EIA NOTIFICATION 2006 AND IT'S PROCEDURE FOR OBTAINING EC by INDUSTRY

Presented by

A. MANOHARAN

Environmental Consultant

EX. Zonal Officer(CPCB)

E mail: mano_cpcb@yahoo.co.in

Chenai

09663021846 (M)

Contents of Presentation

* **Global Environmental Issues: An noverview**

I LEGAL FRAMEWORK

- Pollution control Acts & Rules
- Duties & Responsibilities of Industry
- Regulatory Compliances

II EIA PROCEDURE

- Form I
- Obtaining TOR
- EIA studies
- Public Hearing
- EIA Appraisal
- Obtaining EC

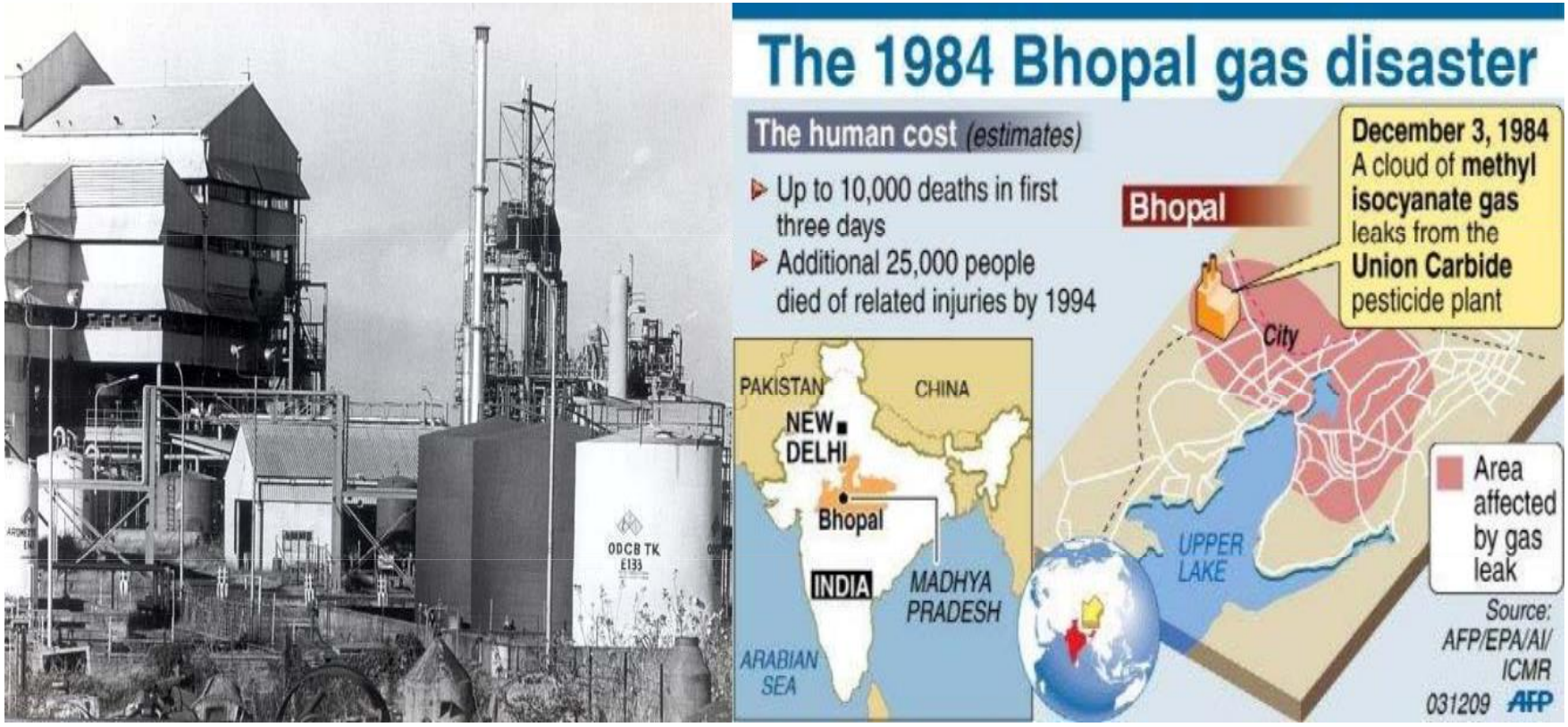
What is EIA?

- *"an important procedure for ensuring that the likely effects of new development on the environment are fully understood and taken into account before the development is allowed to go ahead"*

(DETR and National Assembly for Wales, 1999)

EIA history - India

- After Bhopal Gas tragedy – Environmental Protection Act was enacted (1986) also refer as **Umbrella Act**




COLES
COLES

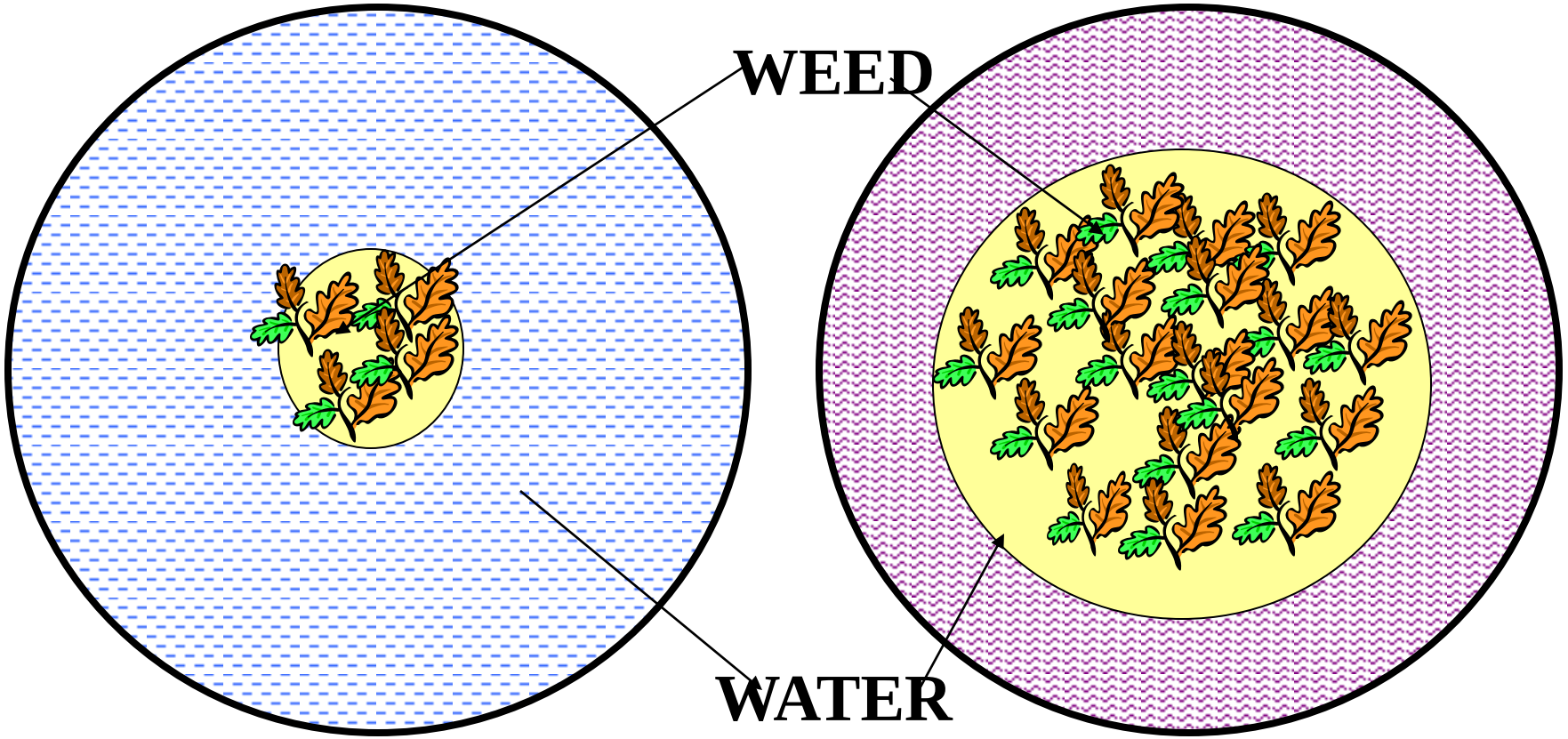
EIA history - India

- **Under EP Act – EIA notification was issued in 1994 (cost of project was criteri for screening)**

- **In 2006 – again new EIA notification was issued, substituted old one**

Global Environmental Issues

POLLUTION STATUS IN INDIA



WHAT WILL HAPPEN ON 99th DAY ?

ENVIRONMENTAL LABORAOTRY
MEDICAL REPORT

NAME OF THE PATIENT	:	“EARTH”
AGE	:	3.5 Billion Years
DISEASES DIAGNOSED (“P” Game Syndrome)	:	Pollution Pesticides Population explosion Politics Poverty POPs
NAME OF THE “VIRUS” ATTACKED	:	Human being
SYMPTOMS OBSERVED	:	Loss of Biosphere Loss of Natural Resources Increase in Temperature Failure of Monsoon Loss of Human Health
LABORATORY ANALYSIS	:	High conc. of pollutants in Soil, Water & Air Large number of PATHOGENIC ORGANISMS
TREATMENT REQUIRED	:	Ecological balance Sustainable development Prevention of pollution Need based utilization
RECOVERY	:	IN 2047 A.D. (EXPECTED)

HOW MUCH ……?

We eat - 1 kg food /day

We drink - 2 kg water/day

We breath- 12,000 litres/day.

WATER QUALITY STATUS

Analysis of 10 years data with respect to BOD values as indicator of organic pollution

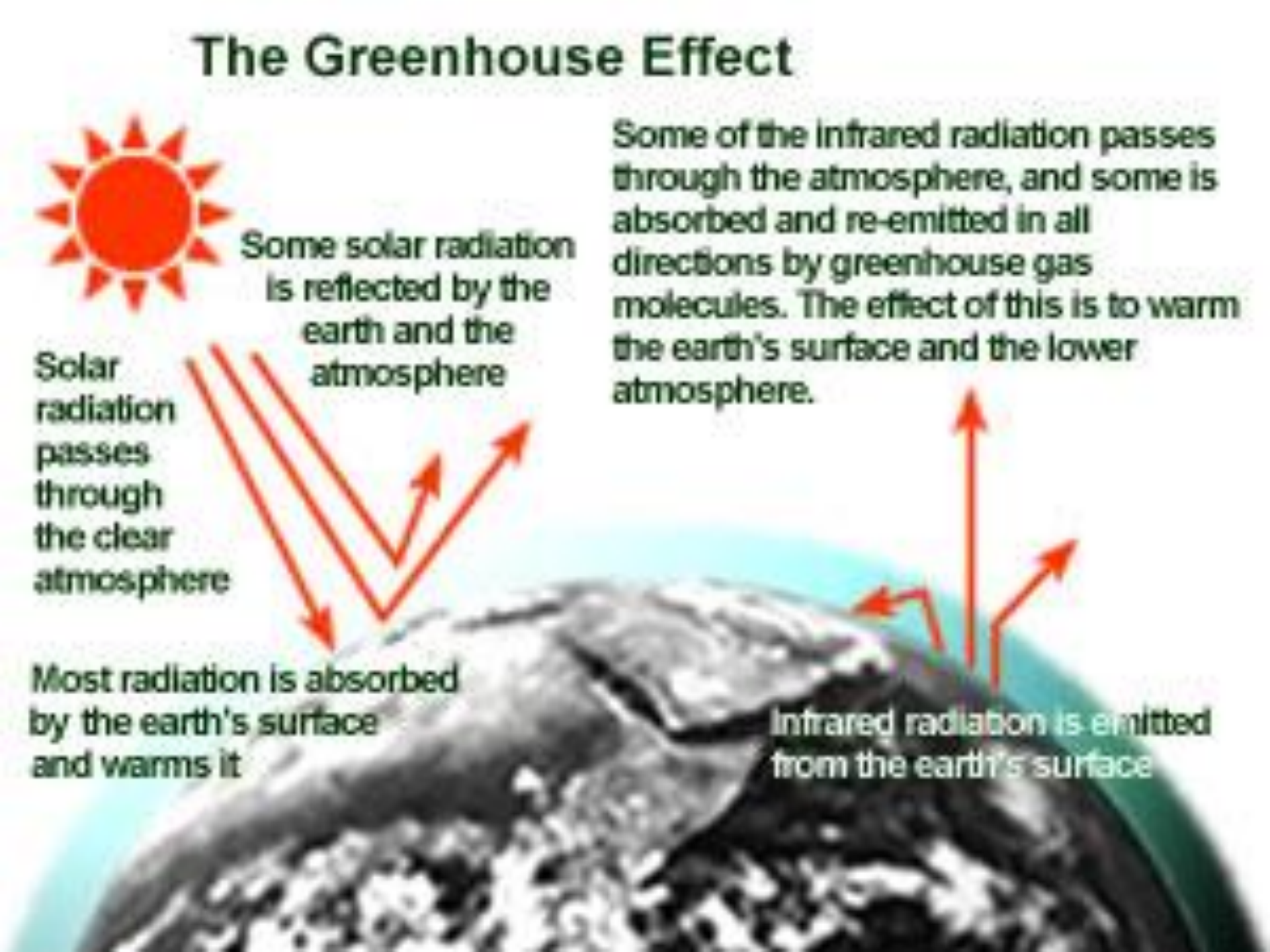
S. No	Level of Pollution	Pollution Criteria	Riverine length, Km.	Riverine length percentage
01.	Severely polluted	BOD more than 6 mg/l	6086	14
02.	Moderately polluted	BOD 3-6 mg/l	8691	19
03.	Relatively clean	BOD less than 3 mg/l	30242	67

cpcb

Global Warming

Are we destroying our own Earth?

The Greenhouse Effect



LEVELS of ATMOSPHERIC CO_2 Concentration

Year	CO_2 level in ppm
Pre – industrial Period 1750 A.D.	276
2010	400 +

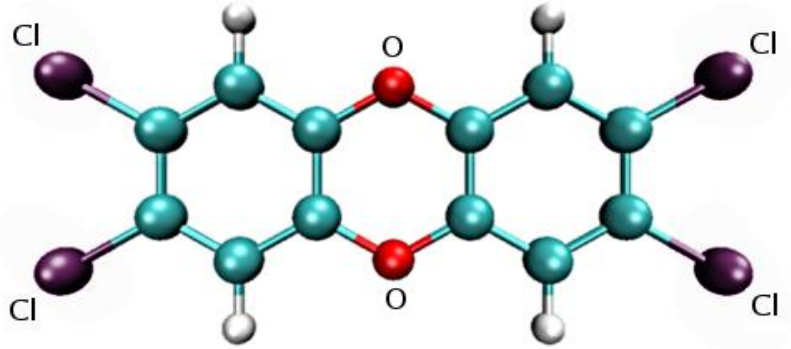
Rate of yearly increase = 1.9 ppm

AVERAGE CARBON FOOTPRINT PER PERSON FOR DIFFERENT COUNTRIES (in tones of CO_2 emitted per year)

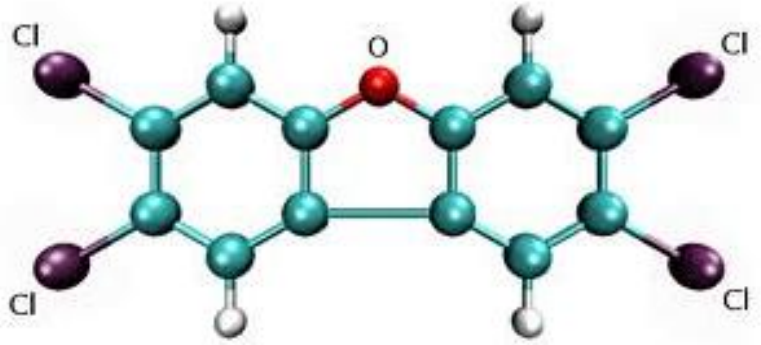
1	US	20.40
2	Canada	20.00
3	Australia	16.30
4	Russia	10.50
5	Greenland	10.00
6	Germany	9.80
7	UK	9.80
8	France	6.20
9	China	3.84
10	India	1.20
11	Pakistan	0.81
12	Bangladesh	0.25
13	Nepal	0.11
14	Afghanistan	0.03

DIOXIN AND FURAN - FACTS

Dioxin and Furan are the popular names for the family of chlorinated organic compounds comprising of Polychlorinated Dibenzo Dioxins (PCDD) and Polychlorinated Dibenzo Furans (PCDF)

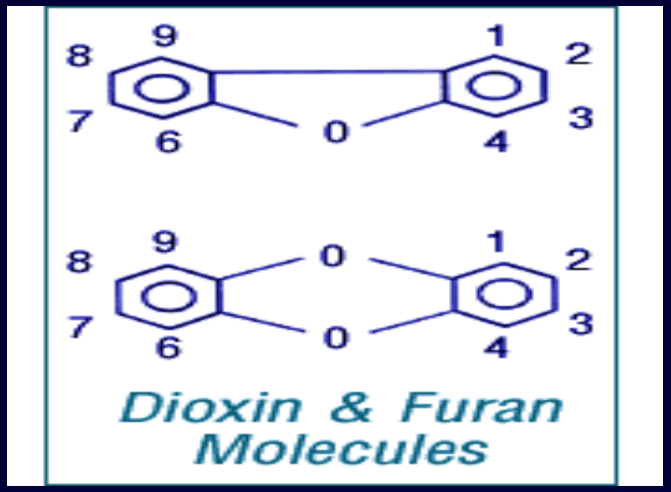


Dioxin



Furan

Monitoring of Dioxin & Furans



Effect of Dioxin & Furans Ukrainian president Viktor

How Dioxin and Furan are Formed ?

- Dioxin are produced at Waste Incinerators, Biomedical Waste Incinerators, industrial processes etc.
- Dioxin are also produced by non-industrial sources like residential wood burning, backyard burning of household trash, oil heating, and emissions from diesel vehicles.
- Burning of Plastics gave rise to Dioxin
- Cigarette smoke also contains a small amount of dioxin.

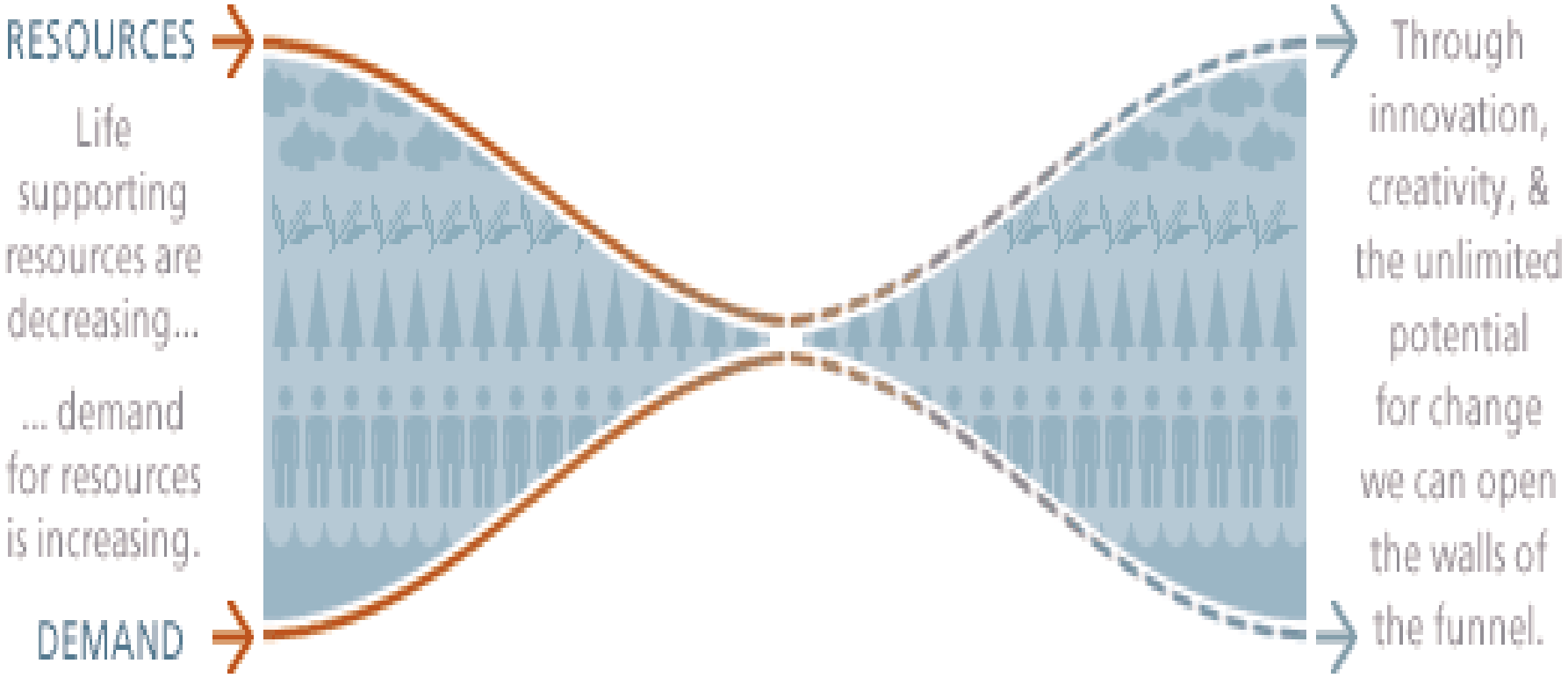


Dioxin Health Effects

BEFORE **Ukraine President** AFTER

Yushchenko endured dioxin poisoning, likely by political foes, which, along with nearly killing him, left his skin severely disfigured. WILLisms.com

OPENING THE WALLS OF THE FUNNEL

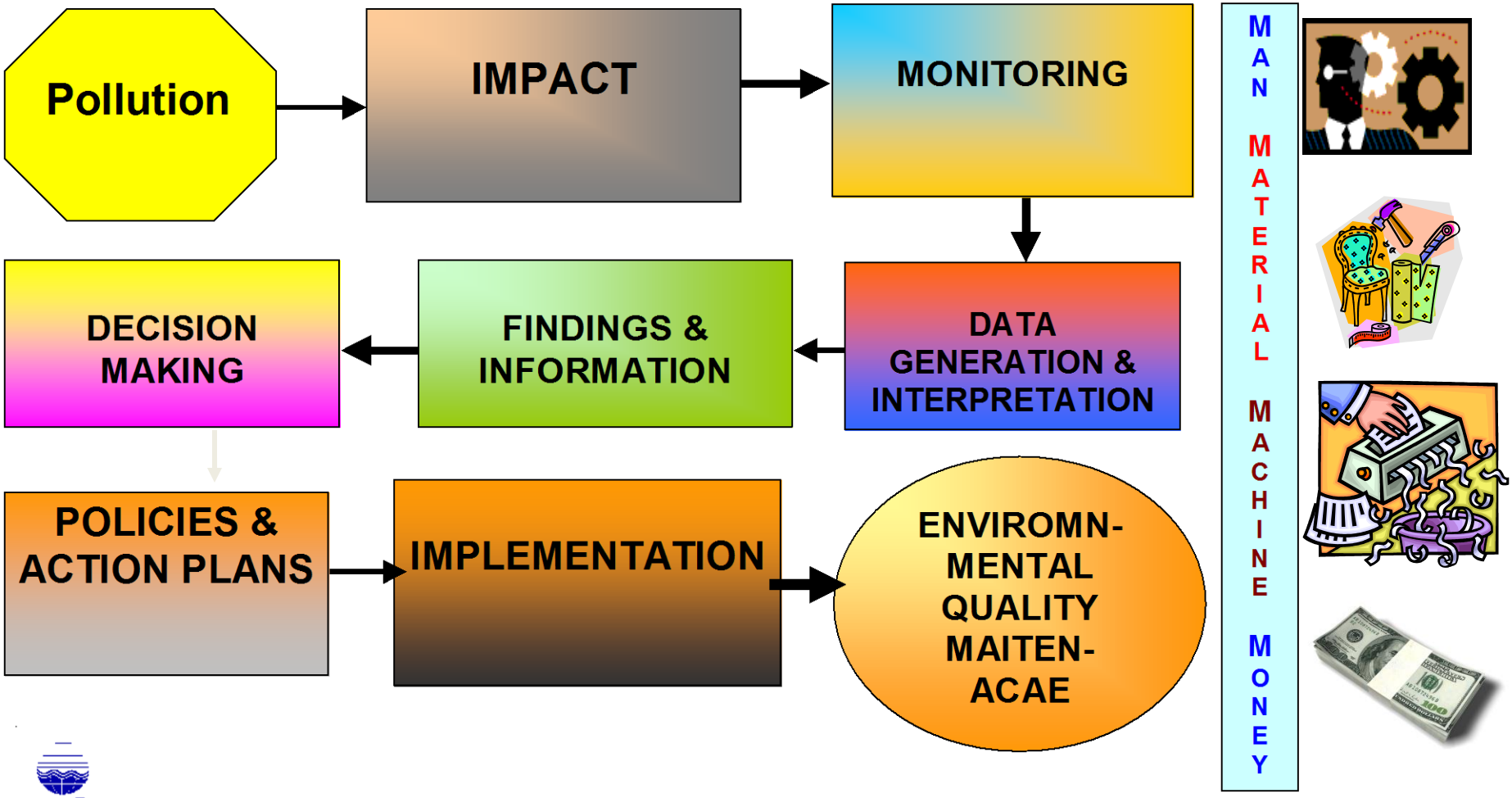


WASTE MINIMIZATION STRATEGY

Diagram 1

Diagram 2

ENVIRONMENTAL MANAGEMENT SCHEME



LEGAL FRAMEWORK

Environmental Legislations in India

Central Pollution Control Board
Delhi

MAJOR ENVIRONMENTAL LAWS IN INDIA

1. The Water (Prevention & Control of Pollution) Act, 1974
2. The Water (Prevention & Control of Pollution) Cess, Act, 1974 as amended in 1991.
3. The Air (Prevention & Control of Pollution) Act, 1981
4. The Environment (Protection) Act, 1986
5. The Public Liability Insurance Act, 1991
6. The National Environment Tribunal Act, 1995
7. The National Green Tribunal Act, 2010

Rules framed under Section 6,8 and 25 of EP Act 1986

- **The Hazardous Waste (Management and Handling) Rules, 2016**
- **The Manufacture, Storage and Import of Hazardous Chemicals Rule, 1989**
- **The Bio-Medical Waste (Management and Handling) Rules, 2016**
- **The Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996**
- **The Recycled Plastics Manufacture and Usage Rules, 2016**

- **The Noise Pollution (Regulation and Control) Rules, 2000**
- **The Solid Wastes (Management and Handling) Rules, 2016**
- **The Ozone Depleting Substances (Regulation) Rules, 2000**
- **The Batteries (Management and Handling) Rules, 2001**
- **E- Wsate Rules 2016**

ENVIRONMENTAL CLEARANCE (EC) PROCESS

Environmental Clearance (EC) and follow up activities by industrial units

1. Environmental Impact Assessment(EIA)

2. Environmental Management Plan (EMP)

Underlying basis, spirit and preamble

- Protect environment and control pollution
- Environment Protection Act 1986 (May 1986)

- Environment Protection Rules 1986 (Nov 1986)
  - Section 5 Environment Protection Rules 1986: Prohibitions and restrictions on the location of industries; carrying on of processes and operations in different areas
- EIA 1994
  - Environment Protection Act 1986
  - Discharge internationally agreed obligations under Rio Declaration
- EIA 2006 is supersession of EIA 1994, except in respect of things done or omitted to be done before such supersession

Broad criteria for categorization of projects
EIA Notification, 2006 *Issued on 14.09.2006*

- Scale of Impact
- Severity of Impact
- Nature of location

- Based on above, certain categories of activities have been identified
- Projects under Category “A” - Requires MOEF & CC clearance
- Projects under Category “B” - Requires state level clearance

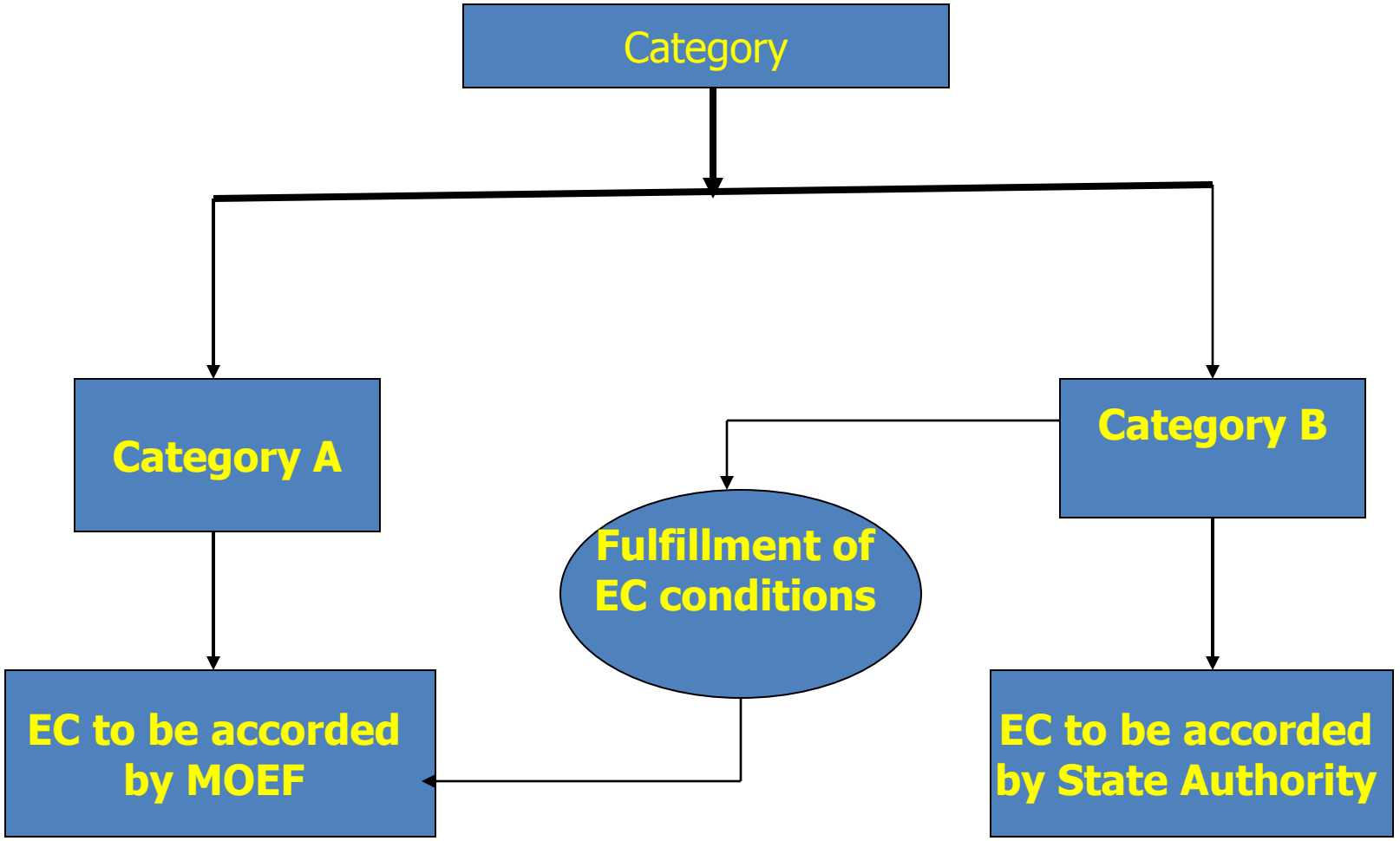
EIA 2006 - Preamble

- Copies of the said notification were made available to the public on 15th September, 2005
- Objections and suggestions received in response to the above mentioned draft notification have been duly considered by the Central Government
- Central Government hereby directs that on and from the date of its publication (14th September, 2006)
    - the required construction of new projects or activities or the expansion or modernization of existing projects or activities listed in the Schedule to this notification entailing capacity addition with change in process and or technology shall be undertaken in any part of India only after the prior environmental clearance from the Central Government or as the case may be, by the State Level Environment Impact Assessment Authority, duly constituted by the Central Government under sub-section (3) of section 3 of the said Act, in accordance with the procedure specified hereinafter in this notification.

Categorization of projects and activities

- All projects and activities are broadly categorized in to two categories - Category A and Category B
  - spatial extent of impacts
  - impacts on natural and man made resources
  - impacts on human health
- Go to schedule of notification and show project list

Categorization of projects



Requirements of prior Environmental Clearance (EC)

- Which projects require EC?
  - Projects listed in the schedule to notification (as Category A and B projects)
  - All new projects or activities listed in the Schedule to this notification
  - Expansion and modernization of existing projects or activities listed in the Schedule to this notification
  - Any change in product - mix in an existing manufacturing unit included in Schedule

Requirements of prior Environmental Clearance (EC)

- **EC by whom?**
  - **Category A projects: Central Government in the Ministry of Environment and Forests**
    - **Base decisions on the recommendation by Expert Appraisal Committee (EAC)**
  - **Category B projects: At state level the State Environment Impact Assessment Authority (SEIAA)**
    - **The SEIAA shall base its decision on the recommendations of a State or Union territory level Expert Appraisal Committee (SEAC) as to be constituted for in this notification**
    - **In the absence of a duly constituted SEIAA or SEAC, a Category 'B' project shall be treated as a Category 'A' project**

State Level Environment Impact Assessment Authority (SEIAA)

- SEIAA shall be constituted by the Central Government
  - comprising of three Members
  - Chairman and a member–secretary to be nominated by the State Government or the Union territory Administration
  - Rules for membership of SEIAA
  - All decisions of the SEIAA shall be unanimous and taken in a meeting

Expert Committees for Screening, Scoping and Appraisal (EAC and SEAC)

- Expert Committees
  - Expert Appraisal Committees (EACs) at the Central Government
  - State Expert Appraisal Committees (SEAC) at the State or the Union territory
- Responsible for screening, scoping and appraising projects
- Procedure for selection and maintenance of EAC and SEAC is given in notification

Screening, Scoping and Appraisal committees

- **Three (3) Member SEIAA Committee to be constituted by MOEF in all States and UTs**
- **MOEF to constitute EAC at Central level and SEAC at state level for screening, scoping and Appraisal of projects**
- **Constitute a combined SEAC for more than one state/UT with prior concurrence of interstate projects**
- **Time period for Committees defined (3 years)**
- **EAC/SEAC may inspect sites (during screening, scoping and appraisal)**
- **Unanimous view of the Committee to prevail for decision**

Application for Prior Environmental Clearance

- An application seeking prior environmental clearance in all cases shall be made
  - In the prescribed Form 1 and Supplementary Form 1A
  - After the identification of prospective site(s)
  - After identification of activities
  - Submit pre-feasibility report for all and conceptual plan for construction activities

➢ *Stages in Prior Env. Clearance Process*

- **Stage 1: Screening**
- **Stage 2: Scoping**
- **Stage 3: Public Consultation**
- **Stage 4: Appraisal**

Stage 1: Screening

- Only for Category B projects and activities to determine if they need EIA
- Category A projects compulsorily need EIA
- Scrutiny of an application seeking EC by SEAC for determining whether or not the project or activity requires further environmental studies
  - Form 1
  - Form 1A
- Classify projects as B1 (require EIA) and B2 (don't require EIA)
- For categorization of projects into B1 or B2, the MoEF shall issue appropriate guidelines from time to time

Stage 2: Scoping

- Who does the scoping?
  - Expert Appraisal Committee (EAC) in the case of Category 'A' projects or activities
  - State level Expert Appraisal Committee (SEAC) in the case of Category 'B1' projects

- Determine comprehensive Terms Of Reference (TOR) addressing all relevant environmental concerns for preparation of an Environment Impact Assessment (EIA) Report based on
  - on the basis of the information furnished by applicant in the prescribed application Form1/Form 1A including
  - proposed by the applicant
  - a site visit by a sub- group of EAC or SEAC only if considered necessary

Stage 3: Public consultation

- Process by which the concerns of local affected persons and others who have plausible stake in the environmental impacts of the project or activity are ascertained

- All Category ‘A’ and Category B1 projects or activities shall undertake Public Consultation
  - A big list of exceptions

After public consultation…

- Applicant shall address all environmental concerns expressed during this process
- Make appropriate changes in the draft EIA
- Final EIA report shall be submitted by the applicant to the concerned regulatory authority for appraisal

Stage 4: Appraisal

- Detailed scrutiny by the EAC or SEAC of
  - documents like the Final EIA report
  - outcome of the public consultations including public hearing proceedings
  - submitted by the applicant to the regulatory authority concerned for grant of environmental clearance
- Appraisal of all projects or activities which are not required to undergo public consultation, or submit an Environment Impact Assessment report (Category B2) shall be carried out on the basis
  - prescribed application Form 1
  - Form 1A
  - any other relevant information

Grant or Rejection of EC

- The regulatory authority shall consider the recommendations of the EAC or SEAC concerned and convey its decision to the applicant
- The regulatory authority shall normally accept the recommendations of the Expert Committees
- In cases where it disagrees with the recommendations of the Expert Committee (Central or State), the regulatory authority shall request reconsideration by the Central or State Expert Appraisal Committee

- After reconsideration, irrespective of views of Expert Committee, decision of the regulatory authority concerned shall be final

Validity of Environmental Clearance

- Ten years in the case of River Valley projects
- Thirty years for mining projects
- Five years in the case of all other projects and activities
- Area Development projects and Townships, the validity period shall be limited only to such activities as may be the responsibility of the applicant as a developer

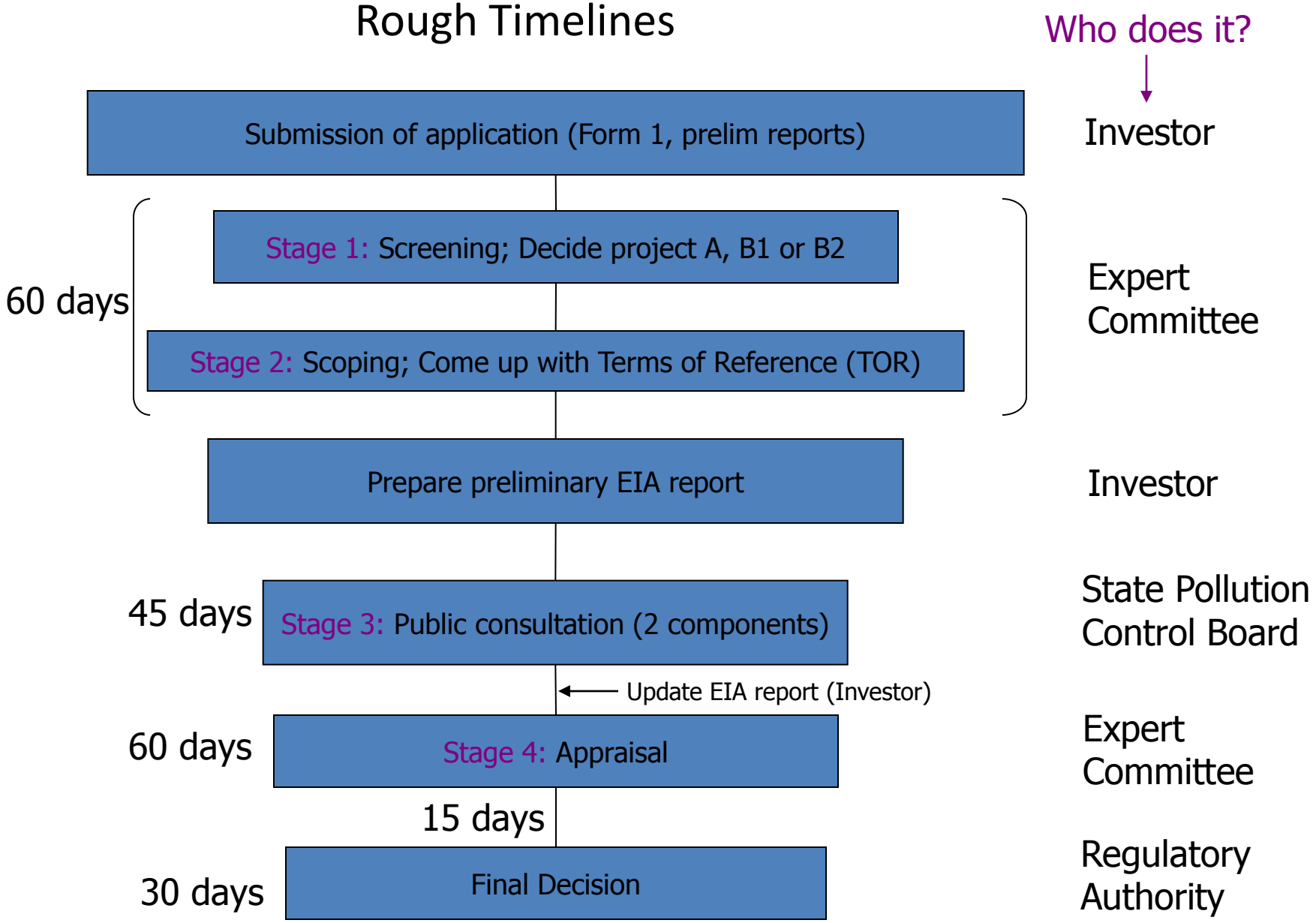
Post Environmental Clearance Monitoring

- Mandatory for the project management to submit half-yearly compliance reports in respect of the stipulated prior environmental clearance terms

EIA Aspects to be studied

1. Land Use (LU)
2. Air Pollution Prevention and Control (AP)
3. Air Quality Modelling (AQ)
4. Water Pollution Prevention and Control (WP)
5. Ecology and Biodiversity (EB)
6. Noise and Vibration (NV)
7. Socio Economic (SE)
8. Hydrology and Hydrogeology (HG)
9. Geology (Geo)
10. Soil Conservation (SC)
11. Risk and Hazards (RH)
12. Solid and Hazardous Wastes (SHW- SW, HW and BMW)

Summary of EIA process and Rough Timelines



Environmental Standards

- Ambient air quality standards (Health Based)
- Water quality standards (inland, coastal)
- Industrial waste water and emission standards (Technology, Pollution Prevention, Techno Economic Viability etc., developed more than 140 categories of Industries Standard)
- Ambient and source-specific noise standards
- Vehicular emission standards (mass emission & in-use vehicles)
- Fuel quality specifications (solid and liquid)

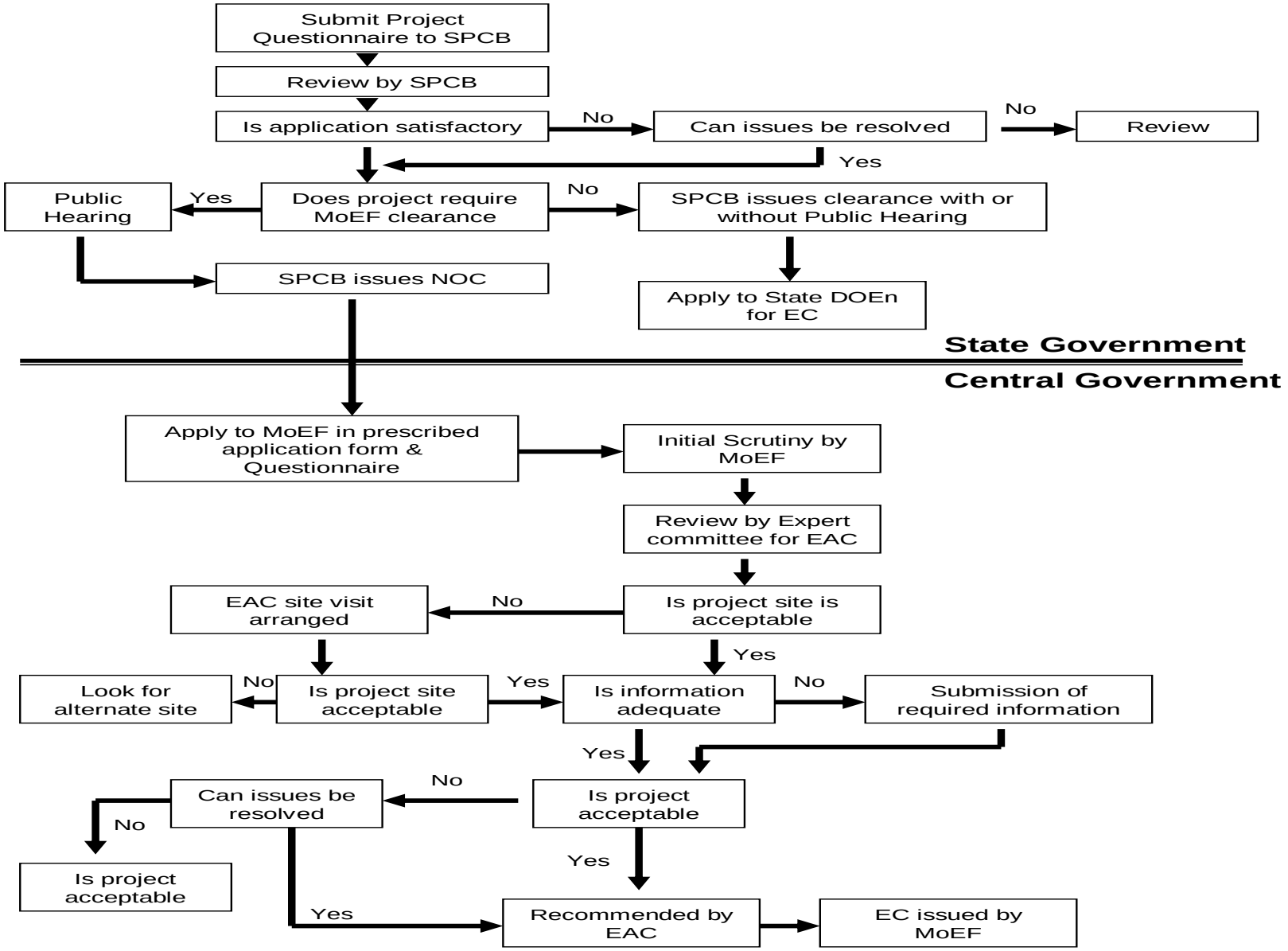
List of Important Physico-chemical parameters in water Analysis for EIA

- **Temperature**
- **Conductivity**
- **pH**
- **SOLIDS: TDS, TSS, COD**
- **Cations**
- **Anions**
- **BOD**
- **Oil & Grease**
- **Nutrients (N.P. K)**
- **Metals**
- **Organic compounds(pesticides)**
- **Bacteria**

Notification for Prior Environmental Clearance

- Clearance by Central Govt. or State Govt. in accordance with the procedure specified
- Creation of State/U.T. level Environment Impact Assessment Authority (SEIAA)
- Projects/activities classified in category ’A’ in the schedule, to be cleared by Central Govt. and by SEIAA in case of category ‘B’.
- Appraisal Committee to do screening & scoping as well.

Procedure for Environmental Clearance



SPCB: State Pollution Control Board
MoEF: Ministry of Environment & Forests
DOEn: State Department of Environment

EAC: Environmental Impact Assessment Committee
NOC: No Objection Certificate
EC: Environmental Clearance
EIA: Environmental Impact Assessment

➢ *Validity of Env. Clearance*

- Ten years in case of river valley project
- Thirty years in case of mining projects
- Five year in case of all other project
- Five year extension maximum on application made.

➢ *Post Env. Clearance Monitoring*

- **Submission of half-yearly compliance reports (1st June and 1st December)**

➢ *Transferability of Env. Clearance*

- **Transfer with a written no objection by transferor**
- **No reference to EAC or SEAC is required**

List of Projects or Activities Requiring Prior Environmental Clearance

Project or Activity		Category		Conditions if any
		A	B	
1		Mining, extraction of natural resources and power generation(for a specified production capacity)		
(a)	Mining of minerals	≥50 ha. Of mining lease area Asbestos mining irrespective of area	≤ 50 ha ≥5 ha. Of mining lease area	General Condition shall apply Note Mineral prospecting (not involving drilling are exempted provided the concession areas have got previous clearance for physical survey
(b)	Offshore and onshore oil and gas exploration, development & production	All projects	-	Note Exploration surveys (not involving drilling) are exempted provided the concession areas have got previous clearance for physical aurvey

Cont/--

Project or Activity		Category		Conditions if any
		A	B	
1		Mining, extraction of natural resources and power generation(for a specified production capacity)		
(d)	Thermal Power Plants	≥500 MW (coal/liginite/naphta & gas based); ≥50MW(Pet coke diesel and other fuels)	< 500 MW ≥ 5 MW (coal/lignite/ naptha & gas based); <50 MW ≥ 5 MW (Pet coke, diesel and all other fuels)	General conditions shall apply

Cont/--

Project or Activity		Category		Conditions if any
		A	B	
3		Materials Production		
(b)	Cement Plants	≥ 1.0 million tonnes/annum production capacity	<1.0 million tonnes/annum production capacity	General conditions shall apply

Cont/--

Project or Activity		Category		Conditions if any
		A	B	
4		Material Processing		
(a)	Petroleum refining industry	All projects	-	-
(b)	Coke oven plants	≥2,50,000 t/annum	<2,50,000 & ≥25,000 t/annum	-
(d)	Chlor-alkali industry	≥ 300 TPD production capacity or a unit located out side the notified industrial area/estate	< 300 TPD production capacity and located within a notified industrial area/estate	Specific condition shall apply No new Mercury cell based plants will be permitted and existing units converting to membrane cell technology are exempted from this notification
(e)	Soda ash industry	All projects	-	-
(f)	Leather/skin/hide processing industry	New projects outside the industrial area or expansion of existing units outside the industrial area	All new or expansion of projects located within a notified industrial area/ Estate	Specific condition shall apply

Project or Activity		Category		Conditions if any
		A	B	
5		Manufacturing/Fabrication		
(b)	Pesticide industry and pesticide specific intermediates (excluding formulations)	All units producing technical grade pesticides	-	-
©	Petrochemical complexes (industries based on processing of petroleum fractions & natural gas and/or reforming to aromatics	All projects	-	-
(d))	Manmade fibres manufacturing	Rayon	Others	General conditions shall apply

Project or Activity		Category		Conditions if any
		A	B	
5		Manufacturing/Fabrication		
(e)	Petrochemical based processing (process other than cracking * reformation and not covered under the complexes	Located outside the notified industrial area/ Estate	Located in a notified industrial area/ Estate	Specific conditions shall apply
(f)	Synthetic organic Chemicals industry (dyes & dye intermediates; bulk drugs and intermediates; Synthetic rubbers; basic organic chemicals)	Located outside the notified industrial area/ Estate	Located in a notified industrial area/ Estate	Specific conditions shall apply

Project or Activity		Category		Conditions if any
		A	B	
5		Manufacturing/Fabrication		
(g)	Distilleries	(i)All Molasses based distilleries (ii)All cane juice/non-molasses based distilleries≥30_KLD	All Cane juice/non-molasses based distilleries <30 KLD	General conditions shall apply
(h)	Integrated paint industry	-	All projects	General conditions shall apply
(i)	Pulp and paper industry excluding manufacturing of paper from waste paper and manufacture of paper from ready pulp with out bleachinng	Pulp manufacturing and pulp & Paper manufacturing industry	Paper manufacturing industry without pulp manufacturing	General conditions shall apply

Project or Activity		Category		Conditions if any
		A	B	
5		Manufacturing/Fabrication		
(j)	Sugar Industry	-	≥ 5000ted cane crushing capacity	General conditions shall apply
(k)	Induction/arc furnaces/cupola furnaces 5TPH or more	-	All projects	General conditions shall apply

Project or Activity		Category		Conditions if any
		A	B	
6		Service Sectors		
(a)	Oil & gas transportation pipe line (crude & refinery/petrochemical products), passing through national parks/ sanctuaries/coral reefs/ ecologically sensitive areas including LNG Terminal	All projects	-	-
(b)	Isolated storage & handling of hazardous chemicals (As per threshholdplanningquantity indicated in column 3 of schedule 2 & 3 of MSIHC Rules 1989 amended 2000	-	All projects	General conditions shall apply

Project or Activity		Category		Conditions if any
		A	B	
7		Physical Infrastructure including Environmental services		
(c)	Industrial estates/parks/complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather complexes	If at least one industry in the proposed industrial estate falls under the category A., entire industrial area shall be treated as Category A, irrespective of the area Industrial estates with area greater than 500 ha. And housing at least one Category B industry	Industrial estates housing at least one category B industry and area <500 ha. Industrial estates of area>500 ha. And not housing any industry belonging to category A or B	Special conditions shall apply Note: Industrial Estate of area below 500 ha. And not housing any industry of category A 0r B does not require clearance
(d)	Common hazardous waste treatment storage and disposal facilities (TSDFs)	All integrated facilities having incineration & landfill or incineration alone	All facilities having land fill only	General conditions shall apply

Air Pollution and Meteorology

- **Inseparable**
- **Scoping of inseparables has to go hand in hand**

Climate & Meteorology (Parameters)

- Temperature
- Humidity
- Wind speed & direction
- Rainfall
- Cloud amount and height
- % frequency of wind directions from the nearest IMD Station (should be within 50 Km over flat terrain)

Climate & Meteorology (Parameters) contd…

- Terrain Features and Land Use Map upto 10 Km around
- On Site Hourly Meteorological Data
  - Temperature
  - Wind Speed and Direction
  - Rainfall (Daily)
  - Cloud Amount and Height
- % Frequency of Ground Based & Elevated Inversions with Base and Top Heights from the nearest IMD Station
- Hourly Mixing Heights interpolated from CPCB Publication

GENERAL GUIDELINES FOR STACK HEIGHTS

For emission of Sulfur Dioxide :

$$H = 14 (QSO_2)^{0.3}$$

Where

H = Total Stack Height in meters from ground level

QSO_2 = Emission of Sulfur Dioxide in Kg/hr

For emission of Particulate matters :

$$H = 74 (Q_P)^{0.27}$$

Q = emissions of particulates in Kg/hr

Generally stack heights should be more than 2.5 times of the neighbouring building heights.

Diesel Generators

$$H = h + 0.2 \sqrt{\ } KVA$$

Where H = Total height of the stack from ground level in meters

h = Height of the building where the generator is located in meters

Presentation & Interpretation of Data

- **Land use map**
  - **interpretation of air quality data**
  - **choosing locations representing different activities**
- **Maximum, Minimum and 98th percentile of air quality data along with applicable National Ambient Air Quality Standards**

Importance of Parameters in Projects

- Meteorological
- Air Quality
- Emissions
- Predictions

Air Quality Monitoring Stations

- Consider wind rose in choosing the locations
- Choose the dominant wind directions
- Determine the frequency weighted wind speed and compute coverage factor for each location
- Sites having high coverage factor are potential monitoring stations

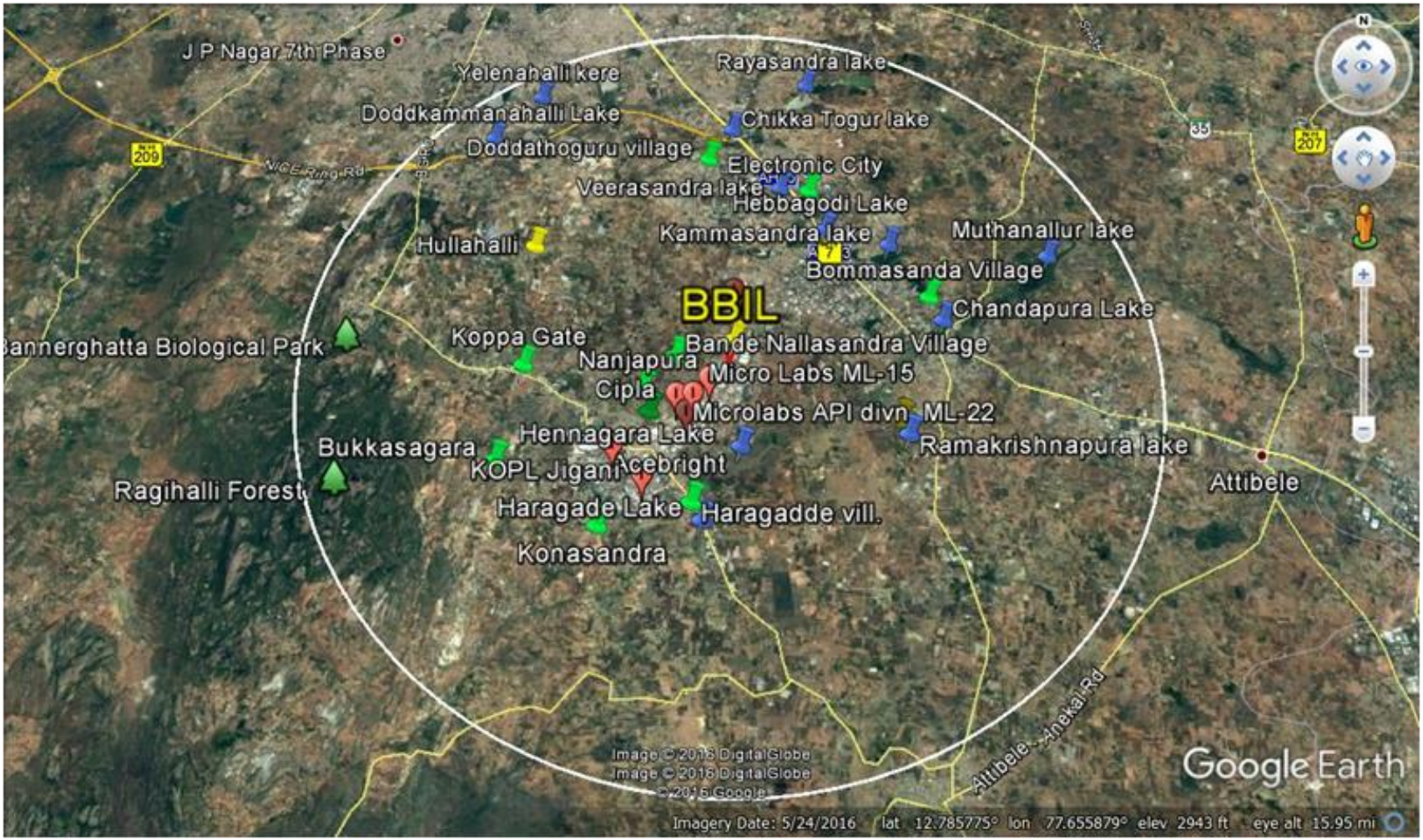
Meteorological Parameters

Parameters	Projects				
	Infrastructure & Others	Industrial	Mining	Thermal	River Valley
Temperature	Less Imp	Imp	Less Imp	Imp	Imp
Humidity	Not Imp	Not Imp	Not Imp	Not Imp	Imp
Wind Speed & Direction	Imp	Imp	Imp	Imp	Less Imp
Rainfall	Not Imp	Imp	Imp	Imp	Most Imp
Inversions	Not Imp	Imp	Not Imp	Imp	Not Imp
Mixing Heights	Not Imp	Imp	Imp	Imp	Not Imp
Wind Rose	Imp	Imp	Imp	Imp	Not Imp
Stability	Imp	Most Imp	Most Imp	Most Imp	Not Imp
Cloud amount & height	Imp	Most Imp	Imp	Most Imp	Not Imp

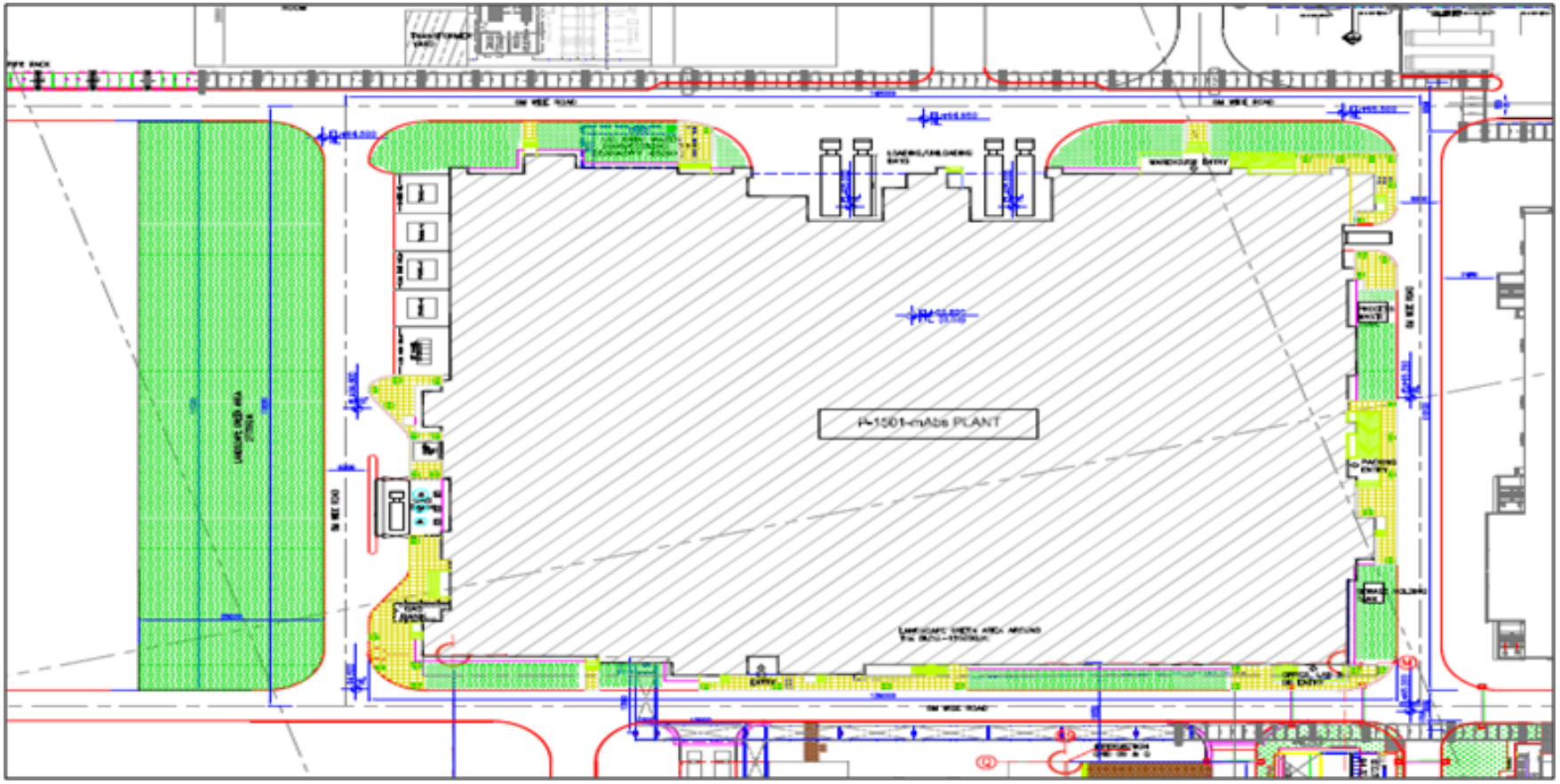
Air Quality Parameters

Parameters	Infrastructure & Others	Industrial	Mining	Thermal	River Valley
SO2	Less Imp	Imp	Less Imp	Most Imp	Not Imp
NOx	Most Imp	Imp	Less Imp	Most Imp	Not Imp
SPM & RSPM	Imp	Most Imp	Most Imp	Most Imp	Not Imp
CO	Most Imp	Imp	Less Imp	Less Imp	Not Imp

SATELLITE IMAGE OF THE PROJECT LOCATION – (10 KM RADIUS)

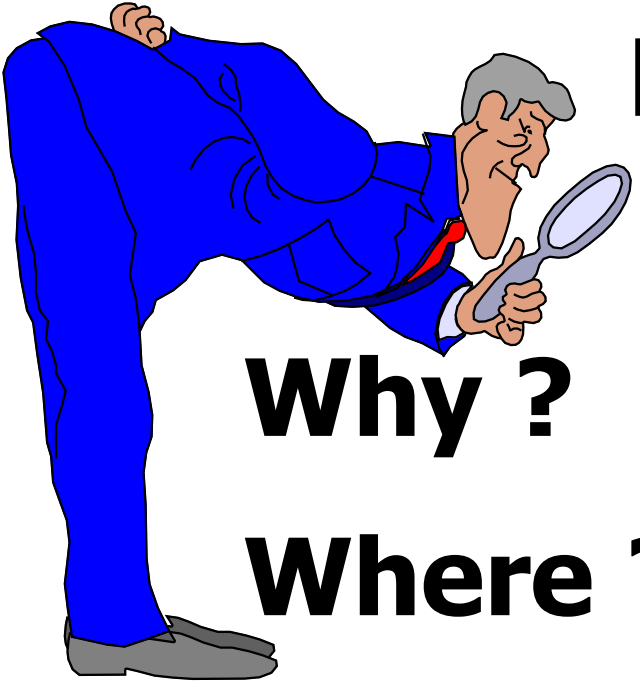


PROPOSED PROJECT SITE LAYOUT



Methods of Monitoring

Air Environment	Sampling Network		Frequency		Measurement Methods & Standards
	MoEF Recommendation	Suggestion	MoEF Recommendation	Suggestion	
Meteorology (Suggested Parameters: Wind Speed, Wind Direction, Air Temperature, Rainfall, Cloud Cover, Solar Radiation)	Minimum one site in the project impact area	Same	Hourly for one season	Hourly for one month representative of the season	On site data to be collected with either manual or automatic weather station
Wind Rose	Project Site	Same	Seasonal & Annual	Seasonal Only	
Air Pollutants	10 - 15 Stations	Based on wind rose and coverage factor: 4 - 5 only	24 hourly twice a week for one season	24 hourly twice a week for one representative month of the season	CPCB recommended methods



MONITORING ?

5 – Ws :

Why ? ..... **Objective**

Where ? ..... **Sitting**

Which ? ..... **Parameters**

When ? ..... **Frequency**

Who ? ..... **Agency**

HOW ?

NATIONAL AMBIENT AIR QUALITY STANDARDS (2009)

Pollutants	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
		Industrial, Residential, Rural and other Areas	Ecologically Sensitive Area (Notified by Central Government)	
Sulphur Dioxide (SO_2), µg/m³	Annual * 24 Hours **	50 80	20 80	-Improved West and Gaeke Method -Ultraviolet Fluorescence
Nitrogen Dioxide (NO_2), µg/m³	Annual * 24 Hours **	40 80	30 80	-Jacob & Hochheiser modified (NaOH-Na As O_2) Method -Gas Phase Chemiluminescence
Particulate Matter (Size less than 10µm) or PM_{10}, µg/m³	Annual * 24 Hours **	60 100	60 100	-Gravimetric -TEOM -Beta attenuation
Particulate Matter (Size less than 2.5µm) or $PM_{2.5}$, µg/m³	Annual * 24 Hours **	40 60	40 60	-Gravimetric -TEOM -Beta attenuation
Ozone (O_3) µg/m³	8 Hours * 1 Hour **	100 180	100 180	-UV Photometric -Chemiluminescence -Chemical Method
Lead (Pb) µg/m³	Annual * 24 Hours **	0.50 1.0	0.50 1.0	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper -ED-XRF using Teflon filter
Carbon Monoxide (CO), mg/m³	8 Hours ** 1 Hour **	02 04	02 04	-Non dispersive Infrared (NDIR) Spectroscopy
Ammonia (NH_3), µg/m³	Annual * 24 Hours **	100 400	100 400	-Chemiluminescence -Indophenol blue method
Benzene (C_6H_6), µg/m³	Annual *	05	05	-Gas Chromatography (GC) based continuous analyzer -Adsorption and desorption followed by GC analysis
Benzo (a)Pyrene (BaP) Particulate phase only, ng/m³	Annual *	01	01	-Solvent extraction followed by HPLC/GC analysis
Arsenic (As), ng/m³	Annual *	06	06	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
Nickel (Ni), ng/m³	Annual *	20	20	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper

* Annual Arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

NOTE: Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigations.

Ambient Air Quality Standards in respect of Noise (2000)

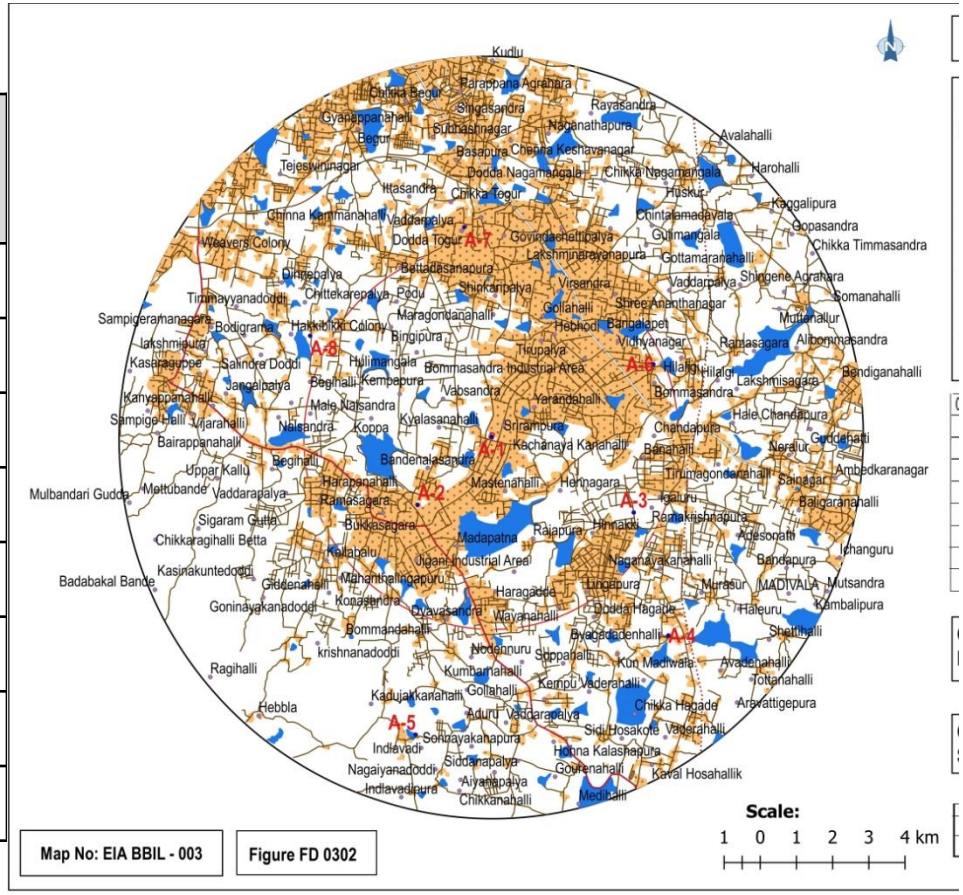
Area Code	*Category of Area/Zone*	*Limits in dB(A) Leq*	
		Day time *(6.00 a.m. to 10.00 p.m)*	Night time *(10.00 p.m. to 6.00 a.m.)*
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential Zone	55	45
D	Silence Zone	50	40

The monitoring programme involves,

1. **Reconnaissance surveys of the study area.**
2. **.Background information on –**
   -Meteorology, topography .population density,
   -emission sources and emission rates ,
   effects and impacts
   3. **Selection of sampling locations based on**
4. **scientific and environmental considerations**
5. **Number of monitoring stations with spatial density**
6. **Parameters to be measured at each station**
7. **No. of samples needed and frequency**
8. **Duration and time of sampling**
9. **Section of relevant equipment / instruments for monitoring**

Ambient Air Quality Monitoring Locations

Station Code	Location	Type of Wind	Lat longs	Distance (km) from Project boundary	Azimuth Directions
A1	Project Site	-	12^{0}48'3.22" N, 77^{0}39' 35.22"E		
A2	Jigani	U/W	12^{0}47'2.70" N, 77^{0}38' 29.91"E	4.31	W
A3	Ramakrishnapura	D/W	12^{0}46'56.24"N, 77^{0}41' 39.39"E	7.02	ESE
A4	Byagadadenahalli	C/W	12^{0}45'10.97"N, 77^{0}42' 9.72"E	7.89	SE
A5	Indalavadi	C/W	12^{0}43'46.06"N, 77^{0}38' 28.19"E	4.45	SSW
A6	Bommasandra	D/W	12^{0}49'3.07"N, 77^{0}41' 56.58"E	5.63	E
A7	Doddathoguru	C/W	12^{0}51'0.42"N, 77^{0}39' 10.82"E	5.45	N
A8	Hullahalli	C/W	12^{0}49'27.45"N, 77^{0}36' 55.68"E	2.60	NW



In all the selected locations of the ambient air quality, The results are found within the NAAQ limits.

Emissions

Infrastructure & Others	Industrial	Mining	Thermal	River Valley
Line source / Stationary Sources	Elevated Point Source	Fugitive	Elevated Point Source	Not Required
Can be estimated very well	Can be estimated very well	Questionable – No Definite Method available under Indian Conditions	Can be estimated very well	-

Impact Prediction

Prediction of Impacts On Air Quality	Imp	Most Imp	Imp	Most Imp	Not Imp
Models to be used	No specific Model but Line Source Model	Recommended Elevated Point Source Model as per CPCB Guidelines	No specific Model but Area Source / Fugitive Diffusion Model	Recommended Elevated Point Source Model as per CPCB Guidelines	Not Required

Model Details

- Brief description of the Model
- Emission estimations
- Input requirements and how they are derived with references if any
- Output of the model
- 24 hourly concentrations at all monitoring stations

contd…

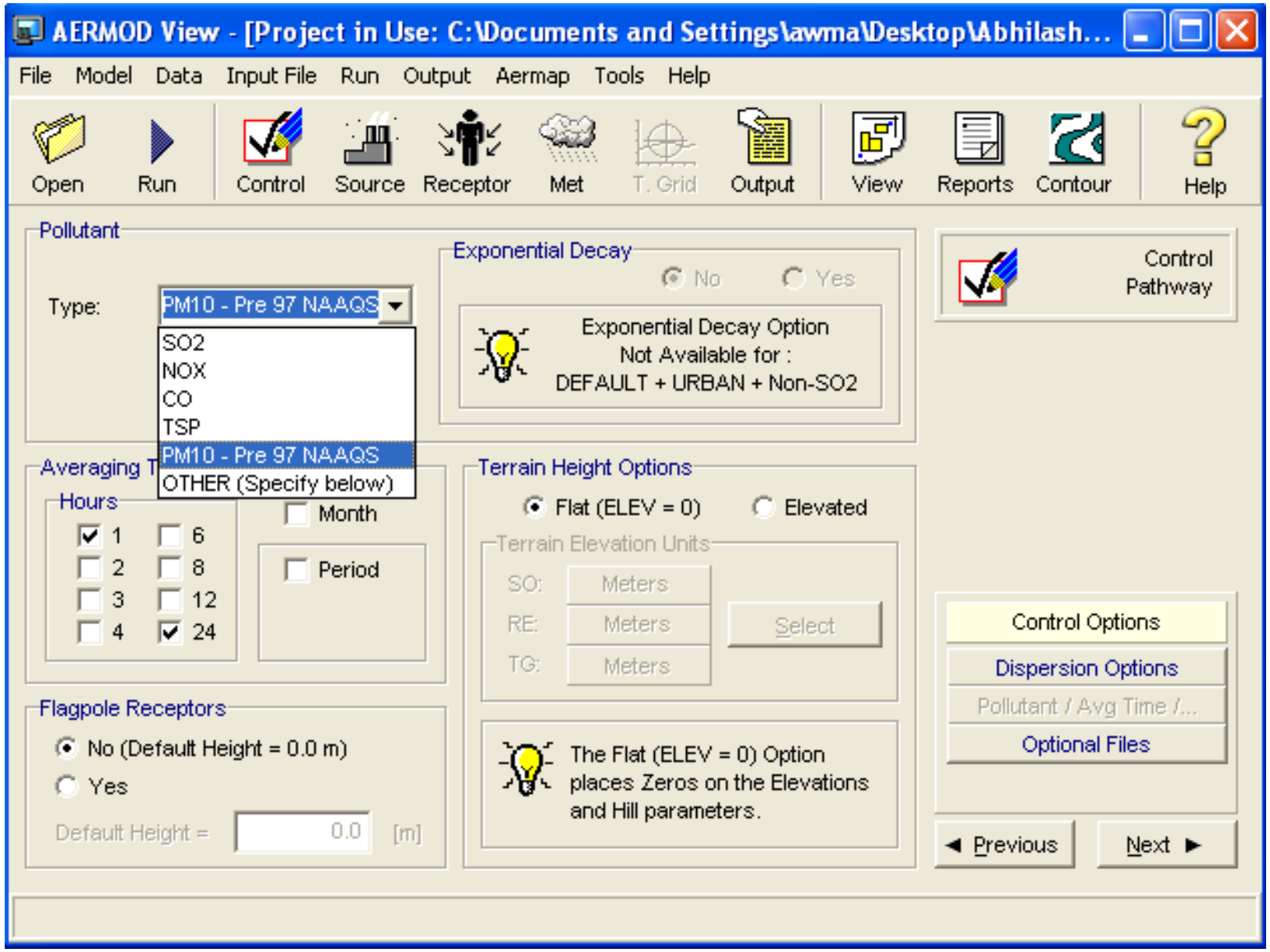
Impact Prediction contd…

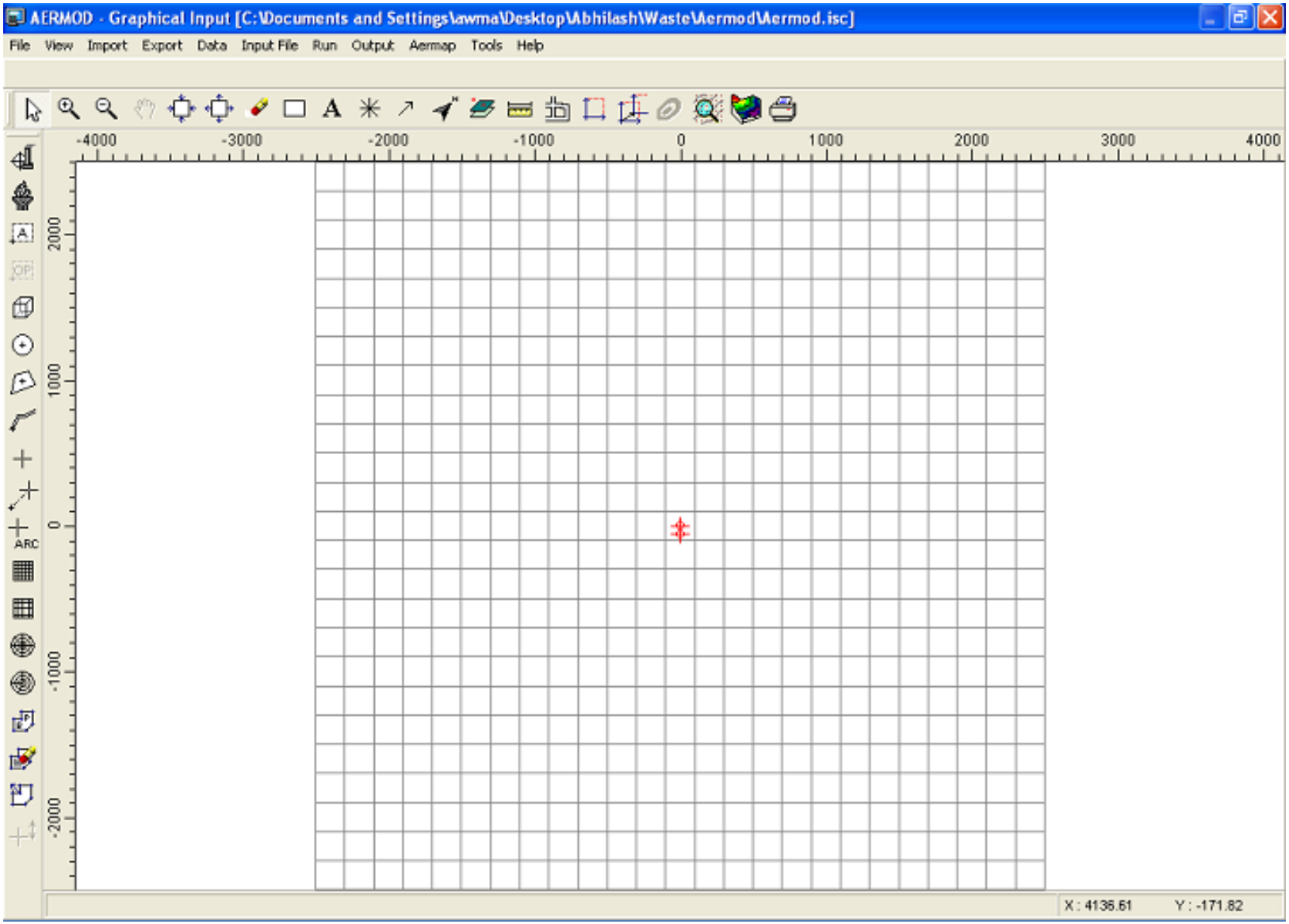
- Isopleth distribution of major pollutants within the study area
- Representation of the impact separately for SO2, NOX, SPM, RSPM & CO, whatever applicable as per the following:

S. No.	Monitoring Station	Distance	Direction	Predicted Conc.	Background Conc.	Resultant Conc.	Applicable Air Quality Standards

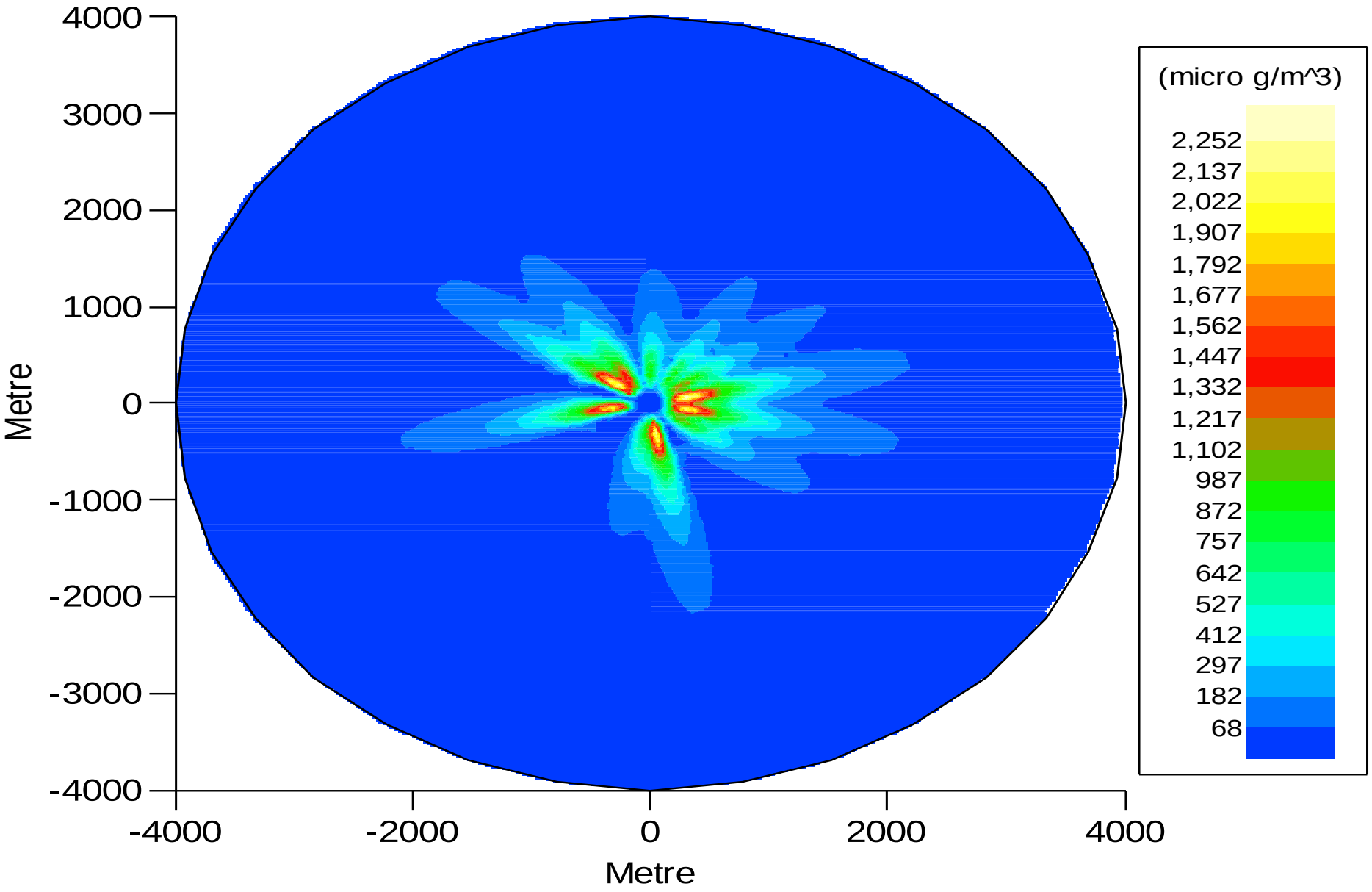
- Mitigative Measures to limit the air quality within the standards to be suggested

USEPA's AERMOD Modeling System for Air Dispersion Modelling


AERMOD View - [Project in Use: C:\Documents and Settings\awma\Desktop\Abhilash...
File Model Data Input File Run Output Aermap Tools Help
Open Run Control Source Receptor Met T. Grid Output View Reports Contour Help
Pollutant
Type:
PM10 - Pre 97 NAAQS
SO2
NOX
CO
TSP
PM10 - Pre 97 NAAQS
OTHER (Specify below)
Exponential Decay
No Yes
Exponential Decay Option
Not Available for :
DEFAULT + URBAN + Non-SO2
Control Pathway
Averaging T
Hours
1 6
2 8
3 12
4 24
Month
Period
Terrain Height Options
Flat (ELEV = 0) Elevated
Terrain Elevation Units
SO: Meters
RE: Meters
TG: Meters
Select
The Flat (ELEV = 0) Option places Zeros on the Elevations and Hill parameters.
Flagpole Receptors
No (Default Height = 0.0 m)
Yes
Default Height = 0.0 [m]
Control Options
Dispersion Options
Pollutant / Avg Time /...
Optional Files
◄ Previous
Next ►


AERMOD - Graphical Input [C:\Documents and Settings\awma\Desktop\Abhilash\Waste\Aermod\Aermod.isc]
File View Import Export Data Input File Run Output Aermap Tools Help
-4000 -3000 -2000 -1000 0 1000 2000 3000 4000
2000 1000 0 -1000 -2000
ARC
X : 4136.61 Y : -171.82

SO_2 - Contour Plot for July



AIR QUALITY DISPERSION MODELING RESULTS

Predicted GLC for existing and proposed stack

Parameters	Baseline data ($\mu g/m^3$) (Max conc)	Estimated Maximum Incremental Concentration ($\mu g/m^3$)	Predicted Maximum GLC ($\mu g/m^3$)	NAAQ standard $\mu g/m^3$ (24hrly)	Direction	Downwind distance (km)
SO_X	17.6	0.084	17.684	80	NW	0.26
NO_X	27.7	0.011	27.711	80	NW	0.3
CO	BDL	1.507	1.507	4.0	NW	0.5
PM 10	60.4	0.002	60.402	100	NW	0.3

Conditions

General conditions(GC)

Any project or activity specified in category 'B' will be treated as category 'A', if located in whole or in part within 10 km from boundary of (i) Protected areas notified under the Wild Life (Protection) Act, 1972 (ii) Critically Polluted areas as identified by the Central Pollution Control Board from time to time. (iii) Notified Eco-sensitive areas, (iv) inter-state boundaries and international boundaries.

Cont/--

Specified Conditions (SC)

If any industrial estate/complex with homogeneous type of industries such as Items 4(d), 4(f), 5(e), 5(f), or those Industrial estates with pre-defined set of activities (not necessarily homogeneous, obtains prior env. Clearance, individual industries including proposed industrial housing within such estates/ complexes will not be required to take prior Env. Clearance, so long as the Terms and Conditions for the industrial complex/estate are compiled with (Such estates/complexes must have a clearly identified management with the legal responsibility of ensuring adherence to th Terms and Conditions of prior Env. Clearance, who may be held responsible for violation of the same throughout the life of the complex/estate).

Scheme for Accreditation of EIA Consultant Organizations

National Accreditation Board For Educationand Training

QUALITY COUNCIL OF INDIA

WASTE MINIMIZATION STRATEGY

Diagram 1

Diagram 2

The Day is not far off!!
Act Now to prevent it

Believe
me!
I am your
LOVER.

Only thing
I did was,
I flew over
DELHI

BEFORE 2000

Our Environmental Issues and Challenges ?

1. Industrial pollution
2. Domestic Pollution
3. Vehicular pollution
4. Hazardous & Non hazardous wastes
5. Fly Ash Utility
6. Municipal Solid waste(MSW)
7. Bio Medical wsate
8. E -waste
9. Resource crises

&

10 Polpulation Density in Cities ??

VOICE OF ENVIRONMENTALISTS

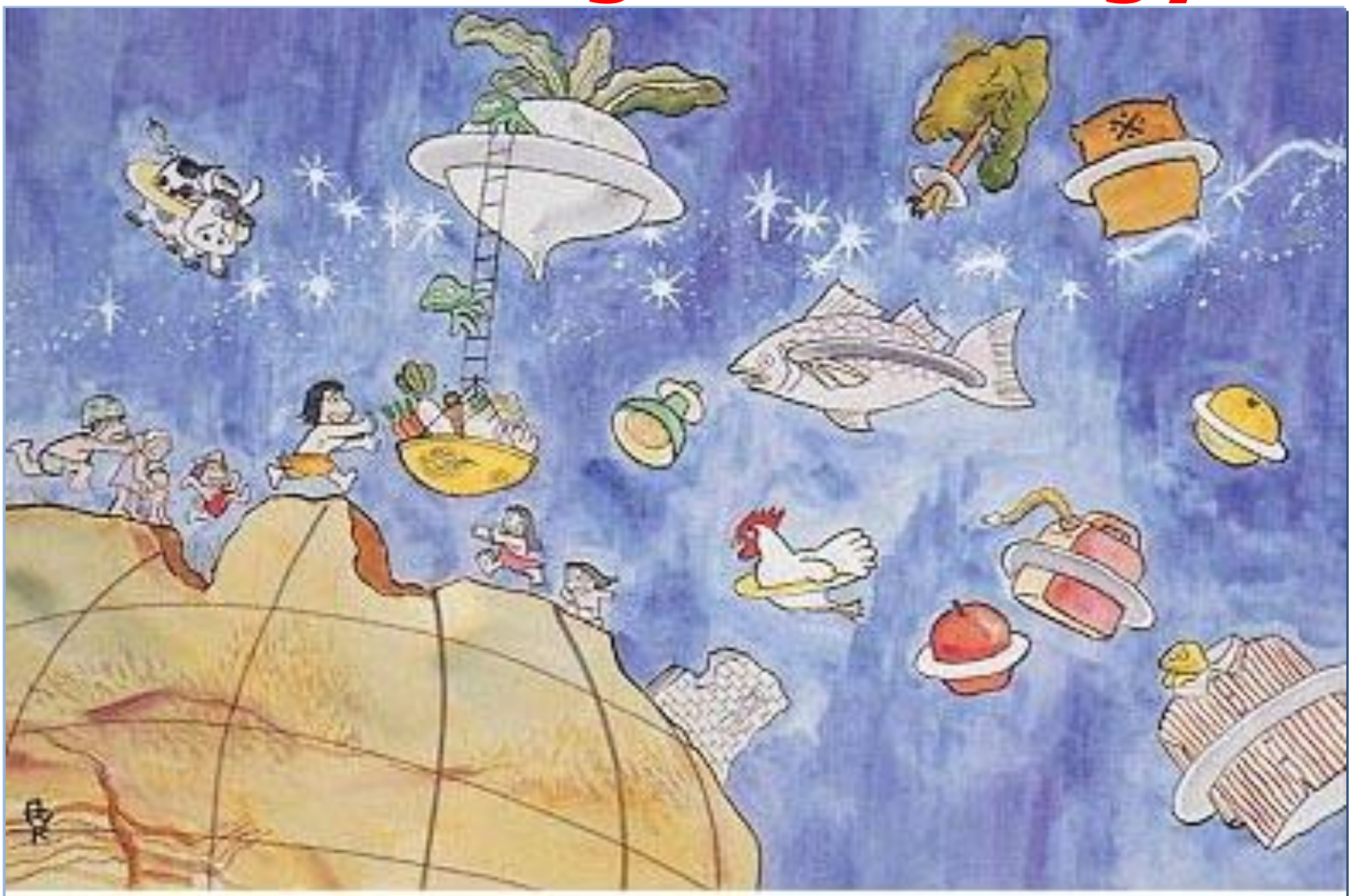
After a deep **consideration,** we came to the **conclusion** that **dilution, separation, filtration, adsorption, absorption, sedimentation, aeration, oxidation, reduction, accumulation, evaporation** etc. are not the ultimate **solution** for **pollution prevention** or control for which the sustainable **solution** is **adoption** of cleaner **production**, waste **minimization, decentralization**, eco-friendly approach, reuse, refill, repair, rejuvenate, recycle, need-based **production** cum-**utilization** and **conservation** of our resources for our future **generation**, whose **contribution** for sustainable environmental **protection** is urgent need of our **nation**.

Earth provides enough to satisfy Man's Need !

But not for Every Man's Greed !!

-Mahatma Gandhi

Out sourcing Technology ??



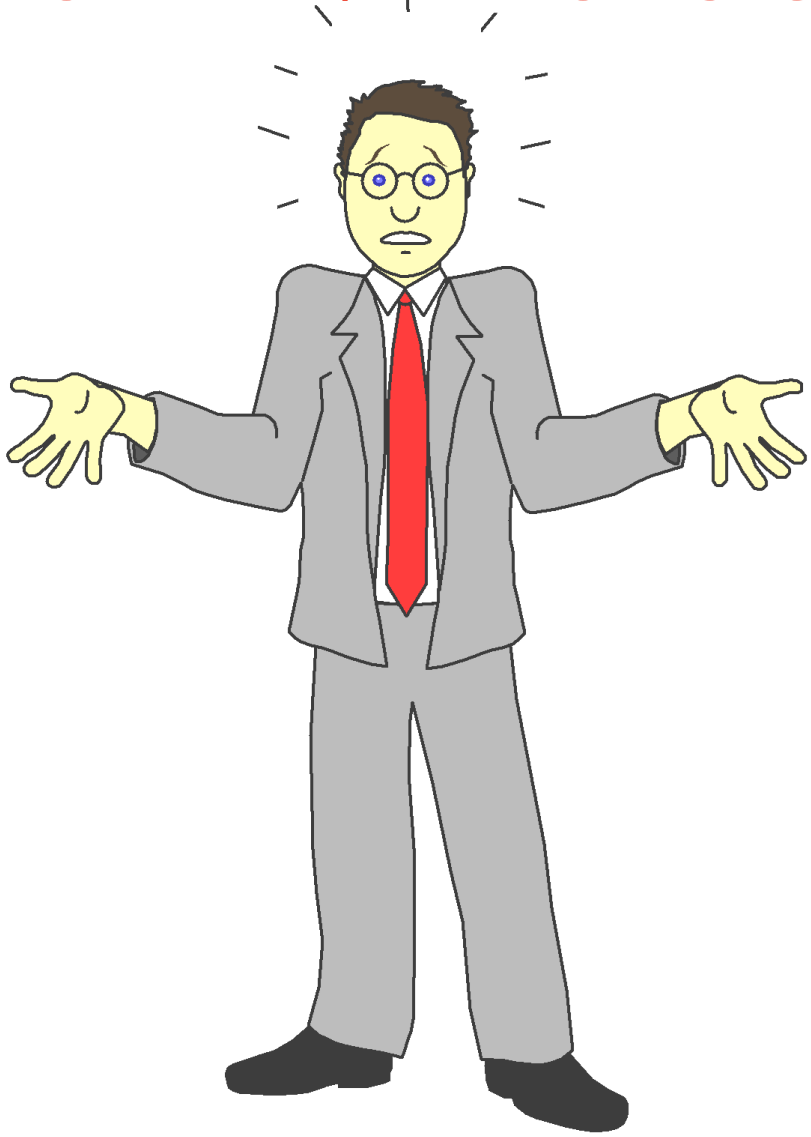
It would be great if there were planets which would supply resources to Earth after it has used up all its resources.

5 R's

1	Re-use
2	Repair
3	Rejuvenate
4	Refill
5	Recycle

POLLUTION PREVENTION & CONTROL

Industry



Government

Last but not least!

A humble and sincere request to our parents :

"MUMMY AND DADDY !

WE WILL NOT ASK ANY PROPERTY OR GIFT FROM YOU

WE WILL BE ASKING

"WHERE IS THE OXYGEN FOR US ?"

SO KINDLY SAVE US.

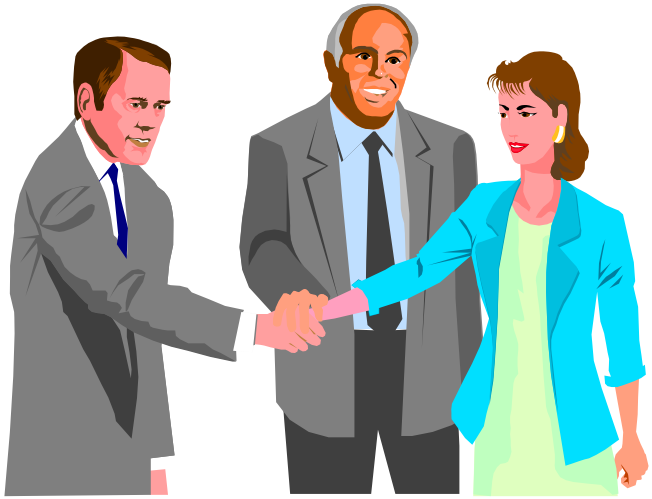
"Let us join hands to fight against pollution".

Thank You ! Thank You for All !!

SIN Q

--------- = TAN Q

COS Q



C U AGAIN

BYE BYE

A. MANOHARAN

Former Zonal Officer(CPCB)

E mail: mano_cpcb@yahoo.co.in

9663021846 (M)