Andhra Pradesh Industrial Infrastructure Corporation Limited (APIIC)

PROPOSED DEVELOPMENT OF KOPPARTHY INDUSTRIAL AREA AT KADAPA IN ANDHRA PRADESH UNDER VCIC PROJECT WITH AN AREA OF 2595.74 ACRES (1050.45 HA.)

Pre-Feasibility Report

July, 2022

Sector: 7 (c): 'Industrial Estates/ Parks/ Complexes/ areas, Export Processing Zones (EPZs),…Biotech park, Leather complexes' (Category B)

Proposal No.: IA/AP/NCP/280803/2022

EIA CONSULTANT

VOYANTS SOLUTIONS PVT. LTD.

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Pre – Feasibility Report

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Project Category: 7(c)-A (**Industrial estates/ parks**/ complexes/ areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes)

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1 Executive Summary

With a view to achieve sustainable economic transformation in Andhra Pradesh, a strong growth impetus on the manufacturing sector has been laid by National Industrial Corridor Development Corporation Ltd. (Henceforth referred to as 'NICDC'). As part of this strategic roadmap, NICDC is undertaking activities related to preparation of Master Planning and Preliminary Engineering for Kopparthy Industrial area at Kadapa in Andhra Pradesh. To fulfil this objective, NICDC has engaged Voyants Solutions Pvt. Ltd. in a JV with JLL India Ltd. (hereinafter referred to as the 'Consultant') for undertaking the Preparation of Detailed Master Plan and Preliminary Design Report for Roads & Services/ Utilities for Kopparthy Industrial Area at Kadapa in Andhra Pradesh under VCIC Project.

NICDC envisions to create a strong economic base with a globally competitive environment and state-of-art infrastructure to activate local commerce, enhance foreign investments and attain sustainable development.' Based on this vision, 11 corridors identified by the government are being developed and 30 projects have been planned in 4 Phases up to 2024-25.

In Andhra Pradesh, the manufacturing sector contributes to 12% of the state's GDP as against the national average of 15%. Hence, tapping locational advantages along the industrial corridor and addressing challenges of industrial diversification and small labor-intensive manufacturing sectors shall be key to enhancing the competitive advantage of the state. The state ranks second in India in 'Ease of doing business' and leads in providing handholding support to new business units.

The Make in India initiative was launched in 2014 to support the country's industrialization efforts by encouraging global firms to set up manufacturing bases in India. The campaign identifies the Economic Corridor Development strategy as a policy instrument to increase manufacturing sector contribution to the country's GDP. In this background, the proposed Kopparthy Industrial Area at Kadapa district can help create an industrial growth multiplier and enhance the state's manufacturing share of GDP.

The NICDC Limited has appointed Voyants Solutions Private Limited., to carry out site screening, Pre-feasibility report, environmental impact assessment and environmental management plan studies for obtaining environmental clearance from the competent authority EAC, Infrastructure and Miscellaneous Projects, MOEF&CC, New Delhi under the project scope of master planning of Mega Industrial Park at Kopparthy and Tadigotla in YSR Kadapa district. The proposed project has been screened with requirement of Environmental and Social guidelines and it has been identified for obtaining prior Environment Clearance and Pre-feasibility study has been conducted for requirement of Form I Application.

2 Introduction of Project/Project Background

2.1 Identification of the Project and Project Proponent

The EIA notification of 2006 stipulates that the application seeking prior environmental clearance which starts with screening phase, where the application must provide a copy of the Pre-Feasibility report (Office Memorandum dated 30th December 2010, the Ministry of Environment and Forests, Government of India) as per the format suggested along with the application in prescribed format (Form 1).

With a view to achieve sustainable economic transformation in Andhra Pradesh, a strong growth impetus on the manufacturing sector has been laid by National Industrial Corridor Development Corporation Ltd. (Henceforth referred to as 'NICDC'). National Industrial Corridor Development Program is India's most ambitious infrastructure program aiming to develop new industrial cities as "Smart Cities" and converging next generation technologies across infrastructure sectors. Govt. of India is developing various Industrial Corridor Projects as part of National Industrial Corridor program which is aimed at development of futuristic industrial cities in India which can compete with the best manufacturing and investment destinations in the world. The same will create employment opportunities and economic growth leading to overall socio-economic development.

The state of Andhra Pradesh has set up Andhra Pradesh Industrial Infrastructure Corporation (APIIC), to provide industrial infrastructure through the development of Industrial areas. APIIC has developed over 300 industrial areas, besides developing sector focused industrial parks like textiles, food apparel, leather parks etc. The government has planned to emphasize on providing incentives to Sunrise and the employment generating industries. The state government has launched Andhra Pradesh Industrial Development Policy 2020-2023, which is phased out for only 3 years citing the reason of the COVID-19 pandemic that policy has to be dynamic due to fast-changing patterns of the market and investment. The policy will support the new entrepreneurs for the entire life-cycle of industry.

The Make in India initiative was launched in 2014 to support the country's industrialization efforts by encouraging global firms to set up manufacturing bases in India. The campaign identifies the Economic Corridor Development strategy as a policy instrument to increase manufacturing sector contribution to the country's GDP. In this background, the proposed Kopparthy Industrial Area at Kadapa district can help create an industrial growth

multiplier and enhance the state's manufacturing share of GDP. Govt. of Andhra Pradesh has envisaged to develop a state-to-art industrial park in Kopparthy at YSR Kadapa district under the policy of industrial development. The site has been identified in Kopparthy and Tadigotla and GoAP had issued a Govt. Order vide G.O. Ms. No. 54 dated 13.02.2019 to conferred the power of land to APIIC in YSR Kadapa district for the development of Mega Industrial Park.

2.2 Brief Description of nature the Project

APIIC Limited proposed to develop the mega-industrial park with multi-specialty manufacturing facility in-line with the development policy to increase the GDS share in manufacturing sector in YSR Kadapa District with 2595.74 acres of Greenfield land.

Few of the objectives that strives to achieve are:

- Establishment of state-of-the-art integrated industrial townships
- Skill Development
- Social Infrastructure
- Single Window Clearances

Establishment of an Integrated Industrial Township promises to change the existing scenario and cluster the scattered community in and around the region. The setting up of the Industrial Township is expected to provide a major boost to the state's manufacturing sector by ensuring a fair share of export revenues and also by raising the living standard of workers. The setting up of the Industrial Township is also expected to bring about a marked improvement in the operational efficiency of the units in the state and reduce the monopoly of few units.

The design purpose of the Master Plan is to guide the creation of place. It is an environment where state-of-the-art facilities engage in a reciprocal relationship with dynamic form. Together they create a special place that caters to every aspect of industrial integrity. The Master Plan must strive to achieve a minimum quality of living and working spaces for the users and in the process attain long term viability for the proposed project.

To achieve appropriate balance between planning, engineering, environmental, sustainability and landscape factors the guiding principles defined for the development are:

- Functionality
- Practicality
- Visual Impact of the development
- Simplified execution
- Enhancement of revenue generation potential
- Reduced cost of operation & maintenance

2.3 Need for the Project and Its Importance to the Country and Region

Economic Overview of Kadapa District

The YSR/Kadapa district is of area 15,369 sq. km. It has three revenue divisions, and a population of 28,82,469 lakhs as per the Census, 2011. There are 27 large industrial units, and 7300 employees of small-scale industries. It consists of 195.13 km railway line and 6,533 km long roadways to facilitate the movement of industrial products to and from the production units. There are 1032 industries (from 2015-2021), with 1005 MSME units. There are 8700 people employed in large and medium industries.

The Gross State Domestic Product is INR 41,060 Cr. The focus sectors are agro and food processing; and mineral based industries.

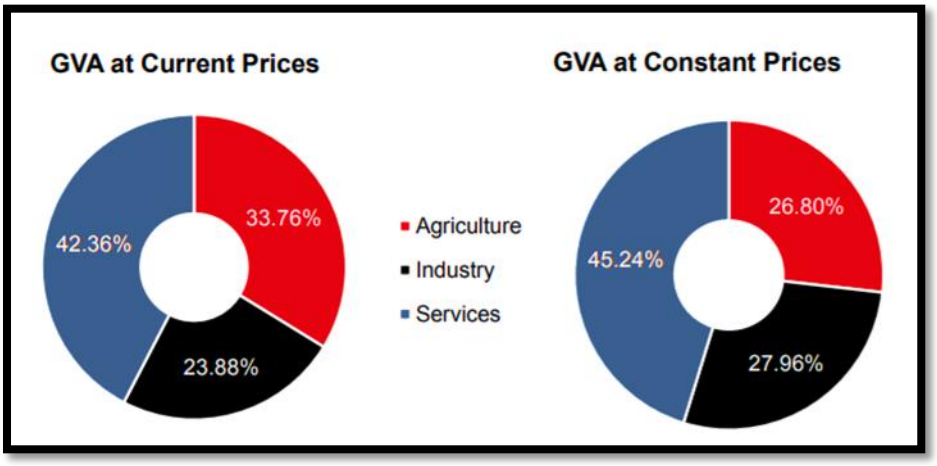


Figure 2-1: GVA Composition by sector 2017-2018

According to 2017-18 AE, Services sector is a major contributor to the economy. Contributor to the agriculture sector are the crops of groundnut, paddy, Bengal gram, cotton, banana, papaya, lemon etc. Major contributors to Industries sector are construction, manufacturing, electricity and minerals etc., while major contributors to services sector are unorganized trade and education etc.

Kadapa Industrial Sector Overview

Kadapa District is known for its rich mineral values. The major minerals in the district are barytes, lime stone and asbestos. Apart from major minerals, minor minerals are Napa slabs, road metal, building stone, marble, mosaic chips etc. Also, majority of the people here depend on agriculture for livelihood. The Major crops of the district are paddy, groundnut, sunflower, cotton, betel leaves and horticultural crops like mango, papaya, banana, lemon and oranges.

As per Kadapa district profile 2020, 30 large industries are existing in the district with an investment of Rs.

13,228.37 Crores employing 17,360 persons. Additionally, 13 nos. are proposed as Large Industries under Implementation in the District with the proposed investment of Rs. 19,175.76 Crores & committed employments to 11,289 persons. In terms of Micro, Small & Medium Industries, there are 2,711 units in the district with an investment of Rs. 1,100.10 Crores employing 37,581 persons. The following table indicates the industrial scenario of Kadapa district.

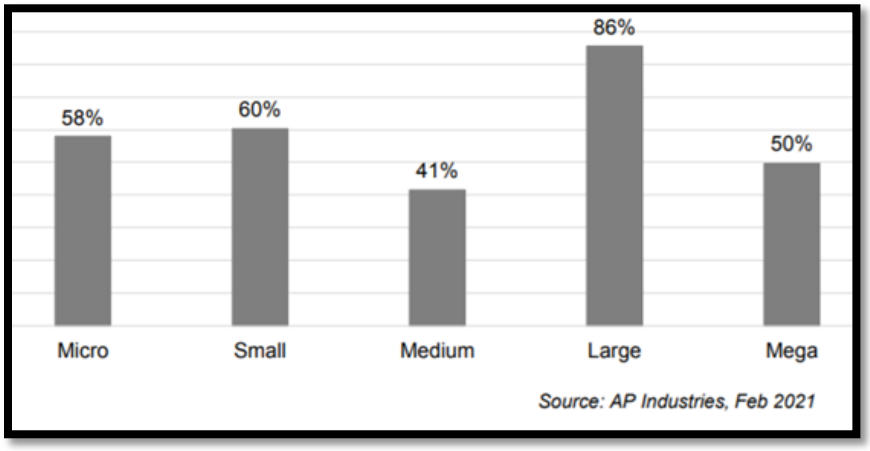


Figure 2-2: CAGR - GROWTH OF INDUSTRIES IN KADAPA DISTRICT (2015-2020)

Source: AP Industries, Feb 2021; Consultant

Growth of Industries

The growth of industries from 2015-16 till 2020-21 illustrates the CAGR of large industries is higher compared to other industries though the micro and small industries are dominant in the district.

Mineral Resources

The district has the World's single largest and best quality deposits of Barytes. Limestone is suitable for manufacturing of cement, which is present in large quantities. High-grade asbestos of Chrysotile variety readily available in the district. The district is also famous for eponymous stone ("Kadapa stone" used in building construction).

A rare hard mineral Fullerene with applications in material science, electronics, and nanotechnology found in the district, one of only two places in the world.

Agriculture Highlights

According to the Department of Agriculture – Y.S.R. District is the

- Leading producer of Tomatoes and Onions
- Major crops include - Paddy, Groundnut, Red gram, Cotton, Bengal gram
- Fruit Crops include- Mango, Citrus, Banana, Melons, Papaya

- Other Commercial crops include - Turmeric, Chilli, Coriander, Chrysanthemum

Mining

According to the Dept. of Mines and Geology, geologically, the Kadapa District forms a part of south-western and southern part of Kadapa Basin which is named after the town "Kadapa '' where the Kadapa Systems of rocks were best developed. The rocks exposed in the district belong to Archaean (oldest rocks) or early Proterozoic Era, Kadapa Supergroup and Kurnool Group of middle to upper Proterozoic age. Gneisses and granites with Veligallu, and Tsundupalli schist belts constitute the main rock types of the Archaean.

The Kadapa Supergroup of rocks unconformably overlie the Archaeans and consists of Gulcheru and Vempalli Formations of Papaghni Group, Pulivendula, Tadipatri and Gandikota Formations of Chitravathi Group, Bairenkonda (Nagari) and Cumbum (Pullampeta) Formations of Nallamalai Group. The next younger groups of rocks are the Kadapa's which comprise Banganapalli Quartzites, Narji Limestone, Ouk Shale, Paniam Quartzite, Koilakuntla Limestone and Nandyal Shale. The town "Kadapa" is situated over the Nandyal Shale of Kurnool Group. Mineral resources in the Kadapa district, in geological parlance, are widely distributed in time and associated with rocks from Archaean to Kurnool Group of rocks. Barytes, chrysotile Asbestos, clays, limestone and Kadapa slabs/napa slabs are some of the well-known workable mineral deposits associated with Proterozoic sedimentary rocks belonging to Kadapa Supergroup and Kurnool Group in Kadapa district.

Iron ore, dolomite, steatite, magnesite, yellow ochre, Quartz and Granite/black granite (dimensional stone) are some of the other minerals occurring in the district. Besides, the district has extensive reserves of building material in quartzites, limestones granites and granite gneisses which are quarried throughout the district.

2.4 Demand and Supply Gap – Market Assessment Study

Demand for industrial space at the State and Project level is derived using 'Regression Analysis'. When forecasting demand for industrial space, it may be useful to do a multiple regression analysis to determine how changes in certain assumptions or drivers of the industrial business will impact demand and supply in the future. For example, there may be a very high correlation between the number of people employed by an industry and the export growth of the industry.

Steps to Assess Demand

Step 1: Assumptions – To carry out the demand assessment, appropriate assumptions are considered based on the data availability in public domain (Govt. records) for specific years and its relevance in the study. To derive the demand for number of industries in various categories various assumptions are used. Cumulative no. of industries for next 10 years is a dependent variable. AP state export growth data and employment growth data for last 4 years (2016-2019) considered in assumptions are independent variables. The data is sourced from Govt. reports

for various type of industries for appropriate use in demand assessment for different type of industries in AP State.

Step 2: Projection of Export and Employment Growth in AP State – AP State level export and employment data have been forecasted for next 10 years using CAGR (Compound annual growth rate) method. It is a business and investing specific term for the geometric progression ratio that provides a constant rate of return over the time period. CAGR of export growth and employment growth is derived to forecast the export and employment for the industries in AP.

Step 3: Projection of Demand (No. of Industries) in AP State – The demand for number of industries for next 10 years is forecasted using Regression Analysis as explained in earlier slide. To forecast the demand, the assumptions explained in Step 1 and 2 are used appropriately in Regression analysis.

Step 4: Projection of Demand (No. of Industries) in Kadapa District – The average share of Kadapa district to total number of industries in AP state is sought to be 5%. However, the district share is different for different type of industries in AP State. Hence, appropriate share has been considered for respective industries to derive the total demand share in Kadapa District.

Step 5: Classification of Demand (no. of industries) into MSME and Large/Mega category in Kadapa District – The forecasted number of industries for next 10 years in Kadapa district is classified into two categories to derive appropriate land requirement since the land intensity is different for MSME and Large/Mega industries. Land intensity is defined as the land area requirement for setting up an industry and it varies depending on the type of industry. It is derived based on average calculation of APIIC land allotment (land area in acres) to MSME, large and mega industries and other private industries in the state as of Feb 2021.

Step 6: Estimation of Demand Share in Proposed Industrial Park at Kopparthy – The demand in Kopparthy industrial park is assumed as 65% on basis of the current land availability in Kadapa District. Land availability in Kopparthy Industrial Park is sought to be ~4126.38 acres. Considering, the proposed project operation and state of the art amenities planned in the project, the project will command premium. Hence, 20% premium is added on the current demand. In total, 65% of the demand is assumed to be catered in Kopparthy Industrial Park as forecasted in Kadapa District for next 10 years.

Target Sectors

1. Textile and Textile-related Industries – MSME

Subsectors in MSME: Spinning, weaving and finishing of textiles, other textiles, Weaving Apparels, except fur apparel, Manufacture of articles of fur, Manufacture of knitted and crocheted apparel.

Sector Assessment in India:

- The industry has strengths across the entire value chain from fiber, yarn, fabric to apparel
- It is highly diversified with a wide range of segments ranging from products of traditional handloom, handicrafts, wool and silk products to the organized textile industry
- Y-o-Y Growth of market size is 58.83% in 2018-19 compared to previous year i.e. 2017-18.
- Market size grew at a CAGR of 17.63% over the past 3 years i.e. from 2015-16 to 2018-19.
- The Y-o-Y growth rate of Exports increased by ~3.04% in 2018-19 compared to previous year i.e. 2017-18
- Exports increased at a CAGR of 3.45% over the past 4 years i.e. from 2014-15 to 2018-19.

Sector Assessment in Andhra Pradesh:

- Largest producer of cotton and the 2nd largest producer of raw silk
- Well-developed ginning and spinning facilities
- Home to over 150 spinning mills with combined capacity of ~3.6 million spindles

2. Engineering Goods– MSMEs

Subsectors: Machinery/ Fabrications, Cement & concrete

3. Chemical & Petrochemical – Large and MSME

Subsectors in Large & Mega: Fertilizer, Bulk chemicals, Specialty chemicals, Agrochemicals, Petrochemicals, Polymers, Refined petroleum products, Plastics products.

Subsectors in MSMEs: Fertilizer, Coke Oven Products, Man-made fibres, Other chemical products, Basic chemicals, fertilizer and nitrogen compounds, plastics and synthetic rubber in primary forms, Refined Petroleum Products, Plastics products.

Sector Assessment in India:

- India ranks 6th in the world and 4th in Asia in chemicals & petrochemicals sector
- Y-o-Y Growth of production is 4.18% in 2018-19 compared to previous year i.e. 2017-18.
- Production of chemicals and petro-chemicals grew at a CAGR of 4.78% over the past 4 years i.e. from 2014-15 to 2018-19
- The Y-o-Y growth rate of Exports is ~29.19% in 2018-19 compared to previous year i.e. 2017-18

Sector Assessment in Andhra Pradesh:

- Growth of the fuel through India's largest offshore gas fields, which is located on Krishna-Godavari Basin

4. Renewable Energy Equipment Manufacturing and Power Generation – Large

Subsectors: Solar Panel Components (PV cells and modules), Wind Turbine manufacturing, others etc.

Sector Assessment in India:

- In India, ~38% of the installed electricity generation capacity is from renewable sources, which is 127.01 billion units in FY20 (excluding large hydro)
- Fourth most attractive renewable energy market in the world
- 4th in wind power, 5th in solar power and 5th in renewable power installed capacity as of 2018.
- Approximately 12.11% growth Y-o-Y Growth from previous year (FY 2019).
- Grew at a CAGR of 17.33% over the past 4 years between FY 2016 and FY 2020

Sector Assessment in Andhra Pradesh:

- 9th largest producer of electricity in India
- 1st in South India in 24/7 power to industrial and domestic sectors
- One of the Renewable Energy rich states. Andhra Pradesh is in 6th position in generation of renewable energy
- Excellent Integrated Watershed Management

2.5 Import v/s Indigenous productions

2.6 Export Possibilities

2.7 Domestic/Export markets

Total export and employment trend in industrial sector for the state of Andhra Pradesh, the share of Kadapa District to overall performance of industrial sector in State is sourced from AP industries portal and the share of Kopparthy as assessed is average of 50% (realistic scenario)

Average growth rate of export across key industries in AP is observed to be 21% in the last 4 years. Most of the industries witnessed lower export growth in the year 2020 due to global economic slowdown. Therefore, the growth rate of export has been assumed at an average of last 4 years.
(Sector wise export percentage table to be incorporated).

2.8 Employment Generation

The proposed industrial park is envisaged to provide direct and indirect employment to 1,48,701 people.

3 Project Description

3.1 Location of the Project and Project Boundary

The proposed Kopparthy Industrial Area of 2595.74 acres extends between longitudes 78°43'31.34"E & 78°44'10.57"E and latitudes 14°28'36.40"N and 14°26'22.35"N and is located at Kopparthy and Tadigotla in Chinthakommadinne mandal. The proposed Kopparthy site is well connected by railway and highway. Other than that, there is a good network of motorable roads in the study area. The location of the site is shown in the figure below.

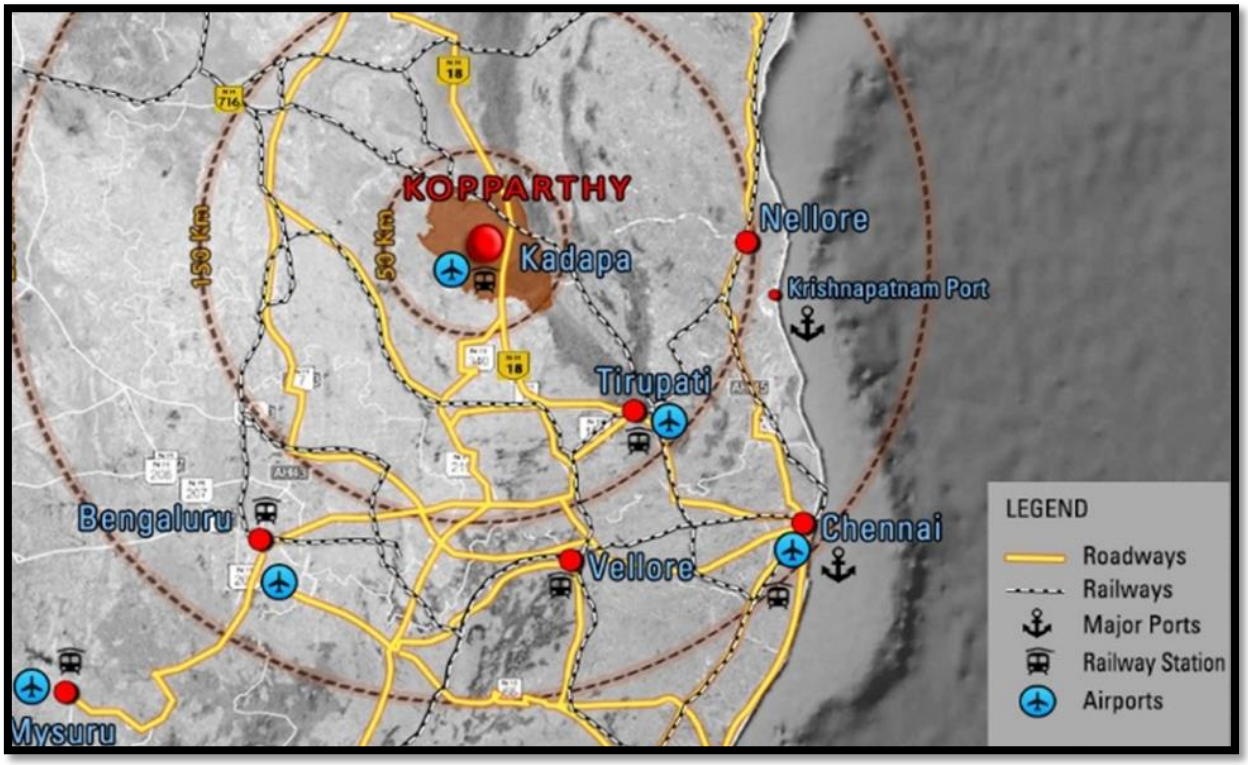


Figure 3-1: Location of the proposed Project Site

3.2 Details of Alternate Sites Considered and Basis of Selecting the Proposed Site

Alternative Locations

There were 2 alternative sites has been studied in consideration to environmental, ecological, socio-economic,

land availability etc. Both the locations have been studied close to the Kadapa Airport, as the prime importance in the proposal to develop a mega industrial park in Kadapa district is to utilize the connectivity advantage of Kadapa airport.

Alternative 1, in Kopparthy village:

The proposed Kopparthy site of 2595.74 acres/ 1050.45 ha. is located at Kopparthy, Tadigotla village in Chinthakommadinne Mandal, Kadapa, (currently YSR District). The site extends between longitudes 78°43'31.34"E & 78°44'10.57"E and latitudes 14°28'36.40"N and 14°26'22.35"N.

- State: Andhra Pradesh
- District: YSR Kadapa
- Mandal: Chinthakommadinne
- Area proposed: 2595.74 acres.
- Private Land and land ownership: 2396.15 acres of land has possession of APIIC and balance 199.59 acres of land is under process of acquisition.
- Type of Land-use: Majority land are non-cultivable agricultural fallow land followed by Agricultural land.
- Water Source: GoAP has accorded permission to APIIC for withdrawing water from existing RTTP supply scheme at Mydukur (distance 41.30 km) From Mydukur to project site at Kopparthy, the water pipeline need to be constructed..
- Power Supply: power would be tapped from supply grid to 132/33 KV Sub-station, which is proposed towards western side boundary of north parcel of the project area, which is proposed towards the Western boundary of the proposed project site.
- Elevation: In South parcel, 512 ft towards Sothern side and it reduces to 465 towards north side of the parcel. The entire area has slope from South, South-west to North, North-East towards the Penna River.
- Estimated project cost: 1273.76 crores.
- Job generation: 1, 48,701.
- Eco-sensitivity: the detailed eco-sensitivity of Kopparthy site is provided in below table.

Table 3-1: Environment-Sensitivity of Kopparthy site alternative

S. No.	Areas	Name / Identity	Aerial distances (within 10 km.) Proposed project location boundary.
1.	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related values.	No	No internationally conserved Ecologically or culturally protected/ important areas have been identified within the 10 km study area of the proposed project.

S. No.	Areas	Name / Identity	Aerial distances (within 10 km.) Proposed project location boundary.
2.	Areas which are important or sensitive for ecological reasons – Wetlands, water or other water bodies, coastal zone, biospheres. Mountains, forests etc. courses	Yes	▪ Nearest Ecologically Protected area is Sri Lankamalleswaram Wildlife Sanctuary, having 20.33 km distance from the proposed project site's North-east boundary. The Eco-sensitive Zone (ESZ) Boundary of the WLS has 13.18 km distance from the proposed project site North-Eastern boundary. ▪ Following Reserve Rarest (RF) areas are identified within the 10 km study area of the project boundary: i) Ganganapalle RF: 2.82 km towards South; ii) Palkonda and Vangimalla RF: 9.19 km towards ESE; ▪ Water Bodies flowing or available within the 10 km study area are as follows: i) Penneru or Penna River: 11.70 km towards NE; ii) Pagani River: 10.61 km towards WNW; iii) Adinimmaya palli Reservoir: 14.06 km towards North;

S. No.	Areas	Name / Identity	Aerial distances (within 10 km.) Proposed project location boundary.
3.	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration.	No	No eco-sensitive or protected areas are identified within 10 km study are of the proposed project site. Nearest Eco-sensitive Zone (ESZ) is Sri Lankamalleswara WLS. The ESZ boundary has 13.18 km distance from the proposed project site and located towards North-East.
4.	Inland, coastal, marine or underground waters	Yes	The proposed project site has stagnant water bodies/pool within the proposed project site. These water bodies will be retained with green buffer area. In project study area, following water streams has been identified and slope of the area is towards North-East. i) Penneru or Penna River: 11.70 km towards NE; ii) Pagani River: 10.61 km towards WNW; iii) Adinimmaya palli Reservoir: 14.06 km towards North;
5.	State, National boundaries	No	No state or national boundary is coming within 10 km of the project study area.
6.	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	Yes	Ameen Peer Dargha connected through MDR 214 (adjacent to the site) followed by SH 51. The dargah is 7.08 km away from the project site towards North-East.
7.	Defense installations	No	None identified within the study area.

S. No.	Areas	Name / Identity	Aerial distances (within 10 km.) Proposed project location boundary.
8.	Densely populated or built-up area	Yes	The study area of proposed project site has some dense pullulated habitations zones, i.e., Kadapa town (344893 Population, Census 2011), Kopparthy, Tadigotla, Chinthakommadinne, Vallur. Detailed Socio-economic survey is being carried in the study area.
9.	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	Yes	The project study area has multiple major population zones and also has well connectivity at the area. Thus, the area has large numbers of educational and heath institutions within the study area. The nearest educational institute is Yogi Vermana Institute, which is situated 1.33 km away from the project boundary towards West.
10.	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	Yes	The area has Penna River towards its North-East direction and also has some minor mineral resources. The area has forest covers in within 10-15 km, thus, area also has richness of forest resources.
11.	Areas already subjected to pollution or environmental damage (those where existing standards are exceeded)	No	The study area does not have close proximity of any critically polluted areas, identified by CPCB.

S. No.	Areas	Name / Identity	Aerial distances (within 10 km.) Proposed project location boundary.
12.	Areas susceptible to natural hazard which could cause the project to present environmental problems (earthquakes, subsidence, landslides, erosion, flooding Or extreme or adverse climatic conditions)	Yes	▪ The district is coming under extreme dry area of Standardized Precipitation Index (SPI-9) of JRC GDO and according the Emergency Response Coordination Centre (ERCC) – DG ECHO Daily Map. Thus, the area is drought prone area. Thus, no uncontrolled ground water extraction will be permitted. ▪ The area situated in 'Low Damage Risk Zone (MSK VI or Less) as according the Vulnerability Atlas of India, Ver. 3 of BMTPC. Thus, the area not prone to frequent or severe earth Quakes. The area is located in watershed basin of Penna River. Thus, construction and area leveling will be followed according the average HFL of the river.

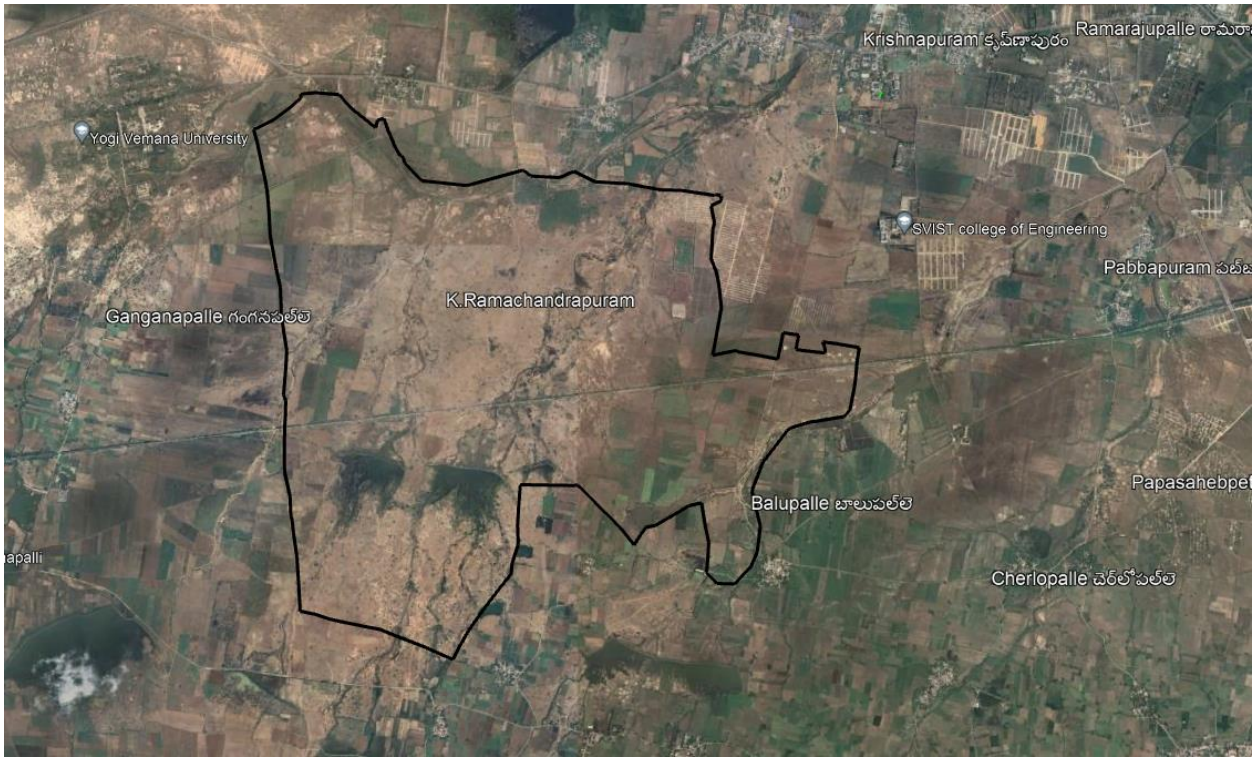


Figure 3-2: Alternative location in Kopparthy

Alternative 2, in Ramanapalle

The proposed site of 4989 acres is located at Chinamachupalle, Ramanapalle, Mundlapalle, Rachinnayapalle, Palempalle, Gudur village of YSR Kadapa district in Andhra Pradesh. The site extends between longitudes 78° 49' 20.50" E & 78° 50' 43.35" E and latitudes 14° 32' 54.15" N and 14° 30' 01.04" N.

- State: Andhra Pradesh
- District: YSR Kadapa
- Area proposed: 4989 acres/ 2019 Ha.
- Private Land and land ownership: The land is not under the possession. Majority of land is available in private ownership and govt. patta land.
- Type of Land-use: Majority land is Agricultural land.
- Water Source: Raw Water would be sourced from Somasila Reservoir. The distance for water supply source is approximately 30 km.
- Power Supply: power would be tapped from supply gridline of the area. No Sub-station available immediately to the proposed site to collect and distribute the power to the internal industrial network. Thus, power sub-station will need to be developed
- Elevation: The slope of the area is from West to East, south east and elevation ranges between 423 ft to 399 ft. The natural drainage of the area is towards the slope of Penna River basin.
- Estimated project cost: Higher than option 1, as there is a major requirement of land acquisition in initial

stage of land possession process. R&R also involved.

- Job generation: 2.20 lakhs.
- Eco-sensitivity: the detailed eco-sensitivity of Ramanapalle site is provided in below table.

Table 3-2: Environmental Sensitivity of Alternative site 2

S. No.	Areas	Name / Identity	Aerial distances (within 10 km.) Proposed project location boundary.
1.	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related values.	Yes	Sri Lankamaleswara WLS is situated 8.3 km from the site towards North-East direction.
2.	Areas which are important or sensitive for ecological reasons – Wetlands, water or other water bodies, coastal zone, biospheres. Mountains, forests etc. courses	Yes	▪ Nearest Ecologically Protected area is Sri Lankamalleswaram wildlife Sanctuary, having 8.3 km distance from the proposed project site's North-east boundary. The Eco-sensitive Zone (ESZ) Boundary of the WLS has approximately 1.3 km distance from the proposed project site North-Eastern boundary. ▪ Water Bodies flowing or available within the 10 km study area are as follows: Penneru or Penna River: 0.9-1km towards NE;
3.	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration.	Yes	Sri Lankamaleswara WLS is situated approximately 8.3 km from the site towards North-East direction which is the place for eco-sensitive place for residence of faunal species – Jerdon Courser.

S. No.	Areas	Name / Identity	Aerial distances (within 10 km.) Proposed project location boundary.
4.	Inland, coastal, marine or underground waters	Yes	▪ Water Bodies flowing or available within the 10 km study area are as follows: Penneru or Penna River: 0.9-1km towards NE;
5.	State, National boundaries	No	No state or national boundary is coming within 10 km of the project study area.
6.	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	No	The proposed site connected with NH 18, which connects local pilgrim sites of the area.
7.	Defense installations	No	None identified within the study area.
8.	Densely populated or built-up area	Yes	The study area of proposed project site has dense pullulated habitations zones, i.e., Kadapa town (344893 Population, Census 2011), which is around 4.5 km away from the proposed location, towards south direction. Additionally, the site has 7-8 habitation zones within the proposed area.
9.	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	Yes	The project study area has multiple major population zones and also has well connectivity at the area. Thus, the area has large numbers of educational and heath institutions within the study area.
10.	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	Yes	The area has Penna River towards its North-east direction and also has some minor mineral resources. The area has forest covers in within 2 km, thus, area also has richness of forest resources.

S. No.	Areas	Name / Identity	Aerial distances (within 10 km.) Proposed project location boundary.
11.	Areas already subjected to pollution or environmental damage (those where existing standards are exceeded)	No	The study area does not have close proximity of any critically polluted areas, identified by CPCB.
12.	Areas susceptible to natural hazard which could cause the project to present environmental problems (earthquakes, subsidence, landslides, erosion, flooding Or extreme or adverse climatic conditions)	Yes	▪ The district is coming under extreme dry area of Standardized Precipitation Index (SPI-9) of JRC GDO and according the Emergency Response Coordination Centre (ERCC) – DG ECHO Daily Map. Thus, the area is drought prone area. Thus, no uncontrolled ground water extraction will be permitted. ▪ The area situated in 'Low Damage Risk Zone (MSK VI or Less) as according the Vulnerability Atlas of India, Ver. 3 of BMTPC. Thus, the area not prone to frequent or severe earth Quakes. The area is located very close to Penna River.

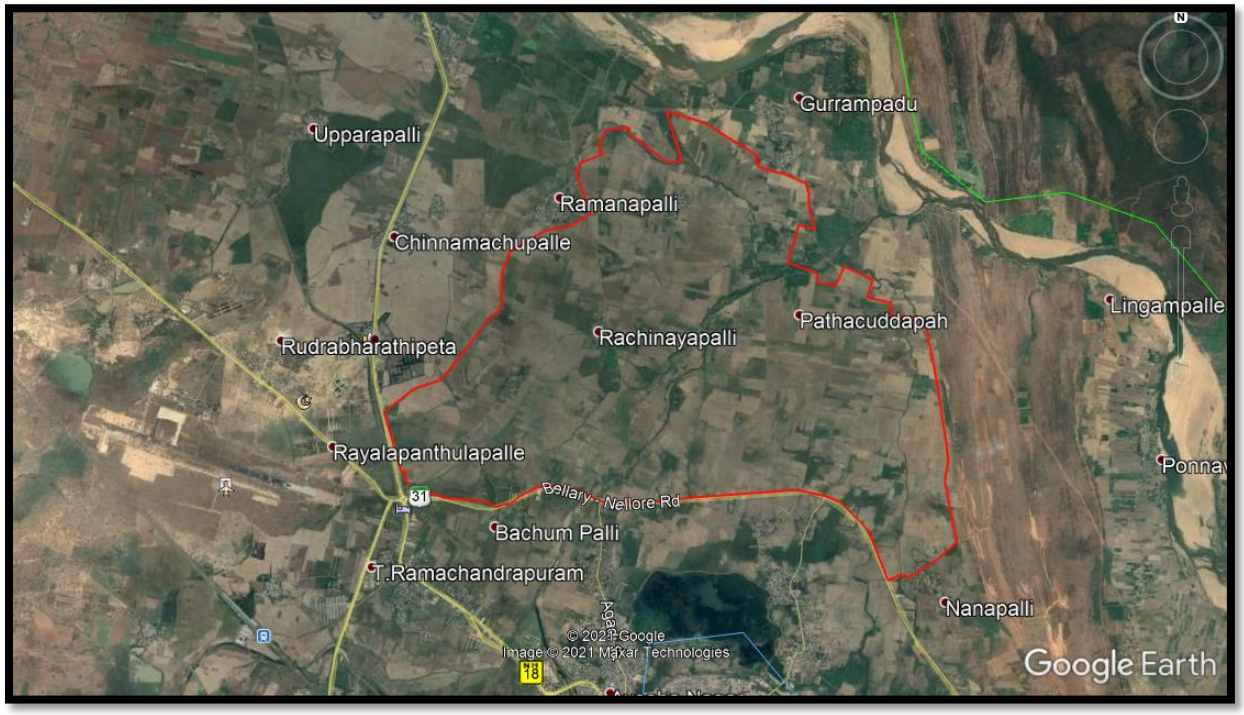


Figure 3-3: Site Location for Alternative 2

Analyzing both the alternative sites in respect to socio-economic, land details, eco-sensitivity, source availability, Kopparthy site identified in YSR Kadapa district has been identified for best feasible alternative for development of such large industrial township; as the alternative site has very close proximity of Eco-sensitive zone and Penna River. According to the market demand assessment, Water and Polluting Red category industries has been identified to develop within the proposed project, thus the alternative site in Ramanapalle is not identified as feasible location in consideration to eco-sensitivity and land availability. Thus, alternative site in Kopparthy has been identified for further detailed study of development of mega industrial park in YSR Kadapa district.

Alternative studied in Master Plan level

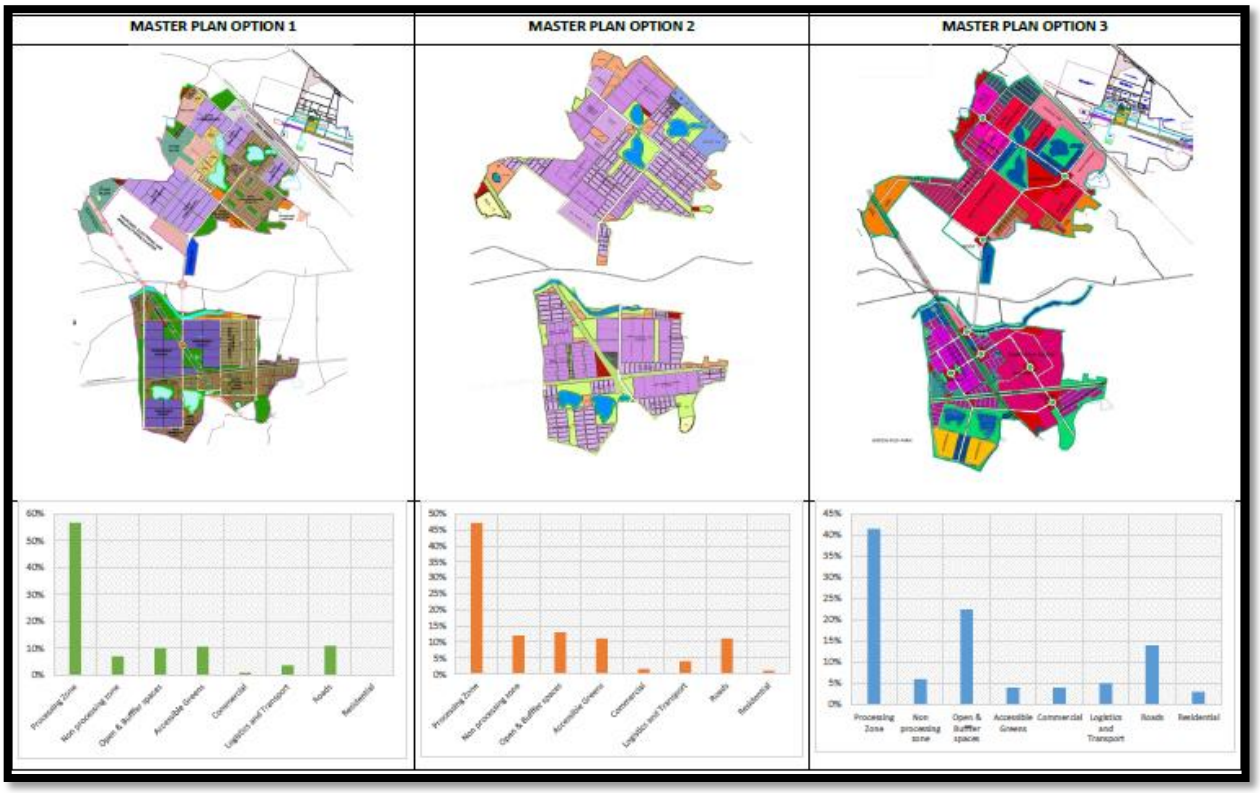


Figure 3-4: Alternatives studied in Master Plan level

According to the alternative master plan proposed in Kopparthy site, option 3 has been identified as best feasible option for the planning, as it has more area for Road network and maximum available area of Green-belt in Master Plan level among the alternatives.

3.3 Project Description & Size of the project

The proposed project is an Industrial Park project having identified land of 2595.74 acres. The project is identified within the district of YSR Kadapa in Eastern Coastal state of Andhra Pradesh.

The aim is to make the industrial area environment friendly and sustainable. Responsiveness to the environment shall be a vital part of land use planning promoting sustainability. Sustainable development through use of renewable energy resources shall provide an eco-sensitive environment for industrial development. Conservation of important physical features shall also be proposed for sustainable industrial development. The industrial area is proposed to be divided into two broad zones based on its functionality:

1. Processing Zone – The processing zone shall form the base of employment focused on export-oriented

industries and development facilities

2. Non-Processing Zone – The non-processing zone is designated as mixed-use neighborhoods located in close proximity to employment concentrations

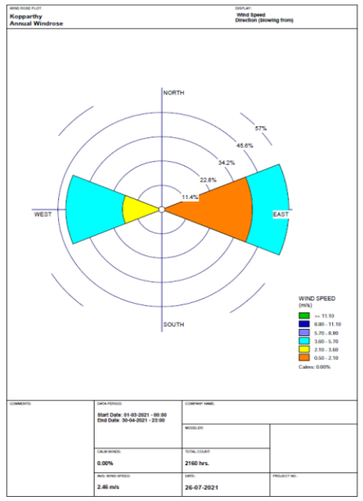
There is 44.4% of area identified for Processing area and 15.28% of area identified for Green area. The detailed proposed land use breakup is provided below:

Table 3-3: Proposed Land use of the Industrial Park

CATEGORY	SUB CATEGORY	Areas in Acres	%	Category Share	SUB TOTAL
Industrial Layouts	TEXTILES - MSME	10.92	0.42%	44.4%	1151.764
	ENGINEEIRING - MSME	95.26	3.67%		
	CHEMICAL - LARGE	200.09	7.71%		
	CHEMICAL - MSME	361.35	13.92%		
	RENEWABLE ENERGY LARGE - POWER GENERATION	484.15	18.65%		
Non - Processing Area	UTILITY	37.79	1.46%	17.7%	458.495
	COMMON AMENITIES AND FACILITIES	91.01	3.51%		
	TRUCK PARKING	33.18	1.28%		
	PARKING SPACES	103.94	4.00%		
	RESIDENTIAL AREA	192.57	7.42%		
Roads and Open Spaces	WATERBODY	203.53	7.84%	38.0%	985.486
	WATERBODY BUFFER	79.79	3.07%		
	ORGANISED GREEN	157.00	6.05%		
	HT LINE AREA	83.03	3.20%		
	GREEN BELT	55.33	2.13%		
	Railway Buffer Line	53.37	2.06%		
	Roads	353.42	13.62%		
Total		2595.75	100.0%		

Greens	Area in acres
Water body Buffer	79.79
Organised Green	157.00
HT Line Area	83.03
Green Belt	55.33
Residential Greens	14.88
Roadside Greens	6.85
Total Greens	396.88

Percentage of Greens= 15.28%



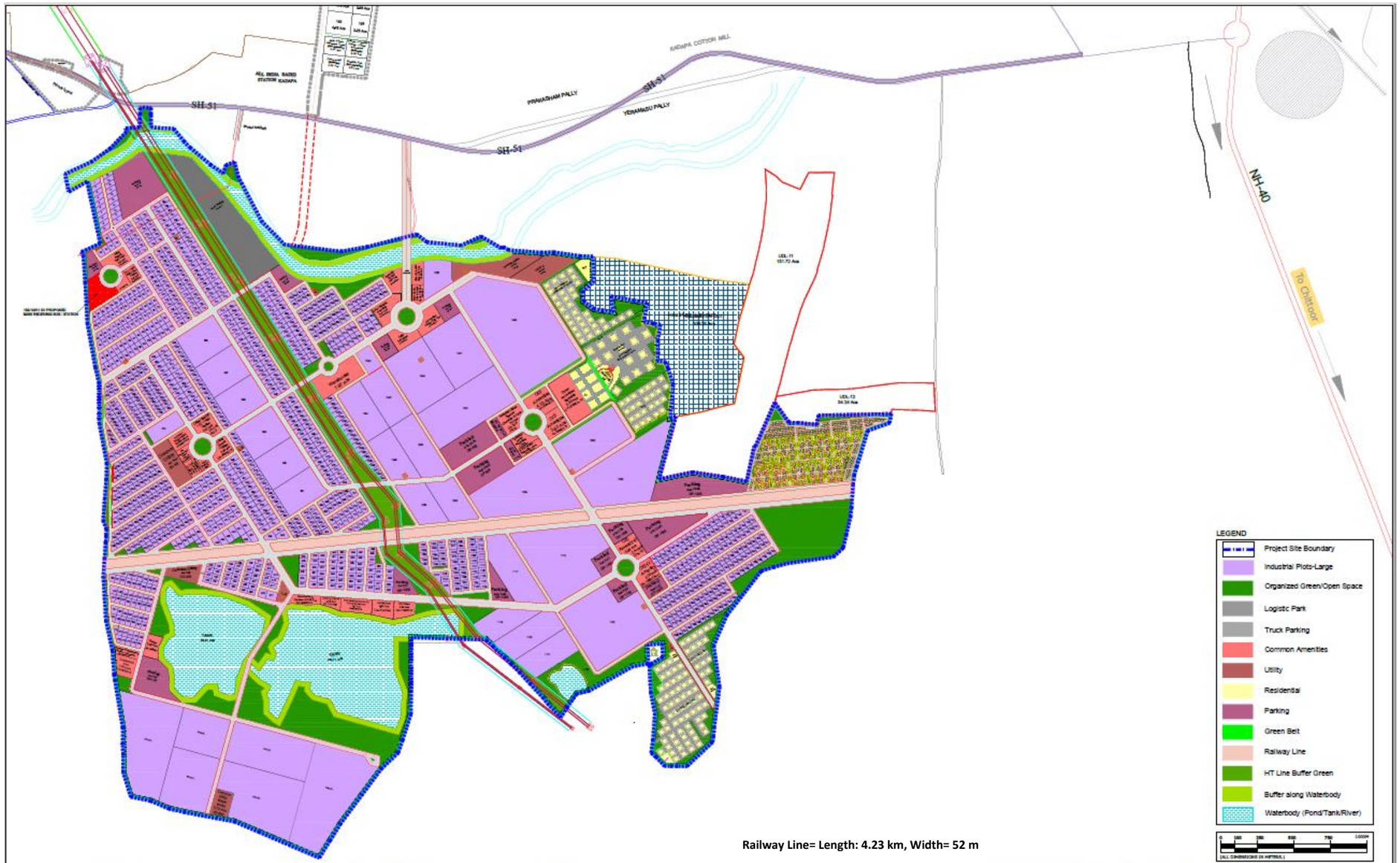


Figure 3-5: Master Plan Layout

Industrial category proposed

Based on Market Demand Assessment, the following industrial sectors have been proposed within thin the area of 2595.74 acres:

- Textile and textile related industries- MSME
- Engineering Goods- MSME
- Chemical and Petrochemical- MSME
- Chemical and Petrochemical- Large
- Renewable Energy Equipment Manufacturing and Power Generation- Large

There will be 353.42 acres of road network provided for ease of connectivity. 192.57 acres of land will be developed for Residential use. Utility facility will have water treatment facility, waste water treatment facility, Cooling and Boiler system, Power supply and backup power setup, sub-station, Solid waste Management area etc.

Table 3-4: Size of Proposed Industrial Layouts

Size (acres)	Industry
95.26 acres	Engineering Goods- MSME
10.92 acres	Textile and Textile related Industries- MSME
361.35 acres	Chemical and Petrochemicals- MSME
200.09 acres	Chemical and Petrochemicals- Large
484.15 acres	Renewable Energy Equipment Manufacturing and Power Generation- Large

Table 3-5: Industrial Categorisation

Proposed Industry	W	A	H	W+A+H	Industrial Category, CPCB, 2016	Categorization as per schedule, EIA Notification, 2006
Textile and Textile related Industries- MSME						
Cotton spinning and weaving (small scale)	-	10	-	25	Green Category; Org. Sl. No., 15	Exempted
Yarn / Textile processing involving any effluent/emission generating processes including bleaching, dyeing, printing and colouring	40	15	20	75	Red Category; Org. Sl. No., 84	5(d), category B
Manufacture of articles of fur	-	10	-	25	Green Category; Org. Sl. No., 34	Exempted
Manufacture of knitted and crocheted apparel					Green Category; Org. Sl. No., 34	Exempted
Engineering Goods- MSME						
Engineering and fabrication units (dry process without any heat treatment / metal surface finishing operations / painting)	-	-	-	-	Orange Category, Org. Sl. No., 23	Exempted
Cement	-	30	-	75	Red Category, Org. Sl. No., 7	3(b), category B
Ready mix cement concrete	-	10	-	25	Green Category,	Exempted

Proposed Industry	W	A	H	W+A+H	Industrial Category, CPCB, 2016	Categorization as per schedule, EIA Notification, 2006
					Org. Sl. No., 72	
Chemical & Petro Chemicals- MSME						
Fertilizer (granulation / formulation / blending only)	-	20	-	50	Orange Category, Org. Sl. No., 26	Exempted
Coke making, liquefaction, coal tar distillation or fuel gas making	30	20	20	70	Red Category, Org. Sl. No., 13	4(b), category A or B
Man-made fibres	40	35	10	85	Red Category, Sl. No. 47	5(d), category A & B
Manufacturing of paints varnishes, pigments and intermediate (excluding blending/mixing)	30	25	15	70	Red Category, Org. Sl. No., 45	5(h), category B
Basic chemicals, plastics	30	-	10	75	Red Category, Sl. No. 25	5(f)
Synthetic rubber excluding moulding	20	20	15	55	Orange Category, Org. Sl. No., 79	5(f)
Manufacturing of lubricating oils, grease and petroleum-based products	20	20	20	60	Red Category, Org. Sl. No., 44	5(e)
Reprocessing of waste plastic including PVC	20	20	-	50	Orange Category, Org. Sl. No., 59	Exempted
Polythene and plastic processed products manufacturing (virgin plastic)	10	10	-	25	Green Category, Org. Sl. No., 67	Exempted
Chemical & Petro Chemicals- Large						
Fertilizer (granulation / formulation / blending only)	-	20	-	50	Orange Category, Sl. No., 26	5(a), category A
Bulk Chemicals, Speciality chemicals, Agrochemicals, Petrochemicals, Polymers	40	35	20	95	Red Category, sl. No. 4,25, 22, 38, 57	5(c), 5(e), 5(f)
Manufacturing of lubricating oils, grease and petroleum-based products	20	20	20	60	Red Category, Org. Sl. No., 44	5(e)
Reprocessing of waste plastic including PVC	20	20	-	50	Orange Category, Org. Sl. No., 59	Exempted
Polythene and plastic processed products manufacturing (virgin plastic)	10	10	-	25	Green Category, Org. Sl. No., 67	Exempted
Renewable Energy Equipment Manufacturing and Power Generation- Large						
Solar module non-conventional energy apparatus manufacturing unit	-	-	-	-	White Category, Org. Sl. No., 78	Exempted
Wind Turbine Manufacturing					Fibre Glass- Red category, sl. No. 13 Steel processing – Orange, sl. No. 63	Exempted

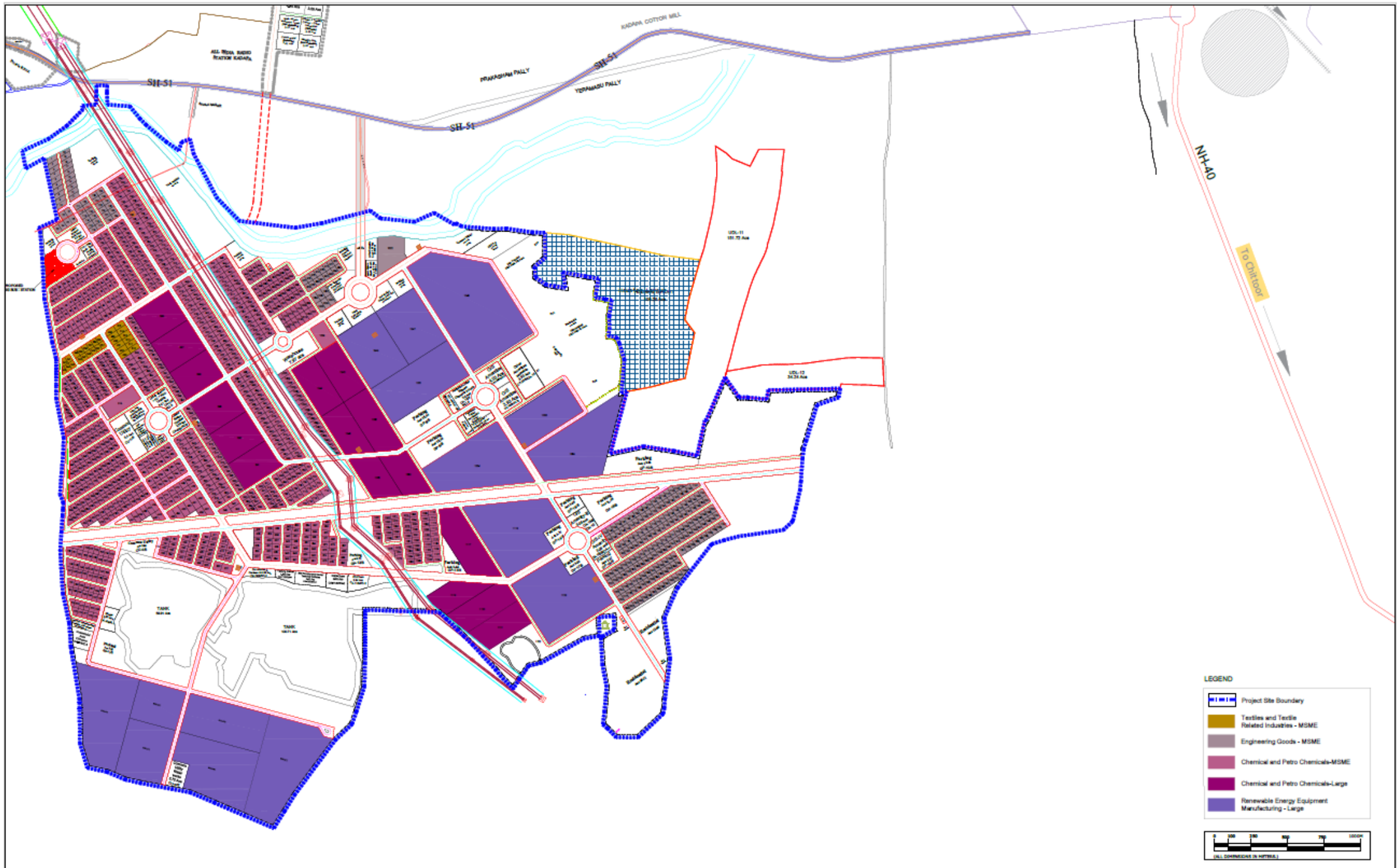


Figure 3-6: Type of Industries

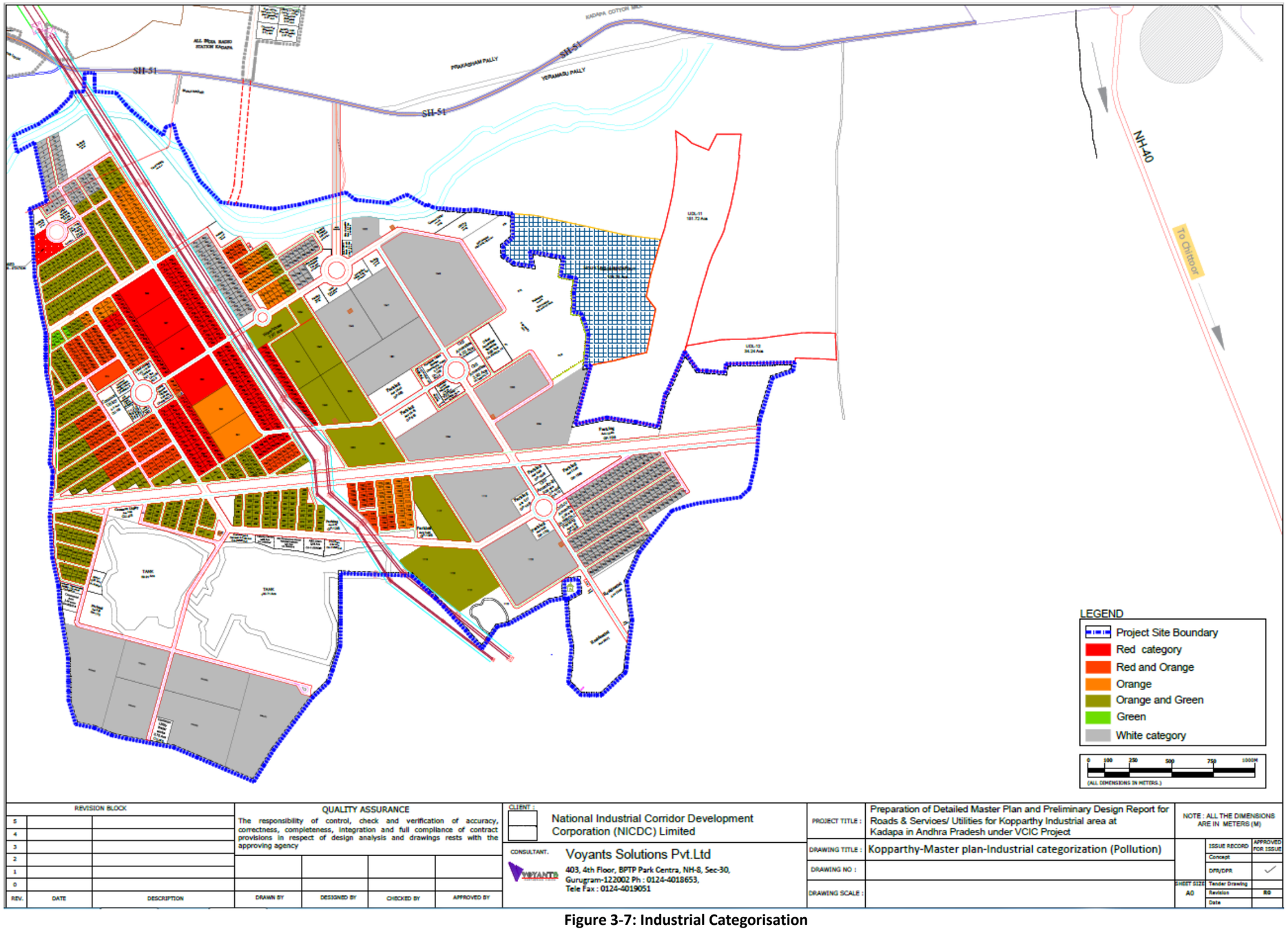


Figure 3-7: Industrial Categorisation

3.4 Resource Optimization

Under this category there are 5 techniques of Cleaner Production – Energy Efficient (CP-EE) are briefly discussed below:

a) **Good Housekeeping**: Systems to prevent leakages & spillages through preventive maintenance schedules and routine equipment inspections. Proper working instructions, supervision and regular training of workforce would facilitate proper housekeeping.

b) **Input Material change** – Substitution of input materials by eco-friendly (non-toxic or less toxic than existing and renewable) material preferably having longer service time.

c) **Equipment Modification –** Modification of existing producing equipment and utilities, addition of measuring and controlling devices, in order to run the processes at higher efficiency and lower waste and emission generation rates.

d) **Recycling**

- **On-site Recovery and Reuse** – Reuse of waste materials in the same process or for another useful application within the industry.
- **Production of useful By-Product** – Modification of the waste generation process in order to transform the waste material into a material that can be reused or recycled for another application within or outside the company.

e) **Product Modification -** Characteristics of the product can be modified to minimize the environmental impacts of its production or those of the product itself during or after its use.

3.5 Availability of Water and Power

GoAP has accorded permission to APIIC for withdrawing water from existing RTTP supply scheme at Mydukur (distance 41.30 km) From Mydukur to project site at Kopparthy, the water pipeline need to be constructed. No Ground Water shall be extracted for the project during operation phase. During construction phase, water demand will be very less and same shall be sourced from local water supply facility or alternatively from Surface water ponds, available at the area. The estimated total water demand for the project is 23.87 MLD.

Storm Water Management

The proposed storm water drainage scheme for the site is explained herein. Key feature of the network is the use of natural drainage channels to minimize drain sizes along the roads. The site has been divided into smaller sub-catchments and run-off generated from each is let into the natural drains where possible. Several outfalls are provided in order to enable safe conveyance of discharge from the site. The rainfall within the project site shall be collected and conveyance through drain to natural drainage stream. The run-off from the utilities, roads and other greens and paved area shall be collected through the drains.

The proposed project site has natural drainage slope from South, South-West to North-East. The same natural

drainage system will be maintained within project site. The project site has 1 major stagnant water pool towards Northern boundary and 2 major water pool towards South; additionally, there are multiple ponds available within the site. All the major water bodies will be reattained for natural storm water management. Paved or road network crossing the natural drainage, will be provided with culverts. Surface runoff through Open and Paved area shall be circulated through Storm Water Drainage system and same will be disposed to natural drainage facility after desiltation process.

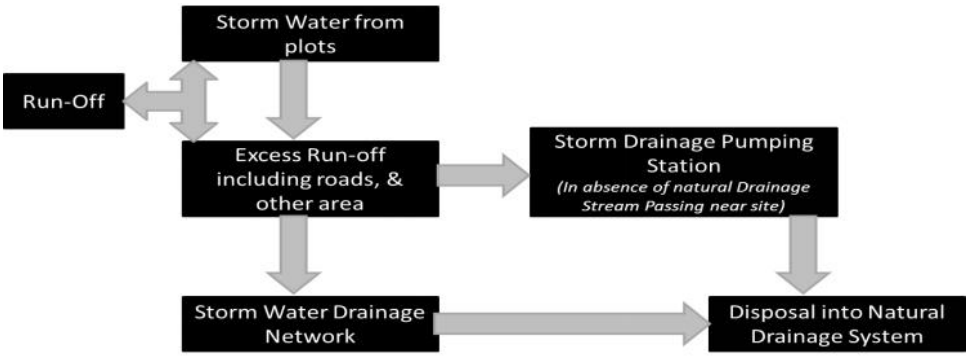


Figure 3-8: Proposed Storm Water Drainage management for Open area

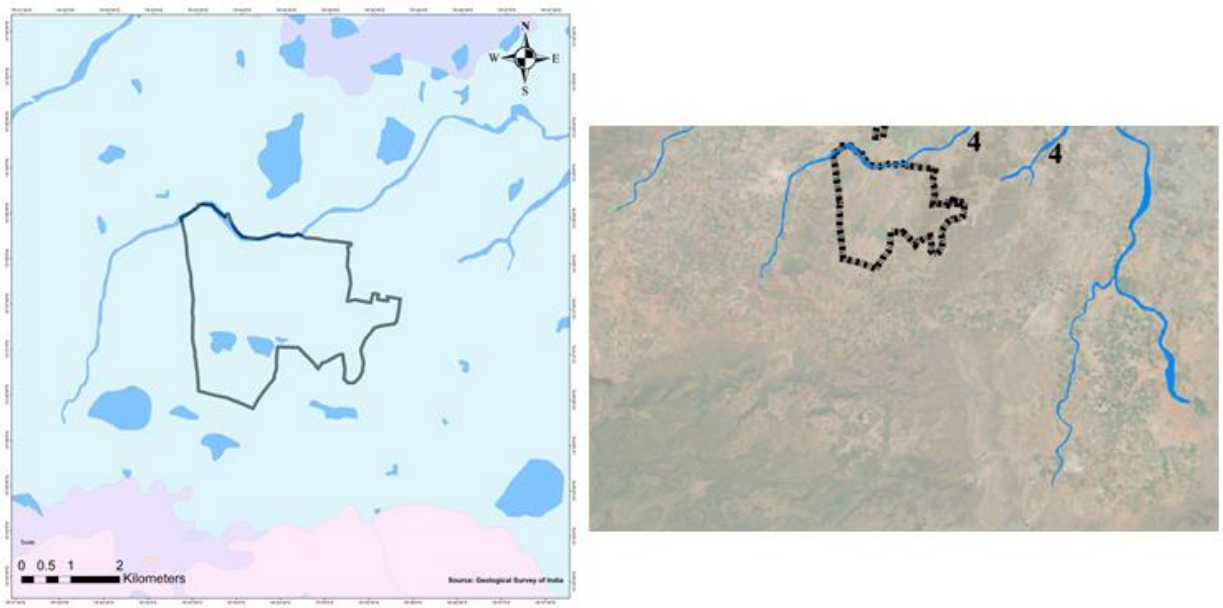


Figure 3-9: Slope/ Drainage pattern

3.6 Quantity of Waste and its Management

Effluent Conveyance system:

The components of sewerage design are the conveyance network, pumping system, the treatment facility and the disposal strategy. The conveyance is by gravity and the treatment facility is located at the lower contour levels. The treated water from the treatment facility shall be recycled and reused for horticultural purpose.

The sewage generation from each industrial cluster has been estimated based on their water demand and estimated proposed sewage flow of the processing and non-processing areas. For the processing units generating complex and High TDS effluent, individual Effluent Treatment Plants has been proposed with addition to a centralized CETP/CESTP. Treated water from individual industries' ETP will be transmitted to CESTP after pre-treatment at individual level. In North Parcel of the industrial Park, 1 CESTP has been proposed, where Domestic and Trade Effluent shall be treated and this treatment plant has been proposed towards Northern boundary of the North Parcel; Whereas, in South Parcel, separate CSTP and CETP has been proposed for Domestic and Trade Effluent respectively. The proposed scheme of individual ETP is provided below:

Effluent Treatment for Textile Industry:

Proposed market assessment and industrial planning for the industrial park has suggested that there will be textile industry, which would be housed in the industrial park. Weaving and Spinning process may not have major effluent generation, but apparel and garment manufacturing units may have activities of printing, dye etc. These processes will require color removal process in effluent treatment with Chrome treatment before primary chemical clarification process. The treatment will be followed further with conventional activated sludge treatment process and will transfer to CETP after considerable quantum of reduction in COD and solids.

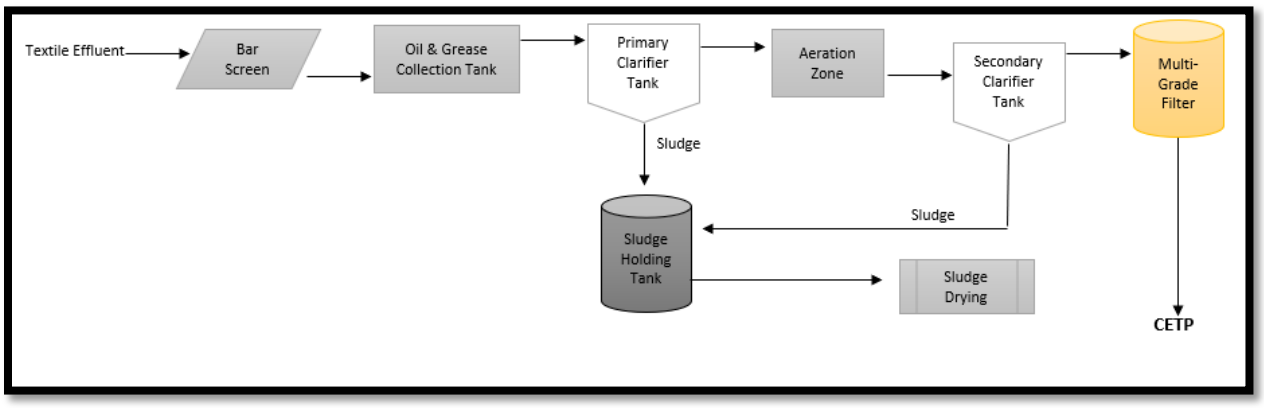


Figure 3-10: Proposed Effluent Treatment process for Textile Industry

3.7 Quantity of Solid Waste and its Management

Solid Waste Management involves activities associated with generation, storage, collection, transport, processing and disposal of waste.

The model can be based on Reduce, recycle and reuse.

- The bio-degradable waste will be processed at the project area and will be used as manure at the green belt of the site.
- The recyclable and landfillable waste shall be segregated and will be transferred to designated authority /landfill.
- Waste to energy, waste recycling, reprocessing units shall be encouraged to develop within the industrial area, so that comprehensive use of resources can be explored.
- Landfillable waste may be transferred to the municipal waste management facility, as the project site has close proximity of Kadapa city (around 11 km towards ENE).
- In addition, the proposed industrial park will have Solid Waste Management (SWM) area, where collection, segregation, storage will be carried out for the solid wastes generating at the industrial area.
- Sludge will be generated from CETP of the industrial park, and shall be collected and stored in SWM facility intermediary and shall be disposed to authorized HWM facility.
- Used Oil shall be generated from utility, during DG set maintenance, from engineering workshop area etc. Used oil shall be collected and stored in HDPE drums and shall be transferred to authorized recyclers.
- Nearest hazardous waste landfill site is at Raviguntapalle village in Nellore district (153.6 km from the proposed project site).
- Suitable Environmental Management Plan (EMP) to be prepared for segregation of waste at source and disposal through authorized recyclers. Suitable advice/guidelines to the occupiers/users of the proposed site, shall be issued by project proponent in this regard and also as directed by State Pollution Control Board time to time.
- The estimated Municipal Solid Waste generation quantity is about 28.85 MTD. The detailed categorization of waste materials with generation quantity will be assessed after finalization Master Planning with plotting of individual industries.

There will be provision for recycling of waste within the industrial park, and promoters/investors interested in solid waste recycling process/ Used Oil reprocessing will be encouraged. These units will be allocated at the industrial zones of Chemical/petro-chemicals.

3.8 Schematic Representation of the Feasibility Drawing for EIA Purpose

For development of proposed industrial park in Kopparthy, following stages of environmental study will be carried out for obtaining of prior Environment Clearance: site screening, pre-feasibility report, environmental impact assessment (EIA) and environmental management plan (EMP) studies, etc.,

Stage 1

Zoning Plan indicating type of industries which can be established considering the site location and market potential. Screening and scoping of the project.

Stage 2

Submission of Form-1, Prefeasibility report, Draft TOR for appraisal to EAC, MOEF&CC.

Stage 3

Public Hearing followed by Submission of EIA & EMP report as per the approved TOR issued by concerned authority (EAC-MOEF&CC).

Proposed Baseline Monitoring Plan:

Ambient Air Quality Monitoring – 10 locations (2 in upwind direction, 4 in downwind locations, 2 within proposed project site, 4 in crosswind direction), at proposed project site, predominant wind directions is from East, thus, downwind direction of the site is West.

Ambient Noise Quality monitoring: 10 locations (4 locations within proposed project site and other locations outside the project site, within 10 km Impact zone and close to any sensitive receptors).

Soil Quality: 10 locations (2 agricultural land sample, 2 non-agricultural land samples from proposed site and 3 samples each from agri and non-agri land, outside the proposed project site).
Surface Water quality: 10 locations (Details given in Proposed TOR).
Ground Water quality: 10 samples (8 samples from tube well/bore well etc., 2 samples preferably from within the proposed project site.

Aquatic Ecology: 6 samples (Details given in Proposed TOR).

Stage 4

Appraisal of the project and obtain Environment Clearance followed by Submission of Consent for Establish (CFE) application to Andhra Pradesh Pollution Control Board.

4 Site Analysis

4.1 Connectivity

The proposed site is strategically located in terms of accessibility. The transportation network of the context of the site is shown in the figure below:

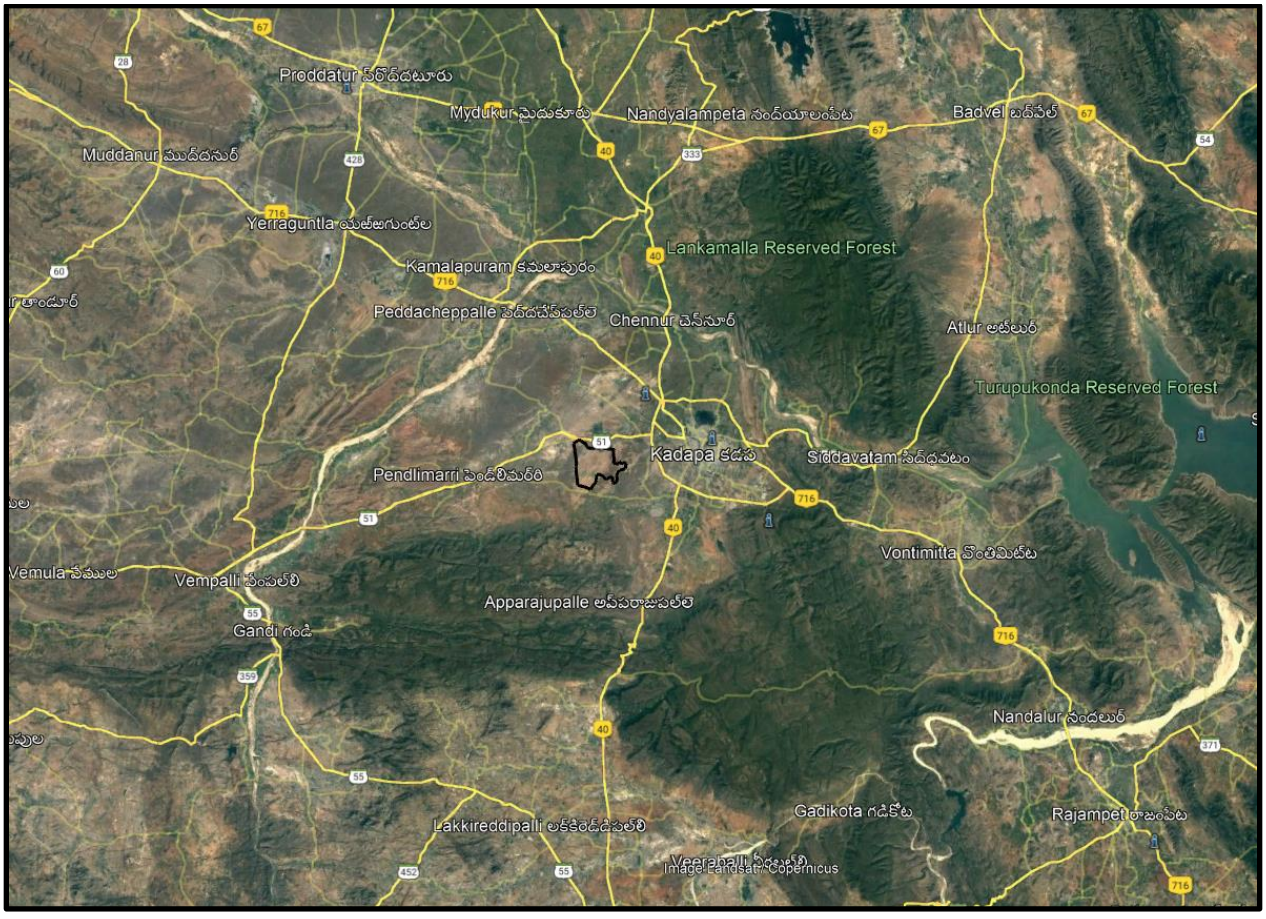


Figure 4-1: Connectivity of the proposed site

Roads

The study area is well connected through a network of roads. NH716 passes through the north of the study area and connects Anantapuram to Chennai via Kadapa. NH40 connects Kurnool to Ranipet via Kadapa. SH 51 connects Pulivendula to Kadapa.

Access to the site: The site is connected through SH 51, followed by NH 40.

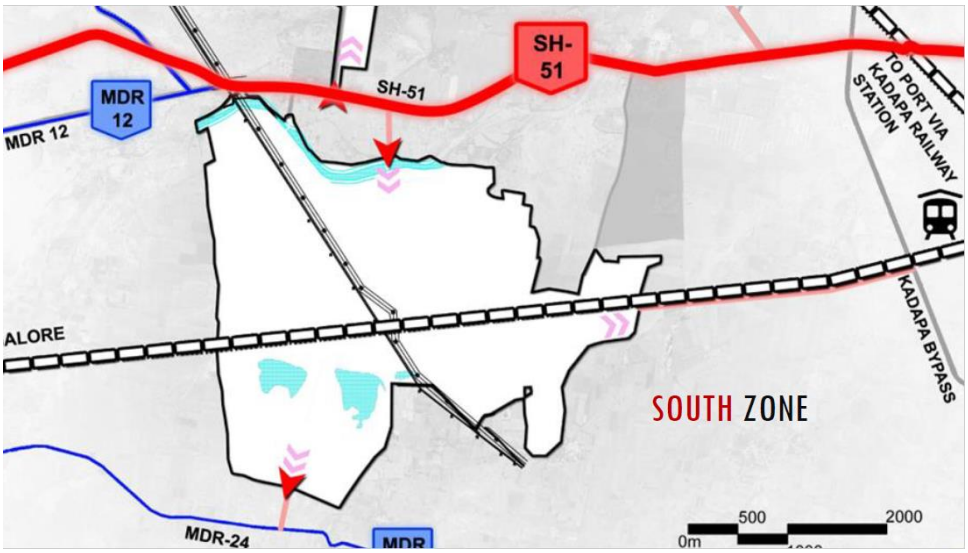


Figure 4-2: Road Connectivity of the proposed site

SH-51 which is present towards the north side of the South Parcel shall be connecting Chemical and Petrochemical industry along with Textile and Textile related Industries and Renewable Energy Equipment manufacturing Industry located towards the upside of the South Parcel. NH-40 and MDR-24 shall be connecting the Engineering Goods, Renewable Energy manufacturing Equipment's & Chemical and Petrochemical Industries located towards downside of the South Parcel.

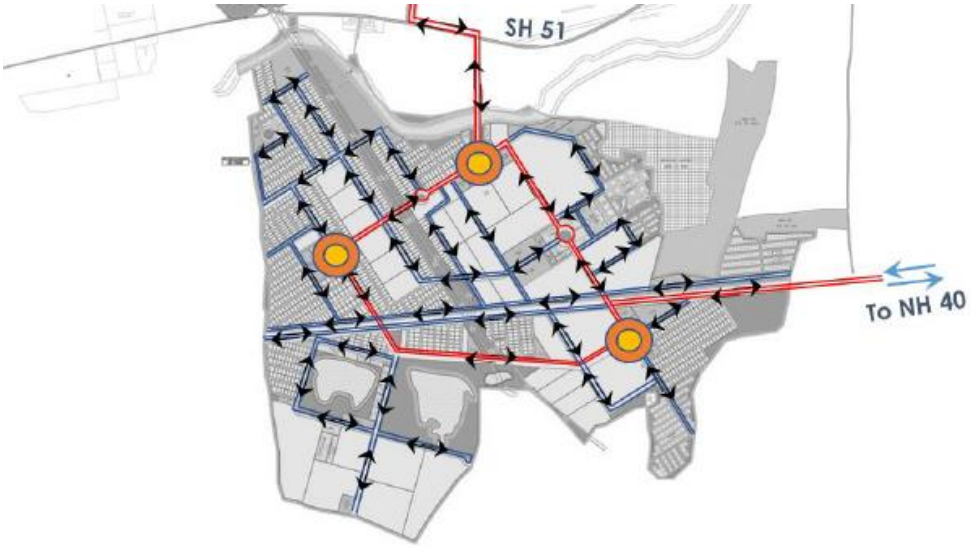


Figure 4-3: Circulation (South Zone)

Figure 4-4: Parking Facility

Railway

Excellent rail connectivity provides locational advantage to the proposed site. Krishnapuram railway station is the nearest railway station located at a distance of around 9.4 km towards North-East direction of the project site. Two major rail junctions, Kadapa railway station and Gangayapalle station is located at a distance of around 12.94 km and 14.20 km from the study area respectively.

The Kadapa railway station connects the site to Hyderabad, Vijaywada, Odisha, Kerala, Tata Nagar and Chennai. Railway line along the northern boundary lies adjacent to the study area. The ICD Logistic Park will be developed along the existing railway line network.

Airport Connectivity

The study area is located contiguous to the Kadapa Airport. Hence the proposed industrial park shall enjoy excellent locational advantages. Kadapa Airport is constructed in 669.5 acres in 1953. Presently, Kadapa Airport handles 100 passengers per hour. The existing flights connect the airport to Chennai, Belgaum, Hyderabad, Vijayawada.

However, height regulations and funnel development shall be applicable as per AAI guidelines. The study area falls within the first funnel. The Tirupati International Airport is located at a distance of 123.72 kms towards South-East and shall act as a major catalyst of air connectivity.

Port Connectivity

The region has excellent port connectivity with the Krishnapatnam port located at a distance of 146.92 kms, Chennai Port (224.41 kms), Kattupalli Port (223.05 kms). Visakhapatnam port, which is an important port of the

region, is located at a distance of 594.07 kms from the study area.

4.2 Land Form, land Use and Land Ownership

The land comprises of agricultural and non-agricultural fallow land. The share of land use for these 2 types of lands is almost in 1:1 ratio. Government of Andhra Pradesh has releases order vide order no.: G.O. Ms. no. 54 dated 13.02.2019, where power conferred for land ownership of 6385.82 acres in YSR Kadapa district to APIIC. 2396.15 acres is in possession of APIIC and balance 199.59 acres of land is under process of acquisition.

4.3 Land classification as per revenue records

2396.15 acres is in possession of APIIC and balance 199.59 acres of land is under process of acquisition. All the required land is being acquiring as per Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (Andhra Pradesh Amendment) Act, 2018.

4.4 Site Topography Along with Map

The proposed project site area falls in Survey of India Topo Sheet Numbers D44G10, D44G11, D44G14, D44G15. The project area has been demarcated in toposheet, and enclosed as Annexure 3-SOI Toposheet with this application. The area has relatively plain terrain, thus area leveling requirement at the site negligible.

4.5 Climate Data from Secondary Sources

As per the District Census Handbook, the climate of YSR district is tropical, wet and dry. The district has a high temperature most of the year and has a record of reaching more than 50 degrees Celsius. During the summers, the minimum temperature is 34 °C and goes to a maximum of 40 °C. During the summer, the humidity of the district is around 75% and is uncomfortable with a hot and humid climate.

4.6 Social Infrastructure Available

The district has a total number of 24 Engineering Colleges, 49 Degree Colleges and 9 Polytechnic Colleges. Number of primary schools in the district are 3122, upper primary schools in the district are 562, and 735 upper Primary and secondary schools.

The district has 462 sub-centers, 70 PHCs, 12 CHCs, one district hospital and one sub-divisional hospital. Additionally, the area has very good connectivity through Rail, road and Air transport system.

5 Planning Brief

Type of Industries, Facilities and Transportation

5.1 Environment Planning in India

The need for the environmental administration of India to become active in the field of environmental planning is founded in the Environment (Protection) Act, 1986, which authorizes the Central and State Government " to have the power to take all such measures as it deems necessary or expedient for the purpose of protecting and improving the quality of the environment and preventing, controlling and abating environmental pollution. Since, the carrying capacity of the environment is not unlimited and some areas or ecosystems are more susceptible to adverse environmental impacts than others, the unplanned and haphazard location of industries might substantially increase the risk to the environment. Environmental planning is a proven tool for reducing the impacts from such risks. However, this tool has seldom been used in this country. Proper sitting of newly planned industries and industrial estates is a strong pollution preventive instrument that ensures environmental soundness of the industrial development.

5.2 Zoning Concept Plan with Consideration to Environmental Angles

- Positioning of major polluting industries (Red category) towards upwind direction. Proposed project site has annual pre-dominant upwind direction from Eastern direction. Thus, in master plan, Major Air polluting industries like Chemical, Petro-Chemical, Metallurgical, Mega and medium scale Auto component units, Dairy units has been proposed towards Eastern zone (towards upwind direction) of the industrial park.
- Positioning of industrial and utility stacks away from the Airport and Flying funnel of the airport; at close vicinity of the airport, industrial plots has been proposed without having major stacks of Boiler, process activity; Boilers has been proposed with PNG fired/Electrical fired, close to the airport area.
- Industries with moderate-high air pollution index, are placed 2 km away from the habitation zones, towards upwind direction.
- CESTP/STP has been proposed away from existing water bodies within the project site and placed according the existing drainage flow of the area.
- Culverting proposed along the paved area, in natural drainage crossing within the site.
- 15.28% of Green area has been proposed.

5.4 Population

Demographic Pattern

Population Distribution

According to the 2011 Census District Census Handbook, the total population of the Y.S.R. District stands at 28,82,469 with 14,51,777 males and 14,30,692 females. The total number of households in the district are 7,06,204 as against 2,09,27,188 households in Andhra Pradesh.

Nearby densely populated areas are as follows: Kopparthy (Populatation: 3250) at a distance of 2.20 km, Ganganapalle (Population: 3018) at a distance of 0.54 km, Chinthakommadinne (Population: 8661) at a distance of 2.15 km, Thadigotla (2815 Populatation, Census 2011) at distance of 2.88 km, Ambavaram (3581 Population, Census 2011) at a distance of 4.61 km and Kadapa (344893 Population, Census 2011) at a distance of around 6.55 km.

Population Growth

According to the 2011 Census District Census Handbook, the population of the district was 26,01,797 as per 2001 Census and has gone up to 28,82,469 persons in 2011 adding 2,80,672 persons during the decade, 2001-2011. The growth rate revealed by the district 10.8% is less than the State growth of 10.98% during the decade. Y.S.R district ranks 10th in growth rate (10.8%) over the decade among 23 districts in the State. Rural and urban growth rates show wide variation. The rural growth rate is recorded as -5.5%, while the urban growth rate is 66.6%.

Population Density

According to the 2011 District Census Handbook, the overall density of population in the district is 188 persons per sq.km and is below the state average of 308. Among the urban areas, Modameedipalle (CT) recorded the highest 12,663 persons per sq.km, followed by 8731 persons in Proddatur (M+OG). Least density, i.e. 547 persons per sq km has been reported in Muddanur(CT).

Sex Ratio

According to the 2011 District Census Handbook, Y.S.R. district had a sex ratio of 985 females per 1,000 males, while it was 974 in the 2001 Census. It is lower than the State average sex ratio 993. The district occupied 16th rank in respect of sex ratio among 23 districts.

Literacy

According to the 2011 Census District Census Handbook, Calculating the effective literacy rate, children in the 0-6 age group have been excluded. The district returned 17, 16,766 literates forming 67.3% of the population of the district. Separating for urban and rural areas, the literacy rate worked out to 75.3% and 63.2% respectively. Again, within the urban areas, male and female literacy rates separating worked out to 83.7% and 66.9%. For the rural population, the male and female literacy rates worked out to 74.7% and 51.5%.

5.5 Land Use Planning (Break up along with Green Belt)

There is 44.4% of area identified for processing area and 396.88 acres (15.28%) identified for Green area. There will be 353.42 acres of road network will be provided for ease of internal connectivity. 192.57 acres of land will be developed for Residential use. Utility facility will have water treatment facility, waste water treatment facility, Cooling and Boiler system, Power supply and backup power setup, sub-station, Solid waste Management area etc. Direct highway connectivity has been proposed from industrial park to Kadapa airport, the proposal has been provided to the airport and railways authority to ease the airways goods movement of the industrial park.

5.6 Green Belt

The common green spaces have been planned in conjunction with the designated facility areas and green connecting corridors have been planned to create pedestrian connectivity across site. 15.28 % of greenbelt area has been proposed, which will comprise of

- 15 meter wide 3 layered greenbelt area along the periphery. The same peripheral greenbelt will be 30 meter wide near the habitation zones adjacent to the industrial park boundary.
- 1.5-meter-wide green belt will be provided on the both side of the 45 m ROW internal road network. 3 m wide shrub cover will be developed along the paved median of the roads. Narrow roads will be provided with median greenbelt.
- The greenbelt along the amenity and common area shall have fruit bearing, shed bearing trees, blossoming trees and shrubs, ornamental and medicinal plants, shrubs, herbs according the landscape plan. The plantation density will be 1100 plants/ha.
- Existing water bodies will be protected with rim development plantation plan. 7 meter wide 2 layered evergreen plants will be provided along the water bodies.
- The proposed project area situated in vegetation zone of ‘sub zone-2, Southern Plateau and Hill Region’. Plantation plan will be prepared according the native species of the vegetation zone and in consultation with local Forest Department.

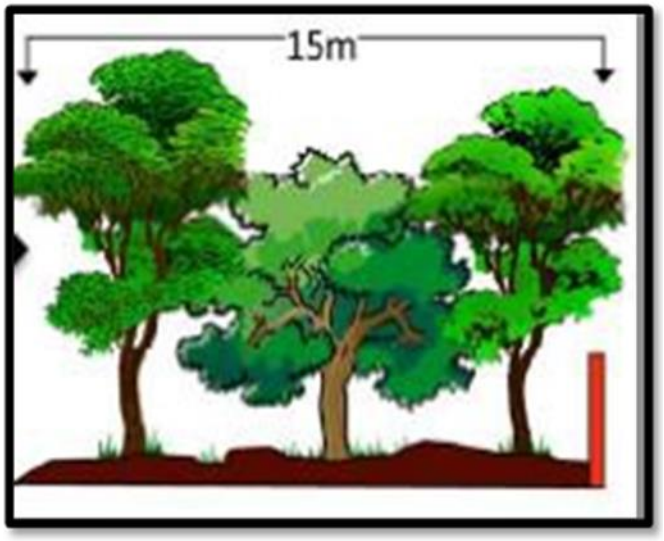


Figure 5-1: Schematic diagram of 3 layered Greenbelt

The green belt / buffer along the main spine and along the industrial boundary will be there to reduce the traffic noise and industrial noise to neighboring areas. The individual plots shall have their own green areas, as per guidelines. There will be 15.28% of green belt area which will be developed in Master Plan level.

5.7 Amenities/Facilities

Recognizing the potential of enhanced living, the Master Plan of the industrial park provides amenities, utilities and common facilities. The locations of these have been carefully selected so that they serve the entire Industrial Township.

The workers of the industries will be spending two third of their 24-hour day time within in their respective Manufacturing zones; therefore, it is very important to provide amenities for them; these amenities should be for short term and long-term benefits.

The short-term benefits include areas such as canteen; recreational spaces etc. in terms of long-term benefits areas such as training centers, skill development and other educational institutes play a significant role in increasing worker satisfaction and hence increased productivity. The functioning of the industrial zone also includes administrative block, post office, police station, fire station. The area is allocated in land use planning so that these important structures are not compromised in later stage. Keeping in mind a commercial center is allocated as dormitories for workers and emergency medical Centre.

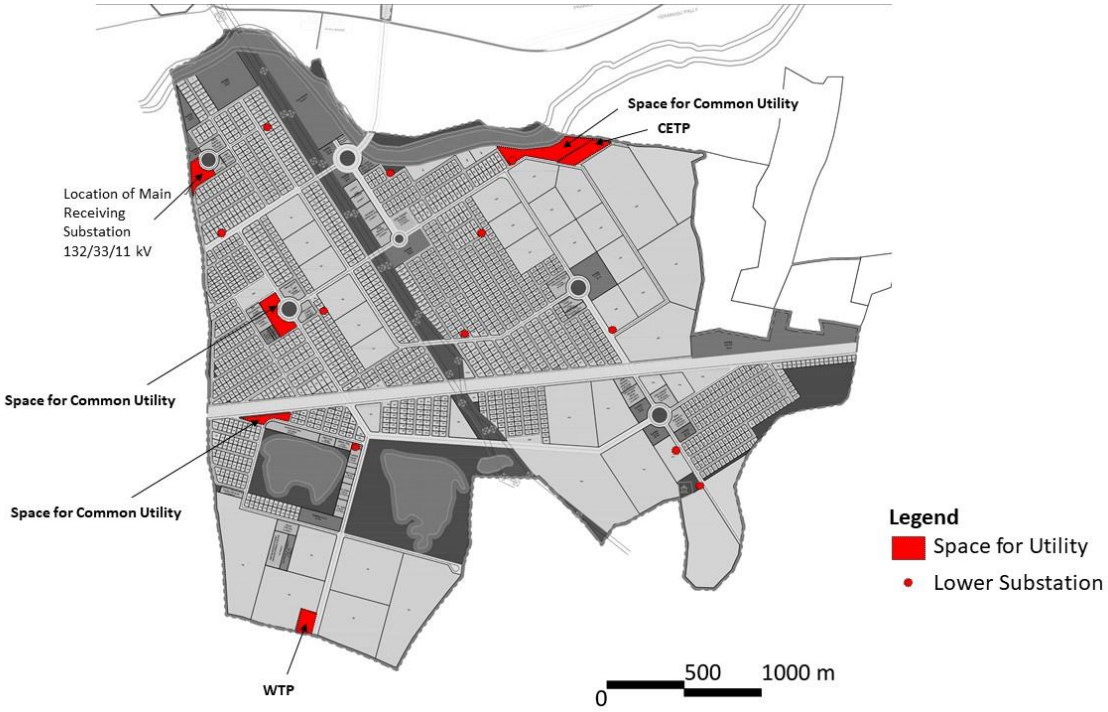


Figure 5-2: Location of utilities

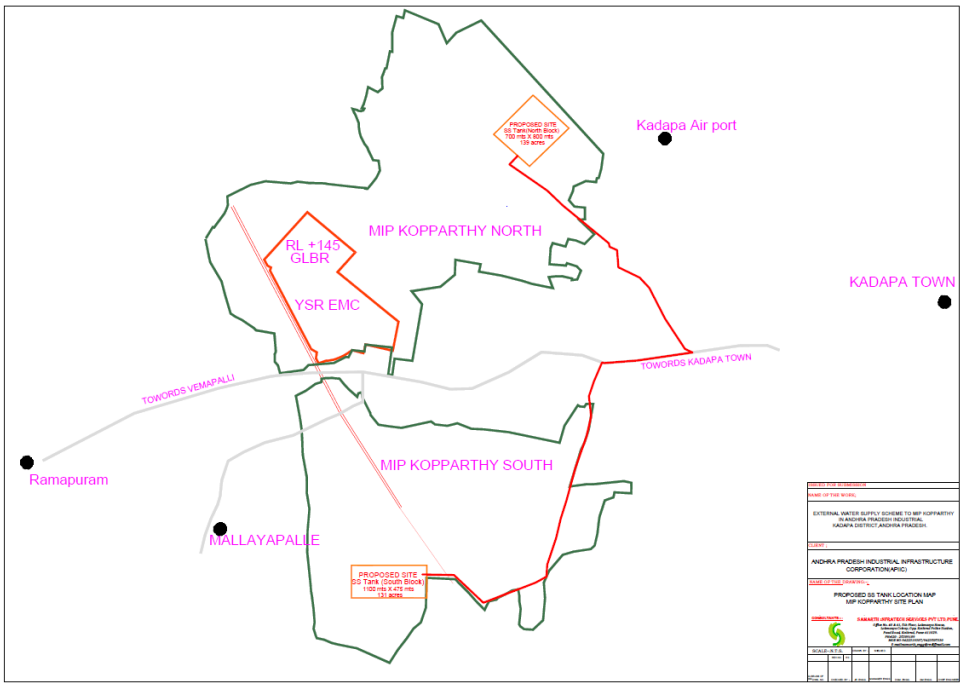


Figure 5-3: Location of Summer tank

6 Proposed Infrastructure

6.1 Industrial Area-Manufacturing area

The proposed Industrial Township is designed based on the market value potential and demand assessment study for sector of industries to be established in the Industrial Township. The categorization of industries by state pollution control board as Red Category, Orange Category and Green Category are implemented in the industrial park.

6.2 Industrial Area Greenbelt

Development of green belt is conceived at the beginning. Around 1100 plants/ha will be planted using native species of the vegetation zone. The distance between two plants will be been kept minimum for thick belt, regular maintenance of green belt will be done, dead plants will be replaced with new one during rainy season.

6.3 Social Infrastructure

The proposed industrial park shall be made available with all infrastructures that required for industrial purpose and also for the locals where they can be benefitted from the infrastructure of the Township. The proposed infrastructure for the Township involves an establishment of Banks, Post Office, Telephone Exchange, Centralized Canteen, Administration Building, Emergency Medical Centre, Police Station, Guest Rooms, Gas Station, Fire Station, and Weigh Bridge, Dormitories for Truck Drivers, Bus Terminal, Truck Terminal, Training and Facilitation Centers, Commercial facilities etc.

6.4 Drinking facility

Water is considered as one of the major resources in industrial and domestic activities. It is used directly in production and also for other utilities like floor and equipment washings, cooling, domestic purposes, green belt development etc. Provision of assured water supply is vital for achieving sustainability in any development. GoAP has accorded permission to APIIC for withdrawing water from existing RTTP supply scheme at Mydukur (distance 41.30 km) From Mydukur to project site at Kopparthy, the water pipeline need to be constructed.

- Transmission system – After collecting raw water from the reservoir, transmitted to Water Treatment Plant located at proposed site.

- Water Treatment Plant – Raw water will be treated for potable use.
- The water from treatment facility will be conveyed to various service reservoirs through transmission pipelines. These transmission pipelines will terminate at various proposed supply reservoirs. These reservoirs are proposed to cater the zonal water distribution system.
- Distribution system – The whole area is divided into two water zones (North zone & South Zone). Each water zone will have its own water distribution system. This distribution system will be supplied from dedicated reservoir.
- Pumping main of DI K-9 pipe of designed diameter to be provided from Intake well to Raw Water Sump.
- Dedicated fire water supply system is proposed through DI K-9 pipe from Clear water Sump.
- The proposed pipe materials are DI & HDPE pipe for the distribution system.

Table 6-1: Water Balance for the proposed project

S.No	Description	%	Demand (KLD)	Demand (MLD)
1	Process Water Demand		7102.59	7.10
2	Potable Water Demand		5841.47	5.84
3	Flushing Water Demand		2819.88	2.82
4	Fire Water Demand Storage			1.2
5	Effluent Generation	60%	4261.56	4.26
6	Waste Water Generated	80%	7493.06	7.49
7	CETP		11754.61	11.75
8	Recycle Water Generate	90%	10579.15	10.58
9	AC Cooling Demand		6534.99	6.53
10	Washing & Cleaning		1238.85	1.24
11	Horticulture Demand		10912.18	10.91
12	Deficit		8106.87	8.11
Total Water Demand Requirement			**23870.82**	**23.87**

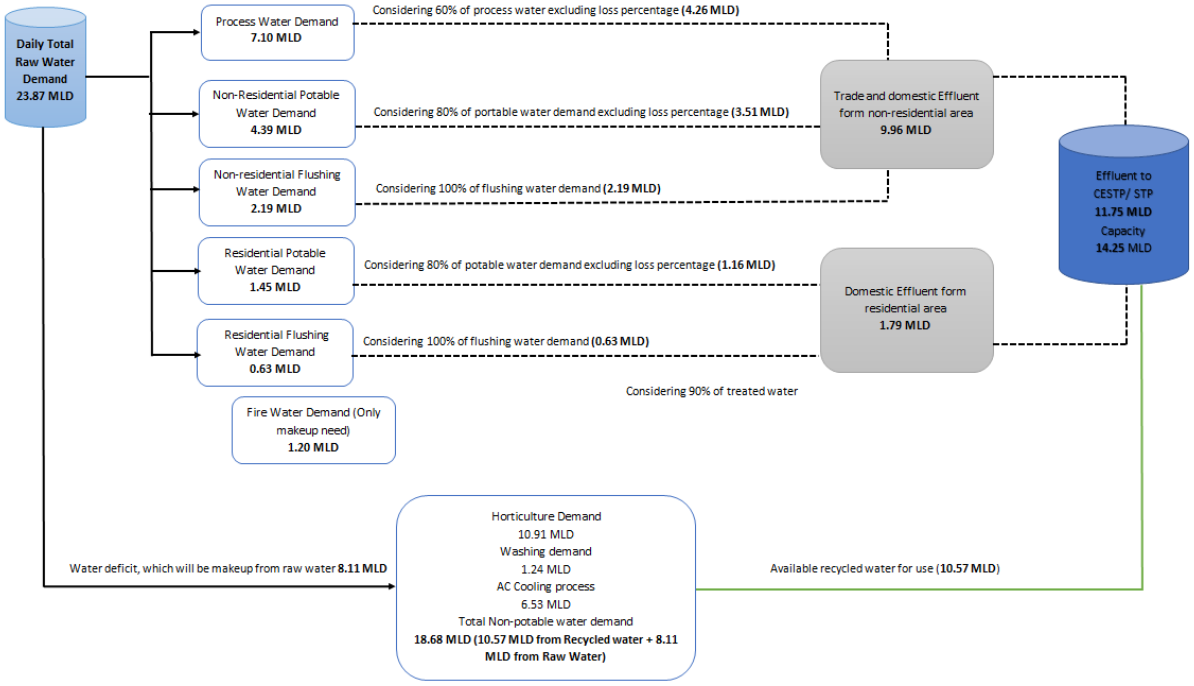


Figure 6-2: Water balance Chart

6.5 Sewage system

Sewerage system will be designed cluster wise in each zone for Industrial Park according to the elevation and contour profile. Sewage water generated form common facilities will be transferred through a pipe line system and diverted to STP (Sewage Treatment Plant). The STP will be operated with conventional system of treatment i.e., Physical treatment followed by Chemical and Biological treatment and finally with tertiary filtration system. The treated water will be used for the green belt and flushing purposes. All the effluent treatment area has been identified as according the drainage pattern of the site and has been placed in down-flow area only. The detailed design of the effluent treatment facility shall be provided in EIA report.

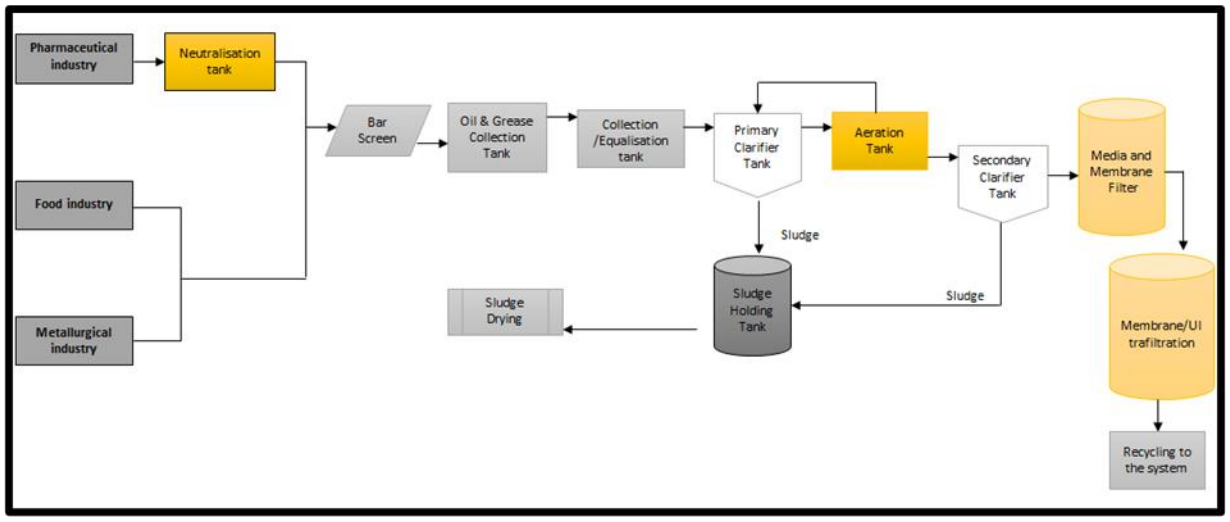


Figure 6-3: Schematic Hydraulic Diagram of CESTP

6.6 Solid Waste Management

Industrial waste management is classified as hazardous and non-hazardous. The Hazardous wastes will be treated as per Hazardous Wastes (Management and Handling) Rules, 1989 and its subsequent amendments. Nearest hazardous waste landfill site is at Raviguntapalle village in Nellore district (153.6 km from the proposed project site). The non-hazardous solid waste shall be collected from individual industries and different clusters of the park, and segregated at fully covered shed within the park and transferred/ disposed accordingly. The estimated quantity of municipal solid waste is 28.85 MTD. The bio-degradable solid waste shall be treated by composter within the Solid Waste Management facility area of the park. The recyclable solid waste shall be segregated and transferred to designated recycler/scrapper facility. Non-recyclable, non-biodegradable solid waste shall be disposed off to landfill site. As the project identified at village area, and no nearest MSW facility identified thus, project would facilitate a landfill site for the requirement of treatment of non-hazardous landfillable waste. There will be provision for recycling of waste within the industrial park, and promoters/investors interested in solid waste recycling process/ Used Oil reprocessing will be encouraged. These units will be allocated at the industrial zones of Chemical/petro-chemicals.

6.7 Power Requirement and Supply/Source

Power for the proposed project can be sourced from 220 KV power grid substation, in Chinnakampalle, Kadapa, 9.18 km from site. Alternatively, power would be tapped from supply grid to 132/33 KV Sub-station, which is proposed towards North side of the project area. However, detailed study regarding the existing electrical connection to north and south shall be taken up during DPR stage of study. The total power demand is 133 MVA.

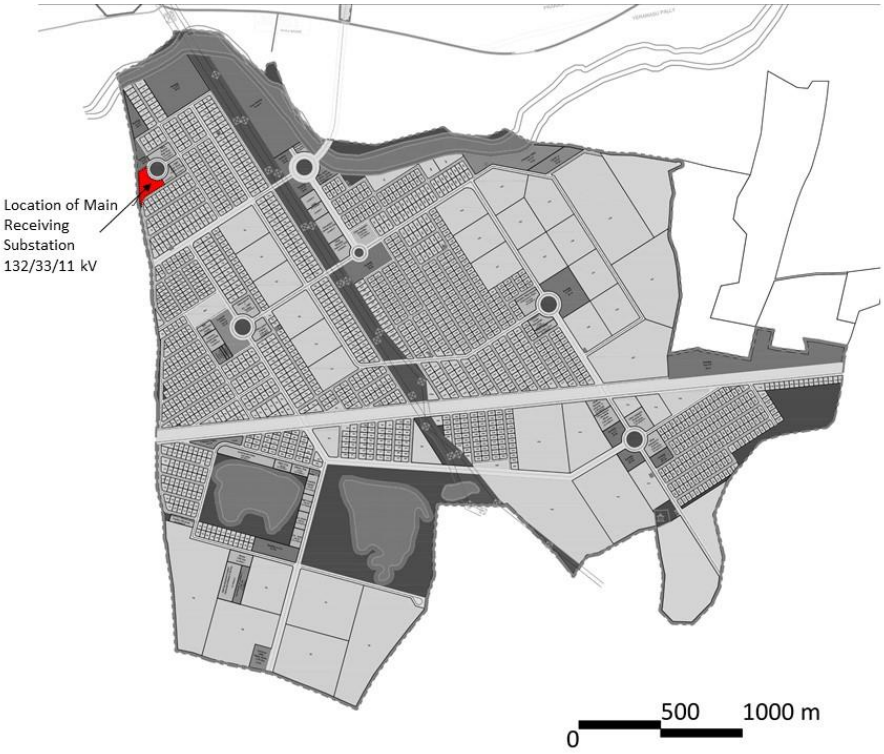


Figure 6-4: Location of Main receiving Substation 132/33/11 kV

6.8 Lung Spaces/Open Spaces

It is proposed to develop open spaces in industrial area at appropriate places. The open spaces are scattered in such a way that the whole industrial layout will give a poised look.

7 Rehabilitation and Resettlement (R&R) Plan

The proposed Industrial Township does not envisage any disturbance to local community or the village since 93% of land for the proposed project has possession with APIIC vide Govt. order no.: G.O. Ms. no. 54 dated 13.02.2019. The proposed project will not affect the home ousters, land ousters and landless laborers.

8 Project Schedule and Cost Estimated

Based on the block estimates for the various facilities proposed in the industrial park, the cost of the Project is tentatively estimated as **Rs. 1273.76 crores.** The 3-5% of the total project cost will be used in Environmental Management of the project and the surroundings.

The proposed industrial park would be developed in a phased manner and the estimated time for starting the project is only after receiving the Environment Clearance form MOEF&CC and other regulatory consents from concerned authorities.

9 Analysis of Proposal

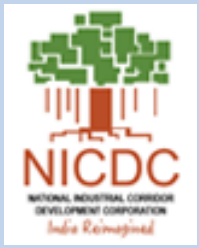
The Pre-Feasibility study was conducted for proposed development of industrial park in Kopparthy. During the Pre-feasibility study to arrive at the proposed suitable location 2 alternative sites were studied. After studying the 2 locations and 3 layout alternatives, technical consultant has concluded that the alternative 1 site and master plan option 3 as best suitable location for the development of the industrial park.

The cost of the project is estimated to be INR 1273.76 crores for the development of Industrial Park. The proposed project will have positive impact on social and economic improvement of the region by overall improvement in living standard through creation of about **1,48,701** of new direct and indirect job opportunities, increase in volume of manufacturing, general trade, general improvement in infrastructural facility with better transport,

In Addition, the proposed project will have following Environmental and Social benefits which would lead the project for a sustainable operation. Industrial Park development is a permitted activity as per Sector 7(c) of EIA Notification 2006 and its amendments thereof.

- No eco-sensitive zones have been identified within the 10 km area study area of the proposed project site.
- No endemic and endangered species of flora and fauna reported within 10 km of the project site during reconnaissance survey. Detailed ecological study will be conducted during EIA and Baseline study.
- No Historical or Cultural Heritage Site or Ecologically sensitive area found within 10 km radius of the proposed development of Industrial Park.

As per the Feasibility Assessment, the project is found to be viable from all aspects such as technical, economic, environmental and social aspects.



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