

# Impact from Mining & Associated Industrial Activities on Air Quality of Ballari Region

T. H. Patel, V. Venkateshwara Reddy, S. R. Mise

**Abstract:** Industrialization and urbanization are the two major causes of air pollution. With the implementation of Sustainable Development concept will ensure development with insignificant impact on Environment and preserve this precious environment for future generation. The impact from mining and associated industrial activities may have impact on Environment if Air Pollution Control measures are not implemented. In this paper efforts have been made to assess the impact on the Air quality from Mining and Associated Industrial activities in Bellary region. Also an attempt has been made to suggest mitigative measures to attenuate Air Quality impacts on environment.

**Keywords:** AAQ, NAAQ, Ground Level Concentration (GLC), Mitigative Measures, CPCB, KSPCB

## I. INTRODUCTION

Air pollution has become a problem of major concern all over the globe as it has no-boundaries, can also lead to national and international consequences.(1) Air pollution is not only an emission problem, it is also a weather-related condition or phenomenon and as such should be considering one of the weather hazards (4). As per the bureau of Indian standards (BIS) publication 4167-1966, air pollution is defined as the presence in the ambient atmosphere of substances generally resulting from the activity of man in sufficient time and under circumstances to interfere significantly the comfort, health or welfare of persons or with full use or enjoyment of property (Air Act, 1981). Through air pollution results both by natural and anthropogenic sources, the latter is the main reason for most of the air pollution problems of the present day. Air pollutant can be either natural or may be the result of various activities of man like mining, industrial operations & emissions emanating from sources other than stacks, such as storage piles or unpaved lots, are called fugitive emissions (3) Mining and associated Industrial activities contribute towards national development. The Mining activities caters the need of iron and steel plants, sponge iron plant and also other consumers. Steel is essential commodity for common man and for national development.(4) Bellary region is considered as one of the major hot spot of the Karnataka State due to problems arising out of mining and other associated industries.

Manuscript published on 30 June 2017.

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Accordingly Study of Impact of Mining and Associated Industries on Air Quality Bellary region has been under taken.

## II. OBJECTIVE

To assess the impact from the mining and associated industries on Air quality of Bellary region. To assess the Air quality impacts 10 KMS radius of Bellary have been Considered.

## III. MATERIALS & METHODS

- Description of study areato assess the impact of mining and other associated industry baseline Air quality with 10 K.M Radius of Bellary studied.
- Air quality parameters

### A. Meteorological Data

Meteorological Data to assess wind direction and speed, temperature, humidity, generated during study period at Bellary used for this study.

### B. Ambient Air Quality

Ambient air quality data generated from 2013 to 2016 for the parameter PM-10, PM - 2.5, SO 2 and NO x with in 10 Kms. Radius at 6 AAQM Stations.

The Meteorological and environmental data collected in Bellary region during the study period

### C. Meteorological Data:

The Meteorological data during 2016 which includes wind speed, Wind Direction, and ambient temperature, relative humidity are collected and summarized in table-I.

Table I. Meteorological Data

Sl. No	Parameters	Maximum	Minimum
1	Temperature o C	43.5	13.7
2	Relative humidity %	97	17.0
3	Wind Speed in m/s	0.8	8.3
4	Predominant direction	WSW/WNW/SE	

### D. Ambient Air Quality Data

The results of Ambient Air quality data monitored in study area for PM-10, PM 2.5 SO 2 and NO x with in 10 Kms. Radius at 6 AAQM Stations are given in Table



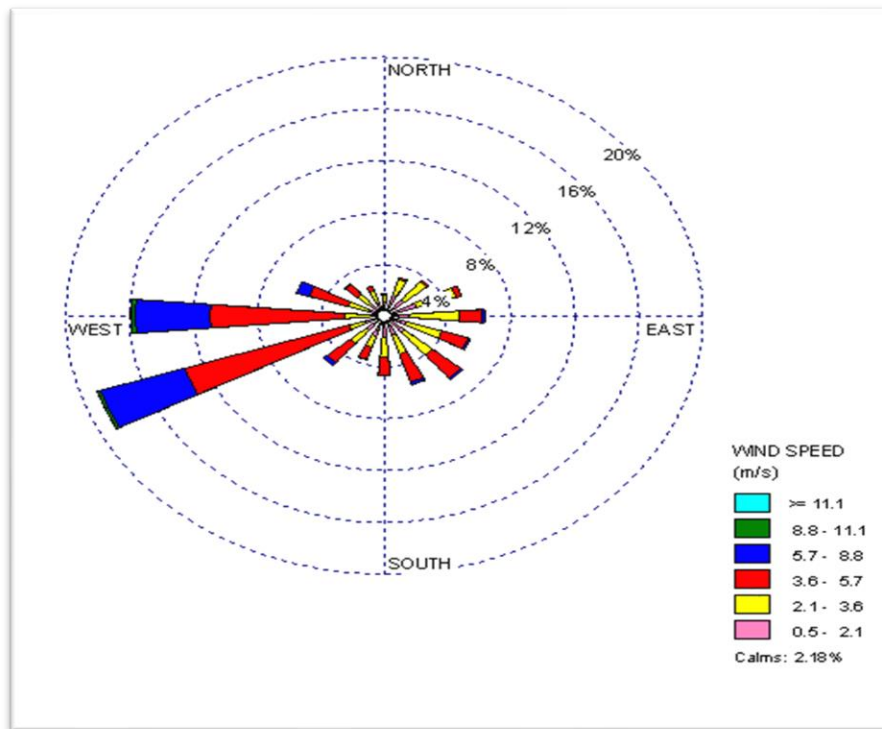
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**TABLE-2 Summary of Ambient Air Quality Data**

S L. No.	AAQM LOCATION	PM 10			PM 2.5			SO 2			NO x		
		Min	Max.	Avg.	Min	Max.	Avg.	Min	Max.	Avg.	Min	Max.	Avg.
1.	Bellary Municipal Corporation	29.4	136.0	88.9	20.2	43.4	31.6	5.3	10.4	9.3	8.2	17.1	14.2
2.	Regional Office KSPCB Bellary	30.1	102.4	71.6	22.2	48.7	35.6	7.3	9.2	7.8	10.2	14.2	11.6
3.	Halkundi Village	24.0	43.0	32.6	8.6	26.2	16.8	2.1	4.9	3.1	4.9	11.2	8.2
4.	Belgal village	26.0	55.0	31.8	13.6	29.6	16.1	3.0	11.1	6.8	4.9	33.1	8.9
5.	Veni Verapura	28.6	143.6	92.1	14.9	72.8	46.8	5.2	14.4	8.8	11.6	46.2	26.5
6.	Janikunte	24.2	89.6	37.8	16	45.6	18.9	3.6	8.2	2.1	3.8	11.8	4.9

All units are in ug/m<sup>3</sup>

**Air Quality Impacts:** AERMOD was developed by AMS/EPA Regulatory Model Improvement Committee (AERMIC). To assess the Air Quality Impacts AERMOD version 8.8 used. Meteorological data for winter season is used. The wind rose is given in the Figure 1 below



**Fig .1 Wind rose for the Winter 2016**

To Predict the Air quality impact AERMOD 8.8 model run to assess the contribution in Ground level Concentration from point sources.

The Baseline Air Quality and Contribution to Ground Level Concentration is given in the Table

**Table-3 Summary of Ambient Air Quality Impact**

SL. No.	AAQM LOCATION	PM 10			PM 2.5			SO 2			NO x		
		Base line	GLC Pred	%	Base line	GLC Pred	%	Base line	GLC Pred	%	Base line	GLC Pred	%

1.	Bellary Municipal Corporation	88.9	12.6	14.1	31.6	4.1	12.9	9.3	2.7	29.1	14.2	5.1	35.9
2.	Regional Office KSPCB Bellary	71.6	8.1	11.3	35.6	3.8	10.6	7.8	2.2	28.2	11.6	4.1	35.3
3.	Halkundi Village	32.6	7.2	22.0	16.8	3.2	19.1	3.1	1.1	35.4	8.2	2.6	31.7
4.	Belgal village	31.8	9.3	29.2	16.1	4.3	26.7	6.8	2.5	36.7	8.9	3.1	34.3
5.	Veni Verapura	92.1	24.6	26.7	46.8	9.5	20.2	8.8	2.9	32.9	26.5	8.3	31.3
6.	Janikunte	37.8	9.7	25.6	18.9	4.7	24.8	2.1	0.5	23.8	4.9	1.4	28.5

All units are in ug/m3

The PM 10 Levels are exceeding the NAAQ limits of 100 ug/m3. It was envisaged that the major contribution is from Transportation of Vehicles in unpaved roads and contribution from industries and other sources The PM 2.5, SO2 and Nox levels are low.

#### IV. CONCLUSION

The present study indicates that the Ambient Air quality for PM 10 exceeding limits of NAAQM limits of 100 ug/m3. As this is attributed namely due to transportation of vehicles.

The following mitigatives measures has to be ensured.

- The unpaved roads has be paved
- By pass roads adjacent habitation is to be provided
- Preventing over load and spillages on the Road

With this measures and ensuring emission level within the limits from associated industries PM 10 Levels can brought within the limits.

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