***Report***

On

# Strengthening of Goa State Pollution Control Board

## Goa State Pollution Control Board

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## 1. INTRODUCTION

### 1.1 General introduction to state:

Goa, a tiny emerald land on the west coast of India, the 25th State in the Union of States of India, was liberated from Portuguese rule in 1961. It was part of Union territory of Goa, Daman & Diu till 30th May 1987 when it was carved out to form a separate State.

Goa, for the purpose of revenue administration is divided into two districts viz. North and South Goa with headquarters at Panaji and Margao, respectively. The entire State comprises 11 talukas. For the purpose of implementation of development programmes, the State is divided into 12 community development blocks. As per 2001 census, the population of the State is 13, 42,998.

Administratively, the State is organized into two districts North Goa comprising six talukas with a total area of 1736 sq. kms. and South Goa comprising five talukas with an area of 1966 sq. kilometers. In all there are 383 villages of which 233 are in North Goa district and 150 in South Goa district. As per the 2001 census, there are 44 towns of which 14 are Municipalities and remaining are census towns.
Geographically, Goa is situated along the Western Ghats of the Central West Coast of India. It covers an area of 3,702 sq.km and accounts for only 1 % of the total geographical area of the country. It is drained by nine rivers that originate in the Sahyadri ranges and flow westward into the Arabian Sea and has coastline of 105 km. Goa is a popular tourist destination. The rapid and increased industrialization of Goa, despite this being required in order for the economy of the state to flourish, is considered a threat to the vast biodiversity of Goa. It has a number of environmentally fragile features, which need to be conserved and protected. Despite being such a small state, Goa has 6 wildlife sanctuaries, 1 national park, 1 world heritage site at old Goa, a number of monuments of national significance, inclusive of churches and temples which form a part of the culture of ancient Goa. There exists also other biologically sensitive areas such as reserved forests, mangroves, estuaries, beaches, wetlands, and turtle nesting grounds.

### 1.2 Resources;

The state of Goa is a prime tourist spot of the world and is known for its beautiful beaches and landscapes. Apart from these, a world heritage site about 9 km east of panjim, the capital city, lies in the erstwhile capital of the Portuguese rule in India that is old Goa or Velha Goa comprising of churches, convents etc which have been declared by UNESCO in 1986 under world heritage category. A total of 21 monuments of national significane have been identified in the state of which most lie in Old Goa, followed by Candolim, Ponda, Arvalem, Tambdi, Surla and Chandor. The state of Goa caters more than 10 lakh tourists per year from around the world with the beauty of its 12 beaches which are located in Salcete, Bardez and Tiswadi talukas..
Biological resources include 1 national park, 6 wildlife sanctuaries, several endangered species, 3 turtle nesting grounds, 1 coral reef, estuarine crockodiles at Cumharjua canal, mangrove areas, wetlands and 354.48 sq.km of reserved forest in North Goa and 869.98 sq.km in south Goa.
There are a total of 9 rivers in the state of Goa viz. Mandovi, Zuari, Sal, Chapora, Talpona, Saleri, Galgibag, Terekhol and Baga.
There are a total of 93 mines and 467 mines of minor minerals in Goa

### 1.3 Ecologically sensitive areas:

Environmentally sensitive areas are the areas that may be susceptible to negative impacts due to development activities such as industries and must be protected from industrial pollution. Hence, industrial activities cannot be allowed in these areas. These areas have been described in two categories:

1. Biological diversity
   This include 1 national park, 6 wildlife sanctuaries, several endangered species, 3 turtle nesting grounds, 1 coral reef, estuarine crocodiles at Cumharjua canal, mangrove areas, wetlands and 354.48 sq.km of reserved forest in North Goa and 869.98 sq.km in south Goa.

2. Sensitivity / incompatible land use areas
   This include public water supply areas from surface water bodies, world heritage sites, monuments of national significance, tourist places, pilgrim centres, agricultural research station, sacred graves, command areas of irrigation projects, airport and coastal regulatory zones.

## 1.4 Urbanization:

The State is organized into two districts; North Goa comprising of 6 Talukas (Tiswari, Bardez, Pernem, Bicholin, Sattari and Ponda) with a total area of 1,736 sq. km and headquarters at Panaji and South Goa comprising of 5 Taluikas (Sanguem, Canacona, Quepem, Salcete and Mrmugao) with a total area of 1,966 sq.km and headquarters at Margao. The State has 1 Municipal Corporation and 13 Municipalities (Mapusa, Pernem, Bicholin, Sanquelim, Valpoi, Ponda, Sanguem, Canacona, Quepem, Curchorem, Margao, Cuncolim, and Mormugao).

According to the Census of India 2001, there is 1 Class I city (Mormugao with a population of 1,04,758) and two Class II towns (Panaji and Margao) in the State of Goa. Also, there are 360 villages distributed evenly through out the State.

The State has developed 3 National Highways, 8 State Highways and 52 Major District Roads. Goa's Railway network comprises of Konakan Railway (105.961 km) and South Western Railway and 6 Railway Stations. Some rivers are also utilized for transportation. Dabolim Airport is the only Airport in Goa and handles both domestic and international flights. It is located at a distance of 25 km from the capital city of Panaji.

## 1.5 Existing status of environment and required action:

There are 20 industrial estates with a total of 1773 industrial units in the State of Goa which are mainly responsible for the pollution load. Apart from these, 7 industries under special projects are also present in the region which manufacture glass, coke, GRP pipe systems and tanks, pig iron, copper, nickel strips, and a distillery. Also there are 1835 Nos. of small scale industries which lie outside the industrial estates with majority of industries engaged in FMCG, food, household, bakery, agrochemical production.

In all, there are about 130 major industries already established in Goa. The State has over 6500 small scale units and about 147 large and medium scale industries employing over 60,000 people.

Besides, there are 93 Nos. opencast mines & 426 Nos. of mines for minor minerals which are contributing to the total pollution level. Iron , manganese and bauxite are the major mines in Goa. The major environmental impact of mining operations are degradation of land, pollution of air, deforestation including loss of flora & fauna, rehabilitation of affected population including tribal and impact on historical monuments and religious places. There are 228 quarries in Goa, specially of latterite stone, which contribute to dust pollution.

A total of 13 settlements have been identified for generation of municipal solid waste in the region of north and south Goa. The solid waste constitutes wastes from households, municipal market, hotels and restaurants and commercial establishments, hospitals, tree trimmings, leaf liter and road sweepings. The biomedical waste inventory shows 123 hospitals and nursing homes generating biomedical waste.

The total hazardous waste generation from 93 units, as on 5$^{th}$ August 2005, is 9600.94 MT and 13,836 barrels. Total used oil generated is 702.62 MT and total waste oil/ residues containing oil generated is 30.32 MT. The hazardous waste generated is recycled/ stored in a TSDF or incinerated as per the nature of the waste.

Domestic sewage is mostly discharged in to the rivers or sea. Class I towns use rivers for wastewater disposal whereas class II towns either use agricultural land or lakes/ponds and rivers for disposal of wastewater. There is only one class I city and two Class II towns in Goa, all of them have sewage treatment plants.

River Kalna, Assonora, Valvanti, Madei, Khandepar, Talpona and Salaulim reservoir (River Zuari) are the main sources of supply of drinking water in North and South Goa districts. Areas upto 2 kms u/s of public water supply abstraction points have been considered incompatible landuse area for protection.

At present water quality of 11 rivers is monitored by the Board. The analytical results show that all the rivers satisfy the quality requirement of the designated best use. CPCB has now sanctioned 18 new stations in addition of 11 existing station, under the National Water Monitoring Programme (NWMP).

The ambient air quality has been classified as moderate at all the 3 locations i.e. Panjim (residential location) Vasco and Mormugao (both industrial locations). At these locations, all the parameters are within the standards prescribed except SPM which marginally exceeds permissible limits.

## 2. NEED OF THIS DOCUMENT

Various functions under the Water (Prevention & Control of Pollution) Act, 1971 & Air (Prevention & Control of Pollution) Act, 1981 are carried out by the Board such as granting NOC (consent to establish), consent to operate including inspection of industries & checking compliance of standards/ conditions and monitoring of ambient air and water quality. The additional function of the Board is grant of authorization for management of municipal, bio-medical and hazardous wastes as per relevant Rules under E(P)A. In order to carry out these functions, the Board has established one central laboratory and two mobile vans, as well as one Regional Office at Verna. One more Regional Pffice has been planned which will have regional laboratory.

Considering the problem of air pollution in areas affected due to transportation of iron ore, the ambient air quality monitoring twice a week have been planned. Board has also planned to conduct stack & ambient air quality monitoring for industries categorized as red category by MoEF. Mining is a significant polluting activity which requires control by regular monitoring.

Since Goa being a touristic place with a significant environmentally sensitive areas & monuments of world and national importance, there is a need to protect & improve the environment quality by strengthening the Goa State Pollution Control Board both in terms of infrastructure & manpower including training, with particular emphasis on having independent building with adequate space for laboratory and regular staff of adequate number as well as with higher positions.

## 3. PRESENT STATUS OF POLLUTION CONTROL IN THE STATE:

### 3.1 Ambient Air Quality Status:

Under the National Air Monitoring Programme (NAMP) sponsored by Central Pollution Control Board (CPCB), the Board continued to monitor the ambient air quality at three Stations (Panaji, Vasco & Marmugao). Based on the results of ambient air quality analysis, the air quality has been classified as moderate at all three locations. At these locations, all the parameters are within permissible limits except SPM, which marginally exceeds permissible limit. In its 85$^{th}$ meeting, the Board has proposed to carry out ambient air quality monitoring twice a week in areas affected due to transportation of iron ore through MoEF approved laboratory and recover the cost from the mining companies operating in the area.

The Board conducts ambient air and source emissions monitoring for industries in Goa. Eighteen stacks were monitored during the year 2007-08. Samples are collected and analyzed for air pollutant such as SPM, RSPM, $SO_2$ and NOx for ambient air and Particulate Matter for stacks. The Board carries out monitoring of noise levels where specific complaints of noise pollution are received and action is taken accordingly.

### 3.2 Water Quality Status:

Under the project National Water quality Monitoring Programme (NWMP) sponsored by Central Pollution Control Board (CPCB), the Board has been monitoring the water quality of the rivers Zuari, Mandovi, Kalna, Valvanti, Madei, Khandepar, Talpona, and Assonora in the State of Goa. Hundred and twenty four water samples from all the rivers were collected and analyzed in the year 2007-08. The analytical results show that all the rivers satisfy the quality requirement of the designated best uses as recommended by Central Pollution Control Board (CPCB). As proposed by GSPCB, CPCB has sanctioned 18 new stations under National Water Monitoring Programme (NWMP) in addition to the existing 11 stations. The total 29 stations are divided into three groups i.e. (i) 11 stations to be monitored monthly (ii) 12 stations to be monitored quarterly and (iii) 6 stations to be monitored half yearly.

So far, there have been 64 complaints regarding ground water quality in Goa. The complaints pertain to industries, mines, hotels/resorts, construction companies and the complaints vary from seepage of chemicals/ contaminants into ground water from industrial / mining dumps to seepage of sewage from soak pits constructed by hotels/ resorts/ construction companies. It has been proposed by the Board in 84$^{th}$ meeting to conduct survey and assess contamination (type and levels) of ground water resources (lakes, public bore wells, private wells and other water bodies for Pilerne Industrial Estate through a laboratory recognized by MoEF under E(P) Act and recover the cost incurred from the industries within the industrial estate. It has also been decided to carry out such studies for Verna industrial estate and Kundaim industrial estate.

### 3.3 Industrial Pollution Control

#### 3.3.1 Consents:

The SPCB carries out inspection and grants NOC (consent to establish), consent to operate and authorization. Consents are issued under Air & Water Acts and authorization is granted for Bio-medical Wastes, Municipal Wastes & Hazardous Wastes, as per relevant Rules under E(P) Act. A total of 243 consents to operate were issued under Air Act alone, 203 consents to operate under Water Act alone, and that 229 under both Air & Water Acts, besides 212 NOCs (consent to establish) were issued in the year 2007-2008 to industries and development projects.

#### 3.3.2 Complaints:

Goa SPCB takes action to address the public complaints. A total of 224 public complaints received in which 169 were regarding Air pollution, 91 regarding surface water pollution and 64 regarding ground water pollution. Besides regular inspections, surprise inspections are also being conducted to check the compliance by the units. To achieve this, industrial monitoring programmes are held at regular intervals, wherein the units are inspected at random with respect to the consent conditions. Samples of waste water, ambient air and stack emissions are collected and analyzed in the Board's laboratory. During the year 2007-08, industrial monitoring programmes were conducted for mining industries, industries under the 17 categories, steel industries (sponge iron and induction furnace units) and stone crushing units at St. Jose de Areal.

### 3.3.3 Legal actions:

Four major cases are pending in the High Court of Bombay pertaining to the pollution made by the industrial clusters at Goa and study is being done by NEERI. Two cases are pending in the Hon. Supreme Court of India.

### 3.3.4 Existing Policies:

(I) The Board has decided to categorize the industries into Red, Orange and Green categories and also decided to issue combined consent under Water and Air Acts and authorization under the Hazardous Waste Rules.

(II) The Board has decided to implement the XGN Software developed by NIC, Gujarat for online processing of applications for consent / authorization, complaints etc. The Work order has already been placed to the NIC and online processing of applications will commence in 3 to 4 months time.

### 3.3.5 Committees:

In order to develop uniformity in approach and to ensure timely clearance of the consent applications, the Chairman of the Board constituted a Technical Committee composing of technical and scientific officers. The Committee holds weekly meetings for scrutiny of consent applications, both under Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981. The Technical Committee meetings are held on every Tuesday wherein the applications are examined keeping in mind that the sole function of the Board is to ensure that all industries discharging effluents or gaseous emissions, shall meet the standards prescribed and published under E(P) Act, 1986. Minutes of the meeting are put up to the Chairman for approval on Wednesday. On approval of the minutes by the Chairman on Wednesday, the approved list is displayed on the notice board of Goa State Pollution Control Board, website of Goa Chamber of Commerce and Industry, and website of Goa State Pollution Control Board on Wednesday itself. The consent orders are dispatched by post to the concerned parties on Thursday. This procedure has brought total transparency in the working of the Board.

The Board has also proposed in its 85$^{th}$ meeting to constitute a committee for purchase of new premises to setup Regional Laboratory cum Office at Margao for better enforcement.

## 3.4 Hazardous Waste Management:

A total of 248 units in Goa generate a total of 12097.839 metric tonnes and 9794 barrels of hazardous waste per year of which 1784.829 MT & 9600 Nos. of barrels constitute the quantity of recyclable waste, 5605.119 MT is the total waste subjected to landfill and 4707.8913 MT & 194 barrels is the quantity subjected to incineration.

## 3.5 Municipal Solid Waste:

The inventory of Municipal Solid Waste shows a total of 279.5 MT of MSW being generated in the State of Goa out of which 88 MT of MSW is being generated in 6 Municipal Council of North Goa and 191.5 MT of MSW is being generated in 7 Municipal Council of South Goa. The Board has issued authorization to all the 14 local bodies under the Municipal Solid Waste (Management & Handling) Rules. Five municipal bodies have partly adopted effective composting methods for processing of their wastes.

## 3.6 Plastic Waste:

There are 21 units involved in manufacture of plastic bags in the State. All these units have obtained consent and have also obtained registration under Recycled Plastic Usage Rules.

There are thirty one units involved in plastic shredding and manufacture of granules (except plastic bags).

The State Govt. has banned manufacture of plastic bags less than 40 micron thickness for sale in the State as per the provision of The Goa Non Biodegradable Garbage (Control) Act, 1996.

There are no units established in the State for recycling of plastic bags. The method of collection and disposal of used plastic bags has to be identified.

## 3.7 Emerging issues:

There are 141 Environmental Clearances granted for iron ore / manganese ore mines. The operation of mines and transportation of ore is done by trucks and barges (barge loading facilities on river banks). In addition, there are existing beneficiation plants which are operating within mining leases. New dry screening plants / crushing plants have been installed. Issues of dust pollution/ air Pollution, damage to agricultural fields / orchards, congestion of roads are associated with such activities. This requires regular monitoring and enforcement of conditions stipulated.

Collection, disposal and recycling of E-waste / tubelights and pen cell batteries are of concern and require action plan, which can be taken up based on new regulation under finalization by MoEF.

- Though there are arrangements made by health care facilities for treatment & disposal of bio-medical waste, there is a need for common disposal facilities.
- Though there is a site identified for common TSDF to treat and dispose hazardous wastes, no construction has been done due to objection from public.
- For management of municipal solid waste, availability of land is a constraint. Thus, there is a need for de-centralized systems and awareness programmes for all concern.
- The coastal belts particularly from Securim to Baga and Mazorda to Cavalcossin have no sewerage facility, where hotels are located on the coast. Time bound programme for treatment and disposal or recycling/ reuse is needed.
- There is a issue of solid waste management in beaches which fall under jurisdiction of Panchayats. Effective solid waste management is needed at beaches through awareness and coordination with Tourism Department and Panchayats.

### 3.7.1 Batteries:

Twenty three manufacturers, / dealers and twenty two Bulk consumers are filing half yearly returns regularly to the Board. Most of the dealers are not filing half yearly returns to this office.

Status reports on Batteries Management and handling Rules is under preparation.

### 3.7.2 Electronic waste:

The computer market in city has been increasing due to lot of commercial development and IT developed activities. The City is emerging with a large middle class group who are willing to buy PC's. A large chunk of demand is still met by Assemblers who compete primarily on low cost advantage.

Assembler’s market is dominated in residential area and MNCs/Branded PC's market has been shifting to commercial area. PC usage increases with the increase of the income level and education level of people. Even though MNCs and branded PC's cover larger market in city, grey market finds its place in between assembled and branded products. Actually assembler’s market is the main originator of grey market because majority of obsolete PC's are diverted to the grey markets, wherein the non functional parts are changed and fixed with the new parts in PC's and further sold back to customers and remaining miscellaneous scraps are sold to scrap-dealers and recyclers.

There are no recyclers in the city specially doing recycling for obsolete PC's.Existing E-waste handling practices are not expected to manage future E-waste generation thus formal recycling center is needed for E-waste collection, segregation, dismantling and recycling of the material.

There is a lack of awareness in public regarding E-waste handling, treatment and disposal.

## 3.8 State specific issues:

Goa is an international tourist destination. The population of Goa is about 14 Lakhs and about 20 to 25 Lakh tourists visit the State every year. There are large number of hotels, restaurants, clubs, discothèques which have come up in the beach belt areas of North and South Goa. However there is no sewerage system in these areas. There is no proper system for collection and disposal of solid waste in the Panchayat areas even though the State Government has notified Rural Garbage Disposal Scheme in line with the provision of the Municipal Solid Waste Rules, in 2005. Areas requiring sewerage facility are Sinquerim to Vagator in North Goa and Velsao to Cavelossim in South Goa.

Since Goa is a international tourist destination there are open air restaurants, pubs, clubs operating in the night time. There are numerous complaints received regarding noise pollution with regard to playing of recorded as well as live music in these areas. This requires noise control programme for enforcement of noise standards.

For setting up of Common Hazardous Waste Treatment Storage and Disposal Facility (CHWTSDF), site has been identified. EIA study and Public Hearing have been carried out but the facility is yet to be developed.

## 3.9 Mass Awareness:

Awareness programmes on solid waste management in the State of Goa have been conducted through The Energy Research Institute (TERI).

Mass awareness programmes are required to be conducted for the following:

1. Municipal Solid Waste segregation, treatment and disposal in each council and coastal Panchayats
2. Awareness regarding Noise Rules in the coastal villages for the general public and stakeholders ( hotels / restaurants / shacks / discotheques)

3. Awareness programmes for segregation , treatment and disposal of bio-medical waste for the doctors, nurses and workers
4. Awareness programmes for the truck drivers transporting iron ore.
5. Awareness programmes for assemblers, distributors and dealers of batteries regarding provision of the Batteries Management and Handling Rules.
6. Awareness programmes for manufacturers of plastic bags

### 3.10 Bio-medical waste:

There are total 182 Health Care Facilities out of which 171 are Hospitals with 5211 beds and 11 Veterinary units in the State. All the facilities have been granted authorization. Out of these, 2 facilities have incinerator with APCD, 135 have autoclave for sterilization, 135 have microwave and 138 have shredders for preliminary disposal of hospital instruments such as syringes, needle etc. The total quantity of bio-medical waste generated per day is 1027.692 Kg and the quantity of bio-medical waste treated per day is 1027.69 Kg. Till date no health care facility has violated any BMW Rules neither any Show Cause Notice have been issued to any of the facility in the State.

## 4. MANDATES & ACTIVITIES

The Goa State Pollution Control Board has been given mandate under the Water (Prevention & control of Pollution) Act, 1972 for control of pollution of water which include surface waters (rivers, lakes, ponds, sea) & ground water, under Air (Prevention & control of Pollution) Act, 1981 for control of air pollution and noise and under Water (Prevention & Control of Pollution) Cess Act, 1977 for collection of cess to augment the resources of the Board. In addition to these mandates, there are mandates of the Board under Environment (P) Act, 1986 and Rules made there under for municipal solid waste, bio-medical waste, hazardous waste and for hazardous chemicals. Various mandates and activities under each Act and Rules are given below.

### 4.1 Water (Prevention & Control of Pollution) Act, 1974:

There are various functions of the Board under Water Act. In order to perform as per the mandates given in the Act, the Board carries out activities such as grant of consent to establish and consent to operate to industries and for other developmental projects which result in generation of waste water, requiring proper treatment and disposal.

The Board carries out monitoring of water bodies (rivers, canals & wells) in order to disseminate information on quality of water and to evolve a programme as needed for prevention, control or abatement of pollution of streams & wells in the State.

Board also carries out activities related to inspection of sewage and trade effluents discharge, works and plant for the treatment of sewage and trade effluents and to review plan, specification or their data relating to plant setup for the treatment of water, works for the purification thereof and the system for disposal of sewage and trade effluents in connection with grant of consent, as required by this Act.

In order to advise State Government with respect to the location of any industry, the Board has come out with a Zoning Atlas report for citing of industries.

The Board also performs such other functions as entrusted by the Central Pollution Control Board (CPCB) or State Government. The Board also organizes training programmes for the persons of the Board and concern Departments/ Local bodies.

### 4.2 Air (Prevention & Control of Pollution) Act, 1981:

There are various functions of the Board under Air Act. In order to perform as per the mandates given in the Act, the Board carries out activities such as grant of consent to establish and consent to operate to industries and any other developmental projects having potential to cause air pollution and require proper control.

The Board carries out monitoring of air quality in three cities regularly and under specific programmes in mining areas and industrial areas, including monitoring as required on receipt of complaints.

Board carries out inspection of air pollution control areas and air pollution control equipment and issue directions as necessary for the prevention, control or abetment of air pollution.

The Board also carries out assessment of air quality in industrial areas and mining area for prevention and control of pollution. Board also organizes training programmes for persons of the Board and other Departments The trainings are related to air quality monitoring and programmes on air pollution control.

Other functions as entrusted by CPCB and State Government for air pollution control are also carried out.

### 4.3 Water (Prevention & Control of Pollution) Cess Act, 1977:

The activities related to Water Cess Act is to verify quantity and quality of effluent discharged for the assessment of the return filed by the industries, municipal bodies etc.

Cess collected is sent to Central Government in order to get back the share of the Board for augmenting its resources.

**4.4 Environment (Protection) Act, 1986 and Rules made there under:**

The Board carries out various activities as per following Rules under the E(P)Act:

- The Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008
- The Municipal Solid Wastes (Management and Handling) Rules, 2000
- The Bio-Medical Waste (Management and Handling) Rules, 1998
- Manufacture, Storage and Import of Hazardous Chemical Rules, 1989
- The Batteries (Management and Handling) Rules, 2001
- Plastic (Manufacturer, Usage and Waste Management) Rules, 2009

Under above first 3 Rules, the Board grants authorization for management of waste to the operator of the facility as well as to the generators and recyclers of hazardous wastes and to Health Care facilities for proper handling and disposal of biomedical wastes.

Under authorization to the operator of facilities, the Board is required to approve the sites, design and layouts of the facility. The mandate also includes supervision of the waste management facilities during construction of facilities. The Board is required to carry out inspection for their proper operation.

Under Manufacture, Storage and Import of Hazardous Chemical Rules, 1989, duties assigned to the Board are enforcement of directions and procedures in respect of isolated storage of hazardous chemicals, to notify major accidents as per Rules 5(1) and 5(2). notification of sites as per Rules 7 to 9, to publish safety reports in respect of isolated storages as per Rule 10 to 12, preparation of on-site emergency plans as per Rule 13 and to check import of hazardous Chemicals and enforcement of directions and procedures on import of hazardous chemicals as per Rule 18.

The Board is responsible for ensuring compliance to various provisions under the Batteries (Management and Handling) Rules, 2001 by importers, recyclers, dealers, consumers and auctioneers. Also it is the duty of the Board to file an annual report to the CPCB by 30$^{th}$ April of every year.

## 5. PRESENT SET UP OF SPCB

### 5.1 Staffing:

Present status of staff and manpower of the Board is given in the Annexure II, which is inadequate considering the mandate and the amount of work required for enforcement of various Acts & Rules. There are a few engineering staff under Technical Cell, that too on deputation. Other cells also need strengthening with regularization of contractual staff (mainly in Scientific Cell).

### 5.2 Funding:

In 2003, the Board had fixed deposits of Rs.2.71 crore and consent fees of Rs. 1.15 crores, in the year 2007-08, the Board had fixed deposits of Rs. 21 crore and consent fees of Rs. 2.5 crore.

### 5.3 Laboratories:

The Board has established it's own laboratories on the fist and fourth floor of Dempo Tower with the funds from MoEF and CPCB, New Delhi. The laboratories are well equipped with modern instruments to carry out water, air and soil analysis for physical, chemical and microbiological parameters. During the period from April, 2007 to March, 2008, the Board had collected 347 samples of industrial effluents and analyzed the same for the following parameters; pH, BOD, COD, Suspended Solids and Oil & Grease, Trace and Heavy Metals, etc. Apart from this, the Board has also collected and analyzed 175 samples from different sources such as rivers, wells, springs, streams, lakes, canals, sea, nallah, etc. Twenty nine soil samples were analyzed for metals during the year 2007-08. The Board has one Central Laboratory which has been accorded recognition under section 12 & 13 of the Environment (Protection) Act, 1986 and two mobile laboratories.

### 5.4 Regional Offices:

The Board has one Regional Office at Verna and one more Regional Office has been planned along with regional laboratory considering the problem of air pollution in areas affected due to transportation of iron ore.

## 6. GOALS OF POLLUTION CONTROL

### 6.1 Surface water quality:

To protect the water quality of all the rivers in Goa by regularly monitoring at existing 11 stations and new 18 stations. Also, to see trends for increase in pollutant levels for identifying sources for control purpose and to draw a programme for the same

### 6.2 Ground water quality:

To initiate regular programme of ground water monitoring for the wells in and around areas of potential pollution such as industrial estates, mining areas and the area of concern for protection of drinking water sources from ground water.

### 6.3 Ambient air quality:

Enhancing monitoring of air quality at critical points particularly mining areas and selected industrial estates with significant air polluting industries, conducting programme of stack monitoring on regular basis on significant point sources.

### 6.4 Management of solid wastes:

To ensure management of solid wastes by all municipalities within a time frame decided in consultation with stake holders.

**6.5 Management of bio-medical waste:**

To ensure management of bio-medical waste by all health care centres above 50 beds within a time frame decided in consultation with stake holders.

**6.6 Management of hazardous waste:**

To ensure proper storage and handling of hazardous waste within the premises of industries and maintaining records of recycling and/or disposal in authorized TSDF. Also to have a tracking system to ensure that hazardous waste is recycled or disposed off properly.

**6.7 Industrial pollution control:**

To continue to regularly monitor effluent quality discharged and to monitor stack emission from significant polluting sources and also to conduct performance study of Effluent Treatment Plants (ETPs) as well as Air Pollution Control Systems (APCSs) installed by the polluting industries.

**6.8 Sewage treatment and disposal:**

To bring out the status of sewerage, sewage treatment and its disposal in various towns and to monitor quality of treated sewage before disposal to river or on agricultural field.

**6.9 Waste management related to Tourism:**

To bring out the status of treatment and disposal of sewage and the solid waste generated by hotels and resorts, particularly for those which are not under the jurisdiction of municipal authorities or not connected to sewerage system having terminal treatment though in municipal areas.

## 7. PROPOSAL FOR STRENGTHENING – NEEDS

The present staff are allocated multiple duties for carrying out inspections under the Water Act, Air Act, Hazardous waste Rules, Bio Medical Waste Rules, Municipal Solid Waste Rules and Batteries Management Handling Rules. Many of the staff are on contract and on deputation, there is need to have adequate number of staff (technical scientific & supporting staff) with higher positions, for effective enforcement of regulation and to address the complaints of air, water & noise pollution besides having additional mandates of waste management under hazardous, bio-medical & municipal waste Rules under E(P) Act. It is also felt necessary to impart training to staff for effective implementation of various Rules. The list drawn for training programmes, as needed, is given in Annexure - I

### 7.1 Staff:

#### 7.1.1 Existing:

The existing organizational chart is shown in Annexure II. with existing staff, the Board has given emphasis on issuing consents under Water & Air Acts and authorization as per Rules under E(P)A, timely carrying out inspection and monitoring as needed (regularly under programmes and on receipt of complaints), by using regular staff, staff on deputation and even on contract.

#### 7.1.2 Requirements and justification:

Since waste management (municipal waste, bio-medical waste & hazardous wastes) as per various Rules under E(P) Act is additional mandate given to the Board, there is a need for adequate staff (technical, scientific & supporting staff)). Moreover, enforcement requires more frequent inspection (with sample collection and analysis) and issue of directions/ notices including follow-up thereafter. Thus Board needs strengthening in terms of adequate manpower in number and with higher positions to take responsibilities and to have interaction as needed with various agencies/ Departments so as to cause to execute the National/ State level pollution control & waste management programmes. In view of these, organizational chart as proposed is given in Annexure III with separate chart for requirement of staff for each Section / Cell.

The present manpower as well as proposed is presented in Annexure IV. It is recommended that Board takes up, at the earliest, the regularization of staff which are on contract & on deputation, particularly those who are with the Board for two years and more, so as to retain experience staff and also initiate process for creating posts as per proposed staff after obtaining approval of the State Government. On approval, appointment may be done in a phased manner so as to have most of the positions within 3 years from now and all in 5 years period.

Absorption of staff (technical) already working on deputation (even for a very long period) is necessary to retain experience hands available with the Board for effective implementation. The absorption of contractual staff (Scientific) working is also needed, as far as possible, by regularizing them to retain experience hands dealing with monitoring activities of the Board.

Once adequate staff is in position, it is advisable to adopt Flexible-Complementary Scheme (FCS) of promotion for technical & scientific staff, as adopted recently in CPCB, so as to encourage and retain talented & experienced staff.

### 7.2 Organogramme:

The proposed Organogramme is presented in Annexure III

### 7.3 Laboratories:

The existing Central Laboratory has been set up in rented premises. There are certain requirements of a laboratory such as having gas cylinder, fume chamber etc. in an independent building of the Board that requires a minimum of 4000 sq. ft. area. The setup of laboratory needs to be upgraded at par with that of a Zonal Office laboratory of CPCB. The lab recently setup by CPCB in Zonal Office at Calcutta and Zonal Office at Bangalore are good examples to replicate. This is also essential to cater growing amount of monitoring work and mandates.

### 7.4 Infrastructure:

Presently, the Board is in possession of area of about 800 sq.mts on the first floor and 400 sq.mts on the fourth floor at Dempo Tower EDC Patto Plaza. The laboratory of the Board is partly on the first floor and on fourth floor. The Goa State Pollution Control Board, therefore, is required to construct an independent building as there are objections to the storage of gas cylinders for the Gas Chromatograph / Atomic Absorption Spectrophotometer and fume hood in the present premises from other occupiers.

The total area required for the Board Laboratory is about 1000 sq.mts including provision of cabins and seating arrangement for the staff and 1000 sq.mts for Technical Section, Legal Section, Accounts Section, Administration, Conference hall and Library. The Board would require funds of Rs 8 to 10 Crores for acquisition of plot and construction of building.

### 7.5 Regional Offices:

As mentioned in para 5.4, the Board has one Regional Office at Verna and one more has been planned alongwith regional laboratory at Margao.

### 7.6 Funding:

The State Pollution Control Board has not obtained funding from the State Government. The details of revenue of the Board are as follow:

| Funds | Actual in lakhs | | | Estimated, in lakhs |
|---|---|---|---|---|
| | 2006-07 | 2007-08 | 2008-09 | 2009-10 |
| 1. Central Govt. | 54.20 | 106.43 | 2.0 | 10.00 |
| 2. State Govt. | Nil | Nil | Nil | Nil |
| 3. Share of Water Cess from Central Govt. | 43.05 | Nil | 29.70 | 50.00 |
| 4. Partial reimbursement of MINARS & NAAQM expenses by CPCB | 11.85 | 3.04 | 5.88 | 5.0 |
| 5. Fees (consent, NOC, authorization and analysis charges) | 203.61 | 354.37 | 386.41 | 400.00 |
| 6. Bank interest | Nil | Nil | 82.5 | 200.00 |
| 7. Public Hearing | 6.48 | 71.86 | 122.77 | 100.00 |
| 8. Other receipts (including grants of SEP programming & Right to Information) | 7.81 | 70.61 | 32.06 | 10.07 |
| Total | 327.00 | 606.31 | 661.32 | 775.07 |

## 8. REFERENCES FROM CENTRAL GOVERNMENT

The Central Pollution Control Board has recommended formation of independent cells for monitoring and implementation of the Bio Medical Waste Rules, Hazardous Waste Rules and Batteries Management Handling Rules. However, the same could not be constituted due to shortage of staff.

## 9. CO-ORDINATION OF SPCB WITH STATE AGENCIES

The Member Secretary of the Board is member of the High Power Coordination Committee which takes decision regarding setting up of new Industrial Units and expansion of existing units.

The Member Secretary is also a member of the Goa Environmental Protection Council under the Chairmanship of H.E the Governor of Goa.

Member Secretary is a member of the Monitoring Committee constituted by the Government to monitor the mining activity.

In addition, the Board is entrusted with the task of issuing NOC to the 189 Village Panchayats for selection of sites under the Rural Garbage Disposal Scheme.

Noise level monitoring reports of the restaurants, wedding halls, hotels etc. are required to be sent to the District Magistrate / Sub Divisional District Magistrate

## 10. SPCB AND PUBLIC INVOLVEMENT

Goa State Pollution Control Board is carrying out public hearings for projects listed in Schedule I of the EIA Notification.

## 11. CONCLUSIONS:

Besides fulfilling mandates under various Acts and Rules and to have effective enforcement of these, various action plans are required to be drawn for timely implementation, considering ecologically sensitive regions of the State and to sustain development for the needs of the people, economic need and specific character of the State in terms of tourism (nation & international). Therefore, strengthening the Goa State Pollution Control Board is needed in terms of manpower (adequate number of regular technical, scientific staff with higher positions& supporting staff), their training as well as in terms of infrastructure i.e. to have own building of the Board to house laboratory with upgradation of Central Lab, as proposed in this report.

Absorption of staff (technical) already working on deputation (even for a very long period) is necessary to retain experience hands available with the Board for effective implementation. The absorption of contractual staff (Scientific) working is also needed as far as possible by regularizing them, to retain experience hands dealing with monitoring activities of the Board. Timely initiation thus is very much desired at State Government level.

Once adequate staff is in position, it is advisable to adopt Flexible-Complementary Scheme (FCS) of promotion for technical & scientific staff, as adopted recently in CPCB, so as to encourage and retain talented & experienced staff.

The Board also needs strengthening by constituting Technical Advisory Committees with experts in specific fields such as mining, decentralized system in case of hotels and resorts for treatment of sewage including recycling /reuse and management of waste (hazardous, bio-medical, municipal), so as to achieve the objectives of sustainable development & environment protection.

*Annexure I*

# Training need

- Training on inspection of industries.
- Training on laboratory instruments e.g. AAS, GC, AOX, etc.
- Training on hazardous waste rules & regulations, inventory and categorization of waste industrial process wise.
- Training on battery management & plastic waste rules.
- Training on processing of application for NOC/ consent/ authorization.
- Training on municipal solid waste including analysis (compost).
- Training on processing & interpretation of monitoring data (air & water) and report preparation.
- Training on stack monitoring.
- Training on inspection for assessing compliance of standards

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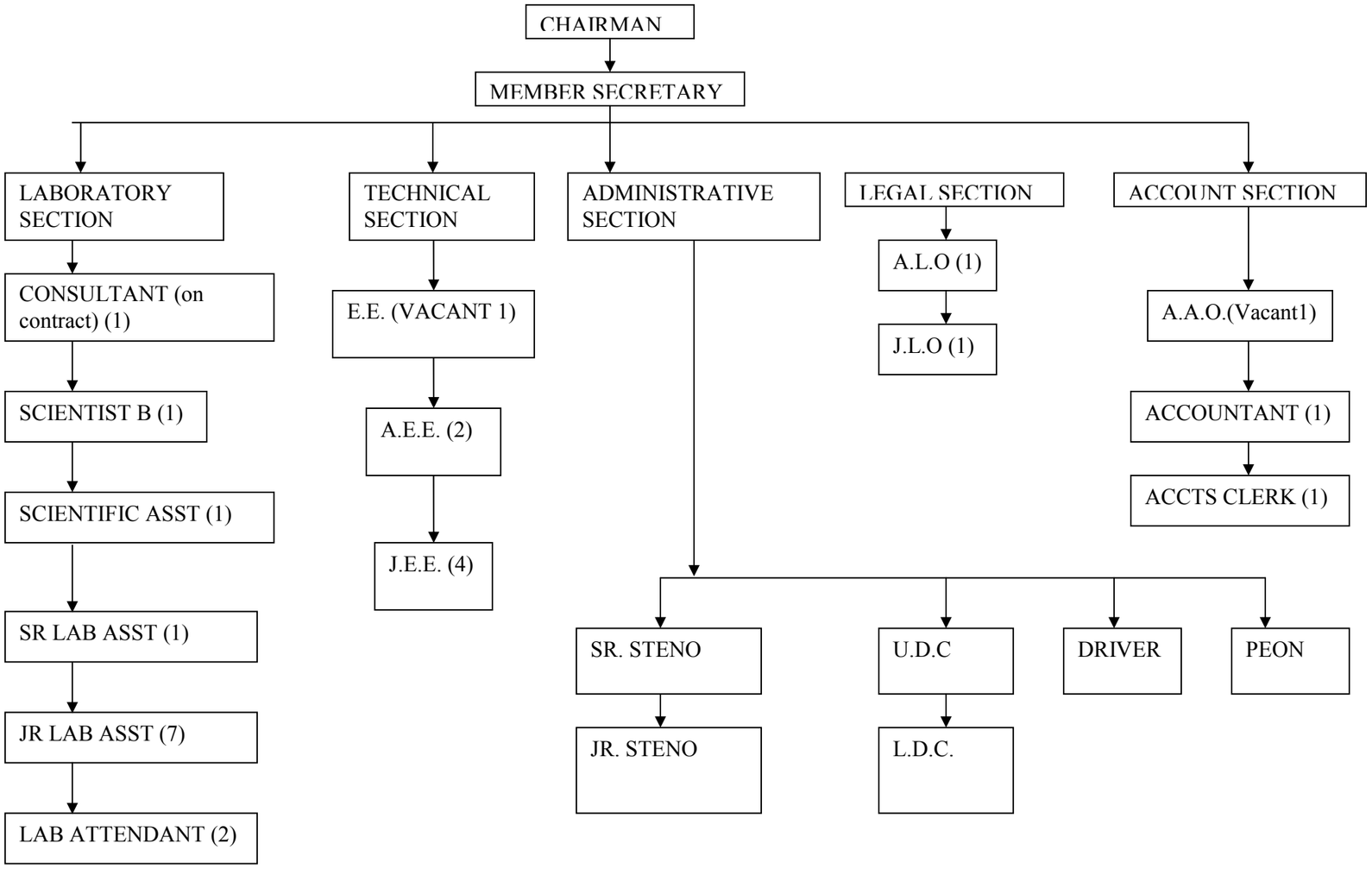
- Training on Air Pollution control equipment.
- Training on industrial effluent treatment plants and sewage treatment plants (including decentralized system).

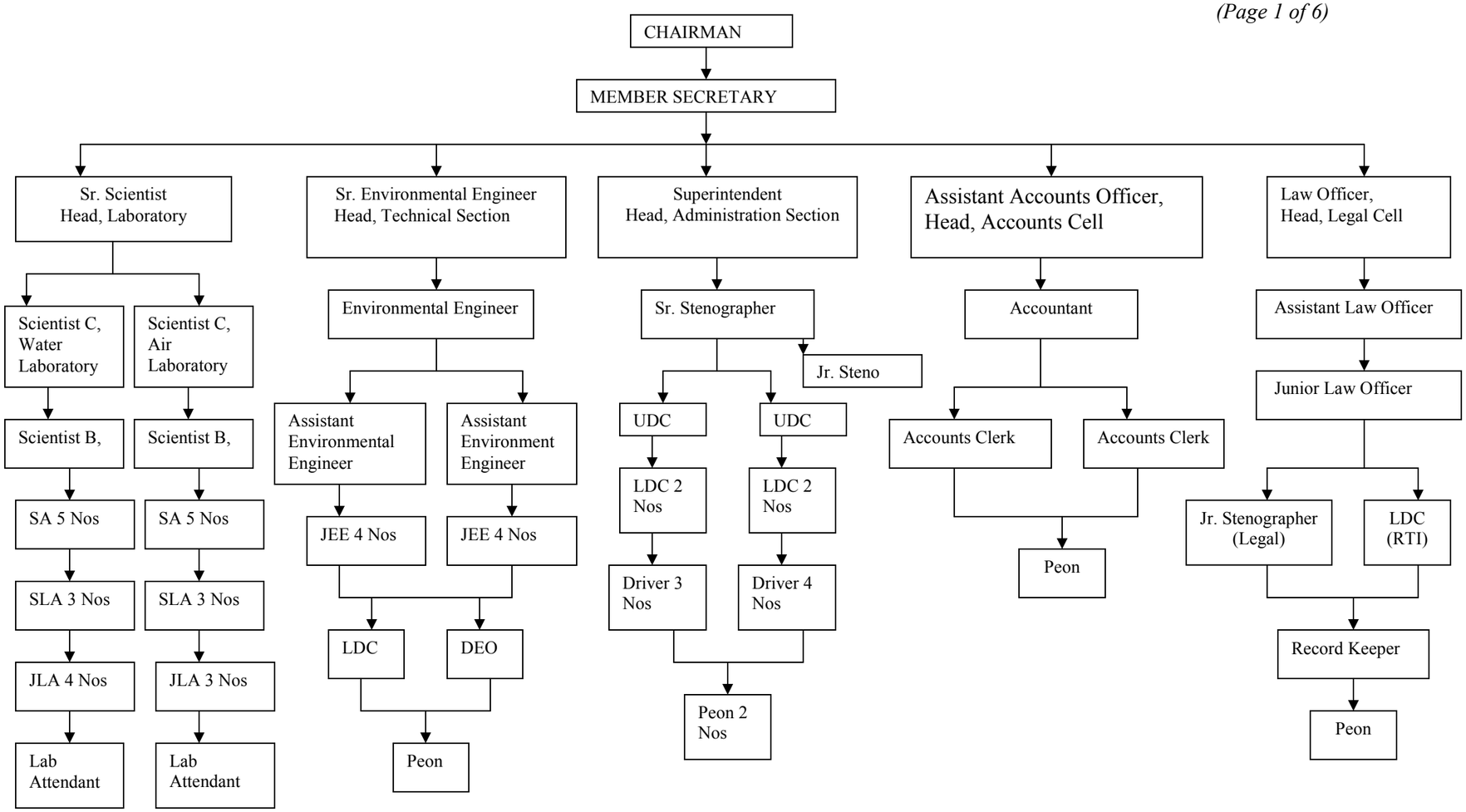
**ORGANIZATION CHART (EXISTING)**

*Annexure II*



**OGRANISATION CHART (PROPOSED)**





# Laboratory

**Senior Scientist (Proposed)**

Water Laboratory

LDC (Proposed)

DEO (Proposed)

Peon (Proposed)

Air Laboratory

Scientist 'C' – (Approved)

Scientist 'C' (Proposed)

Scientist 'B' (Scale – 9300 – 34800 + 5400)

Scientist 'B'(Proposed) (Scale – 9300 – 34800 + 5400)

Scientific Assistant (SA) 1
Scale (9300 – 34800 + 4800)

SA 2

SA 3

SA 4

SA 5

SA 6 (Proposed)

SA 7 (Proposed)

SA 8 (Proposed) Microbiology

SA 9 Proposed)

SA 10 Proposed)

**SA 9 (Proposed)**

**SA 10 (Proposed)**

Senior Lab Assistant (SLA) 1
(5200 – 20200 + 2400 )

SLA 2 (Proposed) (5200 – 20200 + 2400 )

SLA 3 (Proposed) (5200 – 20200 + 2400 )

SLA 4 (Proposed)

SLA 5 (Proposed)

SLA 6 (Proposed))

**SLA 6 (Proposed) (5200 – 20200 + 2400 )**

Junior Lab Assistant (JLA) 1
Scale (5200 – 20200 + 2400 )

JLA 2

JLA 3

JLA 4

JLA 5

JLA 6

JLA 7

Lab Attendant(Scale: 4440- 14400 + 1300) And 5200 – 20200 + 1800

Lab Attendant (Scale: 4440- 14400 + 1300) And 5

*Annexure III*
*(Page 3 of 6)*

Senior Environmental Engineer (Proposed)

Environmental Engineer – (Scale: 15600- 39100 + 6600)

Assistant Environmental Engineer 1 (Scale: 9300- 34800 + 4200)

Assistant Environmental Engineer 2 (Scale: 9300- 34800 + 4200)

JEE 1 – Consent - (Scale: 9300-

JEE 2 – Consent - (Scale: 9300-

JEE 3 – Consent - (Scale: 9300-

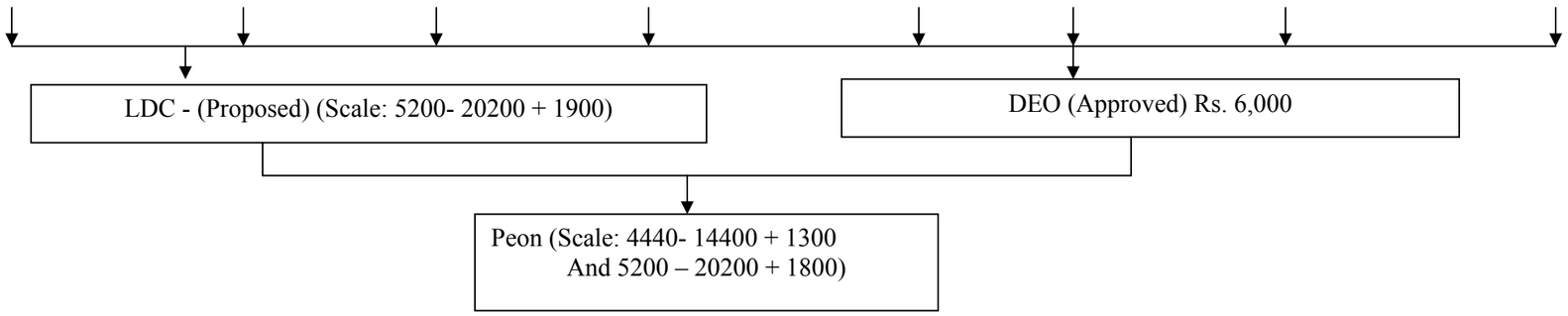
JEE 4 (Proposed) (Scale: 9300-

JEE 5 (Proposed) (Scale: 9300-

JEE 6 HW (Scale: 9300- 34800 + 4200)

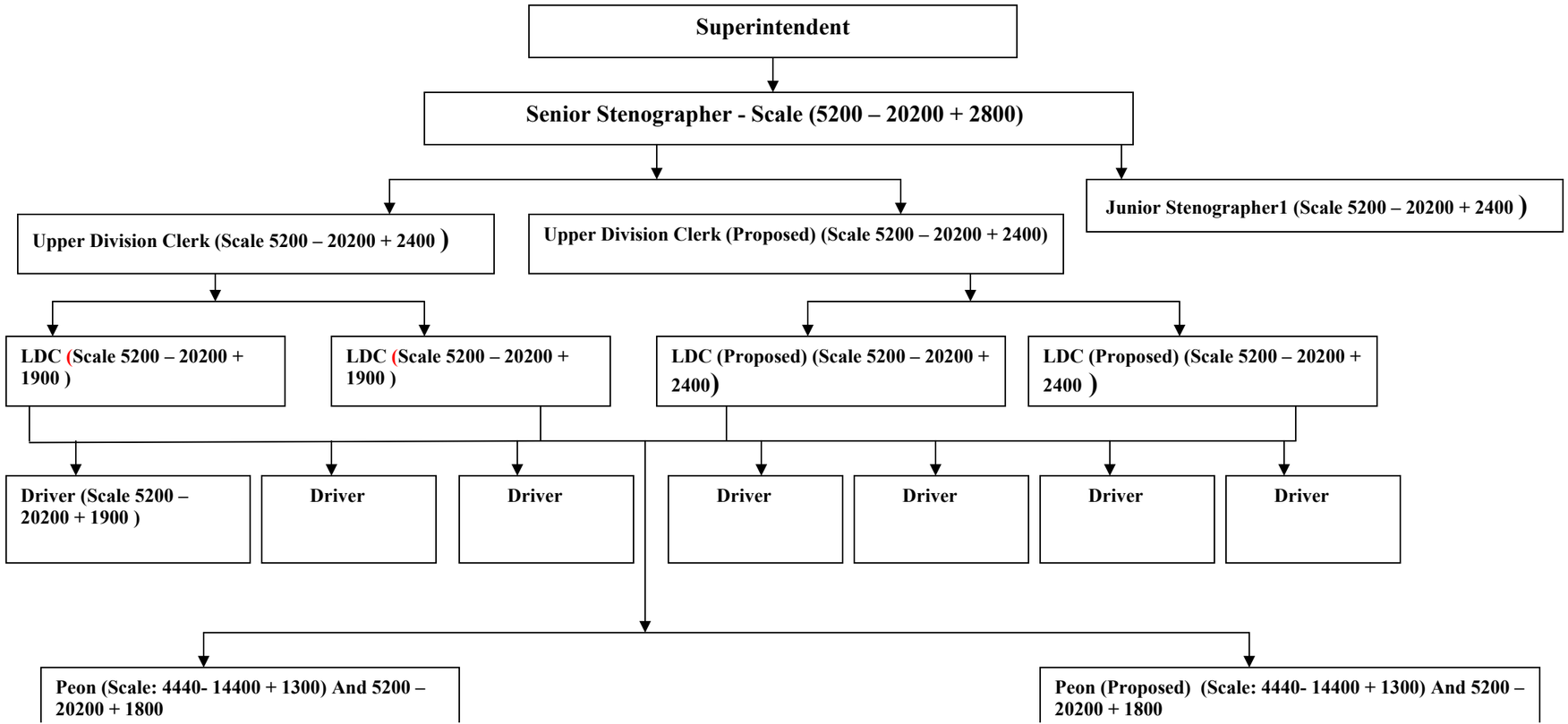
JEE 7 (Proposed) BMW (Scale: 9300- 34800

JEE 8 - (Proposed) MSW/ Batteries/ Plastic (Scale: 9300- 34800 + 4200)

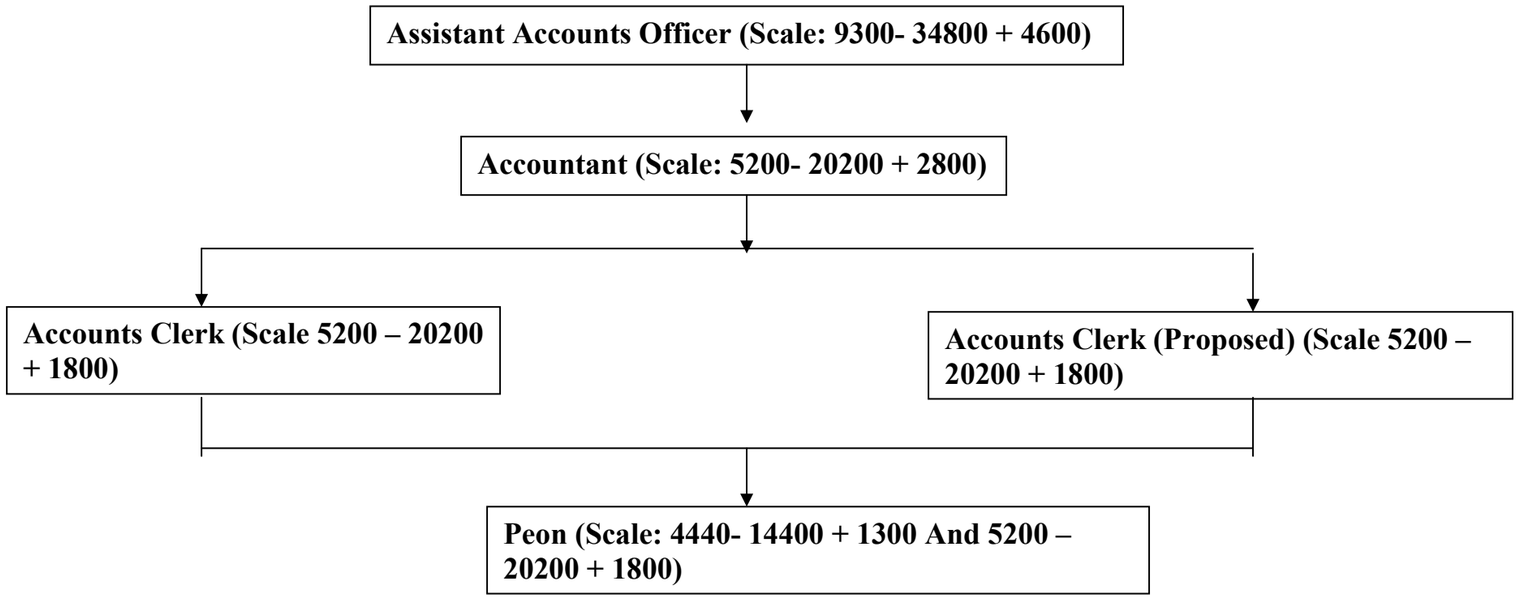





# Administration Section

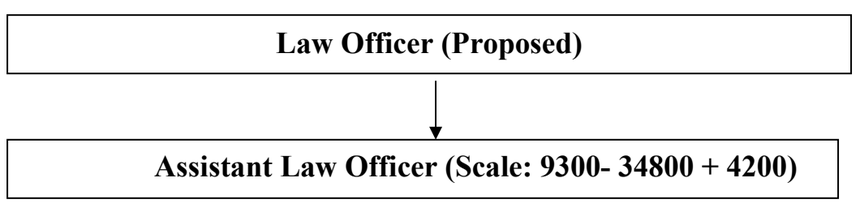


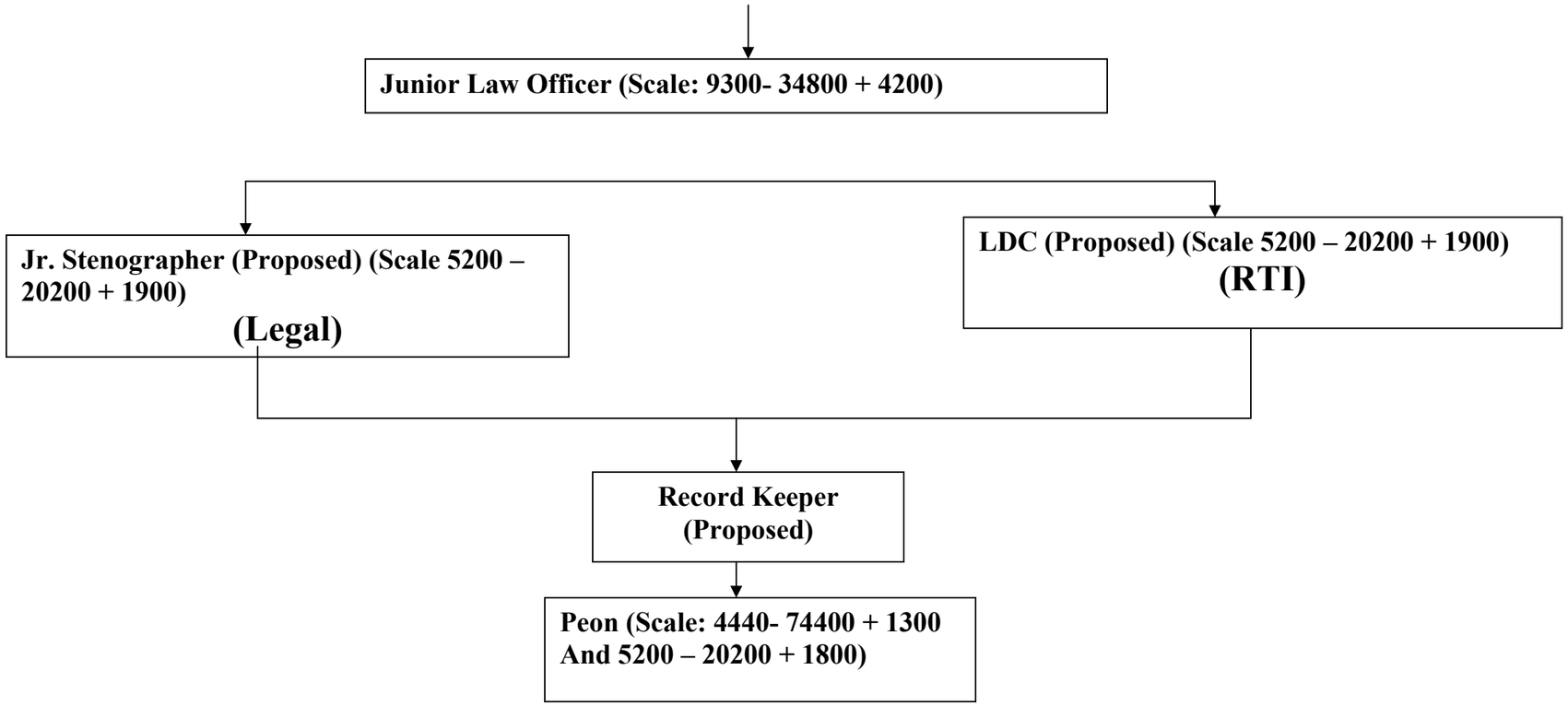
## Accounts Cell






## Legal Cell








**Existing and proposed staff**

**Laboratory**

| S.no | Existing | | Proposed | |
|---|---|---|---|---|
| | **Post** | **No.** | **Post** | **No.** |
| 1 | Sr. Scientist | - | Sr. Scientist | 1 |
| 2 | Scientist C | - | Scientist C | 2 |
| 3 | Scientist B | 1 | Scientist B | 2 |
| 4 | SA | 10* * * * * | SA | 10 |
| 5 | SLA | 1 * | SLA | 6 |
| 6 | JLA | 7 | JLA | 7 |
| 7 | Lab Attendt | 2 | Lab Attendt | 2 |
| 8 | LDC | - | LDC | 1 |
| 9 | DEO | - | DEO | 1 |
| 10 | Peon | - | Peon | 1 |

**Technical Section**

| S.no | Existing | | Proposed | |
|---|---|---|---|---|
| | **Post** | **No.** | **Post** | **No.** |

| | | | | |
|---|---|---|---|---|
| 1 | SEE | - | SEE | 1 |
| 2 | EE | 1 # | EE | 1 |
| 3 | AEE | 1 # | AEE | 2 |
| 4 | JEE | 4 # # # # | JEE | 8 |
| 5 | DEO | - | DEO | 1 |
| 6 | LDC | - | LDC | 1 |
| 7 | Peon | - | Peon | 2 |

**Admin Section**

| S.no | Existing | | Proposed | |
|---|---|---|---|---|
| | **Post** | **No.** | **Post** | **No.** |
| 1 | Superintendent | - | Superintendent | 1 |
| 2 | Senior Steno | 1 | Senior Steno | 1 |
| 3 | Junior Steno | 1 | Junior Steno | 1 |
| 4 | UDC | 1 | UDC | 2 |
| 5 | LDC | 3 * | LDC | 4 |
| 6 | Driver | 7 * | Driver | 7 |
| 7 | Peon | 3 * | Peon | 2 |
| 8 | DEO | 2 * * | DEO | - |
| 9 | Security Guard | 1 * | Security Guard | 1 |



**Accounts Section**

| S.no | Existing | | Proposed | |
|---|---|---|---|---|
| | **Post** | **No.** | **Post** | **No.** |
| 1 | Accounts cum admin officer | 1 # | Accounts cum admin officer | - |
| 2 | Assistant Accounts officer | - | Assistant Accounts officer | 1 |
| 3 | Accountant | 1 # | Accountant | 1 |
| 4 | Accounts clerk | 1 | Accounts clerk | 2 |
| 5 | Peon | - | Peon | 1 |

**Legal Cell**

| S.no | Existing | | Proposed | |
|---|---|---|---|---|
| | **Post** | **No.** | **Post** | **No.** |
| 1 | LO | - | LO | 1 |
| 2 | ALO | 1 | ALO | 1 |
| 3 | JLO | 1 | JLO | 1 |
| 4 | LDC | - | LDC | 1 |
| 5 | Jr. Stenographer | - | Jr. Stenographer | 1 |
| 6 | Record Keeper | - | Record Keeper | 1 |
| 7 | Peon | - | Peon | 1 |

* Number of employees on contract
# Number of employees on deputation