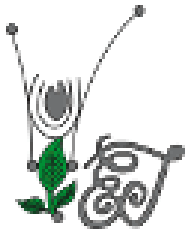
AIR POLLUTION MONITORING



environics trust
innovations in community development

AIR POLLUTION

- Air pollution occurs when gases, dust particles, fumes (or smoke) or odor are introduced into the atmosphere in a way that makes it harmful to humans, animals and plant. This is because the air becomes dirty (contaminated or unclean). During our work in the field, we have often encountered statements like “our clothes become dirty when left out in the open”, “there is a thin layer of dust on everything after some time” etc. all contained in air around us.

Vast majority of world – 6.76 billion people – living with excessive air pollution – **UN report**

Need to check air pollution

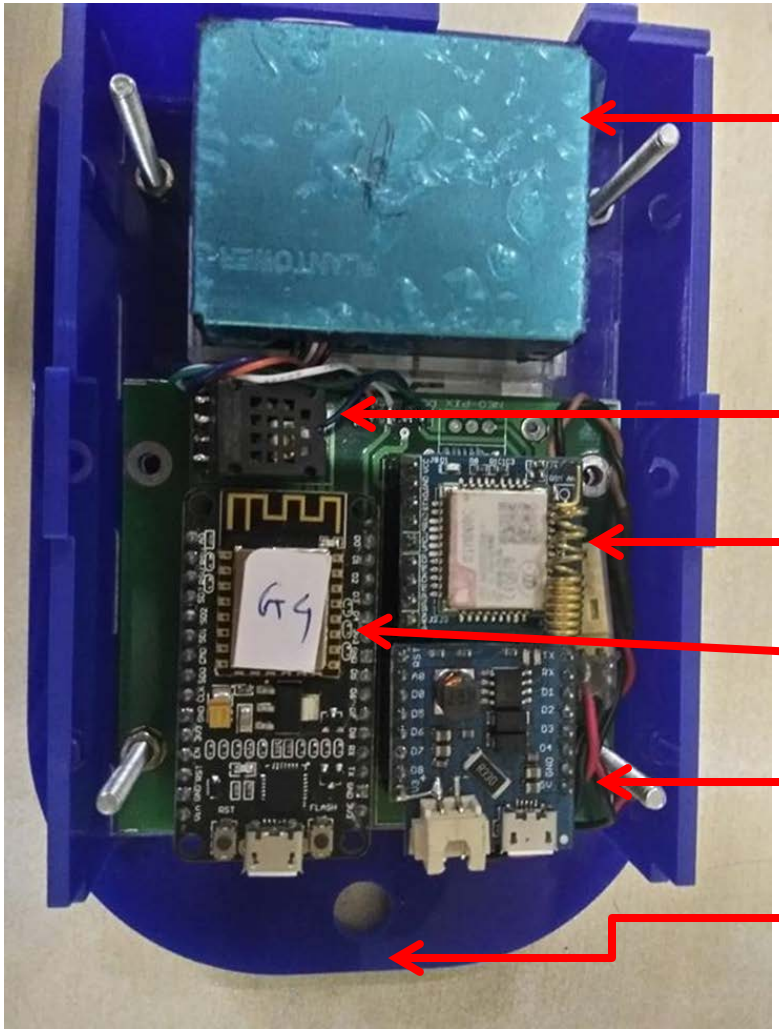
- Although true lack any basis and proof and we cannot have a comparison regarding how bad is the air in the area compared to let’s say air near our office in Delhi.

  How safe is the air I breathe in my room?

Is my health being impacted due to the air I brea while commuting to office or while in office? These questions have no easy answers.

- A start can be made by monitoring the amount of dust particles which are in the air along with comfort factors like Temperature and humidity. Measuring the amount of dust particles and comparing these results with the Air Quality Index for India can give a measure of how polluted the air is while comfort factors like Temperature and humidity can help in gauging the impact of climate change, construction, vehicle density and other factors in the area.
- Environics trust has procured some devices which can do exactly this task – measure different sizes of dust particles (PM 1, 2.5, 10), temperature and humidity. There are sensors available to measure other polluting and harmful factors like CO, SO_2, NO_x etc, and these sensors may be incorporated in future devices which will be procured.

AIR POLLUTION MONITORING INSTRUMENT



SPM MONITOR PMS 5003

AM 2320

SIM CARD MODULE

ESP 8266-NODE MCU 12E

VOLTAGE MODULE

BATTERY(BELOW)

ABOUT THE INSTRUMENT

- In our monitoring device there are following components:-

- **ESP 8266-NODE MCU 12E**:-This is the main part or the controller of the device. All the data of the sensors, sim card and battery are controlled by this component. A program has been developed which instructs the control to perform necessary actions. The chip is Wi-Fi enabled and this feature may be used in future.
- **SPM MONITOR PMS 5003:-** sensor to measure or monitor the dust particles present in the air.
- **AM 2320**:- Sensor to measure and record temperature and humidity.
- **SIM MODULE**: - In this module we insert the sim card which is used to transmit the data to the server where the data is store and presented as graph.

- **VOLTAGE MODULE**: - With the help of this module we can charge the battery of the device.
- **VMOS BATTERY**:-We use a battery of 3000 mAH (miliampere-hour)

These are the pictures of mines we visited


06-10-2017 11:28


06-10-2017 09:48


06-10-2017 09:48


06-10-2017 11:33


06-10-2017 11:51

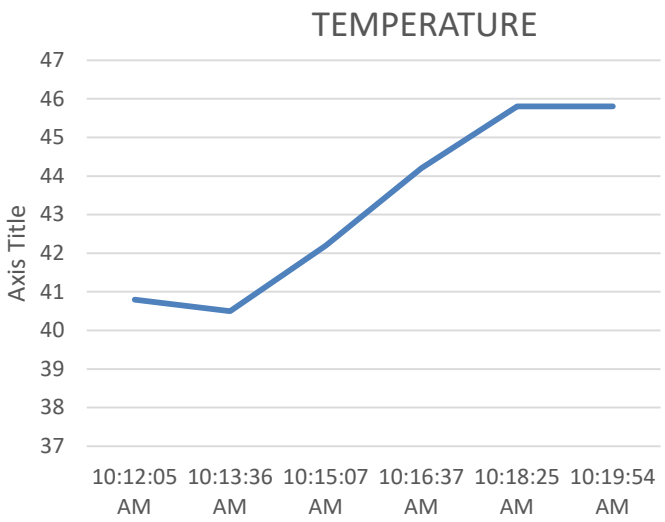
AIR QUALITY INDEX

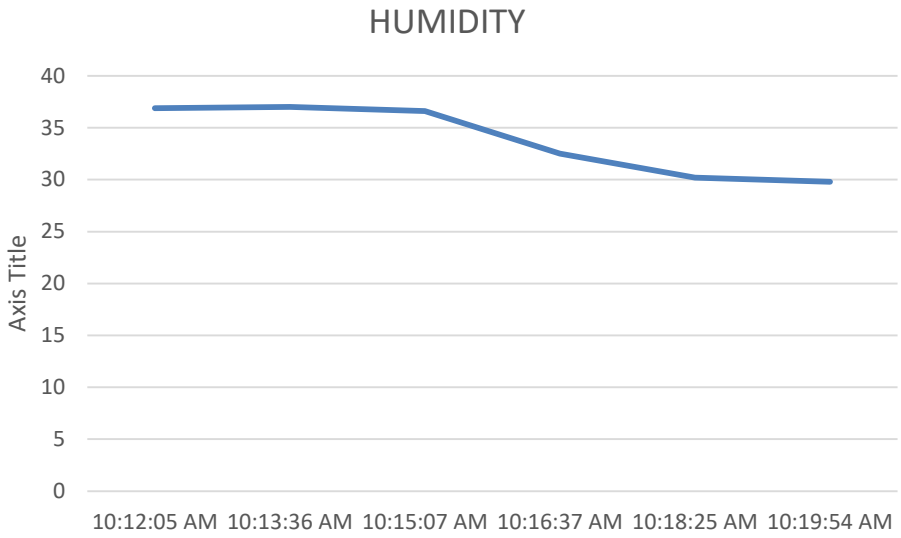
- The AQI is an index for reporting daily air quality. It tells you how clean or polluted your air is, and what associated health effects might be a concern for you. The AQI focuses on health effects you may experience within a few hours or days after breathing polluted air.
- The former Minister for Environment, Forests & Climate Change, Shri Prakash Javadekar launched The National Air Quality Index (AQI) in New Delhi on 17 September 2014 under the Swachh Bharat Abhiyan. There are six AQI categories, namely Good, Satisfactory, Moderately polluted, Poor, Very Poor, and Severe. The proposed AQI will consider eight pollutants (PM10, PM2.5, NO_2, SO_2, CO, O_3, NH_3, and Pb) for which short-term (up to 24-hourly averaging period) standards are prescribed. Based on the measured ambient concentrations, corresponding standards and likely health impact, a sub-index is calculated for each of these pollutants.

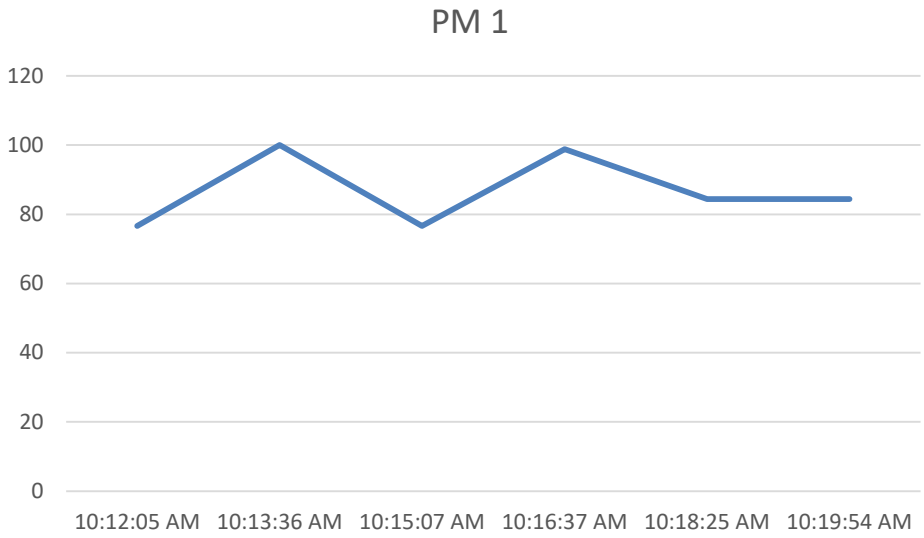
AIR QUALITY INDEX

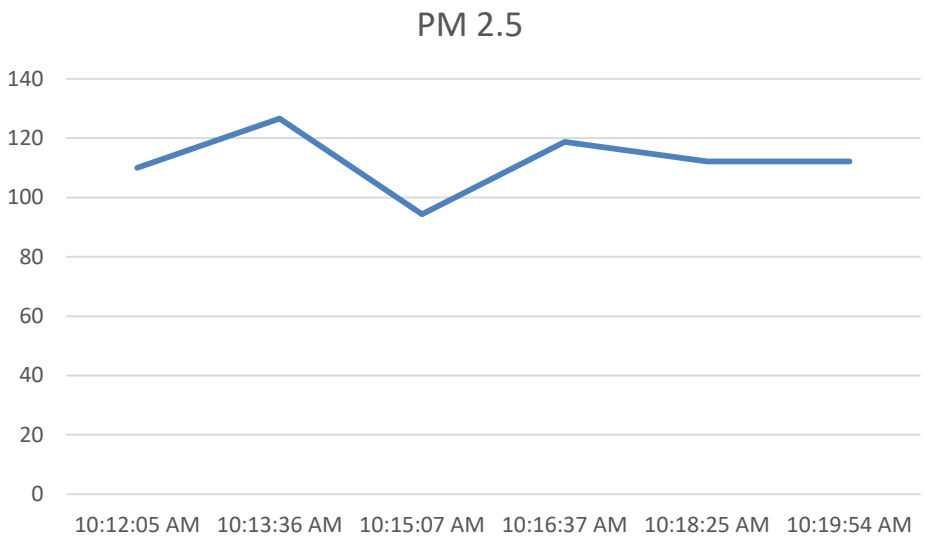
AQI Category, Pollutants and Health Breakpoints[2]								
AQI Category (Range)	PM_{10} (24hr)	$PM_{2.5}$ (24hr)	NO_2 (24hr)	O_3 (8hr)	CO (8hr)	SO_2 (24hr)	NH_3 (24hr)	Pb (24hr)
Good (0-50)	0-50	0-30	0-40	0-50	0-1.0	0-40	0-200	0-0.5
Satisfactory (51-100)	51-100	31-60	41-80	51-100	1.1-2.0	41-80	201-400	0.5-1.0
Moderately polluted (101-200)	101-250	61-90	81-180	101-168	2.1-10	81-380	401-800	1.1-2.0
Poor (201-300)	251-350	91-120	181-280	169-208	10-17	381-800	801-1200	2.1-3.0
Very poor (301-400)	351-430	121-250	281-400	209-748	17-34	801-1600	1200-1800	3.1-3.5
Severe (401-500)	430+	250+	400+	748+	34+	1600+	1800+	3.5+

LODNA VILLAGE








PM 2.5
140
120
100
80
60
40
20
0
10:12:05 AM
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10:16:37 AM
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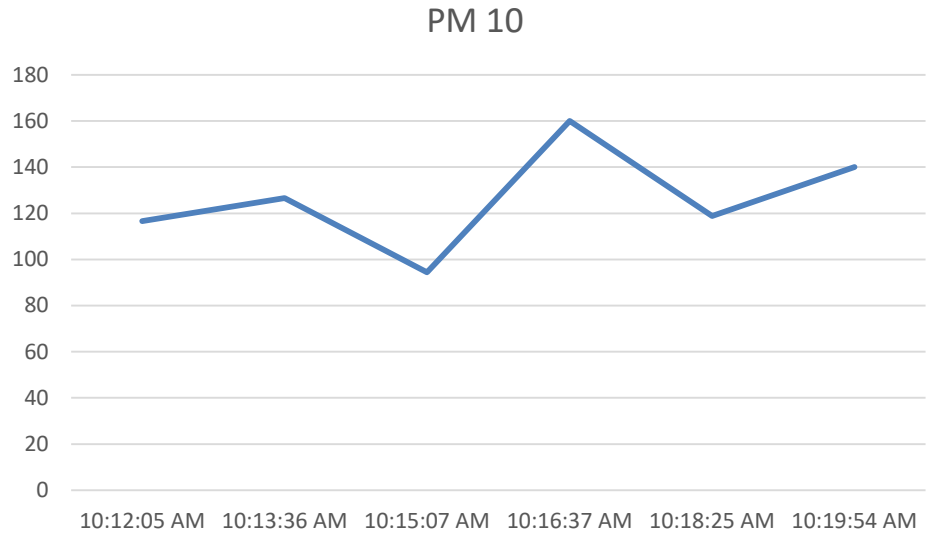
10:19:54 AM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180
160
140
120
100
80
60
40
20
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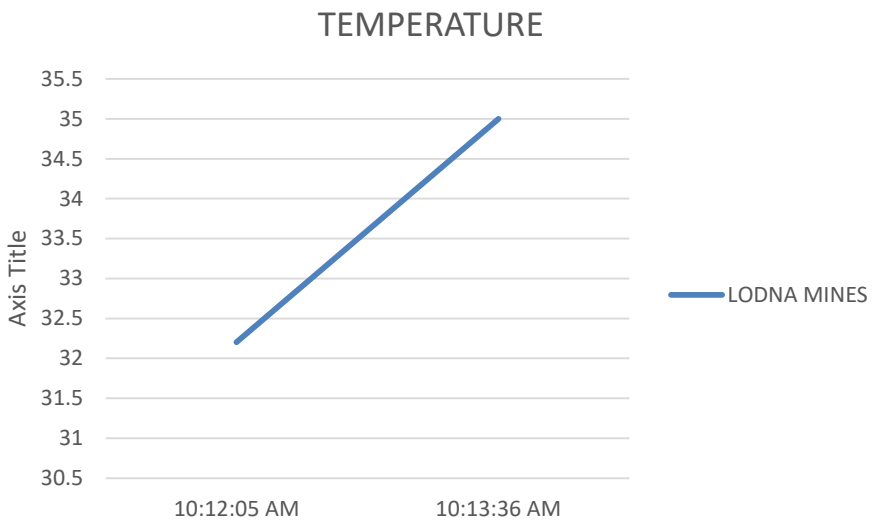
10:15:07 AM
10:16:37 AM
10:18:25 AM
10:19:54 AM

LODNA MINES


TEMPERATURE
35.5
35
34.5
34
33.5
33
32.5
32
31.5
31
30.5
Axis Title
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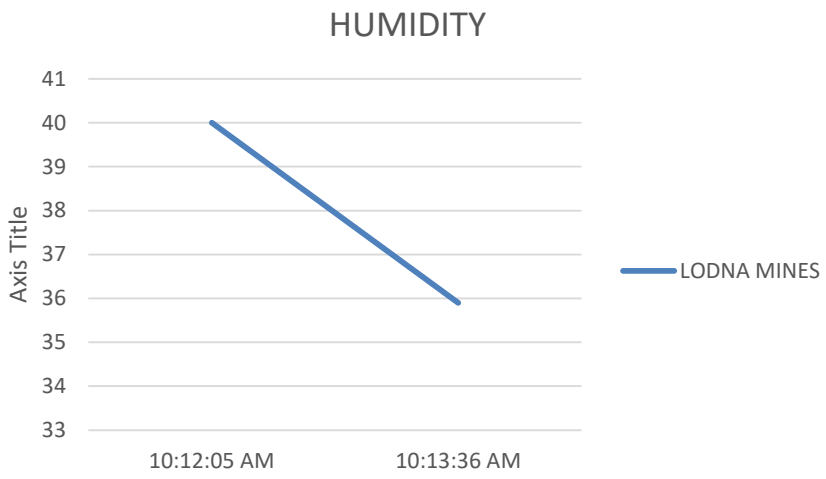
10:13:36 AM
LODNA MINES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Axis Title
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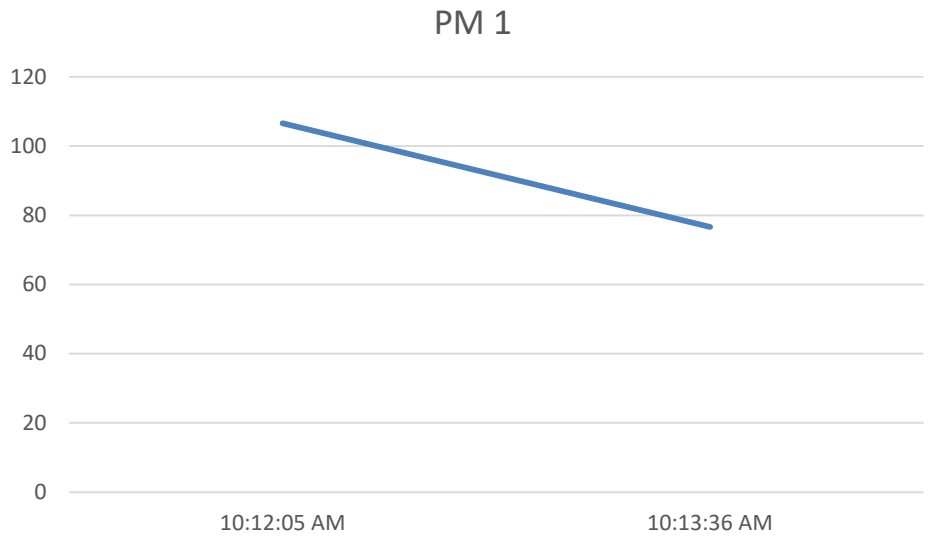
10:13:36 AM
LODNA MINES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60
40
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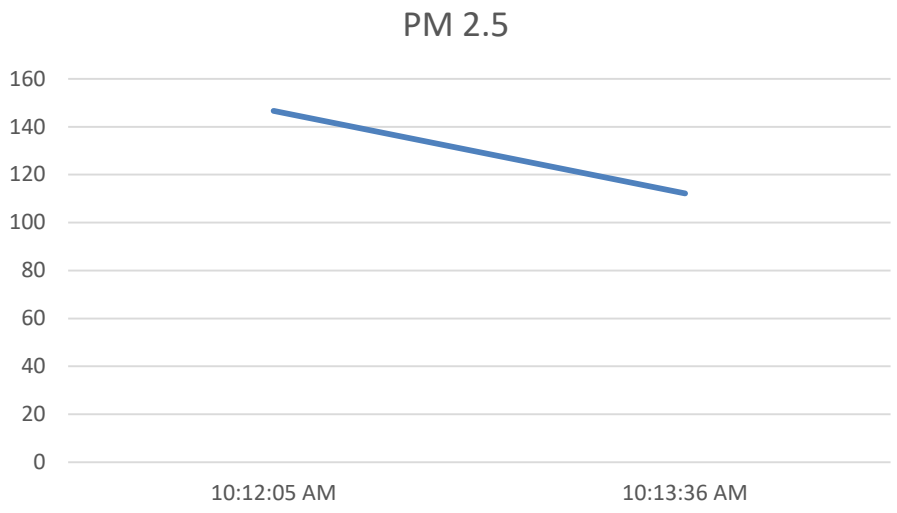
10:13:36 AM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160
140
120
100
80
60
40
20
0
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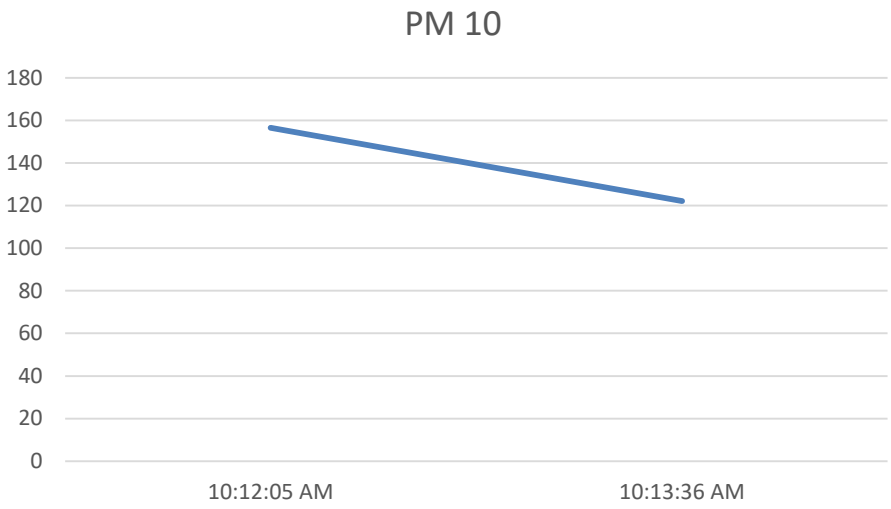
10:13:36 AM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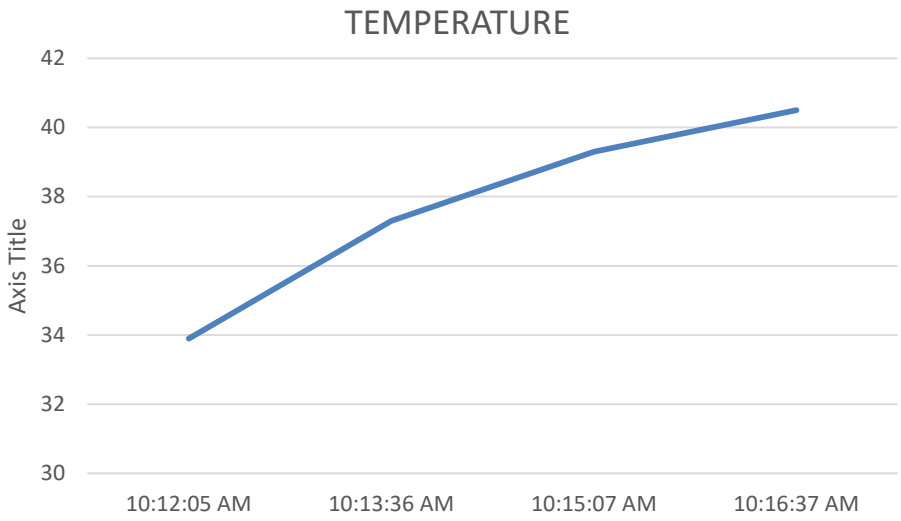
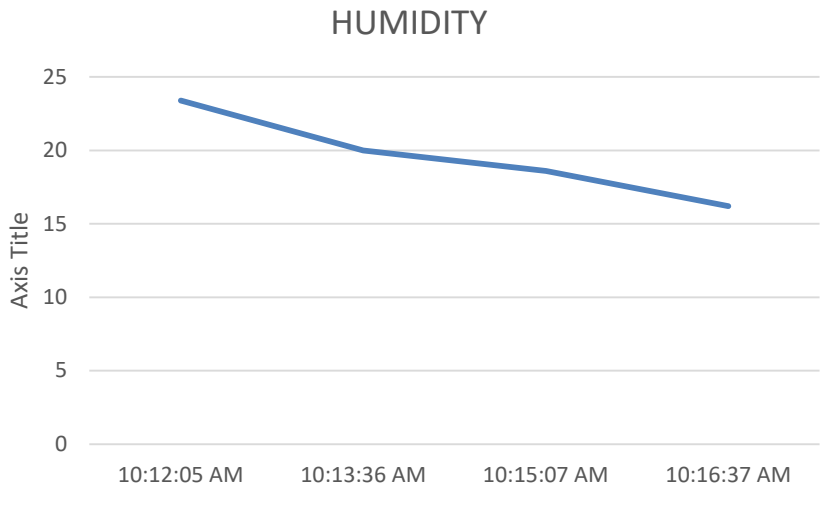
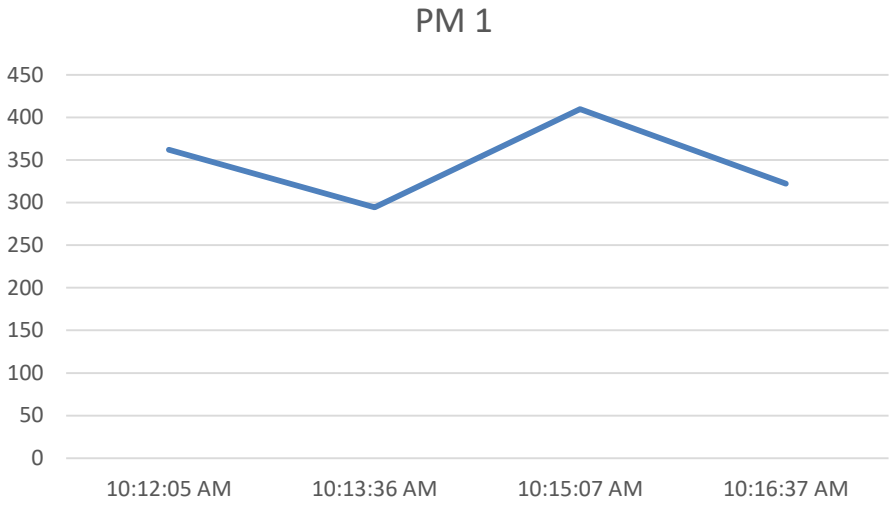
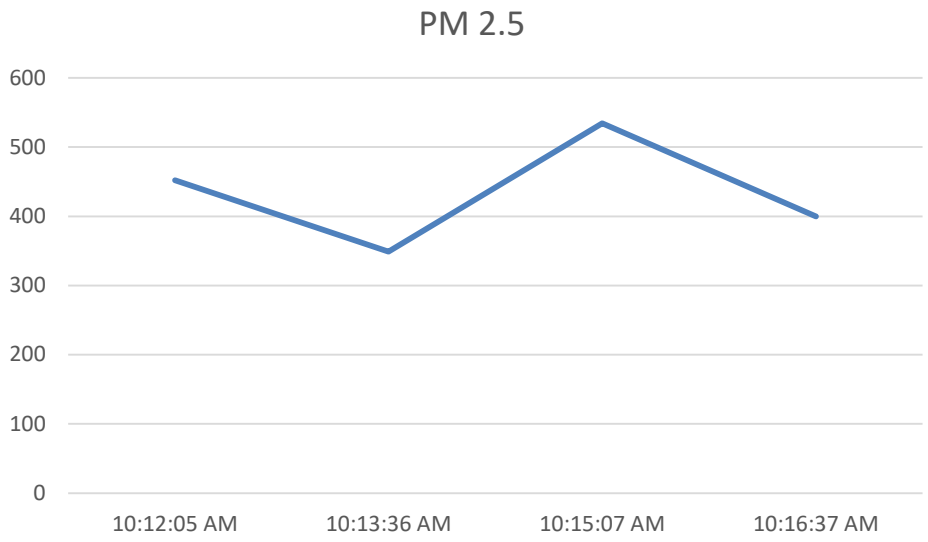
160
140
120
100
80
60
40
20
0
10:12:05 AM
10:13:36 AM

LEBADA MINES





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500
400
300
200
100
0
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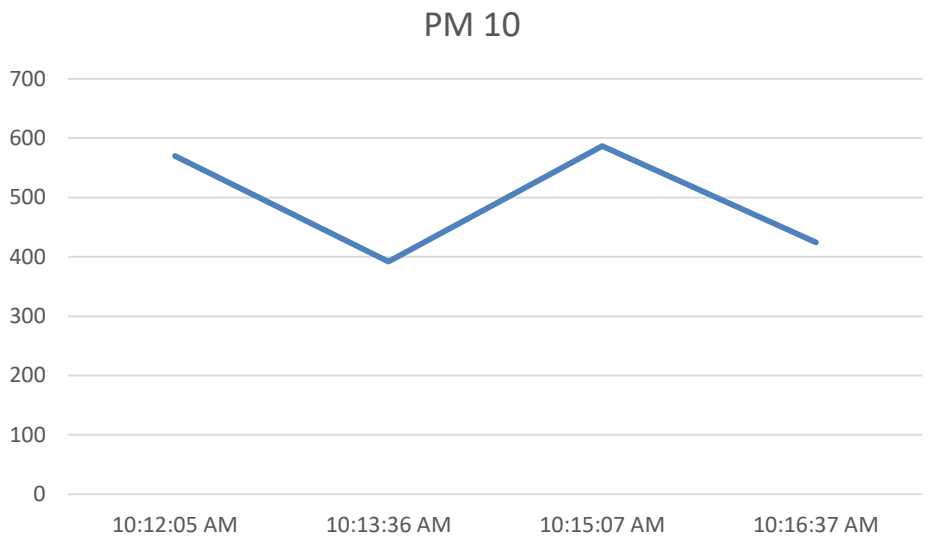
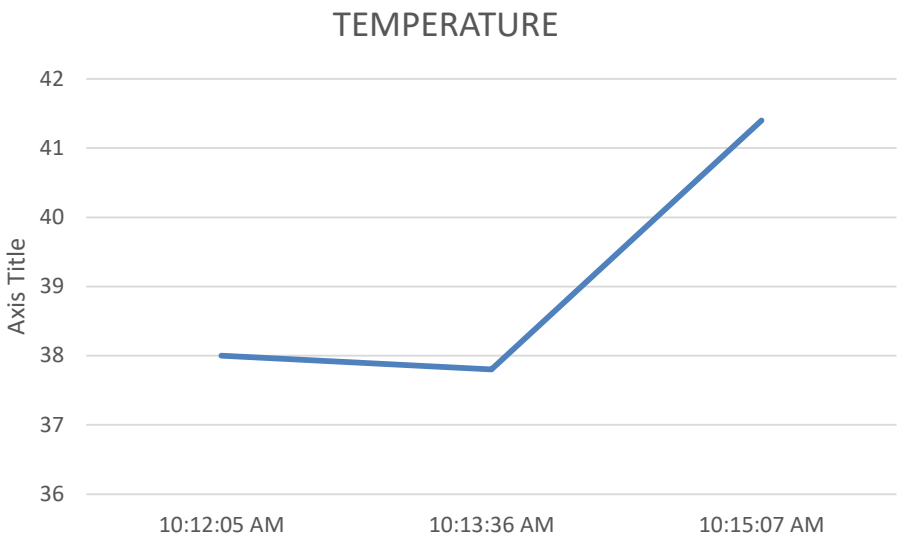
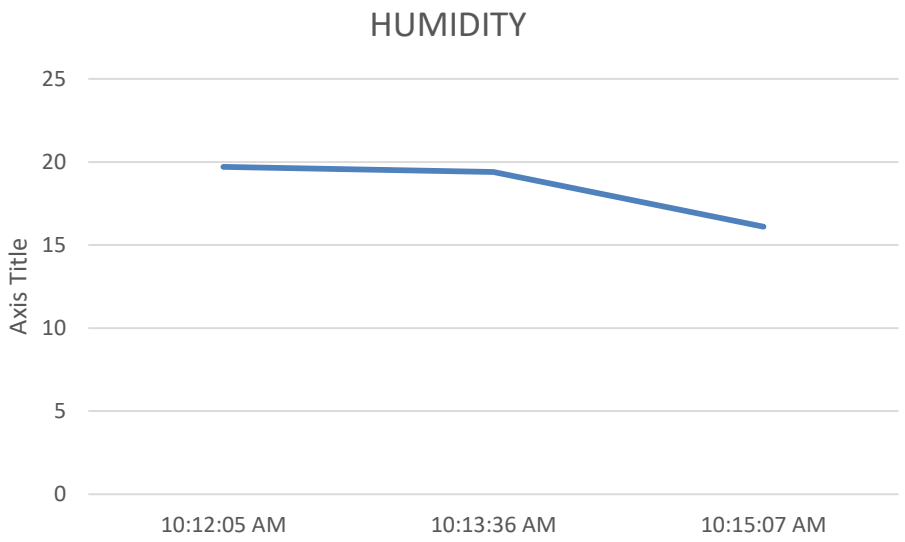
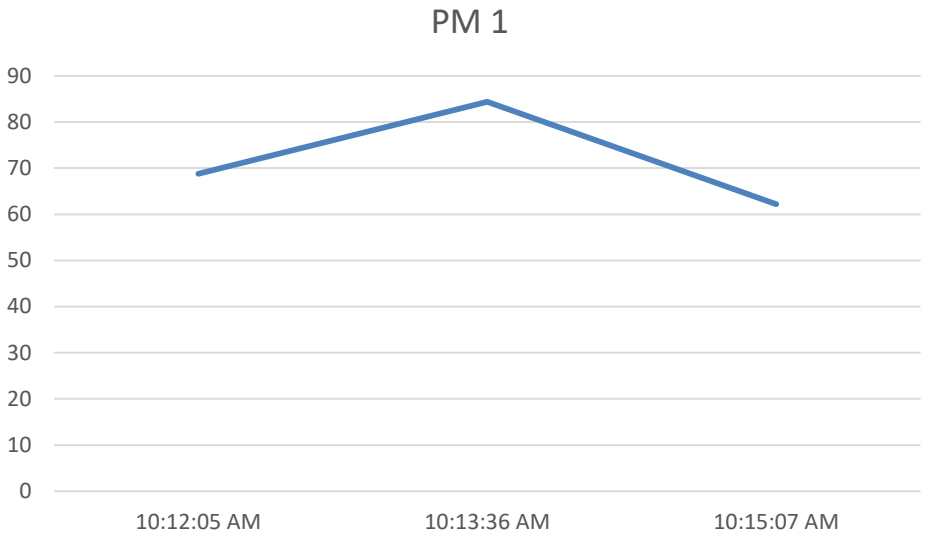
10:16:37 AM

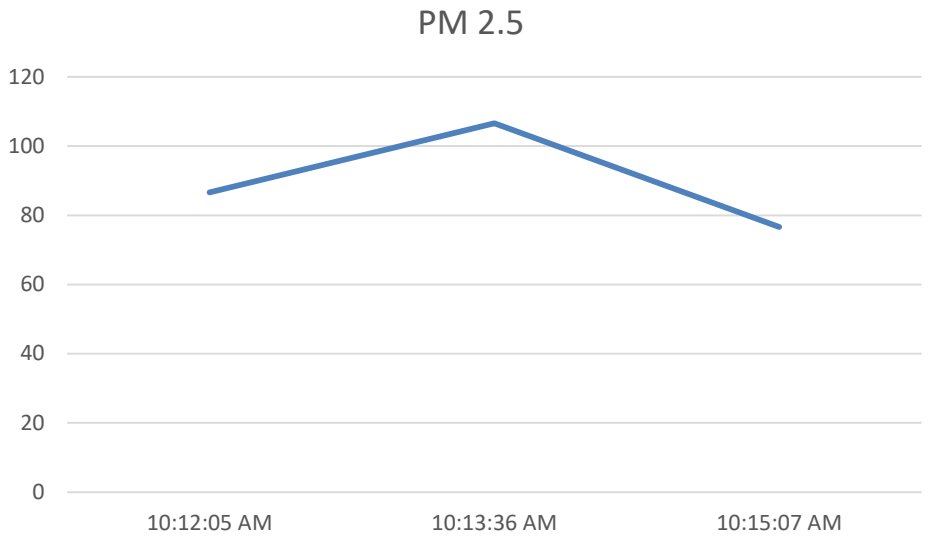

PM 10
700
600
500
400
300
200
100
0
10:12:05 AM
10:13:36 AM
10:15:07 AM
10:16:37 AM

MUDI DIH MINES





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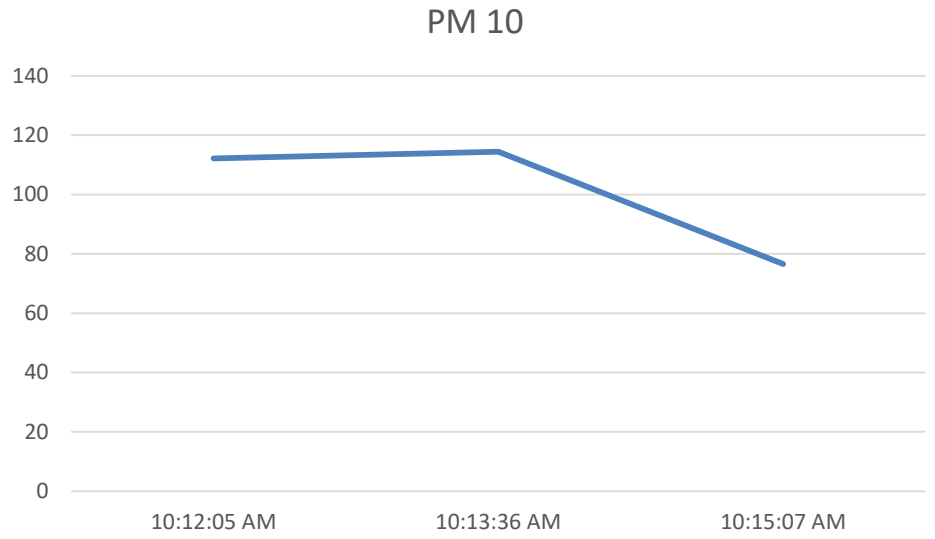
80
60
40
20
0
10:12:05 AM
10:13:36 AM
10:15:07 AM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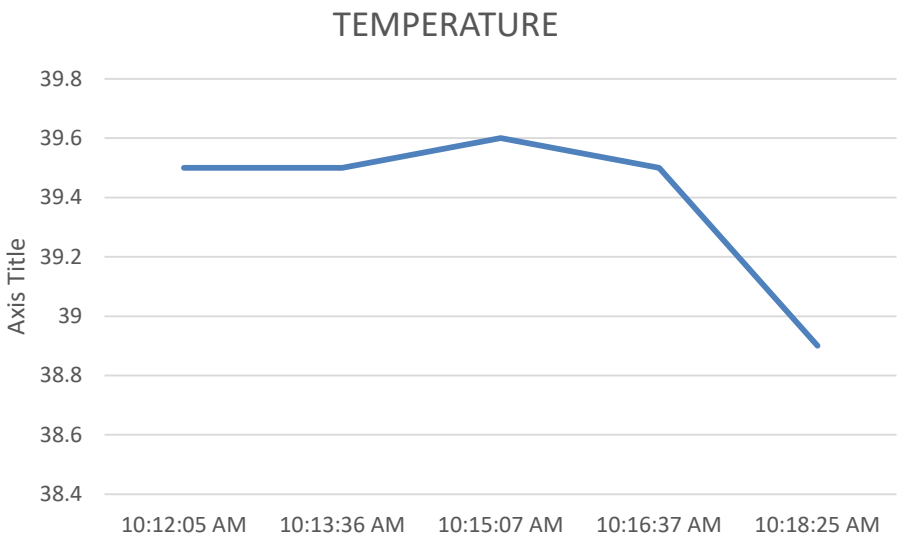
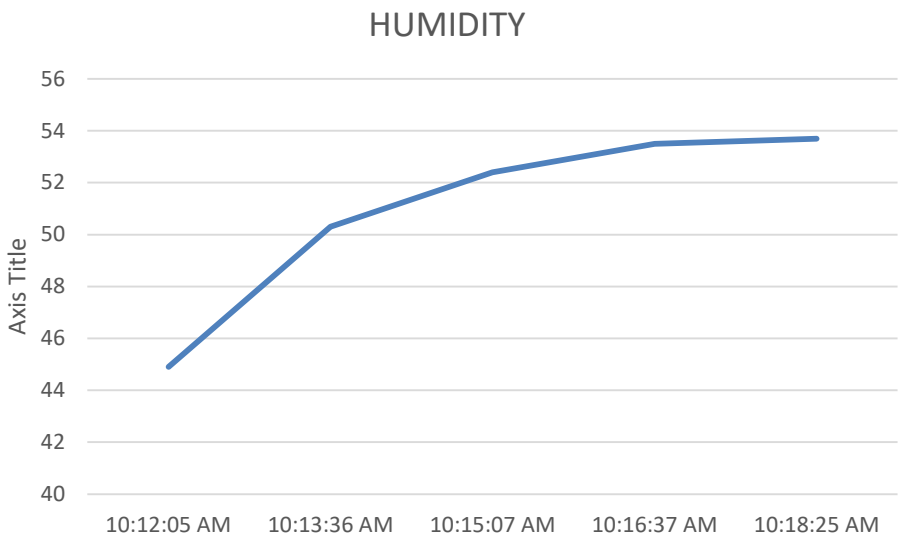
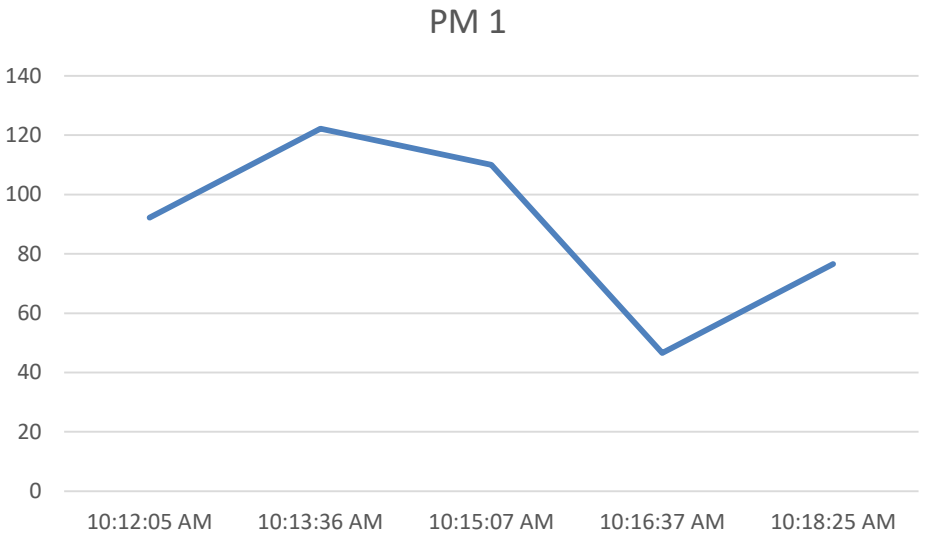
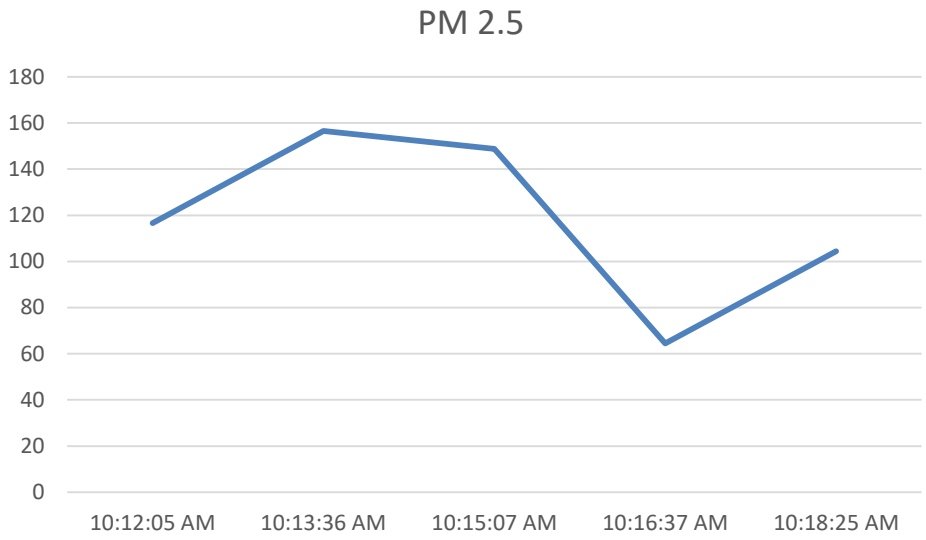
140
120
100
80
60
40
20
0
10:12:05 AM
10:13:36 AM
10:15:07 AM

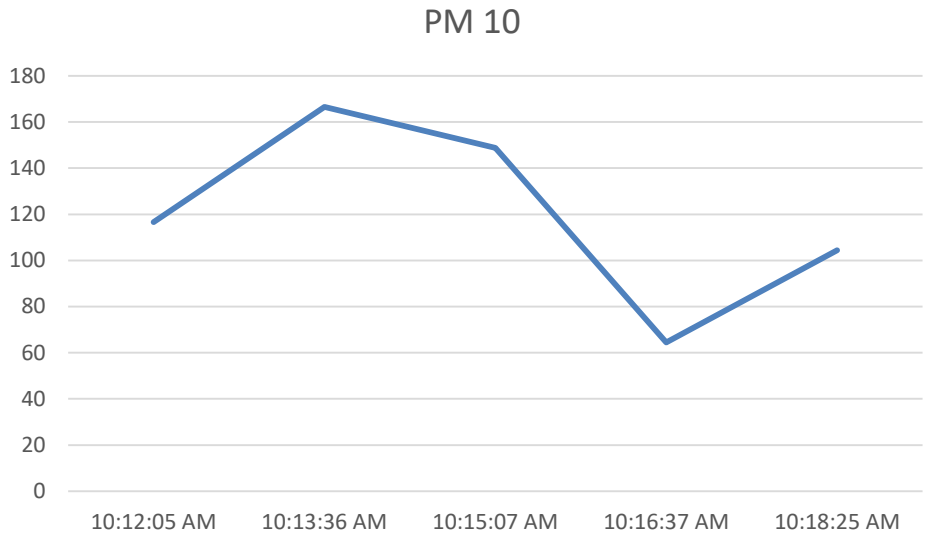
KATRASH MINES








PM 2.5
180
160
140
120
100
80
60
40
20
0
10:12:05 AM
10:13:36 AM
10:15:07 AM
10:16:37 AM
10:18:25 AM


PM 10
180
160
140
120
100
80
60
40
20
0
10:12:05 AM
10:13:36 AM
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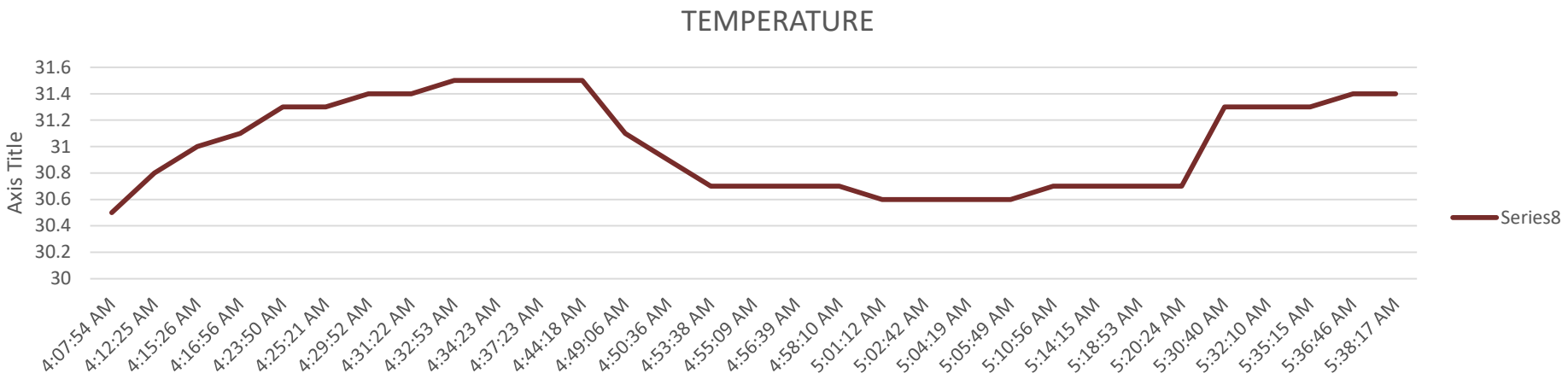
10:16:37 AM
10:18:25 AM

BANK MORE


TEMPERATURE
Axis Title
31.6
31.4
31.2
31
30.8
30.6
30.4
30.2
30
4:07:54 AM
4:12:25 AM
4:15:26 AM
4:16:56 AM
4:23:50 AM
4:25:21 AM
4:29:52 AM
4:31:22 AM
4:32:53 AM
4:34:23 AM
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5:14:15 AM
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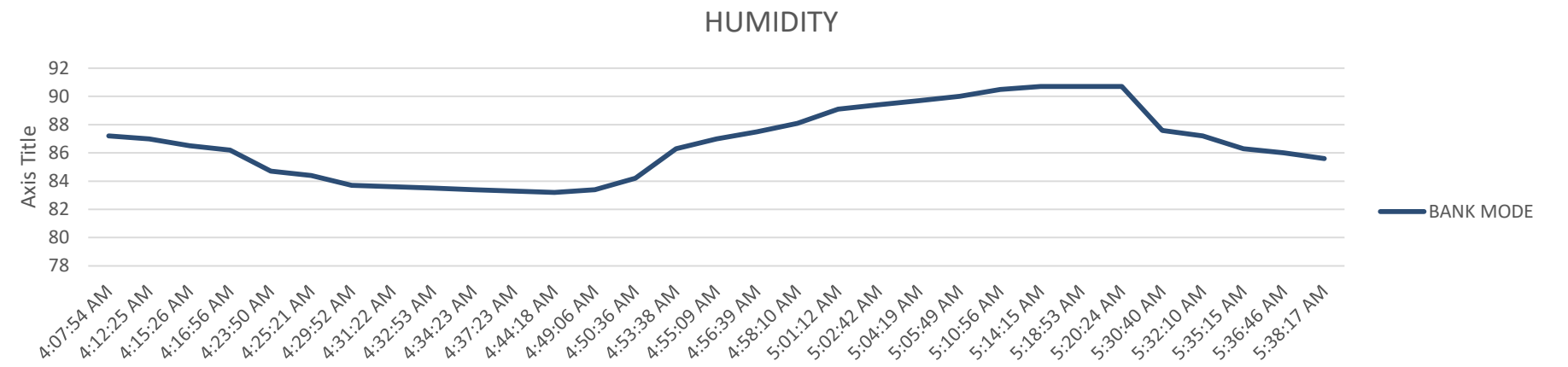
5:38:17 AM
Series8


HUMIDITY
Axis Title
92
90
88
86
84
82
80
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5:14:15 AM
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5:30:40 AM
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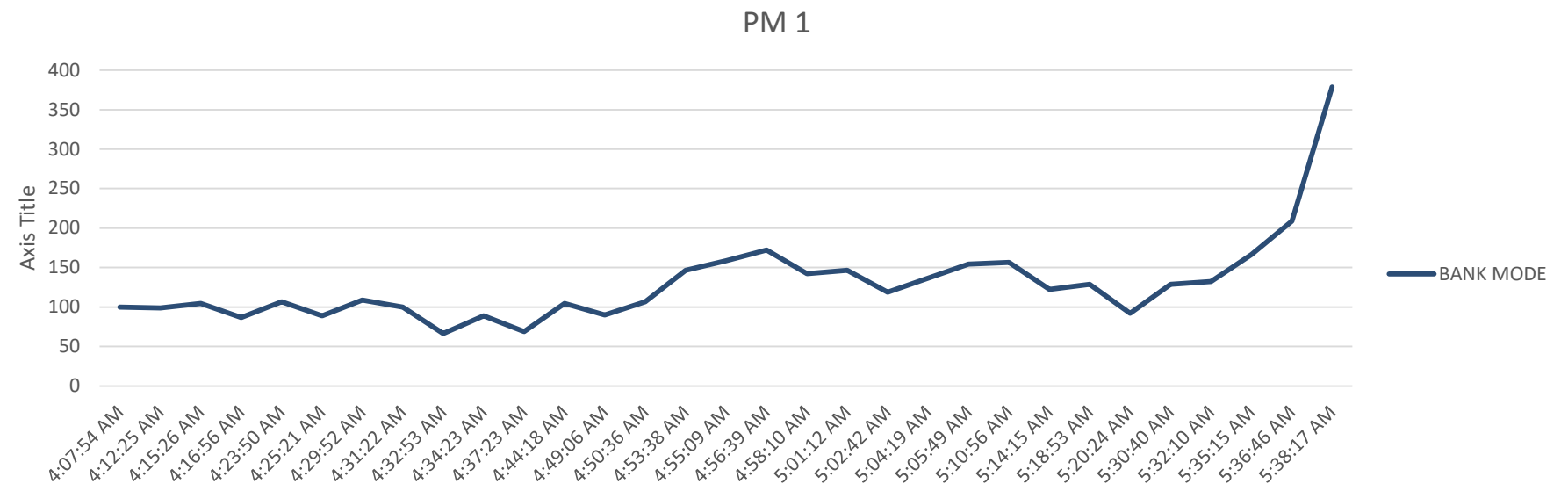
5:36:46 AM
5:38:17 AM
BANK MODE


PM 1
Axis Title
400
350
300
250
200
150
100
50
0
4:07:54 AM
4:12:25 AM
4:15:26 AM
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4:23:50 AM
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5:14:15 AM
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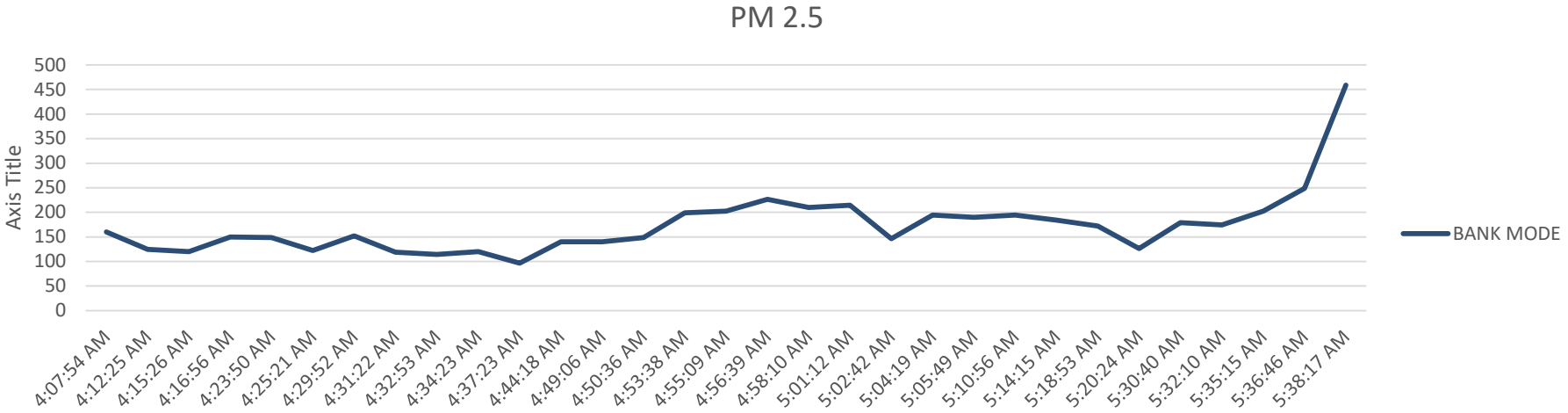
5:38:17 AM
BANK MODE


PM 2.5
Axis Title
500
450
400
350
300
250
200
150
100
50
0
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4:25:21 AM
4:29:52 AM
4:31:22 AM
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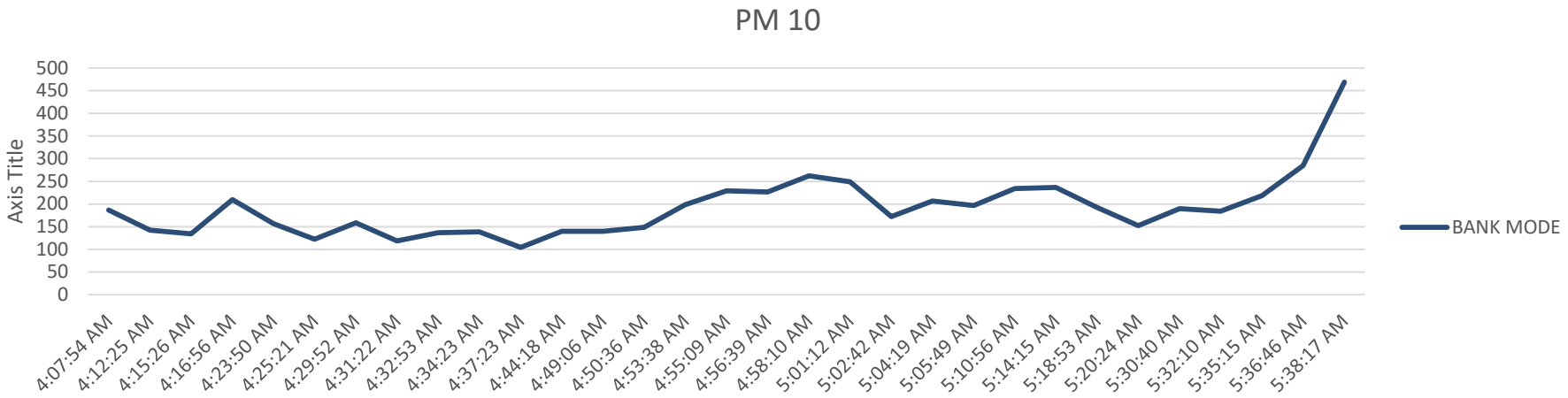
BANK MODE


PM 10
Axis Title
500
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350
300
250
200
150
100
50
0
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5:04:19 AM
5:05:49 AM
5:10:56 AM
5:14:15 AM
5:18:53 AM
5:20:24 AM
5:30:40 AM
5:32:10 AM
5:35:15 AM
5:36:46 AM
5:38:17 AM
BANK MODE

Ambient Air Quality Standards in respect of Noise

Category of Area	Day Time (In Db)	Night Time(in Db)
Industrial area	75	70
Commercial area	65	55
Residential area	55	45
Silence Zone	50	40

*source:-

THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000

Sound Pollution

PLACE	READINGS	Permissible limit according to CPCB
DHANSAR MINES	66.6dB	
LODNA MINES	68.1 dB	
LODNA VILLAGE		
LABADA MINES	71.2dB	
MUDI DIH	65.0 dB	
KATRASH MINES	75.6dB	
BANK MODE	62.1	

LET'S SAVE THE PLANET:

THANK YOU