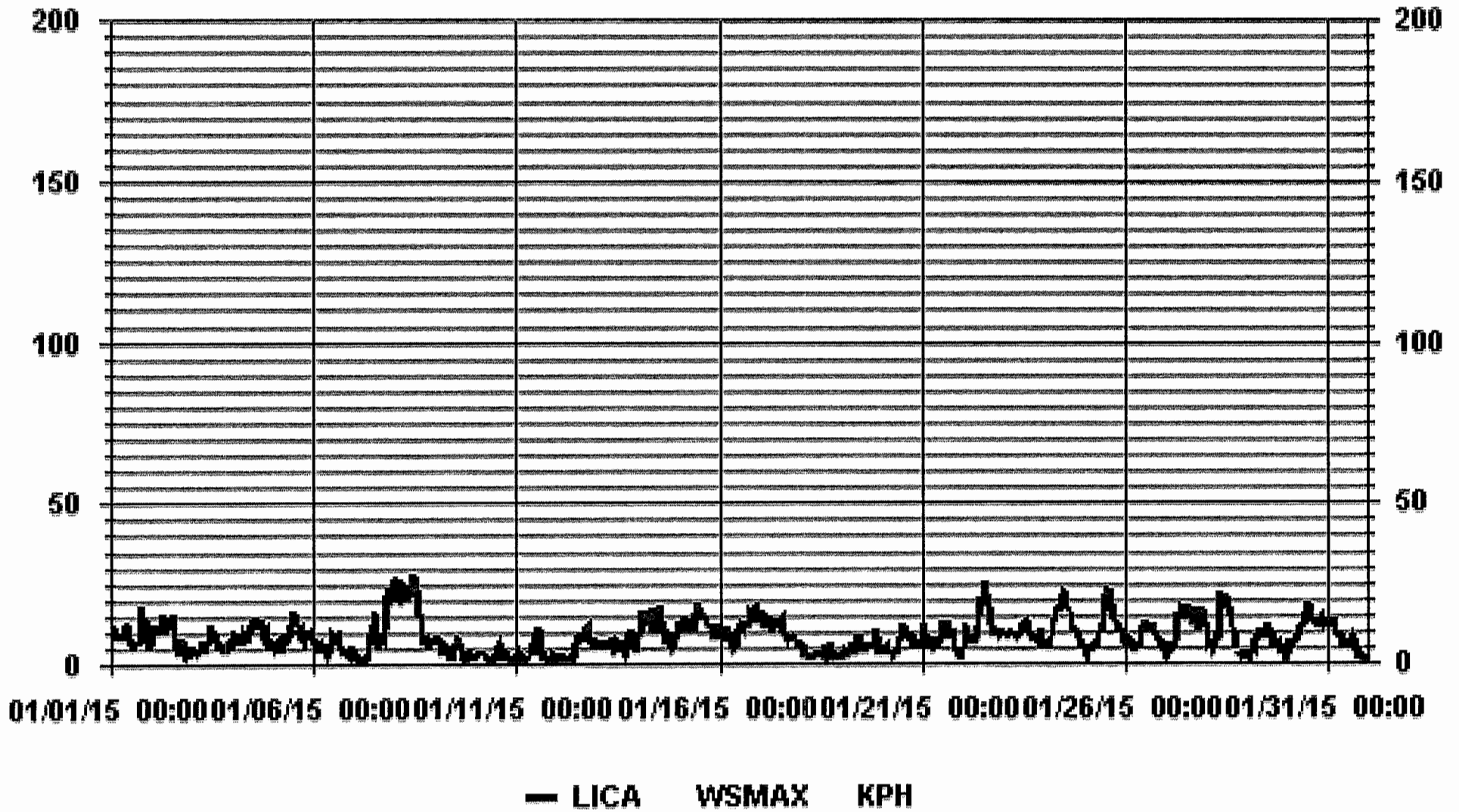
STATUS FLAG CODES

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

MAXIMUM INSTANTANEOUS VALUE:	28.1	KPH	@ HOUR(S)	11	ON DAY(S)	8
					VAR-VARIOUS	
OPERATIONAL TIME:				743	HRS	

01 Hour Averages



LICA
WSP / WD Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 01
Site Name : LICA
Parameter : WSP
Units : KPH

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	
< 6.0	.94	1.47	2.15	.94	1.61	1.47	4.43	2.15	1.61	2.55	5.77	18.68	11.69	4.16	1.47	.80	61.96
< 12.0	.26	1.20	7.52	.00	.94	.13	1.07	.13	.00	.00	.53	8.73	5.64	.80	1.61	.26	28.89
< 20.0	.00	.00	.13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.94	.94	2.01	.80	4.83
< 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	1.20	2.68	9.81	.94	2.55	1.61	5.51	2.28	1.61	2.55	6.31	27.41	18.27	5.91	5.10	1.88	

Calm : 4.30 %

Total # Operational Hours : 744

Distribution By Samples

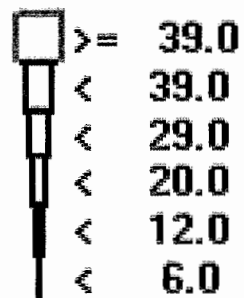
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 6.0	7	11	16	7	12	11	33	16	12	19	43	139	87	31	11	6	461
< 12.0	2	9	56		7	1	8	1			4	65	42	6	12	2	215
< 20.0			1										7	7	15	6	36
< 29.0																	
< 39.0																	
≥ 39.0																	
Totals	9	20	73	7	19	12	41	17	12	19	47	204	136	44	38	14	

Calm : 4.30 %

Total # Operational Hours : 744

Logger : 01 Parameter : WSP

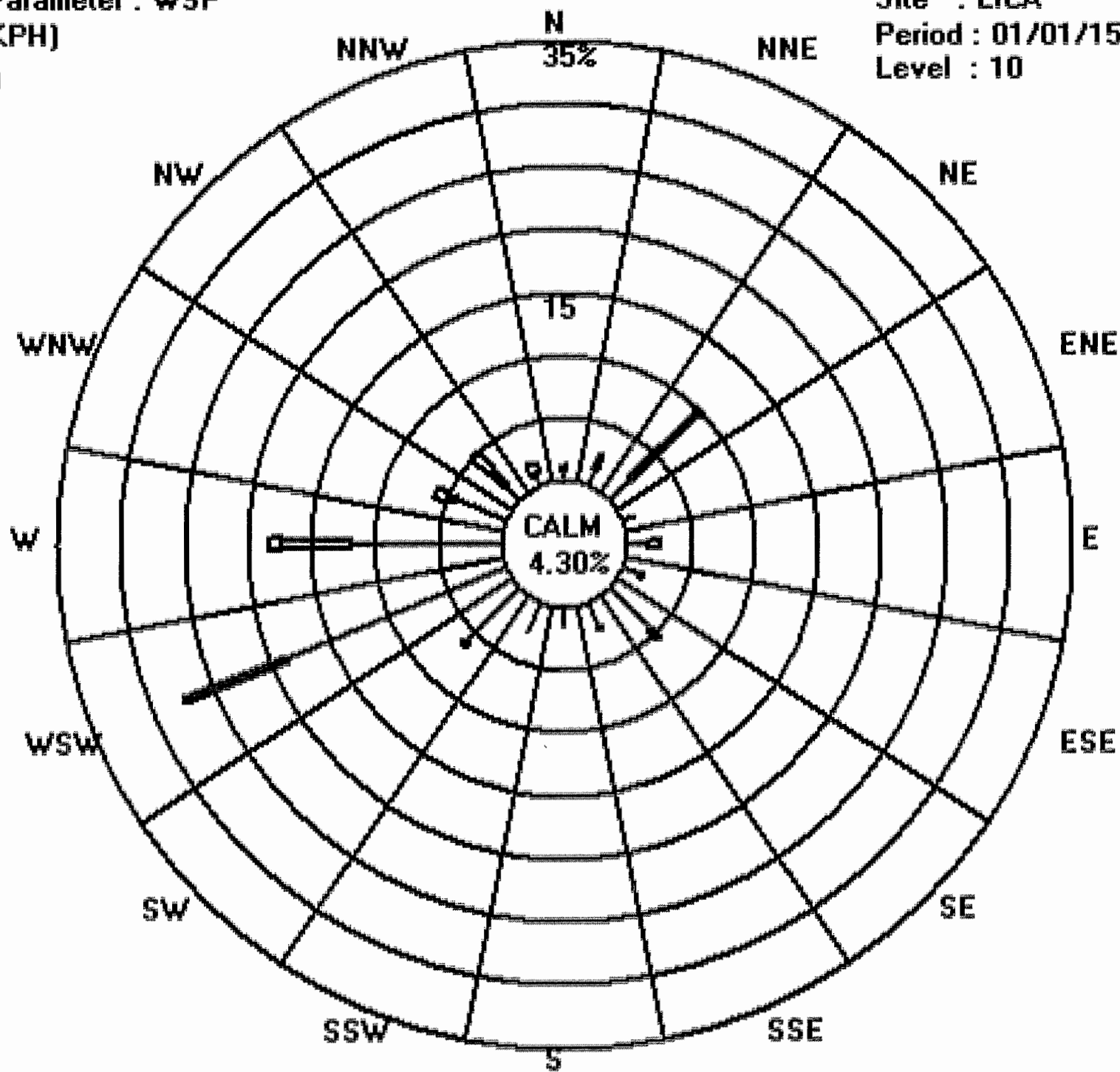
Class Limits (KPH)



Site : LICA

Period : 01/01/15-01/31/15

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

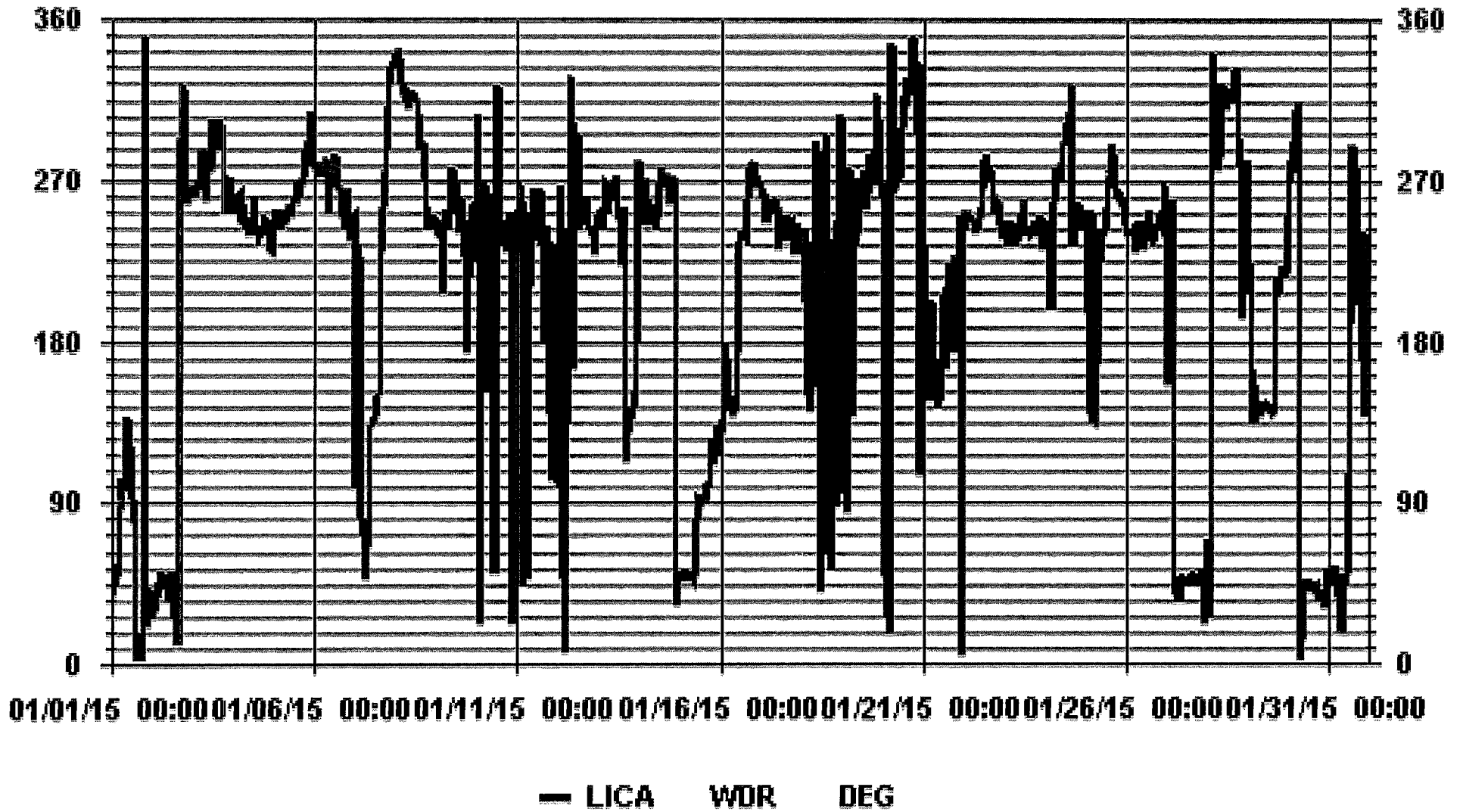
STATUS FLAG CODES

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

LAST CALIBRATION:	December 19, 2014
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0 HRS	OPERATIONAL TIME:	744 HRS
STANDARD DEVIATION:	88.38	AMD OPERATION UPTIME:	100.0 %
		MONTHLY AVERAGE:	W

01 Hour Averages



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Site - JANUARY 2015

JOB # 2833-2015-01-01- C

STANDARD DEVIATION WIND DIRECTION (STDWD) hourly averages in degrees

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
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	0:00
DAY 1	21	19	18	17	19	21	23	17	23	18	20	24	23	30	28	15	16	14	17	16	19	21	21	19
2	20	22	21	21	21	19	19	19	20	21	21	20	20	21	21	20	27	10	12	13	11	8	6	6
3	8	12	9	11	12	14	18	13	17	17	18	20	23	21	21	14	13	11	10	7	11	11	9	12
4	13	14	15	15	14	15	14	17	16	19	20	19	19	19	18	18	18	17	16	16	15	11	12	14
5	12	14	21	14	14	29	17	15	17	20	18	19	18	19	19	17	18	19	18	20	18	16	18	19
6	18	17	13	16	15	14	12	15	9	14	16	18	21	20	20	15	8	9	12	26	15	55	47	13
7	41	43	48	2	5	4	56	18	15	15	16	16	16	26	22	22	18	16	18	16	15	16	17	15
8	17	18	16	17	15	17	16	17	14	15	15	15	16	19	22	20	19	15	16	12	11	13	12	12
9	14	15	10	51	14	33	10	11	50	34	22	19	22	19	20	14	40	16	49	51	57	37	23	3
10	58	33	54	58	43	38	28	26	19	9	51	40	38	25	25	21	24	13	25	33	41	41	5	47
11	17	27	9	12	14	12	12	20	47	50	31	17	21	16	20	15	9	29	20	14	20	48	13	39
12	27	34	19	27	55	41	29	21	19	27	59	29	24	20	19	19	21	20	18	19	21	16	16	17
13	11	13	13	12	17	18	27	20	15	12	17	19	18	26	29	36	23	13	14	15	27	40	63	63
14	19	16	18	19	20	17	17	18	20	19	20	20	19	19	16	17	17	13	14	13	15	15	36	20
15	19	20	20	19	19	21	20	20	20	19	24	22	21	22	21	20	22	23	22	23	22	23	17	20
16	20	19	44	37	19	21	17	43	20	36	34	19	19	20	20	20	17	19	20	18	20	18	17	18
17	18	17	18	18	18	17	18	18	16	17	20	20	19	19	20	22	17	17	21	16	14	14	13	14
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19	24	19	19	26	24	47	43	47	49	33	30	18	23	29	18	16	17	17	15	16	15	15	12	11
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21	26	22	27	16	25	32	39	30	23	24	35	36	37	37	36	24	32	36	26	35	25	22	37	8
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23	15	17	14	33	19	18	19	17	18	18	17	18	19	21	19	18	18	18	16	13	12	13	27	
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25	21	16	21	63	41	27	39	36	20	24	23	20	20	20	20	22	21	18	17	16	16	16	16	12
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27	16	28	12	14	26	20	20	21	20	20	22	21	22	20	20	19	20	20	19	20	20	19	20	21
28	20	41	20	30	25	20	19	18	15	14	18	16	19	19	15	17	11	9	15	47	18	55	29	17
29	30	27	29	21	24	12	16	16	19	17	19	26	25	22	19	21	41	30	30	25	31	35	31	20
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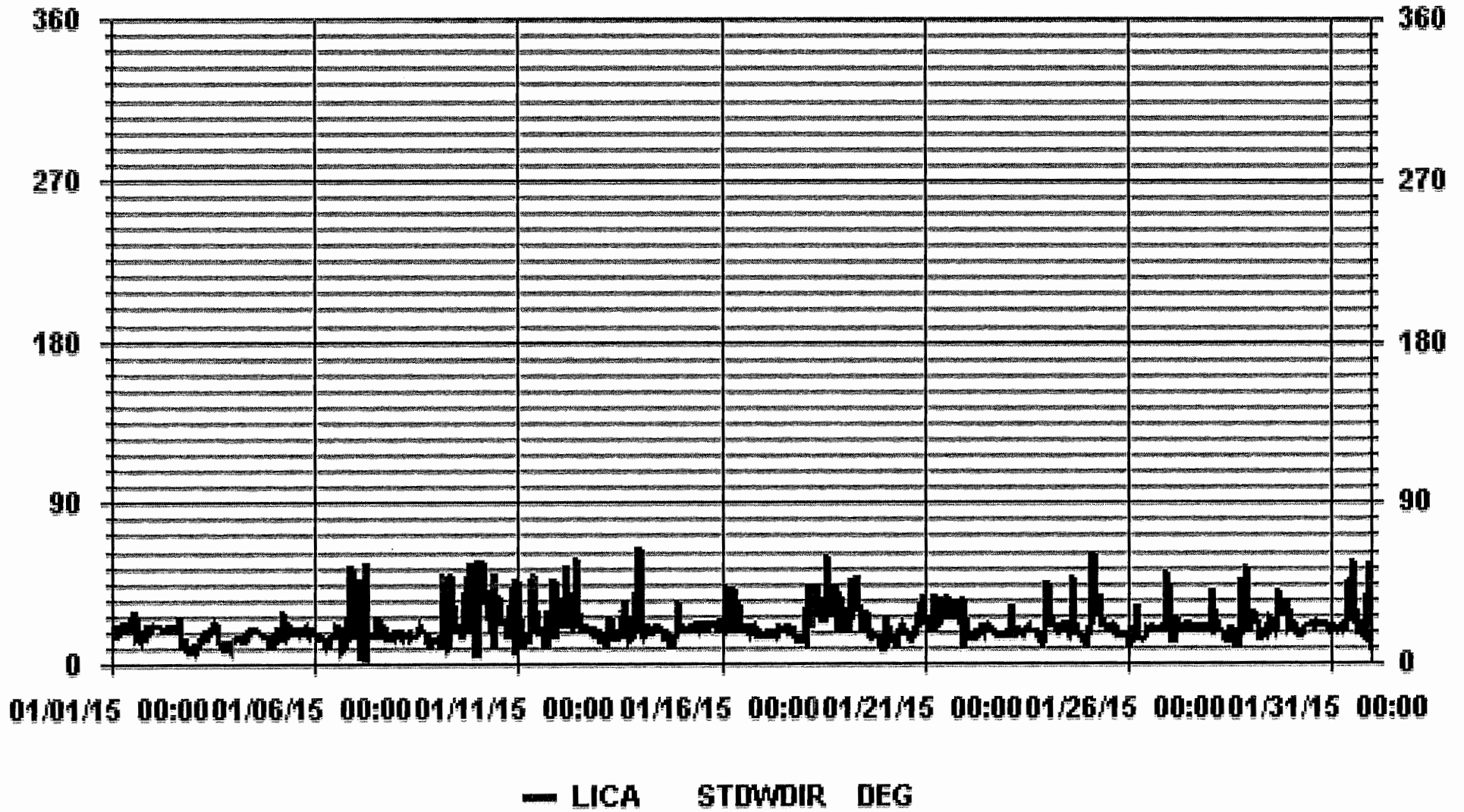
STATUS FLAG CODES

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: December 19, 2014

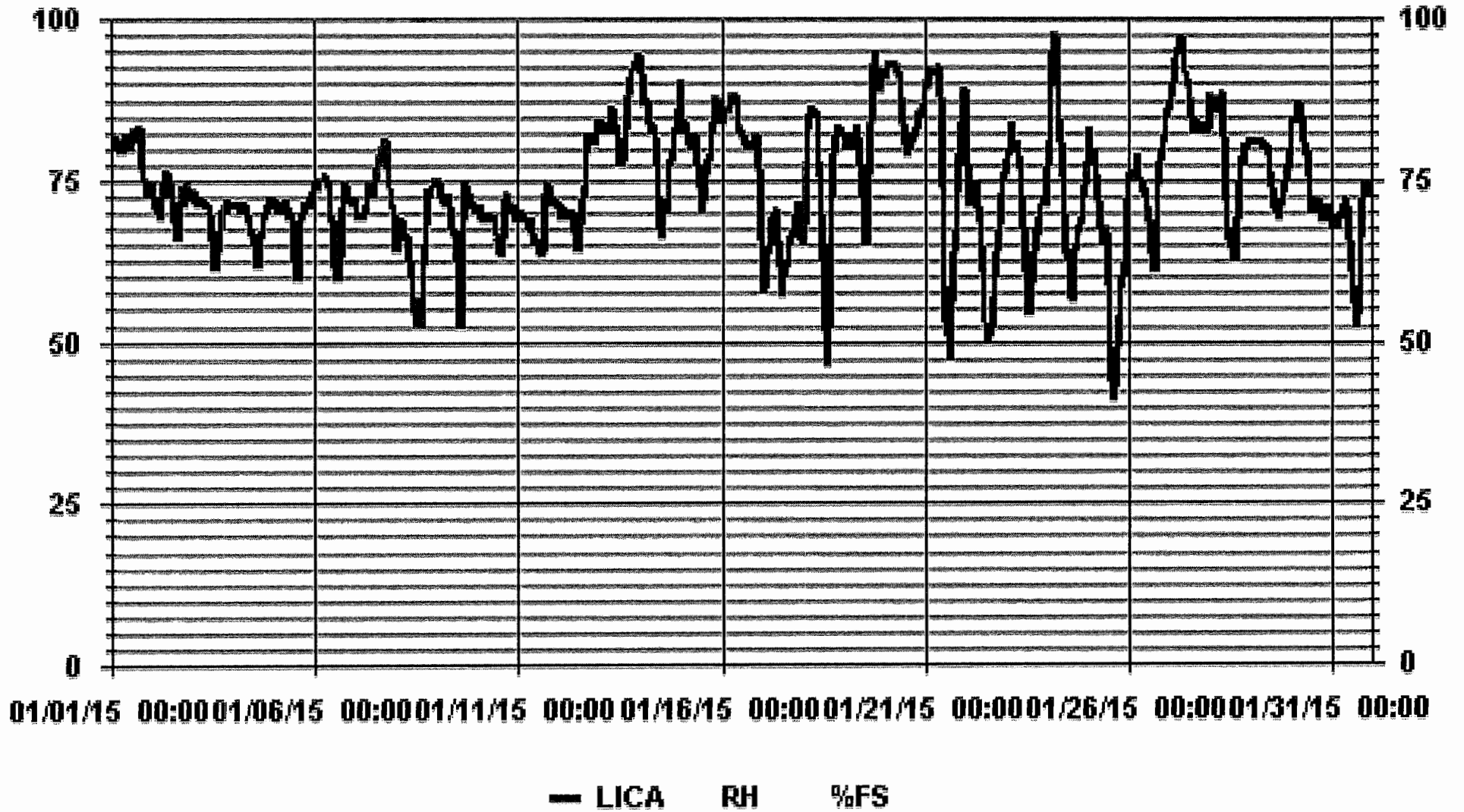
CALIBRATION TIME: 0 HRS OPERATIONAL TIME: 744 HRS

01 Hour Averages



RELATIVE HUMIDITY

01 Hour Averages



AMBIENT TEMPERATURE



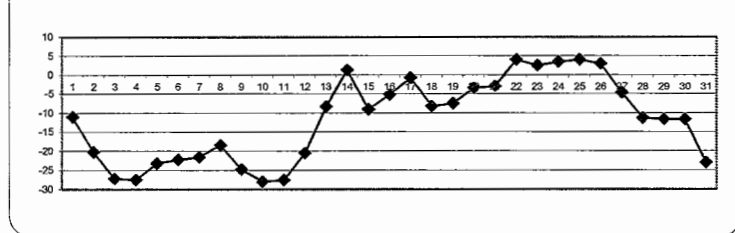
AMBIENT TEMPERATURE (TPX) hourly averages in Degrees Celsius

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	DAILY	24-HOUR	RDGS.
DAY	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	0:00	MAX.	AVG.	
1	1	-6.5	-7.6	-8.3	-9.4	-10.2	-10.2	-10.6	-10.9	-11.3	-11.3	-11.0	-10.7	-10.5	-10.1	-9.8	-10.4	-11.4	-11.8	-11.5	-12.6	-13.2	-14.5	-15.0	-15.2	-6.5	-11.0	24
2	2	-15.4	-16.4	-17.2	-17.9	-18.4	-18.8	-19.0	-19.4	-19.8	-19.9	-19.7	-19.5	-19.1	-19.0	-19.2	-19.2	-19.8	-21.3	-20.8	-21.7	-24.5	-25.0	-26.7	-27.2	-15.4	-20.2	24
3	3	-26.8	-26.3	-26.7	-28.3	-28.9	-28.0	-26.5	-26.8	-26.1	-25.5	-25.0	-23.9	-23.3	-23.2	-23.6	-24.6	-25.9	-27.7	-30.1	-30.8	-31.3	-30.8	-31.0	-31.0	-23.2	-27.2	24
4	4	-30.6	-30.6	-29.9	-29.9	-30.5	-31.1	-30.9	-30.4	-30.2	-29.3	-27.7	-25.6	-23.7	-22.5	-22.2	-22.7	-24.2	-24.9	-25.8	-26.5	-27.0	-27.4	-27.8	-27.5	-22.2	-27.5	24
5	5	-27.4	-27.5	-27.8	-27.6	-27.9	-29.3	-30.6	-28.7	-27.9	-26.9	-24.6	-22.5	-21.0	-19.5	-19.0	-19.1	-19.0	-19.1	-19.6	-18.9	-18.5	-18.2	-18.0	-18.0	-18.0	-23.2	24
6	6	-18.1	-18.2	-19.3	-19.4	-19.5	-20.6	-21.2	-22.6	-24.3	-23.6	-20.6	-18.9	-18.2	-17.6	-17.4	-18.3	-21.1	-23.8	-25.4	-26.7	-28.3	-29.2	-29.9	-29.5	-17.4	-22.2	24
7	7	-29.8	-30.8	-31.7	-31.9	-32.3	-32.2	-31.4	-29.3	-26.7	-24.2	-21.9	-20.2	-18.3	-17.6	-16.4	-14.5	-14.1	-14.1	-14.1	-13.6	-13.2	-13.5	-13.6	-13.5	-13.2	-21.6	24
8	8	-13.8	-15.2	-16.0	-15.8	-16.0	-16.3	-16.8	-17.9	-18.6	-18.6	-18.0	-17.7	-17.3	-16.9	-16.7	-17.2	-18.2	-19.2	-20.3	-22.0	-22.5	-23.4	-24.2	-23.9	-13.8	-18.4	24
9	9	-24.0	-24.1	-25.1	-27.4	-28.0	-26.7	-28.5	-27.7	-28.4	-27.5	-23.8	-21.6	-19.0	-17.2	-15.9	-16.6	-20.5	-23.4	-25.3	-27.1	-28.0	-29.1	-29.7	-30.4	-15.9	-24.8	24
10	10	-30.9	-31.5	-31.5	-31.9	-31.9	-30.9	-29.9	-29.2	-29.3	-29.0	-26.4	-22.5	-21.2	-20.3	-20.1	-20.8	-24.1	-26.7	-28.3	-29.5	-30.3	-31.0	-31.7	-32.1	-20.1	-28.0	24
11	11	-32.2	-31.8	-31.5	-31.5	-31.8	-32.6	-32.6	-33.2	-32.7	-30.5	-25.0	-22.5	-20.9	-20.4	-19.7	-19.3	-22.1	-24.5	-26.0	-27.0	-28.0	-28.8	-28.5	-29.1	-19.3	-27.6	24
12	12	-29.3	-29.8	-29.6	-29.7	-29.9	-29.6	-29.5	-29.4	-28.6	-26.4	-21.6	-18.2	-14.8	-14.3	-13.7	-13.6	-13.5	-13.2	-13.0	-12.8	-12.6	-12.5	-12.5	-13.4	-12.5	-20.5	24
13	13	-14.2	-13.5	-14.1	-15.2	-15.6	-15.7	-12.3	-9.8	-9.4	-9.6	-8.4	-7.2	-5.8	-5.1	-4.7	-4.5	-4.9	-5.1	-5.1	-4.9	-4.4	-3.6	-2.9	-2.7	-2.7	-8.3	24
14	14	-1.8	0.1	1.4	1.3	1.0	1.5	1.6	0.5	0.4	1.3	2.4	3.9	4.7	3.7	3.8	3.3	1.6	0.9	0.6	0.2	0.3	0.5	0.5	-0.9	4.7	1.4	24
15	15	-2.3	-3.5	-4.4	-5.4	-6.5	-7.1	-7.8	-8.7	-9.1	-9.0	-8.5	-8.7	-9.1	-10.0	-10.7	-11.3	-11.9	-11.9	-12.0	-11.8	-11.7	-11.5	-11.3	-10.8	-2.3	-9.0	24
16	16	-10.2	-9.7	-8.5	-8.3	-8.6	-8.9	-9.1	-9.2	-9.3	-8.8	-8.1	-7.5	-6.6	-6.0	-5.2	-3.7	-2.4	-0.1	1.2	1.3	1.2	1.0	0.6	0.9	1.3	-5.2	24
17	17	1.1	1.0	0.5	-0.6	-0.5	-0.5	-1.9	-2.4	-2.2	-0.8	-0.2	0.9	2.3	1.5	0.7	0.5	-0.4	-1.1	-1.6	-2.2	-2.4	-3.1	-2.0	2.3	-0.7	24	
18	18	-1.8	-3.0	-6.0	-8.2	-9.7	-10.8	-11.8	-12.4	-12.5	-10.1	-8.6	-5.7	-4.3	-1.6	0.5	-1.0	-4.5	-7.5	-10.2	-11.8	-12.2	-13.4	-14.4	-15.0	0.5	-8.2	24
19	19	-15.3	-15.6	-16.2	-15.4	-15.0	-14.9	-14.2	-12.9	-12.1	-11.4	-8.7	-5.9	-3.3	-2.1	-1.5	-0.8	-1.0	-1.3	-1.3	-1.3	-1.3	-1.6	-2.1	-0.8	-7.4	24	
20	20	-2.2	-2.6	-2.9	-3.4	-3.7	-3.8	-3.5	-3.5	-3.3	-3.0	-2.4	-2.3	-2.4	-2.6	-2.7	-2.6	-2.8	-3.1	-3.6	-4.1	-4.5	-4.6	-5.3	-5.5	-2.2	-3.4	24
21	21	-5.6	-5.3	-4.9	-4.7	-4.2	-3.5	-3.4	-3.9	-4.8	-4.5	-3.0	-1.1	-0.9	-1.1	-0.6	-0.1	-0.2	-0.9	-0.5	-1.1	-1.8	-2.7	-4.4	-5.6	-0.1	-2.9	24
22	22	-6.1	0.0	1.7	1.6	1.4	0.9	0.8	2.9	3.9	5.0	6.2	8.4	9.3	9.4	9.3	8.8	7.4	6.6	5.3	4.4	4.1	2.7	1.8	1.4	9.4	4.1	24
23	23	0.6	0.3	-0.1	-1.3	-0.4	0.2	-0.4	0.1	1.0	1.9	3.3	4.5	6.3	6.8	6.0	5.8	4.7	3.9	3.8	3.5	2.9	2.6	2.4	2.8	6.8	2.6	24
24	24	1.7	1.7	1.9	1.9	2.4	2.8	3.6	3.9	4.1	4.7	5.3	6.3	6.5	6.8	7.4	7.5	5.3	4.2	3.2	2.4	1.8	0.7	0.0	-1.2	7.5	3.5	24
25	25	-1.5	-1.5	-0.7	0.2	0.0	1.1	2.1	2.7	3.2	3.4	4.4	5.3	7.3	9.8	9.9	10.1	9.1	7.4	6.4	5.4	4.0	4.4	3.5	1.7	10.1	4.1	24
26	26	0.9	0.5	0.5	0.1	0.2	-0.2	1.2	1.8	2.5	3.1	4.0	4.7	5.4	6.6	7.3	7.3	5.5	4.0	3.6	3.2	3.1	2.9	2.3	1.7	7.3	3.0	24
27	27	1.6	1.7	2.1	2.0	1.8	1.0	0.3	-1.1	-2.5	-3.7	-4.6	-5.4	-6.5	-7.4	-8.0	-8.3	-8.0	-8.7	-8.8	-8.7	-9.0	-9.5	-9.9	-10.7	2.1	-4.6	24
28	28	-10.6	-10.0	-9.6	-9.4	-9.2	-9.1	-8.9	-8.2	-8.2	-10.2	-11.3	-11.7	-11.2	-11.0	-10.8	-10.6	-11.9	-13.5	-14.1	-13.9	-14.1	-14.2	-14.8	-14.7	-8.2	-11.3	24
29	29	-14.2	-14.0	-14.1	-14.0	-14.6	-14.9	-14.7	-14.4	-14.3	-14.0	-13.2	-12.1	-11.4	-10.4	-9.2	-8.6	-8.3	-9.3	-9.0	-8.8	-8.7	-8.5	-8.1	-8.5	-8.1	-11.6	24
30	30	-9.9	-8.7	-8.0	-7.9	-7.5	-7.2	-7.2	-7.7	-8.4	-9.8	-10.4	-10.9	-11.2	-11.4	-11.6	-12.4	-12.8	-13.5	-14.1	-15.0	-16.7	-18.0	-19.0	-20.2	-7.2	-11.6	24
31	31	-21.3	-22.4	-23.1	-23.2	-23.4	-23.9	-24.5	-24.6	-24.7	-24.3	-22.2	-21.2	-20.2	-19.1	-19.5	-21.2	-23.1	-24.3	-25.2	-25.6	-26.1	-26.6	-26.6	-26.6	-19.1	-23.0	24
HOURLY MAX		1.7	1.7	2.1	2.0	2.4	2.8	3.6	3.9	4.1	5.0	6.2	8.4	9.3	9.8	9.9	10.1	9.1	7.4	6.4	5.4	5.0	4.4	3.5	2.8			
HOURLY AVG		-12.8	-12.7	-12.9	-13.2	-13.5	-13.5	-13.5	-13.3	-13.2	-12.7	-11.3	-10.1	-9.0	-8.4	-8.2	-8.2	-9.3	-10.3	-10.9	-11.5	-12.0	-12.4	-12.9	-13.2			

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

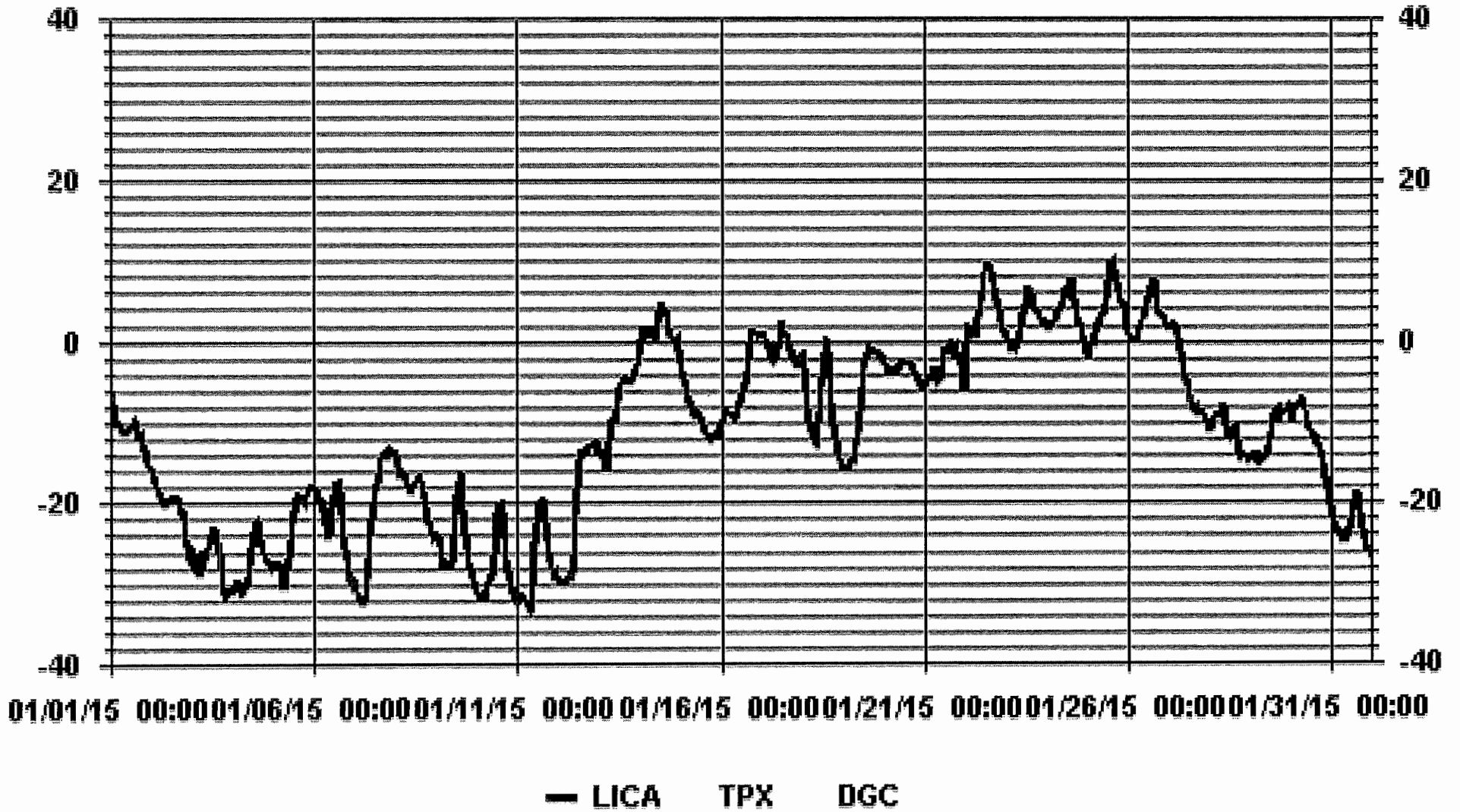
24 HOUR AVERAGES FOR JANUARY 2015



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-33.2 °C	@ HOUR(S)	7	ON DAY(S)	11
MAXIMUM 1-HR AVERAGE:	10.1 °C	@ HOUR(S)	15	ON DAY(S)	25
MAXIMUM 24-HR AVERAGE:	4.1 °C			ON DAY(S)	22, 25
				VAR-VARIOUS	
OPERATIONAL TIME:				744	HRS
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	11.39	MONTHLY AVERAGE:		-11.6	°C

01 Hour Averages

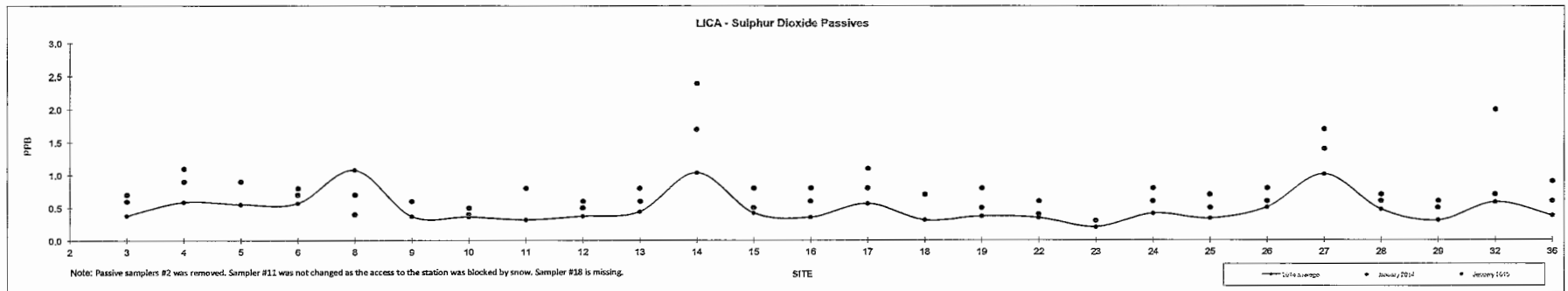


APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

PASSIVE RESULTS

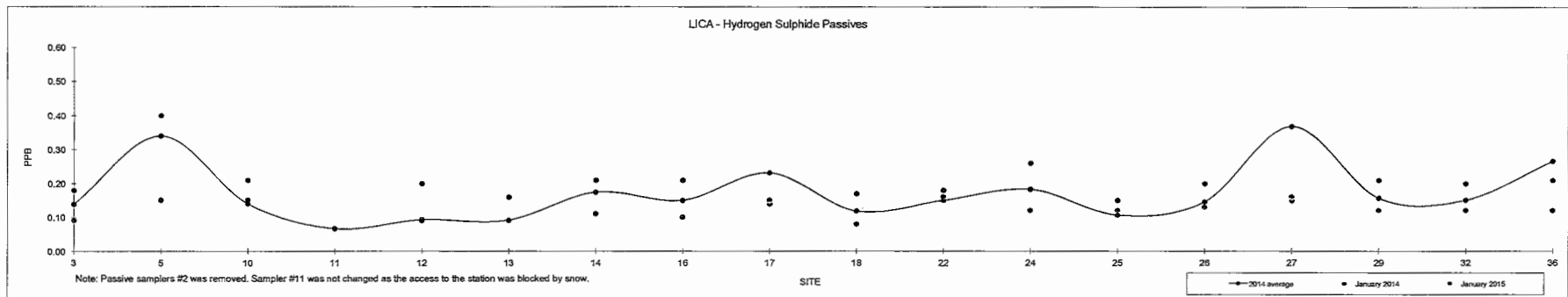
Passive Summary Results for January 2015 Lakeland Industry & Community Association

	Sulphur Dioxide ppb																										January 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
Mean	NA	0.4	0.6	0.6	0.6	1.1	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	0.7	-
Minimum	NA	0.1	0.1	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.4	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.1	0.3	#23
Maximum	NA	0.8	0.9	1.0	1.5	3.2	0.7	0.8	0.8	0.6	0.9	2.4	0.8	0.8	1.1	0.7	0.8	0.7	0.4	0.8	0.5	1.2	1.9	0.8	0.7	2.0	0.9	1.7	#14, #27



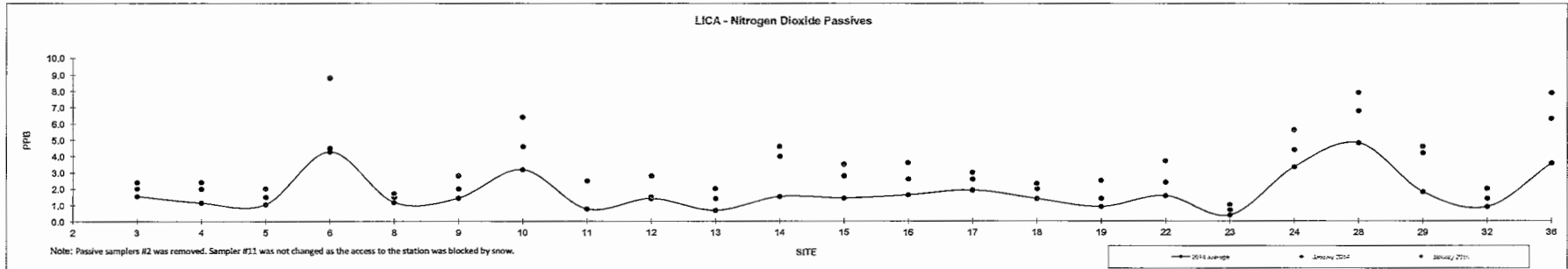
Passive Summary Results for January 2015 Lakeland Industry & Community Association

	Hydrogen Sulphide ppb																	January 2015		
	3	5	10	11	12	13	14	2014 16	17	18	22	24	25	26	27	29	32	36	Reading	Site
Mean	0.14	0.34	0.14	0.07	0.09	0.09	0.17	0.15	0.23	0.12	0.15	0.18	0.11	0.15	0.37	0.16	0.15	0.27	0.12	-
Minimum	0.05	0.07	0.06	0.04	0.02	0.02	0.05	0.07	0.11	0.04	0.04	0.06	0.03	0.06	0.04	0.05	0.05	0.07	0.08	#18
Maximum	0.24	0.97	0.31	0.11	0.20	0.16	0.30	0.29	0.44	0.17	0.32	0.32	0.16	0.21	1.23	0.33	0.26	1.36	0.16	#22, #27



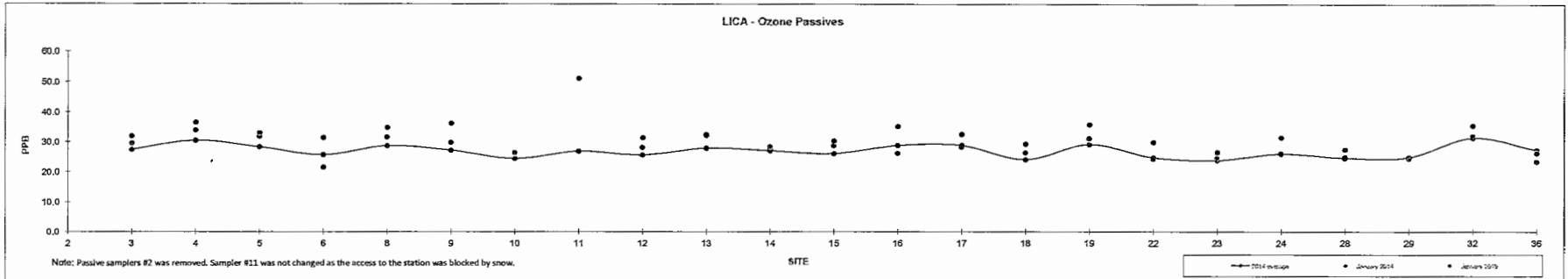
Passive Summary Results for January 2015 Lakeland Industry & Community Association

	Nitrogen Dioxide ppb																												January 2015	
	2	3	4	5	6	8	9	10	11	12	13	14	15	16	17	18	19	22	23	24	28	29	32	36	Reading	Site				
Mean	NA	1.5	1.1	1.0	4.3	1.2	1.4	3.2	0.8	1.4	0.7	1.5	1.4	1.6	1.9	1.4	0.9	1.6	0.4	3.3	4.8	1.8	0.9	3.6	3.6	-				
Minimum	NA	0.5	0.3	0.1	2.1	0.5	0.5	1.4	0.2	0.5	0.1	0.5	0.4	0.5	1.1	0.6	0.2	0.6	0.1	1.5	1.6	0.3	0.2	1.4	1.0	#23				
Maximum	NA	4.2	2.3	2.4	6.8	2.8	2.9	5.3	2.5	2.8	1.4	4.0	3.1	3.7	3.1	2.7	2.3	3.2	1.2	5.7	11.3	4.2	2.0	7.9	8.8	#6				



Passive Summary Results for January 2015 Lakeland Industry & Community Association

		2	3	4	5	6	8	9	10	11	12	2014 13	14	15	16	17	18	19	22	23	24	28	29	32	36	January 2015	
Mean	NA	27.3	30.4	28.2	25.6	28.6	27.1	24.3	26.8	25.5	27.8	27.0	26.0	28.7	28.8	24.0	29.1	24.7	23.8	25.9	24.5	24.8	31.3	27.3		Reading	Site
Minimum	NA	18.7	20.0	19.9	17.0	20.1	17.8	14.5	13.9	16.4	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		21.39	#8
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	38.0	33.6	40.7	32.4	39.2	39.0	31.3	36.7	40.6	34.2		33.82	#4



Lakeland Industry & Community Association SO₂ Passive Bubble Map

JANUARY 2015

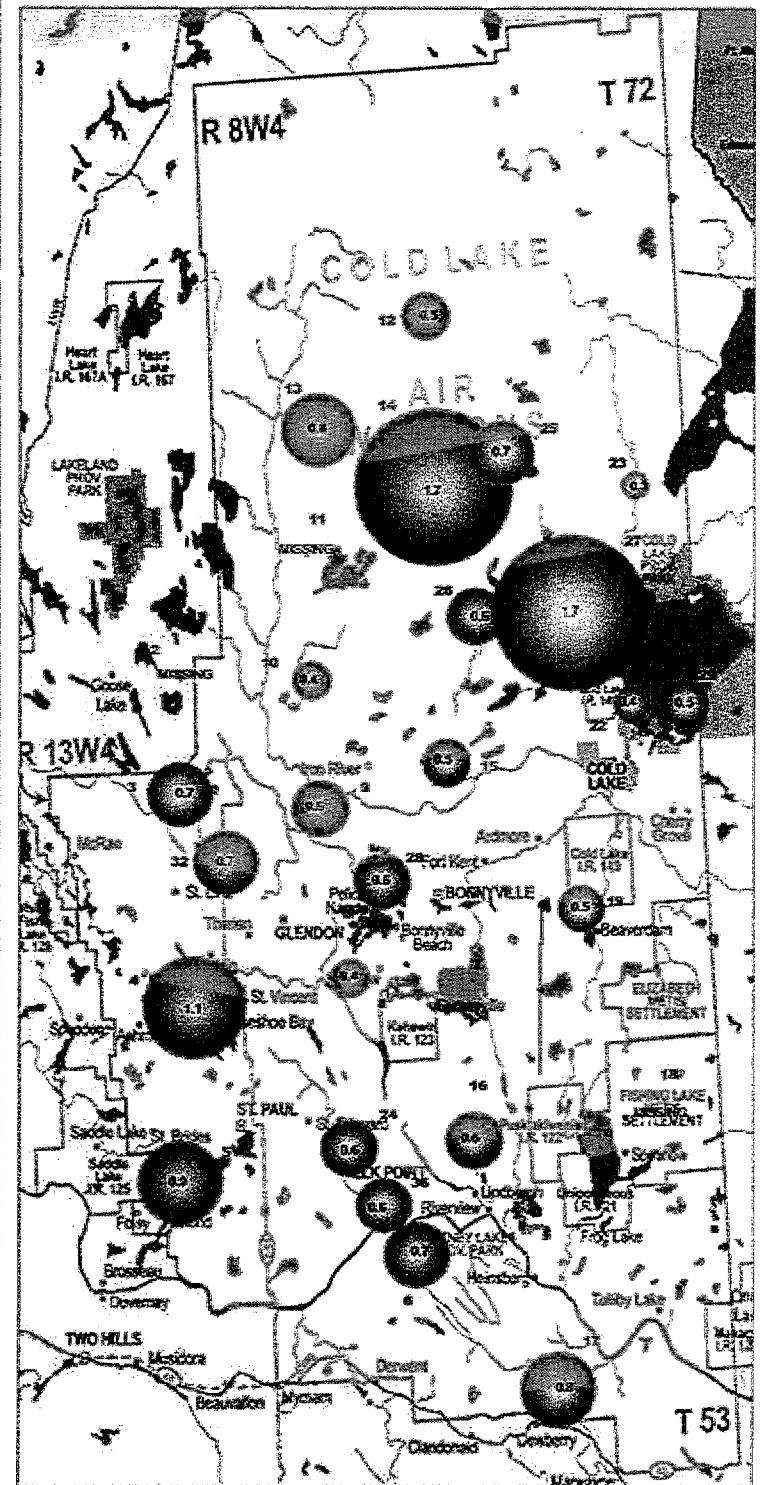
PASSIVE STATIONS

		DUPLICATE
2 - Sand River	MISSING	NA
3 - Therien	0.7 PPB	NA
4 - Flat Lake	1.1 PPB	NA
5 - Lake Eliza	0.9 PPB	NA
6 - Telegraph Creek	0.7 PPB	NA
8 - Muriel-Kehewin	0.4 PPB	NA
9 - Dupre	0.6 PPB	NA
10 - La Corey	0.4 PPB	NA
11 - Wolf Lake	MISSING	NA
12 - Foster Creek	0.5 PPB	NA
13 - Primrose	0.8 PPB	NA
14 - Maskwa	1.7 PPB	NA
15 - Ardmore	0.5 PPB	NA
16 - Frog Lake	0.6 PPB	NA
17 - Clear Range	0.8 PPB	NA
18 - Fishing Lake	MISSING	NA
19 - Beavardam	0.5 PPB	NA
22 - Cold Lake South	0.4 PPB	NA
23 - Medley-Martineau	0.3 PPB	NA
24 - Fort George	0.6 PPB	NA
25 - Burnt Lake	0.6 PPB	0.7 PPB
26 - Mahikan	0.6 PPB	0.5 PPB
27 - Mahkeses	1.6 PPB	1.7 PPB
28 - Town of Bonnyville	0.6 PPB	NA
29 - Cold Lake South 2	0.5 PPB	NA
32 - St. Lina	0.7 PPB	NA
36 - Elk Point	0.6 PPB	NA



Summary

Minimum : 0.3 PPB - Medley-Martineau
 Maximum: 1.7 PPB - Maskwa and Mahkeses
 Average: 0.7 PPB *includes Duplicates

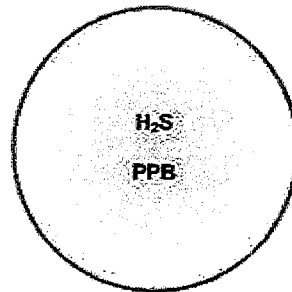


Lakeland Industry & Community Association H₂S Passive Bubble Map

JANUARY 2015

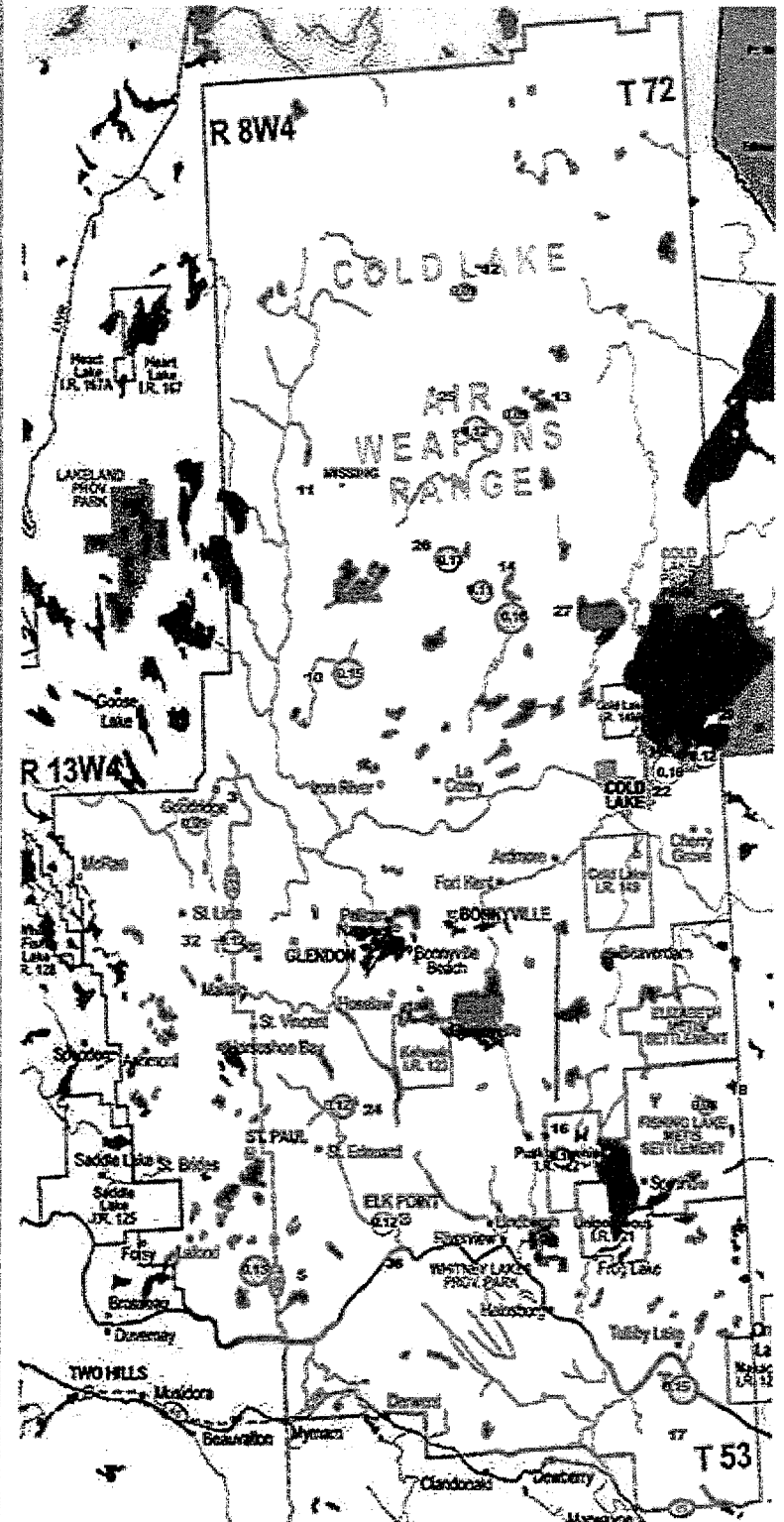
PASSIVE STATIONS

Station Number	Reading	Duplicate
3 - Therien	0.09 PPB	NA
5 - Lake Eliza	0.15 PPB	NA
10 - La Corey	0.15 PPB	NA
11 - Wolf Lake	MISSING	NA
12 - Foster Creek	0.09 PPB	NA
13 - Primrose	0.09 PPB	NA
14 - Maskwa	0.11 PPB	NA
16 - Frog Lake	0.10 PPB	NA
17 - Clear Range	0.15 PPB	NA
18 - Fishing Lake	0.08 PPB	NA
22 - Cold Lake South	0.16 PPB	NA
24 - Fort George	0.12 PPB	NA
25 - Burnt Lake	0.12 PPB	NA
26 - Mahihkan	0.13 PPB	NA
27 - Mahkeses	0.16 PPB	NA
29 - Cold Lake South 2	0.12 PPB	NA
32 - St. Lina	0.14 PPB	0.10 PPB
36 - Elk Point	0.12 PPB	0.12 PPB



Summary

Minimum : 0.08 PPB - Fishing Lake
 Maximum: 0.16 PPB - Cold Lake South and Mahkeses
 Average: 0.12 PPB (Includes Duplicates)

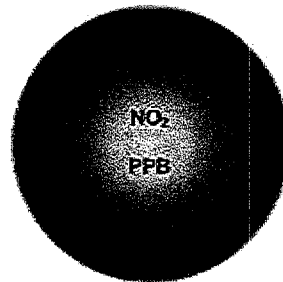


Lakeland Industry & Community Association NO₂ Passive Bubble Map

JANUARY 2015

PASSIVE STATIONS

		DUPLICATE
2 - Sand River	MISSING	NA
3 - Therien	2.0 PPB	NA
4 - Flat Lake	2.4 PPB	NA
5 - Lake Eliza	2.0 PPB	NA
6 - Telegraph Creek	8.8 PPB	NA
8 - Muriel-Kehewin	1.7 PPB	NA
9 - Dupre	2.8 PPB	NA
10 - La Corey	6.4 PPB	NA
11 - Wolf Lake	MISSING	NA
12 - Foster Creek	1.5 PPB	NA
13 - Primrose	2.0 PPB	NA
14 - Maskwa	4.6 PPB	NA
15 - Ardmore	3.5 PPB	NA
16 - Frog Lake	3.6 PPB	NA
17 - Clear Range	3.0 PPB	NA
18 - Fishing Lake	2.3 PPB	NA
19 - Beaverdam	2.5 PPB	NA
22 - Cold Lake South	3.7 PPB	NA
23 - Medley-Martineau	1.0 PPB	NA
24 - Fort George	5.6 PPB	NA
28 - Town of Bonnyville	7.9 PPB	NA
29 - Cold Lake South 2	5.4 PPB	3.7 PPB
32 - St. Lina	2.0 PPB	2.0 PPB
36 - Elk Point	6.3 PPB	NA

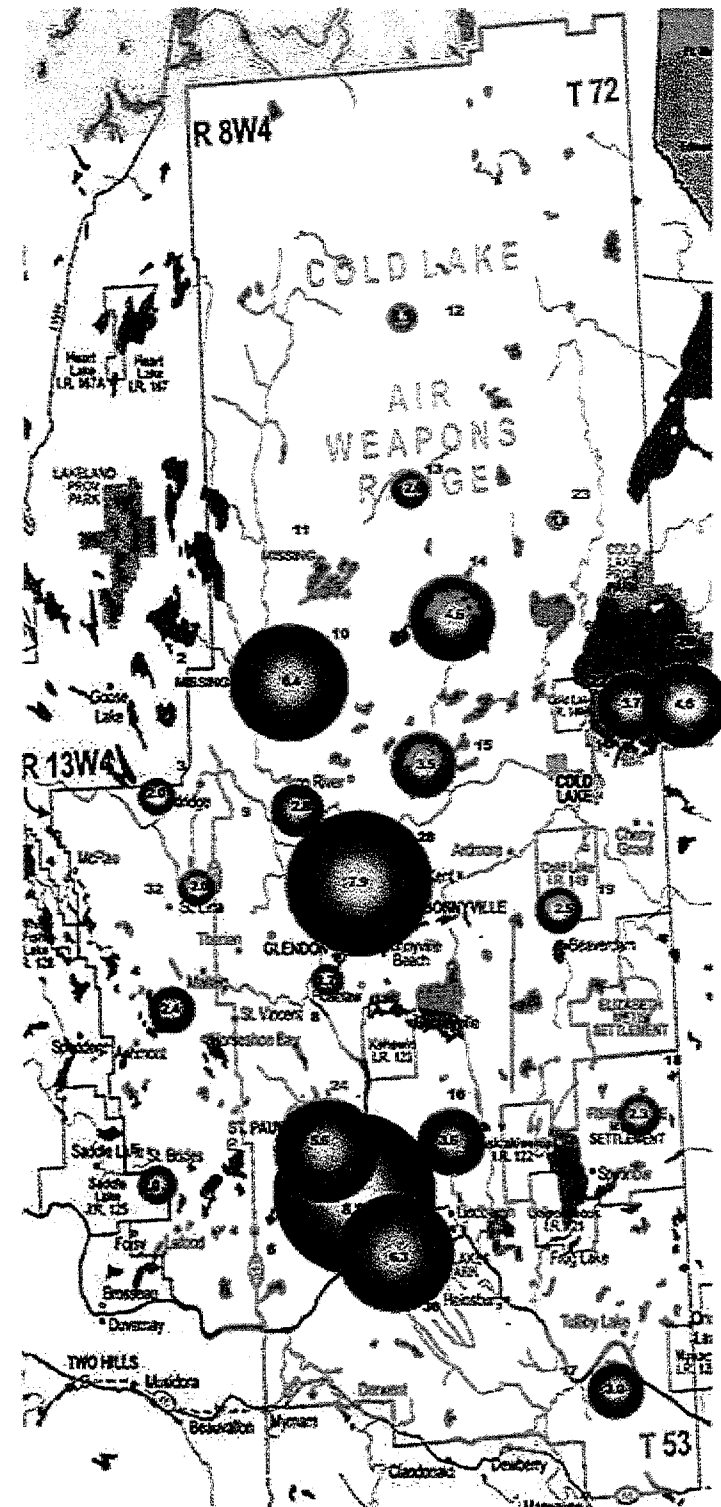


Summary

Minimum : 1.0 PPB - Medley-Martineau

Maximum: 8.8 PPB - Telegraph Creek

Average: 3.6 PPB *includes Duplicates



Lakeland Industry & Community Association O₃ Passive Bubble Map

JANUARY 2015

PASSIVE STATIONS

		DUPLICATE
2 – Sand River	MISSING	NA
3 – Therien	29.45 PPB	NA
4 – Flat Lake	33.82 PPB	NA
5 – Lake Eliza	31.75 PPB	NA
6 – Telegraph Creek	21.39 PPB	NA
8 – Muriel-Kehewin	31.45 PPB	NA
9 – Dupre	29.71 PPB	NA
10 – La Corey	26.36 PPB	NA
11 – Wolf Lake	MISSING	NA
12 – Foster Creek	28.09 PPB	NA
13 – Primrose	32.29 PPB	NA
14 – Maskwa	28.29 PPB	NA
15 – Ardmore	28.71 PPB	NA
16 – Frog Lake	26.17 PPB	NA
17 – Clear Range	28.25 PPB	NA
18 – Fishing Lake	26.37 PPB	NA
19 – Beaverdam	31.12 PPB	NA
22 – Cold Lake South	24.23 PPB	NA
23 – Medley-Martineau	24.54 PPB	NA
24 – Fort George	26.17 PPB	NA
28 – Town of Bonnyville	24.95 PPB	NA
29 – Cold Lake South 2	26.92 PPB	21.85 PPB
32 – St. Lina	31.01 PPB	32.91 PPB
36 – Elk Point	23.37 PPB	NA

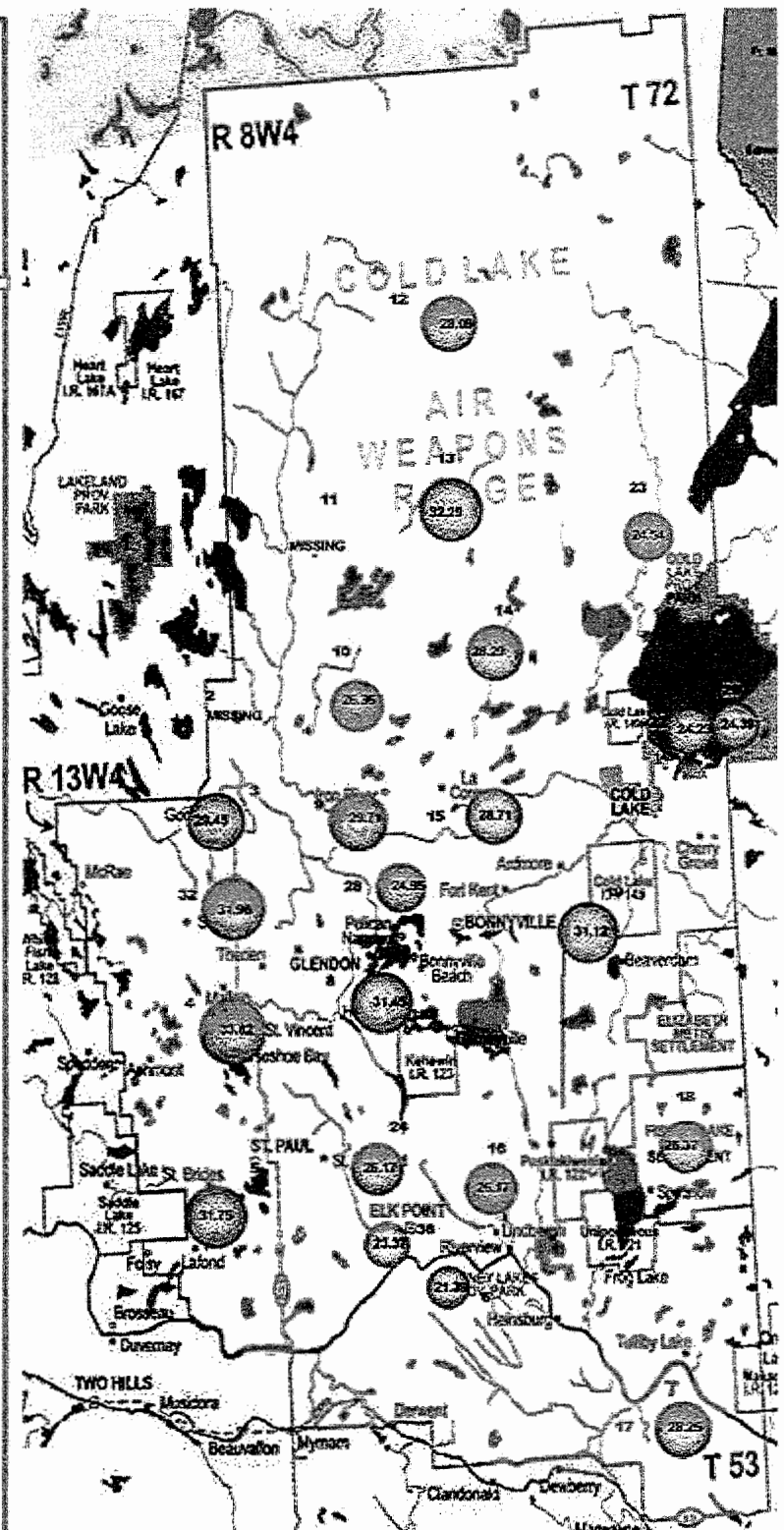


Summary

Minimum : 21.39 PPB – Telegraph Creek

Maximum: 33.82 PPB – Flat Lake

Average: 27.86 PPB *includes Duplicates



Rev: 2015 01 30
3:00 pm *Lincoln*

PASSIVE DATA SHEET JAN 2015

Sample ID	Start Date & Time	End Date & Time	Comments
Passive 2 SO2, NO2, O3			Sampler was remove.
Passive 3 H2S, SO2, NO2, O3	Dec 29, 2014, 15:42	Jan 28, 2015 16:54	
Passive 4 SO2, NO2, O3	Dec 29, 2014, 14:22	Jan 28, 2015 16:44	
Passive 5 H2S, SO2, NO2, O3	Dec 29, 2014 13:34	Jan 28, 2015 17:20	
Passive 6 SO2, NO2, O3	Dec 29, 2014 12:33	Jan 28, 2015 18:27	
Passive 8 SO2, NO2, O3	Dec 29, 2014, 16:34	Jan 27, 2015 19:23	
Passive 9 SO2, NO2, O3	Dec 30, 2014, 17:17	Jan 27 2015 20:05	
Passive 10 H2S, SO2, NO2, O3	Dec 30, 2014 18:30	Jan 29, 2015 18:23	
Passive 11 H2S, SO2, NO2, O3			NO appears also to spill C ₂ did seem left to the place.
Passive 12 H2S, SO2, NO2, O3	Dec 30, 2014, 11:41	Jan 29, 2015 11:46 - (Jan 23) N.Y.	
Passive 13 H2S, SO2, NO2, O3	Dec 30, 2014, 12:45	Jan 29, 2015 15:21	
Passive 14 H2S, SO2, NO2, O3	Dec 30, 2014, 15:11	Jan 29, 2015 16:18	
Passive 15 SO2, NO2, O3	Dec 30, 2014, 16:16	Jan 27, 2015 20:52	
Passive 16 H2S, SO2, NO2, O3	Dec 29, 2014, 10:01	Jan 28, 2015 11:18	
Passive 17 H2S, SO2, NO2, O3	Dec 29, 2014 11:40	Jan 28, 2015 12:44	
Passive 18 H2S, SO2, NO2, O3	Dec 29, 2014: 10:38	Jan 28, 2015 11:57	
Passive 19 SO2, NO2, O3	Dec 29, 2014, 09:32	Jan 28, 2015 10:41	
Passive 22 H2S, SO2, NO2, O3	Dec 28, 2014 21:19	Jan 27 2015, 14:15	
Passive 23 SO2, NO2, O3	Dec 30, 2014: 18:19	Jan 29, 2015, 14:32	
Passive 24 H2S, SO2, NO2, O3	Dec 29 2014, 13:05	Jan 28, 2015 13:56	
* Passive 25 H2S, SO2	Dec 30, 2014, 12:09	Jan 29, 2015 16:15	
* Passive 26 H2S, SO2	Dec 30, 2014, 14:32	Jan 29, 2015 18:56	
* Passive 27 H2S, SO2	Dec 30, 2014, 15:24	Jan 29, 2015 18:25	
Passive 28 SO2, NO2, O3	Dec 29, 2014, 17:16	Jan 24, 2015/16:06	
Passive 29 H2S, SO2, NO2, O3	Dec 28, 2014 21:19	Jan 27, 2015 14:15	
Passive 32 H2S, SO2, NO2, O3	Dec 29, 2014 15:04	Jan 28, 2015 16:21	
Passive 36 H2S, SO2, NO2, O3	Dec 28, 2014 16:40	Jan 27, 2015 17:23	
Duplicate 25 SO2	Dec 30, 2014, 12:09	Jan 29, 2015 16:15	
Duplicate 26 SO2	Dec 30, 2014, 14:32	Jan 29, 2015 18:56	
Duplicate 27 SO2	Dec 30, 2014, 15:24	Jan 29, 2015 18:25	
Duplicate 32 H2S	Dec 29, 2014, 15:04	Jan 28, 2015 16:21	
Duplicate 36 H2S	Dec 28, 2014 16:40	Jan 27, 2015 17:23	
Duplicate 29 NO2, O3	Dec 28, 2014 21:19	Jan 27, 2015 14:15	
Duplicate 32 NO2, O3	Dec 29, 2014, 15:04	Jan 28, 2015 16:21	

VOC RESULTS

Sample ID: 15010042-001

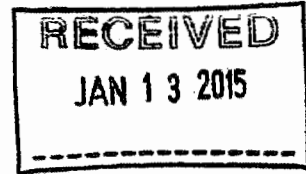
AIR FCD-01320/2

Customer ID: LICA

Cust Samp ID: LICAVOC/CLS/Jan 6, 2015

Priority: Normal

Maxxam



VOC Sample Collection Data Sheet

Client: LICA
Location: CLS
Station ID: LICA 1
Field Sample ID: LICA/VOC/CLS/Jan 6 2015

Sampler S/N: 6167
Canister ID: H2822
Canister Installation Date/Time: Jan 5, 2015 @ 12:04
Canister Removal Date/Time: Jan 7, 2015 @ 17:20

Table with 4 columns: Sample Date, Start Time (MST), End Time (MST), Elapsed Time (Hours). Row 1: Jan 6, 2015, 00:00, 24:00, 24

Table with 3 columns: Meter Reading (sccm), Pot Set Pt., Pump Pressure Setting (psig). Row 1: (blank), (blank), (blank)

Table with 2 columns: Initial Canister Vacuum (inHg), Final Canister Pressure (psig). Row 1: -30, 24

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:

Blank lines for handwritten comments.

Sample in Alex Yakupov Sample out Alex Yakupov

Technician Signature:

Alex Yakupov

Volatile Organics Data Results

Date: JANUARY 6 , 2015
Canister ID: H2822

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.06
1,1,2,2-Tetrachloroethane	< 0.06
1,1,2-Trichloroethane	< 0.06
1,1-Dichloroethane	< 0.06
1,1-Dichloroethylene	< 0.06
1,2,3-Trimethylbenzene	< 0.06
1,2,4-Trichlorobenzene	< 0.06
1,2,4-Trimethylbenzene	< 0.06
1,2-Dibromoethane	< 0.06
1,2-Dichlorobenzene	< 0.06
1,2-Dichloroethane	< 0.06
1,2-Dichloropropane	< 0.06
1,3,5-Trimethylbenzene	< 0.06
1,3-Butadiene	< 0.06
1,3-Dichlorobenzene	< 0.06
1,4-Dichlorobenzene	< 0.06
1,4-Dioxane	< 0.06
1-Butene	< 0.06
1-Hexene	< 0.06
1-Pentene	< 0.06
2,2,4-Trimethylpentane	< 0.06
2,2-Dimethylbutane	< 0.06
2,3,4-Trimethylpentane	< 0.06
2,3-Dimethylbutane	< 0.06
2,3-Dimethylpentane	< 0.06
2,4-Dimethylpentane	< 0.06
2-Methylheptane	< 0.06
2-Methylhexane	< 0.06
2-Methylpentane	0.31
3-Methylheptane	< 0.06
3-Methylhexane	< 0.06
3-Methylpentane	< 0.06
Acetone	< 0.06
Acrolein	< 0.06
Benzene	0.21
Benzyl chloride	< 0.06
Bromodichloromethane	< 0.06
Bromoform	< 0.06
Bromomethane	< 0.06
Carbon disulfide	< 0.06
Carbon tetrachloride	< 0.06
Chlorobenzene	< 0.06
Chloroethane	< 0.06
Chloroform	< 0.06
Chloromethane	< 0.06
cis-1,2-Dichloroethene	< 0.06
cis-1,3-Dichloropropene	< 0.06
cis-2-Butene	< 0.06
cis-2-Pentene	< 0.06
Cyclohexane	0.25
Cyclopentane	< 0.06
Dibromochloromethane	< 0.06
Ethanol	1.43
Ethyl acetate	< 0.06
Ethylbenzene	< 0.06
Freon-11	< 0.06
Freon-113	< 0.06

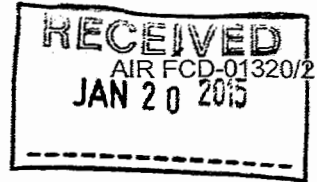
Volatile Organics Data Results

Date: JANUARY 6 , 2015
Canister ID: H2822

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.06
Freon-12	0.69
Hexachloro-1,3-butadiene	< 0.06
Isobutane	1.72
Isopentane	0.92
Isoprene	< 0.06
Isopropyl alcohol	< 0.06
Isopropylbenzene	< 0.06
m,p-Xylene	< 0.06
m-Diethylbenzene	< 0.06
m-Ethyltoluene	< 0.06
Methyl butyl ketone	< 0.06
Methyl ethyl ketone	< 0.06
Methyl isobutyl ketone	< 0.06
Methyl methacrylate	< 0.06
Methyl tert butyl ether	< 0.06
Methylcyclohexane	0.26
Methylcyclopentane	0.20
Methylene chloride	< 0.06
n-Butane	2.00
n-Decane	< 0.06
n-Dodecane	< 0.06
n-Heptane	< 0.06
n-Hexane	< 0.06
n-Nonane	< 0.06
n-Octane	< 0.06
n-Pentane	< 0.06
n-Propylbenzene	< 0.06
n-Undecane	< 0.06
Naphthalene	< 0.06
o-Ethyltoluene	< 0.06
o-Xylene	< 0.06
p-Diethylbenzene	< 0.06
p-Ethyltoluene	< 0.06
Styrene	< 0.06
Tetrachloroethylene	< 0.06
Tetrahydrofuran	< 0.06
Toluene	0.18
trans-1,2-Dichloroethylene	< 0.06
trans-1,3-Dichloropropylene	< 0.06
trans-2-Butene	< 0.06
trans-2-Pentene	< 0.06
Trichloroethylene	< 0.06
Vinyl acetate	< 0.06
Vinyl chloride	< 0.06

Sample ID: 15010129-002

Customer ID: LICA
Cust Samp ID: LICA/VOC/CLS/Jan 12, 2015



Maxxam

VOC Sample Collection Data Sheet

Client: LICA Sampler S/N: 6167
 Location: CLS Canister ID: 14710
 Station ID: LICA 1 Canister Installation Date/Time: Jan 7, 2015 @ 17:25
 Field Sample ID: LICA/VOC/CLS/Jan 12 2015 Canister Removal Date/Time: Jan 14, 2015 @ 19:01

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Jan 12, 2015	00:00	00:30	24

Jan 12, 2015 Jan 13, 2015

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
—	—	—

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
-28.8	22.2

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 - Alex Yakupov
 Sample out - Alex Yakupov

Volatile Organics Data Results

Date: JANUARY 12 , 2015
Canister ID: 14710

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.06
1,1,2,2-Tetrachloroethane	< 0.06
1,1,2-Trichloroethane	< 0.06
1,1-Dichloroethane	< 0.06
1,1-Dichloroethylene	< 0.06
1,2,3-Trimethylbenzene	< 0.06
1,2,4-Trichlorobenzene	< 0.06
1,2,4-Trimethylbenzene	< 0.06
1,2-Dibromoethane	< 0.06
1,2-Dichlorobenzene	< 0.06
1,2-Dichloroethane	< 0.06
1,2-Dichloropropane	< 0.06
1,3,5-Trimethylbenzene	< 0.06
1,3-Butadiene	< 0.06
1,3-Dichlorobenzene	< 0.06
1,4-Dichlorobenzene	< 0.06
1,4-Dioxane	< 0.06
1-Butene	< 0.06
1-Hexene	< 0.06
1-Pentene	< 0.06
2,2,4-Trimethylpentane	< 0.06
2,2-Dimethylbutane	< 0.06
2,3,4-Trimethylpentane	< 0.06
2,3-Dimethylbutane	0.23
2,3-Dimethylpentane	< 0.06
2,4-Dimethylpentane	< 0.06
2-Methylheptane	< 0.06
2-Methylhexane	< 0.06
2-Methylpentane	0.56
3-Methylheptane	< 0.06
3-Methylhexane	< 0.06
3-Methylpentane	0.26
Acetone	< 0.06
Acrolein	< 0.06
Benzene	0.38
Benzyl chloride	< 0.06
Bromodichloromethane	< 0.06
Bromoform	< 0.06
Bromomethane	< 0.06
Carbon disulfide	< 0.06
Carbon tetrachloride	< 0.06
Chlorobenzene	< 0.06
Chloroethane	< 0.06
Chloroform	< 0.06
Chloromethane	0.78
cis-1,2-Dichloroethene	< 0.06
cis-1,3-Dichloropropene	< 0.06
cis-2-Butene	< 0.06
cis-2-Pentene	< 0.06
Cyclohexane	0.28
Cyclopentane	< 0.06
Dibromochloromethane	< 0.06
Ethanol	2.58
Ethyl acetate	< 0.06
Ethylbenzene	< 0.06
Freon-11	0.23
Freon-113	< 0.06

Volatile Organics Data Results

Date: JANUARY 12 , 2015
Canister ID: 14710

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.06
Freon-12	0.57
Hexachloro-1,3-butadiene	< 0.06
Isobutane	2.20
Isopentane	2.01
Isoprene	< 0.06
Isopropyl alcohol	< 0.06
Isopropylbenzene	< 0.06
m,p-Xylene	0.15
m-Diethylbenzene	< 0.06
m-Ethyltoluene	< 0.06
Methyl butyl ketone	< 0.06
Methyl ethyl ketone	< 0.06
Methyl isobutyl ketone	< 0.06
Methyl methacrylate	< 0.06
Methyl tert butyl ether	< 0.06
Methylcyclohexane	0.47
Methylcyclopentane	< 0.06
Methylene chloride	< 0.06
n-Butane	3.73
n-Decane	< 0.06
n-Dodecane	< 0.06
n-Heptane	< 0.06
n-Hexane	0.55
n-Nonane	< 0.06
n-Octane	< 0.06
n-Pentane	2.29
n-Propylbenzene	< 0.06
n-Undecane	< 0.06
Naphthalene	< 0.06
o-Ethyltoluene	< 0.06
o-Xylene	0.07
p-Diethylbenzene	< 0.06
p-Ethyltoluene	< 0.06
Styrene	< 0.06
Tetrachloroethylene	< 0.06
Tetrahydrofuran	< 0.06
Toluene	0.36
trans-1,2-Dichloroethylene	< 0.06
trans-1,3-Dichloropropylene	< 0.06
trans-2-Butene	< 0.06
trans-2-Pentene	< 0.06
Trichloroethylene	< 0.06
Vinyl acetate	< 0.06
Vinyl chloride	< 0.06

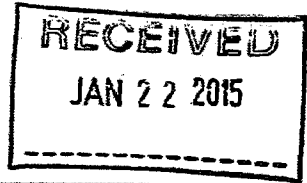
Sample ID: 15010165-002

AIR FCD-01320/2

Customer ID: LICA
Cust Samp ID: LICA/VOC/CLS/Jan 18, 2015

Maxxam

VOC Sample Collection Data Sheet



Client: LICA
Location: CLS
Station ID: LICA 01
Field Sample ID: LICA/VOC/CLS/Jan 18 2015

Sampler S/N: 6167
Canister ID: 2491
Canister Installation Date/Time: Jan 14, 2015 @ 19:02
Canister Removal Date/Time: Jan 19, 2015 @ 14:32

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Jan 18, 2015</u>	<u>00:00</u>	<u>00:00</u>	<u>24</u>

Jan 18, 2015 Jan 19, 2015

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
<u>---</u>	<u>---</u>	<u>---</u>

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
<u>-30.0</u>	<u>23</u>

24psi
IMP

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 - Alex Yakupov
Sample out - Alex Yakupov

Volatile Organics Data Results

Date: JANUARY 18 , 2015
Canister ID: 2491

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.06
1,1,2,2-Tetrachloroethane	< 0.06
1,1,2-Trichloroethane	< 0.06
1,1-Dichloroethane	< 0.06
1,1-Dichloroethylene	< 0.06
1,2,3-Trimethylbenzene	< 0.06
1,2,4-Trichlorobenzene	< 0.06
1,2,4-Trimethylbenzene	< 0.06
1,2-Dibromoethane	< 0.06
1,2-Dichlorobenzene	< 0.06
1,2-Dichloroethane	< 0.06
1,2-Dichloropropane	< 0.06
1,3,5-Trimethylbenzene	0.08
1,3-Butadiene	< 0.06
1,3-Dichlorobenzene	< 0.06
1,4-Dichlorobenzene	< 0.06
1,4-Dioxane	< 0.06
1-Butene	0.56
1-Hexene	< 0.06
1-Pentene	< 0.06
2,2,4-Trimethylpentane	0.93
2,2-Dimethylbutane	< 0.06
2,3,4-Trimethylpentane	0.20
2,3-Dimethylbutane	0.18
2,3-Dimethylpentane	0.54
2,4-Dimethylpentane	< 0.06
2-Methylheptane	< 0.06
2-Methylhexane	0.28
2-Methylpentane	0.66
3-Methylheptane	< 0.06
3-Methylhexane	< 0.06
3-Methylpentane	0.45
Acetone	4.11
Acrolein	< 0.06
Benzene	0.44
Benzyl chloride	< 0.06
Bromodichloromethane	< 0.06
Bromoform	< 0.06
Bromomethane	< 0.06
Carbon disulfide	< 0.06
Carbon tetrachloride	0.10
Chlorobenzene	< 0.06
Chloroethane	< 0.06
Chloroform	< 0.06
Chloromethane	0.60
cis-1,2-Dichloroethene	< 0.06
cis-1,3-Dichloropropene	< 0.06
cis-2-Butene	< 0.06
cis-2-Pentene	< 0.06
Cyclohexane	0.35
Cyclopentane	< 0.06
Dibromochloromethane	< 0.06
Ethanol	4.09
Ethyl acetate	< 0.06
Ethylbenzene	< 0.06
Freon-11	0.22
Freon-113	< 0.06

Volatile Organics Data Results

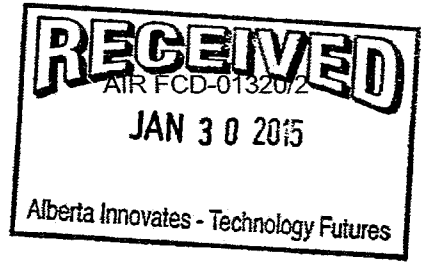
Date: JANUARY 18 , 2015
Canister ID: 2491

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.06
Freon-12	0.60
Hexachloro-1,3-butadiene	< 0.06
Isobutane	2.18
Isopentane	2.42
Isoprene	< 0.06
Isopropyl alcohol	< 0.06
Isopropylbenzene	< 0.06
m,p-Xylene	0.76
m-Diethylbenzene	< 0.06
m-Ethyltoluene	0.12
Methyl butyl ketone	< 0.06
Methyl ethyl ketone	< 0.06
Methyl isobutyl ketone	< 0.06
Methyl methacrylate	< 0.06
Methyl tert butyl ether	< 0.06
Methylcyclohexane	0.32
Methylcyclopentane	0.42
Methylene chloride	< 0.06
n-Butane	3.71
n-Decane	< 0.06
n-Dodecane	< 0.06
n-Heptane	< 0.06
n-Hexane	0.76
n-Nonane	< 0.06
n-Octane	< 0.06
n-Pentane	< 0.06
n-Propylbenzene	< 0.06
n-Undecane	< 0.06
Naphthalene	< 0.06
o-Ethyltoluene	< 0.06
o-Xylene	0.27
p-Diethylbenzene	< 0.06
p-Ethyltoluene	0.08
Styrene	< 0.06
Tetrachloroethylene	< 0.06
Tetrahydrofuran	< 0.06
Toluene	1.10
trans-1,2-Dichloroethylene	< 0.06
trans-1,3-Dichloropropylene	< 0.06
trans-2-Butene	< 0.06
trans-2-Pentene	< 0.06
Trichloroethylene	< 0.06
Vinyl acetate	< 0.06
Vinyl chloride	< 0.06

Sample ID: 15010249-002

Customer ID: LICA

Cust Samp ID: LICA/VOC/CLS/Jan 24, 2015



Maxxam

VOC Sample Collection Data Sheet

A.Y.

Client: LICA Sampler S/N: ~~85677~~ 6167
 Location: CLS Canister ID: 85677
 Station ID: LICA 01 (A.Y.) Canister Installation Date/Time: Jan 19, 2015 @ 14:35
 Field Sample ID: LICA/VOC/CLS/Jan 24, 2015 Canister Removal Date/Time: Jan 25, 2015 @ 15:14

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Jan 24, 2015	00:00	00:00	24

Jan 24, 2015 Jan 25, 2015

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
—	—	—

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
-30.0	24.8

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 - Alex Yakupov

Volatile Organics Data Results

Date: JANUARY 24, 2015
Canister ID: 55677

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.03
1,1,2,2-Tetrachloroethane	< 0.03
1,1,2-Trichloroethane	< 0.03
1,1-Dichloroethane	< 0.03
1,1-Dichloroethylene	< 0.03
1,2,3-Trimethylbenzene	< 0.03
1,2,4-Trichlorobenzene	0.05
1,2,4-Trimethylbenzene	0.09
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	< 0.03
1,2-Dichloropropane	< 0.03
1,3,5-Trimethylbenzene	< 0.03
1,3-Butadiene	< 0.03
1,3-Dichlorobenzene	< 0.03
1,4-Dichlorobenzene	< 0.03
1,4-Dioxane	1.84
1-Butene	0.14
1-Hexene	< 0.03
1-Pentene	< 0.03
2,2,4-Trimethylpentane	< 0.03
2,2-Dimethylbutane	< 0.03
2,3,4-Trimethylpentane	< 0.03
2,3-Dimethylbutane	0.07
2,3-Dimethylpentane	0.04
2,4-Dimethylpentane	0.04
2-Methylheptane	< 0.03
2-Methylhexane	< 0.03
2-Methylpentane	0.09
3-Methylheptane	< 0.03
3-Methylhexane	0.07
3-Methylpentane	0.06
Acetone	6.72
Acrolein	0.20
Benzene	0.18
Benzyl chloride	< 0.03
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.03
Carbon disulfide	< 0.03
Carbon tetrachloride	0.11
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	< 0.03
Chloromethane	0.92
cis-1,2-Dichloroethene	< 0.03
cis-1,3-Dichloropropene	< 0.03
cis-2-Butene	< 0.03
cis-2-Pentene	< 0.03
Cyclohexane	0.11
Cyclopentane	0.04
Dibromochloromethane	< 0.03
Ethanol	3.03
Ethyl acetate	< 0.03
Ethylbenzene	0.04
Freon-11	0.37
Freon-113	0.10

Volatile Organics Data Results

Date: JANUARY 24 , 2015
Canister ID: 55677

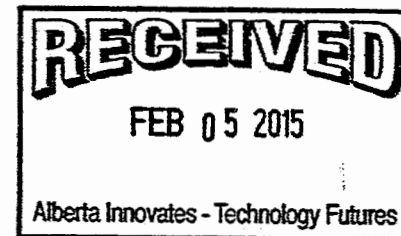
PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.03
Freon-12	0.96
Hexachloro-1,3-butadiene	< 0.03
Isobutane	0.86
Isopentane	0.55
Isoprene	< 0.03
Isopropyl alcohol	0.43
Isopropylbenzene	< 0.03
m,p-Xylene	0.13
m-Diethylbenzene	< 0.03
m-Ethyltoluene	0.05
Methyl butyl ketone	< 0.03
Methyl ethyl ketone	0.23
Methyl isobutyl ketone	< 0.03
Methyl methacrylate	< 0.03
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.13
Methylcyclopentane	0.07
Methylene chloride	0.17
n-Butane	1.57
n-Decane	< 0.03
n-Dodecane	< 0.03
n-Heptane	0.06
n-Hexane	0.10
n-Nonane	0.03
n-Octane	< 0.03
n-Pentane	0.82
n-Propylbenzene	< 0.03
n-Undecane	< 0.03
Naphthalene	0.05
o-Ethyltoluene	< 0.03
o-Xylene	0.04
p-Diethylbenzene	< 0.03
p-Ethyltoluene	0.03
Styrene	< 0.03
Tetrachloroethylene	< 0.03
Tetrahydrofuran	< 0.03
Toluene	0.54
trans-1,2-Dichloroethylene	0.27
trans-1,3-Dichloropropylene	< 0.03
trans-2-Butene	< 0.03
trans-2-Pentene	< 0.03
Trichloroethylene	< 0.03
Vinyl acetate	< 0.03
Vinyl chloride	< 0.03

Sample ID: 15020038-002

AIR FCD-01320/2

Customer ID: LICA
Cust Samp ID: LICA/VOC/CLS/Jan 30, 2015

Maxxam Analytics Inc.



Xontech Model 910A VOC Sample Collection Data Sheet

Client: LICA Sampler s/n: 6167
Location: CLS Canister ID: 5627
Station ID: Lica 01 Canister Installation Date/Time: Jan 25, 2015 @ 15:17
Field Sample ID: LICA/VOC/CLS/Jan 30, 2015 Canister Removal Date/Time: Feb 02, 2015 @ 19:14

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Jan 30, 2015	00:00	00:00	24
	Jan 30, 2015	Jan 31, 2015	

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

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
28.8	23.0

23 psi
INR

Canister valve open prior to sampling?: YES
Timer set to 0.00 minutes prior to sampling? YES
Canister valve closed prior to disconnection?: YES

Comments:

Technician Signature: Sample in - Alex Yakupov
Sample out - Alex Yakupov

Volatile Organics Data Results

Date: JANUARY 30, 2015
Canister ID: S5627

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.03
1,1,2,2-Tetrachloroethane	< 0.03
1,1,2-Trichloroethane	< 0.03
1,1-Dichloroethane	< 0.03
1,1-Dichloroethylene	< 0.03
1,2,3-Trimethylbenzene	< 0.03
1,2,4-Trichlorobenzene	< 0.03
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	< 0.03
1,2-Dichloropropane	< 0.03
1,3,5-Trimethylbenzene	< 0.03
1,3-Butadiene	< 0.03
1,3-Dichlorobenzene	< 0.03
1,4-Dichlorobenzene	< 0.03
1,4-Dioxane	< 0.03
1-Butene	< 0.03
1-Hexene	< 0.03
1-Pentene	< 0.03
2,2,4-Trimethylpentane	< 0.03
2,2-Dimethylbutane	0.04
2,3,4-Trimethylpentane	< 0.03
2,3-Dimethylbutane	0.04
2,3-Dimethylpentane	0.03
2,4-Dimethylpentane	< 0.03
2-Methylheptane	< 0.03
2-Methylhexane	0.04
2-Methylpentane	0.12
3-Methylheptane	< 0.03
3-Methylhexane	0.06
3-Methylpentane	0.07
Acetone	1.21
Acrolein	< 0.03
Benzene	0.21
Benzyl chloride	< 0.03
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.03
Carbon disulfide	< 0.03
Carbon tetrachloride	0.11
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	< 0.03
Chloromethane	0.70
cis-1,2-Dichloroethene	< 0.03
cis-1,3-Dichloropropene	< 0.03
cis-2-Butene	< 0.03
cis-2-Pentene	< 0.03
Cyclohexane	0.08
Cyclopentane	< 0.03
Dibromochloromethane	< 0.03
Ethanol	< 0.03
Ethyl acetate	< 0.03
Ethylbenzene	< 0.03
Freon-11	0.36
Freon-113	0.11

Volatile Organics Data Results

Date: JANUARY 30, 2015
Canister ID: S5627

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.03
Freon-12	0.89
Hexachloro-1,3-butadiene	< 0.03
Isobutane	0.69
Isopentane	0.69
Isoprene	< 0.03
Isopropyl alcohol	< 0.03
Isopropylbenzene	< 0.03
m,p-Xylene	0.05
m-Diethylbenzene	< 0.03
m-Ethyltoluene	< 0.03
Methyl butyl ketone	< 0.03
Methyl ethyl ketone	< 0.03
Methyl isobutyl ketone	< 0.03
Methyl methacrylate	< 0.03
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.10
Methylcyclopentane	0.07
Methylene chloride	0.20
n-Butane	1.07
n-Decane	< 0.03
n-Dodecane	< 0.03
n-Heptane	0.08
n-Hexane	0.11
n-Nonane	< 0.03
n-Octane	< 0.03
n-Pentane	0.70
n-Propylbenzene	< 0.03
n-Undecane	< 0.03
Naphthalene	< 0.03
o-Ethyltoluene	< 0.03
o-Xylene	< 0.03
p-Diethylbenzene	< 0.03
p-Ethyltoluene	< 0.03
Styrene	< 0.03
Tetrachloroethylene	< 0.03
Tetrahydrofuran	< 0.03
Toluene	0.13
trans-1,2-Dichloroethylene	< 0.03
trans-1,3-Dichloropropylene	< 0.03
trans-2-Butene	< 0.03
trans-2-Pentene	< 0.03
Trichloroethylene	< 0.03
Vinyl acetate	< 0.03
Vinyl chloride	< 0.03

PAH RESULTS

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: JANUARY 6 , 2015
PUF S/N: TE06

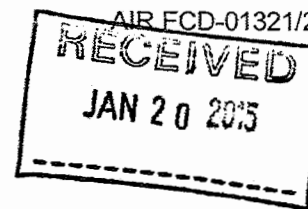
PARAMETERS	CONCENTRATION(UG)
1-Methylnaphthalene	0.61
2-Methylnaphthalene	1.06
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.09
Acenaphthylene	0.02
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	0.01
Benzo(b,j,k)fluoranthene	0.04
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.01
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	0.11
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	1.94
Perylene	< 0.01
Phenanthrene	0.14
Pyrene	0.05
Retene	0.07

Sample ID: 15010129-003

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Jan 12, 2015

Maxxam



Hi-Vol PUF+ Sample Collection Data Sheet

Client: LICA
Location: CLS
Station ID: LICA 01
Field Sample ID: LICA/PUF/CLS/Jan 12, 2015

Puf+ S/N: TE02
Motor S/N: 100-1020
Installation Date/Time: Jan 7, 2015 @ 17:20
Removal Date/Time: Jan 14, 2015 @ 18:31

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Jan 12, 2015	00:00	00:00	24

Jan 12, 2015 Jan 13, 2015

Set Flow Rate (slpm): 230

Date of Last Calibration: Sept 01, 2011

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date

Sampling Data			
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (°C)	Volume (Vstd m ³)
?	?	?	?

n/a n/a n/a n/a

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: No data stored in the Electronic memory of the sampler. The filter does NOT require analysis

Technician Signature: Sample in - Alex Yakupov
Sample out - Alex Yakupov

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: JANUARY 12 , 2015
PUF S/N: TE02

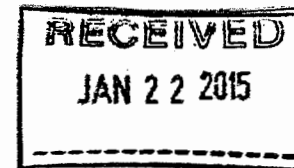
PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.02
2-Methylnaphthalene	0.04
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	< 0.01
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01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

Sample ID: 15010165-001

AIR FCD-01321/2

Customer ID: LICA
Cust Samp ID: LICA/PUF/CLS/Jan 18, 2015

Maxxam



Hi-Vol PUF+ Sample Collection Data Sheet

Client: LICA
Location: CLS
Station ID: LICA 01
Field Sample ID: LICA/PUF/CLS/Jan 18, 2015
Puf+ S/N: TE 08
Motor S/N: 100-1020
Installation Date/Time: Jan 14, 2015 @ 18:32
Removal Date/Time: Jan 19, 2015 @ 14:02

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Jan 18, 2015</u>	<u>00:00</u>	<u>00:00</u>	<u>24</u>

Jan 18, 2015 Jan 19, 2015

Set Flow Rate (slpm): 230

Date of Last Calibration: Sept 01, 2011

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date
_____	_____	_____	_____

Sampling Data			
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (°C)	Volume (Vstd m³)
<u>705</u>	<u>229</u>	<u>-7.1°</u>	<u>330.19</u>

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 - Alex Yakupov
Sample out - Alex Yakupov

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: JANUARY 18 , 2015
PUF S/N: TE08

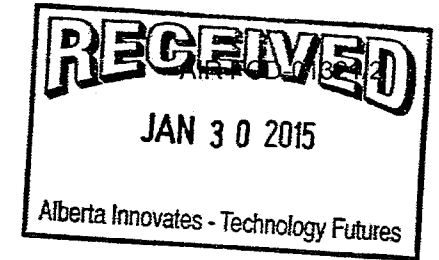
PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	2.29
2-Methylnaphthalene	4.01
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.24
Acenaphthylene	0.51
Acridine	< 0.01
Anthracene	0.07
Benzo(a)anthracene	0.03
Benzo(a)pyrene	0.02
Benzo(b,,k)fluoranthene	0.09
Benzo(c)phenanthrene	< 0.01
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	0.15
Fluorene	0.29
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	3.51
Perylene	0.02
Phenanthrene	0.51
Pyrene	0.12
Retene	0.13

Sample ID: 15010249-003

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Jan 24, 2015

Maxxam Analytics Inc.



Tisch Hi-Vol PUF+ Sample Collection Data Sheet

Client: Lica

Puf+ s/n: 100-1020 **9801**

Location: CLS

Motor s/n: 1138

Station ID: Lica 01

Installation Date/Time: Jan 19, 2015 @ 14:04

Field Sample ID: LICA / PUF / CLS / Jan 24, 2015

Removal Date/Time: Jan 25, 2015 @ 14:53

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Jan 24, 2015	00:00	00:00	24

Jan 24, 2015 Jan 25, 2015

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date
_____	_____	_____	_____

Set Flow Rate (slpm): 230

Sampling Data			
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (C)	Volume (Vstd m ³)
<u>707</u>	<u>229</u>	<u>4.1</u>	<u>330.21</u>

Date of Last Calibration: 22-Sep-11

Time set correctly prior to sampling? **YES**

Timer set correctly prior to sampling? **YES**

Sampling data saved to memory card after sampling? **NO**

Comments: _____

Technician Signature: Sample in - Alex Yakupov
Sample out - Alex Yakupov

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: JANUARY 24 , 2015
PUF S/N: 1138

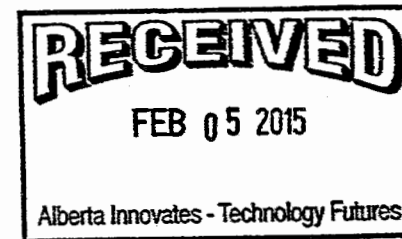
PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.09
2-Methylnaphthalene	0.17
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.03
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	< 0.01
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	0.14
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.20
Perylene	< 0.01
Phenanthrene	0.20
Pyrene	0.04
Retene	0.03

Sample ID: 15020038-001

AIR FCD-01321/2

Customer ID: LICA
Cust Samp ID: LICA/PUF/CLS/Jan 30, 2015

Maxxam Analytics Inc.



Tisch Hi-Vol PUF+ Sample Collection Data Sheet

Client: Lica Puf+ s/n: 100-1020 TE 11
Location: CLS Motor s/n: 1138
Station ID: LICA 01 Installation Date/Time: Jan 25, 2015 @ 15:04
Field Sample ID: LICA/PUF/CLS/Jan 30, 2015 Removal Date/Time: Feb 02, 2015 @ 19:23

A.Y.

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Jan 30, 2015</u>	<u>00:00</u> <u>Jan 30/2015</u>	<u>00:00</u> <u>Jan 31/2015</u>	<u>24</u>

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date

Set Flow Rate (slpm): 230

Date of Last Calibration: 22-Sep-11

Sampling Data			
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (C)	Volume (Vstd m ³)
<u>723</u>	<u>229</u>	<u>-10.8</u>	<u>330.20</u>

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

Comments: _____

Technician Signature: Sample in - Alex Yakupov
Sample out - Alex Yakupov

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: JANUARY 30 , 2015
PUFS/N: TE11

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.17
2-Methylnaphthalene	0.28
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.04
Acenaphthylene	0.02
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	< 0.01
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	0.08
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.46
Perylene	< 0.01
Phenanthrene	0.22
Pyrene	0.05
Retene	0.01

PARTISOL RESULTS



Partisol Sampler Results

Date	Filter NO.	Concentration (mg)
JANUARY 6	P4089563	0.022
JANUARY 12	P4089564	0.304
JANUARY 18	P4089566	0.128
JANUARY 24	P4089557	0.042
JANUARY 30	P4089562	0.094

APPENDIX III
ANALYZER CALIBRATION RESULTS

SULPHUR DIOXIDE

Maxxam Thermo 43i SO2 Analyzer Calibration

Date: 06-Jan-15 **Start/End Time (mst):** 0951-1324
Company: LICA **Calibration Purpose:** routine monthly
Station Name/Location: Cold Lake South **Converter Make & Model:** NA
Performed by: Tom Bourque **Converter Serial #:** NA
Application H₂S/TRS/SO₂: SO2 **Cal Gas Expiry Date:** 12-Aug-17

Analyzer:
Serial Number: AMU 1771 **Range ppb:** 500
Last Calibration Date: 41977 **As Found C.F.:** 1.094
Previous Cal High Point C.F.: 1.000 **New C.F.:** 1.022

<p>MOTHERBOARD:</p> <table border="0"> <tr><td>As found:</td><td></td></tr> <tr><td>BKG:</td><td>7.5</td></tr> <tr><td>COEF:</td><td>1.147</td></tr> <tr><td>3.3</td><td>3.3</td></tr> <tr><td>5.0</td><td>5.0</td></tr> <tr><td>15.0</td><td>15.0</td></tr> <tr><td>24.0</td><td>24.0</td></tr> <tr><td>-3.3</td><td>-3.2</td></tr> </table> <p>INTERFACE BOARD:</p> <table border="0"> <tr><td>PMT:</td><td>-631.6</td></tr> <tr><td>FLASH:</td><td>717</td></tr> <tr><td>3.3</td><td>3.3</td></tr> <tr><td>5.0</td><td>5.0</td></tr> <tr><td>15.0</td><td>14.8</td></tr> <tr><td>-15.0</td><td>-15.0</td></tr> <tr><td>24.0</td><td>23.6</td></tr> <tr><td>INTERNAL:</td><td>27.7</td></tr> <tr><td>CHAMBER:</td><td>44.9</td></tr> <tr><td>PERM OVEN GAS:</td><td>45.00</td></tr> <tr><td>PERM OVEN HEATER:</td><td>44.19</td></tr> <tr><td>PRESSURE:</td><td>696.1</td></tr> <tr><td>SAMPLE FLOW:</td><td>451</td></tr> <tr><td>LAMP INTENSITY:</td><td>76 %</td></tr> <tr><td>CONVERTER:</td><td>na</td></tr> <tr><td>CONVERTER SET:</td><td>na</td></tr> <tr><td>Internal Span:</td><td>407</td></tr> </table>	As found:		BKG:	7.5	COEF:	1.147	3.3	3.3	5.0	5.0	15.0	15.0	24.0	24.0	-3.3	-3.2	PMT:	-631.6	FLASH:	717	3.3	3.3	5.0	5.0	15.0	14.8	-15.0	-15.0	24.0	23.6	INTERNAL:	27.7	CHAMBER:	44.9	PERM OVEN GAS:	45.00	PERM OVEN HEATER:	44.19	PRESSURE:	696.1	SAMPLE FLOW:	451	LAMP INTENSITY:	76 %	CONVERTER:	na	CONVERTER SET:	na	Internal Span:	407	<p>As left:</p> <table border="0"> <tr><td>BKG:</td><td>7.3</td></tr> <tr><td>COEF:</td><td>1.151</td></tr> <tr><td>3.3</td><td>3.3</td></tr> <tr><td>5.0</td><td>5.0</td></tr> <tr><td>15.0</td><td>15.0</td></tr> <tr><td>24.0</td><td>24.0</td></tr> <tr><td>-3.3</td><td>-3.2</td></tr> </table> <p>PMT: -631.6</p> <p>FLASH: 717</p> <p>3.3 3.3</p> <p>5.0 5.0</p> <p>15.0 14.8</p> <p>-15.0 -15.0</p> <p>24.0 23.6</p> <p>INTERNAL: 27.7</p> <p>CHAMBER: 44.9</p> <p>PERM OVEN GAS: 45.00</p> <p>PERM OVEN HEATER: 44.19</p> <p>PRESSURE: 696.1</p> <p>SAMPLE FLOW: 451</p> <p>LAMP INTENSITY: 76 %</p> <p>CONVERTER: NA</p> <p>CONVERTER SET: NA</p> <p>Internal Span: 387</p>	BKG:	7.3	COEF:	1.151	3.3	3.3	5.0	5.0	15.0	15.0	24.0	24.0	-3.3	-3.2
As found:																																																																	
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-3.3	-3.2																																																																

Callibrator: **Callibrator Flow Targets:**

Flow Meter ID's: na Make & Model: Enviroics 6100 Serial #: 4760 Cal Gas Cylinder I.D. #: LL42475 Cal Gas Conc. (ppm): 50.3	<table border="1" style="width: 100%; text-align: center;"> <tr> <th>point</th> <th>diluent (cc/min)</th> <th>cal gas (cc/min)</th> <th>total (cc/min)</th> </tr> <tr><td>zero</td><td>5000</td><td>0</td><td>5000</td></tr> <tr><td>high</td><td>5000</td><td>38</td><td>5038</td></tr> <tr><td>mid</td><td>5000</td><td>19</td><td>5019</td></tr> <tr><td>low</td><td>5000</td><td>9</td><td>5009</td></tr> </table>	point	diluent (cc/min)	cal gas (cc/min)	total (cc/min)	zero	5000	0	5000	high	5000	38	5038	mid	5000	19	5019	low	5000	9	5009
point	diluent (cc/min)	cal gas (cc/min)	total (cc/min)																		
zero	5000	0	5000																		
high	5000	38	5038																		
mid	5000	19	5019																		
low	5000	9	5009																		

Calibration:

Point	Diluent	Cal Gas	Total	Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors:
as found zero	5000	0.0	5000	0	-0.3	NA
adjusted zero	5000	0.0	5000	0	0.1	NA
as found high	4996	34.89	5031	348.8	319.0	1.094
adjusted high	4996	34.95	5031	349.4	349.3	1.001
mid	4997	18.99	5016	190.4	187.3	1.017
low	4998	8.82	5007	88.6	84.7	1.047
calibrator zero	5000	0.00	5000	0	-0.1	NA
Average C.F.=						1.022

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS > or = 0.995	Pass/Fail ?
Slope = 0.998	0.85-1.15	PASS
b (Intercept as % of full scale) = 0.41%	± 3% F.S.	PASS
% change in C.F. from last cal = -9.39%	± 15%	PASS

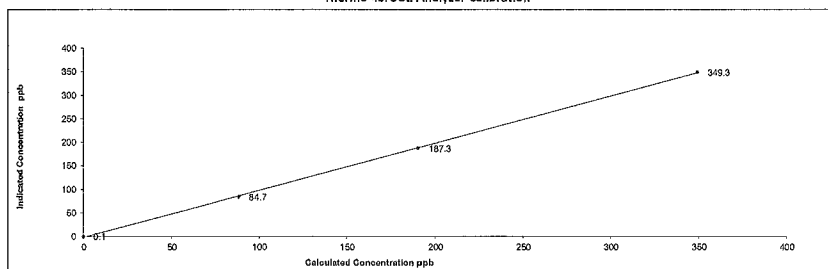
Converter Efficiency Check for H₂S/TRS application:

run converter efficiency test immediately following zero adjust

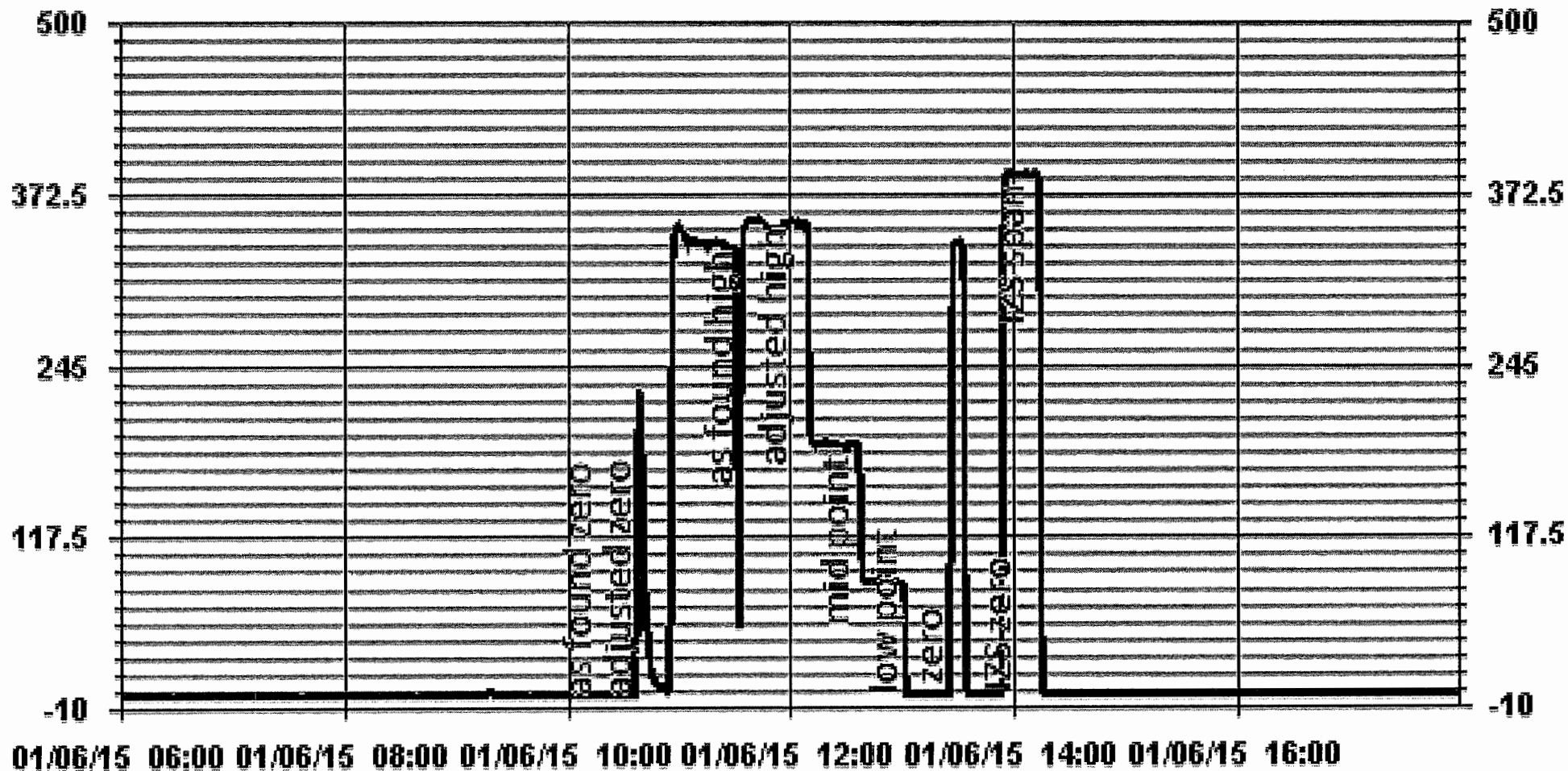
SO₂ High Point gas concentration: NA Time gas run (mst): NA
 Zero corrected analyzer response: NA

Comments:
changed filter

Thermo 43i SO2 Analyzer Calibration



01 Minute Averages



— LICA SO2_ PPB

TOTAL REDUCED SULPHUR

Maxxam Thermo 450i TRS Analyzer Calibration

Date: 06-Jan-15 **Start/End Time (mst):** 0951-1314
Company: LICA **Calibration Purpose:** routine monthly
Station Name/Location: Cold Lake South **Converter Make & Model:** Thermo CDN-101
Performed by: Tom Bourque **Converter Serial #:** 501
Application H₂S/TRS/SO₂: TRS **Cal Gas Expiry Date:** 5-Dec-15

Analyzer:
Serial Number: 812728560 **Range ppb:** 100
Last Calibration Date: 41977 **As Found C.F.:** 1.010
Previous Cal High Point C.F.: 0.997 **New C.F.:** 1.003

<p>MOTHERBOARD:</p> <p>As found:</p> <p>BKG: 12.8 COEF: .933</p> <p>3.3 3.3 5.0 5.0 15.0 15.0 24.0 23.9 -3.3 -3.2</p> <p>INTERFACE BOARD:</p> <p>PMT: -650.5 FLASH: 742</p> <p>3.3 3.2 5.0 5.0 15.0 14.6 -15.0 -15.0 24.0 23.2</p> <p>INTERNAL: 30.8 CHAMBER: 45.1 CONVERTER TEMP: 327.5 CONVERTER SET: 325 PERM OVEN GAS: 45.01 PERM OVEN HTR: 44.39 PRESSURE: 673.0 SAMPLE FLOW: .518 LAMP INTENSITY: 91 % Internal Span: 37.00</p>	<p>As left:</p> <p>BKG: 12.6 COEF: .926</p> <p>3.3 3.3 5.0 5.0 15.0 15.0 24.0 23.9 -3.3 -3.2</p> <p>PMT: -650.5 FLASH: 742</p> <p>3.3 3.2 5.0 5.0 15.0 14.6 -15.0 -15.0 24.0 23.2</p> <p>INTERNAL: 30.8 CHAMBER: 45.1 CONVERTER TEMP: 327.5 CONVERTER SET: 325 PERM OVEN GAS: 45.01 PERM OVEN HTR: 44.39 PRESSURE: 673.0 SAMPLE FLOW: .518 LAMP INTENSITY: 91 % Internal Span: 34.83</p>
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Calibrator: **Calibrator Flow Targets:**

Flow Meter ID's: NA Make & Model: API 700 Serial #: 831 Cal Gas Cylinder I.D. #: BLM005049 Cal Gas Conc. (ppm): 10.1	<table border="1" style="width: 100%;"> <thead> <tr> <th>point</th> <th>diluent (cc/min)</th> <th>cal gas (cc/min)</th> <th>total (cc/min)</th> </tr> </thead> <tbody> <tr> <td>zero</td> <td>5000</td> <td>0</td> <td>5000</td> </tr> <tr> <td>high</td> <td>5000</td> <td>39</td> <td>5039</td> </tr> <tr> <td>mid</td> <td>5000</td> <td>19</td> <td>5019</td> </tr> <tr> <td>low</td> <td>5000</td> <td>11</td> <td>5011</td> </tr> </tbody> </table>	point	diluent (cc/min)	cal gas (cc/min)	total (cc/min)	zero	5000	0	5000	high	5000	39	5039	mid	5000	19	5019	low	5000	11	5011
point	diluent (cc/min)	cal gas (cc/min)	total (cc/min)																		
zero	5000	0	5000																		
high	5000	39	5039																		
mid	5000	19	5019																		
low	5000	11	5011																		

Calibration:

Calibrator Flow Rates (cc/min)	Calculated Concentration:	Indicated Concentration:	Correction Factors:			
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	-
as found zero	5000	0.0	5000	0	0.1	NA
adjusted zero	5000	0.0	5000	0	0.0	NA
as found high	4997	39.00	5036	78.2	77.5	1.010
adjusted high	4997	39.00	5036	78.2	78.3	1.000
mid	4997	19.00	5016	38.3	38.5	0.995
low	4996	11.00	5007	22.2	21.9	1.014
calibrator zero	5000	0.00	5000	0	0.0	NA
Average C.F.=						1.003

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000 Slope = 0.998 b (Intercept as % of full scale) = 0.06% % change in C.F. from last cal = -1.32%	<table border="0"> <tr> <td style="text-align: right;">LIMITS</td> <td style="text-align: left;">Pass/Fail ?</td> </tr> <tr> <td style="text-align: right;">> or = 0.995</td> <td>PASS</td> </tr> <tr> <td style="text-align: right;">0.85-1.15</td> <td>PASS</td> </tr> <tr> <td style="text-align: right;">± 3% F.S.</td> <td>PASS</td> </tr> <tr> <td style="text-align: right;">± 15%</td> <td>PASS</td> </tr> </table>	LIMITS	Pass/Fail ?	> or = 0.995	PASS	0.85-1.15	PASS	± 3% F.S.	PASS	± 15%	PASS
LIMITS	Pass/Fail ?										
> or = 0.995	PASS										
0.85-1.15	PASS										
± 3% F.S.	PASS										
± 15%	PASS										

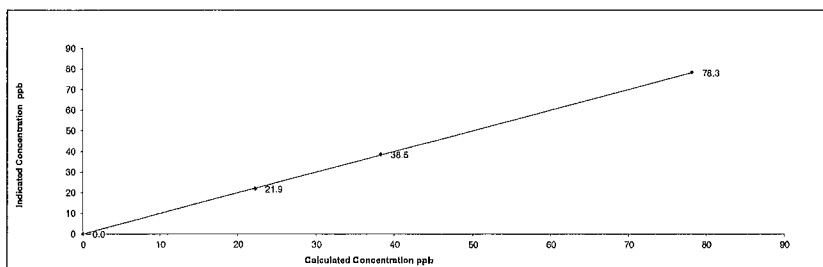
Converter Efficiency Check for H₂S/TRS application:

run converter efficiency test immediately following zero adjust

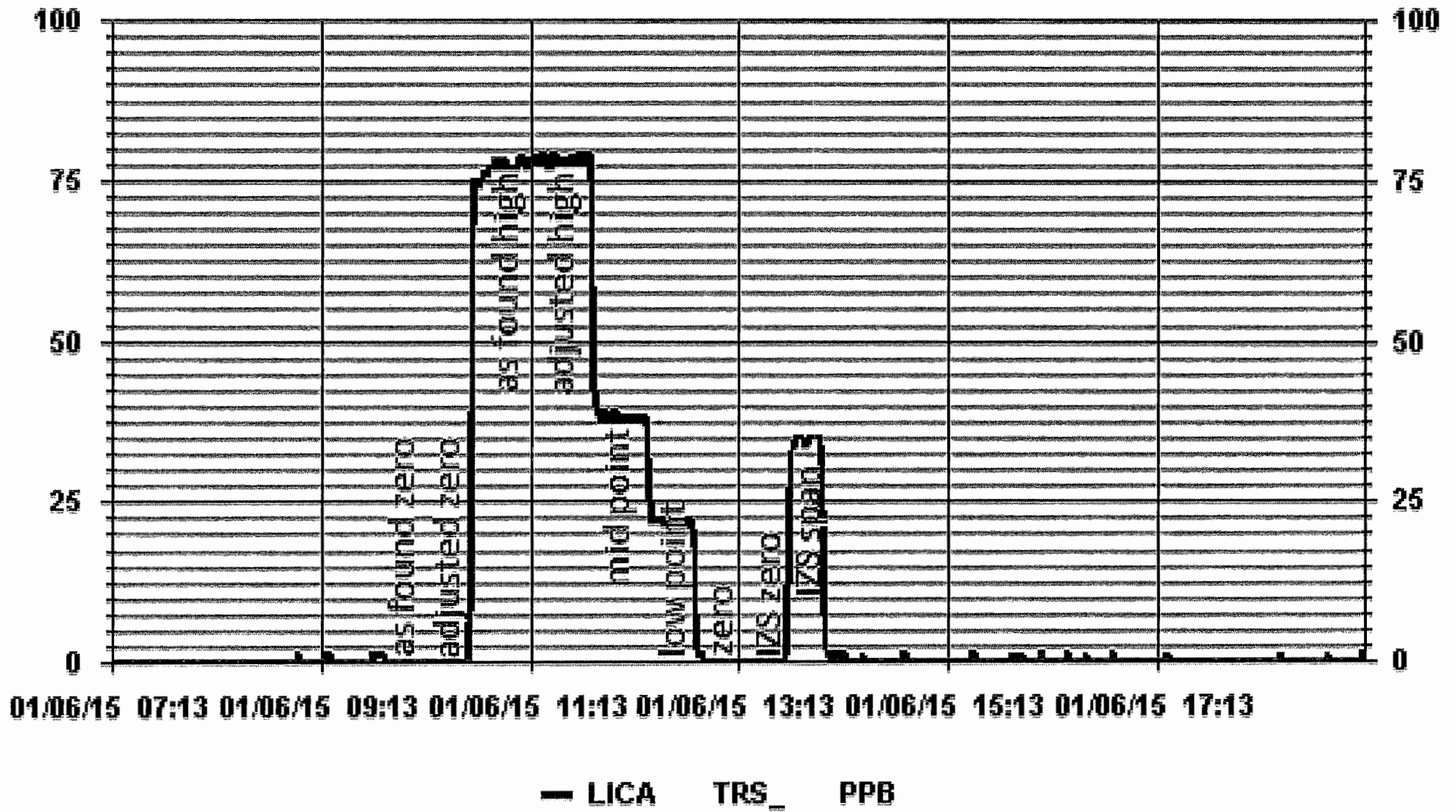
SO₂ High Point gas concentration: 40.2 Time gas run (mst): 0936-0940
 Zero corrected analyzer response: 0.30

Comments:
changed filter

Thermo 450i TRS Analyzer Calibration



01 Minute Averages



TOTAL HYDROCARBON

Maxxam Thermo 51C THC Analyzer Calibration

Date: 06-Jan-15 Start Time (mst): 13:44
 Company: LICA End Time (mst): 17:08
 Station Name/Location: Cold Lake South Calibration Purpose: monthly
 Performed by: Tom Bourque Cal Gas Expiry Date: 26-Mar-17

Analyzer:
 Serial Number: 427408718 Range ppm: 50
 Last Calibration Date: 41977 As Found C.F.: 0.988
 Previous Cal High Point C.F.: 1.000 New C.F.: 1.004

	As found:	As left:
H ₂ cylinder (psi):	<u>750</u>	<u>750</u>
H ₂ cylinder reg set (psi):	<u>22</u>	<u>22</u>
Span Cylinder (psi):	<u>950</u>	<u>950</u>
Span Cylinder Reg Set (psi):	<u>24</u>	<u>24</u>
Zero Air Gen Pressure:	<u>34</u>	<u>34</u>
measurement alarms:	<u>none</u>	<u>none</u>
service alarms:	<u>none</u>	<u>none</u>
FID status:	cnt: <u>1649</u>	cnt: <u>1649</u>
	rng: <u>1</u>	rng: <u>1</u>
	try: <u>1</u>	try: <u>1</u>
	flm: <u>187.0</u>	flm: <u>187.0</u>
	det: <u>125.6</u>	det: <u>125.6</u>
Oven Readings:	Flame: <u>187</u>	Flame: <u>187</u>
	Filter: <u>125</u>	Filter: <u>125</u>
	Base: <u>125</u>	Base: <u>125</u>
	Pump: <u>6.47</u>	Pump: <u>6.47</u>
Voltages:	+5 <u>5</u>	+5 <u>5</u>
	+15 <u>14.8</u>	+15 <u>14.8</u>
	-15 <u>-15.1</u>	-15 <u>-15.1</u>
	Internal Span: <u>32.52</u>	Internal Span: <u>32.39</u>

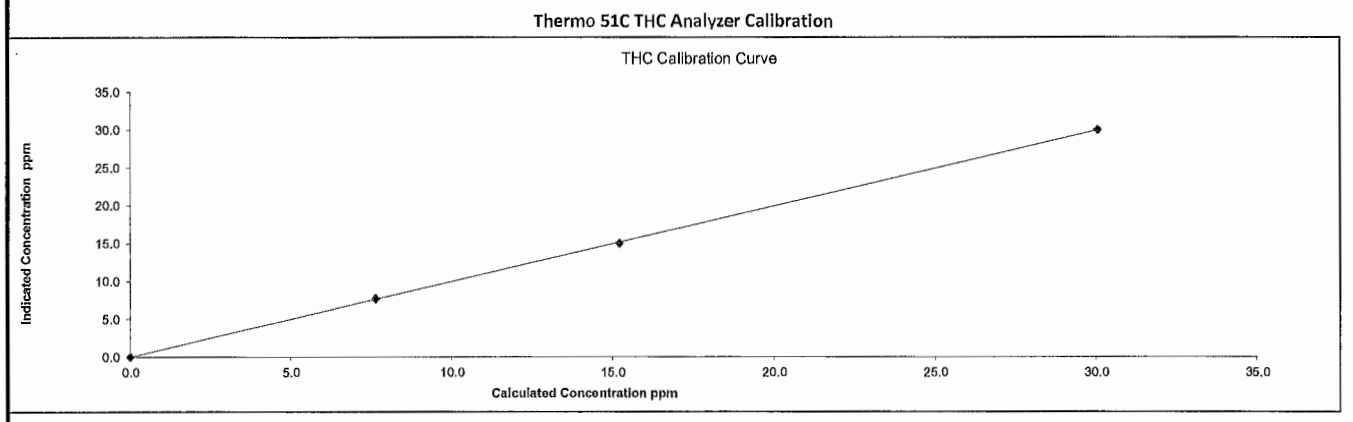
Calibrator:	Flow Meter ID's:	<u>na</u>	Calibrator Flow Targets:			
	Make & Model:	<u>API 700</u>	point	diluent (cc/min)	cal gas (cc/min)	total (cc/min)
	Serial #:	<u>831</u>	zero	<u>3000</u>	<u>0</u>	<u>3000</u>
	Cal Gas Cylinder I.D. #:	<u>LL33674</u>	high	<u>3000</u>	<u>80</u>	<u>3080</u>
	CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	<u>601.4</u> <u>202.0</u>	mid	<u>3000</u>	<u>40</u>	<u>3040</u>
	CH ₄ as propane/total CH ₄ equivalents (ppm):	<u>555.5</u> <u>1156.9</u>	low	<u>3000</u>	<u>20</u>	<u>3020</u>

Calibrator Flow Rates (cc/min)	Diluent	Cal Gas	Total	Calculated Concentration: (ppm)	Indicated Concentration: (ppm)	Correction Factors:
Point						
as found zero	3000	0.00	3000	0	0.52	NA
adjusted zero	3000	0.00	3000	0	0.01	NA
as found high	2998	80.00	3078	30.07	30.44	0.988
adjusted high	2998	80.00	3078	30.07	29.99	1.003
mid	3000	40.00	3040	15.22	15.04	1.013
low	2999	20.00	3019	7.66	7.70	0.997
calibrator zero	3000	0.00	3000	0	0.17	NA
Average C.F.=						1.004

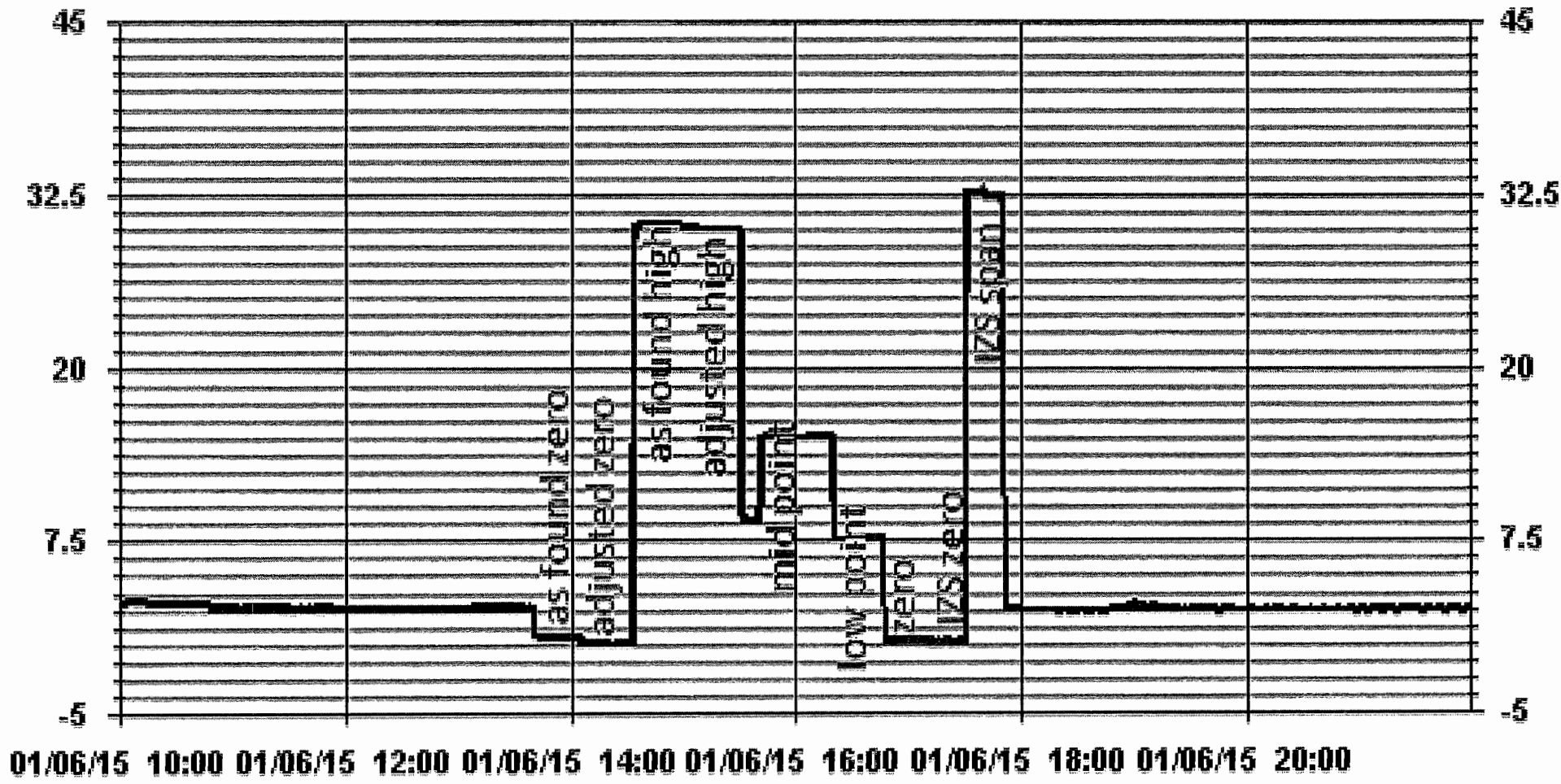
Linear Regression/Calibration Results:

Correlation Coefficient =	<u>1.000</u>	LIMITS	Pass/Fail ?
Slope =	<u>0.996</u>	> or = 0.995	PASS
b (Intercept as % of full scale) =	<u>0.001%</u>	0.85-1.15	PASS
% change in C.F. from last cal	<u>1.19%</u>	± 3% F.S.	PASS
		± 15%	PASS

Comments:
 changed filter



01 Minute Averages



— LICA THC PPM

Maxam Thermo 51C THC Analyzer Calibration

Date: Jan 26th-Jan 27th Start Time (mst): 8:45
 Company: LICA End Time (mst): 12:27
 Station Name/Location: Cold Lake South Calibration Purpose: repeat
 Performed by: Alex Yakupov Cal Gas Expiry Date: 26-Mar-17

Analyzer: 427408718 Range ppm: 50
 Serial Number: 06-Jan- 2015 As Found C.F.: 1.122
 Last Calibration Date: 1.004 New C.F.: 1.010
 Previous Cal High Point C.F.:

	As found:	As left:
H ₂ cylinder (psi):	1500	1500
H ₂ cylinder reg set (psi):	22	22
Span Cylinder (psi):	600	600
Span Cylinder Reg Set (psi):	23	23
Zero Air Gen Pressure:	34	34
measurement alarms:	none	none
service alarms:	none	none
FID status:	cnt: 2158	cnt: 2158
	rng: 1	rng: 1
	try: 1	try: 1
	flm: 181.0	flm: 181.0
	det: 125.8	det: 125.8
Oven Readings:	Flame: 181	Flame: 181
	Filter: 125	Filter: 125
	Base: 125	Base: 125
	Pump: 6.53	Pump: 6.53
Voltagess:	+5 5.0	+5 5.0
	+15 14.8	+15 14.8
	-15 -15.1	-15 -15.1
	Internal Span: 32.39	Internal Span: 32.59

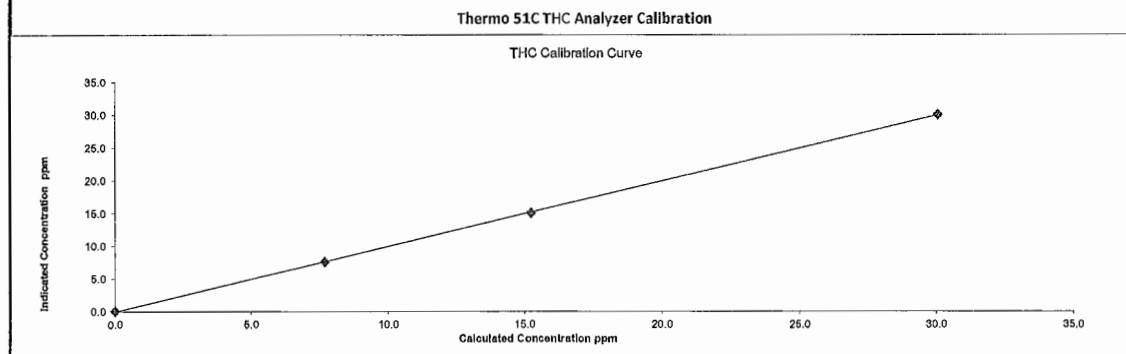
Callibrator: Flow Meter ID's: na Make & Model: API 700 Serial #: 831 Cal Gas Cylinder I.D. #: LL33674 CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm): 601.4 202.0 CH ₄ as propane/total CH ₄ equivalents (ppm): 555.5 1156.9	Callibrator Flow Targets: <table border="1"> <thead> <tr> <th>point</th> <th>diluent (cc/min)</th> <th>cal gas (cc/min)</th> <th>total (cc/min)</th> </tr> </thead> <tbody> <tr> <td>zero</td> <td>3000</td> <td>0</td> <td>3000</td> </tr> <tr> <td>high</td> <td>3000</td> <td>80</td> <td>3080</td> </tr> <tr> <td>mid</td> <td>3000</td> <td>40</td> <td>3040</td> </tr> <tr> <td>low</td> <td>3000</td> <td>20</td> <td>3020</td> </tr> </tbody> </table>	point	diluent (cc/min)	cal gas (cc/min)	total (cc/min)	zero	3000	0	3000	high	3000	80	3080	mid	3000	40	3040	low	3000	20	3020
point	diluent (cc/min)	cal gas (cc/min)	total (cc/min)																		
zero	3000	0	3000																		
high	3000	80	3080																		
mid	3000	40	3040																		
low	3000	20	3020																		

Point	Callibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Diluent	Cal Gas	Total	(ppm)	(ppm)	
as found zero	3000	0.00	3000	0	0.17	NA
adjusted zero	3000	0.00	3000	0	0.01	NA
as found high	2998	80.00	3078	30.07	26.80	1.122
adjusted high	2998	80.00	3078	30.07	30.06	1.001
mid	2998	40.00	3038	15.23	15.02	1.015
low	2999	20.00	3019	7.66	7.56	1.015
calibrator zero	2999	0.00	2999	0	0.01	NA
Average C.F. =						1.010

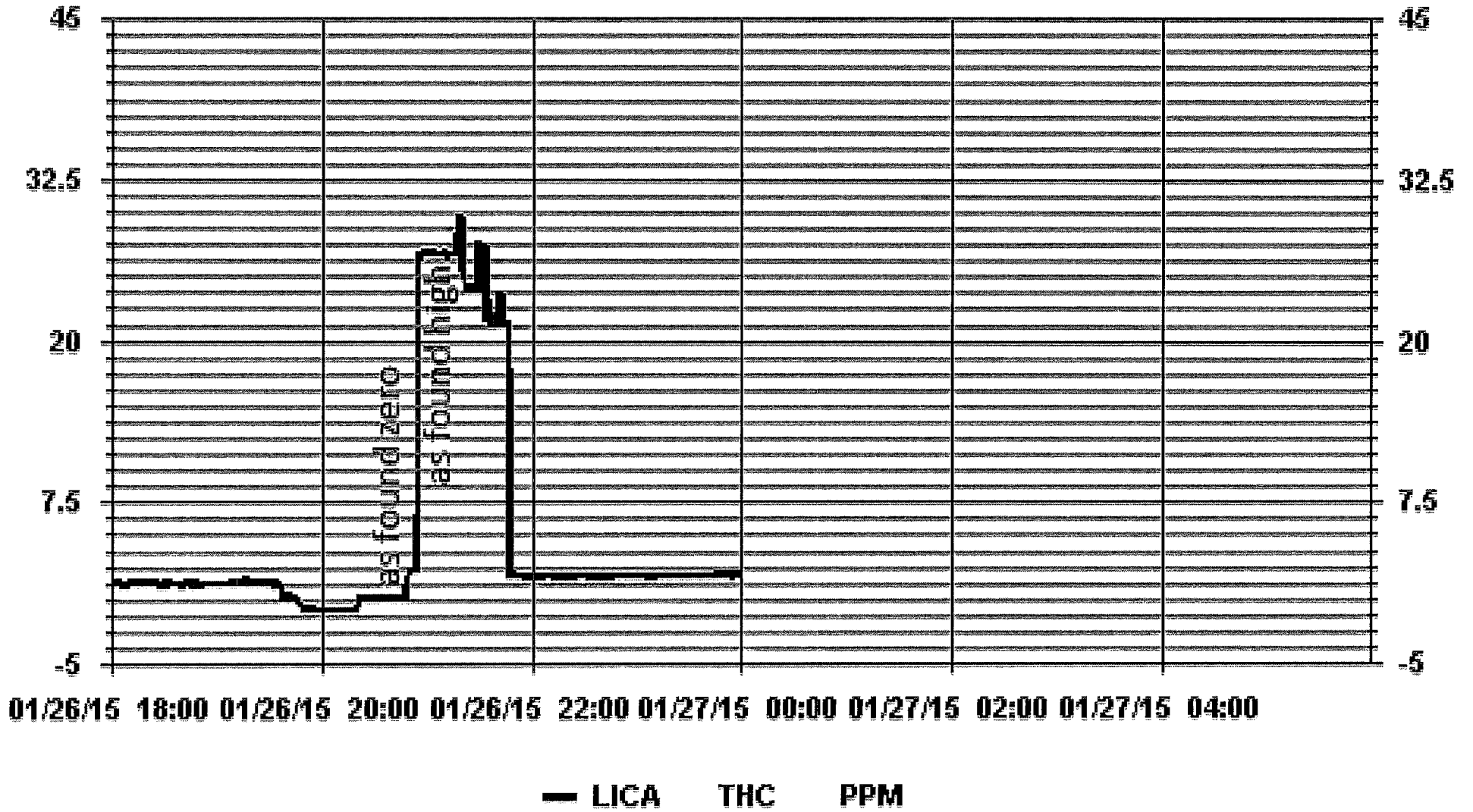
Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	Pass/Fail ?
Slope =	1.000	> or = 0.995	PASS
b (Intercept as % of full scale) =	-0.151%	0.85-1.15	PASS
% change in C.F. from last cal	-11.79%	± 3% F.S.	PASS
		± 15%	PASS

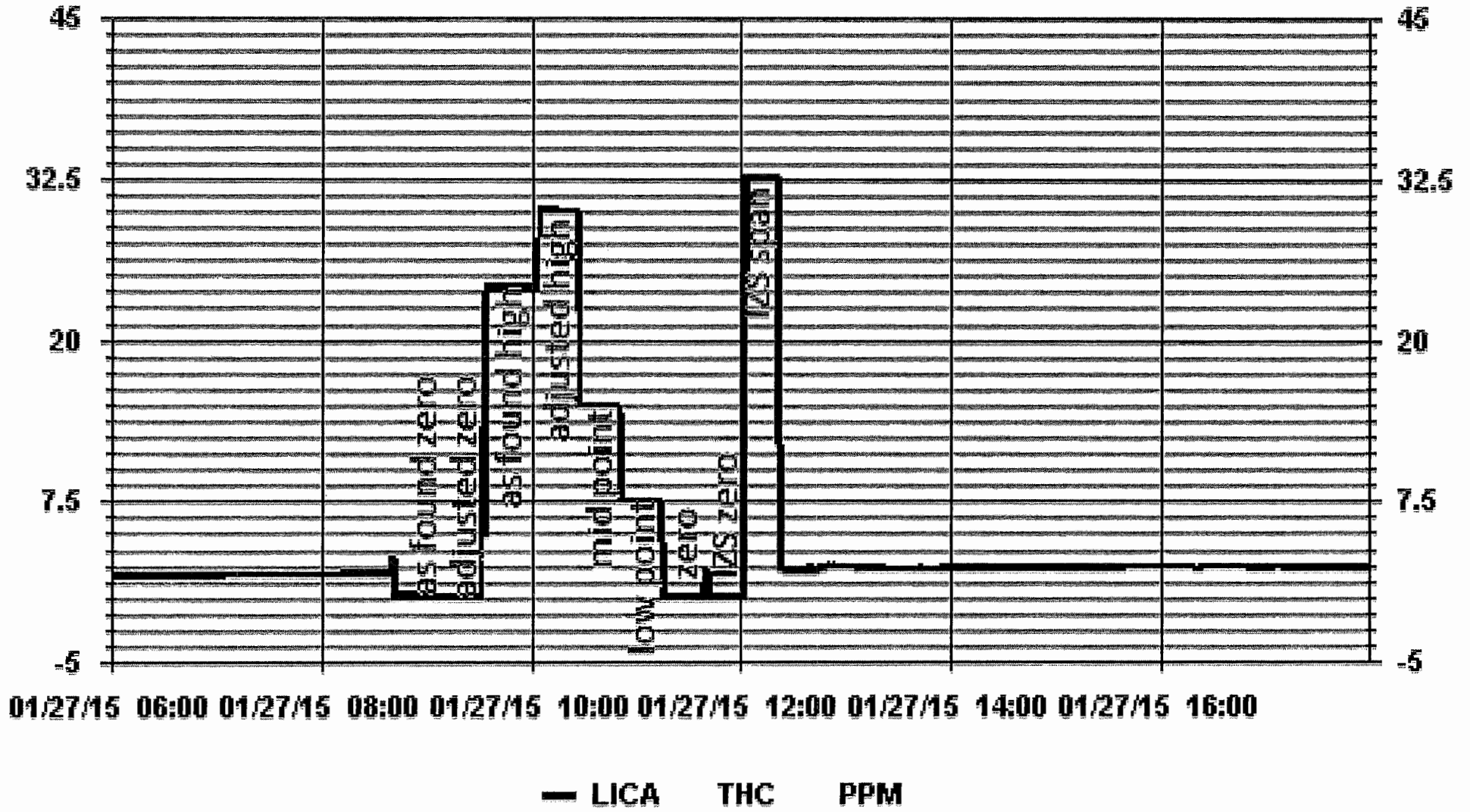
Comments:
 as founds performed on Jan 26th, subsequent analyzer adjustment was set to the wrong value, analyzer remained in maintenance mode overnight, recalibrated on the 27th, as founds shown above are from Jan 26th, rest of calibration Jan 27th



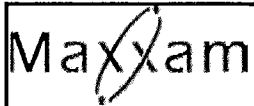
01 Minute Averages



01 Minute Averages



NITROGEN DIOXIDE



Thermo 42C NOx Analyzer Calibration

Date: 06-Jan-15
 Company: LICA
 Station Name/Location: Cold Lake South
 Performed by: Tom Bourque

Start Time (mst): 9:51
 End Time (mst): 15:19
 Calibration Purpose: monthly
 Cal Gas Expiry Date: 12-Aug-17

Analyzer Serial Number: 427408716
 Last Calibration Date: 41977
 Range ppb: 500

Correction Factors:
 As found C.F. Previous Cal High Point C.F.:
 NO= 1.054 NO= 1.004
 NOx= 1.051 NOx= 1.004
 NO₂= 0.992 NO₂= 1.006

As found:
 NO Bkg ppb: 4.9
 NOx Bkg ppb: 5.6
 NO Coef: .997
 NOx Coef: 1.018
 NO₂ Coef: 1.003
 PMT: -850
 +5: 5.0
 +15: 15.1
 -15: -15.1
 Battery: 3.2
 Internal: 24.8
 Chamber: 49.8
 Cooler: -2.5
 Converter: 317
 Converter Set: 320
 Pressure: 215.0
 Sample Flow: .513
 Ozonator Flow: ok
 Internal Span: 7/351/358

As left:
 NO Bkg ppb: 5.3
 NOx Bkg ppb: 5.9
 NO Coef: 1.079
 NOx Coef: 1.009
 NO₂ Coef: 1.003
 PMT: -850
 +5: 5.0
 +15: 15.1
 -15: -15.1
 Battery: 3.2
 Internal: 24.8
 Chamber: 49.8
 Cooler: -2.5
 Converter: 317
 Converter Set: 320
 Pressure: 215.0
 Sample Flow: .513
 Ozonator Flow: ok
 Internal Span: 6/361/367

Callibrator Flow Targets:

Make & Model: EnviroNics 6100
 Serial #: 4760
 Cal Gas Cylinder I.D. #: LL42475
 NO Cylinder Conc. (ppm): 48.5
 NOx Cylinder Conc. (ppm): 48.5

point	diluent (cc/min)	cal gas (cc/min)	O ₃ setting (v or ppb)	total (cc/min)
zero	5000	0	0	5000
high	5000	35	225.00	5035
mid	5000	18	125.00	5018
low	5000	9	75.00	5009

Calibration:

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	-0.1	0.0	NA	NA
adjusted zero	5000	0.0	5000	0	0	-0.1	0.0	NA	NA
as found high	4996	34.89	5031	336.4	336.4	319	320	1.054	1.051
adjusted high	4996	34.95	5031	336.9	336.9	337	339	1.000	0.993
mid	4997	18.99	5016	183.6	183.6	182	183	1.008	1.002
low	4998	8.82	5007	85.4	85.4	85	86	1.005	0.997
calibrator zero	5000	0.00	5000	0	0	-0.1	0.0	NA	NA
Average C.F.=								1.004	0.997

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ Increase	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4998	34.93	5033	0.0	343.0	342.0	-0.8	-0.1	0.1	
as found NO ₂	4998	34.93	5033	225.0	119.0	345.0	225.0	224.0	225.8	0.992
gpt mid	4998	34.93	5033	125.0	219.0	345.0	127.1	124.0	127.9	0.970
gpt low	4998	34.93	5033	75.0	267.1	344.0	77.0	75.9	77.8	0.975
Average NO ₂ C.F.=										0.979

Linear Regression/Calibration Results:

Correlation Coefficient =
 Slope =
 b (Intercept as % of full scale)=
 % change in C.F. from last cal=

NO	NOx	NO ₂
1.000	1.000	1.000
1.000	1.006	1.008
-0.10%	-0.08%	0.23%
-4.99%	-4.70%	1.39%
NO ₂ converter efficiency		102.1%

LIMITS
 > or = 0.995
 0.85-1.15
 ± 3% F.S.
 +/-15%
 >85%

Comments:

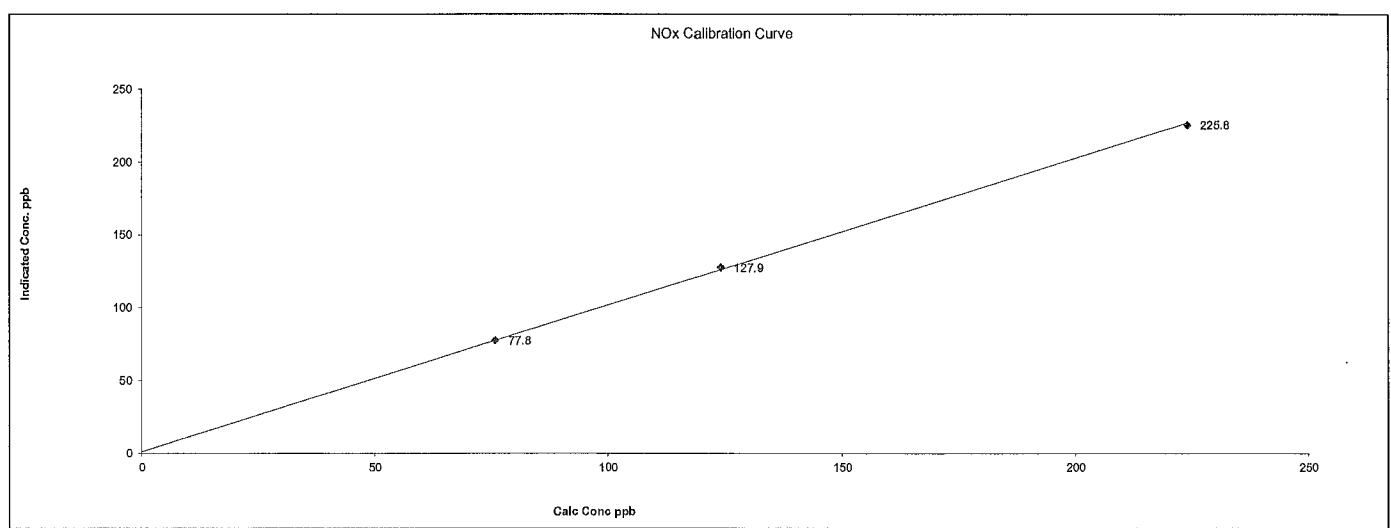
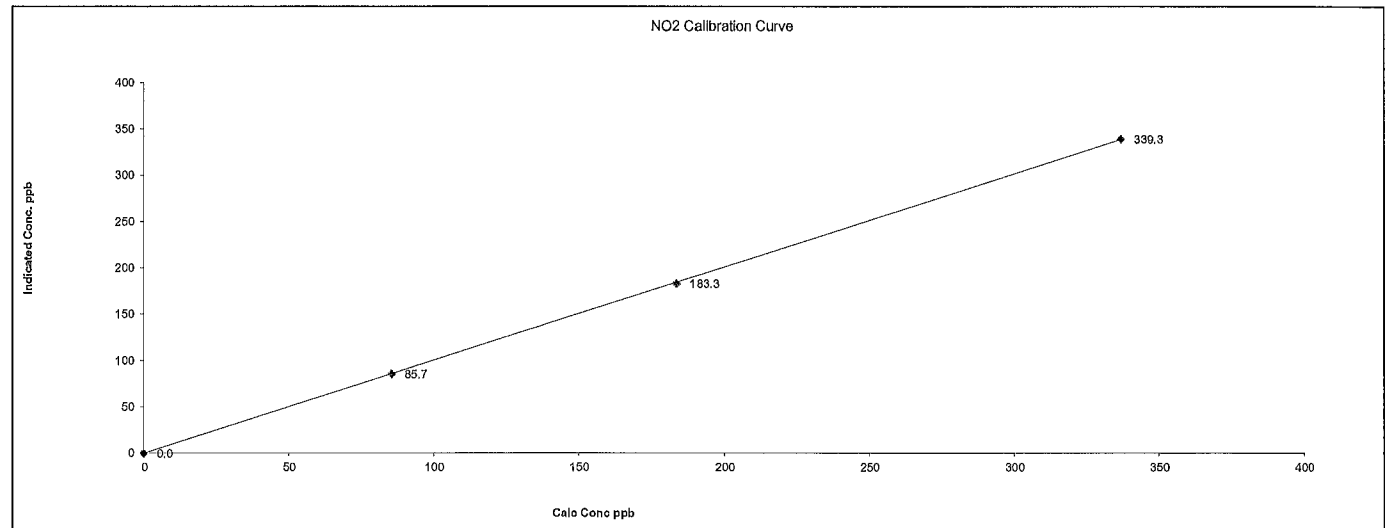
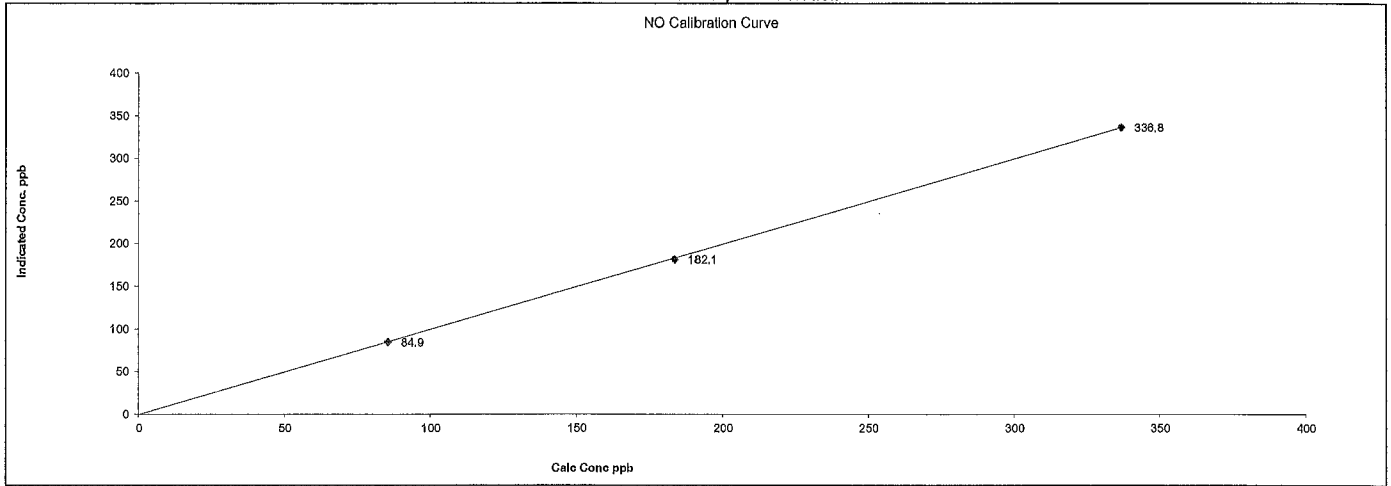
changed meter had numerous problems - had to switch zero air gen - bad zero, also the



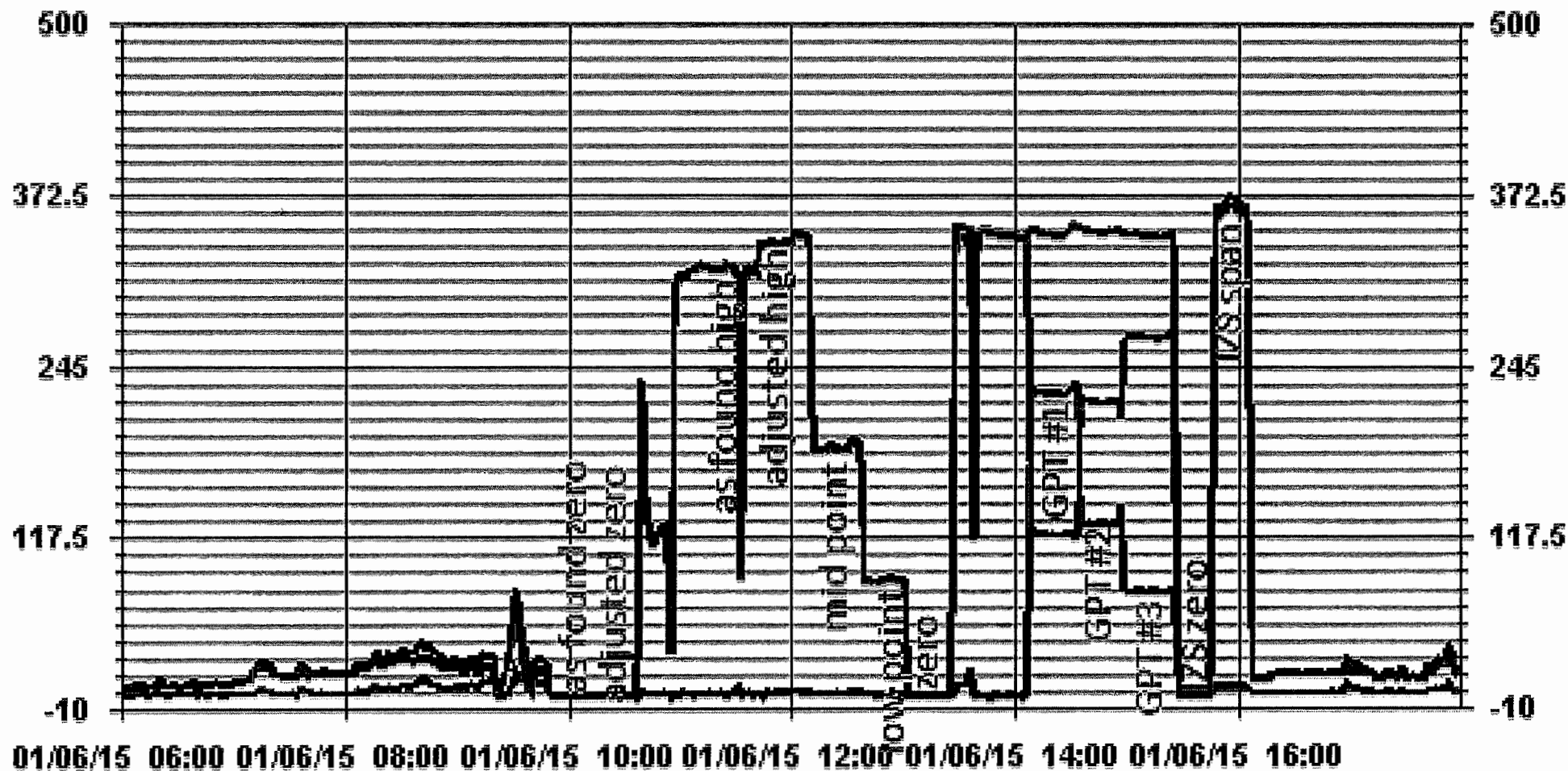
Date: 06-Jan-15
 Company: LICA
 Station Name/Location: Cold Lake South
 Performed by: Tom Bourque

Start Time (mst): 9:51
 End Time (mst): 15:19
 Calibration Purpose: monthly
 Cal Gas Expiry Date: 12-Aug-17

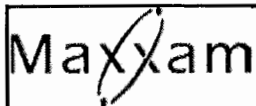
Thermo 42C NOx Analyzer Calibration



01 Minute Averages



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



Thermo 42C NOx Analyzer Calibration

Date: 13-Jan-15
 Company: LICA
 Station Name/Location: Cold Lake South
 Performed by: Limin Li

Start Time (mst): 10:00
 End Time (mst): 11:50
 Calibration Purpose: As Found
 Cal Gas Expiry Date: 4-Feb-18

Correction Factors:

Analyzer Serial Number: 427408716
 Last Calibration Date: 6-Jan-15
 Range ppb: 500

As found C.F. Previous Cal High Point C.F.:

NO= <u>0.894</u>	NO= <u>0.997</u>
NOx= <u>0.897</u>	NOx= <u>0.997</u>
NO ₂ = <u>1.000</u>	NO ₂ = <u>1.000</u>

As found:

NO Bkg ppb: 5.3
 NOx Bkg ppb: 5.9
 NO Coef: 1.079
 NOx Coef: 1.009
 NO₂ Coef: 1.003
 PMT: -850
 +15: 15.1
 +5: 5.0
 -15: -15.1
 Battery: 3.2
 Internal: 25.7
 Chamber: 49.8
 Cooler: -2.5
 Converter: 318
 Converter Set: 320
 Pressure: 189.2
 Sample Flow: 0.543
 Ozonator Flow: ok
 Internal Span: 367/6/361

As left:

NO Bkg ppb: 5.3
 NOx Bkg ppb: 5.9
 NO Coef: 1.079
 NOx Coef: 1.009
 NO₂ Coef: 1.003
 PMT: -850
 +15: 15.1
 +5: 5.0
 -15: -15.1
 Battery: 3.2
 Internal: 25.7
 Chamber: 49.8
 Cooler: -2.5
 Converter: 318
 Converter Set: 320
 Pressure: 189.2
 Sample Flow: 0.543
 Ozonator Flow: ok
 Internal Span: 367/6/361

Calibrator Flow Targets:

Make & Model: SABIO 2010
 Serial #: 042531101(0911)
 Cal Gas Cylinder I.D. #: BLM000428
 NO Cylinder Conc. (ppm): 50.7
 NOx Cylinder Conc. (ppm): 50.8

point	diluent (cc/min)	cal gas (cc/min)	O ₃ setting (v or ppb)	total (cc/min)
zero	4999	0	0	4999
high	4961	39	300.00	5000
mid				
low				

Calibration:

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	0.0	1.0	NA	NA
adjusted zero	NA	0.0		0	0			NA	NA
as found high	4961	39.40	5000	399.5	400.3	447	446	0.894	0.897
adjusted high		NA							
mid		NA							
low		NA							
calibrator zero	NA	0.00		0	0			NA	NA
Average C.F.=								0.894	0.897

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ Increase	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4961	39.40	5000	0.0	447.0	446.0	-1.0	0.0	0.0	
as found NO ₂	4961	39.40	5000	220.0	151.0	446.0	295.0	296.0	296.0	1.000
adjusted NO ₂										
gpt mid										
gpt low										
Average NO ₂ C.F.=										

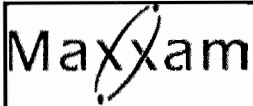
Linear Regression/Calibration Results:

	NO	NOx	NO ₂
Correlation Coefficient =			
Slope =			
b (Intercept as % of full scale)=			
% change in C.F. from last cal=	10.36%	9.98%	0.00%
NO2 converter efficiency			

LIMITS
 > or = 0.995
 0.85-1.15
 ± 3% F.S.
 +/-15%
 >85%

Comments:

After as found point, check pump is -24".



Thermo 42C NOx Analyzer Calibration

Date: 13-Jan-15
 Company: LICA
 Station Name/Location: Cold Lake South
 Performed by: Limin Li

Start Time (mst): 12:00
 End Time (mst): 17:20
 Calibration Purpose: Post Repair
 Cal Gas Expiry Date: 4-Feb-18

Analyzer Serial Number: 427408716
 Last Calibration Date: 6-Jan-15
 Range ppb: 500

Correction Factors:
 As found C.F. Previous Cal High Point C.F.:
 NO= NA NO= 0.997
 NOx= NA NOx= 0.997
 NO₂= 1.004 NO₂= 1.000

As found:
 NO Bkg ppb: 5.3
 NOx Bkg ppb: 5.9
 NO Coef: 1.079
 NOx Coef: 1.009
 NO₂ Coef: 1.003
 PMT: -850
 +15: 15.1
 +5: 5.0
 +15: 15.1
 -15: -15.1
 Battery: 3.2
 Internal: 25.7
 Chamber: 49.8
 Cooler: -2.5
 Converter: 318
 Converter Set: 320
 Pressure: 189.2
 Sample Flow: 0.543
 Ozonator Flow: ok
 Internal Span: 367/6/361

As left:
 NO Bkg ppb: 4.9
 NOx Bkg ppb: 6.0
 NO Coef: 0.969
 NOx Coef: 1.016
 NO₂ Coef: 1.003
 PMT: -850
 +15: 15.1
 +5: 5.0
 +15: 15.1
 -15: -15.1
 Battery: 3.2
 Internal: 25.7
 Chamber: 49.8
 Cooler: -2.5
 Converter: 318
 Converter Set: 320
 Pressure: 189.2
 Sample Flow: 0.543
 Ozonator Flow: ok
 Internal Span: 325/7/332

Calibrator Flow Targets:

Make & Model: SABIO 2010
 Serial #: 042531101(0911)
 Cal Gas Cylinder I.D. #: BLM000428
 NO Cylinder Conc. (ppm): 50.7
 NOx Cylinder Conc. (ppm): 50.8

point	diluent (cc/min)	cal gas (cc/min)	O ₃ setting (v or ppb)	total (cc/min)
zero	4999	0	0	4999
high	4961	39	220.00	5000
mid	4980	20	110.00	5000
low	4990	10	45.00	5000

Calibration:

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	na	0.0	#VALUE!	0	0			NA	NA
adjusted zero	5000	0.0	5000	0	0	0.0	0.0	NA	NA
as found high		na							
adjusted high	4961	39.40	5000	399.5	400.3	400	401	0.999	0.998
mid	4980	19.70	5000	199.8	200.2	199	200	1.004	1.001
low	4990	9.80	5000	99.4	99.6	99	100	1.004	0.996
calibrator zero	NA	0.00		0	0	0.0	0.0	NA	NA
Average C.F.=								1.002	0.998

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ increase	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4961	39.40	5000	0.0	399.0	401.0	2.0	0.0	0.0	
as found NO ₂	4961	39.40	5000	220.0	131.0	400.0	269.0	268.0	267.0	1.004
adjusted NO ₂										
gpt mid	4961	39.40	5000	110.0	259.0	401.0	142.0	140.0	140.0	1.000
gpt low	4961	39.40	5000	45.0	341.0	401.0	60.0	58.0	58.0	1.000
Average NO ₂ C.F.=										1.000

Linear Regression/Calibration Results:			LIMITS	
	NO	NOx		NO ₂
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.001	1.001	0.996	0.85-1.15
b (Intercept as % of full scale)=	-0.08%	0.00%	0.04%	± 3% F.S.
% change in C.F. from last cal=	#VALUE!	#VALUE!	-0.37%	+/-15%
NO ₂ converter efficiency	#VALUE!	#VALUE!	100.0%	>85%

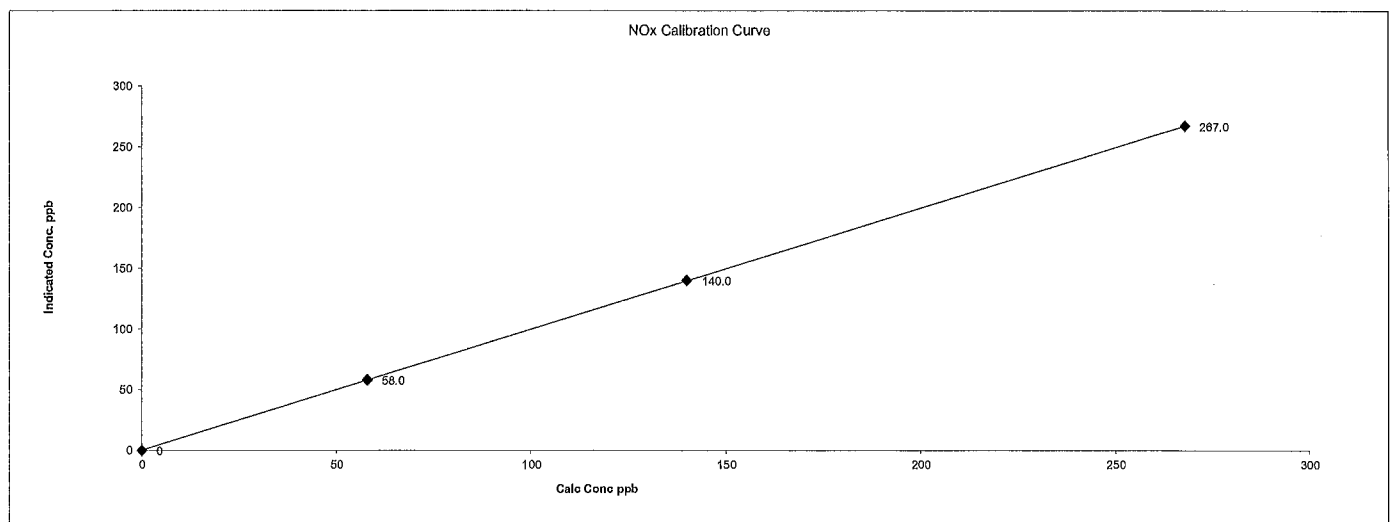
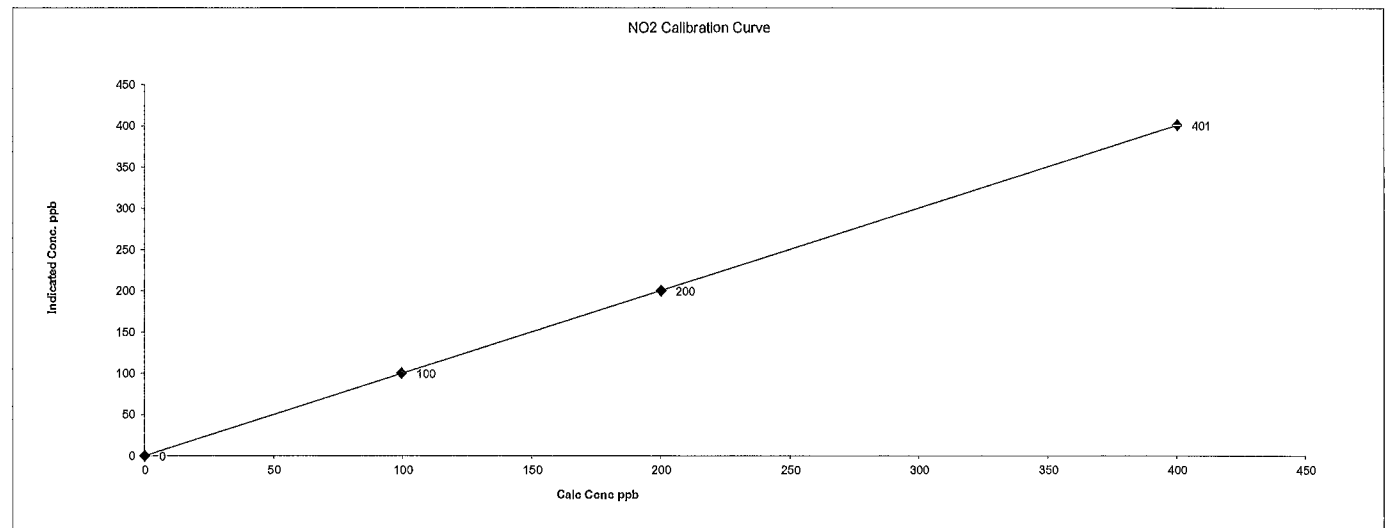
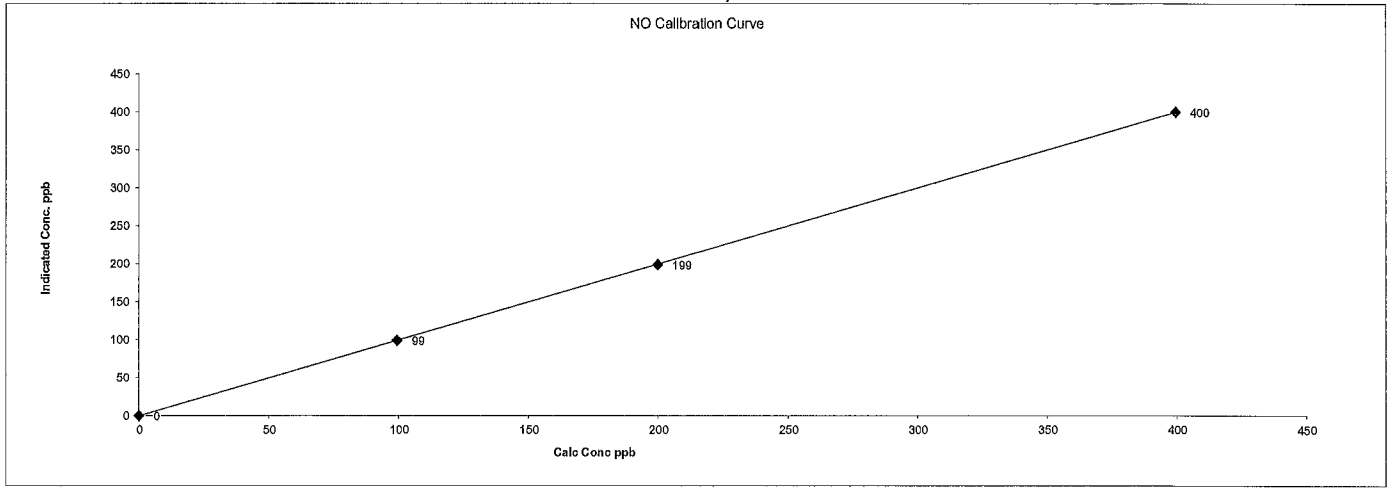
Comments:

Rebuilt Z/S check pump. Check exhaust pump is -24". Good. Renew Z/S check charcoal/purafil. After GPT calibration, do more point: NOx:399, NO:33, NO₂:366 for O3 check.

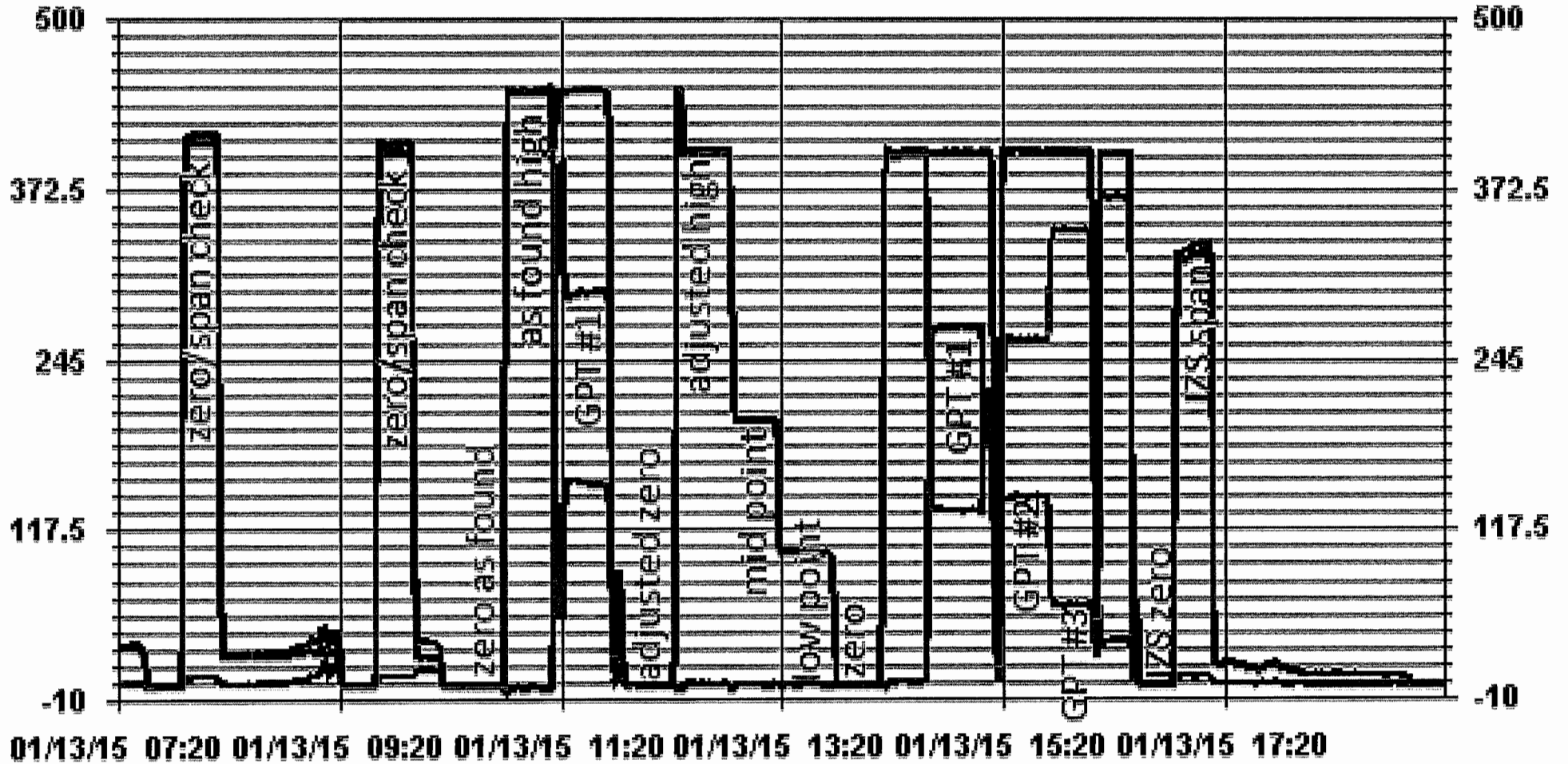
Date: 13-Jan-15
Company: LICA
Station Name/Location: Cold Lake South
Performed by: Limin Li

Start Time (mst): 12:00
End Time (mst): 17:20
Calibration Purpose: Post Repair
Cal Gas Expiry Date: 4-Feb-18

Thermo 42C NOx Analyzer Calibration



01 Minute Averages



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

OZONE

Maxxam Thermo 49i O₃ Analyzer Calibration

Date: <u>06-Jan-15</u>	Start Time (mst): <u>15:33</u>
Company: <u>LICA</u>	End Time (mst): <u>18:50</u>
Station Name/Location: <u>Cold Lake South</u>	Calibration Purpose: <u>routine monthly</u>
Performed by: <u>Tom Bourque</u>	G.P.T. Date: <u>6-Jan-15</u>

Analyzer: Serial Number: <u>700419951</u> Last Calibration Date: <u>41977</u> Previous Cal High Point C.F.: <u>0.996</u>	Range ppm: <u>500</u> As Found C.F.: <u>0.998</u> New C.F.: <u>0.987</u>
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	As found:	As left:
Motherboard:	O ₃ Bkg: <u>1.5</u>	O ₃ Bkg: <u>.2</u>
	O ₃ Coef: <u>1.062</u>	O ₃ Coef: <u>1.062</u>
	3.3 <u>3.3</u>	3.3 <u>3.3</u>
	15.0 <u>4.9</u>	15.0 <u>4.9</u>
	24.0 <u>15.1</u>	24.0 <u>15.1</u>
Interface Board:	-3.3 <u>-3.2</u>	-3.3 <u>-3.2</u>
	3.3 <u>3.2</u>	3.3 <u>3.2</u>
	5.0 <u>4.9</u>	5.0 <u>4.9</u>
	15.0 <u>14.8</u>	15.0 <u>14.8</u>
	-15.0 <u>-14.8</u>	-15.0 <u>-14.8</u>
Photo Lamp <u>23.6</u>	Photo Lamp <u>23.6</u>	
24.0 <u>8.7</u>	24.0 <u>8.7</u>	
O ₃ Lamp <u>9.0</u>	O ₃ Lamp <u>9.0</u>	
Bench: <u>26.7</u>	Bench: <u>26.7</u>	
Bench Lamp: <u>53.4</u>	Bench Lamp: <u>53.4</u>	
O ₃ Lamp: <u>67.4</u>	O ₃ Lamp: <u>67.4</u>	
Pressure: <u>345.5</u>	Pressure: <u>345.5</u>	
Cell A lpm: <u>.404</u>	Cell A lpm: <u>.404</u>	
Cell B lpm: <u>.428</u>	Cell B lpm: <u>.428</u>	
O ₃ ppb: <u>27.7</u>	O ₃ ppb: <u>27.7</u>	
Cell A ppb: <u>40.8</u>	Cell A ppb: <u>40.8</u>	
Cell B ppb: <u>13.8</u>	Cell B ppb: <u>13.8</u>	
Cell A int: <u>60990</u>	Cell A int: <u>60990</u>	
Cell B int: <u>58771</u>	Cell B int: <u>58771</u>	
Internal Span: <u>307</u>	Internal Span: <u>392</u>	

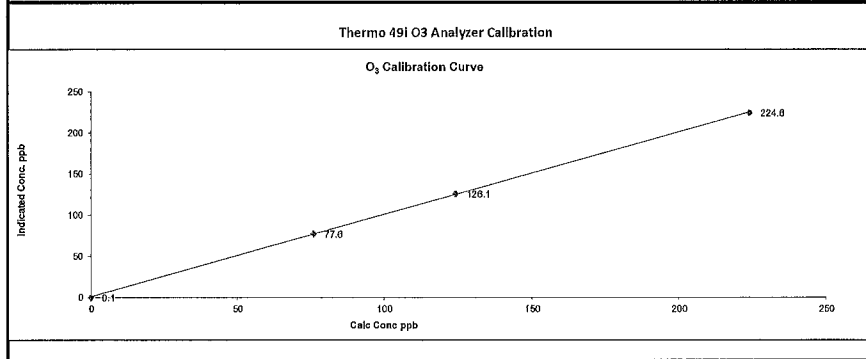
Callibrator: Make & Model: <u>EnviroNics 6100</u> Serial #: <u>4760</u> NOx Gas Cylinder I.D. #: <u>LL42475</u> NOx Cylinder Conc. (ppm): <u>50.1</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">point</th> <th style="text-align: center;">total flow (cc/min)</th> <th style="text-align: center;">O₃ setting (v or ppb)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">zero</td> <td style="text-align: center;">5033</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">high</td> <td style="text-align: center;">5033</td> <td style="text-align: center;">225</td> </tr> <tr> <td style="text-align: center;">mid</td> <td style="text-align: center;">5033</td> <td style="text-align: center;">125</td> </tr> <tr> <td style="text-align: center;">low</td> <td style="text-align: center;">5033</td> <td style="text-align: center;">75</td> </tr> </tbody> </table>	point	total flow (cc/min)	O ₃ setting (v or ppb)	zero	5033	0	high	5033	225	mid	5033	125	low	5033	75
point	total flow (cc/min)	O ₃ setting (v or ppb)														
zero	5033	0														
high	5033	225														
mid	5033	125														
low	5033	75														

Callibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	-
as found zero	5033	0.0	5033	0.0	-0.2	NA
adjusted zero	5033	0.0	5033	0.0	0.1	NA
as found high	5033	0.00	5033	224	224.6	0.998
mid	5033	0.00	5033	124	126.1	0.984
low	5033	0.00	5033	75.9	77.6	0.979
callibrator zero	5033	0.00	5033	0.0	0.2	NA

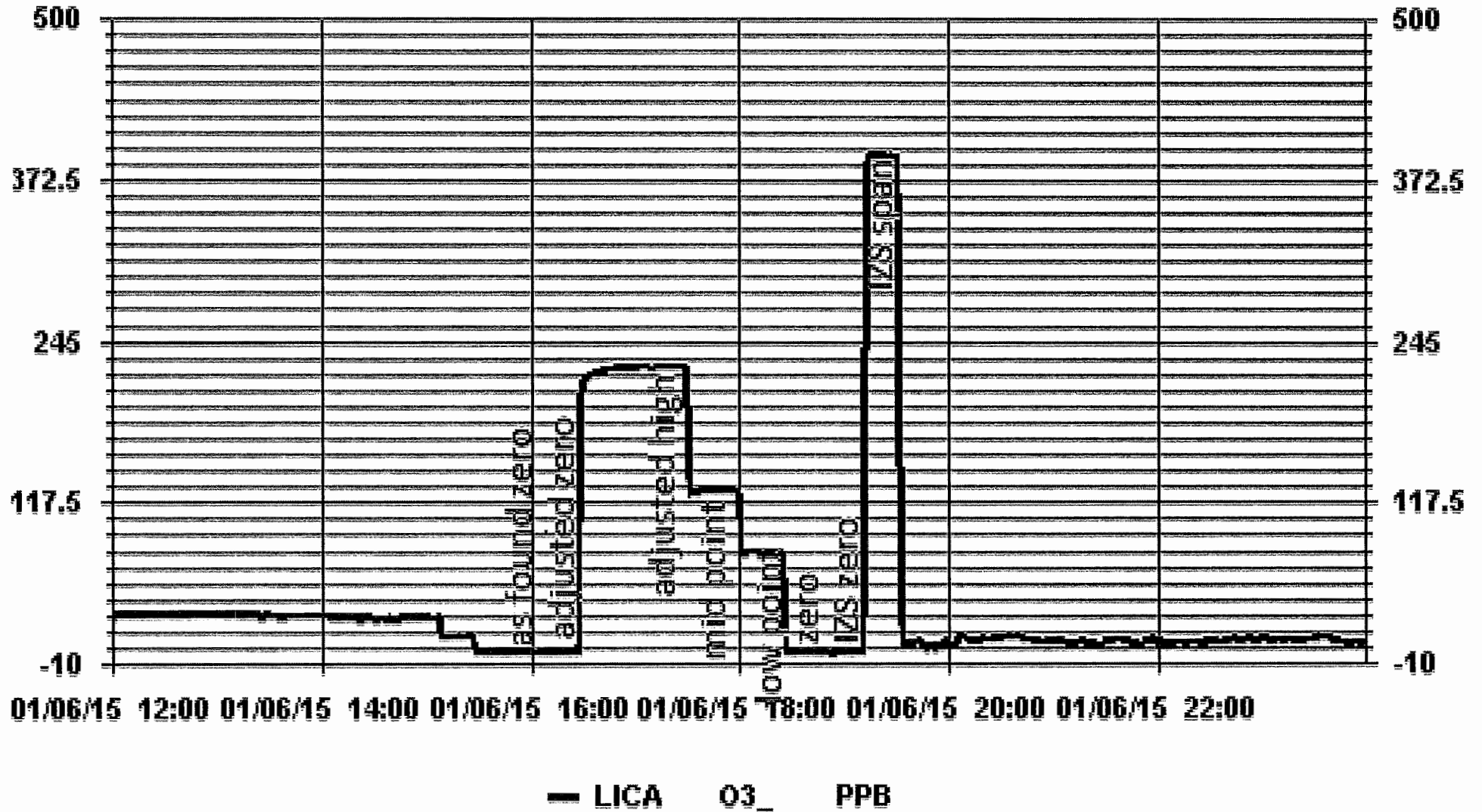
copy and paste flows and NO decrease from NOx cal in to calculated concentration Average C.F.= 0.987

Linear Regression/Calibration Results:				LIMITS	Pass/Fail ?
Correlation Coefficient =	<u>1.000</u>	> or = 0.995	PASS		
Slope =	<u>1.002</u>	0.85-1.15	PASS		
b (Intercept as % of full scale)=	<u>0.187%</u>	± 3% F.S.	PASS		
% change in C.F. from last cal	<u>0%</u>	± 15%	PASS		

Comments:
 changed sample filter, may be problem with pressure



01 Minute Averages



Maxxam Thermo 49i O₃ Analyzer Calibration

Date: <u>13-Jan-15</u>	Start Time (mst): <u>16:30</u>
Company: <u>LICA</u>	End Time (mst): <u>18:25</u>
Station Name/Location: <u>Cold Lake South</u>	Calibration Purpose: <u>As Found</u>
Performed by: <u>Lmln LI</u>	G.P.T. Date: <u>15-Oct-17</u>

Analyzer: Serial Number: <u>700419951</u>	Range ppm: <u>500</u>
Last Calibration Date: <u>6-Jan-15</u>	As Found C.F.: <u>1.000</u>
Previous Cal High Point C.F.: <u>1.000</u>	New C.F.: <u>1.000</u>

	As found:	As left:
Motherboard:	O ₃ Bkg: <u>0.2</u>	O ₃ Bkg: <u>0.2</u>
	O ₃ Coef: <u>1.059</u>	O ₃ Coef: <u>1.059</u>
	<u>3.3</u> <u>3.3</u>	<u>3.3</u> <u>3.3</u>
	<u>15.0</u> <u>15.1</u>	<u>15.0</u> <u>15.1</u>
	<u>24.0</u> <u>23.9</u>	<u>24.0</u> <u>23.9</u>
Interface Board:	<u>-3.3</u> <u>-3.2</u>	<u>-3.3</u> <u>-3.2</u>
	<u>3.3</u> <u>3.2</u>	<u>3.3</u> <u>3.2</u>
	<u>5.0</u> <u>4.9</u>	<u>5.0</u> <u>4.9</u>
	<u>15.0</u> <u>14.8</u>	<u>15.0</u> <u>14.8</u>
	<u>-15.0</u> <u>-14.9</u>	<u>-15.0</u> <u>-14.9</u>
Photo Lamp	<u>8.7</u>	<u>8.7</u>
	<u>24.0</u> <u>23.6</u>	<u>24.0</u> <u>23.6</u>
O ₃ Lamp	<u>9.0</u>	<u>9.0</u>
	<u>27.2</u>	<u>27.2</u>
Bench Lamp:	<u>53.4</u>	<u>53.4</u>
O ₃ Lamp:	<u>67.4</u>	<u>67.4</u>
Pressure:	<u>698.6</u>	<u>698.6</u>
Cell A lpm:	<u>0.708</u>	<u>0.708</u>
Cell B lpm:	<u>0.747</u>	<u>0.747</u>
O ₃ ppb:	<u>1.2</u>	<u>1.2</u>
Cell A ppb:	<u>4.4</u>	<u>4.4</u>
Cell B ppb:	<u>-2.4</u>	<u>-2.4</u>
Cell A Int:	<u>60939</u>	<u>60939</u>
Cell B Int:	<u>58795</u>	<u>58795</u>
Internal Span:	<u>320</u>	<u>282</u>

Calibrator:	Calibrator Flow Targets:															
Make & Model: <u>SABIO 2010</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>point</th> <th>total flow (cc/min)</th> <th>O₃ setting (v or ppb)</th> </tr> </thead> <tbody> <tr> <td>zero</td> <td>5000</td> <td>0</td> </tr> <tr> <td>high</td> <td>5000</td> <td>368</td> </tr> <tr> <td>mid</td> <td>5000</td> <td>110</td> </tr> <tr> <td>low</td> <td>5000</td> <td>45</td> </tr> </tbody> </table>	point	total flow (cc/min)	O ₃ setting (v or ppb)	zero	5000	0	high	5000	368	mid	5000	110	low	5000	45
point	total flow (cc/min)	O ₃ setting (v or ppb)														
zero	5000	0														
high	5000	368														
mid	5000	110														
low	5000	45														
Serial #: <u>042531101(0911)</u>																
NOx Gas Cylinder I.D. #: <u>BLM000428</u>																
NOx Cylinder Conc. (ppm): <u>50.7</u>																

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5000	0.0	5000	0.0	1.0	NA
adjusted zero	NA	0.0		0.0		NA
as found high	5000	0.00	5000	368.0	368.0	1.000
adjusted high	NA					
mid	NA					
low	NA					
calibrator zero	NA	0.00				NA

Average C.F.= 1.000

****copy and paste flows and NO decrease from NOx cal in to calculated concentration****

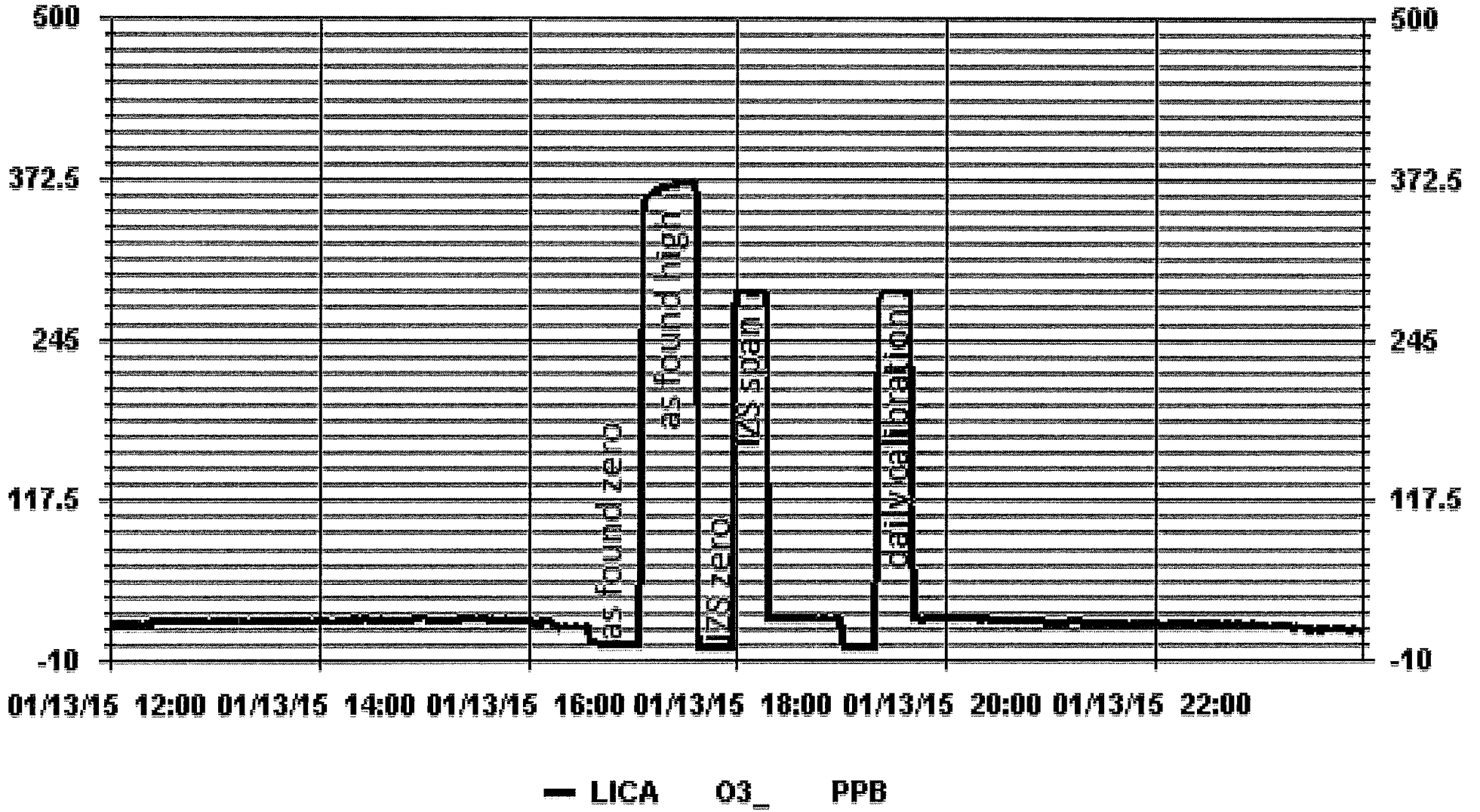
Linear Regression/Calibration Results:			
Correlation Coefficient =	<u>1.000</u>	LIMITS	Pass/Fail ?
Slope =	<u>1.000</u>	> or = 0.995	PASS
b (Intercept as % of full scale)=	<u>0.000%</u>	0.85-1.15	PASS
% change in C.F. from last cal	<u>0%</u>	± 3% F.S.	PASS
		± 15%	PASS

Comments:

Exhaust pump -24".

Thermo 49i O₃ Analyzer Calibration

01 Minute Averages



PARTICULATE MATTER

Maxxam **R & P 1405F TEOM PM 2.5 Analyzer Calibration**

Date: 06-Jan-15 Parameter: PM2.5
 Company: LICA Performed by: Tom Bourque
 Station Name/Location: Cold Lake South Start/End Time (mst): 1445-1628
 Previous Audit Date: 41996 Calibration Purpose: routine monthly

1400A Information and Status:

Serial Number:	<u>1405A201620804</u>	AS FOUND FILTER	<u>23 %</u>
Ko Factor:	<u>14578</u>	AS LEFT FILTER	<u>20.00</u>
Ambient Temperature °C:	<u>-18.27</u>	As Found Noise:	<u>0.009</u>
Ambient Pressure atm:	<u>.976</u>	As Left Noise:	<u>0.000</u>
Main Flow Reading lpm:	<u>3.00</u>	Pump Vacuum:	<u>0.36</u>
Aux Flow Reading lpm:	<u>13.69</u>	Warnings:	<u>pump vac</u>

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher Scientific</u>	<u>Fisher Scientific</u>
Model:	<u>475 Mark III</u>	<u>FB61291</u>	<u>FB61291</u>
Serial Number:	<u>NA</u>	<u>130168457</u>	<u>130168457</u>
Calibration Date:	<u>NA</u>	<u>41740</u>	<u>41740</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.03	0.19	0.03	0.20
	limit	0.15		0.15	
Bypass Flow	actual	0.27	0.25	0.26	0.25
	limit	0.60		0.60	

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.03	0.19	0.03	0.20
	limit	0.15		0.15	
Bypass Flow	actual	0.27	0.25	0.26	0.25
	limit	0.60		0.60	

As found temperature and pressure:

tolerance +/- 2.0°C		tolerance +/- 0.01 atm	
1405F temperature °C:	<u>-19.1</u>	1405F pressure atm:	<u>0.976</u>
reference temperature °C:	<u>-18.9</u>	reference pressure:	<u>0.957</u>
difference °C:	<u>0.2</u>	difference :	<u>0.019</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>-19.1</u>	1405F pressure atm:	<u>0.957</u>
reference temperature °C:	<u>-18.9</u>	reference pressure:	<u>0.957</u>
difference °C:	<u>0.2</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>3.03</u>	reference total/aux flow lpm: <u>16.63</u>
difference lpm: <u>0.03</u>	difference lpm: <u>-0.04</u>

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

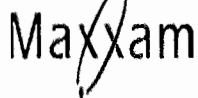
main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>3.03</u>	reference total/aux flow lpm: <u>16.63</u>
difference lpm: <u>0.03</u>	difference lpm: <u>-0.04</u>

K_o Audit:

Last K _o audit date:	<u>41760</u>
1405F K _o factor:	<u>14578</u>
Measured K _o factor:	<u>NA</u>
% difference:	<u>NA</u>

Comments:

pump vac alarm caused by pump bleing on floor and was very cold - moved to shelf and it warmed up, the vacuum got stronger and the alarm went away



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: 26-Jan-15
 Company: LICA
 Station Name/Location: Cold Lake South
 Previous Audit Date: 6-Jan-15

Parameter: PM 2.5
 Performed by: Alex Yakupov
 Start/End Time (mst): 17:05 / 18:36
 Calibration Purpose: 2nd Audit

1400A Information and Status:

Serial Number: <u>1405A20620804</u>	As Found Filter Loading %: <u>27.36</u>
Ko Factor: <u>14578</u>	As Left Filter Loading %: <u>0.68</u>
Ambient Temperature °C: <u>3.73</u>	As Found Noise: <u>0.010</u>
Ambient Pressure atm: <u>0.918</u>	As Left Noise: <u>0.000</u>
Main Flow Reading lpm: <u>3.00</u>	Pump Vacuum: <u>0.33</u>
Aux Flow Reading lpm: <u>13.67</u>	Warnings: <u>None</u>

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	Dwyer	Fisher	Fisher
Model:	475 Mark III	FB61291	FB61291
Serial Number:	NA	130168457	130168457
Calibration Date:	NA	11-Apr-14	11-Apr-14

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.02	0.23	0.04	0.22
	limit	0.15	0.23	0.15	0.22
Bypass Flow	actual	0.26	0.29	0.20	0.29
	limit	0.60	0.29	0.60	0.29

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.02	0.23	0.04	0.22
	limit	0.15	0.23	0.15	0.22
Bypass Flow	actual	0.26	0.29	0.20	0.29
	limit	0.60	0.29	0.60	0.29

As found temperature and pressure:

tolerance +/- 2.0°C 1405F temperature °C: <u>3.7</u> reference temperature °C: <u>3.4</u> difference °C: <u>-0.3</u>	tolerance +/- 0.01 atm 1405F pressure atm: <u>0.918</u> reference pressure: <u>0.927</u> difference: <u>-0.009</u>
---	---

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

tolerance +/- 2.0°C 1405F temperature °C: <u>3.7</u> reference temperature °C: <u>3.4</u> difference °C: <u>-0.3</u>	tolerance +/- 0.01 atm 1405F pressure atm: <u>0.918</u> reference pressure: <u>0.927</u> difference: <u>0.009</u>
---	--

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm 1405F main flow lpm: <u>3.00</u> reference main flow lpm: <u>3.03</u> difference lpm: <u>0.03</u>	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7% 1400A total/aux flow lpm: <u>13.64</u> reference total/aux flow lpm: <u>13.62</u> difference lpm: <u>-0.02</u>
--	--

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

main flow tolerance 3.00 lpm +/- 0.20 lpm 1405F main flow lpm: <u>3.00</u> reference main flow lpm: <u>3.03</u> difference lpm: <u>0.03</u>	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7% 1400A total/aux flow lpm: <u>13.64</u> reference total/aux flow lpm: <u>13.62</u> difference lpm: <u>-0.02</u>
--	--

K_o Audit:

Last K_o audit date: 1-May-14
 1405F K_o factor: 14578
 Measured K_o factor: NA
 % difference: NA

Comments:

Filters changed

WIND SYSTEM

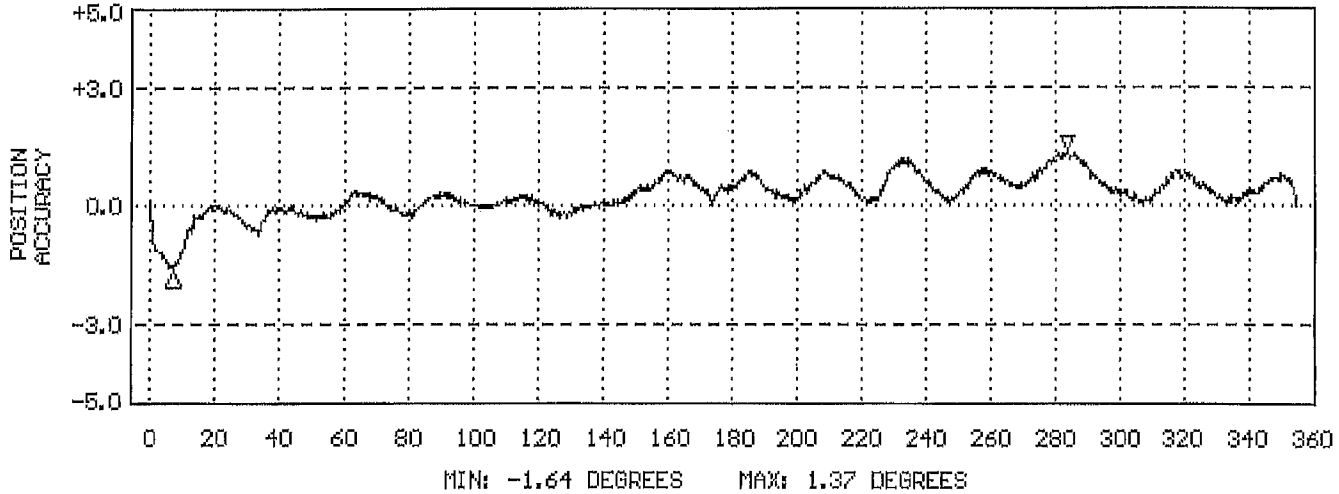
R. M. YOUNG COMPANY WIND SENSOR CALIBRATION CERTIFICATE

SENSOR: 05103 WIND MONITOR
SENSOR SERIAL NUMBER: WM129612
BEARINGS: SEALED/GREASE LUBE
DATE: OCT 21 2013

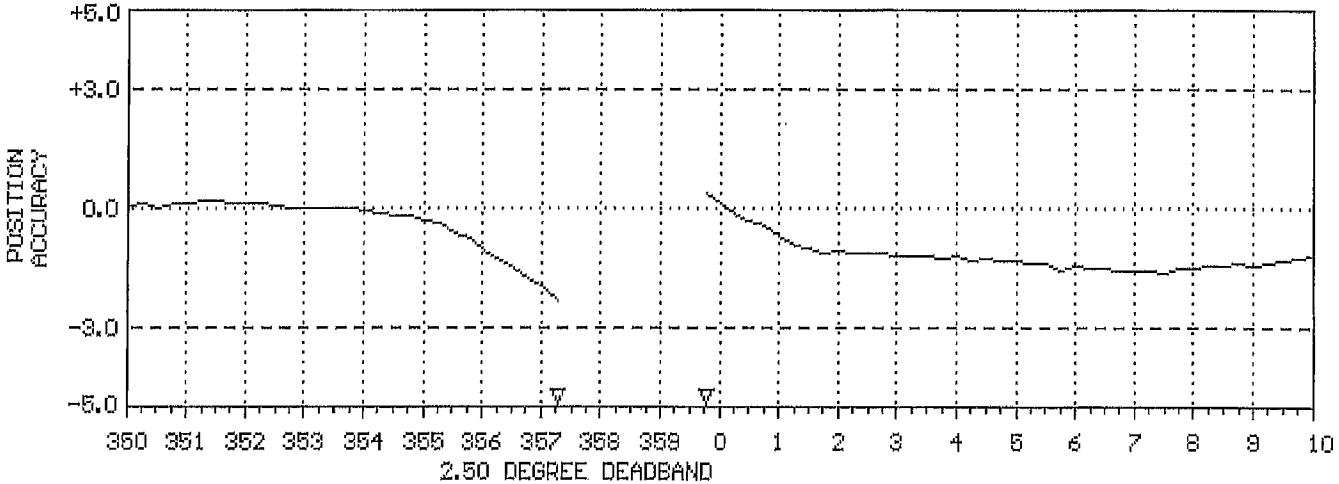
WIND SPEED THRESHOLD TEST: PASS
LOW WIND SPEED AMPLITUDE/FREQUENCY TEST: PASS
HIGH WIND SPEED AMPLITUDE/FREQUENCY TEST: PASS
VANE TORQUE TEST: PASS
SPECIAL NOTES:
SPECIAL NOTES:



AZIMUTH POSITION vs ACCURACY



AZIMUTH POSITION vs ACCURACY



NOTE: Azimuth Position vs Accuracy graphs are accurate to within 0.5 degrees. The accuracy shown in the potentiometer deadband region between 355 and 0 degrees is the result of no resistance change while position changes. The gap represents the actual deadband (open circuit).

CALIBRATORS

Company Maxxam Operator: Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Enviroincs 6100</u>	Make/Model	<u>N/A</u>
Serial Number	<u>4760</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>December 2013</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>LL42475</u>	Barometric Pressure	<u>N/A</u>
NO/NOX Concentration	<u>48.5/48.5</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>	Gas flows not available from display.	

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4980	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
4993	0.0	0.799	0.799	0.840	-0.001	0.839	5%	5%
4994	0.0	0.399	0.399	0.420	-0.001	0.419	5%	5%
4991	0.0	0.200	0.200	0.211	0.000	0.211	5%	5%
Absolute Average Percent Difference							5%	5%

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)=	1.0511	0.90-1.10		m (Slope)=	1.0496
b (Intercept % of FS)=	0.0400	± 3% F.S.		b (Intercept % of FS)=	0.0400

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas		
4993	0.000	0.000	0.823	-0.001	0.822	NO ₂	% Diff. Limit	
4993	0.480	0.530	0.293	0.530	0.823	0	± 10%	
4993	0.240	0.269	0.554	0.269	0.823	0	± 10%	
4993	0.090	0.096	0.727	0.097	0.824	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)=	1.0006	0.90-1.10	
b (Intercept % of FS)=	-0.0132	± 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>December 15, 2014</u>
		Full Scale (ppm)	<u>1.0</u>

COMMENTS: _____

Auditor: Al Clark
Operator Signature: [Signature]

Date: December 17, 2014
Location: McIntyre Center Edmonton



Calibrator Performance Audit Oxides Of Nitrogen

File No. 2013-322A

Company <u>Maxxam</u>		Operator: <u>Limin Li</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sablo 2010</u>	Make/Model	<u>N/A</u>
Serial Number	<u>042531101</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>Jan 2012</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>BAL1263</u>	Barometric Pressure	<u>N/A</u>
NO/NOx Concentration	<u>51.3 / 51.3</u>		

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

Calibrator Flow (scfm)		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	0.000	0.000	Limit ± 10%	
4999	78.0	0.800	0.800	0.785	-0.002	0.783	-2%	-2%
4998	39.0	0.400	0.400	0.396	-0.001	0.395	-1%	-1%
4999	19.5	0.200	0.200	0.196	-0.001	0.195	-2%	-3%
Absolute Average Percent Difference							2%	2%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NO_x			
Correlation=	1.0000	≥	0.990	Correlation=	1.0000		
m (Slope)=	0.9819		0.90-1.10	m (Slope)=	0.9796		
b (Intercept % of FS)=	0.0600	±	3% F.S.	b (Intercept % of FS)=	0.0400		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
4999	0.000	0.000	0.783	-0.003	0.780	NO ₂	% Diff. Limit
4999	0.520	0.550	0.233	0.546	0.778	0	± 10%
4999	0.280	0.300	0.483	0.297	0.781	0	± 10%
4999	0.100	0.109	0.674	0.108	0.782	0	± 10%
Absolute Average Percent Difference						0	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO₂		LIMITS					
Correlation=	1.0000	≥	0.995				
m (Slope)=	0.9967		0.90-1.10				
b (Intercept % of FS)=	-0.1864	±	3% F.S.				

AENV Standards Audit Calibrator		NO_x Analyzer	
Make/Model	<u>Teco 1461</u>	Make/Model	<u>Teco 421</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
		Last Calibration Date	<u>December 4, 2013</u>
		Full Scale (ppm)	<u>1.0</u>

COMMENTS: _____

Auditor: Al Clark Date: December 4, 2013

Operator Signature: *Limin Li* Location: McIntyre Center Edmonton



Calibrator Performance Audit

Hydrogen Sulphide (by Cylinder Dilution)

File No. 2012-301A

Company: Maxxam Operator: Ting Xu

Calibrator:	Flow Measurement Device:
Make/Model <u>API 700</u>	Make/Model <u>N/A</u>
Serial Number <u>831</u>	Serial Number <u>N/A</u>
Last Verification Date <u>Dec 21/11</u>	Temperature (°C) <u>N/A</u>
H ₂ S Cylinder Conc. <u>LL42648</u>	Barometric Pressure <u>N/A</u>
H ₂ S Cylinder S/N <u>10.0</u>	

Flow Measurements

Pt. No. 1 40 Pt. No. 2 20 Pt. No. 3 11.5

Calibrator Flow (scfm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
Zero Air	0.0000	0.0000		
4960	0.0800	0.0809	1%	± 10%
4977	0.0400	0.0404	1%	± 10%
4987	0.0230	0.0234	2%	± 10%
Absolute Average Percent Difference			1%	± 10%

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

H ₂ S	LIMITS
Correlation = 1.0000	≥ 0.995
m (Slope) = 1.0107	0.90-1.10
b (Intercept % of FS) = 0.0439	± 3% F.S.

AENV Standards	H ₂ S Analyzer
Audit Calibrator	Make/Model <u>Teco 45C</u>
Make/Model <u>R&R MFC 201</u>	Serial/AMU Number <u>AMU 1624</u>
Serial/AMU Number <u>AMU 1690</u>	Last Calibration Date <u>Dec13/12</u>
	Full Scale (ppm) <u>0.1</u>

COMMENTS: _____

Auditor: Al Clark Date: Decemebr 13, 2012
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

NO Cylinder Gas

File No. 2014-252CGA

Company: Maxxam Operators name: Limin Li
Cylinder #: LL42475 Conc (PPM) 48.5/48.5 Tolerance (%) 1 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model Teco 146i
Serial Number AMU 1809
Last Verification Date December 15, 2014
Gas Type NO Conc. 48.79
Cylinder Number CAL017892

Flow Measurement Device:

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

Reference Analyzer:

Make/Model Teco 42i Serial/AMU Number: 1868
Instrument Settings Zero: 4.3 Span: 1.017 Range: 1.0
Last Calibration: Date: Dec15/14 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				
4983	82.8	0.830	0.832	0.01662	60.181	50.0	50.1
4998	40.9	0.414	0.415	0.00818	122.200	50.6	50.7
4981	20.3	0.206	0.206	0.00408	245.369	50.5	50.5
Average Cylinder Concentration:						50.4	50.4

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>48.5</u>	<u>48.5</u>
Percent variance from Stated: <u>3.8</u>	<u>4.0</u>

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration Contains 50.3 ppm of SO2.
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder:

Auditor: Al Clark Date: December 16, 2014
Operator Signature: [Signature] Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2013-324CGA

Company: Maxxam **Operator's Name:** Chris Wesson
Cylinder #: BLM005049 **Concentration PPM:** 10.1 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
Serial Number: AMU 1690
Last Verification Date: February 21, 2013
Gas Type: H2S **Conc.** 20.02
Cylinder Number: D249558

Flow Measurement Device:

Make/Model: Blos DC2
Serial Number: AMU 1659
Temp, °C: 21.0 C
B.P. 696 mmhg

Reference Analyzer:

Make/Model: Teco 45C **Serial/AMU Number:** 1624
Instrument Settings: **Zero:** 7.5 **Span:** 1.023 **Range:** 0.1
Last Calibration: **Date:** Feb 21/13 **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
5103	38.2	0.0768	0.00749	133.586	10.3
5087	17.9	0.0355	0.00352	284.190	10.1
5064	9.2	0.0182	0.00182	550.435	10.0
Average Cylinder Concentration:					10.1

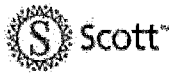
Previous Stated Concentration PPM: 10.1

Percent variance from Stated: 0.2

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: *Chris Wesson*

Date: February 21, 2013
Location: McIntyre Center Edmonton



500 WEAVER PARK RD, LONGMONT, CO 80501 Phone: 888-253-1635 Fax: 303-772-7673

COMPLIANCE CLASS

Guaranteed +/- 2% Accuracy

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A42014
 AIR LIQUIDE AMERICA SPECIALTY GASES LLC
 500 WEAVER PARK RD
 LONGMONT, CO 80501

P.O. No.: 1218334
 Document #: 53834050-001

Customer
 AIR LIQUIDE CANADA
 HARRY GE/PO 1218334
 10020 56TH AVENUE
 EDMONTON T6E 5Z2
 ALBERTA CANADA

ANALYTICAL INFORMATION Gas Type : NO,SO2,BALN

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1. EPA/600/R-12/531; May 2012. Do not use this standard if pressure is less than 100 psig.

Cylinder Number: BLM000428 Certification Date: 03Feb2014 Exp. Date: 04Feb2018
 Cylinder Pressure: 1900 PSIG Batch No: LGM0109922

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY (ABSOLUTE / RELATIVE)
NITRIC OXIDE	50.7 PPM	0.4 PPM / 0.8 %
SULFUR DIOXIDE	48.8 PPM	0.6 PPM / 1.2 %
NITROGEN - OXYGEN FREE	BALANCE	
TOTAL OXIDES OF NITROGEN	50.8 PPM	Reference Value Only

TRACEABILITY

REFERENCE STANDARD COMPONENT	CONCENTRATION	UNCERTAINTY	CYLINDER	TYPE/SRM SAMPLE	EXP. DATE
NITRIC OXIDE	49.4600 PPM	0.4000 PPM	KAL003885	NTRM 1683/051711	15Mar2018
SULFUR DIOXIDE	49.6700 PPM	0.5000 PPM	KAL003244	NTRM 1693	20Aug2016

ANALYTICAL METHOD

1st Analysis: 27Jan2014

COMPONENT	INSTRUMENT	ANALYTICAL/PRINCIPLE	CALIBRATED	CONCENTRATION
NITRIC OXIDE	MKS ONLINE/2030/0929062	FTIR	08Jan2014	50.84 PPM
SULFUR DIOXIDE	MKS ONLINE/2030/0929062	FTIR	04Jan2014	48.83 PPM

2nd Analysis: 03Feb2014

COMPONENT	INSTRUMENT	ANALYTICAL/PRINCIPLE	CALIBRATED	CONCENTRATION
NITRIC OXIDE	MKS ONLINE/2030/0929062	FTIR	08Jan2014	50.58 PPM
SULFUR DIOXIDE	MKS ONLINE/2030/0929062	FTIR	04Jan2014	48.71 PPM

Special Notes:

Note on Tags and Carts: ALC Stock Number: SPG- 3MX0020758 Transfer cost approved by Sarah Herbert NOTE: END USER IS REQUESTING THAT THE ORDER COME FROM LONGMONT AS THEY HAVE HAD ISSUES WITH SOME EPAS SHIPPED FROM TROY

QUALITY ASSURANCE

APPROVED BY: JON WITZAK
 (signature on file)



Praxair Canada, Inc.
 9075 56th Street
 Edmonton, AB T5D 2X5
 Tel: 780-443-0778
 Fax: 780-443-6302

03/27/2014

MAXXAM ANALYTICS INC "LNA"
 8372 43TH ST
 EDMONTON, AB T5B 2L7

Work Order No. 20248656
 Customer Reference No.

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

CERTIFICATE OF ANALYSIS
Primary Standard

Component	Requested Concentration	Certified Concentration	Analytical Purpose	Analytical Accuracy
Methane	100 ppm	801 ppm	U	±1% rel
Ethane	200 ppm	202 ppm	U	±1% rel
Nitrogen	Balance	Balance		

Analytical Instrument: Mettler Toledo Analytical Balance-102axUSA--
 Hewlett Packard (Agilent) 1130-OC-FSD

Cylinder Date: AQ
 Cylinder Pressure: 2200 psig
 Cylinder Volume: 82.0 L
 Valve Drive Connection: CGA-330
 Cylinder No.: U3474

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


 Analyst: Todd Hoyt

This certificate is valid only when used in conjunction with the Praxair Canada, Inc. Certificate of Analysis (COA) prepared by gravimetric, volumetric or partial pressure techniques. The following standard is used as a reference standard for the purposes of this certificate unless otherwise specified. The following standard is used as a reference standard for the purposes of this certificate unless otherwise specified.

- 1. Gas Chromatography with Thermal Conductivity Detector
- 2. Gas Chromatography with Flame Ionization Detector
- 3. Gas Chromatography with Infrared Spectroscopy
- 4. Gas Chromatography with Mass Spectrometry
- 5. Gas Chromatography with Photoacoustic Spectroscopy
- 6. Gas Chromatography with Electrode Response
- 7. Gas Chromatography with Gas Density
- 8. Gas Chromatography with Gas Density and Infrared Spectroscopy
- 9. Gas Chromatography with Gas Density and Mass Spectrometry
- 10. Gas Chromatography with Gas Density and Photoacoustic Spectroscopy
- 11. Gas Chromatography with Gas Density and Thermal Conductivity Detector
- 12. Gas Chromatography with Gas Density and Flame Ionization Detector
- 13. Gas Chromatography with Gas Density and Infrared Spectroscopy
- 14. Gas Chromatography with Gas Density and Mass Spectrometry
- 15. Gas Chromatography with Gas Density and Photoacoustic Spectroscopy
- 16. Gas Chromatography with Gas Density and Electrode Response
- 17. Gas Chromatography with Gas Density and Gas Density
- 18. Gas Chromatography with Gas Density and Infrared Spectroscopy
- 19. Gas Chromatography with Gas Density and Mass Spectrometry
- 20. Gas Chromatography with Gas Density and Photoacoustic Spectroscopy

This information is provided for your reference and is not intended to be used as a substitute for the Praxair Canada, Inc. Certificate of Analysis (COA) prepared by gravimetric, volumetric or partial pressure techniques. The following standard is used as a reference standard for the purposes of this certificate unless otherwise specified. The following standard is used as a reference standard for the purposes of this certificate unless otherwise specified.

APPENDIX IV
ANALYTICAL RESULTS

PASSIVE SAMPLES

Your Project #: 2014/12/29 - 2015/01/28

Site Location: LICA

Attention: MICHAEL BISAGA

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

Report Date: 2015/02/13

Report #: R1802805

Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B508255

Received: 2015/02/02, 11:45

Sample Matrix: Air
Samples Received: 33

Analyses	Quantity	Date		Laboratory Method	Analytical Method
		Extracted	Analyzed		
H2S Passive Analysis (1)	1	2015/02/10	2015/02/13	PTC SOP-00150	Tang.Passive H2S in
H2S Passive Analysis (1)	19	2015/02/12	2015/02/13	PTC SOP-00150	Tang.Passive H2S in
NO2 Passive Analysis (1)	25	2015/02/04	2015/02/13	PTC SOP-00148	Passive NO2 in ATM
O3 Passive Analysis (1)	25	2015/02/05	2015/02/13	PTC SOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	13	2015/02/04	2015/02/13	PTC SOP-00149	Tang Passive SO2 in
SO2 Passive Analysis (1)	16	2015/02/05	2015/02/13	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
13 Feb 2015 10:38:51 -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 #: B508255
Report Date: 2015/02/13

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2014/12/29 - 2015/01/28
Site Location: LICA
Sampler Initials: WA

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		LP7251	LP7252	LP7253	LP7254	LP7255	LP7256	LP7257		
Sampling Date		2014/12/29 15:42	2014/12/29 14:22	2014/12/29 13:34	2014/12/29 12:33	2014/12/29 16:34	2014/12/30 17:17	2014/12/30 13:30		
	Units	3	4	5	6	8	9	10	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	0.09		0.15				0.15	0.02	7807032
Calculated NO2	ppb	2.0	2.4	2.0	8.8	1.7	2.8	6.4	0.1	7798229
Calculated O3	ppb	29.45	33.82	31.75	21.39	31.45	29.71	26.36	0.1	7800050
Calculated SO2	ppb	0.7	1.1	0.9	0.7	0.4	0.6	0.4	0.1	7797778
RDL = Reportable Detection Limit										

Maxxam ID		LP7258	LP7259	LP7260	LP7261	LP7262	LP7263		
Sampling Date		2014/12/29	2014/12/30 11:11	2014/12/30 14:25	2014/12/30 15:11	2014/12/30 16:16	2014/12/29 10:01		
	Units	11	12	13	14	15	16	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	MISSING	0.09	0.09	0.11		0.10	0.02	7807032	
Calculated NO2	ppb	MISSING	1.5	2.0	4.6	3.5	3.6	0.1	7798229	
Calculated O3	ppb	MISSING	28.09	32.29	28.29	28.71	26.17	0.1	7800055	
Calculated SO2	ppb	MISSING	0.5	0.8	1.7	0.5	0.6	0.1	7797778	
RDL = Reportable Detection Limit										

Maxxam ID		LP7264	LP7265	LP7266	LP7267	LP7268	LP7269	LP7270		
Sampling Date		2014/12/29 11:42	2014/12/29 10:35	2014/12/29 09:32	2014/12/28 21:19	2014/12/30 18:19	2014/12/29 13:05	2014/12/30 12:09		
	Units	17	18	19	22	23	24	25	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	0.15	0.08		0.16		0.12	0.12	0.02	7807032
Calculated NO2	ppb	3.0	2.3	2.5	3.7	1.0	5.6		0.1	7798229
Calculated O3	ppb	28.25	26.37	31.12	24.23	24.54	26.17		0.1	7800055
Calculated SO2	ppb	0.8	MISSING	0.5	0.4	0.3	0.6	0.6	0.1	7799164
RDL = Reportable Detection Limit										

Maxxam ID		LP7271	LP7272		LP7273	LP7274	LP7275	LP7276		
Sampling Date		2014/12/30 14:52	2014/12/30 15:27		2014/12/29 17:10	2014/12/28 21:19	2014/12/29 15:04	2014/12/28 16:40		
	Units	26	27	QC Batch	28	29	32	36	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	0.13	0.16	7807032		0.12	0.14	0.12	0.02	7807032
Calculated NO2	ppb			7798229	7.9	5.4	2.0	6.3	0.1	7798233
Calculated O3	ppb			7800055	24.95	26.92	31.01	23.37	0.1	7800055
Calculated SO2	ppb	0.6	1.6	7799164	0.6	0.5	0.7	0.6	0.1	7799164
RDL = Reportable Detection Limit										

Maxxam Job #: B508255
Report Date: 2015/02/13

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2014/12/29 - 2015/01/28
Site Location: LICA
Sampler Initials: WA

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		LP7279	LP7280	LP7281	LP7282	LP7283	LP7284	LP7285		
Sampling Date		2014/12/30 12:09	2014/12/30 14:52	2014/12/30 15:27	2014/12/28 21:19	2014/12/29 15:04	2014/12/29 15:04	2014/12/28 16:40		
	Units	25 DUP	26 DUP	27 DUP	29 DUP	32 DUP	32 DUP	36 DUP	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb						0.10	0.12	0.02	7807032
Calculated NO2	ppb				3.7	2.0			0.1	7798233
Calculated O3	ppb				21.85	32.91			0.1	7800055
Calculated SO2	ppb	0.7	0.5	1.7					0.1	7799164
RDL = Reportable Detection Limit										

Maxxam Job #: B508255
Report Date: 2015/02/13

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2014/12/29 - 2015/01/28
Site Location: LICA
Sampler Initials: WA

GENERAL COMMENTS

Sample: LP7258 (#11) and LP7265 (#18) for SO2 parameter was not returned to the lab. - DF
Sample: LP7258 (#11) for O3 parameter was not returned to the lab. - OZ

Results relate only to the items tested.

Maxxam Job #: B508255
Report Date: 2015/02/13

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2014/12/29 - 2015/01/28
Site Location: LICA
Sampler Initials: WA

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7797778	DF4	Spiked Blank	Calculated SO2	2015/02/04		107	%	90 - 110
7797778	DF4	Method Blank	Calculated SO2	2015/02/04	<0.1		ppb	
7798229	SS6	Spiked Blank	Calculated NO2	2015/02/04		95	%	90 - 110
7798229	SS6	Method Blank	Calculated NO2	2015/02/04	<0.1		ppb	
7798233	SS6	Spiked Blank	Calculated NO2	2015/02/04		97	%	90 - 110
7798233	SS6	Method Blank	Calculated NO2	2015/02/04	<0.1		ppb	
7799164	DF4	Spiked Blank	Calculated SO2	2015/02/05		101	%	90 - 110
7799164	DF4	Method Blank	Calculated SO2	2015/02/05	<0.1		ppb	
7800050	OZ	Spiked Blank	Calculated O3	2015/02/05		101	%	90 - 110
7800050	OZ	Method Blank	Calculated O3	2015/02/05	<0.1		ppb	
7800055	OZ	Spiked Blank	Calculated O3	2015/02/05		98	%	90 - 110
7800055	OZ	Method Blank	Calculated O3	2015/02/05	<0.1		ppb	
7807032	SSZ	Spiked Blank	Calculated H2S	2015/02/12		100	%	90 - 110

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.

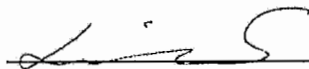
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Maxxam Job #: B508255
Report Date: 2015/02/13

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2014/12/29 - 2015/01/28
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.

VOC SAMPLES

RESULTS TO: Lily Lin LICA 4000, 19 St NE Calgary AB INVOICE TO: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB	403-219-3661 T2E 6P8 780 812-2182 T9N 2J5	LABORATORY SAMPLE ID: 15010042-001 MATRIX: Ambient Air CLIENT SAMPLE ID: LICA/VOC/CLS/Jan 6, 2015 CANISTER ID: H2822 DESCRIPTION: CLS DATE SAMPLED: 06-Jan-15 0:00 DATE RECEIVED: 13-Jan-15 REPORT CREATED: 29-Jan-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
1,1,1-Trichloroethane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1,1,2,2-Tetrachloroethane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1,1,2-Trichloroethane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1,1-Dichloroethane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1,1-Dichloroethylene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1,2,3-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1,2,4-Trichlorobenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1,2,4-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1,2-Dibromoethane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1,2-Dichlorobenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1,2-Dichloroethane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1,2-Dichloropropane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1,3,5-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1,3-Butadiene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1,3-Dichlorobenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1,4-Dichlorobenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1,4-Dioxane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1-Butene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1-Hexene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
1-Pentene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
2,2,4-Trimethylpentane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
2,2-Dimethylbutane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
2,3,4-Trimethylpentane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
2,3-Dimethylbutane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
2,3-Dimethylpentane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
2,4-Dimethylpentane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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RESULTS TO: Lily Lin LICA 4000, 19 St NE Calgary AB INVOICE TO: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB	403-219-3661 T2E 6P8 780 812-2182 T9N 2J5	LABORATORY SAMPLE ID: 15010042-001 MATRIX: Ambient Air CLIENT SAMPLE ID: LICA/VOC/CLS/Jan 6, 2015 CANISTER ID: H2822 DESCRIPTION: CLS DATE SAMPLED: 06-Jan-15 0:00 DATE RECEIVED: 13-Jan-15 REPORT CREATED: 29-Jan-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
Ethanol		1.43	ppbv	0.03	AC-058	16-Jan-15
Ethyl acetate	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Ethylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Freon-11	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Freon-113	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Freon-114	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Freon-12		0.69	ppbv	0.03	AC-058	16-Jan-15
Hexachloro-1,3-butadiene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Isobutane		1.72	ppbv	0.03	AC-058	16-Jan-15
Isopentane		0.92	ppbv	0.03	AC-058	16-Jan-15
Isoprene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Isopropyl alcohol	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Jan-15
Isopropylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
m,p-Xylene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
m-Diethylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
m-Ethyltoluene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Methyl butyl ketone	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Methyl ethyl ketone	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Methyl isobutyl ketone	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Methyl methacrylate	K, T, U	< 0.06	ppbv	0.05	AC-058	16-Jan-15
Methyl tert butyl ether	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Methylcyclohexane	I	0.26	ppbv	0.03	AC-058	16-Jan-15
Methylcyclopentane	I	0.20	ppbv	0.03	AC-058	16-Jan-15
Methylene chloride	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
n-Butane		2.00	ppbv	0.03	AC-058	16-Jan-15
n-Decane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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RESULTS TO: Lily Lin LICA 4000, 19 St NE Calgary AB INVOICE TO: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB	403-219-3661 T2E 6P8 780 812-2182 T9N 2J5	LABORATORY SAMPLE ID: 15010042-001 MATRIX: Ambient Air CLIENT SAMPLE ID: LICA/VOC/CLS/Jan 6, 2015 CANISTER ID: H2822 DESCRIPTION: CLS DATE SAMPLED: 06-Jan-15 0:00 DATE RECEIVED: 13-Jan-15 REPORT CREATED: 29-Jan-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
n-Dodecane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
n-Heptane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
n-Hexane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
n-Octane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
n-Pentane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
n-Propylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
n-Undecane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Naphthalene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
n-Nonane	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
o-Ethyltoluene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
o-Xylene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
p-Diethylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
p-Ethyltoluene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Styrene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Tetrachloroethylene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Tetrahydrofuran	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Toluene	I	0.18	ppbv	0.03	AC-058	16-Jan-15
trans-1,2-Dichloroethylene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
trans-1,3-Dichloropropylene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
trans-2-Butene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
trans-2-Pentene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Trichloroethylene	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Vinyl acetate	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15
Vinyl chloride	K, T, U	< 0.06	ppbv	0.03	AC-058	16-Jan-15

Qualifiers

- K Off-scale low. Actual value is known to be less than the value given
- T Value reported is less than the laboratory method detection limit
- U Compound was analyzed for but not detected
- I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

Certified By: Graham Knox, Ops Manager
On behalf of: PJ Pretorius, Portfolio Manager, EAS

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

RESULTS TO: Lily Lin LICA 4000, 19 St NE Calgary AB INVOICE TO: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB	403-219-3661 T2E 6P8 780 812-2182 T9N 2J5	LABORATORY SAMPLE ID: 15010129-002 MATRIX: Ambient Air CLIENT SAMPLE ID: LICA/VOC/CLS/Jan 12, 2015 CANISTER ID: 14710 DESCRIPTION: CLS DATE SAMPLED: 12-Jan-15 0:00 DATE RECEIVED: 20-Jan-15 REPORT CREATED: 02-Feb-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
1,1,1-Trichloroethane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1,1,2,2-Tetrachloroethane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1,1,2-Trichloroethane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1,1-Dichloroethane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1,1-Dichloroethylene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1,2,3-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1,2,4-Trichlorobenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1,2,4-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1,2-Dibromoethane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1,2-Dichlorobenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1,2-Dichloroethane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1,2-Dichloropropane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1,3,5-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1,3-Butadiene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1,3-Dichlorobenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1,4-Dichlorobenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1,4-Dioxane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1-Butene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1-Hexene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
1-Pentene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
2,2,4-Trimethylpentane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
2,2-Dimethylbutane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
2,3,4-Trimethylpentane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
2,3-Dimethylbutane	I	0.23	ppbv	0.03	AC-058	22-Jan-15
2,3-Dimethylpentane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
2,4-Dimethylpentane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15

Qualifiers

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Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

RESULTS TO: Lily Lin LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15010129-002 MATRIX: Ambient Air CLIENT SAMPLE ID: LICA/VOC/CLS/Jan 12, 2015 CANISTER ID: 14710 DESCRIPTION: CLS DATE SAMPLED: 12-Jan-15 0:00 DATE RECEIVED: 20-Jan-15 REPORT CREATED: 02-Feb-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
Ethanol		2.58	ppbv	0.03	AC-058	22-Jan-15
Ethyl acetate	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Ethylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Freon-11	I	0.23	ppbv	0.03	AC-058	22-Jan-15
Freon-113	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Freon-114	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Freon-12	I	0.57	ppbv	0.03	AC-058	22-Jan-15
Hexachloro-1,3-butadiene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Isobutane		2.20	ppbv	0.03	AC-058	22-Jan-15
Isopentane		2.01	ppbv	0.03	AC-058	22-Jan-15
Isoprene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Isopropyl alcohol	K, T, U	< 0.06	ppbv	0.06	AC-058	22-Jan-15
Isopropylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
m,p-Xylene	I	0.15	ppbv	0.03	AC-058	22-Jan-15
m-Diethylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
m-Ethyltoluene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Methyl butyl ketone	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Methyl ethyl ketone	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Methyl isobutyl ketone	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Methyl methacrylate	K, T, U	< 0.06	ppbv	0.05	AC-058	22-Jan-15
Methyl tert butyl ether	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Methylcyclohexane	I	0.47	ppbv	0.03	AC-058	22-Jan-15
Methylcyclopentane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Methylene chloride	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
n-Butane		3.73	ppbv	0.03	AC-058	22-Jan-15
n-Decane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15

Qualifiers

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RESULTS TO: Lily Lin LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15010129-002 MATRIX: Ambient Air CLIENT SAMPLE ID: LICA/VOC/CLS/Jan 12, 2015 CANISTER ID: 14710 DESCRIPTION: CLS DATE SAMPLED: 12-Jan-15 0:00 DATE RECEIVED: 20-Jan-15 REPORT CREATED: 02-Feb-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
n-Dodecane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
n-Heptane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
n-Hexane	I	0.55	ppbv	0.03	AC-058	22-Jan-15
n-Octane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
n-Pentane		2.29	ppbv	0.03	AC-058	22-Jan-15
n-Propylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
n-Undecane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Naphthalene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
n-Nonane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
o-Ethyltoluene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
o-Xylene	I	0.07	ppbv	0.03	AC-058	22-Jan-15
p-Diethylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
p-Ethyltoluene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Styrene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Tetrachloroethylene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Tetrahydrofuran	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Toluene	I	0.36	ppbv	0.03	AC-058	22-Jan-15
trans-1,2-Dichloroethylene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
trans-1,3-Dichloropropylene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
trans-2-Butene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
trans-2-Pentene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Trichloroethylene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Vinyl acetate	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Vinyl chloride	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15

Qualifiers

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On behalf of: PJ Pretorius, Portfolio Manager, EAS

Inquiries: (780) 632 8455

E-mail: EAS.Results@albertainnovates.ca

<p>RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>LABORATORY SAMPLE ID: 15010165-002</p> <p>MATRIX: Ambient Air</p> <p>CLIENT SAMPLE ID: LICA/VOC/CLS/Jan 18, 2015</p> <p>CANISTER ID: 2494</p> <p>DESCRIPTION: CLS</p> <p>DATE SAMPLED: 18-Jan-15 0:00</p> <p>DATE RECEIVED: 22-Jan-15</p> <p>REPORT CREATED: 04-Mar-15</p> <p>REPORT VERSION: Version 01</p>
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
1,1,1-Trichloroethane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
1,1,2,2-Tetrachloroethane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
1,1,2-Trichloroethane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
1,1-Dichloroethane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
1,1-Dichloroethylene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
1,2,3-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
1,2,4-Trichlorobenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
1,2,4-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
1,2-Dibromoethane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
1,2-Dichlorobenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
1,2-Dichloroethane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
1,2-Dichloropropane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
1,3,5-Trimethylbenzene	I	0.08	ppbv	0.03	AC-058	23-Jan-15
1,3-Butadiene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
1,3-Dichlorobenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
1,4-Dichlorobenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
1,4-Dioxane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
1-Butene	I	0.56	ppbv	0.03	AC-058	23-Jan-15
1-Hexene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
1-Pentene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
2,2,4-Trimethylpentane		0.93	ppbv	0.03	AC-058	23-Jan-15
2,2-Dimethylbutane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
2,3,4-Trimethylpentane	I	0.20	ppbv	0.03	AC-058	23-Jan-15
2,3-Dimethylbutane	I	0.18	ppbv	0.03	AC-058	23-Jan-15
2,3-Dimethylpentane	I	0.54	ppbv	0.03	AC-058	23-Jan-15
2,4-Dimethylpentane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15

Qualifiers

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On behalf of: PJ Pretorius, Portfolio Manager, EAS

Inquiries: (780) 632 8455
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RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15010165-002 MATRIX: Ambient Air CLIENT SAMPLE ID: LICA/VOC/CLS/Jan 18, 2015 CANISTER ID: 2494 DESCRIPTION: CLS DATE SAMPLED: 18-Jan-15 0:00 DATE RECEIVED: 22-Jan-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
2-Methylheptane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
2-Methylhexane	I	0.28	ppbv	0.03	AC-058	23-Jan-15
2-Methylpentane		0.66	ppbv	0.03	AC-058	23-Jan-15
3-Methylheptane	K, T, U	< 0.06	ppbv	0.02	AC-058	23-Jan-15
3-Methylhexane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
3-Methylpentane	I	0.45	ppbv	0.03	AC-058	23-Jan-15
Acetone		4.11	ppbv	0.03	AC-058	23-Jan-15
Acrolein	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Benzene	I	0.44	ppbv	0.03	AC-058	23-Jan-15
Benzyl chloride	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Bromodichloromethane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Bromoform	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Bromomethane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Carbon disulfide	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Carbon tetrachloride	I	0.10	ppbv	0.03	AC-058	23-Jan-15
Chlorobenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Chloroethane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Chloroform	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Chloromethane	I	0.60	ppbv	0.03	AC-058	23-Jan-15
cis-1,2-Dichloroethene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
cis-1,3-Dichloropropene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
cis-2-Butene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
cis-2-Pentene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Cyclohexane	I	0.35	ppbv	0.03	AC-058	23-Jan-15
Cyclopentane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Dibromochloromethane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15010165-002 MATRIX: Ambient Air CLIENT SAMPLE ID: LICA/VOC/CLS/Jan 18, 2015 CANISTER ID: 2494 DESCRIPTION: CLS DATE SAMPLED: 18-Jan-15 0:00 DATE RECEIVED: 22-Jan-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
Ethanol		4.09	ppbv	0.03	AC-058	23-Jan-15
Ethyl acetate	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Ethylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Freon-11	I	0.22	ppbv	0.03	AC-058	23-Jan-15
Freon-113	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Freon-114	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Freon-12		0.60	ppbv	0.03	AC-058	23-Jan-15
Hexachloro-1,3-butadiene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Isobutane		2.18	ppbv	0.03	AC-058	23-Jan-15
Isopentane		2.42	ppbv	0.03	AC-058	23-Jan-15
Isoprene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Isopropyl alcohol	K, T, U	< 0.06	ppbv	0.06	AC-058	23-Jan-15
Isopropylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
m,p-Xylene		0.76	ppbv	0.03	AC-058	23-Jan-15
m-Diethylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
m-Ethyltoluene	I	0.12	ppbv	0.03	AC-058	23-Jan-15
Methyl butyl ketone	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Methyl ethyl ketone	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Methyl isobutyl ketone	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Methyl methacrylate	K, T, U	< 0.06	ppbv	0.05	AC-058	23-Jan-15
Methyl tert butyl ether	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Methylcyclohexane	I	0.32	ppbv	0.03	AC-058	23-Jan-15
Methylcyclopentane	I	0.42	ppbv	0.03	AC-058	23-Jan-15
Methylene chloride	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
n-Butane		3.71	ppbv	0.03	AC-058	23-Jan-15
n-Decane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15010165-002 MATRIX: Ambient Air CLIENT SAMPLE ID: LICA/VOC/CLS/Jan 18, 2015 CANISTER ID: 2494 DESCRIPTION: CLS DATE SAMPLED: 18-Jan-15 0:00 DATE RECEIVED: 22-Jan-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
n-Dodecane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
n-Heptane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
n-Hexane		0.76	ppbv	0.03	AC-058	23-Jan-15
n-Octane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
n-Pentane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
n-Propylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
n-Undecane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Naphthalene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
n-Nonane	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
o-Ethyltoluene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
o-Xylene	I	0.27	ppbv	0.03	AC-058	23-Jan-15
p-Diethylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
p-Ethyltoluene	I	0.08	ppbv	0.03	AC-058	23-Jan-15
Styrene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Tetrachloroethylene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Tetrahydrofuran	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Toluene		1.10	ppbv	0.03	AC-058	23-Jan-15
trans-1,2-Dichloroethylene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
trans-1,3-Dichloropropylene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
trans-2-Butene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
trans-2-Pentene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Trichloroethylene	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Vinyl acetate	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15
Vinyl chloride	K, T, U	< 0.06	ppbv	0.03	AC-058	23-Jan-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15010249-002 MATRIX: Ambient Air CLIENT SAMPLE ID: LICA/VOC/CLS/Jan 24, 2015 CANISTER ID: S5677 DESCRIPTION: CLS DATE SAMPLED: 24-Jan-15 0:00 DATE RECEIVED: 30-Jan-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
1,1-Dichloroethylene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
1,2,3-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
1,2,4-Trichlorobenzene	I	0.05	ppbv	0.03	AC-058	30-Jan-15
1,2,4-Trimethylbenzene	I	0.09	ppbv	0.03	AC-058	30-Jan-15
1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
1,2-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
1,2-Dichloropropane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
1,3,5-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
1,3-Butadiene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
1,3-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
1,4-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
1,4-Dioxane		1.84	ppbv	0.03	AC-058	30-Jan-15
1-Butene	I	0.14	ppbv	0.03	AC-058	30-Jan-15
1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
1-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
2,2,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
2,2-Dimethylbutane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
2,3,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
2,3-Dimethylbutane	I	0.07	ppbv	0.03	AC-058	30-Jan-15
2,3-Dimethylpentane	I	0.04	ppbv	0.03	AC-058	30-Jan-15
2,4-Dimethylpentane	I	0.04	ppbv	0.03	AC-058	30-Jan-15

Qualifiers

- K Off-scale low. Actual value is known to be less than the value given
- T Value reported is less than the laboratory method detection limit
- U Compound was analyzed for but not detected
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Certified By: Graham Knox, Ops Manager
On behalf of: PJ Pretorius, Portfolio Manager, EAS

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

RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15010249-002 MATRIX: Ambient Air CLIENT SAMPLE ID: LICA/VOC/CLS/Jan 24, 2015 CANISTER ID: S5677 DESCRIPTION: CLS DATE SAMPLED: 24-Jan-15 0:00 DATE RECEIVED: 30-Jan-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
2-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
2-Methylhexane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
2-Methylpentane	I	0.09	ppbv	0.03	AC-058	30-Jan-15
3-Methylheptane	I, K, T	< 0.03	ppbv	0.02	AC-058	30-Jan-15
3-Methylhexane	I	0.07	ppbv	0.03	AC-058	30-Jan-15
3-Methylpentane	I	0.06	ppbv	0.03	AC-058	30-Jan-15
Acetone		6.72	ppbv	0.03	AC-058	30-Jan-15
Acrolein		0.20	ppbv	0.03	AC-058	30-Jan-15
Benzene	I	0.18	ppbv	0.03	AC-058	30-Jan-15
Benzyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Bromomethane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Carbon disulfide	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Carbon tetrachloride	I	0.11	ppbv	0.03	AC-058	30-Jan-15
Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Chloroform	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Chloromethane		0.92	ppbv	0.03	AC-058	30-Jan-15
cis-1,2-Dichloroethene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
cis-1,3-Dichloropropene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
cis-2-Butene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Cyclohexane	I	0.11	ppbv	0.03	AC-058	30-Jan-15
Cyclopentane	I	0.04	ppbv	0.03	AC-058	30-Jan-15
Dibromochloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15010249-002 MATRIX: Ambient Air CLIENT SAMPLE ID: LICA/VOC/CLS/Jan 24, 2015 CANISTER ID: S5677 DESCRIPTION: CLS DATE SAMPLED: 24-Jan-15 0:00 DATE RECEIVED: 30-Jan-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
Ethanol		3.03	ppbv	0.03	AC-058	30-Jan-15
Ethyl acetate	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Ethylbenzene	I	0.04	ppbv	0.03	AC-058	30-Jan-15
Freon-11		0.37	ppbv	0.03	AC-058	30-Jan-15
Freon-113	I	0.10	ppbv	0.03	AC-058	30-Jan-15
Freon-114	I	0.03	ppbv	0.03	AC-058	30-Jan-15
Freon-12		0.96	ppbv	0.03	AC-058	30-Jan-15
Hexachloro-1,3-butadiene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Isobutane		0.86	ppbv	0.03	AC-058	30-Jan-15
Isopentane		0.55	ppbv	0.03	AC-058	30-Jan-15
Isoprene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Isopropyl alcohol		0.43	ppbv	0.06	AC-058	30-Jan-15
Isopropylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
m,p-Xylene	I	0.13	ppbv	0.03	AC-058	30-Jan-15
m-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
m-Ethyltoluene	I	0.05	ppbv	0.03	AC-058	30-Jan-15
Methyl butyl ketone	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Methyl ethyl ketone	I	0.23	ppbv	0.03	AC-058	30-Jan-15
Methyl isobutyl ketone	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Methyl methacrylate	K, T, U	< 0.03	ppbv	0.05	AC-058	30-Jan-15
Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Methylcyclohexane	I	0.13	ppbv	0.03	AC-058	30-Jan-15
Methylcyclopentane	I	0.07	ppbv	0.03	AC-058	30-Jan-15
Methylene chloride	I	0.17	ppbv	0.03	AC-058	30-Jan-15
n-Butane		1.57	ppbv	0.03	AC-058	30-Jan-15
n-Decane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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<p>RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>LABORATORY SAMPLE ID: 15010249-002</p> <p>MATRIX: Ambient Air</p> <p>CLIENT SAMPLE ID: LICA/VOC/CLS/Jan 24, 2015</p> <p>CANISTER ID: S5677</p> <p>DESCRIPTION: CLS</p> <p>DATE SAMPLED: 24-Jan-15 0:00</p> <p>DATE RECEIVED: 30-Jan-15</p> <p>REPORT CREATED: 04-Mar-15</p> <p>REPORT VERSION: Version 01</p>
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
n-Dodecane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
n-Heptane	I	0.06	ppbv	0.03	AC-058	30-Jan-15
n-Hexane	I	0.10	ppbv	0.03	AC-058	30-Jan-15
n-Octane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
n-Pentane		0.82	ppbv	0.03	AC-058	30-Jan-15
n-Propylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
n-Undecane	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Naphthalene	I	0.05	ppbv	0.03	AC-058	30-Jan-15
n-Nonane	I	0.03	ppbv	0.03	AC-058	30-Jan-15
o-Ethyltoluene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
o-Xylene	I	0.04	ppbv	0.03	AC-058	30-Jan-15
p-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
p-Ethyltoluene	I	0.03	ppbv	0.03	AC-058	30-Jan-15
Styrene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Tetrachloroethylene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Tetrahydrofuran	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Toluene		0.54	ppbv	0.03	AC-058	30-Jan-15
trans-1,2-Dichloroethylene	I	0.27	ppbv	0.03	AC-058	30-Jan-15
trans-1,3-Dichloropropylene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
trans-2-Butene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
trans-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Trichloroethylene	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Vinyl acetate	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15
Vinyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	30-Jan-15

Qualifiers

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On behalf of: PJ Pretorius, Portfolio Manager, EAS

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

RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15020038-002 MATRIX: Ambient Air CLIENT SAMPLE ID: LICA/VOC/CLS/Jan 30, 2015 CANISTER ID: S5627 DESCRIPTION: CLS DATE SAMPLED: 30-Jan-15 0:00 DATE RECEIVED: 05-Feb-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1,1-Dichloroethylene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1,2,3-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1,2,4-Trichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1,2-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1,2-Dichloropropane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1,3,5-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1,3-Butadiene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1,3-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1,4-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1,4-Dioxane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1-Butene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
1-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
2,2,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
2,2-Dimethylbutane	I	0.04	ppbv	0.03	AC-058	05-Feb-15
2,3,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
2,3-Dimethylbutane	I	0.04	ppbv	0.03	AC-058	05-Feb-15
2,3-Dimethylpentane	I	0.03	ppbv	0.03	AC-058	05-Feb-15
2,4-Dimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15020038-002 MATRIX: Ambient Air CLIENT SAMPLE ID: LICA/VOC/CLS/Jan 30, 2015 CANISTER ID: S5627 DESCRIPTION: CLS DATE SAMPLED: 30-Jan-15 0:00 DATE RECEIVED: 05-Feb-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
2-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
2-Methylhexane	I	0.04	ppbv	0.03	AC-058	05-Feb-15
2-Methylpentane	I	0.12	ppbv	0.03	AC-058	05-Feb-15
3-Methylheptane	K, T, U	< 0.03	ppbv	0.02	AC-058	05-Feb-15
3-Methylhexane	I	0.06	ppbv	0.03	AC-058	05-Feb-15
3-Methylpentane	I	0.07	ppbv	0.03	AC-058	05-Feb-15
Acetone		1.21	ppbv	0.03	AC-058	05-Feb-15
Acrolein	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Benzene	I	0.21	ppbv	0.03	AC-058	05-Feb-15
Benzyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Bromomethane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Carbon disulfide	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Carbon tetrachloride	I	0.11	ppbv	0.03	AC-058	05-Feb-15
Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Chloroform	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Chloromethane		0.70	ppbv	0.03	AC-058	05-Feb-15
cis-1,2-Dichloroethene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
cis-1,3-Dichloropropene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
cis-2-Butene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Cyclohexane	I	0.08	ppbv	0.03	AC-058	05-Feb-15
Cyclopentane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Dibromochloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15

Qualifiers

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Certified By: Graham Knox, Ops Manager

On behalf of: PJ Pretorius, Portfolio Manager, EAS

Inquiries: (780) 632 8455

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<p>RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>LABORATORY SAMPLE ID: 15020038-002</p> <p>MATRIX: Ambient Air</p> <p>CLIENT SAMPLE ID: LICA/VOC/CLS/Jan 30, 2015</p> <p>CANISTER ID: S5627</p> <p>DESCRIPTION: CLS</p> <p>DATE SAMPLED: 30-Jan-15 0:00</p> <p>DATE RECEIVED: 05-Feb-15</p> <p>REPORT CREATED: 04-Mar-15</p> <p>REPORT VERSION: Version 01</p>
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
Ethanol	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Ethyl acetate	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Ethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Freon-11		0.36	ppbv	0.03	AC-058	05-Feb-15
Freon-113	I	0.11	ppbv	0.03	AC-058	05-Feb-15
Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Freon-12		0.89	ppbv	0.03	AC-058	05-Feb-15
Hexachloro-1,3-butadiene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Isobutane		0.69	ppbv	0.03	AC-058	05-Feb-15
Isopentane		0.69	ppbv	0.03	AC-058	05-Feb-15
Isoprene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Isopropyl alcohol	K, T, U	< 0.03	ppbv	0.06	AC-058	05-Feb-15
Isopropylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
m,p-Xylene	I	0.05	ppbv	0.03	AC-058	05-Feb-15
m-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
m-Ethyltoluene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Methyl butyl ketone	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Methyl ethyl ketone	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Methyl isobutyl ketone	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Methyl methacrylate	K, T, U	< 0.03	ppbv	0.05	AC-058	05-Feb-15
Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Methylcyclohexane	I	0.10	ppbv	0.03	AC-058	05-Feb-15
Methylcyclopentane	I	0.07	ppbv	0.03	AC-058	05-Feb-15
Methylene chloride	I	0.20	ppbv	0.03	AC-058	05-Feb-15
n-Butane		1.07	ppbv	0.03	AC-058	05-Feb-15
n-Decane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15

Qualifiers

- K Off-scale low. Actual value is known to be less than the value given
- T Value reported is less than the laboratory method detection limit
- U Compound was analyzed for but not detected
- I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

Certified By: Graham Knox, Ops Manager
On behalf of: PJ Pretorius, Portfolio Manager, EAS

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

RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15020038-002 MATRIX: Ambient Air CLIENT SAMPLE ID: LICA/VOC/CLS/Jan 30, 2015 CANISTER ID: S5627 DESCRIPTION: CLS DATE SAMPLED: 30-Jan-15 0:00 DATE RECEIVED: 05-Feb-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
n-Dodecane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
n-Heptane	I	0.08	ppbv	0.03	AC-058	05-Feb-15
n-Hexane	I	0.11	ppbv	0.03	AC-058	05-Feb-15
n-Octane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
n-Pentane		0.70	ppbv	0.03	AC-058	05-Feb-15
n-Propylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
n-Undecane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Naphthalene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
n-Nonane	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
o-Ethyltoluene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
o-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
p-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
p-Ethyltoluene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Styrene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Tetrachloroethylene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Tetrahydrofuran	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Toluene	I	0.13	ppbv	0.03	AC-058	05-Feb-15
trans-1,2-Dichloroethylene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
trans-1,3-Dichloropropylene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
trans-2-Butene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
trans-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Trichloroethylene	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Vinyl acetate	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15
Vinyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	05-Feb-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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PAH SAMPLES

RESULTS TO: Lily Lin LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	403-219-3661 780 812-2182	LABORATORY SAMPLE ID: 15010129-003 MATRIX: Air Filter CLIENT SAMPLE ID: LICA/PUF/CLS/Jan 12, 2015 CANISTER ID: TE02 DESCRIPTION: CLS DATE SAMPLED: 12-Jan-15 0:00 DATE RECEIVED: 20-Jan-15 REPORT CREATED: 02-Feb-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
1-Methylnaphthalene		0.02	ug/Filter	0.01	NA-017	24-Jan-15
2-Methylnaphthalene		0.04	ug/Filter	0.01	NA-017	24-Jan-15
3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Acenaphthene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Acenaphthylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Benzo(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Benzo(a)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Benzo(c)phenanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Benzo(e)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Chrysene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Fluoranthene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Fluorene		0.02	ug/Filter	0.01	NA-017	24-Jan-15
Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Naphthalene		0.09	ug/Filter	0.01	NA-017	24-Jan-15
Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Phenanthrene		0.02	ug/Filter	0.01	NA-017	24-Jan-15
Pyrene		0.01	ug/Filter	0.01	NA-017	24-Jan-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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<p>RESULTS TO: Lily Lin LICA 4000, 19 St NE Calgary AB INVOICE TO: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB</p>	<p>403-219-3661 T2E 6P8 780 812-2182 T9N 2J5</p>	<p>LABORATORY SAMPLE ID: 15010129-003 MATRIX: Air Filter CLIENT SAMPLE ID: LICA/PUF/CLS/Jan 12, 2015 CANISTER ID: TE02 DESCRIPTION: CLS DATE SAMPLED: 12-Jan-15 0:00 DATE RECEIVED: 20-Jan-15 REPORT CREATED: 02-Feb-15 REPORT VERSION: Version 01</p>
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
Retene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15

Qualifiers

- K Off-scale low. Actual value is known to be less than the value given
- T Value reported is less than the laboratory method detection limit
- U Compound was analyzed for but not detected
- I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

Certified By: Graham Knox, Ops Manager
On behalf of: PJ Pretorius, Portfolio Manager, EAS

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

RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15010165-001 MATRIX: Air Filter CLIENT SAMPLE ID: LICA/PUF/CLS/Jan 18, 2015 CANISTER ID: TE08 DESCRIPTION: CLS DATE SAMPLED: 18-Jan-15 0:00 DATE RECEIVED: 22-Jan-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
1-Methylnaphthalene		2.29	ug/PUF	0.01	NA-017	12-Feb-15
2-Methylnaphthalene		4.01	ug/PUF	0.01	NA-017	12-Feb-15
3-Methylcholanthrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Acenaphthene		0.24	ug/PUF	0.01	NA-017	12-Feb-15
Acenaphthylene		0.51	ug/PUF	0.01	NA-017	12-Feb-15
Acridine	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Anthracene		0.07	ug/PUF	0.01	NA-017	12-Feb-15
Benzo(a)anthracene		0.03	ug/PUF	0.01	NA-017	12-Feb-15
Benzo(a)pyrene		0.02	ug/PUF	0.01	NA-017	12-Feb-15
Benzo(b,j,k)fluoranthene		0.09	ug/PUF	0.01	NA-017	12-Feb-15
Benzo(c)phenanthrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Benzo(e)pyrene		0.04	ug/PUF	0.01	NA-017	12-Feb-15
Benzo(ghi)perylene		0.04	ug/PUF	0.01	NA-017	12-Feb-15
Chrysene		0.05	ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Fluoranthene		0.15	ug/PUF	0.01	NA-017	12-Feb-15
Fluorene		0.29	ug/PUF	0.01	NA-017	12-Feb-15
Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Naphthalene		3.51	ug/PUF	0.01	NA-017	12-Feb-15
Perylene		0.02	ug/PUF	0.01	NA-017	12-Feb-15
Phenanthrene		0.51	ug/PUF	0.01	NA-017	12-Feb-15
Pyrene		0.12	ug/PUF	0.01	NA-017	12-Feb-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15010165-001 MATRIX: Air Filter CLIENT SAMPLE ID: LICA/PUF/CLS/Jan 18, 2015 CANISTER ID: TE08 DESCRIPTION: CLS DATE SAMPLED: 18-Jan-15 0:00 DATE RECEIVED: 22-Jan-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result Units	MDL	Method	Analysis Date
Retene		0.13 ug/PUF	0.01	NA-017	12-Feb-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15010249-003 MATRIX: Air Filter CLIENT SAMPLE ID: LICA/PUF/CLS/Jan 24, 2015 CANISTER ID: 1138 DESCRIPTION: CLS DATE SAMPLED: 24-Jan-15 0:00 DATE RECEIVED: 30-Jan-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
1-Methylnaphthalene		0.09	ug/PUF	0.01	NA-017	12-Feb-15
2-Methylnaphthalene		0.17	ug/PUF	0.01	NA-017	12-Feb-15
3-Methylcholanthrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Acenaphthene		0.03	ug/PUF	0.01	NA-017	12-Feb-15
Acenaphthylene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Acridine	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Anthracene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Benzo(a)anthracene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Benzo(a)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Benzo(c)phenanthrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Benzo(e)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Benzo(ghi)perylene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Chrysene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Fluoranthene		0.05	ug/PUF	0.01	NA-017	12-Feb-15
Fluorene		0.14	ug/PUF	0.01	NA-017	12-Feb-15
Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Naphthalene		0.20	ug/PUF	0.01	NA-017	12-Feb-15
Perylene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	12-Feb-15
Phenanthrene		0.20	ug/PUF	0.01	NA-017	12-Feb-15
Pyrene		0.04	ug/PUF	0.01	NA-017	12-Feb-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15010249-003 MATRIX: Air Filter CLIENT SAMPLE ID: LICA/PUF/CLS/Jan 24, 2015 CANISTER ID: 1138 DESCRIPTION: CLS DATE SAMPLED: 24-Jan-15 0:00 DATE RECEIVED: 30-Jan-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result Units	MDL	Method	Analysis Date
Retene		0.03 ug/PUF	0.01	NA-017	12-Feb-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15020038-001 MATRIX: Air Filter CLIENT SAMPLE ID: LICA/PUF/CLS/Jan 30, 2015 CANISTER ID: TE-11 DESCRIPTION: CLS DATE SAMPLED: 30-Jan-15 0:00 DATE RECEIVED: 05-Feb-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result Units	MDL	Method	Analysis Date
1-Methylnaphthalene		0.17 ug/PUF	0.01	NA-017	12-Feb-15
2-Methylnaphthalene		0.28 ug/PUF	0.01	NA-017	12-Feb-15
3-Methylcholanthrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Acenaphthene		0.04 ug/PUF	0.01	NA-017	12-Feb-15
Acenaphthylene		0.02 ug/PUF	0.01	NA-017	12-Feb-15
Acridine	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(a)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(a)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(b,j,k)fluoranthene		0.03 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(c)phenanthrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(e)pyrene		0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(ghi)perylene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Chrysene		0.02 ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Fluoranthene		0.06 ug/PUF	0.01	NA-017	12-Feb-15
Fluorene		0.08 ug/PUF	0.01	NA-017	12-Feb-15
Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Naphthalene		0.46 ug/PUF	0.01	NA-017	12-Feb-15
Perylene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Phenanthrene		0.22 ug/PUF	0.01	NA-017	12-Feb-15
Pyrene		0.05 ug/PUF	0.01	NA-017	12-Feb-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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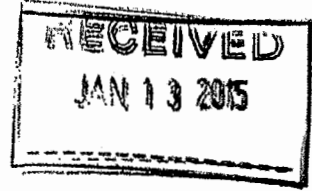
RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15020038-001 MATRIX: Air Filter CLIENT SAMPLE ID: LICA/PUF/CLS/Jan 30, 2015 CANISTER ID: TE-11 DESCRIPTION: CLS DATE SAMPLED: 30-Jan-15 0:00 DATE RECEIVED: 05-Feb-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
--	---

Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
Retene		0.01	ug/PUF	0.01	NA-017	12-Feb-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
---	--

PARTISOL SAMPLES

Partisol Sample Data Sheet



A.K. → Jan

Date Sampled: Dec 6, 2015

Location: CLS

Parameter: TSP PM10

PM2.5

Filter #: P 4089 563

Start Time 00:00

Sample ID: 15010041-001

End Time 24:00

Customer ID: LICA

Cust Samp ID: CLS- #P4089563

Status -OK

Priority: Normal

Std Vol 20.876

Valid Time 15:02

Total Time 24

Comments: Weather Conditions, etc.

Horizontal lines for handwritten comments.

Technician Signature: Alex Yakupov

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"
- 8) Make Sure it is left in RUN mode

Note: Beginning & End Date should be same date

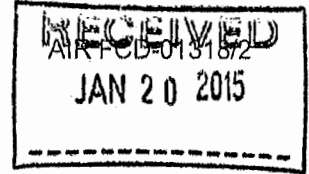
Sample ID: 15010131-001

Customer ID: LICA

Cust Samp ID: CLS Filter # P4089564

Partisol Sample Data Sheet

Priority: Normal



Date Sampled: Jan 12, 2015

Location: CLS

Parameter: TSP PM10

PM2.5

Filter #: P 4089 564

Start Time 00:00 (Jan 12, 2015)

End Time 00:00 (Jan 13, 2015)

Status OK

Std Vol 20.531

Valid Time 13:57

Total Time 24

Comments: Weather Conditions, etc.

Horizontal lines for additional comments.

Technician Signature: Alex Yakupov

- 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"
 - 8) Make Sure it is left in RUN mode

Note: Beginning & End Date should be same date

<p>RESULTS TO: Lily Lin LICA 4000, 19 St NE Calgary AB</p> <p>INVOICE TO: Mike Bisaga PO Box 8237 5107W-50 St Bonnyville AB</p>	<p>403-219-3661 T2E 6P8 780 812-2182 T9N 2J5</p>	<p>LABORATORY SAMPLE ID: 15010131-001 MATRIX: Air Filter CLIENT SAMPLE ID: CLS Filter # P4089564 CANISTER ID: DESCRIPTION: DATE SAMPLED: 12-Jan-15 0:00 DATE RECEIVED: 20-Jan-15 REPORT CREATED: 26-Jan-15 REPORT VERSION: Version 01</p>
--	---	--

Parameter	Qualifier	Result Units	MDL	Method	Analysis Date
Particulate Weight		0.304 mg	0.004	AC-029	23-Jan-15

<p><u>Qualifiers</u></p>	<p>Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS</p> <p>Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca</p>
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Sample ID: 15010164-001

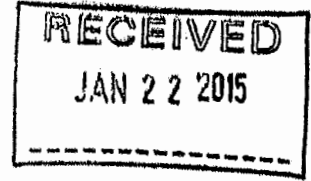
Customer ID: LICA

Cust Samp ID: CLS Filter #4089566

AIR FCD-01318/2

Priority: Normal

Partisol Sample Data Sheet



Date Sampled: Jan 18, 2015

Location: CLS

Parameter: TSP PM10

PM2.5

Filter #: P4089 566

Start Time 00:00 Jan 18, 2015

End Time 00:00 Jan 19, 2015

Status OK

Std Vol 20,852

Valid Time 20:24

Total Time 24

Comments: Weather Conditions, etc.

Technician Signature: Alex Yakupov.

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"
- 8) Make Sure it is left in RUN mode

Note: Beginning & End Date should be same date

<p>RESULTS TO: Lily Lin LICA 4000, 19 St NE Calgary AB</p> <p>INVOICE TO: Mike Bisaga PO Box 8237 5107W-50 St Bonnyville AB</p>	<p>403-219-3661 T2E 6P8 780 812-2182 T9N 2J5</p>	<p>LABORATORY SAMPLE ID: 15010164-001 MATRIX: Air Filter CLIENT SAMPLE ID: CLS Filter #4089566 CANISTER ID: DESCRIPTION: DATE SAMPLED: 18-Jan-15 0:00 DATE RECEIVED: 22-Jan-15 REPORT CREATED: 02-Feb-15 REPORT VERSION: Version 01</p>
--	---	--

Parameter	Qualifier	Result Units	MDL	Method	Analysis Date
Particulate Weight		0.128 mg	0.004	AC-029	26-Jan-15

<p><u>Qualifiers</u></p>	<p>Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS</p> <p>Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca</p>
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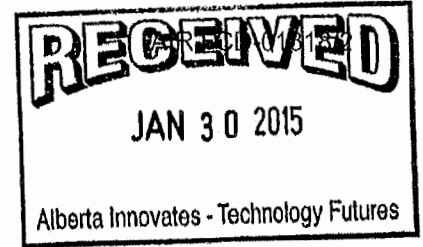
Sample ID: 15010248-001

Customer ID: LICA

Cust Samp ID: CLS Filter # P4089557

Partisol Sample Data Sheet

Priority: Normal



Date Sampled: Jan 24, 2015

Location: CLS

Parameter: TSP PM10

PM2.5

Filter #: P4089 557

Start Time 00:00 Jan 24, 2015

End Time 00:00 Jan 25, 2015

Status OK

Std Vol 23.876

Valid Time 23:50

Total Time 24:00

Comments: Weather Conditions, etc.

Horizontal lines for handwritten comments.

Technician Signature: Alex Yakupov

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"
8) Make Sure it is left in RUN mode

Note: Beginning & End Date should be same date

<p>RESULTS TO: Lily Lin LICA 4000, 19 St NE Calgary AB</p> <p>INVOICE TO: Mike Bisaga PO Box 8237 5107W-50 St Bonnyville AB</p>	<p>403-219-3661 T2E 6P8 780 812-2182 T9N 2J5</p>	<p>LABORATORY SAMPLE ID: 15010248-001 MATRIX: Air Filter CLIENT SAMPLE ID: CLS Filter # P4089557 CANISTER ID: DESCRIPTION: DATE SAMPLED: 24-Jan-15 0:00 DATE RECEIVED: 30-Jan-15 REPORT CREATED: 10-Feb-15 REPORT VERSION: Version 01</p>
--	---	--

Parameter	Qualifier	Result Units	MDL	Method	Analysis Date
Particulate Weight		0.042 mg	0.004	AC-029	05-Feb-15

<p><u>Qualifiers</u></p>	<p>Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS</p> <p>Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca</p>
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Sample ID: 15020037-001

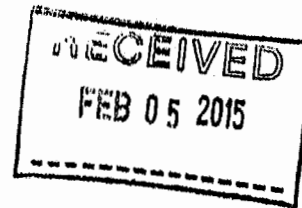
Customer ID: LICA

Cust Samp ID: CLS Filter # P4089562

AIR FCD-01318/2

Partisol Sample Data Sheet

Priority: Normal



Date Sampled: Jan 30, 2015

Location: CLS

Parameter: TSP PM10

PM2.5

Filter #: P4089 562

Start Time 00:00 Jan 30, 2015

End Time 00:00 Jan 31, 2015

Status OK

Std Vol 22.235

Valid Time 20:56

Total Time 24

Comments: Weather Conditions, etc.

Horizontal lines for handwritten comments.

Technician Signature: Alex Yakupov

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

8) Left in RUN mode.

Handwritten mark

<p>RESULTS TO: Lily Lin LICA 4000, 19 St NE Calgary AB</p> <p>INVOICE TO: Mike Bisaga PO Box 8237 5107W-50 St Bonnyville AB</p>	<p>403-219-3661 T2E 6P8 780 812-2182 T9N 2J5</p>	<p>LABORATORY SAMPLE ID: 15020037-001 MATRIX: Air Filter CLIENT SAMPLE ID: CLS Filter # P4089562 CANISTER ID: DESCRIPTION: DATE SAMPLED: 30-Jan-15 0:00 DATE RECEIVED: 05-Feb-15 REPORT CREATED: 20-Feb-15 REPORT VERSION: Version 01</p>
--	---	--

Parameter	Qualifier	Result Units	MDL	Method	Analysis Date
Particulate Weight		0.094 mg	0.004	AC-029	09-Feb-15

<p><u>Qualifiers</u></p>	<p>Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca</p>
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maxxam.ca

MAXXAM ANALYTICS

#1 2080 39 Ave. NE, Calgary

AB T2E 6P7

Toll Free 800-386-7247

Fax 403-219-3673

**AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
MASKWA SITE**

JOB #:2833-2015-01-30- C

JANUARY 2015

Prepared for:

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

Attention: MIKE BISAGA

DATE: **February 4, 2015**

Prepared by:

Wunmi Adekanmbi, M.Sc.

Project Manager Assistant, Source Testing, Maxxam Analytics

Reviewed by:

Lily Lin, B.Sc.

Customer Service Supervisor, Air Services, Maxxam Analytics

SUMMARY

In JANUARY 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 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.

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 (%)
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	1	14	8	19	8.2	NW	4.3	8	100.0
H2S (PPB)	10	3	0	0	0	2	7	10	3.7	NE	0.7	13	100.0
THC (PPM)	-	-	-	-	2.4	5.1	19	12	4.5	SSW	3.2	12	100.0
NO2 (PPB)	159	-	0	-	6.8	31.7	18	18	1	ESE	20.2	12	100.0
NO (PPB)	-	-	-	-	2.7	43.1	10	11	0.9	SW	10.7	11	100.0
NOX (PPB)	-	-	-	-	9.5	68.2	11	8	0.7	SSW	30.8	12	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	71.6	90	24	5	7.3	W	82.0	27	100.0
BAROMETRIC PRESSURE (MILIBAR)	-	-	-	-	943	971	6	VAR	VAR	VAR	965	6	100.0
AMBIENT TEMPERATURE (DEG C)	-	-	-	-	-11.5	10.3	25	13	18	WNW	4.0	25	100.0
PRECIPITATION (MM)	-	-	-	-	0.0	1.6	24	2	3.9	SSW	0.2	27	100.0
VECTOR WS (KPH)	-	-	-	-	5.4	18.4	25	12	-	WNW	9.1	8	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

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

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	Oxides of Nitrogen
	Nitric Oxides
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	Wind Direction
	Standard Deviation Wind Direction
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	Ambient Temperature
	Precipitation
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	Total Hydrocarbon
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	Wind System
	Calibrators
	Calibration Gases

1.0 Discussion

This monthly report consists data for parameters of SO₂, H₂S, THC, NO_x, NO, NO₂, WS, WD, RH, BP, Precipitation and Temperature.

Sample filters for all continuous air monitors were changed before the calibration was started. The sample manifold was 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 is to be operational 90% of the time (minimum), on a monthly basis.

All data was within Provincial objectives for the month.

SULPHUR DIOXIDE (SO₂)

The analyzer was working well throughout the month. Following as an found points check on January 15, the pump was rebuilt and the analog output calibration was performed. Another as found points check was completed after the maintenance in order to confirm the analyzer's functionality. The routine monthly calibration was completed on January 16. The inlet filter was changed before the calibration was started.

HYDROGEN SULPHIDE (H₂S)

The analyzer was working well throughout the month. Following as an found points check on January 15, the analog output calibration was performed. Another as found points check was completed after the maintenance in order to confirm the analyzer's functionality. The routine monthly calibration was completed on January 16. The inlet filter was changed before the calibration was started.

TOTAL HYDROCARBONS (THC)

The analyzer was working well throughout the month.

The routine monthly calibration was performed on January 16. The inlet filter was changed before the calibration was started.

NITROGEN DIOXIDE (NO2)

The analyzer was working well throughout the month. Following as an found points check on January 15, the analog output calibration was performed. Another as found points check was completed after the maintenance in order to confirm the analyzer's functionality. The routine monthly calibration was completed on January 16. The inlet filter was changed before the calibration was started.

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. 5 hourly maximum data collected on January 7 hour 1 and hour 6 and January 11 hour 8 to hour 10 were invalidated due to spikes.

RELATIVE HUMIDITY (RH)

The humidity sensor was working well throughout the month.

BAROMETRIC PRESSURE (BP)

The pressure sensor was working well throughout the month.

PRECIPITATION

Both the rain gauge system and heating system were working well throughout the month.

AMBIENT TEMPERATURE (TPX)

The temperature sensor was working well throughout the month.

2.0 Sampling Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association, and the Maxxam field sampling team consisted of 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 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-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-00242: Precipitation Collector Installation /Maintenance

There were no deviations from the prescribed methods.

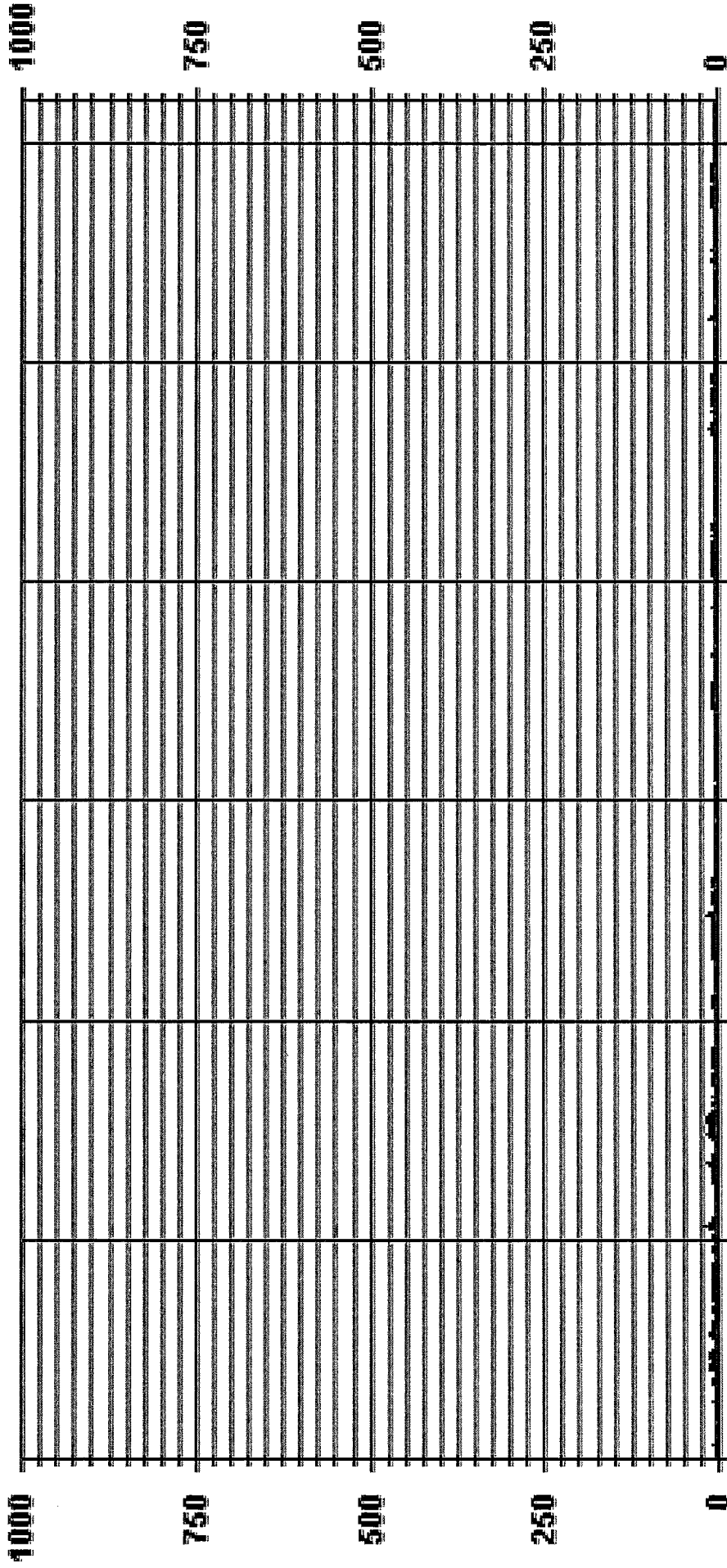
The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100E 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 - y Unit
- Precipitation - Met One Unit
- Datalogger - ESC 8832

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

01 Hour Averages



01/01/15 00:00 01/06/15 00:00 01/11/15 00:00 01/16/15 00:00 01/21/15 00:00 01/26/15 00:00 01/31/15 00:00

— LICA30 SO2_ PPB



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - JANUARY 2015

JOB # 2833-2015-01-30-C

SULPHUR DIOXIDE 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	24-HOUR		
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	0:00	MAX	AVG.	RDGS.	
DAY 1	1	1	1	1	1	0	1	1	2	3	1	1	2	2	1	13	1	1	1	S	1	2	2	2	13	1.8	24	
2	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	1	1	S	3	2	2	1	1	3	0.9	24	
3	1	11	22	22	22	16	13	15	3	5	11	8	2	8	3	7	9	S	4	4	11	19	3	2	22	9.6	24	
4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	3	1	1	1	1	2	2	3	1.9	24	
5	2	3	4	4	3	3	3	3	3	3	3	2	5	8	8	S	2	1	3	4	18	2	8	2	18	4.2	24	
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7	1	0	0	0	1	1	1	1	1	1	2	2	2	S	1	1	2	2	17	5	2	3	3	2	17	2.2	24	
8	2	2	1	0	3	7	9	14	4	12	14	11	S	18	17	17	12	13	10	23	21	8	17	2	23	10.3	24	
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11	0	0	0	0	0	1	0	1	4	S	11	10	14	3	1	1	1	1	1	1	2	1	1	1	14	2.4	24	
12	1	2	1	1	1	1	1	2	S	2	3	3	3	4	3	3	3	3	3	3	3	2	2	2	4	2.3	24	
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14	3	1	1	1	2	2	S	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0.6	24	
15	0	0	0	0	0	S	1	1	1	1	1	1	1	1	5	2	C	C	C	C	3	2	0	0	5	1.1	24	
16	0	0	0	0	S	0	1	1	C	C	C	C	C	1	0	0	0	0	0	0	0	0	0	0	1	0.2	24	
17	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0.2	24	
18	0	0	S	1	2	2	2	2	2	2	2	3	4	4	4	4	2	2	2	1	2	1	0	0	4	1.9	24	
19	0	S	0	0	0	0	0	2	2	2	2	1	2	1	1	1	9	0	0	0	0	0	0	5	9	1.3	24	
20	S	1	1	1	0	1	1	5	4	5	8	6	5	4	6	0	2	0	0	5	0	0	2	S	8	2.6	24	
21	1	1	1	1	1	1	2	1	2	2	2	2	2	2	3	2	2	3	3	3	3	3	S	1	3	1.9	24	
22	1	1	2	2	3	2	2	1	2	2	1	1	1	0	0	0	0	0	0	0	0	0	S	0	0	3	0.9	24
23	0	0	0	8	0	0	0	1	1	2	2	0	1	0	0	0	0	1	1	1	S	1	1	0	8	0.9	24	
24	0	1	1	1	1	1	1	1	1	4	4	11	13	16	7	14	11	0	0	S	1	1	1	1	16	4.0	24	
25	1	1	1	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	S	0	0	0	0	1	3	1.5	24	
26	0	0	1	1	2	1	1	1	1	1	3	1	0	0	0	0	1	S	1	1	1	0	0	0	3	0.7	24	
27	12	4	8	3	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	1	0	1	1	1	12	1.4	24	
28	1	1	1	0	1	1	12	2	8	6	10	8	2	6	10	S	0	1	3	0	0	0	0	0	12	3.2	24	
29	0	0	0	0	0	0	0	0	1	0	0	0	1	0	S	2	1	1	1	1	1	1	1	1	2	0.5	24	
30	1	2	5	3	7	1	1	2	2	2	2	1	1	S	1	1	1	1	1	1	1	0	0	0	7	1.6	24	
31	0	0	0	0	0	0	0	0	0	0	1	1	S	2	1	0	1	0	0	0	0	0	1	1	2	0.3	24	
HOURLY MAX	12	11	22	22	22	16	13	15	17	12	19	12	14	18	17	17	12	13	17	23	21	19	17	5				
HOURLY AVG	1.5	1.7	2.6	2.4	2.1	1.7	2.1	2.2	2.4	2.6	4.1	3.6	2.6	3.3	2.9	2.8	2.1	1.9	2.1	2.3	2.7	1.9	1.9	1.1				

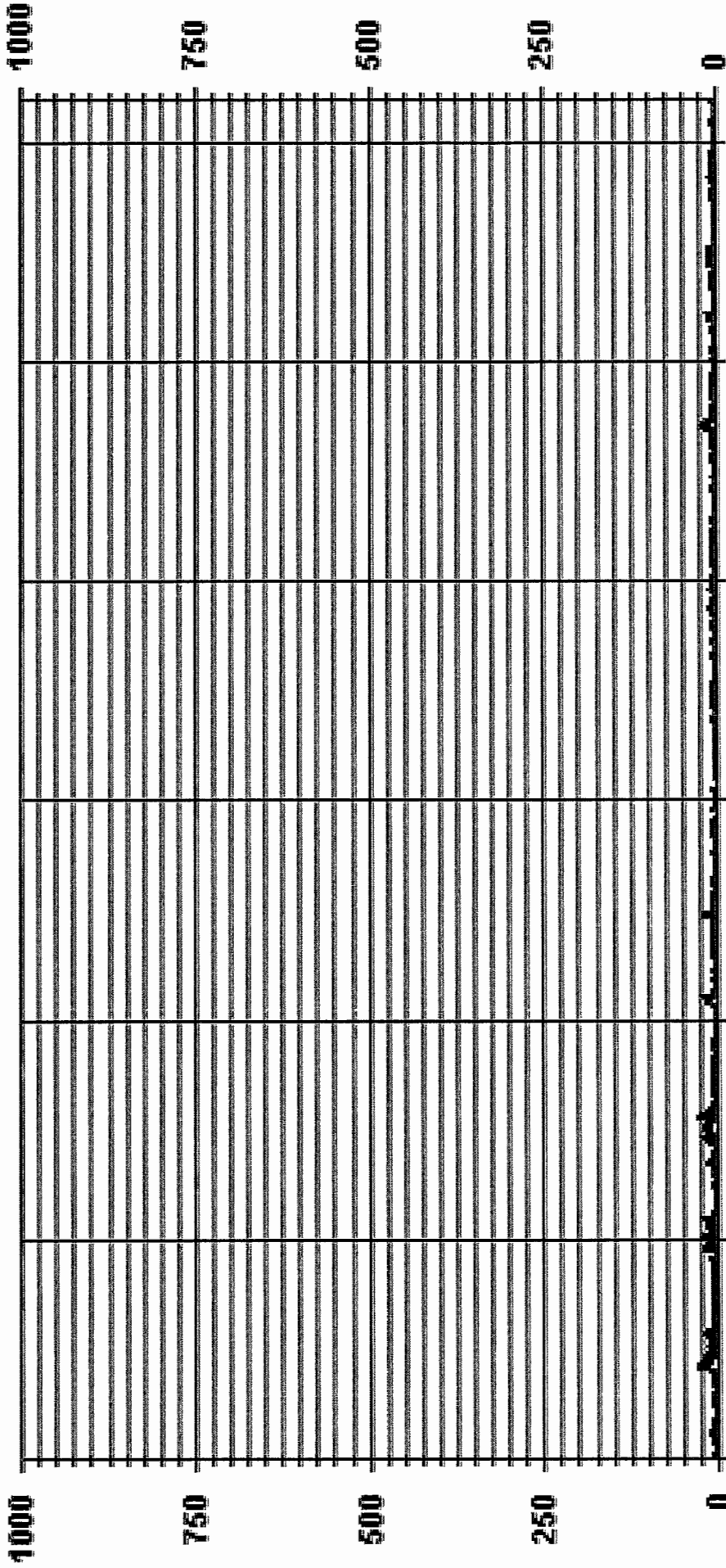
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	502
MAXIMUM INSTANTANEOUS VALUE:	23 PPB @ HOUR(S) 19 ON DAY(S) 8
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	9 HRS
STANDARD DEVIATION:	3.71
OPERATIONAL TIME:	744 HRS

01 Hour Averages



— LICA30 SO2MAX PPB

LICA30
SO2_ / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 30
Site Name : LICA30
Parameter : SO2_
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	
< 20	3.69	5.25	7.24	2.84	.99	1.13	2.13	1.42	3.69	15.48	17.18	6.39	6.25	12.07	7.24	6.96	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	3.69	5.25	7.24	2.84	.99	1.13	2.13	1.42	3.69	15.48	17.18	6.39	6.25	12.07	7.24	6.96	

Calm : .00 %

Total # Operational Hours : 704

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 20	26	37	51	20	7	8	15	10	26	109	121	45	44	85	51	49	704
< 60																	
< 110																	
< 170																	
< 340																	
>= 340																	
Totals	26	37	51	20	7	8	15	10	26	109	121	45	44	85	51	49	

Calm : .00 %

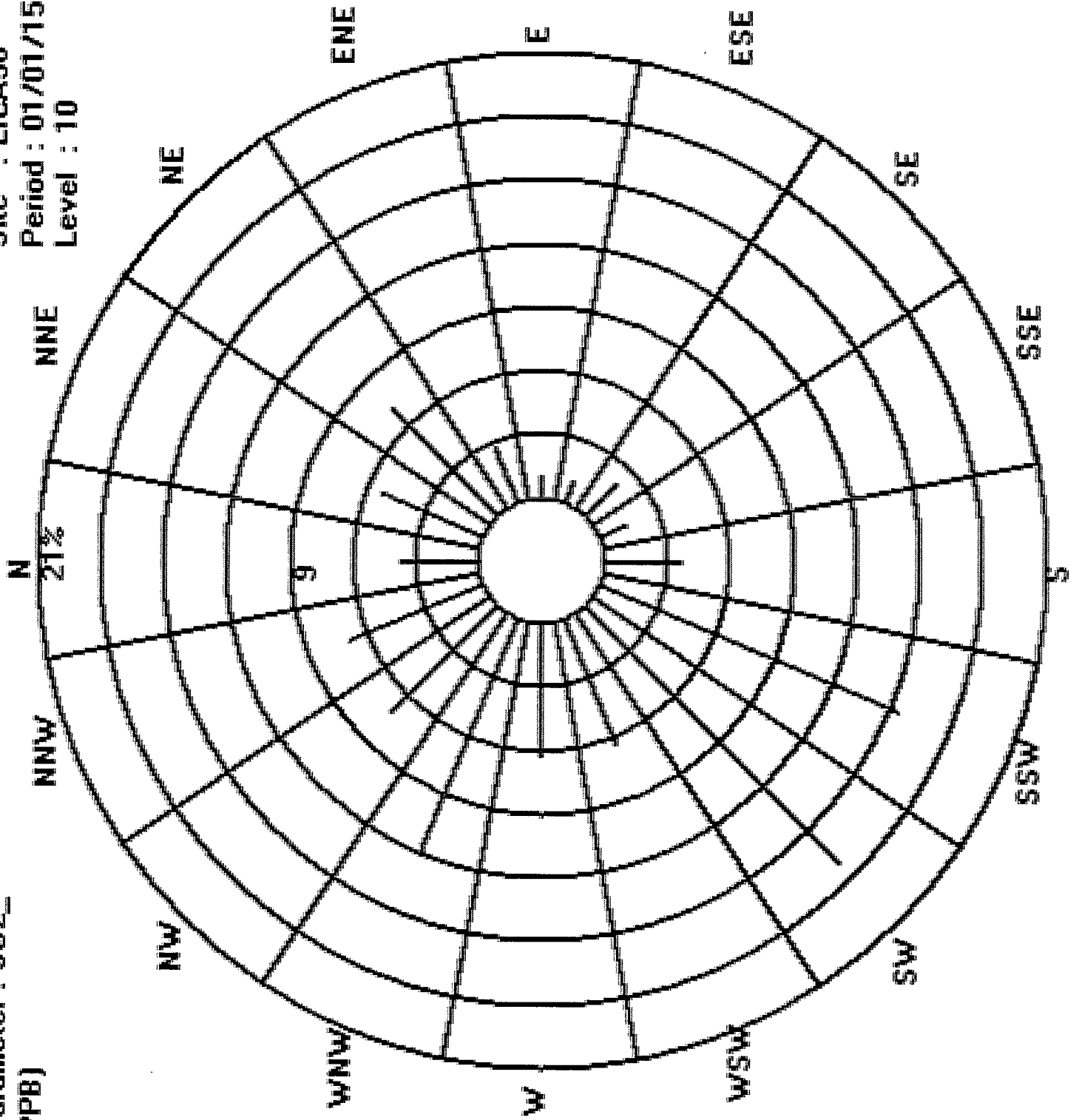
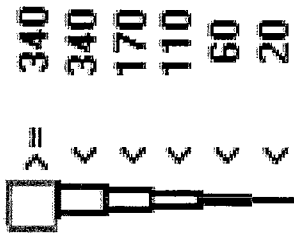
Total # Operational Hours : 704

Logger : 30 Parameter : SO2_

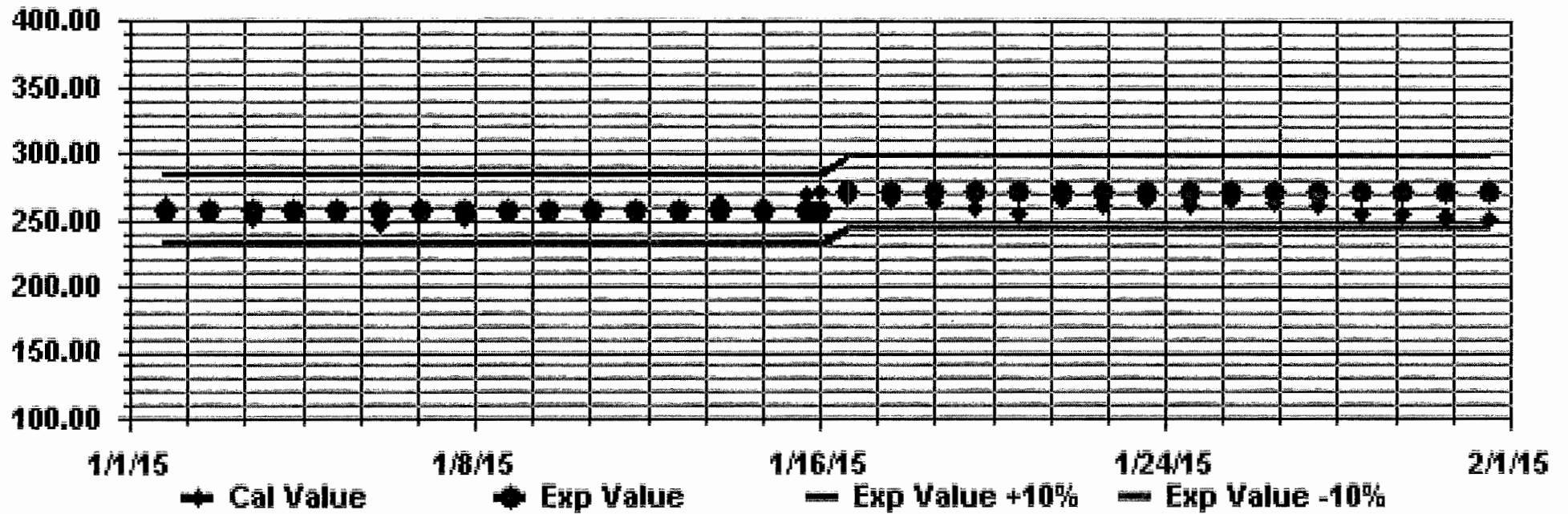
Site : LICA30

Class Limits (PPB)

Period : 01/01/15-01/31/15
Level : 10



Calibration Graph for Site: LICA30 Parameter: SO2_ Sequence: S02 Phase: SPAN



HYDROGEN SULPHIDE

HYDROGEN SULPHIDE (H2S) hourly averages 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	24-HOUR	
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	MAX.	AVG.	RDGS.	
DAY																											
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	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	S	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	S	0	0	0	0	0	0	0	0.0	24
4	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0.0	24
5	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	1	0.1	24
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0.0	24
7	0	0	0	0	0	0	0	0	S	0	2	1	1	S	0	0	0	0	0	1	0	0	0	0	2	0.2	24
8	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	0	0	0	0	0	1	0.0	24
9	0	0	0	0	0	0	0	0	0	0	0	S	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	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0	24
11	0	0	0	0	0	0	0	0	1	S	0	1	1	0	0	0	0	1	0	0	0	1	1	0	1	0.3	24
12	0	1	0	1	0	1	1	1	S	1	0	0	0	0	0	0	0	1	1	0	1	0	0	1	1	0.4	24
13	1	1	1	1	1	1	0	S	0	0	1	1	1	1	0	1	0	0	0	1	1	1	0	1	1	0.7	24
14	1	1	1	0	0	0	S	1	1	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0.3	24
15	0	1	1	1	1	S	0	0	1	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	1	0.3	24
16	0	0	0	0	S	0	0	0	0	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
17	0	0	0	S	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	S	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	0	0	1	0	0	1	0.2	24
19	0	S	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2	24
20	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	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	S	0	0.0	24
22	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0.1	24
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	S	0	0	0	1	0.1	24
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0.0	24
25	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0.1	24
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	S	0	0	0	0	0	0	0	1	0.0	24
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	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	S	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	S	0	0	0	0	0	0	0	0	0	0	0.0	24
30	0	0	0	0	0	0	0	S	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0.0	24
31	0	0	0	0	0	0	0	S	0	1	0	0	S	0	0	0	0	0	0	0	0	0	S	0	1	0.0	24
HOURLY MAX	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	0	1			
HOURLY AVG	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1			

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

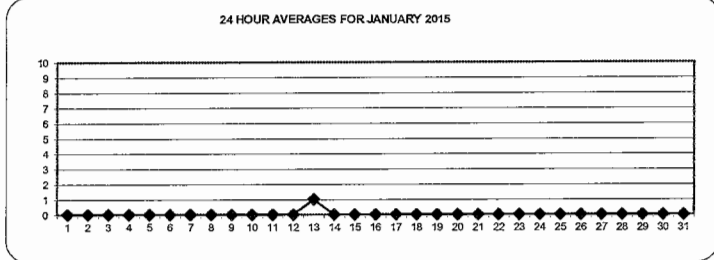
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1 HR 10 PPB, 24 HR 3 PPB

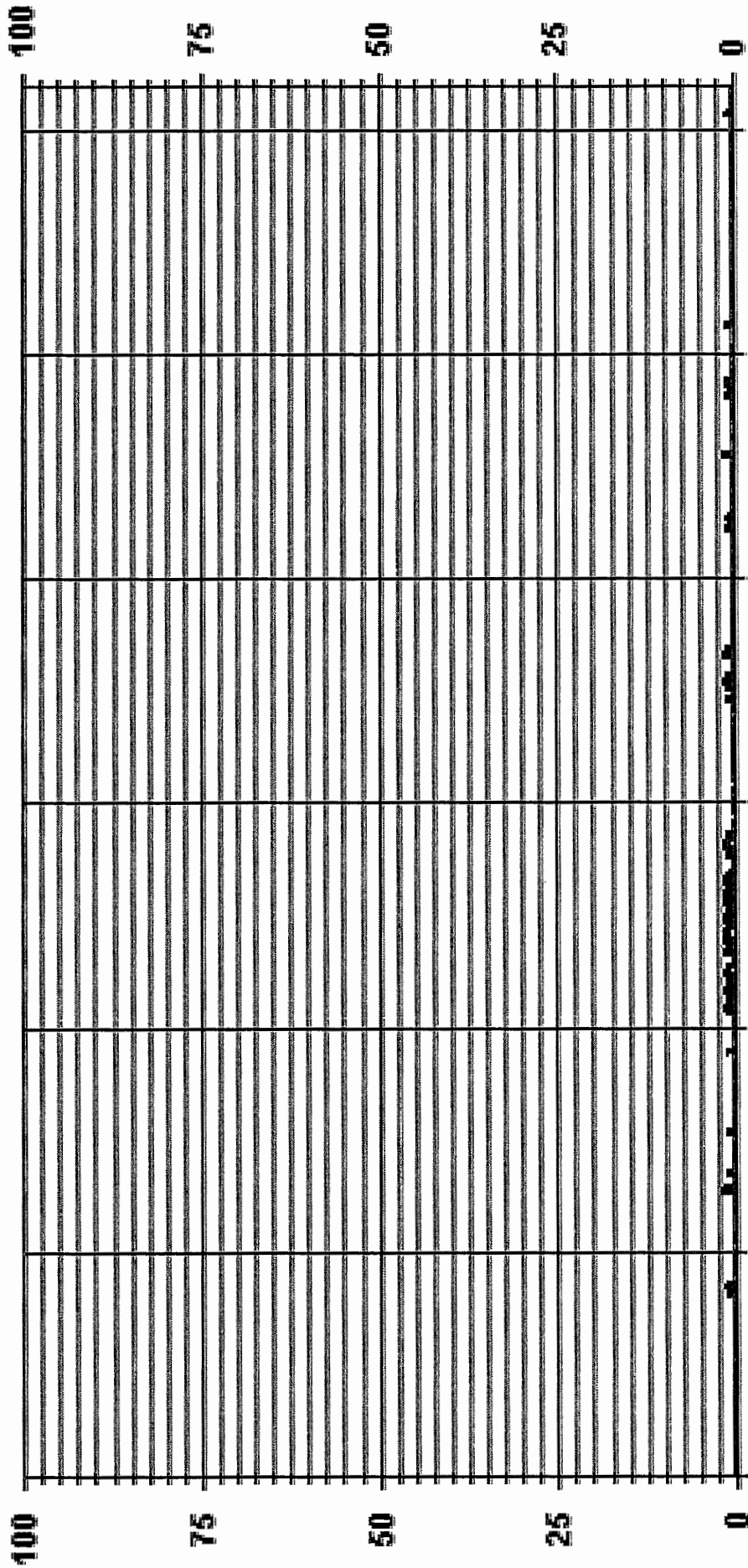
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0
NUMBER OF 24-HR EXCEEDENCES:	0
NUMBER OF NON-ZERO READINGS:	72
MAXIMUM 1-HR AVERAGE:	2 PPB @ HOUR(S) 10 ON DAY(S) 7
MAXIMUM 24-HR AVERAGE:	0.7 PPB ON DAY(S) 13 VAR-VARIOUS
IZS CALIBRATION TIME:	37 HRS
MONTHLY CALIBRATION TIME:	8 HRS
OPERATIONAL TIME:	744 HRS
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0.31
MONTHLY AVERAGE:	0 PPB

24 HOUR AVERAGES FOR JANUARY 2015



01 Hour Averages



01/01/15 00:00 01/06/15 00:00 01/11/15 00:00 01/16/15 00:00 01/21/15 00:00 01/26/15 00:00 01/31/15 00:00

— LICA30 H2S_ PPB



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - JANUARY 2015

JOB # 2833-2015-01-30-C

HYDROGEN SULPHIDE 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.	RDGS.		
1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	0	1	1	1	1	1	0.9	24	
2	0	1	1	0	1	1	1	1	1	1	0	0	0	1	1	1	1	1	S	1	1	0	0	1	1	1	0.7	24	
3	1	0	0	1	1	0	1	1	1	1	0	0	0	1	1	0	0	S	0	0	1	0	1	0	1	0	1	0.4	24
4	0	0	0	0	0	0	0	S	2	0	0	1	1	0	1	0	S	0	0	1	1	1	1	1	1	2	0.5	24	
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	S	0	0	1	1	1	0	0	0	1	0.7	24		
6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0.0	24	
7	0	0	0	0	0	1	0	0	S	S	1	2	2	S	1	1	1	1	1	1	1	1	0	1	0	2	0.7	24	
8	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	1	1	2	2	1	0	1	0	0	0	2	0.4	24	
9	1	1	1	1	1	1	1	0	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4	24	
10	0	0	0	0	0	0	0	0	0	0	S	4	1	1	1	1	1	1	1	1	1	1	1	1	1	4	0.7	24	
11	1	1	1	0	1	0	1	2	S	S	1	4	1	1	1	1	1	1	1	1	1	2	2	1	2	5	1.4	24	
12	1	2	1	1	1	2	1	2	S	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1.1	24	
13	1	1	1	1	1	1	1	S	1	1	2	1	1	1	1	1	1	1	3	1	1	1	1	1	2	3	1.2	24	
14	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	24	
15	1	3	1	1	1	S	1	1	1	1	1	1	1	0	1	1	C	C	C	C	1	1	0	0	3	0.9	24		
16	1	0	0	1	S	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1	24	
17	0	0	0	S	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	S	1	1	0	1	1	2	1	1	1	1	1	1	1	2	2	1	2	1	2	1	1	2	1.0	24		
19	1	S	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	2	1.1	24	
20	S	0	0	0	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	S	1	0.3	24		
21	0	0	0	0	0	0	0	0	1	0	0	1	0	1	1	0	1	1	1	0	1	1	S	1	1	0.4	24		
22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	S	1	1	1	0.9	24		
23	1	0	1	1	0	0	1	0	0	1	1	0	0	0	1	0	1	1	1	1	S	0	0	0	1	0.5	24		
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0.0	24		
25	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	0	0	0	1	0.8	24		
26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	0	0	0	0	0	0	0	1	0.7	24		
27	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	S	0	0	0	1	0	1	0	1	0.1	24		
28	0	1	0	1	1	1	1	0	0	0	0	0	0	0	0	1	S	1	1	0	0	1	0	0	1	0.4	24		
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	1	1	0.1	24		
30	0	1	0	1	1	1	1	S	1	0	1	0	1	S	0	1	0	0	1	0	0	0	0	0	1	0.5	24		
31	0	0	0	0	0	0	0	S	S	1	1	1	S	0	0	0	0	0	0	0	0	0	S	S	1	0.2	24		
HOURLY MAX	1	3	1	1	1	2	1	2	5	2	2	4	2	1	1	1	1	2	3	1	2	2	1	2					
HOURLY AVG	0.5	0.6	0.4	0.5	0.6	0.5	0.6	0.6	0.9	0.6	0.7	0.8	0.6	0.6	0.7	0.6	0.6	0.6	0.7	0.5	0.6	0.4	0.5	0.5					

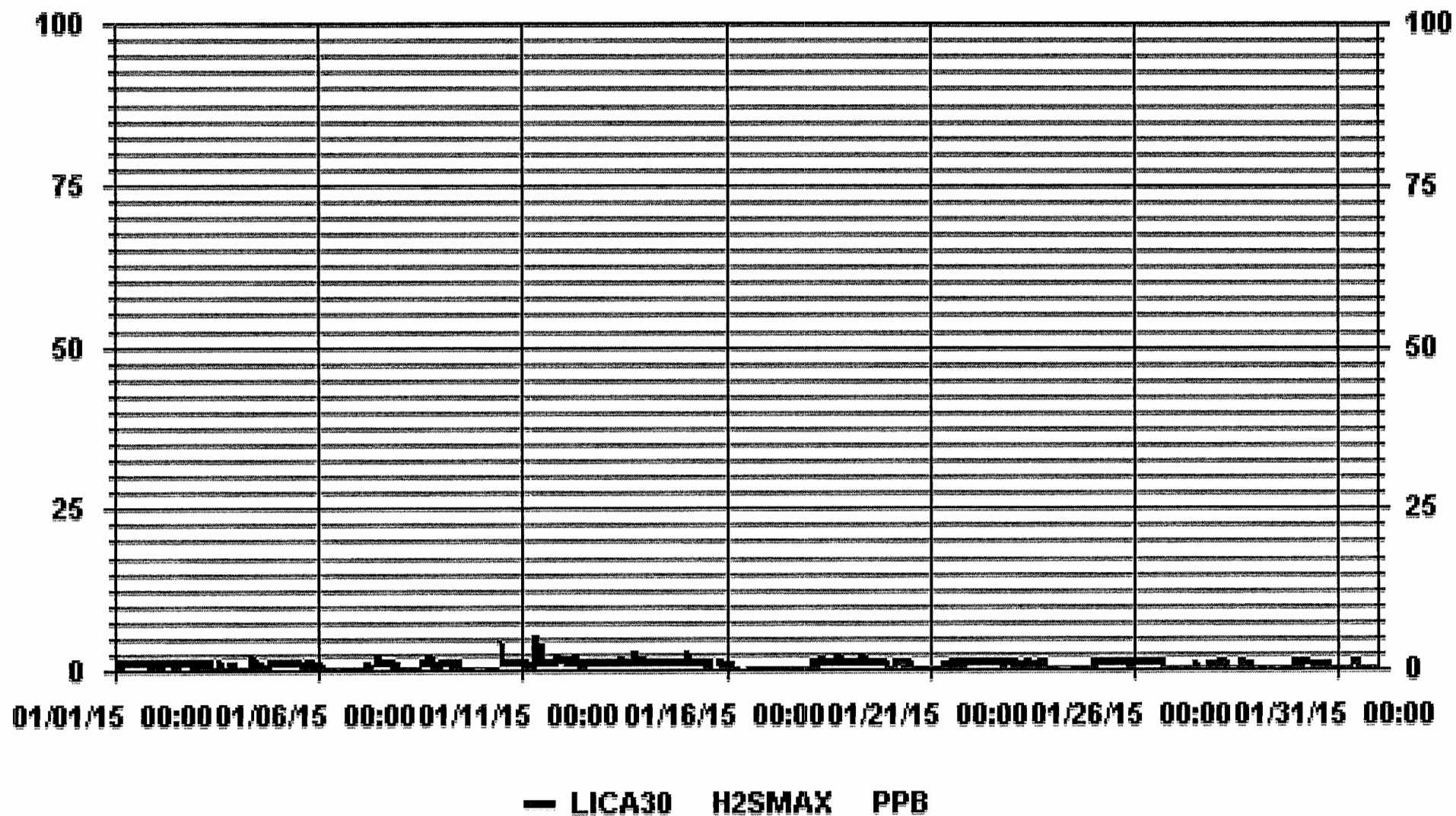
STATUS FLAG CODES

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:	377
MAXIMUM INSTANTANEOUS VALUE:	5 PPB @ HOUR(S) 8 ON DAY(S) 11
	VAR-VARIOUS
IZS CALIBRATION TIME:	40 HRS
MONTHLY CALIBRATION TIME:	9 HRS
STANDARD DEVIATION:	0.62
OPERATIONAL TIME:	744 HRS

01 Hour Averages



LICA30
H2S_ / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 30
Site Name : LICA30
Parameter : H2S_
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	
< 3	3.71	5.00	7.15	2.71	1.00	1.14	2.14	1.43	3.71	15.59	17.31	6.29	6.29	12.16	7.29	7.01	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	3.71	5.00	7.15	2.71	1.00	1.14	2.14	1.43	3.71	15.59	17.31	6.29	6.29	12.16	7.29	7.01	

Calm : .00 %

Total # Operational Hours : 699

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 3	26	35	50	19	7	8	15	10	26	109	121	44	44	85	51	49	699
< 10																	
< 50																	
>= 50																	
Totals	26	35	50	19	7	8	15	10	26	109	121	44	44	85	51	49	

Calm : .00 %

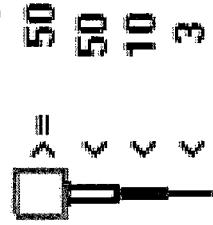
Total # Operational Hours : 699

Logger : 30 Parameter : H2S_

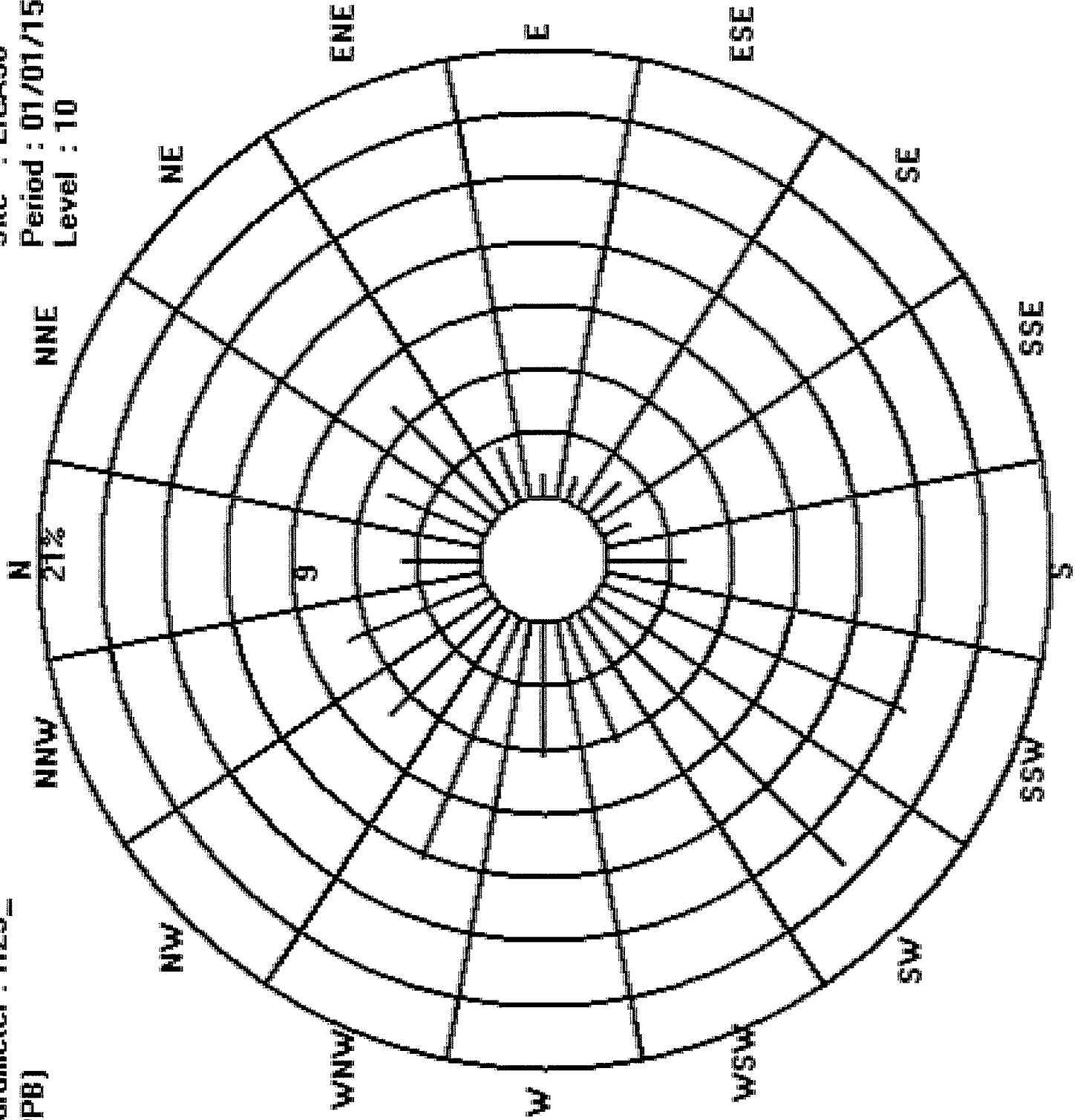
Site : LICA30

Class Limits (FPB)

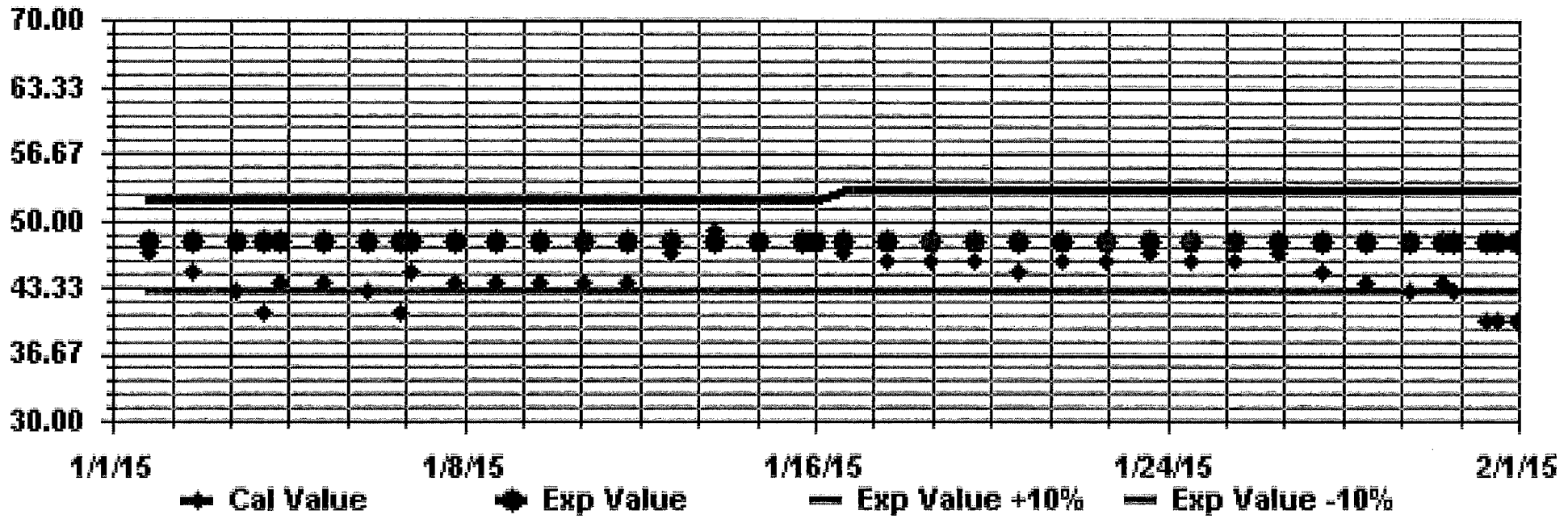
Period : 01/01/15-01/31/15



Level : 10



Calibration Graph for Site: LICA30 Parameter: H2S_ Sequence: H2S Phase: SPAN



TOTAL HYDROCARBON

TOTAL HYDROCARBONS (THC) hourly averages in ppm

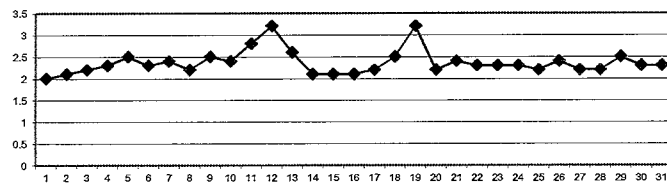
MST

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	DAILY MAX.	24-HOUR AVG.	RDGS.	
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	2.1	2.1	2.2	2.2	2.2	2.0	2.4	
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	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.4	
3	2.2	2.2	2.3	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.4	
4	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.3	2.4	
5	2.5	2.5	2.5	2.4	2.7	2.7	2.9	2.9	2.9	3.0	2.9	2.5	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	3.0	2.5	2.4	
6	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	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	2.3	2.4	2.3	2.4	
7	2.3	2.3	2.7	2.9	2.6	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.6	2.6	2.6	2.6	2.5	2.3	2.2	2.2	2.2	2.2	2.9	2.4	2.4	
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	2.2	2.2	2.3	2.2	2.3	2.3	2.4	2.2	2.1	2.1	2.1	2.3	2.4	2.2	2.4
9	2.4	2.4	2.4	2.4	2.5	2.5	2.4	2.6	2.8	3.1	2.7	2.7	2.7	2.6	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.7	2.6	2.3	3.1	2.5	2.4	
10	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	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.5	2.8	3.0	3.0	2.8	2.5	3.0	2.4	2.4
11	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.7	3.6	3.5	3.3	3.4	3.4	3.4	3.4	3.3	3.4	3.3	3.3	3.6	2.8	2.4	
12	3.2	3.3	3.2	3.2	3.2	3.3	3.4	3.5	3.5	3.4	3.1	2.9	2.8	2.8	2.9	3.0	3.2	3.4	3.7	3.9	4.0	3.4	3.0	2.9	4.0	3.2	2.4	2.4	
13	2.9	3.0	3.1	3.0	2.7	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.5	2.7	3.0	2.6	2.4	2.5	2.5	2.6	2.5	2.6	2.5	2.6	3.1	2.6	2.4
14	2.6	2.2	2.1	2.0	2.1	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	2.1	2.1	2.1	2.1	2.1	2.6	2.1	2.4
15	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4
16	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.1	2.1	2.3	2.1	2.4
17	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	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	2.6	2.2	2.4
18	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.6	2.7	2.6	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.6	2.6	2.6	2.6	2.7	2.8	2.8	2.5	2.4
19	2.9	2.9	3.0	3.1	3.1	3.3	3.5	4.1	3.3	3.2	4.3	4.2	5.1	4.5	4.0	3.1	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	5.1	3.2	2.4	
20	2.9	2.9	3.0	3.1	3.1	3.3	3.5	4.1	3.3	3.2	4.3	4.2	5.1	4.5	4.0	3.1	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	5.1	3.2	2.4	
21	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.4	2.4
22	2.4	2.5	2.6	2.6	2.6	2.5	2.5	2.6	2.7	2.6	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	2.7	2.3	2.4	
23	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.5	2.8	2.6	2.5	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.4	2.4	2.4	2.6	2.8	2.3	2.4	
24	2.6	2.6	2.5	2.5	2.7	2.3	2.1	2.1	2.0	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	2.7	2.3	2.4	
25	2.5	2.3	2.4	2.4	2.4	2.3	2.2	2.4	2.3	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	2.5	2.2	2.4	
26	2.1	2.2	2.3	2.6	2.5	2.5	2.4	2.5	2.5	2.5	2.7	2.7	2.5	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.6	2.6	2.7	2.4	2.4	
27	2.5	2.3	2.2	2.2	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	2.1	2.1	2.1	2.1	2.1	2.5	2.2	2.4	
28	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.2	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	2.3	2.2	2.3	2.2	2.4
29	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.3	2.4	2.3	2.3	2.3	2.4	2.6	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.5	2.4	
30	2.7	2.6	2.6	2.5	2.4	2.3	2.3	2.2	2.2	2.2	2.2	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	2.7	2.3	2.4	
31	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	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	2.3	2.4	
HOURLY MAX	3.2	3.3	3.2	3.2	3.2	3.3	3.5	4.1	3.3	3.4	4.3	4.2	5.1	4.5	4.0	3.5	3.3	3.4	3.7	3.9	4.0	3.4	3.3	3.3	3.3	3.3	3.3	3.3	
HOURLY AVG	2.4	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.3	2.4	2.3	2.4	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	

STATUS FLAG CODES

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

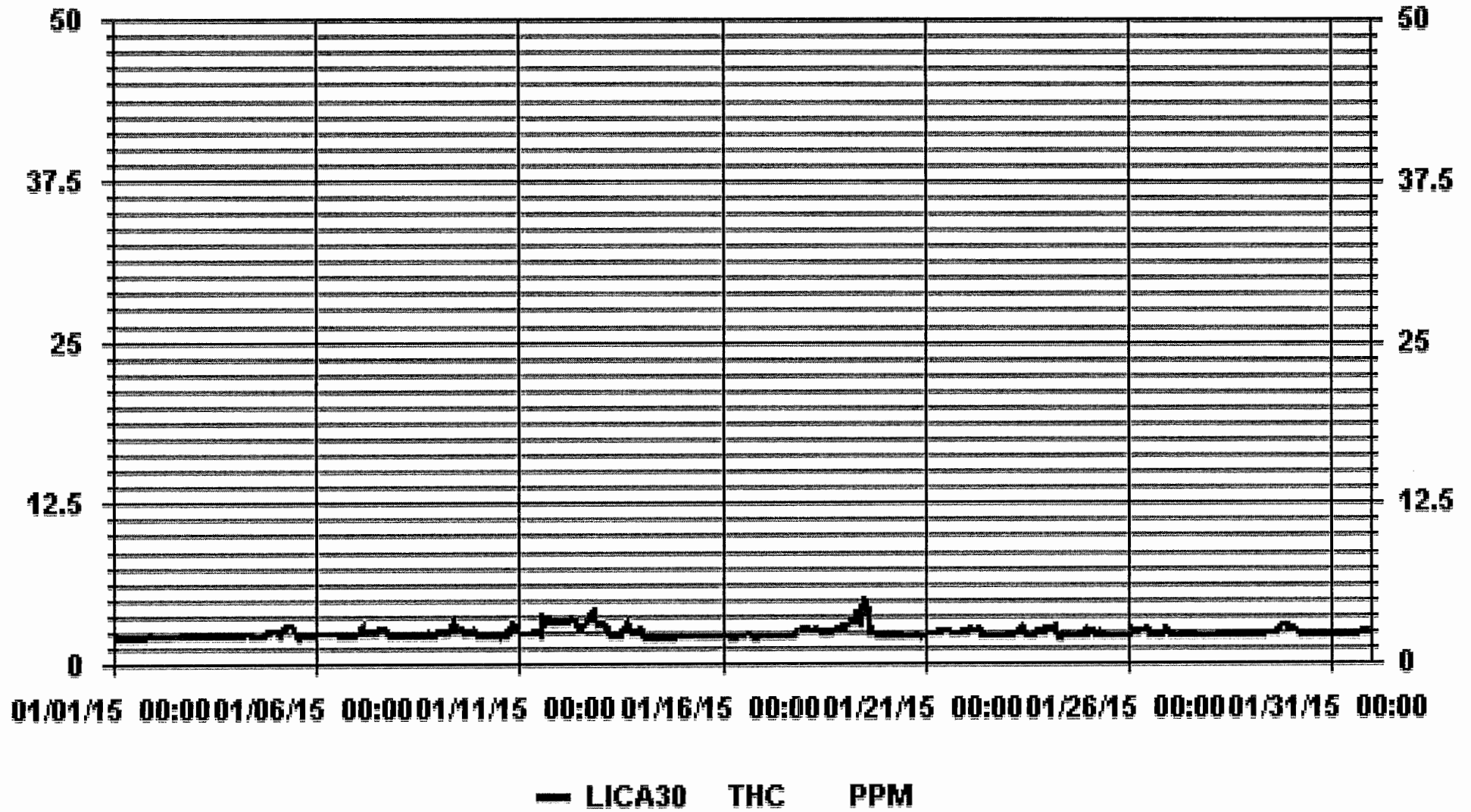
24 HOUR AVERAGES FOR JANUARY 2015



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	708		
MAXIMUM 1-HR AVERAGE:	5.1 PPM	@ HOUR(S)	12 ON DAY(S) 19
MAXIMUM 24-HR AVERAGE:	3.2 PPM		ON DAY(S) 12
			VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS	OPERATIONAL TIME:	744 HRS
MONTHLY CALIBRATION TIME:	4 HRS	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0.37	MONTHLY AVERAGE:	2.4 PPM

01 Hour Averages





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - JANUARY 2015

JOB # 2833-2015-01-30- C

TOTAL HYDROCARBONS MAX instantaneous maximum in ppm

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	24:00	DAILY MAX	24-HOUR AVG.	RDGS.		
DAY	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	0:00						
1	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	2.1	2.0	2.0	2.0	S	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.0	24		
2	2	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	S	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.2	24		
3	3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.4	S	2.2	2.3	2.4	2.4	2.2	2.2	2.2	2.2	2.4	2.3	2.4	24		
4	4	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	S	2.3	2.4	2.4	2.4	2.5	2.5	2.6	2.6	2.6	2.3	24	24		
5	5	2.6	2.6	2.5	2.6	2.8	2.8	3.1	3.0	3.0	3.1	3.1	2.7	3.2	3.0	2.2	S	2.2	2.2	2.4	2.3	2.3	2.3	2.3	2.3	3.2	2.6	2.4	24		
6	6	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.4	2.8	2.7	2.3	2.3	2.3	2.3	S	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.4	2.8	2.3	24	24		
7	7	2.3	2.4	4.2	3.6	2.8	2.5	2.5	2.4	2.4	2.4	2.4	2.5	S	2.6	2.6	2.6	2.6	2.6	2.4	2.3	2.2	2.2	2.2	2.2	4.2	2.6	24	24		
8	8	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.3	S	2.6	2.6	2.4	2.6	3.0	2.7	2.5	2.2	2.1	2.2	2.4	3.0	2.4	2.4	24	24		
9	9	2.5	2.5	2.5	2.5	2.6	2.6	2.5	2.8	2.9	3.3	3.0	S	2.7	2.7	2.7	2.6	2.5	2.5	2.4	2.5	2.6	2.7	2.7	2.4	3.3	2.6	24	24		
10	10	2.3	2.3	2.5	2.2	2.2	2.3	2.3	2.2	2.2	S	2.8	2.2	2.2	2.2	2.2	2.2	2.3	2.7	3.0	3.1	3.0	3.0	2.6	3.1	2.4	2.4	24	24		
11	11	2.4	2.3	2.4	2.5	2.3	2.4	2.4	2.6	2.5	S	2.5	2.6	2.6	3.5	3.7	3.7	3.3	3.5	3.5	3.4	3.4	3.4	3.4	3.4	3.7	2.9	24	24		
12	12	3.3	3.4	3.3	3.2	3.2	3.4	3.6	3.6	S	3.5	3.2	3.1	2.8	2.8	2.9	3.1	3.3	3.6	3.8	3.9	4.0	3.9	3.1	2.9	4.0	3.3	24	24		
13	13	3.0	3.1	3.1	3.1	3.0	2.5	2.3	S	2.4	2.4	2.3	2.3	2.6	2.5	2.9	3.8	2.9	2.5	2.5	2.6	2.6	2.6	2.7	3.8	2.7	3.8	2.7	24	24	
14	14	2.7	2.5	2.2	2.1	2.2	2.2	S	2.0	2.0	2.0	2.0	2.0	2.1	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	2.4	24	24
15	15	2.1	2.1	2.1	2.1	2.1	S	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	24	24	
16	16	2.1	2.1	2.1	2.2	S	2.1	2.0	2.1	2.1	2.1	2.1	2.2	C	C	C	2.5	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.5	2.1	24	24	
17	17	2.1	2.1	2.1	S	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.4	2.5	2.7	2.7	2.7	2.2	2.4	24	24	
18	18	2.7	2.7	S	2.6	2.6	2.6	2.6	2.7	2.8	2.7	2.5	2.4	2.4	2.4	2.4	2.4	2.5	2.6	2.6	2.7	2.7	2.8	3.0	3.0	2.6	2.6	24	24		
19	19	3.0	S	3.1	3.2	3.2	3.4	4.4	4.5	3.9	4.0	4.4	4.9	5.2	4.9	4.3	3.7	2.3	2.3	2.4	2.3	2.3	2.2	2.3	2.3	5.2	3.4	24	24		
20	20	S	2.2	2.2	2.2	2.2	2.2	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	S	2.3	2.2	24	24		
21	21	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.3	2.3	2.4	2.4	2.3	S	2.4	2.5	2.4	24	24		
22	22	2.4	2.6	2.6	2.6	2.7	2.6	2.6	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	S	2.1	2.1	2.1	2.8	2.4	24	24	
23	23	2.2	2.2	2.2	2.5	2.4	2.4	2.3	2.6	2.6	3.0	2.7	2.5	2.5	2.2	2.1	2.1	2.2	2.4	2.5	2.5	S	2.4	2.5	2.7	3.0	2.4	24	24		
24	24	2.7	2.6	2.5	2.6	2.8	2.8	2.1	2.1	2.1	2.4	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.1	S	2.2	2.2	2.3	2.8	2.8	2.3	24	24		
25	25	2.7	2.4	2.5	2.4	2.4	2.4	2.3	2.4	2.4	2.3	2.3	2.1	2.1	2.1	2.1	2.1	S	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.7	2.3	24	24	
26	26	2.2	2.3	2.4	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.8	2.8	2.6	2.4	2.2	2.3	2.3	S	2.3	2.3	2.4	2.5	2.7	2.6	2.8	2.5	24	24		
27	27	2.6	2.5	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	S	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.6	2.2	24	24		
28	28	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.2	3.3	3.0	2.3	2.7	S	2.3	2.3	2.3	2.2	2.2	2.3	2.5	2.3	3.3	2.3	24	24		
29	29	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.3	S	2.5	2.7	2.9	2.9	2.9	3.0	3.0	2.9	2.9	3.0	2.5	24	24		
30	30	2.9	2.6	2.7	2.6	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	S	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.9	2.3	24	24		
31	31	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	S	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.4	2.4	2.5	2.3	24	24		
HOURLY MAX		3.3	3.4	4.2	3.6	3.2	3.4	4.4	4.5	3.9	4.0	4.4	4.9	5.2	4.9	4.3	3.7	3.8	3.6	3.8	3.9	4.0	3.9	3.4	3.4						
HOURLY AVG		2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.5	2.4	2.5	2.5	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						

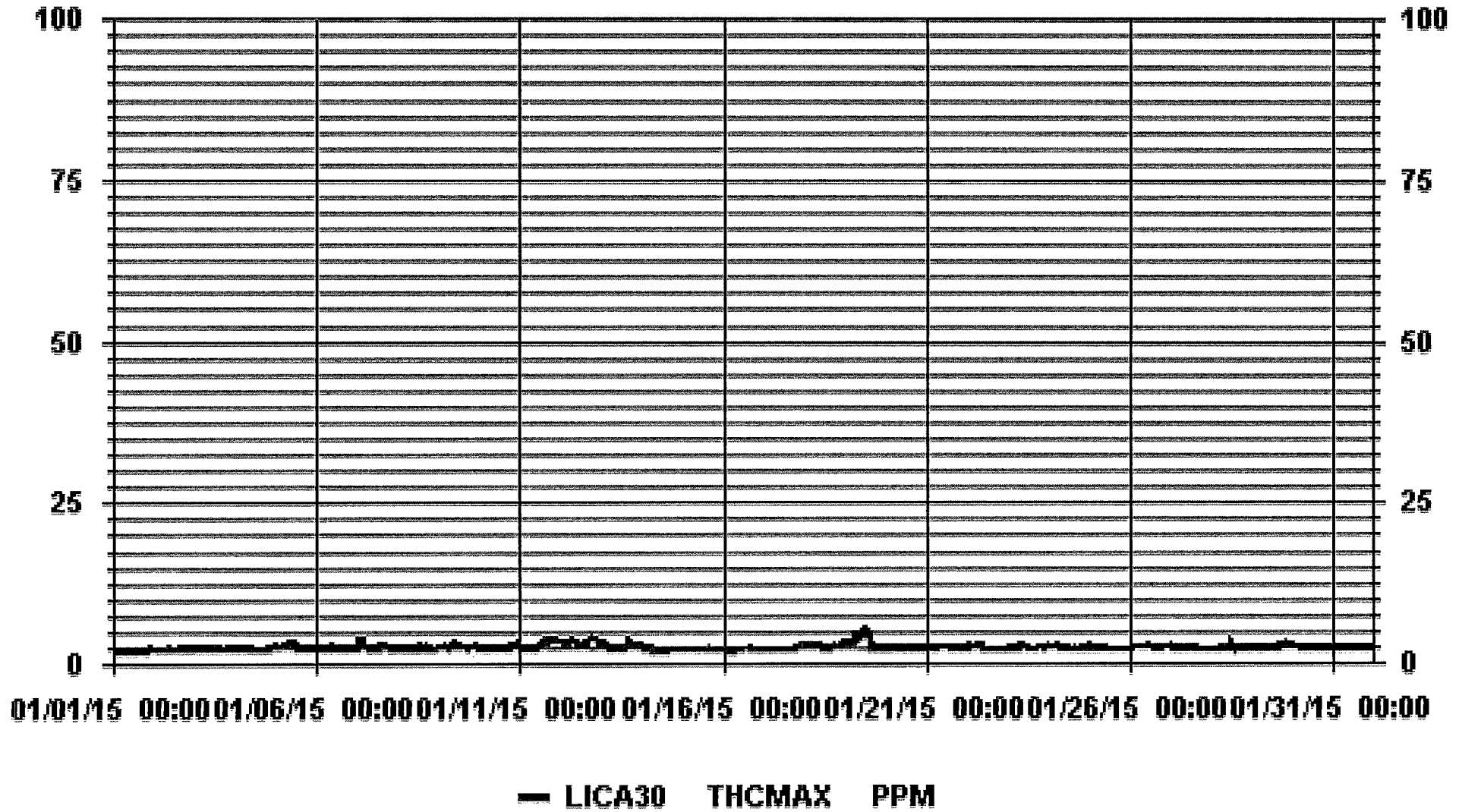
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	708
MAXIMUM INSTANTANEOUS VALUE:	5.2 PPM @ HOUR(S) 12 ON DAY(S) 19
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	4 HRS
STANDARD DEVIATION:	0.43
OPERATIONAL TIME:	744 HRS

01 Hour Averages



LICA30
 THC / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 30
 Site Name : LICA30
 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	3.53	5.08	6.63	2.82	.70	1.27	1.97	1.12	3.67	14.12	14.26	5.79	6.21	11.86	7.06	6.77	92.93
< 10.0	.14	.14	.56	.00	.28	.14	.42	.28	.00	1.55	2.68	.42	.00	.14	.14	.14	7.06
< 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	3.67	5.22	7.20	2.82	.98	1.41	2.40	1.41	3.67	15.67	16.94	6.21	6.21	12.00	7.20	6.92	

Calm : .00 %

Total # Operational Hours : 708

Distribution By Samples

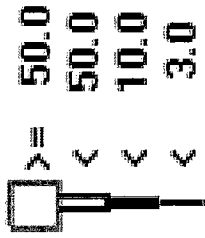
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 3.0	25	36	47	20	5	9	14	8	26	100	101	41	44	84	50	48	658
< 10.0	1	1	4		2	1	3	2		11	19	3		1	1	1	50
< 50.0																	
>= 50.0																	
Totals	26	37	51	20	7	10	17	10	26	111	120	44	44	85	51	49	

Calm : .00 %

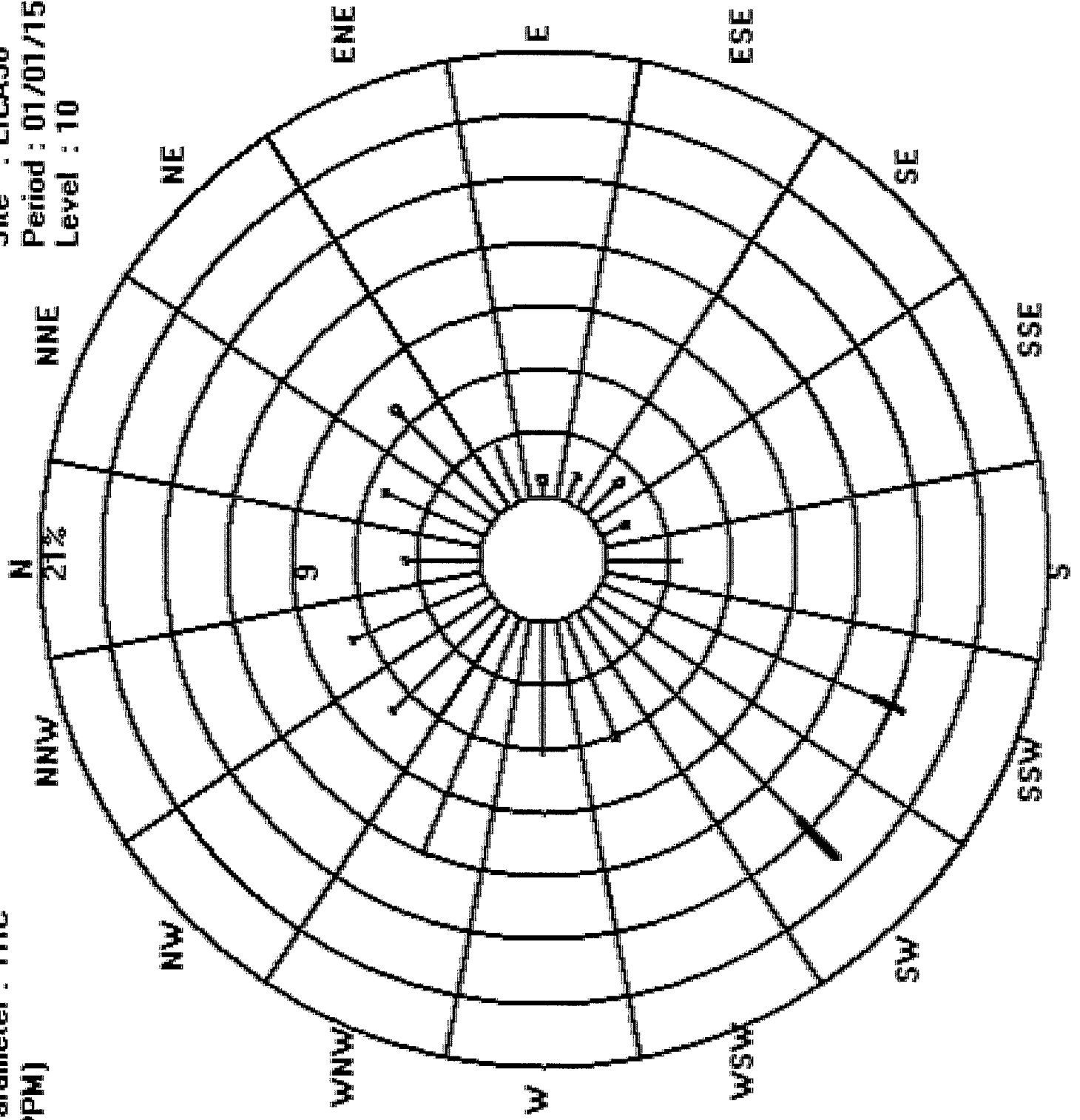
Total # Operational Hours : 708

Logger : 30 Parameter : THC

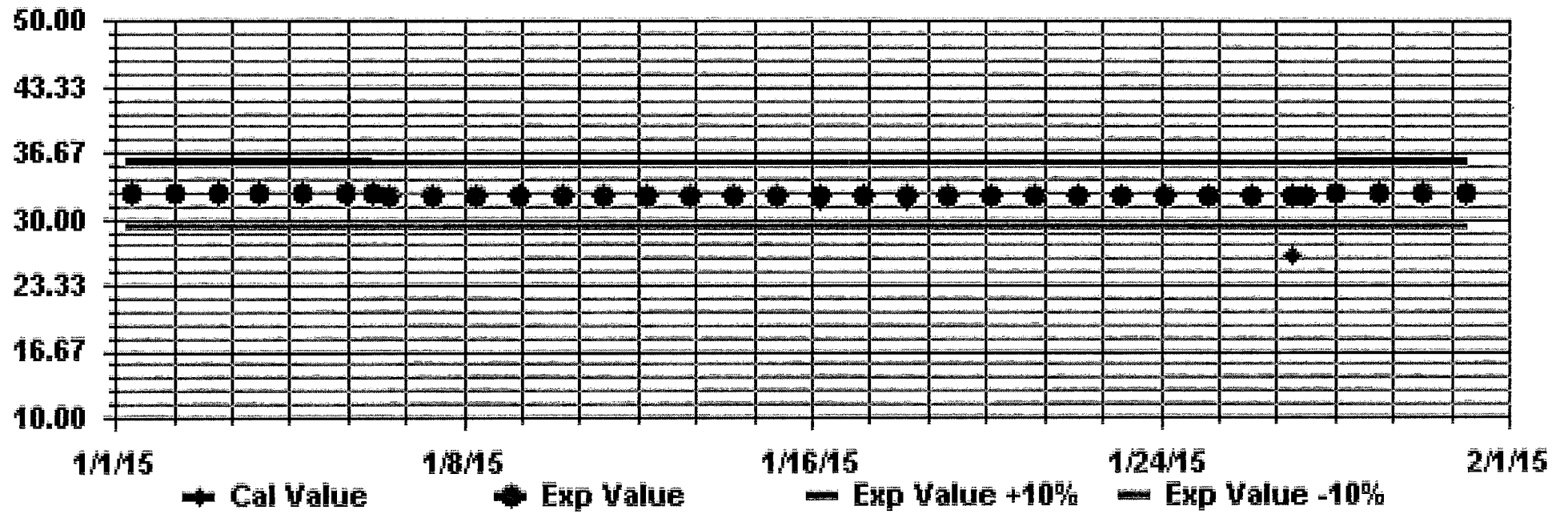
Class Limits (PPM)



Site : LICA30
Period : 01/01/15-01/31/15
Level : 10



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



OXIDES OF NITROGEN

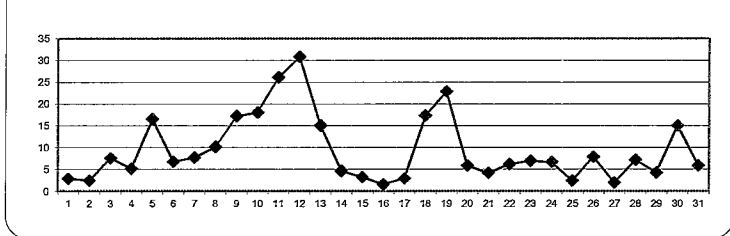
OXIDES OF NITROGEN (NOx) hourly averages in ppb

DAY	HOUR START																								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			
1	2.3	1.8	1.2	1.1	1.0	1.0	1.0	1.0	2.4	2.8	1.3	1.2	3.5	1.6	2.4	8.5	3.3	2.6	2.4	S	2.7	4.5	7.8	6.5	8.5	2.8	24
2	2.8	1.7	1.3	1.3	1.1	1.0	1.1	1.2	1.3	1.5	1.4	1.3	1.4	2.6	1.4	1.5	3.7	5.1	S	4.4	8.3	6.3	1.8	1.5	8.3	2.4	24
3	2.5	7.4	16.1	16.1	7.0	10.9	8.6	10.8	3.8	1.7	12.1	2.5	1.5	2.4	4.8	4.4	10.1	S	9.9	8.8	7.2	9.8	10.3	3.8	16.1	7.5	24
4	1.4	1.0	1.1	1.1	1.4	5.1	8.0	7.8	7.3	7.4	4.6	1.8	1.3	1.4	1.4	1.7	S	6.0	8.4	7.6	9.2	9.9	10.7	11.5	11.5	5.1	24
5	16.7	17.2	17.4	14.6	22.4	20.9	27.7	29.5	27.9	36.0	32.7	20.1	12.2	10.8	7.6	S	6.9	6.5	13.6	13.5	9.9	1.9	4.9	7.9	36.0	16.5	24
6	10.9	9.8	11.6	8.2	3.6	2.7	1.6	3.5	17.3	10.9	14.0	10.3	1.8	2.3	S	4.0	10.9	8.9	8.3	3.2	1.5	1.6	2.5	3.8	17.3	6.7	24
7	4.6	5.9	8.7	6.7	9.7	11.1	6.6	6.5	9.3	7.1	8.6	5.6	6.9	S	8.1	6.7	11.7	7.9	20.2	6.0	4.9	4.7	4.5	4.0	20.2	7.7	24
8	4.1	4.9	3.7	1.2	1.3	3.6	4.9	10.3	3.4	12.2	23.4	17.6	S	20.7	18.5	19.8	10.7	7.5	9.5	25.0	12.0	3.2	9.2	5.6	25.0	10.1	24
9	11.2	15.1	11.0	12.5	11.4	12.2	15.4	18.1	25.5	28.0	18.1	S	20.4	22.6	22.9	18.9	23.5	18.2	13.5	16.7	11.4	15.8	21.7	11.0	28.0	17.2	24
10	12.0	15.6	42.4	24.9	13.8	30.0	34.5	26.2	16.5	5.1	S	66.2	3.3	3.6	2.8	5.5	6.2	9.4	13.4	19.1	18.3	21.4	13.8	9.1	66.2	18.0	24
11	7.3	4.3	6.5	4.2	7.6	7.8	12.8	21.5	68.2	S	21.3	45.7	18.3	23.0	30.0	36.5	26.6	24.5	35.6	29.6	48.0	53.1	31.4	36.4	68.2	26.1	24
12	28.3	57.9	31.7	25.8	32.5	53.9	33.9	54.1	S	49.1	20.7	15.6	12.9	14.6	19.4	20.3	25.0	27.0	31.8	36.1	38.7	28.6	23.4	26.3	57.9	30.8	24
13	28.5	30.0	31.7	29.0	19.8	9.8	7.9	S	15.3	12.8	21.1	14.5	10.6	12.0	9.5	11.7	12.2	9.8	8.3	9.0	9.5	11.5	9.4	12.7	31.7	15.1	24
14	15.5	5.3	1.8	1.2	1.1	4.6	S	3.1	3.4	3.9	2.8	3.5	3.0	7.0	3.2	3.5	4.4	3.4	2.7	2.5	8.5	6.4	7.6	7.3	15.5	4.6	24
15	8.3	10.0	6.1	3.6	1.6	S	1.9	1.8	1.9	1.7	1.3	1.0	1.4	1.2	4.9	1.6	C	C	C	C	7.6	3.8	0.1	0.2	10.0	3.2	24
16	0.4	0.7	1.3	1.0	S	1.3	1.0	1.6	2.0	C	C	C	C	C	C	C	6.5	3.3	2.0	1.0	0.5	0.4	0.3	0.2	6.5	1.5	24
17	0.1	0.3	0.3	S	0.6	0.3	0.3	0.6	0.4	0.6	1.7	1.3	1.3	0.6	1.0	6.0	5.7	5.0	2.2	1.6	6.8	8.6	12.0	8.6	12.0	2.9	24
18	5.7	7.2	S	11.5	12.7	13.5	13.3	12.1	44.1	14.2	8.7	9.3	14.1	11.2	12.9	10.2	11.4	50.2	55.0	16.3	29.8	11.1	12.7	10.3	55.0	17.3	24
19	10.4	S	27.3	11.7	12.1	13.7	23.1	65.2	36.5	45.6	42.8	39.3	48.0	38.9	31.5	23.7	12.9	13.1	5.9	4.5	4.6	4.0	3.4	5.5	65.2	22.8	24
20	S	4.4	10.8	8.2	4.0	5.7	7.3	9.2	8.5	8.8	11.2	7.3	5.5	5.1	4.0	1.9	1.7	2.4	3.5	7.1	2.7	2.1	5.2	S	11.2	5.8	24
21	2.0	1.6	1.4	0.7	0.7	1.0	1.7	2.4	2.4	2.8	3.5	5.6	5.8	6.2	6.4	6.5	7.2	6.5	5.5	6.2	5.8	5.4	S	7.5	7.5	4.1	24
22	7.3	7.9	11.9	14.2	13.7	10.8	10.8	14.8	17.5	17.0	6.1	1.8	1.4	0.9	0.7	1.0	0.3	0.6	0.0	0.1	S	0.9	0.7	17.5	6.1	24	
23	2.2	2.6	1.8	13.3	2.6	4.3	4.4	8.6	10.7	14.6	13.9	7.7	6.5	3.5	2.7	2.7	6.0	13.5	7.7	8.0	S	7.4	7.2	6.6	14.6	6.9	24
24	7.6	6.8	7.4	10.9	12.7	5.6	1.2	0.9	1.9	8.3	7.4	16.4	19.3	13.9	2.4	5.8	6.5	0.7	0.4	S	1.3	1.3	4.6	8.1	19.3	6.6	24
25	5.1	3.2	3.3	3.7	5.2	2.9	2.0	3.1	3.2	3.6	4.3	3.9	0.8	1.2	1.0	1.1	1.5	0.1	S	0.5	0.4	0.3	0.3	4.0	5.2	2.4	24
26	1.4	3.2	4.6	10.1	9.0	7.4	8.1	9.2	11.9	12.9	14.3	16.5	8.7	4.4	2.7	5.1	15.5	S	5.3	3.7	5.0	6.7	7.5	6.7	16.5	7.8	24
27	13.9	6.1	7.3	2.4	1.6	1.1	0.5	0.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.3	0.0	0.5	1.7	0.8	5.5	0.0	13.9	1.9	24
28	0.2	4.5	4.0	1.6	1.3	3.2	11.1	3.8	6.4	4.9	5.0	7.2	6.9	4.0	10.2	S	10.3	28.8	7.1	8.7	7.7	10.8	6.4	9.4	28.8	7.1	24
29	3.4	3.5	1.7	1.2	0.6	0.3	2.7	3.1	2.1	2.2	2.3	2.8	2.4	2.5	S	4.0	5.5	7.5	7.8	7.2	8.0	8.3	8.9	9.2	9.2	4.2	24
30	9.3	14.7	15.6	9.6	12.4	18.7	16.5	30.7	20.0	20.5	26.8	18.9	22.8	S	14.5	15.6	10.3	20.1	20.5	13.0	11.7	2.7	0.8	0.0	30.7	15.0	24
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0	4.5	2.9	2.9	S	2.8	0.5	2.7	4.0	3.7	8.6	4.0	7.3	4.9	33.9	50.5	50.5	5.8	24
HOURLY MAX	28.5	57.9	42.4	29.0	32.5	53.9	34.5	65.2	68.2	49.1	42.8	66.2	48.0	38.9	31.5	36.5	26.6	50.2	55.0	36.1	48.0	53.1	33.9	50.5			
HOURLY AVG	7.5	8.5	9.7	8.4	7.5	8.8	9.0	12.1	12.4	11.7	11.5	12.0	8.6	7.9	8.1	8.2	9.3	10.4	11.1	9.4	9.7	8.6	9.0	9.2			

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

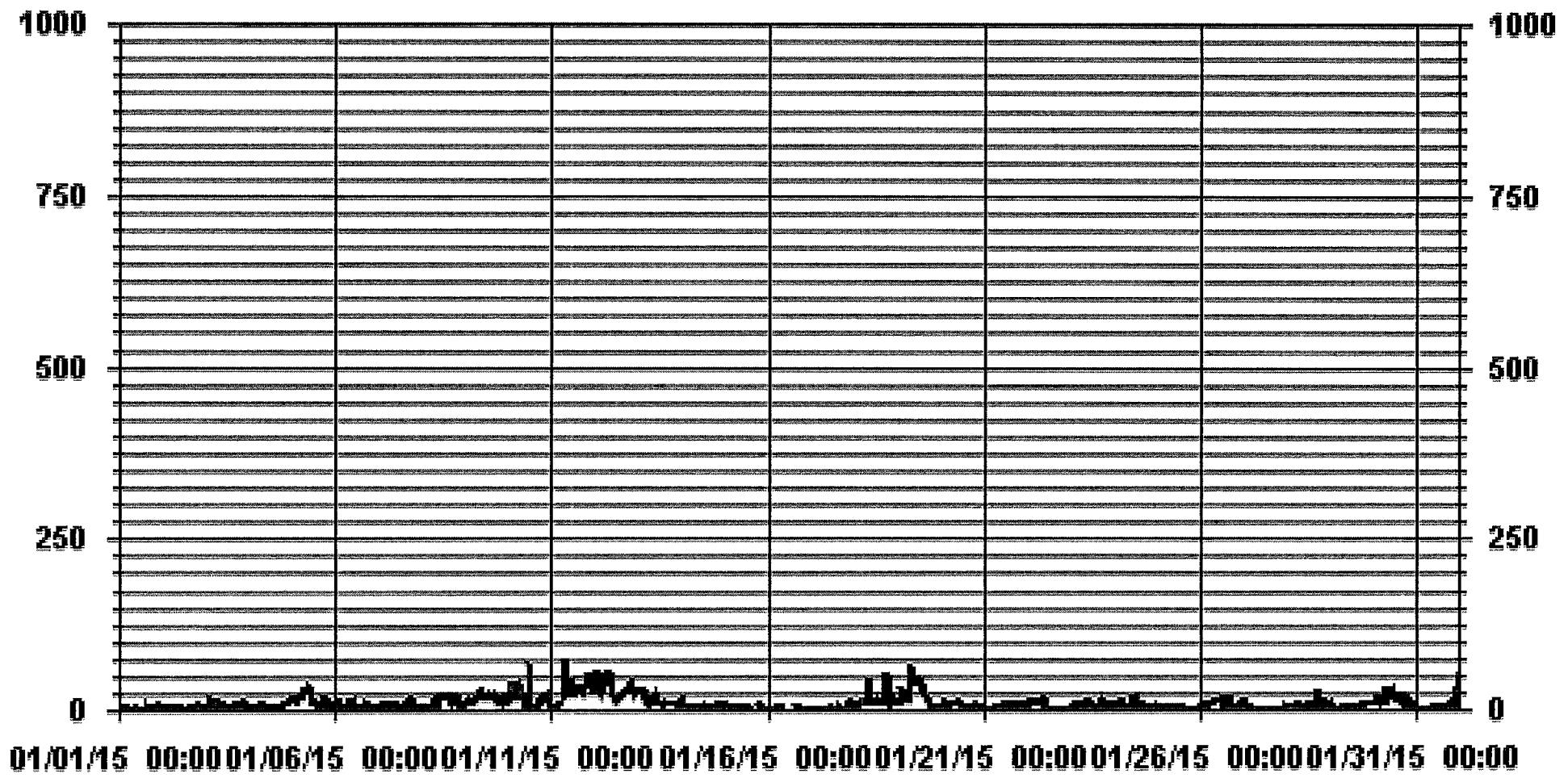
24 HOUR AVERAGES FOR JANUARY 2015



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	683				
MAXIMUM 1-HR AVERAGE:	68.2	PPB @ HOUR(S)	8	ON DAY(S)	11
MAXIMUM 24-HR AVERAGE:	30.8	PPB		ON DAY(S)	12
				VAR-VARIOUS	
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	744	HRS
MONTHLY CALIBRATION TIME:	11	HRS	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	10.72		MONTHLY AVERAGE:	9.5	PPB

01 Hour Averages



— LICA30 NOX_ PPB



OXIDES OF NITROGEN MAX instantaneous maximum in ppb

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	DAILY	24-HOUR	
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	MAX.	AVG.	RDGS.
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	0:00			
DAY 1	2.8	2.4	1.7	1.5	1.2	1.5	1.6	1.5	5.4	7.5	1.8	1.8	5.2	4.2	3.3	25.5	4.6	3.1	2.8	S	3.3	7.0	8.6	8.5	25.5	4.6	24
2	4.4	2.4	1.8	1.8	1.5	1.5	1.5	1.7	1.9	2.0	2.1	1.8	2.3	3.7	2.4	2.4	9.1	9.6	S	9.6	14.6	9.9	3.7	3.9	14.6	4.2	24
3	8.6	17.9	31.4	32.2	30.4	21.5	20.1	20.3	37.5	6.5	63.8	12.2	2.5	9.9	72.6	9.9	86.5	S	36.5	11.4	16.0	21.5	16.6	16.4	86.5	26.2	24
4	4.8	2.3	2.5	1.7	2.9	7.6	9.0	8.9	10.9	10.0	7.5	4.1	1.7	2.2	3.8	7.7	S	8.5	11.4	8.2	10.4	11.8	11.9	15.1	15.1	7.2	24
5	17.6	18.0	22.6	20.8	23.9	23.1	36.8	35.4	35.7	44.6	39.7	24.9	18.2	15.9	15.4	S	17.9	9.9	22.4	22.6	25.9	3.8	9.9	9.6	44.6	22.4	24
6	15.8	15.9	23.2	17.6	5.5	4.2	3.8	10.9	28.3	22.2	38.4	22.2	3.4	3.3	S	12.9	64.3	11.5	9.8	8.1	2.1	2.3	6.6	5.7	64.3	14.7	24
7	6.1	9.1	13.0	7.6	14.6	16.6	8.4	11.8	12.6	7.8	20.9	7.8	10.7	S	10.3	10.9	15.6	13.1	33.8	9.2	5.5	5.9	6.0	5.3	33.8	11.4	24
8	4.8	6.4	5.6	1.9	4.4	13.7	14.8	25.0	7.6	25.8	31.4	27.1	S	34.4	57.1	33.1	22.2	24.3	21.4	37.5	34.5	10.4	25.4	9.9	57.1	20.8	24
9	13.4	60.3	33.8	46.3	14.1	17.9	23.7	23.4	36.5	34.3	21.7	S	39.2	51.5	32.2	24.2	57.7	56.3	63.3	53.6	14.4	21.6	32.9	15.9	63.3	34.3	24
10	72.4	105.3	147.6	57.2	29.6	75.7	56.8	89.9	87.9	7.2	S	216.9	6.0	8.2	7.4	13.1	9.7	25.9	21.5	38.5	20.1	43.4	18.4	11.0	216.9	50.9	24
11	10.3	6.3	60.3	12.9	15.8	11.7	58.4	329.6	405.4	S	39.5	104.3	32.0	56.5	33.9	95.8	43.7	28.7	88.8	83.0	131.1	97.2	37.9	141.3	405.4	83.7	24
12	88.9	163.1	59.0	31.8	60.9	106.9	85.3	70.2	S	92.9	38.6	20.0	13.6	17.7	24.9	25.4	54.6	31.7	34.5	38.2	40.9	38.7	25.4	28.7	163.1	51.8	24
13	29.8	31.6	32.8	32.6	25.5	13.0	10.6	S	24.6	16.6	36.6	24.3	16.2	17.4	12.1	15.4	15.5	12.1	9.4	10.0	10.2	16.5	10.3	17.0	36.6	19.1	24
14	18.0	11.1	3.3	1.2	4.6	5.5	S	4.1	5.5	63.7	5.2	38.9	23.4	32.0	5.2	6.0	9.2	5.6	6.2	5.2	14.2	13.3	13.7	14.7	63.7	13.5	24
15	18.5	13.3	12.5	11.6	2.4	S	2.6	3.1	3.3	2.6	1.8	1.6	2.1	1.6	13.9	3.9	C	C	C	C	12.8	8.2	0.6	0.7	18.5	6.2	24
16	1.0	1.4	1.9	1.6	S	1.9	2.6	2.7	C	C	C	C	C	C	C	C	10.4	4.3	3.0	1.7	1.1	1.0	0.9	0.8	10.4	2.4	24
17	0.7	0.7	0.8	S	1.2	0.8	1.0	1.8	1.0	1.8	29.4	31.4	5.5	1.5	2.6	40.6	31.2	47.8	5.5	4.7	9.9	12.4	13.4	12.1	47.8	11.2	24
18	7.3	8.1	S	12.7	13.8	15.5	14.8	14.1	89.6	81.9	10.8	15.4	16.4	12.2	57.6	16.5	57.4	203.9	109.0	22.2	171.2	14.1	29.3	11.6	203.9	43.7	24
19	15.0	S	51.4	13.6	15.0	14.9	48.2	188.0	46.1	61.3	54.6	61.9	50.9	45.8	36.0	49.7	19.8	26.2	12.2	7.1	9.9	6.6	7.2	12.8	188.0	37.1	24
20	S	7.0	16.0	15.2	6.5	8.4	9.4	17.6	18.1	17.2	18.2	25.5	11.8	10.2	11.4	6.5	4.5	3.4	4.7	12.2	4.1	2.6	13.0	S	25.5	11.1	24
21	5.2	2.8	2.3	1.2	1.3	1.8	2.4	3.2	3.1	3.9	4.3	11.0	7.5	7.5	7.8	8.3	8.6	6.1	7.2	7.0	5.9	S	8.6	11.0	5.4	24	
22	8.0	9.5	14.3	15.2	15.9	12.2	17.0	18.2	20.9	25.0	12.8	8.9	26.0	8.6	15.7	14.3	2.1	1.0	3.5	0.5	0.6	S	1.8	1.2	26.0	11.0	24
23	3.8	3.3	2.5	30.2	6.1	6.1	7.0	11.1	15.9	34.7	59.6	10.9	44.8	17.4	37.1	13.3	25.4	17.6	13.4	9.6	S	8.5	8.5	8.1	59.6	17.2	24
24	8.5	7.4	9.4	12.9	14.9	13.3	1.7	1.6	4.6	11.7	11.8	26.3	30.1	33.2	11.7	22.7	16.3	2.7	0.8	S	1.9	3.2	6.0	13.3	33.2	11.6	24
25	8.4	4.9	4.6	4.8	6.3	3.8	3.1	3.6	4.3	4.9	5.5	5.6	1.7	2.9	3.2	2.7	3.2	1.3	S	1.5	0.8	0.8	1.0	8.5	8.5	3.8	24
26	3.2	4.4	9.4	11.6	11.0	9.3	11.6	11.1	55.9	27.0	19.9	52.6	13.8	8.5	4.6	11.2	158.0	S	8.0	6.0	6.0	9.6	8.0	8.0	158.0	20.4	24
27	25.5	17.1	20.9	6.6	2.1	1.9	1.0	1.2	1.5	0.6	0.2	0.3	0.1	0.0	0.1	0.1	S	1.3	0.5	3.4	6.3	8.8	11.2	0.0	25.5	4.8	24
28	5.1	17.8	14.9	5.8	2.7	4.7	28.4	7.9	11.6	8.4	11.4	14.5	11.4	10.4	58.2	S	61.4	72.2	36.0	13.6	12.7	21.7	20.7	22.0	72.2	20.6	24
29	14.3	5.0	2.6	2.2	1.4	1.3	4.1	4.0	3.5	2.8	3.2	6.7	3.4	3.8	S	6.1	8.5	8.6	11.0	7.9	8.7	9.5	10.8	17.3	17.3	6.4	24
30	16.4	21.6	30.6	17.0	18.3	34.0	46.6	77.1	63.4	48.8	50.3	28.2	28.8	S	29.4	55.9	28.3	58.0	48.5	18.1	19.7	10.6	2.7	0.2	77.1	32.7	24
31	0.1	0.0	0.3	1.0	1.5	0.5	0.1	1.8	12.0	14.2	4.1	31.9	S	6.0	1.2	26.4	6.4	7.1	29.1	7.9	43.5	15.5	104.8	116.8	116.8	18.8	24
HOURLY MAX	88.9	163.1	147.6	57.2	60.9	106.9	85.3	329.6	405.4	92.9	63.8	216.9	50.9	56.5	72.6	95.8	158.0	203.9	109.0	83.0	171.2	97.2	104.8	141.3			
HOURLY AVG	14.6	19.2	21.1	14.3	11.8	15.0	17.7	33.4	36.4	23.7	22.2	28.9	15.3	15.2	20.4	20.0	30.4	25.2	23.3	16.4	22.0	14.7	15.6	18.2			

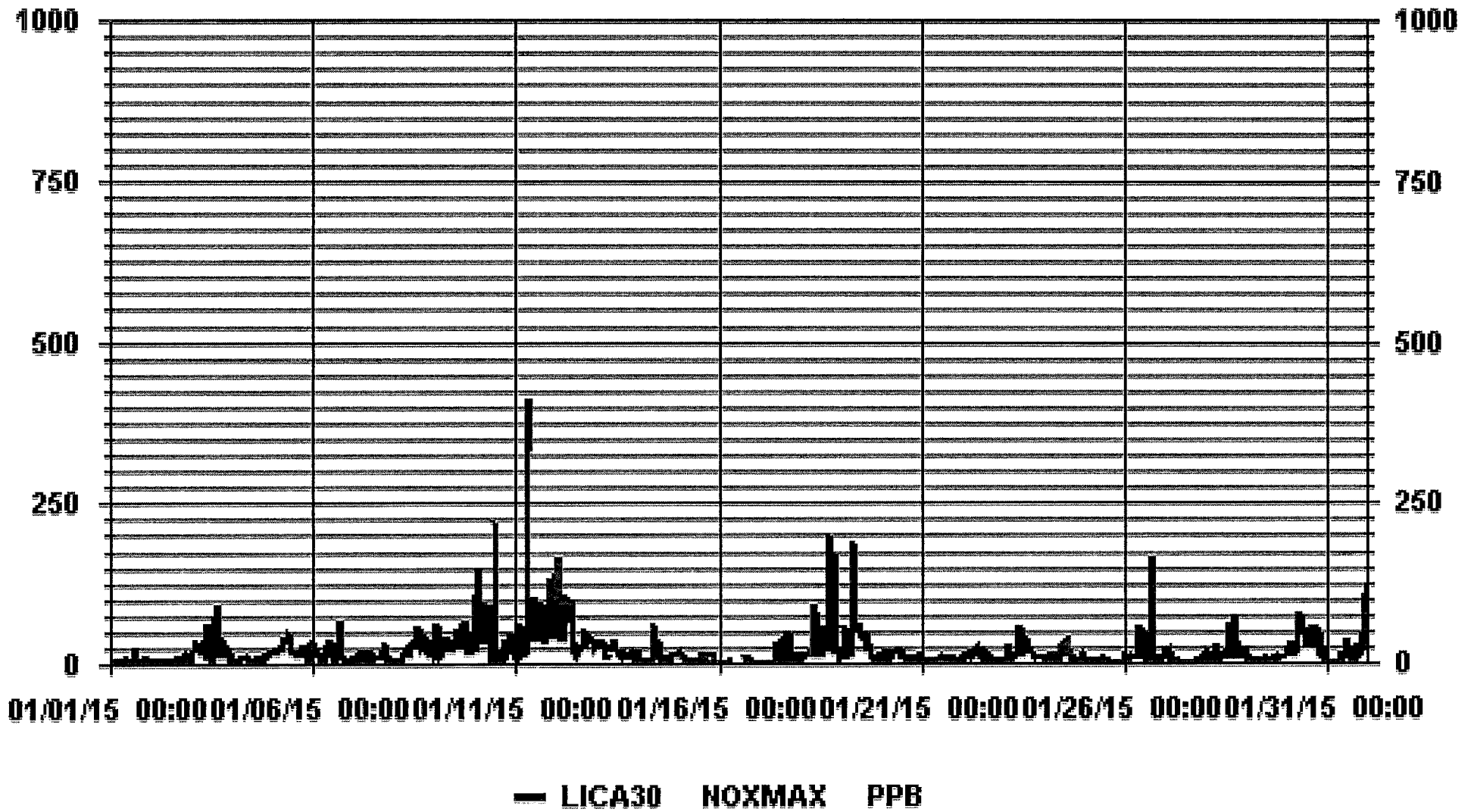
STATUS FLAG CODES

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:	697
MAXIMUM INSTANTANEOUS VALUE:	405.4 PPB @ HOUR(S) 8 ON DAY(S) 11
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	12 HRS
STANDARD DEVIATION:	32.35
OPERATIONAL TIME:	744 HRS

01 Hour Averages



LICA30
NOX_ / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 30
Site Name : LICA30
Parameter : NOX_
Units : PPB

Wind Parameter : WDR
Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	3.70	5.27	6.99	2.85	.85	.99	2.13	1.42	3.70	15.40	16.69	6.27	6.27	12.12	7.13	6.70	98.57
< 110.0	.00	.00	.28	.00	.14	.14	.00	.00	.00	.14	.28	.00	.00	.00	.14	.28	1.42
< 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	3.70	5.27	7.27	2.85	.99	1.14	2.13	1.42	3.70	15.54	16.97	6.27	6.27	12.12	7.27	6.99	

Calm : .00 %

Total # Operational Hours : 701

Distribution By Samples





	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	26	37	49	20	6	7	15	10	26	108	117	44	44	85	50	47	691
< 110.0			2		1	1				1	2				1	2	10
< 210.0																	
>= 210.0																	
Totals	26	37	51	20	7	8	15	10	26	109	119	44	44	85	51	49	

Calm : .00 %

Total # Operational Hours : 701

Logger : 30 Parameter : NOX_

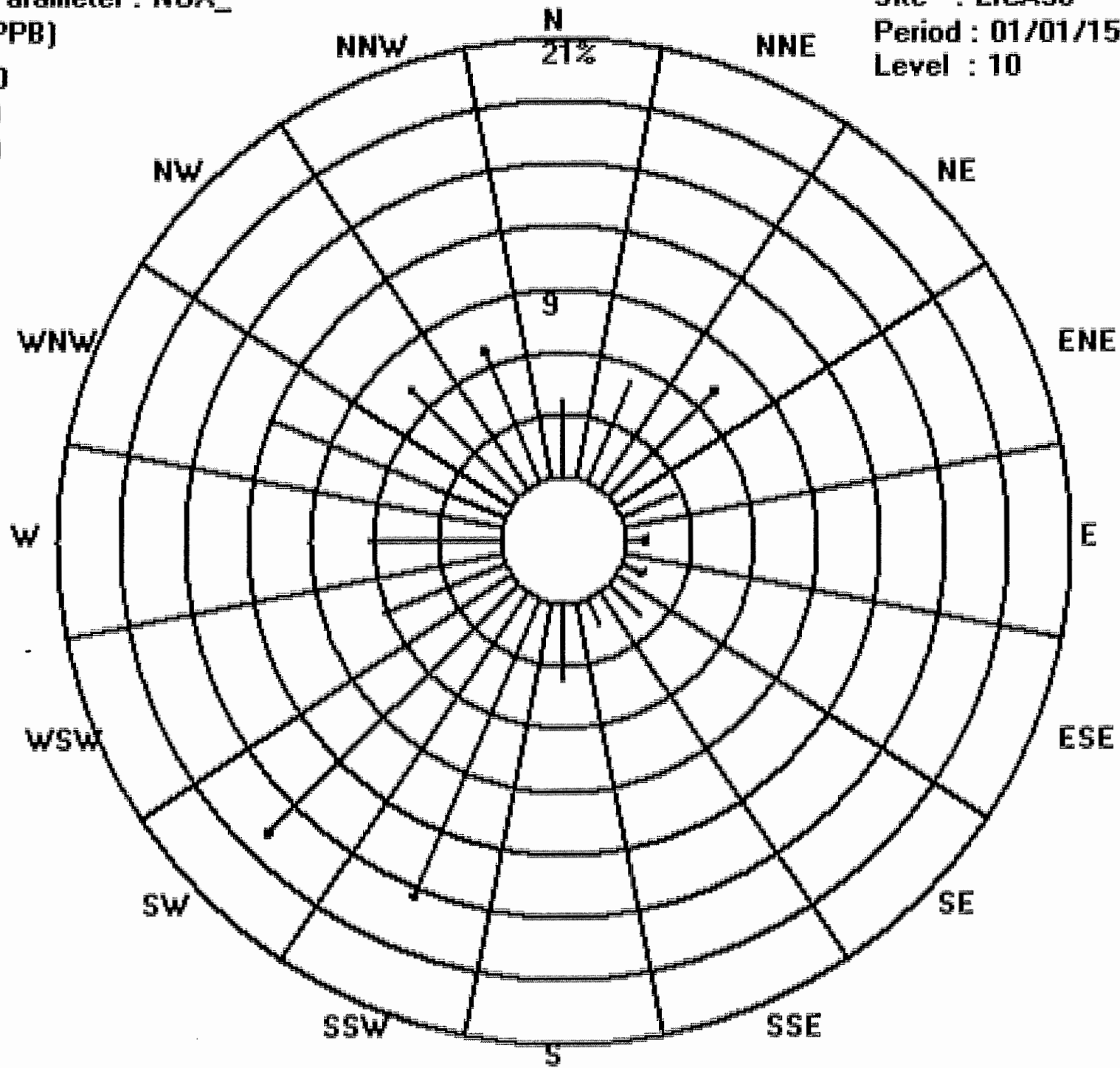
Class Limits (PPB)

-  ≥ 210.0
-  < 210.0
-  < 110.0
-  < 50.0

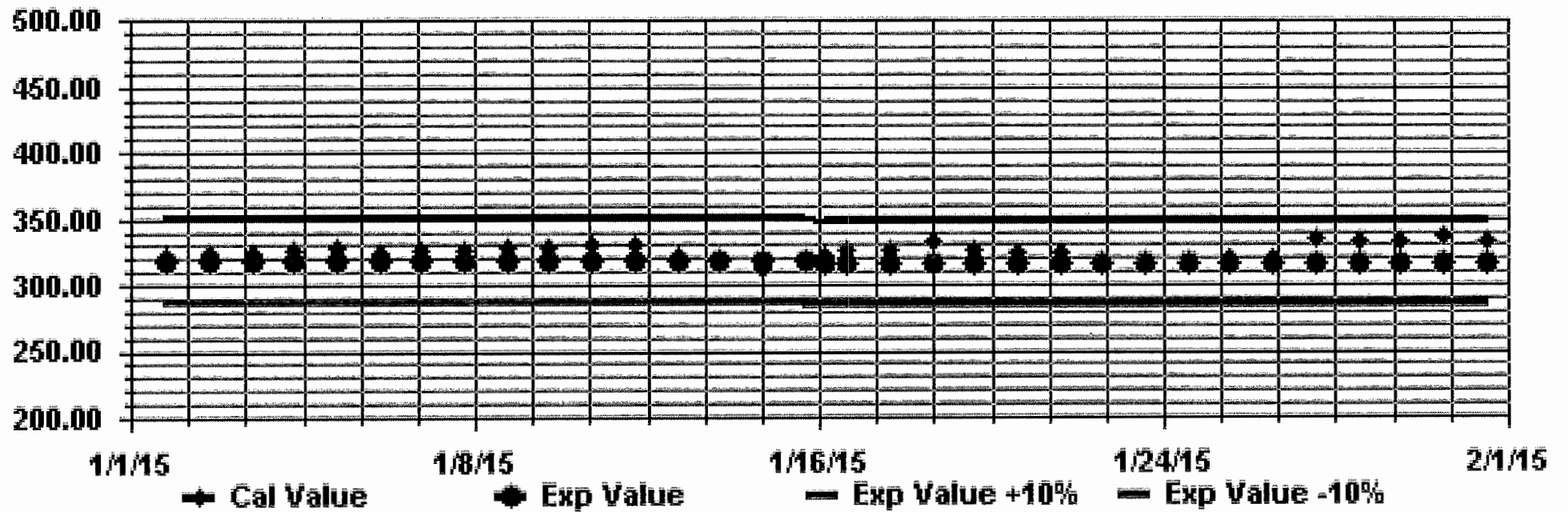
Site : LICA30

Period : 01/01/15-01/31/15

Level : 10



Calibration Graph for Site: LICA30 Parameter: NOX_ Sequence: N02 Phase: SPAN



NITRIC OXIDES



NITRIC OXIDE (NO) hourly averages 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	24-HOUR		
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	0:00	MAX	AVG.	RDGS.	
DAY																												
1	1.3	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.2	1.2	1.1	1.1	1.5	1.1	1.2	2.3	1.1	1.0	1.0	S	1.1	1.1	1.2	1.2	2.3	1.2	24	
2	1.1	1.1	1.0	1.1	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.2	1.2	1.4	1.1	1.1	1.0	1.0	S	1.2	1.4	1.2	1.1	1.3	1.4	1.1	24	
3	1.3	1.9	4.6	5.4	2.6	3.1	2.9	3.2	2.7	1.6	5.8	2.1	1.5	2.0	3.6	2.2	4.6	S	4.1	1.5	2.2	3.4	1.3	1.2	5.8	2.8	24	
4	1.2	1.0	1.1	1.1	1.1	1.1	1.2	1.3	1.4	2.3	2.6	1.8	1.3	1.4	1.4	1.6	S	1.3	1.3	1.2	1.5	1.3	1.3	1.3	2.6	1.4	24	
5	1.4	1.5	1.6	1.5	1.7	1.7	3.7	3.4	3.5	12.7	12.6	8.3	5.3	4.7	2.9	S	2.0	1.8	1.7	1.9	3.0	1.2	1.6	1.2	12.7	3.5	24	
6	1.7	1.5	2.7	1.9	1.2	1.2	1.2	1.4	3.4	2.8	5.6	5.1	1.8	1.9	S	2.0	4.8	1.5	1.3	1.4	1.1	1.2	1.3	1.2	5.6	2.1	24	
7	1.2	1.3	1.5	1.4	1.6	1.6	1.4	1.4	1.5	2.1	3.2	2.2	2.4	S	2.6	1.6	2.0	1.3	5.6	1.5	1.1	1.0	1.1	1.0	5.6	1.8	24	
8	1.2	1.2	1.2	1.1	1.2	1.7	2.1	3.4	1.5	4.6	9.7	7.8	S	10.0	8.5	7.2	3.1	2.6	3.0	8.6	3.7	1.5	1.8	1.2	10.0	3.8	24	
9	1.3	2.7	2.2	2.5	1.3	1.9	2.2	1.8	3.9	7.8	6.8	S	9.5	10.3	8.7	4.4	6.8	2.4	1.8	4.1	1.5	1.3	2.1	1.3	10.3	3.9	24	
10	2.9	4.7	19.3	7.0	2.8	9.4	9.1	7.6	5.4	1.7	S	43.1	2.3	2.4	1.9	2.4	1.4	1.6	1.6	3.3	1.5	3.8	1.4	1.4	43.1	6.0	24	
11	1.4	1.1	1.9	1.3	1.5	1.2	3.4	9.6	42.6	S	8.9	28.7	9.4	11.9	14.7	16.9	5.4	2.5	11.2	7.9	22.5	24.0	7.3	11.7	42.6	10.7	24	
12	6.9	30.1	10.1	4.5	9.7	27.1	15.3	32.7	S	29.6	9.7	7.0	5.5	5.5	6.5	5.1	4.9	2.9	4.2	7.6	10.0	4.1	1.8	2.6	32.7	10.6	24	
13	3.1	4.2	5.3	3.8	1.9	1.5	1.6	S	2.6	3.4	8.3	5.2	3.8	4.1	3.4	2.5	1.8	1.3	1.2	1.3	1.2	1.5	1.3	1.3	8.3	2.9	24	
14	1.4	1.1	1.1	1.2	1.1	1.3	S	1.4	1.4	1.8	1.4	1.9	1.7	3.4	1.5	1.5	1.6	1.3	1.2	1.1	1.5	1.3	2.3	2.5	3.4	1.6	24	
15	3.2	3.7	2.5	1.8	1.1	S	1.1	1.1	1.1	1.0	1.1	1.0	1.2	1.2	1.9	1.2	C	C	C	C	0.9	0.2	0.0	0.1	3.7	1.3	24	
16	0.0	0.0	0.1	0.0	S	0.0	0.0	0.0	0.0	C	C	C	C	C	C	1.3	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	1.3	0.1	24	
17	0.0	0.0	0.0	S	0.1	0.0	0.0	0.0	0.0	0.0	0.6	0.3	0.4	0.1	0.3	2.3	1.3	1.7	0.1	0.0	0.0	0.1	0.1	0.0	2.3	0.3	24	
18	0.0	0.2	S	0.3	0.2	0.4	0.2	0.4	18.0	2.7	1.6	2.2	4.2	3.2	3.2	1.4	0.9	24.1	23.3	1.0	11.4	0.0	0.8	0.0	24.1	4.3	24	
19	0.2	S	9.1	0.3	0.3	0.1	3.6	34.0	11.4	22.3	20.1	18.8	25.6	17.1	10.0	5.9	1.4	1.7	1.1	0.8	0.7	0.6	0.3	0.5	34.0	8.1	24	
20	S	0.2	3.2	2.5	0.4	0.6	0.7	1.4	1.4	1.9	4.3	3.0	2.3	1.6	1.2	0.5	0.1	0.0	0.0	0.5	0.0	0.2	0.2	S	4.3	1.2	24	
21	0.2	0.2	0.2	0.2	0.2	0.0	0.1	0.2	0.1	0.5	0.8	1.7	1.6	1.3	1.1	0.5	0.2	0.2	0.1	0.1	0.1	0.1	0.2	S	0.5	1.7	24	
22	0.4	0.2	0.3	0.3	0.1	0.1	0.6	0.9	1.4	3.3	1.3	0.7	0.7	0.6	0.5	0.5	0.2	0.1	0.3	0.0	0.1	S	0.1	0.1	3.3	0.6	24	
23	0.3	0.3	0.2	1.2	0.2	0.0	0.2	0.3	0.7	2.3	3.9	1.8	2.6	1.3	1.3	0.7	0.9	0.8	0.2	0.3	S	0.2	0.3	0.3	3.9	0.9	24	
24	0.3	0.4	0.2	0.2	0.2	0.1	0.2	0.1	0.3	1.5	1.9	6.0	6.8	4.8	0.8	1.4	0.7	0.0	0.1	S	0.1	0.1	0.2	0.1	6.8	1.2	24	
25	0.1	0.1	0.0	0.1	0.2	0.1	0.0	0.1	0.1	0.4	0.7	1.0	0.3	0.3	0.2	0.2	0.1	0.0	S	0.1	0.2	0.1	0.1	0.2	1.0	0.2	24	
26	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.1	2.0	2.3	2.6	4.4	2.1	1.1	0.4	0.7	6.2	S	0.4	0.3	0.2	0.3	0.2	0.3	6.2	1.1	24	
27	0.6	0.2	0.2	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	S	0.3	0.0	0.0	0.6	0.2	2.4	0.0	2.4	0.2	24	
28	0.0	1.1	0.7	0.0	0.0	0.0	2.1	0.9	2.1	1.6	2.1	3.6	3.6	2.0	4.7	S	3.5	10.0	1.4	2.2	2.2	3.8	1.6	2.8	10.0	2.3	24	
29	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.4	0.2	S	0.6	0.2	0.0	0.0	0.0	0.3	0.2	0.2	0.7	0.7	0.2	24	
30	0.5	1.5	3.9	1.0	3.3	7.9	7.4	16.9	9.5	10.6	15.3	9.8	12.0	S	7.2	8.8	5.5	9.4	9.8	5.9	5.1	0.8	0.0	0.0	16.9	6.6	24	
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.5	0.4	0.9	S	0.9	0.0	0.3	0.2	0.0	1.2	0.0	0.9	0.0	13.5	21.2	21.2	1.8	24	
HOURLY MAX	6.9	30.1	19.3	7.0	9.7	27.1	15.3	34.0	42.6	29.6	20.1	43.1	25.6	17.1	14.7	16.9	6.8	24.1	23.3	8.6	22.5	24.0	13.5	21.2				
HOURLY AVG	1.1	2.1	2.5	1.4	1.2	2.1	2.1	4.2	4.0	4.3	4.6	5.9	4.0	3.4	3.2	2.7	2.3	2.5	2.8	1.9	2.5	1.8	1.6	1.9				

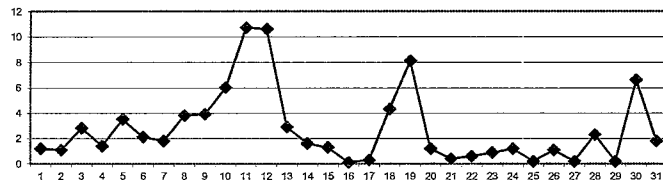
STATUS FLAG CODES

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

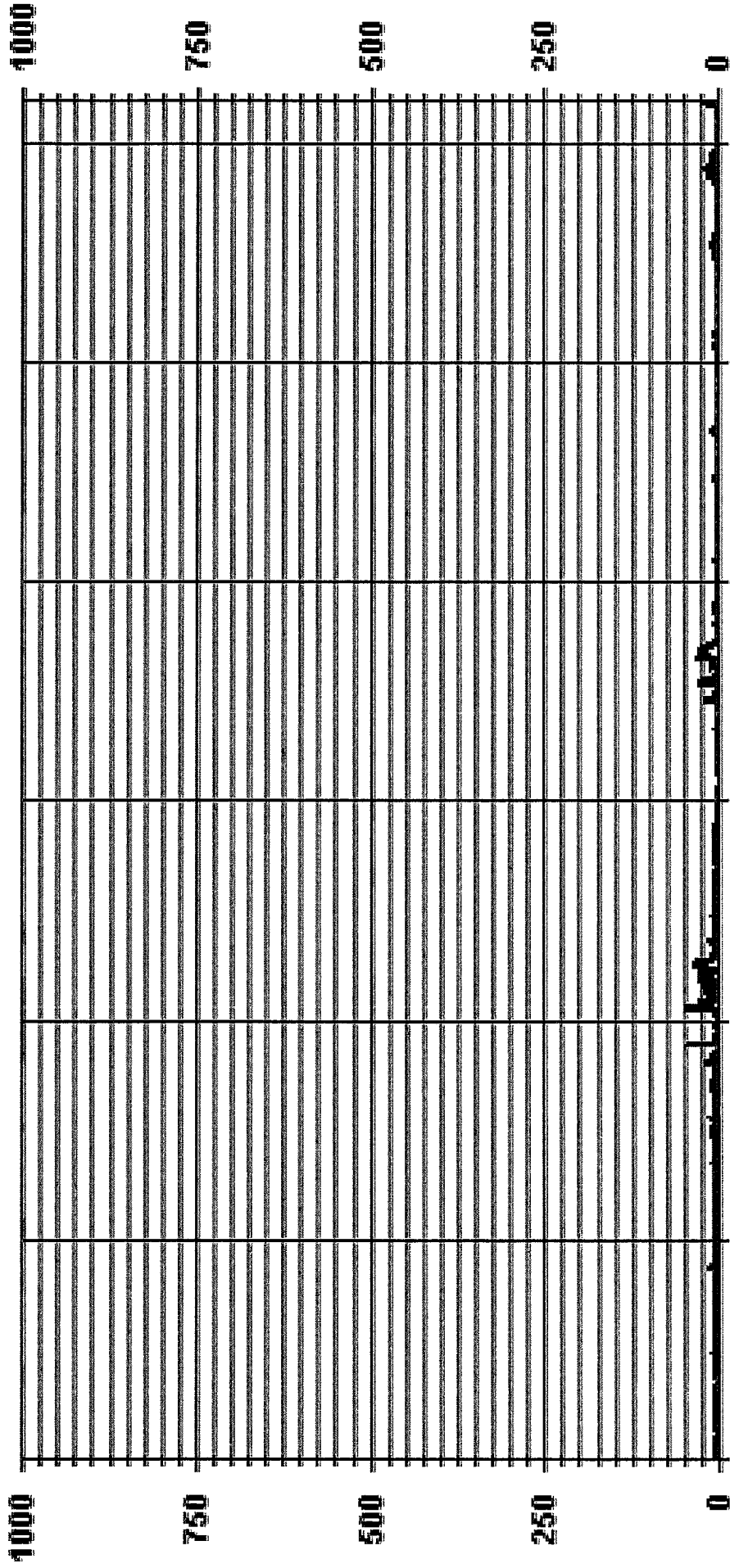
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	617					
MAXIMUM 1-HR AVERAGE:	43.1	PPB	@ HOUR(S)	11	ON DAY(S)	10
MAXIMUM 24-HR AVERAGE:	10.7	PPB			ON DAY(S)	11
					VAR-VARIOUS	
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	744	HRS	
MONTHLY CALIBRATION TIME:	11	HRS	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	5.01		MONTHLY AVERAGE:	2.7	PPB	

24 HOUR AVERAGES FOR JANUARY 2015



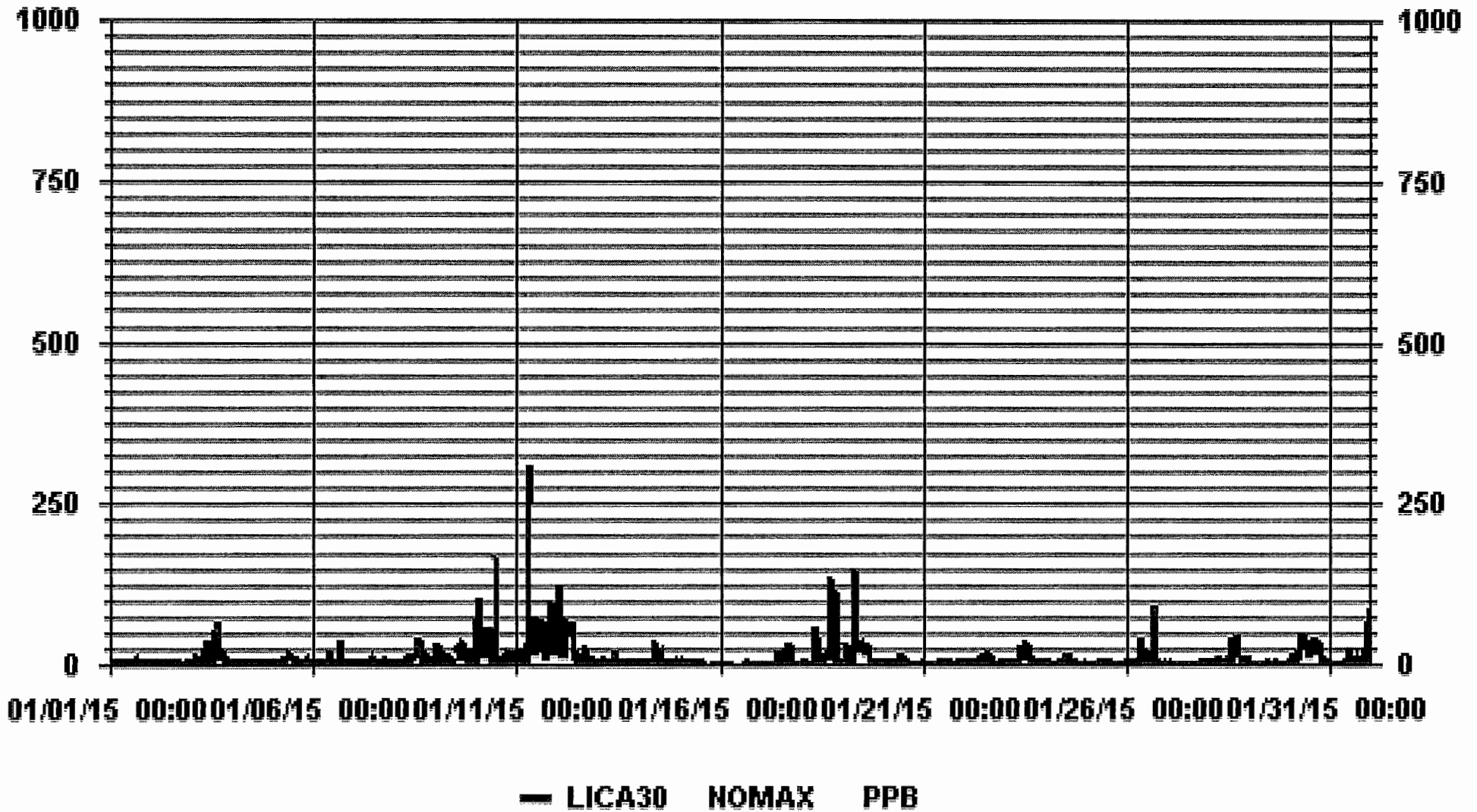
01 Hour Averages



01/01/15 00:00 01/06/15 00:00 01/11/15 00:00 01/16/15 00:00 01/21/15 00:00 01/26/15 00:00 01/31/15 00:00

— LICA30 NO_ PPB

01 Hour Averages



LICA30
 NO_ / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 30
 Site Name : LICA30
 Parameter : NO_
 Units : PPS

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	3.70	5.27	7.27	2.85	.99	1.14	2.13	1.42	3.70	15.54	16.97	6.27	6.27	12.12	7.27	6.99	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	3.70	5.27	7.27	2.85	.99	1.14	2.13	1.42	3.70	15.54	16.97	6.27	6.27	12.12	7.27	6.99	

Calm : .00 %

Total # Operational Hours : 701

Distribution By Samples





Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	26	37	51	20	7	8	15	10	26	109	119	44	44	85	51	49	701
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	26	37	51	20	7	8	15	10	26	109	119	44	44	85	51	49	

Calm : .00 %

Total # Operational Hours : 701

Logger : 30 Parameter : NO_

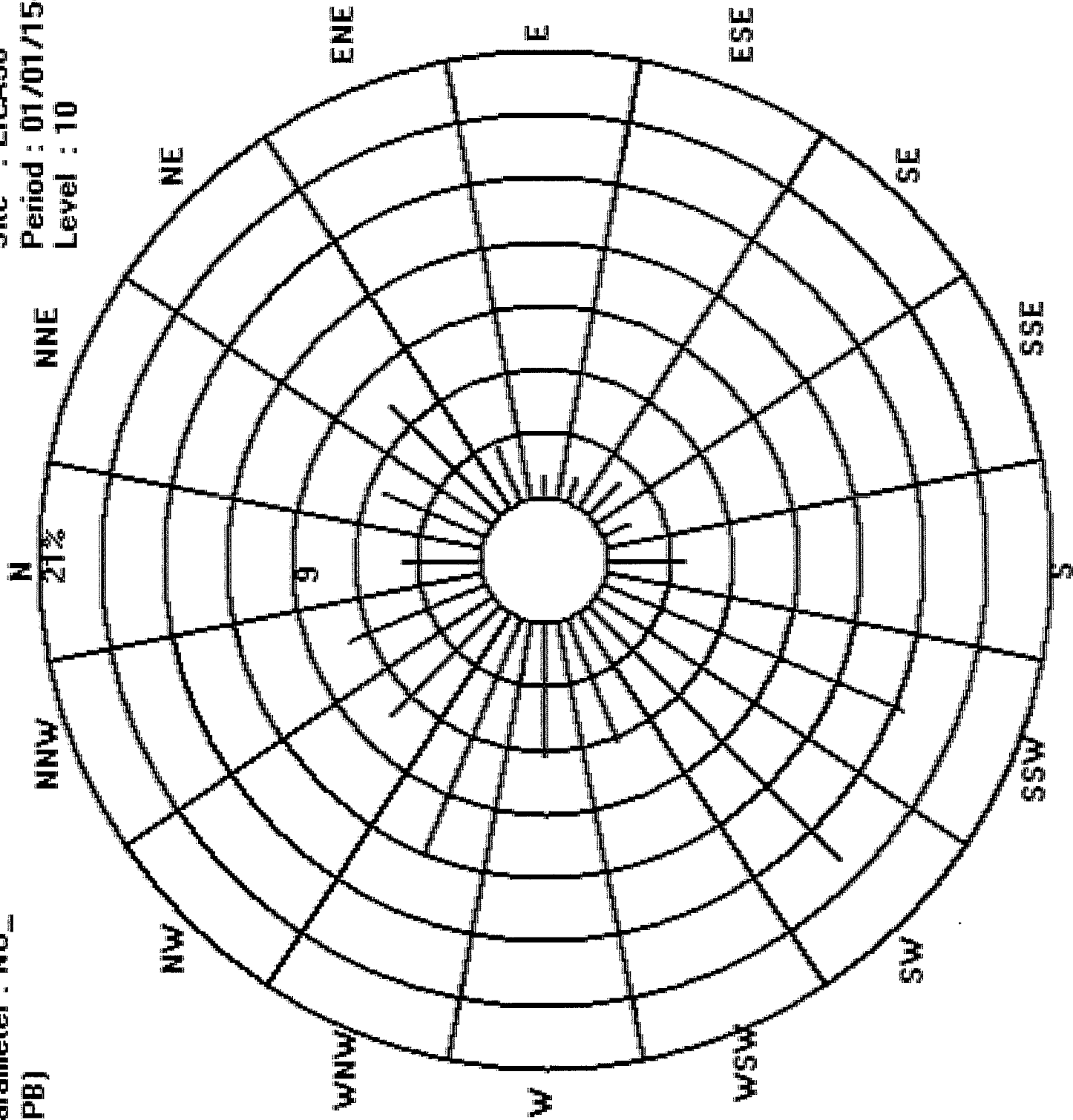
Class Limits (PPB)

-  \geq 210.0
-  $<$ 210.0
-  $<$ 110.0
-  $<$ 50.0

Site : LICA30

Period : 01/01/75-01/31/75

Level : 10



NITROGEN DIOXIDE

NITROGEN DIOXIDE (NO2) hourly averages 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	24-HOUR	
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	0:00	MAX	AVG	RDGS.
DAY																											
1	1.0	0.7	0.1	0.0	0.0	0.0	0.0	0.0	1.2	1.6	0.2	0.1	2.0	0.5	1.2	6.2	2.2	1.6	1.4	S	1.6	3.4	6.6	5.3	6.6	1.6	24.0
2	1.7	0.6	0.3	0.2	0.1	0.0	0.1	0.1	0.2	0.4	0.3	0.1	0.2	1.2	0.3	0.4	2.7	4.1	S	3.2	6.9	5.1	0.7	0.2	6.9	1.3	24.0
3	1.2	5.5	11.5	10.7	4.4	7.8	5.7	7.6	1.1	0.1	6.3	0.4	0.0	0.4	1.2	2.2	5.5	S	5.8	7.3	5.0	6.4	9.0	2.6	11.5	4.7	24.0
4	0.2	0.0	0.0	0.0	0.3	4.0	6.8	6.5	5.9	5.1	2.0	0.0	0.0	0.0	0.0	0.1	S	4.7	7.1	6.4	7.7	8.6	9.4	10.2	10.2	3.7	24.0
5	15.3	15.7	15.8	13.1	20.7	19.2	24.0	26.1	24.4	23.3	20.1	11.8	6.9	6.1	4.7	S	4.9	4.7	11.9	11.6	6.9	0.7	3.3	6.7	26.1	13.0	24.0
6	9.2	8.3	8.9	6.3	2.4	1.5	0.4	2.1	13.9	8.1	8.4	5.2	0.0	0.4	S	2.0	6.1	7.4	7.0	1.8	0.4	0.4	1.2	2.6	13.9	4.5	24.0
7	3.4	4.6	7.2	5.3	8.1	9.5	5.2	5.1	7.8	5.0	5.4	3.4	4.5	S	5.5	5.1	9.7	6.6	14.6	4.5	3.8	3.7	3.4	3.0	14.6	5.8	24.0
8	2.9	3.7	2.5	0.1	0.1	1.9	2.8	6.9	1.9	7.6	13.7	9.8	S	10.7	10.0	12.6	7.6	4.9	6.5	16.4	8.3	1.7	7.4	4.4	16.4	6.3	24.0
9	9.9	12.4	8.8	10.0	10.1	10.3	13.2	16.3	21.6	20.2	11.3	S	10.9	12.3	14.2	14.5	16.7	15.8	11.7	12.6	9.9	14.5	19.6	9.7	21.6	13.3	24.0
10	9.1	10.9	23.1	17.9	11.0	20.6	25.4	18.6	11.1	3.4	S	23.1	1.0	1.2	0.9	3.1	4.8	7.8	11.8	15.8	16.8	17.6	12.4	7.7	25.4	12.0	24.0
11	5.9	3.2	4.6	2.9	6.1	6.6	9.4	11.9	25.6	S	12.4	17.0	8.9	11.1	15.3	19.6	21.2	22.0	24.4	21.7	25.5	29.1	24.1	24.7	29.1	15.4	24.0
12	21.4	27.8	21.6	21.3	22.8	26.8	18.6	21.4	S	19.5	11.0	8.6	7.4	9.1	12.9	15.2	20.1	24.1	27.6	28.5	28.7	24.5	21.6	23.7	28.7	20.2	24.0
13	25.4	25.8	26.4	25.2	17.9	8.3	6.3	S	12.7	9.4	12.8	9.3	6.8	7.9	6.1	9.2	10.4	8.5	7.1	7.7	8.3	10.0	8.1	11.4	26.4	12.2	24.0
14	14.1	4.2	0.7	0.0	0.0	3.3	S	1.7	2.0	2.1	1.4	1.6	1.3	3.6	1.7	2.0	2.8	2.1	1.5	1.4	7.0	5.1	5.3	4.8	14.1	3.0	24.0
15	5.1	6.3	3.6	1.8	0.5	S	0.8	0.7	0.8	0.7	0.2	0.0	0.2	0.0	3.0	0.4	C	C	C	C	6.7	3.6	0.1	0.1	6.7	1.8	24.0
16	0.4	0.7	1.2	1.0	S	1.3	1.0	1.6	2.0	C	C	C	C	C	C	C	5.2	3.0	1.7	0.9	0.5	0.4	0.3	0.2	5.2	1.3	24.0
17	0.1	0.3	0.3	S	0.5	0.3	0.3	0.6	0.4	0.6	1.1	1.0	0.9	0.5	0.7	3.7	4.4	3.3	2.1	1.6	6.8	8.5	11.9	8.6	11.9	2.5	24.0
18	5.7	7.0	S	11.2	12.5	13.1	13.1	11.7	26.1	11.5	7.1	7.1	9.9	8.0	9.7	8.8	10.5	26.1	15.3	18.4	11.1	11.9	10.3	31.7	12.9	24.0	
19	10.2	S	18.2	11.4	11.8	13.6	19.5	31.2	25.1	23.3	22.7	20.5	22.4	21.8	21.5	17.8	11.5	11.4	4.8	3.7	3.9	3.4	3.1	5.0	31.2	14.7	24.0
20	S	4.2	7.6	5.7	3.6	5.1	6.6	7.8	7.1	6.9	6.9	4.3	3.2	3.5	2.8	1.4	1.6	2.4	3.5	6.6	2.7	1.9	5.0	S	7.8	4.6	24.0
21	1.8	1.4	1.2	0.5	0.5	1.0	1.6	2.2	2.3	2.3	2.7	3.9	4.2	4.9	5.3	6.0	7.0	6.3	5.4	6.1	5.7	5.2	S	7.0	7.0	3.7	24.0
22	6.9	7.7	11.6	13.9	13.6	10.7	10.2	13.9	16.1	13.7	4.8	1.1	0.7	0.3	0.2	0.5	0.8	0.2	0.3	0.0	0.0	S	0.8	0.6	16.1	5.6	24.0
23	1.9	2.3	1.6	12.1	2.4	4.3	4.2	8.3	10.0	12.3	10.0	5.9	3.9	2.2	1.4	2.0	5.1	12.7	7.5	7.7	S	7.2	6.9	6.3	12.7	6.0	24.0
24	7.3	6.4	7.2	10.7	12.5	5.5	1.0	0.8	1.6	6.8	5.5	10.4	12.5	9.1	1.6	4.4	5.8	0.7	0.3	S	1.2	1.2	4.4	8.0	12.5	5.4	24.0
25	5.0	3.1	3.3	3.6	5.0	2.8	2.0	3.0	3.1	3.2	3.6	2.9	0.5	0.9	0.8	0.9	1.4	0.1	S	0.4	0.2	0.2	0.2	3.8	5.0	2.2	24.0
26	1.4	3.2	4.5	10.0	8.8	7.1	7.7	9.1	9.9	10.6	11.7	12.1	6.6	3.3	2.3	4.4	9.3	S	4.9	3.4	4.8	6.4	7.3	6.4	12.1	6.7	24.0
27	13.3	5.9	7.1	2.4	1.5	1.1	0.5	0.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.5	1.1	0.6	3.1	0.0	13.3	1.7	24.0
28	0.2	3.4	3.3	1.6	1.3	3.2	9.0	2.9	4.3	3.3	2.9	3.6	3.3	2.0	5.5	S	6.8	18.8	5.7	6.5	5.5	7.0	4.8	6.6	18.8	4.8	24.0
29	3.3	3.5	1.7	1.2	0.6	0.3	2.7	3.1	2.1	2.2	2.3	2.1	2.0	2.3	S	3.4	5.3	7.5	7.8	7.2	7.7	8.1	8.7	8.5	8.7	4.1	24.0
30	8.8	13.2	11.7	8.6	9.1	10.8	9.1	13.8	10.5	9.9	11.5	9.1	10.8	S	7.3	6.8	4.8	10.7	10.7	7.1	6.6	1.9	0.8	0.0	13.8	8.4	24.0
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9	3.0	2.5	2.0	S	1.9	0.5	2.4	3.8	3.7	7.4	4.0	6.4	4.9	20.4	29.3	29.3	4.1	24.0
HOURLY MAX	25.4	27.8	26.4	25.2	22.8	26.3	25.4	31.2	26.1	23.3	22.7	23.1	22.4	21.8	21.5	19.6	21.2	26.1	31.7	28.5	28.7	29.1	24.1	29.3			
HOURLY AVG	6	6	7	7	6	7	7	8	8	7	7	6	5	4	5	6	7	8	8	7	7	7	7	7			

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

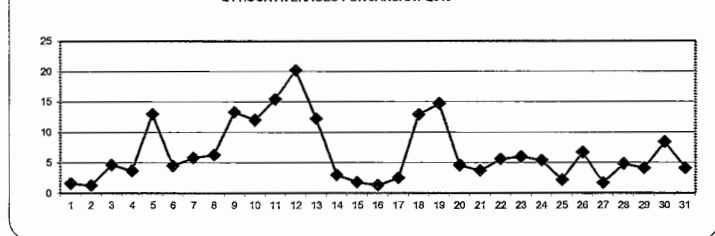
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 PPB

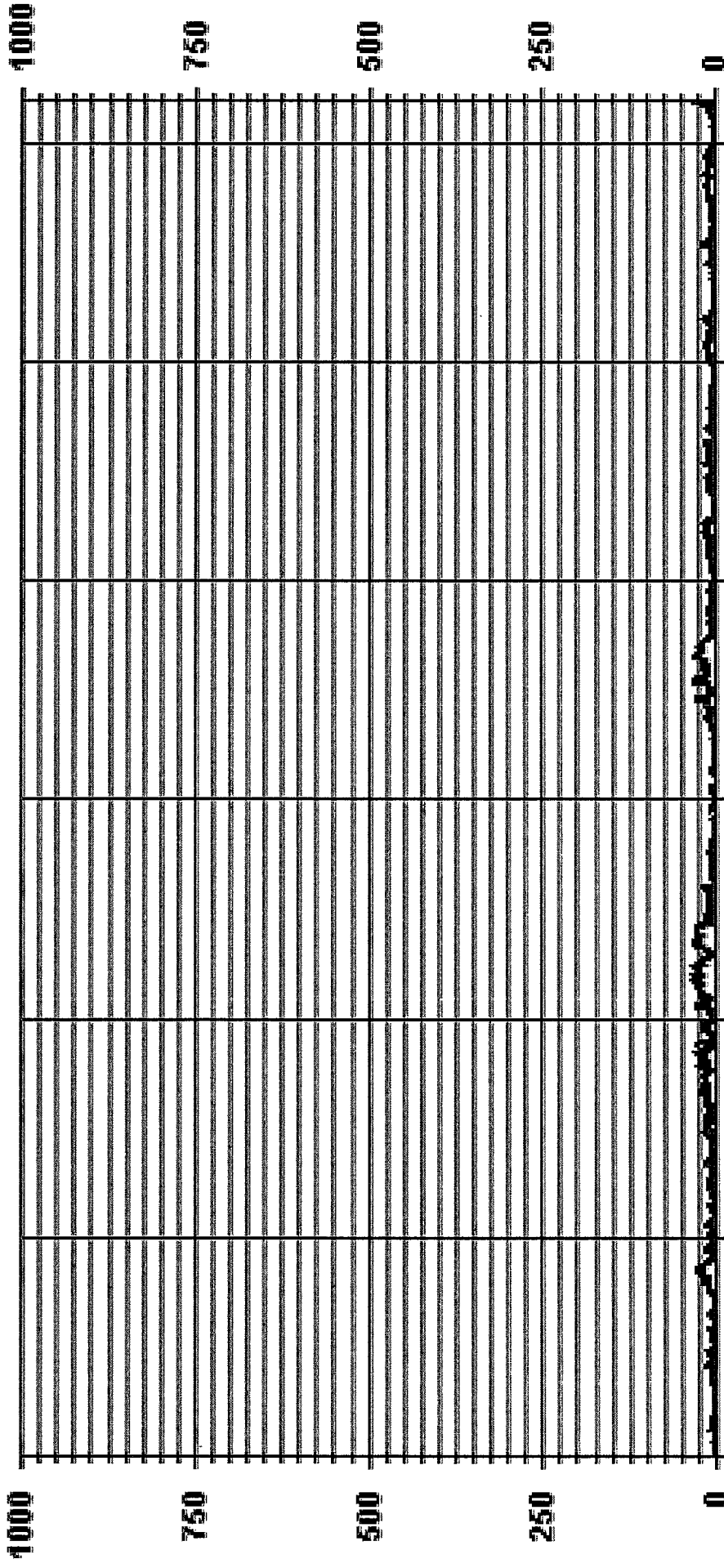
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0					
NUMBER OF NON-ZERO READINGS:	662					
MAXIMUM 1-HR AVERAGE:	31.7	PPB	@ HOUR(S)	18	ON DAY(S)	18
MAXIMUM 24-HR AVERAGE:	20.2	PPB			ON DAY(S)	12
					VAR-VARIOUS	
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	744	HRS	
MONTHLY CALIBRATION TIME:	11	HRS	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	6.73		MONTHLY AVERAGE:	6.8	PPB	

24 HOUR AVERAGES FOR JANUARY 2015



01 Hour Averages



01/01/15 00:00 01/06/15 00:00 01/11/15 00:00 01/16/15 00:00 01/21/15 00:00 01/26/15 00:00 01/31/15 00:00

— LICA30 NO2_ PPB



NITROGEN DIOXIDE 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	24-HOUR	RDGS.
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	0:00	MAX	AVG.	
DAY 1	2.4	2.1	1.6	1.2	1.2	1.2	1.2	1.3	5	7.2	1.6	1.6	4.5	3.7	3.1	19.1	4.2	2.9	2.9	S	3.1	6.8	8.3	8.2	19.1	4.1	24
2	4	2.4	1.6	1.8	1.3	1.4	1.6	1.6	1.8	1.9	1.7	1.6	1.7	2.9	2	1.8	8.3	8.7	S	9.1	12.9	9.6	3.4	3	12.9	3.7	24
3	7.1	14.6	21.8	21.7	22.1	16.6	14.8	15.3	18	4.3	29.4	7.2	1.4	5.9	25.4	6.9	28.5	S	18.4	10.9	12.6	15.3	16.3	16.1	29.4	15.2	24
4	4.4	2.2	2.4	1.2	3.1	7.7	9.1	8.8	10.2	9.2	5.1	2.4	1.1	1.3	2.2	4.3	S	8	10.6	8	9.8	11.2	11.4	14.7	14.7	6.5	24
5	17.1	17.4	21.2	20.2	23	22.7	29.8	29.1	26.9	26.7	24.3	16.3	11	10.2	9.7	S	14.5	8.6	21.4	22	19.4	3.6	8.5	9.3	29.8	18.0	24
6	13.3	13.3	18.9	14.5	5.5	4.3	3.6	8.9	22.9	18.7	20.7	12.7	2	2.3	S	7.8	36	11.2	9.6	7.6	2.1	2.2	4.3	5.5	36	10.8	24
7	6	8.7	12.7	7.4	13.2	15.4	8	11.1	11.9	7	12.2	6	7.8	S	6.5	7.6	11.5	10.9	21.7	7	4.3	4.8	4.9	4.2	21.7	9.2	24
8	3.7	5.3	4.5	0.7	2.5	9.5	9.8	16.6	5.4	16.1	17.7	14.7	S	18	25.5	19.7	17.5	18.6	16.4	24.5	25.3	8.2	22.6	9.9	25.5	13.6	24
9	13.1	30.1	19.4	26.1	13.8	15.3	18.6	22.3	26.4	24.4	15.4	S	17.3	25.5	17.4	18.6	31.4	34.5	43.8	36.9	12.8	20.9	27.3	15.6	43.8	22.9	24
10	39.8	48.5	47.9	37.6	24.3	47.6	30.3	38.6	36.4	6.9	S	76.8	3.9	5.2	4.6	7.9	8.5	20	18.6	25.3	18.9	26.1	17.8	10.4	76.8	26.2	24
11	9.9	6.3	38.4	10.9	13.3	11.6	26.3	88.2	111.3	S	21.7	32.9	16.2	34	19	36.5	24.3	24.3	39.4	36.4	67.9	50.3	27.9	48	111.3	34.6	24
12	45.9	49.1	27.3	24.7	35.8	47.5	30	28	S	41.7	17.6	12.2	9.6	13.2	16.8	18.9	28.5	26.9	30.2	30.6	30.9	30.4	24.8	26.1	49.1	28.1	24
13	27.8	28.3	28.5	28.2	24.6	13	10.4	S	22.4	12.8	20.6	16.2	11.8	12.8	8.6	13.2	13.3	11.8	9.6	9.8	10.1	15.6	10.1	16.7	28.5	16.4	24
14	17.5	11.1	3.6	1.2	4.7	5.5	S	2.3	2.8	31	3	15.4	11.5	17.2	2.9	3.9	6.7	3.4	3.5	3.8	12	10.8	8.6	9.1	31	8.3	24
15	11.9	8.3	7	6.8	1.1	S	2.3	3	2.9	2.4	1.8	1.6	1.6	1.4	11	3.5	C	C	C	C	11.3	7.1	0.5	0.8	11.9	4.5	24
16	1.1	1.5	1.9	1.6	S	1.9	1.9	2.8	C	C	C	C	C	C	C	C	8.3	4.3	2.9	1.8	1.6	1.5	1.2	1.4	8.3	2.4	24
17	1.4	1.4	1.4	S	1.1	0.7	0.9	1.3	1.2	1.4	9.6	21.8	4.2	1.1	2.1	20.3	18.5	20.9	4.9	4.3	10.1	12.3	13.6	12	21.8	7.2	24
18	7.3	8	S	12.4	13.5	14.8	14.4	13.5	36.2	38.7	8.4	10.7	11.2	8.5	40.9	12.7	36.3	81.2	43	19.8	61.7	13.8	19.5	11.7	81.2	23.4	24
19	12.8	S	26.1	13.5	14.9	15.3	30.2	46.3	29.1	26.4	25	31.6	23.7	22.7	22.6	23.1	15.3	18.7	9.2	5.6	7.4	5.6	6.5	11.5	46.3	19.3	24
20	5	7	10.6	9.6	6	7.7	8.4	15.2	15.4	11.2	11.7	13	7.6	7.1	8.3	3.9	4.1	3.8	4.9	10.9	4.4	2.8	13.1	S	15.4	8.5	24
21	4.8	2.8	2.5	1.2	1.1	1.8	2.6	3.1	3	3.2	3.5	6.4	5.6	5.7	6.5	6.7	8	7.8	6.1	7	7	5.7	S	8.2	8.2	4.8	24
22	7.8	9.3	14.4	15	15.8	12.1	14.9	15.8	19.4	17.4	10.7	5.3	10.3	6.3	3.2	8.3	1.8	1	2.1	0.7	0.8	S	1.4	1	19.4	8.5	24
23	3.7	2.9	2.5	25.8	6	5.9	6.6	10.7	13.1	24.3	33	8	12.3	10.6	11.4	8.1	17.3	15.4	13	9.1	S	8.2	8.2	7.4	33	11.5	24
24	8	6.8	8.9	12.4	14.3	13.1	1.4	1.4	4.3	8.7	8.7	15.2	18.3	20.3	7.6	15.5	14.4	1.9	0.6	S	1.7	3.1	6.2	13.1	20.3	9.0	24
25	8.3	4.5	4.8	4.7	6.2	3.7	3	3.7	3.9	4.4	4.8	4.4	1.4	2.3	2.6	2.4	3.4	1	S	1.1	0.6	0.6	0.8	8.1	8.3	3.5	24
26	3.2	4.3	9.2	11.4	10.8	8.6	10.3	11.2	23	21.6	14.8	28.3	9.4	6.4	3.5	8	73	S	7.3	5.6	5.9	8.7	7.9	7.8	73	13.1	24
27	24.4	16.6	20.2	6.4	2	1.9	0.9	1.3	1.2	0.5	0	0.2	0	0	0	0	S	0.9	0.2	1.8	3.2	4.3	5.9	0.2	24.4	4.0	24
28	3.4	10.4	9	5.6	2.9	4.8	16.2	6.7	8.1	5.5	5.6	6.9	6.4	5.1	25.8	S	30.3	29.1	23.6	9.6	8.6	11.9	12.6	13.3	30.3	11.4	24
29	8.9	5.4	2.8	2.5	1.4	1.6	4.3	4.3	3.5	2.7	2.8	3.4	2.8	3.1	S	4	6.6	8.5	9.1	7.6	8.3	8.9	10.3	13.2	13.2	5.5	24
30	13.5	15.7	15.7	11.8	11	16.8	23.2	28.4	31.2	23.2	22	12.4	12.8	S	13.2	26.3	12.1	26.3	21.2	10.3	10.1	6.5	1.9	0.2	31.2	15.9	24
31	0.2	0.3	0.1	0.6	1.2	0.3	0.4	1.5	6.8	8	3.1	12.4	S	3.6	0.9	18.3	5.6	6.7	18.3	7.5	21.2	12.9	39.9	43	43	9.3	24
HOURLY MAX	46	49	48	38	36	48	30	88	111	42	33	77	24	34	41	37	73	81	44	37	68	50	40	48			
HOURLY AVG	11.1	11.5	12.9	11.3	9.9	11.0	11.2	14.7	17.4	14.1	12.3	13.7	8.1	9.2	10.8	11.7	17.4	14.9	14.7	12.0	13.5	11.0	11.5	11.7			

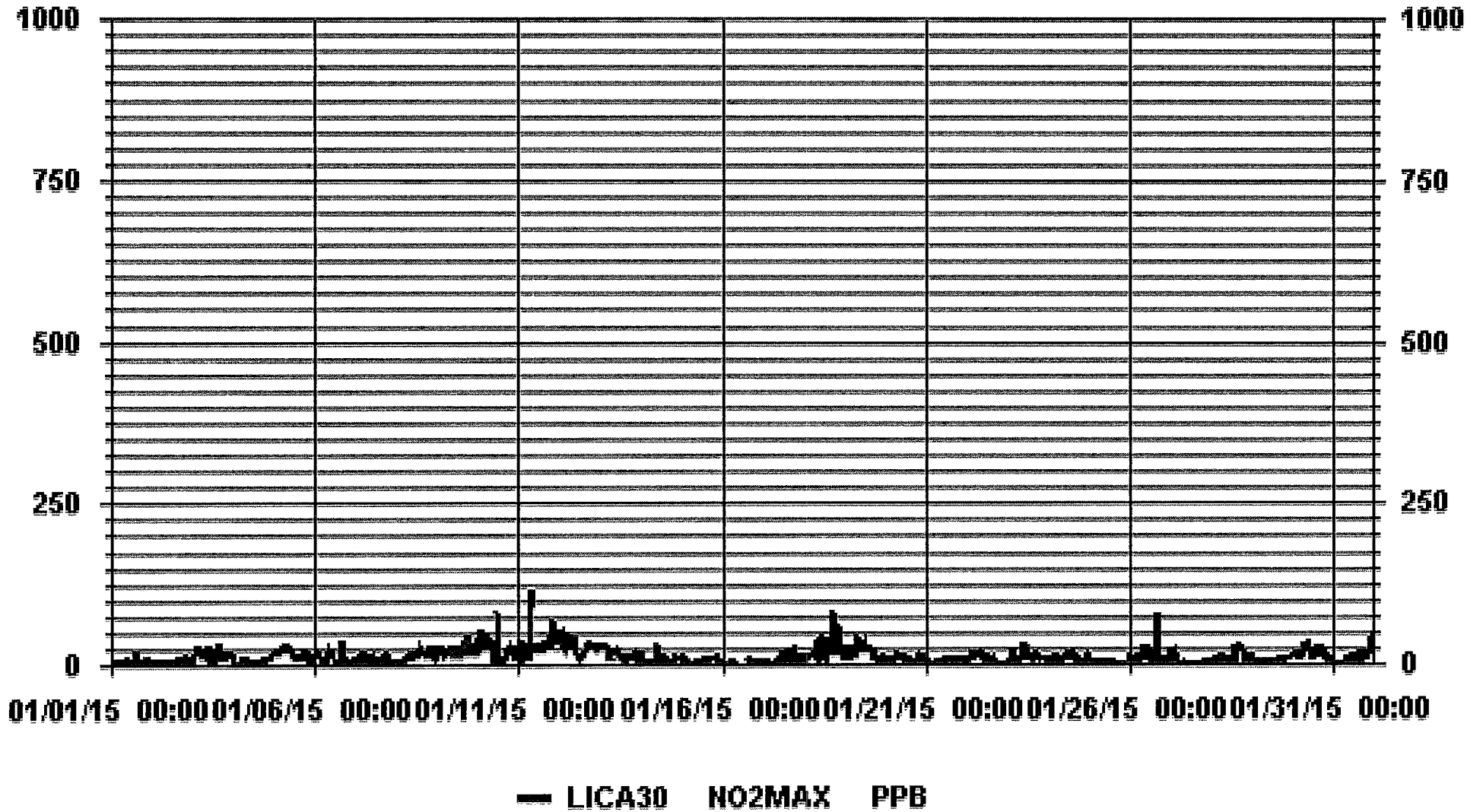
STATUS FLAG CODES

C	CALIBRATION	G	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:	695
MAXIMUM INSTANTANEOUS VALUE:	111.3 PPB @ HOUR(S) 8 ON DAY(S) 11
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 HRS
MONTHLY CAUBRATION TIME:	12 HRS
OPERATIONAL TIME:	744 HRS
STANDARD DEVIATION:	12.34

01 Hour Averages



LICA30
 NO2_ / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 30
 Site Name : LICA30
 Parameter : NO2_
 Units : PPF

Wind Parameter : WDR
 Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	3.70	5.27	7.27	2.85	.99	1.14	2.13	1.42	3.70	15.54	16.97	6.27	6.27	12.12	7.27	6.99	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	3.70	5.27	7.27	2.85	.99	1.14	2.13	1.42	3.70	15.54	16.97	6.27	6.27	12.12	7.27	6.99	

Calm : .00 %

Total # Operational Hours : 701

Distribution By Samples





	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	26	37	51	20	7	8	15	10	26	109	119	44	44	85	51	49	701
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	26	37	51	20	7	8	15	10	26	109	119	44	44	85	51	49	

Calm : .00 %

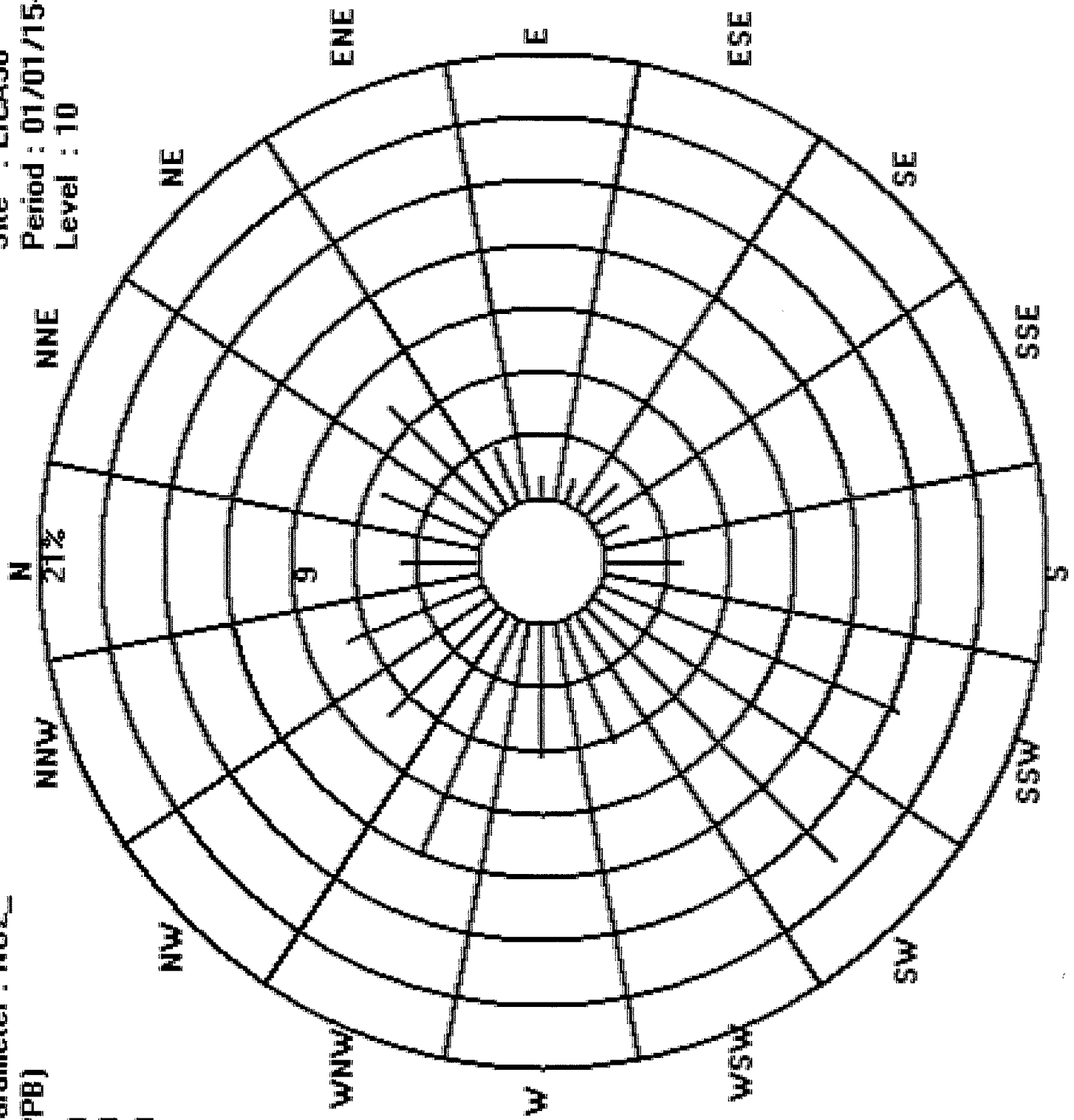
Total # Operational Hours : 701

Logger : 30 Parameter : NO2_

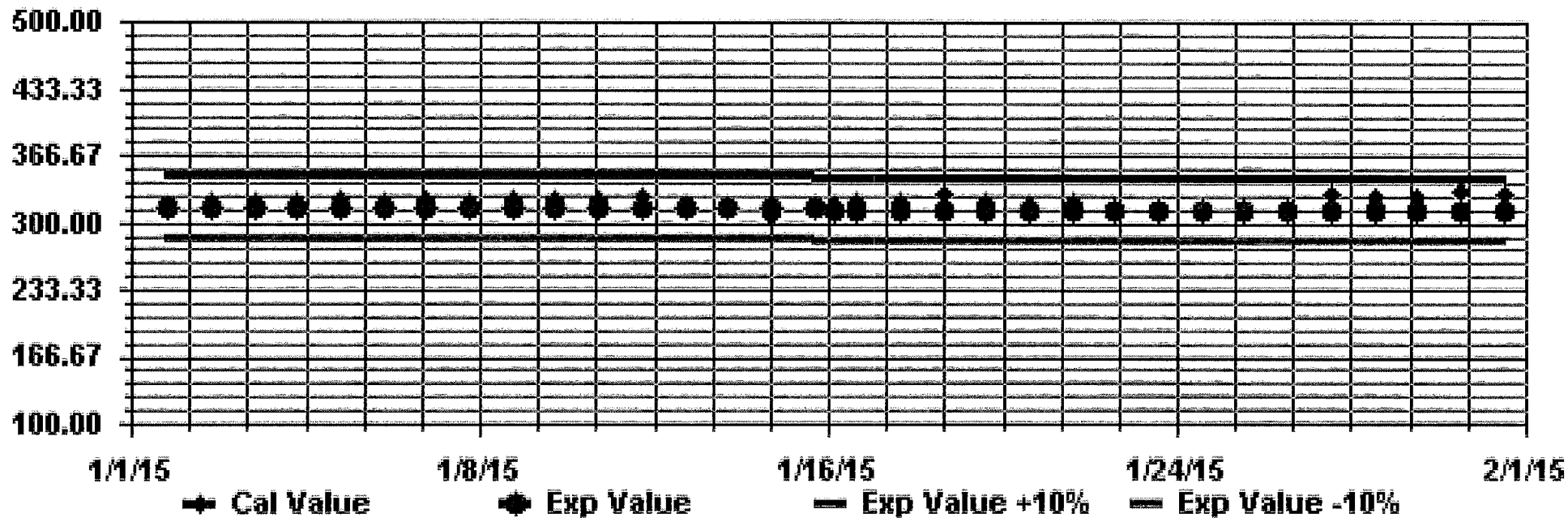
Class Limits (PPB)

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

Site : LICA30
Period : 01/01/15-01/31/15
Level : 10



Calibration Graph for Site: LICA30 Parameter: NO2_ Sequence: NO2 Phase: SPAN



WIND SPEED

WIND SPEED (WS) hourly averages in km/hr

MST

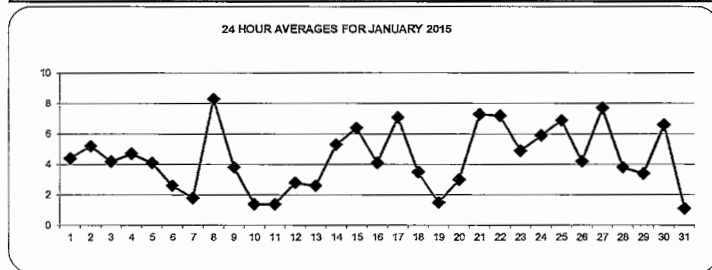
HOUR START	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	24-HOUR	RDGS.
HOUR END	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MAX.	AVG.	
DAY 1	5.9	4.5	5.0	6.5	5.9	5.5	4.1	4.7	4.1	3.7	3.7	3.9	1.6	2.5	3.0	4.1	7.4	8.1	10.1	10.4	8.4	7.5	5.9	5.2	10.4	5.5	24
2	8.1	9.2	5.5	7.7	6.5	7.7	7.3	9.0	9.1	9.9	9.9	9.2	9.2	5.1	5.7	3.1	3.0	2.4	2.4	2.4	2.1	1.4	2.1	2.7	9.9	6.1	24
3	2.8	3.6	5.1	6.4	4.0	5.2	7.1	6.4	2.9	5.1	5.9	5.6	4.8	4.8	5.4	4.6	5.1	1.6	0.6	4.1	4.7	6.0	1.7	2.2	7.1	4.4	24
4	4.3	3.7	2.0	4.6	4.4	4.4	5.6	4.9	5.4	6.2	5.2	4.9	6.8	7.1	5.4	4.5	5.0	4.1	6.2	5.5	6.3	5.5	6.0	4.6	7.1	5.1	24
5	1.2	2.4	2.7	3.5	4.7	3.8	4.5	5.3	5.0	3.2	4.9	4.3	8.0	7.8	6.8	6.9	7.3	6.8	6.9	6.4	5.8	4.6	4.7	4.6	8.0	5.1	24
6	6.2	4.5	4.5	3.7	2.3	1.8	3.8	2.6	3.8	2.5	3.8	5.0	5.2	4.0	3.6	2.7	1.4	1.9	1.1	2.3	2.3	1.9	2.1	4.1	6.2	3.2	24
7	0.6	1.3	3.2	1.2	0.9	0.6	2.4	2.2	2.9	2.6	3.7	4.8	4.0	4.7	6.3	4.7	2.8	3.9	8.3	8.5	8.9	10.7	10.8	11.2	11.2	4.6	24
8	11.9	11.5	10.8	10.0	8.6	9.7	9.2	10.1	10.3	10.6	10.6	10.9	11.7	10.7	9.9	8.9	7.4	8.6	8.6	8.2	4.9	5.1	3.5	6.8	11.9	9.1	24
9	6.3	4.8	4.2	4.0	5.3	3.9	5.5	7.1	3.7	7.2	4.4	4.2	6.4	4.8	3.4	4.5	3.0	2.0	1.7	2.0	1.4	1.2	1.5	2.2	7.2	3.9	24
10	1.8	1.5	1.7	2.4	1.0	2.4	2.2	0.8	0.9	0.6	0.4	0.9	4.6	4.1	3.7	4.0	3.7	3.7	3.7	3.5	2.6	2.7	3.4	3.3	4.6	2.5	24
11	1.4	3.3	2.4	1.2	0.9	1.1	1.6	2.8	0.7	0.5	0.9	0.7	2.4	4.9	5.3	2.8	3.6	2.5	0.7	0.9	0.1	0.4	0.9	0.8	5.3	1.8	24
12	1.2	1.3	0.6	0.7	0.8	0.4	1.3	0.9	1.5	0.8	6.2	5.6	6.3	6.8	5.7	6.1	4.7	3.8	4.2	3.9	5.3	5.0	4.6	4.5	6.8	3.4	24
13	5.6	5.4	5.5	3.4	3.9	4.4	4.5	3.2	2.8	1.4	2.3	2.4	1.6	4.3	4.1	4.0	3.0	3.1	4.6	3.6	2.4	0.8	3.0	4.7	5.6	3.5	24
14	5.2	4.3	6.9	7.4	4.9	5.7	5.1	9.0	7.9	7.4	10.0	9.6	10.9	9.5	6.0	6.3	4.9	4.4	4.2	4.0	3.3	2.1	5.3	5.3	10.9	6.2	24
15	8.5	8.6	9.5	7.8	6.9	7.8	8.0	8.6	7.2	8.0	8.0	8.0	7.6	7.7	8.5	8.2	7.8	7.0	7.2	6.2	6.4	6.5	6.3	6.3	9.5	7.6	24
16	4.8	5.5	5.0	5.4	6.5	6.1	4.2	4.0	4.2	3.5	2.6	6.2	4.8	6.5	6.4	4.1	8.3	9.8	8.9	10.1	9.8	10.2	9.9	12.3	12.3	6.6	24
17	11.6	11.1	10.8	10.7	12.8	12.8	11.1	11.2	9.8	7.4	7.9	11.5	8.9	7.0	5.6	3.5	3.5	3.5	3.7	3.5	3.9	5.7	6.1	6.4	12.8	7.9	24
18	7.9	7.7	6.8	5.5	5.2	4.8	8.5	5.4	2.5	5.6	4.8	2.9	2.6	2.2	4.5	3.4	0.6	0.5	1.0	1.0	1.7	1.2	1.7	1.9	8.5	3.7	24
19	1.9	0.4	1.6	0.3	0.9	1.9	4.1	2.2	1.6	1.8	3.2	3.0	4.5	4.5	4.7	2.5	3.2	3.4	3.7	4.6	4.3	2.9	1.9	3.0	4.7	2.8	24
20	1.5	1.4	3.0	4.2	1.9	3.2	2.8	2.6	3.4	3.4	4.7	6.3	5.2	5.3	4.6	5.0	3.8	5.1	4.6	3.3	3.1	1.6	1.1	3.2	6.3	3.5	24
21	4.0	5.5	4.1	4.6	6.1	7.9	6.3	7.6	7.8	7.3	8.2	8.2	9.8	9.3	10.2	9.9	11.2	11.3	6.8	6.4	5.7	8.5	6.5	5.8	11.3	7.5	24
22	5.5	7.0	5.8	5.9	7.1	8.0	6.3	6.6	6.7	6.6	6.5	13.7	16.4	14.4	14.6	11.8	9.0	7.6	9.2	9.3	8.5	7.5	5.5	5.9	16.4	8.6	24
23	5.6	5.4	3.5	2.6	5.3	4.4	5.5	7.1	6.3	6.0	4.8	5.1	5.9	7.6	8.2	5.6	4.6	6.3	5.9	5.0	3.6	3.9	5.3	6.3	8.2	5.4	24
24	1.8	2.2	3.9	4.5	4.6	7.3	10.5	9.7	11.2	14.4	15.3	15.0	13.0	12.0	8.1	5.7	3.4	6.1	4.3	4.5	4.3	5.2	5.7	7.4	15.3	7.5	24
25	6.8	7.4	7.6	5.3	4.8	4.7	8.0	7.6	5.3	7.9	6.6	9.2	18.4	18.0	16.3	16.0	12.9	9.5	8.4	7.0	8.2	8.6	5.2	3.8	18.4	8.9	24
26	4.3	4.2	4.7	4.6	4.8	4.0	4.9	3.1	4.1	6.1	5.3	4.3	5.0	5.1	4.2	3.2	5.8	6.2	4.9	4.3	5.0	3.1	2.3	0.8	6.2	4.3	24
27	1.1	1.5	1.6	3.0	3.6	6.2	9.5	10.2	11.4	11.8	11.4	11.5	12.6	11.5	9.4	9.3	10.1	9.1	8.4	9.3	8.4	8.8	8.4	5.1	12.6	8.1	24
28	4.0	2.9	1.4	0.3	1.9	2.8	6.1	8.1	8.5	7.5	8.2	6.5	7.3	6.6	6.0	5.0	3.2	1.8	3.7	3.0	2.7	3.2	2.4	3.7	8.5	4.5	24
29	2.7	1.7	2.5	2.7	2.4	3.8	4.4	5.0	6.0	5.6	6.2	6.2	7.1	5.7	4.3	5.1	5.1	4.1	4.4	2.8	2.7	1.3	2.4	1.7	7.1	4.0	24
30	2.8	2.0	2.0	3.4	3.6	4.6	5.5	8.0	5.7	7.1	8.1	8.2	7.6	9.1	9.5	10.3	9.1	9.0	8.3	9.7	9.1	11.2	8.2	6.9	11.2	7.0	24
31	7.2	6.3	7.4	7.9	5.5	5.4	3.3	3.7	3.4	2.8	1.5	3.5	3.8	5.1	5.4	4.8	4.3	3.8	3.4	3.2	2.3	0.7	0.5	0.3	7.9	4.0	24
HOURLY MAX	11.9	11.5	10.8	10.7	12.8	12.8	11.1	11.2	11.4	14.4	15.3	15.0	18.4	18.0	16.3	16.0	12.9	11.3	10.1	10.4	9.8	11.2	10.8	12.3			
HOURLY AVG	4.7	4.6	4.6	4.5	4.9	5.6	5.8	5.4	5.6	6.0	6.5	7.2	7.2	6.6	5.9	5.4	5.2	5.2	5.1	4.8	4.7	4.4	4.6				

STATUS FLAG CODES

G	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 04, 2014
DECLINATION:	MAGNETIC DECLINATION 19 DEGREE EAST

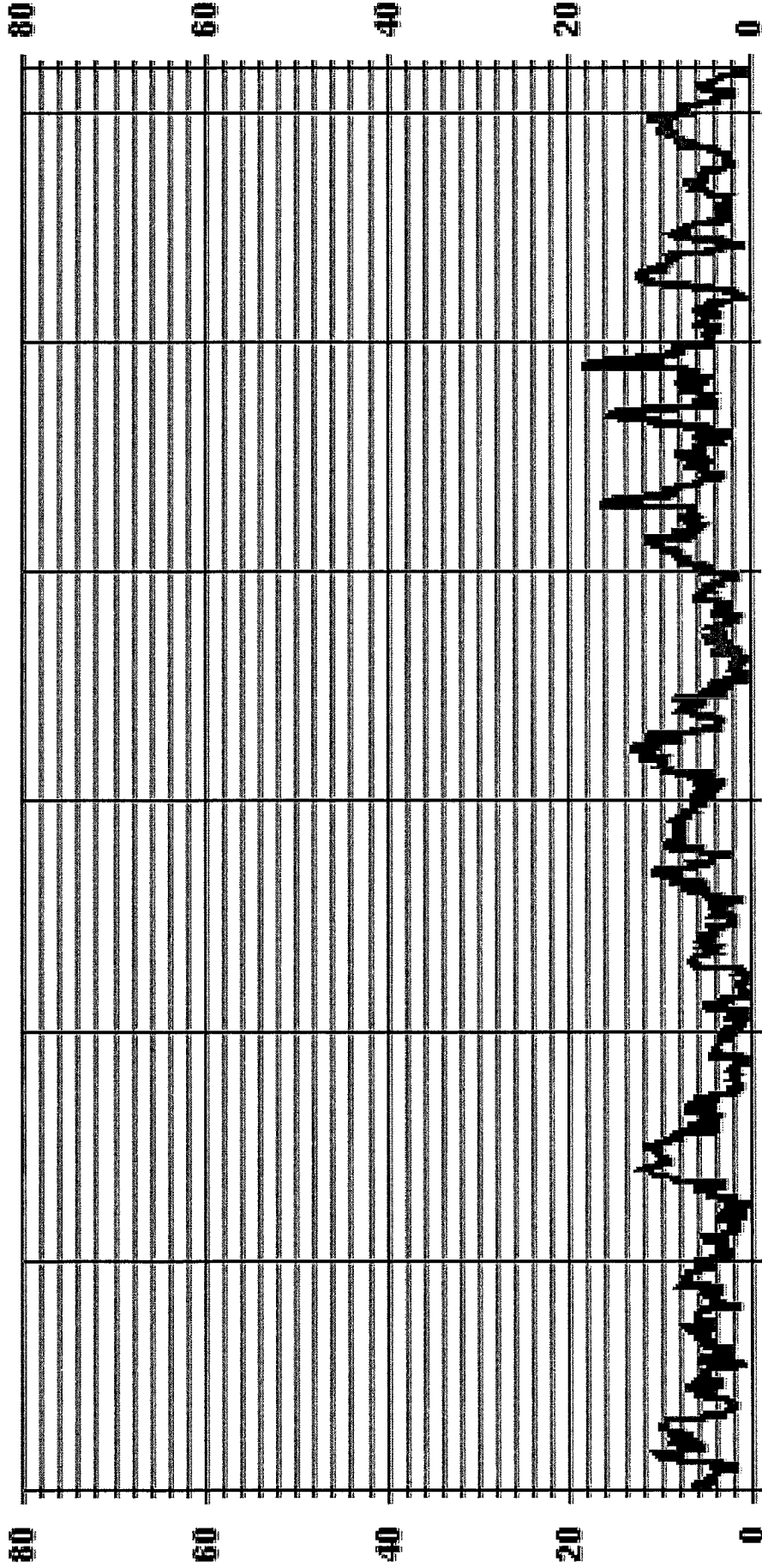
24 HOUR AVERAGES FOR JANUARY 2015



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	744
MAXIMUM 1-HR AVERAGE:	18.4 KPH @ HOUR(S) 12 ON DAY(S) 25
MAXIMUM 24-HR AVERAGE:	9.1 KPH ON DAY(S) 8
	VAR-VARIOUS
MONTHLY CAUBRATION TIME:	0 HRS
OPERATIONAL TIME:	744 HRS
STANDARD DEVIATION:	3.06
AMD OPERATION UPTIME:	100.0 %
MONTHLY AVERAGE:	5.4 KPH

01 Hour Averages



01/01/15 00:00 01/06/15 00:00 01/11/15 00:00 01/16/15 00:00 01/21/15 00:00 01/26/15 00:00 01/31/15 00:00

— LICA30 WSP KPH



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - JANUARY 2015

JOB # 2833-2015-01-30- C

VECTOR WIND SPEED MAX instantaneous maximum in km/hr

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	24:00	DAILY	24-HOUR	
DAY	HOURLY MAX	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	MAX.	AVG.	RDGS.	
1	17.5	13.1	14.2	23.8	16.7	21.0	13.5	19.0	17.0	12.4	14.0	12.7	12.4	19.0	12.0	18.1	25.9	31.7	26.7	27.6	23.2	19.7	19.8	17.1	31.7	18.7	24		
2	31.8	20.4	16.7	21.0	24.5	20.8	22.0	22.8	24.3	24.5	27.0	23.6	22.5	22.8	14.6	17.5	28.2	20.1	69.6	70.2	58.6	88.2	83.2	58.8	88.2	34.7	24		
3	84.3	100.5	68.3	34.7	41.2	22.8	24.3	76.8	17.5	46.7	48.7	22.1	40.3	21.7	20.9	63.6	57.5	52.9	56.1	55.1	30.3	38.6	48.7	48.3	100.5	46.7	24		
4	46.5	23.9	53.3	39.5	20.0	25.6	19.5	18.4	22.8	20.0	21.7	32.7	27.9	38.0	21.0	45.0	60.3	18.0	21.9	17.9	19.1	21.0	20.6	22.6	60.3	28.2	24		
5	55.1	19.3	19.9	44.8	13.1	20.5	17.1	14.0	22.3	19.3	70.7	72.8	29.3	28.9	25.0	24.3	26.7	26.9	80.1	24.3	22.5	18.6	24.5	30.5	80.1	31.3	24		
6	21.2	48.2	83.8	43.6	71.1	27.6	79.4	43.0	52.8	26.3	86.0	38.0	19.9	21.4	30.2	16.9	76.6	95.2	99.4	40.5	26.9	48.0	88.5	14.6	99.4	50.0	24		
7	72.2	X	15.1	22.8	29.8	53.1	X	33.4	48.5	53.7	14.9	16.0	15.3	15.3	15.6	25.2	32.7	59.2	27.4	31.2	45.8	47.4	49.5	41.0	72.2	34.8	22		
8	54.0	51.5	47.8	42.3	41.2	47.9	45.2	37.7	41.4	37.3	42.5	43.6	40.3	38.3	36.4	32.9	28.0	28.8	27.4	26.7	25.4	20.4	18.2	19.5	54.0	36.4	24		
9	16.2	26.7	14.4	14.6	16.7	14.0	16.0	16.9	15.1	18.0	18.9	13.1	15.7	14.2	13.8	13.6	12.4	73.7	60.8	69.8	64.3	80.1	88.1	28.9	88.1	30.7	24		
10	37.7	82.1	76.9	39.5	79.0	84.5	80.1	45.6	65.5	52.2	27.8	45.6	15.4	27.4	29.1	23.0	12.3	12.2	12.2	60.4	55.7	32.9	91.8	54.8	91.8	47.7	24		
11	27.2	95.5	84.5	94.2	84.5	16.4	37.9	57.9	X	X	X	41.2	73.0	14.0	32.9	13.1	17.3	20.8	25.4	25.9	60.8	44.7	18.2	83.6	95.5	46.1	21		
12	26.7	37.7	30.3	43.9	33.3	43.7	41.7	59.9	60.8	75.5	17.7	19.7	16.6	16.8	13.7	14.0	13.3	26.3	14.4	13.5	14.6	17.9	13.5	16.4	75.5	28.4	24		
13	15.1	11.8	13.6	9.8	17.5	18.4	20.8	16.7	15.1	12.2	12.4	13.7	15.7	11.8	9.4	9.8	8.3	9.1	14.4	11.8	9.6	11.3	12.2	12.4	20.8	13.0	24		
14	12.7	14.8	29.5	23.6	16.8	14.8	23.8	28.0	24.3	28.9	30.2	36.2	37.1	32.6	21.8	19.2	25.3	17.7	15.7	15.0	12.2	9.6	16.6	14.2	37.1	21.7	24		
15	18.4	20.6	21.0	23.2	23.4	22.1	23.2	21.2	19.5	24.9	23.6	22.3	23.8	22.5	28.7	26.9	28.9	26.0	26.3	20.1	20.4	21.2	18.8	19.5	28.9	22.8	24		
16	17.7	16.4	16.0	15.1	21.0	26.5	17.7	15.5	14.3	10.8	12.2	17.0	16.6	23.6	17.7	14.5	28.1	32.8	33.9	31.9	29.1	30.0	36.1	45.3	45.3	22.5	24		
17	42.0	44.4	38.5	34.9	45.1	46.0	38.3	40.0	34.1	31.9	28.4	38.3	29.9	24.7	22.1	13.1	12.7	14.6	13.1	12.2	8.7	10.7	12.2	14.2	46.0	27.1	24		
18	17.2	19.9	16.2	15.3	14.2	11.8	16.4	14.6	11.1	16.4	13.7	10.9	7.4	10.9	9.6	9.6	3.2	9.6	8.9	13.3	13.7	8.0	6.9	9.6	19.9	12.0	24		
19	16.2	12.9	13.5	10.0	19.5	14.9	17.9	13.2	12.9	16.4	13.3	16.4	15.9	11.8	11.1	12.7	12.1	15.7	14.8	15.5	16.6	11.6	9.8	12.2	19.5	14.0	24		
20	10.7	9.7	12.2	10.2	10.4	14.2	11.1	12.4	12.9	12.4	16.8	25.8	20.1	23.6	18.4	17.9	17.5	18.6	15.1	12.2	12.9	13.1	10.9	13.5	25.8	14.7	24		
21	13.7	16.4	8.9	13.8	14.4	29.1	17.2	21.2	20.3	22.1	23.0	18.8	23.0	29.1	26.4	30.0	24.5	28.9	16.8	15.0	14.8	18.0	18.7	17.2	30.0	20.1	24		
22	14.6	15.3	16.4	13.7	17.9	18.6	15.5	17.0	15.3	16.9	34.1	54.2	72.9	48.1	52.7	43.5	30.6	25.6	34.8	31.3	29.7	21.2	18.3	15.9	72.9	28.1	24		
23	12.4	13.4	11.8	11.8	15.7	12.2	11.6	14.8	14.2	16.8	19.4	19.9	28.8	27.2	31.8	20.6	17.9	13.7	12.2	11.5	9.1	11.1	15.7	19.0	31.8	16.4	24		
24	8.7	10.2	9.3	11.4	12.1	31.9	37.8	35.4	39.4	51.6	46.6	47.7	48.6	48.1	35.9	27.7	15.0	20.3	18.1	11.6	13.4	10.9	13.1	15.0	51.6	25.8	24		
25	14.2	16.8	16.6	12.6	12.6	13.9	26.7	19.3	16.5	21.2	20.1	57.1	66.1	72.4	52.7	54.5	49.4	30.8	26.7	26.2	29.9	28.9	20.8	12.1	72.4	29.9	24		
26	11.6	11.1	10.7	10.7	11.3	10.4	12.8	7.8	11.3	14.6	12.4	10.7	14.2	18.3	16.1	13.3	16.1	17.5	15.5	9.8	11.5	10.4	8.5	6.5	18.3	12.2	24		
27	6.9	9.1	11.8	15.8	14.6	22.7	28.6	32.6	31.1	27.8	27.6	30.4	33.4	27.3	26.0	30.2	25.4	25.2	19.7	21.9	20.8	23.8	19.7	16.8	33.4	22.9	24		
28	14.9	15.3	14.8	12.9	12.7	18.6	27.8	31.5	31.5	32.9	24.7	23.6	30.0	22.8	20.8	17.7	13.7	17.3	16.2	29.6	13.3	12.2	48.7	14.5	48.7	21.6	24		
29	71.5	17.5	13.5	14.9	30.2	13.1	12.0	14.4	26.9	14.7	16.6	21.0	17.0	17.0	13.1	14.4	14.2	13.7	15.3	11.1	11.3	6.8	9.6	12.7	71.5	17.6	24		
30	15.3	14.0	14.6	15.3	15.3	16.4	19.9	19.7	18.4	17.7	18.7	21.9	15.9	20.3	21.0	24.5	21.2	21.4	18.8	23.9	19.3	25.2	21.2	24.1	25.2	19.3	24		
31	20.8	19.1	26.9	26.3	16.0	16.4	60.1	65.6	59.5	81.9	85.1	16.2	30.5	13.3	13.7	15.1	12.5	25.0	12.4	63.5	32.5	71.8	28.5	31.8	85.1	35.2	24		
HOURLY MAX	84.3	100.5	84.5	94.2	84.5	84.5	80.1	76.8	65.5	81.9	86.0	72.8	73.0	72.4	52.7	63.6	76.6	95.2	99.4	70.2	64.3	88.2	91.8	83.6					
HOURLY AVG	27.3	27.6	27.1	24.7	26.2	24.8	27.9	28.6	27.2	28.6	29.0	28.5	28.2	25.3	23.0	23.3	24.8	27.4	28.1	27.4	25.0	26.9	29.4	24.6					

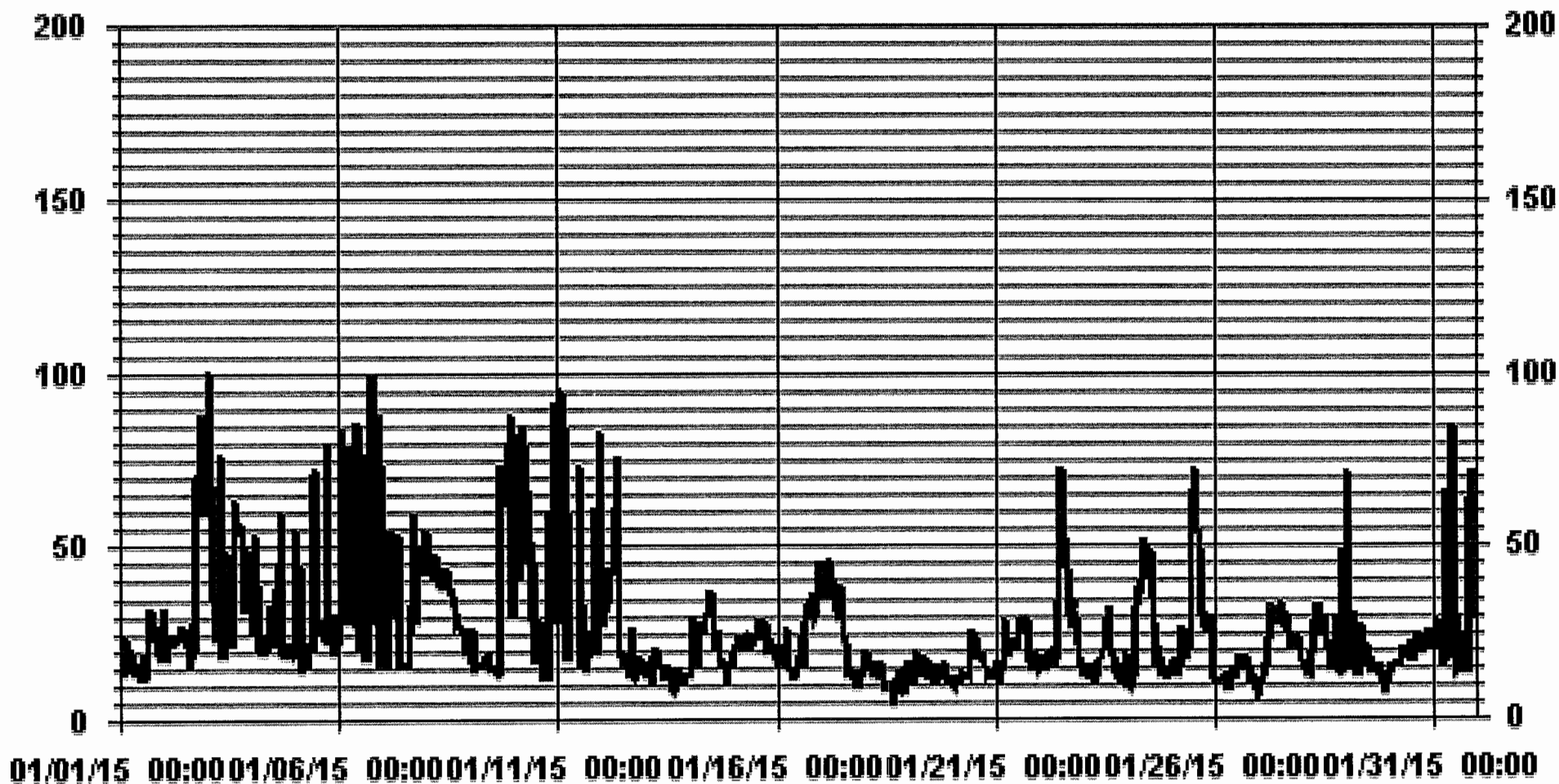
STATUS FLAG CODES

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

MAXIMUM INSTANTANEOUS VALUE:	100.5 KPH	@ HOUR(S)	3	ON DAY(S)	1
				VAR-VARIOUS	
OPERATIONAL TIME:			739	HRS	

01 Hour Averages



— LICA30 WSMAX KPH

LICA30
WSP / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 30
Site Name : LICA30
Parameter : WSP
Units : KPH

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	
< 6.0	3.09	2.15	2.15	1.61	.67	.80	1.74	1.34	2.28	10.75	14.38	6.04	4.03	2.95	4.30	5.24	63.57
< 12.0	.67	3.22	4.70	1.34	.26	.53	.53	.13	1.47	4.83	2.82	.13	2.01	6.98	2.68	1.61	34.00
< 20.0	.00	.00	.13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.01	.26	.00	2.41
< 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	3.76	5.37	6.98	2.95	.94	1.34	2.28	1.47	3.76	15.59	17.20	6.18	6.04	11.96	7.25	6.85	

Calm : .00 %

Total # Operational Hours : 744

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 6.0	23	16	16	12	5	6	13	10	17	80	107	45	30	22	32	39	473
< 12.0	5	24	35	10	2	4	4	1	11	36	21	1	15	52	20	12	253
< 20.0			1											15	2		18
< 29.0																	
< 39.0																	
>= 39.0																	
Totals	28	40	52	22	7	10	17	11	28	116	128	46	45	89	54	51	

Calm : .00 %

Total # Operational Hours : 744

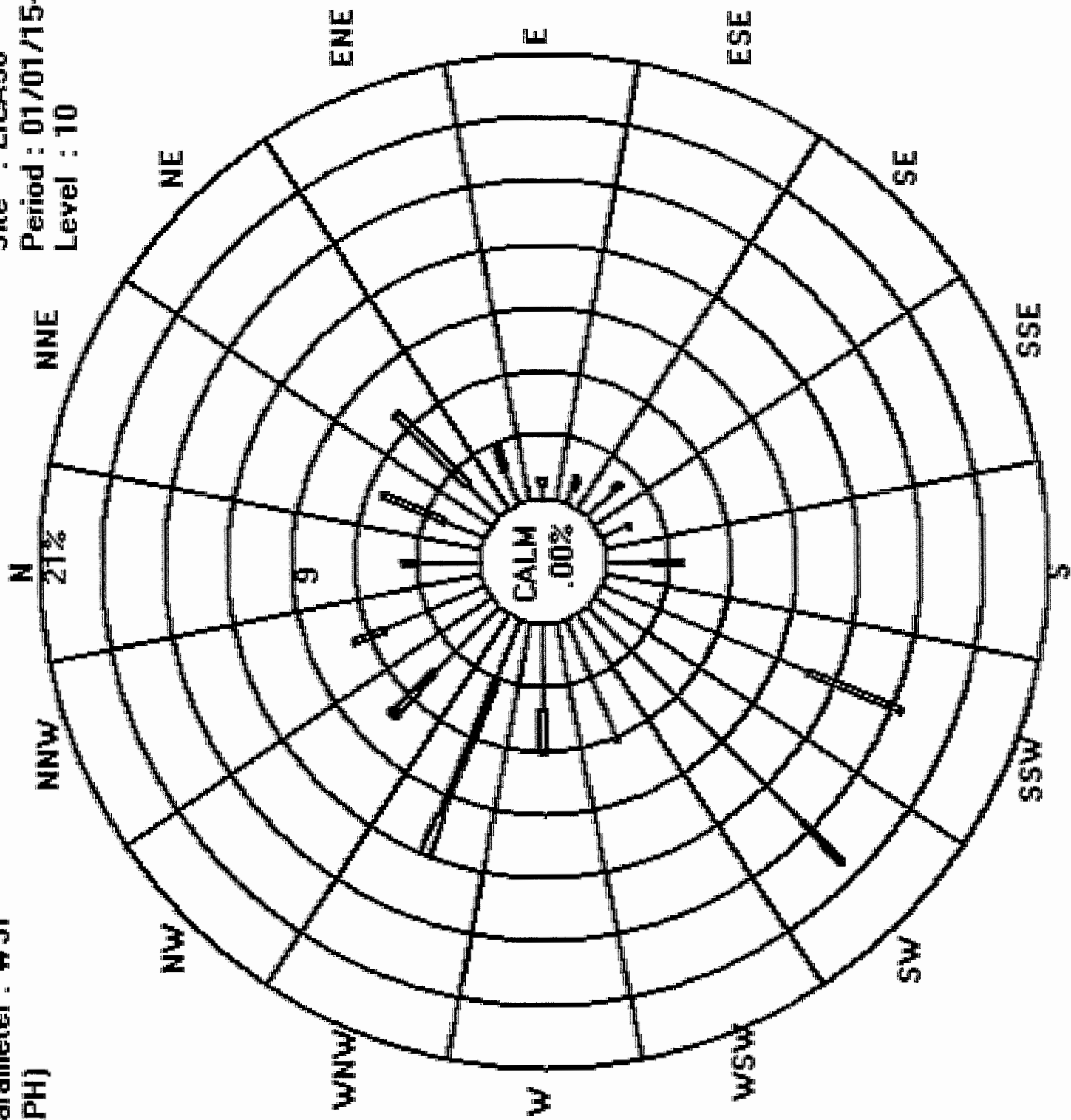
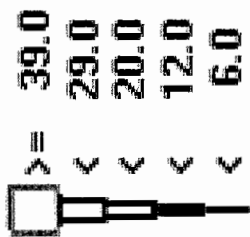
Logger : 30 Parameter : WSP

Site : LICA30

Period : 01/01/15-01/31/15

Level : 10

Class Limits (KPH)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - JANUARY 2015

JOB # 2833-2015-01-30-C

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

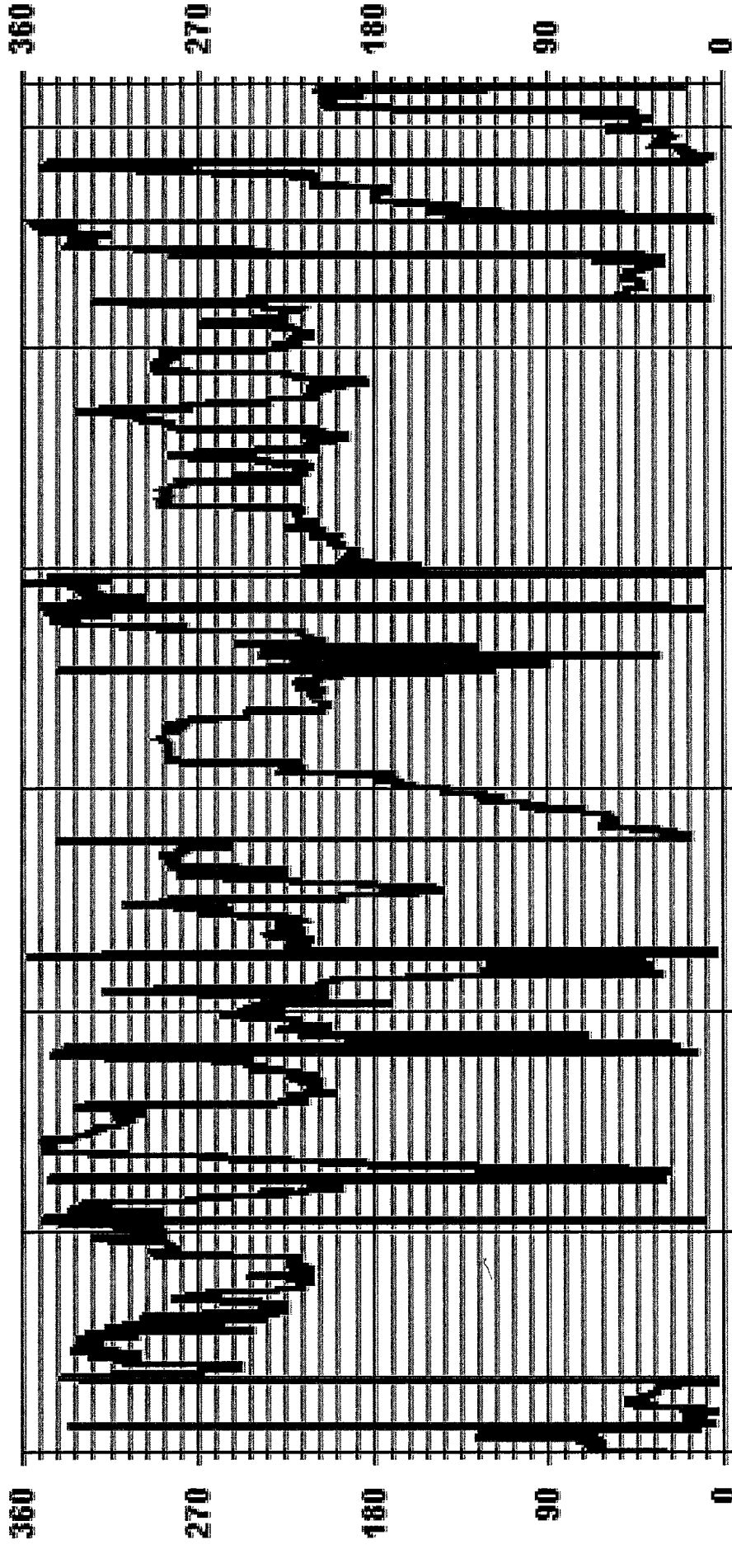
STATUS FLAG CODES

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

LAST CALIBRATION:	March 04, 2014
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0 HRS	OPERATIONAL TIME:	744 HRS
STANDARD DEVIATION:	95.90	AMD OPERATION UPTIME:	100.0 %
		MONTHLY AVERAGE:	W

01 Hour Averages



01/01/15 00:00 01/06/15 00:00 01/11/15 00:00 01/16/15 00:00 01/21/15 00:00 01/26/15 00:00 01/31/15 00:00

— LICA30 WDR DEG

STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Maskwa Site - JANUARY 2015

JOB # 2833-2015-01-30- C

STANDARD DEVIATION WIND DIRECTION (STDWD) hourly averages in degrees

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	0:00		
DAY																										
1	15	22	22	24	24	24	25	25	27	32	34	30	66	33	28	31	30	23	19	20	18	21	23	24		
2	19	13	20	17	24	20	19	16	16	13	18	16	16	17	25	25	38	34	47	33	41	46	43	31		
3	34	40	35	32	42	35	29	33	44	33	37	37	34	37	38	39	30	55	55	41	38	38	61	56		
4	34	22	54	37	23	27	22	28	25	26	31	39	30	29	35	34	24	24	19	23	20	23	18	30		
5	52	27	47	26	13	15	23	17	19	36	19	28	28	27	28	29	29	28	28	27	32	36	34	32		
6	25	30	31	30	32	27	24	26	29	40	34	33	34	39	40	47	58	43	47	32	33	31	42	26		
7	72	55	24	47	50	52	31	28	33	27	29	34	35	34	19	30	39	29	30	37	33	33	34	34		
8	38	32	33	36	40	38	36	35	35	32	33	32	31	32	31	33	27	26	25	32	38	40	36	14		
9	15	22	20	22	17	16	16	14	23	14	26	27	18	21	21	17	20	27	50	35	49	37	38	22		
10	58	51	47	41	46	32	42	40	58	54	69	51	23	33	29	22	14	18	17	29	39	28	36	35		
11	50	32	36	65	41	51	45	37	62	56	58	62	38	26	18	22	17	26	37	44	67	65	47	60		
12	38	56	53	57	53	71	42	52	41	36	23	28	22	20	19	19	30	34	30	29	16	22	23	21		
13	19	15	15	20	27	29	28	28	30	50	44	40	54	20	20	19	25	25	21	26	46	67	43	18		
14	19	27	26	27	25	17	27	22	26	31	25	29	28	24	31	25	27	29	27	28	32	40	24	21		
15	17	14	13	21	24	24	23	23	24	24	25	25	25	25	27	27	26	26	25	27	28	29	28	24		
16	33	26	25	26	27	25	39	36	34	38	39	20	28	21	21	30	24	25	24	27	26	24	28	27		
17	27	27	27	24	26	25	26	26	26	29	29	26	27	29	32	37	26	30	25	24	14	10	12	13		
18	12	12	16	20	19	16	13	21	38	19	20	30	25	42	13	16	54	51	49	47	51	56	47	54		
19	44	51	35	57	38	36	29	50	39	43	29	26	25	19	17	46	34	39	33	29	31	40	34	35		
20	39	31	19	15	32	37	35	41	27	32	36	36	37	36	39	35	35	28	33	38	37	45	42	44		
21	34	24	19	24	21	19	21	21	20	21	21	20	17	19	18	19	15	16	19	16	20	16	18	20		
22	17	14	16	14	16	15	18	18	15	17	35	29	26	27	25	24	25	25	24	23	20	21	26	21		
23	19	15	29	35	15	15	14	14	15	20	27	31	33	30	26	31	24	14	13	12	18	14	12	19		
24	39	36	14	14	23	27	25	27	27	27	26	30	32	36	37	39	29	27	26	23	24	14	14	12		
25	16	14	14	20	17	22	22	19	24	23	31	33	26	27	26	27	26	23	23	25	22	21	27	27		
26	18	18	14	15	15	15	14	17	19	17	18	21	24	32	36	34	21	21	19	16	23	29	60			
27	62	42	46	34	25	20	22	20	21	18	20	19	19	19	23	24	19	23	23	18	20	20	19	27		
28	26	26	47	57	47	37	30	36	37	35	34	37	37	32	35	32	37	32	39	30	28	21	27	20		
29	25	30	29	22	20	24	25	26	23	24	24	25	24	27	33	26	23	21	31	25	24	57	21	39		
30	36	47	41	33	34	23	23	17	25	20	21	22	22	17	19	14	13	12	14	14	14	13	18	22		
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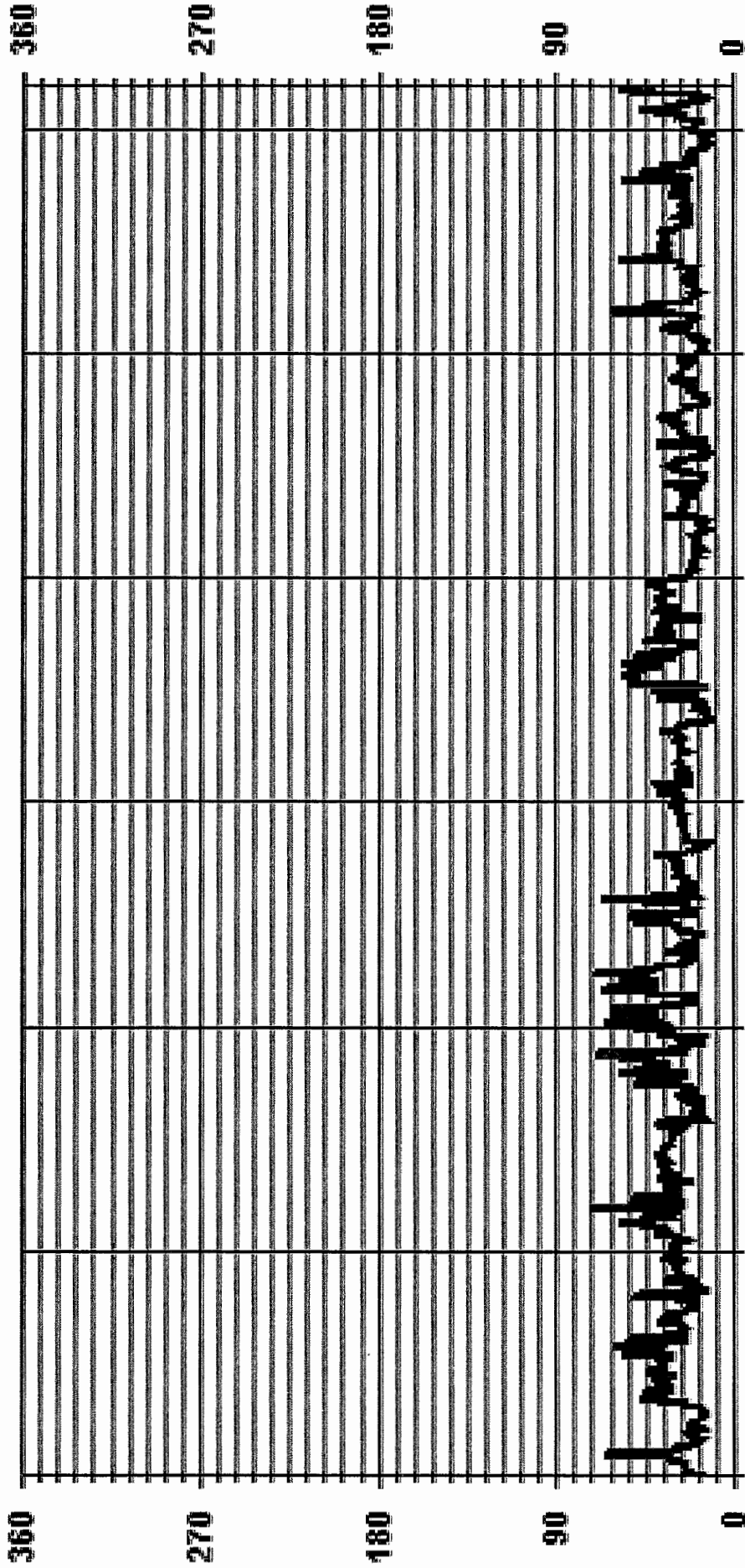
STATUS FLAG CODES

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

LAST CALIBRATION: March 04, 2014

CALIBRATION TIME: 0 HRS OPERATIONAL TIME: 744 HRS

01 Hour Averages



01/01/15 00:00 01/06/15 00:00 01/11/15 00:00 01/16/15 00:00 01/21/15 00:00 01/26/15 00:00 01/31/15 00:00

— LICA30 STOWDIR DEG

RELATIVE HUMIDITY

RELATIVE HUMIDITY (RH) hourly averages in %

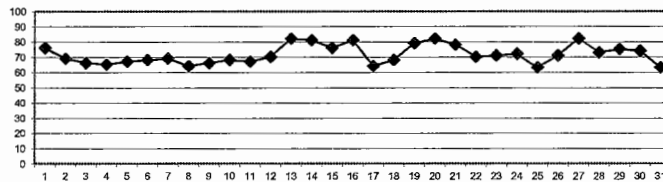
MST

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	24-HOUR		
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	0:00	MAX	AVG.	RDGS.	
DAY																												
1	79	80	80	80	78	77	76	76	77	77	76	74	73	74	74	78	77	76	74	73	73	72	72	71	80	75.7	24	
2	69	69	68	66	65	66	67	70	71	71	70	69	69	68	68	69	70	71	70	71	70	70	69	70	71	69.0	24	
3	69	70	70	69	68	68	68	67	67	66	66	63	62	62	61	64	65	66	66	66	66	66	65	65	70	66.0	24	
4	64	64	64	65	64	63	62	63	63	63	64	65	63	62	63	67	70	70	68	68	67	66	66	66	70	65.0	24	
5	66	66	67	66	65	65	65	66	65	65	67	67	63	61	62	68	69	70	71	71	70	70	71	71	71	67.0	24	
6	72	73	73	73	74	73	72	72	72	70	67	60	57	54	54	63	70	72	73	71	70	70	69	68	74	68.4	24	
7	65	65	65	63	63	63	62	62	63	65	69	70	70	71	73	74	75	76	75	73	73	71	71	68	76	68.5	24	
8	65	68	69	68	67	67	67	66	64	64	61	57	56	56	56	60	63	65	66	68	67	67	69	70	70	64.4	24	
9	71	70	69	68	68	67	68	68	67	67	67	66	62	56	50	54	62	69	70	70	71	71	71	72	72	66.4	24	
10	70	69	70	70	68	67	67	68	67	67	67	67	67	63	60	65	69	71	70	70	70	69	70	69	71	67.9	24	
11	69	70	68	67	66	67	67	68	66	67	69	67	62	59	58	62	68	71	70	70	68	67	66	65	71	66.5	24	
12	65	65	65	65	64	64	64	65	65	67	71	66	65	68	70	73	78	78	77	78	77	77	77	78	78	70.1	24	
13	78	78	79	79	81	82	83	83	83	83	83	82	80	78	78	80	82	83	84	84	85	86	87	88	88	81.8	24	
14	88	88	87	86	88	89	88	83	83	81	77	73	70	68	74	76	79	81	83	81	83	84	83	84	83	89	81.4	24
15	84	81	79	80	80	79	75	75	76	74	72	70	71	69	67	69	72	77	80	80	80	80	80	80	84	76.1	24	
16	81	82	82	83	83	83	83	83	83	83	83	82	81	80	81	82	83	83	84	82	82	78	70	63	84	80.8	24	
17	61	60	62	63	64	65	65	65	67	65	59	56	54	55	57	61	64	66	67	70	72	72	70	69	72	63.7	24	
18	68	69	69	71	71	72	69	70	75	69	62	59	54	46	47	52	63	70	75	78	79	82	82	82	82	68.1	24	
19	80	80	80	80	80	80	80	80	81	79	72	66	66	67	70	77	85	86	86	84	83	82	83	83	86	78.8	24	
20	83	86	86	86	86	86	85	85	86	83	80	77	76	76	75	77	79	80	80	81	81	82	82	85	86	81.8	24	
21	86	87	86	86	87	87	88	88	87	85	78	69	61	55	54	56	68	71	73	77	81	83	85	84	88	77.6	24	
22	83	83	81	80	79	77	77	78	78	73	65	55	54	55	55	58	62	64	64	65	68	70	72	75	83	69.6	24	
23	77	79	81	83	84	84	81	80	78	77	72	63	52	51	53	56	60	64	69	71	72	72	70	71	84	70.8	24	
24	72	78	86	88	89	90	87	85	82	75	68	63	62	59	55	56	63	64	65	67	69	70	73	73	90	72.5	24	
25	73	72	72	72	72	77	75	73	73	72	71	61	48	46	46	44	48	52	56	60	62	62	66	68	77	63.4	24	
26	70	74	76	78	77	75	71	72	74	71	68	65	62	58	56	60	62	70	74	75	76	78	79	79	79	70.8	24	
27	80	80	86	86	88	89	89	87	86	84	83	82	81	80	79	79	79	79	79	78	78	78	78	79	89	82.0	24	
28	79	79	79	80	80	82	84	80	76	71	67	65	63	61	60	64	71	77	74	73	73	74	74	74	84	73.3	24	
29	73	74	75	76	76	76	77	78	78	77	74	72	72	70	69	70	72	73	75	76	77	78	80	80	80	74.8	24	
30	83	83	82	83	82	81	80	79	77	74	72	69	69	69	70	70	70	70	70	70	70	69	69	70	83	74.2	24	
31	69	69	68	67	66	66	65	65	65	62	58	53	53	50	49	52	56	64	67	69	69	69	68	68	69	62.8	24	
HOURLY MAX	88	88	87	88	89	90	89	88	87	85	83	82	81	80	81	82	85	86	86	84	85	86	87	88				
HOURLY AVG	73.9	74.5	75.0	75.1	74.9	75.1	74.4	74.2	74.0	72.6	70.4	66.9	64.4	62.9	62.8	65.6	69.3	71.7	72.6	73.2	73.5	73.6	73.7	73.8				

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

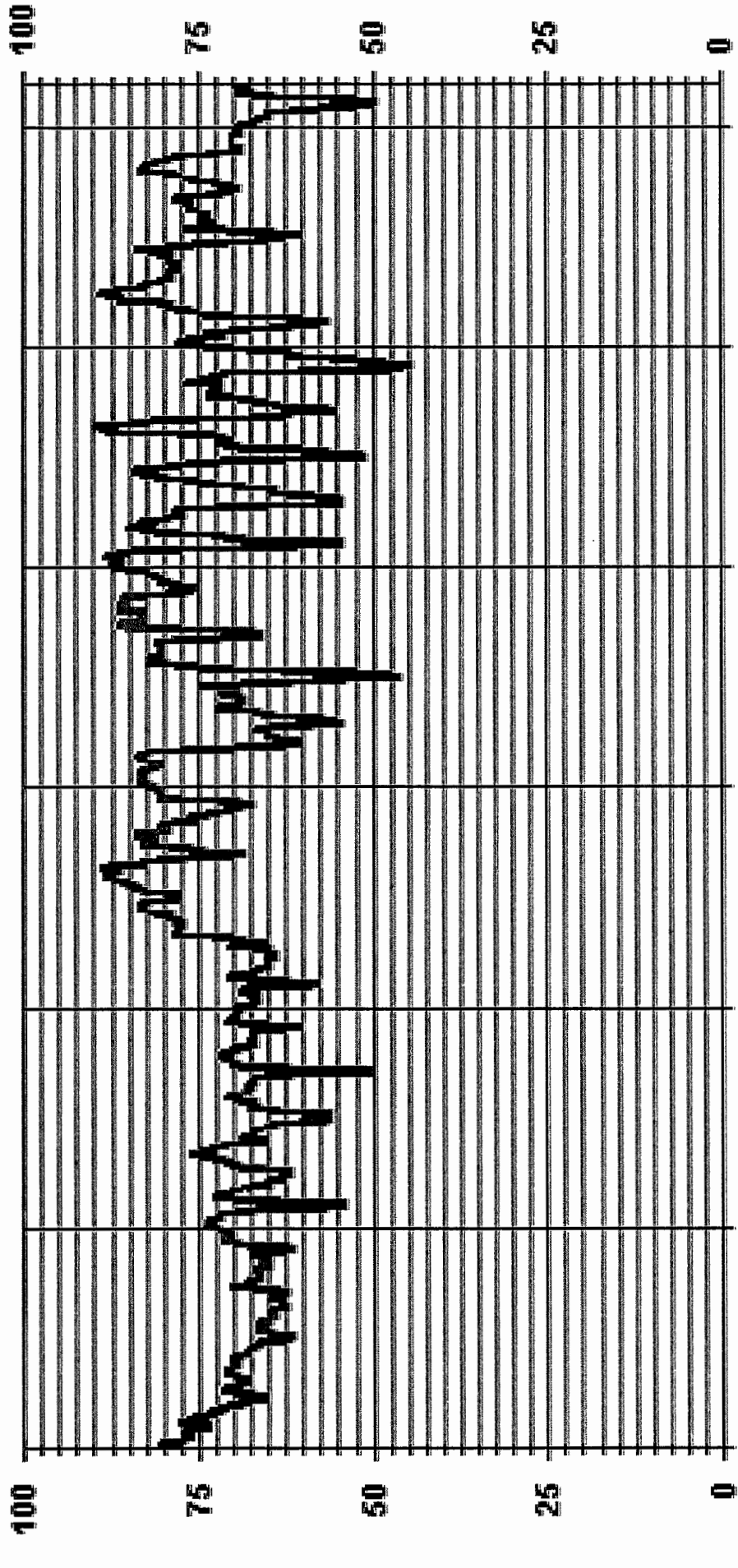
24 HOUR AVERAGES FOR JANUARY 2015



MONTHLY SUMMARY

MAXIMUM 1-HR AVERAGE:	90	%	@ HOUR(S)	5	ON DAY(S)	24
MAXIMUM 24-HR AVERAGE:	82.0	%			ON DAY(S)	27
					VAR-VARIOUS	
					OPERATIONAL TIME:	744 HRS
					AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	8.60				MONTHLY AVERAGE:	71.6 %

01 Hour Averages

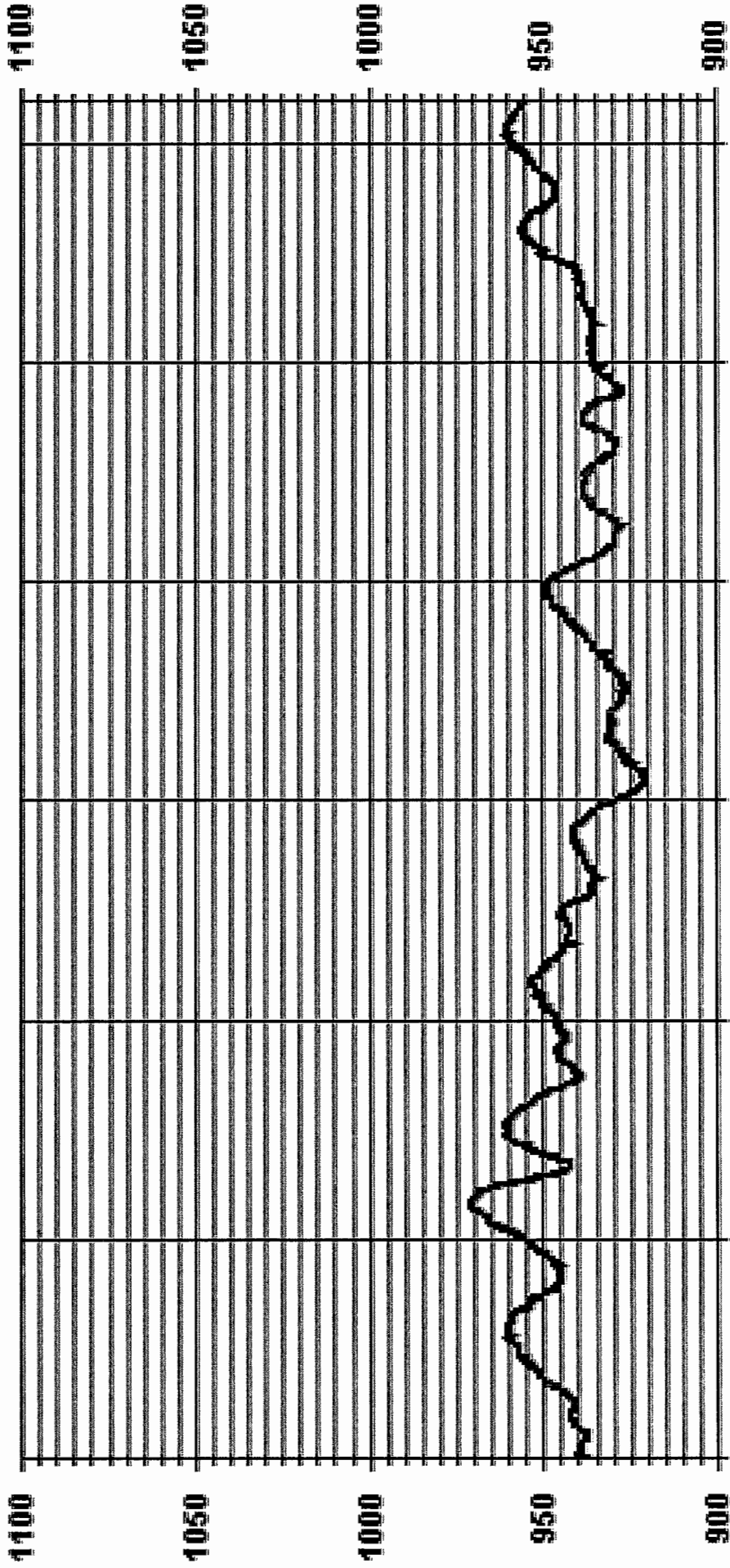


01/01/15 00:00 01/06/15 00:00 01/11/15 00:00 01/16/15 00:00 01/21/15 00:00 01/26/15 00:00 01/31/15 00:00

— LICA30 RH %

BAROMETRIC PRESSURE

01 Hour Averages



01/01/15 00:00 01/06/15 00:00 01/11/15 00:00 01/16/15 00:00 01/21/15 00:00 01/26/15 00:00 01/31/15 00:00

— LIC A30 BP MB

AMBIENT TEMPERATURE

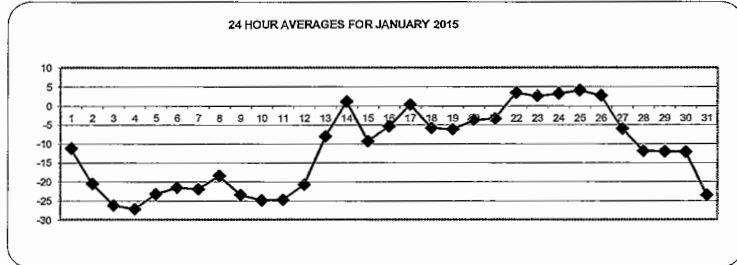
AMBIENT TEMPERATURE (TPX) hourly averages in Degrees Celsius

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	DAILY	24-HOUR	
		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	MAX.	AVG.	RDGS.
1	DAY																											
1		-7.1	-7.8	-8.7	-9.8	-11.0	-11.7	-11.9	-12.3	-12.2	-11.7	-11.0	-10.3	-9.3	-9.1	-8.9	-9.7	-10.2	-11.2	-12.2	-13.2	-14.1	-15.4	-16.3	-16.7	-7.1	-11.3	24
2		-17.5	-18.3	-18.5	-18.9	-19.2	-19.7	-20.0	-20.2	-20.3	-20.1	-19.6	-19.0	-18.4	-18.3	-18.6	-19.2	-20.7	-21.9	-22.1	-24.0	-25.0	-25.1	-26.1	-24.8	-17.5	-20.6	24
3		-24.8	-24.7	-25.0	-25.0	-25.8	-26.1	-25.5	-25.3	-25.8	-26.1	-24.8	-23.4	-22.9	-23.0	-23.8	-25.5	-26.8	-27.9	-28.7	-29.0	-29.3	-29.1	-29.6	-30.1	-22.9	-26.2	24
4		-30.3	-30.6	-29.8	-29.9	-30.8	-31.8	-32.4	-32.3	-31.9	-30.9	-27.8	-23.8	-20.9	-19.3	-19.7	-21.7	-22.8	-23.7	-25.2	-26.2	-27.1	-28.1	-28.4	-28.2	-19.3	-27.2	24
5		-28.4	-28.9	-28.0	-27.9	-29.4	-30.2	-29.8	-28.6	-28.8	-28.1	-25.1	-21.4	-17.7	-17.1	-16.8	-18.5	-19.7	-20.3	-20.4	-19.7	-19.1	-18.9	-18.5	-18.6	-16.8	-23.3	24
6		-18.4	-19.5	-19.9	-19.8	-21.7	-22.1	-23.0	-22.2	-22.7	-21.8	-20.0	-17.6	-17.3	-16.1	-16.0	-19.0	-21.9	-23.3	-24.0	-24.7	-26.0	-26.0	-27.0	-27.7	-16.0	-21.6	24
7		-29.4	-30.7	-30.2	-31.5	-32.2	-32.2	-32.1	-30.6	-29.0	-26.6	-22.5	-18.6	-17.6	-16.9	-16.6	-16.1	-15.7	-15.3	-14.5	-13.9	-13.9	-14.3	-14.2	-14.4	-13.9	-22.0	24
8		-15.2	-16.3	-16.3	-16.4	-16.8	-17.2	-18.1	-18.9	-19.6	-19.5	-18.3	-17.5	-17.1	-16.5	-16.3	-17.6	-18.8	-19.4	-19.8	-20.1	-20.7	-21.3	-22.3	-23.6	-15.2	-18.5	24
9		-24.6	-25.2	-25.8	-27.3	-26.6	-27.4	-27.8	-26.5	-27.8	-26.6	-23.9	-20.2	-18.7	-16.5	-14.2	-16.4	-19.6	-21.6	-23.1	-24.4	-24.9	-25.5	-25.6	-24.4	-14.2	-23.5	24
10		-24.5	-25.7	-26.2	-26.2	-26.2	-26.6	-26.4	-26.2	-27.3	-27.1	-24.9	-21.7	-20.9	-19.7	-19.0	-21.2	-24.3	-25.3	-25.8	-26.1	-26.4	-26.6	-26.6	-25.9	-19.0	-24.9	24
11		-26.7	-26.4	-26.8	-27.8	-28.8	-28.0	-27.6	-26.6	-28.1	-26.4	-22.9	-17.1	-14.5	-15.3	-17.5	-19.4	-21.8	-24.3	-26.1	-27.1	-27.9	-28.5	-29.0	-29.6	-14.5	-24.8	24
12		-29.8	-30.1	-30.0	-30.0	-30.1	-29.8	-29.3	-29.0	-28.1	-25.5	-18.1	-15.2	-14.4	-14.6	-14.6	-15.0	-15.2	-14.4	-13.8	-13.9	-14.3	-14.4	-14.0	-14.8	-13.8	-20.8	24
13		-15.2	-15.2	-15.0	-15.4	-13.6	-11.1	-8.7	-8.6	-9.8	-9.3	-7.3	-5.8	-4.7	-4.9	-5.6	-5.8	-5.8	-5.5	-5.2	-4.7	-4.2	-3.8	-3.2	-3.2	-3.2	-8.1	24
14		-2.6	-0.8	0.5	0.9	-0.1	-0.9	-0.7	1.0	1.0	1.2	2.4	3.6	4.5	5.1	3.1	2.7	1.7	0.7	0.1	0.8	1.1	0.8	0.6	-0.8	5.1	1.1	24
15		-2.2	-3.3	-4.2	-5.3	-6.7	-7.7	-8.8	-9.7	-10.5	-10.7	-10.8	-10.1	-9.7	-10.0	-9.7	-10.3	-10.8	-11.6	-12.1	-12.4	-12.4	-12.1	-11.9	-11.5	-2.2	-9.4	24
16		-11.0	-10.4	-9.9	-9.5	-9.3	-9.2	-9.2	-9.2	-9.0	-8.1	-6.7	-6.2	-5.8	-5.3	-3.9	-1.9	-0.5	-0.2	0.3	0.3	0.3	0.5	0.8	0.8	-5.5	24	
17		0.7	0.8	0.5	0.4	0.5	0.4	0.1	0.2	0.0	0.6	2.5	3.6	4.2	3.6	2.6	1.4	0.1	-0.9	-1.4	-2.3	-3.0	-3.1	-2.8	-2.6	4.2	0.3	24
18		-2.7	-3.3	-3.8	-4.8	-5.5	-6.4	-6.1	-6.8	-9.0	-6.8	-4.7	-3.6	-1.6	1.4	1.1	-1.0	-4.4	-6.6	-8.6	-9.8	-10.9	-11.7	-12.2	-13.0	1.4	-5.9	24
19		-13.4	-14.1	-13.5	-12.6	-12.7	-12.7	-11.2	-10.4	-9.9	-8.9	-6.9	-4.1	-3.6	-2.1	-1.5	-1.1	-1.2	-1.3	-1.3	-1.4	-1.5	-1.6	-1.9	-2.0	-1.1	-6.3	24
20		-2.1	-2.4	-2.4	-2.7	-2.9	-3.1	-3.5	-3.8	-4.6	-4.1	-3.3	-3.1	-3.0	-2.9	-2.6	-3.1	-3.7	-4.4	-4.9	-5.2	-5.5	-5.7	-5.8	-6.4	-2.1	-3.8	24
21		-6.5	-6.3	-5.8	-5.1	-4.6	-4.3	-4.1	-4.2	-4.6	-4.7	-3.9	-2.6	-2.1	-1.6	-1.6	-1.8	-2.4	-2.3	-1.9	-2.4	-2.7	-2.4	-2.3	-1.4	-1.4	-3.4	24
22		-1.2	-1.6	-1.1	-0.6	-0.5	0.2	0.3	0.2	0.1	2.3	5.3	8.7	9.1	9.1	9.0	7.8	6.3	5.4	5.2	4.8	4.1	3.4	2.8	2.2	9.1	3.4	24
23		1.3	0.5	0.0	-0.5	-0.9	-1.2	-0.5	-0.1	0.5	0.7	1.9	4.5	8.2	8.6	8.0	6.9	5.5	4.1	2.7	2.3	1.9	2.0	2.3	1.9	8.6	2.5	24
24		1.6	1.2	1.0	1.0	1.3	2.5	3.4	3.2	3.4	4.3	5.5	6.7	6.7	7.1	7.9	6.9	4.4	3.5	2.5	1.7	1.0	0.3	-0.5	-0.7	7.9	3.2	24
25		-0.4	-0.1	0.1	0.3	0.5	0.8	1.2	1.6	1.5	2.4	3.3	6.6	10.0	10.3	9.7	9.6	8.1	6.8	5.7	4.5	4.1	3.9	2.7	1.8	10.3	4.0	24
26		1.4	0.3	-0.2	-0.8	-0.7	-0.3	0.8	0.8	0.4	1.6	3.0	4.4	5.8	7.2	7.4	6.2	5.7	4.3	3.4	3.2	2.9	2.5	2.2	2.1	7.4	2.7	24
27		2.1	2.3	2.2	2.0	1.3	0.3	-1.2	-2.6	-4.1	-5.4	-6.3	-7.1	-8.5	-9.4	-9.7	-9.9	-10.3	-11.0	-11.1	-11.5	-11.7	-12.0	-12.3	-12.4	2.3	-6.1	24
28		-12.2	-11.6	-11.2	-10.6	-10.3	-9.6	-8.0	-8.3	-11.0	-12.7	-12.3	-11.6	-11.5	-11.0	-10.3	-11.4	-13.5	-15.9	-14.3	-13.9	-13.8	-14.0	-14.0	-14.0	-8.0	-12.0	24
29		-14.1	-14.5	-14.5	-15.0	-15.0	-14.7	-14.7	-14.7	-14.6	-14.3	-13.4	-11.8	-11.2	-11.0	-9.8	-9.2	-9.7	-10.2	-10.0	-9.9	-9.9	-9.6	-9.4	-10.0	-9.2	-12.1	24
30		-9.2	-8.4	-8.0	-7.8	-7.6	-7.8	-8.2	-9.0	-10.0	-10.5	-10.9	-10.8	-10.7	-11.0	-11.5	-12.3	-13.1	-14.4	-15.3	-16.5	-18.0	-19.4	-20.3	-21.4	-7.6	-12.2	24
31		-22.7	-23.5	-24.0	-24.3	-25.2	-25.6	-25.6	-25.3	-24.2	-22.2	-20.4	-20.3	-19.2	-18.3	-19.4	-21.0	-23.1	-23.7	-25.0	-25.4	-26.9	-27.9	-28.5	-18.3	-23.6	24	
	HOURLY MAX	2.1	2.3	2.2	2.0	1.3	2.5	3.4	3.2	3.4	4.3	5.5	8.7	10.0	10.3	9.7	9.6	8.1	6.8	5.7	4.8	4.1	3.9	2.8	2.2			
	HOURLY AVG	-12.4	-12.7	-12.7	-12.9	-13.2	-13.3	-13.2	-13.1	-13.5	-12.8	-11.1	-9.2	-8.2	-7.7	-7.7	-8.6	-9.8	-10.7	-11.2	-11.6	-12.0	-12.3	-12.6	-12.8			

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

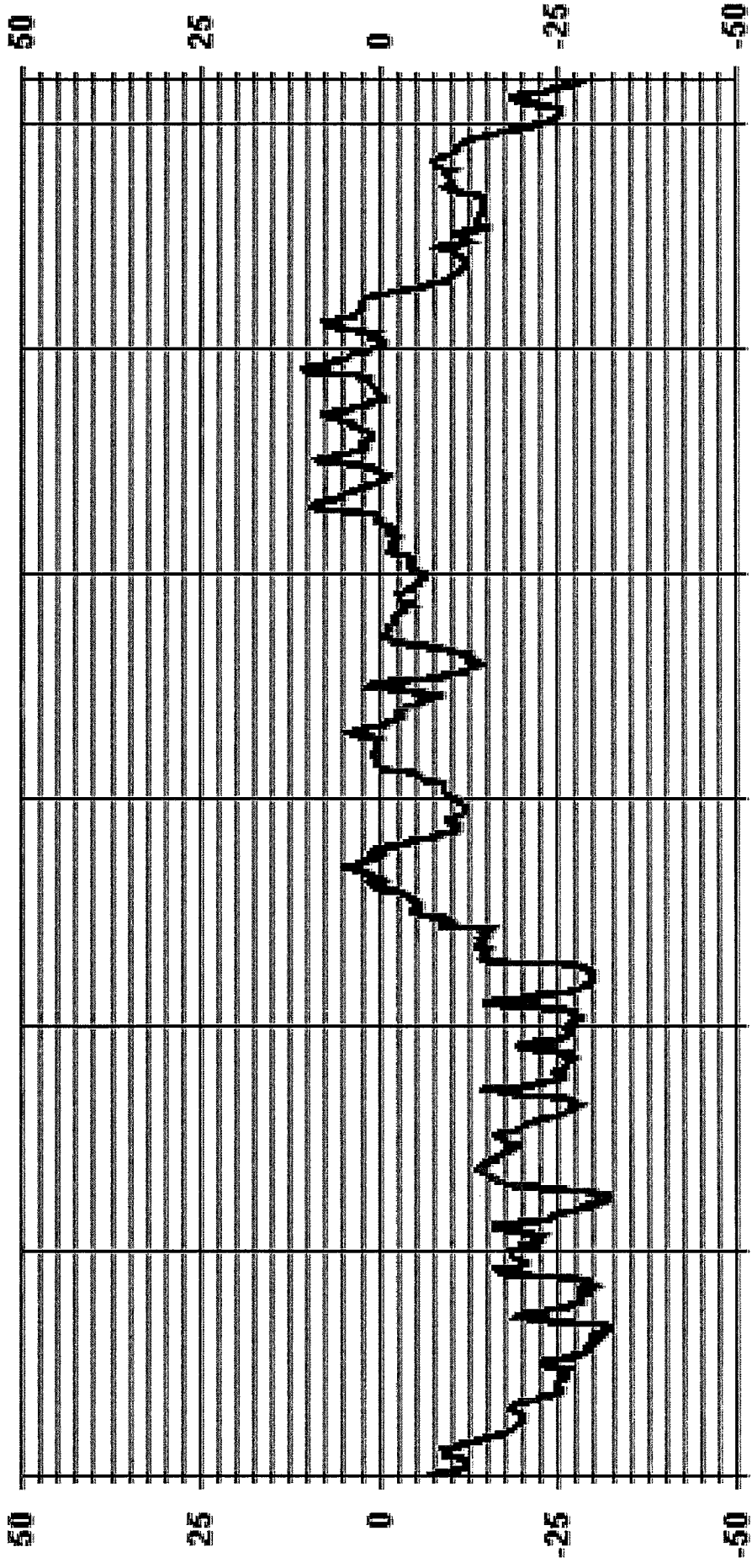
24 HOUR AVERAGES FOR JANUARY 2015



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-32.4 °C	@ HOUR(S)	6	ON DAY(S)	4
MAXIMUM 1-HR AVERAGE:	10.3 °C	@ HOUR(S)	13	ON DAY(S)	25
MAXIMUM 24-HR AVERAGE:	4.0 °C			ON DAY(S)	25
				VAR-VARIOUS	
OPERATIONAL TIME:				744 HRS	
AMD OPERATION UPTIME:				100.0 %	
STANDARD DEVIATION:	10.98	MONTHLY AVERAGE:		-11.5 °C	

01 Hour Averages

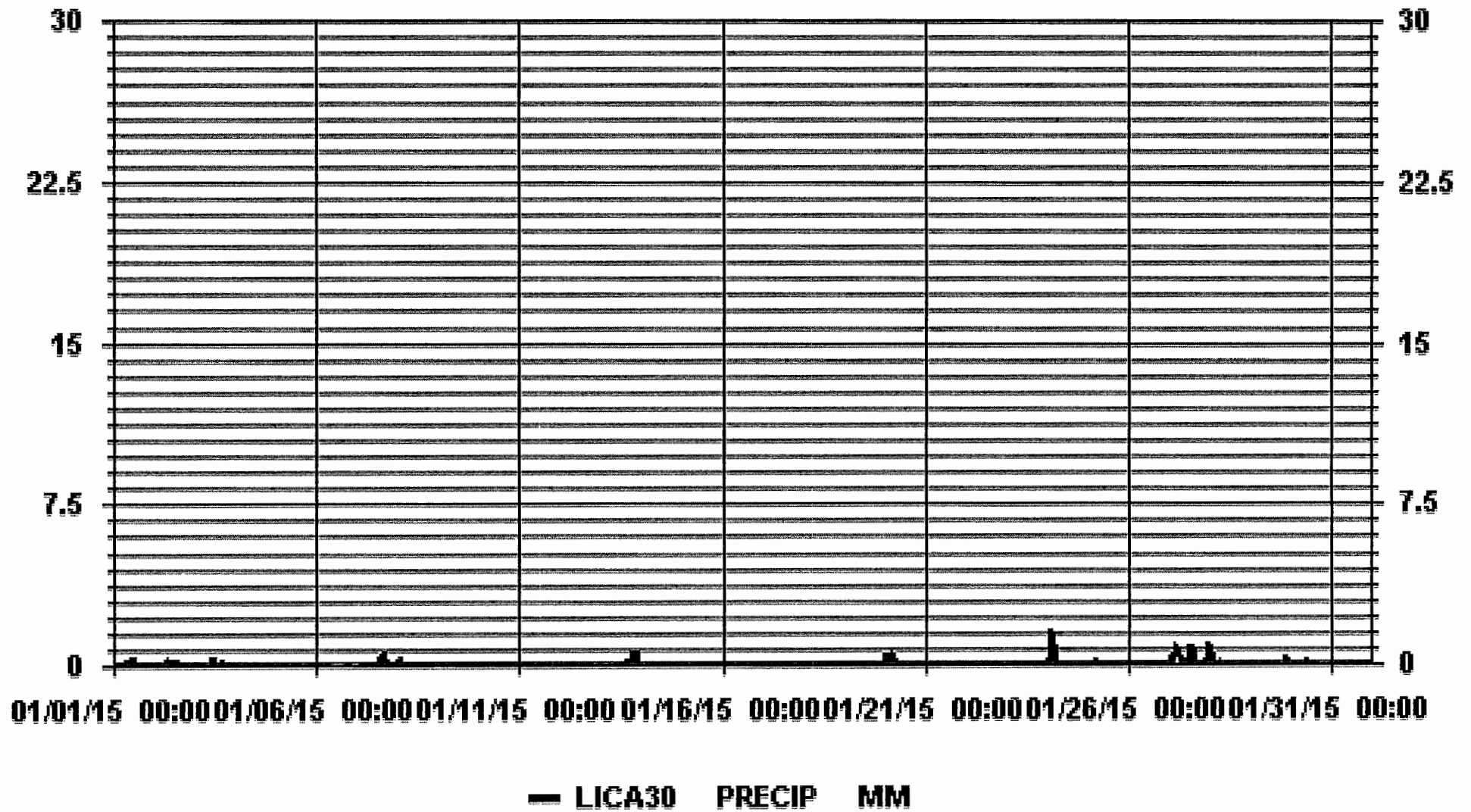


01/01/15 00:00 01/06/15 00:00 01/11/15 00:00 01/16/15 00:00 01/21/15 00:00 01/26/15 00:00 01/31/15 00:00

— LICA30 TPX DGC

PRECIPITATION

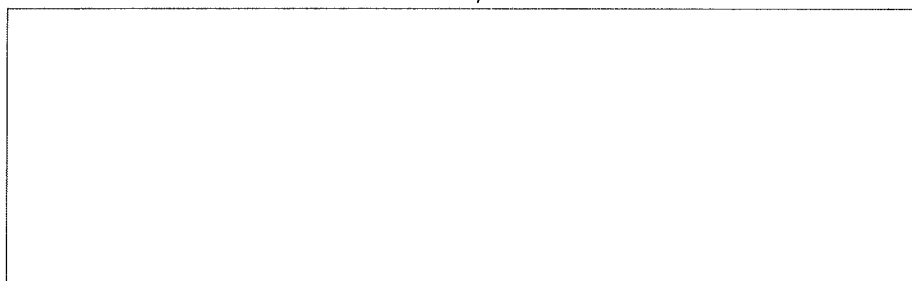
01 Hour Averages



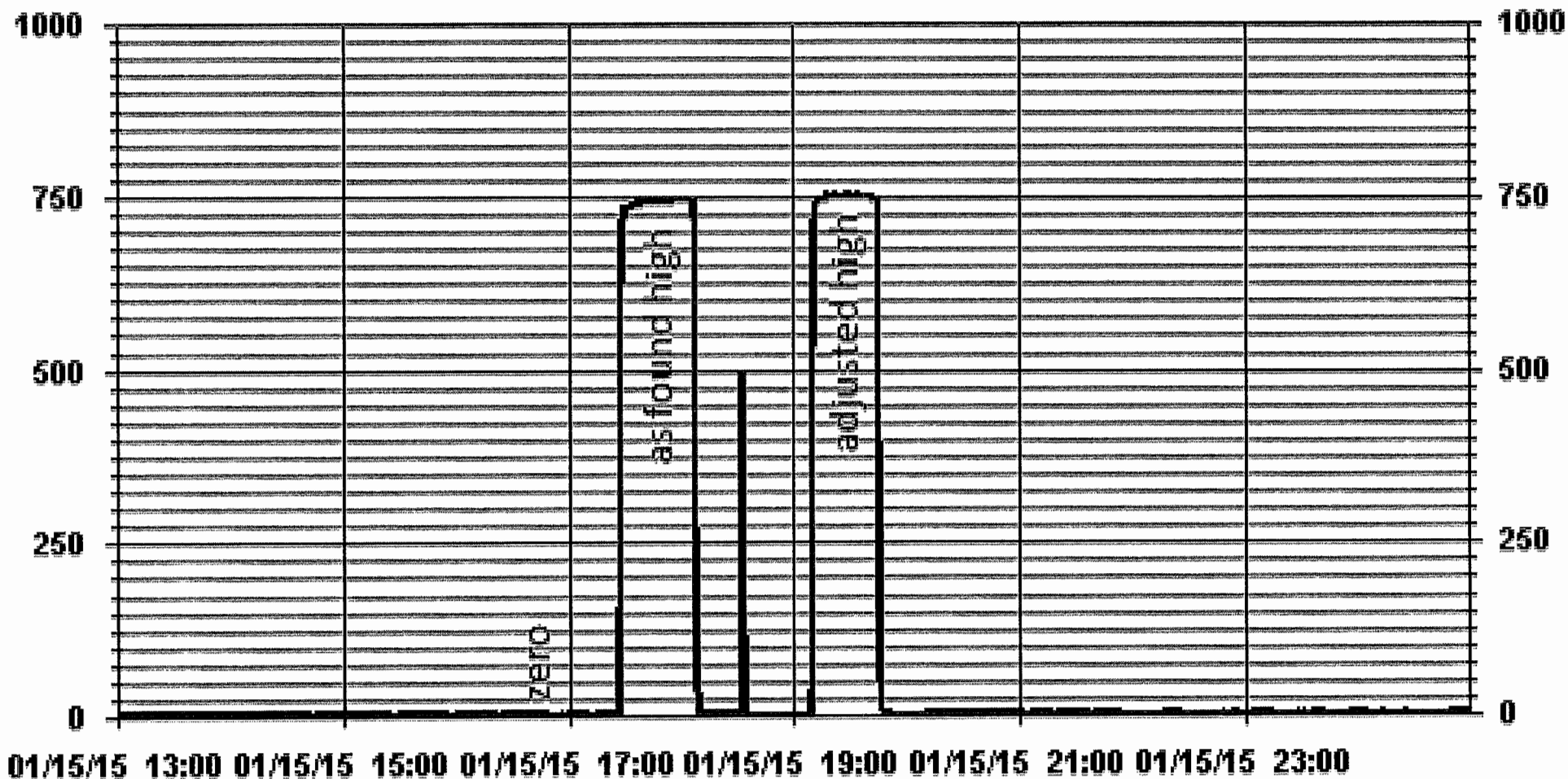
APPENDIX II
ANALYZER CALIBRATION RESULTS

SULPHUR DIOXIDE


API 100E SO2 Analyzer Calibration																																																												
Date: <u>15-Jan-15</u> Company: <u>LICA</u> Station Name/Location: <u>Maskwa</u> Performed by: <u>Limin Li</u> Application H ₂ S/TRS/SO ₂ : <u>SO2</u>	Start/End Time (mst): <u>16:50/19:45</u> Calibration Purpose: <u>As found</u> Converter Make & Model: <u>na</u> Converter Serial #: <u>na</u> Cal Gas Expiry Date: <u>4-Feb-18</u>																																																											
Analyzer: Serial Number: <u>508</u> Range ppb: <u>1000</u> Last Calibration Date: <u>23-Dec-14</u> As Found C.F.: <u>1.008</u> Previous Cal High Point C.F.: <u>0.999</u> New C.F.: <u>NA</u>																																																												
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Calibrator: Flow Meter ID's: <u>na</u> Make & Model: <u>Sabio 2010</u> Serial #: <u>042531101(0911)</u> Cal Gas Cylinder I.D. #: <u>BLM000428</u> Cal Gas Conc. (ppm): <u>48.8</u>																																																												
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Comments: Changed filter. After as found point, rebuilt pump. -18". Analogue output calibration.																																																												



01 Minute Averages



— LICA30 SO2_ PPB



API 100E SO2 Analyzer Calibration

Date: 16-Jan-15

Company: LICA

Station Name/Location: Maskwa

Performed by: Limin Li

Application H₂S/TRS/SO₂: SO2

Start/End Time (mst): 09:00/13:00

Calibration Purpose: Post Repair

Converter Make & Model: na

Converter Serial #: na

Cal Gas Expiry Date: 4-Feb-18

Analyzer:

Serial Number: 508

Last Calibration Date: 23-Dec-14

Previous Cal High Point C.F.: 0.999

Range ppb: 1000

As Found C.F.: NA

New C.F.: 0.998

As found:

SLOPE: 1.017

OFFSET: 120.4

HVPS: 495

RCELL TEMP: 50.0

BOX TEMP: 31.0

PMT TEMP: 7.7

IZS TEMP: 45.0

TEST: na

STABIL: 0.1

PRES: 24.4

SAMP FL: 585

PMT: 106.7

NORM PMT: 116.6

UV LAMP: 3145.6

LAMP RATIO: 98.1 %

STR. LGT: 58.0

DRK PMT: 11.9

DRK LMP: -1.8

Internal Span: 258

As left:

SLOPE: 1.017

OFFSET: 120.4

HVPS: 495

RCELL TEMP: 50.0

BOX TEMP: 31.0

PMT TEMP: 7.7

IZS TEMP: 45.0

TEST: na

STABIL: 0.1

PRES: 24.4

SAMP FL: 585

PMT: 106.7

NORM PMT: 116.6

UV LAMP: 3145.6

LAMP RATIO: 98.1 %

STR. LGT: 58.0

DRK PMT: 11.9

DRK LMP: -1.8

Internal Span: 271

Calibrator:

Flow Meter ID's: na

Make & Model: Sabro 2010

Serial #: 042531101(0911)

Cal Gas Cylinder I.D. #: BLM000428

Cal Gas Conc. (ppm): 48.8

Calibrator Flow Targets:

point	diluent (cc/min)	cal gas (cc/min)	total (cc/min)
zero	5000	0	5000
high	5000	77	5077
mid	5000	38	5038
low	5000	19	5019

Calibration:

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero						
adjusted zero	5000	0.0	5000	0	0.0	NA
as found high						
adjusted high	4923	76.90	5000	750.6	751.0	0.999
mid	4963	37.50	5001	366.0	368.9	0.992
low	4981	18.70	5000	182.5	182.0	1.003
calibrator zero	5000	0.00	5000	0	0.0	NA
Average C.F.=						0.998

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS	Pass/Fail ?
Slope = <u>0.999</u>	> or = 0.995	PASS
b (Intercept as % of full scale) = <u>-0.03%</u>	0.85-1.15	PASS
% change in C.F. from last cal = <u>NA</u>	± 3% F.S.	PASS
	± 15%	FAIL

Converter Efficiency Check for H₂S/TRS application:

run converter efficiency test immediately following zero adjust

SO₂ High Point gas concentration: na Time gas run (mst): na

Zero corrected analyzer response: na

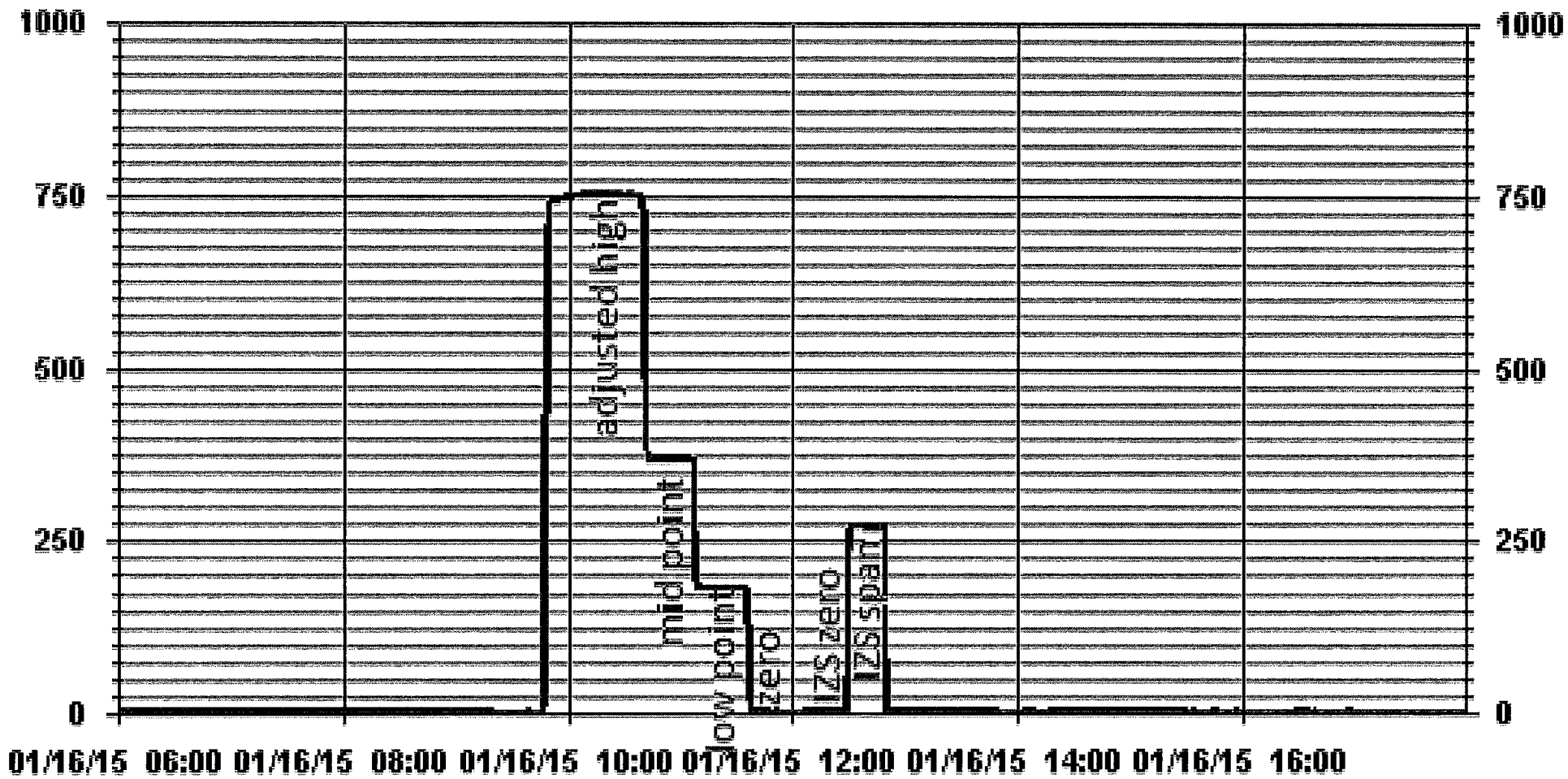
Comments:

Changed filter. After as found point, rebuilt pump. -18". Analogue output calibration.

API 100E SO2 Analyzer Calibration

Calculated ppb	Indicated ppb
0	0
182	182
369	369
751	751

01 Minute Averages



— LICA30 SO2_ PPB

HYDROGEN SULPHIDE

API 101E H2S Analyzer Calibration

Date: 15-Jan-15

Company: LICA

Station Name/Location: Maskwa

Performed by: Limin Li

Application H₂S/TRS/SO₂: H2S

Start/End Time (mst): 16:50/19:45

Calibration Purpose: As found

Converter Make & Model: Internal

Converter Serial #: na

Cal Gas Expiry Date: 25-Dec-15

Analyzer:

Serial Number: 511

Last Calibration Date: 23-Dec-14

Previous Cal High Point C.F.: 0.998

Range ppb: 100

As Found C.F.: 0.947

New C.F.: NA

As found:

SLOPE: .905

OFFSET: 45.1

HVPS: 616

RCELL TEMP: 50.0

BOX TEMP: 31.4

PMT TEMP: 7.9

IZS TEMP: 45.0

TEST: na

STABIL: 0.1

PRES: 29

SAMP FL: 653

PMT: 78.7

NORM PMT: 44.6

UV LAMP: 3010

LAMP RATIO: 96.7 %

STR. LGT: 20.4

DRK PMT: 33

DRK LMP: 5.7

Internal Span: 49.12

As left:

SLOPE: 0.85

OFFSET: 46

HVPS: 616

RCELL TEMP: 50.0

BOX TEMP: 31.4

PMT TEMP: 7.9

IZS TEMP: 45.0

TEST: na

STABIL: 0.1

PRES: 29

SAMP FL: 653

PMT: 78.7

NORM PMT: 44.6

UV LAMP: 3010

LAMP RATIO: 96.7 %

STR. LGT: 20.4

DRK PMT: 33

DRK LMP: 5.7

Internal Span: 49.12

Calibrator:

Flow Meter ID's: na

Make & Model: API 700

Serial #: 690

Cal Gas Cylinder I.D. #: BLM005217

Cal Gas Conc. (ppm): 9.6

Calibrator Flow Targets:

point	diluent (cc/min)	cal gas (cc/min)	total (cc/min)
zero	5000	0	5000
high	5000	41	5041
mid	5000	20	5020
low	5000	12	5012

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5000	0.0	5000	0	0.3	NA
adjusted zero	5000	0.0	5000	0	-0.1	NA
as found high	4959	40.70	5000	78.0	82.3	0.947
adjusted high	4959	40.70	5000	78.0	78.0	0.999
mid						
low						
calibrator zero						

Average C.F.: NA

Linear Regression/Calibration Results:

Correlation Coefficient = _____	LIMITS	Pass/Fail ?
Slope = _____	> or = 0.995	
b (Intercept as % of full scale) = _____	0.85-1.15	
% change in C.F. from last cal = <u>5.11%</u>	± 3% F.S.	
	± 15%	PASS

Converter Efficiency Check for H₂S/TRS application:

run converter efficiency test immediately following zero adjust

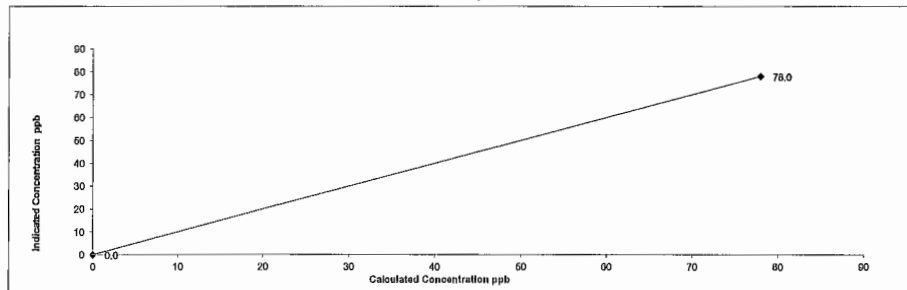
SO₂ High Point gas concentration: NA Time gas run (mst): NA

Zero corrected analyzer response: NA

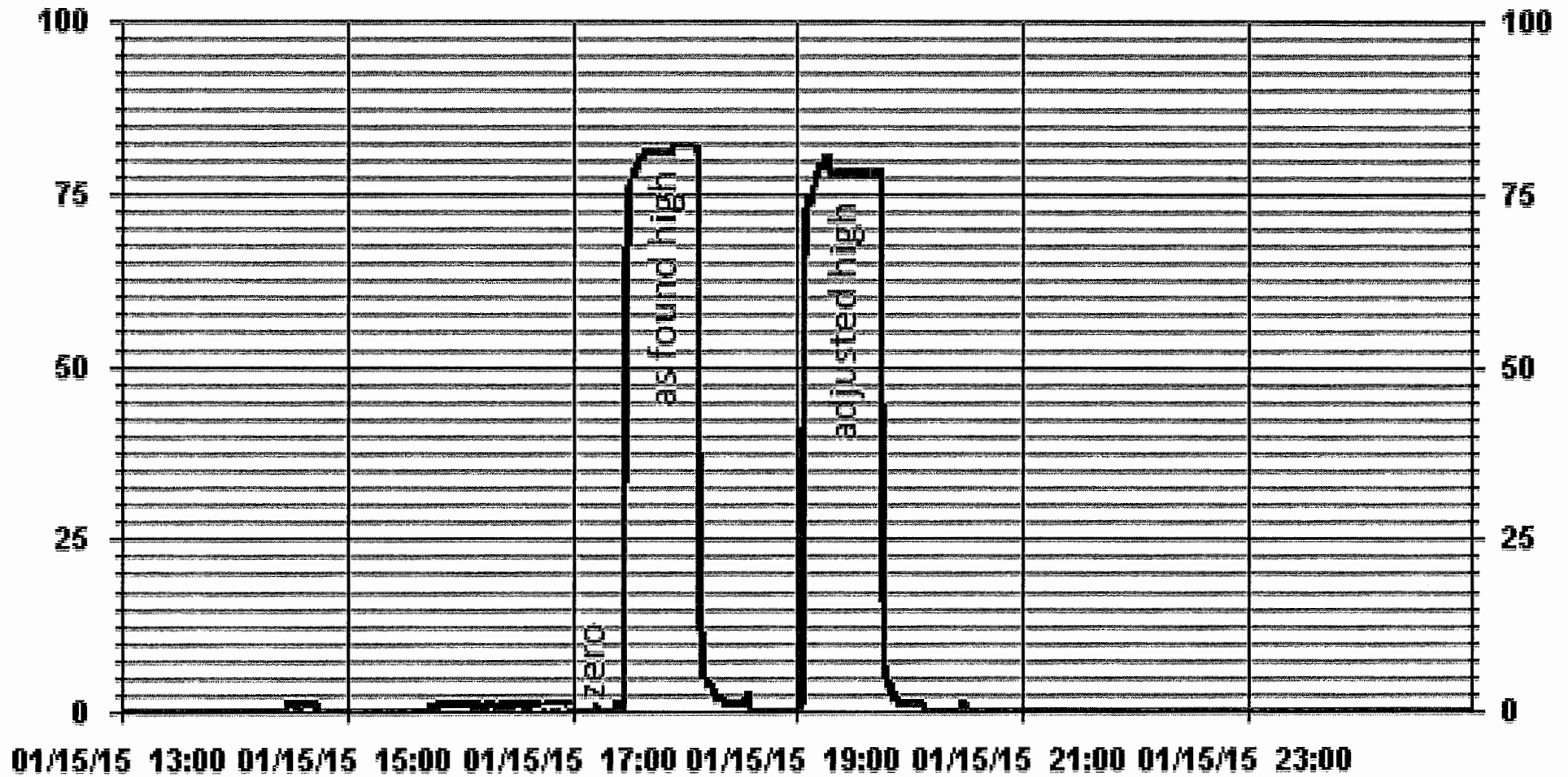
Comments:

Changed filter. After as found point, check pump is ok. -20". Analogue output calibration.

API 101E H2S Analyzer Calibration



01 Minute Averages



— LICA30 H2S_ PPB

API 101E H2S Analyzer Calibration

Date: 16-Jan-15

Company: LICA

Station Name/Location: Maskwa

Performed by: Limin Li

Application H₂S/TRS/SO₂: H2S

Start/End Time (mst): 09:00/13:00

Calibration Purpose: Post Repair

Converter Make & Model: Internal

Converter Serial #: na

Cal Gas Expiry Date: 25-Dec-15

Analyzer: 511

Serial Number: 23-Dec-14

Last Calibration Date: 0.998

Previous Cal High Point C.F.:

Range ppb: 100

As Found C.F.: 1.010

New C.F.:

As found:

SLOPE: 0.85

OFFSET: 46

HVPS: 616

RCELL TEMP: 50.0

BOX TEMP: 31.4

PMT TEMP: 7.9

IZS TEMP: 45.0

TEST: na

STABIL: 0.1

PRES: 29

SAMP FL: 653

PMT: 78.7

NORM PMT: 44.6

UV LAMP: 3010

LAMP RATIO: 96.7 %

STR. LGT: 20.4

DRK PMT: 33

DRK LMP: 5.7

Internal Span: 47.5

As left:

SLOPE: 0.85

OFFSET: 46

HVPS: 616

RCELL TEMP: 50.0

BOX TEMP: 31.4

PMT TEMP: 7.9

IZS TEMP: 45.0

TEST: na

STABIL: 0.1

PRES: 29

SAMP FL: 653

PMT: 78.7

NORM PMT: 44.6

UV LAMP: 3010

LAMP RATIO: 96.7 %

STR. LGT: 20.4

DRK PMT: 33

DRK LMP: 5.7

Internal Span: 48.16

Calibrator:

Flow Meter ID's: na

Make & Model: API 700

Serial #: 690

Cal Gas Cylinder I.D. #: BLM005217

Cal Gas Conc. (ppm): 9.6

Calibrator Flow Targets:

point	diluent (cc/min)	cal gas (cc/min)	total (cc/min)
zero	5000	0	5000
high	5000	41	5041
mid	5000	20	5020
low	5000	12	5012

Calibration:

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors:
	Diluent	Cal Gas	Total			
as found zero	NA	0.0	#####	0		NA
adjusted zero	5000	0.0	5000	0	0.0	NA
as found high						
adjusted high	4959	40.70	5000	78.0	78.2	0.997
mid	4980	19.80	5000	37.9	37.5	1.012
low	4988	12.00	5000	23.0	22.5	1.022
calibrator zero	5000	0.00	5000	0	0.4	NA
Average C.F. =						1.010

Linear Regression/Calibration Results:

Correlation Coefficient =	<u>1.000</u>	LIMITS	Pass/Fail ?
Slope =	<u>0.996</u>	> or = 0.995	PASS
b (Intercept as % of full scale) =	<u>0.33%</u>	0.85-1.15	PASS
% change in C.F. from last cal	<u>NA</u>	± 3% F.S.	PASS
		± 15%	#####

Converter Efficiency Check for H₂S/TRS application:

****run converter efficiency test immediately following zero adjust****

SO₂ High Point gas concentration: NA Time gas run (mst): NA

Zero corrected analyzer response: NA

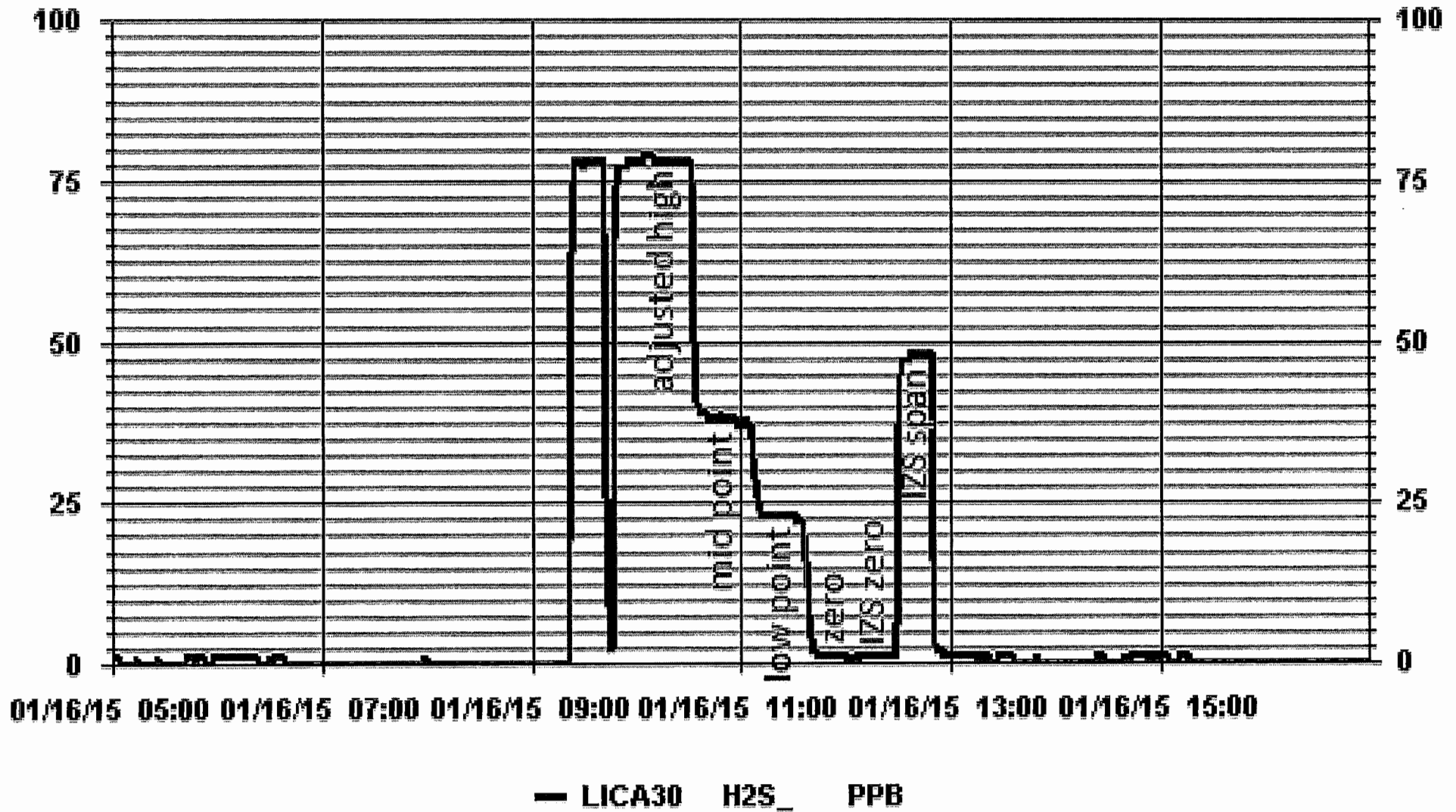
Comments:

Changed filter. After as found point, check pump is ok. -20". Analogue output calibration. When doing as found high point, touched calibrator switch off. Redo high point.

API 101E H2S Analyzer Calibration

Calculated Concentration (ppb)	Indicated Concentration (ppb)
0.0	0.0
22.5	22.5
37.5	37.5
78.2	78.2

01 Minute Averages



TOTAL HYDROCARBON

Maxxam Thermo 51C THC Analyzer Calibration

Date: 16-Jan-15
 Company: LICA
 Station Name/Location: Maskwa
 Performed by: Limin Li

Start Time (mst): 12:10
 End Time (mst): 15:45
 Calibration Purpose: monthly Cal.
 Cal Gas Expiry Date: 7-Jan-22

Analyzer: 436609738
 Serial Number: 22-Dec-14
 Last Calibration Date: 0.999
 Previous Cal High Point C.F.:

Range ppm: 50
 As Found C.F.: 1.009
 New C.F.: 1.000

	As found:	As left:
H ₂ cylinder (psi):	1480	2000
H ₂ cylinder reg set (psi):	20	20
Span Cylinder (psi):	1730	2100
Span Cylinder Reg Set (psi):	25	25
Zero Air Gen Pressure:	31	31
measurement alarms:	none	none
service alarms:	none	none
FID status:	cnt: 832	cnt: 974
	rng: 1	rng: 1
	try: 2	try: 2
	flm: 176.8	flm: 179.8
	det: 125.5	det: 125.7
Oven Readings:	Flame: 176	Flame: 179
	Filter: 125	Filter: 125
	Base: 125	Base: 125
	Pump: 7.50	Pump: 7.50
Voltages:	+5 4.9	+5 4.9
	+15 14.8	+15 14.8
	-15 -15.0	-15 -15.0
	Internal Span: 33.6	Internal Span: 33.6

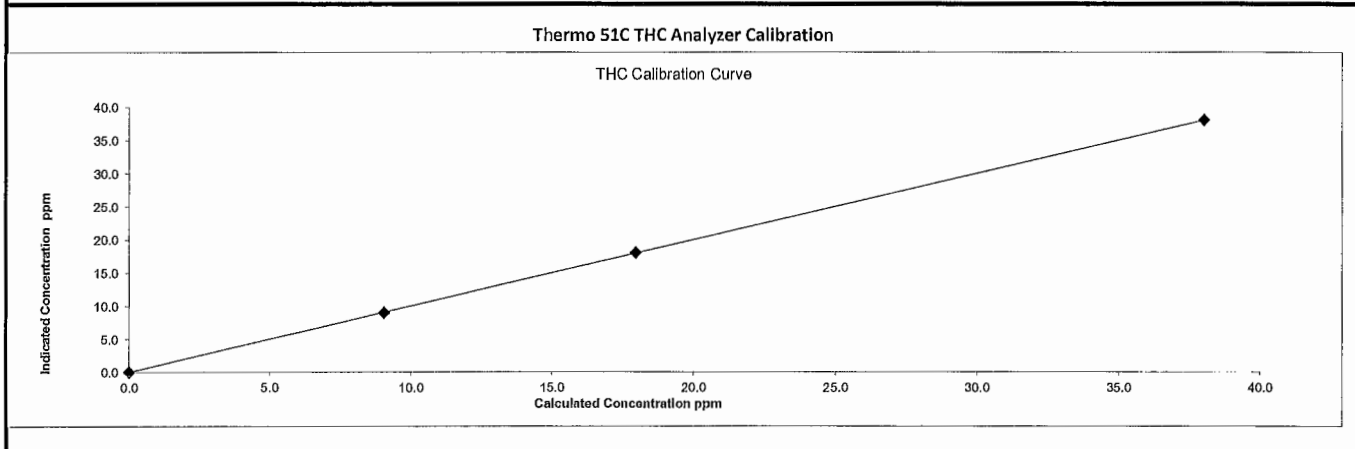
Calibrator:	Flow Meter ID's:	na	Calibrator Flow Targets:			
	Make & Model:	API 700	point	diluent (cc/min)	cal gas (cc/min)	total (cc/min)
	Serial #:	690	zero	2000	0	2000
	Cal Gas Cylinder I.D. #:	L183638	high	2000	69	2069
	CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	582.0 203.0	mid	2000	32	2032
	CH ₄ as propane/total CH ₄ equilivants (ppm):	558.3 1140.3	low	2000	16	2016

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppm)	Indicated Concentration (ppm)	Correction Factors
	Diluent	Cal Gas	Total			
as found zero	2000	0.00	2000	0	-0.17	NA
adjusted zero	2000	0.00	2000	0	0.00	NA
as found high	2000	69.00	2069	38.03	37.70	1.009
adjusted high	2000	69.00	2069	38.03	38.04	1.000
mid	2000	32.00	2032	17.96	18.04	0.995
low	2000	16.00	2016	9.05	9.00	1.006
calibrator zero	2000	0.00	2000	0	0.01	NA
Average C.F. =						1.000

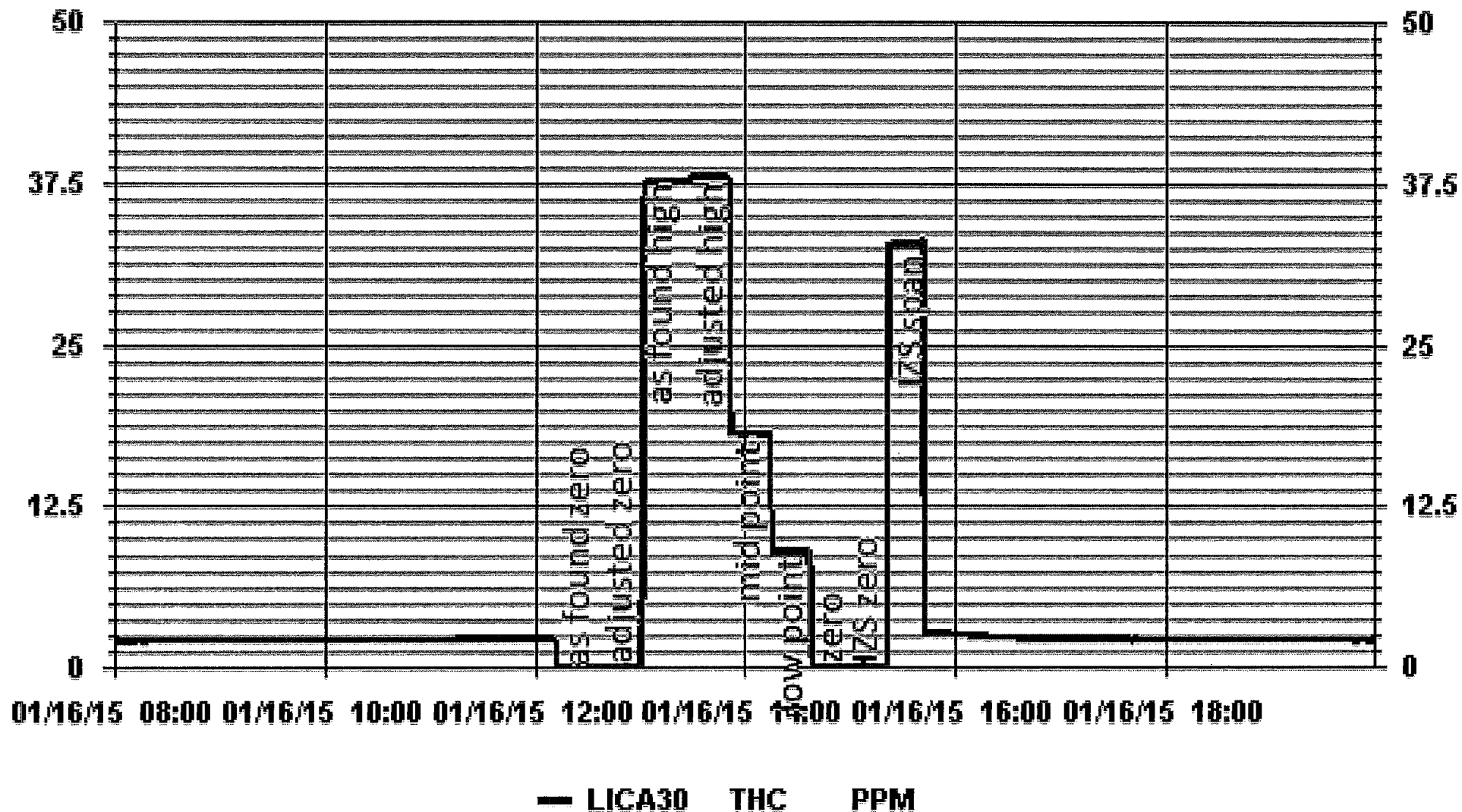
Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	Pass/Fail ?
Slope =	1.001	> or = 0.995	PASS
b (Intercept as % of full scale) =	-0.009%	0.85-1.15	PASS
% change in C.F. from last cal	-0.97%	± 3% F.S.	PASS
		± 15%	PASS

Comments:
 Sample filter changed.



01 Minute Averages



NITROGEN DIOXIDE



API 200E NOx Analyzer Calibration

Date: 15-Jan-15
 Company: LICA
 Station Name/Location: Maskwa
 Performed by: Limin Li

Start Time (mst): 16:50
 End Time (mst): 19:45
 Calibration Purpose: As Found
 Cal Gas Expiry Date: 4-Feb-18

Analyzer Serial Number: 593
 Last Calibration Date: 23-Dec-14
 Range ppb: 1000

Correction Factors:
 As found C.F. Previous Cal High Point C.F.:
 NO= 1.017 NO= 1.003
 NOx= 1.006 NOx= 0.999
 NO₂= 0.000 NO₂= 0.996

As found:
 NOx SLOPE: .945
 NOx OFFS: -.1
 NO SLOPE: .932
 NO OFFS: -1.5
 TEST:
 SAMP FLW: 490
 OZONE FL: 77
 PMT: 7.4
 NORM PMT: -1.4
 AZERO: 7.3
 HVPS: 634
 RCELL TEMP: 50.0
 BOX TEMP: 31.3
 PMT TEMP: 6.7
 IZS TEMP: 50.2
 MOLY TEMP: 315.5
 RCEL: 6.9
 SAMP: 27.1
 Internal Span: 7/473/488

As left:
 NOx SLOPE: 0.954
 NOx OFFS: 0.8
 NO SLOPE: 0.946
 NO OFFS: -0.5
 TEST:
 SAMP FLW: 490
 OZONE FL: 77
 PMT: 7.4
 NORM PMT: -1.4
 AZERO: 7.3
 HVPS: 634
 RCELL TEMP: 50.0
 BOX TEMP: 31.3
 PMT TEMP: 6.7
 IZS TEMP: 50.2
 MOLY TEMP: 315.5
 RCEL: 6.9
 SAMP: 27.1
 Internal Span: 7/473/488

Calibrator Flow Targets:

Make & Model: Sablo 2010
 Serial #: 042531101(0911)
 Cal Gas Cylinder I.D. #: BLM000428
 NO Cylinder Conc. (ppm): 50.7
 NOx Cylinder Conc. (ppm): 50.8

point	diluent (cc/min)	cal gas (cc/min)	O ₃ setting (v or ppb)	total (cc/min)
zero	5000	0	0	5000
high	5000	77	460	5077
mid	5000	37	240	5037
low	5000	17	90	5017

Calibration:

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	1.2	2.1	NA	NA
adjusted zero	5000	0.0	5000	0	0	0.0	0.0	NA	NA
as found high	4923	76.90	5000	779.8	781.3	767	777	1.017	1.006
adjusted high	4923	76.90	5000	779.8	781.3	780	781	1.000	1.000
mid									
low									
calibrator zero							NA		
Average C.F.=								1.000	1.000

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ increase	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4923	76.90	5000	0.0				0.0	0.0	
as found NO ₂	4923	76.90	5000	460				0.0	0.0	
gpt mid	4923	76.90	5000	240.0				0.0	0.0	
gpt low	4923	76.90	5000	90.0				0.0	0.0	

Average NO₂ C.F.=

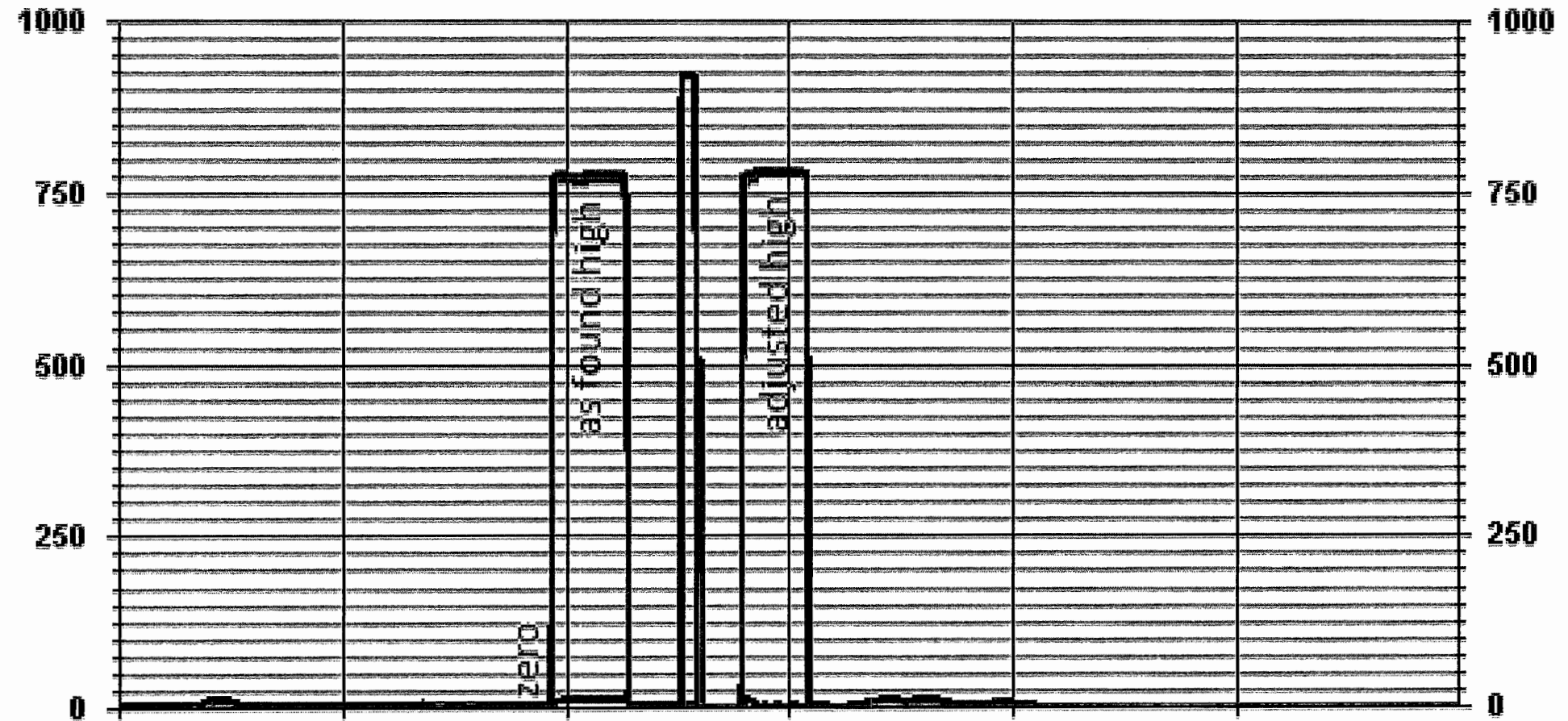
Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	NA	NA	NA	> or = 0.995
Slope =	NA	NA	NA	0.85-1.15
b (Intercept as % of full scale) =	NA	NA	NA	± 3% F.S.
% change in C.F. from last cal =	-1.36%	-0.66%		+/-15%
NO ₂ converter efficiency				>85%

Comments:

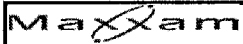
Changed filter. After as found point, check pump. -23". Analogue output calibration.

01 Minute Averages



01/15/15 13:35 01/15/15 15:35 01/15/15 17:35 01/15/15 19:35 01/15/15 21:35 01/15/15 23:35

— LICA30 NOX_ PPB — LICA30 NO_ PPB — LICA30 NO2_ PPB



API 200E NOx Analyzer Calibration

Date: 16-Jan-15
 Company: LICA
 Station Name/Location: Maskwa
 Performed by: Limin Li

Start Time (mst): 9:00
 End Time (mst): 15:30
 Calibration Purpose: Post Repair
 Cal Gas Expiry Date: 4-Feb-18

Analyzer Serial Number: 593
 Last Calibration Date: 23-Dec-14
 Range ppb: 1000

Correction Factors:
 As found C.F. Previous Cal High Point C.F.:
 NO= NA NO= 1.003
 NOx= NA NOx= 0.999
 NO₂= 1.000 NO₂= 0.996

As found:
 NOx SLOPE: 0.954
 NOx OFFS: 0.8
 NO SLOPE: 0.946
 NO OFFS: -0.5
 TEST:
 SAMP FLW: 490
 OZONE FL: 77
 PMT: 7.4
 NORM PMT: -1.4
 AZERO: 7.3
 HVPS: 634
 RCELL TEMP: 50.0
 BOX TEMP: 31.3
 PMT TEMP: 6.7
 IZS TEMP: 50.2
 MOLY TEMP: 315.5
 RCEL: 6.9
 SAMP: 27.1
 Internal Span: 4.8/315/319

As left:
 NOx SLOPE: 0.953
 NOx OFFS: 0.8
 NO SLOPE: 0.951
 NO OFFS: -0.5
 TEST:
 SAMP FLW: 490
 OZONE FL: 77
 PMT: 7.4
 NORM PMT: -1.4
 AZERO: 7.3
 HVPS: 634
 RCELL TEMP: 50.0
 BOX TEMP: 31.3
 PMT TEMP: 6.7
 IZS TEMP: 50.2
 MOLY TEMP: 315.5
 RCEL: 6.9
 SAMP: 27.1
 Internal Span: 4/312/316

Callibrator Flow Targets:

Make & Model: Sablo 2010
 Serial #: 042531101(0911)
 Cal Gas Cylinder I.D. #: BLM000428
 NO Cylinder Conc. (ppm): 50.7
 NOx Cylinder Conc. (ppm): 50.8

point	diluent (cc/min)	cal gas (cc/mln)	O ₃ setting (v or ppb)	total (cc/mln)
zero	5000	0	0	5000
high	5000	77	460	5077
mid	5000	37	240	5037
low	5000	17	90	5017

Calibration:

Callibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero									
adjusted zero	5000	0.0	5000	0	0	0.0	0.0	NA	NA
as found high									
adjusted high	4923	76.90	5000	779.8	781.3	780	781	1.000	1.000
mid	4963	37.50	5001	380.2	381.0	385	385	0.988	0.990
low	4981	18.70	5000	189.6	190.0	191	191	0.993	0.995
callibrator zero	na	0.00	#VALUE!	0	0	0.0	0.0	NA	NA
Average C.F.=								0.993	0.995

Callibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ increase	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4923	76.90	5000	0.0	781.0	781.0	0.0	0.0	0.0	
as found NO ₂	4923	76.90	5000	460	231.0	781.0	550.0	550.0	550.0	1.000
gpt mid	4923	76.90	5000	240.0	494.0	782.0	288.0	287.0	288.0	0.997
gpt low	4923	76.90	5000	90.0	678.0	782.0	104.0	103.0	104.0	0.990
Average NO ₂ C.F.=									1.010	

Linear Regression/Calibration Results:			LIMITS
NO	NOx	NO ₂	
Correlation Coefficient =	1.000	1.000	> or = 0.995
Slope =	1.000	1.000	0.85-1.15
b (Intercept as % of full scale)=	0.15%	0.13%	± 3% F.S.
% change in C.F. from last cal=	NA	NA	+/-15%
NO ₂ converter efficiency		99.0%	>85%

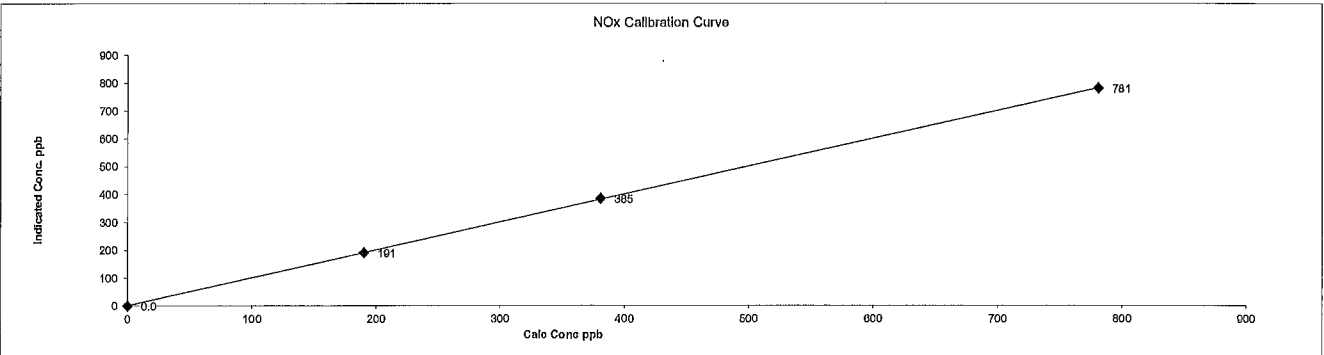
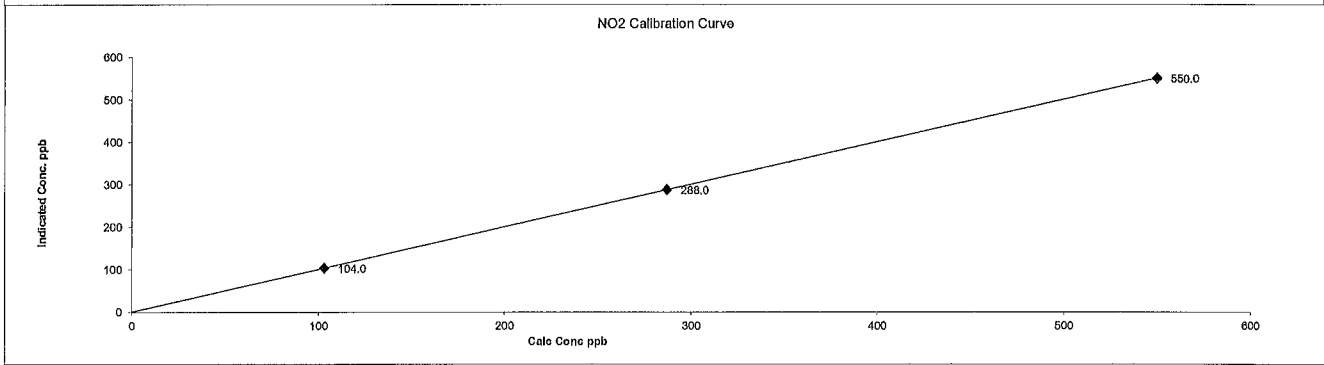
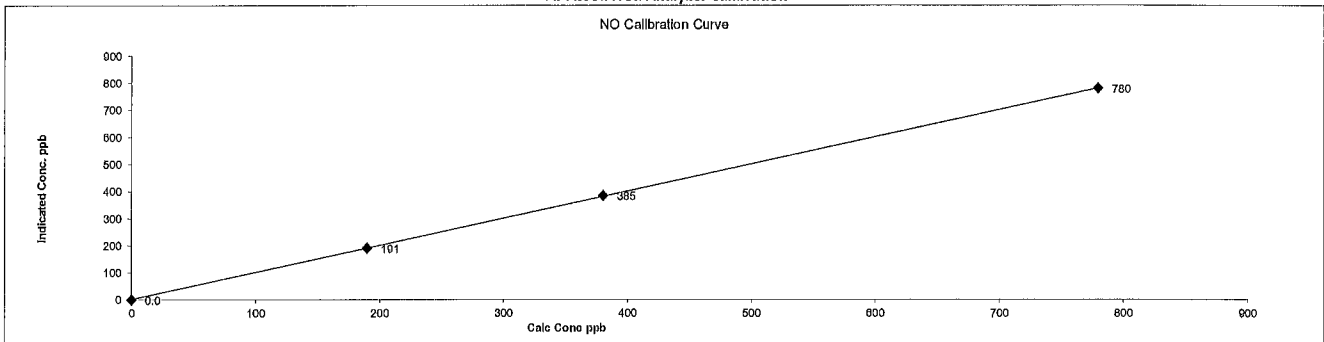
Comments:

Changed filter. After as found point, check pump. -23". Analogue output calibration. As found point GPT CAL: 231/783/552. When doing GPT calibration, callibrator reset itself. Redo GPT.

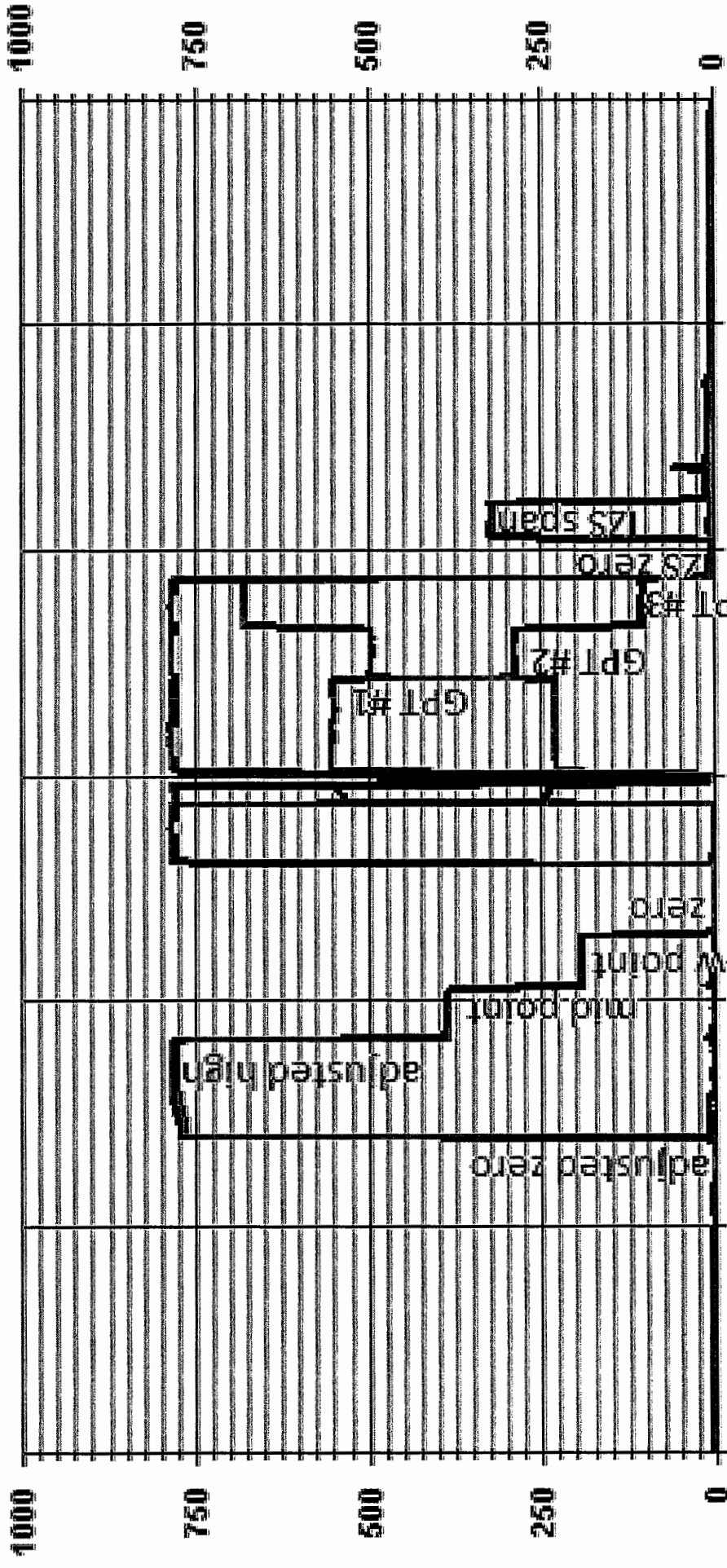
Date: 16-Jan-15
 Company: LICA
 Station Name/Location: Maskwa
 Performed by: Limin LI

Start Time (mst): 9:00
 End Time (mst): 15:30
 Calibration Purpose: Post Repair
 Cal Gas Expiry Date: 4-Feb-18

API 200E NOx Analyzer Calibration



01 Minute Averages



01/16/15 07:00 01/16/15 09:00 01/16/15 11:00 01/16/15 13:00 01/16/15 15:00 01/16/15 17:00

— LICA30 NOX_ 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.: 35-51786

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: Dan Paul

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 Vibration none
Humidity 20 to 70 % 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). Instruments accuracy meets the requirements of Regulatory Guide 1.23 (2/72). Compliant with ISO 9001:2008 requirements.

QC Inspection by: Byron Pearson

Date: 3/10/14

Met One Instruments
Sonic Sensor Test Data
50.5-6100

Model: 50.5H Tech: D. Paul Date: 3/4/2014
 Serial # H10703 Customer: Maxxam Analytics
 P.O. No.: 35-54786 Sensor Output Voltage: 1 vdc
 Sales Order Number: 101530 As Found: _____ As Left: X

Test 1: Actual Wind Tunnel Speed 2.22 m/s

WD Setting (Degree)	WD Output Voltage	WD Indication	WD Error +/- 3 deg	WS Output Voltage	WS Indication	WS Error +/- .20 m/s
30	0.087	31.3	1.3	0.044	2.20	-0.02
60	0.172	61.9	1.9	0.043	2.15	-0.07
120	0.337	121.3	1.3	0.045	2.25	0.03
150	0.418	150.5	0.5	0.045	2.25	0.03
210	0.586	211.0	1.0	0.044	2.20	-0.02
240	0.670	241.2	1.2	0.045	2.25	0.03
300	0.837	301.3	1.3	0.045	2.25	0.03
330	0.922	331.9	1.9	0.045	2.25	0.03

Test 2: Actual Wind Tunnel Speed 11.19 m/s

WD Setting (Degree)	WD Output Voltage	WD Indication	WD Error +/- 3 deg	WS Output Voltage	WS Indication	WS Error +/- .24 m/s
30	0.085	30.6	0.6	0.224	11.20	0.01
60	0.169	60.8	0.8	0.225	11.25	0.06
120	0.334	120.2	0.2	0.226	11.30	0.11
150	0.422	151.9	1.9	0.225	11.25	0.06
210	0.588	211.0	1.0	0.223	11.15	-0.04
240	0.672	241.9	1.9	0.225	11.25	0.06
300	0.837	301.3	1.3	0.228	11.40	0.21
330	0.922	331.9	1.9	0.227	11.35	0.16

CALBRATORS



Calibrator Performance Audit Oxides Of Nitrogen

File No. 2013-338A

Company <u>Maxxam</u>		Operator: <u>Chris Wesson</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>N/A</u>
Serial Number	<u>690</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>June 2011</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>8AL3165</u>	Barometric Pressure	<u>N/A</u>
NO/NOx Concentration	<u>48.9/49.0</u>		

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

Calibrator Flow (scfm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4998	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
4998	81.8	0.800	0.800	0.818	-0.007	0.810	2%	1%
4998	40.9	0.400	0.400	0.413	-0.003	0.410	3%	2%
4996	20.4	0.200	0.200	0.211	-0.001	0.210	5%	5%
Absolute Average Percent Difference							4%	3%

LINEAR REGRESSION ANALYSIS			<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>		
NO		LIMITS		NOx	
Correlation=	1.0000	≥ 0.990		Correlation=	0.9999
m (Slope)=	1.0203	0.90-1.10		m (Slope)=	1.0100
b (Intercept % of FS)=	0.3400	± 3% F.S.		b (Intercept % of FS)=	0.4000

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
4998	0.000	0.000	0.817	-0.005	0.812	NO ₂	% Diff. Limit
4998	0.800	0.469	0.348	0.463	0.811	0%	± 10%
4998	0.300	0.249	0.568	0.244	0.813	0%	± 10%
4998	0.120	0.099	0.718	0.095	0.813	1%	± 10%
Absolute Average Percent Difference						0%	± 10%

LINEAR REGRESSION ANALYSIS			<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>		
NO₂		LIMITS			
Correlation=	1.0000	≥ 0.995			
m (Slope)=	0.9970	0.90-1.10			
b (Intercept % of FS)=	-0.4395	± 3% F.S.			

AENV Standards		NO_x Analyzer	
Audit Calibrator		Make/Model	<u>Teco 421</u>
Make/Model	<u>Teco 1461</u>	Serial/AMU Number	<u>AMU 1868</u>
Serial/AMU Number	<u>AMU 1809</u>	Last Calibration Date	<u>February 21, 2013</u>
		Full Scale (ppm)	<u>1.0</u>

COMMENTS: Long stabilization required for 1st pt GPT. Check UV O3 lamp.

Auditor: Al Clark Date: February 21, 2013
 Operator Signature: _____ Location: McIntyre Center Edmonton



Calibrator Performance Audit Oxides Of Nitrogen

File No. 2013-322A

Company <u>Maxxam</u>		Operator: <u>Limin Li</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sablo 2010</u>	Make/Model	<u>N/A</u>
Serial Number	<u>042531101</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>Jan 2012</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>BAL1263</u>	Barometric Pressure	<u>N/A</u>
NO/NOx Concentration	<u>51.3 / 51.3</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	0.000	0.000	Limit ± 10%	
4999	78.0	0.800	0.800	0.785	-0.002	0.783	-2%	-2%
4998	39.0	0.400	0.400	0.396	-0.001	0.395	-1%	-1%
4999	19.5	0.200	0.200	0.196	-0.001	0.195	-2%	-3%
Absolute Average Percent Difference							2%	2%

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)= 0.9819	0.90-1.10	m (Slope)= 0.9796
b (Intercept % of FS)= 0.0600	± 3% F.S.	b (Intercept % of FS)= 0.0400

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
4999	0.000	0.000	0.783	-0.003	0.780	NO ₂	% Diff. Limit
4999	0.520	0.550	0.233	0.546	0.778	0	± 10%
4999	0.260	0.300	0.483	0.297	0.781	0	± 10%
4999	0.100	0.109	0.674	0.108	0.782	0	± 10%
Absolute Average Percent Difference						0	± 10%

LINEAR REGRESSION ANALYSIS

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

NO₂	LIMITS	
Correlation= 1.0000	≥ 0.995	
m (Slope)= 0.9967	0.90-1.10	
b (Intercept % of FS)= -0.1864	± 3% F.S.	

AENV Standards Audit Calibrator	NO_x Analyzer
Make/Model <u>Teco 1461</u>	Make/Model <u>Teco 421</u>
Serial/AMU Number <u>AMU 1809</u>	Serial/AMU Number <u>AMU 1868</u>
	Last Calibration Date <u>December 4, 2013</u>
	Full Scale (ppm) <u>1.0</u>

COMMENTS:

Auditor: Al Clark
Operator Signature: [Signature]

Date: December 4, 2013
Location: Molntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2013-333CGA

Company: Maxxam **Operator's Name:** Chris Wesson
Cylinder #: BLM005217 **Concentration PPM:** 9.58 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: February 21, 2013
 Gas Type: H2S **Conc.** 20.02
 Cylinder Number: D249556

Flow Measurement Device:

Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp, °C: 21.0 C
 B.P.: 696 mmhg

Reference Analyzer:

Make/Model: Teco 45C **Serial/AMU Number:** 1624
Instrument Settings: **Zero:** 7.5 **Span:** 1.023 **Range:** 0.1
Last Calibration: **Date:** Feb 21/13 **C.F.** 1.000 **Done By:** AI Clark

Calibrator Flows (scem)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	0.0000	0.0000
5106	38.5	0.0708	0.00754	132.623	9.39
5105	18.0	0.0329	0.00353	283.611	9.33
5078	9.2	0.0169	0.00181	551.957	9.33
Average Cylinder Concentration:					9.35

Previous Stated Concentration PPM: 9.58

Percent variance from Stated: 2.4

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: AI Clark
 Operator Signature: *AI Clark*

Date: February 21, 2013
 Location: McIntyre Center Edmonton



500 WEAVER PARK RD, LONGMONT, CO 80501 Phone: 888-253-1635 Fax: 303-772-7673

COMPLIANCE CLASS

Guaranteed +/- 2% Accuracy

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A42014
 AIR LIQUIDE AMERICA SPECIALTY GASES LLC
 500 WEAVER PARK RD
 LONGMONT, CO 80501

P.O. No.: 1218334
 Document #: 63834050-001

Customer
 AIR LIQUIDE CANADA
 HARRY GE/PO 1218334
 10020 56TH AVENUE
 EDMONTON T6E 5Z2
 ALBERTA CANADA

ANALYTICAL INFORMATION Gas Type : NO,SO2,BALN

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1. EPA/600/R-12/531; May 2012. Do not use this standard if pressure is less than 100 psig.

Cylinder Number: BLM000428
Cylinder Pressure: 1900 PSIG

Certification Date: 03Feb2014

Exp. Date: 04Feb2018
Batch No: LGM0109922

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY (ABSOLUTE / RELATIVE)
NITRIC OXIDE	50.7 PPM	0.4 PPM / 0.8 %
SULFUR DIOXIDE	48.8 PPM	0.6 PPM / 1.2 %
NITROGEN - OXYGEN FREE	BALANCE	
TOTAL OXIDES OF NITROGEN	50.8 PPM	Reference Value Only

TRACEABILITY

REFERENCE STANDARD COMPONENT	CONCENTRATION	UNCERTAINTY	CYLINDER	TYPE/SRM SAMPLE	EXP. DATE
NITRIC OXIDE	49.4600 PPM	0.4000 PPM	KAL003885	NTRM 1683/051711	16Mar2018
SULFUR DIOXIDE	49.6700 PPM	0.5000 PPM	KAL003244	NTRM 1693	20Aug2016

ANALYTICAL METHOD

1st Analysis: 27Jan2014

COMPONENT	INSTRUMENT	ANALYTICAL/PRINCIPLE	CALIBRATED	CONCENTRATION
NITRIC OXIDE	MKS ONLINE/2030/0929062	FTIR	08Jan2014	50.84 PPM
SULFUR DIOXIDE	MKS ONLINE/2030/0929062	FTIR	04Jan2014	48.83 PPM

2nd Analysis: 03Feb2014

COMPONENT	INSTRUMENT	ANALYTICAL/PRINCIPLE	CALIBRATED	CONCENTRATION
NITRIC OXIDE	MKS ONLINE/2030/0929062	FTIR	08Jan2014	50.58 PPM
SULFUR DIOXIDE	MKS ONLINE/2030/0929062	FTIR	04Jan2014	48.71 PPM

Special Notes:

Note on Tags and Certs: ALC Stock Number: SPG- 3MX0020758 Transfer cost approved by Sarah Herbert NOTE: END USER IS REQUESTING THAT THE ORDER COME FROM LONGMONT AS THEY HAVE HAD ISSUES WITH SOME EPAS SHIPPED FROM TROY

QUALITY ASSURANCE

APPROVED BY: JON WITZAK
 (signature on file)



Praxair
 5700 South Alameda Street
 Los Angeles, CA 90058
 Tel: (323) 585-2154 Fax: (714) 542-6689
 PGVPID: F22014

DocNumber: 000068924

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

MAXXAM ANALYTICS INC *NA*
 9372 49TH ST
 EDMONTON AB T6B 2L

Praxair Order Number: 21137117
 Customer P. O. Number: 35-55963
 Customer Reference Number:

Fill Date: 7/1/2014
 Part Number: NI ME600P2E-AQ
 Lot Number: 109418203
 Cylinder Style & Outlet: AQ CGA 350
 Cylinder Pressure & Volume: 2200 psig 78 cu. ft.

Certified Concentration:

Expiration Date:	7/7/2022	NIST Traceable
Cylinder Number:	LL83638	Analytical Uncertainty:
582 ppm	METHANE	± 1.5 %
203 ppm	PROPANE	± 0.9 %
Balance	NITROGEN	

Certification Information: Certification Date: 7/7/2014 Term: 96 Months Expiration Date: 7/7/2022

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component: METHANE

Requested Concentration: 600 ppm
 Certified Concentration: 582 ppm
 Instrument Used: MKS Multigas 2031 FTIR
 Analytical Method: Fourier Transform Infrared
 Last Multipoint Calibration: 6/24/2014

Reference Standard Type: GMIS
 Ref. Std. Cylinder #: CC139480
 Ref. Std. Conc: 246 ppm
 Ref. Std. Traceable to SRM #: 2751
 SRM Sample #: 212-09-AL
 SRM Cylinder #: SX-20000

First Analysis Data:		Date: 7/7/2014	
Z: 0	R: 249.5	C: 589.4	Conc: 581.21
R: 249.5	Z: 0	C: 589	Conc: 580.82
Z: 0	C: 592	R: 249.4	Conc: 583.77
UOM: ppm	Mean Test Assay: 581.93 ppm		

Second Analysis Data:		Date:	
Z: 0	R: 0	C: 0	Conc: 0
R: 0	Z: 0	C: 0	Conc: 0
Z: 0	C: 0	R: 0	Conc: 0
UOM: ppm	Mean Test Assay: 0 ppm		

2. Component: PROPANE

Requested Concentration: 200 ppm
 Certified Concentration: 203 ppm
 Instrument Used: MKS Multigas 2031 FTIR
 Analytical Method: Fourier Transform Infrared
 Last Multipoint Calibration: 6/24/2014

Reference Standard Type: GMIS
 Ref. Std. Cylinder #: CC 163442
 Ref. Std. Conc: 265.8 ppm
 Ref. Std. Traceable to SRM #: vs 2644a
 SRM Sample #: 101-C-45
 SRM Cylinder #: XF003829B

First Analysis Data:		Date: 7/7/2014	
Z: 0	R: 273.6	C: 208.4	Conc: 202.43
R: 273.7	Z: 0	C: 208.6	Conc: 202.63
Z: 0	C: 208.5	R: 273.6	Conc: 202.53
UOM: ppm	Mean Test Assay: 202.53 ppm		

Second Analysis Data:		Date:	
Z: 0	R: 0	C: 0	Conc: 0
R: 0	Z: 0	C: 0	Conc: 0
Z: 0	C: 0	R: 0	Conc: 0
UOM: ppm	Mean Test Assay: 0 ppm		

Analyzed by:

Jack Fu

Certified by:

Ying Yu



maxxam.ca

MAXXAM ANALYTICS

#1 2080 39 Ave. NE, Calgary

AB T2E 6P7

Toll Free 800-386-7247

Fax 403-219-3673

(REVISION)

**AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
ST. LINA SITE**

JOB #:2833-2015-01-31- C

JANUARY 2015

Prepared for:

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

Attention: MIKE BISAGA

DATE: **March 18, 2015**

This report supersedes all previous reports with the same Maxxam project number.

Prepared by:



Wunmi Adekanmbi, M.Sc.

Project Manager Assistant, Source Testing, Maxxam Analytics

Reviewed by:



Lily Lin, B.Sc.

Customer Service Supervisor, Air Services, Maxxam Analytics

SUMMARY

This is a revised version of the AQM January 2015 report for St. Lina site. The revision is based on changes made to the PM2.5 data. This report supersedes all previous reports with the same Maxxam project number.

In JANUARY 2015, the Air Services Group of Maxxam Analytics conducted an ambient air monitoring program on the St. Lina 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 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.

The summary of results is presented on the following pages.

The PM2.5 did not meet the 90% operational time requirement due to instrument failure. AENV Reference Number: 296041.

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, St. Lina 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 St. Lina 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	4	13, 23	20, 22	15 9.5	SW SW	1.2	18	97.3
H2S (PPB)	10	3	0	0	0	1	VAR	VAR	VAR	VAR	0.5	12	100.0
THC (PPM)	-	-	-	-	2.2	3.6	18	19	7.1	SSE	2.6	12	99.7
NO2 (PPB)	159	-	0	-	3.7	31.4	13	0	10.9	SSW	16.0	12	99.7
NO (PPB)	-	-	-	-	0.5	10.1	12	15	9.2	SSW	2.7	12	99.7
NOX (PPB)	-	-	-	-	4.2	37.2	13	0	10.9	SSW	18.7	12	99.7
O3 (PPB)	82	-	0	-	31	46	25	16	18	W	39.7	26	100.0
PM2.5 (UG/M3)	-	30	-	0	9.3	39.0	12	18	13	SW	26.6	12	78.6
RELATIVE HUMIDITY (%)	-	-	-	-	71.0	89	VAR	VAR	VAR	VAR	85.9	27	100.0
BAROMETRIC PRESSURE (MILIBAR)	-	-	-	-	929	954	6	VAR	VAR	VAR	949	6	100.0
AMBIENT TEMPERATURE (DEG C)	-	-	-	-	-9.9	10.4	22, 25	13, 13	20.1 20.5	W W	5.1	22	100.0
PRECIPITATION (MM)	-	-	-	-	0.0	2.1	24	1	12.7	SW	0.1	VAR	100.0
VECTOR WS (KPH)	-	-	-	-	11.6	28.8	22	8	-	WSW	17.4	8	100.0
VECTOR WD (DEG)	-	-	-	-	WSW	-	-	-	-	-	-	-	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

PM_{2.5} 24- Hour Exceedences

No Exceedences Recorded During the Month

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1.0 Discussion

This monthly report consists data for parameters of SO₂, H₂S, THC, NO_x, NO, NO₂, PM_{2.5}, WS, WD, RH, BP, Precipitation, Temperature and O₃.

Sample filters for all continuous air monitors were changed before the calibration was started. The sample manifold was 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 is to be operational 90% of the time (minimum), on a monthly basis.

All data was within Provincial objectives for the month.

SULPHUR DIOXIDE (SO₂)

The analyzer spanned high on January 14 due to UV filter failure. On January 14 the UV filter was changed, the sample filter was replaced, an analog output calibration was performed, and the pump was rebuilt. A post-repair calibration was performed after the maintenance. 20 hours of data were invalidated due to this event.

HYDROGEN SULPHIDE (H₂S)

The analyzer was working well throughout the month. A removal calibration was performed before a major maintenance was performed on January 14. The inlet filter was changed before the calibration was started. The UV lamp and the HVPS were adjusted after the calibration, and an analog output calibration was completed on the same day. A post-repair calibration was performed after the maintenance. Some daily span results went below -10% of the acceptance range because the expected span value was set too low after the monthly calibration in December 2014. This issue did not affect data quality.

TOTAL HYDROCARBONS (THC)

The analyzer was working well throughout the month. The routine monthly calibration was performed on January 15. On January 16, the channel was put into maintenance mode for the hydrogen cylinder change out.

NITROGEN DIOXIDE (NO₂)

The analyzer was working well throughout the month. A removal calibration was performed on the analyzer API 200E S/N 592 on January 14. The analyzer API 200E S/N 594 was allowed to stabilize over some hours. The 3-point calibration was subsequently performed. The GPT calibration was completed on January 15. Two hours of data were invalidated due to this event. The analyzer API 200E S/N 592 was brought to Maxxam Calgary shop for routine annual maintenance.

OZONE (O₃)

The analyzer was working well throughout the month. The routine monthly calibration was performed on January 14. The inlet filter was changed before the calibration was started.

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

Two routine TEOM audits were performed this month. One was performed on January 15 and the other was completed on January 25. The sample filters were replaced on January 25. The Teom unit failed a leak check on February 5. As we could not determine when the issue that caused the leak check failure started, data was invalidated back to the January 25 audit. 154 hours of data were discarded in January due to this event. Data was corrected using Alberta air quality guideline. If the data was between 0 and -3 ug/m³, the data was corrected to 0 ug/m³. If the data was below -3ug/m³, the data was invalidated. 5 hours of data were invalidated as the data were below -3 ug/m³ this month. One hour of data on January 26 at hour 14 was invalidated due to a spike: Reason unknown. Operational uptime for the month was 78.6%. AENV Reference Number: 296041.

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

The wind system was working well throughout the month. 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. Two hourly maximum data collected on January 28 hour 21 and January 31 hour 9 were invalidated due to spikes.

RELATIVE HUMIDITY (RH)

The humidity sensor was working well throughout the month.

BAROMETRIC PRESSURE (BP)

The pressure sensor was working well throughout the month.

PRECIPITATION

Both the rain gauge system and heating system were working well throughout the month.

AMBIENT TEMPERATURE (TPX)

The temperature sensor was working well throughout the month.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association, and the Maxxam field sampling team consisted of 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 90% requirement, except PM2.5 which was 78.6%. AENV Reference Number: 296041.

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-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/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00215: Teom Operation
- 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 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Oxides of Nitrogen - API 200E 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
- 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

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.	RDGS.	
DAY																												
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
2	1	1	0	0	1	1	1	0	1	1	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.5	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	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	0.2	24
5	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	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	24
7	0	0	0	0	0	0	0	2	2	1	1	2	2	2	2	3	5	0	0	0	0	0	0	0	0	0	0.7	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	24
9	0	0	0	0	0	0	0	0	0	1	1	2	2	2	2	5	0	0	0	0	0	0	0	0	0	0	0.5	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	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	0.1	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	0.6	24
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	3	4	X	X	X	X	0.7	21
14	X	X	X	X	X	X	X	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	C	0.0	7	
15	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	24
16	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0.4	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	0.3	24
18	3	3	3	3	2	5	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	3	1.2	24
19	0	0	1	1	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	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	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	24
22	1	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	24
23	5	0	0	0	0	0	1	1	2	2	2	1	1	0	0	0	0	0	1	1	1	1	3	4	5	4	1.0	24
24	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	24
25	0	0	0	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	24
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	1	0	1	0.1	24
27	1	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	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	5	1	1	1	1	1	1	1	0.4	24
30	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	5	0	0	0	0	0	0	0	0	0	0.3	24
31	0	0	0	0	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	3	3	3	3	2	1	1	2	2	2	2	2	2	2	2	3	2	2	2	2	3	4	3	4	2			
HOURLY AVG	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.3				

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

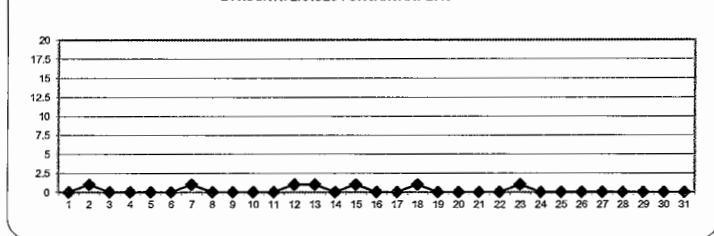
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1 HR	1.72	PPB	24 HR	43	PPB
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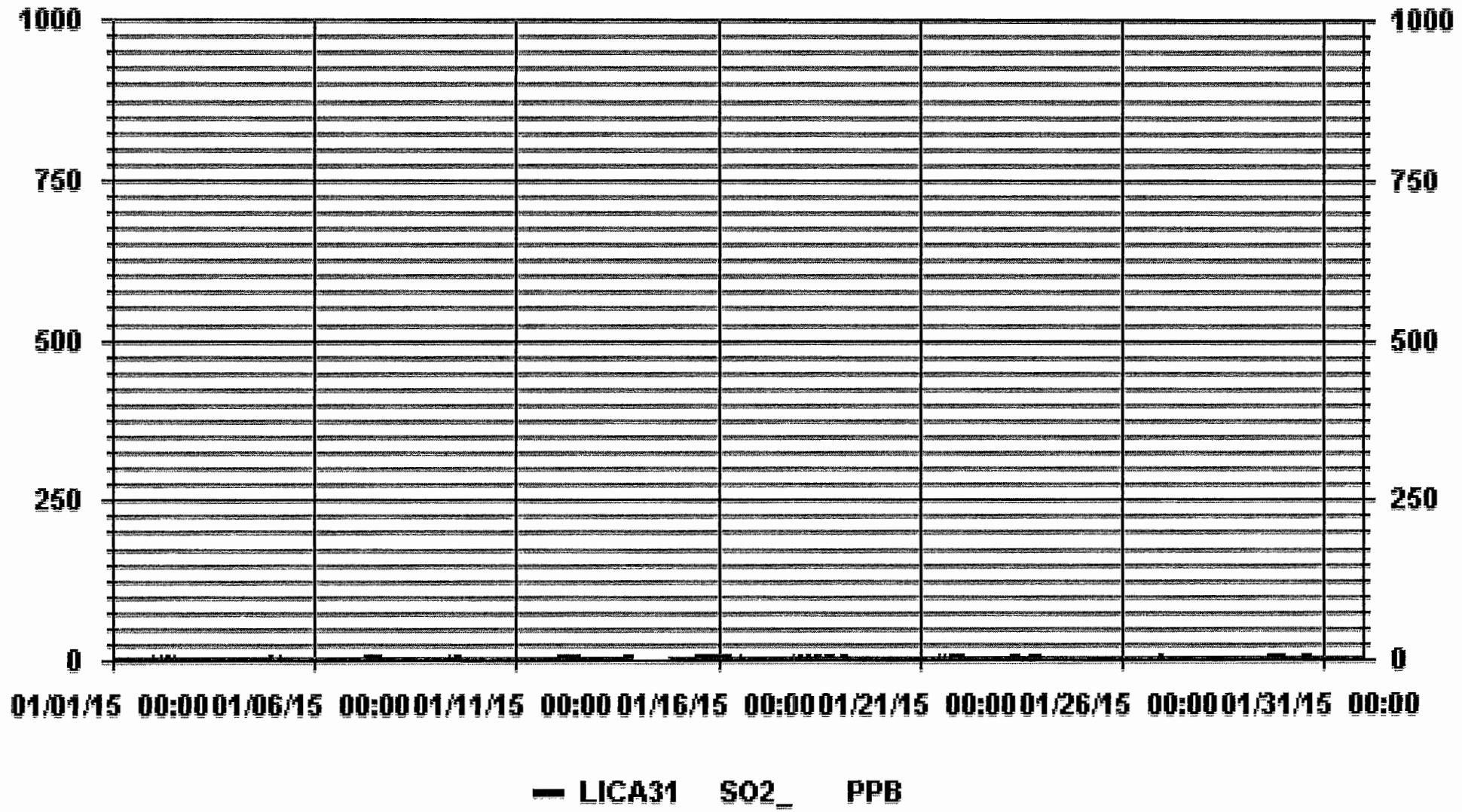
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0		
NUMBER OF 24-HR EXCEEDENCES:	0		
NUMBER OF NON-ZERO READINGS:	153		
MAXIMUM 1-HR AVERAGE:	4 PPB @ HOUR(S) 20, 22 ON DAY(S) 13, 23		
MAXIMUM 24-HR AVERAGE:	1.2 PPB ON DAY(S) 18 VAR-VARIOUS		
IZS CALIBRATION TIME:	33 HRS	OPERATIONAL TIME:	724 HRS
MONTHLY CALIBRATION TIME:	4 HRS	AMD OPERATION UPTIME:	97.3 %
STANDARD DEVIATION:	0.60	MONTHLY AVERAGE:	0 PPB

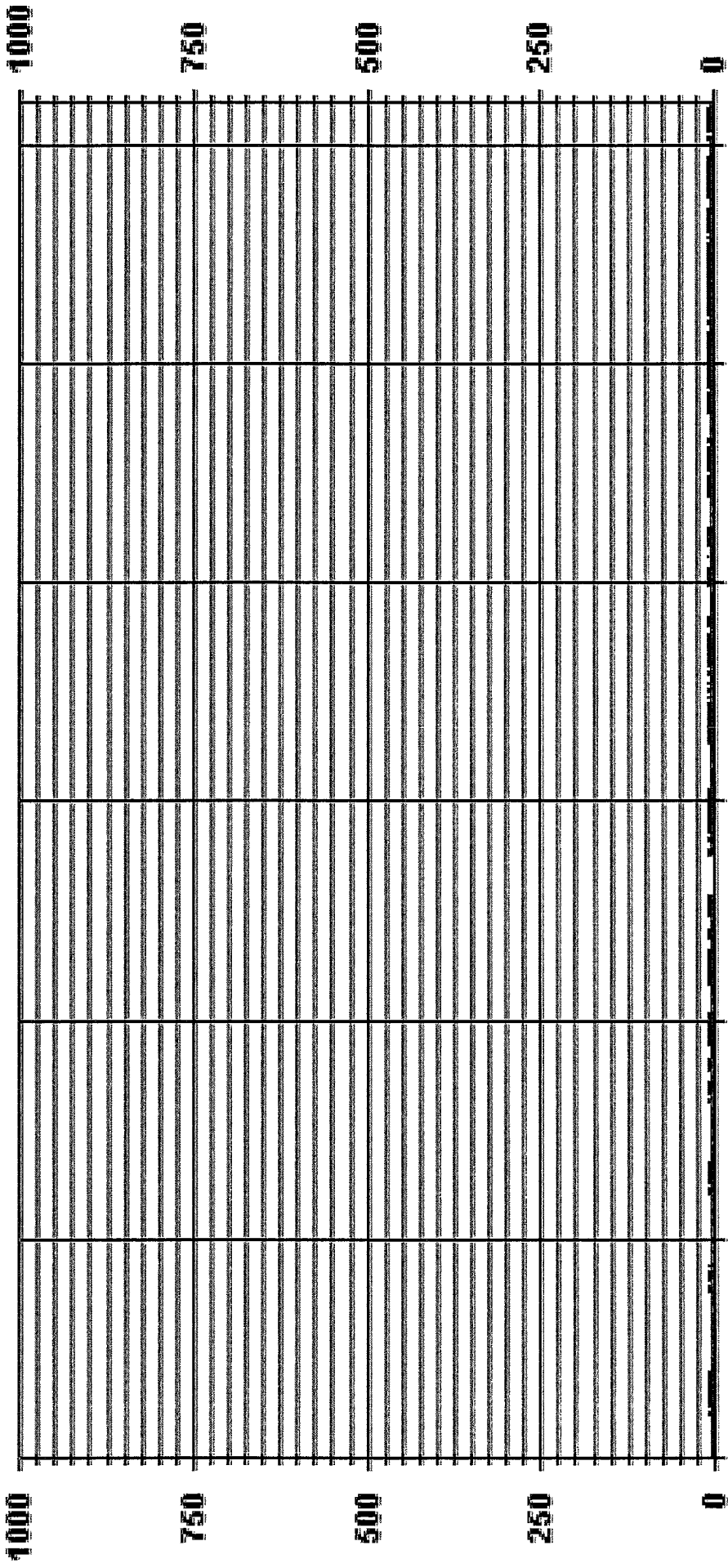
24 HOUR AVERAGES FOR JANUARY 2015



01 Hour Averages



01 Hour Averages



01/01/15 00:00 01/06/15 00:00 01/11/15 00:00 01/16/15 00:00 01/21/15 00:00 01/26/15 00:00 01/31/15 00:00

— LICA31 SO2MAX PPB

LICA31
 SO2_ / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 31
 Site Name : LICA31
 Parameter : SO2_
 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	
< 20	2.47	3.63	4.65	3.49	1.31	.58	1.31	3.63	9.60	11.79	11.79	15.42	8.87	9.46	8.87	3.05	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	2.47	3.63	4.65	3.49	1.31	.58	1.31	3.63	9.60	11.79	11.79	15.42	8.87	9.46	8.87	3.05	

Calm : .00 %

Total # Operational Hours : 687

Distribution By Samples

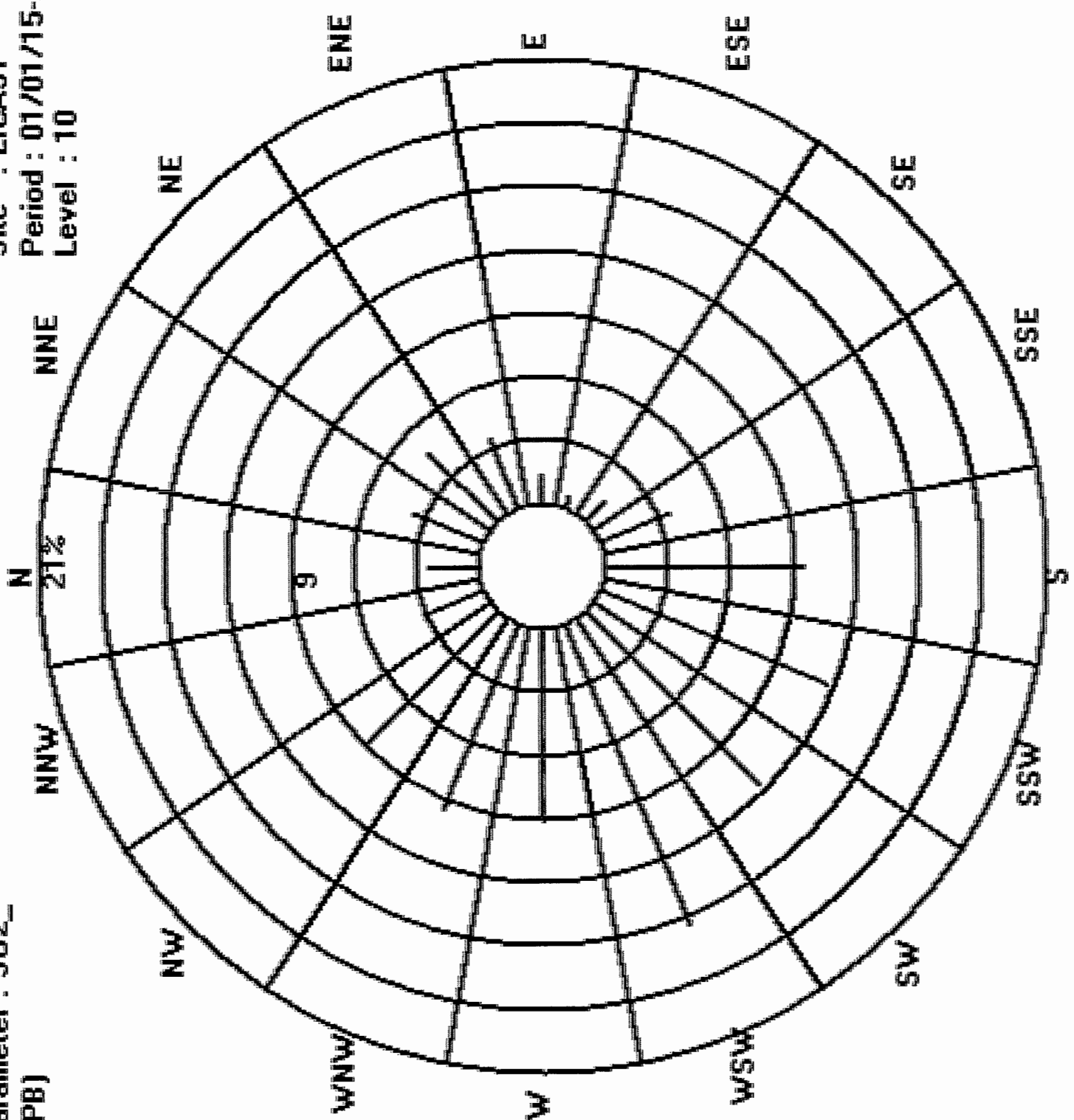
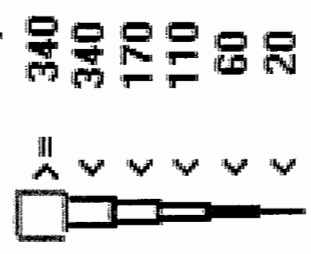
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 20	17	25	32	24	9	4	9	25	66	81	81	106	61	65	61	21	687
< 60																	
< 110																	
< 170																	
< 340																	
>= 340																	
Totals	17	25	32	24	9	4	9	25	66	81	81	106	61	65	61	21	

Calm : .00 %

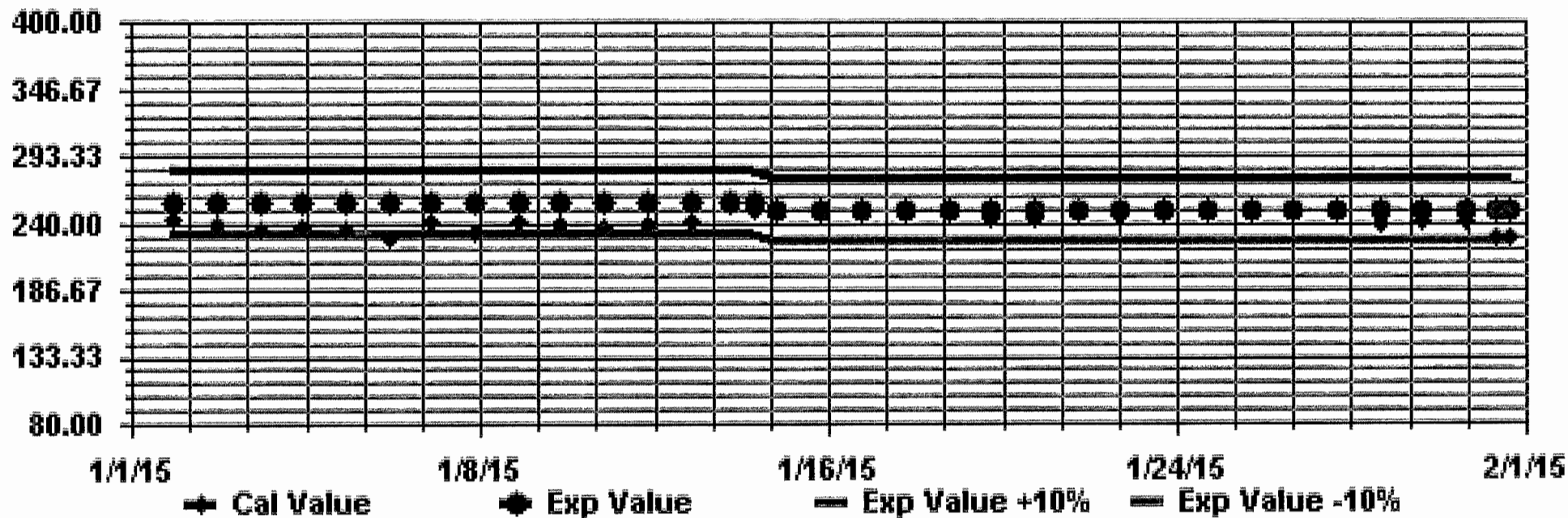
Total # Operational Hours : 687

Site : LICA31
 Period : 01/01/15-01/31/15
 Level : 10

Logger : 31 Parameter : SO2_
 Class Limits (PPB)



Calibration Graph for Site: LICA31 Parameter: SO2_ Sequence: SO2 Phase: SPAN



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	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	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	24
3	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	S	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	S	0	0	0	0	0.0	24
5	0	0	0	0	0	0	0	S	S	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0.0	24
6	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	S	0	0	0	0	0	0	0	0.0	24
7	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	0.5	24
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	1	1	1	1	1	0.3	24
9	1	1	1	1	1	1	1	S	S	0	0	0	0	0	S	0	0	0	0	0	0	0	0	1	0	0.4	24
10	0	0	0	0	0	0	0	0	0	0	0	0	0	S	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	S	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
12	0	0	0	0	0	0	0	S	0	0	0	S	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5	24
13	1	1	1	1	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	24
14	0	0	0	0	0	0	0	C	C	C	C	C	C	C	C	C	C	1	0	0	0	S	0	0	0	0.1	24
15	0	0	0	0	0	0	0	0	S	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	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	24
17	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0	24
18	1	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	24
19	0	0	0	0	S	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	S	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	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0.1	24
22	1	S	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
23	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	S	0.1	24
24	1	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0.3	24
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	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	S	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	S	0	0	0	0	0.0	24
28	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	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	S	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	S	0	0	0	0	0	0	0	0	0.0	24
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0.0	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	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	

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

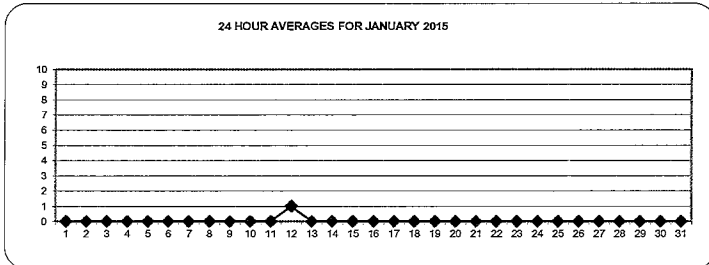
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR: 10 PPB 24-HR: 3 PPB

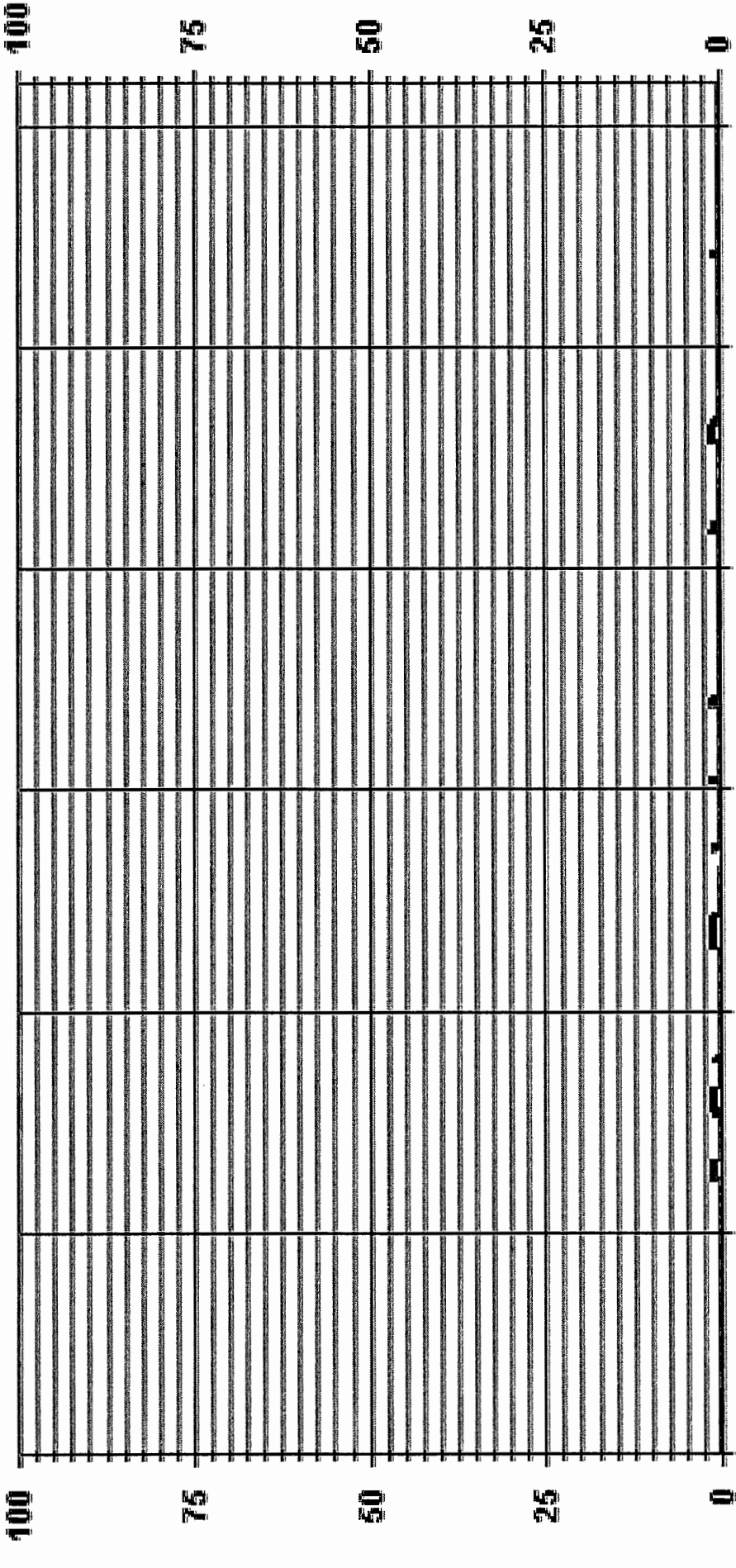
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0
NUMBER OF 24-HR EXCEEDENCES:	0
NUMBER OF NON-ZERO READINGS:	62
MAXIMUM 1-HR AVERAGE:	1 PPB @ HOUR(S) VAR
MAXIMUM 24-HR AVERAGE:	0.5 PPB ON DAY(S) VAR-12, 7
IZS CALIBRATION TIME:	39 HRS
MONTHLY CALIBRATION TIME:	10 HRS
OPERATIONAL TIME:	744 HRS
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0.29
MONTHLY AVERAGE:	0 PPB

24 HOUR AVERAGES FOR JANUARY 2015

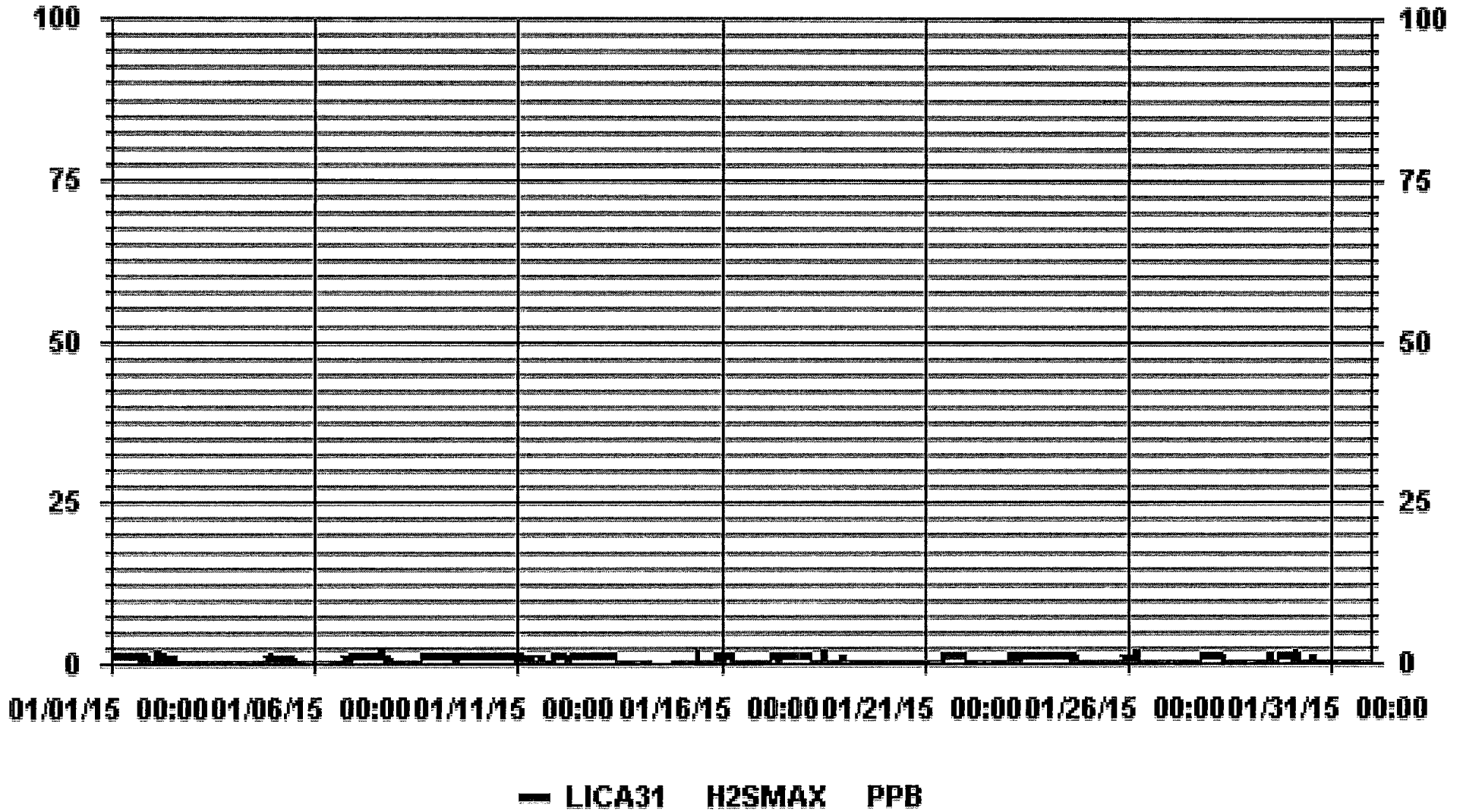


01 Hour Averages



— LICA31 H2S_ PPB

01 Hour Averages



LICA31
H2S_ / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 31
Site Name : LICA31
Parameter : H2S_
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	
< 3	2.44	3.59	4.60	3.59	1.43	.57	1.29	3.59	9.35	11.36	11.65	16.69	8.77	9.20	8.77	3.02	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	2.44	3.59	4.60	3.59	1.43	.57	1.29	3.59	9.35	11.36	11.65	16.69	8.77	9.20	8.77	3.02	

Calm : .00 %

Total # Operational Hours : 695

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 3	17	25	32	25	10	4	9	25	65	79	81	116	61	64	61	21	695
< 10																	
< 50																	
>= 50																	
Totals	17	25	32	25	10	4	9	25	65	79	81	116	61	64	61	21	

Calm : .00 %

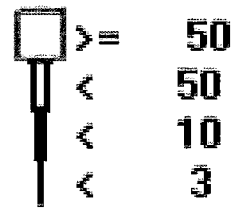
Total # Operational Hours : 695

Logger : 31 Parameter : H2S_

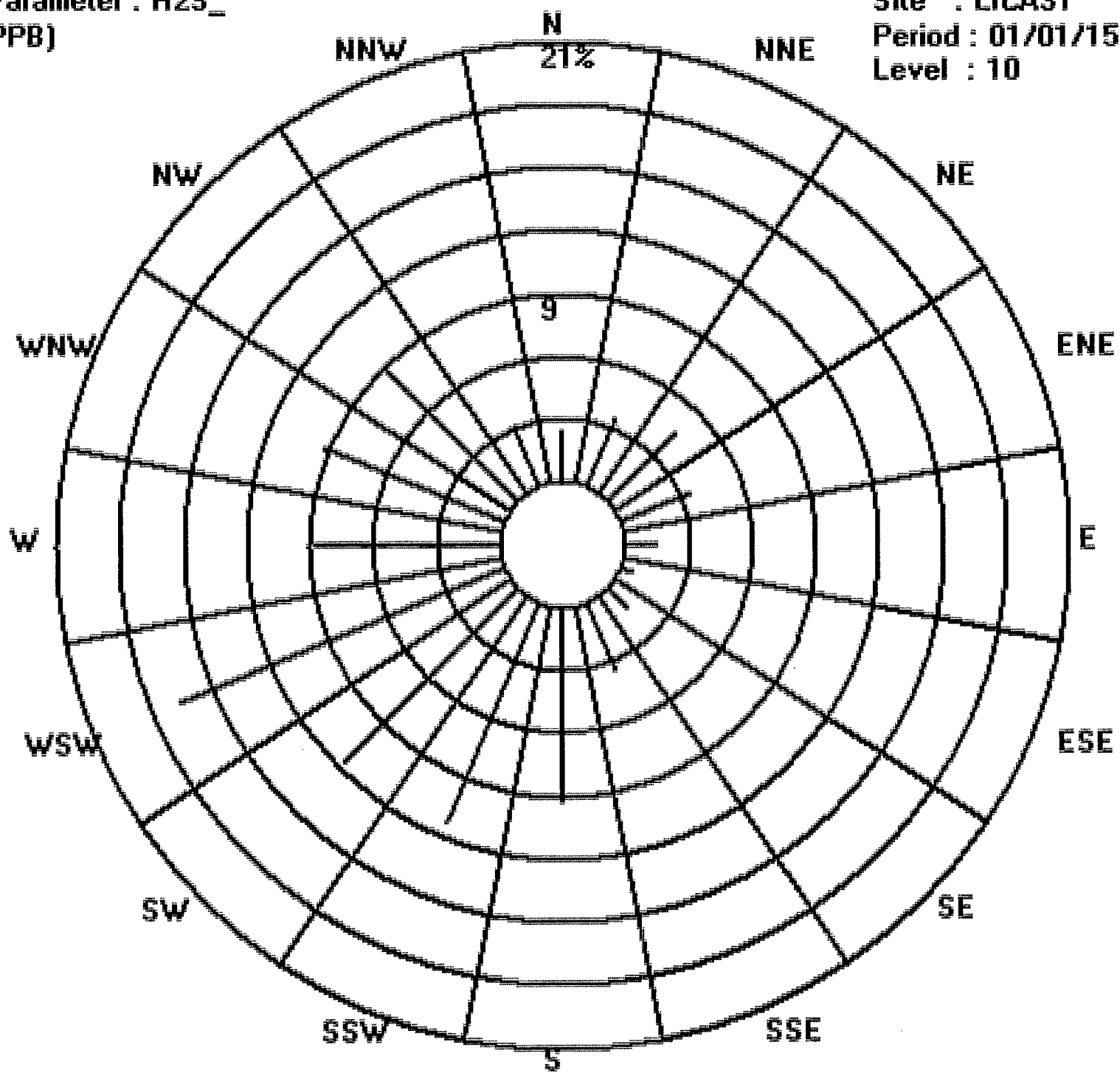
Site : LICA31

Class Limits (PPB)

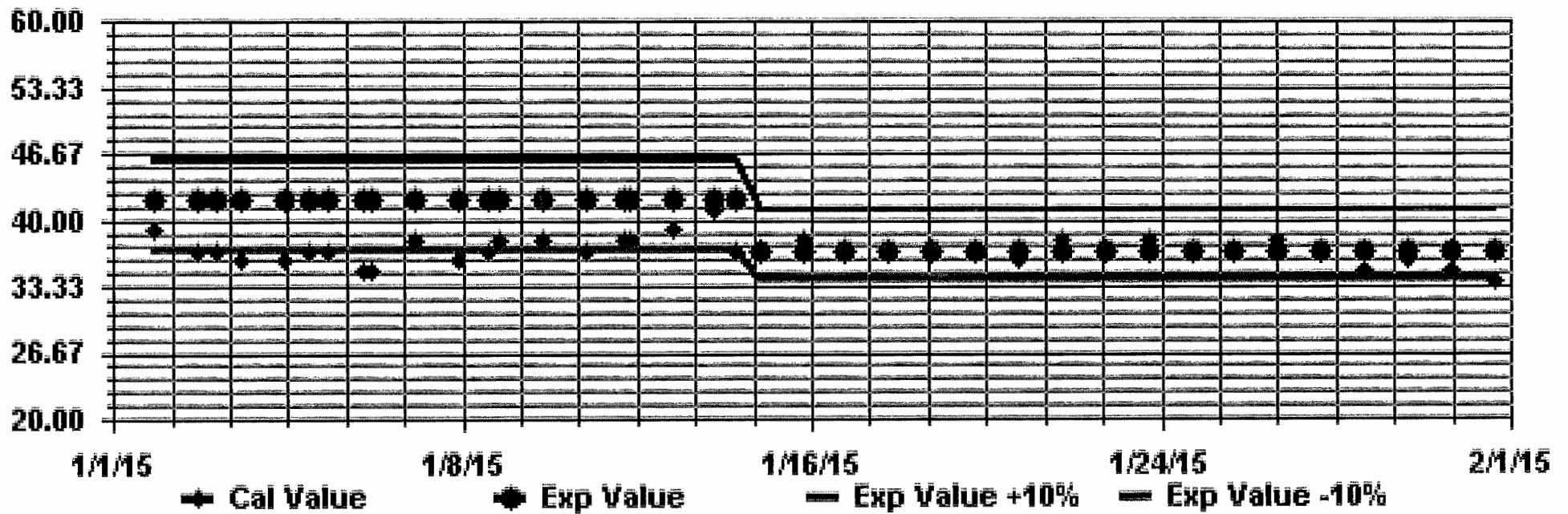
Period : 01/01/15-01/31/15



Level : 10



Calibration Graph for Site: LICA31 Parameter: H2S_ Sequence: H2S Phase: SPAN



TOTAL HYDROCARBON



TOTAL HYDROCARBONS (THC) hourly averages in ppm

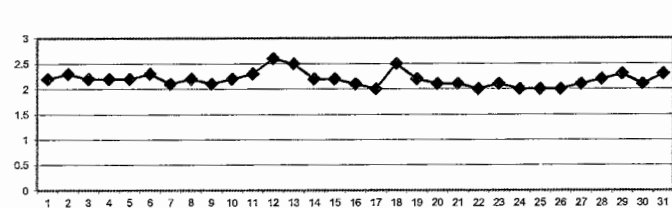
MST

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	24-HOUR	RDGS.		
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	0:00	MAX.	AVG.			
DAY																													
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	2.3	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.3	2.3	5	2.1	2.3	2.2	24		
2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	5	2.0	2.1	2.4	2.3	24		
3	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	5	2.1	2.1	2.1	2.2	2.2	24		
4	2.1	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	5	2.3	2.3	2.3	2.3	2.3	2.2	24		
5	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	5	2.1	2.2	2.2	2.2	2.2	2.3	2.2	24		
6	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	5	2.1	2.1	2.2	2.2	2.3	2.2	2.4	2.3	24		
7	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	1.9	1.8	1.8	1.8	1.8	5	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	24		
8	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	5	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	2.2	24	
9	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	5	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.1	24	
10	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	5	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.2	24	
11	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.4	2.3	5	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.4	2.4	2.5	2.5	2.5	2.3	2.4	24	
12	2.5	2.5	2.6	2.6	2.6	2.6	2.5	2.5	2.4	2.5	2.5	5	2.5	2.6	2.7	2.7	2.7	2.8	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.8	2.6	24	
13	2.7	2.7	2.5	2.4	2.3	2.1	2.2	2.2	2.2	2.2	5	2.9	2.8	2.7	2.7	2.7	2.7	2.6	2.6	2.4	2.4	2.4	2.4	2.4	2.4	2.9	2.5	24	
14	2.3	2.3	2.2	2.2	2.2	2.2	2.2	5	2.2	2.2	2.2	2.1	2.0	2.3	2.3	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	24	
15	2.2	2.2	2.2	2.4	2.2	2.2	2.2	2.2	C	C	C	C	C	C	C	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.4	2.2	24	
16	2.1	2.1	2.1	2.0	2.0	2.0	2.0	5	2.1	2.1	2.1	2.1	Y	Y	2.3	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.1	22	
17	2.0	2.0	2.0	2.1	2.1	2.1	5	1.9	1.9	2.0	2.0	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	2.0	24	
18	2.2	2.2	2.2	2.1	2.1	5	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.4	3.0	3.3	3.6	3.4	3.0	2.8	2.4	3.6	2.5	24		
19	2.5	2.5	2.3	2.5	5	2.6	2.4	2.3	2.3	2.4	2.3	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.6	2.2	24	
20	2.1	2.1	2.1	5	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	24	
21	2.1	2.1	5	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	1.9	2.2	2.1	2.4	24	
22	2.0	5	2.0	2.1	2.0	2.0	2.0	2.0	2.0	1.9	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	2.1	2.1	2.0	24	
23	5	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	5	2.3	2.1	24	
24	2.1	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.1	2.1	5	2.1	2.2	2.0	24	
25	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	5	2.0	2.0	2.1	2.0	24		
26	2.0	2.0	2.0	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	2.1	2.1	2.1	2.1	2.1	5	2.1	2.0	2.0	2.1	2.0	24	
27	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	5	2.1	2.2	2.2	2.2	2.3	2.1	2.4	24	
28	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.4	5	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.2	24	
29	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.5	2.6	2.6	2.7	2.6	2.6	2.5	2.4	2.3	2.3	5	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.7	2.3	24	
30	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.2	5	2.2	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.4	2.1	24	
31	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	5	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	24	
HOURLY MAX	2.7	2.7	2.6	2.6	2.6	2.6	2.5	2.5	2.6	2.6	2.6	2.7	2.9	2.8	2.7	2.7	2.7	3.0	3.3	3.6	3.4	3.0	2.8	2.7					
HOURLY AVG	2.2	2.2	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	

STATUS FLAG CODES

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

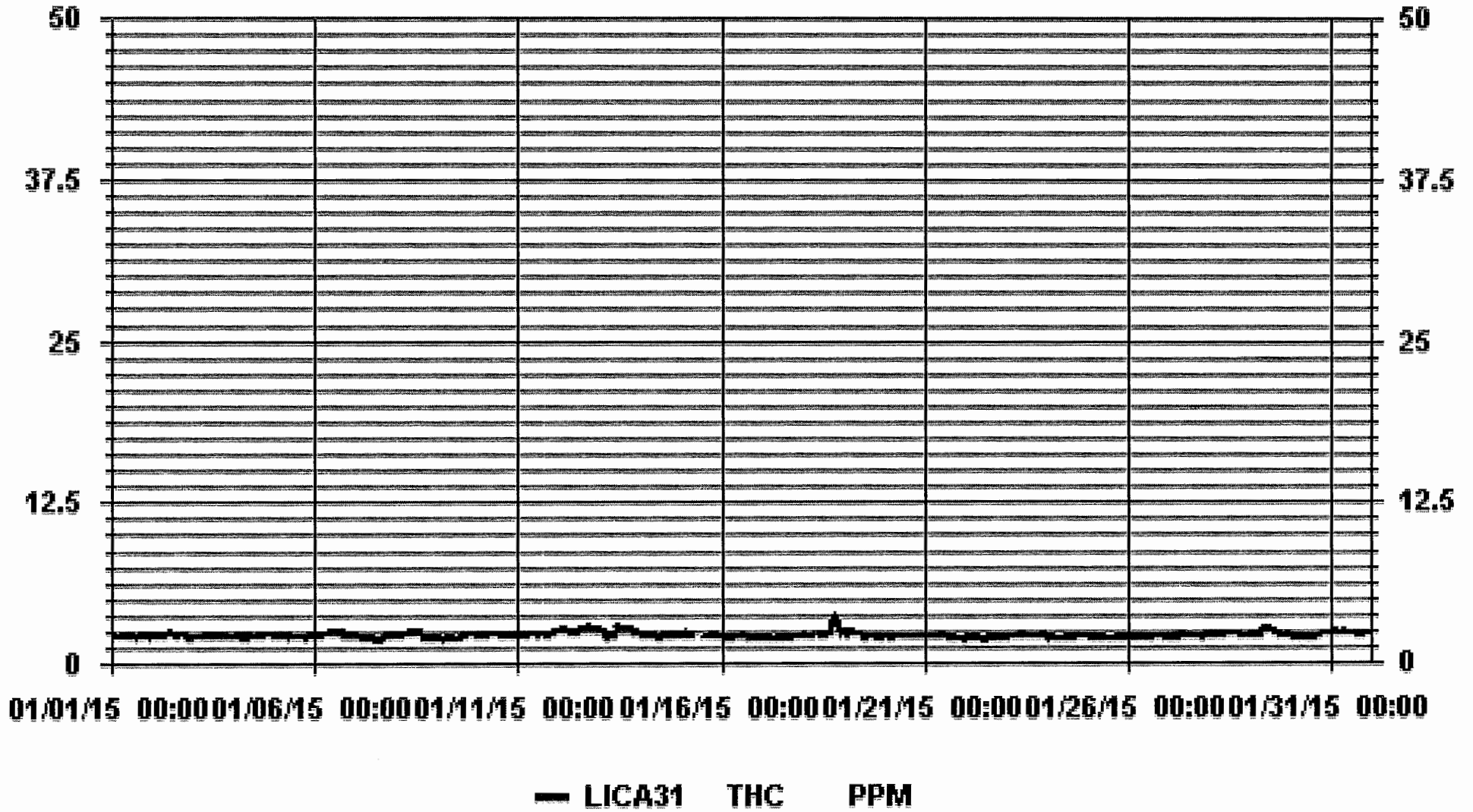
24 HOUR AVERAGES FOR JANUARY 2015



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	704		
MAXIMUM 1-HR AVERAGE:	3.6 PPM	@ HOUR(S)	19
MAXIMUM 24-HR AVERAGE:	2.6 PPM	ON DAY(S)	18
		ON DAY(S)	12
		VAR-VARIOUS	
IZS CALIBRATION TIME:	31 HRS	OPERATIONAL TIME:	742 HRS
MONTHLY CALIBRATION TIME:	7 HRS	AMD OPERATION UPTIME:	99.7 %
STANDARD DEVIATION:	0.20	MONTHLY AVERAGE:	2.2 PPM

01 Hour Averages





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - JANUARY 2015

JOB # 2833-2015-01-31- C

TOTAL HYDROCARBONS MAX instantaneous maximum in ppm

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	DAILY	24-HOUR	
		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	MAX.	AVG.	RDGS.
DAY	1	2.1	2.1	2.3	2.2	2.3	2.4	2.3	2.3	2.3	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.6	2.3	2.3	2.6	S	2.2	2.6	2.3	24	
2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.4	2.4	2.5	2.4	2.4	2.9	2.3	2.3	2.3	2.3	2.3	2.4	2.4	S	2.1	2.1	2.9	2.3	24	
3	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	S	S	2.2	2.2	2.2	2.3	2.2	24	
4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	S	2.4	2.3	2.3	2.4	2.2	24	
5	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.3	2.2	S	2.2	2.2	2.2	2.2	2.2	2.3	2.2	24	
6	2.2	2.2	2.3	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	2.5	S	S	2.1	2.2	2.2	2.3	2.3	2.5	2.3	24	
7	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.0	1.9	1.9	1.8	1.8	S	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	24	
8	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	S	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.4	24	
9	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	1.9	S	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.4	2.1	24	
10	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.6	2.8	2.4	2.3	2.3	S	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.2	2.3	2.3	2.8	2.3	24	
11	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.5	2.4	S	2.3	2.3	2.4	2.3	2.3	2.3	2.4	2.4	2.5	2.5	2.5	2.5	2.4	24	
12	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.6	2.5	2.5	2.5	S	2.6	2.6	2.8	2.8	2.8	2.8	2.9	2.8	2.8	2.8	2.8	2.7	2.8	2.9	24	
13	2.7	2.7	2.6	2.5	2.3	2.2	2.2	2.2	2.3	2.3	S	2.9	2.8	2.8	2.8	2.8	2.7	2.7	2.6	2.6	2.5	2.5	2.4	2.4	2.9	2.5	24	
14	2.3	2.3	2.3	2.3	2.2	2.2	S	S	2.3	2.2	2.2	2.1	2.5	2.5	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.5	2.3	24	
15	2.3	2.8	2.4	2.5	2.3	2.3	2.3	C	C	C	C	C	C	C	C	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.8	2.3	24	
16	2.2	2.1	2.1	2.1	2.1	2.1	2.1	S	2.1	2.1	2.1	2.1	Y	Y	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.3	2.1	22	
17	2.0	2.1	2.1	2.1	2.1	2.1	S	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	24	
18	2.3	2.3	2.2	2.2	2.2	S	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.5	2.5	2.8	3.1	3.4	3.7	3.5	3.3	3.0	2.7	3.7	2.6	24	
19	2.8	2.8	2.6	2.7	S	2.7	2.6	2.3	2.3	2.5	2.5	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	2.8	24	
20	2.1	2.1	2.2	S	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.2	2.1	2.2	2.1	24	
21	2.2	2.2	S	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	1.9	2.0	2.0	2.3	2.1	24	
22	2.0	S	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	24	
23	S	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.2	S	2.3	24	
24	2.1	2.0	2.1	2.1	2.0	2.0	1.9	1.9	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	2.3	2.1	2.1	S	2.1	24	
25	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	2.0	2.0	2.0	S	2.0	2.0	2.1	24	
26	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.0	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	S	2.1	2.1	2.1	2.2	24	
27	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.4	2.4	2.3	2.3	2.5	2.2	2.2	2.3	2.3	2.2	2.1	2.2	S	2.2	2.2	2.4	2.5	2.5	2.2	24	
28	2.5	2.4	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4	S	2.2	2.2	2.2	2.2	2.2	2.5	2.3	24	
29	2.3	2.4	2.7	2.3	2.3	2.2	2.5	2.6	2.6	2.7	2.8	2.7	2.6	2.6	2.4	2.4	2.4	S	2.3	2.2	2.2	2.2	2.2	2.2	2.8	2.4	24	
30	2.2	2.1	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	2.2	S	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.2	24	
31	2.4	2.4	2.4	2.5	2.5	2.4	2.7	2.8	3.0	2.5	2.5	2.4	2.3	2.3	2.3	S	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	3.0	24	
HOURLY MAX	2.8	2.8	2.7	2.7	2.6	2.7	2.7	2.8	3.0	2.8	2.8	2.9	2.8	2.9	2.8	2.8	2.8	2.8	3.1	3.4	3.7	3.5	3.3	3.0	2.8			
HOURLY AVG	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.3	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	2.2			

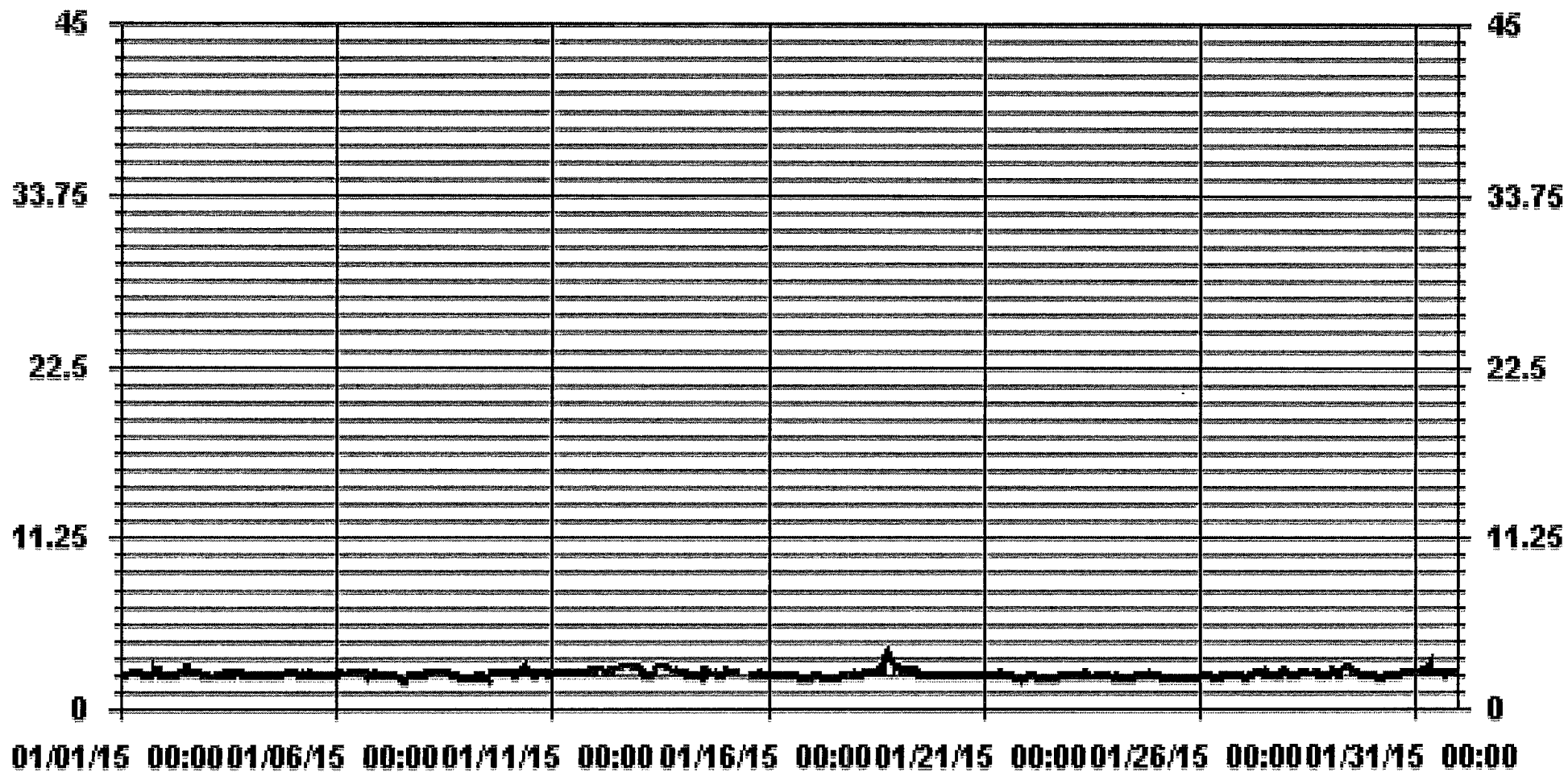
STATUS FLAG CODES

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:	703
MAXIMUM INSTANTANEOUS VALUE:	3.7 PPM @ HOUR(S) 19 ON DAY(S) 18
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	7 HRS
OPERATIONAL TIME:	742 HRS
STANDARD DEVIATION:	0.22

01 Hour Averages



— LICA31 THC MAX PPM

LICA31
 THC / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 31
 Site Name : LICA31
 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	2.40	3.54	4.53	2.69	1.41	.56	1.13	3.39	9.20	11.18	11.61	17.70	9.06	9.20	8.64	2.97	99.29
< 10.0	.00	.00	.00	.00	.00	.00	.14	.14	.14	.28	.00	.00	.00	.00	.00	.00	.70
< 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	2.40	3.54	4.53	2.69	1.41	.56	1.27	3.54	9.34	11.47	11.61	17.70	9.06	9.20	8.64	2.97	

Calm : .00 %

Total # Operational Hours : 706

Distribution By Samples





Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 3.0	17	25	32	19	10	4	8	24	65	79	82	125	64	65	61	21	701
< 10.0							1	1	1	2							5
< 50.0																	
>= 50.0																	
Totals	17	25	32	19	10	4	9	25	66	81	82	125	64	65	61	21	

Calm : .00 %

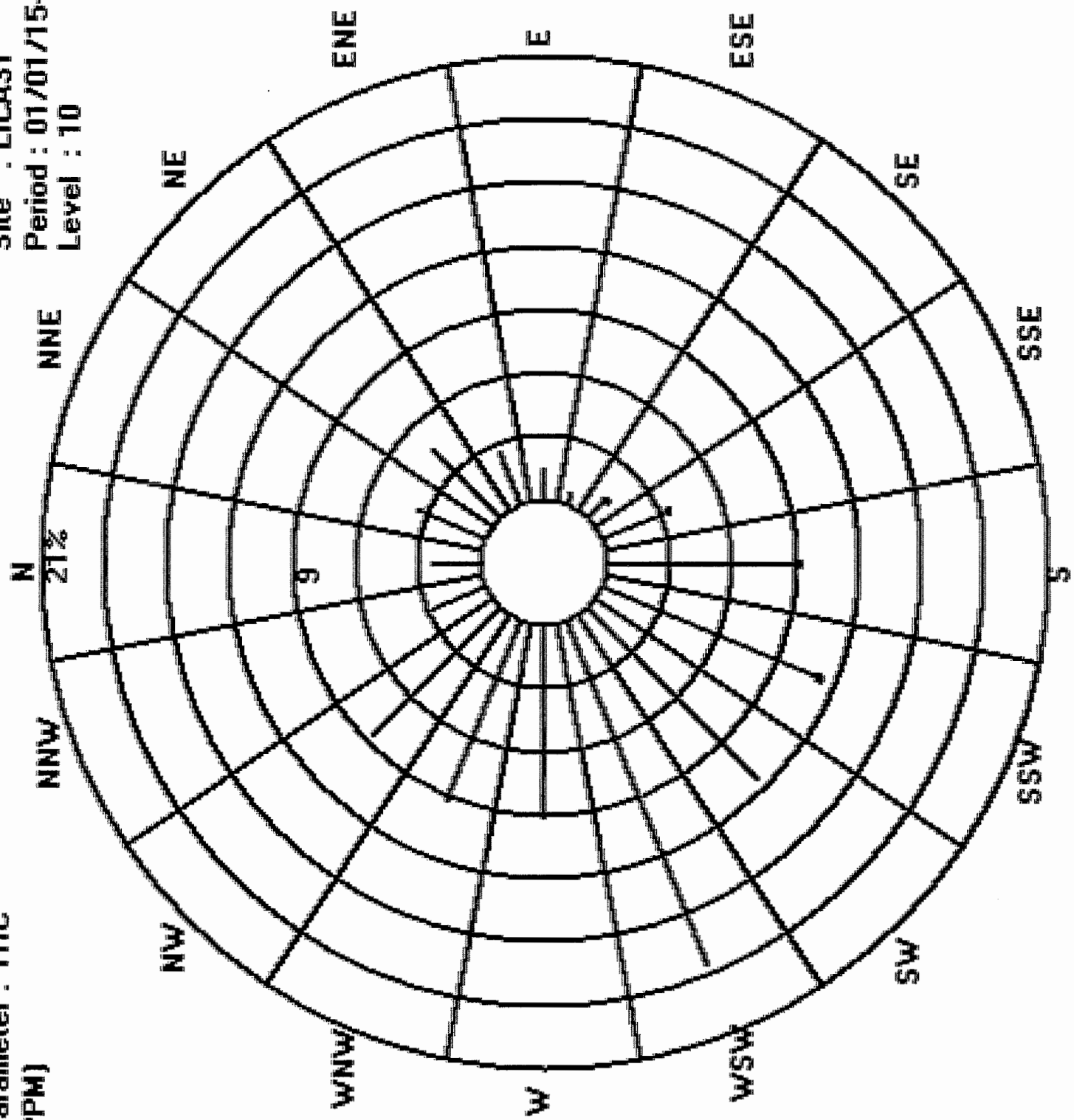
Total # Operational Hours : 706

Logger : 31 Parameter : THC

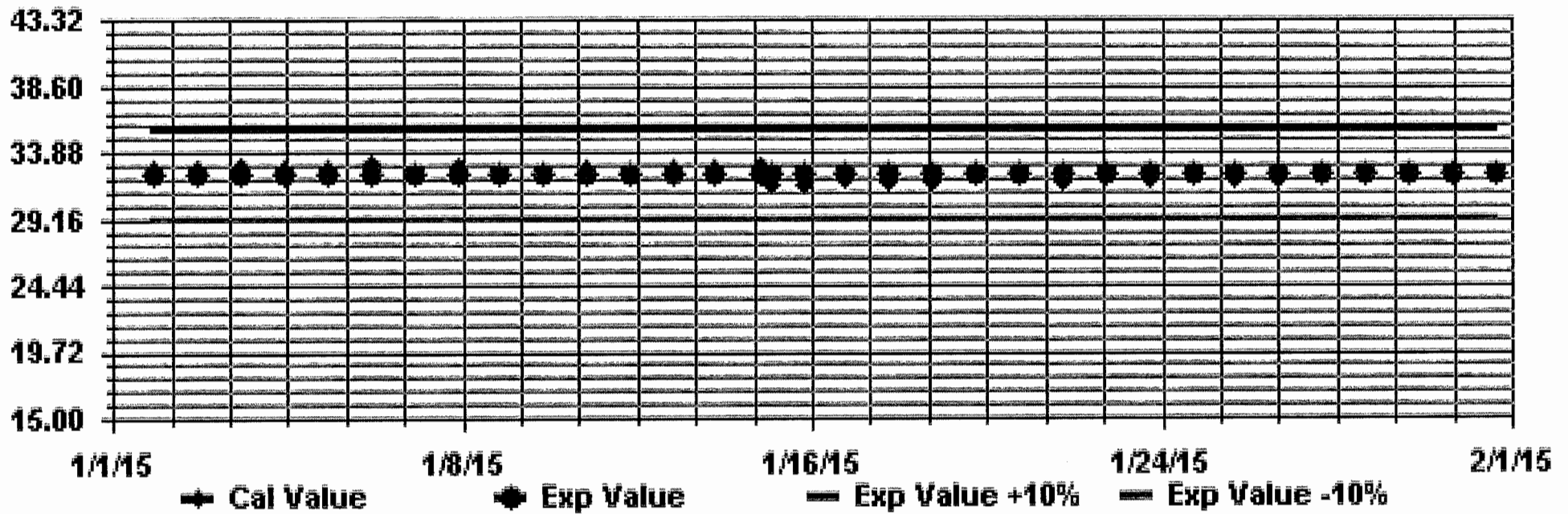
Class Limits (PPM)

-  >= 50.0
-  < 50.0
-  < 10.0
-  < 3.0

Site : LICA31
Period : 01/01/15-01/31/15
Level : 10



Calibration Graph for Site: LICA31 Parameter: THC Sequence: THC Phase: SPAN



OXIDES OF NITROGEN



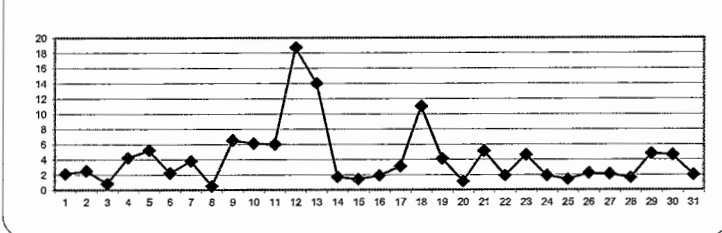
OXIDES OF NITROGEN (NOx) hourly averages in ppb

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	DAILY	24-HOUR	
HOURLY START	HOURLY 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	MAX.	AVG.	RDGS.	
DAY																												
1		1.8	2.0	2.4	1.3	1.5	3.1	2.1	2.0	1.9	2.1	2.4	2.9	3.8	2.6	2.5	2.1	1.9	2.0	1.5	1.5	1.7	2.1	S	2.0	3.8	2.1	24
2		4.3	4.1	1.7	2.8	3.0	2.3	1.5	2.6	2.9	3.2	3.6	3.6	3.5	4.2	2.5	1.8	1.0	2.2	2.4	1.3	1.5	S	1.3	1.2	4.3	2.5	24
3		1.3	1.8	2.2	1.0	0.1	0.1	0.1	0.2	0.2	0.5	0.6	0.5	0.5	0.4	0.3	0.6	1.0	0.9	0.9	1.5	S	0.8	0.8	1.2	2.2	0.8	24
4		0.8	0.7	0.8	0.9	0.9	0.8	0.9	1.0	0.7	0.6	1.1	2.6	2.0	2.7	4.0	3.9	4.3	5.2	10.1	S	21.6	12.1	10.2	9.4	21.6	4.2	24
5		9.0	8.6	8.1	8.6	8.6	8.0	7.5	6.5	6.3	7.0	6.7	5.6	3.7	2.2	1.5	1.6	3.9	3.7	S	2.5	2.2	2.4	2.7	2.1	9.0	5.2	24
6		1.8	1.5	1.2	1.3	1.2	1.5	1.4	1.5	1.7	1.4	1.6	1.5	1.6	1.5	1.2	1.0	S	2.5	2.5	3.5	6.1	6.7	5.3	6.7	2.2	24	
7		4.7	6.0	4.2	3.4	3.3	2.9	3.3	4.2	4.5	4.7	4.1	3.9	3.8	3.9	4.1	4.4	S	4.8	4.9	4.0	3.4	2.2	1.6	1.4	6.0	3.8	24
8		1.0	0.5	0.4	0.1	0.4	0.2	0.4	0.3	0.6	0.9	0.7	0.4	0.2	0.3	0.5	S	0.3	0.4	0.5	0.7	0.5	0.5	0.8	1.2	1.2	0.5	24
9		0.9	0.8	2.4	1.8	1.7	2.0	3.2	4.9	9.7	11.4	12.3	10.4	9.6	8.6	S	6.6	6.2	6.2	6.6	6.2	7.3	6.8	11.2	12.0	12.3	6.5	24
10		9.0	7.7	7.5	3.9	5.5	6.5	5.9	4.3	4.6	4.1	3.8	4.4	5.0	S	6.3	7.1	7.5	8.6	7.9	7.2	6.4	5.6	5.4	5.3	9.0	6.1	24
11		5.8	6.0	6.7	6.6	5.9	5.2	4.7	5.0	3.5	3.6	5.4	3.7	S	5.5	3.9	4.2	4.7	2.8	2.9	5.1	7.7	10.6	13.9	14.9	14.9	6.0	24
12		14.3	13.8	13.1	12.7	11.9	11.4	10.3	9.8	8.8	8.9	8.8	S	10.0	13.0	19.9	25.0	23.6	25.0	30.6	28.5	30.2	31.9	33.9	35.1	35.1	18.7	24
13		37.2	35.3	28.4	22.7	11.7	4.9	4.4	5.2	5.6	5.9	S	13.0	10.1	8.6	10.3	12.9	18.8	15.8	15.4	15.8	12.3	11.3	10.3	6.7	37.2	14.0	24
14		4.1	2.5	1.7	1.4	1.2	0.9	0.6	C	C	C	C	C	C	C	Y	Y	C	C	C	C	C	1.6	1.6	1.4	4.1	1.7	22
15		1.2	1.2	1.4	4.0	3.1	3.0	1.4	0.7	C	C	C	C	C	C	0.8	0.5	0.6	0.8	0.8	1.3	1.2	1.1	1.1	0.9	4.0	1.4	24
16		0.6	0.5	0.8	0.9	0.9	1.1	1.1	S	2.0	2.0	2.0	2.5	3.5	5.7	5.5	4.3	3.7	2.3	1.3	1.0	0.7	0.5	0.7	0.5	5.7	1.9	24
17		0.2	0.4	0.5	0.6	0.7	0.7	S	0.5	0.6	0.6	0.7	0.7	1.2	1.2	1.5	1.3	1.8	3.4	4.5	4.7	7.5	12.6	12.1	12.6	12.6	3.1	24
18		16.4	17.3	11.6	9.5	7.6	S	5.8	5.4	6.0	6.5	7.5	8.7	8.5	8.4	8.1	6.9	8.2	15.6	19.4	22.5	19.5	14.5	12.0	7.5	22.5	11.0	24
19		7.7	8.8	6.5	8.7	S	7.8	6.2	S	S	5.8	8.0	4.5	3.1	2.3	3.2	2.7	1.6	1.8	1.5	1.3	1.4	1.0	1.0	0.8	8.8	4.1	24
20		0.9	0.9	0.9	S	1.4	1.3	1.0	0.8	0.8	0.9	1.3	1.4	1.3	2.3	1.4	1.3	1.0	1.1	0.7	0.5	0.8	0.6	1.2	0.5	2.3	1.1	24
21		1.1	1.5	S	1.5	1.6	2.5	2.8	3.4	5.5	5.5	6.4	7.3	6.3	5.8	7.1	8.0	8.8	8.5	7.5	6.3	5.4	5.0	5.2	4.9	8.8	5.1	24
22		5.3	S	6.3	6.1	4.8	4.6	3.8	2.2	2.7	2.1	0.6	0.6	0.6	0.3	0.4	0.3	0.5	0.4	0.7	0.4	0.4	0.3	0.4	0.8	6.3	1.9	24
23		S	0.9	0.9	1.1	1.2	1.7	1.7	1.9	8.7	12.2	7.9	6.4	3.8	1.8	1.5	1.9	2.2	2.5	3.3	3.6	4.6	13.9	16.5	S	16.5	4.6	24
24		11.5	4.1	5.7	7.2	4.2	1.4	0.3	0.4	0.2	0.4	0.4	0.5	0.3	0.4	0.3	0.4	0.4	0.3	0.5	1.1	0.9	1.3	S	2.2	11.5	1.9	24
25		2.8	3.0	2.5	2.4	2.0	1.9	1.5	1.3	1.9	3.1	3.8	2.1	1.0	0.4	0.5	0.4	0.4	0.5	0.3	0.4	0.2	S	0.4	0.5	3.8	1.4	24
26		1.2	1.2	1.1	1.2	1.0	0.8	0.5	0.4	0.5	0.5	0.4	0.6	0.7	0.9	1.4	2.7	3.4	4.4	4.4	6.9	S	6.5	5.1	5.4	6.9	2.2	24
27		7.0	5.8	2.4	1.6	1.3	1.0	1.8	2.7	3.0	2.1	1.9	1.4	1.0	1.4	1.9	1.5	0.9	0.5	0.4	S	1.2	2.4	1.9	2.1	7.0	2.1	24
28		2.5	2.1	2.2	1.6	1.3	1.4	1.6	1.4	1.7	1.8	1.7	1.9	2.0	1.4	1.3	1.3	1.7	1.7	S	1.4	1.6	1.0	1.1	1.1	2.5	1.6	24
29		1.2	1.7	2.2	1.7	1.3	1.4	2.6	4.9	5.6	5.5	5.4	4.7	4.5	3.9	3.6	3.6	3.9	S	3.5	4.2	5.3	8.8	14.5	16.2	16.2	4.8	24
30		12.8	8.6	5.3	4.0	3.8	3.1	2.8	2.7	2.5	2.0	2.3	2.2	4.3	4.6	6.3	7.9	S	6.2	5.2	4.5	4.5	3.6	3.6	3.3	12.8	4.6	24
31		3.4	3.4	2.6	2.4	1.1	1.4	2.3	2.4	1.4	0.8	0.8	1.1	0.9	1.0	1.4	S	1.3	2.0	2.0	2.5	2.6	2.7	2.8	3.1	3.4	2.0	24
HOURLY MAX		37.2	35.3	28.4	22.7	11.9	11.4	10.3	9.8	9.7	12.2	12.3	13.0	10.1	13.0	19.9	25.0	23.6	25.0	30.6	28.5	30.2	31.9	33.9	35.1			
HOURLY AVG		5.7	5.1	4.5	4.1	3.1	2.8	2.8	2.8	3.4	3.7	3.7	3.5	3.5	3.4	3.6	4.2	4.1	4.6	5.1	5.0	5.6	5.9	6.2	5.4			

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

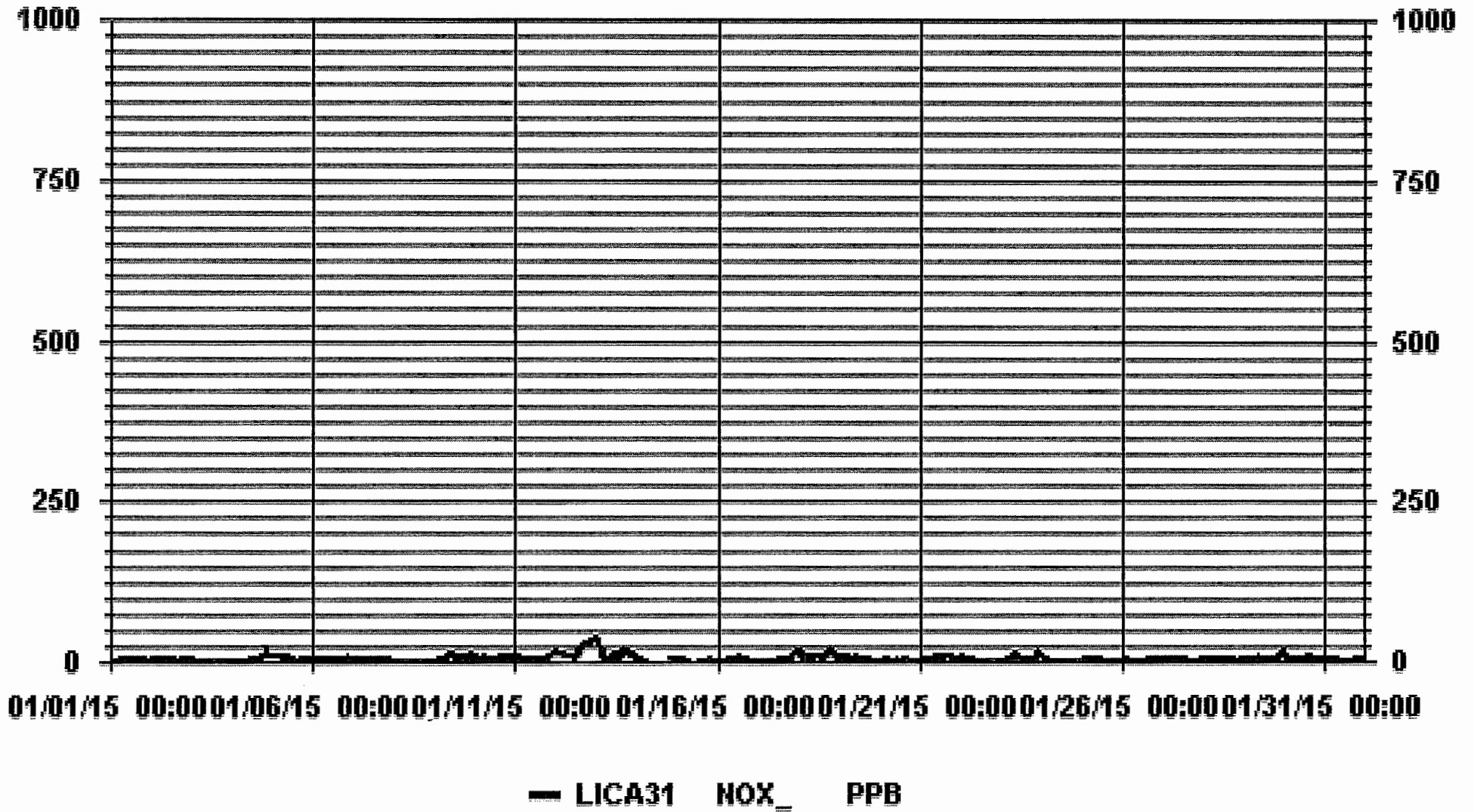
24 HOUR AVERAGES FOR JANUARY 2015



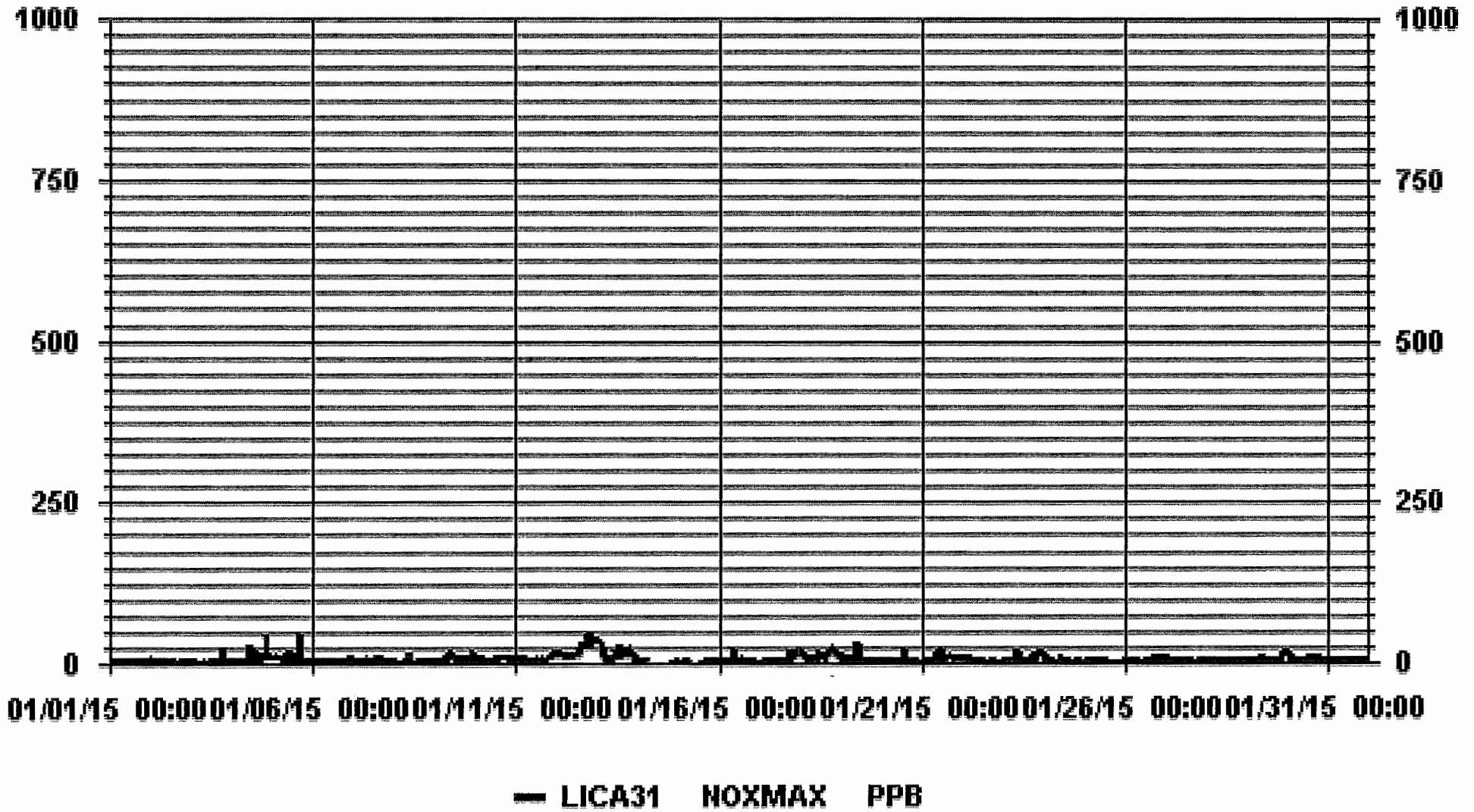
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	692		
MAXIMUM 1-HR AVERAGE:	37.2 PPB	@ HOUR(S)	0
MAXIMUM 24-HR AVERAGE:	18.7 PPB		ON DAY(S) 13
			ON DAY(S) 12
			VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS	OPERATIONAL TIME:	742 HRS
MONTHLY CALIBRATION TIME:	18 HRS	AMD OPERATION UPTIME:	99.7 %
STANDARD DEVIATION:	5.19	MONTHLY AVERAGE:	4.2 PPB

01 Hour Averages



01 Hour Averages



LICA31
NOX_ / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 31
Site Name : LICA31
Parameter : NOX_
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	
< 50.0	2.45	3.61	4.62	2.89	1.44	.57	1.30	3.61	9.53	11.70	11.70	16.76	8.67	9.24	8.81	3.03	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	2.45	3.61	4.62	2.89	1.44	.57	1.30	3.61	9.53	11.70	11.70	16.76	8.67	9.24	8.81	3.03	

Calm : .00 %

Total # Operational Hours : 692

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	17	25	32	20	10	4	9	25	66	81	81	116	60	64	61	21	692
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	17	25	32	20	10	4	9	25	66	81	81	116	60	64	61	21	

Calm : .00 %

Total # Operational Hours : 692

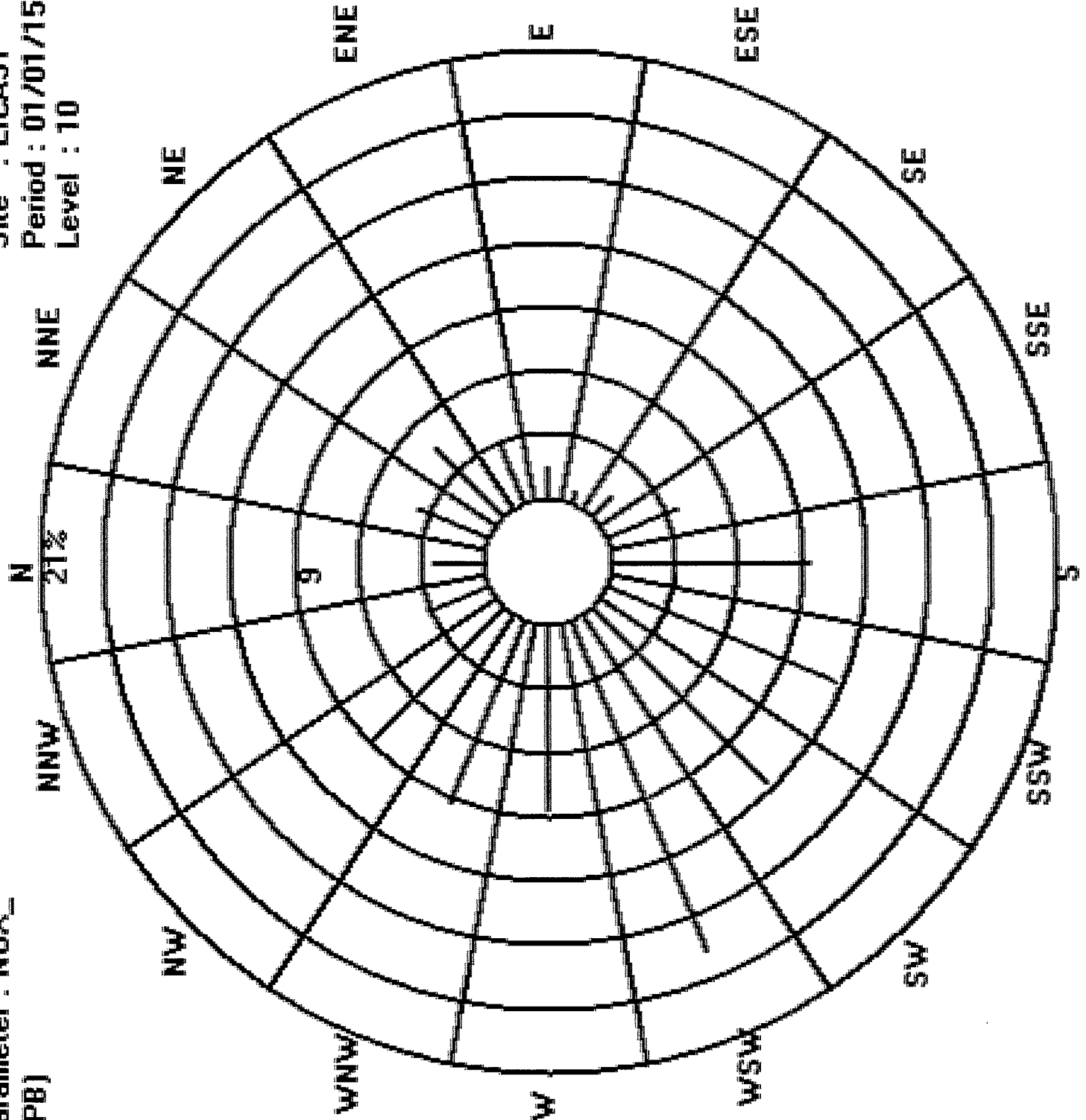
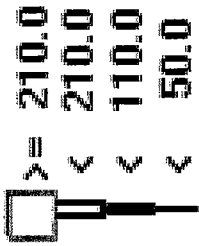
Logger : 31 Parameter : NOX_

Site : LICA31

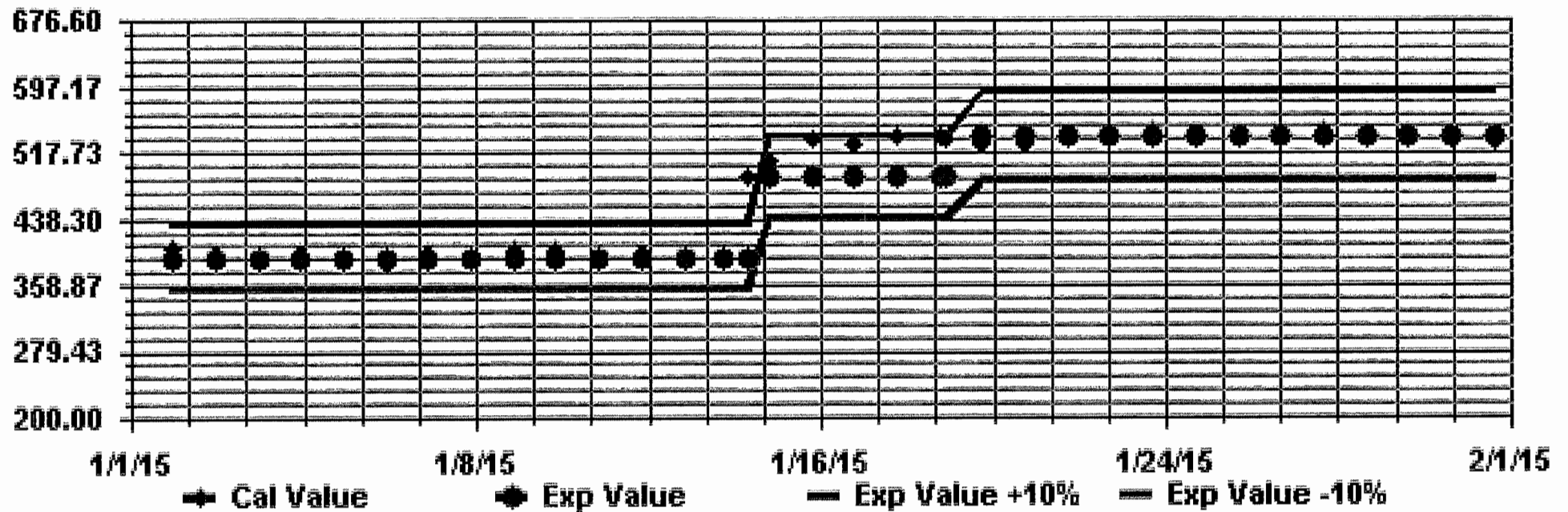
Period : 01/01/15-01/31/15

Level : 10

Class Limits (PPB)

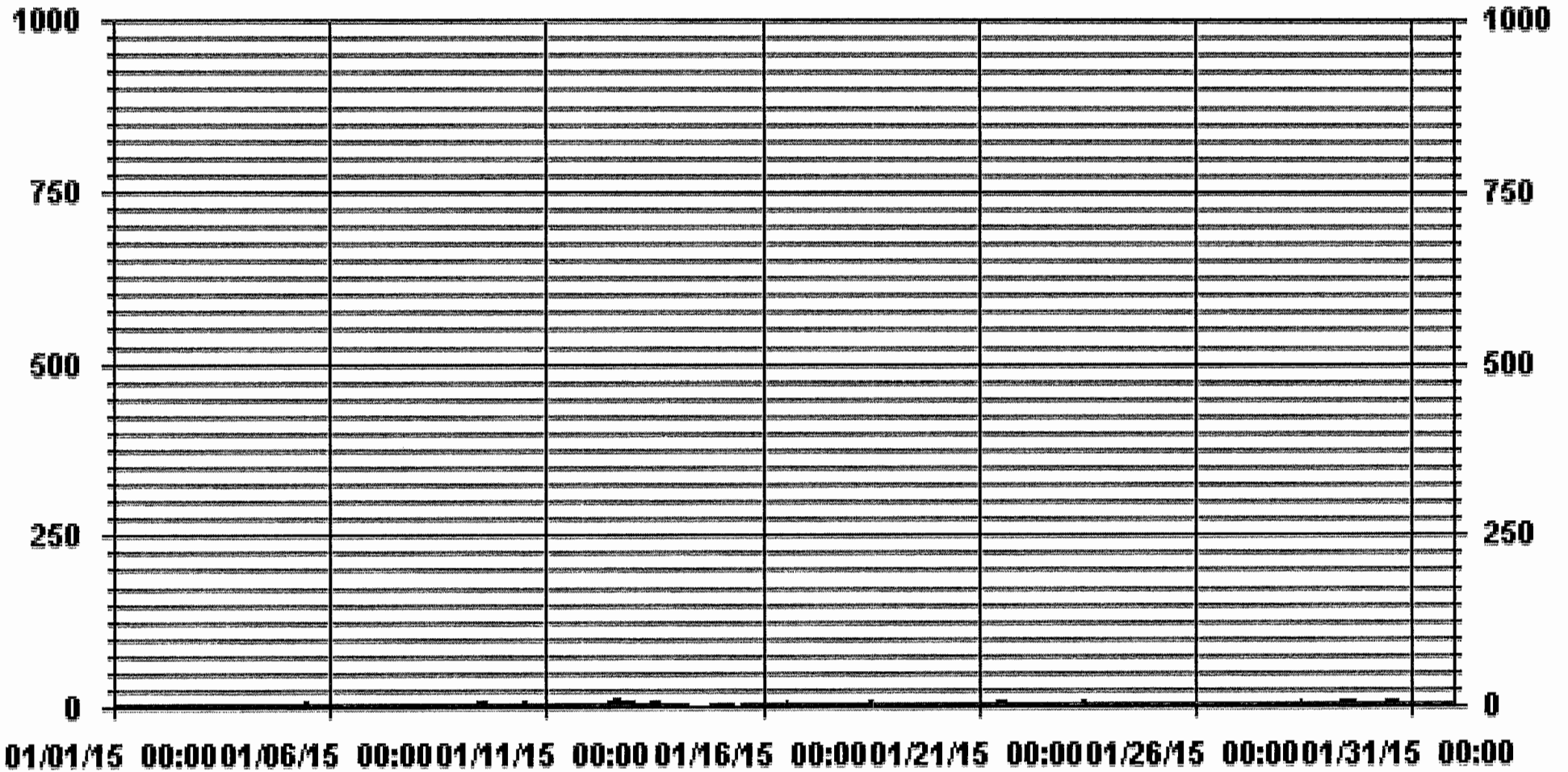


Calibration Graph for Site: LICA31 Parameter: NOX_ Sequence: NO2 Phase: SPAN



NITRIC OXIDES

01 Hour Averages



— LICA31 NO_ PPB



NITRIC OXIDE 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	24-HOUR	
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	0:00	MAX.	AVG.	RDGS.
DAY																											
1	0.8	1.0	1.1	0.6	0.5	0.6	0.6	0.8	0.6	0.7	0.7	1.1	2.4	1.0	1.0	0.7	1.5	1.0	0.7	0.7	0.8	1.0	S	0.4	2.4	0.9	24
2	0.6	0.4	0.3	0.4	0.4	0.3	0.3	0.4	0.4	0.7	1.0	1.1	1.6	1.5	0.9	1.2	0.4	1.3	0.5	0.4	0.9	S	0.8	0.6	1.6	0.7	24
3	0.6	0.6	0.9	0.6	0.6	0.6	0.7	0.4	0.7	0.7	1.3	1.2	1.4	1.0	1.1	1.2	1.2	1.9	0.7	12.7	S	0.7	0.7	0.7	12.7	1.4	24
4	0.9	0.9	0.6	0.7	0.5	0.6	0.6	0.9	0.5	0.7	1.0	3.1	7.0	10.0	3.3	1.3	0.6	0.9	0.8	S	3.9	1.8	0.7	0.7	10.0	1.8	24
5	0.6	0.6	0.6	0.7	0.6	0.5	0.6	0.5	3.7	2.7	2.6	6.1	2.6	3.4	12.5	1.1	27.6	1.1	S	0.6	0.3	0.4	0.6	0.2	27.6	3.1	24
6	0.5	0.4	0.2	0.3	0.3	0.3	0.6	1.0	0.4	0.3	1.4	0.8	1.1	0.8	2.8	0.6	0.2	S	0.9	0.9	0.9	0.7	0.7	1.0	2.8	0.7	24
7	0.6	1.1	0.7	0.8	0.6	0.6	0.6	0.7	0.6	0.9	1.2	1.3	1.3	1.2	1.5	1.2	S	0.5	0.5	0.8	0.7	0.7	0.6	0.8	1.5	0.8	24
8	0.6	0.6	0.5	0.4	0.6	0.6	0.6	0.8	1.1	5.7	0.8	1.4	0.7	0.6	0.6	S	0.6	1.0	0.2	1.2	0.4	0.4	0.6	0.4	5.7	0.9	24
9	0.3	0.4	0.6	0.3	0.4	0.4	0.4	0.3	0.8	3.4	4.4	5.1	4.3	3.3	S	2.1	1.4	0.9	0.8	0.9	1.1	0.8	0.9	1.3	5.1	1.5	24
10	0.9	0.9	0.9	0.6	1.0	0.7	0.8	0.9	0.9	1.2	1.5	2.1	2.6	S	2.8	2.5	1.2	1.9	0.9	0.8	0.6	0.8	0.9	0.6	2.8	1.2	24
11	0.8	0.8	0.6	0.6	0.5	0.7	0.5	0.7	0.5	1.1	2.2	1.6	S	3.4	2.0	1.8	0.9	0.7	0.7	0.7	0.8	2.5	0.8	1.2	3.4	1.1	24
12	0.7	0.8	0.9	0.9	0.7	0.7	1.7	1.0	1.8	2.3	3.4	S	6.9	6.8	14.4	11.6	10.3	2.5	15.8	4.1	16.2	4.7	5.6	6.0	16.2	5.2	24
13	6.9	5.7	2.9	0.5	0.4	0.1	0.5	0.3	1.7	3.5	S	5.9	3.0	3.0	12.3	3.4	2.4	1.0	1.1	3.6	0.8	1.0	0.8	0.6	12.3	2.7	24
14	0.9	0.8	0.7	0.8	0.8	0.8	0.5	C	C	C	C	C	C	C	C	Y	Y	C	C	C	C	0.6	1.0	0.4	1.0	0.7	22
15	0.4	0.2	0.4	0.3	0.3	0.2	0.2	0.3	C	C	C	C	C	C	1.0	0.6	0.5	0.6	0.6	0.3	0.7	0.5	0.6	0.5	1.0	0.5	24
16	0.5	0.5	0.7	0.7	0.5	0.6	0.7	S	5.1	2.0	0.8	1.2	1.3	3.1	2.1	1.1	0.7	0.5	0.7	0.5	0.5	0.7	0.8	0.8	5.1	1.1	24
17	0.4	0.4	0.6	0.6	0.6	0.7	S	0.9	0.8	0.6	1.0	1.7	0.9	1.0	1.1	1.0	1.1	0.8	7.0	0.8	1.0	1.0	1.0	1.1	7.0	1.1	24
18	1.0	1.4	0.7	0.8	0.6	S	1.7	0.9	1.0	1.5	2.3	13.0	4.2	3.3	2.3	1.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	13.0	1.9	24
19	1.4	1.0	0.8	0.9	S	1.2	1.0	S	S	1.3	25.3	1.7	2.8	1.0	1.8	1.2	0.8	1.0	0.9	0.8	0.9	0.8	0.8	0.6	25.3	2.3	24
20	1.0	1.0	1.0	S	1.0	1.0	0.8	0.8	0.8	1.0	2.3	2.3	1.3	16.5	2.3	1.0	0.8	1.2	1.0	0.9	1.1	1.0	1.1	0.8	16.5	1.8	24
21	1.0	1.0	S	1.1	1.0	0.9	1.0	1.0	3.5	1.5	2.1	11.8	2.6	2.1	2.9	2.1	1.3	1.1	1.3	1.1	1.0	1.0	1.0	0.9	11.8	1.9	24
22	1.0	S	1.2	1.0	1.0	0.7	0.7	0.9	1.0	1.1	1.0	1.0	1.2	0.9	1.2	1.0	1.5	1.0	1.7	0.8	1.1	1.0	1.0	1.1	1.7	1.0	24
23	S	1.0	1.0	0.8	1.0	1.2	1.0	0.7	3.4	5.2	3.8	3.4	2.2	1.3	1.2	7.4	1.6	1.7	7.2	1.0	1.0	1.3	1.3	S	7.4	2.3	24
24	1.3	1.1	1.1	1.1	1.0	1.0	0.8	1.0	0.7	1.0	1.0	1.0	1.0	1.7	1.5	1.2	1.0	0.9	1.4	1.1	0.8	1.1	S	1.2	1.7	1.1	24
25	1.0	1.0	1.0	1.3	1.0	0.8	1.1	0.8	1.0	1.5	1.5	1.5	1.3	1.5	1.7	1.0	1.1	1.0	0.9	1.0	0.8	S	1.0	1.1	1.7	1.1	24
26	1.0	1.0	1.0	1.0	1.0	1.1	0.9	1.3	1.3	1.3	1.0	1.5	1.1	1.0	1.3	1.3	1.2	1.4	1.4	0.8	S	0.7	1.0	1.0	1.5	1.1	24
27	1.0	1.0	1.1	1.0	1.1	1.1	1.1	1.1	0.9	1.1	1.1	1.2	1.2	1.5	1.3	1.0	1.1	1.0	0.8	S	1.2	1.0	1.2	1.0	1.5	1.1	24
28	1.0	0.9	1.0	1.0	0.9	1.1	1.1	1.1	1.3	1.4	1.4	1.9	2.7	1.5	1.4	1.4	1.2	1.1	S	1.2	2.3	1.0	1.0	1.0	2.7	1.3	24
29	1.1	1.0	1.0	1.1	1.0	1.1	1.1	1.1	1.1	1.4	2.4	2.4	2.4	2.2	2.2	1.6	1.7	S	1.3	1.9	1.3	1.0	1.2	1.6	2.4	1.5	24
30	1.1	1.0	1.1	1.0	1.1	1.0	1.3	1.2	1.2	2.4	1.8	2.1	3.1	3.1	2.9	3.0	S	1.3	1.1	1.1	1.4	1.1	1.1	1.1	3.1	1.6	24
31	1.1	1.1	1.1	1.0	1.2	1.1	1.0	1.1	1.1	1.2	1.3	1.3	1.5	1.6	1.4	S	1.6	1.5	1.3	1.1	1.1	1.1	1.5	1.1	1.6	1.2	24
HOURLY MAX	6.9	5.7	2.9	1.3	1.2	1.2	1.7	1.3	5.1	5.7	25.3	13.0	7.0	16.5	14.4	11.6	27.6	2.5	15.8	12.7	16.2	4.7	5.6	6.0			
HOURLY AVG	1.0	1.0	0.9	0.8	0.7	0.7	0.8	0.8	1.4	1.7	2.6	2.9	2.3	2.8	2.9	2.0	2.4	1.1	1.9	1.5	1.6	1.1	1.1	1.0			

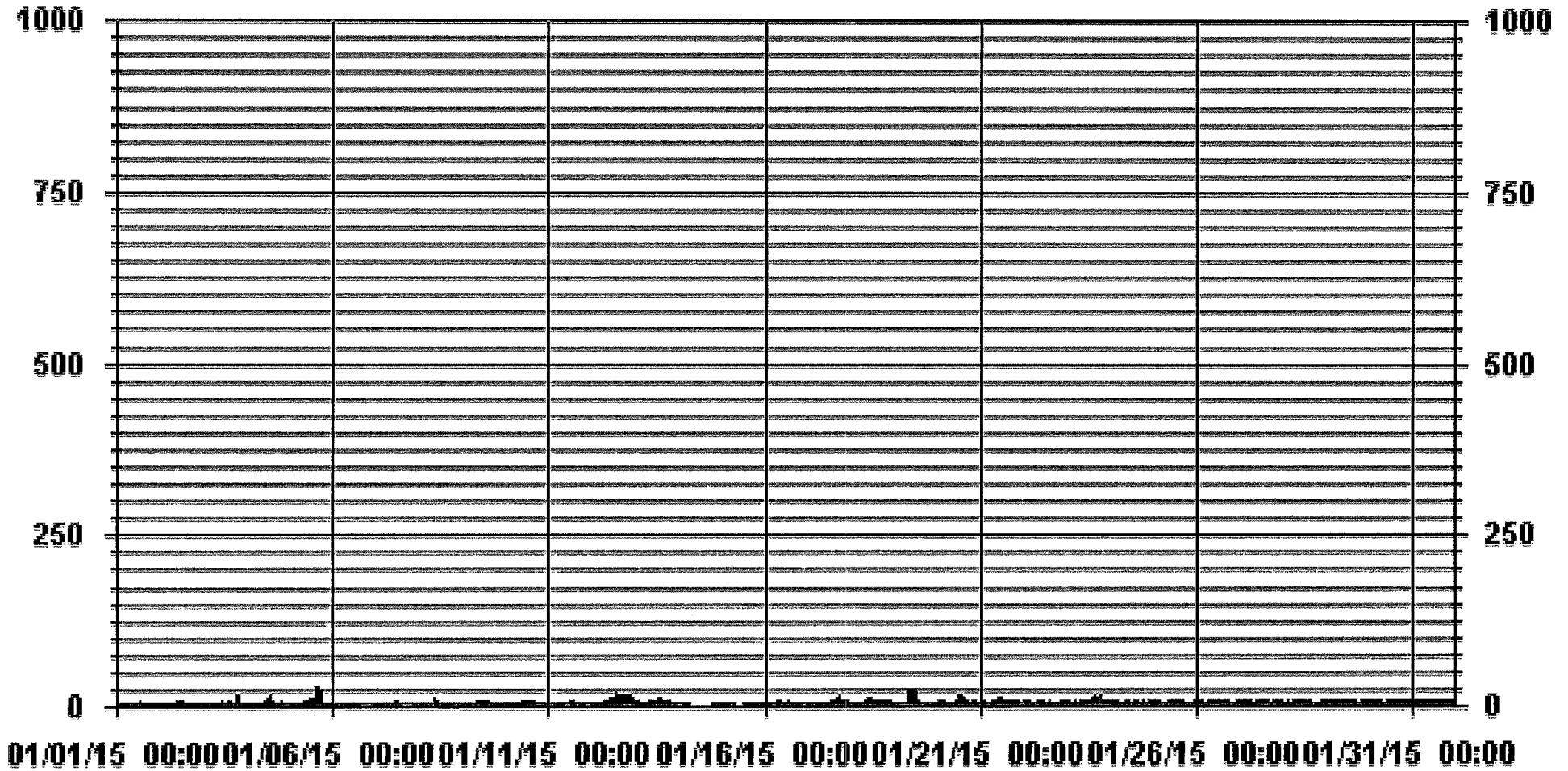
STATUS FLAG CODES

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:	692				
MAXIMUM INSTANTANEOUS VALUE:	27.6	PPB	@ HOUR(S)	16	ON DAY(S) 5
				VAR-VARIOUS	
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	742	HRS
MONTHLY CALIBRATION TIME:	18	HRS			
STANDARD DEVIATION:	2.31				

01 Hour Averages



— LICA31 NOMAX PPB

LICA31
 NO_ / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 31
 Site Name : LICA31
 Parameter : NO_
 Units : PPB

Wind Parameter : WDR
 Instrument Height : 10 Meters

		Direction															
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	2.46	3.61	4.63	2.89	1.44	.57	1.30	3.61	9.55	11.72	11.72	16.64	8.68	9.26	8.82	3.03	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	2.46	3.61	4.63	2.89	1.44	.57	1.30	3.61	9.55	11.72	11.72	16.64	8.68	9.26	8.82	3.03	

Calm : .00 %

Total # Operational Hours : 691

Distribution By Samples

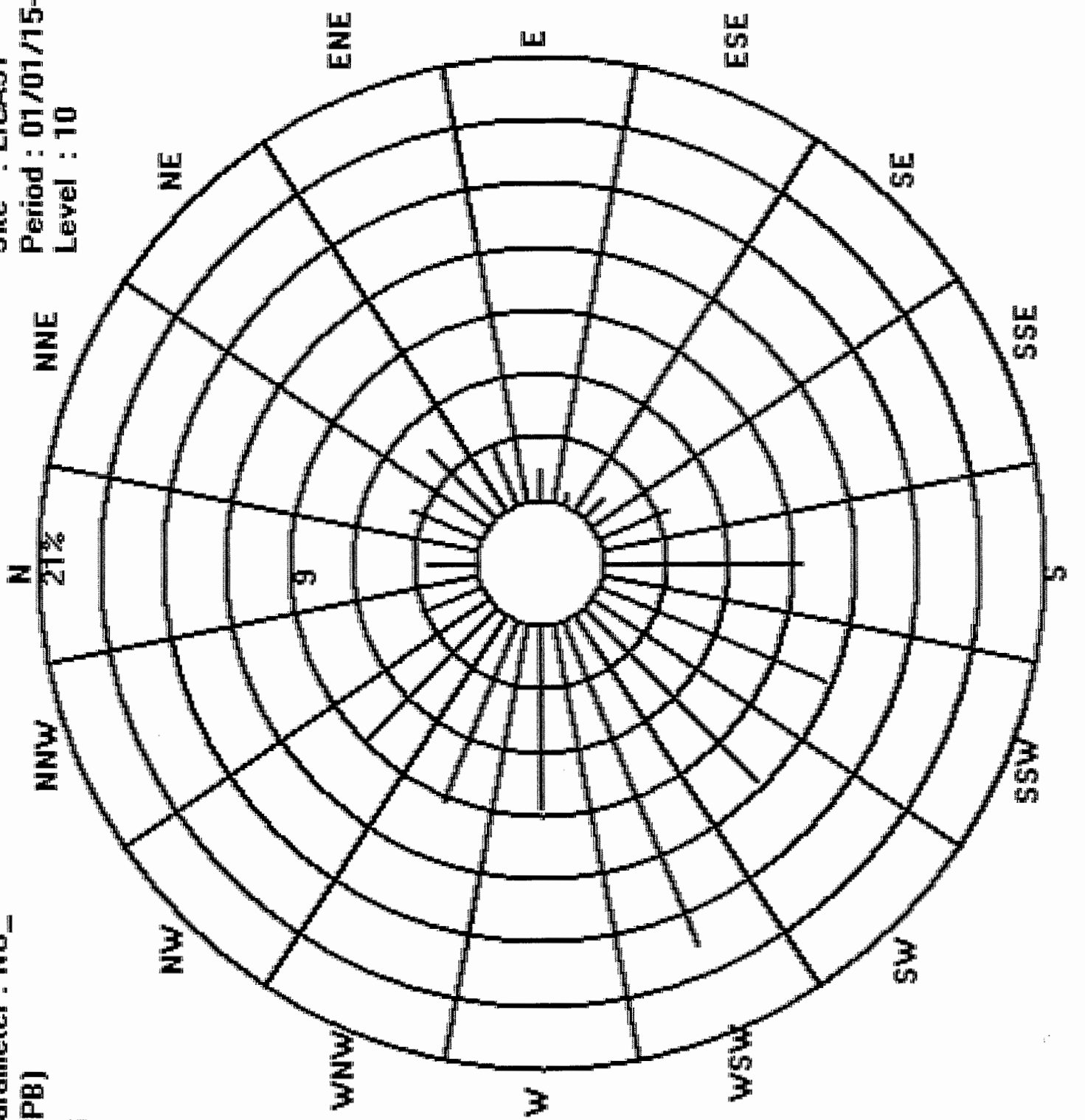
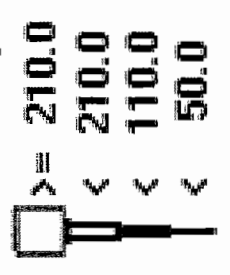
		Direction															
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	17	25	32	20	10	4	9	25	66	81	81	115	60	64	61	21	691
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	17	25	32	20	10	4	9	25	66	81	81	115	60	64	61	21	

Calm : .00 %

Total # Operational Hours : 691

Site : LICA31
Period : 01/01/15-01/31/15
Level : 10

Logger : 31 Parameter : NO_
Class Limits (PPB)



NITROGEN DIOXIDE

NITROGEN DIOXIDE (NO2) hourly averages in ppb

DAY	HOUR START																								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				
1	1.6	1.8	2.1	1.3	1.5	3.1	2.1	1.9	1.9	2.1	2.3	2.5	3.0	2.3	2.2	2.0	1.7	1.7	1.5	1.5	1.6	1.8	S	2.0	3.1	2.0	24.0	
2	4.3	4.1	1.7	2.8	3.0	2.3	1.5	2.6	2.9	3.2	3.3	3.1	2.9	3.5	2.3	1.7	1.0	2.2	2.4	1.3	1.5	S	1.2	1.2	4.3	2.4	24.0	
3	1.3	1.7	2.1	1.0	0.1	0.1	0.0	0.2	0.1	0.3	0.4	0.3	0.2	0.2	0.1	0.3	0.7	0.7	0.9	1.2	S	0.8	0.8	1.2	2.1	0.6	24.0	
4	0.7	0.6	0.8	0.9	0.9	0.8	0.9	1.0	0.7	0.6	0.9	2.1	1.3	1.9	2.6	3.3	4.3	5.1	10.0	S	21.4	11.9	10.2	9.4	21.4	4.0	24.0	
5	9.0	8.6	8.1	8.6	8.6	8.0	7.5	6.5	6.3	6.1	4.9	3.7	2.5	1.6	1.3	1.5	3.4	3.7	S	2.5	2.2	2.4	2.7	2.1	9.0	4.9	24.0	
6	1.8	1.5	1.2	1.3	1.2	1.5	1.4	1.5	1.7	1.4	1.4	1.4	1.3	1.4	1.2	1.2	1.0	S	2.2	2.4	3.3	5.9	6.6	5.0	6.6	2.1	24.0	
7	4.7	5.8	4.1	3.3	3.3	2.9	3.3	4.2	4.5	4.4	3.7	3.5	3.3	3.5	3.6	4.1	S	4.8	4.9	4.0	3.4	2.2	1.6	1.4	5.8	3.7	24.0	
8	1.0	0.5	0.4	0.1	0.4	0.2	0.4	0.3	0.5	0.8	0.6	0.3	0.2	0.3	0.4	S	0.3	0.4	0.5	0.7	0.5	0.5	0.8	1.2	1.2	0.5	24.0	
9	0.9	0.8	2.4	1.8	1.7	2.0	3.2	4.9	9.7	9.8	8.7	7.0	6.4	6.0	S	5.4	5.8	6.1	6.4	6.0	7.0	6.6	11.0	11.8	11.8	5.7	24.0	
10	8.8	7.5	7.2	3.9	5.3	6.5	5.8	4.2	4.5	3.6	2.9	3.1	3.1	S	4.6	6.0	7.3	8.3	7.9	7.1	6.4	5.6	5.3	5.3	8.8	5.7	24.0	
11	5.7	5.8	6.7	6.6	5.9	5.2	4.7	5.0	3.5	3.2	4.0	2.8	S	3.2	2.7	3.4	4.5	2.8	2.8	5.1	7.6	10.2	13.8	14.7	14.7	5.6	24.0	
12	14.2	13.6	12.8	12.4	11.8	11.3	9.9	9.5	8.3	7.7	6.7	S	5.0	6.9	11.0	14.9	19.4	23.9	26.8	26.5	27.2	28.2	29.3	30.1	30.1	16.0	24.0	
13	31.4	31.2	27.7	22.7	11.7	4.9	4.4	5.2	5.6	4.9	S	9.3	7.9	6.7	8.0	11.2	17.8	15.5	15.0	15.2	12.1	11.1	10.1	6.7	31.4	12.9	24.0	
14	3.9	2.3	1.6	1.3	1.1	0.8	0.6	C	C	C	C	C	C	C	C	Y	Y	C	C	C	1.6	1.6	1.4	3.9	1.6	22.0		
15	1.2	1.2	1.4	4.0	3.1	3.0	1.4	0.7	C	C	C	C	C	C	0.5	0.4	0.6	0.8	0.7	1.3	1.1	1.1	1.1	0.9	4.0	1.4	24.0	
16	0.6	0.5	0.8	0.9	0.9	1.1	1.1	S	1.6	1.6	1.8	2.0	2.8	4.3	4.3	3.9	3.6	2.3	1.2	1.0	0.7	0.5	0.6	0.5	4.3	1.7	24.0	
17	0.2	0.3	0.4	0.6	0.6	0.6	S	0.4	0.4	0.5	0.3	0.3	0.9	0.9	1.1	1.1	1.5	3.2	4.1	4.4	7.2	12.2	11.7	12.2	12.2	2.8	24.0	
18	16.1	16.9	11.5	9.4	7.5	S	5.5	5.1	5.8	5.6	6.0	5.9	5.6	6.2	6.3	5.8	7.7	15.1	18.9	21.9	19.0	14.2	11.5	7.0	21.9	10.2	24.0	
19	7.3	8.5	6.3	8.4	S	7.3	5.8	S	5.1	6.3	3.7	2.4	1.9	2.6	2.4	1.4	1.4	1.2	1.1	1.1	0.9	0.7	0.8	8.5	3.6	24.0		
20	0.5	0.7	0.6	S	1.0	0.9	0.7	0.5	0.5	0.8	0.8	0.7	1.1	0.7	0.9	0.7	0.6	0.4	0.1	0.4	0.2	0.8	0.3	1.1	0.6	24.0		
21	0.8	1.0	S	0.9	1.3	2.1	2.4	3.0	4.8	4.6	4.8	5.1	4.3	4.2	5.5	6.8	8.1	8.0	7.0	5.9	5.1	4.6	4.8	4.5	8.1	4.3	24.0	
22	4.9	S	5.8	5.6	4.5	4.3	3.6	1.9	2.3	1.6	0.3	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.2	0.1	0.0	0.0	0.4	5.8	1.6	24.0		
23	S	0.4	0.5	0.7	0.8	1.2	1.2	1.7	8.0	9.8	6.0	4.2	2.6	1.1	1.0	1.3	1.8	2.1	2.9	3.2	4.1	13.3	15.9	S	15.9	3.8	24.0	
24	10.8	3.5	5.2	6.8	3.7	1.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.7	0.6	0.8	S	1.7	10.8	1.5	24.0	
25	2.4	2.5	1.9	1.9	1.6	1.5	1.0	1.1	1.6	2.4	2.8	1.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	2.8	1.0	24.0
26	0.8	0.8	0.7	0.7	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.8	2.1	2.8	3.9	3.9	6.6	S	6.3	4.8	5.0	6.6	1.8	24.0	
27	6.5	5.4	1.9	1.1	0.9	0.6	1.3	2.3	2.6	1.5	1.3	0.8	0.4	0.6	1.1	0.9	0.4	0.1	0.1	S	0.5	2.1	1.5	1.7	6.5	1.5	24.0	
28	2.1	1.8	1.7	1.2	0.9	1.0	1.0	0.9	1.1	1.0	0.8	0.7	0.6	0.4	0.5	0.5	1.0	1.1	S	0.8	0.9	0.5	0.7	0.5	2.1	0.9	24.0	
29	0.6	1.3	1.8	1.2	0.8	0.7	2.0	4.4	4.8	4.1	3.6	2.8	2.7	2.1	2.1	2.6	2.9	S	2.9	3.5	4.8	8.3	13.8	15.4	15.4	3.9	24.0	
30	12.3	8.1	4.7	3.5	3.3	2.7	2.3	2.1	1.9	1.3	1.2	1.0	2.2	2.3	4.0	5.8	S	5.4	4.6	3.9	3.7	3.0	2.9	2.8	12.3	3.7	24.0	
31	2.8	2.8	2.1	1.9	0.6	0.8	1.8	1.9	0.9	0.3	0.2	0.2	0.0	0.1	0.5	S	0.4	1.4	1.3	1.8	2.0	1.9	2.2	2.5	2.8	1.3	24.0	
HOURLY MAX	31.4	31.2	27.7	22.7	11.8	11.3	9.9	9.5	9.7	9.8	8.7	9.3	7.9	6.9	11.0	14.9	19.4	23.9	26.8	26.5	27.2	28.2	29.3	30.1				
HOURLY AVG	5.3	4.7	4.2	3.9	3.0	2.6	2.6	2.6	3.1	3.0	2.7	2.4	2.2	2.3	2.4	3.2	3.6	4.3	4.7	4.6	5.2	5.5	5.8	5.0				

STATUS FLAG CODES

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

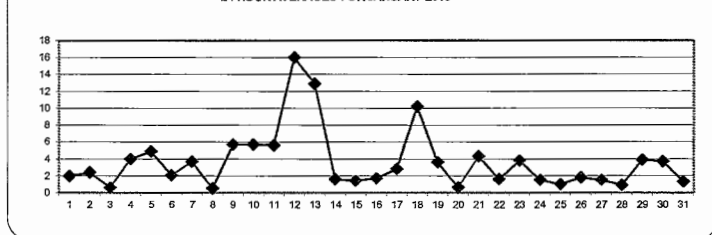
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR: 159 PPB

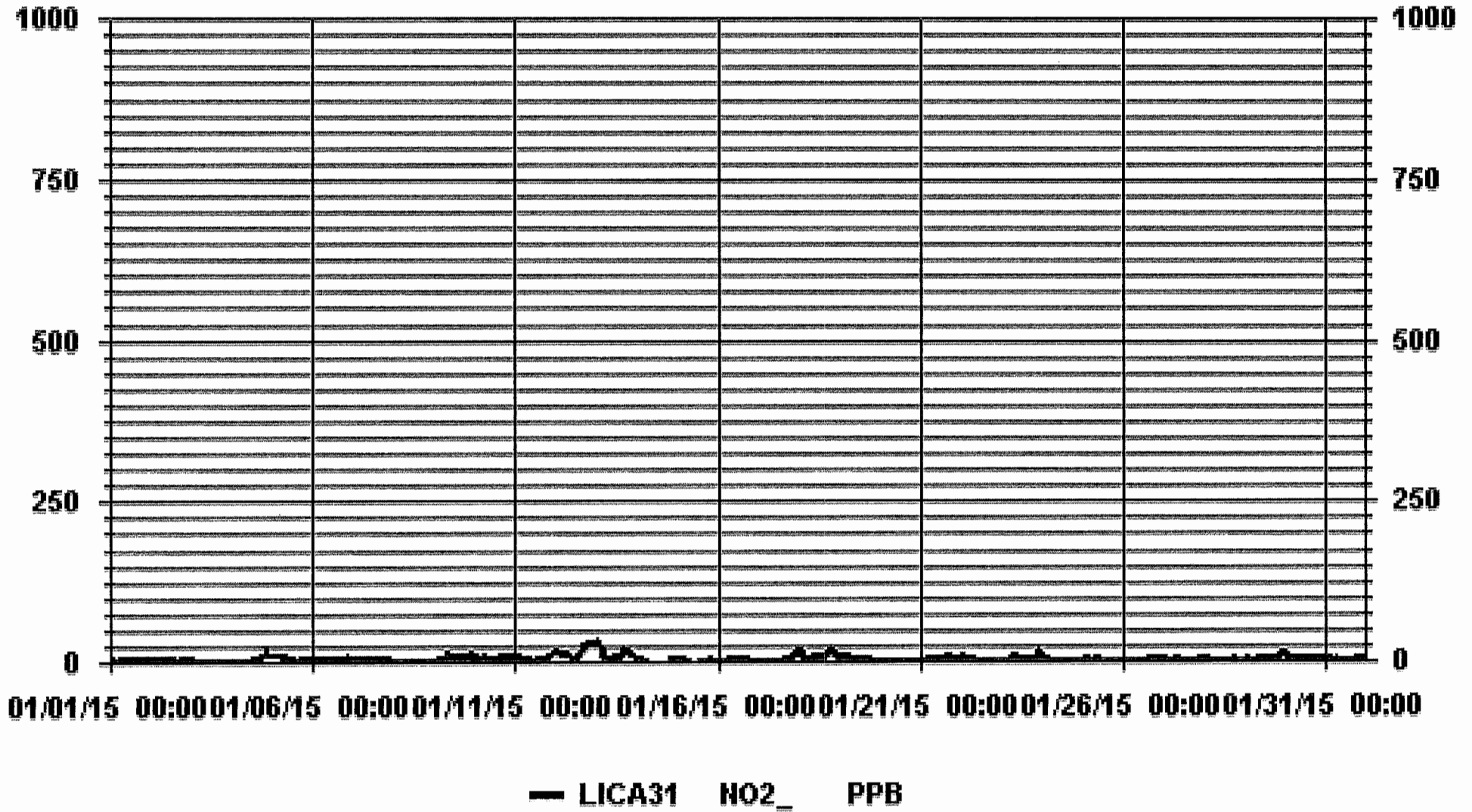
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0			
NUMBER OF NON-ZERO READINGS:	656			
MAXIMUM 1-HR AVERAGE:	31.4	PPB	@ HOUR(S)	0
MAXIMUM 24-HR AVERAGE:	16.0	PPB	ON DAY(5)	13
			ON DAY(5)	12
			VAR-VARIOUS	
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	742
MONTHLY CAUBRATION TIME:	18	HRS	AMD OPERATION UPTIME:	99.7
				%
STANDARD DEVIATION:	4.77		MONTHLY AVERAGE:	3.7
				PPB

24 HOUR AVERAGES FOR JANUARY 2015



01 Hour Averages





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - JANUARY 2015

JOB # 2833-2015-01-31- C

NITROGEN DIOXIDE 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.	RDGS.	
1	2.5	2.5	2.7	2	3.3	4.3	2.5	2	2	2.4	2.5	2.8	3.4	2.6	2.4	2.3	2.8	2.1	1.9	1.8	1.9	2.1	5	3.8	4.3	2.5	24	
2	6.1	6.6	3.5	4.2	4.4	3.7	3.3	4.1	4.3	4.5	4.3	4	3.9	5	4.1	3.6	2.1	3.6	3.7	2.3	2.6	5	1.6	1.9	6.6	3.8	24	
3	2	2.8	2.7	2.2	0.8	0.8	0.6	0.9	0.8	1	1.1	1	1.2	1.3	0.8	1.4	1.7	1.8	1.8	8.6	5	1.7	1.8	2	8.6	1.8	24	
4	1.4	1.2	1.5	1.7	1.5	1.5	1.7	1.7	1.6	1.4	1.4	27.1	7.4	9.7	3.5	4.3	5.2	6.9	13.8	5	35.7	15.8	11.2	10.3	35.7	7.3	24	
5	10	9.4	9.8	9.5	9.4	9.1	9.2	8.2	13	6.8	6	16.3	3.5	3	6	3.2	23.3	5.9	5	3.2	3.1	3.3	3.4	3.2	23.3	7.7	24	
6	2.5	2.2	2.1	2	2.1	2.2	2.4	2.9	2.4	2.3	2.1	1.9	2	2.2	1.9	2.3	1.9	5	2.1	2.6	4	7.3	7.3	5.6	7.3	2.9	24	
7	5.1	6.3	4.7	3.4	3.4	2.9	3.4	4.4	4.5	4.5	3.7	3.4	3.1	3.6	3.6	4.2	5	6.1	5.9	5.1	4.3	3.4	2.5	2.1	6.3	4.1	24	
8	1.8	1.7	1.1	1.1	1.1	1	1.2	1	1.7	10.6	1.4	1.1	0.8	1	1.1	5	1	1	1.4	1.3	1.6	1.1	1.6	2.1	10.6	1.7	24	
9	1.9	1.7	3.7	3.7	2.7	2.6	4.8	9	11.2	11	10.7	7.9	7.1	6.7	5	6.6	7.4	7.4	7.4	7.6	8.1	7.9	15.1	14.8	15.1	7.3	24	
10	10.4	8.8	9	6.3	8.5	7.8	7.5	5.8	5.6	5.4	4	4.4	4.5	5	5.3	7.1	8.3	9.8	8.8	9.1	7.2	6.4	5.9	6.1	10.4	7.0	24	
11	6.2	6.7	7.5	7.5	7.3	6.4	5.5	5.8	4.6	4.2	5.1	3.4	5	4.7	4	4	5.9	4.4	4.4	6.7	9.2	12.1	15.2	15.4	15.4	6.8	24	
12	15	14.3	13.9	13	12.5	12.4	11.1	10.4	9.4	8.6	7.6	5	7.3	8.4	13.4	18.3	21.8	27	31.8	28.7	34.9	29.8	30.7	31.3	34.9	17.9	24	
13	32.6	32.1	31.8	26.8	16.2	7.9	6.2	7.5	7.5	6	5	11.6	8.5	7.6	17	16.2	19.2	16.4	15.4	17.3	13.7	11.8	11.8	7.7	32.6	15.2	24	
14	4.9	3	1.8	1.6	1.4	1	0.9	C	C	C	C	C	C	C	C	Y	Y	C	C	C	C	1.7	2.4	1.6	4.9	2.0	22	
15	1.6	1.5	1.9	5	3.4	3.3	3.2	1	C	C	C	C	C	C	1	0.8	0.8	1.3	1.1	1.9	1.6	1.4	1.5	1.4	5	1.9	24	
16	1	1	1.2	1.3	1.4	1.2	1.3	5	14.9	2.9	2.1	2.8	4.4	5.3	4.8	4.6	4	3.3	1.8	1.7	1.3	1.1	1	1	14.9	2.8	24	
17	0.8	0.7	0.8	1	1	0.9	5	0.8	0.8	0.8	1.1	1	1.6	1.7	1.6	1.6	2.3	4.6	14.8	5.2	10.8	13.2	12.9	14.3	14.8	4.1	24	
18	17.9	18.1	14.8	10.1	9.4	5	6.3	5.7	6.3	6.1	6.7	10.6	6.4	7.1	7	6.8	12.5	17.3	20.2	23	20.5	17.8	13.3	9.5	23	11.9	24	
19	10.4	10.5	8.1	10.6	5	8.9	8.6	5	5	5.8	10.1	4.6	2.9	2	2.7	2.5	1.9	1.3	1.3	1	1.1	1.1	0.6	0.8	10.6	4.6	24	
20	0.6	0.6	0.5	5	1.6	1.3	1.1	1	1.1	1.3	2.1	2.1	1.3	9.2	1.7	1.4	1.2	1.9	1.9	0.8	1.8	1.8	2.2	1	9.2	1.7	24	
21	1.9	2.3	5	1.9	1.9	3.6	3.2	4.6	8.3	5.6	6	13	5.6	5.5	6.9	8.3	9.1	9.6	8	7	6.5	5.7	6	5.8	13	5.9	24	
22	6.1	5	6.6	6.7	6.3	5.6	5.6	3.2	3.4	3.1	1.4	1.1	1.1	1	0.5	0.7	1.8	2	2.1	1.3	1.2	1	1	1.6	6.7	2.8	24	
23	5	1.2	1.6	1.7	1.8	2.2	2.2	3.7	12.9	11.3	8.3	5.9	4.4	2.2	1.9	2.4	3.1	3	10.4	4.6	9.7	16.3	18.2	5	18.2	5.9	24	
24	12.8	7	7.4	8	6.3	2.8	0.9	0.7	0.6	0.7	8.9	0.7	0.6	0.9	0.9	1.1	0.6	0.9	1.1	1.9	1.5	2	5	2.2	12.8	3.1	24	
25	2.8	2.8	2.3	2.2	1.8	2	1.3	1.7	2.2	3.3	3.2	2.4	0.8	0.3	0.3	0	0	0	0	0	0	0	5	1	1.1	3.3	1.4	24
26	2	1.8	1.8	1.8	1.8	1.6	1.2	1.4	1.5	2	0.9	1.4	1.2	1.7	1.8	3.4	4	7.9	6	9.1	5	8	6.1	6.9	9.1	3.3	24	
27	7.8	7.4	4	2.1	2	1.9	2.9	3.8	3.8	3.1	2.7	1.9	1.5	2	2.3	2.1	1.5	1.2	1	5	2.9	3.4	2.4	2.9	7.8	2.9	24	
28	3.1	2.9	2.5	2.3	1.9	1.9	2	1.6	1.9	1.9	1.6	1.4	1.4	1.3	1.1	1.3	2.1	2.1	5	2	3.4	2	2	1.8	3.4	2.0	24	
29	2	2.9	3.9	2.7	2	2.2	4.5	6.2	6.8	5.5	5.2	4.4	4.4	3.8	3.7	4.1	4.4	5	4.5	5.2	7.3	12.7	17	18.6	18.6	5.8	24	
30	14.8	11.8	7.3	4.8	4.3	4	3.3	3.8	3	2.7	3.2	2.5	4	4.1	6	7.7	5	6.5	5.9	5.2	4.9	3.9	4	3.7	14.8	5.3	24	
31	3.7	4	3.1	2.8	1.8	2.2	2.7	2.9	2	1.4	1	1	0.9	1	1.2	5	1.9	2.9	2.4	3.1	3	3.2	3.8	3.8	4	2.4	24	
HOURLY MAX	33	32	32	27	16	12	11	10	15	11	11	27	9	10	17	18	23	27	32	29	36	30	31	31				
HOURLY AVG	6.4	5.9	5.5	5.0	4.1	3.6	3.7	3.8	4.9	4.4	4.1	5.1	3.4	3.7	3.7	4.4	5.4	5.7	6.5	6.0	7.3	6.9	7.0	6.1				

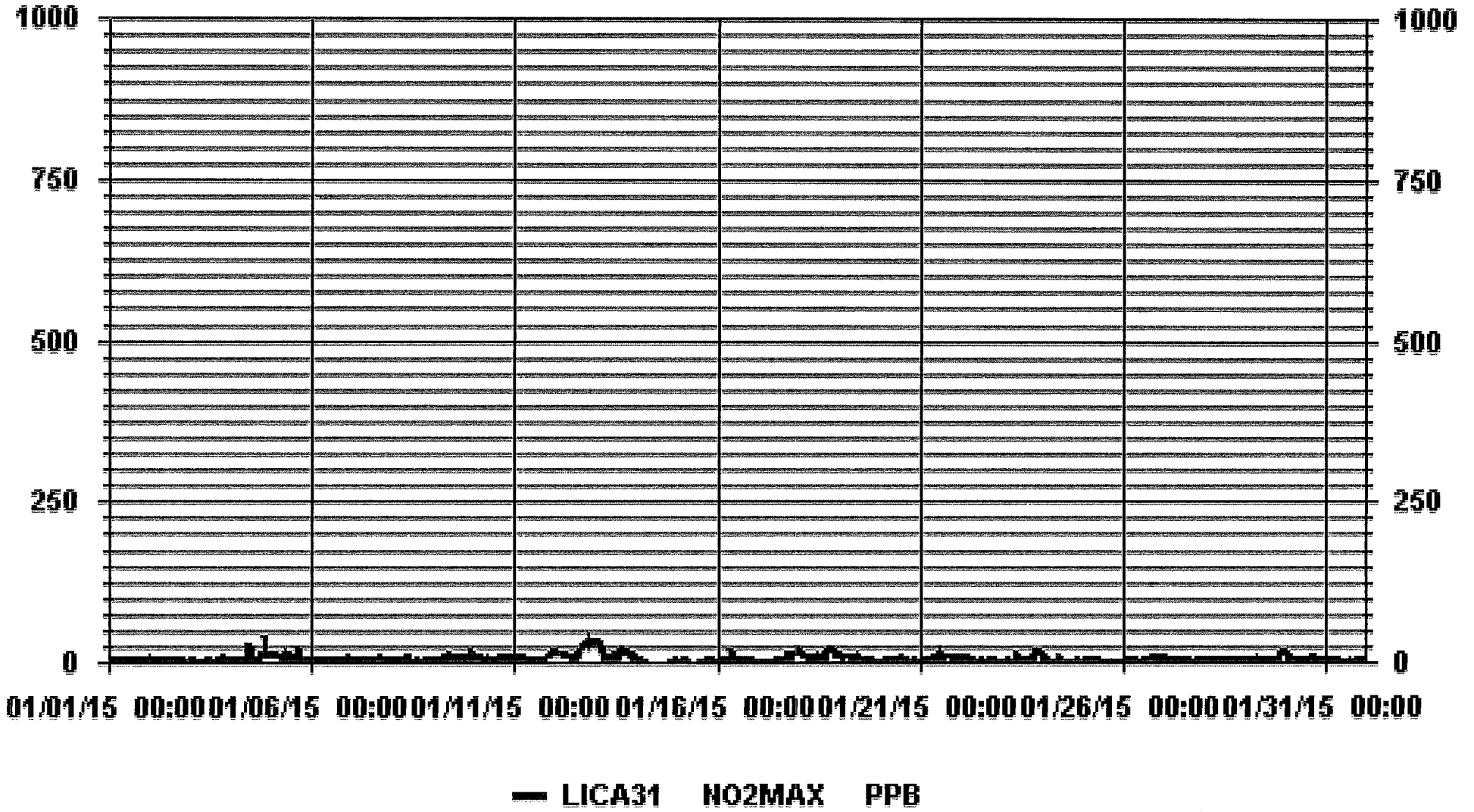
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	686
MAXIMUM INSTANTANEOUS VALUE:	35.7 PPB @ HOUR(S) 20 ON DAY(S) 4
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	18 HRS
STANDARD DEVIATION:	5.48
OPERATIONAL TIME:	742 HRS

01 Hour Averages



LICA31
 NO2_ / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 31
 Site Name : LICA31
 Parameter : NO2_
 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	
< 50.0	2.45	3.61	4.62	2.89	1.44	.57	1.30	3.61	9.53	11.70	11.70	16.76	8.67	9.24	8.81	3.03	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	2.45	3.61	4.62	2.89	1.44	.57	1.30	3.61	9.53	11.70	11.70	16.76	8.67	9.24	8.81	3.03	

Calm : .00 %

Total # Operational Hours : 692

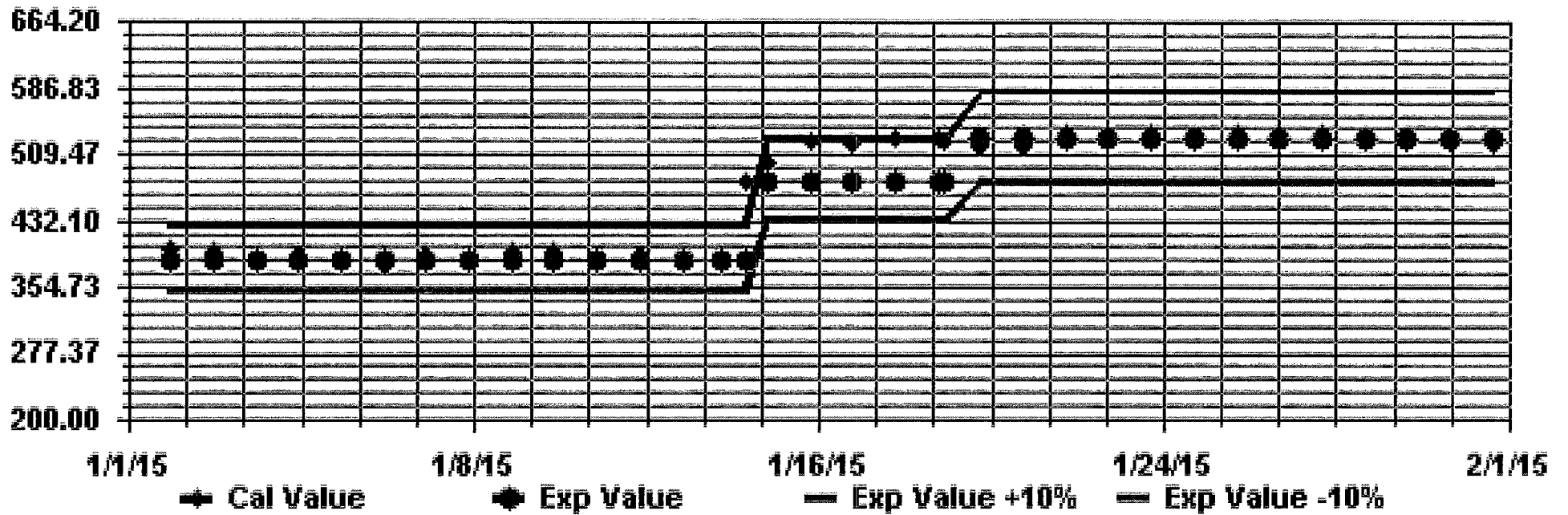
Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 50.0	17	25	32	20	10	4	9	25	66	81	81	116	60	64	61	21	692
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	17	25	32	20	10	4	9	25	66	81	81	116	60	64	61	21	

Calm : .00 %

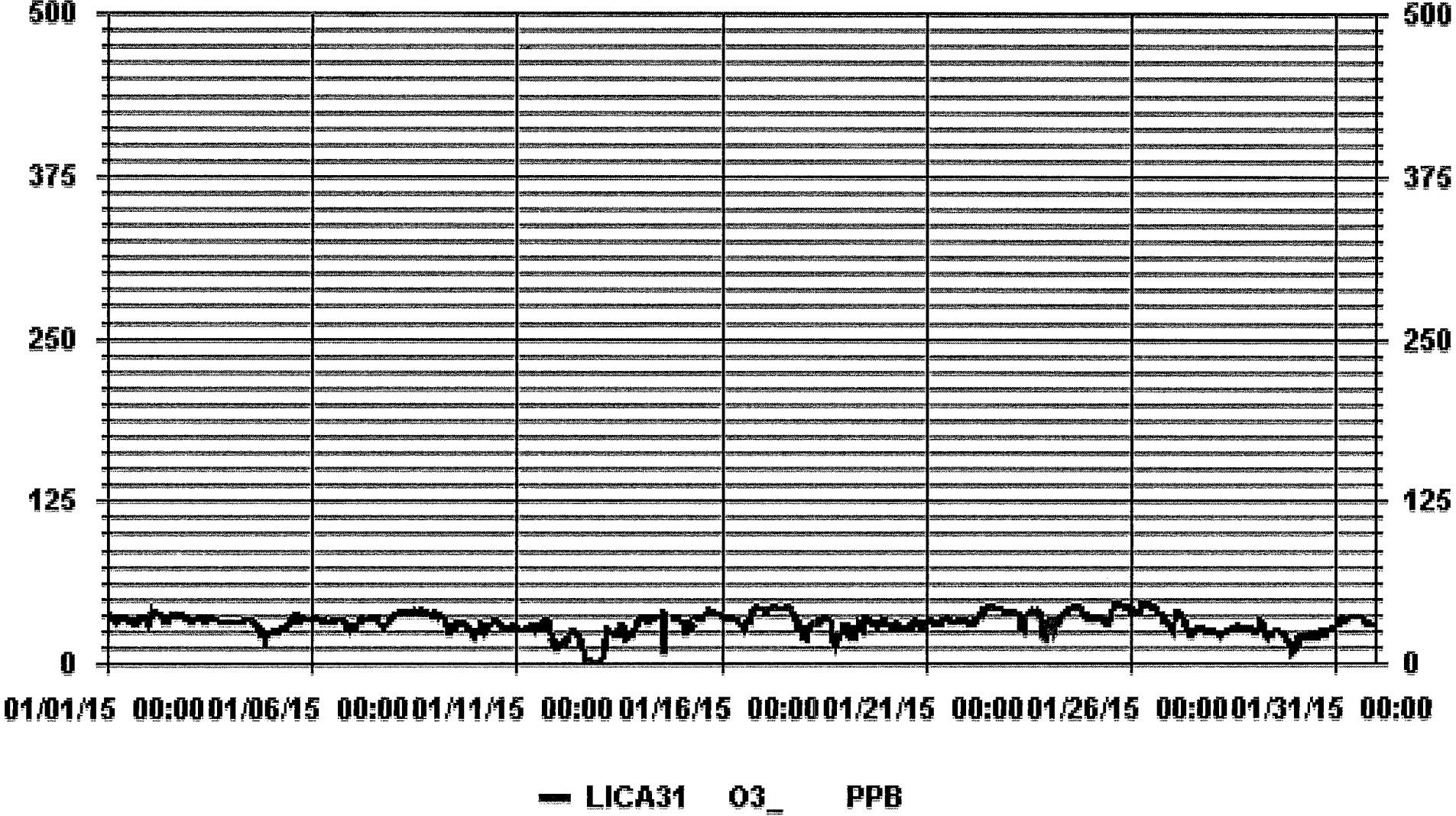
Total # Operational Hours : 692

Calibration Graph for Site: LICA31 Parameter: NO2_ Sequence: NO2 Phase: SPAN



OZONE

01 Hour Averages





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - JANUARY 2015

JOB # 2833-2015-01-31- C

OZONE 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.	RDGS.	
1	39	39	39	39	36	34	35	35	36	36	35	34	33	33	33	33	32	32	35	34	35	35	S	34	39	35.0	24	
2	31	39	41	40	39	40	40	38	38	37	36	33	36	37	38	38	38	38	37	37	37	S	35	35	41	37.3	24	
3	34	34	33	35	35	35	35	35	35	34	34	34	34	34	34	34	34	34	33	33	S	32	32	31	35	33.8	24	
4	31	31	32	32	31	32	31	32	33	33	34	34	34	34	34	32	32	31	29	26	S	18	23	23	26	34	30.2	24
5	24	24	27	25	24	25	29	31	29	28	30	33	35	38	39	38	37	34	S	35	34	34	34	34	39	31.3	24	
6	34	34	34	34	34	33	33	32	32	32	32	33	33	33	33	S	33	34	33	31	27	29	34	34	32.5	24		
7	29	28	32	33	34	35	35	35	33	33	34	35	35	35	35	34	S	32	28	30	31	34	35	35	35	33.0	24	
8	37	38	38	38	38	39	39	40	39	39	41	41	41	41	41	S	40	40	40	40	40	39	38	38	41	39.3	24	
9	39	38	37	38	38	37	36	32	26	25	27	29	32	32	S	32	32	31	30	30	28	27	27	23	39	31.6	24	
10	25	25	28	33	33	25	26	30	29	33	33	33	32	S	32	33	29	27	28	28	28	28	28	28	33	29.3	24	
11	27	27	26	25	26	27	27	27	29	30	29	31	S	30	30	30	30	35	34	29	24	20	16	13	35	27.0	24	
12	13	13	14	15	16	18	20	24	25	26	27	S	24	22	19	14	9	4	1	4	1	1	1	1	27	13.6	24	
13	1	1	7	16	24	27	26	25	25	S	24	28	30	29	28	21	22	22	23	28	27	30	33	33	22.7	24		
14	35	36	35	35	35	34	36	S	S	36	37	36	37	38	38	38	C	C	C	C	C	35	34	35	38	35.9	24	
15	34	35	34	26	31	31	31	30	S	37	37	36	36	35	37	40	42	42	41	39	39	39	37	38	42	36.0	24	
16	38	38	37	36	35	35	34	S	34	33	33	32	31	28	30	32	32	38	42	42	43	43	43	42	43	36.1	24	
17	42	41	41	41	41	41	S	42	42	43	43	43	43	43	43	43	42	42	42	38	38	30	29	28	43	40.0	24	
18	23	22	28	28	31	S	31	31	31	33	33	34	35	36	35	35	35	27	21	17	18	23	26	30	36	28.8	24	
19	31	28	33	29	S	20	28	29	33	33	30	35	37	37	35	34	33	32	31	31	30	33	35	34	37	31.8	24	
20	34	33	31	S	33	32	32	32	30	29	28	27	28	29	29	30	33	33	33	33	31	30	31	34	37	30.9	24	
21	32	32	S	32	32	32	31	31	31	32	33	36	37	36	34	34	32	32	33	34	34	34	34	34	35	37	33.2	24
22	34	S	31	31	34	34	36	37	37	40	42	43	43	44	44	44	43	43	42	42	42	42	41	40	44	39.5	24	
23	S	41	40	39	38	38	37	38	34	30	36	37	40	41	42	42	40	40	39	38	38	26	21	S	42	37.0	24	
24	30	36	34	27	30	33	34	36	38	39	39	40	41	42	43	44	44	44	43	43	41	40	S	37	44	38.2	24	
25	34	34	35	34	35	34	35	35	33	32	32	34	37	41	44	46	46	46	46	45	45	S	44	44	46	38.7	24	
26	42	41	41	40	40	43	45	45	45	44	44	45	45	45	44	42	41	39	38	35	S	32	32	30	45	40.8	24	
27	29	36	40	40	39	39	37	34	34	30	25	23	25	26	26	26	26	27	27	S	26	25	25	25	40	30.0	24	
28	25	24	24	24	23	22	24	24	26	25	26	26	26	28	29	29	29	26	S	27	27	27	26	26	29	25.8	24	
29	26	25	31	35	35	33	30	23	20	21	22	23	24	25	26	26	25	S	23	22	20	16	11	11	35	24.0	24	
30	11	15	22	22	22	22	22	21	21	24	24	22	19	25	25	26	S	24	24	25	26	27	28	30	30	22.9	24	
31	30	32	32	34	35	35	34	S	S	35	35	35	35	35	35	S	34	33	32	31	30	30	30	29	35	32.9	24	
HOURLY MAX	42	41	41	41	41	43	45	45	44	44	45	45	45	44	46	46	46	46	46	46	45	45	43	44	44			
HOURLY AVG	29.8	30.7	31.9	31.9	32.6	32.2	32.3	32.3	32.1	32.5	33.0	33.4	33.8	34.4	34.5	34.1	33.6	33.1	32.3	32.1	31.0	29.8	29.4	30.2				

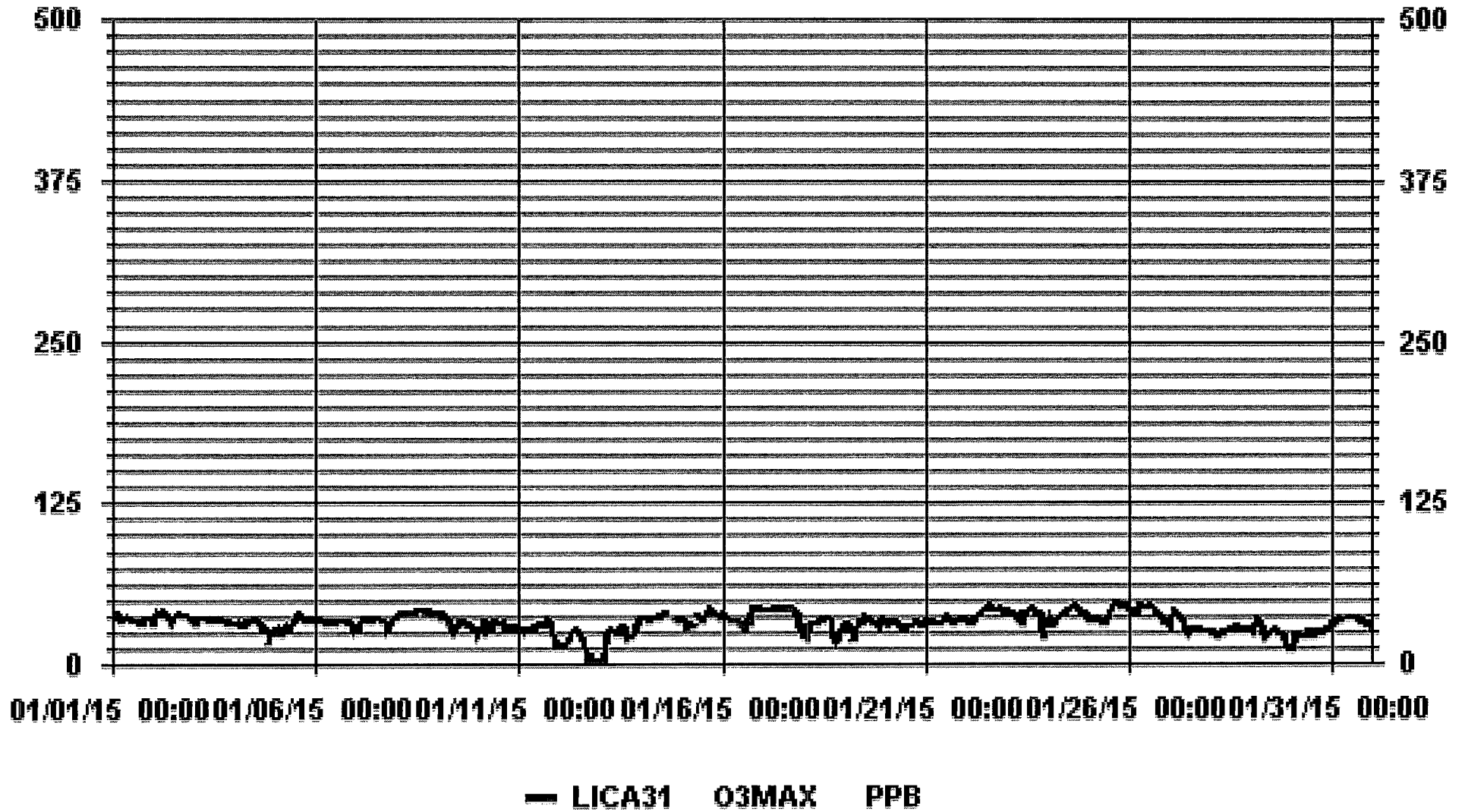
STATUS FLAG CODES

C	- CALIBRATION	Q	- QUANTITY 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:	704				
MAXIMUM INSTANTANEOUS VALUE:	46	PPB	@ HOUR(S)	VAR	ON DAY(S) 25
				VAR-VARIOUS	
IZS CALIBRATION TIME:	35	HRS	OPERATIONAL TIME:	744	HRS
MONTHLY CALIBRATION TIME:	5	HRS			
STANDARD DEVIATION:	7.43				

01 Hour Averages



LICA31
 O3_ / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 31
 Site Name : LICA31
 Parameter : O3_
 Units : PPB

Wind Parameter : WDR
 Instrument Height : 10 Meters

		Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq	
< 50	2.41	3.54	4.53	3.40	1.27	.56	1.27	3.54	9.36	11.48	11.48	17.30	8.93	9.21	8.65	2.97	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	2.41	3.54	4.53	3.40	1.27	.56	1.27	3.54	9.36	11.48	11.48	17.30	8.93	9.21	8.65	2.97		

Calm : .00 %

Total # Operational Hours : 705

Distribution By Samples

		Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq	
< 50	17	25	32	24	9	4	9	25	66	81	81	122	63	65	61	21	705	
< 110																		
< 210																		
>= 210																		
Totals	17	25	32	24	9	4	9	25	66	81	81	122	63	65	61	21		

Calm : .00 %





Total # Operational Hours : 705

Logger : 31 Parameter : O3_

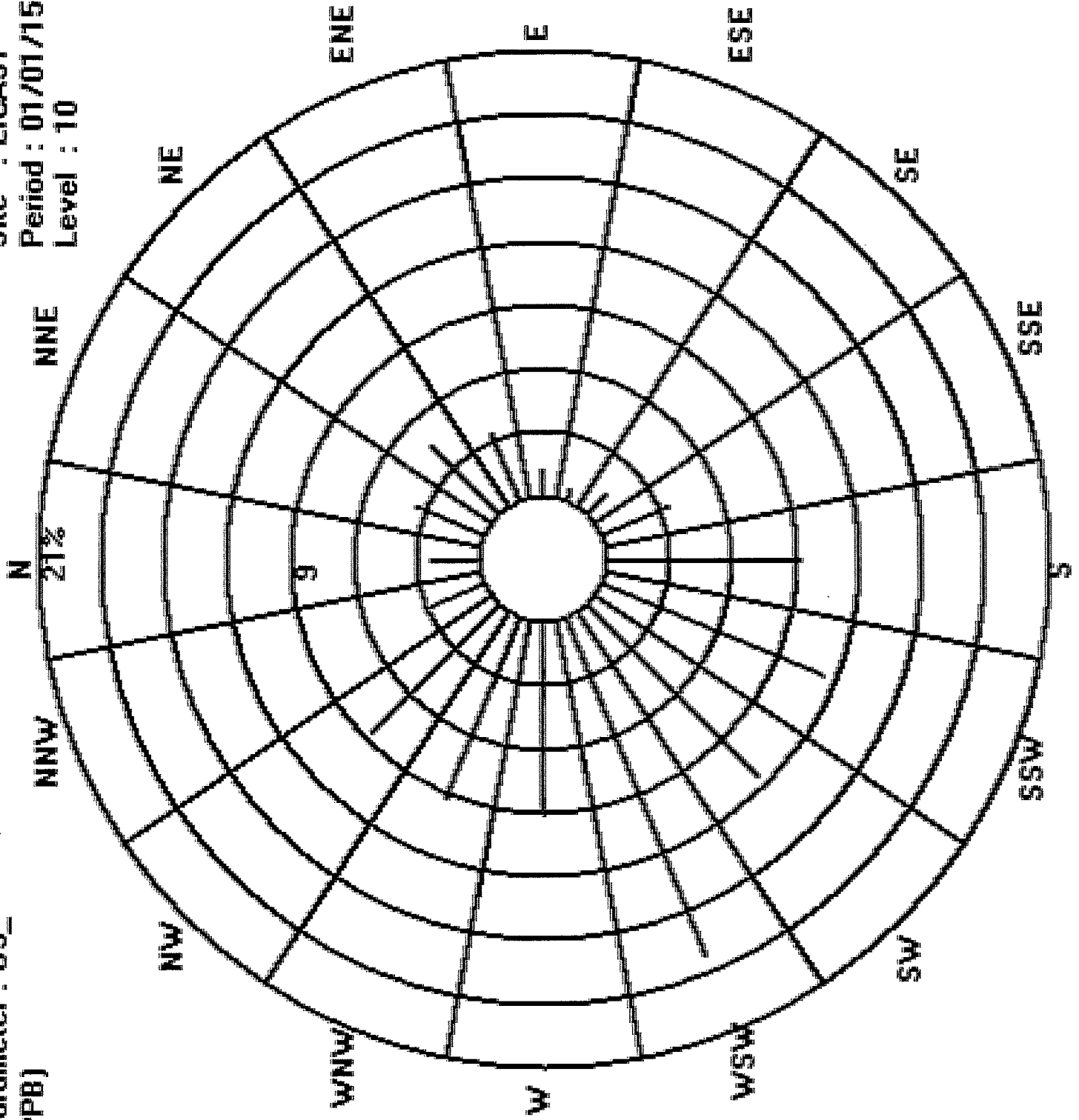
Site : LICA31

Class Limits (PPB)

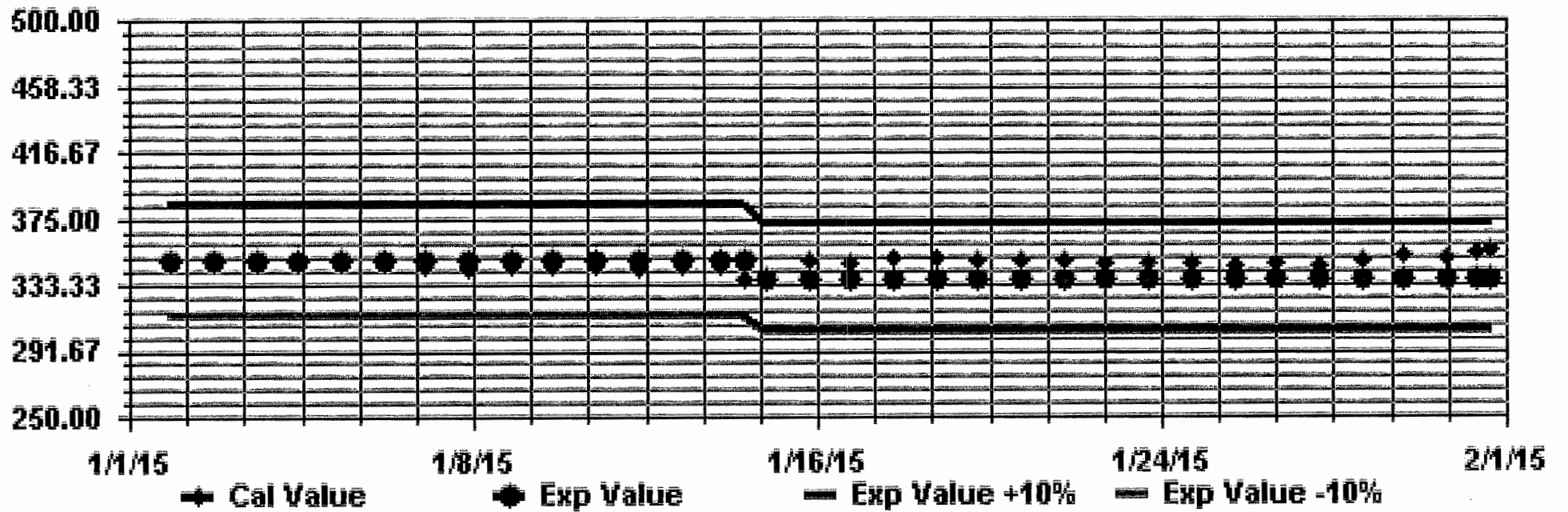
Period : 01/01/15-01/31/15

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

Level : 10



Calibration Graph for Site: LICA31 Parameter: O3_ Sequence: 03 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	DAILY MAX.	24-HOUR AVG.	RDGS.	
1	9	7	6	2	4	7	6	3	2	6	3	5	7	10	6	5	5	4	3	0	4	5	1	6	10	4.8	24	
2	8	5	3	6	3	5	2	5	7	8	12	3	2	8	X	4	11	1	7	3	12	5	0	4	12	5.4	23	
3	3	0	12	4	5	1	12	6	5	6	2	10	6	9	2	5	5	9	8	4	8	9	9	6	12	6.1	24	
4	5	9	9	12	8	10	9	11	8	10	6	8	6	9	12	8	14	11	21	21	25	16	17	14	25	11.6	24	
5	11	12	11	15	14	12	12	11	7	9	20	12	8	7	3	4	9	1	7	10	7	6	7	14	20	9.5	24	
6	11	5	7	4	8	5	X	1	4	11	4	3	5	6	7	0	13	15	15	7	11	8	9	9	15	7.3	23	
7	9	11	9	6	7	1	6	4	8	11	5	9	0	2	7	9	12	13	12	3	10	8	3	1	13	6.9	24	
8	6	9	5	7	11	8	9	6	0	5	6	6	5	4	11	5	4	0	9	X	X	3	7	4	11	5.9	22	
9	8	10	5	7	6	5	9	13	27	26	7	9	8	10	11	9	5	7	8	10	11	0	10	25	27	10.3	24	
10	16	5	9	0	4	11	19	3	8	3	15	5	10	5	6	10	13	15	8	17	8	17	5	16	19	9.5	24	
11	11	10	15	15	11	7	4	11	12	16	11	2	11	12	9	13	15	19	15	17	14	14	27	18	27	12.9	24	
12	21	21	18	16	19	25	27	33	18	20	19	23	28	31	29	30	29	30	39	31	31	35	35	30	39	26.6	24	
13	28	23	25	19	15	10	11	11	11	9	16	16	16	13	12	12	9	19	14	17	13	11	9	7	28	14.4	24	
14	6	0	0	3	7	5	5	2	2	5	1	5	13	18	2	5	3	4	8	5	X	9	4	14	18	5.5	23	
15	15	11	5	3	12	6	5	9	3	2	0	5	C	0	0	0	4	7	2	0	4	12	2	8	15	5.0	24	
16	13	7	9	9	15	11	13	12	11	13	15	23	21	19	17	11	10	2	12	1	3	9	8	6	23	11.3	24	
17	0	7	1	4	8	11	7	3	7	6	1	4	4	10	10	5	4	3	5	4	6	8	10	13	13	5.9	24	
18	13	14	15	16	16	14	8	12	15	12	15	9	12	10	8	14	8	18	13	15	13	14	12	11	18	12.8	24	
19	16	15	17	21	16	17	23	21	18	20	17	11	11	9	10	6	6	2	2	5	9	3	11	8	23	12.3	24	
20	5	8	8	6	9	8	1	7	8	1	4	7	6	8	7	6	6	5	8	6	13	4	4	9	13	6.4	24	
21	4	5	7	12	10	12	11	13	11	13	11	15	14	14	8	7	3	8	8	3	12	2	8	7	15	9.1	24	
22	8	10	10	10	10	16	12	4	3	5	4	2	8	5	8	6	7	3	5	6	9	7	12	7	16	7.4	24	
23	6	11	7	6	5	6	4	11	10	18	14	6	7	2	0	9	9	3	10	7	6	10	13	12	18	8.0	24	
24	12	13	14	13	13	8	5	5	9	13	8	6	9	12	10	7	14	1	6	7	4	10	5	3	14	8.6	24	
25	7	5	12	5	5	3	12	7	3	7	11	C	C	C	X	X	X	X	X	X	X	X	X	X	12	7.0	14	
26	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
27	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
28	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
29	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
30	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
31	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HOURLY MAX	28	23	25	21	19	25	27	33	27	26	20	23	28	31	29	30	29	30	39	31	31	35	35	30				
HOURLY AVG	10.0	9.3	9.6	8.8	9.6	9.0	9.7	9.0	8.7	10.2	9.1	8.5	9.4	9.7	8.5	7.9	9.1	8.3	10.2	8.7	10.6	9.4	9.5	10.5				

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

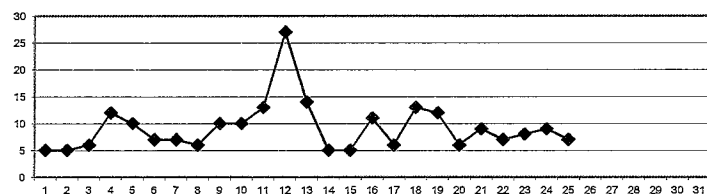
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 24-HR: 30 ug/m3

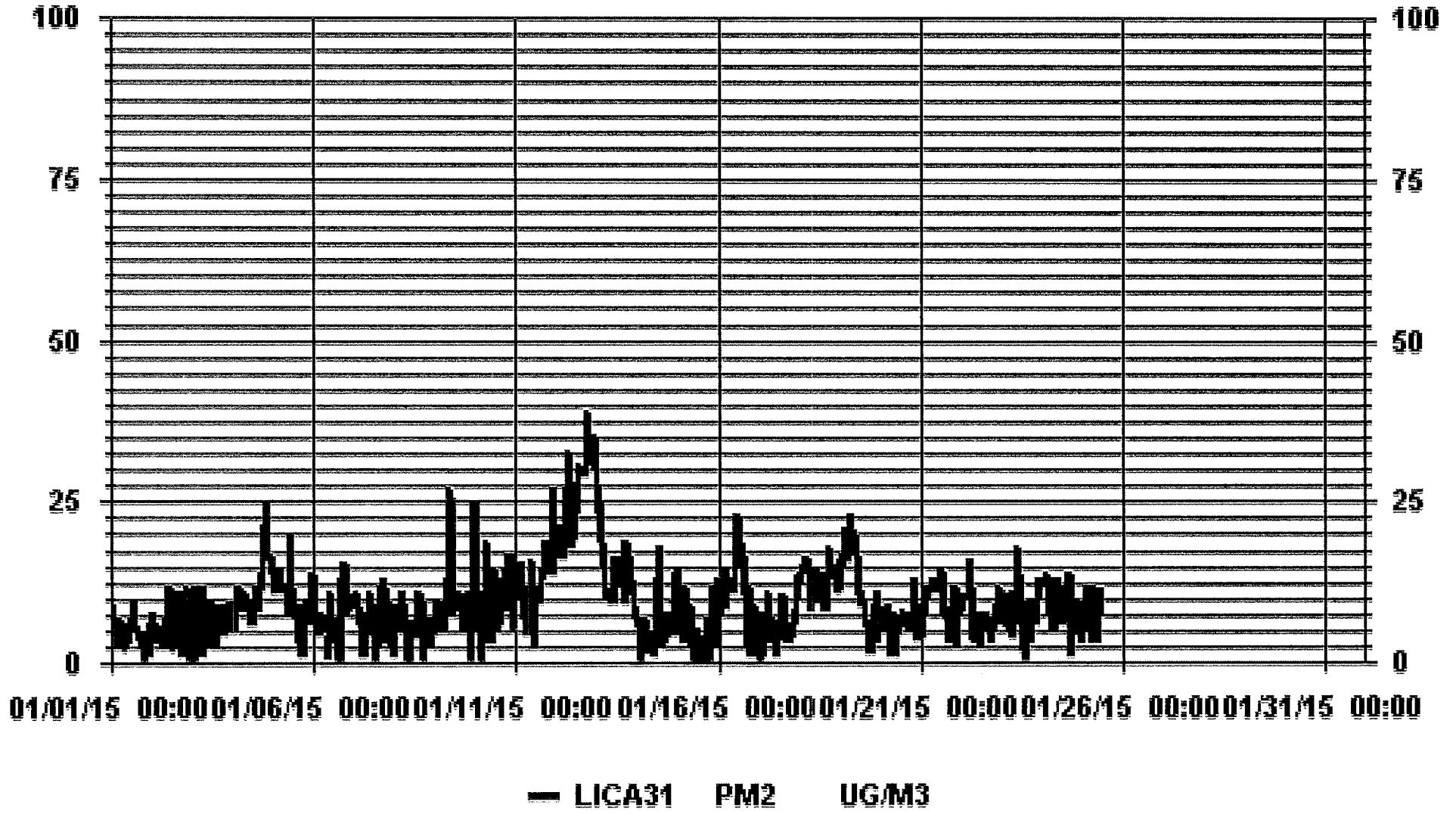
MONTHLY SUMMARY

NUMBER OF 24-HR EXCEEDENCES:	0		
NUMBER OF NON-ZERO READINGS:	563		
MAXIMUM 1-HR AVERAGE:	39 ug/m3	@ HOUR(S)	18 ON DAY(S)
MAXIMUM 24-HR AVERAGE:	26.6 ug/m3		12 ON DAY(S)
			VAR-VARIOUS
MONTHLY CAUBRATION TIME:	4 HRS	OPERATIONAL TIME:	585 HRS
STANDARD DEVIATION:	6.25	AMD OPERATION UPTIME:	78.6 %
		MONTHLY AVERAGE:	9.3 ug/m3

24 HOUR AVERAGES FOR JANUARY 2015



01 Hour Averages



LICA31
 PM2 / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 31
 Site Name : LICA31
 Parameter : PM2
 Units : UG/M3

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	
< 30	1.72	1.89	2.23	2.92	.86	.68	1.20	2.92	10.32	11.87	11.01	20.30	8.95	11.01	8.26	2.06	98.27
< 60	.00	.00	.00	.00	.00	.00	.00	.00	.17	.68	.86	.00	.00	.00	.00	.00	1.72
< 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	1.72	1.89	2.23	2.92	.86	.68	1.20	2.92	10.49	12.56	11.87	20.30	8.95	11.01	8.26	2.06	

Calm : .00 %

Total # Operational Hours : 581

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 30	10	11	13	17	5	4	7	17	60	69	64	118	52	64	48	12	571
< 60									1	4	5						10
< 80																	
< 120																	
< 240																	
>= 240																	
Totals	10	11	13	17	5	4	7	17	61	73	69	118	52	64	48	12	

Calm : .00 %

Total # Operational Hours : 581

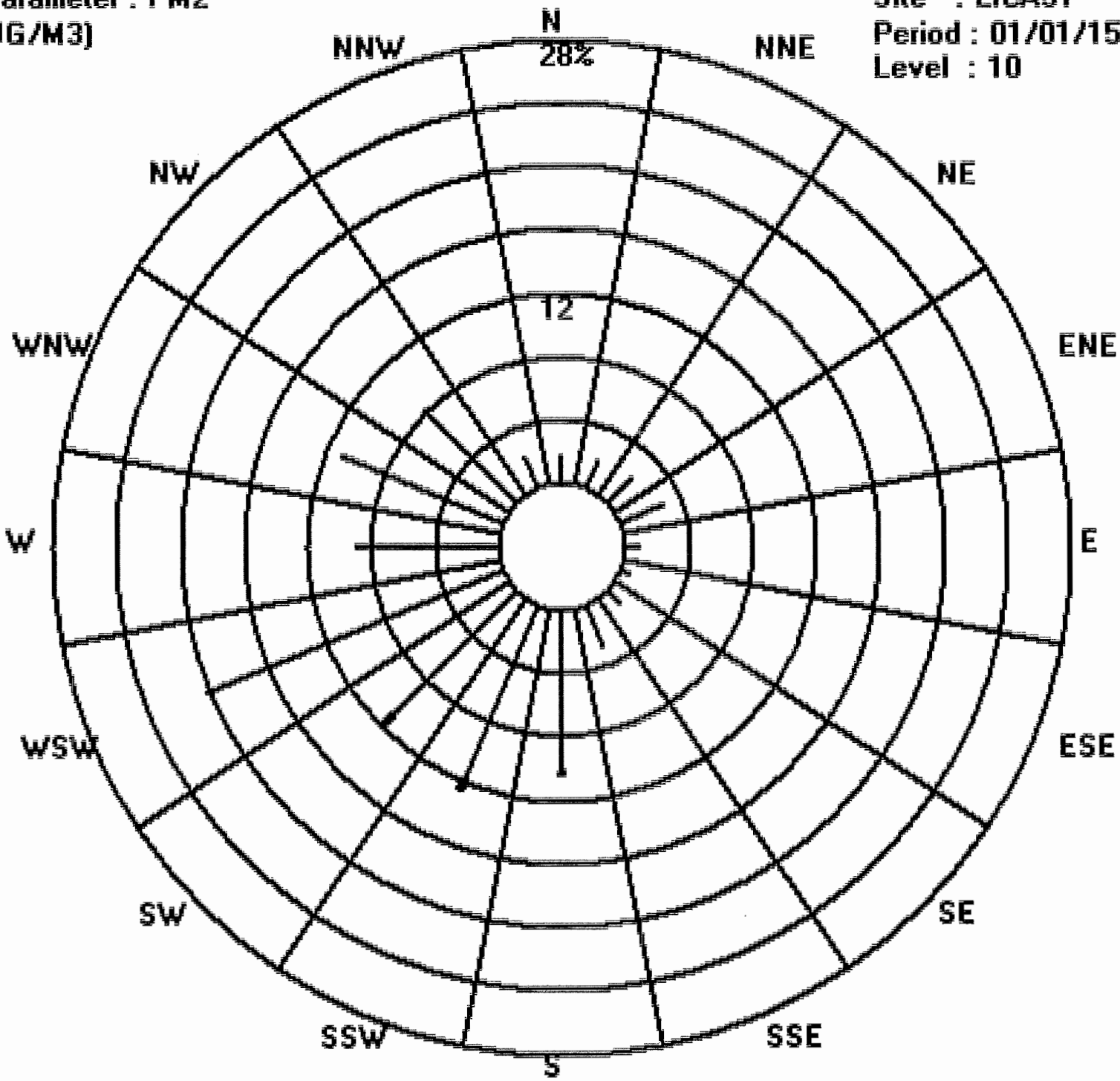
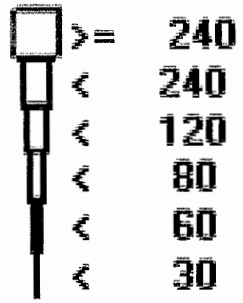
Logger : 31 Parameter : PM2

Site : LICA31

Class Limits (UG/M3)

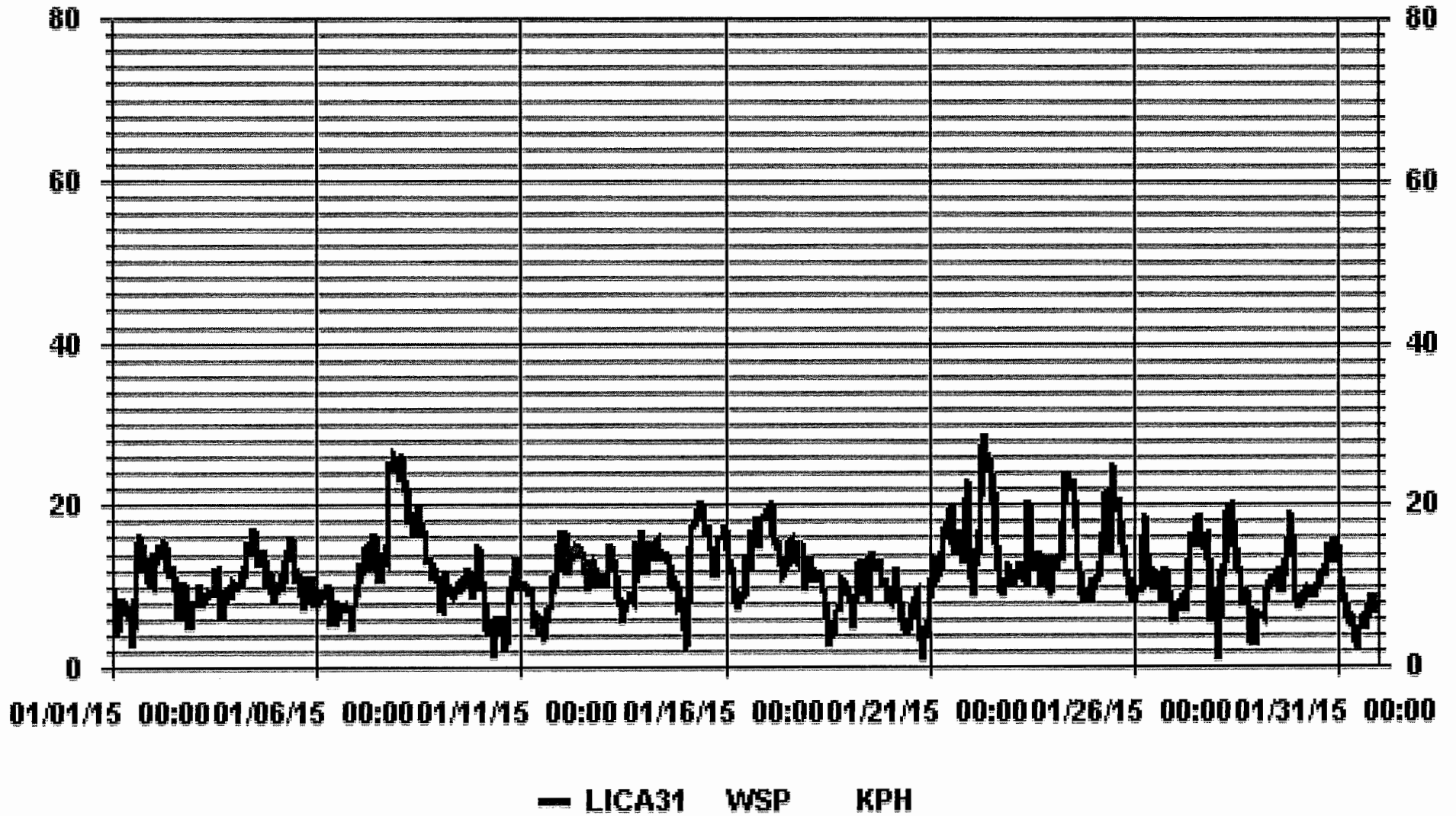
Period : 01/01/15-01/31/15

Level : 10



WIND SPEED

01 Hour Averages





VECTOR WIND SPEED MAX instantaneous maximum in km/hr

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	DAILY	24-HOUR	
DAY	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	0:00	MAX.	AVG.	RDGS.
1	1	23.6	19.0	14.3	11.3	14.0	16.4	21.1	18.3	17.9	18.3	15.4	13.0	14.4	17.4	36.5	31.9	37.1	33.8	40.6	31.8	30.5	24.6	23.8	23.3	40.6	22.8	24
2	2	31.4	30.1	27.5	27.2	30.9	32.2	32.2	34.0	28.7	24.1	25.9	28.5	25.3	30.5	29.2	19.7	16.8	18.4	25.1	30.0	16.2	19.5	28.9	17.7	34.0	26.3	24
3	3	18.7	18.6	16.2	21.4	18.4	22.5	23.6	18.2	18.1	19.5	18.4	22.5	26.9	25.4	19.0	17.5	15.5	16.6	19.9	17.0	17.2	19.8	18.6	21.2	26.9	19.6	24
4	4	22.1	21.9	21.0	23.1	25.1	24.4	22.2	20.9	29.9	21.8	28.4	27.8	23.8	21.0	19.9	30.8	20.4	21.0	20.3	18.4	19.4	25.1	21.0	12.4	30.8	22.6	24
5	5	11.8	12.0	21.6	24.9	22.5	20.8	25.3	25.3	24.5	27.1	22.5	21.8	26.1	25.7	26.1	23.4	19.5	17.5	23.9	23.4	21.9	21.5	21.0	17.1	27.1	22.0	24
6	6	16.0	15.8	18.0	26.5	21.2	19.9	17.5	21.1	18.8	12.1	15.1	13.6	19.8	16.0	16.9	18.2	16.4	15.3	14.0	14.9	19.5	14.7	13.4	17.3	26.5	17.2	24
7	7	22.6	22.1	23.7	20.6	23.2	28.5	33.0	30.8	29.1	30.0	36.8	33.5	34.0	27.5	22.8	21.0	23.7	44.5	60.3	51.5	50.2	52.1	57.4	58.1	60.3	34.9	24
8	8	56.7	52.4	67.9	64.1	48.0	52.3	39.6	48.3	44.4	35.0	42.4	39.6	42.7	42.7	34.8	39.1	33.9	27.3	25.8	26.7	25.8	22.3	15.3	15.5	67.9	39.3	24
9	9	20.1	17.5	12.9	16.4	16.4	17.7	13.3	13.1	15.7	17.1	17.6	20.4	21.5	19.3	22.2	21.6	16.4	18.2	17.7	19.3	19.3	24.5	31.5	25.8	31.5	19.0	24
10	10	31.4	33.3	25.8	23.6	63.0	79.0	84.3	72.2	80.8	76.4	19.9	25.0	15.6	9.5	37.5	66.7	7.0	10.5	11.8	15.1	15.1	22.9	20.5	20.1	84.3	36.1	24
11	11	18.0	20.1	21.3	18.9	19.2	20.8	23.0	15.9	26.0	12.8	8.3	15.8	10.3	15.1	54.1	14.7	18.8	16.4	13.8	25.6	25.8	25.8	32.4	31.2	54.1	21.0	24
12	12	34.6	32.0	36.6	28.8	27.1	27.1	29.3	30.2	26.3	26.1	23.4	23.0	21.1	20.0	16.9	16.4	18.4	17.6	16.7	16.2	12.6	14.5	14.5	14.7	36.6	22.7	24
13	13	14.9	13.2	15.8	18.2	27.9	31.0	19.3	17.6	19.7	17.4	9.6	10.4	11.7	17.2	15.7	13.5	16.1	12.8	14.5	20.1	33.7	25.6	28.7	38.7	38.7	19.3	24
14	14	23.2	20.3	30.0	23.6	24.0	21.2	30.6	26.6	23.3	24.7	24.2	22.9	33.1	27.8	31.2	33.5	20.1	17.0	16.2	15.1	15.0	14.6	15.8	14.8	33.5	22.9	24
15	15	13.1	12.2	23.2	29.1	35.7	32.6	38.7	48.5	40.0	41.3	44.1	44.6	40.1	42.8	43.5	33.6	39.7	24.6	23.6	27.0	32.1	33.6	36.3	39.1	48.5	34.1	24
16	16	37.1	34.1	33.6	29.7	26.8	25.3	19.4	20.9	23.3	16.8	15.4	19.4	27.8	20.3	20.3	46.0	43.7	44.6	46.2	49.2	31.7	47.0	44.2	41.6	49.2	31.9	24
17	17	45.5	52.7	33.7	32.5	33.2	30.8	41.7	35.4	30.6	22.9	19.0	22.7	20.7	20.5	25.5	25.1	24.9	24.9	21.0	21.8	26.4	21.4	19.4	13.5	52.7	27.7	24
18	18	17.0	17.9	18.1	16.1	14.6	21.2	21.3	23.5	23.1	20.7	24.2	18.6	16.2	14.0	13.1	13.9	14.1	19.2	18.1	18.1	15.1	16.5	18.3	18.7	24.2	18.0	24
19	19	14.3	15.3	19.8	17.0	47.2	13.6	25.5	27.2	27.0	18.8	19.0	22.1	19.2	23.6	22.7	22.7	29.9	28.8	28.4	25.3	23.4	20.1	21.8	20.9	47.2	23.1	24
20	20	18.6	24.8	27.6	25.3	32.3	21.8	20.3	16.5	14.6	14.0	10.9	13.1	14.0	13.7	19.6	26.4	23.3	26.8	15.9	14.6	11.3	13.3	13.7	16.8	32.3	18.7	24
21	21	18.4	24.5	30.4	30.1	25.3	26.0	27.9	28.8	32.3	32.8	37.8	38.4	39.3	41.1	31.2	31.5	30.3	29.2	35.9	44.5	30.4	36.7	35.4	35.9	44.5	32.3	24
22	22	24.3	21.4	16.4	23.6	24.9	36.3	40.7	50.5	56.0	51.2	46.4	64.8	65.0	54.0	59.7	51.2	33.9	22.7	13.3	15.3	17.5	16.2	17.3	18.6	65.0	35.1	24
23	23	17.5	17.4	15.5	15.1	18.8	19.4	19.0	22.9	17.3	18.6	47.3	34.3	26.7	27.4	22.6	26.2	25.4	17.9	14.2	16.4	17.0	20.1	17.9	17.3	47.3	21.3	24
24	24	22.1	22.8	20.1	21.0	25.6	26.4	41.6	57.1	62.4	53.6	59.3	57.5	55.3	47.5	39.4	31.7	28.6	17.4	13.5	12.4	12.4	12.5	13.5	20.1	62.4	32.2	24
25	25	20.1	18.4	23.2	25.1	30.7	32.6	32.0	41.5	38.3	22.9	47.9	56.9	49.7	52.6	67.0	50.4	42.2	36.1	37.0	26.7	25.4	18.9	15.3	12.2	67.0	34.3	24
26	26	12.5	14.2	14.4	14.5	19.9	29.3	35.9	22.9	18.6	19.5	17.5	17.8	14.9	16.4	17.1	19.0	11.3	14.8	17.0	15.7	13.3	14.4	12.3	9.6	35.9	17.2	24
27	27	12.5	16.2	21.6	16.1	18.4	17.7	14.7	19.2	29.1	32.8	33.7	30.2	35.9	40.0	42.4	32.3	28.6	33.4	31.4	28.0	27.0	17.0	22.9	24.2	42.4	26.1	24
28	28	26.2	10.7	13.5	17.4	17.4	33.0	41.3	47.4	42.1	36.4	42.3	33.0	27.0	25.2	26.4	18.3	19.3	21.5	21.6	19.5	15.8	X	58.3	12.2	58.3	27.2	23
29	29	15.3	14.4	19.4	16.3	15.8	18.2	23.6	23.0	23.9	24.6	25.8	25.5	29.0	27.7	26.3	26.5	27.9	22.0	25.7	27.7	24.0	20.4	15.0	18.5	29.0	22.4	24
30	30	14.4	21.6	24.1	17.6	22.0	27.5	27.5	28.1	29.9	25.7	21.1	26.4	29.4	24.9	25.0	24.9	28.0	29.0	30.3	29.5	29.7	34.0	31.7	32.1	34.0	26.4	24
31	31	29.0	24.8	27.4	20.5	18.5	13.2	25.7	16.4	78.6	X	52.8	43.6	16.0	17.0	16.0	12.7	27.6	16.7	17.6	13.0	18.2	18.2	20.4	78.6	24.2	23	
HOURLY MAX		56.7	52.7	67.9	64.1	63.0	79.0	84.3	72.2	80.8	76.4	59.3	64.8	65.0	54.0	67.0	66.7	43.7	44.6	60.3	51.5	50.2	52.1	58.3	58.1			
HOURLY AVG		22.7	22.3	23.7	23.1	26.1	27.1	29.4	29.8	31.9	27.2	28.1	28.6	27.5	26.6	29.1	27.8	24.5	23.1	23.6	23.6	22.2	22.9	24.3	22.6			

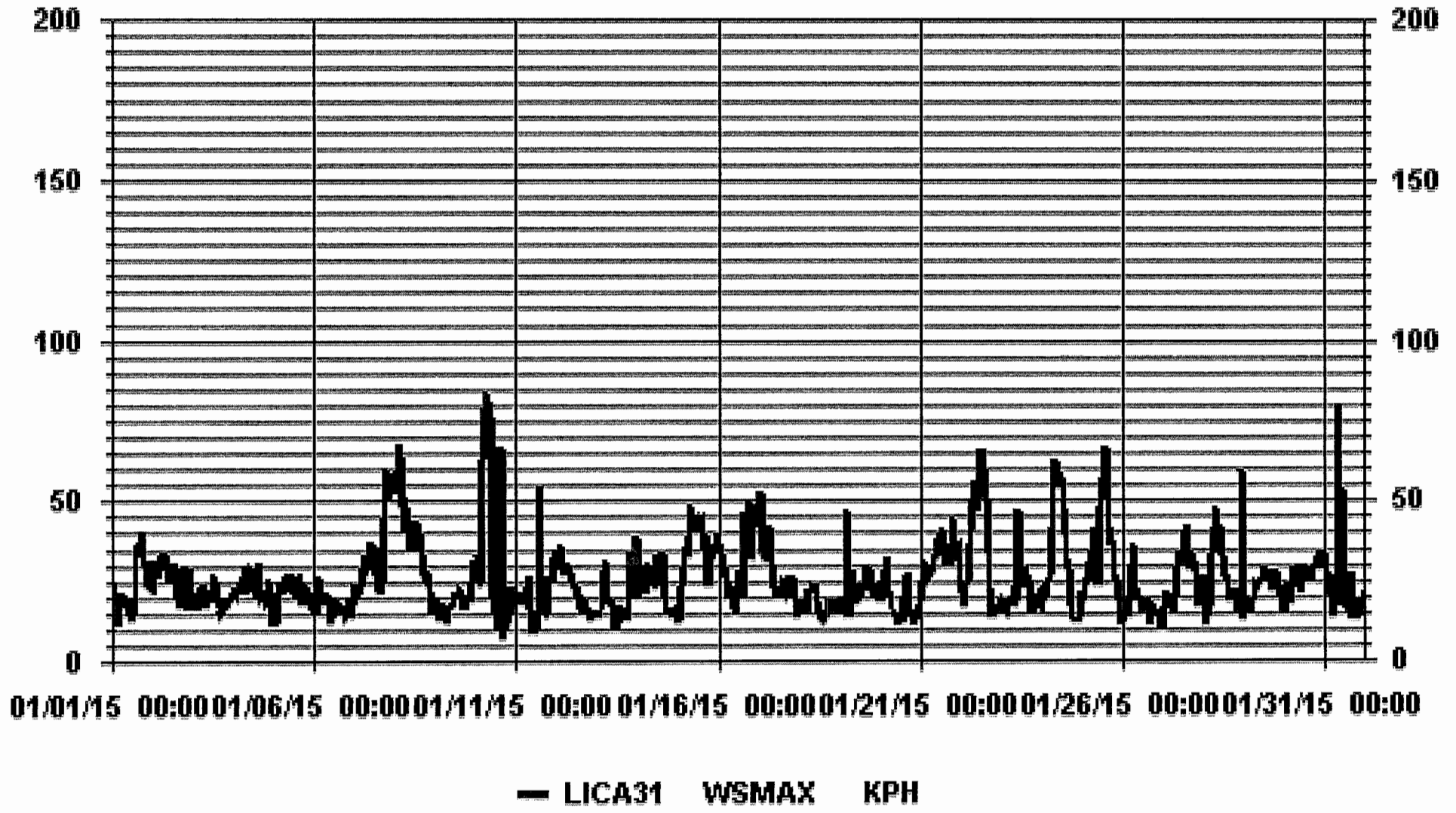
STATUS FLAG CODES

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

MAXIMUM INSTANTANEOUS VALUE:	84.3	KPH	@ HOUR(S)	6	ON DAY(S)	10	
VAR-VARIOUS							
OPERATIONAL TIME:						742	HRS

01 Hour Averages



LICA31
WSP / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 31
Site Name : LICA31
Parameter : WSP
Units : KPH

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	
< 6.0	.67	.40	.53	.53	.53	.26	.00	.13	.80	1.47	.13	.53	.80	.67	.94	.26	8.73
< 12.0	1.20	1.88	.80	1.34	.67	.13	.53	1.74	5.24	7.52	6.45	6.85	4.70	4.56	4.30	2.15	50.13
< 20.0	.53	1.34	3.09	1.47	.13	.13	.67	1.47	3.22	2.41	4.83	8.46	2.41	3.49	1.34	.40	35.48
< 29.0	.00	.00	.00	.13	.00	.00	.00	.00	.00	.26	.40	1.34	.67	.80	1.74	.00	5.37
< 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	2.41	3.62	4.43	3.49	1.34	.53	1.20	3.36	9.27	11.69	11.82	17.20	8.60	9.54	8.33	2.82	

Calm : .26 %

Total # Operational Hours : 744

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 6.0	5	3	4	4	4	2		1	6	11	1	4	6	5	7	2	65
< 12.0	9	14	6	10	5	1	4	13	39	56	48	51	35	34	32	16	373
< 20.0	4	10	23	11	1	1	5	11	24	18	36	63	18	26	10	3	264
< 29.0				1						2	3	10	5	6	13		40
< 39.0																	
>= 39.0																	
Totals	18	27	33	26	10	4	9	25	69	87	88	128	64	71	62	21	

Calm : .26 %

Total # Operational Hours : 744

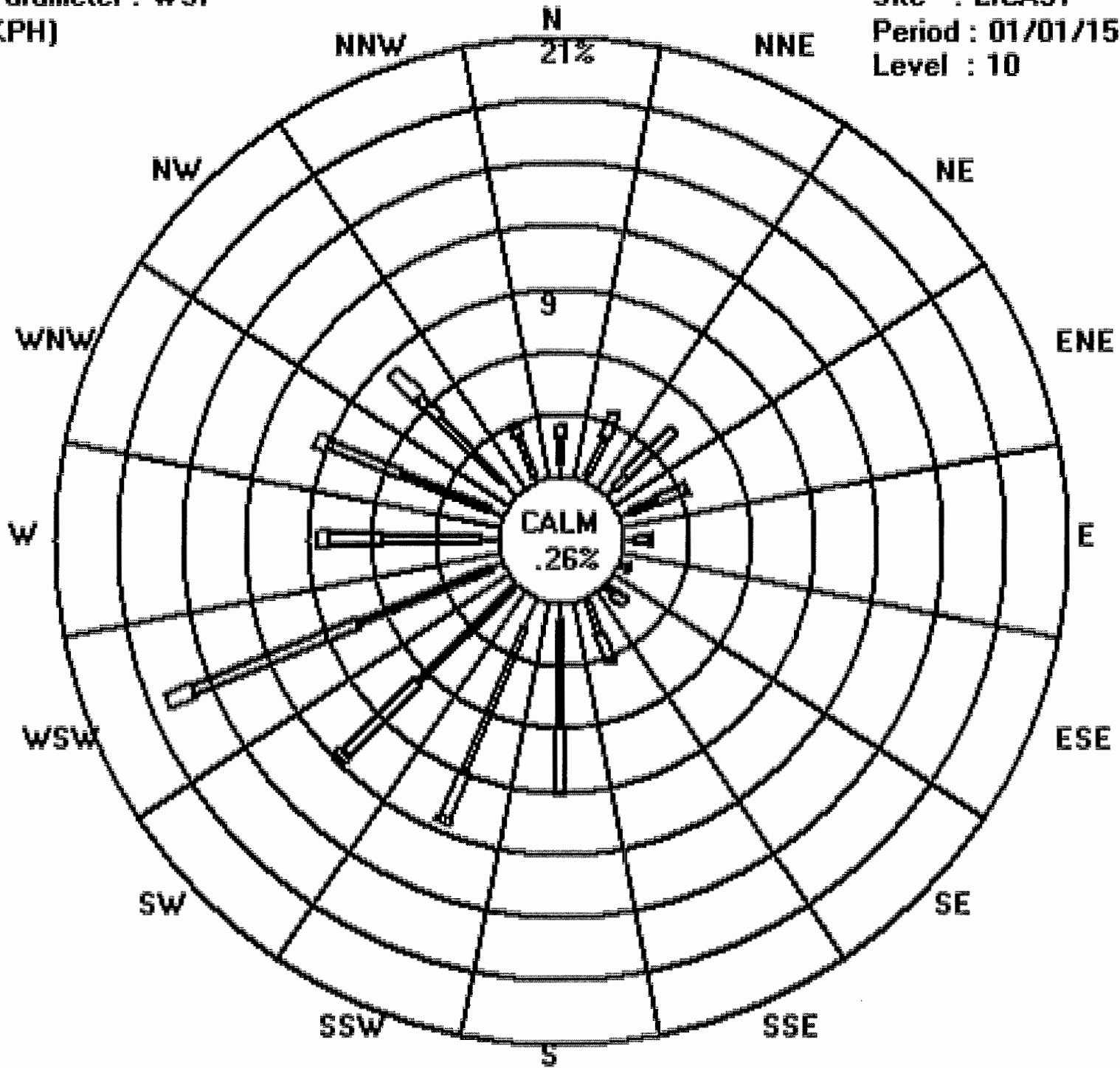
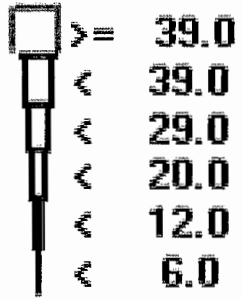
Logger : 31 Parameter : WSP

Site : LICA31

Class Limits (KPH)

Period : 01/01/15-01/31/15

Level : 10



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - JANUARY 2015

JOB # 2833-2015-01-31- C

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

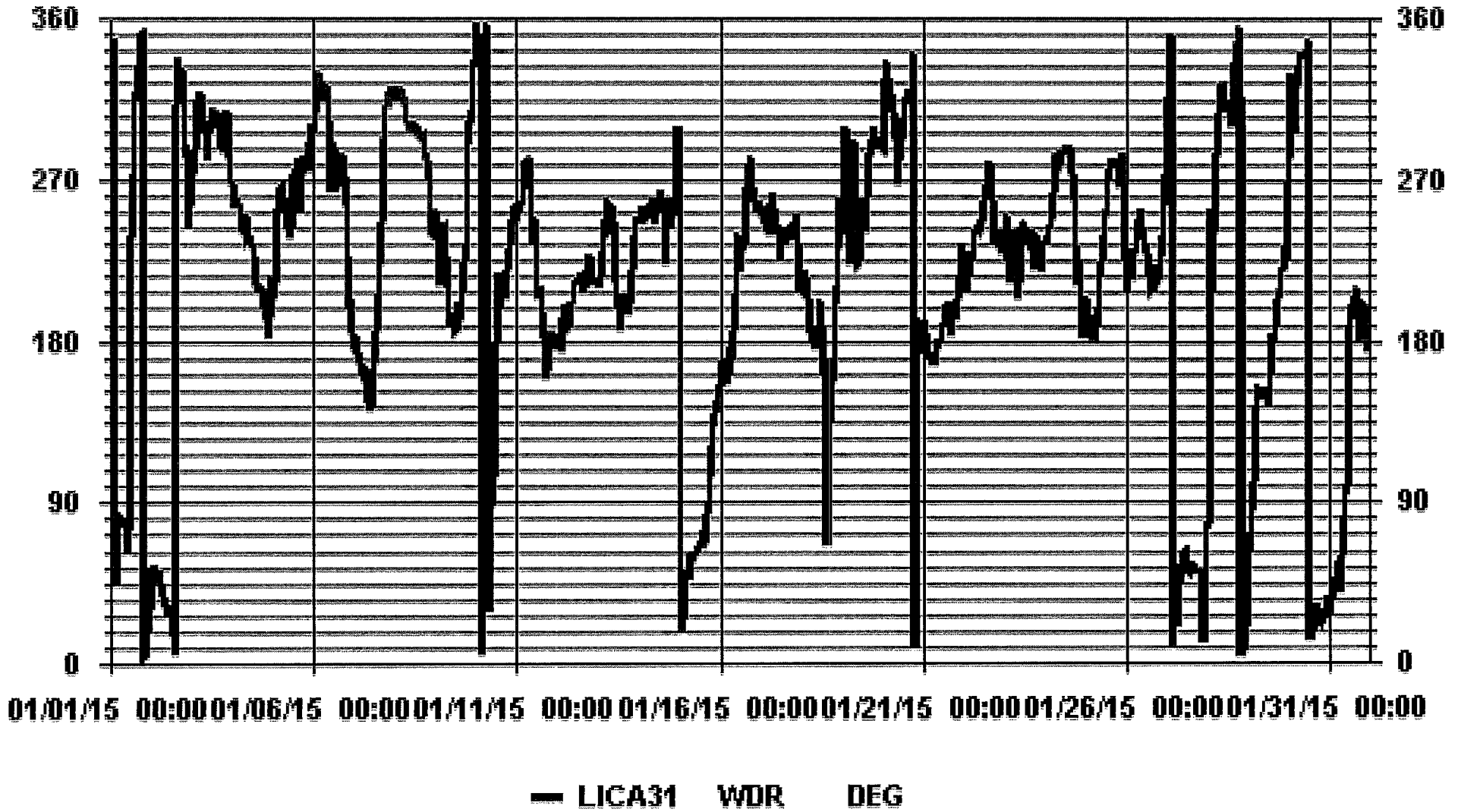
STATUS FLAG CODES

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

LAST CALIBRATION:	August 28, 2014
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	HRS	OPERATIONAL TIME:	744	HRS
STANDARD DEVIATION:	83.44		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	WSW	

01 Hour Averages



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Site - JANUARY 2015

JOB # 2833-2015-01-31- 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	13	13	16	13	11	13	11	11	12	13	10	27	23	12	13	13	14	16	19	15	13	13	11	12	12
2	12	12	13	12	11	12	11	12	13	12	12	12	15	15	15	16	15	11	13	16	14	13	10	6	6
3	12	12	13	12	13	12	13	13	12	13	12	14	15	15	14	12	11	13	11	11	10	11	13	11	11
4	11	7	10	9	9	7	5	5	8	5	5	6	6	7	5	6	5	4	5	6	6	7	6	8	8
5	5	5	10	7	10	10	8	6	5	5	5	9	15	16	15	13	13	12	13	13	12	13	13	13	13
6	13	12	12	13	12	11	11	11	12	12	19	16	16	18	15	13	10	10	10	6	13	6	5	8	8
7	9	9	8	9	10	10	10	12	13	13	13	14	14	13	10	8	9	15	13	13	14	13	14	14	14
8	13	14	13	14	15	14	14	14	13	14	14	13	13	15	15	14	14	13	12	13	12	6	4	5	5
9	8	8	8	4	4	5	5	3	5	6	8	9	10	8	8	7	6	3	5	13	11	11	11	12	12
10	10	18	14	15	19	30	28	13	41	35	18	15	16	5	26	12	5	3	3	3	4	4	5	6	6
11	4	6	8	7	11	13	14	16	13	10	6	14	9	11	16	10	9	9	8	10	12	10	11	10	10
12	11	11	12	12	10	10	10	11	10	10	7	8	7	6	6	8	7	6	3	4	3	4	3	3	3
13	3	4	4	3	6	9	4	4	8	7	4	7	7	11	11	8	7	6	8	9	9	7	7	6	6
14	6	6	9	6	7	5	8	8	9	8	6	9	13	13	12	12	8	6	8	5	5	7	10	11	11
15	17	23	8	11	10	10	10	11	11	11	11	11	12	11	11	11	11	11	12	13	14	14	14	13	13
16	13	14	13	13	14	14	16	15	13	11	9	10	8	6	7	11	14	16	16	15	12	13	11	11	11
17	11	11	8	6	7	8	12	13	11	11	11	11	7	6	7	7	7	5	6	6	6	8	7	8	8
18	5	4	4	4	5	6	6	6	7	8	8	8	11	29	31	10	15	9	5	9	5	4	6	8	8
19	9	18	20	49	20	5	14	19	12	10	7	12	14	8	9	12	15	15	15	13	15	15	15	15	15
20	16	21	15	14	14	12	13	13	15	15	18	17	15	15	16	15	13	15	17	16	28	21	17	19	19
21	11	11	13	12	11	11	9	10	10	10	11	10	11	10	11	9	13	9	12	13	10	9	7	7	7
22	7	8	9	7	9	9	8	8	8	7	7	9	13	15	15	16	14	13	8	8	5	7	5	8	8
23	6	9	7	4	5	4	5	6	7	7	7	9	9	8	7	8	8	6	3	5	6	6	13	8	8
24	6	6	8	7	8	13	15	16	16	15	15	16	16	15	16	16	14	10	7	8	6	5	8	10	10
25	9	11	12	10	11	11	10	10	8	7	8	10	12	16	17	16	16	15	15	14	14	14	10	8	8
26	10	6	12	6	8	7	9	9	11	12	8	6	8	10	6	7	7	6	6	6	6	4	8	9	9
27	11	12	12	12	10	10	12	10	10	11	11	12	10	11	11	12	11	10	10	12	11	19	17	12	12
28	43	64	14	6	8	15	14	16	15	14	14	14	16	16	14	14	18	13	12	12	19	31	5	5	5
29	7	7	11	13	15	12	12	11	12	12	14	14	12	13	15	13	12	8	9	5	5	5	7	12	12
30	11	14	15	16	15	16	18	16	16	16	19	16	15	12	13	13	13	13	12	12	12	12	13	11	11
31	11	12	12	13	13	12	14	11	24	33	33	36	23	20	15	13	14	14	8	6	7	11	8	10	10

STATUS FLAG CODES

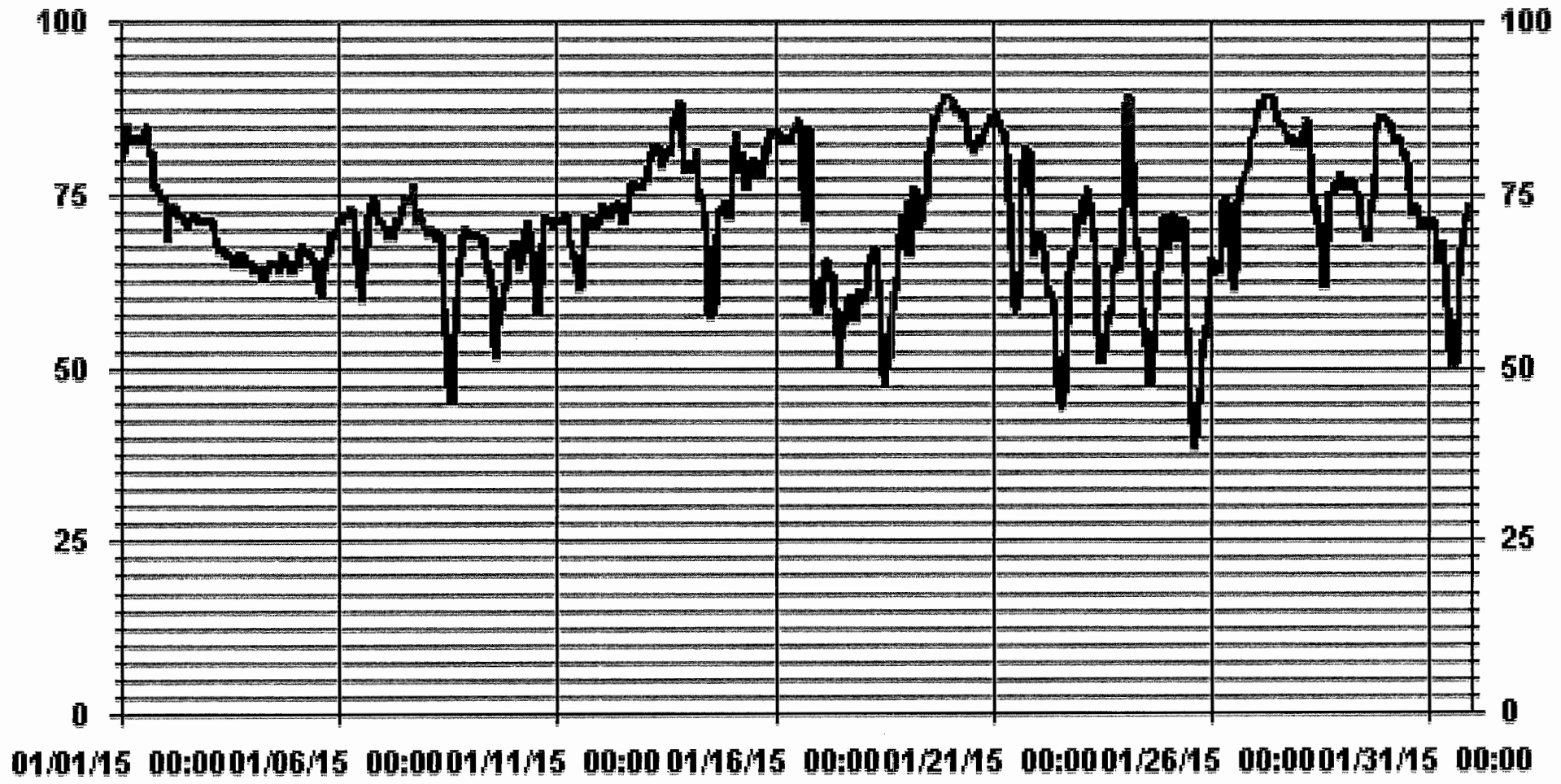
C	-CALIBRATION-	Q	-QUALITY ASSURANCE-
M	-MAINTENANCE-	R	-RECOVERY-
S	-DAILY ZERO/SPAN CHECK-	X	-MACHINE MALFUNCTION-
P	-POWER FAILURE-	O	-OPERATOR ERROR-
G	-OUT FOR REPAIR-	K	-COLLECTION ERROR-

LAST CALIBRATION: August 28, 2014

CALIBRATION TIME: 0 HRS OPERATIONAL TIME: 744 HRS

RELATIVE HUMIDITY

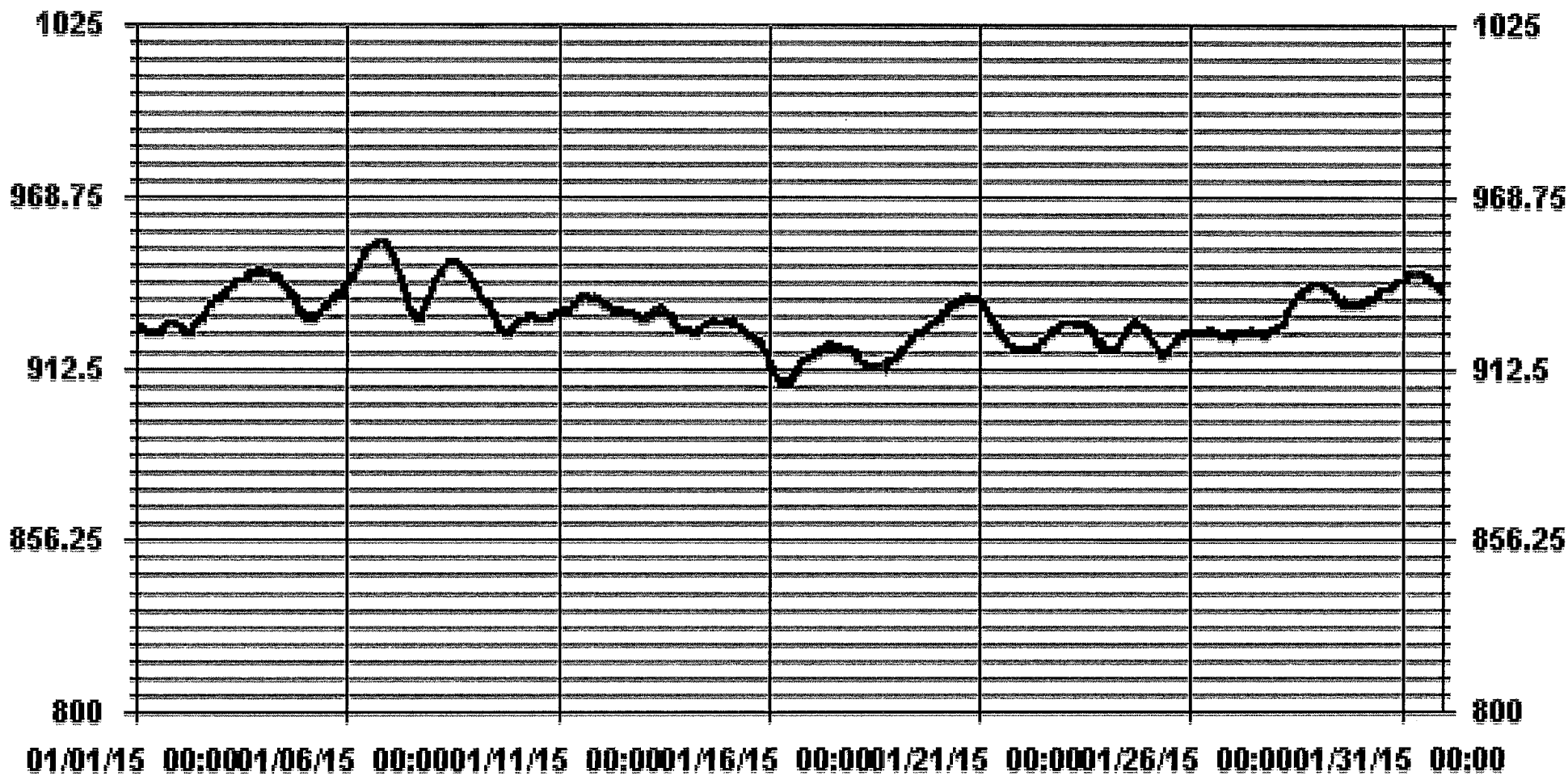
01 Hour Averages



— LICA31 RH %FS

BAROMETRIC PRESSURE

01 Hour Averages



— LICA31 BP MB

AMBIENT TEMPERATURE



AMBIENT TEMPERATURE (TPX) hourly averages in Degrees Celsius

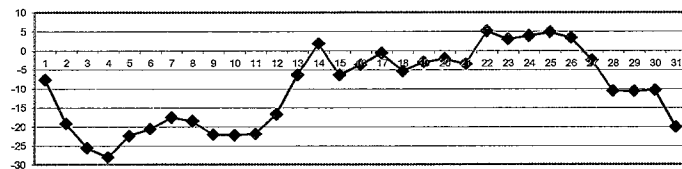
MST

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	24-HOUR	
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	0:00	MAX.	AVG.	RDGS.
DAY																											
1	-3.8	-4.1	-4.4	-4.9	-5.4	-6.4	-7.5	-8.1	-8.3	-8.3	-8.0	-7.5	-5.9	-4.4	-4.5	-5.2	-7.0	-7.8	-9.6	-11.2	-12.1	-12.8	-13.5	-14.0	-3.8	-7.7	24
2	-15.1	-16.4	-17.4	-18.0	-18.2	-18.5	-18.9	-19.4	-19.6	-19.5	-18.9	-18.5	-18.1	-17.9	-18.1	-19.2	-20.1	-20.8	-20.8	-21.0	-21.7	-22.3	-22.5	-15.1	-19.2	24	
3	-21.7	-22.0	-22.2	-23.0	-24.4	-25.3	-26.1	-26.8	-27.0	-26.4	-25.6	-23.1	-23.0	-22.7	-23.8	-24.7	-26.2	-27.2	-27.4	-27.9	-28.5	-29.1	-29.7	-29.9	-21.7	-25.6	24
4	-29.6	-30.5	-30.4	-30.6	-30.7	-30.7	-30.9	-31.0	-29.6	-28.3	-26.4	-24.5	-23.3	-22.4	-23.3	-24.3	-26.7	-27.9	-28.4	-28.4	-28.9	-29.5	-29.5	-28.4	-22.4	-28.1	24
5	-28.1	-27.9	-26.2	-27.6	-24.8	-25.9	-26.6	-26.2	-25.7	-25.2	-24.1	-21.2	-18.3	-16.2	-16.0	-17.4	-19.7	-20.8	-20.1	-20.0	-20.2	-20.1	-19.9	-19.8	-16.0	-22.4	24
6	-19.6	-19.5	-19.3	-19.2	-19.7	-20.3	-20.6	-21.4	-22.2	-20.9	-18.9	-17.7	-16.8	-16.8	-18.5	-19.5	-21.0	-21.0	-21.3	-22.5	-22.7	-23.6	-24.9	-25.4	-16.8	-20.6	24
7	-25.9	-25.6	-24.6	-24.1	-23.3	-22.5	-21.3	-20.3	-20.0	-19.4	-17.9	-16.4	-15.3	-14.4	-13.2	-12.6	-12.2	-11.7	-12.4	-13.4	-13.7	-13.9	-14.0	-14.3	-11.7	-17.6	24
8	-15.0	-16.1	-16.7	-16.4	-16.0	-16.5	-17.8	-18.5	-19.4	-19.3	-18.5	-17.8	-16.8	-16.2	-16.3	-17.1	-18.4	-19.3	-20.1	-20.8	-21.6	-22.7	-23.5	-23.8	-15.0	-18.5	24
9	-23.4	-23.6	-25.1	-24.5	-24.4	-24.8	-25.6	-27.2	-26.7	-24.6	-23.2	-20.7	-18.4	-16.4	-17.0	-19.2	-20.1	-20.3	-21.0	-20.8	-20.6	-21.5	-20.1	-20.9	-16.4	-22.1	24
10	-21.4	-22.1	-22.9	-21.2	-22.4	-23.0	-23.0	-23.2	-23.3	-23.0	-21.7	-21.3	-20.1	-19.2	-19.0	-20.7	-22.2	-23.0	-23.2	-23.1	-23.8	-23.3	-23.3	-23.5	-19.0	-22.2	24
11	-23.7	-23.6	-23.5	-23.4	-22.2	-21.9	-22.5	-25.1	-26.0	-25.7	-23.8	-18.1	-17.6	-16.9	-16.8	-19.8	-22.1	-22.4	-22.0	-22.3	-22.3	-22.3	-21.4	-21.2	-16.8	-21.9	24
12	-20.1	-19.1	-19.0	-19.7	-20.0	-19.6	-19.3	-18.9	-19.1	-18.0	-16.3	-14.2	-13.4	-13.1	-14.3	-14.1	-15.3	-14.7	-15.1	-15.5	-16.3	-16.5	-16.3	-16.1	-13.1	-16.8	24
13	-15.1	-14.8	-13.1	-12.2	-10.0	-7.6	-8.6	-9.1	-8.6	-8.2	-8.1	-7.3	-6.5	-5.7	-4.8	-4.3	-3.9	-3.8	-3.0	-1.7	-0.3	0.9	1.3	1.1	1.3	-6.4	24
14	0.6	0.3	1.0	0.4	0.0	-0.5	0.6	1.1	0.8	1.2	2.0	2.8	5.6	6.1	5.6	5.4	2.4	1.1	1.5	1.1	0.8	1.2	1.5	1.7	6.1	1.8	24
15	1.2	-0.1	-0.7	-1.8	-3.5	-4.3	-5.2	-6.3	-7.2	-7.7	-8.0	-8.3	-7.9	-8.1	-8.1	-8.7	-9.4	-9.7	-8.9	-8.5	-8.2	-8.1	-7.9	-7.9	1.2	-6.4	24
16	-8.0	-7.7	-7.5	-7.4	-7.5	-7.6	-7.6	-7.7	-7.8	-7.5	-6.8	-5.7	-4.6	-3.0	-1.4	0.4	1.5	1.7	1.8	0.5	1.0	1.5	0.7	0.0	1.8	-3.7	24
17	0.0	-0.1	-1.2	-1.9	-2.1	-2.6	-1.4	-1.0	-1.3	0.1	1.1	3.1	1.2	1.4	0.7	0.3	-0.2	-0.3	-0.9	-1.1	-1.1	-1.5	-2.1	-2.8	3.1	-0.6	24
18	-3.5	-3.8	-4.4	-4.9	-6.3	-7.5	-8.0	-8.6	-8.5	-7.3	-6.1	-4.4	-1.6	-0.9	-2.2	-2.3	-4.2	-4.6	-5.1	-5.4	-6.6	-7.7	-8.8	-7.6	-0.9	-5.4	24
19	-8.4	-9.3	-6.2	-8.5	-9.8	-10.5	-6.5	-5.5	-4.6	-5.0	-3.9	-0.3	1.9	1.4	1.0	0.8	0.6	0.3	0.1	0.0	0.0	0.0	-0.1	-0.1	1.9	-3.0	24
20	-0.1	-0.5	-1.0	-1.3	-1.9	-2.4	-2.6	-3.0	-3.2	-2.8	-1.8	-0.9	-0.6	-0.4	-1.0	-1.5	-2.2	-2.8	-3.1	-3.5	-3.5	-3.6	-3.7	-3.8	-0.1	-2.1	24
21	-3.8	-3.7	-4.1	-5.0	-5.8	-6.7	-7.4	-7.9	-8.1	-7.6	-6.3	-5.1	-3.7	-2.8	-2.7	-2.1	-2.3	-2.5	-1.4	-0.4	-0.1	1.4	2.3	2.7	2.7	-3.5	24
22	2.0	1.7	1.6	1.9	2.9	4.3	5.2	5.9	5.8	6.0	6.7	8.6	9.8	10.4	10.2	9.5	7.5	6.0	4.0	3.3	3.1	2.7	2.1	1.1	10.4	5.1	24
23	1.5	1.7	0.8	0.3	-0.1	0.3	0.7	1.6	0.8	1.9	4.9	6.7	7.4	7.0	6.7	5.8	4.9	4.2	3.0	2.9	2.2	2.1	2.8	2.7	7.4	3.0	24
24	3.0	3.2	2.8	2.9	3.3	3.7	4.5	4.6	4.6	5.4	6.1	6.4	6.7	7.0	7.2	6.8	5.3	3.9	2.9	1.6	1.1	0.2	0.0	-0.4	7.2	3.9	24
25	0.0	0.8	0.9	0.9	1.6	2.0	2.5	2.7	3.0	3.4	5.1	7.7	8.8	10.4	10.1	10.2	8.8	7.3	6.5	5.6	4.8	4.4	4.0	3.1	10.4	4.8	24
26	1.3	1.2	2.3	2.5	2.9	3.6	3.8	3.2	3.0	3.4	5.3	5.4	6.1	6.9	6.0	3.6	3.1	2.7	2.7	2.8	2.7	2.6	2.7	2.6	6.9	3.4	24
27	2.9	2.7	2.6	2.1	1.6	1.3	1.0	0.8	0.5	-0.2	-1.0	-1.8	-2.5	-3.1	-4.2	-5.1	-5.8	-6.6	-7.1	-7.4	-7.5	-7.7	-7.9	-8.1	2.9	-2.5	24
28	-8.6	-8.1	-7.9	-7.6	-6.2	-4.7	-5.6	-7.8	-11.4	-12.0	-12.1	-11.6	-10.3	-9.4	-9.2	-9.1	-11.1	-13.0	-13.6	-14.2	-14.9	-15.2	-15.8	-15.9	-4.7	-10.6	24
29	-15.7	-15.2	-14.6	-14.2	-14.1	-14.6	-15.0	-14.7	-14.3	-13.6	-12.3	-11.2	-10.2	-8.9	-7.7	-8.4	-8.8	-7.6	-6.6	-6.1	-5.3	-4.9	-4.2	-4.2	-4.2	-10.7	24
30	-4.6	-5.3	-6.4	-6.4	-6.8	-8.1	-8.5	-8.5	-8.6	-8.7	-9.1	-9.1	-9.0	-9.3	-9.9	-10.4	-11.4	-12.6	-13.4	-14.3	-15.3	-16.7	-17.7	-19.3	-4.6	-10.4	24
31	-20.1	-20.7	-21.4	-21.8	-22.0	-22.3	-22.8	-23.0	-22.2	-20.4	-18.6	-18.2	-17.1	-16.7	-16.3	-17.9	-19.2	-19.9	-20.1	-19.7	-19.7	-20.2	-20.6	-16.3	-20.1	24	
HOURLY MAX	3.0	3.2	2.8	2.9	3.3	4.3	5.2	5.9	5.8	6.0	6.7	8.6	9.8	10.4	10.2	10.2	8.8	7.3	6.5	5.6	4.8	4.4	4.0	3.1			
HOURLY AVG	-10.4	-10.6	-10.6	-10.8	-10.8	-10.9	-11.0	-11.3	-11.5	-11.0	-9.9	-8.5	-7.6	-6.9	-7.1	-7.7	-8.8	-9.5	-9.8	-10.1	-10.3	-10.5	-10.7	-10.8			

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

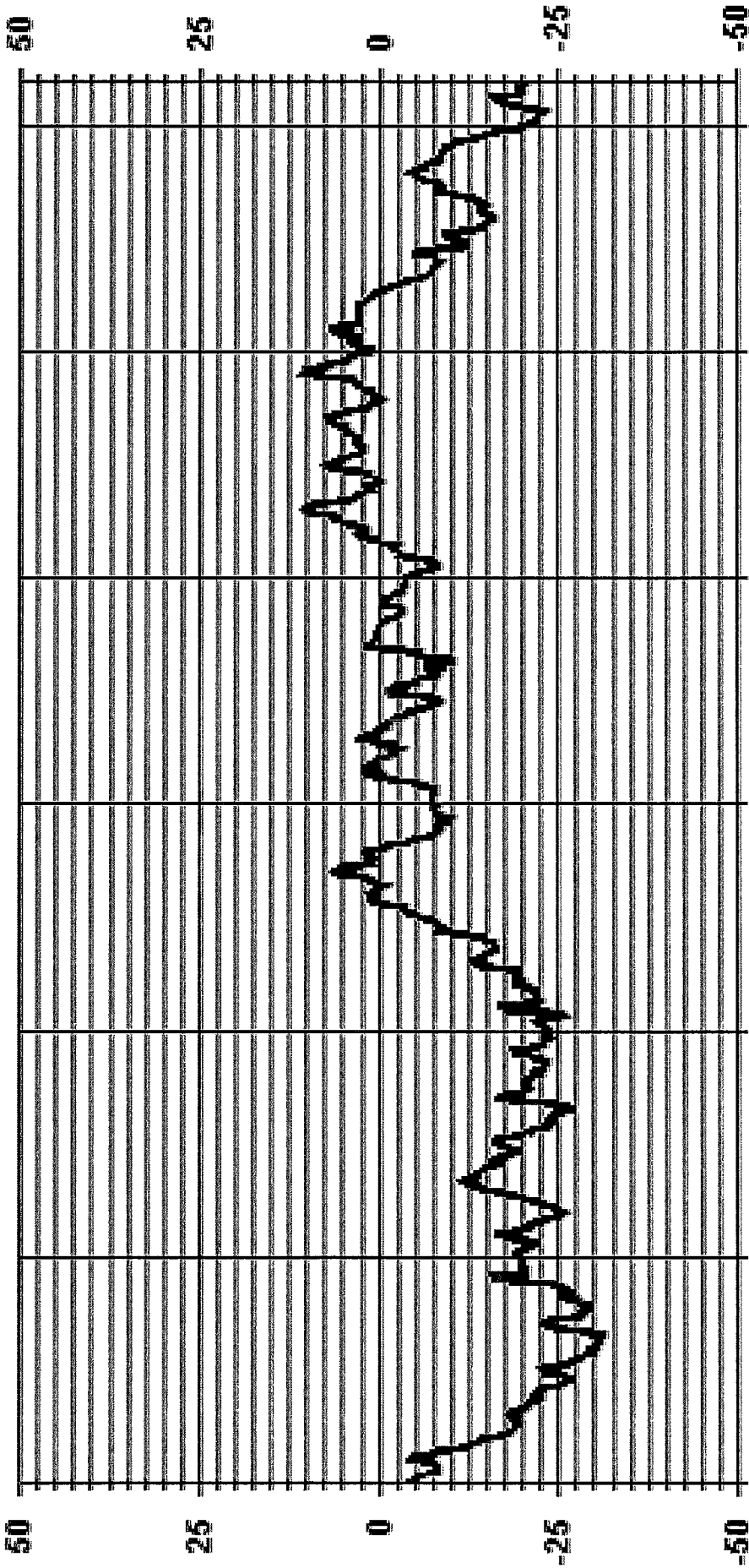
24 HOUR AVERAGES FOR JANUARY 2015



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-31.0	°C	@ HOUR(S)	7	ON DAY(S)	4
MAXIMUM 1-HR AVERAGE:	10.4	°C	@ HOUR(S)	13 , 13	ON DAY(S)	22 , 25
MAXIMUM 24-HR AVERAGE:	5.1	°C			ON DAY(S)	22
					VAR-VARIOUS	
OPERATIONAL TIME:						744 HRS
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	10.51					MONTHLY AVERAGE: -9.9 °C

01 Hour Averages



01/01/15 00:00 01/06/15 00:00 01/11/15 00:00 01/16/15 00:00 01/21/15 00:00 01/26/15 00:00 01/31/15 00:00

— LICA31 TPX DGC

PRECIPITATION



PRECIPITATION hourly averages (mm)

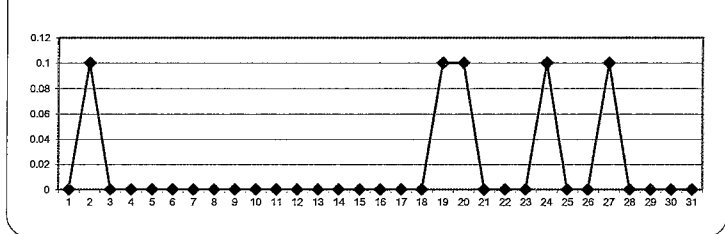
MST

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	24-HOUR	
HOUR END	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	MAX.	AVG.	RDGS.
DAY																											
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	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
2	0.0	0.0	0.0	0.0	0.3	0.2	0.1	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.1
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	0.0	0.0	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	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	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	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	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	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	0.0	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	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	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	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	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.3	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	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	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	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	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	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	0.1	0.4	0.4	0.4	0.2	0.4	0.2	0.4	0.1
20	0.0	0.3	0.1	0.4	0.5	0.1	0.2	0.0	0.0	0.0	0.2	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	0.5	0.1	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	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.3	2.1	0.8	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	2.1	0.1	24
25	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
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	0.1	0.2	0.0	0.2	0.0	24
27	0.1	0.0	0.2	0.3	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	0.1	0.6	0.6	0.6	0.1	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	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	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	24
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.3	2.1	0.8	0.4	0.5	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.0	0.4	0.0	0.1	0.1	0.3	0.1	0.4	0.4	0.6	0.6			
HOURLY AVG	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			

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

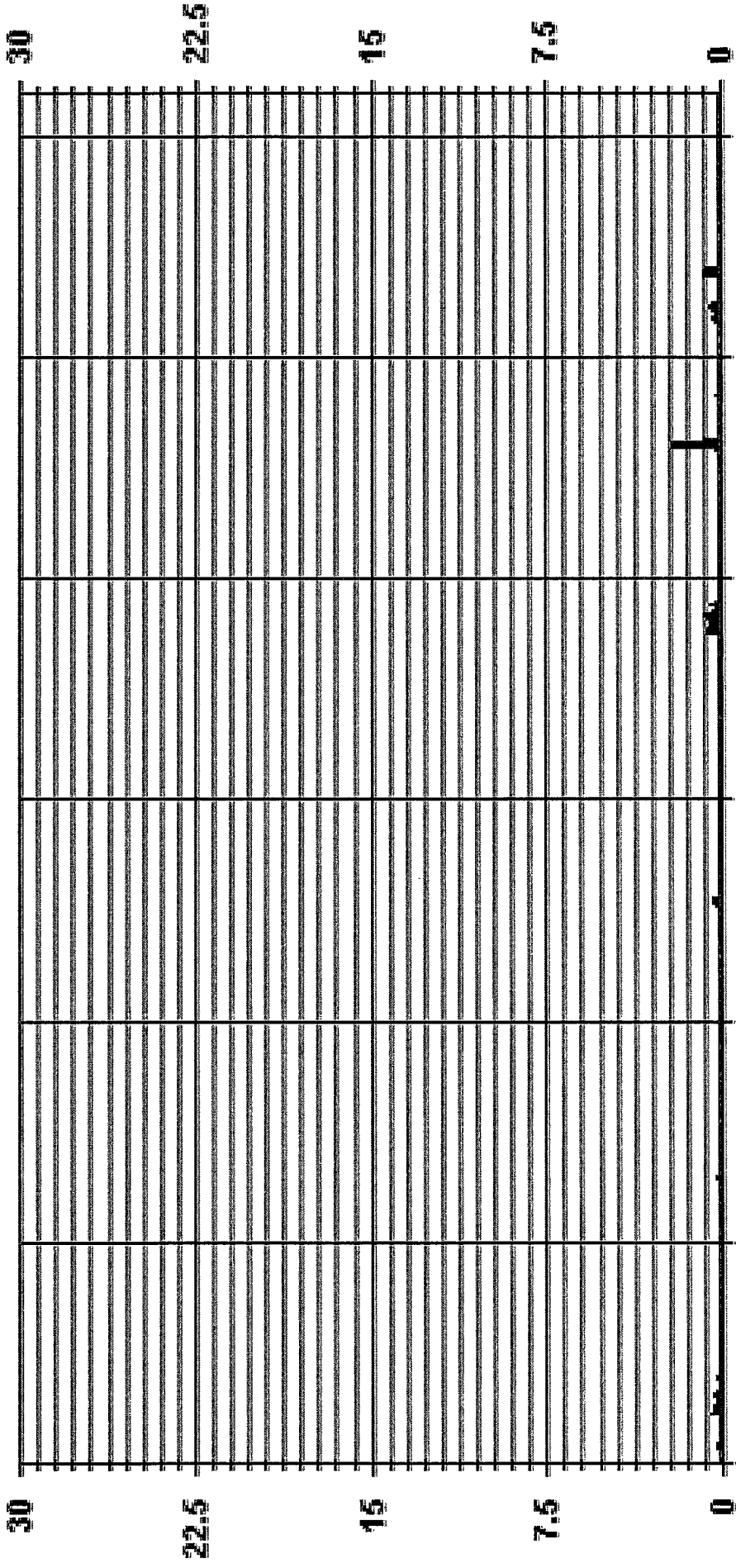
24 HOUR AVERAGES FOR JANUARY 2015



MONTHLY SUMMARY

MAXIMUM 1-HR AVERAGE:	2.1	MM	@ HOUR(S)	1	ON DAY(S)	24
MAXIMUM 24-HR AVERAGE:	0.1	MM			ON DAY(S)	VAR
MONTHLY TOTAL	12.0	MM			VAR-VARIOUS	
OPERATIONAL TIME:					744	HRS
AMD OPERATION UPTIME:					100.0	%
STANDARD DEVIATION:	0.10				MONTHLY AVERAGE:	0.0 MM

01 Hour Averages

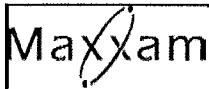


01/01/15 00:00:01/06/15 00:00:01/11/15 00:00:01/16/15 00:00:01/21/15 00:00:01/26/15 00:00:01/31/15 00:00

— LICA31 PRECIP MM

APPENDIX II
ANALYZER CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E SO2 Analyzer Calibration

Date: 14-Jan-15 Start/End Time (mst): 1730/2000
 Company: LICA Calibration Purpose: Post Repair
 Station Name/Location: St Lina Converter Make & Model: n/a
 Performed by: LlmIn Li Converter Serial #: n/a
 Application H₂S/TRS/SO₂: SO₂ Cal Gas Expiry Date: 4-Feb-18

Analyzer:
 Serial Number: 468 Range ppb: 100
 Last Calibration Date: 11-Dec-14 As Found C.F.: NA
 Previous Cal High Point C.F.: 0.999 New C.F.: 0.995

<p>As found:</p> <p>SLOPE: 0.946</p> <p>OFFSET: 61</p> <p>HVPS: 533</p> <p>RCELL TEMP: 50</p> <p>BOX TEMP: 33.3</p> <p>PMT TEMP: 7.8</p> <p>IZS TEMP: 40.0</p> <p>STABIL: 0.1</p> <p>PRES: 23.6</p> <p>SAMP FL: 565</p> <p>PMT: 71.5</p> <p>NORM PMT: 62</p> <p>UV LAMP: 2540</p> <p>LAMP RATIO: 102.3</p> <p>STR. LGT: 28.9</p> <p>DRK PMT: 18.6</p> <p>DRK LMP: 4.1</p> <p>Internal Span: 256.8</p>	<p>As left:</p> <p>SLOPE: 0.940</p> <p>OFFSET: 52.3</p> <p>HVPS: 533</p> <p>RCELL TEMP: 50</p> <p>BOX TEMP: 33.3</p> <p>PMT TEMP: 7.8</p> <p>IZS TEMP: 40.0</p> <p>STABIL: 0.1</p> <p>PRES: 23.6</p> <p>SAMP FL: 565</p> <p>PMT: 71.5</p> <p>NORM PMT: 62</p> <p>UV LAMP: 2540</p> <p>LAMP RATIO: 102.3</p> <p>STR. LGT: 28.9</p> <p>DRK PMT: 18.6</p> <p>DRK LMP: 4.1</p> <p>Internal Span: 256.8</p>
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Calibrator:		Calibrator Flow Targets:			
Flow Meter ID's:	na	point	diluent (cc/min)	cal gas (cc/min)	total (cc/min)
Make & Model:	API700	zero	5000	0	5000
Serial #:	690	high	5000	77	5077
Cal Gas Cylinder I.D. #:	BLM000428	mid	5000	38	5038
Cal Gas Conc. (ppm):	48.8	low	5000	19	5019

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero						
adjusted zero	5000	0.0	5000	0	0.0	NA
as found high						
adjusted high	4923	76.90	5000	750.6	750.0	1.001
mid	4963	37.50	5001	366.0	369.0	0.992
low	4981	18.70	5000	182.5	184.0	0.992
calibrator zero	5000	0.00	5000	0	0.0	NA
Average C.F. =						0.995

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	Pass/Fail ?
Slope =	1.001	> or = 0.995	PASS
b (Intercept as % of full scale) =	-1.32%	0.85-1.15	PASS
% change in C.F. from last cal	NA	± 3% F.S.	PASS
		± 15%	NA

Converter Efficiency Check for H₂S/TRS application:

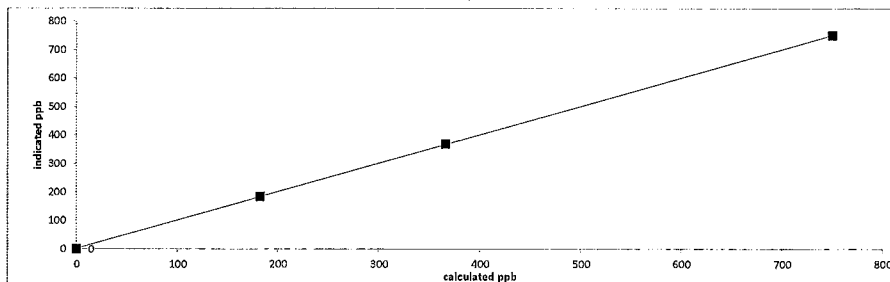
****run converter efficiency test immediately following zero adjust****

SO₂ High Point gas concentration: na Time gas run (mst): na
 Zero corrected analyzer response: na

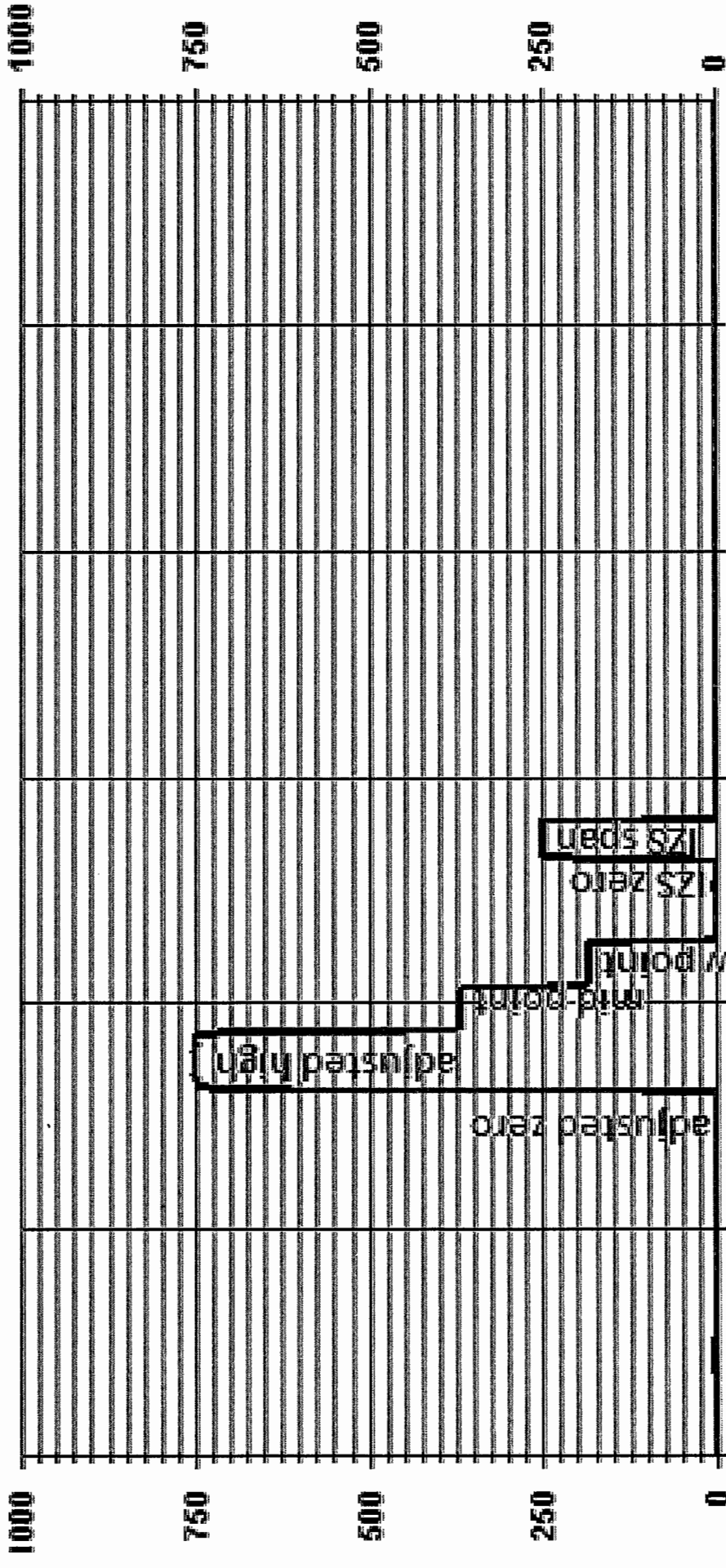
Comments:

When be station, found alarm on DARK PMT high, UV lamp high and shuttle fail. Found 214nm UV filter broken. Change a new one. Not available to do as found point. Change sample filter. Rebuilt pump. Anologe output calibration.

API 100E SO2 Analyzer Calibration



01 Minute Averages



— LICA31 SO2_ PPB

HYDROGEN SULPHIDE

Maxxam API 101E H2S Analyzer Calibration

Date: 14-Jan-15 Start/End Time (mst): 10:00-13:02
 Company: LICA Calibration Purpose: Removal
 Station Name/Location: St Lina Converter Make & Model: Internal
 Performed by: Limin Li Converter Serial #: na
 Application H₂S/TRS/SO₂: H2S Cal Gas Expiry Date: 25-Dec-15

Analyzer:
 Serial Number: 722 Range ppb: 100
 Last Calibration Date: 11-Dec-14 As Found C.F.: NA
 Previous Cal High Point C.F.: 1.001 New C.F.: 0.918

As found:	As left:
SLOPE: 1.294	SLOPE: 1.294
OFFSET: 44.2	OFFSET: 44.2
HVPS: 595	HVPS: 595
RCELL TEMP: 50.0	RCELL TEMP: 50.0
BOX TEMP: 33.7	BOX TEMP: 33.7
PMT TEMP: 8.2	PMT TEMP: 8.2
IZS TEMP: 45.0	IZS TEMP: 45.0
CONVERTER TEMP: 314.8	TEST: 314.8
STAB: .1	STABIL: .1
PRES: 24.9	PRES: 24.9
SAMP FL: 590	SAMP FL: 590
PMT: 66.1	PMT: 66.1
NORM PMT: 44.5	NORM PMT: 44.5
UV LAMP: 2517	UV LAMP: 2517
LAMP RATIO: 109.3%	LAMP RATIO: 109.3%
STR. LGT: 28.6	STR. LGT: 28.6
DRK PMT: 27	DRK PMT: 27
DRK LMP: 3.5	DRK LMP: 3.5
Internal Span: 41.52	Internal Span: 41.52

Calibrator:		Calibrator Flow Targets:			
Flow Meter ID's: na		point	diluent (cc/min)	cal gas (cc/min)	total (cc/min)
Make & Model: API 700		zero	5000	0	5000
Serial #: 690		high	5000	41	5041
Cal Gas Cylinder I.D. #: BLM005217		mid	5000	20	5020
Cal Gas Conc. (ppm): 9.6		low	5000	12	5012

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5000	0.0	5000	0	0.4	NA
adjusted zero						
as found high	4959	40.70	5000	78.0	85.0	0.918
adjusted high		na				
mid	4980	19.80	5000	37.9	41.5	0.914
low	4988	12.00	5000	23.0	25.3	0.909
calibrator zero						NA
Average C.F.=						0.918

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS	Pass/Fail ?
Slope = 0.918	> or = 0.995	PASS
b (Intercept as % of full scale) = -0.11%	0.85-1.15	PASS
% change in C.F. from last cal = 7.74%	± 3% F.S.	PASS
	± 15%	NA

Converter Efficiency Check for H₂S/TRS application:

run converter efficiency test immediately following zero adjust

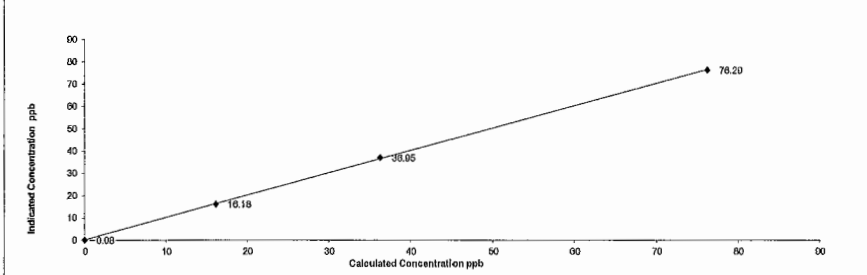
SO₂ Low Point gas concentration: na Time gas run (mst): na

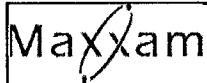
Zero corrected analyzer response: na

Comments:

After shot down calibration, adjust HVPS. Change sample filter. Check pump ok. Adjust UV lamp. Anologe output calibration.

API 101E H2S Analyzer Calibration





API 101E H2S Analyzer Calibration

Date: 14-Jan-15 Start/End Time (mst): 14:15/17:05
 Company: LICA Calibration Purpose: Post Repair
 Station Name/Location: St Lina Converter Make & Model: Internal
 Performed by: Limin Li Converter Serial #: na
 Application H₂S/TRS/SO₂: H2S Cal Gas Expiry Date: 25-Dec-15

Analyzer:
 Serial Number: 722 Range ppb: 100
 Last Calibration Date: 11-Dec-14 As Found C.F.: NA
 Previous Cal High Point C.F.: 1.001 New C.F.: 0.995

As found:		As left:	
SLOPE:	<u>1.294</u>	SLOPE:	<u>0.94</u>
OFFSET:	<u>44.2</u>	OFFSET:	<u>57.1</u>
HVPS:	<u>595</u>	HVPS:	<u>606</u>
RCELL TEMP:	<u>50.0</u>	RCELL TEMP:	<u>50.0</u>
BOX TEMP:	<u>33.7</u>	BOX TEMP:	<u>34.3</u>
PMT TEMP:	<u>8.2</u>	PMT TEMP:	<u>8.2</u>
IZS TEMP:	<u>45.0</u>	IZS TEMP:	<u>45.0</u>
CONVERTER TEMP:	<u>314.8</u>	TEST:	<u>314.8</u>
STAB:	<u>.1</u>	STABIL:	<u>.1</u>
PRES:	<u>24.9</u>	PRES:	<u>25</u>
SAMP FL:	<u>590</u>	SAMP FL:	<u>590</u>
PMT:	<u>66.1</u>	PMT:	<u>78.2</u>
NORM PMT:	<u>44.5</u>	NORM PMT:	<u>71.3</u>
UV LAMP:	<u>2517</u>	UV LAMP:	<u>2517</u>
LAMP RATIO:	<u>109.3%</u>	LAMP RATIO:	<u>100.7%</u>
STR. LGT:	<u>28.6</u>	STR. LGT:	<u>26.8</u>
DRK PMT:	<u>27</u>	DRK PMT:	<u>28.1</u>
DRK LMP:	<u>3.5</u>	DRK LMP:	<u>3.8</u>
Internal Span:	<u>41.52</u>	Internal Span:	<u>41.52</u>

Calibrator:		Calibrator Flow Targets:			
Flow Meter ID's:	<u>na</u>	point	diluent (cc/min)	cal gas (cc/min)	total (cc/min)
Make & Model:	<u>API 700</u>	zero	<u>5000</u>	<u>0</u>	<u>5000</u>
Serial #:	<u>690</u>	high	<u>5000</u>	<u>41</u>	<u>5041</u>
Cal Gas Cylinder I.D. #:	<u>BLM005217</u>	mid	<u>5000</u>	<u>20</u>	<u>5020</u>
Cal Gas Conc. (ppm):	<u>9.6</u>	low	<u>5000</u>	<u>12</u>	<u>5012</u>

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero						
adjusted zero	<u>5000</u>	<u>0.0</u>	<u>5000</u>	<u>0</u>	<u>0.0</u>	<u>NA</u>
as found high		<u>NA</u>				
adjusted high	<u>4959</u>	<u>40.70</u>	<u>5000</u>	<u>78.0</u>	<u>78.0</u>	<u>1.000</u>
mid	<u>4980</u>	<u>19.80</u>	<u>5000</u>	<u>37.9</u>	<u>38.0</u>	<u>0.998</u>
low	<u>4988</u>	<u>12.00</u>	<u>5000</u>	<u>23.0</u>	<u>23.3</u>	<u>0.987</u>
calibrator zero	<u>5000</u>	<u>0.00</u>	<u>5000</u>	<u>0</u>	<u>0.0</u>	<u>NA</u>
Average C.F. =						<u>0.995</u>

Linear Regression/Calibration Results:
 Correlation Coefficient = 1.000 LIMITS > or = 0.995 PASS
 Slope = 1.001 0.85-1.15 PASS
 b (Intercept as % of full scale) = -0.13% ± 3% F.S. PASS
 % change in C.F. from last cal NA ± 15% NA

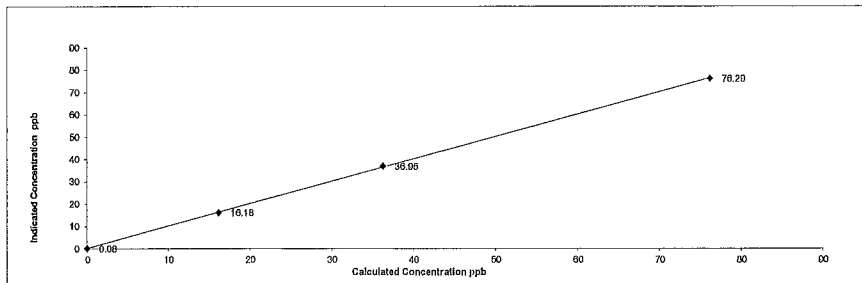
Converter Efficiency Check for H₂S/TRS application:

****run converter efficiency test immediately following zero adjust****

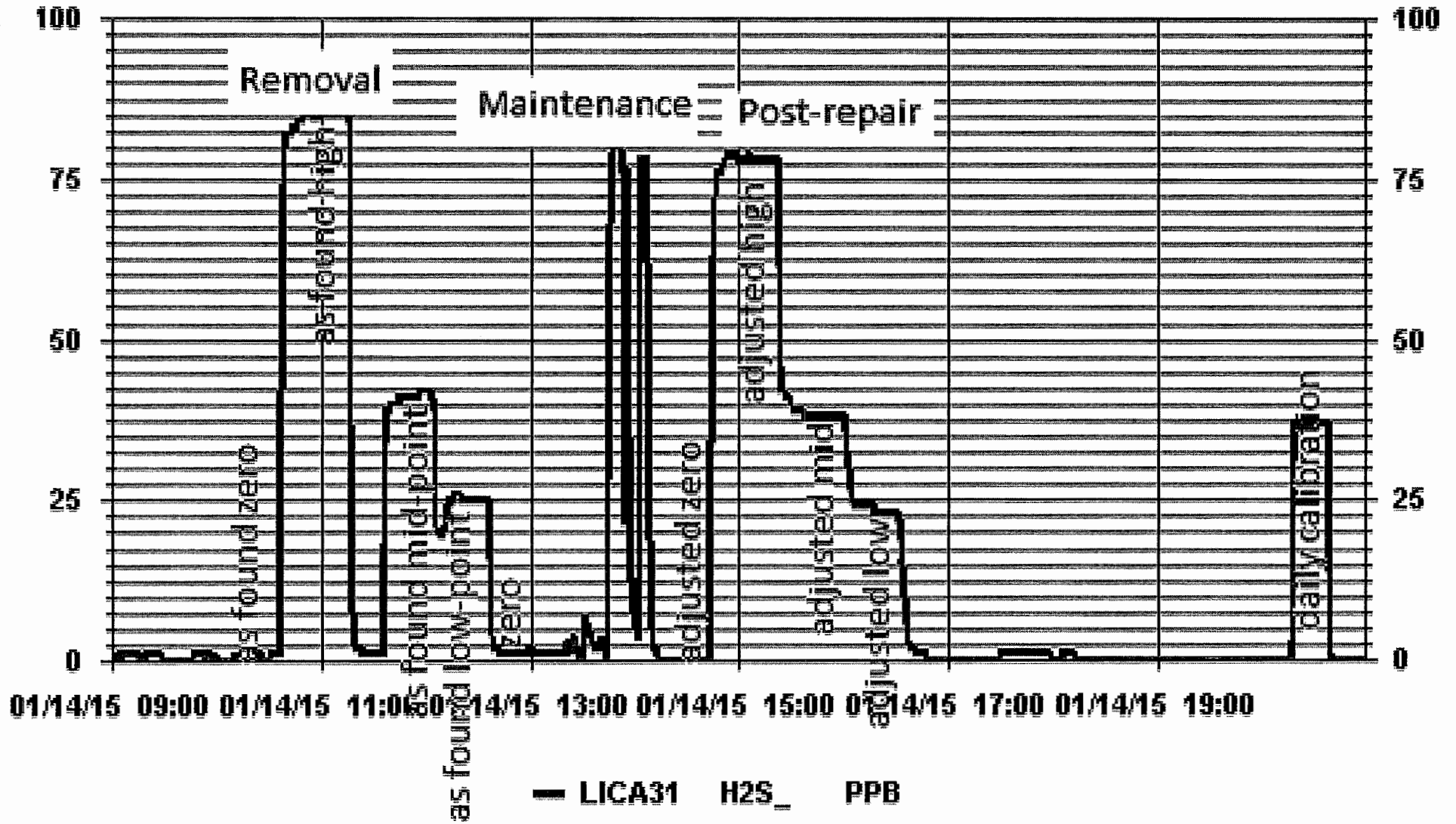
SO₂ Low Point gas concentration: na Time gas run (mst): na
 Zero corrected analyzer response: na

Comments:

API 101E H2S Analyzer Calibration



01 Minute Averages



TOTAL HYDROCARBON

Maxam Thermo 51C THC Analyzer Calibration

Date: 15-Jan-14 Start Time (mst): 10:00
 Company: LICA End Time (mst): 14:00
 Station Name/Location: St Lina Calibration Purpose: routine monthly
 Performed by: Limin Li Cal Gas Expiry Date: 7-Jan-22

Analyzer:
 Serial Number: 436609739 Range ppm: 50
 Last Calibration Date: 11-Dec-14 As Found C.F.: 0.978
 Previous Cal High Point C.F.: 0.999 New C.F.: 0.990

	As found:		As left:
H ₂ cylinder (psi):	<u>50</u>	H ₂ cylinder (psi):	<u>450</u>
H ₂ cylinder reg set (psi):	<u>28</u>	H ₂ cylinder reg set (psi):	<u>28</u>
Span Cylinder (psi):	<u>1100</u>	Span Cylinder (psi):	<u>1100</u>
Span Cylinder Reg Set (psi):	<u>30</u>	Span Cylinder Reg Set (psi):	<u>30</u>
Zero Air Gen Pressure:	<u>47</u>	Zero Air Gen Pressure:	<u>47</u>
measurement alarms:	<u>none</u>	measurement alarms:	<u>none</u>
service alarms:	<u>none</u>	service alarms:	<u>none</u>
FID status:	cnt: <u>2110</u>	FID status:	cnt: <u>2110</u>
	rng: <u>1</u>		rng: <u>1</u>
	try: <u>1</u>		try: <u>1</u>
	flm: <u>205.3</u>		flm: <u>205.3</u>
	det: <u>125.2</u>		det: <u>125.2</u>
Oven Readings:	Flame: <u>205</u>	Oven Readings:	Flame: <u>205</u>
	Filter: <u>125</u>		Filter: <u>125</u>
	Base: <u>125</u>		Base: <u>125</u>
	Pump: <u>6.81</u>		Pump: <u>6.81</u>
Voltages:	+5: <u>4.9</u>	Voltages:	+5: <u>4.9</u>
	+15: <u>14.9</u>		+15: <u>14.9</u>
	-15: <u>-15</u>		-15: <u>-15</u>
	Internal Span: <u>32.3</u>		Internal Span: <u>32.3</u>

Calibrator: Flow Meter ID's: na
 Make & Model: API 700
 Serial #: 690
 Cal Gas Cylinder I.D. #: LL83638
 CH₄/C₃H₈ Cylinder Conc. (ppm): 582.0 | 203.0
 CH₄ as propane/total CH₄ equivalents (ppm): 558.3 | 1140.3

point	diluent (cc/min)	cal gas (cc/min)	total (cc/min)
zero	3000	0	3000
high	3000	69	3069
mid	3000	32	3032
low	3000	16	3016

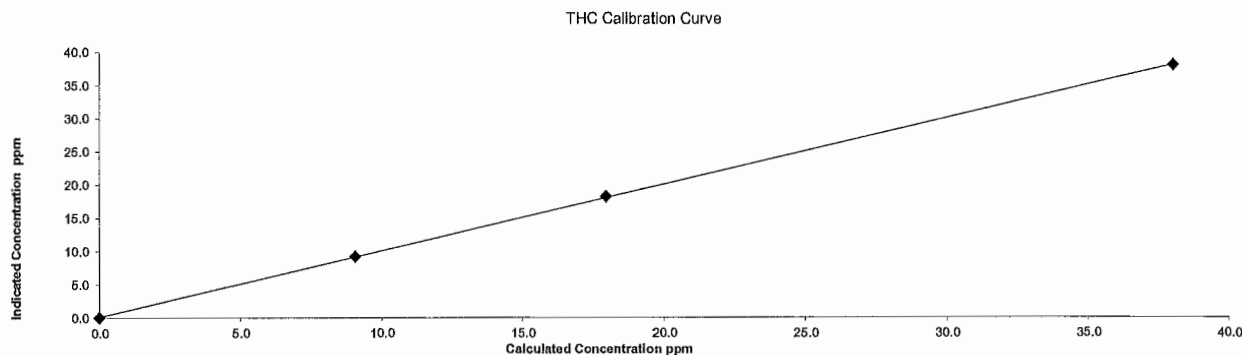
Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppm)	(ppm)	
as found zero	2000	0.00	2000	0	0.24	NA
adjusted zero	2000	0.00	2000	0	0.00	NA
as found high	2000	69.00	2069	38.03	38.90	0.978
adjusted high	2000	69.00	2069	38.03	38.00	1.001
mid	2000	32.00	2032	17.96	18.20	0.987
low	2000	16.00	2016	9.05	9.22	0.982
calibrator zero	2000	0.00	2000	0	0.04	NA
Average C.F.=						0.990

Linear Regression/Calibration Results:

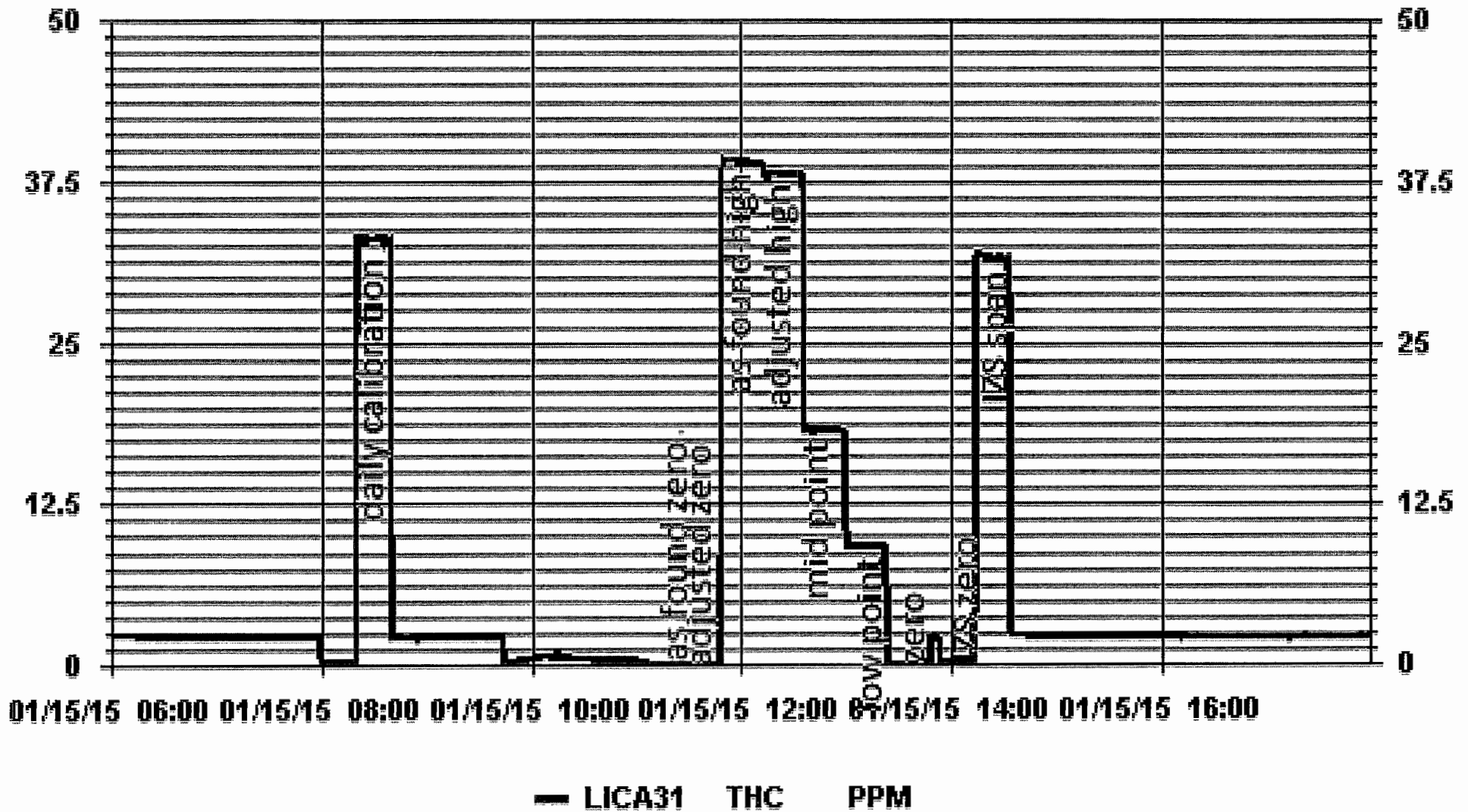
Correlation Coefficient =	<u>1.000</u>	LIMITS	Pass/Fail ?
Slope =	<u>0.998</u>	> or = 0.995	PASS
b (Intercept as % of full scale)=	<u>0.252%</u>	0.85-1.15	PASS
% change in C.F. from last cal	<u>2.14%</u>	± 3% F.S.	PASS
		± 15%	PASS

Comments:
 changed analyzer filter

Thermo 51C THC Analyzer Calibration



01 Minute Averages



NITROGEN DIOXIDE



API 200E NOx Analyzer Calibration

Date: 14-Jan-15
 Company: LICA
 Station Name/Location: St Lina
 Performed by: Limin Li

Start Time (mst): 10:00
 End Time (mst): 15:20
 Calibration Purpose: Remove calibration
 Cal Gas Expiry Date: 4-Feb-18

Analyzer Serial Number: 592
 Last Calibration Date: 11-Dec-14
 Range ppb: 1000

Correction Factors:

As found C.F.	Previous Cal High Point C.F.:
NO= <u>0.995</u>	NO= <u>0.999</u>
NOx= <u>0.994</u>	NOx= <u>1.000</u>
NO ₂ = <u>1.012</u>	NO ₂ = <u>0.997</u>

As found:

NOx SLOPE: 0.92
 NOx OFFS: 7.4
 NO SLOPE: 0.921
 NO OFFS: 0.1
 TEST: 130.7
 SAMP FLW: 476
 OZONE FL: 73
 PMT: 18.7
 NORM PMT: 3
 AZERO: 19.7
 HVPS: 654
 RCELL TEMP: 50.0
 BOX TEMP: 33.3
 PMT TEMP: 6.9
 IZS TEMP: 40.0
 MOLY TEMP: 314
 RCEL: 6.7
 SAMP: 26.8
 Internal Span: 5.9/388/393

As left:

NOx SLOPE: 0.92
 NOx OFFS: 7.4
 NO SLOPE: 0.921
 NO OFFS: 0.1
 TEST: 130.7
 SAMP FLW: 476
 OZONE FL: 73
 PMT: 18.7
 NORM PMT: 3
 AZERO: 19.7
 HVPS: 654
 RCELL TEMP: 50.0
 BOX TEMP: 33.3
 PMT TEMP: 6.9
 IZS TEMP: 40.0
 MOLY TEMP: 314
 RCEL: 6.7
 SAMP: 26.8
 Internal Span: 5.9/388/393

Calibrator Flow Targets:

Make & Model: Sabro 2010
 Serial #: 042531101(0911)
 Cal Gas Cylinder I.D. #: BLM000428
 NO Cylinder Conc. (ppm): 50.7
 NOx Cylinder Conc. (ppm): 50.8

point	diluent (cc/min)	cal gas (cc/min)	O ₂ setting (v or ppb)	total (cc/min)
zero	5000	0	0	5000
high	5000	77	480(360)	5077
mid	5000	37	240	5037
low	5000	17	90	5017

Calibration:

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	0.0	0.0	NA	NA
adjusted zero									
as found high	4923	76.90	5000	779.8	781.3	784	786	0.995	0.994
adjusted high									
mid	4963	37.50	5001	380.2	381.0	389	388	0.977	0.982
low	4981	18.70	5000	189.6	190.0	194	194	0.977	0.979
calibrator zero									
Average C.F.=								0.986	0.985

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ Increase	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4923	76.90	5000	0.0	791.0	791.0	0.0	0.0	0.0	
as found NO ₂	4923	76.90	5000	480(360)	207.0	784.0	577.0	584.0	577.0	1.012
gpt mid	4923	76.90	5000	240.0	497.0	785.0	288.0	294.0	288.0	1.021
gpt low	4923	76.90	5000	90.0	678.0	787.0	109.0	113.0	109.0	1.037
Average NO ₂ C.F.=									1.040	

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.005	1.005	0.990	0.85-1.15
b (Intercept as % of full scale)=	0.27%	0.21%	-0.19%	± 3% F.S.
% change in C.F. from last cal=	0.44%	0.60%	-1.52%	+/-15%
NO ₂ converter efficiency			96.1%	>85%

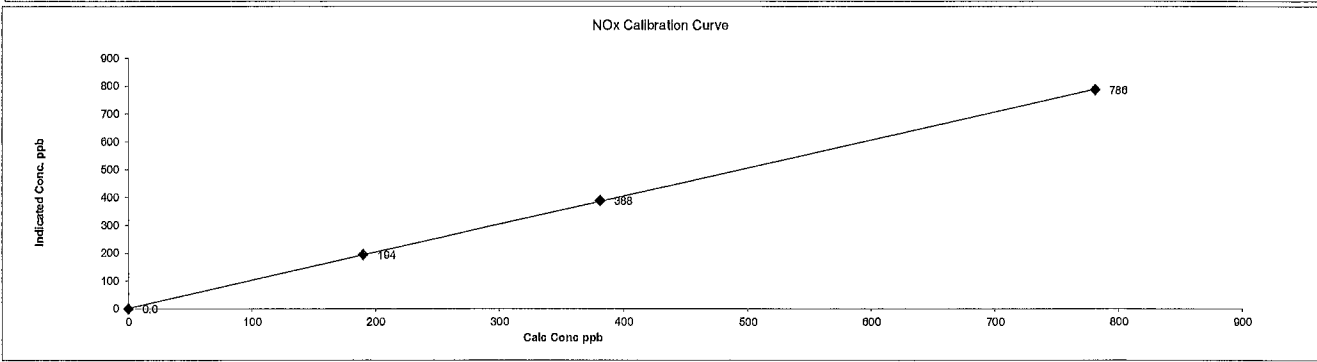
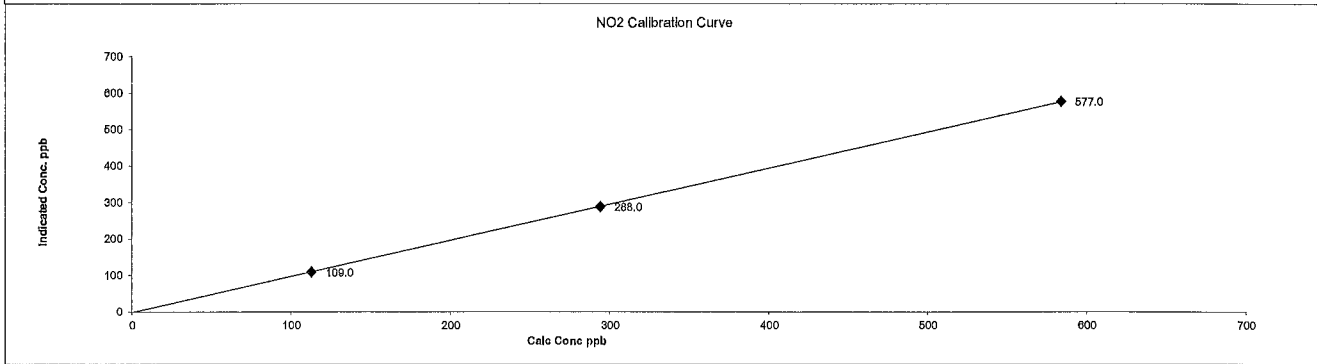
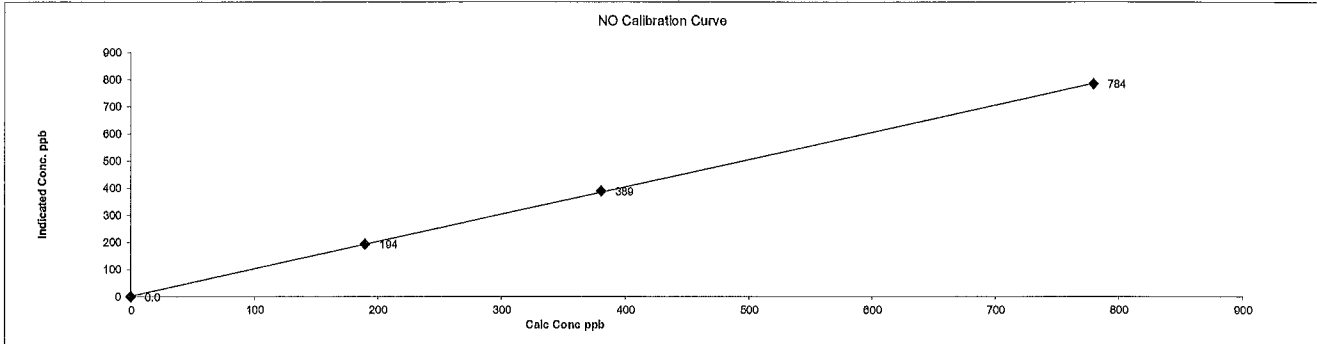
Comments:

One more GPT point. NOx: 782 NO: 350 NO₂: 432. NO drop: 441.

Date: 14-Jan-15
Company: LICA
Station Name/Location: St Lina
Performed by: Limin LJ

Start Time (mst): 10:00
End Time (mst): 15:20
Calibration Purpose: Remove calibration
Cal Gas Expiry Date: 4-Feb-18

API 200E NOx Analyzer Calibration





API 200E NOx Analyzer Calibration

Date: 14-Jan-15
 Company: LICA
 Station Name/Location: St Lina
 Performed by: Limin LI

Start Time (mst): 17:30
 End Time (mst): 20:00
 Calibration Purpose: Install calibration
 Cal Gas Expiry Date: 4-Feb-18

Correction Factors:

Analyzer Serial Number: 594
 Last Calibration Date: na
 Range ppb: 1000

As found C.F. Previous Cal High Point C.F.:

NO= <u>1.000</u>	NO= <u>na</u>
NOx= <u>0.999</u>	NOx= <u>na</u>
NO ₂ = <u>NA</u>	NO ₂ = <u>na</u>

As found:

NOx SLOPE:	<u>1.010</u>
NOx OFFS:	<u>1.4</u>
NO SLOPE:	<u>1.003</u>
NO OFFS:	<u>-1.4</u>
TEST:	<u>130.7</u>
SAMP FLW:	<u>447</u>
OZONE FL:	<u>78</u>
PMT:	<u>25.8</u>
NORM PMT:	<u>-0.3</u>
AZERO:	<u>22.2</u>
HVPS:	<u>771</u>
RCELL TEMP:	<u>50.0</u>
BOX TEMP:	<u>32.3</u>
PMT TEMP:	<u>6.7</u>
IZS TEMP:	<u>45</u>
MOLY TEMP:	<u>315.4</u>
RCEL:	<u>5.1</u>
SAMP:	<u>26.4</u>
Internal Span:	<u>5.9/388/393</u>

As left:

NOx SLOPE:	<u>0.953</u>
NOx OFFS:	<u>1.4</u>
NO SLOPE:	<u>0.955</u>
NO OFFS:	<u>-1.4</u>
TEST:	<u>130.7</u>
SAMP FLW:	<u>452</u>
OZONE FL:	<u>78</u>
PMT:	<u>25.8</u>
NORM PMT:	<u>-0.3</u>
AZERO:	<u>22.2</u>
HVPS:	<u>771</u>
RCELL TEMP:	<u>50.0</u>
BOX TEMP:	<u>32.3</u>
PMT TEMP:	<u>6.7</u>
IZS TEMP:	<u>45</u>
MOLY TEMP:	<u>315.4</u>
RCEL:	<u>5.1</u>
SAMP:	<u>26.4</u>
Internal Span:	<u>5.9/388/393</u>

Calibrator Flow Targets:

Make & Model: API700
 Serial #: 690
 Cal Gas Cylinder I.D. #: BLM000428
 NO Cylinder Conc. (ppm): 50.7
 NOx Cylinder Conc. (ppm): 50.8

point	diluent (cc/min)	cal gas (cc/min)	O ₂ setting (v or ppb)	total (cc/min)
zero	5000	0	0	5000
high	5000	77	480(360)	5077
mid	5000	37	240	5037
low	5000	17	90	5017

Calibration:

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	0.0	0.0	NA	NA
adjusted zero									
as found high	4923	76.90	5000	779.8	781.3	780	782	1.000	0.999
adjusted high		na							
mid	4963	37.50	5001	380.2	381.0	385	386	0.988	0.987
low	4981	18.70	5000	189.6	190.0	192	194	0.988	0.979
calibrator zero									
Average C.F.=								0.994	0.988

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ Increase	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference		na								
as found NO ₂		na								
gpt mid		na								
gpt low		na								

Average NO₂ C.F.=

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000		> or = 0.995
Slope =	1.000	1.000		0.85-1.15
b (Intercept as % of full scale) =	0.19%	0.25%		± 3% F.S.
% change in C.F. from last cal =	#VALUE!	#VALUE!	#VALUE!	+/-15%
NO ₂ converter efficiency				>85%

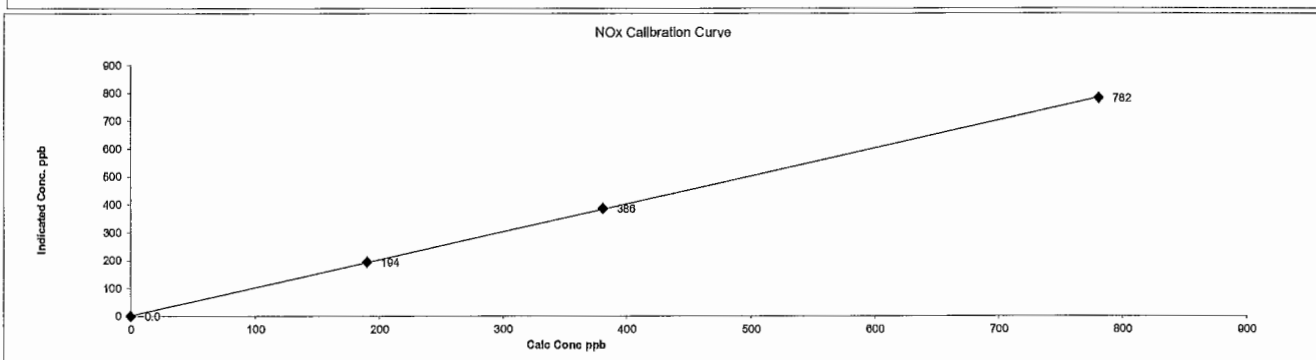
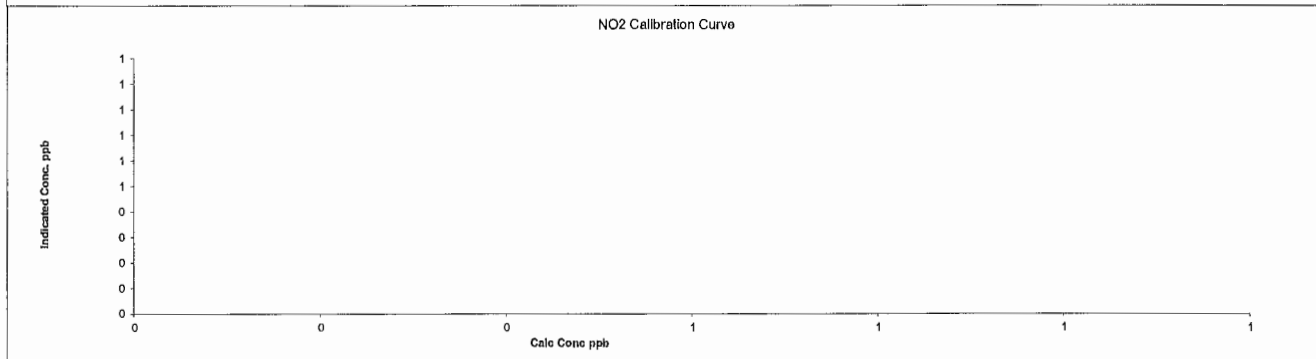
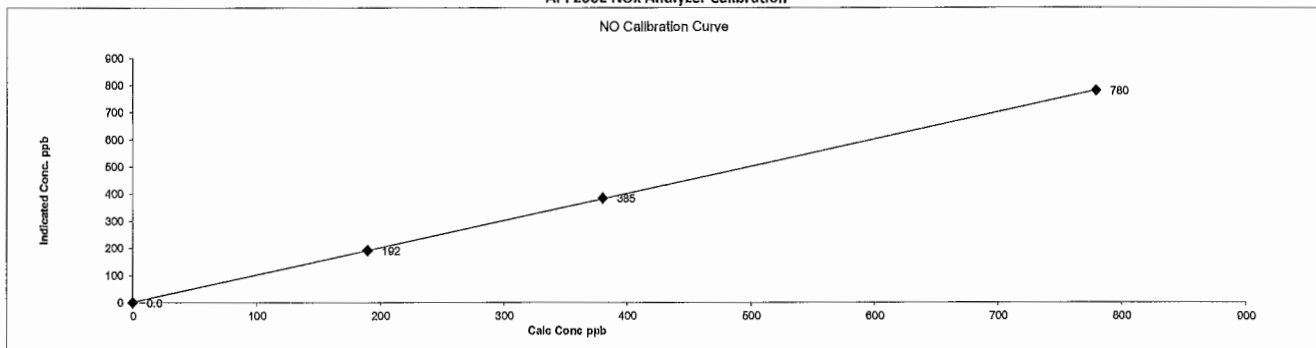
Comments:

Change a new pump.

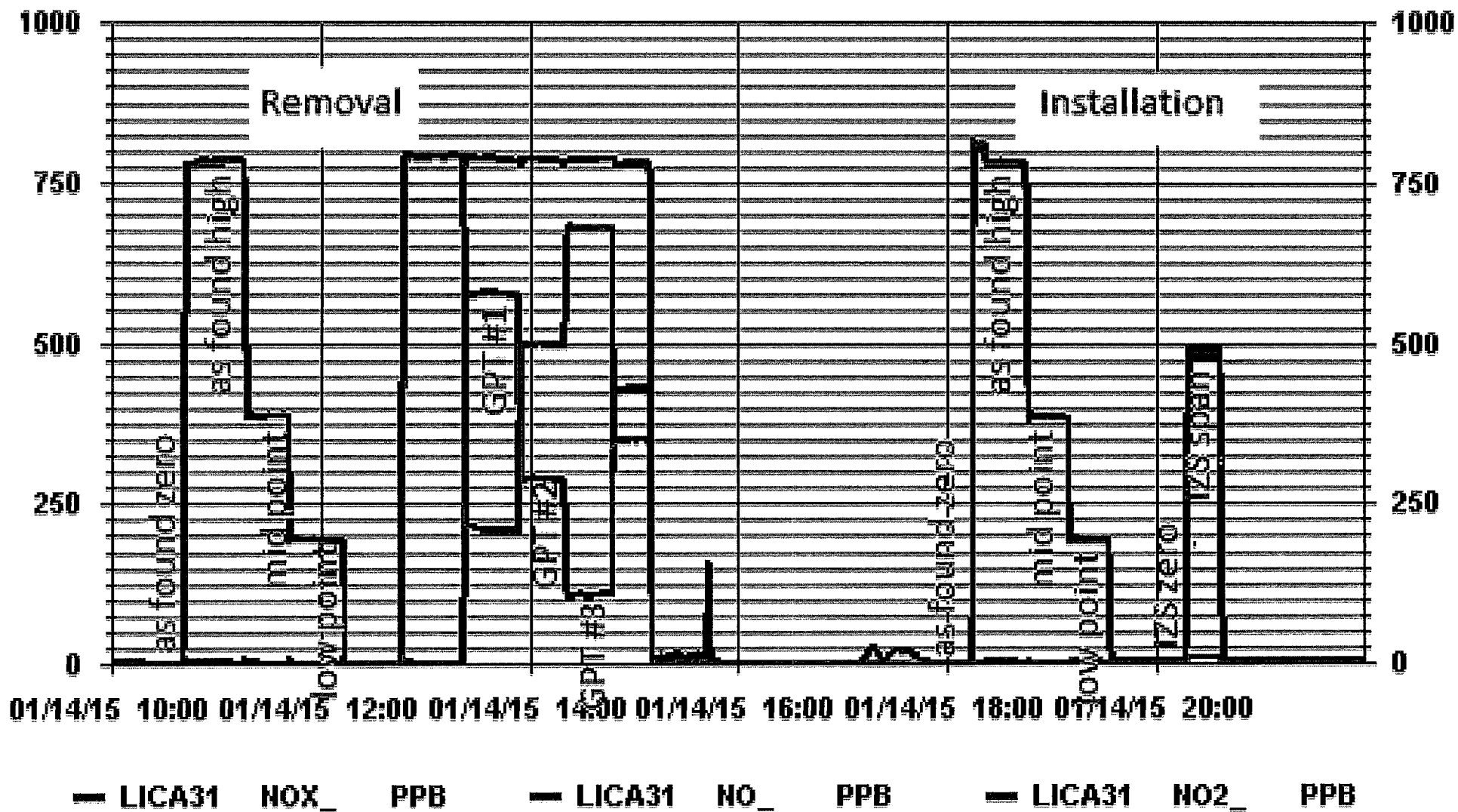
Date: 14-Jan-15
 Company: LICA
 Station Name/Location: St Lina
 Performed by: Limin Li

Start Time (mst): 17:30
 End Time (mst): 20:00
 Calibration Purpose: Install calibration
 Cal Gas Expiry Date: 4-Feb-18

API 200E NOx Analyzer Calibration



01 Minute Averages





API 200E NOx Analyzer Calibration

Date: 15-Jan-15
 Company: LICA
 Station Name/Location: St Lina
 Performed by: Limin Li

Start Time (mst): 10:00
 End Time (mst): 13:40
 Calibration Purpose: Install calibration
 Cal Gas Expiry Date: 4-Feb-18

Correction Factors:

Analyzer Serial Number: 594
 Last Calibration Date: 14-Jan-15
 Range ppb: 1000

As found C.F. Previous Cal High Point C.F.:

NO= <u>1.000</u>	NO= <u>1.000</u>
NOx= <u>1.004</u>	NOx= <u>0.999</u>
NO ₂ = <u>1.000</u>	NO ₂ = <u>1.012</u>

As found:

NOx SLOPE: 0.953
 NOx OFFS: 1.4
 NO SLOPE: 0.955
 NO OFFS: -1.4
 TEST: 130.7
 SAMP FLW: 452
 OZONE FL: 78
 PMT: 25.8
 NORM PMT: -0.3
 AZERO: 22.2
 HVPS: 771
 RCELL TEMP: 50.0
 BOX TEMP: 32.3
 PMT TEMP: 6.7
 IZS TEMP: 45
 MOLY TEMP: 315.4
 RCEL: 5.1
 SAMP: 26.4
 Internal Span: 5.9/388/393

As left:

NOx SLOPE: 0.953
 NOx OFFS: 1.4
 NO SLOPE: 0.955
 NO OFFS: -1.4
 TEST: 130.7
 SAMP FLW: 452
 OZONE FL: 78
 PMT: 25.8
 NORM PMT: -0.3
 AZERO: 22.2
 HVPS: 771
 RCELL TEMP: 50.0
 BOX TEMP: 32.3
 PMT TEMP: 6.7
 IZS TEMP: 45
 MOLY TEMP: 315.4
 RCEL: 5.1
 SAMP: 26.4
 Internal Span: 5.9/388/393

Calibrator Flow Targets:

Make & Model: Sablo 2010
 Serial #: 042531101(0911)
 Cal Gas Cylinder I.D. #: BLM000428
 NO Cylinder Conc. (ppm): 50.7
 NOx Cylinder Conc. (ppm): 50.8

point	diluent (cc/min)	cal gas (cc/min)	O ₂ setting (v or ppb)	total (cc/mln)
zero	5000	0	0	5000
high	5000	77	460	5077
mid	5000	37	240	5037
low	5000	17	90	5017

Calibration:

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	0.0	1.4	NA	NA
adjusted zero	NA							NA	NA
as found high	4923	76.90	5000	779.8	781.3	780	778	1.000	1.004
adjusted high	NA								
mid	NA								
low	NA								
calibrator zero	NA								
Average C.F.=								1.000	1.004

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ Increase	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4923	76.90	5000	0.0	780.0	778.0	-3.0	0.0	0.0	
as found NO ₂	4923	76.90	5000	460.0	231.0	778.0	546.0	549.0	549.0	1.000
gpt mid	4923	76.90	5000	240.0	493.0	779.0	285.0	287.0	288.0	0.997
gpt low	4923	76.90	5000	90.0	674.0	778.0	103.0	106.0	106.0	1.000
Average NO ₂ C.F.=										1.011

Linear Regression/Calibration Results:

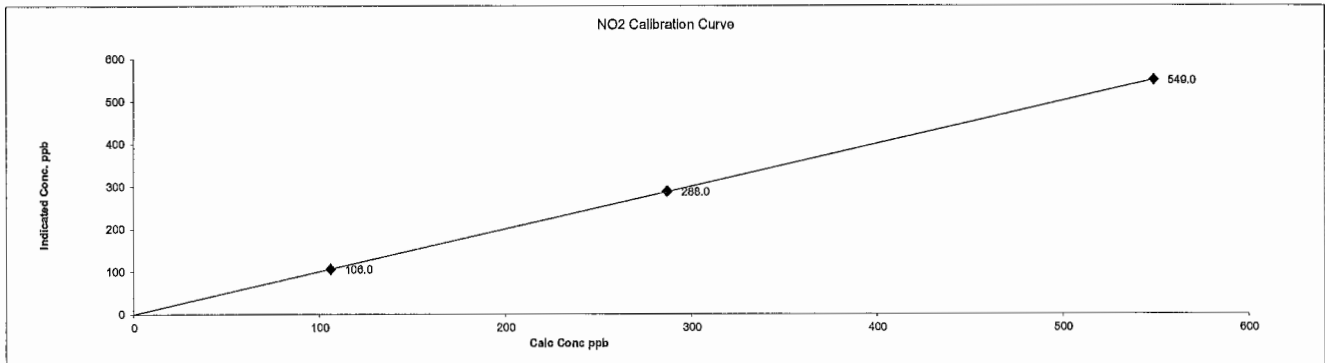
	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.000	0.996	1.001	0.85-1.15
b (Intercept as % of full scale) =	0.00%	0.00%	-0.02%	± 3% F.S.
% change in C.F. from last cal =	0.03%	-0.53%	1.19%	+/-15%
NO ₂ converter efficiency			98.9%	>85%

Comments:

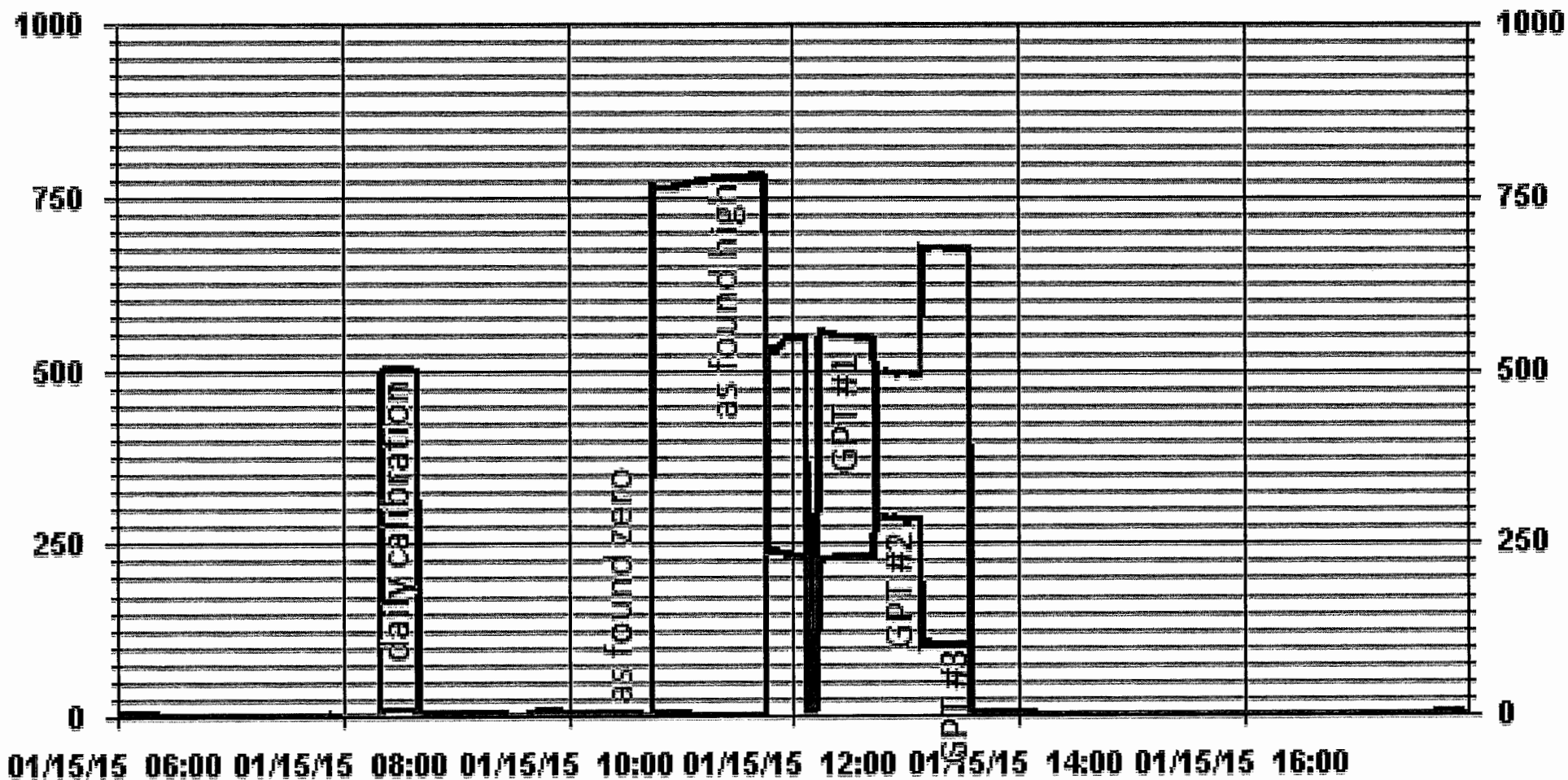
Date: 15-Jan-15
Company: LICA
Station Name/Location: St Lina
Performed by: Limin Li

Start Time (mst): 10:00
End Time (mst): 13:40
Calibration Purpose: Install calibration
Cal Gas Expiry Date: 4-Feb-18

API 200E NOx Analyzer Calibration



01 Minute Averages



— LICA31 NOX_ PPB — LICA31 NO_ PPB — LICA31 NO2_ PPB

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: 15-Jan-15
 Company: LICA
 Station Name/Location: St Lina
 Previous Audit Date: n/a

Parameter: PM2.5
 Performed by: Limin Li
 Start/End Time (mst): 12:30-13:30
 Calibration Purpose: Routine calibration

1400A Information and Status:

Serial Number: 1405A208301003 As Found Filter Loading %: 38 %
 Ko Factor: 13125.0 As Left Filter Loading %: 21.24 %
 Ambient Temperature °C: -4.41 As Found Noise: 0.005
 Ambient Pressure atm: .918 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>BRUNTON</u>	<u>FLUKE</u>
Model:	<u>475 Mark III</u>	<u>ADC.PRO</u>	<u>FLUKE1551A EX</u>
Serial Number:	<u>NA</u>	<u>NA</u>	<u>2329070</u>
Calibration Date:	<u>NA</u>	<u>5-May-14</u>	<u>NA</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.04	-0.15	0.04	-0.15
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.56	-0.64	0.28	-0.64
	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	0.04	-0.15	0.04	-0.15
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.56	-0.64	0.28	-0.64
	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>-8.1</u>	1405F pressure atm:	<u>0.927</u>
reference temperature °C:	<u>-7.4</u>	reference pressure:	<u>0.918</u>
difference °C:	<u>0.8</u>	difference :	<u>0.009</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>-7.8</u>	1405F pressure atm:	<u>0.918</u>
reference temperature °C:	<u>-7.8</u>	reference pressure:	<u>0.917</u>
difference °C:	<u>0.0</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>13.67</u>
reference main flow lpm: <u>2.96</u>	reference total/aux flow lpm: <u>13.54</u>
difference lpm: <u>-0.04</u>	difference lpm: <u>-0.13</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>13.67</u>
reference main flow lpm: <u>2.96</u>	reference total/aux flow lpm: <u>13.56</u>
difference lpm: <u>-0.04</u>	difference lpm: <u>-0.11</u>

K_o Audit:

Last K_o audit date: 1-May-14
 1405F K_o factor: 13125.0
 Measured K_o factor: NA
 % difference: NA

Comments:



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: 26-Jan-15
 Company: LICA
 Station Name/Location: St Lina
 Previous Audit Date: 15-Jan-15

Parameter: PM 2.5
 Performed by: Alex Yakupov
 Start/End Time (mst): 10:53 - 14:20
 Calibration Purpose: 2nd Audit

1400A Information and Status:

Serial Number: <u>1405A208301003</u>	As Found Filter Loading %: <u>26.75</u>
Ko Factor: <u>13125.0</u>	As Left Filter Loading %: <u>22.67</u>
Ambient Temperature °C: <u>5.49</u>	As Found Noise: <u>0.007</u>
Ambient Pressure atm: <u>0.914</u>	As Left Noise: <u>0.013</u>
Main Flow Reading lpm: <u>3.00</u>	Pump Vacuum: <u>0.30</u>
Aux Flow Reading lpm: <u>13.67</u>	Warnings: <u>None</u>

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>MetOne</u>
Model:	<u>475 Mark III</u>	<u>FB61291</u>	<u>Station</u>
Serial Number:	<u>NA</u>	<u>130168457</u>	<u>NA</u>
Calibration Date:	<u>NA</u>	<u>11-Apr-14</u>	<u>NA</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.03	-0.15	0.06	-0.15
	limit	0.15	X	0.15	X
Bypass Flow	actual	0.43	-0.64	0.46	-0.64
	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	0.06	-0.15
	limit	0.15	X	0.15	X
Bypass Flow	actual	0.43	-0.64	0.46	-0.64
	limit	0.60	X	0.60	X

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>5.5</u>	1405F pressure atm: <u>0.914</u>
reference temperature °C: <u>5.1</u>	reference pressure: <u>0.913</u>
difference °C: <u>-0.4</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>5.5</u>	1405F pressure atm: <u>0.914</u>
reference temperature °C: <u>5.1</u>	reference pressure: <u>0.913</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>13.67</u>
reference main flow lpm: <u>3.01</u>	reference total/aux flow lpm: <u>13.71</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>13.67</u>
reference main flow lpm: <u>3.09</u>	reference total/aux flow lpm: <u>14.06</u>
difference lpm: <u>0.09</u>	difference lpm: <u>0.39</u>

K_o Audit:

Last K_o audit date: 1-May-14
 1405F K_o factor: 13125.0
 Measured K_o factor: NA
 % difference: NA

Comments:

OZONE

Maxxam Thermo 49i O₃ Analyzer Calibration

Date: 14-Jan-15
 Company: LICA
 Station Name/Location: St Lina
 Performed by: Limin LI

Start Time (mst): 15:20
 End Time (mst): 18:30
 Calibration Purpose: routine monthly
 G.P.T. Date: 4-Feb-18

Analyzer:
 Serial Number: 1002240371
 Last Calibration Date: 11-Dec-14
 Previous Cal High Point C.F.: 1.001

Range ppm: 500
 As Found C.F.: 0.998
 New C.F.: 1.002

	As found:	As left:
Motherboard:	O ₃ Bkg: -1.8	O ₃ Bkg: -1.8
	O ₃ Coef: 1.026	O ₃ Coef: 1.026
	3.3 3.3	3.3 3.3
	15.0 14.8	15.0 14.8
	24.0 23.7	24.0 23.7
Interface Board:	-3.3 -3.2	-3.3 -3.2
	3.3 3.2	3.3 3.2
	5.0 4.9	5.0 4.9
	15.0 14.7	15.0 14.7
	-15.0 -15.0	-15.0 -15.0
Photo Lamp:	9.4	9.4
	24.0 23.4	24.0 23.4
O ₃ Lamp:	8.3	8.3
	Bench: 29.2	Bench: 29.2
Bench Lamp:	53.7	53.7
	O ₃ Lamp: 67.8	O ₃ Lamp: 67.8
Pressure:	673.8	673.8
	Cell A lpm: 724	Cell A lpm: 724
Cell B lpm:	718	718
	O ₃ ppb: 39.7	O ₃ ppb: 39.7
Cell A ppb:	46	46
	Cell B ppb: 33.4	Cell B ppb: 33.4
Cell A Int:	64054	64054
	Cell B Int: 74652	Cell B Int: 74652
Internal Span:	349	349

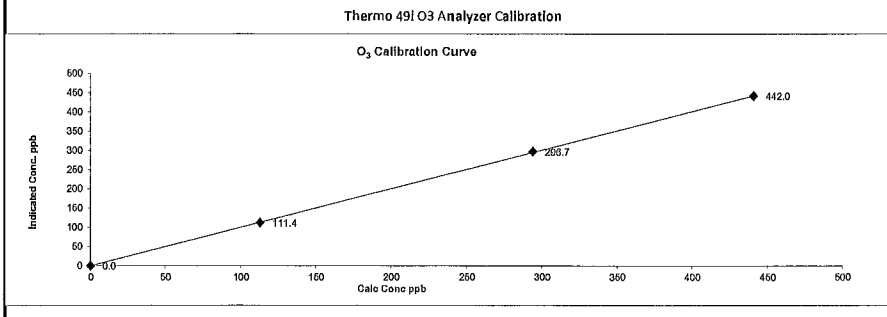
Calibrator:	Calibrator Flow Targets:
Make & Model: Sabio 2010	point total flow (cc/min) O ₃ setting (v or ppb)
Serial #: 042531101(0911)	zero 5000 0
NOx Gas Cylinder I.D. #: BLM00428	high 5000 360
NOx Cylinder Conc. (ppm): 50.7	mid 5000 240
	low 5000 90

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5000		5000	0.0	0.2	NA
adjusted zero	5000.0		5000	0.0	0.2	NA
as found high	5000.0	0.00	5000	441.0	442.0	0.998
adjusted high	5000.0	0.00	5000	441.0	442.0	0.998
mid	5000.0	0.00	5000	294.0	296.7	0.992
low	5000.0	0.00	5000	113.0	111.4	1.016
calibrator zero	5000.00		5000	0.0	1.0	NA

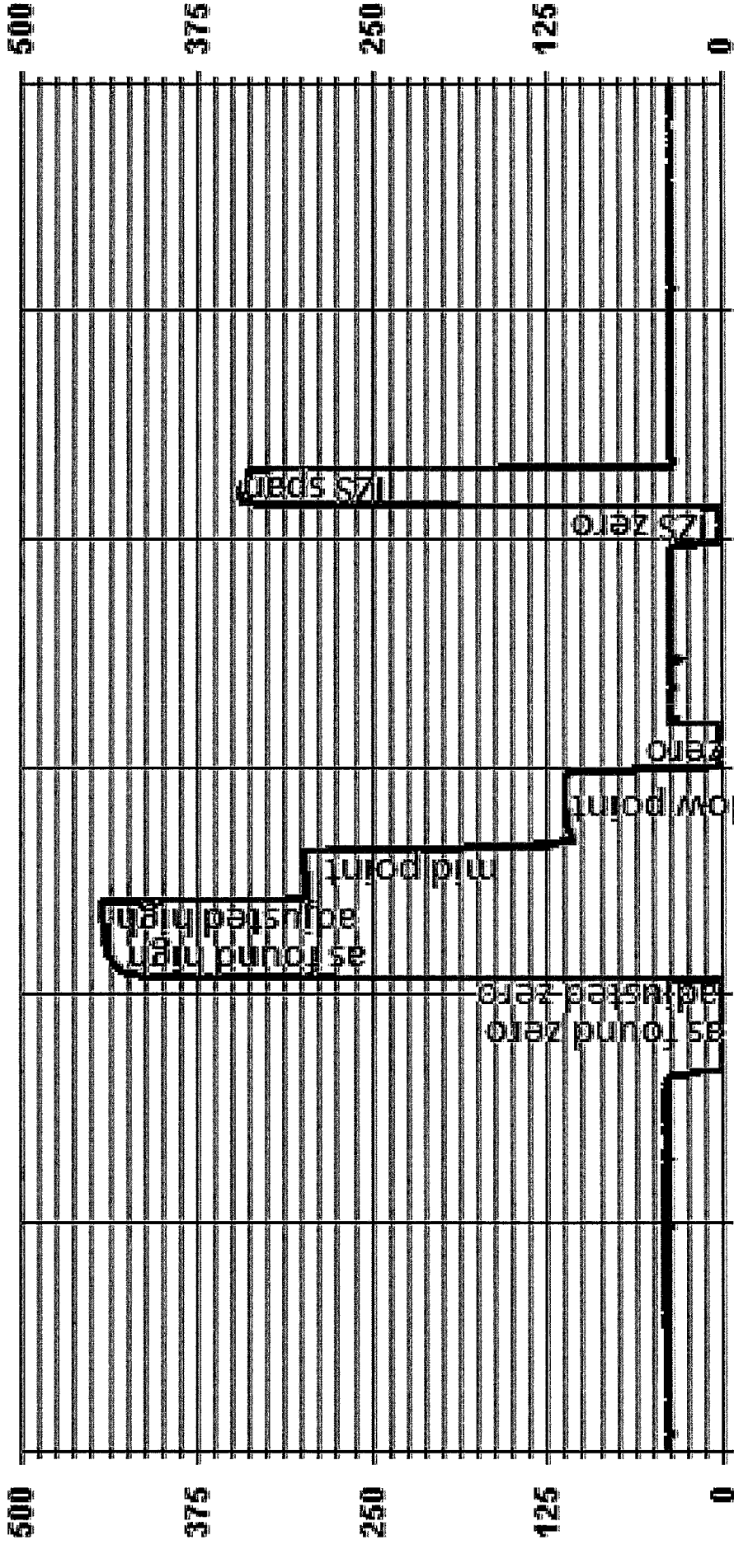
copy and paste flows and NO decrease from NOx cal in to calculated concentration Average C.F.:= 1.002

Linear Regression/Calibration Results:				LIMITS	Pass/Fail ?
Correlation Coefficient =	1.000	> or = 0.995	PASS		
Slope =	1.005	0.85-1.15	PASS		
b (Intercept as % of full scale)=	-0.122%	± 3% F.S.	PASS		
% change in C.F. from last cal	0%	± 15%	PASS		

Comments:
 No zero and span adjusted. Change sample filter.



01 Minute Averages



— LICA31_03_ PPB

WIND SYSTEM

Met One Instruments

1204 Main St., Suite 108
Regional Service Center
Rowlett, TX, 75088

Wind Tunnel Calibration
Data Sheet
60.6-6100

NIST Old Model No. 170.41 Serial No. 3309
NIST Sensor Model No. 50.10 Serial No. 1263

Average Wind Speed 218 mph 11.12

WTS Reading Degrees	WTS Output Vdc	WTS Reading Degrees	WTS Error +/- 1 Deg	WTS Standard mpa	WTS Output Vdc	WTS Reading mpa	WTS Error +/- 0.25 mpa
28.2	0.240	28.8	-0.6	11.21	0.224	11.18	-0.03
31.8	0.184	31.8	0.0	11.27	0.227	11.23	-0.04
126.4	0.221	118.1	8.3	11.86	0.221	11.86	-0.00
134.2	0.428	131.3	2.9	11.29	0.223	11.11	-0.18
141.2	0.382	208.2	-6.6	11.23	0.223	11.18	-0.05
141.3	0.467	226.4	-8.1	11.18	0.226	11.32	0.14
206.3	0.829	206.3	0.0	11.98	0.224	11.98	0.00
126.3	0.817	126.3	0.0	11.98	0.223	11.95	-0.03

Average Wind Speed 221 mph 2.21

WTS Reading Degrees	WTS Output Vdc	WTS Reading Degrees	WTS Error +/- 1 Deg	WTS Standard mpa	WTS Output Vdc	WTS Reading mpa	WTS Error +/- 0.25 mpa
28.2	0.240	28.2	0.0	2.18	0.242	2.08	-0.10
31.8	0.184	31.8	0.0	2.26	0.243	2.11	-0.15
126.4	0.221	126.4	0.0	2.21	0.242	2.08	-0.13
134.2	0.428	134.2	0.0	2.22	0.242	2.07	-0.15
141.2	0.382	141.2	0.0	2.26	0.242	2.12	-0.14
141.3	0.467	208.2	-6.2	2.23	0.242	2.10	-0.13
206.3	0.829	206.3	0.0	2.22	0.243	2.18	-0.04
126.3	0.817	126.3	0.0	2.21	0.243	2.17	-0.04

Average Wind Speed 225 mph 2.25

Met One Instruments, Inc. 112035
 1204 Main St., Suite 108 01501000
 Rowlett, TX 75088 01501000
 Phone: 972.261.0000 01501000
 Fax: 972.261.0000 01501000
 Email: sales@metone.com 01501000
 Website: www.metone.com 01501000
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 Website: www.metone.com 01501000

CALIBRATORS



Calibrator Performance Audit Oxides Of Nitrogen

File No. 2013-338A

Company Maxxam Operator: Chris Wesson

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>N/A</u>
Serial Number	<u>690</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>June 2011</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>BAL3165</u>	Barometric Pressure	<u>N/A</u>
NO/NOx Concentration	<u>48.9/48.0</u>		

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

Calibrator Flow (scfm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4998	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
4998	81.8	0.800	0.800	0.818	-0.007	0.810	2%	1%
4998	40.9	0.400	0.400	0.413	-0.003	0.410	3%	2%
4996	20.4	0.200	0.200	0.211	-0.001	0.210	5%	5%
Absolute Average Percent Difference							4%	3%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NO _x			
Correlation=	1.0000	≥ 0.990		Correlation=	0.9999		
m (Slope)=	1.0203	0.90-1.10		m (Slope)=	1.0100		
b (Intercept % of FS)=	0.3400	± 3% F.S.		b (Intercept % of FS)=	0.4000		

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NO _x	% Diff. Vs Audit gas	
4998	0.000	0.000	0.817	-0.006	0.812	NO ₂	% Diff. Limit
4998	0.600	0.469	0.348	0.463	0.811	0%	± 10%
4998	0.300	0.249	0.568	0.244	0.813	0%	± 10%
4998	0.120	0.099	0.718	0.095	0.813	1%	± 10%
Absolute Average Percent Difference						0%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO ₂		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	0.9970	0.90-1.10					
b (Intercept % of FS)=	-0.4395	± 3% F.S.					

AENV Standards Audit Calibrator		NO _x Analyzer	
Make/Model	<u>Teco 1461</u>	Make/Model	<u>Teco 421</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
		Last Calibration Date	<u>February 21, 2013</u>
		Full Scale (ppm)	<u>1.0</u>

COMMENTS: Long stabilization required for 1st pt GPT. Check UV O3 lamp.

Auditor: Al Clark
Operator Signature: _____

Date: February 21, 2013
Location: McIntyre Center Edmonton

Company Maxxam Operator: Limin Li

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sablo 2010</u>	Make/Model	<u>N/A</u>
Serial Number	<u>042531101</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>December 2010</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>LL42475</u>	Barometric Pressure	<u>N/A</u>
NO/NOx Concentration	<u>48.5/48.5</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>	Gas flows not available from display.	

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4999	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
4999	80.4	0.780	0.780	0.814	-0.002	0.812	4%	4%
4999	39.1	0.399	0.399	0.402	0.000	0.402	1%	1%
5000	19.6	0.190	0.190	0.200	0.000	0.200	5%	5%
Absolute Average Percent Difference							3%	3%

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

NO		LIMITS		NOx	
Correlation=	0.9998	≥ 0.990		Correlation=	0.9998
m (Slope)=	1.0404	0.90-1.10		m (Slope)=	1.0378
b (Intercept % of FS)=	-0.2067	± 3% F.S.		b (Intercept % of FS)=	-0.1673

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
4999	0.000	0.000	0.808	-0.002	0.802	NO ₂	% Diff. Limit
4999	0.460	0.525	0.283	0.521	0.803	0	± 10%
4999	0.240	0.278	0.530	0.273	0.803	0	± 10%
4999	0.090	0.108	0.700	0.102	0.802	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)=	0.9983	0.90-1.10	
b (Intercept % of FS)=	-0.3864	± 3% F.S.	

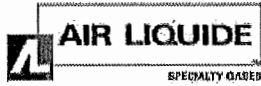
AENV Standards Audit Calibrator		NO _x Analyzer	
Make/Model	<u>Teco 146i</u>	Make/Model	<u>Teco 42i</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
		Last Calibration Date	<u>December 15, 2014</u>
		Full Scale (ppm)	<u>1.0</u>

COMMENTS: _____

Auditor: Al Clark Date: December 17, 2014

Operator Signature: *Limin Li* Location: McIntyre Center Edmonton

CALIBRATION GASES



500 WEAVER PARK RD, LONGMONT, CO 80501 Phone: 888-253-1635 Fax: 303-772-7673

COMPLIANCE CLASS

Guaranteed +/- 2% Accuracy

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A42014
 AIR LIQUIDE AMERICA SPECIALTY GASES LLC
 500 WEAVER PARK RD
 LONGMONT, CO 80501

P.O. No.: 1218334
 Document #: 53834050-001

Customer
 AIR LIQUIDE CANADA
 HARRY GE/PO 1218334
 10020 56TH AVENUE
 EDMONTON T6E 5Z2
 ALBERTA CANADA

ANALYTICAL INFORMATION Gas Type : NO,SO2,BALN

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1. EPA/600/R-12/531; May 2012. Do not use this standard if pressure is less than 100 psig.

Cylinder Number: BLM000428
 Cylinder Pressure: 1900 PSIG

Certification Date: 03Feb2014

Exp. Date: 04Feb2018
 Batch No: LGM0109822

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY (ABSOLUTE / RELATIVE)
NITRIC OXIDE	50.7 PPM	0.4 PPM / 0.8 %
SULFUR DIOXIDE	48.8 PPM	0.6 PPM / 1.2 %
NITROGEN - OXYGEN FREE	BALANCE	
TOTAL OXIDES OF NITROGEN	50.8 PPM	Reference Value Only

TRACEABILITY

REFERENCE STANDARD COMPONENT	CONCENTRATION	UNCERTAINTY	CYLINDER	TYPE/SRM SAMPLE	EXP. DATE
NITRIC OXIDE	49.4600 PPM	0.4000 PPM	KAL003885	NTRM 1683/051711	15Mar2018
SULFUR DIOXIDE	49.6700 PPM	0.5000 PPM	KAL003244	NTRM 1693	20Aug2016

ANALYTICAL METHOD

1st Analysis: 27Jan2014

COMPONENT	INSTRUMENT	ANALYTICAL/PRINCIPLE	CALIBRATED	CONCENTRATION
NITRIC OXIDE	MKS ONLINE/2030/0929062	FTIR	08Jan2014	50.84 PPM
SULFUR DIOXIDE	MKS ONLINE/2030/0929062	FTIR	04Jan2014	48.83 PPM

2nd Analysis: 03Feb2014

COMPONENT	INSTRUMENT	ANALYTICAL/PRINCIPLE	CALIBRATED	CONCENTRATION
NITRIC OXIDE	MKS ONLINE/2030/0929082	FTIR	08Jan2014	50.58 PPM
SULFUR DIOXIDE	MKS ONLINE/2030/0929062	FTIR	04Jan2014	48.71 PPM

Special Notes:

Note on Tags and Certs: ALC Stock Number: SPG-3MX0020758 Transfer cost approved by Sarah Herbert NOTE: END USER IS REQUESTING THAT THE ORDER COME FROM LONGMONT AS THEY HAVE HAD ISSUES WITH SOME EPAS SHIPPED FROM TROY

QUALITY ASSURANCE

APPROVED BY: JON WITZAK
 (signature on file)



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2013-333CGA

Company: Maxxam Operator's Name: Chris Wesson
 Cylinder #: BLM005217 Concentration PPM: 9.58 Tolerance(%): 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: February 21, 2013
 Gas Type: H2S Conc. 20.02
 Cylinder Number: D249556

Flow Measurement Device:

Make/Model: Bios DC2
 Serial Number: AMU 1669
 Temp. °C: 21.0 C
 B.P. 696 mmhg

Reference Analyzer:

Make/Model: Teco 45C Serial/AMU Number: 1624
 Instrument Settings: Zero: 7.5 Span: 1.023 Range: 0.1
 Last Calibration: Date: Feb 21/13 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	0.0000	0.0000
5106	38.5	0.0708	0.00754	132.623	9.39
5105	18.0	0.0329	0.00353	283.611	9.33
5078	9.2	0.0169	0.00181	551.957	9.33
Average Cylinder Concentration:					9.36

Previous Stated Concentration PPM: 9.58

Percent variance from Stated: 2.4

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: February 21, 2013
 Location: McIntyre Center Edmonton



Praxair
 5700 South Alameda Street
 Los Angeles, CA 90058
 Tel: (323) 585-2154 Fax: (714) 542-6689
 PGVPID: F22014

DocNumber: 000068924

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

MAXXAM ANALYTICS INC *NA*
 9372 49TH ST
 EDMONTON AB T6B 2L

Praxair Order Number: 21137117
 Customer P. O. Number: 35-55963
 Customer Reference Number:

Fill Date: 7/1/2014
 Part Number: NI ME600P2E-AQ
 Lot Number: 109418203
 Cylinder Style & Outlet: AQ CGA 350
 Cylinder Pressure & Volume: 2200 psig 78 cu. ft.

Certified Concentration:

Expiration Date:	7/7/2022	NIST Traceable
Cylinder Number:	LL83638	Analytical Uncertainty:
582 ppm	METHANE	± 1.5 %
203 ppm	PROPANE	± 0.9 %
Balance	NITROGEN	

Certification Information: Certification Date: 7/7/2014 Term: 96 Months Expiration Date: 7/7/2022

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component: METHANE

Requested Concentration: 600 ppm
 Certified Concentration: 582 ppm
 Instrument Used: MKS Multigas 2031 FTIR
 Analytical Method: Furler Transform Infrared
 Last Multipoint Calibration: 6/24/2014

Reference Standard Type: GMIS
 Ref. Std. Cylinder #: CC139480
 Ref. Std. Conc: 246 ppm
 Ref. Std. Traceable to SRM #: 2751
 SRM Sample #: 212-09-AL
 SRM Cylinder #: SX-20000

First Analysis Data:		Date: 7/7/2014	
Z: 0	R: 249.5	C: 589.4	Conc: 581.21
R: 249.5	Z: 0	C: 589	Conc: 580.82
Z: 0	C: 592	R: 249.4	Conc: 583.77
UOM: ppm	Mean Test Assay: 581.93 ppm		

Second Analysis Data:		Date:	
Z: 0	R: 0	C: 0	Conc: 0
R: 0	Z: 0	C: 0	Conc: 0
Z: 0	C: 0	R: 0	Conc: 0
UOM: ppm	Mean Test Assay: 0 ppm		

2. Component: PROPANE

Requested Concentration: 200 ppm
 Certified Concentration: 203 ppm
 Instrument Used: MKS Multigas 2031 FTIR
 Analytical Method: Fourier Transform Infrared
 Last Multipoint Calibration: 6/24/2014

Reference Standard Type: GMIS
 Ref. Std. Cylinder #: CC 163442
 Ref. Std. Conc: 265.8 ppm
 Ref. Std. Traceable to SRM #: vs 2644a
 SRM Sample #: 101-C-45
 SRM Cylinder #: XF003829B

First Analysis Data:		Date: 7/7/2014	
Z: 0	R: 273.6	C: 208.4	Conc: 202.43
R: 273.7	Z: 0	C: 208.6	Conc: 202.63
Z: 0	C: 208.5	R: 273.6	Conc: 202.53
UOM: ppm	Mean Test Assay: 202.53 ppm		

Second Analysis Data:		Date:	
Z: 0	R: 0	C: 0	Conc: 0
R: 0	Z: 0	C: 0	Conc: 0
Z: 0	C: 0	R: 0	Conc: 0
UOM: ppm	Mean Test Assay: 0 ppm		

Analyzed by:

Jack Fu

Certified by:

Ying Yu



maxxam.ca

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Fax 403-219-3673

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

JOB #:2833-2015-01-35- C

JANUARY 2015

Prepared for:

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

Attention: MIKE BISAGA

DATE: **March 18, 2015**

Prepared by:

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

Reviewed by:

Lily Lin, B.Sc.
Customer Service Supervisor, Air Services, Maxxam Analytics

SUMMARY

In JANUARY 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 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.

The summary of results is presented on the following pages.

VOC results are not included in this report as the VOC sampler was out for repair.

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	3	VAR	VAR	VAR	VAR	1.5	12	99.9
H2S (PPB)	10	3	0	0	0	2	VAR	VAR	VAR	VAR	1.0	12	99.9
THC (PPM)	-	-	-	-	2.6	8.8	19	3	1.1	W	4.4	12	99.9
CH4 (PPM)	-	-	-	-	2.6	8.6	19	3	1.1	W	4.4	12	99.9
NMHC (PPM)	-	-	-	-	0.01	0.30	12, 13	VAR	VAR	VAR	0.09	12	99.9
NO2 (PPB)	159	-	0	-	10.9	36.3	10	20	3.8	W	24.7	18	99.5
NO (PPB)	-	-	-	-	4.5	55.5	5	4	2.8	WSW	22.7	9	99.5
NOX (PPB)	-	-	-	-	15.4	88.1	5	4	2.8	WSW	46.1	9	99.5
O3 (PPB)	82	-	0	-	22	40	VAR	VAR	VAR	VAR	35.2	8	96.2
PM2.5 (UG/M3)	-	30	-	0	5.7	65.0	11	23	9.2	E	18.2	12	90.5
VECTOR WS (KPH)	-	-	-	-	10.8	38.4	7	19	-	NW	25.3	8	99.9
VECTOR WD (DEG)	-	-	-	-	WNW	-	-	-	-	-	-	-	99.9

NA-NOT AVAILABLE VAR-VARIOUS

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collected Date	Maximum reading (ug)	Semi-Volatile Organic
JANUARY 6, 2015	1.12	Naphthalene
JANUARY 12, 2015	1.53	2-Methylnaphthalene
JANUARY 18, 2015	1.22	2-Methylnaphthalene
JANUARY 24, 2015	0.16	2-Methylnaphthalene
JANUARY 30, 2015	0.25	Naphthalene

Note: NA

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

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1.0 Discussion

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

Sample filters for all continuous air monitors were changed before the calibration was started. The sample manifold was 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 data was within Provincial objectives for the month.

SULPHUR DIOXIDE (SO₂)

The analyzer was working well throughout the month. The routine monthly calibration was performed on January 8. The inlet filter was changed before the calibration was started. Both hourly and hourly maximum data collected on January 19 at hour 13 were invalidated due to a small power outage that affected data quality.

HYDROGEN SULPHIDE (H₂S)

The analyzer was working well throughout the month. The routine monthly calibration was performed on January 7. The inlet filter was changed before the calibration was started. Both hourly and hourly maximum data collected on January 19 at hour 13 were invalidated due to a small power outage that affected data quality.

TOTAL HYDROCARBONS (THC)

The analyzer was working well throughout the month. The routine monthly calibration was performed on January 7. The inlet filter was changed before the calibration was started. Data collected on January 19 at hour 13 was invalidated due to a small power outage that affected data quality.

NITROGEN DIOXIDE (NO₂)

An as found points check was performed on January 8. The result was within acceptance limits. Following the as found points check, a full calibration was attempted. However, the analyzer failed the low point check. The calibrator was changed and calibration was repeated. All points passed. The analyzer was put into Maintenance mode on January 13 from hour 9 to hour 11 as GPT calibration was being performed for ozone calibration. Data collected on January 19 at hour 13 was invalidated due to a small power outage that affected data quality. Hourly maximum data on January 20 hour 13 was invalidated due a spike: Reason unknown.

OZONE (O₃)

A shut-down calibration was performed for the reaction cell cleaning on January 13. Following the maintenance, an installation calibration was performed on the same day. The analyzer did not function properly after the daily calibration on January 22 due to the zero/span valve getting stuck. This was reset automatically during the daily calibration on January 23. This issue repeated itself on January 26 and Maxxam staff reset the zero/span valve remotely. 28 hours of data from January 22 hour 7 to January 23 hour 4 and January 26 hour 3 to hour 7 were invalidated due to this event. Data on January 19 at hour 13 was invalidated due to a small power outage that affected data quality.

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

Two Teom audits were performed this month: one was completed on January 13, and the other audit was performed on January 27. Both the inlet filter and the FDMS filter were replaced on January 27. 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. 69 hours of data were invalidated as the data were below -3 ug/m³ this month. Data collected on January 19 at hour 13 was invalidated due to a small power outage that affected data quality. Data on January 19 at hour 14 was invalidated as the analyzer was recovering from the power outage.

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. Both hourly and hourly maximum data collected on January 19 at hour 13 were invalidated due to a small power outage that affected data quality.

VOC SAMPLES

The sampler was programmed to run for 24 hours, and, every 6 days per sample cycle. The values for the VOCs are reported as ppb in 2 decimal places.

No VOC samples were collected in January as the sampler was out for repair. The VOC sampler data sheets included in this report were made for AITF lab for tracking purposes.

PAH SAMPLES

The sampler was programmed to run for 24 hours, and, every 6 days per sample cycle. The values for the PAHs are reported as µg in 2 decimal places.

Samples were collected on January 6, 12, 18, 24 and 30. They were sent to the lab for analysis. Results are included in this report.

NMHC CANISTER SAMPLES

Samples were programmed to be collected whenever the NMHC canister is triggered by a 5-minute average concentration of ≥ 0.3 ppb.

The canister was triggered on January 12 and January 18. The samples for the January 12 canister event were sent to the lab for analysis. Results are included in this report. No sample was collected for the January 18 event due to a leak. The canister was changed on January 19.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association, and the Maxxam field sampling team consisted of Tom Bourque and 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 90% requirements.

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/NO_x Monitoring
- Maxxam AIR SOP-00215: Teom Operation

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100A UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 55i FID Analyzer
- Methane, Non-Methane Hydrocarbon - Thermo 55i FID Analyzer
- Oxides of Nitrogen - API 200E Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - R&P 1405F Teom Unit
- Wind System - RM Young Unit
- Datalogger - ESC 8832

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE



SULPHUR DIOXIDE (SO2) hourly averages 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	24-HOUR	RDGS.	
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	0:00	MAX.	AVG.		
DAY 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	1	1	2	2	0.2	24	
DAY 2	2	3	3	3	1	1	0	0	0	0	0	0	0	1	0	0	1	0	1	5	0	0	0	1	1	3	0.8	24
DAY 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0.0	24
DAY 4	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	2	5	2	2	2	3	3	2	2	3	1.0	24	
DAY 5	2	2	2	2	2	2	1	1	1	1	1	1	1	1	0	0	5	0	0	0	0	0	0	0	0	2	0.8	24
DAY 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	1	1	1	1	0	1	1	1	1	0.3	24
DAY 7	1	1	1	1	1	1	1	1	1	1	1	2	2	5	1	1	1	1	1	1	1	1	1	1	1	2	1.1	24
DAY 8	1	0	0	0	0	0	0	0	0	C	C	C	C	C	C	1	1	1	1	1	5	0	0	1	1	0.4	24	
DAY 9	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	5	1	1	2	1	2	0.7	24	
DAY 10	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	1	1	1	1	0	0	2	1.0	24
DAY 11	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	1	1	5	1	1	1	1	0	1	1	0.7	24	
DAY 12	0	1	1	1	1	2	2	2	2	2	2	2	1	2	2	1	5	0	1	2	2	2	2	1	2	1.5	24	
DAY 13	1	2	3	3	2	2	1	0	0	0	0	0	0	0	1	5	1	1	1	1	1	1	2	2	3	1.1	24	
DAY 14	2	1	1	1	1	1	0	1	1	1	1	1	0	0	5	0	0	0	0	0	0	0	0	0	0	2	0.5	24
DAY 15	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
DAY 16	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
DAY 17	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	1	1	1	1	1	1	2	2	0.4	24	
DAY 18	1	1	0	1	0	1	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2	24
DAY 19	0	0	0	1	1	0	0	0	0	5	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0	1	0.1	23
DAY 20	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
DAY 21	0	0	0	0	0	0	0	5	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0.6	24
DAY 22	1	1	1	1	1	1	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	24
DAY 23	0	0	0	0	0	5	0	1	2	3	2	1	1	0	0	0	0	1	1	1	1	0	0	0	0	3	0.6	24
DAY 24	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
DAY 25	0	0	0	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	24
DAY 26	0	0	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	24
DAY 27	0	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	24
DAY 28	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0.0	24	
DAY 29	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	0	0	0	0	0	0	5	0	1	0.2	24	
DAY 30	0	1	1	1	0	0	0	0	0	0	0	1	1	1	1	0	0	0	1	1	1	5	0	0	1	0.4	24	
DAY 31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	1	1	1	1	0.1	24	
HOURLY MAX	2	3	3	3	2	2	2	2	2	3	2	2	2	2	2	2	1	2	2	2	2	3	3	2	2			
HOURLY AVG	0.4	0.5	0.5	0.6	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.5	0.4	0.3	0.4	0.4	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5				

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

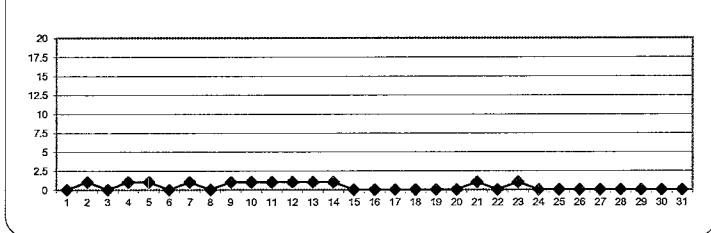
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	172	PPB	24-HR	48	PPB
----------------------	------	-----	-----	-------	----	-----

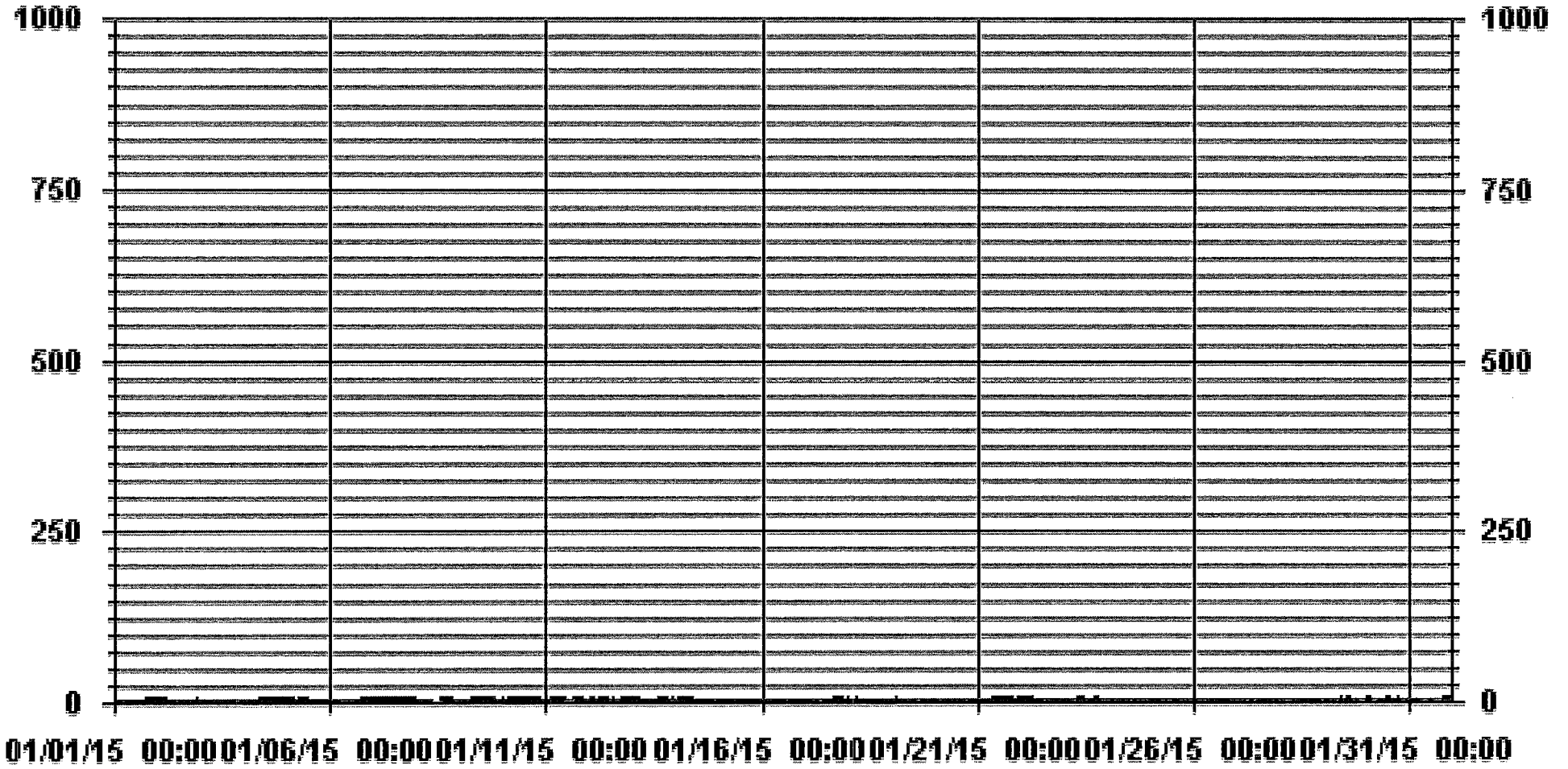
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0			
NUMBER OF 24-HR EXCEEDENCES:	0			
NUMBER OF NON-ZERO READINGS:	243			
MAXIMUM 1-HR AVERAGE:	3 PPB @ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 24-HR AVERAGE:	1.5 PPB		ON DAY(S)	12
			VAR-VARIOUS	
IZS CALIBRATION TIME:	32 HRS	OPERATIONAL TIME:	743 HRS	
MONTHLY CALIBRATION TIME:	6 HRS	AMD OPERATION UPTIME:	99.9 %	
STANDARD DEVIATION:	0.65	MONTHLY AVERAGE:	0 PPB	

24 HOUR AVERAGES FOR JANUARY 2015

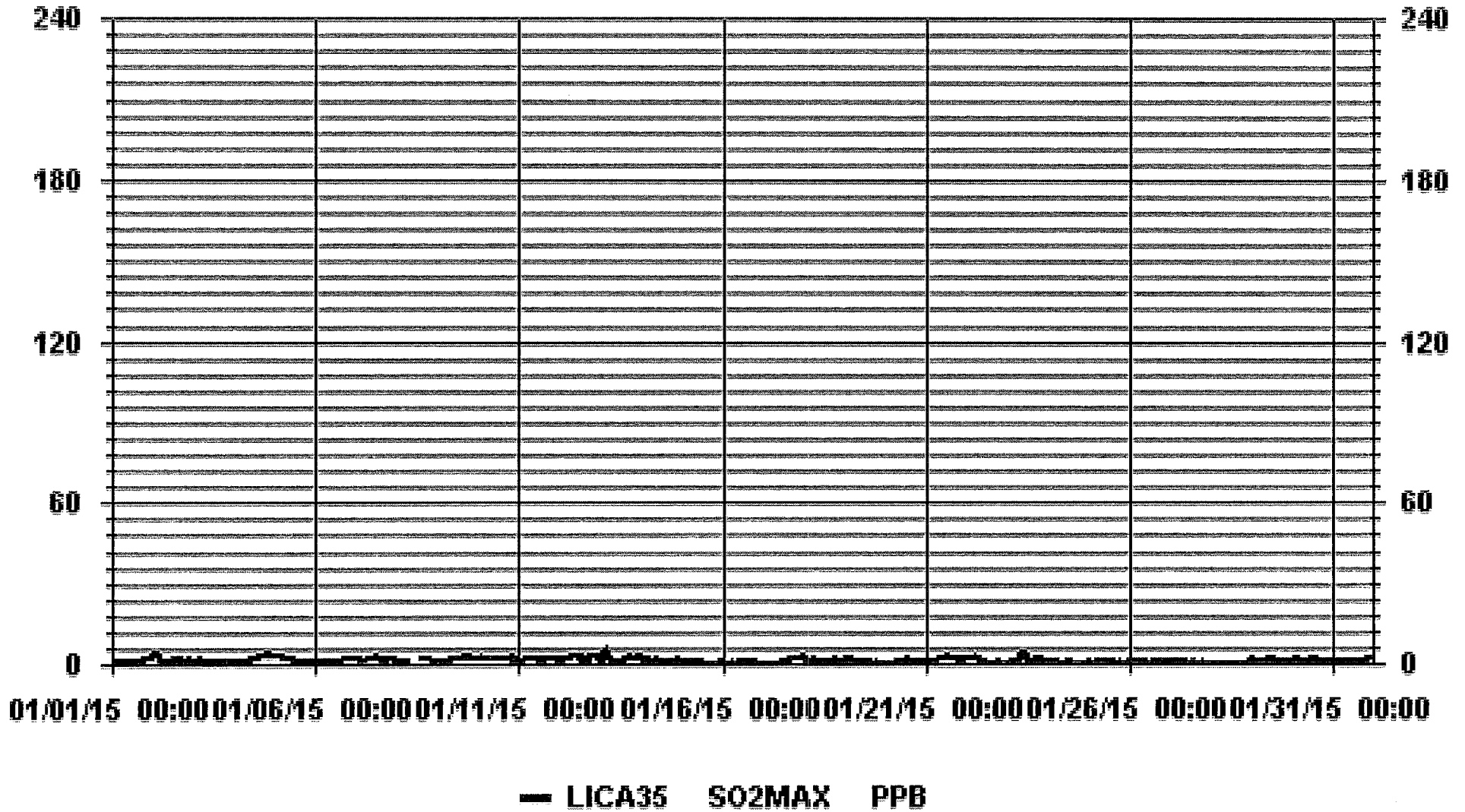


01 Hour Averages



— LICA35 SO2_ PPB

01 Hour Averages



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

January 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA-ELK
 Parameter : SO2_
 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	
< 20	1.84	3.12	2.41	4.68	8.79	7.80	2.55	1.84	1.41	1.70	1.98	17.16	19.29	12.90	10.07	2.41	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	1.84	3.12	2.41	4.68	8.79	7.80	2.55	1.84	1.41	1.70	1.98	17.16	19.29	12.90	10.07	2.41	

Calm : .00 %

Total # Operational Hours : 705

Distribution By Samples

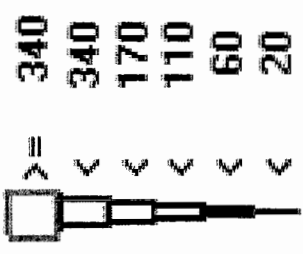
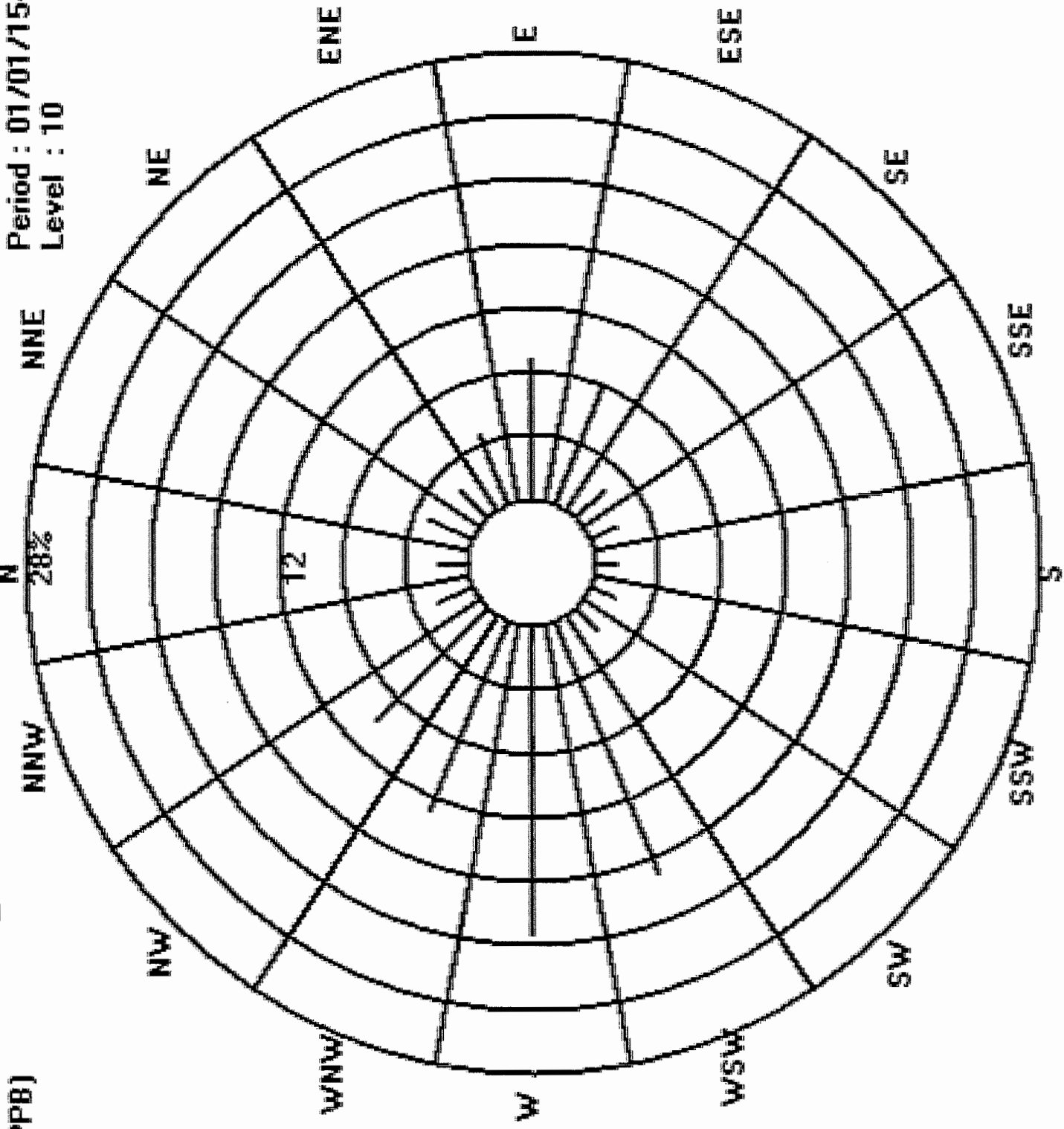
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 20	13	22	17	33	62	55	18	13	10	12	14	121	136	91	71	17	705
< 60																	
< 110																	
< 170																	
< 340																	
>= 340																	
Totals	13	22	17	33	62	55	18	13	10	12	14	121	136	91	71	17	

Calm : .00 %

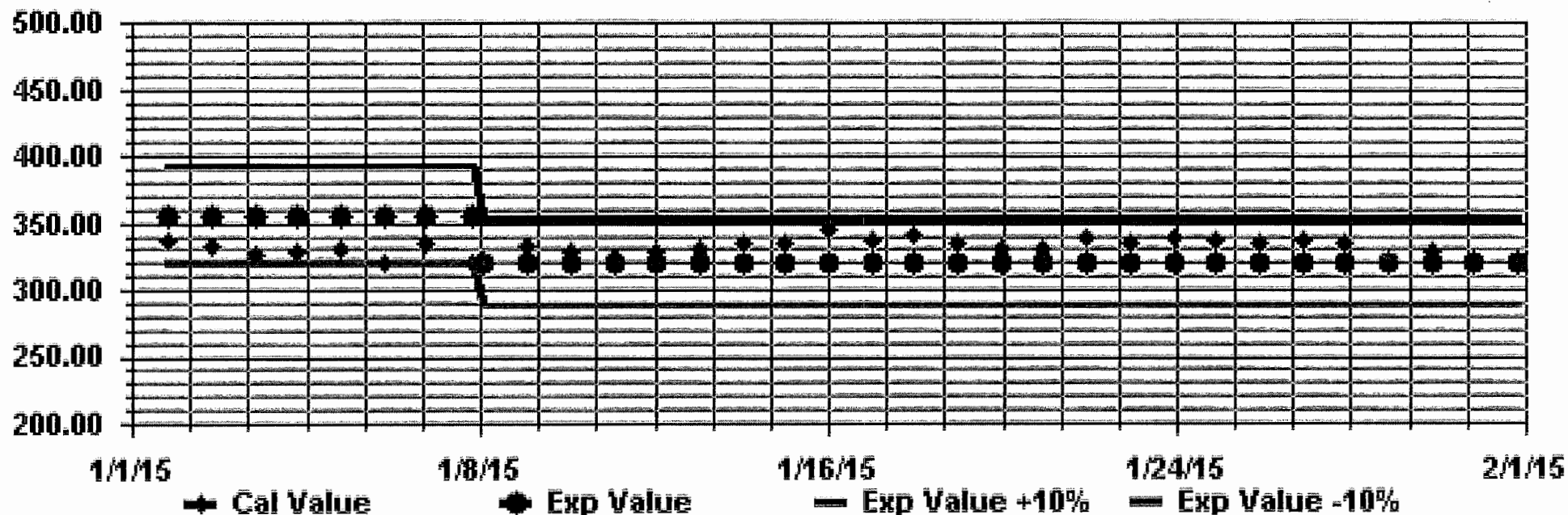
Total # Operational Hours : 705

Logger : 35 Parameter : SO2_

Site : LICA-ELK
Period : 01/01/15-01/31/15
Level : 10



Calibration Graph for Site: LICA35 Parameter: SO2_ Sequence: SO2 Phase: SPAN



HYDROGEN SULPHIDE



HYDROGEN SULPHIDE (H2S) hourly averages in ppb

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	DAILY	24-HOUR	
HOUR START	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	MAX.	AVG.	RDGS.	
DAY																												
1		0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	S	0	0	0	0	1	0.1	24
2		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	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	S	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	S	0	0	0	0	0	0	1	1	0.0	24
5		0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	1	0.2	24
6		0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	1	1	1	1	1	1	1	1	0.3	24
7		1	1	1	1	1	1	1	1	1	C	C	C	C	C	C	C	1	1	1	0	0	0	0	0	1	0.7	24
8		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0.0	24
9		0	0	0	0	1	0	0	1	1	1	2	1	1	1	1	1	1	2	1	S	1	1	1	0	2	0.8	24
10		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	0	0	1	0	0.0	24
11		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	2	1	1	1	1	2	0.3	24
12		0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	2	2	2	1.0	24
13		2	2	1	1	1	1	1	1	1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	0	2	0.7	24
14		0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	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	S	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	S	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	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
18		0	0	0	0	0	1	1	1	1	0	S	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0.2	24
19		1	1	1	1	1	0	0	0	S	0	0	0	P	1	0	0	0	0	0	0	0	0	0	0	1	0.3	23
20		0	0	0	0	0	0	0	0	S	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	S	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	S	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	S	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	S	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	S	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	S	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	S	0	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		S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	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	S	1	1	0.0	24
30		1	2	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	S	0	0	2	0.3	24
31		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	1	0.0	24
HOURLY MAX		2	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	1	2	1	1	2	2				
HOURLY AVG		0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2				

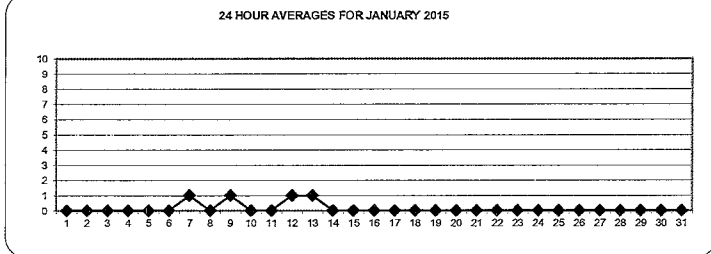
STATUS FLAG CODES

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

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR: 1.0 PPB 24-HR: 0.3 PPB

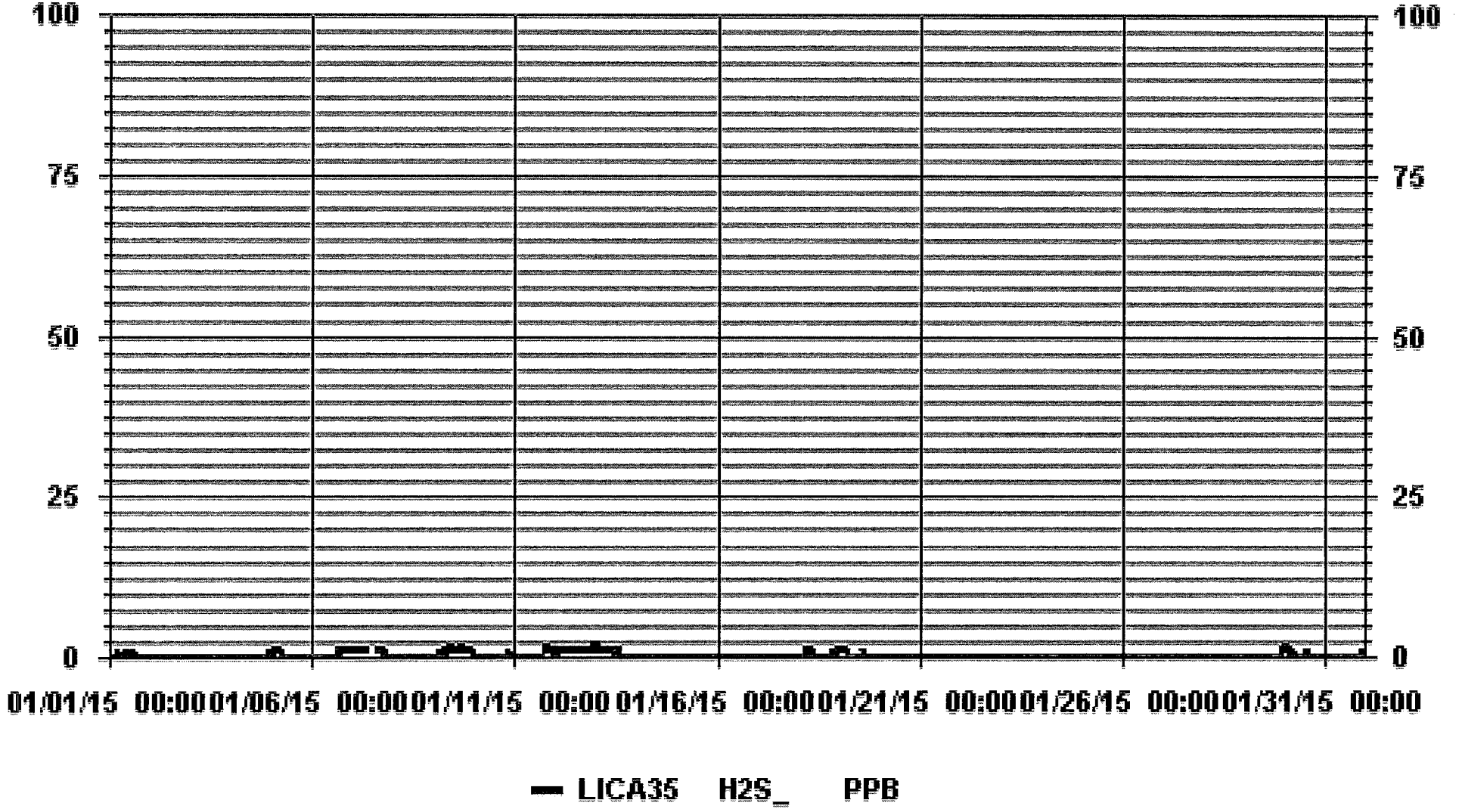
24 HOUR AVERAGES FOR JANUARY 2015



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0				
NUMBER OF 24-HR EXCEEDENCES:	0				
NUMBER OF NON-ZERO READINGS:	106				
MAXIMUM 1-HR AVERAGE:	2	PPB	@ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 24-HR AVERAGE:	1.0	PPB			ON DAY(S) VAR-VARIOUS
12S CALIBRATION TIME:	31	HRS	OPERATIONAL TIME:	743	HRS
MONTHLY CALIBRATION TIME:	7	HRS	AMD OPERATION UPTIME:	99.9	%
STANDARD DEVIATION:	0.40		MONTHLY AVERAGE:	0	PPB

01 Hour Averages





HYDROGEN SULPHIDE MAX instantaneous maximum in ppb

MST

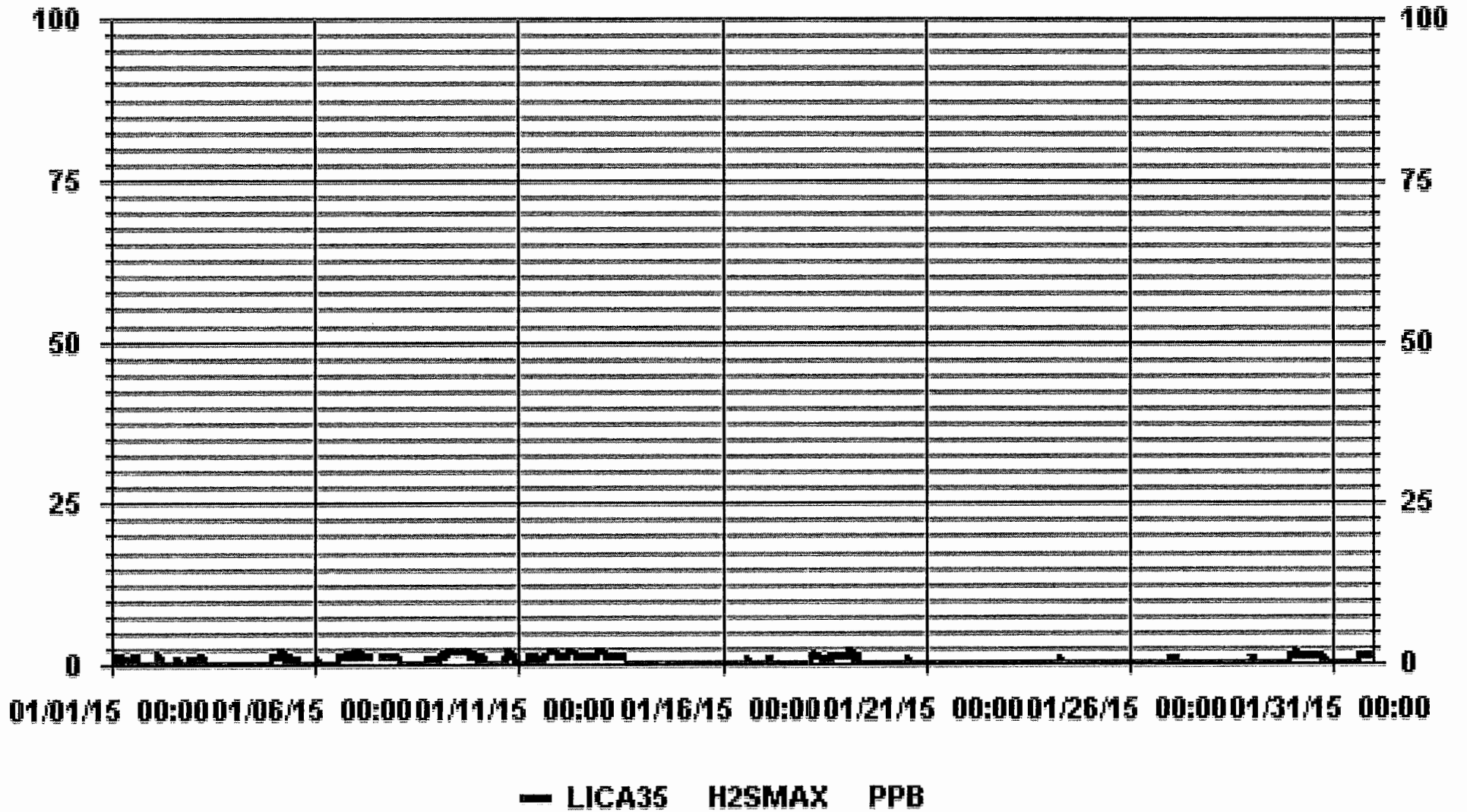
HOUR START	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	DAILY	24-HOUR	RDGS.
HOUR END	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	MAX	AVG.		
DAY																												
1	1	1	0	0	1	1	1	0	0	0	1	0	0	1	1	1	0	0	0	S	0	0	0	0	0	1	0.4	24
2	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	1	0	0	S	0	0	0	1	0	2	0.2	24	
3	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0.1	24	
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	1	1	0.1	24	
5	1	1	1	2	2	2	0	0	1	1	0	0	0	1	S	S	0	0	0	0	0	0	0	0	2	0.5	24	
6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	1	1	2	1	1	1	1	2	0.5	24	
7	2	2	2	2	1	1	1	1	1	C	C	C	C	C	C	C	1	1	1	1	1	1	1	1	2	1.2	24	
8	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	S	1	0	0	1	0.2	24	
9	0	0	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	S	1	1	2	1	2	1.6	24	
10	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	S	1	2	1	0	0	2	0.4	24	
11	0	0	0	0	0	0	1	1	1	1	1	0	0	0	1	S	S	2	2	2	2	2	2	1	2	0.8	24	
12	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	S	1	1	1	1	1	1	2	2	2	1.3	24	
13	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	2	0.8	24	
14	0	0	0	0	0	0	0	0	0	0	0	0	0	S	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	S	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	S	0	0	1	0	0	0	0	0	0	0	0	1	0.0	24	
17	0	0	0	0	1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0	24	
18	0	0	0	0	1	1	2	1	1	1	S	1	0	1	0	0	1	1	1	1	1	1	1	1	2	0.7	24	
19	1	1	1	2	2	1	0	1	1	S	0	0	0	P	R	0	0	0	0	0	0	0	0	0	2	0.5	22	
20	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0.0	24	
21	0	0	0	0	0	0	0	S	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	S	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	S	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	S	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0	24	
25	0	0	0	S	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	S	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	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1	24	
28	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0.0	24	
29	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	0.1	24	
30	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	S	0	0	2	0.9	24	
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	S	1	1	1	1	0.3	24	
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				
HOURLY AVG	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.2	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4				



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	196				
MAXIMUM INSTANTANEOUS VALUE:	2	PPB	@ HOUR(S)	VAR	ON DAY(S)
					VAR-VARIOUS
I/S CALIBRATION TIME:	31	HRS		OPERATIONAL TIME:	742
MONTHLY CALIBRATION TIME:	7	HRS			
STANDARD DEVIATION:	0.60				

01 Hour Averages



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

January 2015

Distribution By % Of Samples

Logger Id : 35
Site Name : LICA-ELK
Parameter : H2S_
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	
< 3	1.84	3.12	2.41	4.68	8.51	7.23	2.55	1.84	1.41	1.70	1.98	17.16	19.29	13.19	10.63	2.41	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	1.84	3.12	2.41	4.68	8.51	7.23	2.55	1.84	1.41	1.70	1.98	17.16	19.29	13.19	10.63	2.41	

Calm : .00 %

Total # Operational Hours : 705

Distribution By Samples

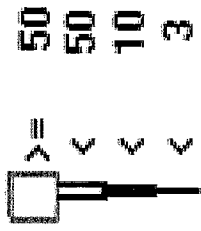
Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 3	13	22	17	33	60	51	18	13	10	12	14	121	136	93	75	17	705
< 10																	
< 50																	
>= 50																	
Totals	13	22	17	33	60	51	18	13	10	12	14	121	136	93	75	17	

Calm : .00 %

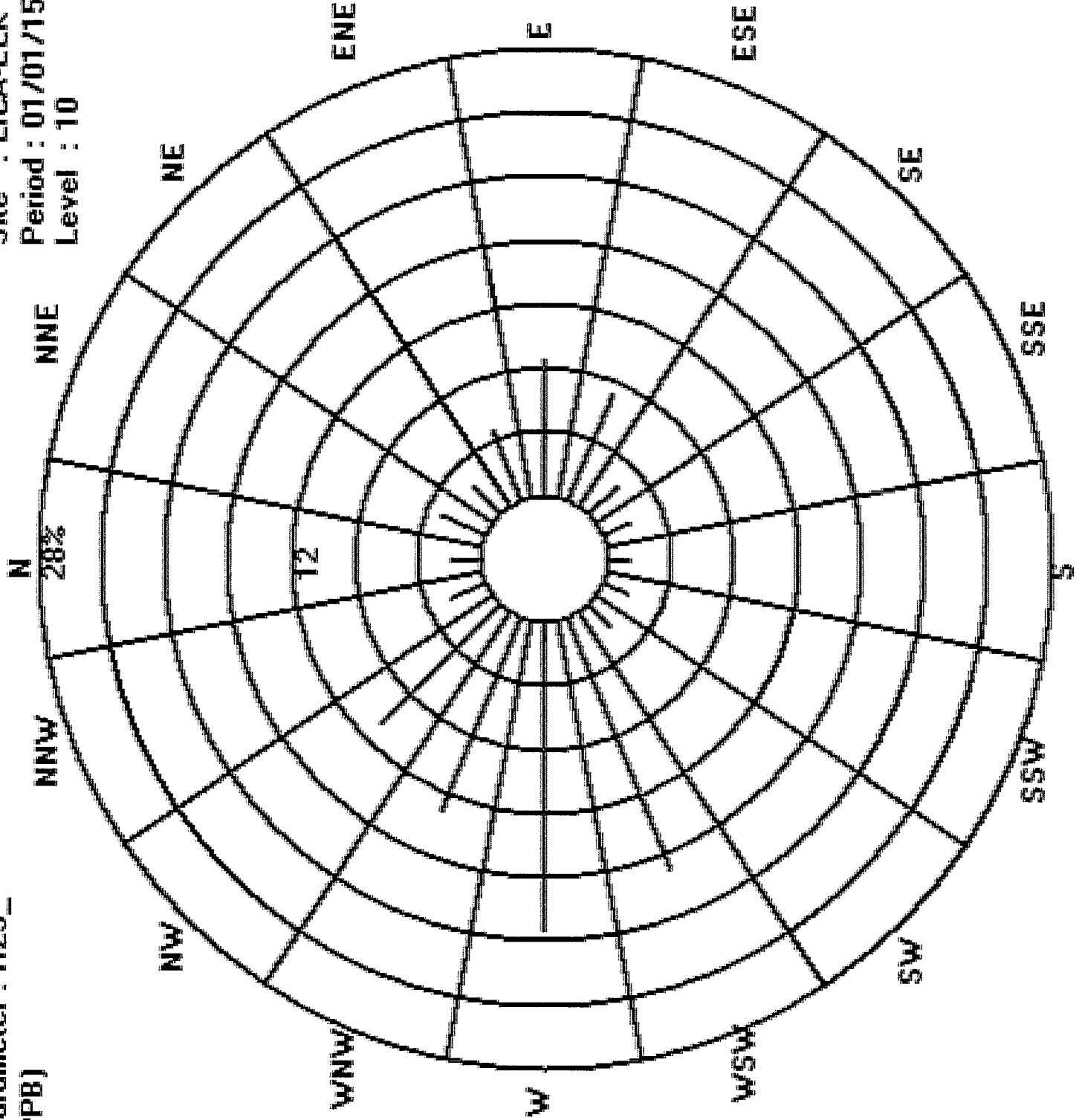
Total # Operational Hours : 705

Logger : 35 Parameter : H2S_

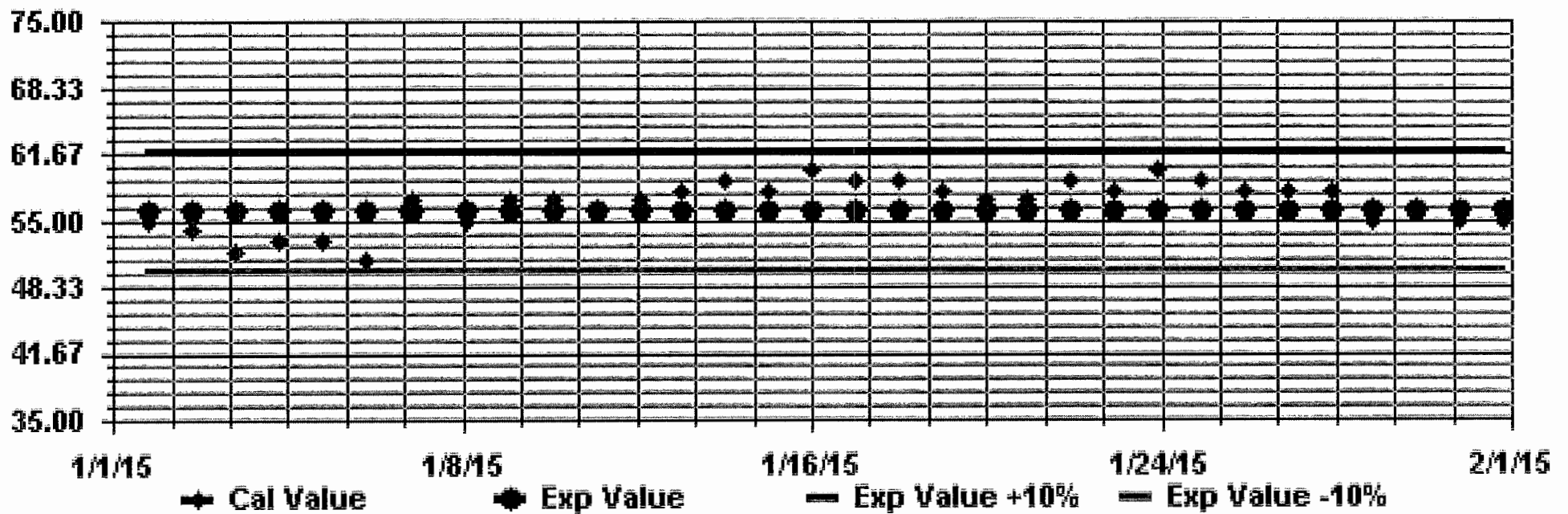
Class Limits (PPB)



Site : LICA-ELK
Period : 01/01/15-01/31/15
Level : 10



Calibration Graph for Site: LICA35 Parameter: H2S_ Sequence: H2S Phase: SPAN



TOTAL HYDROCARBON



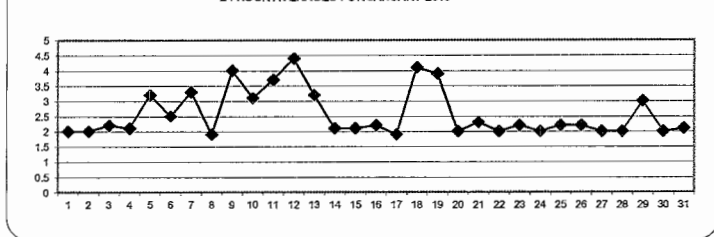
TOTAL HYDROCARBONS (THC) hourly averages in ppm

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	DAILY	24-HOUR	
DAY	THC (ppm)	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	MAX	AVG.	RDGS.	
1	1.8	1.8	1.8	1.9	1.8	1.9	1.9	2.1	2.2	1.9	2.0	2.2	2.3	2.4	2.9	2.1	1.9	1.9	1.9	S	1.8	1.8	1.9	1.9	2.9	2.0	24	
2	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.9	2.1	S	2.0	2.1	2.4	3.6	2.5	3.6	2.0	24	
3	2.8	2.2	2.3	2.6	2.8	2.8	2.1	2.3	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.1	S	2.8	2.6	2.5	2.3	2.1	2.1	2.8	2.3	24	
4	2.1	2.2	2.1	2.2	2.1	2.2	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	S	2.1	2.1	2.0	2.2	2.4	2.8	3.4	3.4	2.2	24	
5	3.2	4.3	5.0	6.7	7.5	6.6	2.7	2.6	2.6	2.3	2.1	2.1	2.0	2.2	2.1	S	S	2.4	2.6	2.3	2.4	2.4	3.0	2.4	7.5	3.3	24	
6	2.4	2.5	2.2	2.2	2.3	2.3	2.3	2.2	2.5	2.4	2.6	2.4	2.1	2.2	S	S	2.0	2.1	2.3	2.4	2.6	2.8	3.5	3.5	4.2	4.2	2.5	24
7	4.6	5.3	5.1	5.1	4.1	3.6	3.9	3.8	3.4	C	C	C	C	C	C	3.3	3.1	2.8	2.5	2.0	1.9	1.9	1.9	1.9	5.3	3.3	24	
8	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	2.1	2.1	2.2	S	2.6	2.0	2.0	2.6	2.0	24	
9	2.1	2.1	2.2	2.9	2.9	2.5	2.5	3.6	3.7	5.4	4.8	4.5	4.3	4.9	4.5	6.0	4.5	4.0	S	5.2	5.3	5.5	4.7	6.0	4.0	24		
10	4.1	2.8	3.3	2.6	2.4	2.4	2.2	2.3	2.3	2.4	2.7	2.8	2.7	2.9	2.8	3.3	3.6	S	5.1	5.8	4.6	3.5	2.9	5.8	3.1	24		
11	3.1	3.2	3.4	2.8	3.1	2.9	5.3	4.0	3.7	3.0	3.5	2.4	2.4	2.2	2.3	2.9	4.1	S	5.3	5.7	6.0	5.5	4.9	4.7	6.0	3.8	24	
12	4.6	5.0	4.8	4.5	4.9	4.9	4.7	S	S	4.5	4.3	4.8	3.9	S	S	3.7	S	4.4	3.1	2.8	3.4	3.2	7.5	5.4	7.5	4.4	24	
13	5.4	6.1	3.7	3.2	2.7	3.0	2.2	2.3	2.6	2.4	2.3	3.1	2.2	2.4	2.6	S	4.5	3.9	4.1	4.4	3.5	3.6	2.7	2.1	6.1	3.3	24	
14	2.0	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.0	1.9	2.1	S	2.0	2.0	2.3	2.2	2.1	2.0	2.2	2.4	2.7	2.7	2.1	24	
15	2.6	2.5	2.8	2.6	2.1	2.0	1.9	1.9	1.9	1.9	2.0	2.0	S	2.0	2.0	2.2	2.1	2.0	2.0	2.2	2.1	2.1	2.1	2.1	2.1	2.8	2.1	24
16	2.1	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.7	2.6	S	2.1	2.1	2.3	2.2	2.0	1.9	2.0	1.9	1.9	2.0	2.7	2.2	2.2	24	
17	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	2.0	1.9	2.0	S	2.0	2.0	2.0	1.9	1.9	2.0	2.2	2.1	2.0	2.0	2.2	2.2	2.2	2.0	24	
18	2.4	2.8	3.2	3.3	3.3	5.5	5.6	5.4	4.9	4.1	S	4.3	3.2	3.2	3.2	3.0	3.3	4.3	4.2	4.5	5.1	5.6	5.5	6.1	6.1	4.2	24	
19	7.9	7.5	7.6	8.8	8.6	5.5	4.3	3.4	5.5	S	2.4	2.4	2.3	P	2.0	2.1	2.1	1.9	2.0	2.0	1.9	1.9	1.9	2.1	8.8	3.9	23	
20	2.2	2.2	2.2	2.2	2.0	2.0	2.0	2.0	S	2.1	2.3	2.0	2.0	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.3	2.0	24
21	2.1	2.4	2.2	2.4	2.5	2.2	2.4	S	2.7	2.7	2.8	2.5	2.3	2.4	2.4	2.1	2.0	2.2	2.4	2.2	2.1	2.3	3.1	2.5	3.1	2.4	24	
22	2.1	2.1	2.4	2.8	2.4	2.4	S	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.9	1.9	1.9	2.0	2.0	2.3	2.1	2.2	2.1	2.1	2.8	2.1	24	
23	2.2	2.1	2.1	2.1	2.1	S	2.1	2.0	2.1	2.3	2.2	2.0	1.9	2.0	2.0	2.1	1.9	2.1	2.7	2.6	2.5	2.9	2.3	2.7	2.9	2.2	24	
24	3.1	2.0	1.9	1.9	S	1.9	1.8	1.9	1.9	1.8	1.8	1.9	1.9	1.8	1.8	1.8	1.8	1.9	2.0	2.2	2.0	2.2	2.4	3.5	3.5	2.1	24	
25	3.0	2.9	2.8	S	3.3	3.0	2.9	2.3	2.0	2.0	2.0	1.8	1.8	1.8	1.8	1.8	2.1	1.9	1.9	1.9	1.9	2.0	2.2	2.0	3.3	2.2	24	
26	2.2	2.7	S	2.2	2.9	2.3	2.7	2.3	2.2	2.1	1.8	1.9	2.0	1.9	2.0	2.5	2.3	2.4	2.0	2.2	2.1	2.2	2.7	2.9	2.9	2.3	24	
27	3.7	S	3.3	2.6	2.6	2.0	2.0	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	3.7	2.1	24	
28	S	1.9	1.9	2.2	2.4	2.1	2.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	2.3	2.8	3.0	S	3.0	2.0	24	
29	4.2	3.4	3.5	3.8	3.5	3.9	4.1	3.7	3.3	3.1	2.9	2.8	2.6	2.6	2.4	2.4	2.3	2.6	2.4	2.5	2.8	2.9	S	2.9	4.2	3.1	24	
30	2.9	3.7	3.7	2.7	2.0	1.8	1.8	1.8	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	S	1.8	1.8	3.7	2.1	24	
31	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0	1.9	1.9	1.9	1.8	1.9	2.1	2.1	2.2	2.2	2.4	3.0	S	2.9	3.1	3.0	3.1	2.2	2.2	24	
HOURLY MAX		7.9	7.5	7.6	8.8	8.6	6.6	5.6	5.4	5.5	5.4	4.8	4.8	4.3	4.9	4.5	6.0	4.5	4.4	5.3	5.7	6.0	5.6	7.5	6.1			
HOURLY AVG		2.9	2.9	2.9	2.9	2.9	2.8	2.6	2.5	2.5	2.4	2.4	2.4	2.2	2.2	2.2	2.3	2.4	2.5	2.5	2.6	2.7	2.8	2.9	2.8			

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

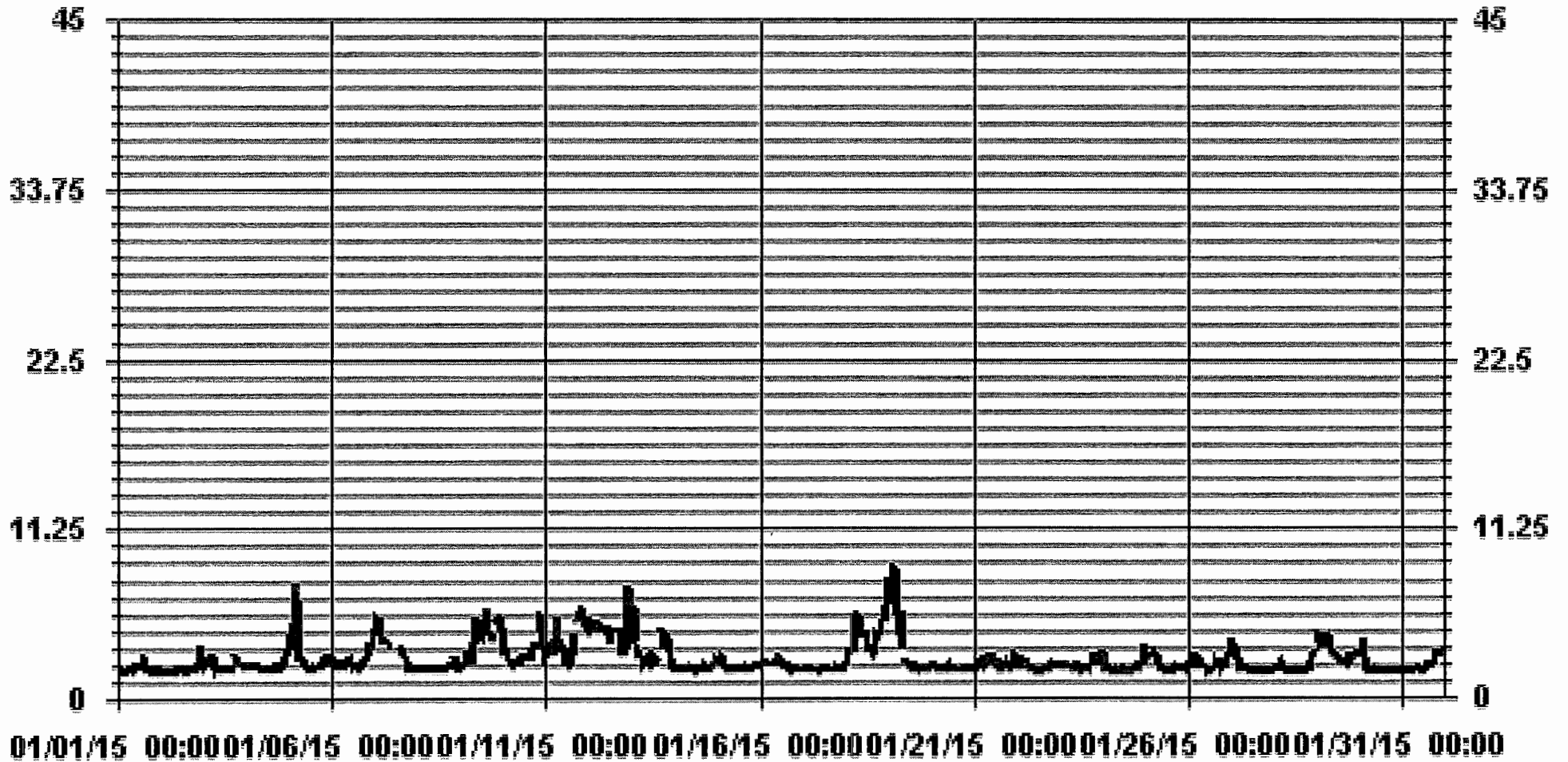
24 HOUR AVERAGES FOR JANUARY 2015



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	701		
MAXIMUM 1-HR AVERAGE:	8.8 PPM	@ HOUR(S)	3 ON DAY(S)
MAXIMUM 24-HR AVERAGE:	4.4 PPM		12 ON DAY(S)
			VAR-VARIOUS
I/SZ CALIBRATION TIME:	36 HRS	OPERATIONAL TIME:	743 HRS
MONTHLY CALIBRATION TIME:	6 HRS	AMD OPERATION UPTIME:	99.9 %
STANDARD DEVIATION:	1.09	MONTHLY AVERAGE:	2.6 PPM

01 Hour Averages



— LICA35 THC55 PPM



TOTAL HYDROCARBONS MAX instantaneous maximum in ppm

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	24-HOUR		
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	0:00	MAX.	AVG.	RDGS.	
DAY																												
1	1.9	1.9	1.9	2.0	2.0	2.1	2.3	2.3	2.6	2.1	2.2	2.4	2.6	2.9	3.4	3.0	2.0	2.0	2.0	S	1.9	1.9	1.9	1.9	3.4	2.2	24	
2	2.0	1.9	1.9	1.9	1.9	2.1	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	3.2	S	2.2	2.5	3.1	5.2	3.2	5.2	2.3	24	
3	3.3	2.5	2.5	3.2	3.7	3.5	2.9	3.5	2.3	2.5	2.2	2.0	1.9	1.9	2.0	2.0	2.5	S	3.5	3.4	2.8	2.6	2.3	2.3	3.7	2.7	24	
4	2.2	2.3	2.4	2.6	2.3	2.8	2.3	2.3	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.1	S	2.3	2.4	2.2	2.5	2.6	3.1	3.9	3.9	2.4	24	
5	3.6	5.5	5.5	11.4	10.4	8.7	3.6	2.9	3.0	3.1	2.4	2.2	2.3	3.4	2.4	S	S	2.8	4.0	2.7	3.5	3.4	4.8	3.0	11.4	4.3	24	
6	3.3	3.4	2.8	2.8	3.0	3.1	2.5	3.0	3.3	3.4	3.4	2.7	2.5	2.9	S	2.3	2.4	2.6	2.6	3.0	4.1	4.6	4.1	5.9	5.9	3.2	24	
7	6.7	6.2	5.7	6.2	5.1	3.8	6.4	5.0	4.0	C	C	C	C	C	C	5.3	5.4	3.3	3.0	2.0	2.0	2.0	2.0	2.0	6.7	4.2	24	
8	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.4	2.6	2.4	S	3.3	2.3	2.1	3.3	2.1	24
9	2.1	2.3	2.4	3.7	3.4	3.2	4.3	4.7	4.5	6.6	5.5	5.0	5.4	5.6	4.8	18.5	6.9	4.4	4.3	S	6.4	6.0	6.6	5.4	18.5	5.3	24	
10	6.6	3.4	4.7	4.0	3.0	2.8	2.4	2.6	2.6	2.7	3.3	3.3	3.4	2.9	3.4	3.0	4.5	4.5	S	5.9	6.5	6.5	5.2	3.4	6.6	3.9	24	
11	3.6	3.9	4.1	3.0	3.4	3.2	6.5	4.8	4.5	3.7	4.4	2.7	2.6	2.3	2.5	3.8	4.6	S	6.7	6.5	6.5	6.1	5.3	5.8	6.7	4.4	24	
12	5.1	6.1	5.6	4.8	5.4	5.3	5.0	S	S	5.1	4.9	6.5	4.2	S	S	4.0	S	4.7	4.2	3.4	4.3	3.4	12.3	11.6	12.3	5.6	24	
13	7.6	7.5	5.6	4.0	3.2	6.2	2.4	2.6	2.8	2.6	3.0	3.5	2.5	3.2	3.1	S	12.6	6.1	5.4	9.1	3.8	3.8	4.7	2.2	12.6	4.7	24	
14	2.2	2.3	2.2	2.1	2.2	2.0	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.3	S	2.1	2.2	2.5	2.5	2.2	2.2	2.5	2.8	3.9	3.9	2.3	24	
15	3.6	2.7	3.4	3.0	2.3	2.0	2.0	2.1	2.0	2.0	2.1	2.2	2.1	S	2.1	2.2	2.5	2.6	2.1	2.2	2.3	2.2	2.2	2.2	3.6	2.3	24	
16	2.3	2.5	2.5	2.6	2.5	2.4	2.6	2.6	2.6	2.6	3.0	2.9	S	2.2	2.2	2.8	2.4	2.2	2.0	2.2	1.9	2.1	2.0	2.1	3.0	2.4	24	
17	2.0	2.0	2.1	2.1	2.1	1.9	2.0	2.1	2.2	2.0	2.3	S	2.1	2.3	2.2	2.0	2.0	2.2	2.4	2.2	2.2	2.2	2.2	2.7	2.7	2.1	24	
18	2.5	4.1	4.0	4.0	4.3	6.8	6.3	6.3	5.7	5.2	S	5.0	4.3	3.9	3.5	3.4	3.8	8.5	5.4	5.6	5.6	6.3	6.7	8.1	8.5	5.2	24	
19	11.1	8.6	9.3	9.8	10.0	7.6	5.8	5.0	8.4	S	2.8	2.6	2.5	P	2.4	2.2	2.4	2.0	2.0	2.1	2.0	2.0	2.1	2.3	11.1	4.8	23	
20	2.6	2.6	2.3	2.7	2.2	2.1	2.1	2.1	S	2.9	2.8	2.2	2.1	2.0	2.0	2.1	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.9	2.2	24	
21	2.6	2.9	2.6	3.1	2.8	2.5	2.6	S	3.0	2.9	3.3	2.8	2.7	2.7	2.7	2.5	2.2	2.4	2.7	2.4	2.3	3.3	4.3	3.9	4.3	2.8	24	
22	2.3	2.2	3.3	3.5	2.9	2.9	S	2.0	2.1	2.0	2.0	1.9	1.9	2.0	2.0	2.2	2.1	2.1	2.2	2.8	2.4	2.5	2.2	2.4	3.5	2.3	24	
23	2.4	2.2	2.3	2.3	2.3	S	2.3	2.4	2.8	3.2	2.9	2.1	2.2	2.4	2.1	2.4	2.0	3.0	3.5	3.8	3.4	3.6	2.6	3.3	3.8	2.7	24	
24	4.7	2.3	2.0	2.1	S	2.2	2.0	2.2	2.1	2.0	1.9	2.1	2.1	1.9	1.9	1.9	2.2	2.1	2.5	2.3	2.4	2.5	2.8	4.7	4.7	2.4	24	
25	4.3	4.0	3.2	S	4.1	3.8	4.1	2.7	2.2	2.1	2.2	2.0	2.0	2.0	2.0	2.1	2.5	2.4	2.3	2.2	2.1	2.4	2.7	2.1	4.3	2.7	24	
26	2.6	3.3	S	2.8	3.6	3.1	3.1	3.3	2.4	2.4	2.0	2.2	2.2	2.3	2.4	2.9	2.6	3.0	2.2	2.4	2.5	2.3	4.6	4.1	4.6	2.8	24	
27	4.4	S	4.5	2.9	3.5	2.2	2.1	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.8	2.0	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	4.5	2.3	24	
28	S	2.0	2.1	2.5	2.8	2.2	2.3	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.3	2.0	2.5	3.7	5.5	S	5.5	2.3	24
29	6.6	4.3	4.3	4.1	3.9	4.1	4.4	4.3	3.6	3.3	3.1	2.9	2.8	2.8	2.5	2.5	2.5	2.7	2.8	2.8	3.0	3.0	S	3.2	6.6	3.5	24	
30	3.2	4.4	4.4	3.4	2.3	2.0	1.9	1.9	2.0	2.0	1.9	1.9	2.0	1.9	1.9	1.9	1.8	1.9	1.9	1.9	1.9	S	1.9	1.9	4.4	2.3	24	
31	2.0	1.8	1.9	1.9	1.9	1.9	2.1	2.1	2.0	1.9	2.0	2.0	2.1	2.3	2.3	2.3	2.3	2.9	3.2	3.2	S	3.2	3.4	3.4	3.4	2.3	24	
HOURLY MAX	11.1	8.6	9.3	11.4	10.4	8.7	6.5	6.3	8.4	6.6	5.5	6.5	5.4	5.6	4.8	18.5	12.6	8.5	6.7	9.1	6.5	6.5	12.3	11.6				
HOURLY AVG	3.7	3.4	3.5	3.5	3.4	3.1	2.9	2.9	2.8	2.7	2.7	2.5	2.5	2.4	3.1	3.1	3.0	3.0	3.1	3.1	3.1	3.2	3.7	3.6				

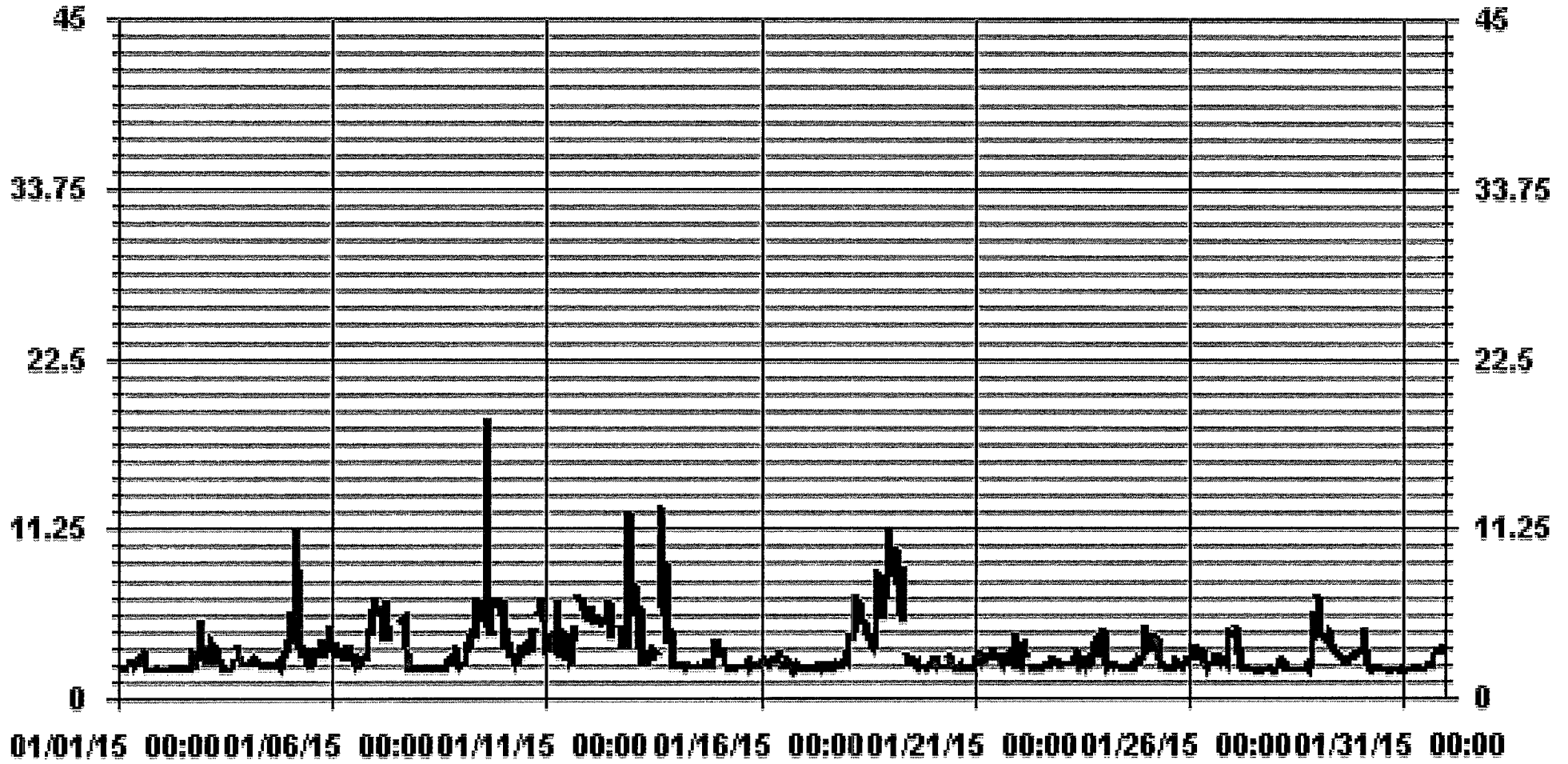
STATUS FLAG CODES

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:	701
MAXIMUM INSTANTANEOUS VALUE:	18.5 PPM @ HOUR(S) 15 ON DAY(S) 9
	VAR-VARIOUS
I/ZS CALIBRATION TIME:	36 HRS
MONTHLY CALIBRATION TIME:	6 HRS
OPERATIONAL TIME:	743 HRS
STANDARD DEVIATION:	1.69

01 Hour Averages



— LICA35 THC55MAX PPM

LICA35
 THC55 / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA35
 Parameter : THC55
 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	1.71	2.85	2.42	3.28	2.99	4.13	1.99	1.14	.99	1.28	1.56	14.40	17.26	10.84	9.98	1.99	78.88
< 10.0	.14	.28	.00	1.28	5.56	2.85	.57	.71	.42	.42	.42	2.85	1.99	2.42	.71	.42	21.11
< 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	1.85	3.13	2.42	4.56	8.55	6.99	2.56	1.85	1.42	1.71	1.99	17.26	19.25	13.26	10.69	2.42	

Calm : .00 %

Total # Operational Hours : 701

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 3.0	12	20	17	23	21	29	14	8	7	9	11	101	121	76	70	14	553
< 10.0	1	2		9	39	20	4	5	3	3	3	20	14	17	5	3	148
< 50.0																	
>= 50.0																	
Totals	13	22	17	32	60	49	18	13	10	12	14	121	135	93	75	17	

Calm : .00 %

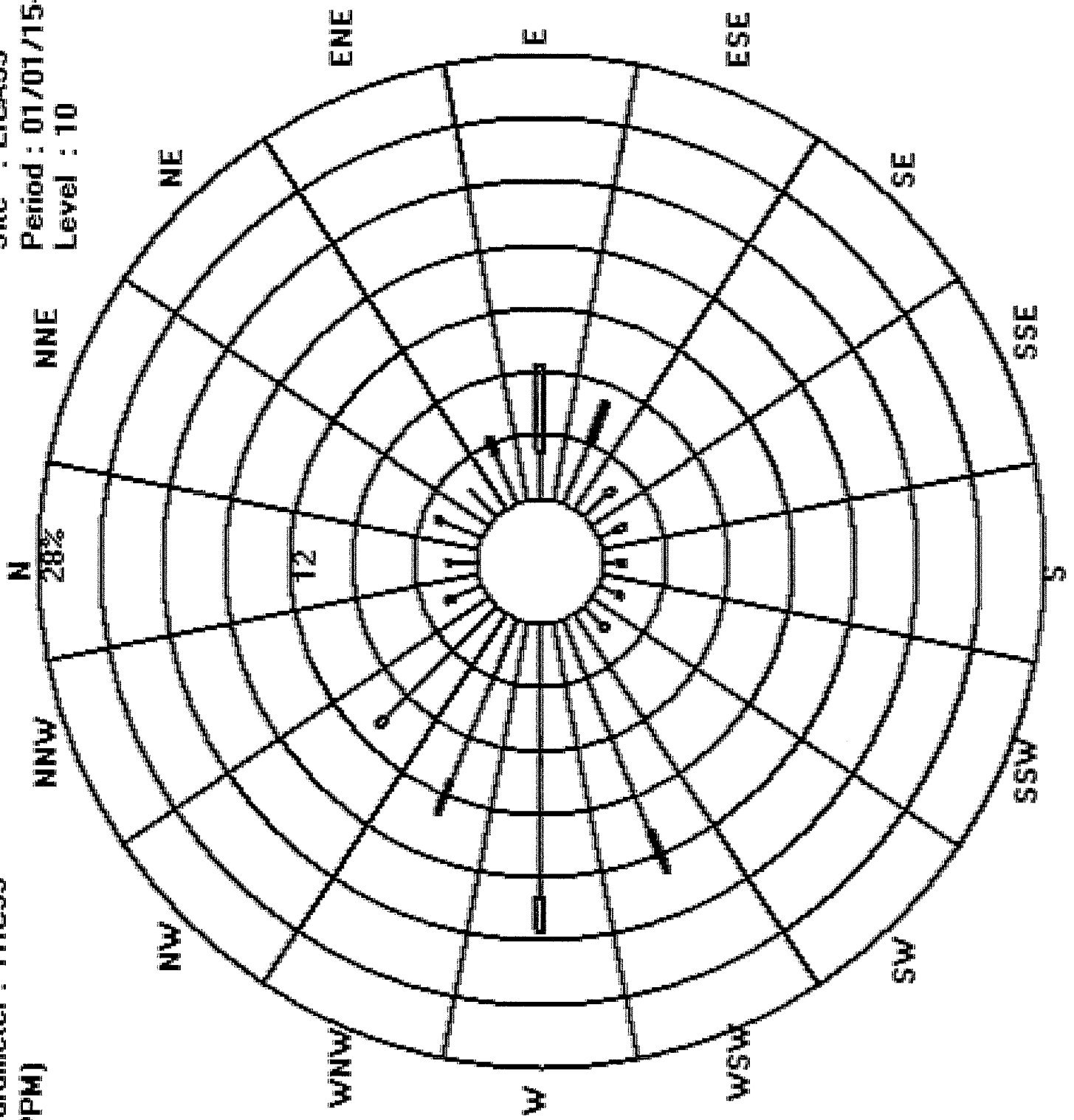
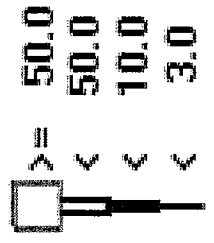
Total # Operational Hours : 701

Logger : 35 Parameter : THC55

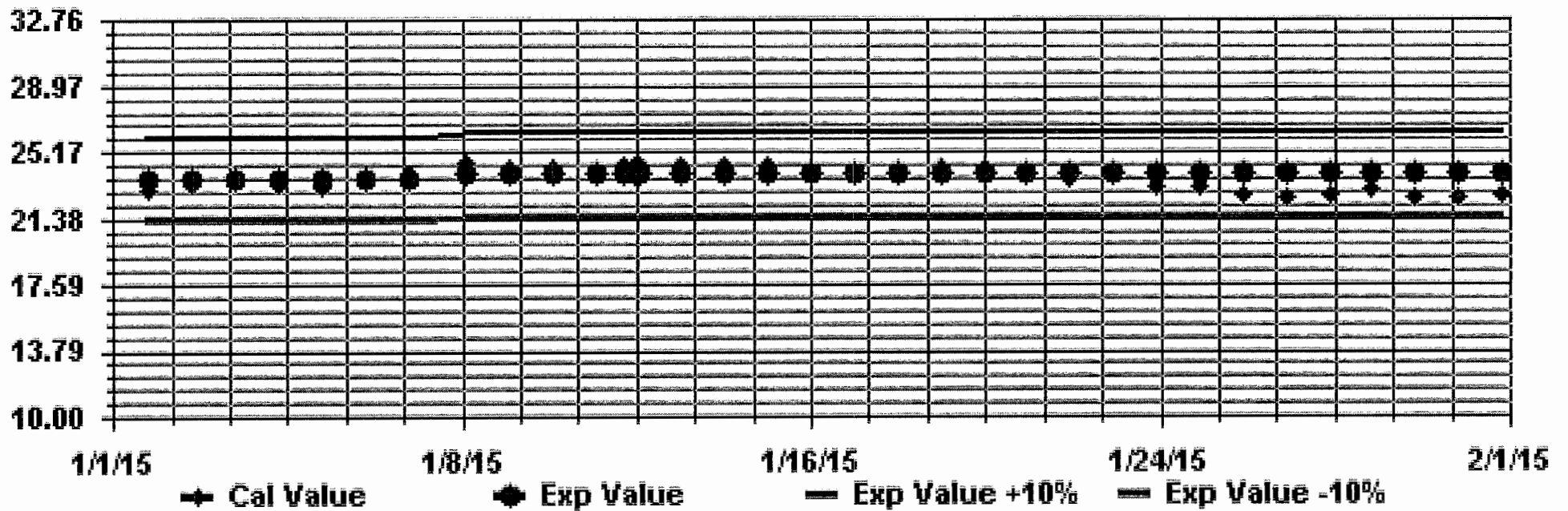
Site : LICA35

Class Limits (PPM)

Period : 01/01/15-01/31/15
Level : 10



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



METHANE



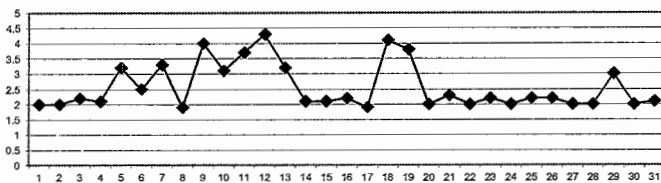
METHANE (CH4) hourly averages in ppm

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	DAILY	24-HOUR		
DAY	HR	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	MAX.	AVG.	RDGS.		
1		1.8	1.8	1.8	1.9	1.8	1.9	1.9	2.1	2.2	1.9	2.0	2.2	2.3	2.4	2.9	2.1	1.9	1.9	1.9	S	1.8	1.8	1.9	1.9	2.9	2.0	24	
2		1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.9	2.1	S	2.0	2.1	2.4	3.6	2.5	3.6	2.0	24	
3		2.8	2.2	2.3	2.6	2.8	2.8	2.1	2.3	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.1	S	2.8	2.6	2.5	2.3	2.1	2.1	2.8	2.3	24	
4		2.1	2.2	2.1	2.2	2.1	2.2	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	S	2.1	2.1	2.0	2.2	2.4	2.7	3.4	3.4	2.2	24	
5		3.2	4.3	4.9	6.6	7.3	6.5	2.7	2.6	2.6	2.3	2.1	2.1	2.0	2.2	2.1	S	2.4	2.6	2.3	2.4	2.4	3.0	2.4	7.3	3.2	24		
6		2.4	2.5	2.2	2.2	2.3	2.3	2.3	2.2	2.5	2.4	2.6	2.4	2.1	2.2	S	2.0	2.1	2.3	2.4	2.6	2.8	3.5	3.5	4.2	4.2	2.5	24	
7		4.6	5.3	5.1	5.1	4.1	3.6	3.9	3.8	3.4	C	C	C	C	C	C	3.3	3.1	2.8	2.5	2.0	1.9	1.9	1.9	5.3	3.3	24		
8		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	2.1	2.1	2.2	S	2.6	2.0	2.0	2.6	2.0	24	
9		2.1	2.1	2.2	2.9	2.9	2.5	2.5	3.6	3.7	5.4	4.8	4.5	4.3	4.9	4.5	5.9	4.5	4.0	4.0	S	5.2	5.3	5.5	4.7	5.9	4.0	24	
10		4.0	2.8	3.3	2.6	2.4	2.4	2.2	2.3	2.3	2.4	2.7	2.8	2.7	2.9	2.8	3.3	3.6	S	5.1	5.8	4.6	3.5	2.9	5.8	3.1	24		
11		3.1	3.2	3.4	2.8	3.1	2.9	5.3	4.0	3.7	3.0	3.5	2.4	2.4	2.2	2.3	2.9	4.1	S	5.2	5.6	5.9	5.5	4.9	4.7	5.9	3.7	24	
12		4.6	4.9	4.8	4.5	4.9	4.9	4.6	S	S	4.4	4.2	4.7	3.9	S	S	3.7	S	4.4	3.0	2.6	3.3	3.0	7.2	5.1	7.2	4.4	24	
13		5.1	5.8	3.6	3.1	2.6	2.9	2.2	2.3	2.6	2.4	2.3	3.0	2.2	2.4	2.6	S	4.5	3.9	4.0	4.4	3.5	3.5	2.7	2.1	5.8	3.2	24	
14		2.0	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.0	1.9	2.1	S	2.0	2.0	2.3	2.2	2.1	2.0	2.2	2.4	2.7	2.7	2.1	24	
15		2.6	2.5	2.8	2.6	2.1	2.0	1.9	1.9	1.9	1.9	2.0	2.0	S	2.0	2.0	2.2	2.1	2.0	2.0	2.2	2.1	2.1	2.1	2.1	2.8	2.1	24	
16		2.1	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.7	2.6	S	2.1	2.1	2.3	2.2	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.7	2.2	24
17		1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	2.0	S	2.0	2.0	2.0	1.9	1.9	2.0	1.9	2.0	2.2	2.1	2.0	2.0	2.2	2.2	2.2	2.0	24	
18		2.4	2.8	3.2	3.3	3.3	5.4	5.5	5.3	4.9	4.1	S	4.3	3.2	3.2	3.2	3.0	3.3	4.3	4.2	4.4	5.1	5.6	5.4	6.0	6.0	4.1	24	
19		7.8	7.4	7.4	8.6	8.5	5.5	4.3	3.4	5.5	S	2.4	2.4	2.3	P	2.0	2.1	2.1	1.9	2.0	2.0	1.9	1.9	1.9	1.9	2.1	8.6	3.9	23
20		2.2	2.2	2.2	2.2	2.0	2.0	2.0	2.0	S	2.1	2.3	2.0	2.0	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.3	2.0	24
21		2.1	2.4	2.2	2.4	2.5	2.2	2.4	S	2.7	2.7	2.8	2.5	2.3	2.4	2.4	2.1	2.0	2.2	2.4	2.2	2.1	2.3	3.0	2.5	3.0	2.4	24	
22		2.1	2.1	2.4	2.8	2.4	2.4	S	2.0	1.9	1.9	1.8	1.8	1.8	1.8	1.9	1.9	1.9	2.0	2.0	2.3	2.1	2.2	2.1	2.1	2.8	2.1	24	
23		2.2	2.1	2.1	2.1	2.1	S	2.1	2.0	2.1	2.3	2.2	2.0	1.9	2.0	2.0	2.1	1.9	2.1	2.7	2.6	2.5	2.9	2.3	2.7	2.9	2.2	24	
24		3.0	2.0	1.9	1.9	S	1.9	1.8	1.9	1.9	1.8	1.8	1.9	1.9	1.8	1.8	1.8	1.9	2.0	2.2	2.0	2.2	2.4	3.5	3.5	2.1	24		
25		3.0	2.9	2.8	S	3.3	3.0	2.9	2.2	2.0	2.0	1.8	1.8	1.8	1.8	1.8	1.8	2.1	1.9	1.9	1.9	1.9	2.0	2.2	2.0	3.3	2.2	24	
26		2.2	2.7	S	2.2	2.9	2.3	2.7	2.3	2.2	2.1	1.8	1.9	2.0	1.9	2.0	2.5	2.3	2.4	2.0	2.2	2.1	2.2	2.7	2.9	2.9	2.3	24	
27		3.7	S	3.3	2.6	2.6	2.0	2.0	1.9	1.9	1.9	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	3.7	2.1	24	
28		S	1.9	1.9	2.2	2.4	2.1	2.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	2.3	2.8	3.0	S	3.0	2.0	24	
29		4.1	3.4	3.5	3.8	3.5	3.9	4.1	3.7	3.3	3.1	2.9	2.8	2.6	2.6	2.4	2.4	2.3	2.6	2.4	2.5	2.8	2.9	S	2.9	4.1	3.1	24	
30		2.9	3.7	3.7	2.7	2.0	1.8	1.8	1.8	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	S	1.8	1.8	3.7	2.1	24	
31		1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0	1.9	1.9	1.9	1.8	1.9	2.1	2.2	2.2	2.4	3.0	S	2.9	3.1	3.0	3.1	3.0	3.1	2.2	24	
HOURLY MAX		7.8	7.4	7.4	8.6	8.5	6.5	5.5	5.3	5.5	5.4	4.8	4.7	4.3	4.9	4.5	5.9	4.5	4.4	5.2	5.6	5.9	5.6	7.2	6.0				
HOURLY AVG		2.9	2.9	2.9	2.9	2.9	2.8	2.6	2.5	2.5	2.4	2.4	2.4	2.2	2.2	2.2	2.3	2.4	2.5	2.5	2.6	2.7	2.8	2.9	2.8				

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

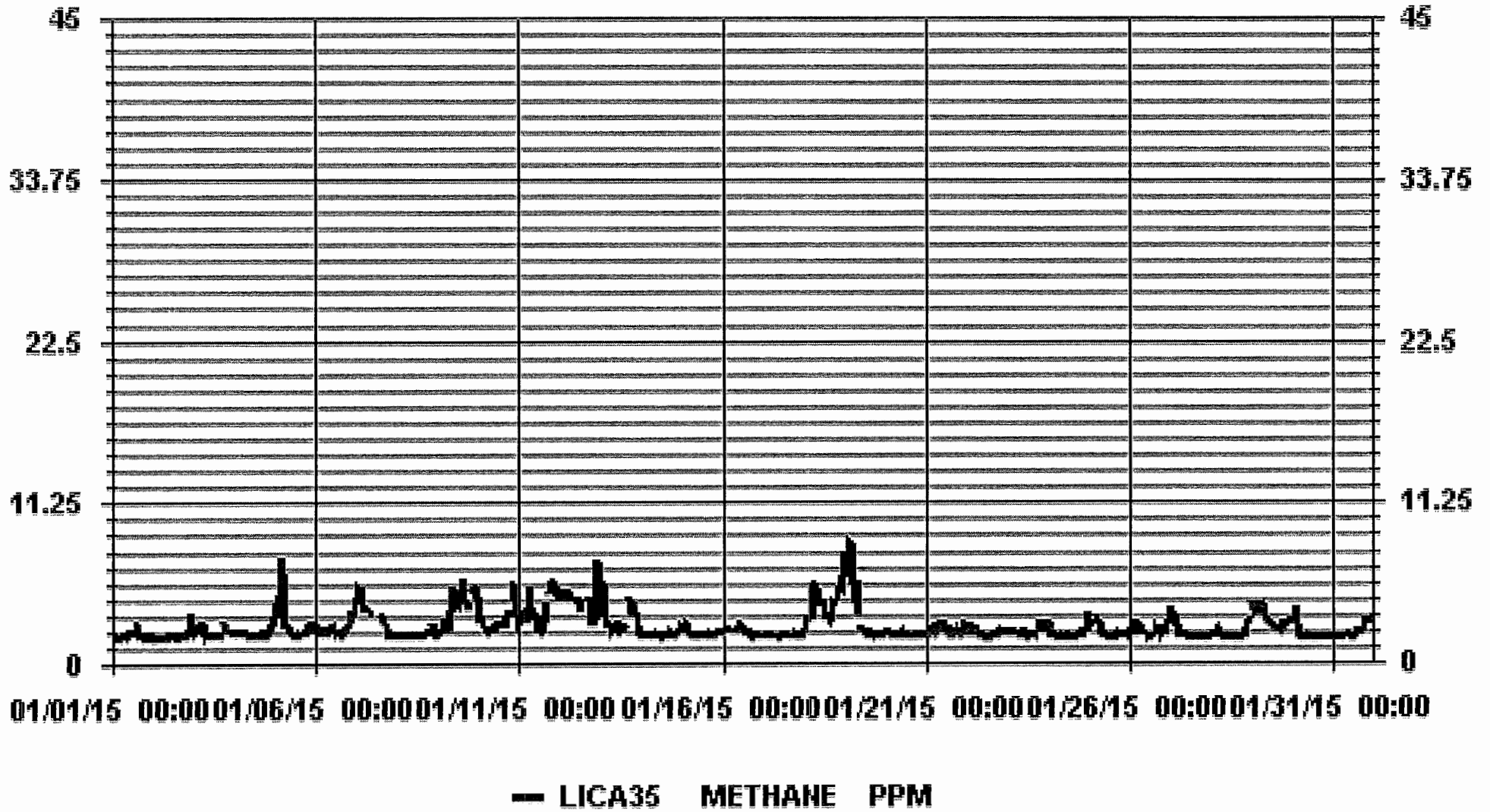
24 HOUR AVERAGES FOR JANUARY 2015



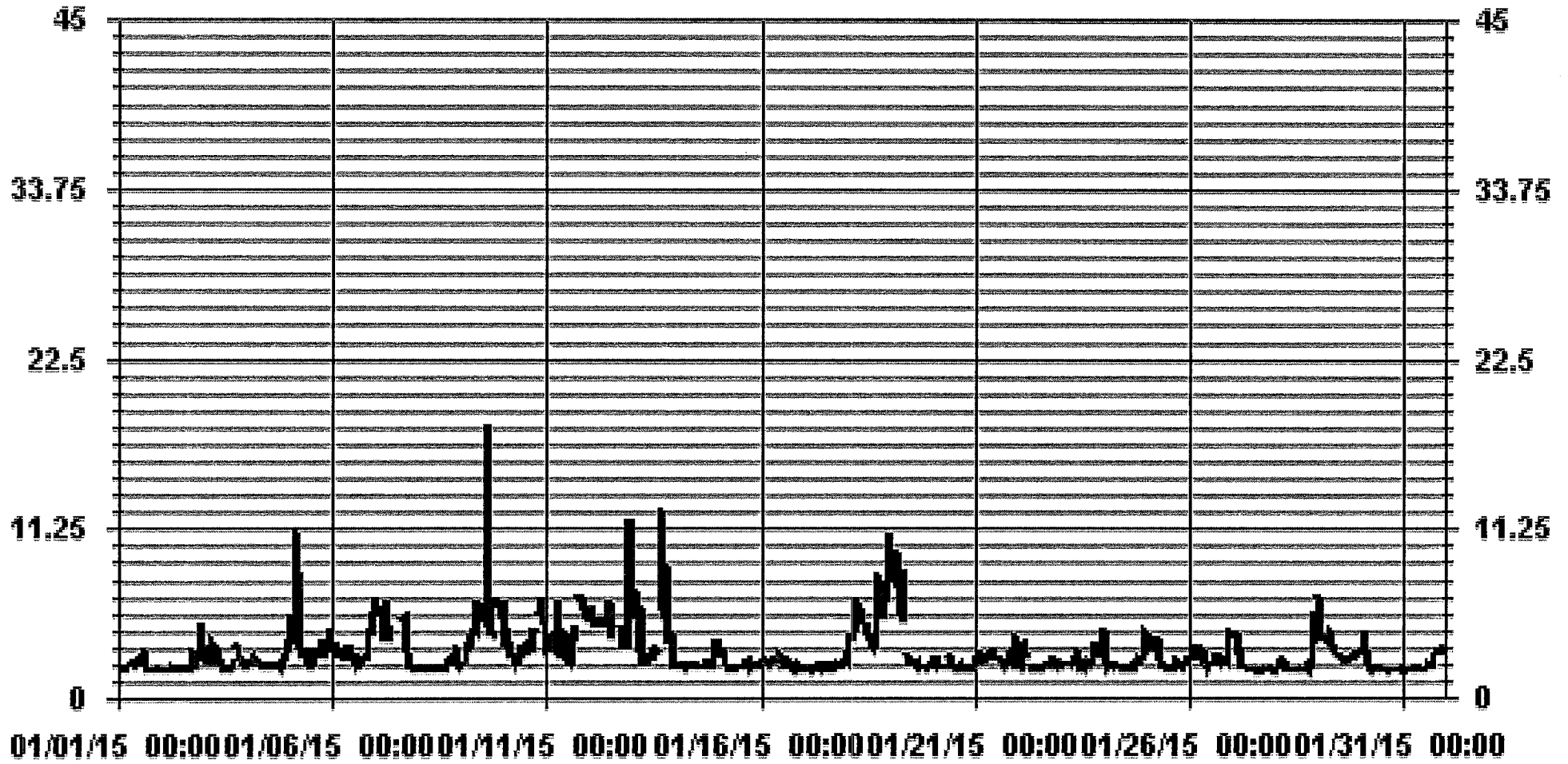
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	701		
MAXIMUM 1-HR AVERAGE:	8.6 PPM	@ HOUR(S)	3 ON DAY(S)
MAXIMUM 24-HR AVERAGE:	4.4 PPM		12 ON DAY(S)
			VAR-VARIOUS
IZS CALIBRATION TIME:	36 HRS	OPERATIONAL TIME:	743 HRS
MONTHLY CALIBRATION TIME:	6 HRS	AMD OPERATION UPTIME:	99.9 %
STANDARD DEVIATION:	1.07	MONTHLY AVERAGE:	2.6 PPM

01 Hour Averages



01 Hour Averages



— LICA35 MATHMAX PPM

LICA35
METHANE / WDR Joint Frequency Distribution (Percent)

January 2015

Distribution By % Of Samples

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

Wind Parameter : WDR
Instrument Height : 10 Meters

	Direction																	
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq	
< 3.0	1.71	2.85	2.42	3.28	2.99	4.13	1.99	1.14	.99	1.28	1.56	14.55	17.26	10.84	9.98	1.99	79.02	
< 10.0	.14	.28	.00	1.28	5.56	2.85	.57	.71	.42	.42	.42	2.71	1.99	2.42	.71	.42	20.97	
< 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	1.85	3.13	2.42	4.56	8.55	6.99	2.56	1.85	1.42	1.71	1.99	17.26	19.25	13.26	10.69	2.42		

Calm : .00 %

Total # Operational Hours : 701

Distribution By Samples

	Direction																	
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq	
< 3.0	12	20	17	23	21	29	14	8	7	9	11	102	121	76	70	14	554	
< 10.0	1	2		9	39	20	4	5	3	3	3	19	14	17	5	3	147	
< 50.0																		
>= 50.0																		
Totals	13	22	17	32	60	49	18	13	10	12	14	121	135	93	75	17		

Calm : .00 %

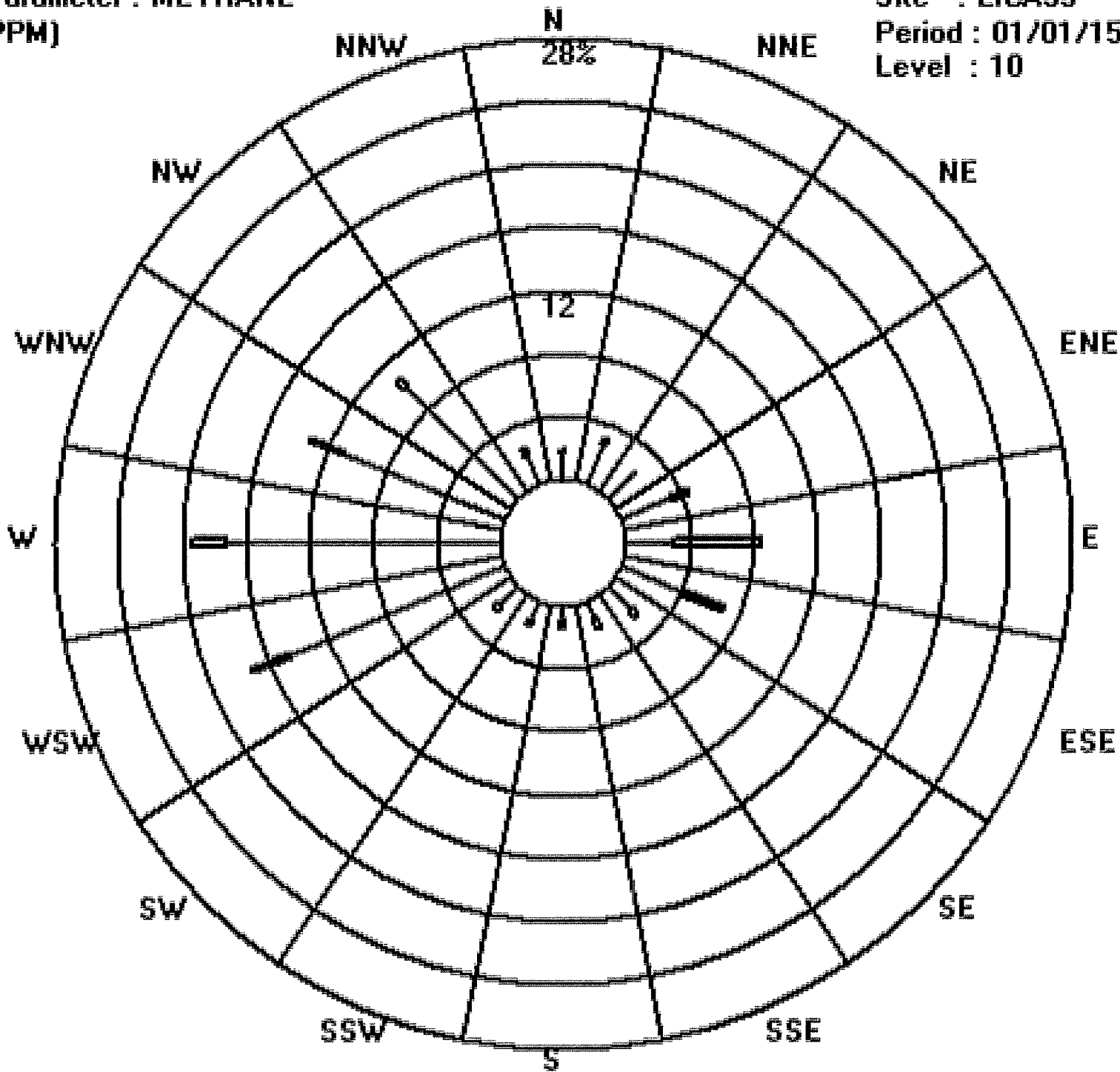
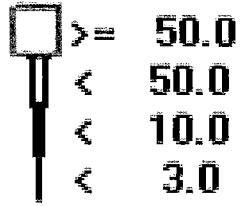
Total # Operational Hours : 701

Logger : 35 Parameter : METHANE

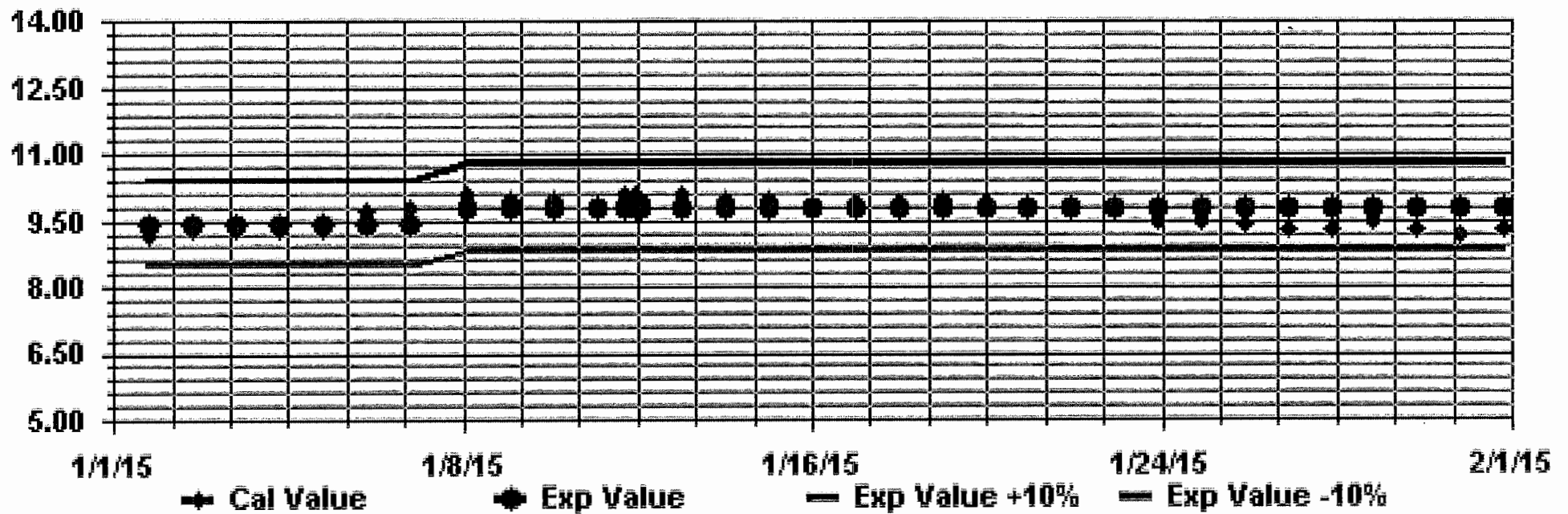
Site : LICA35

Class Limits (PPM)

Period : 01/01/15-01/31/15

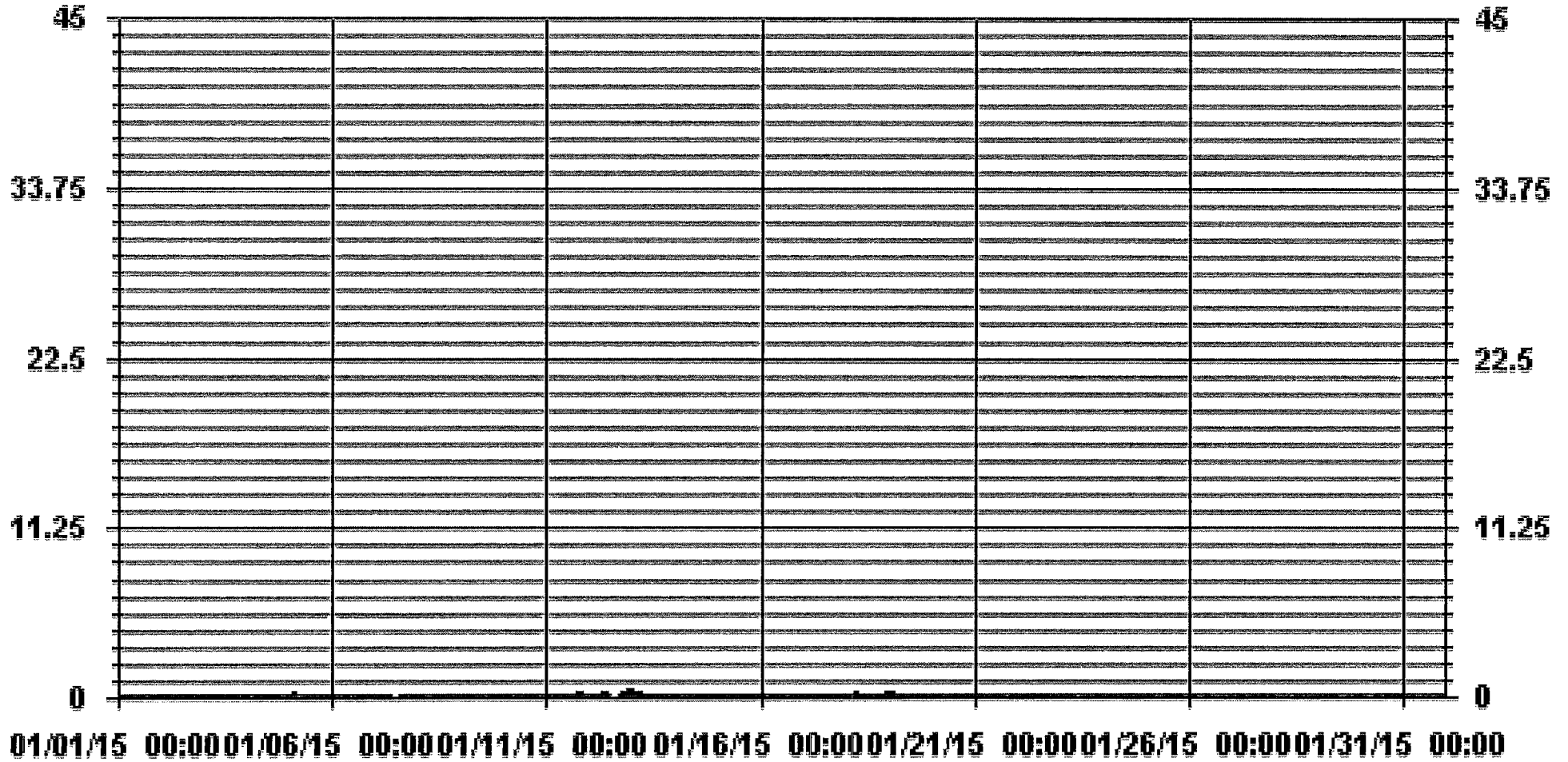


Calibration Graph for Site: LICA35 Parameter: METHANE Sequence: THC55 Phase: SPAN



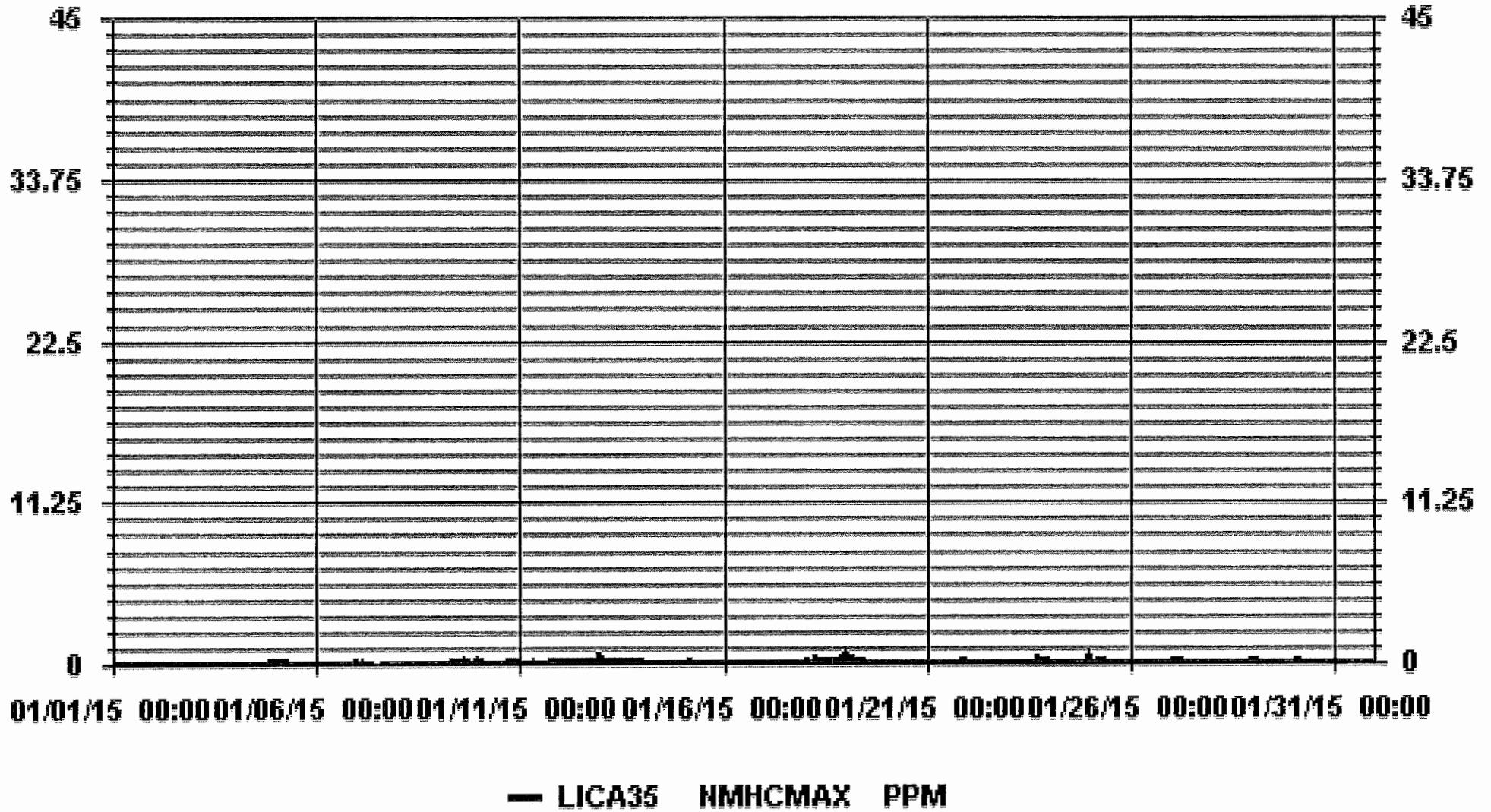
NON-METHANE HYDROCARBON

01 Hour Averages



— LICA35 NMHC PPM

01 Hour Averages



LICA35
 NMHC / WDR Joint Frequency Distribution (Percent)

January 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	1.85	3.13	2.42	4.56	8.55	6.99	2.56	1.85	1.42	1.71	1.99	17.26	19.11	12.98	10.55	2.42	99.42
< .5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.14	.28	.14	.00	.57
< 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	1.85	3.13	2.42	4.56	8.55	6.99	2.56	1.85	1.42	1.71	1.99	17.26	19.25	13.26	10.69	2.42	

Calm : .00 %

Total # Operational Hours : 701

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< .2	13	22	17	32	60	49	18	13	10	12	14	121	134	91	74	17	697
< .5													1	2	1		4
< 1.0																	
< 2.0																	
< 4.0																	
>= 4.0																	
Totals	13	22	17	32	60	49	18	13	10	12	14	121	135	93	75	17	

Calm : .00 %

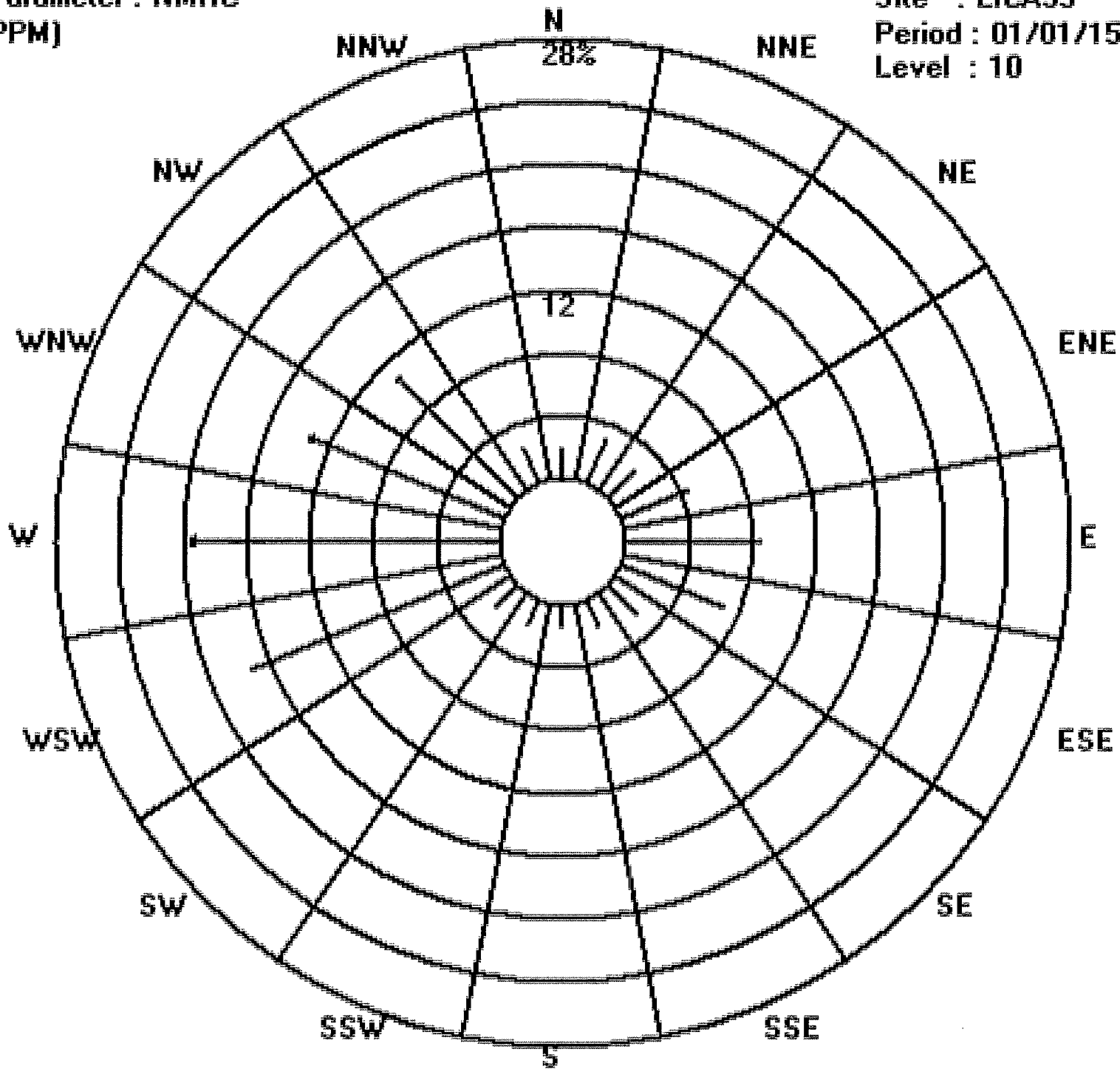
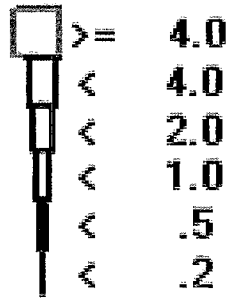
Total # Operational Hours : 701

Logger : 35 Parameter : NMHC

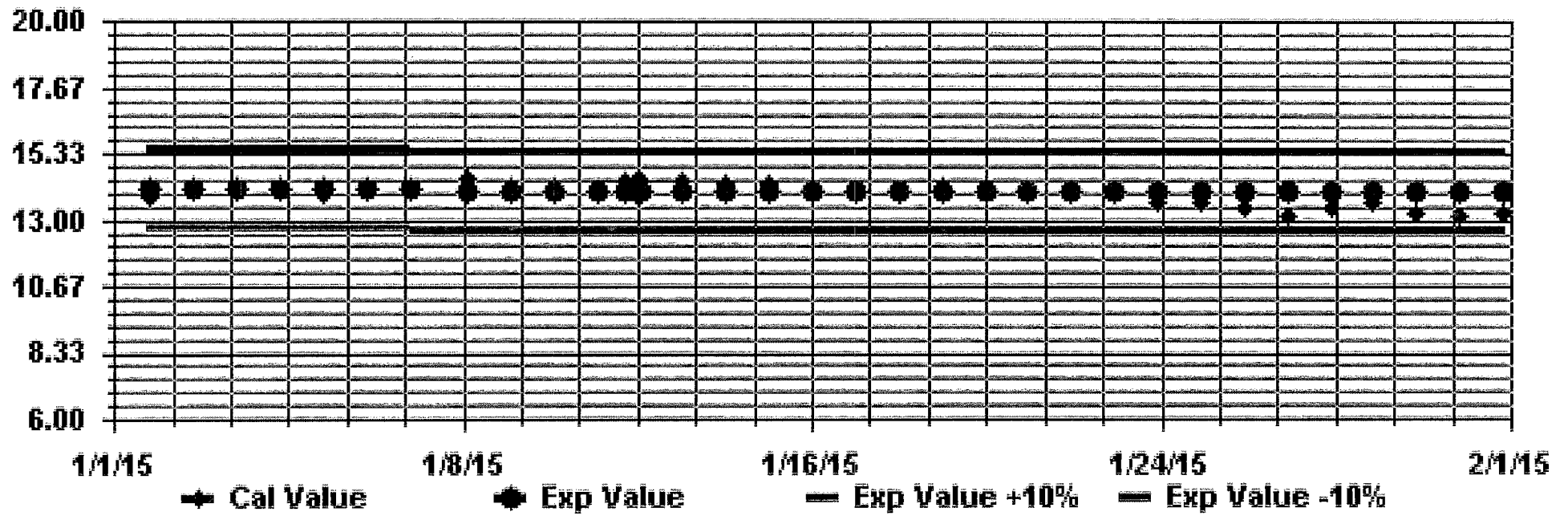
Site : LICA35

Class Limits (PPM)

Period : 01/01/15-01/31/15



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



OXIDES OF NITROGEN



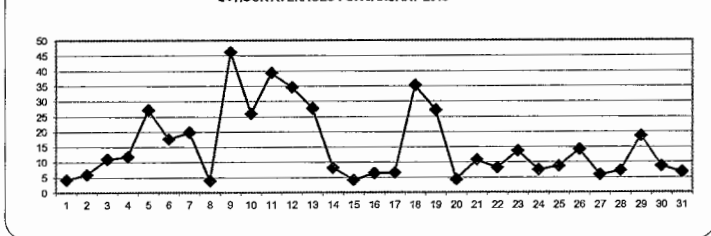
OXIDES OF NITROGEN (NOx) hourly averages in ppb

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	0:00	DAILY	24-HOUR	
HOURLY MAX	HOURLY AVG	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	MAX.	AVG.	RDGS.	
DAY																													
1		1.5	1.5	1.3	2.3	2	3	4.1	4.2	5.6	2.3	3.2	4.5	5.1	12.3	18.1	5.7	3.1	2.8	2.5	S	3.3	2.8	2.8	2.6	2.6	18.1	4.2	24
2		2.3	2.5	3	2.9	1.7	1.1	0.8	0.4	0.5	1.1	1.1	1.1	1	0.8	1	20.5	1.3	11.5	S	7.4	11.7	14.9	31.7	16.5	31.7	5.9	24	
3		27.6	7.7	14.1	14.1	27.6	18.9	3.8	9.4	4.8	6.3	4.9	0.9	0.1	0.1	0.3	0.7	9.7	S	22.6	15.9	28	16.6	9.9	8.5	28	11.0	24	
4		7.7	9.1	6.4	3	3.6	5.1	6.1	9.8	11.7	4	5.4	5.6	7.9	10.1	11.2	12.4	S	18	14.9	13.8	14.5	18.2	30.1	43.9	43.9	11.8	24	
5		35.6	51.8	49.9	68.0	88.1	79.7	22.0	19.2	22.5	15.7	11.1	9.9	8.7	10.2	9.7	S	9.3	19.4	20.0	11.6	14.7	12.5	24.2	11.2	88.1	27.2	24	
6		12.6	15.9	7.4	6.5	14.1	10.9	9.1	8.5	16	6.2	19.1	14.5	8.5	8.4	S	8.4	12.7	27.8	26.4	33.7	24.8	36.7	32.9	43.9	43.9	17.6	24	
7		50	60.8	58.8	46.1	29.1	24.5	22.2	22.3	17.7	16.4	12.3	11	11.3	S	12.2	13.5	12.4	11.2	10.6	3.9	3	2.5	1.5	1.2	60.8	19.8	24	
8		0.7	0.5	0.2	0	0	0	0	0	0.1	C	C	C	C	C	C	C	C	C	11	10.1	8.6	S	16.7	5.4	16.7	3.9	24	
9		5.9	9.1	10.2	15.5	17.3	14	22.7	58.6	65.7	77	72.6	67.2	41	42.7	48.8	54.3	56.7	56.5	56.5	S	62.5	72.9	72.4	60.7	77	46.1	24	
10		28.6	14.8	34.1	10.9	11.8	12.2	10.1	16.1	12	9.5	22.5	12.9	10.9	12.9	10.9	12.9	14	24	40.7	57.6	S	60.8	83.6	54.4	24.2	18.7	24	
11		22	22.4	28.4	17.1	29.1	20.3	56	42.4	51.7	41.2	36.7	18.7	18.8	14.6	23.8	46.7	69.5	S	66.1	76.7	57.1	52.3	50.3	41.1	76.7	39.3	24	
12		35.8	36.3	33.1	29.6	33.5	33.5	39.9	44.3	42.9	40.5	26.9	26.3	23.3	29	24.4	24.5	S	37.1	22.7	23.9	29.4	39.3	64.1	55.5	64.1	34.6	24	
13		60	65.2	45.4	34.2	22.1	19.9	16.2	16.8	21.4	Y	Y	Y	11.3	17.5	20.8	S	28.4	30.7	33.6	28.3	28.3	27.2	17.6	9.3	65.2	27.7	21	
14		9.9	8	6	5	5.3	6	5.4	6.7	7.5	7	8.2	3.9	3.5	7.5	S	6.3	8.3	12.3	11.8	12	6.7	11.3	14.8	12.7	14.8	8.1	24	
15		14.4	12	16.6	11	2.7	1.2	1.2	1.2	0.7	0.6	0.8	1	1.1	S	2.1	2	2.3	3.9	1.6	2.8	3.8	3.4	4	3.4	16.6	4.1	24	
16		3.7	4.9	5.1	6.9	4.4	4.7	5.9	7.6	7.2	7.3	9	10.7	S	8.2	8.1	12.3	10	8.5	4.2	4.8	2	3.9	2.7	2.4	12.3	6.3	24	
17		2.1	1.9	2.6	3.5	2.5	2.4	2.6	4	5.6	4.8	5.7	S	6	8	6.7	6.3	7.1	10.7	14.6	11.3	8.8	10.7	7.8	14.7	14.7	6.5	24	
18		17.8	24.8	29.5	29.7	38.4	68.2	82	70.1	43.3	32.6	S	29	17.8	16.8	16.5	13.2	25.6	24	35.4	33.9	35	38.2	40.5	48.3	82	35.2	24	
19		62.5	73.4	61.5	84.2	74.3	42.2	27.6	27	44.4	S	15.4	14.8	12.7	P	12.8	11.6	9.7	3.7	3.2	4.3	2.5	2.1	2.6	5.1	84.2	27.2	23	
20		8.8	9.1	6.4	6.4	3.3	2.3	2.1	2.3	S	9.8	13.4	3.8	6.1	8.1	1.2	2.3	3.3	1.2	1.2	1.5	1.3	1.6	2.5	1.4	13.4	4.3	24	
21		2.3	7.9	3.4	5.4	7.6	4.3	8.1	S	15.3	16.1	16	12.7	12.1	10.5	13.3	7.9	10.4	10.6	10.5	14.8	11.1	12.9	18	15.9	18	10.7	24	
22		14.2	11.9	13.2	12.4	13	15.2	S	9.2	7.3	5	4.5	4.1	2.7	2.4	2.8	3	6	6.3	7.7	13.6	7.6	8.9	8	7.1	15.2	8.1	24	
23		10.2	6.7	7.5	7.8	6.9	S	12	9.5	10.8	14.3	12.3	10	9.3	10.5	13.1	14.5	9.7	17.1	30.8	22.8	19.7	23.8	13.5	21.4	30.8	13.7	24	
24		23.5	7.3	4	6	S	5.9	4.2	6.3	3.8	2.9	2.1	7	3.1	1.6	1.2	5.3	3.5	8.3	14.1	7.3	6.9	10.6	12.5	22.6	23.5	7.4	24	
25		19.7	13.8	10.2	S	16.8	11.3	12.2	9.1	6.5	6.6	9.6	5.4	4.6	5.8	6.1	4.6	15.1	7.3	3.8	3.3	1.5	8.2	11.2	6.4	19.7	8.7	24	
26		9.8	18.5	S	12.6	18.9	17.5	18.5	14.3	15.3	11.5	6	11.2	8.4	7.6	7.2	17	18.6	18.5	18.3	14.7	10.7	12.3	19.9	16.5	19.9	14.1	24	
27		39	S	31.5	11.9	10.2	4.2	3.7	3.7	3.9	3.1	2.8	2.3	1.7	1.5	1.4	1.2	1.2	1	1	0.6	0.9	1.3	3	1.6	39	5.8	24	
28		5	3.4	4	8.8	15.6	8.2	4.9	2.1	1.7	1.7	1.9	1.8	1.8	2.1	2.1	1.6	1.6	1.5	7.4	6.6	12.8	31.7	32.6	S	32.6	7.1	24	
29		42.3	31.4	28.7	23.9	21.3	27.3	31.3	21.3	19.1	15.9	14.2	12	11.5	9	6.6	8.4	8.9	11.4	13.1	17.4	17.2	16.3	S	19.1	42.3	18.6	24	
30		23.2	43.8	43.2	24.5	8.7	4.2	3.8	3.5	4.9	4.6	4.1	5.5	5	4	2.7	2	2.2	2.4	1.5	1.3	1.3	S	2.6	1.9	43.8	8.7	24	
31		1.5	0.7	0.9	1	0.7	0.4	1.4	1.8	1.7	2.1	3.4	2.6	3.8	5.7	5.8	7.1	8.2	17.2	18.6	14.2	S	16.4	20.6	17.5	20.6	6.7	24	
HOURLY MAX		62.5	73.4	61.5	84.2	88.1	79.7	82	70.1	65.7	77	72.6	67.2	41	42.7	48.8	54.3	69.5	57.6	66.1	76.7	83.6	72.9	72.4	60.7				
HOURLY AVG		19.8	19.2	18.9	17.0	17.7	15.6	14.7	15.1	15.7	13.1	12.3	11.1	8.9	9.9	10.5	12.0	14.1	15.5	16.7	16.3	17.6	19.4	19.5	17.9				

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

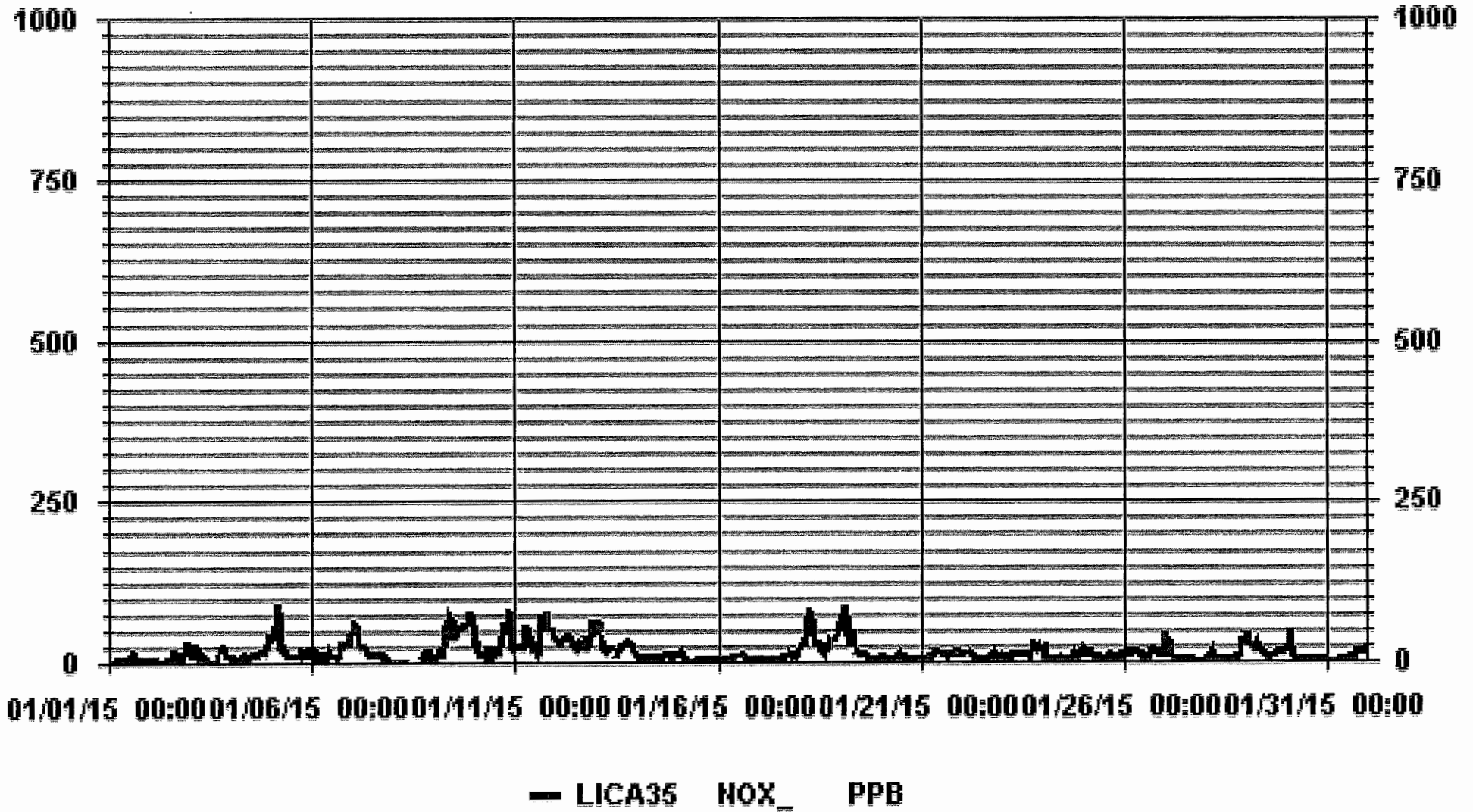
24 HOUR AVERAGES FOR JANUARY 2015



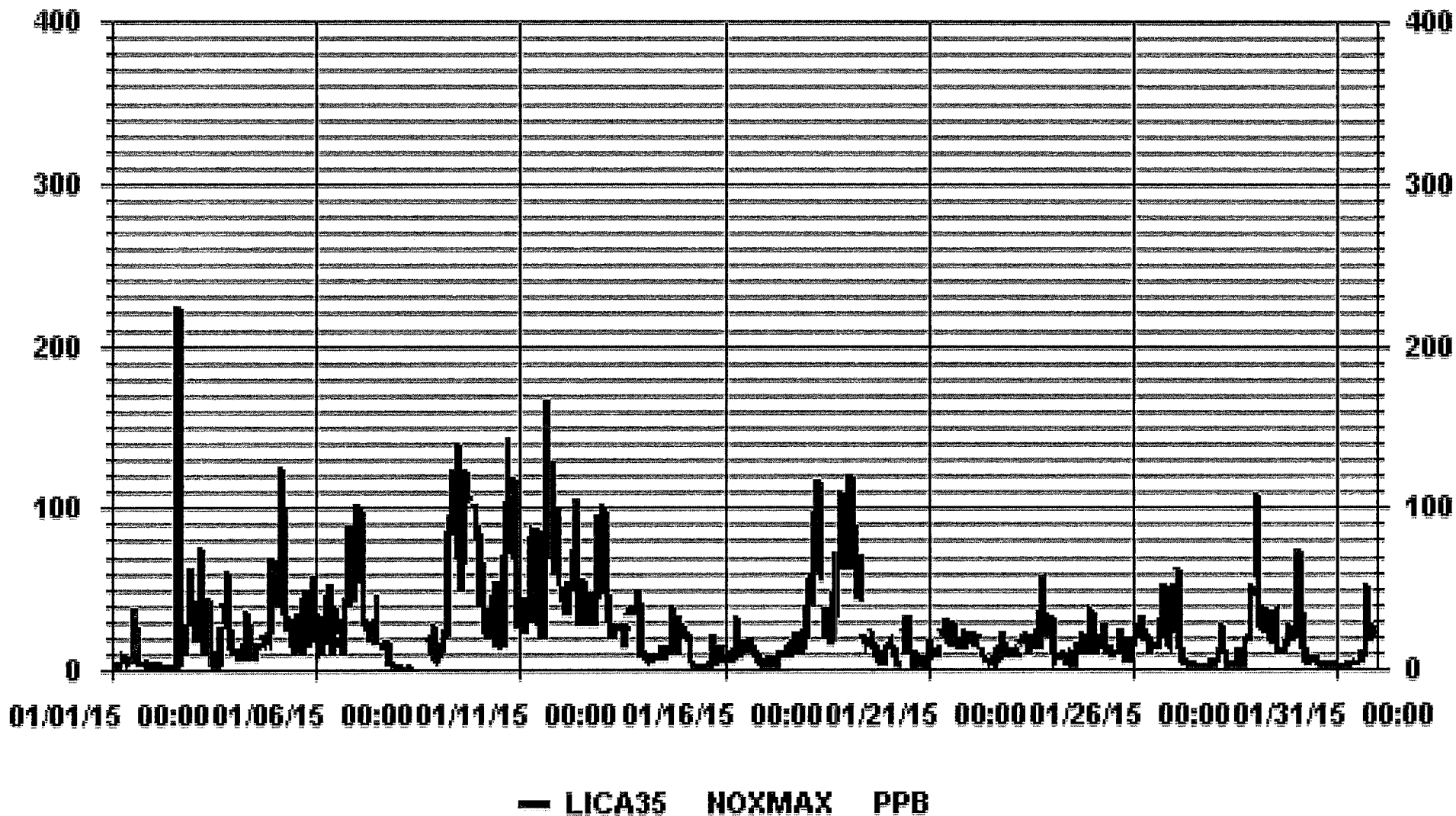
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	695			
MAXIMUM 1-HR AVERAGE:	88.1	PPB	@ HOUR(S)	4
MAXIMUM 24-HR AVERAGE:	46.1	PPB	ON DAY(S)	5
			ON DAY(S)	9
			VAR-VARIOUS	
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	740
MONTHLY CALIBRATION TIME:	8	HRS	AMD OPERATION UPTIME:	99.5
				%
STANDARD DEVIATION:	16.70		MONTHLY AVERAGE:	15.4
				PPB

01 Hour Averages



01 Hour Averages



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

January 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA-ELK
 Parameter : NOX_
 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	
< 50.0	1.85	2.85	2.42	4.71	7.42	7.14	2.57	1.42	1.42	1.42	1.85	16.28	18.42	11.57	10.00	2.28	93.71
< 110.0	.00	.28	.00	.00	1.42	.71	.00	.42	.00	.28	.14	.71	.85	1.14	.14	.14	6.28
< 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	1.85	3.14	2.42	4.71	8.85	7.85	2.57	1.85	1.42	1.71	2.00	17.00	19.28	12.71	10.14	2.42	

Calm : .00 %

Total # Operational Hours : 700

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	20	17	33	52	50	18	10	10	10	13	114	129	81	70	16	656
< 110.0		2			10	5		3		2	1	5	6	8	1	1	44
< 210.0																	
>= 210.0																	
Totals	13	22	17	33	62	55	18	13	10	12	14	119	135	89	71	17	

Calm : .00 %

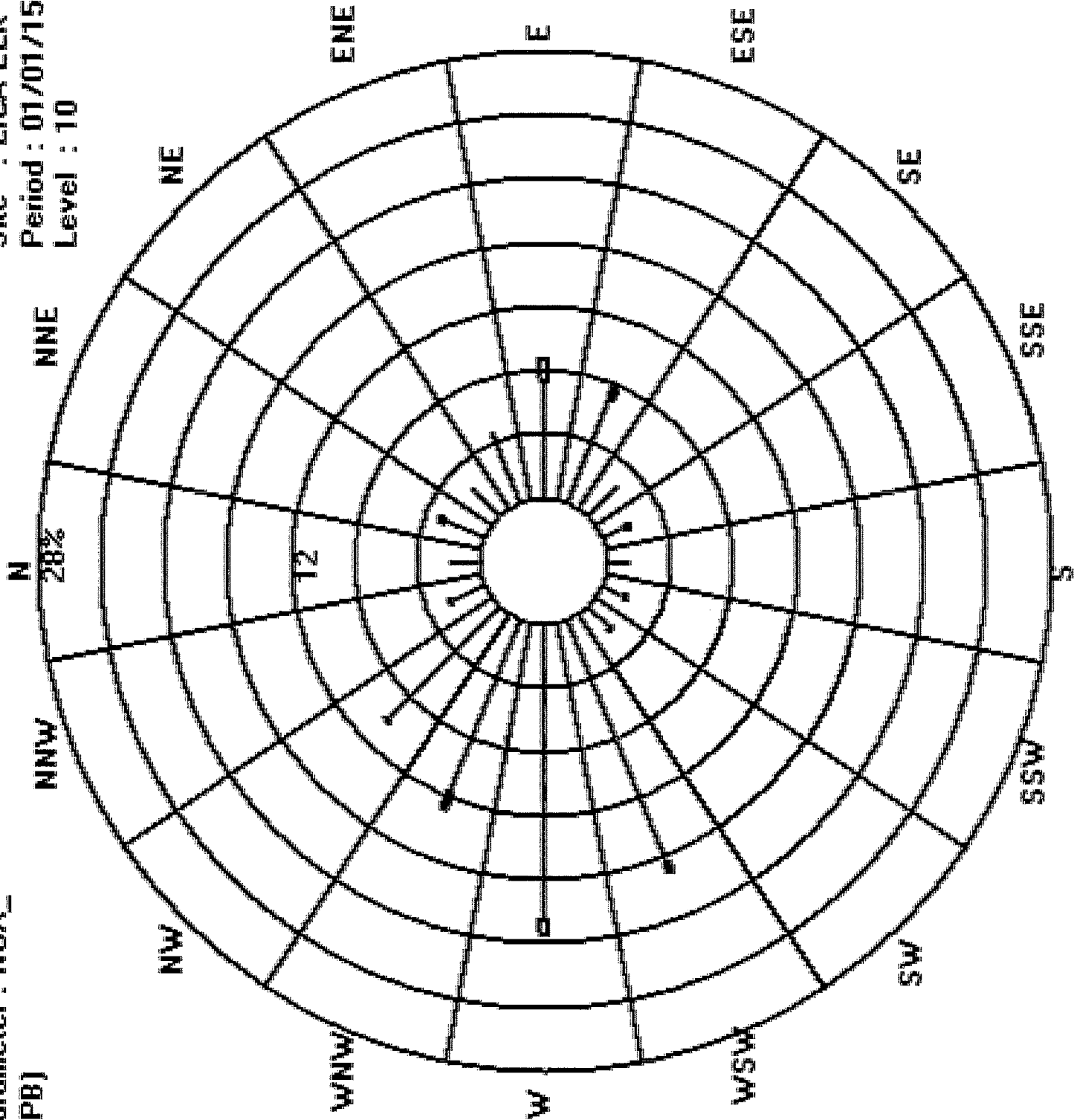
Total # Operational Hours : 700

Logger : 35 Parameter : NOX_

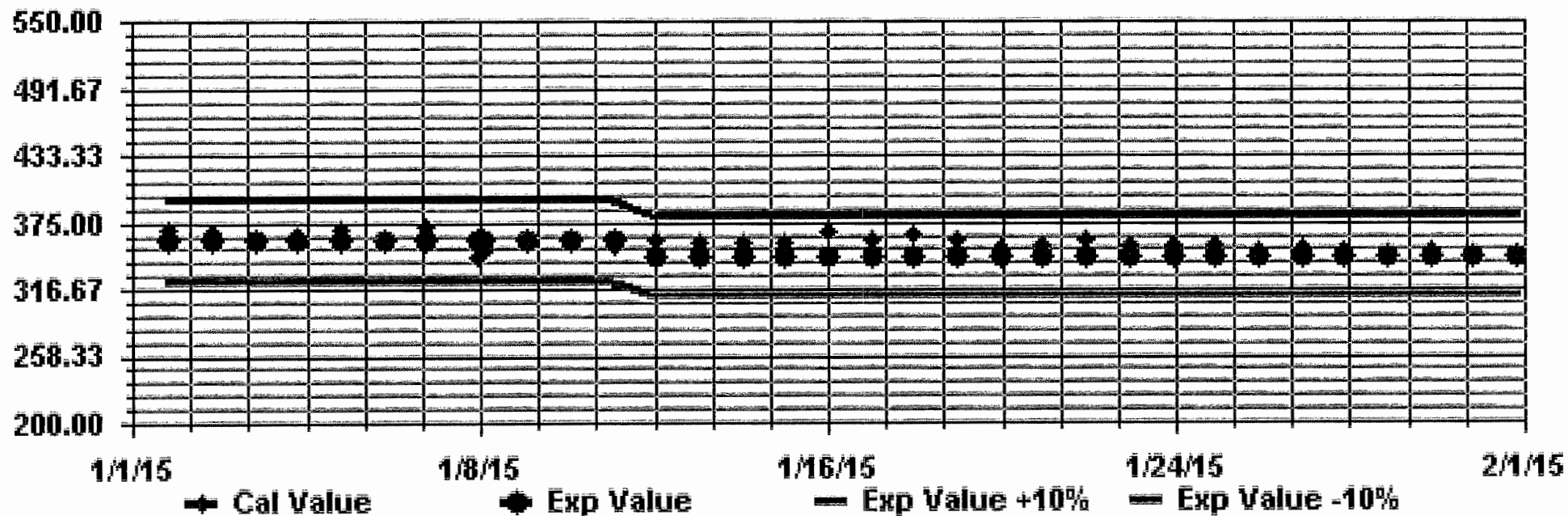
Class Limits (PPB)

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

Site : LICA-ELK
Period : 01/01/15-01/31/15
Level : 10



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



NITRIC OXIDES



NITRIC OXIDE (NO) hourly averages in ppb

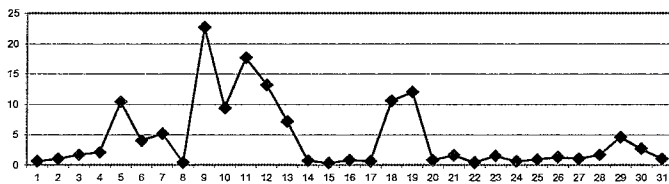
MST

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	24-HOUR		
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	0:00	MAX.	AVG.	RDGS.	
DAY																												
1	0	0	0	0	0	0	0.2	0	0.4	0.2	0.6	0.9	1.4	3.6	4.8	0.8	0.1	0	0	S	0	0	0	0	0	4.8	0.6	24
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11.1	0	2	S	0.1	1.7	2.4	5.7	1.1	11.1	1.0	24	
3	2.9	0	2.4	1.5	5.4	3.4	0	0.9	0.7	1.8	1.7	0.1	0	0	0	0	2.5	S	4.3	2.5	5.3	1.5	0.4	0.7	5.4	1.7	24	
4	0.4	0.1	0.1	0	0	0.1	0.5	1	2.1	0.9	2.1	2.6	3.9	4.6	4.3	2.8	S	1.3	0.8	0.9	0.1	0.9	5.2	13.3	13.3	2.1	24	
5	6.6	21.5	19.7	36.8	55.5	47.4	3.7	2.3	4.5	4.5	4.6	4.5	4.1	4.7	3.7	S	0.5	2.9	3.1	0.3	1.3	1.5	4.8	0.8	55.5	10.4	24	
6	0.7	2.3	0.2	0.1	1.5	0.4	0.6	2	5.6	1.4	9.1	6.8	4.1	3.9	S	1.3	1.5	5	4.1	8.4	4.7	10.4	5.2	12.9	12.9	4.0	24	
7	19.3	30.1	28.3	15.5	3.2	1.5	0.9	1.7	1.3	3.4	3.5	3.7	3.6	S	2.7	1.8	0.1	0	0.1	0	0	0	0	0	30.1	5.2	24	
8	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	C	C	1.6	1.2	0.7	S	0.9	0.4	1	1.6	0.4	24	
9	0.9	1	0.7	0.8	0.8	0.4	4.4	25.1	32.6	46.5	45	43.8	24.5	25.2	27.6	27.5	24.5	23.8	22.7	S	30.6	42.5	41	29.3	46.5	22.7	24	
10	6.8	1.4	9.9	0.7	0.8	1	1.4	2.9	2.3	2.3	10.6	6	4.9	5.9	6.1	8.3	14.5	24	S	25.7	47.3	27	3.9	1.7	47.3	9.4	24	
11	2.5	3.1	6.7	1.6	5.3	2.5	27.5	16.5	24.3	20.5	21.3	9.6	10	7	11.1	23.9	38.6	S	35.8	47.6	29.9	24.9	22.1	15	47.6	17.7	24	
12	10.8	9.5	8.6	5.7	9.3	8.8	14.1	18.1	18.1	21.6	14.3	15	12.9	16.6	11.1	7.7	S	9	2.3	2.6	6.3	13.9	38.4	29.7	38.4	13.2	24	
13	34.3	39.6	19.3	8.5	1.7	1.5	1.3	1.2	3	Y	Y	Y	4.2	6.4	7.1	S	3.4	2.7	2.7	1.2	1.6	1.9	1.8	0.3	39.6	7.2	21	
14	0.2	0.2	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.8	2	1	1	2.2	S	0.9	0.6	0.9	0.7	0.5	0.3	0.9	0.6	0.9	2.2	0.7	24	
15	0.6	0.6	0.6	0.3	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	S	0.2	0.2	0.2	0.5	0.3	0.5	0.3	0.1	0.6	0.2	0.6	0.3	24	
16	0.2	0.2	0.2	0.4	0.3	0.3	0.7	0.7	0.4	1	1.9	3.2	S	2.1	1.9	2.4	1	0.7	0.4	0.4	0.2	0.3	0.2	0.3	3.2	0.8	24	
17	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.2	0.4	0.8	1.7	S	1.5	2	1.5	0.8	0.5	0.5	0.8	0.3	0.4	0.5	0.2	0.7	2	0.6	24	
18	0.4	1.2	2	1.8	5.5	33.1	46.2	36.1	14.4	11.8	S	13.8	7.7	6.8	5.7	2.8	5.2	1.3	7.5	3.8	5.2	5.1	11	15.2	46.2	10.6	24	
19	30.4	41.4	31.4	53.2	44.3	15.1	3.7	6.4	19.9	S	3.7	4	3.5	P	2.5	1.4	0.9	0.3	0.1	0.4	0.2	0.2	0.2	0.3	53.2	12.0	23	
20	0.9	1.1	0.3	0.4	0.2	0.2	0.2	0.1	S	2.5	5.1	1.2	2.2	2.5	0.2	0.4	0.5	0.1	0	0.1	0.1	0.2	0.3	0	5.1	0.8	24	
21	0.2	0.9	0.4	0.4	0.6	0.3	0.8	S	2.5	4.2	5.8	4.2	3.9	3	3.9	1.5	1.3	0.8	0.5	0.7	0.4	0.6	0.5	0.5	5.8	1.6	24	
22	0.3	0.4	0.5	0.2	0.3	0.4	S	0.5	0.4	0.6	0.8	1.2	0.5	0.5	0.4	0.6	0.4	0.3	0.6	0.2	0.2	0.3	0.2	1.2	0.4	0.4	24	
23	0.2	0.2	0.2	0.2	0.2	S	0.4	0.5	1	2.8	3.3	2.8	3	3.3	2.8	0.9	1.1	4	1.7	0.4	0.9	0.5	1.1	4	1.5	24		
24	1.1	0.1	0.2	0.2	S	0.2	0.2	0.4	0.2	0.7	0.4	2.5	1	0.4	0.3	1.4	0.2	0.2	0.8	0.3	0.1	0.3	0.4	1.7	2.5	0.6	24	
25	1.7	0.7	0.2	S	0.8	0.3	0.5	0.9	0.5	0.9	2.2	1.6	1.3	2	1.6	0.9	2.1	0.4	0.3	0.2	0.4	0.5	0.2	2.2	0.9	24		
26	0.2	1.1	S	0.4	0.4	1.2	1.1	1.1	1.2	1.4	1.4	3.3	2.8	2.1	1.8	2.8	2	0.9	2.3	0.5	0.2	0.3	1.1	0.3	3.3	1.3	24	
27	11.6	S	6.7	0.2	0.3	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.4	0.4	0.2	0.2	0.2	0	0.1	0.1	0.1	0.2	0.3	0.1	11.6	1.0	24	
28	S	0.2	0.6	0.6	2	0.7	0.5	0.2	0.2	0.6	0.8	0.8	0.9	1	1.1	0.6	0.2	0.2	1.6	1.1	1.9	11.7	10.2	S	11.7	1.7	24	
29	19.6	10.6	8.5	4.8	2.6	6.9	10.1	2.2	3.8	4.6	S	5.2	4.7	3.8	2	2.3	1.6	1.2	1.3	2.6	1.7	0.5	S	0.5	19.6	4.6	24	
30	2.8	22.1	22	6	0.4	0.1	0.2	0.1	0.3	0.6	0.7	1.2	1.5	1.3	0.8	0.2	0.2	0.2	0.2	0.2	0.2	S	0.1	0.2	22.1	2.7	24	
31	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.5	0.9	1	1.6	2.5	2.4	2.1	1.3	3.1	1.6	1.2	S	0.4	1.1	0.7	3.1	1.0	24	
HOURLY MAX	34.3	41.4	31.4	53.2	55.5	47.4	46.2	36.1	32.6	46.5	45	43.8	24.5	25.2	27.6	27.5	38.6	24	35.8	47.6	47.3	42.5	41	29.7				
HOURLY AVG	5.2	6.3	5.7	4.7	4.7	4.2	4.0	4.1	4.7	4.9	5.3	5.0	3.8	4.2	3.9	3.9	3.8	2.9	3.4	3.6	4.9	5.0	5.2	4.3				

STATUS FLAG CODES

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

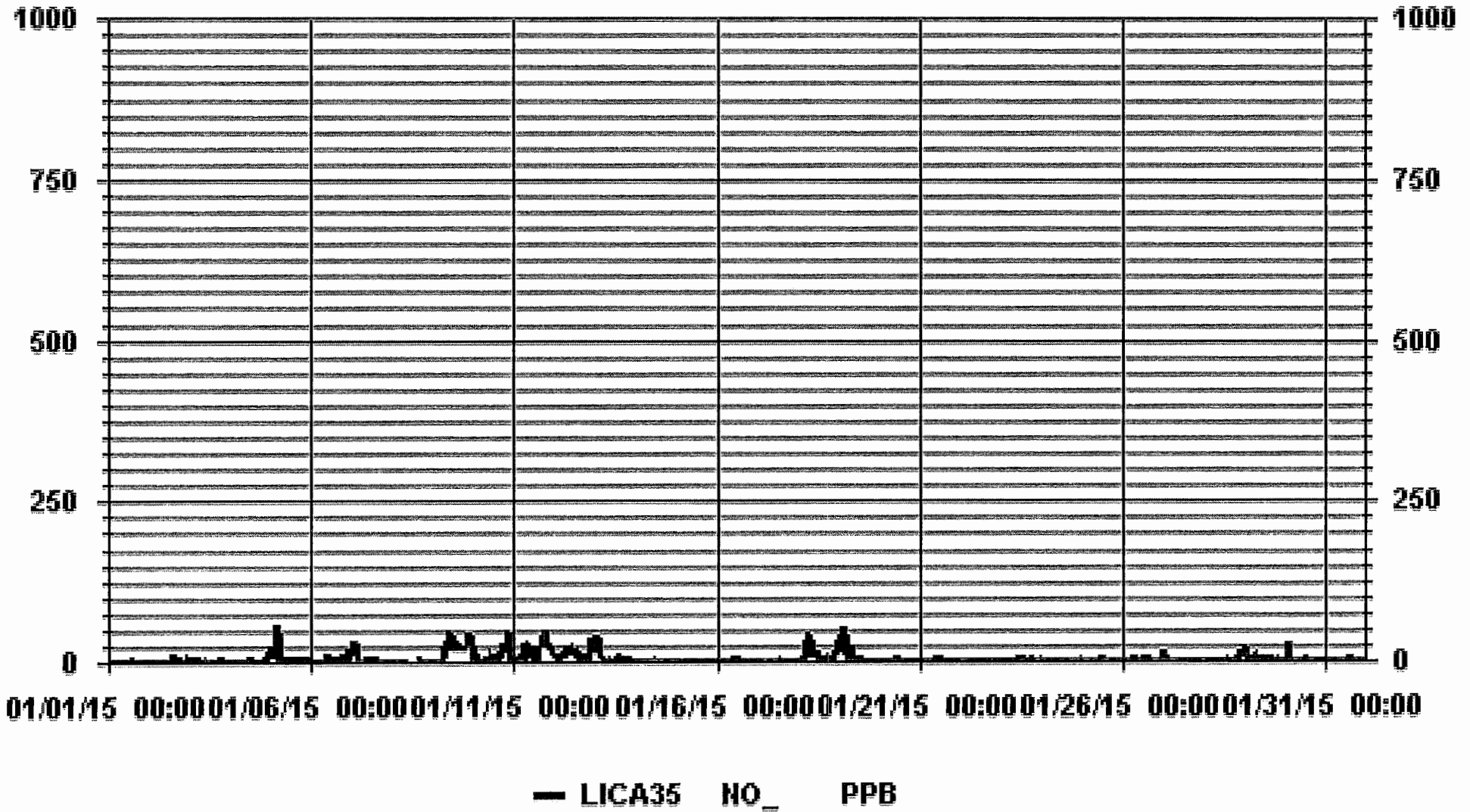
24 HOUR AVERAGES FOR JANUARY 2015



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	645					
MAXIMUM 1-HR AVERAGE:	55.5	PPB	@ HOUR(S)	4	ON DAY(S)	5
MAXIMUM 24-HR AVERAGE:	22.7	PPB			ON DAY(S)	9
					VAR-VARIOUS	
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	740	HRS	
MONTHLY CALIBRATION TIME:	8	HRS	AMD OPERATION UPTIME:	99.5	%	
STANDARD DEVIATION:	9.03		MONTHLY AVERAGE:	4.5	PPB	

01 Hour Averages





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Elk Point Airport Site - JANUARY 2015

JOB # 2833-2015-01-35- C

NITRIC OXIDE MAX instantaneous maximum in ppb

DAY	HOUR																								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				24:00
1	0.6	0	0	0	0	0.6	1.2	0.6	1.2	1.2	1.2	1.2	1.8	15.3	8.8	4.7	0.6	0	0.6	S	0.2	0.2	0.2	0	15.3	1.7	24	
2	0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	126.3	0.2	20.1	S	0.8	6.7	7.2	26	4.9	126.3	8.5	24	
3	5.5	0.2	17.8	6.7	46.5	13.1	1.4	4.3	20.2	6.7	5.5	0.8	0.2	0.2	0.2	0.2	9	S	10.8	6.1	31.3	3.2	1.4	1.4	46.5	8.4	24	
4	1.4	0.8	0.8	0.2	0.8	0.8	2.6	17.2	14.3	2	4.3	3.8	8.4	6.1	6.1	3.7	S	2.6	2	3.2	0.8	4.3	34.8	21.9	34.8	6.2	24	
5	9.6	30.8	26.6	91.7	71.8	66.5	14.3	4.3	10.8	9.6	7.2	5.5	7.8	19	8.4	S	1.4	16.1	19	0.8	7.8	7.2	24.9	2.6	91.7	20.2	24	
6	4.3	8.4	1.4	1.4	5.5	1.4	2	22.5	30.1	3.2	20.7	10.8	8.4	9	S	2.6	10.2	10.2	12.6	48.9	27.2	39	10.2	20.8	48.9	13.5	24	
7	68.3	46.5	63	24.9	6.1	3.2	2	3.2	2.6	5.5	4.9	18.4	28.4	S	3.8	2.6	0.8	0.2	1.4	0.2	0	0.2	0.2	0.2	68.3	12.5	24	
8	0	0	0	0.2	0	0.2	0.2	0	C	C	C	C	C	C	C	C	S	5.5	2.6	2	S	2	0.8	1.4	5.5	1.1	24	
9	2	2	2.6	1.4	1.4	1.4	50.1	61.8	47.8	89.9	75.2	99.9	46.6	30.1	39	61.8	78.2	68.8	64.1	S	57.1	65.9	61.3	48.9	99.9	46.0	24	
10	41.8	14.3	36.6	2.6	3.8	3.8	5.5	17.3	22.5	4.3	28.4	16.1	6.6	7.2	7.2	41.3	67.1	95.3	S	37.2	80.6	65.9	13.1	3.8	95.3	27.1	24	
11	5.6	8.4	17.3	3.2	7.2	5	50.1	24.3	52.4	62.9	62.9	15.5	12	9	21.9	40.1	124.6	S	87.6	105.8	40.7	32.5	62.9	26	124.6	38.2	24	
12	14.9	15.5	13.2	9	27.2	24.9	25.4	47.8	42.4	75.3	15.5	18.4	14.4	36.6	14.3	10.2	S	18.4	13.1	4.3	21.3	17.3	69.4	60.7	75.3	26.5	24	
13	73.5	52.4	70.6	21.4	9.6	3.2	3.2	3.7	6.6	Y	Y	6.6	11.4	10.2	S	5	8.4	5.5	3.8	6	21.4	12	0.8	73.5	16.8	21		
14	0.2	0.2	0.2	0.2	0.8	0.8	0.8	0.8	0.8	0.8	2	4.3	2	4.3	S	1.4	0.8	9.6	2	2	10.8	2	11.4	11.4	2.8	24		
15	2	1.4	2.6	0.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.8	0.2	0.8	S	0.2	0.8	0.2	7.2	0.8	1.4	1.4	0.8	9.6	0.2	9.6	1.4	24
16	0.8	0.8	0.8	1.4	0.8	0.8	2	15.5	0.8	1.4	2.6	6	S	5	2.6	5	1.4	1.4	1.4	0.8	0.8	0.8	0.8	0.8	15.5	2.4	24	
17	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4	1.4	3.2	S	3.2	3.8	4.3	1.4	0.8	1.4	3.2	1.4	0.8	0.8	0.8	2	4.3	1.6	24	
18	1.4	10.2	20.7	10.8	24.9	58.9	65.9	81.7	34.2	33.6	S	17.8	9.6	8.4	6.6	4.9	18.4	2.6	37.8	32.5	74	25.4	46	27.8	81.7	28.4	24	
19	43.6	67.7	85.2	67.7	60.1	33.1	17.3	19	39.6	S	5	5.5	7.2	P	12.5	2	1.4	2	0.2	2.6	0.2	0.2	2	85.2	21.6	23		
20	2.6	3.2	0.8	0.8	0.8	0.2	0.2	0.2	S	10.8	14.3	2.6	16	X	0.2	1.4	2	0.2	0.2	0.2	0.2	0.2	0.8	0.2	16	2.6	23	
21	0.2	4.9	2	1.4	1.4	0.8	2.6	S	4.9	6.6	16.7	5.5	7.8	4.3	15.5	10.2	3.2	2.6	1.4	1.4	2.6	0.8	0.8	16.7	4.3	24		
22	1.4	1.4	2	0.8	1.4	0.8	S	1.4	0.8	0.8	1.4	2	0.8	1.4	1.4	0.8	1.4	0.8	0.8	2	0.8	0.2	0.8	0.2	2	1.1	24	
23	0.2	0.2	0.2	0.2	0.2	S	1.4	1.4	2	4.9	6	4.3	4.3	6.6	4.3	6	1.4	7.2	20.7	22.5	1.4	4.3	1.4	4.3	22.5	4.6	24	
24	4.9	0.8	0.8	0.2	S	0.8	0.2	1.4	0.2	2	1.4	4.3	3.2	0.8	0.8	4.9	2	0.8	3.2	1.4	0.8	0.8	1.4	7.8	7.8	2.0	24	
25	7.2	3.7	0.2	S	2	0.8	2	10.2	1.4	2.6	3.2	3.2	2.6	3.8	2.6	2.6	4.3	1.4	1.4	0.2	0.2	1.4	1.4	0.2	10.2	2.5	24	
26	0.2	2.6	S	0.8	1.4	3.8	2.6	2.6	2	3.2	2.6	5.6	4.9	5.5	3.8	6	4.9	2.6	17.2	1.4	0.8	0.8	9.6	0.8	17.2	3.7	24	
27	19.6	S	30.8	0.2	0.8	0.2	0.2	0.2	0.2	0.8	0.8	0.8	0.8	0.8	0.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	30.8	2.7	24	
28	S	0.2	1.4	2.6	6	1.4	1.4	0.2	0.2	0.8	0.8	0.8	2	12.5	0.8	0.8	0.8	0.2	6.1	6.6	5.5	26.6	21.4	S	26.6	4.6	24	
29	80.6	34.8	19.6	7.2	5	11.4	16.1	6.1	8.4	5.6	6.6	14.9	20.2	5.6	2.6	4.3	4.3	2	3.8	8.4	5	0.8	S	1.4	80.6	11.9	24	
30	6.6	53.5	39	15.5	0.8	0.2	0.2	0.2	0.8	0.8	1.4	2	2	1.4	1.4	0.2	0.8	0.2	0.2	0.2	0.2	S	0.2	0.8	53.5	5.6	24	
31	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.8	1.4	1.4	2	2	4.3	4.3	2.6	2	29.6	3.8	3.2	S	1.4	2.6	0.8	29.6	2.8	24	
HOURLY MAX	80.6	67.7	85.2	91.7	71.8	66.5	65.9	81.7	52.4	89.9	75.2	99.9	46.6	36.6	39	126.3	124.6	95.3	87.6	105.8	80.6	65.9	69.4	60.7				
HOURLY AVG	13.3	12.2	15.2	9.2	9.6	8.0	9.1	11.6	12.1	12.1	10.6	9.8	8.0	7.8	7.0	12.5	12.4	11.0	11.2	10.4	12.9	11.5	14.0	8.5				

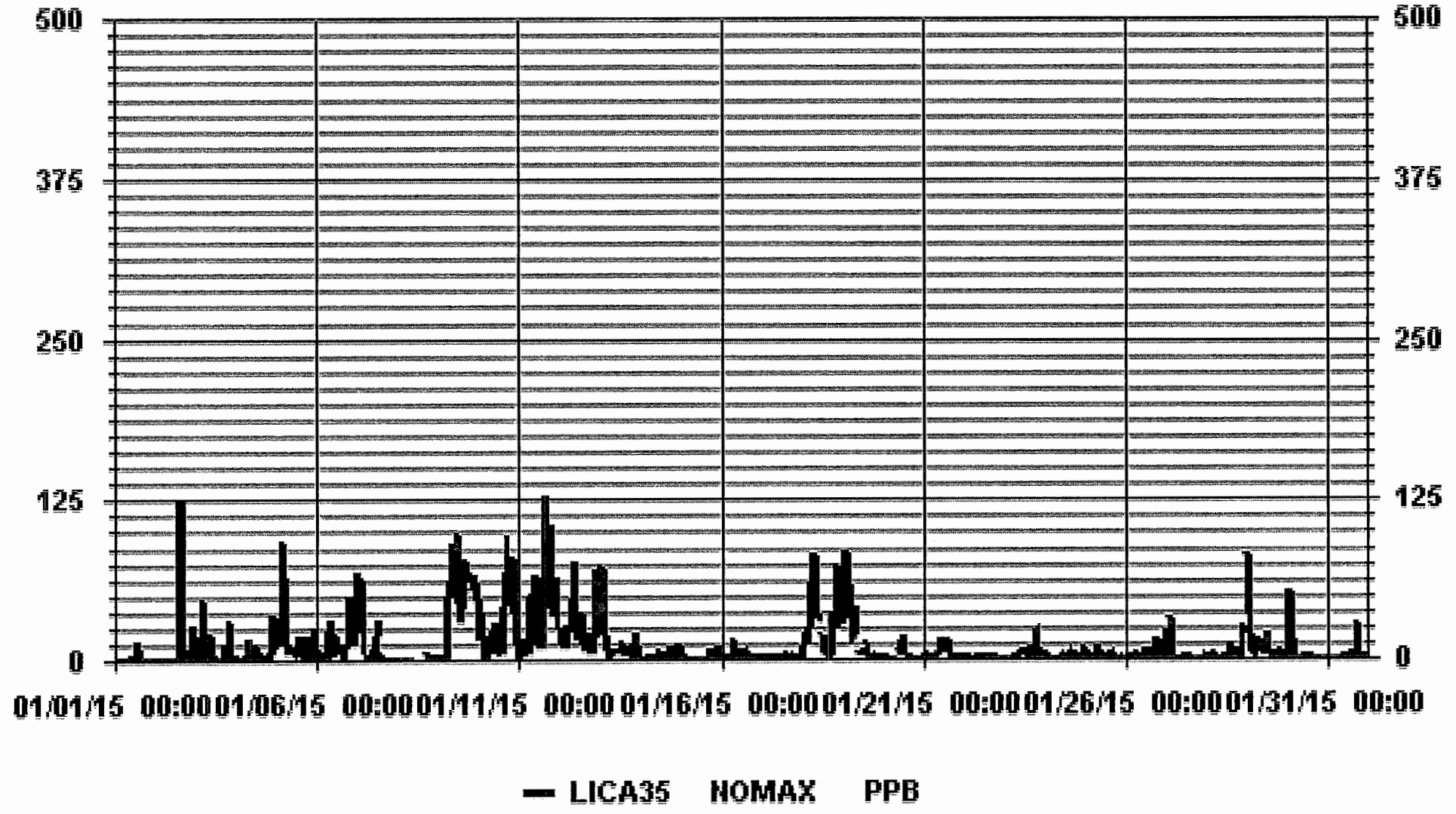
STATUS FLAG CODES

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:	685
MAXIMUM INSTANTANEOUS VALUE:	126.3 PPB @ HOUR(S) 15 ON DAY(S) 2
VAR-VARIOUS	
IZS CALIBRATION TIME:	33 HRS
MONTHLY CALIBRATION TIME:	8 HRS
STANDARD DEVIATION:	19.47
OPERATIONAL TIME:	739 HRS

01 Hour Averages



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

January 2015

Distribution By % Of Samples

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

Wind Parameter : WDR
 Instrument Height : 10 Meters

	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	1.85	3.14	2.42	4.71	8.85	7.85	2.57	1.85	1.42	1.71	2.00	16.85	19.14	12.71	10.14	2.42	99.71
< 110.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.14	.14	.00	.00	.00	.28
< 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	1.85	3.14	2.42	4.71	8.85	7.85	2.57	1.85	1.42	1.71	2.00	17.00	19.28	12.71	10.14	2.42	

Calm : .00 %

Total # Operational Hours : 700

Distribution By Samples





	Direction																
Limit	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq
< 50.0	13	22	17	33	62	55	18	13	10	12	14	118	134	89	71	17	698
< 110.0												1	1				2
< 210.0																	
>= 210.0																	
Totals	13	22	17	33	62	55	18	13	10	12	14	119	135	89	71	17	

Calm : .00 %

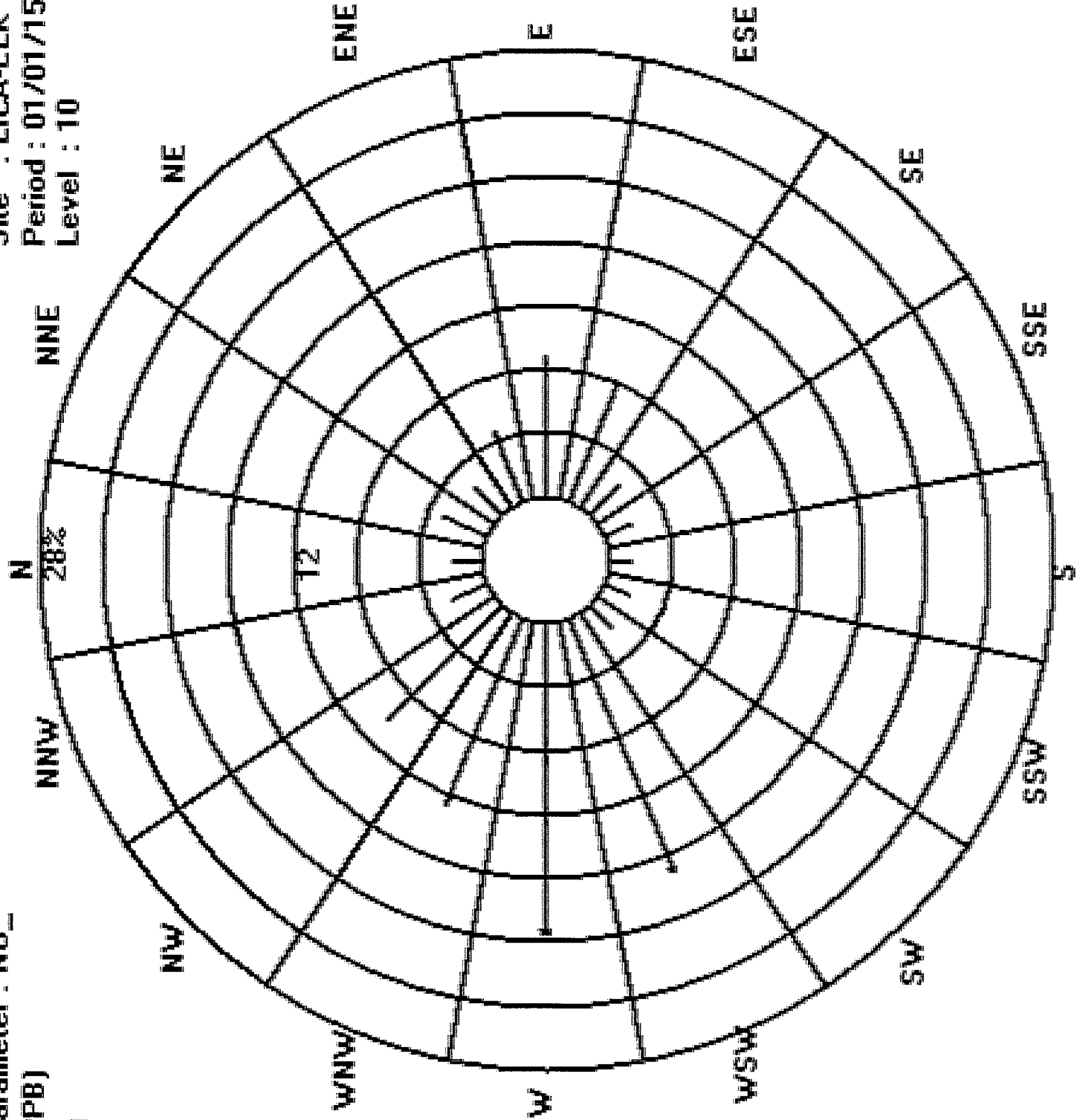
Total # Operational Hours : 700

Logger : 35 Parameter : NO_

Class Limits (PPB)

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

Site : LICA-ELK
Period : 01/01/15-01/31/15
Level : 10



NITROGEN DIOXIDE

NITROGEN DIOXIDE (NO2) hourly averages in ppb

MST	HOUR START																								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				
DAY	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	0:00				
1	1.5	1.5	1.3	2.3	2.0	3.0	3.9	4.2	5.2	2.1	2.6	3.6	3.7	8.7	13.3	4.9	3.0	2.8	2.5	S	3.3	2.8	2.6	13.3	3.6	24		
2	2.3	2.5	3.0	2.9	1.7	1.1	0.8	0.4	0.5	1.1	1.1	1.1	1.0	0.8	1.0	9.4	1.3	9.5	S	7.3	10.0	12.5	26.0	15.4	26.0	4.9	24	
3	24.7	7.7	11.7	12.6	22.2	15.5	3.8	8.5	4.1	4.5	3.2	0.8	0.1	0.1	0.3	0.7	7.2	S	18.3	13.4	22.7	15.1	9.5	7.8	24.7	9.3	24	
4	7.3	9.0	6.3	3.0	3.6	5.0	5.6	8.8	9.6	3.1	3.3	3.0	4.0	5.5	6.9	9.6	S	16.7	14.1	12.9	14.4	17.3	24.9	30.6	30.6	9.8	24	
5	29.0	30.3	30.2	31.2	32.6	32.3	18.3	16.9	18.0	11.2	6.5	5.4	4.6	5.5	6.0	S	8.8	16.5	16.9	11.3	13.4	11.0	19.4	10.4	32.6	16.8	24	
6	11.9	13.6	7.2	6.4	12.6	10.5	8.5	6.5	10.4	4.8	10.0	7.7	4.4	4.5	S	7.1	11.2	22.8	22.3	25.3	20.1	26.3	27.7	31.0	31.0	13.6	24	
7	30.7	30.7	30.5	30.6	25.9	23.0	21.3	20.6	16.4	13.0	8.8	7.3	7.7	S	9.5	11.7	12.3	11.2	10.5	3.9	3.0	2.5	1.5	1.2	30.7	14.5	24	
8	0.7	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.1	C	C	C	C	C	C	C	C	C	9.4	8.9	7.9	S	15.8	5.0	3.8	15.8	3.5	24
9	5.0	8.1	9.5	14.7	16.5	13.6	18.3	33.5	33.1	30.5	27.6	23.4	16.5	17.5	21.2	26.8	32.2	32.7	33.8	S	31.9	30.4	31.4	31.4	33.8	23.5	24	
10	21.8	13.4	24.2	10.2	11.0	11.2	8.7	13.2	9.7	7.2	11.9	6.9	6.0	7.0	7.9	15.7	26.2	33.6	S	35.1	36.3	27.4	20.3	17.0	36.3	16.6	24	
11	19.5	19.3	21.7	15.5	23.8	17.8	28.5	25.9	27.4	20.7	15.4	9.1	8.8	7.6	12.7	22.8	30.9	S	30.3	29.1	27.2	27.4	28.2	26.1	30.9	21.6	24	
12	25.0	26.8	24.5	23.9	24.2	24.7	25.8	26.2	24.8	18.9	12.6	11.3	10.4	12.4	13.3	16.8	S	28.1	20.4	21.3	23.1	25.4	25.7	25.8	28.1	21.4	24	
13	25.7	25.6	26.1	25.7	20.4	18.4	14.9	15.6	18.4	Y	Y	Y	7.1	11.1	13.7	S	25.0	28.0	30.9	27.1	26.7	25.3	15.8	9.0	30.9	20.5	21	
14	9.7	7.8	5.9	4.8	5.1	5.7	5.1	6.4	7.1	6.2	6.2	2.9	2.5	5.3	S	5.4	7.7	11.4	11.1	11.5	6.4	10.4	14.2	11.8	14.2	7.4	24	
15	13.8	11.4	16.0	10.7	2.6	1.1	1.0	1.1	0.6	0.4	0.6	0.8	0.9	S	1.9	1.8	2.1	3.4	1.3	2.3	3.5	3.3	3.4	3.2	16.0	3.8	24	
16	3.5	4.7	4.9	6.5	4.1	4.4	5.2	6.9	6.8	6.3	7.1	7.5	S	6.1	6.2	9.9	9.0	7.8	3.8	4.4	1.8	3.6	2.5	2.1	9.9	5.4	24	
17	1.9	1.7	2.4	3.2	2.2	2.0	2.3	3.8	5.2	4.0	4.0	S	4.5	6.0	5.2	5.5	6.6	10.2	13.8	11.0	8.4	10.2	7.6	14.0	14.0	5.9	24	
18	17.4	23.6	27.5	27.9	32.9	35.1	35.8	34.0	28.9	20.8	S	15.2	10.1	10.0	10.8	10.4	20.4	22.7	27.9	30.1	29.8	33.1	29.5	33.1	35.8	24.7	24	
19	32.1	32.0	30.1	31.0	30.0	27.1	23.9	20.6	24.5	S	11.7	10.8	9.2	P	10.3	10.2	8.8	3.4	3.1	3.9	2.3	1.9	2.4	4.8	32.1	15.2	23	
20	7.9	8.0	6.1	6.0	3.1	2.1	1.9	2.2	S	7.3	8.3	2.6	3.9	5.6	1.0	1.9	2.8	1.1	1.2	1.4	1.2	1.4	2.2	1.4	8.3	3.5	24	
21	2.1	7.0	3.0	5.0	7.0	4.0	7.3	S	12.8	11.9	10.2	8.5	8.2	7.5	9.4	6.4	9.1	9.8	10.0	14.1	10.7	12.3	17.5	15.4	17.5	9.1	24	
22	13.9	11.5	12.7	12.2	12.7	14.8	S	8.7	6.9	4.4	3.7	2.9	2.2	1.9	2.3	2.6	5.4	5.9	7.4	13.0	7.4	8.7	7.7	6.9	14.8	7.6	24	
23	10.0	6.5	7.3	7.6	6.7	S	11.6	9.0	9.8	11.5	9.0	7.2	6.3	7.5	9.8	11.7	8.8	16.0	26.8	21.1	19.3	22.9	13.0	20.3	26.8	12.2	24	
24	22.4	7.2	3.8	5.8	S	5.7	4.0	5.9	3.6	2.2	1.7	4.5	2.1	1.2	0.9	3.9	3.3	8.1	13.3	7.0	6.8	10.3	12.1	20.9	22.4	6.8	24	
25	18.0	13.1	10.0	S	16.0	11.0	11.7	8.2	6.0	5.7	7.4	3.8	3.3	3.8	4.5	3.7	13.0	6.9	3.5	3.1	1.3	7.8	10.7	6.2	18.0	7.8	24	
26	9.6	17.4	S	12.2	18.5	16.3	17.4	13.2	14.1	10.1	4.6	7.9	5.6	5.5	5.4	14.2	16.6	17.6	16.0	14.2	10.5	12.0	18.8	16.2	18.8	12.8	24	
27	27.4	S	24.8	11.7	9.9	4.1	3.5	3.5	3.7	2.8	2.6	2.1	1.3	1.1	1.2	1.0	1.0	1.0	0.9	0.5	0.8	1.1	2.7	1.5	27.4	4.8	24	
28	S	3.2	3.4	8.2	13.6	7.5	4.4	1.9	1.5	1.1	1.1	1.0	0.9	1.1	1.0	1.0	1.4	1.3	5.8	5.5	10.9	20.0	22.4	S	22.4	5.4	24	
29	22.7	20.8	20.2	19.1	18.7	20.4	21.2	19.1	15.3	11.3	9.2	6.8	6.8	5.2	4.6	6.1	7.3	10.2	11.8	14.8	15.5	15.8	S	18.6	22.7	14.0	24	
30	20.4	21.7	21.2	18.5	8.3	4.1	3.6	3.4	4.6	4.0	3.4	4.3	3.5	2.7	1.9	1.8	2.0	2.2	1.3	1.1	1.1	S	2.5	1.7	21.7	6.1	24	
31	1.3	0.5	0.7	0.8	0.5	0.3	1.2	1.6	1.5	1.6	2.5	1.6	2.2	3.2	3.4	5.0	6.9	14.1	17.0	13.0	S	16.0	19.5	16.8	19.5	5.7	24	
HOURLY MAX	32	32	31	31	33	35	36	34	33	31	28	23	17	18	21	27	32	34	34	35	36	33	31	33				
HOURLY AVG	15	13	13	12	13	11	11	11	11	8	7	6	5	6	7	8	10	13	13	13	13	14	14	14				

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

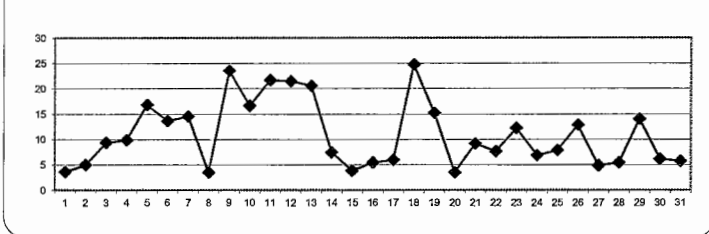
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 PPB

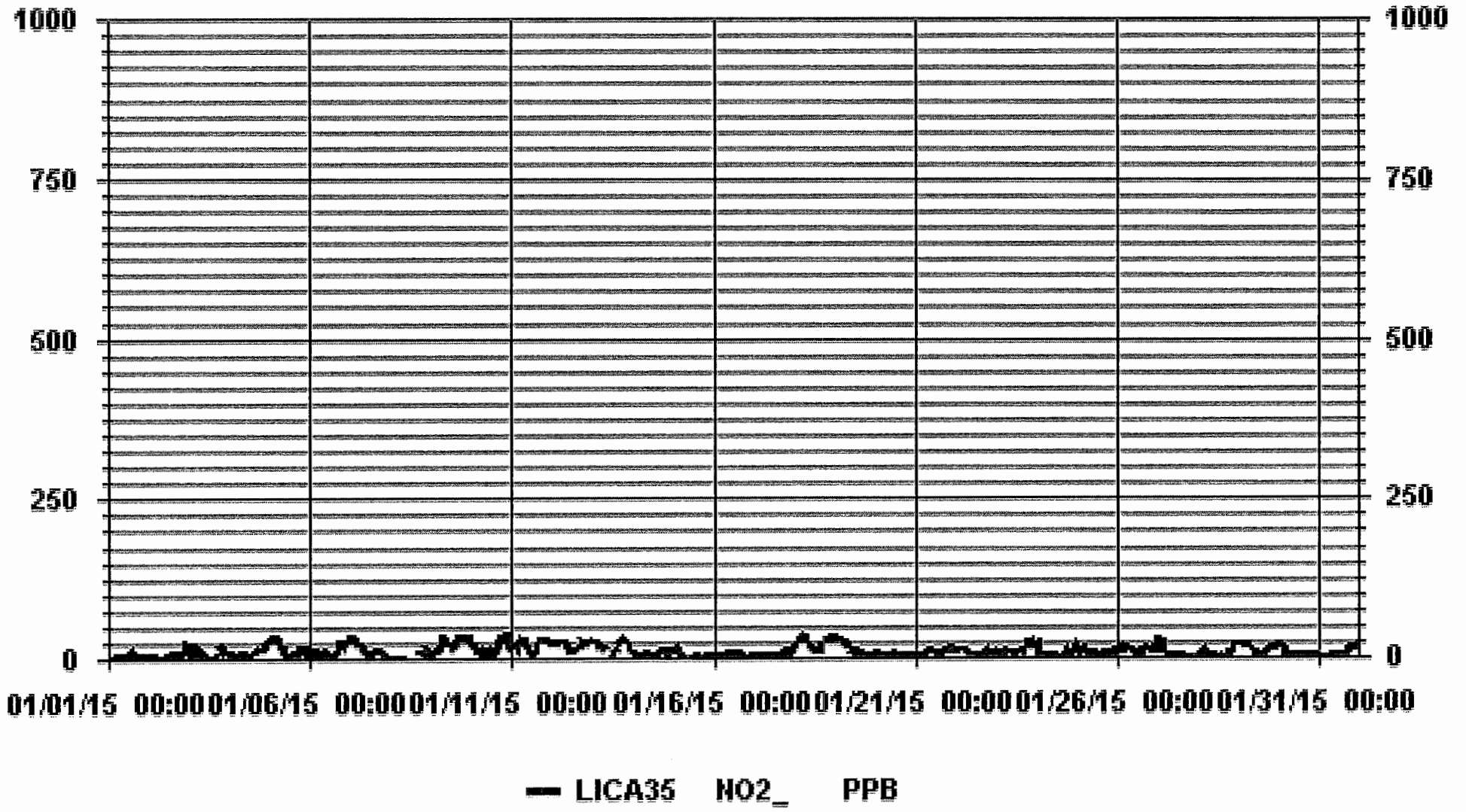
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0			
NUMBER OF NON-ZERO READINGS:	695			
MAXIMUM 1-HR AVERAGE:	36.3	PPB	@ HOUR(S)	20
MAXIMUM 24-HR AVERAGE:	24.7	PPB		ON DAY(S) 10
				ON DAY(S) 18
				VAR-VARIOUS
IZS CALIBRATION TIME:	32	HRS	OPERATIONAL TIME:	740
MONTHLY CALIBRATION TIME:	8	HRS	AMD OPERATION UPTIME:	99.5
				%
STANDARD DEVIATION:	9.12		MONTHLY AVERAGE:	10.9
				PPB

24 HOUR AVERAGES FOR JANUARY 2015



01 Hour Averages





NITROGEN DIOXIDE MAX instantaneous maximum 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	24-HOUR	
HOURLY 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	MAX.	AVG.	RDGS.
DAY																											
1	1.3	1.3	1.3	2.5	2.5	4.3	6	6.6	6	3.1	3.1	3.7	4.3	22.4	17.7	13.6	3.1	2.5	2.5	S	4.1	2.9	2.9	2.9	22.4	5.2	24
2	2.9	2.9	3.5	3.5	1.7	1.1	1.1	0.6	1.1	1.1	1.1	0.6	1.1	1.1	1.1	131.7	1.7	32.7	S	10.6	20.6	21.1	37.6	25.3	131.7	13.3	24
3	30.5	15.3	25.8	20.6	37.5	24.6	8.8	20	24.1	12.4	7.1	1.8	0	0.6	0.7	1.2	16.4	S	28.3	24.7	35.9	23.6	12.5	11.3	37.5	16.7	24
4	11.3	10.7	12.5	4.9	8.3	8.9	14.8	18.8	19.5	4.9	4.9	4.3	6.6	7.2	8.9	13	S	18.3	17.1	18.3	18.2	20.1	38.2	35.9	38.2	14.2	24
5	31.2	31.8	31.2	35.9	42.3	44	24.8	19.5	21.8	20.1	8.9	6.6	8.3	15.4	10.7	S	11.3	29.4	31.7	13	25.9	23.6	34.1	14.8	44	23.3	24
6	20.6	26.5	11.3	11.3	26.5	17.1	13.6	25.3	24.7	7.7	18.3	11.3	8.3	8.9	S	8.3	21.3	32.3	28.9	41.7	35.2	35.3	30.6	32.3	41.7	21.6	24
7	44	31.2	38.8	41.7	26.5	24.2	22.4	23	17.7	16	11.3	13.6	21.2	S	11.3	13.6	14.8	13.6	17.1	4.3	4.3	3.1	2.5	1.9	44	18.2	24
8	1.9	1.3	1.3	0.2	0.7	0.2	1.3	0.7	C	C	C	C	C	C	C	C	C	14.1	18.7	11.8	S	24.1	6.6	4.8	24.1	6.3	24
9	6	10.1	13.6	16.5	20.6	20.6	34.7	35.8	37	37.1	39.4	41.7	23.6	18.3	25.9	37	55.1	38.8	50.5	S	48.8	38.8	34.6	41.1	55.1	31.5	24
10	42.3	25.9	32.9	21.8	20.6	20	14.8	24.1	24.1	11.3	29.9	12.4	8.9	8.9	10.1	31.7	41.1	51	S	37.6	42.3	40	27.1	22.9	51	26.2	24
11	23.6	25.9	27.7	18.9	27.1	22.4	34.1	29.4	34.6	28.8	29.4	13.6	10.1	10.1	18.3	31.2	45.8	S	53.4	39.4	30	31.7	44	30	53.4	28.7	24
12	34.1	35.2	27.1	26.5	30.6	29.4	30	34.1	35.2	34.1	16.6	14.8	14.2	23	16.6	22.9	S	29.3	26.3	23.4	25.8	26.9	29.8	31	35.2	26.8	24
13	32.8	35.1	32.8	28.1	23.4	21.1	17	20.5	21.1	Y	Y	Y	9.4	17.6	17.5	S	30.6	32.9	32.9	31.8	30	34.1	31.2	10.7	35.1	25.5	21
14	10.7	10.1	7.7	6	6.5	8.3	6.6	7.7	8.3	7.7	8.3	5.4	4.3	9.5	S	9.5	10.1	30	15.4	16	9.5	24.2	20.6	18.9	30	11.4	24
15	23.6	17.7	20.6	18.2	5.4	1.3	1.3	1.3	0.7	0.7	1.3	0.7	S	2.5	1.9	3.1	13.6	1.9	4.9	5.4	4.2	7.2	4.2	23.6	6.2	24	
16	6	6.6	7.1	8.3	6	6	6.5	18.2	9.5	7.7	8.3	10.7	S	10.1	7.2	14.2	11.3	11.9	6.6	10.7	3.7	8.3	3.7	2.5	18.2	8.3	24
17	2.5	1.9	6	6.6	3.1	3.1	3.1	7.2	10.7	6.5	7.1	S	7.2	10.7	11.3	6.6	9.5	13	19.4	17.7	10.1	13	11.3	21.8	21.8	9.1	24
18	21.8	35.3	38.2	32.3	37	42.3	44.6	45.2	34.1	26.5	S	19.5	12.5	11.9	11.9	11.3	30	29.4	40.5	40	44.7	69.8	35.8	36.4	69.8	32.7	24
19	37.6	35.3	37.6	33.5	32.3	30.6	28.8	27.1	28.8	S	14.8	11.9	12.5	P	13.6	12.5	13.1	7.7	3.7	8.9	3.1	3.7	3.7	12.5	37.6	18.8	23
20	12.5	13.6	11.3	14.8	8.9	2.5	2.5	2.5	S	15.4	19.5	4.9	20.6	X	1.3	4.3	8.9	1.9	1.3	1.3	1.9	1.9	7.2	2.5	20.6	7.3	23
21	4.3	13.6	7.2	10.1	10.1	6.5	10.7	S	19.4	17.7	19.5	9.5	14.2	9.5	14.2	17.1	17.1	15.4	11.9	16.6	16	22.4	20.1	19.5	22.4	14.0	24
22	17.7	14.8	21.2	13.6	18.2	19.5	S	11.3	8.3	6	4.9	4.3	3.1	3.1	4.3	3.1	8.9	8.3	13.6	21.2	11.3	16.6	9.5	10.1	21.2	11.0	24
23	12.5	7.7	10.1	12.5	10.1	S	16.6	16.5	18.3	17.1	14.8	8.3	8.3	13.6	11.9	18.2	10.7	28.8	37.7	37.6	28.8	30	19.5	23.6	37.7	18.0	24
24	27.7	12.5	4.9	7.2	S	8.3	4.9	10.1	4.9	3.7	3.7	6	5.5	1.9	1.3	11.3	7.7	15.4	19.4	9.5	14.2	12.5	17.1	28.8	28.8	10.4	24
25	30.6	18.2	11.3	S	19.5	15.9	17.1	18.9	10.7	9.5	11.3	6.6	6.5	6	7.7	8.3	21.8	20	14.8	8.9	3.1	16	19.5	7.7	30.6	13.5	24
26	13.6	24.2	S	19.4	25.3	28.8	23.6	16	18.3	17.7	6.5	10.1	9.5	9.5	8.9	21.8	23.6	24.2	37.6	20.6	15.4	14.2	25.9	21.2	37.6	19.0	24
27	30.6	S	33.5	13.6	13	5.4	4.3	3.7	4.3	3.7	3.1	2.5	1.9	1.3	1.3	1.3	1.3	1.3	1.3	0.7	1.3	1.9	4.9	2.5	33.5	6.0	24
28	S	6	9.5	11.3	22.4	9.6	10.7	3.1	1.9	1.9	1.3	1.3	1.3	7.2	7.2	1.3	3.1	2.5	13.6	14.2	13.6	25.9	31.1	S	31.1	9.1	24
29	37.6	24.1	23	20.1	21.2	21.2	22.4	20.6	18.8	13	10.7	21.2	20.6	6.6	6	8.3	10.7	11.9	15.4	19.4	20.1	18.9	S	20.6	37.6	17.9	24
30	21.8	25.3	30	21.8	13.6	5.4	4.3	4.2	6.1	6	4.9	4.9	4.3	3.1	2.5	1.9	2.5	3.1	1.9	1.9	1.9	S	4.2	1.9	30	7.7	24
31	1.9	1.3	1.3	1.3	0.7	1.9	2.5	3.1	2.5	3.7	2.5	3.1	5.4	5.4	6.6	8.9	27.7	25.9	16.6	S	18.9	22.9	20.6	27.7	8.1	24	
HOURLY MAX	44	35	39	42	42	44	45	45	37	37	39	42	24	23	26	132	55	51	53	42	49	70	44	41			
HOURLY AVG	19.9	17.4	18.0	16.1	17.4	15.1	14.4	15.8	16.3	12.1	11.2	9.1	8.7	9.3	9.2	16.6	15.8	19.3	20.3	18.0	18.1	20.9	19.9	17.3			

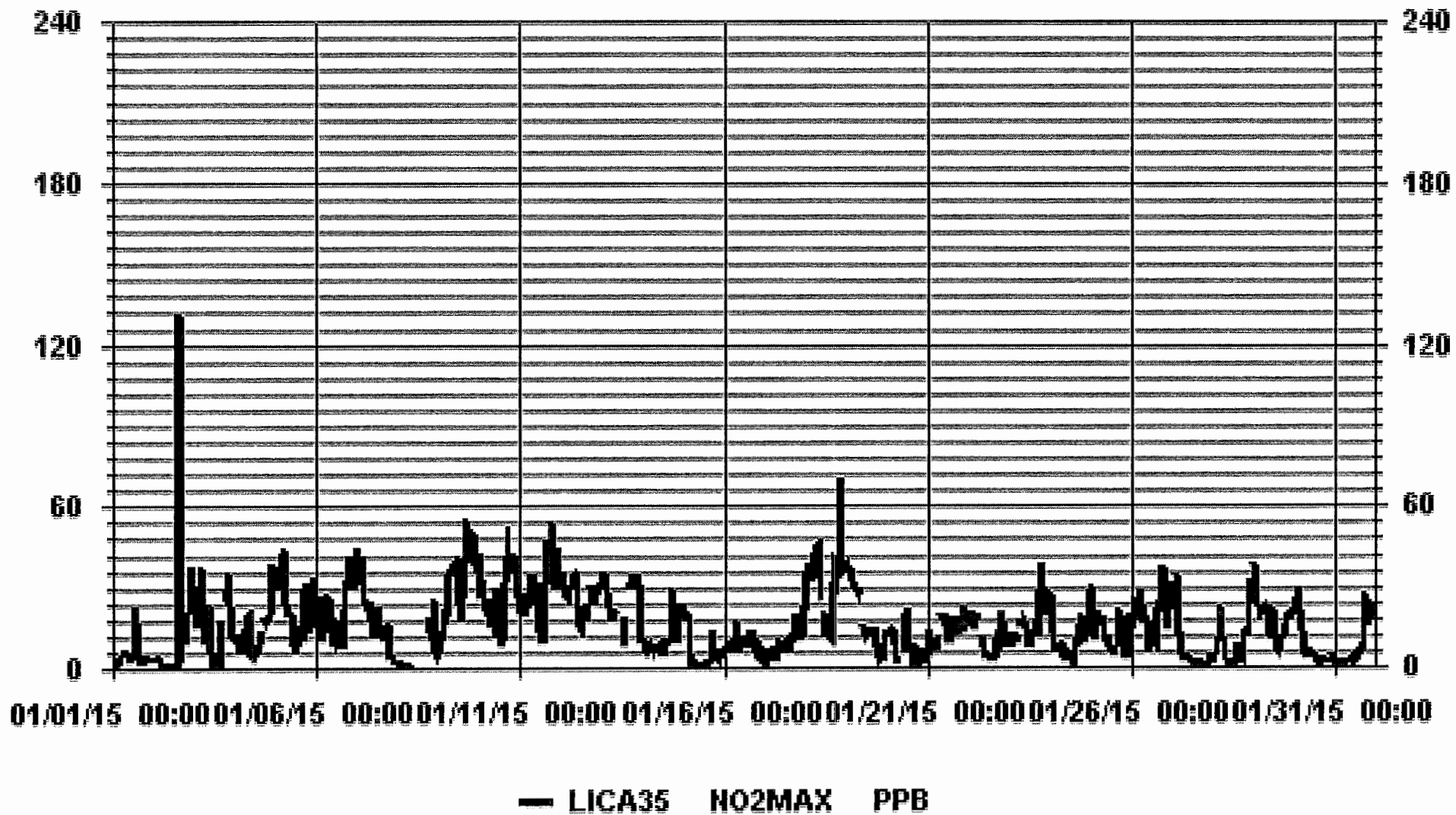
STATUS FLAG CODES

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:	697
MAXIMUM INSTANTANEOUS VALUE:	131.7 PPB @ HOUR(S) 15 ON DAY(S) 2
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 HRS
MONTHLY CALIBRATION TIME:	9 HRS
STANDARD DEVIATION:	12.73
OPERATIONAL TIME:	739 HRS

01 Hour Averages



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

January 2015

Distribution By % Of Samples

Logger Id : 35
 Site Name : LICA-ELK
 Parameter : NO2_
 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	
< 50.0	1.85	3.14	2.42	4.71	8.85	7.85	2.57	1.85	1.42	1.71	2.00	17.00	19.28	12.71	10.14	2.42	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	1.85	3.14	2.42	4.71	8.85	7.85	2.57	1.85	1.42	1.71	2.00	17.00	19.28	12.71	10.14	2.42	

Calm : .00 %

Total # Operational Hours : 700

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	22	17	33	62	55	18	13	10	12	14	119	135	89	71	17	700
< 110.0																	
< 210.0																	
>= 210.0																	
Totals	13	22	17	33	62	55	18	13	10	12	14	119	135	89	71	17	

Calm : .00 %

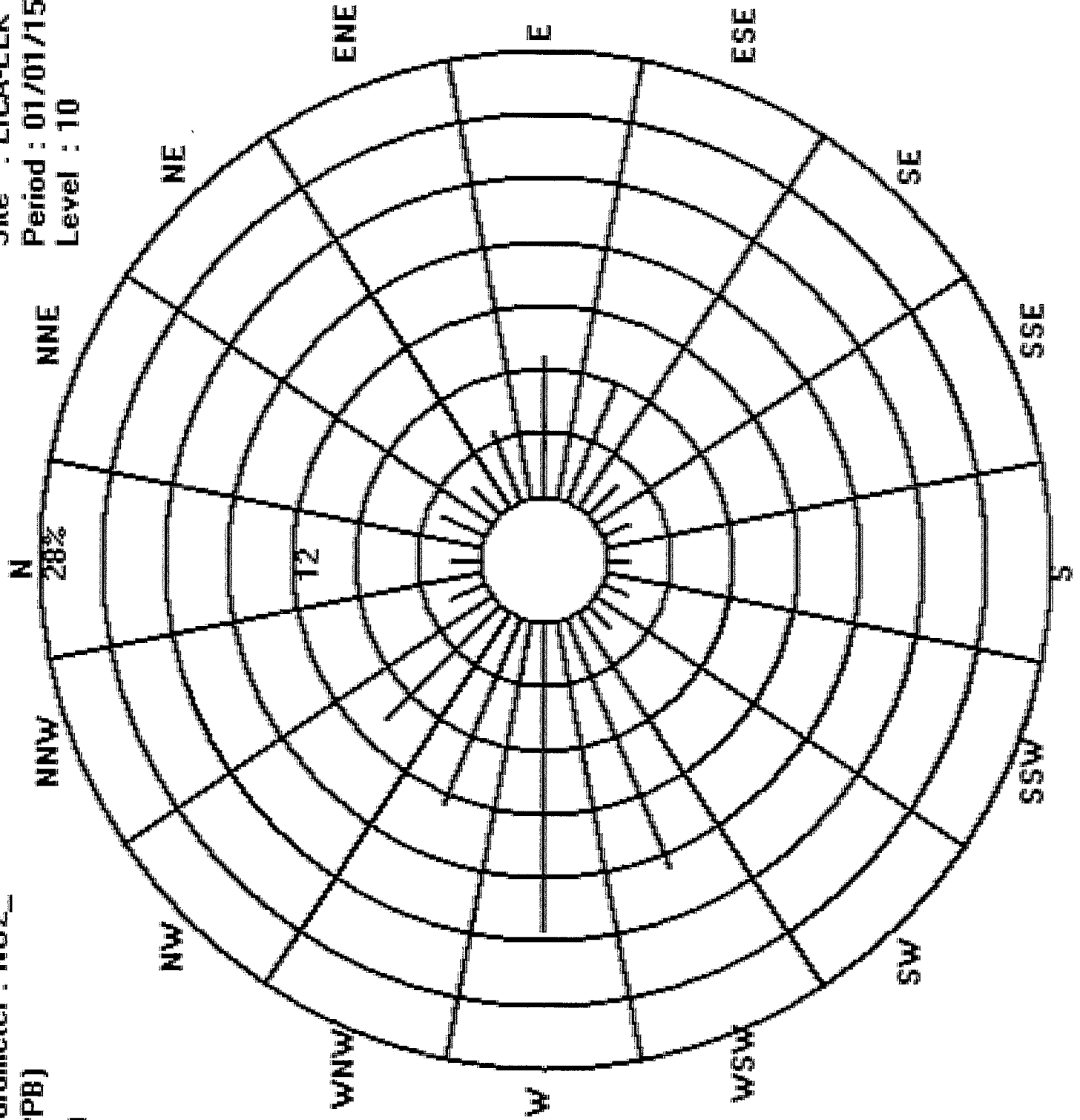
Total # Operational Hours : 700

Logger : 35 Parameter : NO2_

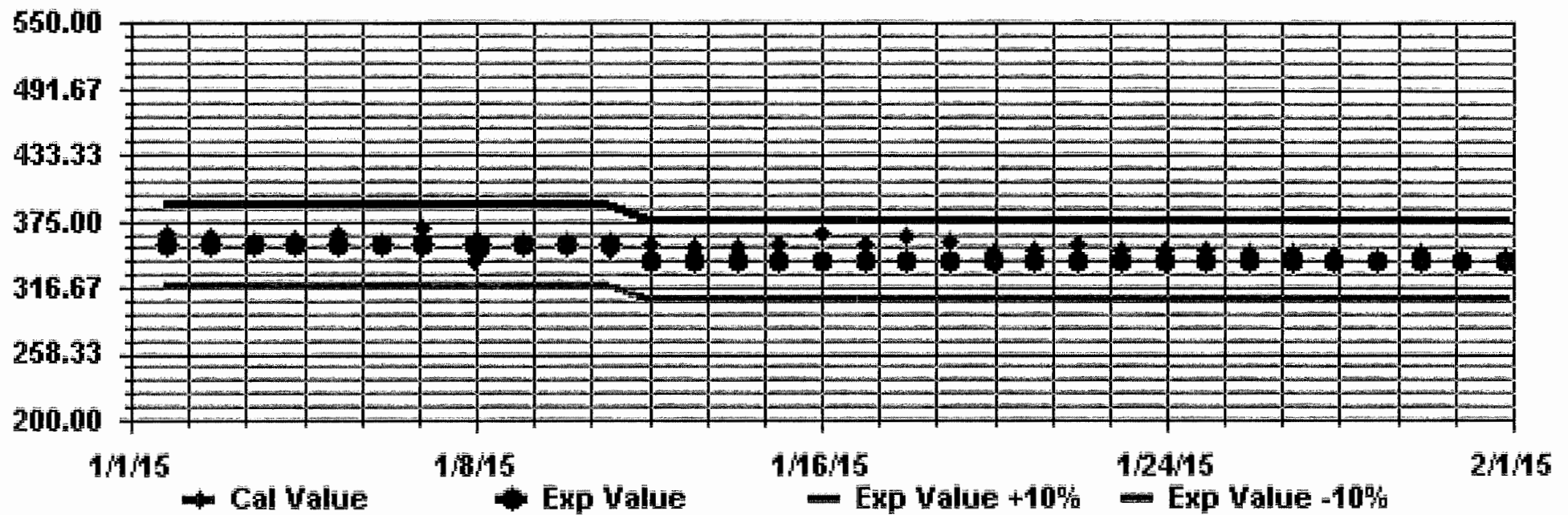
Class Limits (PPB)

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

Site : LICA-ELK
Period : 01/01/15-01/31/15
Level : 10



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



OZONE

OZONE (O3) hourly averages in ppb

MST		OZONE (O3) hourly averages in ppb																							DAILY	24-HOUR	
DAY	HR	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	MAX.	AVG.	RDGS.
1	38	37	36	33	34	33	32	31	31	35	34	33	32	28	22	31	31	31	31	5	33	33	33	32	38	32.3	24
2	32	31	31	31	34	36	40	40	39	37	38	37	37	38	37	34	36	26	5	29	26	24	10	19	40	32.3	24
3	10	27	23	21	10	18	29	26	29	31	31	33	34	34	33	33	25	5	15	18	10	18	22	24	34	24.1	24
4	24	21	24	27	26	26	25	22	23	29	29	30	29	28	27	24	5	17	19	20	17	14	6	1	30	22.1	24
5	1	0	0	0	0	1	10	12	11	19	24	27	30	30	29	5	26	18	19	23	20	24	15	24	30	15.8	24
6	21	20	26	27	19	22	24	26	22	28	23	27	30	29	5	28	21	11	12	10	13	7	3	0	30	19.5	24
7	0	0	0	1	3	5	7	8	13	19	24	26	26	5	25	22	21	21	23	28	29	30	33	34	34	17.3	24
8	34	34	35	37	38	38	38	39	39	37	37	37	38	38	38	5	34	30	30	31	5	24	34	35	39	35.2	24
9	33	30	28	22	18	22	16	1	2	5	10	13	19	16	13	8	3	1	0	5	0	0	0	1	33	11.3	24
10	9	17	7	21	19	20	21	16	20	23	20	27	27	26	26	18	9	3	5	1	1	7	11	15	27	15.8	24
11	11	10	9	14	5	12	1	2	2	9	13	20	20	22	18	9	1	5	0	0	0	0	0	0	22	7.7	24
12	0	0	0	1	0	1	1	5	2	8	14	16	18	17	16	12	5	1	6	5	2	1	0	1	18	5.5	24
13	1	1	2	2	6	10	15	14	10	15	18	C	C	C	C	C	C	C	3	7	6	6	21	28	28	9.7	24
14	28	30	32	33	32	31	32	30	30	31	31	35	35	33	5	34	31	27	26	25	31	25	21	22	35	29.8	24
15	20	22	16	18	25	29	33	36	33	31	32	36	35	5	40	39	36	34	38	36	36	36	37	37	40	32.0	24
16	36	33	32	30	30	29	29	27	27	28	27	26	5	28	27	23	26	28	33	34	39	37	39	38	39	30.7	24
17	39	39	37	37	39	39	38	37	35	36	37	5	38	36	37	37	36	32	27	30	31	29	31	23	39	34.8	24
18	19	12	8	8	3	1	1	1	4	11	5	18	25	26	27	28	18	15	9	6	5	3	4	1	28	11.0	24
19	1	1	1	1	1	2	4	7	4	5	21	23	27	P	28	28	29	32	29	27	28	28	28	23	32	17.0	23
20	19	18	19	18	23	24	24	22	5	24	22	26	25	28	29	27	26	29	32	31	32	32	31	33	33	25.8	24
21	31	26	31	28	27	29	25	5	20	21	23	27	31	32	31	33	31	30	28	24	28	24	17	20	33	26.8	24
22	22	25	21	22	20	20	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	25	21.7	7
23	X	X	X	X	X	5	24	26	26	25	28	30	33	32	30	28	30	22	9	15	16	12	21	11	33	23.2	19
24	9	28	31	26	5	27	27	24	27	34	35	30	35	37	38	35	37	31	24	31	31	25	21	10	38	28.4	24
25	16	18	18	5	13	20	20	28	30	29	26	28	30	30	31	33	24	33	37	38	40	32	29	33	40	27.7	24
26	27	19	5	X	X	X	X	X	5	26	31	28	33	36	37	26	24	23	25	25	26	23	14	17	37	25.9	19
27	2	5	5	15	18	31	33	31	29	29	29	28	29	27	26	24	25	25	25	25	25	25	22	23	33	24.0	24
28	5	24	23	16	10	15	19	21	23	25	25	25	26	26	27	28	27	27	21	21	15	5	1	5	28	20.5	24
29	1	1	1	1	2	1	1	2	7	12	15	18	20	22	24	23	22	18	15	10	9	8	5	6	24	10.4	24
30	3	1	1	3	15	22	22	22	20	21	20	19	19	21	24	30	27	24	26	28	29	5	30	31	31	19.9	24
31	32	35	34	34	34	34	34	33	33	33	32	33	32	32	32	30	27	18	16	19	5	16	11	13	35	28.1	24
HOURLY MAX	39	39	37	37	39	39	40	40	39	37	38	37	38	38	40	39	37	34	38	38	40	37	39	38			
HOURLY AVG	17.9	19.3	18.3	18.8	18.0	20.6	21.6	21.6	21.1	24.5	25.8	27.0	29.0	28.9	28.6	26.9	25.3	22.5	20.6	21.3	20.6	18.9	18.8	19.1			

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
XG	- OUT OF REPAIR	K	- COLLECTION ERROR

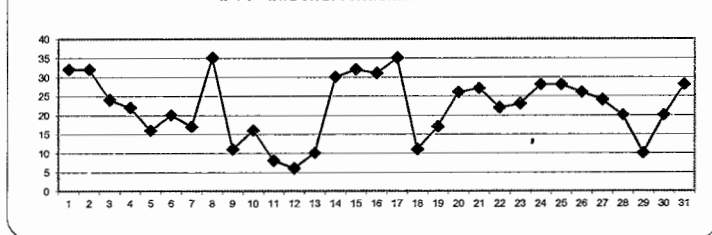
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 PPB

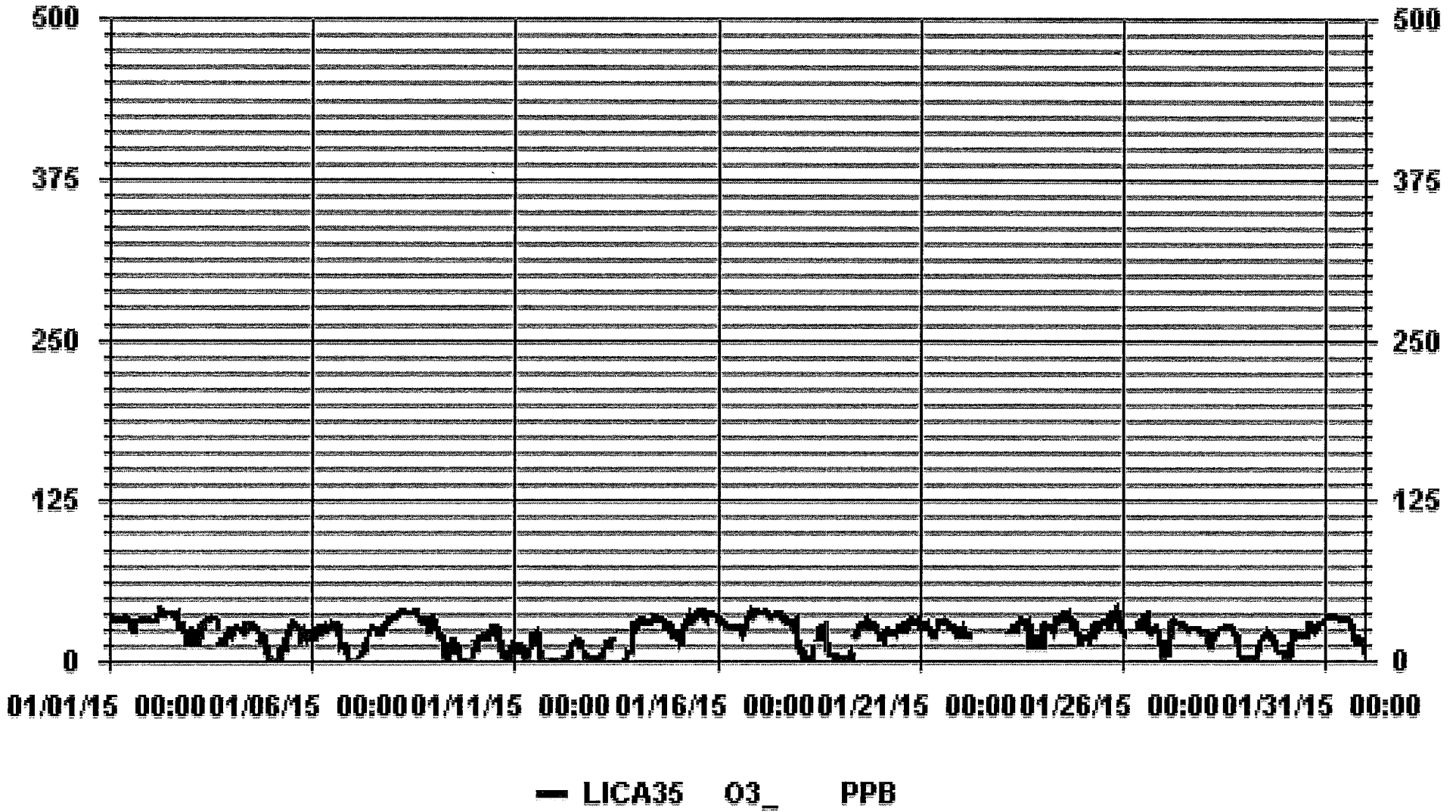
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDENCES:	0				
NUMBER OF NON-ZERO READINGS:	652				
MAXIMUM 1-HR AVERAGE:	40	PPB	@ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 24-HR AVERAGE:	35.2	PPB			VAR-VARIOUS
IZS CALIBRATION TIME:	34	HRS	OPERATIONAL TIME:	716	HRS
MONTHLY CALIBRATION TIME:	7	HRS	AMD OPERATION UPTIME:	96.2	%
STANDARD DEVIATION:	11.22		MONTHLY AVERAGE:	22	PPB

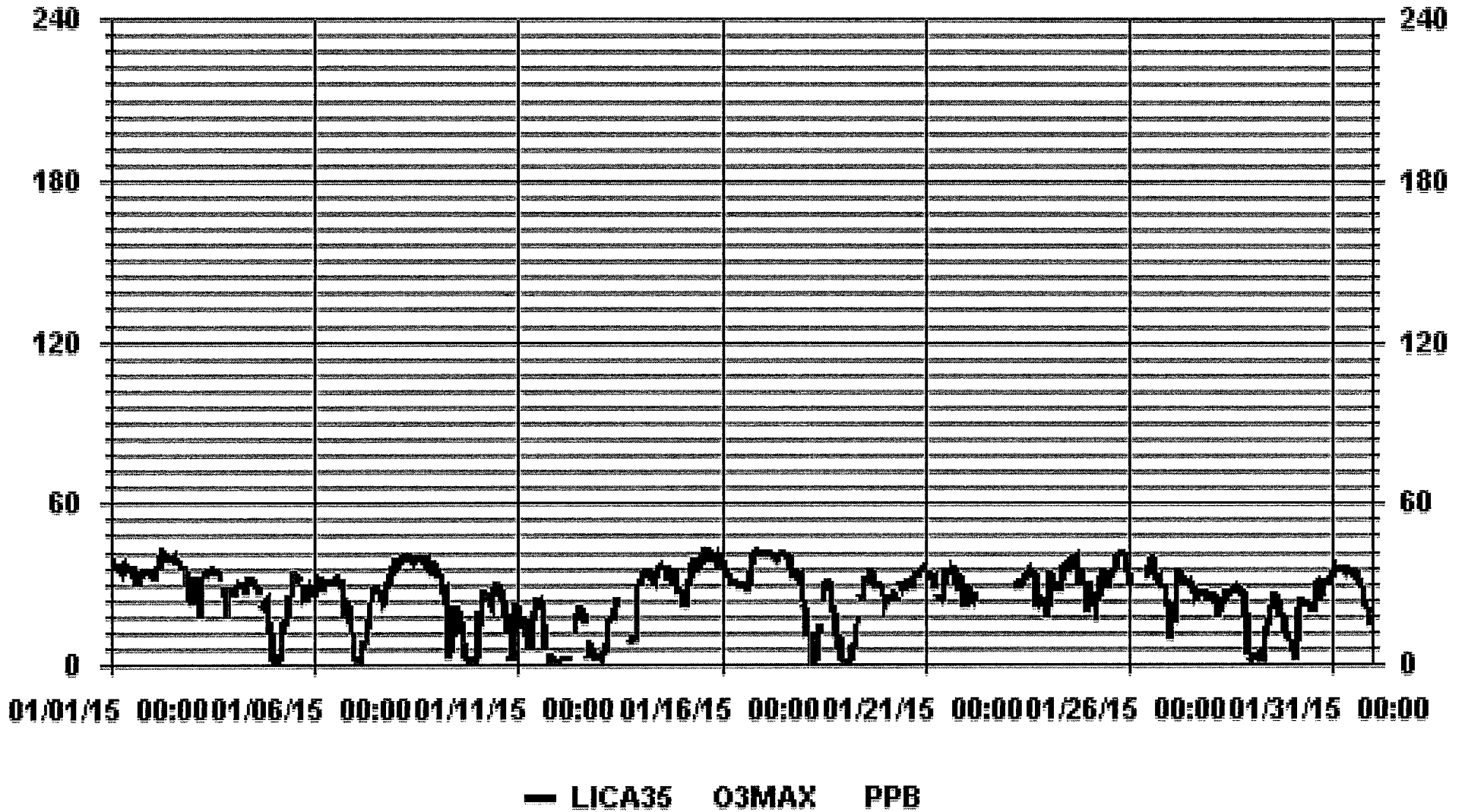
24 HOUR AVERAGES FOR JANUARY 2015



01 Hour Averages



01 Hour Averages



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

January 2015

Distribution By % Of Samples

Logger Id : 35
Site Name : LICA-ELK
Parameter : O3_
Units : PPE

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	1.92	3.25	2.51	4.88	9.18	7.85	2.51	1.92	1.48	1.77	1.77	16.14	17.92	13.18	11.11	2.51	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	1.92	3.25	2.51	4.88	9.18	7.85	2.51	1.92	1.48	1.77	1.77	16.14	17.92	13.18	11.11	2.51	

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	
< 50	13	22	17	33	62	53	17	13	10	12	12	109	121	89	75	17	675
< 110																	
< 210																	
>= 210																	
Totals	13	22	17	33	62	53	17	13	10	12	12	109	121	89	75	17	

Calm : .00 %

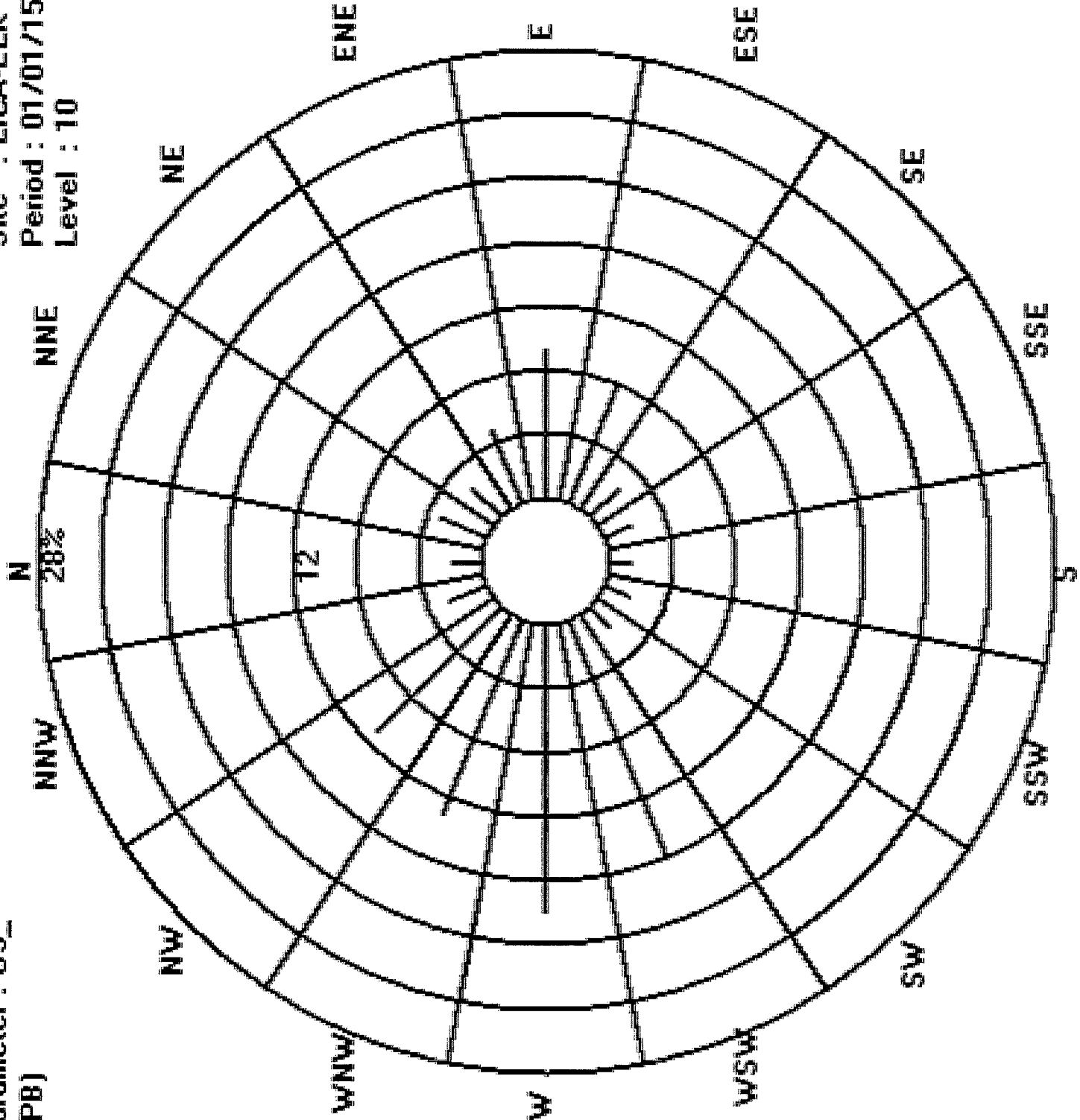
Total # Operational Hours : 675

Logger : 35 Parameter : O3_

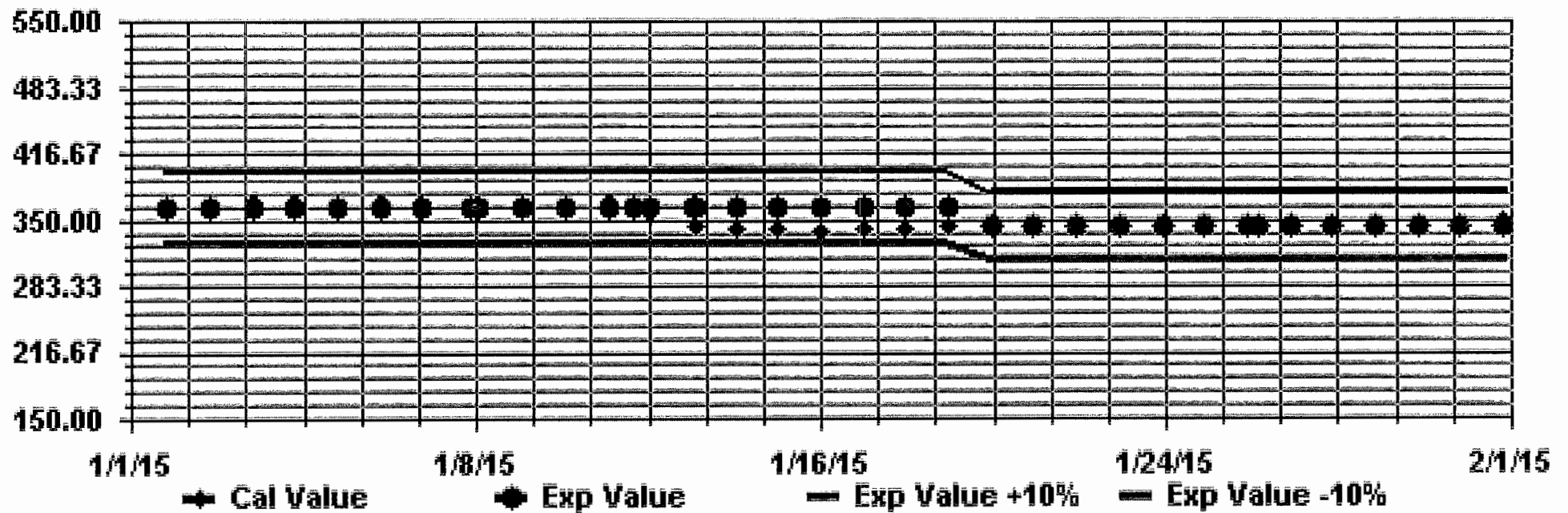
Class Limits (PPB)

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

Site : LICA-ELK
 Period : 01/01/15-01/31/15
 Level : 10



Calibration Graph for Site: LICA35 Parameter: 03_ Sequence: 03 Phase: SPAN



PARTICULATE MATTER 2.5

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

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	24-HOUR	RDGS.	
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	0:00	MAX.	AVG.		
DAY																												
1	0.0	1.0	3.0	4.0	5.0	X	8.0	X	X	X	0.0	0.0	6.0	3.0	0.0	5.0	4.0	2.0	0.0	6.0	X	3.0	4.0	6.0	8.0	3.2	19	
2	4.0	5.0	4.0	1.0	6.0	0.0	2.0	4.0	0.0	1.0	2.0	X	X	0.0	3.0	5.0	0.0	3.0	6.0	4.0	0.0	2.0	2.0	6.0	6.0	2.7	22	
3	2.0	3.0	2.0	4.0	5.0	5.0	1.0	1.0	0.0	2.0	4.0	2.0	0.0	2.0	1.0	1.0	0.0	1.0	1.0	0.0	4.0	4.0	0.0	2.0	5.0	2.0	24	
4	3.0	4.0	1.0	2.0	3.0	3.0	6.0	1.0	6.0	0.0	5.0	5.0	10.0	11.0	14.0	11.0	11.0	11.0	10.0	3.0	6.0	4.0	7.0	5.0	14.0	5.9	24	
5	8.0	9.0	9.0	6.0	5.0	6.0	4.0	5.0	10.0	4.0	10.0	10.0	2.0	2.0	6.0	3.0	1.0	10.0	0.0	10.0	5.0	X	14.0	X	14.0	6.3	22	
6	2.0	X	X	5.0	X	0.0	0.0	X	X	9.0	X	X	24.0	0.0	X	X	2.0	X	9.0	X	7.0	X	14.0	0.0	24.0	6.0	12	
7	X	5.0	7.0	6.0	12.0	15.0	5.0	3.0	0.0	X	9.0	15.0	7.0	16.0	9.0	6.0	5.0	6.0	5.0	5.0	7.0	4.0	3.0	0.0	16.0	6.8	22	
8	2.0	3.0	1.0	X	3.0	0.0	3.0	X	2.0	4.0	0.0	X	X	0.0	12.0	9.0	11.0	X	0.0	12.0	9.0	2.0	9.0	X	12.0	4.6	18	
9	9.0	3.0	0.0	8.0	5.0	2.0	6.0	0.0	10.0	5.0	32.0	12.0	6.0	22.0	21.0	10.0	15.0	24.0	5.0	9.0	8.0	7.0	X	X	32.0	10.0	22	
10	3.0	2.0	X	0.0	5.0	4.0	27.0	14.0	16.0	8.0	X	4.0	X	26.0	17.0	20.0	23.0	12.0	X	11.0	0.0	1.0	X	15.0	27.0	10.9	19	
11	13.0	X	0.0	6.0	X	9.0	14.0	12.0	16.0	15.0	19.0	40.0	9.0	16.0	0.0	4.0	7.0	0.0	19.0	36.0	22.0	6.0	0.0	65.0	65.0	14.9	22	
12	X	9.0	17.0	8.0	32.0	7.0	1.0	36.0	X	19.0	4.0	34.0	22.0	X	19.0	13.0	20.0	24.0	10.0	21.0	43.0	7.0	X	17.0	43.0	18.2	20	
13	56.0	17.0	23.0	23.0	6.0	7.0	13.0	X	11.0	38.0	36.0	32.0	C	C	4.0	9.0	5.0	9.0	15.0	9.0	6.0	11.0	3.0	0.0	56.0	15.9	23	
14	6.0	6.0	7.0	5.0	3.0	4.0	0.0	7.0	2.0	0.0	0.0	0.0	4.0	0.0	X	2.0	2.0	1.0	0.0	X	2.0	3.0	1.0	1.0	7.0	2.5	22	
15	0.0	7.0	0.0	1.0	4.0	3.0	0.0	3.0	12.0	6.0	X	4.0	0.0	1.0	3.0	5.0	0.0	12.0	3.0	0.0	4.0	8.0	3.0	6.0	12.0	3.7	23	
16	2.0	0.0	0.0	0.0	11.0	8.0	6.0	14.0	12.0	2.0	15.0	9.0	20.0	7.0	14.0	11.0	11.0	3.0	0.0	1.0	1.0	0.0	0.0	0.0	20.0	6.1	24	
17	0.0	2.0	4.0	0.0	1.0	0.0	0.0	X	X	0.0	0.0	5.0	2.0	0.0	2.0	0.0	4.0	3.0	3.0	4.0	5.0	9.0	X	X	9.0	2.2	20	
18	4.0	1.0	5.0	1.0	0.0	2.0	12.0	0.0	4.0	13.0	5.0	5.0	8.0	8.0	11.0	0.0	12.0	6.0	1.0	9.0	7.0	8.0	11.0	5.0	13.0	5.8	24	
19	2.0	10.0	7.0	8.0	9.0	8.0	8.0	21.0	15.0	25.0	24.0	8.0	13.0	P	R	6.0	7.0	5.0	5.0	1.0	3.0	1.0	3.0	0.0	25.0	8.6	22	
20	0.0	4.0	0.0	4.0	5.0	7.0	0.0	7.0	0.0	10.0	3.0	0.0	0.0	3.0	5.0	1.0	0.0	X	6.0	6.0	X	3.0	2.0	3.0	10.0	3.1	22	
21	0.0	4.0	2.0	0.0	0.0	8.0	2.0	5.0	9.0	10.0	3.0	6.0	5.0	X	8.0	2.0	1.0	1.0	0.0	X	0.0	6.0	2.0	3.0	10.0	3.5	22	
22	3.0	5.0	5.0	4.0	7.0	10.0	1.0	0.0	0.0	10.0	6.0	6.0	X	14.0	X	0.0	1.0	0.0	0.0	X	0.0	0.0	0.0	0.0	14.0	3.1	21	
23	0.0	3.0	X	0.0	4.0	2.0	3.0	5.0	1.0	3.0	9.0	X	28.0	9.0	0.0	6.0	6.0	0.0	4.0	2.0	0.0	5.0	6.0	5.0	28.0	4.6	22	
24	5.0	4.0	8.0	11.0	3.0	0.0	5.0	0.0	1.0	4.0	2.0	0.0	1.0	0.0	1.0	X	2.0	2.0	0.0	5.0	3.0	0.0	0.0	8.0	11.0	2.8	23	
25	0.0	5.0	0.0	3.0	2.0	0.0	0.0	0.0	0.0	1.0	X	X	X	2.0	X	0.0	1.0	2.0	0.0	0.0	0.0	0.0	4.0	0.0	5.0	1.0	20	
26	3.0	4.0	0.0	X	0.0	0.0	0.0	0.0	1.0	0.0	0.0	4.0	1.0	X	X	6.0	6.0	4.0	4.0	6.0	0.0	4.0	5.0	2.0	6.0	2.4	21	
27	7.0	7.0	5.0	10.0	7.0	8.0	4.0	2.0	9.0	1.0	0.0	4.0	1.0	4.0	0.0	3.0	3.0	C	C	0.0	6.0	11.0	8.0	14.0	14.0	5.2	24	
28	4.0	0.0	0.0	0.0	5.0	1.0	X	18.0	X	0.0	5.0	0.0	0.0	1.0	0.0	7.0	0.0	3.0	4.0	4.0	4.0	2.0	4.0	0.0	18.0	2.8	22	
29	4.0	4.0	2.0	1.0	0.0	1.0	0.0	6.0	7.0	5.0	4.0	6.0	6.0	6.0	1.0	0.0	2.0	4.0	1.0	9.0	6.0	8.0	4.0	0.0	9.0	3.6	24	
30	11.0	8.0	17.0	15.0	17.0	11.0	7.0	10.0	10.0	4.0	13.0	12.0	9.0	6.0	7.0	3.0	0.0	2.0	1.0	0.0	3.0	1.0	1.0	4.0	17.0	7.2	24	
31	0.0	0.0	6.0	2.0	0.0	2.0	1.0	3.0	0.0	0.0	3.0	2.0	4.0	0.0	3.0	2.0	4.0	8.0	3.0	1.0	7.0	3.0	1.0	5.0	8.0	2.5	24	
HOURLY MAX	56.0	17.0	23.0	23.0	32.0	15.0	27.0	36.0	16.0	38.0	36.0	40.0	28.0	26.0	21.0	20.0	23.0	24.0	19.0	36.0	43.0	11.0	14.0	65.0				
HOURLY AVG	5.3	4.7	4.8	4.8	5.7	4.4	4.6	6.8	5.9	6.5	8.0	8.7	7.5	6.1	6.4	5.2	5.4	5.9	4.0	6.4	5.8	4.2	4.1	6.4				

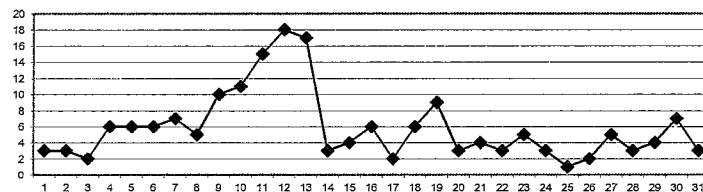
STATUS FLAG CODES

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

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 24-HR: 30 ug/m3

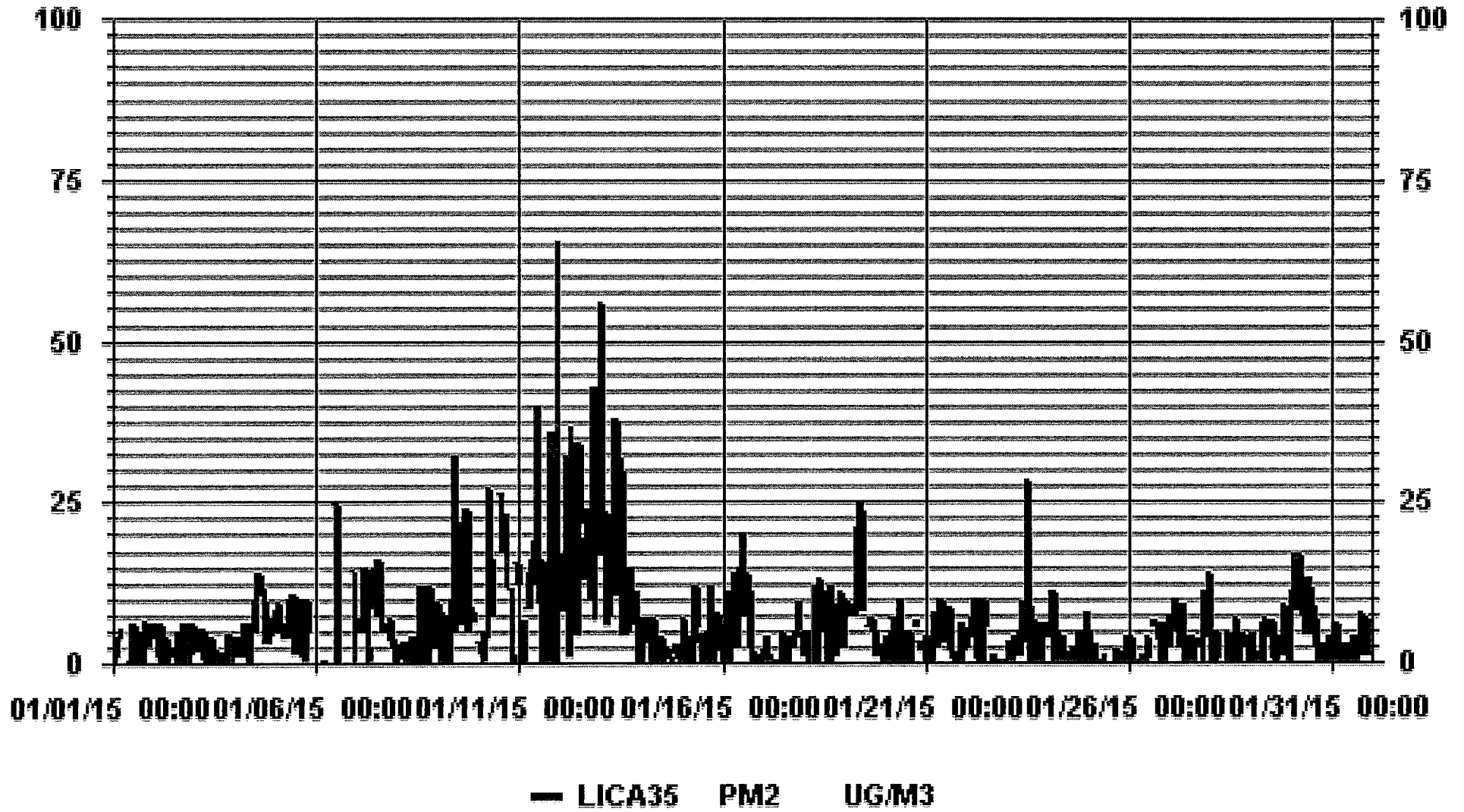
24 HOUR AVERAGES FOR JANUARY 2015



MONTHLY SUMMARY

NUMBER OF 24-HR EXCEEDENCES:	0		
NUMBER OF NON-ZERO READINGS:	524		
MAXIMUM 1-HR AVERAGE:	65.0 ug/m3 @ HOUR(S)	23	ON DAY(S)
MAXIMUM 24-HR AVERAGE:	18.2 ug/m3		ON DAY(S)
			VAR-VARIOUS
MONTHLY CALIBRATION TIME:	4 HRS	OPERATIONAL TIME:	673 HRS
STANDARD DEVIATION:	7.15	AMD OPERATION UPTIME:	90.5 %
		MONTHLY AVERAGE:	5.7 ug/m3

01 Hour Averages



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

January 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																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 30	1.93	3.27	2.53	4.91	8.34	7.45	2.98	1.78	1.49	1.78	1.78	16.39	18.62	11.92	10.43	2.53	98.21
< 60	.00	.00	.00	.00	.29	.44	.00	.00	.00	.00	.00	.59	.14	.14	.00	.00	1.63
< 80	.00	.00	.00	.00	.14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.14
< 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	1.93	3.27	2.53	4.91	8.79	7.89	2.98	1.78	1.49	1.78	1.78	16.98	18.77	12.07	10.43	2.53	

Calm : .00 %

Total # Operational Hours : 671

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 30	13	22	17	33	56	50	20	12	10	12	12	110	125	80	70	17	659
< 60					2	3						4	1	1			11
< 80					1												1
< 120																	
< 240																	
>= 240																	
Totals	13	22	17	33	59	53	20	12	10	12	12	114	126	81	70	17	

Calm : .00 %

Total # Operational Hours : 671

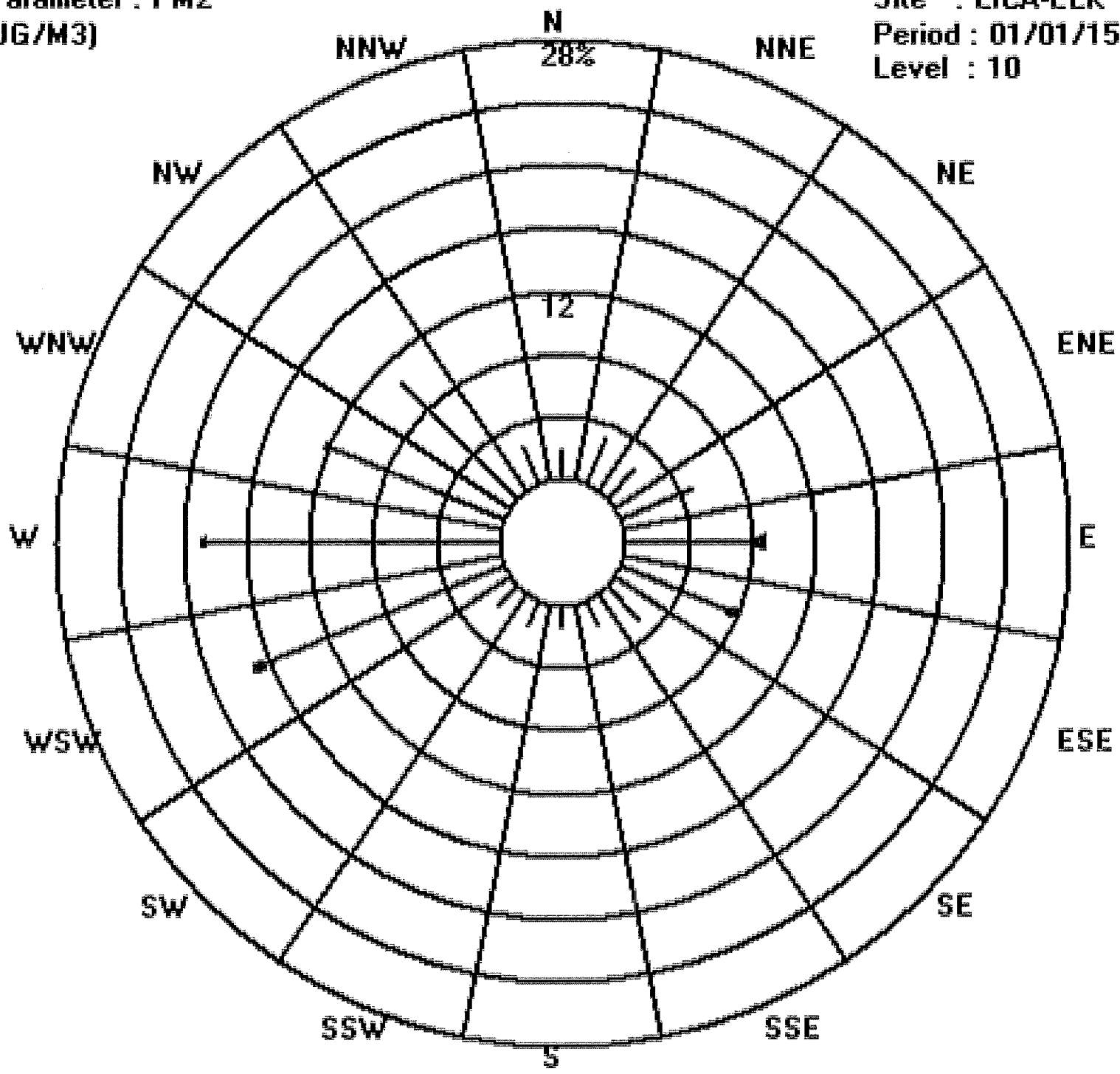
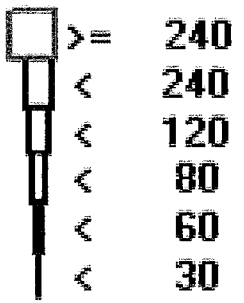
Logger : 35 Parameter : PM2

Site : LICA-ELK

Class Limits (UG/M3)

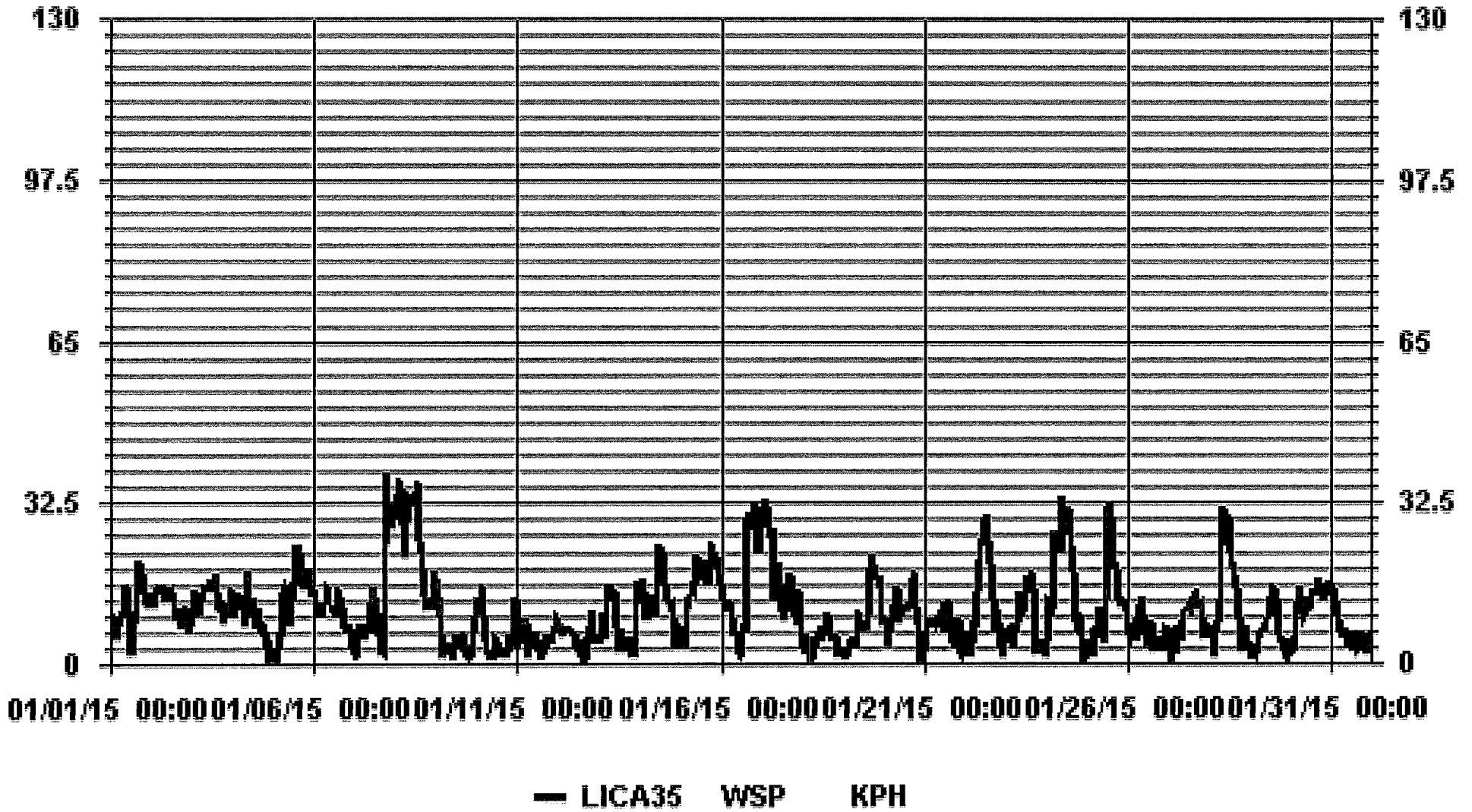
Period : 01/01/15-01/31/15

Level : 10

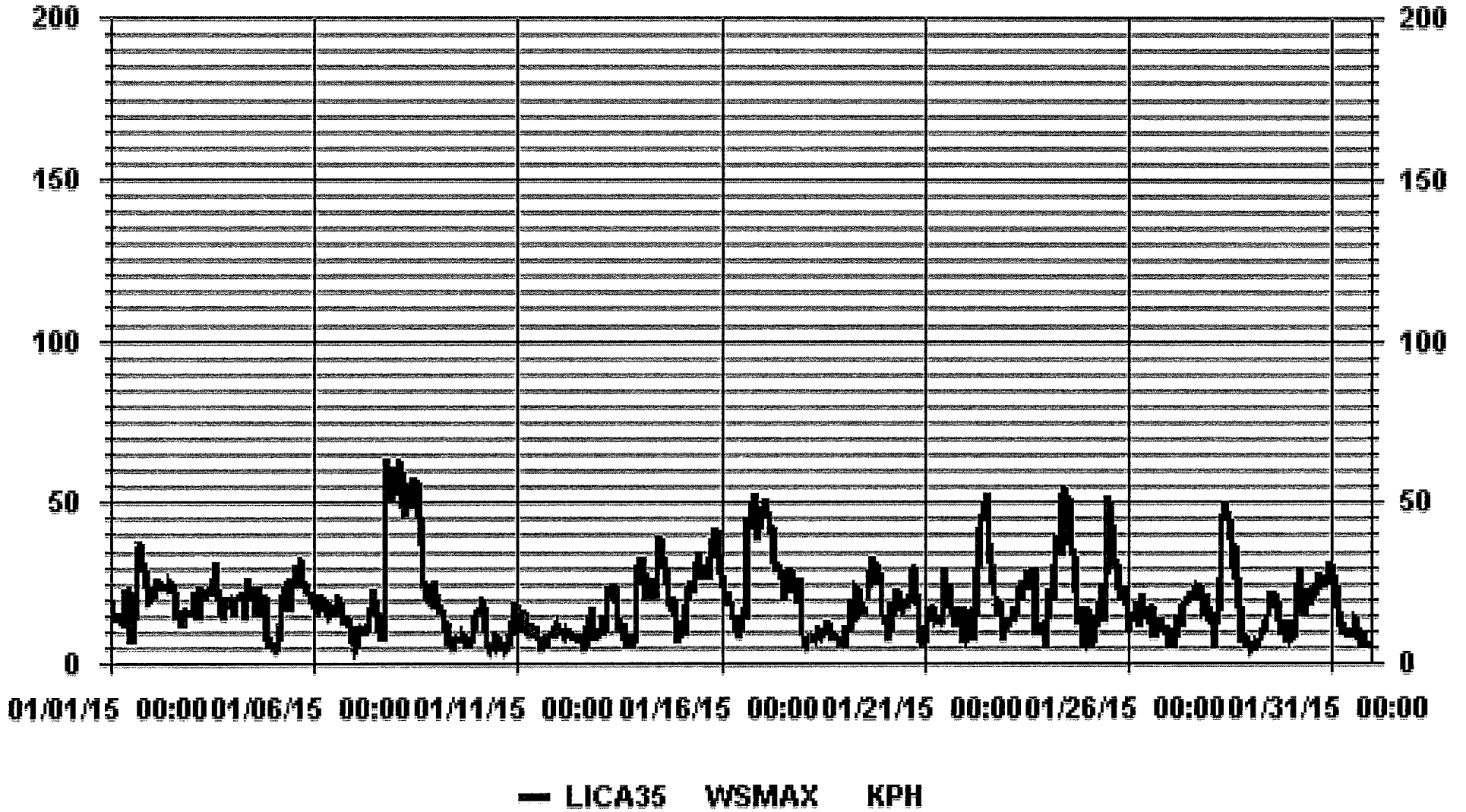


WIND SPEED

01 Hour Averages



01 Hour Averages



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

January 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																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 6.0	.53	.67	.00	1.48	4.97	2.69	1.07	1.21	.80	1.21	1.34	3.90	3.90	3.90	1.61	.94	30.28
< 12.0	.40	.40	1.07	1.48	2.55	3.49	.67	.26	.40	.53	.53	7.67	6.72	3.63	2.28	.94	33.10
< 20.0	.94	2.15	1.21	1.74	.67	1.48	.67	.26	.13	.00	.00	5.24	4.03	3.23	2.82	.26	24.89
< 29.0	.00	.00	.00	.00	.40	.26	.26	.00	.00	.00	.00	.13	3.76	1.07	1.61	.13	7.67
< 39.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.21	.80	2.01	.00	4.03
>= 39.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals	1.88	3.23	2.28	4.71	8.61	7.94	2.69	1.74	1.34	1.74	1.88	16.95	19.65	12.65	10.36	2.28	

Calm : .00 %

Total # Operational Hours : 743

Distribution By Samples

Limit	Direction																Freq
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
< 6.0	4	5		11	37	20	8	9	6	9	10	29	29	29	12	7	225
< 12.0	3	3	8	11	19	26	5	2	3	4	4	57	50	27	17	7	246
< 20.0	7	16	9	13	5	11	5	2	1			39	30	24	21	2	185
< 29.0					3	2	2					1	28	8	12	1	57
< 39.0													9	6	15		30
>= 39.0																	
Totals	14	24	17	35	64	59	20	13	10	13	14	126	146	94	77	17	

Calm : .00 %

Total # Operational Hours : 743

WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Elk Point Airport Site - JANUARY 2015

JOB # 2833-2015-01-35- C

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-HOUR AVG	
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	0:00	QUADRANT	RDGS.
DAY 1	NNW	NNW	NNW	NNE	ENE	E	ESE	E	ESE	ESE	ESE	E	ENE	WNW	WNW	NW	NNW	NNW	N	N	N	NNE	NE	NNE	NNE	24
2	NE	NE	ENE	ENE	ENE	ENE	ENE	NE	NE	NNE	NNE	NNE	NNE	N	N	NNW	NW	WNW	NW	NW	WNW	WNW	WNW	W	NNE	24
3	SW	WSW	WNW	WNW	W	WNW	NW	WNW	WNW	WNW	WNW	WNW	NW	NW	NW	NW	WNW	W	WNW	WNW	W	WSW	W	W	WNW	24
4	W	W	WSW	WSW	WSW	WSW	W	WSW	WSW	W	WSW	WSW	W	WSW	WSW	WSW	WSW	W	W	WSW	NW	WNW	NW	E	WSW	24
5	SE	SE	SSW	WNW	WSW	WSW	SW	WSW	WSW	WSW	WSW	WSW	W	W	W	W	W	WNW	W	W	W	WNW	WNW	W	W	24
6	W	WNW	WNW	WNW	W	WSW	WNW	WNW	WNW	WNW	W	W	W	W	W	W	W	W	WSW	WSW	WSW	WSW	NNW	NNW	W	24
7	SSW	E	E	ESE	E	ENE	ENE	ENE	E	ESE	ESE	ESE	ESE	ESE	E	E	E	NW	NW	NW	NW	NW	NW	NW	N	24
8	NW	NW	NW	NW	NW	NW	NW	NW	NW	NNW	WNW	NW	NW	WNW	WNW	WNW	WNW	WNW	W	W	W	WSW	WSW	W	WNW	24
9	W	W	WSW	WSW	W	WNW	W	WNW	WNW	SSW	ESE	E	E	ESE	E	E	ESE	NNE	E	WSW	W	WNW	WNW	W	W	24
10	NW	NW	WNW	NW	WNW	NW	WNW	WNW	NW	NW	ESE	ESE	E	ENE	E	ESE	S	SW	W	W	W	WNW	W	WSW	WNW	24
11	WSW	WSW	W	WSW	WSW	W	WSW	W	W	WSW	WSW	WSW	W	W	W	W	W	WSW	ESE	ESE	ESE	E	E	E	ESE	24
12	E	E	E	E	ESE	ESE	ESE	ESE	ESE	ESE	E	E	ENE	E	ENE	E	ENE	E	SE	W	W	WSW	WSW	W	WNW	24
13	WNW	NW	WSW	W	W	WSW	WSW	WSW	WSW	WSW	W	WSW	WSW	SW	WSW	SSW	ESE	ESE	ESE	ENE	ESE	NW	WSW	WSW	WSW	24
14	WSW	W	W	W	WSW	WSW	WSW	W	WSW	WSW	WSW	W	W	W	W	W	W	WNW	WSW	WSW	WSW	WSW	W	WSW	W	24
15	WSW	WSW	W	NNE	NE	NE	ENE	ENE	ENE	E	E	ENE	ENE	E	E	E	ESE	ESE	ESE	SE	SE	SE	SE	SE	E	24
16	SE	SE	SE	SE	ESE	ESE	ESE	ESE	ESE	E	ENE	WNW	WSW	WSW	WSW	W	W	WNW	WNW	WNW	WNW	W	W	W	W	24
17	W	W	W	W	W	W	W	W	WSW	WSW	W	WSW	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	24
18	W	WNW	NW	NW	WNW	SE	ENE	E	E	E	ENE	ENE	E	ENE	E	ENE	E	SE	ESE	E	ESE	ESE	N	SW	SSE	24
19	WSW	NNE	SSE	W	NNW	WSW	W	WSW	WSW	WSW	WSW	W	WSW	P	WSW	W	W	WNW	NW	WNW	NW	NW	NW	WNW	WNW	23
20	WNW	WNW	NW	WNW	NW	NNW	NW	NW	WNW	WNW	WNW	WNW	WNW	WNW	NW	NW	NW	NW	NW	NW	NNW	NW	NW	NNW	N	24
21	ESE	SSW	SSW	S	SSE	SE	SE	ESE	ESE	ESE	ESE	SE	SSE	SSE	S	SSW	SSW	SSE	SSW	SSW	SSW	SSW	SSW	S	SSW	24
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27	WNW	SE	WSW	NW	N	NE	NE	N	NE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	ENE	ENE	ENE	ENE	WNW	NNW	24
28	ENE	E	SW	W	WSW	W	WNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	WNW	W	W	W	WNW	W	NW	24
29	WNW	E	E	ENE	E	E	E	E	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	SE	SSE	SSE	SSE	SSW	NNW	W	E	ESE	24
30	SE	S	W	NW	NW	NW	NNW	NW	N	N	N	NNE	N	N	NNE	NNE	NNE	NNE	NE	NNE	NNE	NNE	NNE	NNE	N	24
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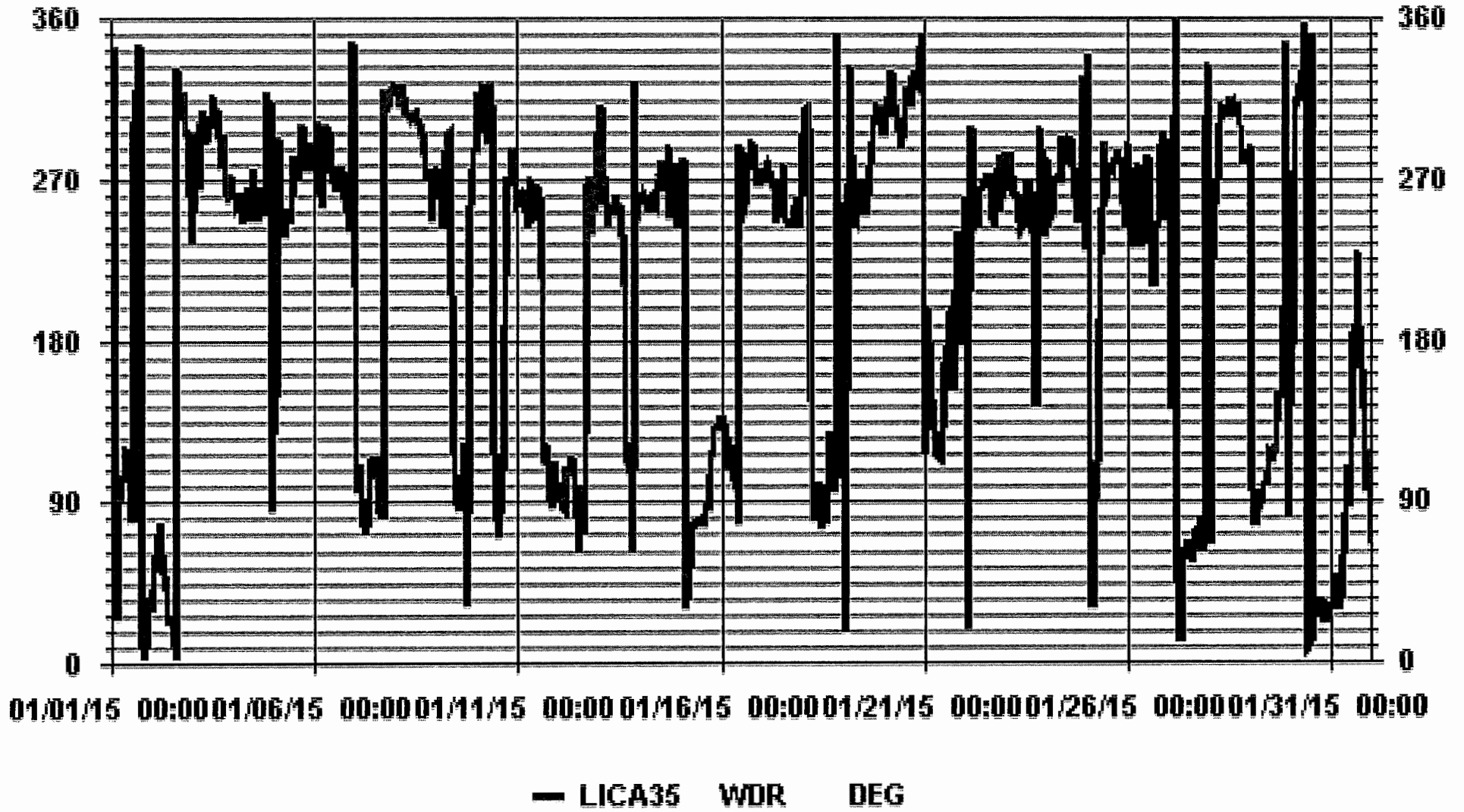
STATUS FLAG CODES

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

LAST CALIBRATION:	February 21, 2014
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0 HRS	OPERATIONAL TIME:	743 HRS
STANDARD DEVIATION:	94.13	AMD OPERATION UPTIME:	99.9 %
		MONTHLY AVERAGE:	WNW

01 Hour Averages



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Elk Point Airport Site - JANUARY 2015

JOB # 2833-2015-01-35-C

STANDARD DEVIATION WIND DIRECTION (STDWD) hourly averages in degrees

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
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	0:00
DAY 1	12	7	10	21	9	18	7	6	6	8	8	10	25	32	6	15	9	12	14	14	14	11	11	11
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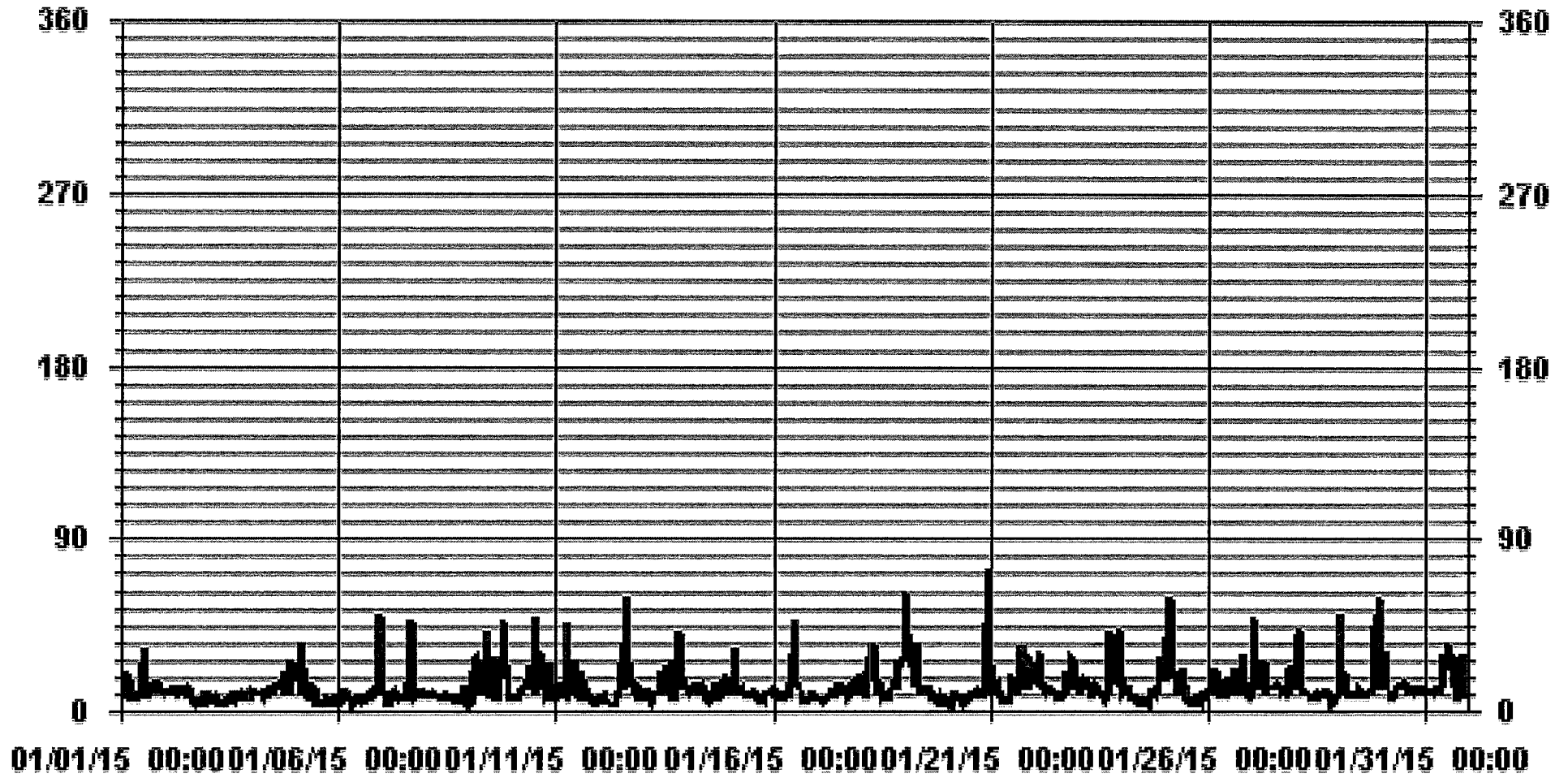
STATUS FLAG CODES

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: February 21, 2014

CALIBRATION TIME: 0 HRS OPERATIONAL TIME: 743 HRS

01 Hour Averages



— LICA35 STDWDIR DEG

APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

VOC RESULTS

Sample ID: 15010042-001

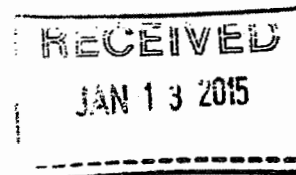
AIR FCD-01320/2

Customer ID: LICA

Cust Samp ID: LICAVOC/CLS/Jan 6, 2015

Priority: Normal

Maxxam Analytics Inc.



Xontech Model 910A VOC Sample Collection Data Sheet

Client: LICA
Location: Elk Point Airport
Station ID: Lica 35
Field Sample ID: n/a

Sampler s/n: n/a
Canister ID: 2648
Canister Installation Date/Time: n/a
Canister Removal Date/Time: n/a

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
n/a	n/a	n/a	n/a

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

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
n/a	n/a

-30

Canister valve open prior to sampling?: YES
Timer set to 0.00 minutes prior to sampling? YES
Canister valve closed prior to disconnection?: YES

Comments: No sampling was done. The sampler is out for repair services.
The canister does not require to be analyzed

Technician Signature: Alex Yakupov

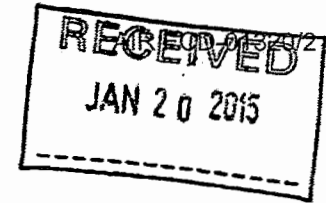
Sample ID: 15010129-001

Customer ID: LICA

Cust Samp ID: LICA/PUF/EP/Jan 12, 2015

Priority: Normal

Maxxam Analytics Inc.



Xontech Model 910A VOC Sample Collection Data Sheet

Client: LICA
Location: Elk Point Airport
Station ID: Lica 35
Field Sample ID: NA

Sampler s/n: N/A
Canister ID: 2643
Canister Installation Date/Time: NA
Canister Removal Date/Time: Jan 14 2015 6:05 (a.m)

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>nd</u>

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
<u>10.0</u>		<u>24</u>

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
<u>-30</u>	<u>n/a</u>

Canister valve open prior to sampling?: YES
Timer set to 0.00 minutes prior to sampling? YES
Canister valve closed prior to disconnection?: YES

Comments: No sampling has been done / VOC sampler is out for repair services
The canister does NOT require ANALYSIS

Technician Signature: A. Yakupov

Jan 14, 2015

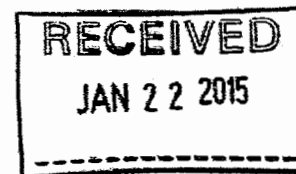
Sample ID: 15010165-001

Customer ID: LICA

AIR FCD-01320/2

Cust Samp ID: LICA/PUF/CLS/Jan 18, 2015

Maxxam Analytics Inc.



Xontech Model 910A VOC Sample Collection Data Sheet

Client: LICA
Location: ELK Point Airport
Station ID: Lica 35
Field Sample ID: _____

Sampler s/n: N/A
Canister ID: S 5620
Canister Installation Date/Time: N/A
Canister Removal Date/Time: Jan 19, 2015 @ 16:14


Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
<u>10.0</u>	<u>—</u>	<u>24</u>

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
<u>- 30.0</u>	<u>N/A</u>

Canister valve open prior to sampling?: YES
Timer set to 0.00 minutes prior to sampling? YES
Canister valve closed prior to disconnection?: YES

Comments: No sampling has been done / the VOC sampler is out for repair services
The canister # 55620 does NOT require analysis

Technician Signature: Alex Vakupov

Jan. 19, 2015

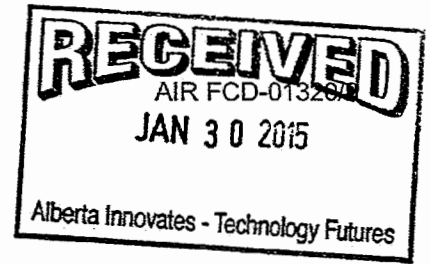
Sample ID: 15010249-001

Customer ID: LICA

Cust Samp ID: LICA/PUF/EP/Jan 24, 2015

Priority: Normal

Maxxam



VOC Sample Collection Data Sheet

Client: LICA
 Location: Elk Point Airport
 Station ID: LICA 35
 Field Sample ID: LICA/VOC/EP/Jan 27

Sampler S/N: N/A
 Canister ID: S 5605
 Canister Installation Date/Time: NA
 Canister Removal Date/Time: Jan 28, 2015 @ 14:12

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
<u>—</u>	<u>—</u>	<u>—</u>


Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
<u>-30.0</u>	<u>-30.0</u>

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: No sampling has been done / The VOC sampler is out for repair services
The canister # S5605 does NOT require analysis

Technician Signature:

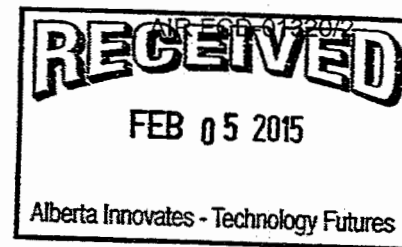
Alex Kaluper



Jan 28, 2015

Sample ID: 15020038-001

Customer ID: LICA
Cust Samp ID: LICA/PUF/CLS/Jan 30, 2015



Maxxam

VOC Sample Collection Data Sheet

Client: LICA
Location: ELK POINT Airport
Station ID: LICA 35
Field Sample ID: LICA/VOC/EP/FEB 5

Sampler S/N: NA
Canister ID: S 5682
Canister Installation Date/Time: NA
Canister Removal Date/Time: Feb 03, 2015 @ 10:47

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
<u>—</u>	<u>—</u>	<u>—</u>

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
<u>28.8</u>	<u>—</u>

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

Comments: no sampling has been done / The VOC sampler is out for repair services
The canister # S 5682 does NOT require analysis

Technician Signature: Alex Vakupov

PAH RESULTS

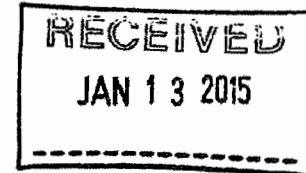
Sample ID: 15010042-003

AIR FCD-01321/2

Customer ID: LICA
Cust Samp ID: LICA/PUF/EP/Jan 6, 2015

Priority: Normal

Maxxam Analytics Inc.



Tisch Hi-Vol PUF+ Sample Collection Data Sheet

TE 03

Client: Lica
Location: ELK Point
Station ID: Lica 35
Field Sample ID: LICA/PUF/EP/Jan 6, 2015

Puf+ s/n: 100-1020
Motor s/n: 1138 1139 A.Y.
Installation Date/Time: Jan 5, 2015 16:17
Removal Date/Time: Jan 7, 2015 13:27

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Jan 6, 2015	00:00 Jan 6, 2015	00:00 Jan 7, 2015	24

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date

Set Flow Rate (slpm): 230

Date of Last Calibration: 28-Sep-11
A.Y.

Sampling Data			
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (C)	Volume (Vstd m ³)
730	229	-22.1	330.17

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

Comments:

Technician Signature: Sample in Alex Yakupov Sample out - Alex Yakupov

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: JANUARY 6, 2015
PUF S/N: TE03

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.42
2-Methylnaphthalene	0.66
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.04
Acenaphthylene	0.03
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	0.01
Benzo(b,j,k)fluoranthene	0.04
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	0.01
Benzo(ghi)perylene	< 0.01
Chrysene	< 0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.03
Fluorene	0.12
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	1.12
Perylene	< 0.01
Phenanthrene	0.17
Pyrene	0.02
Retene	0.04

Sample ID: 15010129-001

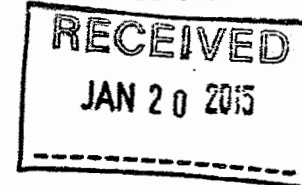
Customer ID: LICA

Cust Samp ID: LICA/PUF/EP/Jan 12, 2015

Priority: Normal

Maxxam Analytics Inc.

AIR FCD-01321/2



Tisch Hi-Vol PUF+ Sample Collection Data Sheet

Client: Lica
Location: ELK Point
Station ID: LICA 35
Field Sample ID: LICA/PUF/EP/Jan 12, 2015

Puf+ s/n: 100-1020
Motor s/n: 1488
Installation Date/Time: Jan 7, 2015 @ 13:26
Removal Date/Time: Jan 14, 2015 @ 06:17

TE04

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Jan 12, 2015	00:00	00:00	24

Jan 12 / 2015 Jan 13 / 2015

Set Flow Rate (slpm): 230

Date of Last Calibration: 22-Sep-11

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date
_____	_____	_____	_____

Sampling Data			
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (C)	Volume (Vstd m ³)
<u>717</u>	<u>229</u>	<u>-20.5°</u>	<u>330.18</u>

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

Comments: _____

Technician Signature: Sample in - Alex Yakupov / Sample out - Alex Yakupov

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: JANUARY 12, 2015
PUF S/N: TE04

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	1.00
2-Methylnaphthalene	1.53
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.11
Acenaphthylene	0.14
Acridine	< 0.01
Anthracene	0.02
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	0.01
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	0.09
Fluorene	0.24
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	1.17
Perylene	< 0.01
Phenanthrene	0.33
Pyrene	0.06
Retene	0.06

Sample ID: 15010165-003

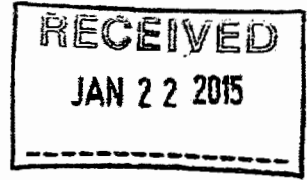
AIR FCD-01321/2

Customer ID: LICA

Cust Samp ID: LICA/PUF/EP/Jan 18, 2015

Priority: Normal

Maxxam Analytics Inc.



Tisch Hi-Vol PUF+ Sample Collection Data Sheet

Client: Lica
Location: Elk Point Airport
Station ID: LICA 33
Field Sample ID: LICA/PUF/EP/Jan 18, 2015

Puf+ s/n: 100-1020 TE07
Motor s/n: 1138 1139 (A.K.)
Installation Date/Time: Jan 14, 2015 @ 06:22
Removal Date/Time: Jan 19, 2015 @ 16:17

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Jan 18, 2015</u>	<u>00:00</u>	<u>00:00</u>	<u>24</u>

Jan 18, 2015 Jan 19, 2015

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date

Set Flow Rate (slpm): 230

Date of Last Calibration: 22-Sep-11

Sampling Data			
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (C)	Volume (Vstd m ³)
<u>700</u>	<u>229</u>	<u>-9.5</u>	<u>330.19</u>

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

Comments: _____

Technician Signature: Sample in - Alex Yakupov / Sample out - Alex Yakupov

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: JANUARY 18, 2015
PUF S/N: TE07

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.67
2-Methylnaphthalene	1.22
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.08
Acenaphthylene	< 0.01
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	< 0.01
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	0.04
Fluorene	0.16
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.48
Perylene	< 0.01
Phenanthrene	0.13
Pyrene	0.03
Retene	0.02

Sample ID: 15010249-001

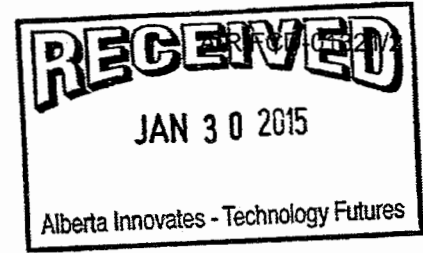
Customer ID: LICA

Cust Samp ID: LICA/PUF/EP/Jan 24, 2015

Priority: Normal

Maxxam Analytics Inc.

Tisch Hi-Vol PUF+ Sample Collection Data Sheet



Client: Lica
 Location: ECK POINT Airport
 Station ID: LICA 35
 Field Sample ID: LICA/PUF/EP/Jan 24, 2015

Puf+ s/n: 100-1020 A-13-02
 Motor s/n: 1138 1139 PB-02
 Installation Date/Time: JAN 19, 2015 @ 16:27
 Removal Date/Time: JAN 27, 2015 @ 17:40

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Jan 24, 2015</u>	<u>00:00</u>	<u>00:00</u>	<u>24</u>

Jan 24, 2015 Jan 25, 2015

Set Flow Rate (slpm): 230

Date of Last Calibration: 22-Sep-11

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date

Sampling Data			
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (C)	Volume (Vstd m ³)
<u>704</u>	<u>229</u>	<u>2.7</u>	<u>330.12</u>

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

Comments: _____

Technician Signature: Sample in - Alex Yakupov
Sample out - RAJA ABID

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: JANUARY 24 , 2015
PUF S/N: A-13-02

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.09
2-Methylnaphthalene	0.16
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.02
Acenaphthylene	< 0.01
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(ghi)perylene	< 0.01
Chrysene	< 0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.04
Fluorene	0.10
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.11
Perylene	< 0.01
Phenanthrene	0.15
Pyrene	0.03
Retene	0.02

Sample ID: 15020038-003

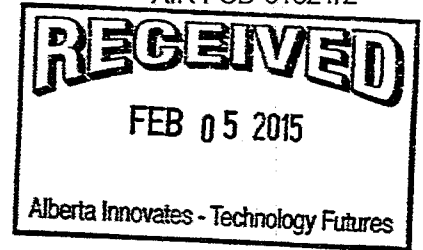
Customer ID: LICA

Cust Samp ID: LICA/PUF/EP/Jan 30, 2015

Priority: Normal

Maxxam

AIR FCD-01321/2



Hi-Vol PUF+ Sample Collection Data Sheet

Client: LICA
Location: ELK POINT AIRPORT
Station ID: LICA-35
Field Sample ID: LICA/PUF/EP/Jan 30, 2015

Puf+ S/N: TE-02
Motor S/N: 1139
Installation Date/Time: Jan 27, 2015 @ 17:40
Removal Date/Time: Feb 03, 2015 @ 11:42

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Jan 30, 2015	00:00	00:00	24

Jan 30, 2015 Jan 31, 2015

Set Flow Rate (slpm): 230

Date of Last Calibration: 22-Sep-11

PUF and QFF Information			
Date Received	Date Shipped	Puf Expiration Date	QFF Prep Date

Sampling Data			
Average Pressure (mmHg)	Average Flow (Qstd slpm)	Average Temperature (Volume (Vstd m ³)
717	229	-9.4	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:

The data has been transferred from internal memory into memory card and retrieved. No data stored / displayed on the screen of the sampler (The screen reads "No previous sampling data")

Technician Signature:

Sample in - Alex Yakupov

Sample out - Alex Yakupov

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: JANUARY 30 , 2015
PUF S/N: TE02

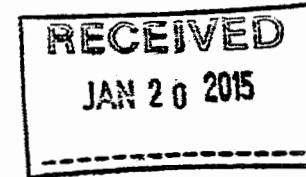
PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.10
2-Methylnaphthalene	0.14
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.03
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,,k)fluoranthene	0.02
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	< 0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.04
Fluorene	0.08
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.25
Perylene	< 0.01
Phenanthrene	0.13
Pyrene	0.03
Retene	0.01

NMHC CANISTER RESULTS

Sample ID: 15010128-001

Customer ID: LICA

Cust Samp ID: LICA/VOC/ELK/Jan 12, 2015



Maxxam Analytics Inc.

Canister Collection Data Sheet

Client: LICA

Location: ELK Point Airport

Station ID: Lica 35

Field Sample ID: LICA VOC/ELK/Jan 12, 2015

Canister ID: _____

1061

Canister Installation Date/Time: Jan 8, 2015/13:25(MST)

Canister Removal Date/Time: Jan 13, 2015 @ 1057 (MST)

Date and Time Information
Sample Date and time (MST)
<u>Jan 12, 2015 @ 22:20 start</u>

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
<u>- 30</u>	<u>3</u>

Canister valve open after to connection?: YES

Canister valve closed prior to disconnection?: YES

Comments:

Technician Signature: Installed by Alex Yakupov
recovered by Tom Bourque

Volatile Organics Data Results (NMHC Canister System)

Date: JANUARY 12, 2015
Canister ID: 1061

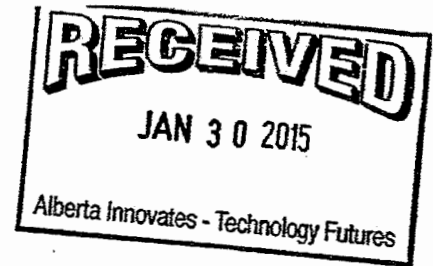
PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.06
1,1,2,2-Tetrachloroethane	< 0.06
1,1,2-Trichloroethane	< 0.06
1,1-Dichloroethane	< 0.06
1,1-Dichloroethylene	< 0.06
1,2,3-Trimethylbenzene	< 0.06
1,2,4-Trichlorobenzene	< 0.06
1,2,4-Trimethylbenzene	< 0.06
1,2-Dibromoethane	< 0.06
1,2-Dichlorobenzene	< 0.06
1,2-Dichloroethane	< 0.06
1,2-Dichloropropane	< 0.06
1,3,5-Trimethylbenzene	< 0.06
1,3-Butadiene	< 0.06
1,3-Dichlorobenzene	< 0.06
1,4-Dichlorobenzene	< 0.06
1,4-Dioxane	< 0.06
1-Butene	< 0.06
1-Hexene	< 0.06
1-Pentene	< 0.06
2,2,4-Trimethylpentane	< 0.06
2,2-Dimethylbutane	< 0.06
2,3,4-Trimethylpentane	< 0.06
2,3-Dimethylbutane	0.52
2,3-Dimethylpentane	< 0.06
2,4-Dimethylpentane	< 0.06
2-Methylheptane	< 0.06
2-Methylhexane	< 0.06
2-Methylpentane	0.72
3-Methylheptane	< 0.06
3-Methylhexane	< 0.06
3-Methylpentane	0.52
Acetone	14.8
Acrolein	< 0.06
Benzene	< 0.06
Benzyl chloride	< 0.06
Bromodichloromethane	< 0.06
Bromoform	< 0.06
Bromomethane	< 0.06
Carbon disulfide	< 0.06
Carbon tetrachloride	< 0.06
Chlorobenzene	< 0.06
Chloroethane	< 0.06
Chloroform	< 0.06
Chloromethane	1.24
cis-1,2-Dichloroethene	< 0.06
cis-1,3-Dichloropropene	< 0.06
cis-2-Butene	< 0.06
cis-2-Pentene	< 0.06
Cyclohexane	0.83
Cyclopentane	< 0.06
Dibromochloromethane	< 0.06
Ethanol	12.3
Ethyl acetate	< 0.06
Ethylbenzene	< 0.06
Freon-11	0.40
Freon-113	< 0.06

Volatile Organics Data Results (NMHC Canister System)

Date: JANUARY 12 , 2015
Canister ID: 1061

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.06
Freon-12	0.89
Hexachloro-1,3-butadiene	< 0.06
Isobutane	7.35
Isopentane	2.95
Isoprene	0.34
Isopropyl alcohol	< 0.06
Isopropylbenzene	< 0.06
m,p-Xylene	< 0.06
m-Diethylbenzene	< 0.06
m-Ethyltoluene	< 0.06
Methyl butyl ketone	< 0.06
Methyl ethyl ketone	< 0.06
Methyl Isobutyl ketone	< 0.06
Methyl methacrylate	< 0.06
Methyl tert butyl ether	< 0.06
Methylcyclohexane	1.22
Methylcyclopentane	< 0.06
Methylene chloride	< 0.06
n-Butane	7.90
n-Decane	0.60
n-Dodecane	< 0.06
n-Heptane	< 0.06
n-Hexane	1.30
n-Nonane	< 0.06
n-Octane	< 0.06
n-Pentane	< 0.06
n-Propylbenzene	< 0.06
n-Undecane	< 0.06
Naphthalene	< 0.06
o-Ethyltoluene	< 0.06
o-Xylene	< 0.06
p-Diethylbenzene	< 0.06
p-Ethyltoluene	< 0.06
Styrene	< 0.06
Tetrachloroethylene	< 0.06
Tetrahydrofuran	< 0.06
Toluene	0.52
trans-1,2-Dichloroethylene	< 0.06
trans-1,3-Dichloropropylene	< 0.06
trans-2-Butene	< 0.06
trans-2-Pentene	< 0.06
Trichloroethylene	< 0.06
Vinyl acetate	< 0.06
Vinyl chloride	< 0.06

Sample ID: 15010249-001
Customer ID: LICA
Cust Samp ID: LICA/PUF/EP/Jan 24, 2015
Priority: Normal



Maxxam Analytics Inc.

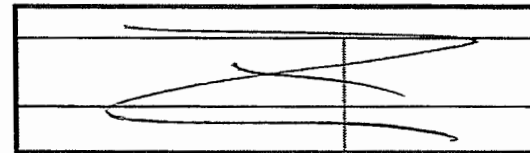
Canister Collection Data Sheet

Jan 28, 2015

Client: LICA
Location: ELK Point Airport
Station ID: Lica 35
Field Sample ID: LICA VOC/ ELK/

Canister ID: 1137
Canister Installation Date/Time: Jan 19, 2015 (MST) @ 16:32
Canister Removal Date/Time: Jan 28, 2015 (MST) @ 14:12

Date and Time Information
Sample Date and time (MST) <u>n/a</u>



Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Pressure (psig)
<u>-30</u>	<u>0</u>

Canister valve open after to connection?: YES

Canister valve closed prior to disconnection?: YES NA require

Comments: The sample canister does NOT ^{require} to be analyzed
The sample has not been taken. The canister was replaced due to
the leak.

Technician Signature: Installed by Alex Yakupov
Removed by Alex Yakupov

APPENDIX III
ANALYZER CALIBRATION RESULTS

SULPHUR DIOXIDE

API 100A SO2 Analyzer Calibration

Date: 8-Jan-15

Company: LICA

Station Name/Location: Elk Point

Performed by: TB/AY

Application H₂S/TRS/SO₂: SO2

Start/End Time (mst): 907-1406

Calibration Purpose: routine monthly

Converter Make & Model: NA

Converter Serial #: NA

Cal Gas Expiry Date: 12-Aug-17

Analyser:

Serial Number: 467

Last Calibration Date: 2-Dec-14

Previous Cal High Point C.F.: 1.000

Range ppb: 1000

As Found C.F.: 1.004

New C.F.: 0.998

As found:

SLOPE: 0.952

OFFSET: 33.8

HVPS: 528

DCPS: n/a

RCELL TEMP: 50.0

BOX TEMP: 30.9

PMT TEMP: 8.1

IZS TEMP: 45.0

STABIL: 0.0

PRES: 25.3

SAMP FL: 631

PMT: 40.5

UV LAMP: 2503.8

STR. LGT: 16.1

DRK PMT: 13.0

DRK LMP: 2.7

Internal Span: 356

As left:

SLOPE: .933

OFFSET: 33.8

HVPS: 528

DCPS: n/a

RCELL TEMP: 50.0

BOX TEMP: 30.9

PMT TEMP: 8.1

IZS TEMP: 45.0

STABIL: 0.0

PRES: 25.3

SAMP FL: 631

PMT: 40.5

UV LAMP: 2503.8

STR. LGT: 16.1

DRK PMT: 13.0

DRK LMP: 2.7

Internal Span: 320

Calibrator:

Flow Meter ID's: NA

Make & Model: EnviroNics 6100

Serial #: 4760

Cal Gas Cylinder I.D. #: LL42475

Cal Gas Conc. (ppm): 50.3

Calibrator Flow Targets:

point	diluent (cc/min)	cal gas (cc/min)	total (cc/min)
zero	5000	0	5000
high	5000	77	5077
mid	5000	37	5037
low	5000	17	5017

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppb)	Indicated Concentration (ppb)	Correction Factors
	Diluent	Cal Gas	Total			
as found zero	5000	0.0	5000	0	-0.2	NA
adjusted zero	5000	0.0	5000	0	0.6	NA
as found high	4998	76.92	5075	762.4	760.0	1.004
adjusted high	4994	80.00	5074	793.1	792.6	1.001
mid	4995	40.00	5035	399.6	401.0	0.998
low	4994	20.00	5014	200.6	202.5	0.994
calibrator zero	5000	0.00	5000	0	0.9	NA
Average C.F.=						0.998

Linear Regression/Calibration Results:

Correlation Coefficient =	<u>1.000</u>	LIMITS	Pass/Fail ?
Slope =	<u>1.002</u>	> or = 0.995	PASS
b (Intercept as % of full scale)=	<u>-0.15%</u>	0.85-1.15	PASS
% change in C.F. from last cal	<u>-0.39%</u>	± 3% F.S.	PASS
		± 15%	PASS

Converter Efficiency Check for H₂S/TRS application:

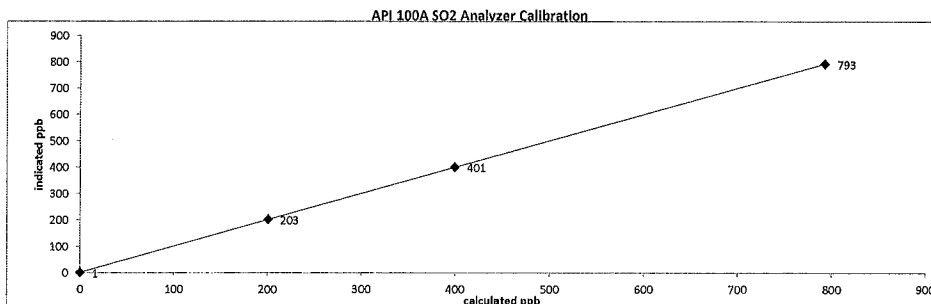
run converter efficiency test immediately following zero adjust

SO₂ High Point gas concentration: NA Time gas run (mst): NA

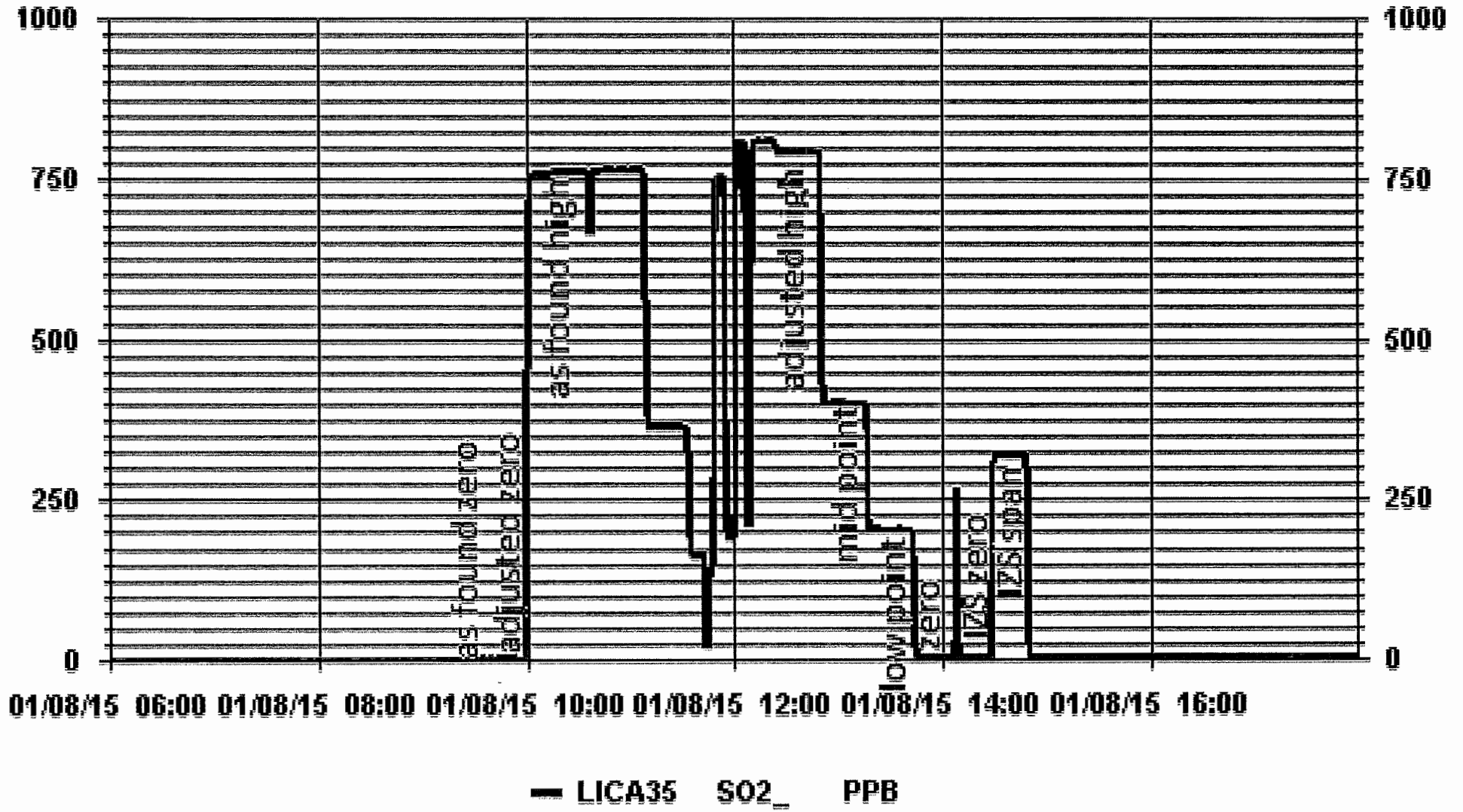
Zero corrected analyzer response: NA

Comments:

Change analyzer filter. The NO/NOx low point failed, and the SO2 passed but was nearly a fail, the reading being very low like NOx. Changed calibrators and all points pass. Did as founds with EnviroNics 6100 and rest of cal with API 700 s/n 831.



01 Minute Averages



HYDROGEN SULPHIDE

API 101E H2S Analyzer Calibration

Date:	7-Jan-15	Start/End Time (mst):	1010-1443
Company:	LICA	Calibration Purpose:	routine monthly
Station Name/Location:	Elk Point	Converter Make & Model:	Internal
Performed by:	TB/AY	Converter Serial #:	NA
Application H ₂ S/TRS/SO ₂ :	H2S	Cal Gas Expiry Date:	25-Dec-15

Analyzer:		Range ppb:	100
Serial Number:	510	As Found C.F.:	1.043
Last Calibration Date:	2-Dec-14	New C.F.:	1.005
Previous Cal High Point C.F.:	0.998		

As found:	As left:
SLOPE: 1.136	SLOPE: 1.179
OFFSET: 29.5	OFFSET: 28.7
HVPS: 526	HVPS: 526
RCELL TEMP: 50.0	RCELL TEMP: 50.0
BOX TEMP: 33.2	BOX TEMP: 33.2
PMT TEMP: 8.4	PMT TEMP: 8.4
IZS TEMP: 45.0	IZS TEMP: 45.0
STABIL: NA	STABIL: NA
PRES: 22.8	PRES: 22.8
SAMP FL: 529	SAMP FL: 529
PMT: 56.2	PMT: 56.2
NORM PMT: 28.4	NORM PMT: 28.4
UV LAMP: 3465	UV LAMP: 3465
LAMP RATIO: 98.4 %	LAMP RATIO: 98.4 %
STR. LGT: 16.8	STR. LGT: 16.8
DRK PMT: 34.7	DRK PMT: 34.7
DRK LMP: -1.6	DRK LMP: -1.6
Internal Span: 55.91	Internal Span: 57

Callibrator: Flow Meter ID's: <u>na</u> Make & Model: <u>API 700</u> Serial #: <u>831</u> Cal Gas Cylinder I.D. #: <u>BLM0005049</u> Cal Gas Conc. (ppm): <u>10.1</u>	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="4">Callibrator Flow Targets:</th> </tr> <tr> <th>point</th> <th>diluent (cc/min)</th> <th>cal gas (cc/min)</th> <th>total (cc/min)</th> </tr> </thead> <tbody> <tr><td>zero</td><td>5000</td><td>0</td><td>5000</td></tr> <tr><td>high</td><td>5000</td><td>38</td><td>5038</td></tr> <tr><td>mid</td><td>5000</td><td>18</td><td>5018</td></tr> <tr><td>low</td><td>5000</td><td>10</td><td>5010</td></tr> </tbody> </table>	Callibrator Flow Targets:				point	diluent (cc/min)	cal gas (cc/min)	total (cc/min)	zero	5000	0	5000	high	5000	38	5038	mid	5000	18	5018	low	5000	10	5010
Callibrator Flow Targets:																									
point	diluent (cc/min)	cal gas (cc/min)	total (cc/min)																						
zero	5000	0	5000																						
high	5000	38	5038																						
mid	5000	18	5018																						
low	5000	10	5010																						

Callibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5000	0.0	5000	0	-0.4	NA
adjusted zero	5000	0.0	5000	0	0.0	NA
as found high	4997	37.95	5035	76.1	73.0	1.043
adjusted high	4997	37.95	5035	76.1	76.2	0.999
mid	4997	17.96	5015	36.2	35.6	1.015
low	4997	9.42	5006	19.0	19.0	1.000
calibrator zero	5000	0.00	5000	0	0.3	NA
Average C.F. =						1.005

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS	Pass/Fail ?
Slope = <u>0.999</u>	> or = 0.995	PASS
b (Intercept as % of full scale) = <u>0.15%</u>	0.85-1.15	PASS
% change in C.F. from last cal = <u>-4.51%</u>	± 3% F.S.	PASS
	± 15%	PASS

Converter Efficiency Check for H₂S/TRS application:

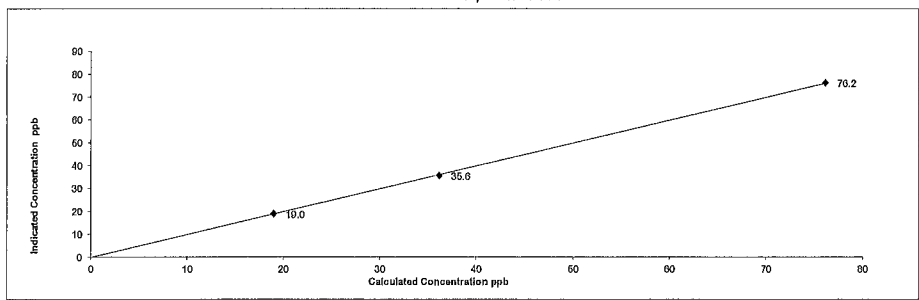
run converter efficiency test immediately following zero adjust

SO ₂ High Point gas concentration:	NA	Time gas run (mst):	NA
Zero corrected analyzer response:	NA		

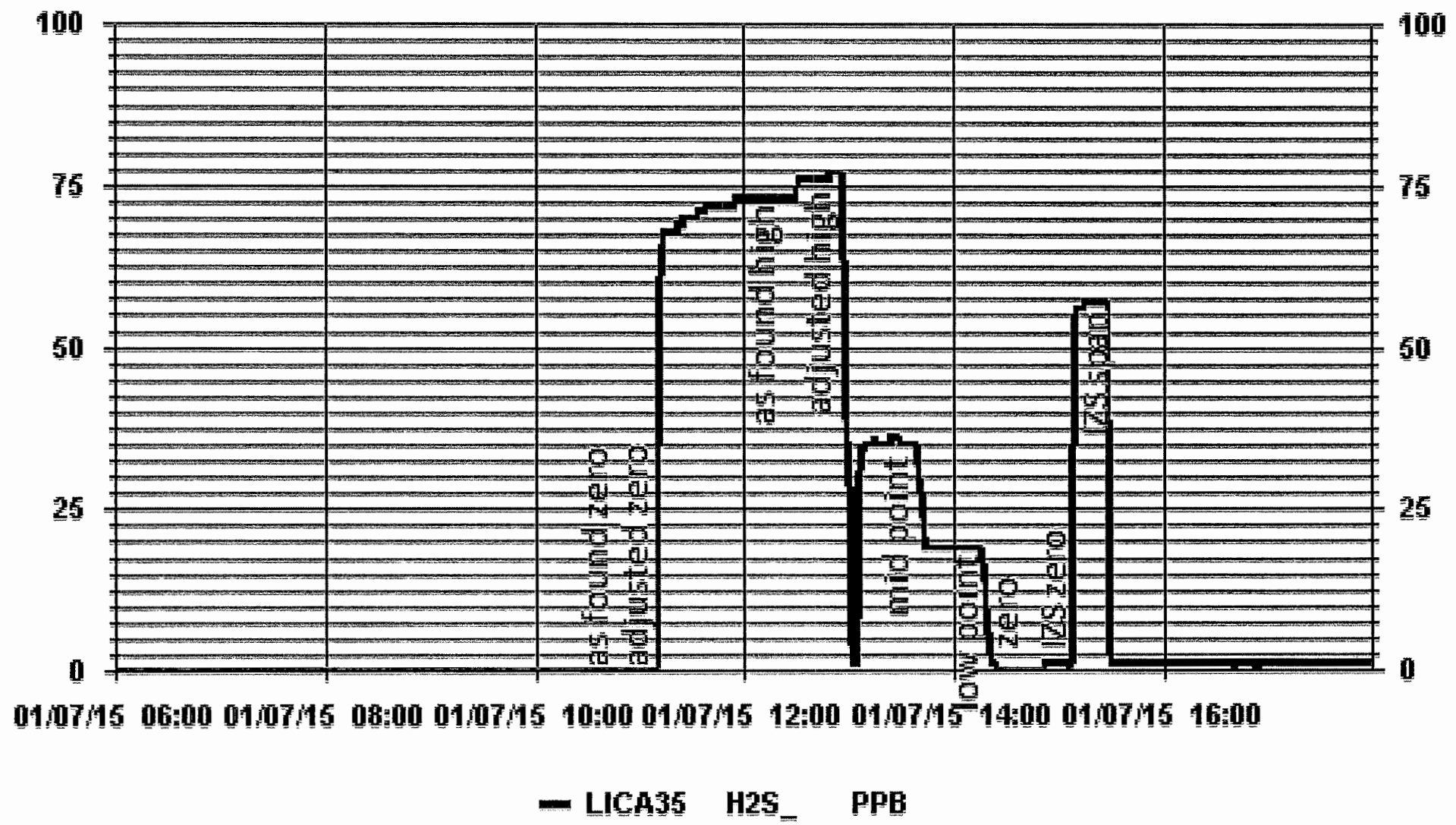
Comments:

changed filter, long response time probably due to cold regulators and moisture from being left in truck overnight - did extra long evacuation, same issue as yesterday, also cal program kicked in and interrupted mid point

API 101E H2S Analyzer Calibration



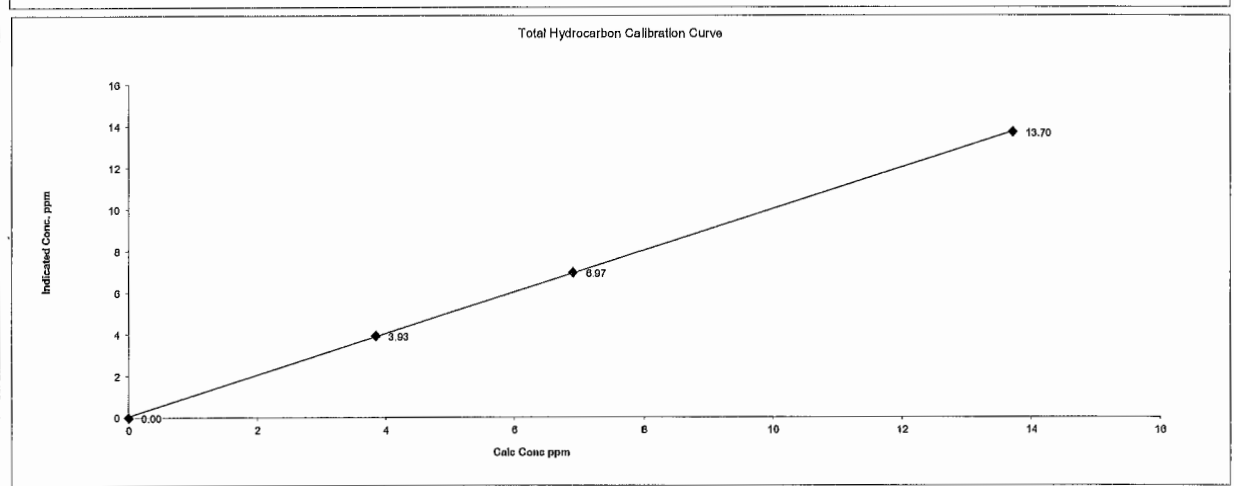
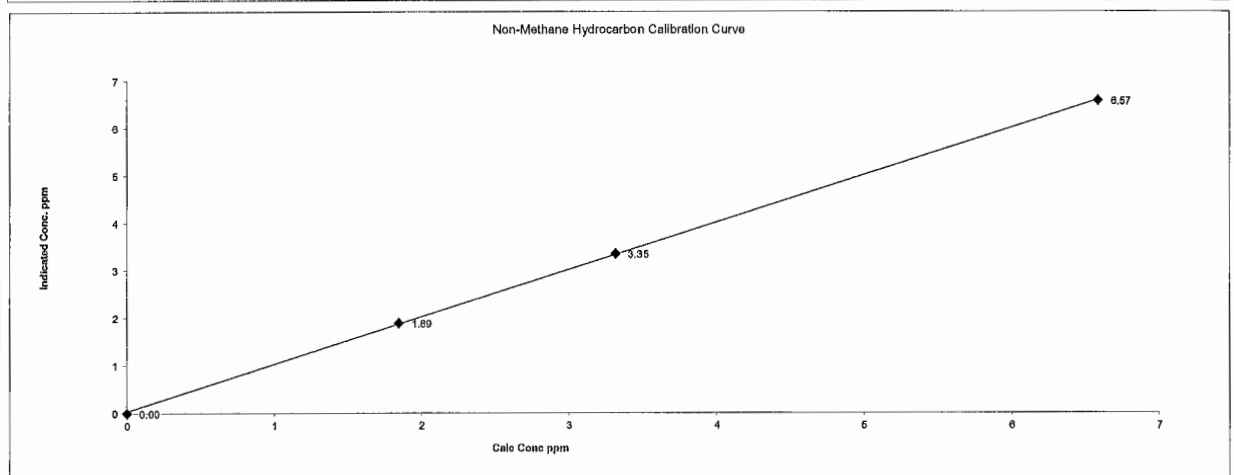
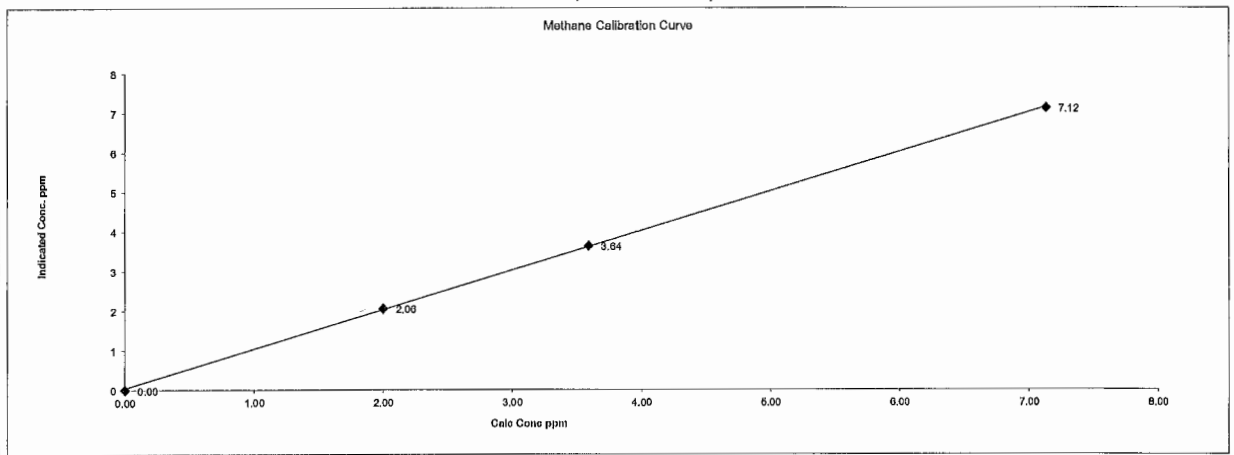
01 Minute Averages



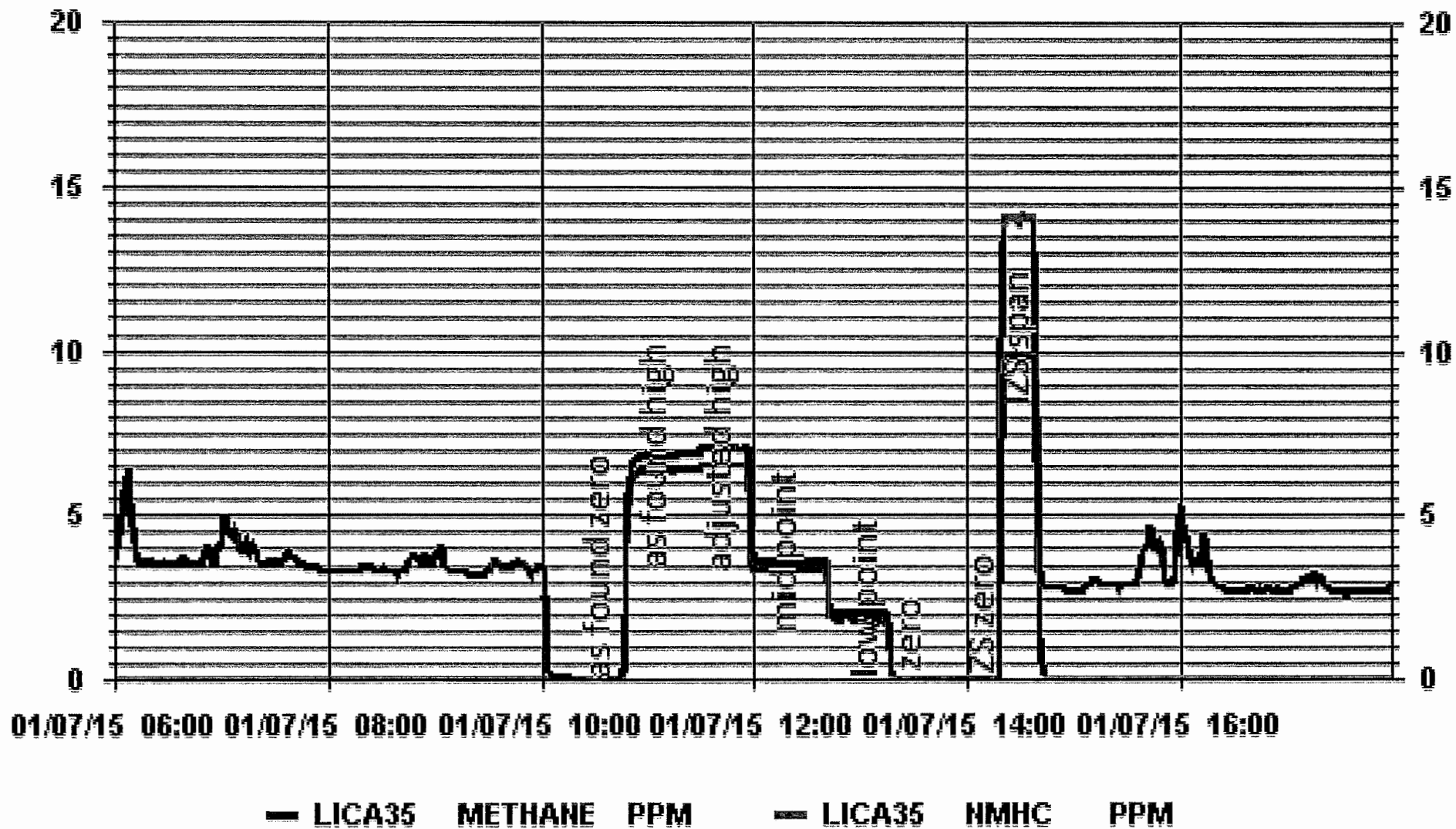
TOTAL HYDROCARBON

Date:	7-Jan-15	Start Time (mst):	10:20
Company:	LICA	End Time (mst):	13:39
Station Name:	Elk Point	Calibration Purpose:	routine monthly
Performed by:	TB/AY	Cal Gas Expiry Date:	26-Mar-17

Thermo 55C Methane/Non-Methane Analyzer Calibration



01 Minute Averages



NITROGEN DIOXIDE



API 200E NOx Analyzer Calibration

Date: 8-Jan-15
 Company: LICA
 Station Name/Location: Elk Point
 Performed by: TB/AV

Start Time (mst): 9:07
 End Time (mst): 15:54
 Calibration Purpose: routine monthly
 Cal Gas Expiry Date: 12-Aug-17

Correction Factors:

Analyzer Serial Number: 2166
 Last Calibration Date: 2-Dec-14
 Range ppb: 1000

As found C.F. Previous Cal High Point C.F.:
 NO= 0.992 NO= 0.999
 NOx= 0.987 NOx= 0.999
 NO₂= 1.002 NO₂= 0.996

As found:

NOx SLOPE: .973
 NOx OFFS: 2.4
 NO SLOPE: .970
 NO OFFS: .4
 TEST: 1381.5
 SAMP FLW: 488
 OZONE FL: 76
 PMT: 1.9
 NORM PMT: 0.1
 AZERO: 11.9
 HVPS: 691
 RCELL TEMP: 49.9
 BOX TEMP: 26.2
 PMT TEMP: 7.0
 IZS TEMP: 45.1
 MOLY TEMP: 316.4
 RCEL: 8.0
 SAMP: 26.9
 Internal Span: 4.5/354/359

As left:

NOx SLOPE: .935
 NOx OFFS: 0.0
 NO SLOPE: .938
 NO OFFS: -.6
 TEST: 1381.5
 SAMP FLW: 488
 OZONE FL: 76
 PMT: 1.9
 NORM PMT: 0.1
 AZERO: 11.9
 HVPS: 691
 RCELL TEMP: 49.9
 BOX TEMP: 26.2
 PMT TEMP: 7.0
 IZS TEMP: 45.1
 MOLY TEMP: 316.4
 RCEL: 8.0
 SAMP: 26.9
 Internal Span: 4.5/341/345

Calibrator Flow Targets:

Make & Model: EnviroNics 6100
 Serial #: 4760
 Cal Gas Cylinder I.D. #: LL42575
 NO Cylinder Conc. (ppm): 48.5
 NOx Cylinder Conc. (ppm): 48.5

point	diluent (cc/min)	cal gas (cc/min)	O ₃ setting (v or ppb)	total (cc/min)
zero	5000	0	0	5000
high	5000	77	0.550	5077
mid	5000	37	0.220	5037
low	5000	21	0.130	5021

Calibration:

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	-0.1	-1.0	NA	NA
adjusted zero	5000	0.0	5000	0	0	0.2	0.0	NA	NA
as found high	4998	76.92	5075	735.1	735.1	741	745	0.992	0.987
adjusted high	4994	80.00	5074	764.7	764.7	764	764	1.001	1.001
mid	4995	40.00	5035	385.3	385.3	380	382	1.014	1.009
low	4994	20.00	5014	193.5	193.5	191	190	1.014	1.018
calibrator zero	5000	0.00	5000	0	0	-0.5	0.0	NA	NA
Average C.F.=								1.010	1.009

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ increase	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4996	79.95	5076	0.0	748.5	744.5	-3.4	0.2	-0.2	
as found NO ₂	4996	79.95	5076	0.6	238.0	744.0	506.0	510.5	509.4	1.002
gpt mid	4996	79.95	5076	0.2	538.0	745.0	207.6	210.5	211.0	0.998
gpt low	4996	79.95	5076	0.1	623.5	748.3	124.0	125.0	127.4	0.981
Average NO ₂ C.F.=									0.994	

Linear Regression/Calibration Results:

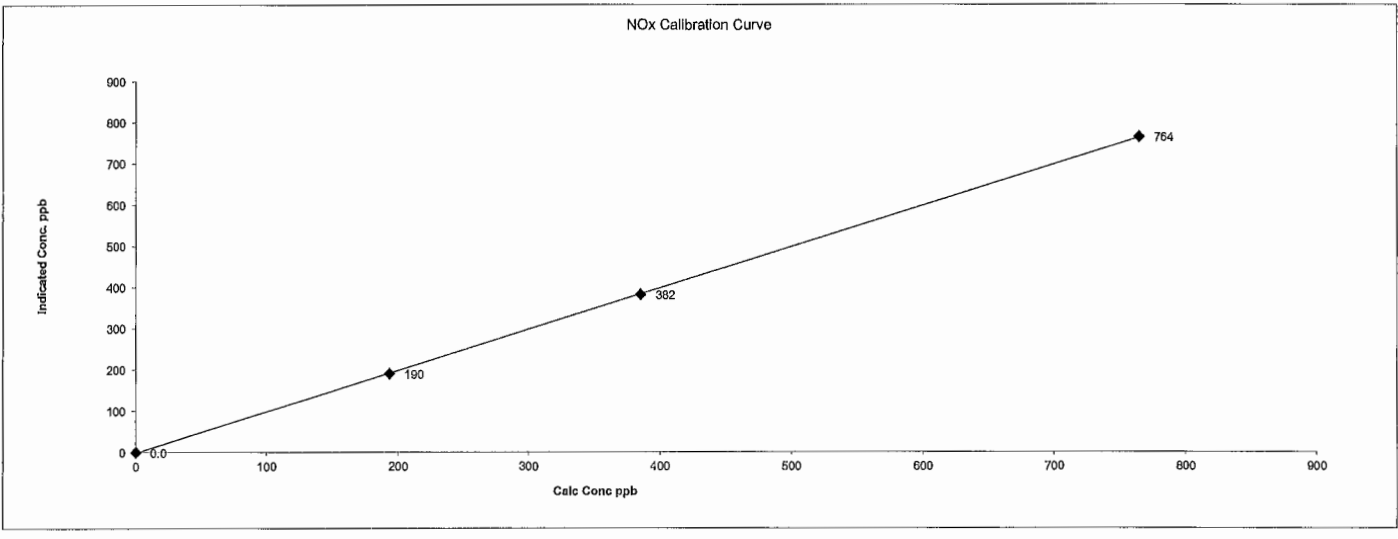
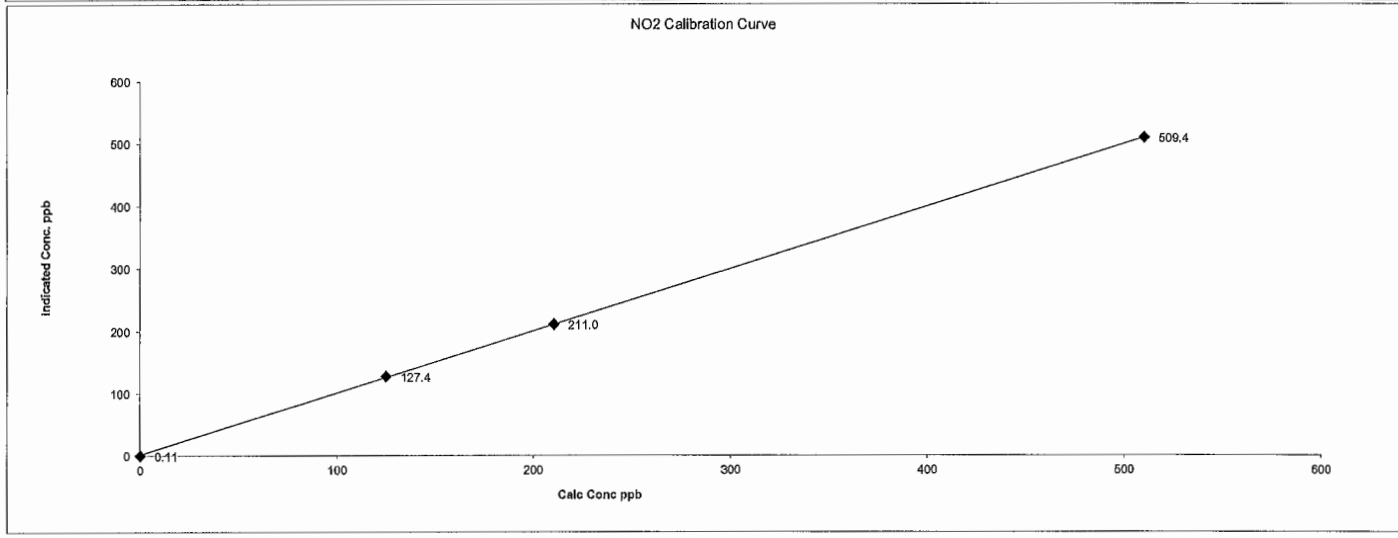
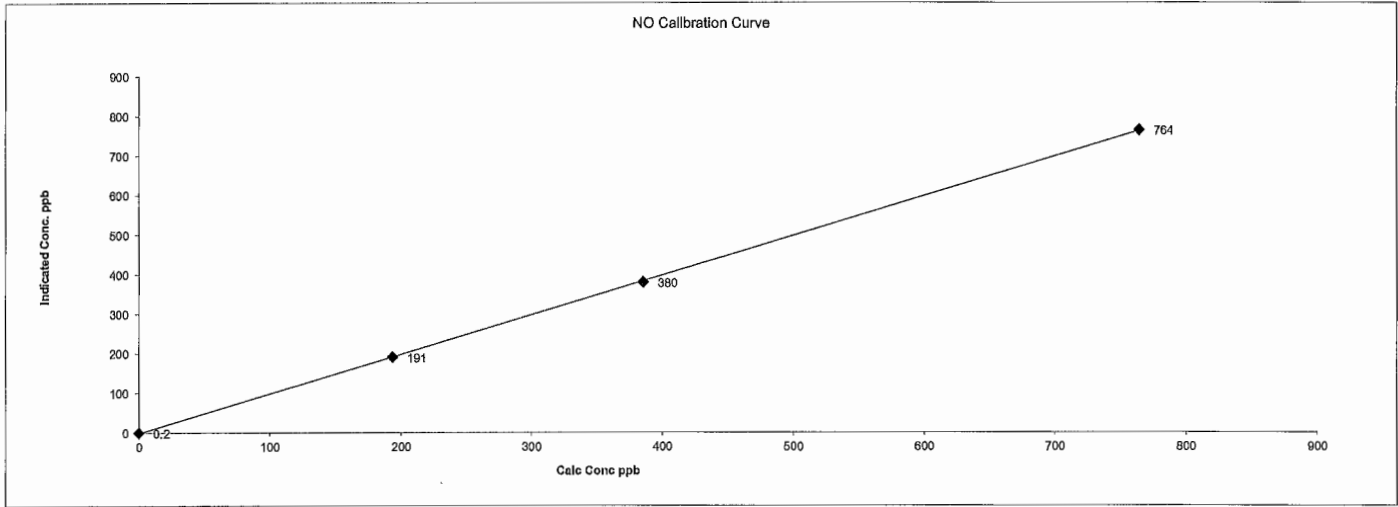
	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	1.000	0.996	0.85-1.15
b (Intercept as % of full scale)=	-0.18%	-0.19%	0.12%	± 3% F.S.
% change in C.F. from last cal=	0.67%	1.20%	-0.62%	+/-15%
NO ₂ converter efficiency			100.6%	>85%

Comments:

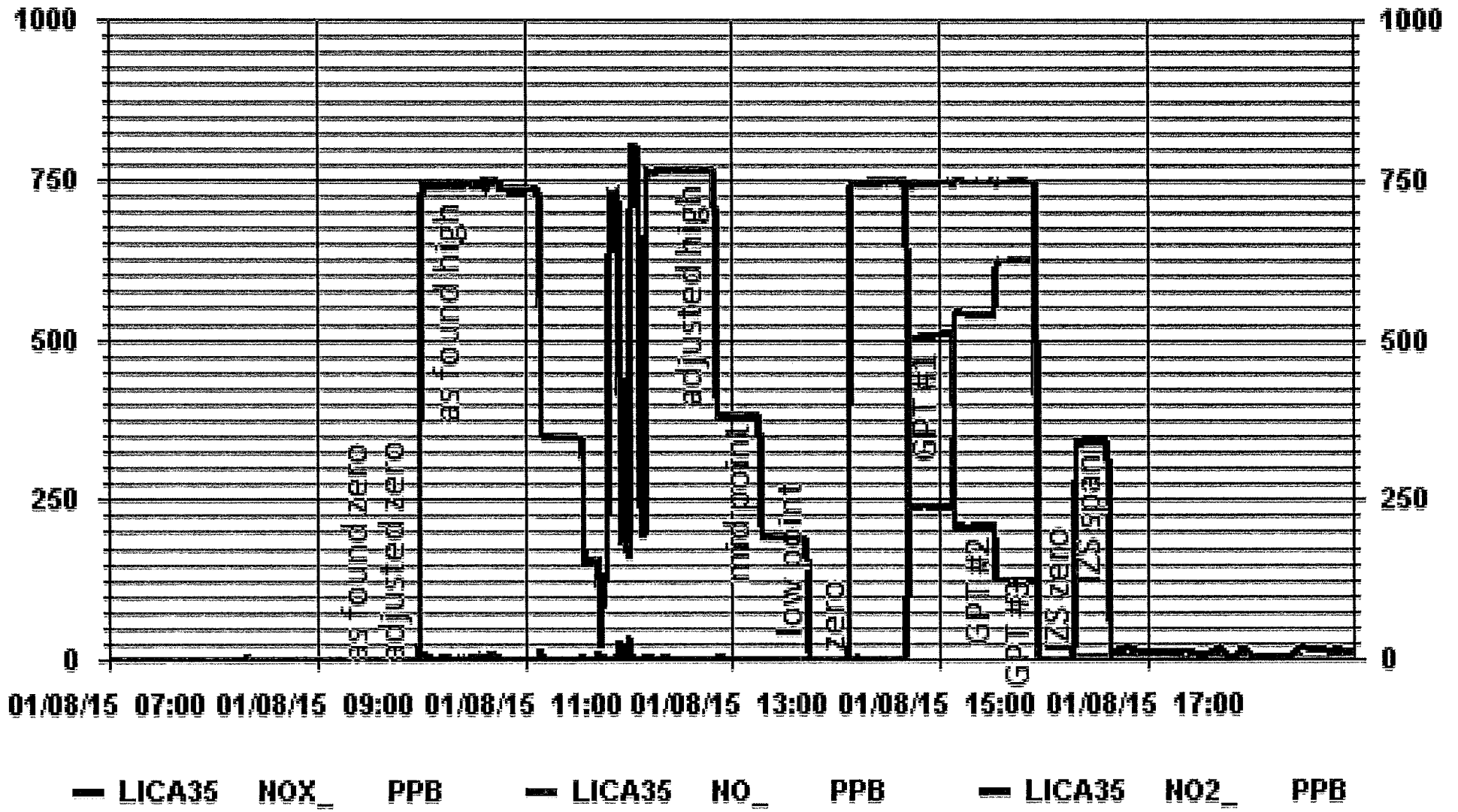
Change analyzer filter. The NO/NOx low point failed. Changed calibrators and all points pass. Did as founds with EnviroNics 6100 NO/NOx cal with API 700 s/n 831, then the gpt with the enviroNics 6100 since the api does not have an ozone generator.

Date:	8-Jan-15	Start Time (mst):	9:07
Company:	LICA	End Time (mst):	15:54
Station Name/Location:	Elk Point	Calibration Purpose:	routine monthly
Performed by:	TB/AY	Cal Gas Expiry Date:	12-Aug-17

API 200E NOx Analyzer Calibration



01 Minute Averages



OZONE

Maxam Thermo 49i O₃ Analyzer Calibration

Date: 13-Jan-15 **Start Time (mst):** 11:18
Company: LICA **End Time (mst):** 13:06
Station Name/Location: Elk Point **Calibration Purpose:** shut down
Performed by: Tom Bourque **G.P.T. Date:** 13-Jan-15

Analyzer: 1002240372 **Range ppm:** 500
Serial Number: 1002240372 **As Found C.F.:** 0.970
Last Calibration Date: 3-Dec-14 **New C.F.:** 0.971
Previous Cal High Point C.F.: 0.999

<p>As found:</p> <p>O₃ Bkg: <u>.1</u> O₃ Coef: <u>1.049</u> Motherboard: <u>3.3 3.3</u> <u>15.0 15.0</u> <u>24.0 23.9</u> <u>-3.3 -3.2</u> Interface Board: <u>3.3 3.3</u> <u>5.0 5.0</u> <u>15.0 14.9</u> <u>-15.0 -15.1</u> Photo Lamp: <u>9.8</u> <u>24.0 23.5</u> O₃ Lamp: <u>9.4</u> Bench: <u>29.1</u> Bench Lamp: <u>54.1</u> O₃ Lamp: <u>68.2</u> Pressure: <u>700.3</u> Cell A lpm: <u>.751</u> Cell B lpm: <u>.757</u> O₃ ppb: <u>19.6</u> Cell A ppb: <u>23.2</u> Cell B ppb: <u>16.0</u> Cell A int: <u>43363</u> Cell B int: <u>47245</u> Internal Span: <u>362</u></p>	<p>As left:</p> <p>O₃ Bkg: <u>.1</u> O₃ Coef: <u>1.049</u> <u>3.3 3.3</u> <u>15.0 15.0</u> <u>24.0 23.9</u> <u>-3.3 -3.2</u> <u>3.3 3.3</u> <u>5.0 5.0</u> <u>15.0 14.9</u> <u>-15.0 -15.1</u> Photo Lamp: <u>9.8</u> <u>24.0 23.5</u> O₃ Lamp: <u>9.4</u> Bench: <u>29.1</u> Bench Lamp: <u>54.1</u> O₃ Lamp: <u>68.2</u> Pressure: <u>700.3</u> Cell A lpm: <u>.751</u> Cell B lpm: <u>.757</u> O₃ ppb: <u>19.6</u> Cell A ppb: <u>23.2</u> Cell B ppb: <u>16.0</u> Cell A int: <u>43363</u> Cell B int: <u>47245</u> Internal Span: <u>NA</u></p>
--	--

Calibrator: EnviroNics 6100 **Serial #:** 4760
NOx Gas Cylinder I.D. #: LL42475
NOx Cylinder Conc. (ppm): 48.5

point	total flow (cc/min)	O ₂ setting (v or ppb)
zero	5071	0
high	5071	0.340
mid	5071	0.220
low	5071	0.080

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors:
	Diluent	Cal Gas	Total			
as found zero	5074	0.0	5074	0.0	0.1	NA
as found high	5074	0.00	5074	323.0	333.0	0.970
mid	5074	0.00	5074	211.0	219.0	0.964
low	5074	0.00	5074	79.0	80.7	0.980
Average C.F.=						0.971

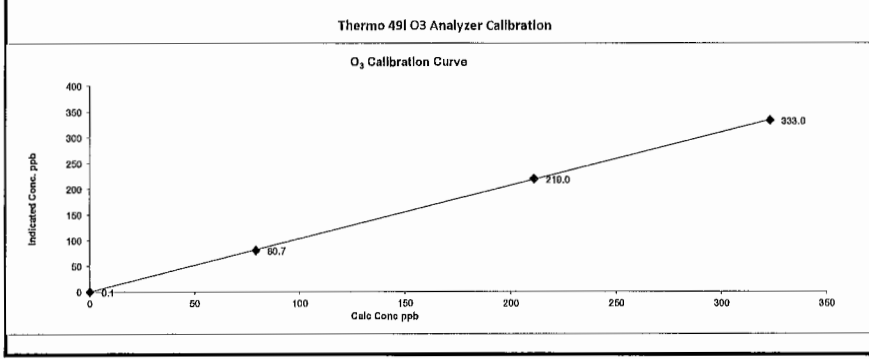
****copy and paste flows and NO decrease from NOx cal in to calculated concentration****

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS	Pass/Fail ?
Slope = <u>1.033</u>	> or = 0.995	PASS
b (intercept as % of full scale) = <u>-0.024%</u>	0.85-1.15	PASS
% change in C.F. from last cal = <u>3%</u>	± 3% F.S.	PASS
	± 15%	PASS

Comments:

This is a shut down calibration - analyzer is alarming for low intensity, do shutdown cal and clean reaction cells.



Maxxam Thermo 49i O₃ Analyzer Calibration

Date: <u>13-Jan-15</u>	Start Time (mst): <u>14:40</u>
Company: <u>LICA</u>	End Time (mst): <u>17:09</u>
Station Name/Location: <u>Elk Point</u>	Calibration Purpose: <u>Installation</u>
Performed by: <u>Tom Bourque</u>	G.P.T. Date: <u>13-Jan-15</u>

Analyzer: <u>1002240372</u>	Range ppm: <u>500</u>
Last Calibration Date: <u>3-Dec-14</u>	As Found C.F.: <u>1.000</u>
Previous Cal High Point C.F.: <u>0.999</u>	New C.F.: <u>1.001</u>

As found:

O₃ Bkg: .1

O₃ Coef: 1.049

Motherboard: 3.3 3.3

15.0 15.0

24.0 23.9

-3.3 -3.2

Interface Board: 3.3 3.3

5.0 5.0

15.0 14.9

-15.0 -15.1

Photo Lamp 9.8

24.0 23.5

O₃ Lamp 9.4

Bench: 29.1

Bench Lamp: 54.1

O₃ Lamp: 68.2

Pressure: 700.3

Cell A lpm: .751

Cell B lpm: .757

O₃ ppb: 19.6

Cell A ppb: 23.2

Cell B ppb: 16.0

Cell A Int: 43363

Cell B Int: 47245

Internal Span: 362

As left:

O₃ Bkg: -.3

O₃ Coef: 1.026

3.3 3.3

15.0 15.0

24.0 23.9

-3.3 -3.2

3.3 3.3

5.0 5.0

15.0 14.9

-15.0 -15.1

Photo Lamp 9.8

24.0 23.5

O₃ Lamp 9.4

Bench: 29.1

Bench Lamp: 54.1

O₃ Lamp: 68.2

Pressure: 700.3

Cell A lpm: .748

Cell B lpm: .757

O₃ ppb: 322

Cell A ppb: 319

Cell B ppb: 320

Cell A Int: 50010

Cell B Int: 48197

Internal Span: 343

Calibrator:	Calibrator Flow Targets:															
Make & Model: <u>Enviroincs 6100</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>point</th> <th>total flow (cc/min)</th> <th>O₃ setting (v or ppb)</th> </tr> <tr> <td>zero</td> <td>5071</td> <td>0</td> </tr> <tr> <td>high</td> <td>5071</td> <td>0.340</td> </tr> <tr> <td>mid</td> <td>5071</td> <td>0.220</td> </tr> <tr> <td>low</td> <td>5071</td> <td>0.080</td> </tr> </table>	point	total flow (cc/min)	O ₃ setting (v or ppb)	zero	5071	0	high	5071	0.340	mid	5071	0.220	low	5071	0.080
point	total flow (cc/min)	O ₃ setting (v or ppb)														
zero	5071	0														
high	5071	0.340														
mid	5071	0.220														
low	5071	0.080														
Serial #: <u>4760</u>																
NOx Gas Cylinder I.D. #: <u>LI42475</u>																
NOx Cylinder Conc. (ppm): <u>48.5</u>																

Calibration:						
Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors:	
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
adjusted zero	5073	0.0	5073	0.0	0.4	NA
adjusted high	5073	0.00	5073	323.0	323.2	1.000
mid	5073	0.00	5073	211.0	212.4	0.995
low	5073	0.00	5073	79.0	78.8	1.007
calibrator zero	5073	0.00	5073	0.0	0.2	NA
Average C.F.=						1.001

copy and paste flows and NO decrease from NOx cal in to calculated concentration

Linear Regression/Calibration Results:

Correlation Coefficient =	<u>1.000</u>	LIMITS	Pass/Fail ?
Slope =	<u>1.001</u>	> or = 0.995	PASS
b (Intercept as % of full scale)=	<u>0.049%</u>	0.85-1.15	PASS
% change in C.F. from last cal	<u>0%</u>	± 3% F.S.	PASS
		± 15%	PASS

Comments:

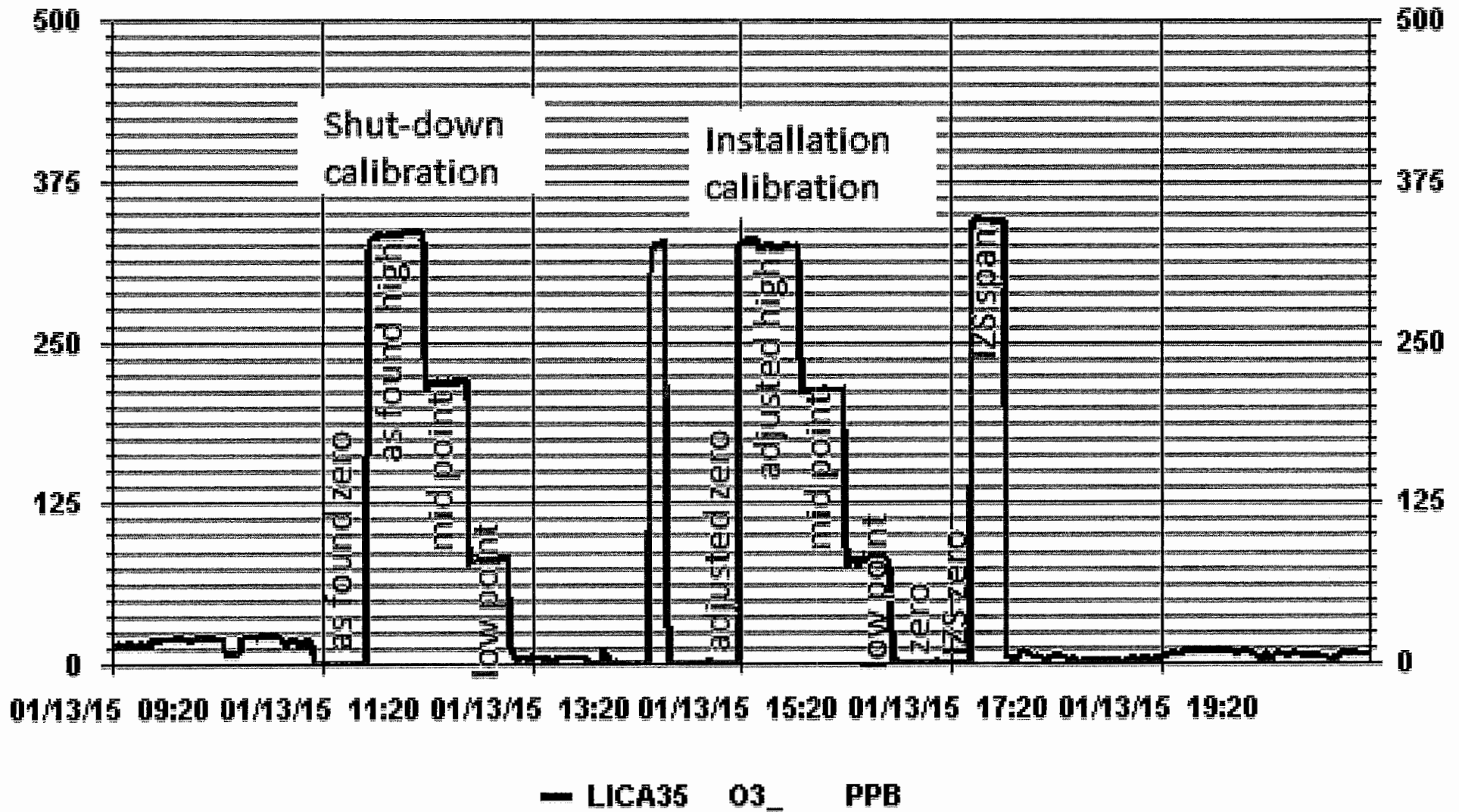
This is a startup/outline monthly calibration after cleaning the reaction cells. Daily zero span cut in immediately after the initial zero at 15:00 - discovered the problem and aborted cal program and continued with the calibration.

Thermo 49i O₃ Analyzer Calibration

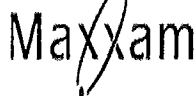
O₃ Calibration Curve

Calc Conc (ppb)	Indicated Conc (ppb)
0.4	0.4
78.8	78.8
212.4	212.4
323.2	323.2

01 Minute Averages



PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: 13-Jan-15
 Company: LICA
 Station Name/Location: Elk Point
 Previous Audit Date: 3-Dec-14

Parameter: PM2.5
 Performed by: Tom Bourque
 Start/End Time (mst): 1221-1438
 Calibration Purpose: monthly routine

1400A Information and Status:

Serial Number:	<u>1405A207691003</u>	As Found Filter Loading %:	<u>23.26%</u>
Ko Factor:	<u>15634</u>	As Left Filter Loading %:	<u>19.6 %</u>
Ambient Temperature °C:	<u>-6.57</u>	As Found Noise:	<u>0.042</u>
Ambient Pressure atm:	<u>.936</u>	As Left Noise:	<u>0.000</u>
Main Flow Reading lpm:	<u>3.00</u>	Pump Vacuum:	<u>0.36</u>
Aux Flow Reading lpm:	<u>13.67</u>	Warnings:	<u>none</u>

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher Scientific</u>	<u>Fisher Scientific</u>
Model:	<u>475 Mark III</u>	<u>FB61291</u>	<u>FB61291</u>
Serial Number:	<u>NA</u>	<u>130168457</u>	<u>130168457</u>
Calibration Date:	<u>NA</u>	<u>11-Apr-14</u>	<u>11-Apr-14</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.04	0.00	0.04
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	0.46	0.00	0.46
	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	0.00	0.04	0.00	0.04
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	0.46	0.00	0.46
	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>-6.6</u>	1405F pressure atm: <u>0.936</u>
reference temperature °C: <u>-8.2</u>	reference pressure: <u>0.940</u>
difference °C: <u>-1.6</u>	difference: <u>-0.004</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>-6.6</u>	1405F pressure atm: <u>0.936</u>
reference temperature °C: <u>-8.2</u>	reference pressure: <u>0.940</u>
difference °C: <u>-1.6</u>	difference: <u>0.004</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>2.93</u>	reference total/aux flow lpm: <u>16.29</u>
difference lpm: <u>-0.07</u>	difference lpm: <u>-0.38</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>2.99</u>	reference total/aux flow lpm: <u>16.32</u>
difference lpm: <u>-0.01</u>	difference lpm: <u>-0.35</u>

K_o Audit:

Last K_o audit date: NA
 1405F K_o factor: 15634
 Measured K_o factor: NA
 % difference: NA

Comments:



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: 27-Jan-15
 Company: LICA
 Station Name/Location: Elk Point
 Previous Audit Date: 13/03/2015

Parameter: PM2.5
 Performed by: Alex Yakupov
 Start/End Time (mst): 17:20/18:22
 Calibration Purpose: Monthly Audit #2

1400A Information and Status:

Serial Number:	<u>1405A207691003</u>	As Found Filter Loading %:	<u>21.65</u>
Ko Factor:	<u>15634.0</u>	As Left Filter Loading %:	<u>19.40</u>
Ambient Temperature °C:	<u>-2.96</u>	As Found Noise:	<u>0.008</u>
Ambient Pressure atm:	<u>0.927</u>	As Left Noise:	<u>0.000</u>
Main Flow Reading lpm:	<u>3.00</u>	Pump Vacuum:	<u>0.37</u>
Aux Flow Reading lpm:	<u>13.67</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>FB61291</u>	<u>FB61291</u>
Serial Number:	<u>NA</u>	<u>130168457</u>	<u>130168457</u>
Calibration Date:	<u>NA</u>	<u>25-Mar-14</u>	<u>25-Mar-14</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.04	0.00	0.04
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	0.46	0.00	0.46
	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	0.00	0.04	0.00	0.04
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	0.46	0.00	0.46
	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>-3.0</u>	1405F pressure atm: <u>0.927</u>
reference temperature °C: <u>-3.1</u>	reference pressure: <u>0.929</u>
difference °C: <u>-0.1</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>0.927</u>
reference temperature °C: <u>-3.1</u>	reference pressure: <u>0.929</u>
difference °C: <u>-0.1</u>	difference: <u>0.002</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>13.66</u>
reference main flow lpm: <u>3.01</u>	reference total/aux flow lpm: <u>13.69</u>
difference lpm: <u>0.01</u>	difference lpm: <u>0.03</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>13.67</u>
reference main flow lpm: <u>3.01</u>	reference total/aux flow lpm: <u>13.69</u>
difference lpm: <u>0.01</u>	difference lpm: <u>0.02</u>

K_o Audit:

Last K_o audit date: NA
 1405F K_o factor: 15634.0
 Measured K_o factor: NA
 % difference: NA

Comments:

WIND SYSTEM

Remove the colour



Meteorological Sensor Audit

Station Information

Company:	LICA	Performed By:	Chris Wesson/Kevin Hope
Location:	Elk Point	Reason:	Bi-annual audit
Audit Date:	21-Feb-14	Start Time (mst):	15:10
Previous Audit Date:	24-Nov-11	End Time (mst):	15:40

Wind Speed

Sensor make:	RM Young	Sensor height:	10M
Sensor model:	5103VK	Serial Number:	56589
Calibrator:	RM Young	Variable speed motor:	CA 03309
Voltage range:	0 - 1	Output signal range:	0 - 200 KPH

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:	RM Young	Sensor height:	10M
Sensor model:	5103VK	Serial Number:	56589
Calibrator:	RM Young	Variable speed motor:	CA03309
Voltage range:	0 - 1	Output signal range:	0 - 360

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 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:

CALIBRATORS

Company <u>Maxxam</u>		Operator: <u>Limin Li</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>Enviroics 6100</u>	Make/Model	<u>N/A</u>
Serial Number	<u>4760</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>December 2013</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>LL42475</u>	Barometric Pressure	<u>N/A</u>
NO/NOx Concentration	<u>48.5/48.5</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>	Gas flows not available from display.	

Callibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4980	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
4993	0.0	0.799	0.799	0.840	-0.001	0.839	5%	5%
4994	0.0	0.399	0.399	0.420	-0.001	0.419	5%	5%
4991	0.0	0.200	0.200	0.211	0.000	0.211	5%	5%
Absolute Average Percent Difference							5%	5%

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)=	1.0511	0.90-1.10		m (Slope)=	1.0496
b (Intercept % of FS)=	0.0400	± 3% F.S.		b (Intercept % of FS)=	0.0400

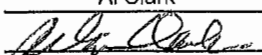
Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
4993	0.000	0.000	0.823	-0.001	0.822	NO ₂	% Diff, Limit
4993	0.480	0.530	0.293	0.530	0.823	0	± 10%
4993	0.240	0.269	0.554	0.269	0.823	0	± 10%
4993	0.090	0.096	0.727	0.097	0.824	0	± 10%
Absolute Average Percent Difference						0	± 10%

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

<u>NO₂</u>		<u>LIMITS</u>	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	1.0006	0.90-1.10	
b (Intercept % of FS)=	-0.0132	± 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>December 15, 2014</u>
		Full Scale (ppm)	<u>1.0</u>

COMMENTS: _____

Auditor: Al Clark
Operator Signature: 

Date: December 17, 2014
Location: McIntyre Center Edmonton



Calibrator Performance Audit

Hydrogen Sulphide (by Cylinder Dilution)

File No. 2012-301A

Company: Maxxam Operator: Ting Xu

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>N/A</u>
Serial Number	<u>831</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>Dec 21/11</u>	Temperature (°C)	<u>N/A</u>
H ₂ S Cylinder Conc.	<u>LL42648</u>	Barometric Pressure	<u>N/A</u>
H ₂ S Cylinder S/N	<u>10.0</u>		

Flow Measurements

Pt. No. 1 40 Pt. No. 2 20 Pt. No. 3 11.5

Calibrator Flow (scm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
Zero Air	0.0000	0.0000		
4960	0.0800	0.0809	1%	± 10%
4977	0.0400	0.0404	1%	± 10%
4987	0.0230	0.0234	2%	± 10%
Absolute Average Percent Difference			1%	± 10%

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

H ₂ S		LIMITS	
Correlation=	1.0000	≥	0.995
m (Slope)=	1.0107	0.90-1.10	
b (Intercept % of FS)=	0.0439	± 3%	F.S.

AENV Standards		H ₂ S Analyzer	
Audit Calibrator		Make/Model	<u>Teco 45C</u>
Make/Model	<u>R&R MFC 201</u>	Serial/AMU Number	<u>AMU 1624</u>
Serial/AMU Number	<u>AMU 1690</u>	Last Calibration Date	<u>Dec13/12</u>
		Full Scale (ppm)	<u>0.1</u>

COMMENTS: _____

Auditor: Al Clark Date: Decemébr 13, 2012
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

NO Cylinder Gas

File No. 2014-252CGA

Company: Maxxam **Operators name:** Limin Li
Cylinder #: LL42475 **Conc (PPM)** 48.5/48.5 **Tolerance (%)** 1 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model Teco 146I
Serial Number AMU 1809
Last Verification Date December 15, 2014
Gas Type NO **Conc.** 48.79
Cylinder Number CAL017892

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 42i **Serial/AMU Number:** 1868
Instrument Settings **Zero:** 4.3 **Span:** 1.017 **Range:** 1.0
Last Calibration: **Date:** Dec15/14 **C.F.** 1.000 **Done By:** Al Clark

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000				
4983	82.8	0.830	0.832	0.01662	60.181	50.0	50.1
4998	40.9	0.414	0.415	0.00818	122.200	50.6	50.7
4981	20.3	0.206	0.206	0.00408	245.369	50.5	50.5
Average Cylinder Concentration:						50.4	50.4

NO	NOx
Previous Stated Concentration PPM: <u>48.5</u>	<u>48.5</u>
Percent variance from Stated: <u>3.8</u>	<u>4.0</u>

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration Contains 50.3 ppm of SO2.
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark **Date:** December 16, 2014
Operator Signature: *Al Clark* **Location:** McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2013-324CGA

Company: Maxxam **Operator's Name:** Chris Weeson
Cylinder #: BLM005049 **Concentration PPM:** 10.1 **Tolerance(%):** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: February 21, 2013
 Gas Type: H2S Conc. 20.02
 Cylinder Number: D249556

Flow Measurement Device:

Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp, °C: 21.0 C
 B.P. 696 mmhg

Reference Analyzer:

Make/Model: Teco 45C Serial/AMU Number: 1624
 Instrument Settings: Zero: 7.5 Span: 1.023 Range: 0.1
 Last Calibration: Date: Feb 21/13 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	0.00749	133.586	10.3
5103	38.2	0.0768	0.00749	133.586	10.3
5087	17.9	0.0355	0.00352	284.190	10.1
5064	9.2	0.0182	0.00182	550.435	10.0
Average Cylinder Concentration:					10.1

Previous Stated Concentration PPM: 10.1

Percent variance from Stated: 0.2

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:

Date: February 21, 2013
 Location: McIntyre Center Edmonton



Praxair Control, Inc.
2001-24th Street
Edmond, OK 73035
Tel: 800-413-0776
Fax: 800-413-0302

03/27/2014

MAXXAM ANALYTICS INC/NA*
3272 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 Range	Analytical Accuracy
Methane	500.0ppm	501.4ppm	U	±1% rel
Propane	200.0ppm	202ppm	U	±1% rel
Nitrogen	Balance	Balance		

Analytical Instruments: Mettler-Toledo Analytical Balance-ID2xx/USA--
Hewlett-Packard (Agilent)-5890--GC-FID

Cylinder Style: AQ
Cylinder Pressure @ 70°F: 2200 psig
Cylinder Volume: 82.5 ltr
Valve Orientation: COA-210
Cylinder No(s): CC33874

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

Analyst: Todd Hryciw

This gas certificate reflects the measurements of Praxair Control, Inc. or its authorized service centers. It is prepared by gravimetric, volumetric, or partial pressure techniques. The technique used is specified in the "Analytical Range" column. The following information is provided for your reference: 1. The tolerance of the measurement is ±1.0% for all gases and ±0.5% for all other gases. 2. The tolerance of the measurement is ±1.0% for all gases and ±0.5% for all other gases. 3. The tolerance of the measurement is ±1.0% for all gases and ±0.5% for all other gases.

1. The tolerance of the measurement is ±1.0% for all gases and ±0.5% for all other gases.	2. The tolerance of the measurement is ±1.0% for all gases and ±0.5% for all other gases.	3. The tolerance of the measurement is ±1.0% for all gases and ±0.5% for all other gases.	4. The tolerance of the measurement is ±1.0% for all gases and ±0.5% for all other gases.
1. The tolerance of the measurement is ±1.0% for all gases and ±0.5% for all other gases.	2. The tolerance of the measurement is ±1.0% for all gases and ±0.5% for all other gases.	3. The tolerance of the measurement is ±1.0% for all gases and ±0.5% for all other gases.	4. The tolerance of the measurement is ±1.0% for all gases and ±0.5% for all other gases.

This certificate is valid for one year from the date of issue. It is not valid for use in any other jurisdiction. Praxair Control, Inc. makes no warranty, representation or guarantee as to the accuracy of the gas or the information for any purpose. The information is provided for your reference only. The information is the sole property of Praxair Control, Inc. and is not to be used for any other purpose. Praxair Control, Inc. is not responsible for any loss or damage resulting from the use of this certificate.

APPENDIX IV
ANALYTICAL RESULTS

PAHS SAMPLES

<p>RESULTS TO: Lily Lin LICA 4000, 19 St NE Calgary AB INVOICE TO: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB</p>	<p>403-219-3661 T2E 6P8 780 812-2182 T9N 2J5</p>	<p>LABORATORY SAMPLE ID: 15010129-001 MATRIX: Air Filter CLIENT SAMPLE ID: LICA/PUF/EP/Jan 12, 2015 CANISTER ID: TE04 DESCRIPTION: Elk Point DATE SAMPLED: 12-Jan-15 0:00 DATE RECEIVED: 20-Jan-15 REPORT CREATED: 02-Feb-15 REPORT VERSION: Version 01</p>
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
1-Methylnaphthalene		1.00	ug/Filter	0.01	NA-017	24-Jan-15
2-Methylnaphthalene		1.53	ug/Filter	0.01	NA-017	24-Jan-15
3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Acenaphthene		0.11	ug/Filter	0.01	NA-017	24-Jan-15
Acenaphthylene		0.14	ug/Filter	0.01	NA-017	24-Jan-15
Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Anthracene		0.02	ug/Filter	0.01	NA-017	24-Jan-15
Benzo(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Benzo(a)pyrene		0.01	ug/Filter	0.01	NA-017	24-Jan-15
Benzo(b,j,k)fluoranthene		0.05	ug/Filter	0.01	NA-017	24-Jan-15
Benzo(c)phenanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Benzo(e)pyrene		0.01	ug/Filter	0.01	NA-017	24-Jan-15
Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Chrysene		0.02	ug/Filter	0.01	NA-017	24-Jan-15
Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Fluoranthene		0.09	ug/Filter	0.01	NA-017	24-Jan-15
Fluorene		0.24	ug/Filter	0.01	NA-017	24-Jan-15
Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Naphthalene		1.17	ug/Filter	0.01	NA-017	24-Jan-15
Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	24-Jan-15
Phenanthrene		0.33	ug/Filter	0.01	NA-017	24-Jan-15
Pyrene		0.06	ug/Filter	0.01	NA-017	24-Jan-15

<p>Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit</p>	<p>Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca</p>
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<p>RESULTS TO: Lily Lin LICA 4000, 19 St NE Calgary AB</p> <p>INVOICE TO: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB</p>	<p>403-219-3661</p> <p>T2E 6P8</p> <p>780 812-2182</p> <p>T9N 2J5</p>	<p>LABORATORY SAMPLE ID: 15010129-001</p> <p>MATRIX: Air Filter</p> <p>CLIENT SAMPLE ID: LICA/PUF/EP/Jan 12, 2015</p> <p>CANISTER ID: TE04</p> <p>DESCRIPTION: Elk Point</p> <p>DATE SAMPLED: 12-Jan-15 0:00</p> <p>DATE RECEIVED: 20-Jan-15</p> <p>REPORT CREATED: 02-Feb-15</p> <p>REPORT VERSION: Version 01</p>
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
Retene		0.06	ug/Filter	0.01	NA-017	24-Jan-15

<p>Qualifiers</p> <p>K Off-scale low. Actual value is known to be less than the value given</p> <p>T Value reported is less than the laboratory method detection limit</p> <p>U Compound was analyzed for but not detected</p> <p>I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit</p>	<p>Certified By: Graham Knox, Ops Manager</p> <p>On behalf of: PJ Pretorius, Portfolio Manager, EAS</p> <p>Inquiries: (780) 632 8455</p> <p>E-mail: EAS.Results@albertainnovates.ca</p>
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RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15010165-003 MATRIX: Air Filter CLIENT SAMPLE ID: LICA/PUF/EP/Jan 18, 2015 CANISTER ID: TE07 DESCRIPTION: Elk Point Airport DATE SAMPLED: 18-Jan-15 0:00 DATE RECEIVED: 22-Jan-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result Units	MDL	Method	Analysis Date
1-Methylnaphthalene		0.67 ug/PUF	0.01	NA-017	12-Feb-15
2-Methylnaphthalene		1.22 ug/PUF	0.01	NA-017	12-Feb-15
3-Methylcholanthrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Acenaphthene		0.08 ug/PUF	0.01	NA-017	12-Feb-15
Acenaphthylene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Acridine	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(a)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(a)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(b,j,k)fluoranthene		0.03 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(c)phenanthrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(e)pyrene		0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(ghi)perylene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Chrysene		0.02 ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Fluoranthene		0.04 ug/PUF	0.01	NA-017	12-Feb-15
Fluorene		0.16 ug/PUF	0.01	NA-017	12-Feb-15
Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Naphthalene		0.48 ug/PUF	0.01	NA-017	12-Feb-15
Perylene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Phenanthrene		0.13 ug/PUF	0.01	NA-017	12-Feb-15
Pyrene		0.03 ug/PUF	0.01	NA-017	12-Feb-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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<p>RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8</p> <p>INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>LABORATORY SAMPLE ID: 15010165-003</p> <p>MATRIX: Air Filter</p> <p>CLIENT SAMPLE ID: LICA/PUF/EP/Jan 18, 2015</p> <p>CANISTER ID: TE07</p> <p>DESCRIPTION: Elk Point Airport</p> <p>DATE SAMPLED: 18-Jan-15 0:00</p> <p>DATE RECEIVED: 22-Jan-15</p> <p>REPORT CREATED: 04-Mar-15</p> <p>REPORT VERSION: Version 01</p>
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Parameter	Qualifier	Result Units	MDL	Method	Analysis Date
Retene		0.02 ug/PUF	0.01	NA-017	12-Feb-15

Qualifiers

K Off-scale low. Actual value is known to be less than the value given
T Value reported is less than the laboratory method detection limit
U Compound was analyzed for but not detected
I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

Certified By: Graham Knox, Ops Manager
On behalf of: PJ Pretorius, Portfolio Manager, EAS

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

RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15010249-001 MATRIX: Air Filter CLIENT SAMPLE ID: LICA/PUF/EP/Jan 24, 2015 CANISTER ID: P13-02 DESCRIPTION: Elk Point Airport DATE SAMPLED: 24-Jan-15 0:00 DATE RECEIVED: 30-Jan-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result Units	MDL	Method	Analysis Date
1-Methylnaphthalene		0.09 ug/PUF	0.01	NA-017	12-Feb-15
2-Methylnaphthalene		0.16 ug/PUF	0.01	NA-017	12-Feb-15
3-Methylcholanthrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Acenaphthene		0.02 ug/PUF	0.01	NA-017	12-Feb-15
Acenaphthylene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Acridine	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(a)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(a)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(b,j,k)fluoranthene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(c)phenanthrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(e)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(ghi)perylene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Chrysene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Fluoranthene		0.04 ug/PUF	0.01	NA-017	12-Feb-15
Fluorene		0.10 ug/PUF	0.01	NA-017	12-Feb-15
Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Naphthalene		0.11 ug/PUF	0.01	NA-017	12-Feb-15
Perylene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Phenanthrene		0.15 ug/PUF	0.01	NA-017	12-Feb-15
Pyrene		0.03 ug/PUF	0.01	NA-017	12-Feb-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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<p>RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>LABORATORY SAMPLE ID: 15010249-001</p> <p>MATRIX: Air Filter</p> <p>CLIENT SAMPLE ID: LICA/PUF/EP/Jan 24, 2015</p> <p>CANISTER ID: P13-02</p> <p>DESCRIPTION: Elk Point Airport</p> <p>DATE SAMPLED: 24-Jan-15 0:00</p> <p>DATE RECEIVED: 30-Jan-15</p> <p>REPORT CREATED: 04-Mar-15</p> <p>REPORT VERSION: Version 01</p>
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Parameter	Qualifier	Result Units	MDL	Method	Analysis Date
Retene		0.02 ug/PUF	0.01	NA-017	12-Feb-15

<p>Qualifiers</p> <p>K Off-scale low. Actual value is known to be less than the value given</p> <p>T Value reported is less than the laboratory method detection limit</p> <p>U Compound was analyzed for but not detected</p> <p>I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit</p>	<p>Certified By: Graham Knox, Ops Manager</p> <p>On behalf of: PJ Pretorius, Portfolio Manager, EAS</p> <p>Inquiries: (780) 632 8455</p> <p>E-mail: EAS.Results@albertainnovates.ca</p>
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RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15020038-003 MATRIX: Air Filter CLIENT SAMPLE ID: LICA/PUF/EP/Jan 30, 2015 CANISTER ID: TE-02 DESCRIPTION: Elk Point Airport DATE SAMPLED: 30-Jan-15 0:00 DATE RECEIVED: 05-Feb-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result Units	MDL	Method	Analysis Date
1-Methylnaphthalene		0.10 ug/PUF	0.01	NA-017	12-Feb-15
2-Methylnaphthalene		0.14 ug/PUF	0.01	NA-017	12-Feb-15
3-Methylcholanthrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Acenaphthene		0.03 ug/PUF	0.01	NA-017	12-Feb-15
Acenaphthylene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Acridine	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(a)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(a)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(b,j,k)fluoranthene		0.02 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(c)phenanthrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(e)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Benzo(ghi)perylene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Chrysene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Fluoranthene		0.04 ug/PUF	0.01	NA-017	12-Feb-15
Fluorene		0.08 ug/PUF	0.01	NA-017	12-Feb-15
Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Naphthalene		0.25 ug/PUF	0.01	NA-017	12-Feb-15
Perylene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	12-Feb-15
Phenanthrene		0.13 ug/PUF	0.01	NA-017	12-Feb-15
Pyrene		0.03 ug/PUF	0.01	NA-017	12-Feb-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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RESULTS TO: Adewunmi Adekanmbi LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15020038-003 MATRIX: Air Filter CLIENT SAMPLE ID: LICA/PUF/EP/Jan 30, 2015 CANISTER ID: TE-02 DESCRIPTION: Elk Point Airport DATE SAMPLED: 30-Jan-15 0:00 DATE RECEIVED: 05-Feb-15 REPORT CREATED: 04-Mar-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
Retene		0.01	ug/PUF	0.01	NA-017	12-Feb-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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NMHC CANISTER SAMPLES

RESULTS TO: Lily Lin LICA 4000, 19 St NE Calgary AB INVOICE TO: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB	403-219-3661 T2E 6P8 780 812-2182 T9N 2J5	LABORATORY SAMPLE ID: 15010128-001 MATRIX: Ambient Air CLIENT SAMPLE ID: LICA/VOC/ELK/Jan 12, 2015 CANISTER ID: 1061 DESCRIPTION: Elk Point Airport DATE SAMPLED: 12-Jan-15 22:20 DATE RECEIVED: 20-Jan-15 REPORT CREATED: 02-Feb-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result Units	MDL	Method	Analysis Date
1,1,1-Trichloroethane	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1,1,2,2-Tetrachloroethane	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1,1,2-Trichloroethane	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1,1-Dichloroethane	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1,1-Dichloroethylene	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1,2,3-Trimethylbenzene	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1,2,4-Trichlorobenzene	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1,2,4-Trimethylbenzene	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1,2-Dibromoethane	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1,2-Dichlorobenzene	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1,2-Dichloroethane	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1,2-Dichloropropane	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1,3,5-Trimethylbenzene	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1,3-Butadiene	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1,3-Dichlorobenzene	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1,4-Dichlorobenzene	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1,4-Dioxane	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1-Butene	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1-Hexene	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
1-Pentene	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
2,2,4-Trimethylpentane	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
2,2-Dimethylbutane	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
2,3,4-Trimethylpentane	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
2,3-Dimethylbutane	I	0.52 ppbv	0.03	AC-058	22-Jan-15
2,3-Dimethylpentane	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15
2,4-Dimethylpentane	K, T, U	< 0.06 ppbv	0.03	AC-058	22-Jan-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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RESULTS TO: Lily Lin LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15010128-001 MATRIX: Ambient Air CLIENT SAMPLE ID: LICA/VOC/ELK/Jan 12, 2015 CANISTER ID: 1061 DESCRIPTION: Elk Point Airport DATE SAMPLED: 12-Jan-15 22:20 DATE RECEIVED: 20-Jan-15 REPORT CREATED: 02-Feb-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
2-Methylheptane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
2-Methylhexane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
2-Methylpentane		0.72	ppbv	0.03	AC-058	22-Jan-15
3-Methylheptane	K, T, U	< 0.06	ppbv	0.02	AC-058	22-Jan-15
3-Methylhexane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
3-Methylpentane	I	0.52	ppbv	0.03	AC-058	22-Jan-15
Acetone		14.8	ppbv	0.03	AC-058	22-Jan-15
Acrolein	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Benzene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Benzyl chloride	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Bromodichloromethane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Bromoform	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Bromomethane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Carbon disulfide	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Carbon tetrachloride	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Chlorobenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Chloroethane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Chloroform	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Chloromethane		1.24	ppbv	0.03	AC-058	22-Jan-15
cis-1,2-Dichloroethene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
cis-1,3-Dichloropropene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
cis-2-Butene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
cis-2-Pentene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Cyclohexane		0.83	ppbv	0.03	AC-058	22-Jan-15
Cyclopentane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Dibromochloromethane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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RESULTS TO: Lily Lin LICA 4000, 19 St NE Calgary AB T2E 6P8 INVOICE TO: Charmaine Code PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	LABORATORY SAMPLE ID: 15010128-001 MATRIX: Ambient Air CLIENT SAMPLE ID: LICA/VOC/ELK/Jan 12, 2015 CANISTER ID: 1061 DESCRIPTION: Elk Point Airport DATE SAMPLED: 12-Jan-15 22:20 DATE RECEIVED: 20-Jan-15 REPORT CREATED: 02-Feb-15 REPORT VERSION: Version 01
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Parameter	Qualifier	Result	Units	MDL	Method	Analysis Date
n-Dodecane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
n-Heptane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
n-Hexane		1.30	ppbv	0.03	AC-058	22-Jan-15
n-Octane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
n-Pentane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
n-Propylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
n-Undecane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Naphthalene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
n-Nonane	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
o-Ethyltoluene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
o-Xylene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
p-Diethylbenzene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
p-Ethyltoluene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Styrene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Tetrachloroethylene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Tetrahydrofuran	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Toluene	I	0.52	ppbv	0.03	AC-058	22-Jan-15
trans-1,2-Dichloroethylene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
trans-1,3-Dichloropropylene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
trans-2-Butene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
trans-2-Pentene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Trichloroethylene	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Vinyl acetate	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15
Vinyl chloride	K, T, U	< 0.06	ppbv	0.03	AC-058	22-Jan-15

Qualifiers K Off-scale low. Actual value is known to be less than the value given T Value reported is less than the laboratory method detection limit U Compound was analyzed for but not detected I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit	Certified By: Graham Knox, Ops Manager On behalf of: PJ Pretorius, Portfolio Manager, EAS Inquiries: (780) 632 8455 E-mail: EAS.Results@albertainnovates.ca
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