

## Study on Level of Carbon Monoxide in Residential Area of GIDC, Mundra

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### ABSTRACT

A study was carried out to evaluate the Level of Carbon Monoxide in residential area of GIDC Mundra. Some locations of residential area of Mundra were selected. For that purpose reading should be taken from the locations, they were Orient Abrasives Limited (kaolin Division), Adani Wilmar Ltd., Gujarat Credo Alumina Chemicals Pvt Ltd, Oriental Carbon and Chemicals Ltd, Drof Ketal Chemicals Pvt Ltd, Mundra Plant, Adani Wilmar Limited. Samples one during Morning and one after the Evening were taken from each sampling point. The atmospheric parameters which include measurement of CO level were taken from each locations using CO level meter instrument and the value compared with (WHO) guideline. Data analysis was carried out and suitable measures should be taken out to living healthy human life which free from harmful CO gas.

**Keywords :** CO level, after Monsoon, Locations, Samples.

### I. INTRODUCTION

Carbon monoxide (CO) is one of the most common and widely distributed air pollutants. It is a colorless, odourless and tasteless gas that is poorly soluble in water. Complete combustion of carbon and oxygen produces carbon dioxide (Co<sub>2</sub>), a non-toxic gas. Incomplete combustion occurs when there is insufficient combustion air, insufficient time for complete combustion, incomplete combustion, incomplete mixing of air and fuel, or when the temperature drops below combustion temperature. CO is slightly lighter than air (0.97) and easily moves through small cracks throughout an entire house. Carbon monoxide has a slightly lower density than air. In the human body, it reacts readily with haemoglobin to form carboxyhaemoglobin. Small amounts of carbon monoxide are also produced endogenously. Carbon monoxide exposure is still one of the leading causes of unintentional and suicidal poisonings, and it causes a large number of deaths annually both in India.

Incomplete combustion occurs in all fires and even in the most efficient appliances and furnaces. All fossil fuels (e.g. coal, fuel oil, kerosene, gasoline, natural gas) contain carbon, as do other natural fuels ( wood and charcoal). When these fuels burn (or oxidize). CO may be emitted as one of the gaseous by product. We are usually surrounded by potential surrounded by potential source sources, since so many home gas oil appliance (furnaces, refrigerator, clothes, dryers, ranges, water heater, space heater), fireplaces, charcoal grills, and wood burning stoves use fossil fuels as their source of energy. fumes from automobiles and gas-powered lawn tools also contain carbon monoxide. Tobacco smoke produces low level of CO in the smoker; however, the long term effects are not clear and are overshadowed by other detrimental effects associated with smoking.

The present study aims to solve the problems in residential area of GIDC, Mundra and build pollution free areas by fulfilling the following objectives: The overall objective is to enhance the living standards of

residential area of GIDC, Mundra by providing some suitable measures. The specific objectives of the Research were as follows:

- A. To study the existing status of CO levels in the study area by recording the CO intensity at various locations.
- B. Identification and consideration of suitable mitigation and abatement measures.

## II. STUDY AREA

Mundra city is located at district Bhuj. Mundra, Gujarat, India. Let Long Coordinates info the latitude of Mundra, Gujarat, India is 22.839520, and the longitude is 69.721329. Mundra, Gujarat, India is located at India country in the Towns place category with the GPS coordinates of 22° 50' 22.2720" N and 69° 43' 16.7844" E.

Interest has been conditionally expressed by potential investors for approximately 300 hectares (720 acres) of net industrial land at the Mundra industrial estate. Accounting for land required for infrastructure the total demand for industrial land translates into approximately 410 hectares. It must be noted that above demand is subjected to the infrastructure development at the estate matching the profile of expectations of the potential investors. It may be also noted that the interest expressed at this stage is prior to any physical development at the subject site. If the infrastructure development and pricing at Mundra matches the expectations of the potential investors then this demand is likely to increase.

Registered in 2016, Ashapura Group of Industries has made a name for itself in the list of top suppliers of Chemical Supplies in India. The supplier company is located in Mundra, Gujarat and is one of the leading sellers of listed products. Ashapura Group of Industries is listed in Trade India's list of verified sellers offering supreme quality of Calcium

Carbonates etc. Buy Chemical Supplies in bulk from us for the best quality products and service.

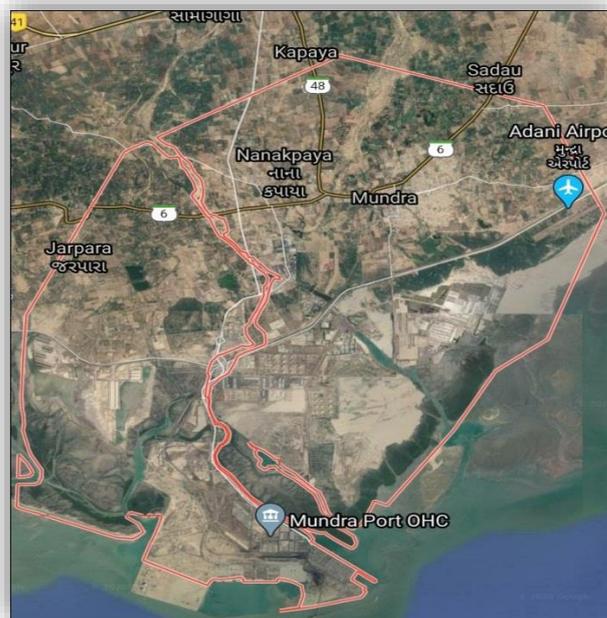


Fig.1 Map of Mundra

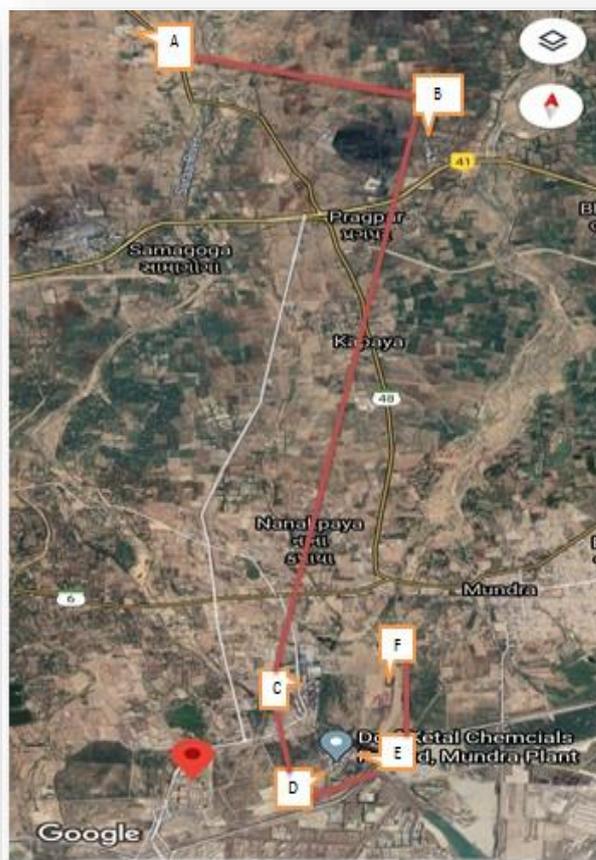


Fig.2 map of study area

### III. METHODS AND MATERIALS

The sampling area is the Mundra city. The CO level was recorded from residential area which was at variable distances depending on the location of the residential of GIDC, Mundra. Carbon monoxide sites of the city were identified and selected during the survey. These were Orient Abrasives Limited (kaolin Division), Adani Wilmar Ltd, Gujarat Credo Alumina Chemicals Pvt Ltd, Oriental Carbon and Chemicals Ltd, Drof Ketal Chemicals Pvt Ltd, Mundra Plant, Adani Wilmar Limited which were representatives of entire area of residential GIDC in Mundra. All these sites have their unique characteristics i.e. heavy industry nears the housing sector, heavy traffic and industrial smoke, poor vegetation.

The methodology adopted in this project has been shown below through the flowchart.

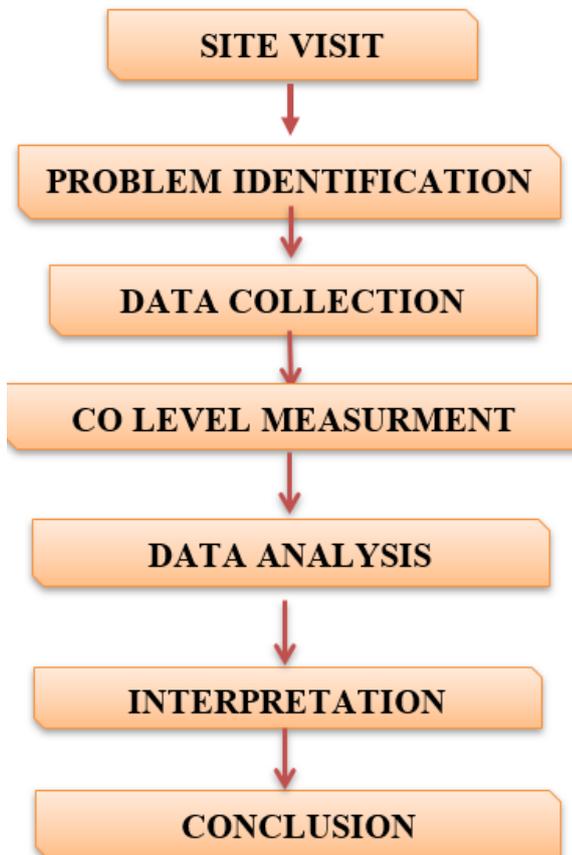


Fig.3. Flowchart of Methodology

### IV. RESULTS AND DISCUSSION

#### Data analysis and Interpretation:

The data were collected from all seven locations i.e. Orient Abrasives Limited (kaolin Division), Adani Wilmar Ltd, Gujarat Credo Alumina Chemicals Pvt Ltd, Oriental Carbon and Chemicals Ltd, Drof Ketal Chemicals Pvt Ltd, Mundra Plant, Adani Wilmar Limited At each selected spot, the measurements were taken at different times during the day in Morning and Evening time. One sets of samples one during after the monsoon was taken from each sampling point. Here Carbon monoxide survey was noted at every 20 minutes intervals and CO level was counted with special equipment. This equipment is known as" CO level meter. Collected data related to all the location were analyzed and suitable measures were suggested to control co level in this residential area of GIDC, Mundra. The graphs of CO levels of all seven locations for morning and evening session for after monsoon were drawn.

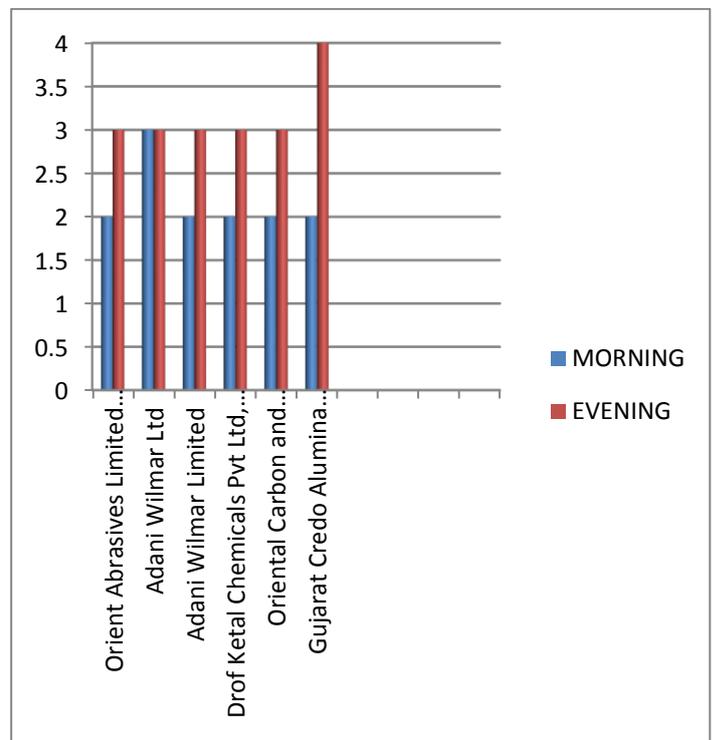


Fig.4. CO level measurement at all seven locations in Morning and Evening.

From all above observation and analysis, it was found that Maximum CO level occur in Gujarat Credo

Alumina Chemicals Pvt Ltd (4 ppm) after monsoon season. These locations are prone to unhygienic air quality. Orient Abrasives Limited (kaolin Division) (2 ppm), Adani Wilmar Limited (2ppm) were the areas in which there was minimum level of CO occur during after monsoon season and it was safe to the human health. From these locations some areas situated near the industry and it seems to increase CO level day by day which were Gujarat Credo Alumina Chemicals Pvt Ltd.

## V. CONCLUSION

From the analysis of level of carbon monoxide in residential area of GIDC Mundra. It was clear that the existing level of CO was high comparatively and it varies dynamically from day to day. This variation in CO level was due to industrial, vehicular, commercial and other miscellaneous activities. It was endanger to the human life and causes hazardous diseases such as lung cancer, asthma, headache, irritation etc. CO level should be control over the region of GIDC Mundra area by such manually/mechanically operated devices (i.e. Cyclone Scrubber, Spray tower, Electrostatic Precipitator, Fabric filter cyclone separator, Gravitational setting chamber). The atmospheric parameters which include measurement of CO level were taken from each locations using CO level meter instrument and the value compared with (WHO) guideline.

## VI. ACKNOWLEDGEMENT

It is our proud privilege to express our deep sense of gratitude and venerable regard to our revered guide **Prof. Kuldip B. Patel**, Assistant Professor in GEC, BHUJ who has been imparting excellent guidance, valuable suggestions, constant encouragement and wonderful inspiration throughout the investigation and preparation of this project report, without which, it would not have been possible for us to bring the same in the present shape.

## VII. REFERENCES

- [1]. Bascom, R. Et Al. Health effects of outdoor air pollution (Part 2). American journal of respiratory and critical care medicine, 153: 477–498 (1996).
- [2]. Cullis, C.F. & Hirschler, M.M. Man's emissions of carbon monoxide and hydrocarbons into the atmosphere. Atmospheric environment, 23:1195–1203 (1989).
- [3]. Rudolf, W. Concentration of air pollutants inside cars driving on highways and in down town areas. The science of the total environment, 146/147: 433–444 (1994).
- [4]. Meredith and Vale Et Al. Analysis and interpretation of air quality data from an urban road side location in central London over the period from July 1991 to July 1992. Atmospheric environment, 29: 923–946 (1995).
- [5]. Dor, F. Et Al. Exposure of city residents to carbon monoxide and monocyclic aromatic hydrocarbons during commuting trips in the Paris metropolitan area. Journal of the Air & Waste Management Association, 45: 103–110 (1995).
- [6]. Schaplowsky et al. Lung tumour risk in radon-exposed rats from different experiments: comparative analysis with a biologically based models, Radiation and Environmental Biophysics, 2004, 43:189–201.
- [7]. Heimbach and Waeckerle et al. Modelling lung cancer incidence in rats following exposure to radon progeny. Radiation Protection Dosimetry, 2006, 122:345–348.
- [8]. Roy and Crawford et al., cytogenetic and carcinogenic effects of radon: a review. Mutation Research, 1996, 340:125–139.
- [9]. Brenner DJ, Little JB, Saks K. The bystander effect in radiation oncogenesis: II. A quantitative model. Radiation Research, 2001, 155:402–408
- [10]. Brenner DJ, Sachs RK. Do low dose-rate bystander effects influence domestic radon

risks? *International Journal of Radiation Biology*, 2002,78:593–604.

- [11]. Scheinkestel et al. Carbon monoxide poisoning: easy to treat but difficult to recognise. *Postgrad. Med. J.* 72, 470–473.
- [12]. Barret Balzan et al.. Les intoxicationsaigue`s par l`oxyde de carbone et les gaz de chauffage. *Rev.Prat.* 29, 1211–1231.
- [13]. Ducasse´ et al. Mathieu et al, 1985. Carbon monoxide poisoning, a diagnosis frequently overlooked. *J. Toxicol.Clin. Toxicol.*23, 309–313.
- [14]. Bascom, R., Bromberg, P.A., Costa, D.L., Devlin, R., Dockery, D.W., Frampton, M.W., Lambert, W., Samet, J.M., Speizer, F.E., Utell, M., 1996. Health effects of outdoor air pollution (part 2). *Am. J. Respir. Crit. Care Med.* 153,477–498.
- [15]. Samet J, Dominici J, Curriero F, Coursac I, Zeger SL: Fine particulate air pollution and mortality in 20 US cities, 1987–1994. *NEngl J Med* 2000, 343:1742-1749.
- [16]. Schaplowsky et al, Ponce de Leon A, Bland J, Bower JS, Strachan DP: Air pollution and daily mortality in London: 1987–92. *BMJ* 1996, 312:665-669.
- [17]. Mathieu et al Association between ozone and hospitalization for respiratory diseases in 16 Canadian cities. *Environ Res* 1997, 72:24-31.
- [18]. Linn W, Szlachcic Y, Gong H, Kinney PL, Berhane KT: Air pollution and daily hospital admissions in metropolitan Los Angeles. *Environ Health Perspect* 2000, 108:427-434.

**Cite this article as :**

Jignesh K. Konkani, Ashish R. Chaudhari, Kuldip B. Patel, Nikunj Patel, Pratik Nisarta, Montu Motaka, "Study on Level of Carbon Monoxide in Residential Area of GIDC, Mundra", *International Journal of Scientific Research in Science, Engineering and Technology (IJSRSET)*, Online ISSN : 2394-4099, Print ISSN : 2395-1990, Volume 7 Issue 2, pp. 243-247, March-April 2020. Available at doi : <https://doi.org/10.32628/IJSRSET207252>  
Journal URL : <http://ijsrset.com/IJSRSET207252>