

1.1.1 Green Belt Development

Green Belt design and development has been attributed a great importance and became an essential element of planning policy. The main objective of the green belt is to provide a buffer / barrier between the sources of pollution and the surrounding areas. The green belt helps to capture the fugitive emissions and attenuate the noise apart from improving the aesthetics quality of the region. Greenbelt will be developed by using appropriate plant species as suggested by CPCB guidelines to mitigate air pollution and to improve biodiversity status of the study area.

Green Belt Designing

Identification of Impact Zone

Though the concentration of PM₁₀, PM_{2.5}, SO₂, NO_x, SO₃, HCl is found within permissible limits, dispersion modeling shows that these gases have likely impact on ecology / ecosystem at North -East South -West directions.

Selection of Plant Species

Facts considered during selection of plant species for greenbelt development are:

- Type of pollutant (mainly air) likely to disperse from project
- Agro-climatic zone and sub-zone of the project area (Semi arid to dry sub humid and South Gujarat)
- Biological-filter Efficiency : Absorption of gases, Dust capturing and Noise control

Locations of Green Belt

Total Plot area is 70,242.11 m² and M/s Metropolitan Exichem Pvt. Ltd. has proposed a green belt area of 23,291.67 m² inside premises.

Green belt has been developed in periphery of project location and in various ecosystems falling in the identified impact zone. Plantation will be carried out as per CPCB guidelines (CPCB 2000)¹.

Proposed green belt within the project premises

Industry have proposed a green belt area of 23,291.67 m² (33.2%) within the project premises. Considering 1500 trees per Ha, proposed green belt of 23,291.67 m² (2.32 ha) with project premises will have a total plantation of approximate 3,480 trees as per the Standard ToR condition.

Greenbelt will include periphery plantation, road side plantation and plantation around various buildings. Map showing area under greenbelt at site is shown in *Error! Reference source not found.*. Details of proposed greenbelt at project site are given in **Table Error! No text of specified style in document.-1**. Types of tree planted are Aam, Teak, Neem, Peepal, Jamun etc.

Table Error! No text of specified style in document.-1: Details of Greenbelt Plantation Proposed inside the project premises

Plant Species	Local/Hindi Name	Height (m)	Type	Ecological and Environmental Performances of Plant Species	No. of trees to be planted
<i>Bauhinia variegata</i>	Kachnar	5m	Tree	T,DC,NC	3,480
<i>Bougainvillea spectabilis</i>	Bougainvillea	8m	Shrub	T,DC,NC	
<i>Emblca officinalis</i>	Amla	5m	Tree	T,DC,NC	

1 CPCB 2000. Guidelines for developing green belts, Programme Objective Series PROBES/75/1999-2000nCentral Pollution Control Board, New Delhi, pp. 195.

<i>Nerium indicum</i>	Kaner	5m	Shrub	T,DC	
<i>Saraca asoka</i>	Asoka	5m	Tree	T,DC,NC	
<i>Butea monosperma</i>	Palas	10	Tree	NC, OGE, DC	
<i>Polyalthia longifolia</i>	Ashoka	15	Tree	DC, OGE, NC, AG.	
<i>Albizia lebbbeck</i>	Siris	20	Tree	DC, NC, AG, DR, SR, FR.	
<i>Azadirachta indica</i>	Neem	20	Tree	DC, OGE, NC, AG, DR, SR, FR.	
<i>Derris indica</i>	Karanj			NC, DR, SR, FR.	
<i>Ficus bengalensis</i>	Banyan	20	Tree	NC, DC	
<i>Ficus religiosa</i>	Peepal	20	Tree	NC, OGE, DC	
<i>Mangifera indica</i>	Aam	15	Tree	DC	
<i>Syzygium cumini</i>	Jamun, Jambu	20	Tree	NC, DC	
<i>Tectona grandis</i>	Teak	20	Tree	DC	
Ecological performance: CN –Control Noise level, OGE – Absorb Gas emission (Sexena 1991) ² and (Abbasi & Khan 2000) ³ , DC - Dust Controller (CPCB 2007) ⁴ , Environmental Adaptation (DR - Drought resistance, SR - Salinity resistance, FR - Fire Resistance, T- Tolerant to Air Pollution).					

Budget Allocation

Table Error! No text of specified style in document.-2: Five year overheads for Proposed Greenbelt Development & Annual Maintenance

Work or Activity	1st year	2nd year	3rd year	4th year	5th year	Capital cost (INR)	Recurring cost/year (INR) (considering 20% mortality rate)
Proposed plantation inside Project premises, totally 3480 saplings will be planted (Approx. Cost @ INR 100 per sapling / plant)							
Saplings Required	696	696	696	696	696	3,48,000/-	15,000 (approx.)
Amount	69,600	69,600	69,600	69,600	69,600		
Total Budget						3,48,000/-	15,000

1.1.2 Plantation Technique and Care

Plantation Technique

Following basic procedures need to be followed for greening the area.

- Since the project area fall under semi-arid condition and having poor soil quality, plantation of tree species required approx. 1m³ pit for soil enrichment
- Pit should be filled with imported soil with 3:1:1 the ratio of sand, silt and form yard manure
- Procure well grown saplings of recommended species from the nearby Forest Department nursery
- Make 1m diameter ring bund around the planted saplings for water retention
- Watering of sapling is species specific, therefore watering need to be done once in 2 or 3 days for a period of two years
- Soil wok and weeding need to be done once in a two months

² Saxena, V.S. 1991. Afforestation as a tool for environmental improvement. In: Executive development program on greening the townships. Vaniki Prashikshan Sansthan, Jaipur. Pp 13-44.

³ Greenbelts for Pollution Control: Concepts, Design, Applications. 2000. Abbasi, S.A. and F.I. Khan. Discovery Publishing House, New Delhi.

⁴ Phytoremediation of particulate matter from ambient environment through dust capturing plant species. Published 2007 by Central Pollution Control Board, Ministry of Environment & Forests, Govt. of India in Delhi.

Monitoring Protocol

- The plantations need to be managed by regular watering, soil enrichment work, applying manure, weeding and provide proper protection.
- Replacement of sapling (replanting) required whenever mortality occurs in the plantation during the growth stage.
- Plantation requires after care for a period of minimum five years till the saplings attain matured tree stage.
- Any damage to the developed greenbelt due to any natural or cattle activity should be redeveloped and maintained by the agency.

1.1.3 Biodiversity / Ecological Monitoring

Project site encompasses common species of plants so clearing of these species will not have significant impact on the floral diversity and associated faunal diversity at ecosystem level. Moreover, floral and faunal species reported during this survey are common and generally found in many habitats in the project study area. So, it can be stated that the proposed project and associated activities are unlikely to influence any floral and faunal components significantly provided that the suggestions / recommendations in this report are implemented. Strict implementations of EMP / mitigation measures are required to ensure that the biodiversity of the study area should not be impacted negatively.