

THE ROLE OF THE HEALTH OFFICER IN RECORDING PRIMARY BASIC DATA IN RELATION TO MALODOROUS GAS NUISANCES

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SYNOPSIS

At the time of commissioning of a multimillion rand pulp-mill at Richards Bay during the period November 1984 to June 1985, malodorous gas nuisances affected virtually all the developed areas of Richards Bay and at times, spread to surrounding towns and villages. Despite modern high technology; in the end it was found that the Health Officers had to resort to the use of the five basic human senses to establish the actual extent of the problem which varied from mild to nauseous, depending on various conditions which existed.

OPSOMMING

Ten tye van die inbedryfstelling van 'n multimiljoen rand papierpulpmeule te Richardsbaai gedurende die periode November 1984 tot Junie 1985 het onwelriekende gasoorlaste bykans alle ontwikkelde gebiede van Richardsbaai sowel as ander omringende dorpe van tyd-tot-tyd ge-afekteer. Nieteenstaande die moderne tegnologie was dit aan die einde van die dag bevind dat Gesondheidsbeamptes hulle moes toespits op hul vyf basiese menslike sintuie ten einde die omvang van die probleem te bepaal wat gewissel het van matig tot walglik afhange van verskeie toestande wat bestaan het.

INTRODUCTION

When the establishment of a pulp-mill at Richards Bay was first discussed in 1979 the Council expressed its reservations regarding the odour problems related to these plants. It was then stated that the pulp-mill would be the most modern in the world and that plants already existed in the Scandinavian countries which caused no odour problems. The consultants of the company once again in 1981 gave the assurance that the odours should not be noticed outside the plant's boundary.

In reply to the Chief Air Pollution Control Officer's request for comments the Council requested that a single high stack should be considered to assist with the dispersion of gases. This proposal was not accepted and the plant was erected with three stacks.

When it was announced in the first quarter of 1982 that the erection of the plant was to commence it was given wide news media publicity due to the economic growth which would be created in the region and that assurances had been given that there would be no odour problems.

Early in October 1984 the Head : Community Services held a meeting with the Management and by virtue of the fact that the plant was on the point of being commissioned suggested that they advise the public by means of a press statement of the fact that while all reasonable precautions would be taken odour and nuisance problems may occur and that if the conditions became unbearable the public could contact the company. This was not done.

During the last week of December 1984 complaints were received regarding offensive odours. The Head: Commu-

nity Services advised the complainants that a major plant was being commissioned and it was possible that teething problems were being experienced. This action was accepted by the public and the news media.

As the number of complaints was increasing a round table discussion was held with the company and a Liaison Committee was established to interview complainants to determine the measure of the nuisance. This did not reduce the displeasure of the public and news media by virtue of the fact they felt they were being told that a pulp-mill always omits odours and they would have to learn to live with it.

It was decided to appoint a Joint Technical Committee to investigate the offensive odour problem and briefly the findings of the committee were as follows:

- (i) There were various chemical compounds involved such as: Methyl - Mercaptan, Dimethyl - Sulphide, Hydrogen - Sulphide.
- (ii) The plant was still in the process of being commissioned and snags were still occurring such as: Power failures, retention work, calibration of instrumentation, etc.
- (iii) That it was impossible at that stage to set a date for efficient operation within the design parameters.

By virtue of the fact that the complains were increasing and no solutions were forthcoming a joint meeting was held on 9 July 1985 by the parties concerned. After the evidence had been produced it was agreed to meet on a monthly basis until the best practical solutions could be found to solve the odour problem. To date progress is being made.

NUISANCE CONTROL

Legal requirements

In terms of the Health Act 63/1977 it is the Local Authority's duty to take all reasonable and practical steps to ensure that nuisances are controlled within its area of jurisdiction.

In terms of the Atmospheric Pollution Prevention Act 1965 it is the duty of the Chief Air Pollution Control Officer to control all scheduled processes.

In terms of the Water Act 1956 as amended it is the duty of the Department of Water Affairs and the Local Authority to prevent water pollution.

In terms of the Offence Trade Regulations and the Public Health Bylaws it is the duty of the Medical Officer of Health to control nuisances.

It is the duty of the registered owner to take all reasonable steps to ensure that nuisances do not arise on his premises.

Role of health officers

In terms of the Health Act 63/1977 the term "Health Officer" includes the undermentioned staff members:

- (i) Medical Officer of Health;
- (ii) Health Inspectors, and
- (iii) Community Health Nurses.

The Local Authority is required to appoint the required staff and their respective duties are briefly:

- (i) **Medical Officer of Health.** He is the leader of the health control team and is responsible for the medical aspects of health control.
- (ii) **Health Inspectors** assist with the environmental and technical aspects of health control.
- (iii) **Community Health Nurses** assist with the personal aspects of health control.

It will be noted that the term "Health Officer" refers to a health control team which has to work in harmony at all times if the interests of the inhabitants of an area are to be best served.

If the academic training curriculum of the various members of the health officer team were investigated it would be found that their training covered almost every aspect of human endeavour.

GENERAL GEOGRAPHICAL AND CLIMATICAL CONDITIONS

Richards Bay is situated on the east coast of South Africa 185 km north of Durban.

The climate is sub-tropical, summers are hot and humid, winters mild and frost-free and the warm Mocambique current keeps the sea at a relatively uniform temperature of 21°C to 25°C – throughout the year.

The municipal area is 328 sq kilometres in extent, of this, 92 sq kilometres is taken up by the bay, lakes and the flood plain.

Average Temperature:

| | |
|----------|--------|
| January: | 25,4°C |
| July: | 17,2°C |
| Year: | 21,3°C |

Average Rainfall:

1 590 mm per annum.

There are two major river valleys which converge within the industrial areas of the town. These, during the months April to September, feed cold air from inland over the warm humid conditions which results in heavy dew falls (more like misty rain). This condition is clearly noticeable by virtue of the fact that this mist bank can be clearly seen hanging at between five and twenty metres above the ground.

Large swamps and peat areas exist within the town and the temperature increase caused by decomposition causes the mist level mentioned in 3.5 to rise considerably with less dew formation.

PRELIMINARY INVESTIGATION PROCEDURE

The number of complaints received were as follows:

| | |
|---------------|-----|
| February 1985 | 10 |
| March 1985 | 20 |
| April 1985 | 43 |
| May 1985 | 296 |
| June 1985 | 144 |

When complaints were received they were plotted by means of mapping pins on the map of the Local Authority area. This gave a clear indication of the areas that were affected by the malodorous gases.

The Medical Officer of Health and the Community Health Nurses were requested to keep a record of the type of complaints they were receiving from their patients, these are briefly as follows:

- (i) People complained that they were actually woken up at night by the obnoxious odour. This led to disturbed sleeping patterns causing severe insomnia in some cases.
- (ii) Most people suffering from allergic conditions such as sinusitis found that the following signs and symptoms coincided with the odour:
 1. Dull, frontal headaches.
 2. Eye irritation – watery, red eyes.
 3. Nasal irritation – stuffy nose, sneezing.
 4. Tachypnoea – short of breath.
- (iii) Asthmatic patients found that the odour caused dyspnoea leading to an asthma attack. The cases reported at the clinic were in the 1–6 years age group. The mothers reported that these attacks coincided with the odour usually at night between 21h00 to 24h00 or 02h00 to 06h00.

In this regard all doctors and nurses within the area played a vital role in that they advised their patients in a responsible manner thereby avoiding the development of a panic situation.

The Health Inspectorate up until the end of April were mainly involved in investigation of conditions on site, interviews and efforts to get gas monitors to work. In addition photographs were taken of stack emissions.

In spite of the aforementioned it was not possible to establish the exact source of the nuisance.

OLFACTORY SURVEY

By virtue of the large number of complaints it was essential that an investigation be undertaken to eliminate the possibility that these were being made by the hypercritical few. An olfactory survey was undertaken by the Health Inspectorate during the period 8 May 1985 to 29 May 1985. This provided that the residents had every reason to be dissatisfied.

The survey was assisted greatly by virtue of the fact that the fertilizer plant was in its annual shutdown and therefore could be disregarded.

The survey proved that the odours from slight to nauseous were affecting all the developed areas of the town.

The extent to which developed areas were being affected was recorded on 25 coloured 35 mm slides which were produced as evidence at the joint meeting that was held on 9 July 1985 (slides will be shown at the meeting and examples in black and white are attached as Annexures).

The procedure that was adopted in the olfactory survey was as follows:

- (i) Two health officers travelled \pm 120 km over a four hour period and covered the entire Local Authority area. They were requested to note wind direction, mist zone level, angle of spread of stack emissions and to endeavour to classify the odour level.
- (ii) The officers were replaced on a one on one off basis and the results were discussed every morning. In total ten persons were involved. It was very soon noticed that consensus was being reached on the following scale:
 - mild;
 - strong;
 - offence, and
 - nauseous.

Both the periods 01h00–05h00 and 20h00–24h00 were covered during the survey.

FINDINGS

A malodorous gas nuisance was being caused by the pulp-mill and was affecting most developed areas within the town.

The effluent treatment works at which effluent is released at between 45 and 52 degrees celcius was causing a fuming effect due to the temperature differential similar to the steaming effect in bathrooms during winter months. This hot vapour was then being carried, with a convection effect below the cold mist level, to the affected areas. The vapours from the effluent were very malodorous and it was also established that these odours were also being released from the various surge towers on the sea-outfall pipeline.

To determine the direction of the very slight air movements the method of licking the finger and holding it in the air was utilized. After a period this caused some strange tastes in the mouth. It is possible only to try and explain a few, namely:

- (i) the taste on the hand when one has been using spirits of salts when soldering, or
- (ii) after using fertilizers in the garden both organic or inorganic.

The description of the odours varied from a cloying sweetish smell to a stench similar to rotten eggs and rotten cabbage/onions to an odour similar to the old fashioned stink bomb.

The inversions which occurred did cause the stackemissions to reach ground level.

Both high and low level emissions from the pulp-mill were the cause of the malodorous gas nuisance.

CONCLUSION

It has been proved that the Health Officer has a vital role to play in the tracing and controlling of malodorous gas nuisances. They should always remember that the basic foundations of their training and the five basic human senses will always remain their most vital tools.

With the co-operation of the management of the pulp-mill to date the nuisance levels caused by malodorous gas are being greatly reduced and it is envisaged that these will be reduced to a few very isolated instances in the near future.

ACKNOWLEDGEMENTS

I wish to thank the Town Clerk and Councillors of the Borough of Richards Bay and the Management of Messrs

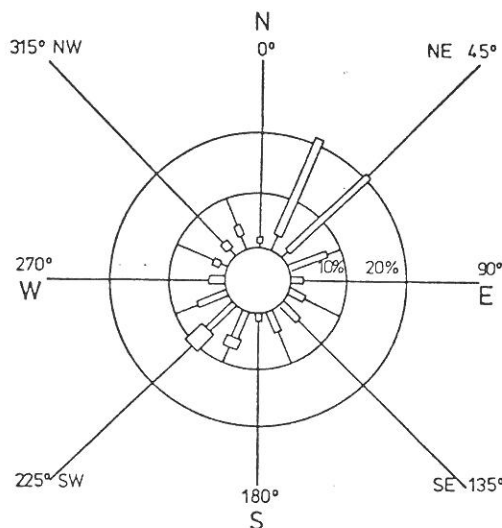
Mondi Paper Company for the permission granted to make the presentation. Furthermore to convey my sincere appreciation for the assistance given in preparing it to the undermentioned persons:

- (i) The Medical Officer of Health;
- (ii) All Community Health Nurses and Health Inspectors in the employ of the Borough of Richards Bay;
- (iii) The Town Engineer and his staff;
- (iv) Dr N Boegman, and
- (v) Mrs C Bosman, my personal typist.

ANNEXURES;

- ANNEXURE 1:** Windrose June 1968–May 1980.
ANNEXURE 2: 8 May 1985. One of the most widespread malodorous gas nuisance periods.
ANNEXURE 3: 16 May 1985. Typical stack effect under inversion conditions.
ANNEXURE 4: 28 May 1985. Effect of wind direction change.

ANNEXURE 1

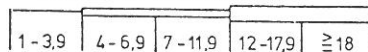


WIND ROSE
JUNE 1968 - MAY 1980

OCCURRENCE SCALE IN %

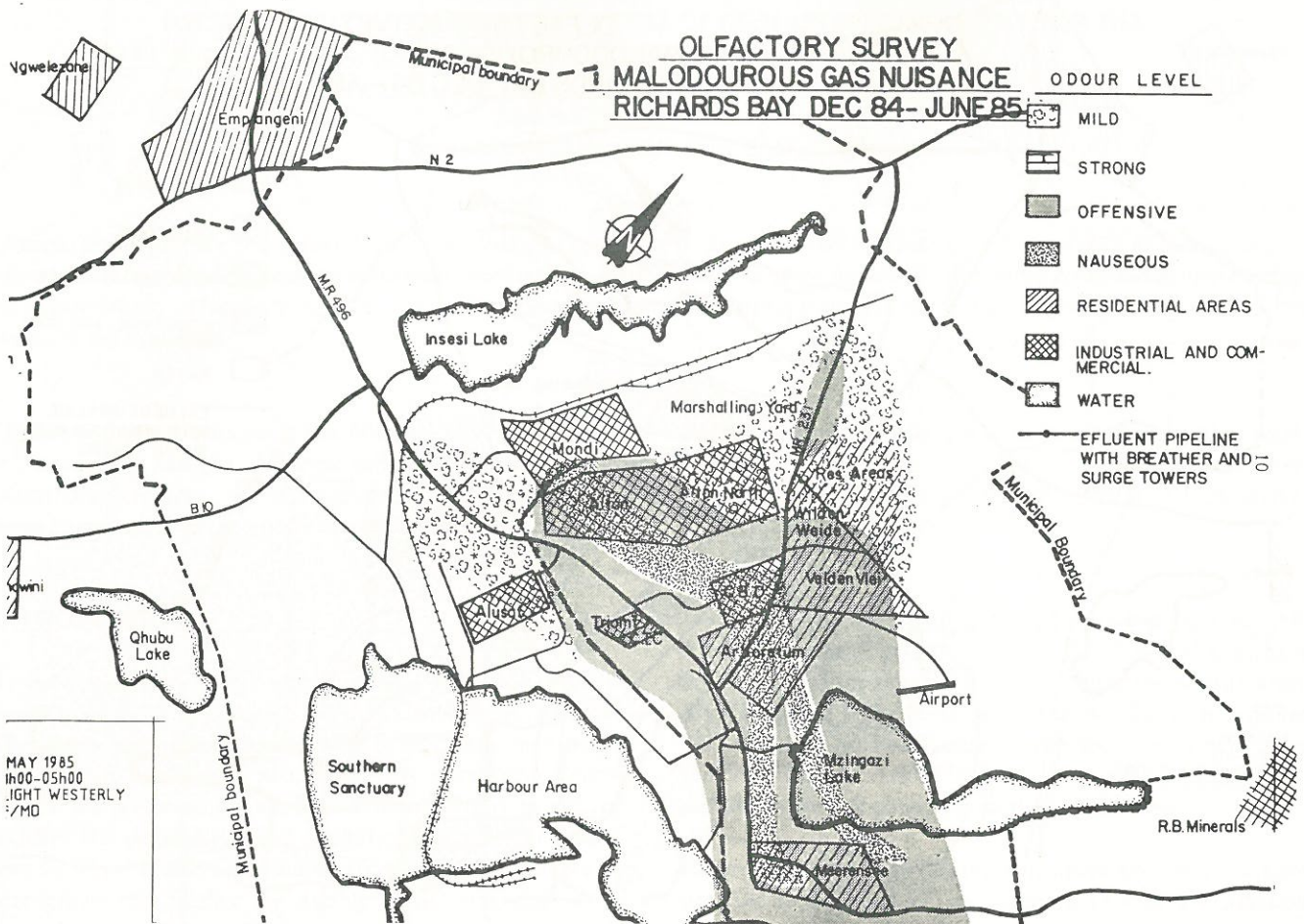


WIND SPEED METRES /SECOND

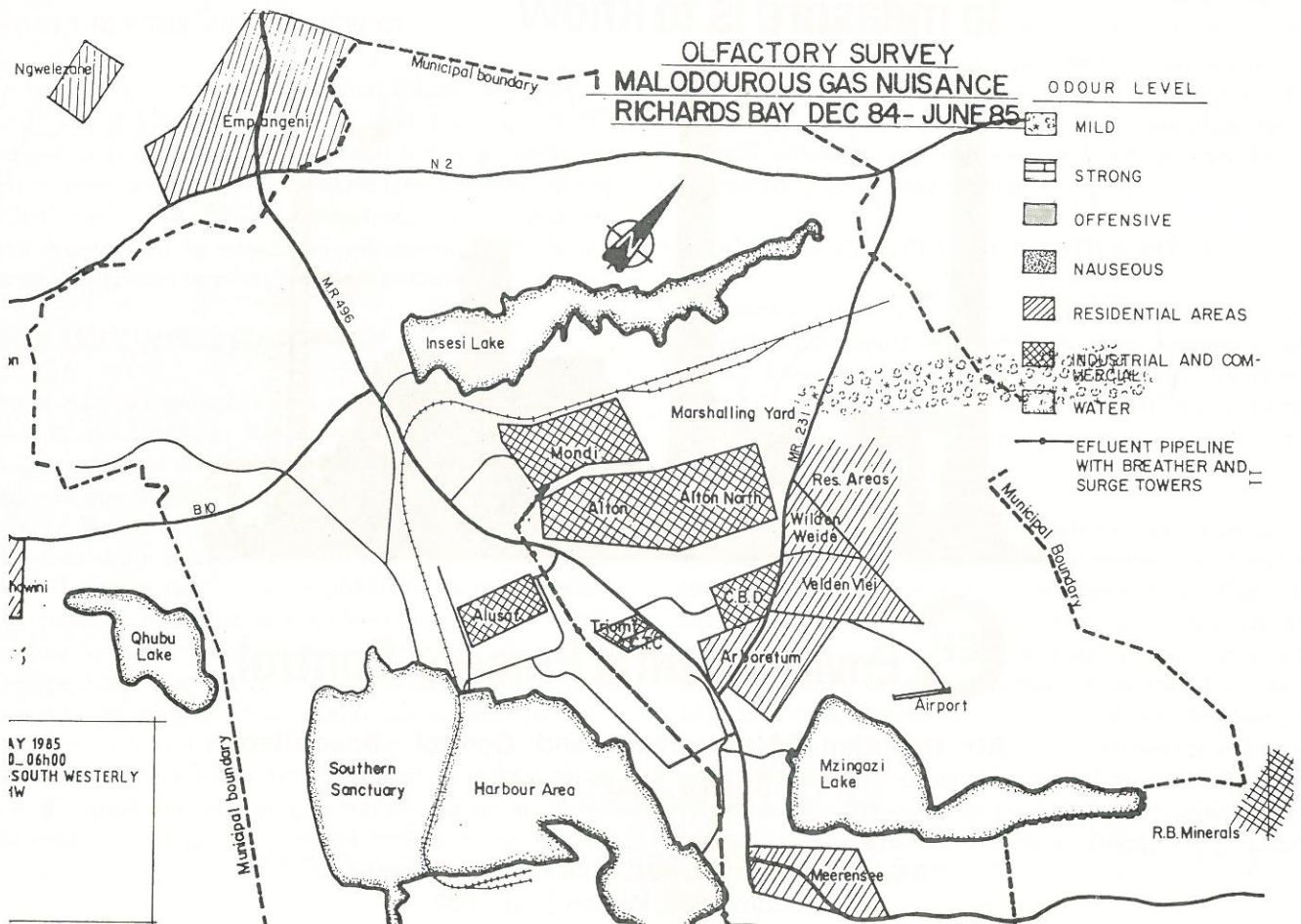


ROLE OF HEALTH OFFICER : MALODOROUS GAS NUISANCES

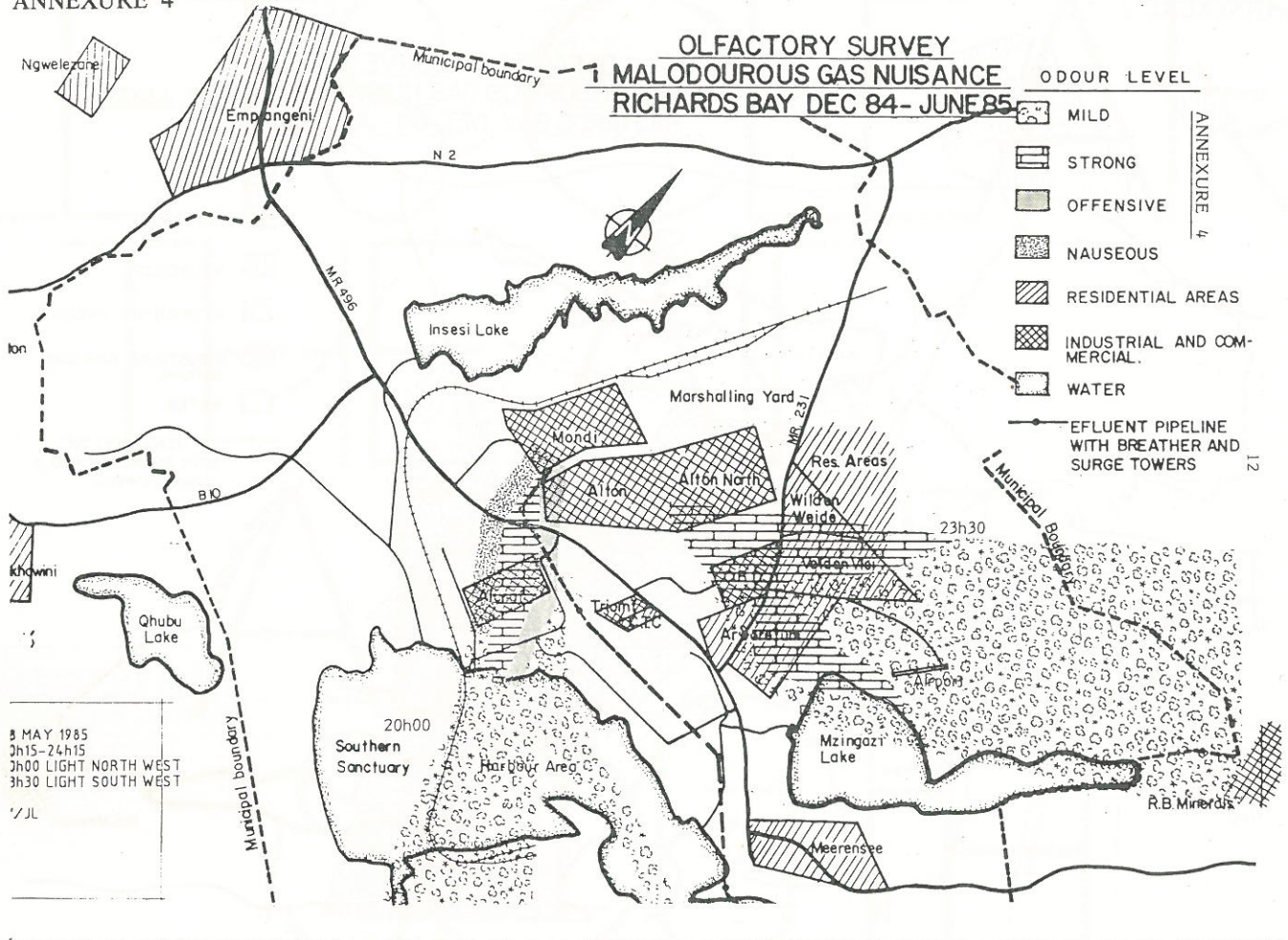
ANNEXURE 2



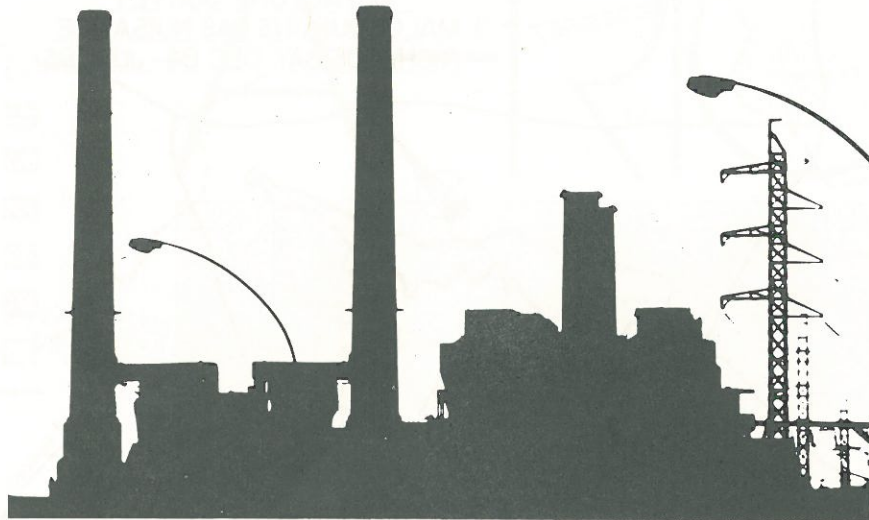
ANNEXURE 3



ANNEXURE 4



To measure is to know



EP Environmental Process Control

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