1 LAND ENVIRONMENT

1.1 WILL THE EXISTING LANDUSE GET SIGNIFICANTLY ALTERED FROM THE PROJECT THAT IS NOT CONSISTENT WITH THE SURROUNDINGS? (PROPOSED LANDUSE MUST CONFORM TO THE APPROVED MASTER PLAN/DEVELOPMENT PLAN OF THE AREA. CHANGE OF LANDUSE IF ANY AND THE STATUTORY APPROVAL FROM THE COMPETENT AUTHORITY BE SUBMITTED). ATTACH MAPS OF (I) SITE LOCATION, (II) SURROUNDING FEATURES OF THE PROPOSED SITE (WITHIN 500 METERS) AND (III) THE SITE (INDICATING LEVELS & CONTOURS) TO APPROPRIATE SCALES. IF NOT AVAILABLE ATTACH ONLY CONCEPTUAL PLANS.

Intel Technology India Private limited (hereinafter referred to as Intel) is proposing development of Multi Level Car Parking named MLCP (hereinafter referred to as Project site) as part of expansion of Intel's SRR Campus located within Plot Nos. 23-56-P (survey nos.23/1, 23/2P, 24, 25, 26/P, 31/1, 31/2, 31/3, 31/4, 31/5, 37/2p, 38/1, 38/2, 38/3, 39, 40, 41/3A1P, 41/3A2P, 41/3B1P, 41/3B2, 41/4, 42/P, 56/P, 23/3P, 27/P, 28/1P, 28/2P, 28/3, 29/3P and 30) adjacent to their existing office buildings (SRR-1 and SRR-2) located within SRR Campus in an area developed by Karnataka Industrial Area Development Board (KIADB), Karnataka. The landuse of the site (of existing SRR1 &2 , SRR-K buildings and under construction SRR-3 and Proposed MLCP Project) has been classified as Industrial High Tech Zone as per the revised Bengaluru Master Plan 2015 of Bangalore Development Authority. The proposed MLCP project has been conceived to utilise the available land for future expansion of Intel SRR campus, currently being utilised for surface parking cum landscaping. The MLCP project t will have a built-up area of 89,405 m^2 to accommodate about 2996 cars. With the proposed expansion of MLCP Project, the total built-up area of the SRR campus will be 1, 89,702.8 m^2 and utility area of 12,403 m^2 for SRR-1& SRR-2 buildings and 2,301 m^2 for SRR-3 under construction building

An Environmental Clearance under schedule 8(a) of EIA notification 2006 and amended up to date for development of fuel cell based power (FCTP) generation unit and construction of SRR-3 for expansion of Intel's SRR campus for Hardware Development, Software Validation and related Research and Development at Deverabeesanhalli, Bangalore was obtained from State Environmental Impact Assessment Authority (SEIAA), Karnataka, under File No. SEIAA:153 CON 2015 dated 29 December 2015 and No SEIAA: 197: CON: 2013 dated 3 October 2013 and as amended on August 14, 2015 as an expansion Project. Refer to **Annex A** of Form-1 for the EC granted and as amended by SEIAA for the expansion of SRR Campus in a plot area of 17.28 Ha comprising of total built up area of 101,667.8m^2. The approval included SRR-1 building with G+2, SRR-2 Building with G+2, SRR-K building with G+1, SRR-3 Building with G+9 and establishment of 2.5 MW FCTP. With the proposed expansion of MLCP Project, the total built-up area of the SRR campus will be 1, 89,702.8 m^2. Total parking space currently available was 2,110 cars inclusive

of addition of space for 1,169 cars for under construction SRR-3 as open parking and with the proposed MLCP, the total parking space will be for 3349 cars including 2900 as MLCP, 372 as open space at SRR-1 and 77 at SRR-3, the proposed MLCP also include parking provision of 1169 cars for future expansion SRR-4[1].

Total fresh water consumption post expansion is estimated as 405.98 m^3/day. Total wastewater discharge is 203.53 m^3/day with sewage treatment plants of 250 m^3/day (100 m^3/day + 150 m^3/day). Construction work for SRR-3 campus has been initiated from February 2014 is in the final stage of construction and is anticipated to commission in November 2016

The plantation in existing SRR-1 and SRR-1 buildings comprise of 750 trees of 49 different species (SRR1-527 trees and SRR2 -223 trees). Most of the trees in SRR1 & 2 building areas were observed as well grown.

Location map and Google Earth Image of the MLCP Project Site are shown in ***Figure 1.1and Figure 1.2*** respectively**. Figure 1.3** shows the physical features prevailing within 10 km of Intel SRR Project site. An elevation contours and spot height within 10 km from the Intel SRR Project site is shown in **Figure 1.4.**

Intel's SRR campus is bounded by existing 45 m wide outer ring road (ORR) on northern side and 12 m wide road along the eastern and southern boundary which gets connected to the Adarsh Palm Retreat and LSI Tech Park. Open area for Global Technology Park on the West, Outer Ring road followed by Novotel and IBIS Hotel, Passport Seva Kendra & Saffron Square on North, KPIT Cummins Info system, Honeywell India and *Deverabeesanahalli* Village on the East and Adarsh Palm Retreat (under construction) on the South.

The nearest settlement is *Deverabeesanahalli* located approximately 0.5 km towards east of the Project site. Other settlements in the vicinity of the Project site include *Bellandur* at a distance of about 1.0 km to NW direction, *Doddokanahalli* at a distance of 1.8 km to SE direction and *Panathur* at a distance of 2.2 km to NE direction. The nearest town (Marthahalli) is located at a distance of 2.2 km to North east direction.

The proposed MLCP Project site comprises of open surface parking with landscape area having trees, shrubs and herbs. Dominant shrubs and herbs present at the MLCP Project site include *Ricinum communis, Solanum nigerum, Argemone Mexicana, Euphorbia hirta, Parthenium hysterophorous, and Achyranthus aspera*. A total of 148 individuals of 9 species of tree forms of > 30 cm girth at breast height (GBH) were recorded *and* a total of 58 individuals of 5 species of tree forms of < 30 cm girth at breast height (GBH) were recorded.

[1] SRR-4 refers to Future expansion

The plantation in existing SRR1 and SRR1 buildings comprise of 750 trees of 49 different species (SRR1-527 trees and SRR2 -223 trees). Most of the trees in SRR1 & 2 building areas were observed as well grown.

Onsite measurements of geographical coordinates of the corners of the proposed MLCP Project site were done using Garmin GPS MAP 78S, which included the following:

- A: 12°55'30.68"N, 77°41'8.01"E
- B: 12°55'30.68"N, 77°41'6.82"E
- C: 12°55'33.08", 77°41'6.72"E
- D: 12°55'33.10"N, 77°41'4.98"E
- E: 12°55'33.49"N, 77°41'4.56"E
- F: 12°55'38.33"N, 77°41'4.67"E
- G: 12°55'38.18"N, 77°41'5.87"E
- H: 12°55'36.53"N, 77°41'7.95"E

Figure 1.1 Location Map of the SRR Project Site

Figure 1.2 Google Image showing SRR Project Site

Figure 1.3 Physical Features within 10 km radius from SRR Project Site

Figure 1.4 Contour and Spot Height within 10 km Radius from the SRR Project Site

Figure 1.5 Contour and Spot Height within 1 km Radius from the SRR Project Site

1.2 LIST OUT ALL THE MAJOR PROJECT REQUIREMENTS IN TERMS OF THE LAND AREA, BUILT UP AREA, WATER CONSUMPTION, POWER REQUIREMENT, CONNECTIVITY, COMMUNITY FACILITIES, PARKING NEEDS ETC.

1.2.1 Land Area

Proposed MLCP Project

Within the existing land for SRR Campus, Intel is proposing development of a new multi-level car parking (MLCP) building spread over in an area of 1.49 ha with built-up area of 89,405 m^2 having height of 14.9 m as per the project features described in ***Table 1.1*** to accommodate about 2900 car**s** including 1169 cars for the future expansion, which is currently being used as surface parking.

Existing SRR Campus

Presently there exist the following buildings/ amenities within SRR Campus:

- SRR-1 building;
- SRR-2 building;
- SRR-K building;
- Utilities, Services and Cafeteria in SRR-2 ;
- Organic Waste Converter Yard ;
- Food Waste Yard,
- Tennis court;
- Basketball court;
- Parking area;
- Security room; and
- Sewage Treatment Plant.

The existing SRR-1 & SRR-2 and SRR-K buildings have a total plot area of 9.995 ha (24.70 acres) with built-up area of 43,217.8 m^2. The existing SRR-1 is LEED silver certified building, SRR-2 and SRR-K are LEED gold certified buildings in Operation and maintenance category. The existing SRR-1, SRR-2 and SRR-K buildings are LEED certified meant for software development and hardware validation. The total occupancy of existing SRR -1 & SRR-2 buildings is approximately 2600 personnel (at 90% diversity), which includes approximately 1900 of fixed population and approximately 700 of floating population of contractors and personnel from other Intel offices visiting SRR-1 and SRR-2 buildings for short duration.

Existing Under Construction SRR-3

Construction work for SRR-3 Building is ongoing as per the prior Environmental Clearance obtained from Karnataka SEIAA on October 4, 2013 as amended on August 14, 2015. The SRR-3 building would be spread over in an area of 7.28 ha (18 acres) with built-up area of 58,450 m^2. The SRR-3 Project will include office building having height of 47.23 m as per the project features described in **Table 1.1** and **Table 1.2.** The SRR-3 building will be 'Disabled-

friendly' with all features, like parking bays, entrance ramps, lifts and toilets/ wash rooms.

1.2.2 Built-up Area & Space Distribution

The overall built-up area and space details for the existing SRR 1 &2 buildings and proposed SRR-3 Project are as given in **Table 1.1** ***and*** **Table 1.2**. The Layout Plan of the existing buildings is shown in ***Figure 1.6*** and the Master Plan of the proposed MLCP Project is shown in ***Figure 1.7.***

Table 1.1 Details of Built-up Area of the Existing SRR1 &2, SRR-K Buildings, Under construction SRR-3 building and Proposed MLCP

S.N	Description	Built-up Area(m^2)
A	**Proposed MLCP Building with height of 14.9 m**	
1	Basement	14,900
2	Ground Floor	14,865
3	First Floor	14,865
4	Second Floor	14,865
5	Third floor	14,865
6	Fourth Floor	14,865
7	Terrace Parking	180
	Total MLCP Building	**89,405**
B	**Under Construction SRR 3 Building with height of 48.23m**	**57,080**
C	**SRR-1**	**20,921.25**
D	**SRR2**	**20,879.55**
E	**SRR-K**	**1417.00**
	Total (SRR1+SRR2+SRR-K +SRR3+ MLCP)	**1,89,702.8**

Source: Intel

Space distribution under different facilities for the existing SRR1 & 2 and SRR-K buildings, FCTP Project, under construction SRR-3 Project and proposed MLCP project is given in ***Table 1.2.***

Table 1.2 Space Distribution Details for the SRR campus

S.N	Parameter	Combined Project SRR1+SRR2+SRR-K+ SRR-3 and MLCP)
1	Site Area, Ha (acres)	17.28 (42.7)
2	Total Floors	G+2; G+2; G+1; G+9; (-1, G+4+Terrace)
3	Permissible ground coverage	47.5%
4	Permissible F.A.R.	3.05
	FAR achieved	1.08
5	Area under Roads	3.1092
6	Office Space, Cafeteria, Lab- Space and Data Centre Built-up area, m^2	**1,89,702.8** m^2
7	SRR1 & 2 Central Utility Building (CUB), m^2	12,403
8	SRR-3 Utility Building	2,301

1.2.3 *Existing Storage Areas*

No additional storage area is proposed as part of proposed MLCP Project. Details of storage area existing at SRR-1, SRR-2 and SRR-K buildings, FCTP Project and SRR-3 building under construction is given below in **Table 1.3.**

Table 1.3 Storage area Existing

S. N	Material	Area meant for Storage (m^2)			
		SRR-1&2 Buildings	**SRR -3 Building under construction**	**SRR-K**	**FCTP**
1	HSD for Diesel Generators	360.00	120.00	0	0
2	LPG Gas cylinder for cafeteria	1.50	166.00	37.99	0
3	Office material such as Printing Material, cartridge, stationery	0.92	11.00	0	0
4	Food Material for cafeteria	30.50	51.00	21.95	0
5	Operation and Maintenance chemicals for STP	133.00	215.00	0	0
6	Rubbish and recycling Material	92.90	19.00	27.98	0
7	CNG storage	0	0	0	188.00
8	RO water tank	0	0	0	60.00
10	**Total**	**904.84**	**582.00**	**95.95**	**148**
					1730.79

Source: Intel

Figure 1.6 Layout Plan of Existing SRR-1, SRR-2, SRR-K, Under Construction SRR-3 and Proposed MLCP Project

Source: Intel

Figure 1.7 Master Layout Plan of the Proposed MLCP Project

Source: Intel

1.2.4 Water Consumption

Proposed MLCP Project

Average water consumption for the proposed MLCP Project during construction phase of will be average 35 m^3/day. The breakup of water requirement during construction phase for the proposed MLCP Project is given in ***Table 1.4***

Table 1.4 Daily Water Requirement – MLCP Construction Phase

S.N	Water Requirement	Proposed MLCP Project	
		Average Quantity (m^3/day)	**Peak Quantity (m3/day)**
1.	Construction	8	12
2.	Human Consumption	27	54
	Total	35	66

Water requirement for the construction activities will be met through treated water from the existing STP for construction and BWSSB supply for drinking.

Operation Phase

Proposed MLCP Project

Water fresh water requirement for proposed MLCP project during operation phase is estimated around 0.9 m^3/ day[1] considering 20 number of additional security personal to be deployed at MLCP site. This will be met through existing water supply by Bangalore Water Supply and Sewerage Board (BWSSB).

SRR-1, SRR-2, SRR-3, SRR-K Buildings and FCTP

Total fresh water consumption of existing SRR-1 & SRR-2 Buildings is 175 m^3/day, SRR-K building is 20 m^3/day and very minor requirement of 0.08 m^3/day for FCTP, which is being met through existing water supply by Bangalore Water Supply and Sewerage Board (BWSSB).

Fresh water requirement for the SRR-3 Building under construction will be 210 m^3/day, to be met through water supply from BWSSB, rainwater harvesting (during monsoon) and reuse of treated wastewater. Intel has got an approval for supply of 705.6 m^3 of water from BWSSB (refer to ***Annex D of Form 1***). The breakup of daily water requirement for SRR Campus is shown in ***Table*** 1.5.

[1] Additional water requirement for drivers accompanying Intel staff for the future expansion (SRR-4) Project will be considered during the Project planning and hence not considered here. All the assumptions that the existing requirement of water current capacity has been already considered in the previous respective applications.

Table 1.5 Daily Water Requirement during Operation Phase for Existing SRR Buildings

S. N	Area	Water Requirement (m^3/day)		
		Total Water Requirement	Reuse of Treated Water from SRR 1& 2 & SRR-3 STP's	Net freshwater Requirement
A	**SRR-1 & SRR-2 Buildings**			
1	Domestic	88	0	88
2	HVAC	87	0	87
3	Gardening	80	80	0
B	**SRR-3 Building under construction**			
4	Domestic	130*	0	130
5	HVAC	80	0	80
6	Landscaping	107*	107	0
C	**SRR-K Building**			
7	Domestic	20	0	20
8	Gardening	9	9	0
D	**FCTP**			
9	Reverse Osmosis (RO) Unit	0.08	0	0.08
E	**MLCP**			
10	Domestic	0.9		0.9
11	Gardening	0.5	0.5	0
	Total	**602.48**	**196. 5**	**405.98**

With the MLCP Project requirement of 0.9 m^3/day, the total fresh water requirement for the SRR campus of 405.98 m^3/day, which will continue to be met through already approved water supply from BWSSB, rainwater harvesting (during monsoon) and reuse of treated wastewater. Intel has got an approval for supply of 705.6 m^3 of water from BWSSB (refer to ***Annex D of Form 1***).

Of the total water requirement, ~33% will be met by reusing treated sewage for landscape and greenbelt development. Also refer to ***Figures 2.1 & 2.2*** in ***Section 2*** for water balances of the SRR Campus during non-rainy and rainy seasons.

1.2.5 Power Requirement

Construction Phase

The power requirement during construction phase will be for operation of construction equipment, lightening of working areas and is estimated to be peak of 1000 kVA and normal of 600 kVA, to be sourced from Bangalore Electricity Supply Company Limited (BESCOM). Emergency power backup arrangement will be maintained through four diesel generators of 50 kVA capacity each.

Approximately 40 litres/hour of diesel will be required for operation of diesel generators for construction activities. Approximately 1 m^3 of high speed diesel will be stored at the construction site in 5 x 200 liters MS drums.

SRR Campus

The power demand and supply for SRR Campus is described in ***Table 1.8***.

Table 1.6 Power Requirement during Operation Phase for SRR Campus

SN	Power Source	Units	SRR-1 & SRR-2 Buildings	SRR-3 Building under construction	SRR-K Building	FCTP	Proposed MLCP Project	Combined (SRR1+SRR2+SRR3+SRR-K+ FCTP +MLCP)
A	**BESCOM**							
1	Contract demand	KVA	5,500	0	0	0	00	5,500
2	Power Demand	KVA	2700	2000	430	0	290	5,420
B	**Onsite Power Generation**							
B	On site generation/ alternate supply source	KWH	500 installed solar power	600 planned solar power for Q-4 2016 upon commissioning	-	2,500 (through natural gas based fuel cells)	-	3,680
C	**Transformer capacity**	KVA	6,000	12,000	0	0	0	18,000
D	**Diesel Generators**							
1	Back up through Diesel Generators	KVA	9,000 1500x6	8000 2000x4	0	0	0	17,000
2	Diesel consumption to run back up DG sets	Litres/ hour per DG set	270 (135# post FCTP Project)	360	0	0		-
3	Onsite Diesel Storage	m^3	45 m^3 (15 m^3x 3 AST)	60 m^3 (20 m3 x 3 AST)	0	0	0	100

Note: Power supply to SRR-K is through BESCOM supply of existing main LT panel & MSB located in CUB building of SRR 2. The power tapped from SRR-2 will provide both BESCOM / DG power to the kitchen. Hence no provision for Transformer is envisaged; SB = Standby

1.2.6 Road Connectivity

The SRR Campus is bounded by existing 45m wide outer ring road on the North.

1.2.7 Traffic and Parking Arrangement

Existing & Proposed Parking

Parking facilities provided for existing SRR1 & 2 and the under construction SRR-3 are provided in ***Table 1.8***.

Table 1.7 Parking Details existing SRR1&2, SRR-3 and SRR-K Buildings and the Proposed SRR-3 Project

SN	Parking Provisions	SRR-1 & 2, Buildings	SRR-K Building	SRR-3, Building under construction	Proposed FCTP Project #	MLCP	Combined Traffic SRR1+SRR2+SRR3 + future expansion, nos.	Combined PCU Eq. (SRR1+ SRR2+SRR3), nos.
1	Cars Parking	372* (410 current utilisation)	0	77	None	2874	3323	3323
2	2-W Parking	655	0	578	None		1,233	617

Note*50 Car parking space will be used for placing Bloomenergy servers; # Project will be remotely operated and no manpower is required on site for O&M.
* Intel will be utilizing 150 car park spaces for 578 two wheeler parking spaces

MLCP

Due to proposed MLCP project, no additional traffic is anticipated, as the proposed MLCP project is a Multi-level car parking for the existing operational, under construction SRR campus and no change in traffic is anticipated. However, the vehicular movement plan of the existing arrangement will be changed with the proposed MLCP Project; the main entry is proposed through west gate and exit through north gate. Refer ***Figure 1.8*** for proposed vehicle movement plan of the Project.

Existing SRR campus

For employee vehicles, the primary entry/exit is planned from the existing north east gate present to the north of the site. A secondary entry/exit existing to the North West side of the site will continue to be utilized for service vehicles and pedestrian movement. Intel will ensure that in the morning hour's entry of vehicles is maintained through two gates and exit through one gate while in the evening hours exit is maintained through two gates and entry through one gate.

Figure 1.8 Vehicular Movement Plan

1.3 WHAT ARE THE LIKELY IMPACTS OF THE PROPOSED ACTIVITY ON THE EXISTING FACILITIES ADJACENT TO THE PROPOSED SITE? (SUCH AS OPEN SPACES, COMMUNITY FACILITIES, DETAILS OF THE EXISTING LANDUSE, DISTURBANCE TO THE LOCAL ECOLOGY).

1.3.1 Impact on Existing Facilities

The proposed MLCP expansion Project will be located within to the existing SRR-1 & SRR-2 buildings of Intel SRR campus in already allotted KIADB land. The landuse of the site will remain unchanged as the area has been classified as Industrial High Tech Zone as per the revised Bengaluru Master Plan 2015 of Bangalore Development Authority. The proposed MLCP expansion Project is being developed in KIADB allocated land.

The SRR campus is bounded by existing 45 m wide outer ring road on northern boundary and 12 m wide road along its eastern boundary (no public access). Other buildings operating adjoining the Project site include Honeywell India towards east, Novotel IBIS Hotel towards North, LSI Technologies towards west and Adarsh Palm retreat (under construction) on south.

1.3.2 Impact on Landuse

The proposed MLCP Project is an integral part of SRR campus, hence will not result in any change of landuse of the area.

The SRR Campus and surrounding area is situated in KIADB, Karnataka allotted land. The landuse of the area is categorized as Industrial High Tech Zone as per the revised Bengaluru Master Plan 2015 of Bangalore Development Authority. The master plan of the District is shown in ***Figure 1.9.*** SRR Campus has been set up within Industrial high Tech Zone as per revised Master Plan 2015.

Figure 1.9 Revised Master Plan Bangalore 2015

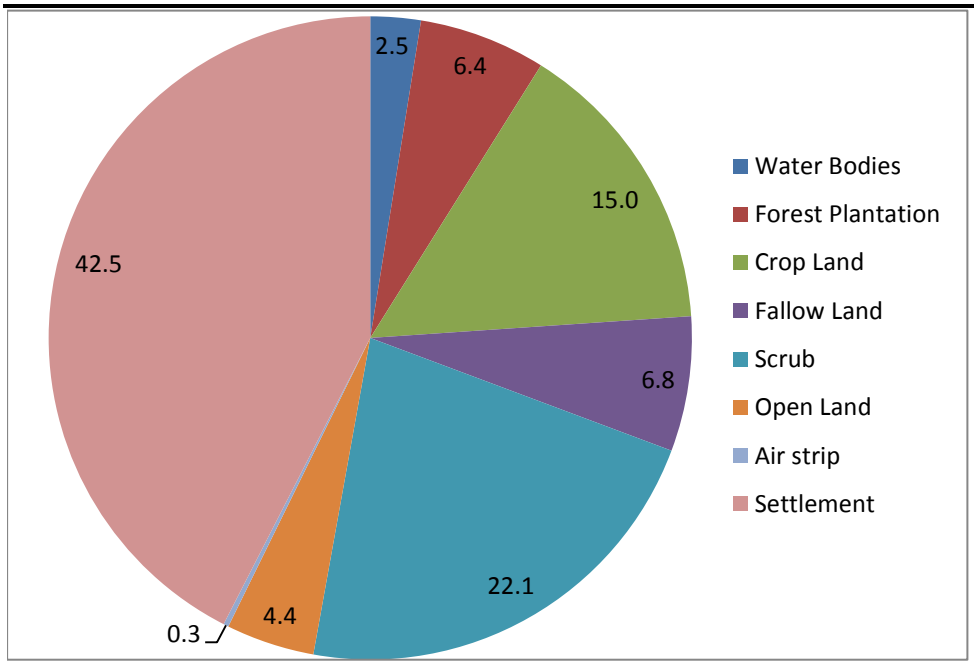
Based on satellite imagery, the landuse classification of area of 10 km, 5km and 2 km radius from the Intel SRR campus is given in ***Table 1.8*** and depicted in ***Figure 1.10.***

Table 1.8 Landuse in the 10 km study area

Land Use	Area (sq. km) within 10 km	Area (sq. km) within 5 km	Area (sq. km) within 2 km
Water	7.94	2.40	0.96
Forest Plantation	20.05	5.05	0.35
Crop Land	47.18	11.00	1.09
Fallow Land	21.30	4.25	0.43
Scrub	69.55	23.32	3.23
Open Land	13.96	5.37	0.72
Air strip	0.82	0.82	0.00
Settlement	133.42	26.58	5.91
Total	**314.21**	**78.80**	**12.70**

Source: Interpretations of Satellite Imagery of the Area

Figure 1.10 Percentage Distribution of Landuse within 10 km Study Area



It can be seen from the above figure that the predominant land use in the study area is human settlement. The landuse map of the site and surrounding area of radius 10 km, from the Proposed SRR-3 Project site are shown in **Figure 1.11**.

Figure 1.11 Landuse Plan of 10 km Study Area

1.3.3 Impact on Ecology

The proposed MLCP Project site comprises of landscape cum open surface parking with trees. Dominant tree species present at the site includes *Bauhinia Variegata Tabebuia impetiginosa, Roystonea, Tamarindus indica, Albizia saman, Calliandra, Ficus elastic, Millettia pinnata, Tabubia chrisotricha.* A total of 148 individuals of 9 species of tree forms of > 30 cm girth at breast height (GBH) were recorded *and* a total of 58 individuals of 5 species of tree forms of < 30 cm girth at breast height (GBH) were recorded.

The construction activities will result in loss of vegetation primarily grasses with potential loss of topsoil to some extent in the Project area, thereby resulting in impacts on existing land and ecology. The development of MLCP Project is expected to result in removal of approximately 148 individuals of trees forms of >30 GBH and 58 individual of <30 cm GBH with the prior approval from Department of Forests, Karnataka. Efforts will be made to retain as much of the existing trees as possible.

The existing landscaped area within existing SRR 1 and 2 and SRR-K buildings in SRR Campus is 31,840 m² (31.85%) and with the under construction SRR-3 and proposed MLCP Project, the total landscape area would be 63,469 m² (37.19%) of total area.

1.4 WILL THERE BE ANY SIGNIFICANT LAND DISTURBANCE RESULTING IN EROSION, SUBSIDENCE & INSTABILITY? (DETAILS OF SOIL TYPE, SLOPE ANALYSIS, VULNERABILITY TO SUBSIDENCE, SEISMICITY ETC. MAY BE GIVEN).

1.4.1 Soil Types & Quality

As part of SRR-3 expansion Project during 2013, baseline study was conducted during summer season 2013. Soil samples were collected from six locations from the SRR Project site and surrounding area and analysed for the physical and chemical parameters. The details of the soil sampling locations are described in ***Table 1.9*** and method of soil sample analysis provided in ***Table 1.10.*** Soil sampling locations are shown in ***Figure 1.12.***

For the proposed expansion EIA study, soil sample at proposed project site and surrounding area at the same locations was collected during May 2016 and the result will be included in EIA report.

Table 1.9 Details of Soil Sampling Locations

S.N	Sampling Location	Code	Geographical Location	Distance and Direction from project site	Land use
1	SRR3 Project Site	SQ1	12°55'25.09"N 77°41'4.19"E	Within Project site	Open Land

S.N	Sampling Location	Code	Geographical Location	Distance and Direction from project site	Land use
2	Kadubeesanahall	SQ5	12°55'51.12"N 77°41'11.88"E	0.89, NNE	Open land
3	Doddakanahalli	SQ3	12°54'23.86"N 77°41'42.11"E	2.08. SE	Open Land
4	Bellandur	SQ4	77°41'11.88"E 77°40'44.18"E	0.65, W	Agriculture land
5	Devarabeesanahalli	SQ2	12°56'20.10"N 77°41'51.66"E	2.29, NE	Built-up area
6	Adarsh Palm Retreat	SQ6	12°55'26.43"N 77°41'17.37"E	0.35, E	Open land

Soil sampling locations were chosen based on a reconnaissance survey of the area and prevailing activities within the 10 km study area. Samples were collected by hand sampling augurs from surface region. All the soil samples were taken at depth of 30 cm (sub surface) from the upper surface. Samples were homogenised before testing. The samples were packed in dependable, waterproof containers and analysed as per ASTM, USEPA, IS-2270, M.L. Jackson (Soil Chemical Analysis). A brief methodology of each parameter is as given as ***Table 1.10***. The sampled soil quality results are presented in ***Table 1.11*** *a*nd are described in the further subsections.

Table 1.10 Method for Soil Analysis

S.N	Parameters	Methodology
1.	Texture	IS:2720 (Part -4)
2.	Sand, %	IS:2720 (Part -4)
3.	Silt, %	IS:2720 (Part -4)
4.	Clay, %	IS:2720 (Part -4)
5.	pH	AOAC-994.18
6.	% Moisture	IS:2720(P-)
7.	Total Alkalinity	APHA 2320 B
8.	Acidity	APHA 2310 B
9.	Specific Gravity	M.L. Jackson
10.	Conductivity,	APHA -2510 (B), IS 14767 (2000)
11.	SAR	By calculation of Na, Ca, & Mg
12.	Permeability,	M.L. Jackson Method
13.	Nitrogen	APHA 4500 N
14.	Phosphorous	AFLPL/SOP/WI/ENV/W-35
15.	Chloride	APHA 4500 Cl (B)
16.	Sulphate	M.L. Jackson
17.	Carbonate	M.L. Jackson
18.	Nitrite	AFLPL/SOP/WI/ENV/W-36
19.	Nitrate	AFLPL/SOP/WI/ENV/W-36
20.	Phosphate	APHA 4500 P(C) Vandamolybdophosphoric Acid Calorimetric Method
21.	Fluoride	APHA 4500 – F_ (D) Calorimetric
22.	Water holding capacity, %	AOAC 969.05
23.	Porosity, %	M.L.Jackson Method
24.	Bulk density, g/cm3	M.L.Jackson Method
25.	Cation Exchange Capacity	IS:2720 (P-24)
26.	Mercury	USEPA 3050 (AAS -VGA)

S.N	Parameters	Methodology
27.	Boron	M.L.Jackson Method
28.	Manganese	USEPA 3050 B (AAS- Flame)
29.	Barium	
30.	Lead	
31.	Nickel	
32.	Zinc	
33.	Copper	
34.	Cadmium	
35.	Chromium	
36.	Iron	
37.	Na	
38.	K	
39.	Ca	
40.	Mg	

Source: Baseline Monitoring Report by Avon Food Lab

Figure 1.12 Map Showing Soil Sampling Locations within the study Area

Table 1.11 Soil Quality in the Study Area

Location	Parameters	Unit	SQ-1	SQ-2	SQ-3	SQ-4	SQ-5	SQ-6
S. N.			SRR Project Site	Kadubeesanahalli	Doddakanahalli	Bellandur	Devarabeesanahalli	Adarsh Palm Layout
1	Particle Size Distribution							
	Sand	%	72.4	76.79	72	83.33	85.5	85.17
	Silt	%	12.4	5.42	8.71	4.25	4.28	4.91
	Clay	%	15.2	17.79	19.29	12.42	10.22	9.92
2	Texture	%	Sandy loam	Sandy loam	Sandy loam	Loamy Sand	Loamy Sand	Loamy Sand
3	pH		7.31	6.82	7.08	7.29	6.93	7.25
4	Moisture	%	2.9	4.17	1.3	13.4	1.8	10.4
5	Total Alkalinity	mg/kg	30	25	36	38	42	40
6	Acidity	mg/kg	17.00	15	16	24	19	23
7	Specific Gravity	-	2.39	2.42	3.15	2.2	2.15	2.38
8	Bulk Density	g/cm^3	1.45	1.2	1.49	1.13	1.38	1.28
9	Porosity	%	15	15	10	6	10	12
10	Permeability	cm/hr	6.2	7.5	7.9	8.8	8.6	6.5
11	Nitrogen	mg/kg	2.4	1.93	1.6	1.7	1.21	2.1
12	Phosphorus	%	1.22	1.06	1.25	0.98	1.21	1.03
13	Potassium	mg/100g	82.21	62.56	33.3	43.77	607.39	71.42
14	Calcium	mg/100g	33.29	40.16	44.45	38.90	40.24	35.23
15	Magnesium	mg/100g	13.45	8.27	16.37	8.96	10.42	14.3
16	Chloride	%	1.15	0.47	0.33	0.62	0.52	0.6
17	Sulphate	%	1.80	1.30	2.98	2.13	1.06	1.22
18	Carbonate	mg/100g	91.77	85.90	117.58	87.00	92.73	97.30
19	Sodium	mg/kg	80.34	105.58	128.57	109.70	103.00	123.70
20	Electrical Conductivity	µS/Sec	49.00	27.90	52.40	45.20	92.60	34.40
21	Cation Exchange Capacity	meq %	0.42	0.39	0.53	0.48	0.63	0.57
22	SAR		0.936	1.25	1.32	1.30	1.18	1.40
23	Nitrates	mg/kg	1.00	1.10	0.92	0.89	0.73	1.20
24	Nitrites	mg/kg	0.60	0.70	0.53	0.63	0.29	0.65
25	Fluoride	mg/kg	BDL	BDL	BDL	BDL	BDL	BDL
26	Phosphates	mg/100 g	2.50	2.30	3.10	1.50	1.80	2.20
27	Water Holding Capacity	%	27.00	33.10	20.00	30.70	26.89	34.60
28	Iron	mg/kg	5.08	11.50	7.46	12.85	13.95	9.84
29	Copper	mg/kg	2.38	1.32	ND	1.58	1.15	1.40
30	Zinc	mg/kg	1.17	3.21	2.39	8.72	1.25	1.60
31	Boron	mg/kg	BDL	BDL	BDL	BDL	BDL	BDL
32	Lead	mg/kg	6.36	4.23	9.24	9.52	3.05	3.29
33	Manganese	mg/kg	2.29	9.67	5.14	9.85	4.10	9.20
34	Nickel	mg/kg	2.38	3.81	2.54	1.66	2.81	3.87
35	Cadmium	mg/kg	BDL	0.03	0.06	0.10	0.04	0.02
36	Chromium	mg/kg	3.64	BDL	3.17	0.67	2.81	ND

Location	Parameters	Unit	SQ-1	SQ-2	SQ-3	SQ-4	SQ-5	SQ-6
37	Mercury	mg/kg	BDL	BDL	BDL	BDL	BDL	BDL
38	Barium	mg/kg	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL = Below Detection Limit, Detection Limit of Mercury (as Hg)= 0.02 mg/kg, Detection Limit of Barium (as Ba) =1 mg/kg), Detection Limit of Boron (as B) =0.2 mg/kg, Detection limit for Fluoride (as F) =0.5 mg/kg, Detection Limit for Cadmium (as Cd) = 0.2 mg/Kg and Detection Limit for Chromium (as Cr) =0.1 mg/kg.

Soil Type and Quality at SRR site

Soil texture at the SRR site was observed as sandy loam. pH of the soil was observed to be 7.31 while sodium absorption ratio (SAR) was observed as 1.06. The water holding capacity of soil was observed as 27% while porosity was observed as 15%. The concentration of metals in the soil was observed as 5.08 mg/kg for Iron, 6.36 mg/kg for Lead, 2.29 mg/kg for Manganese, 2.38 mg/kg for Nickel, 1.17 mg/kg for Zinc, 2.38 mg/kg for Copper, 3.64 mg/kg for chromium and BDL for Barium, Boron, Fluoride, Cadmium and Mercury.

Currently, in India, there are no specific concentration based soil contamination standards. In absence of any existing standards, to assess for safe heavy metals contents, Dutch standards have been considered for the purpose of interpretation of soil quality with respect to heavy metals analysis. The observed values for metals namely Zinc, Lead, Cadmium, Copper and Mercury (inorganic) have been observed to be much below the soil remediation intervention values specified in Soil Remediation Circular 2009 as presented in ***Table 1.12.***

Table 1.12 Soil Remediation Intervention Values as per Dutch Standards

Parameter	Intervention Values (mg/kg dry matter)
Zinc	720
Arsenic	76
Lead	530
Cadmium	13
Copper	190
Mercury (inorganic)	36
Nickel	100

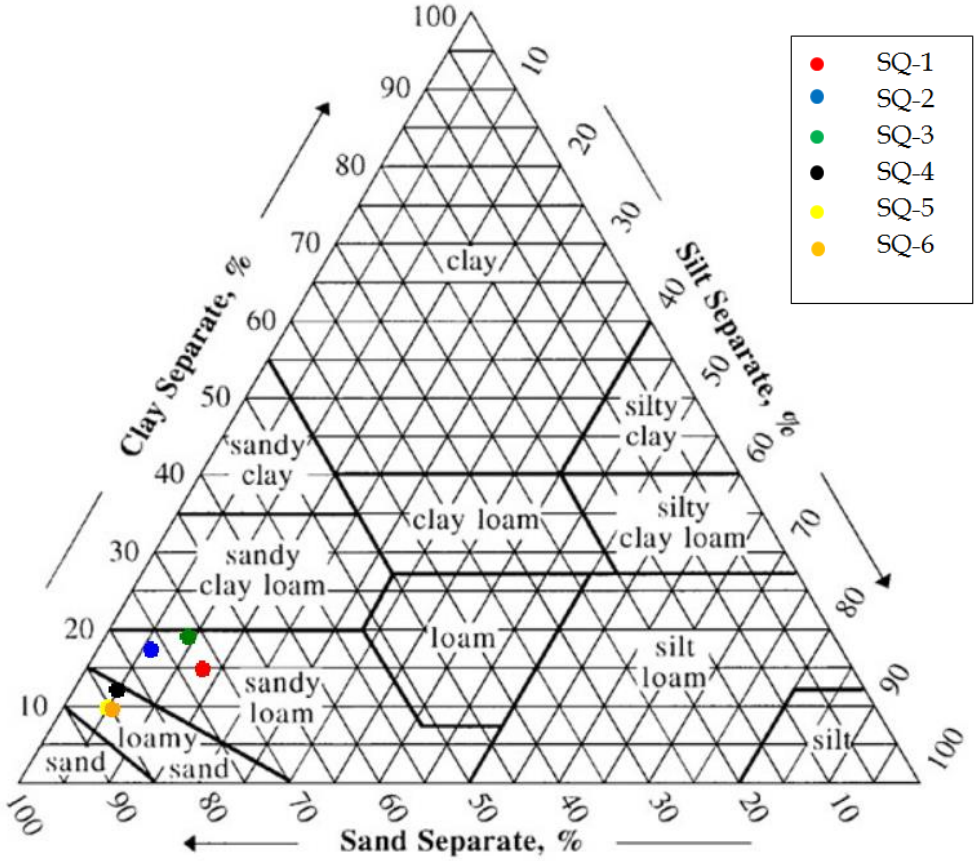
Source: Soil Remediation Circular 2009, Minister of Housing, Spatial Planning and Environment, Netherlands.
Note: Concentrations are shown for standard soil (10% organic matter and 25% clay)

Soil Quality in the Study Area

Soil Texture Classification

The soil texture for the study area surrounding the SRR Project site was observed to be Sandy Loam and Loamy sand. The sand percentage in most samples was above 60% and silt percentage varied from 21% to 27%. The soil texture classification for the six soil samples is depicted in ***Figure 1.13***

Figure 1.13 Soil Texture Classification



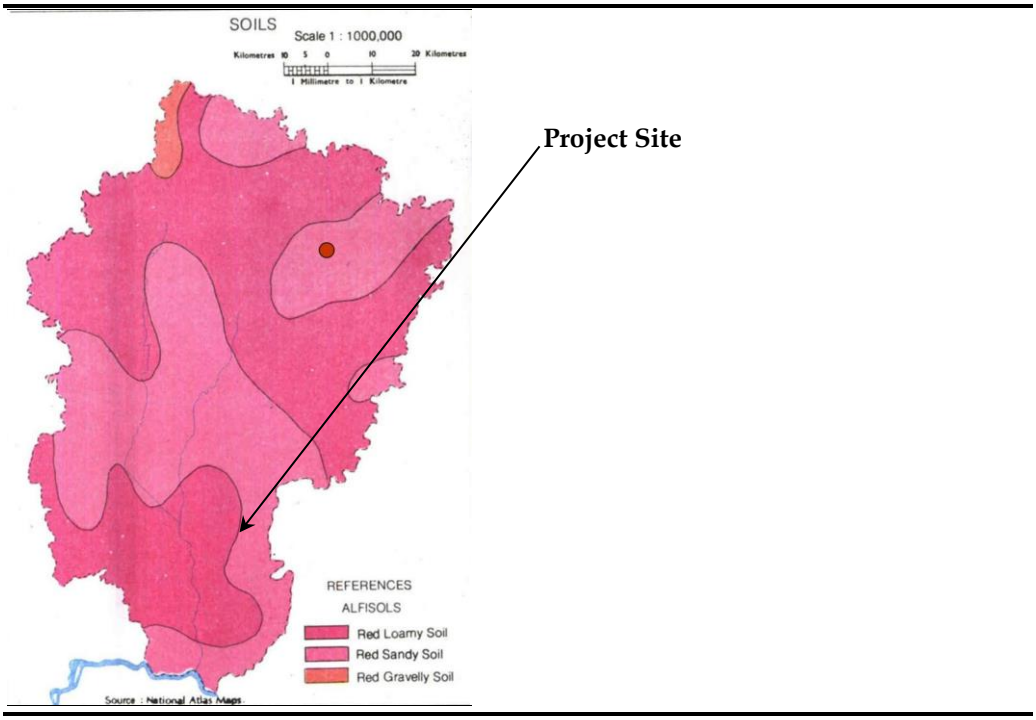
The pH of the samples varied from 6.82 to 7.31. The pH of samples collected from all the site except at Project site were neutral, whereas the soil sample at Project site was analysed to be slightly alkaline as per the standard soil classification as given in ***Table 1.13.***

Table 1.13 Standard Soil Classification

pH	Classification	Sample
<4.5	Extremely acidic	-
4.51- 5.00	Very strong acidic	-
5.01- 5.50	Strongly acidic	-
5.51- 6.00	Moderately acidic	
6.01- 6.50	Slightly acidic	
6.51- 7.30	Neutral	Kadubeesanahalli, Doddakanahalli, Bellandur, Deverabeesanahalli and Adarsh Palm Layout.
7.31- 7.80	Slightly alkaline	SRR3 Project Site
7.81- 8.50	Moderately alkaline	-
8.51- 9.00	Strongly alkaline	-
> 9.00	Very strongly alkaline	-

Based on District Planning Series of 1997, Bangalore, the agricultural capability of soil of the study area is classified as red sandy soil. ***Figure 1.14*** shows the soil map of the area.

Figure 1.14 Soil Map



Source: District Planning Series, Bangalore, published by Survey of India, 1997

1.4.2 Soil Erosion, Subsidence, Instability and Vulnerability

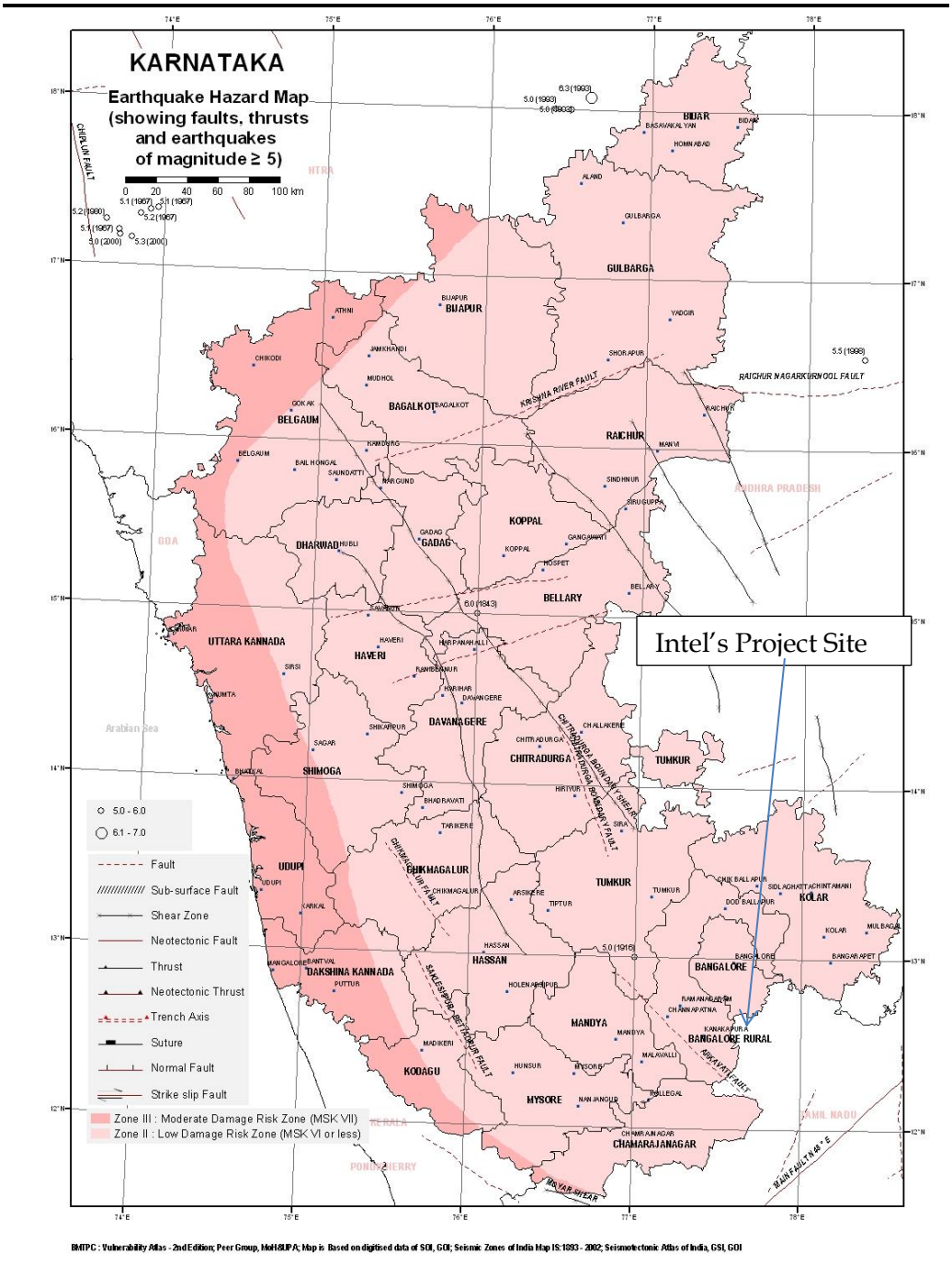
The proposed expansion project construction activities will result in loss of vegetation which along with digging and excavations in the Project area would make the land susceptible to erosion during rainy season. The top soil removed will be disposed to nearby construction sites through the contractor. The project would involve compaction of soil due to construction activities and landscaping towards the later part which would reduce the chance of erosion and subsidence.

1.4.3 Seismo- Tectonic Appraisal of the Area

The SRR Campus area is located in Seismic Zone II, Low Damage Risk Zone and having probability of earthquake with intensity MSK VI or less as per earthquake hazard map prepared by Building Materials and Technology Promotion Council of Government of India (BMTPC) as shown in ***Figure 1.15***.

The building design of the Project will be in accordance to IS 1893: 2002 (Part 1) and IS 13920: 1993 to counter potential hazards due to earthquake. There will be low potential impact on land disturbance due to earthquake.

Figure 1.15 Earthquake Hazard Map of India

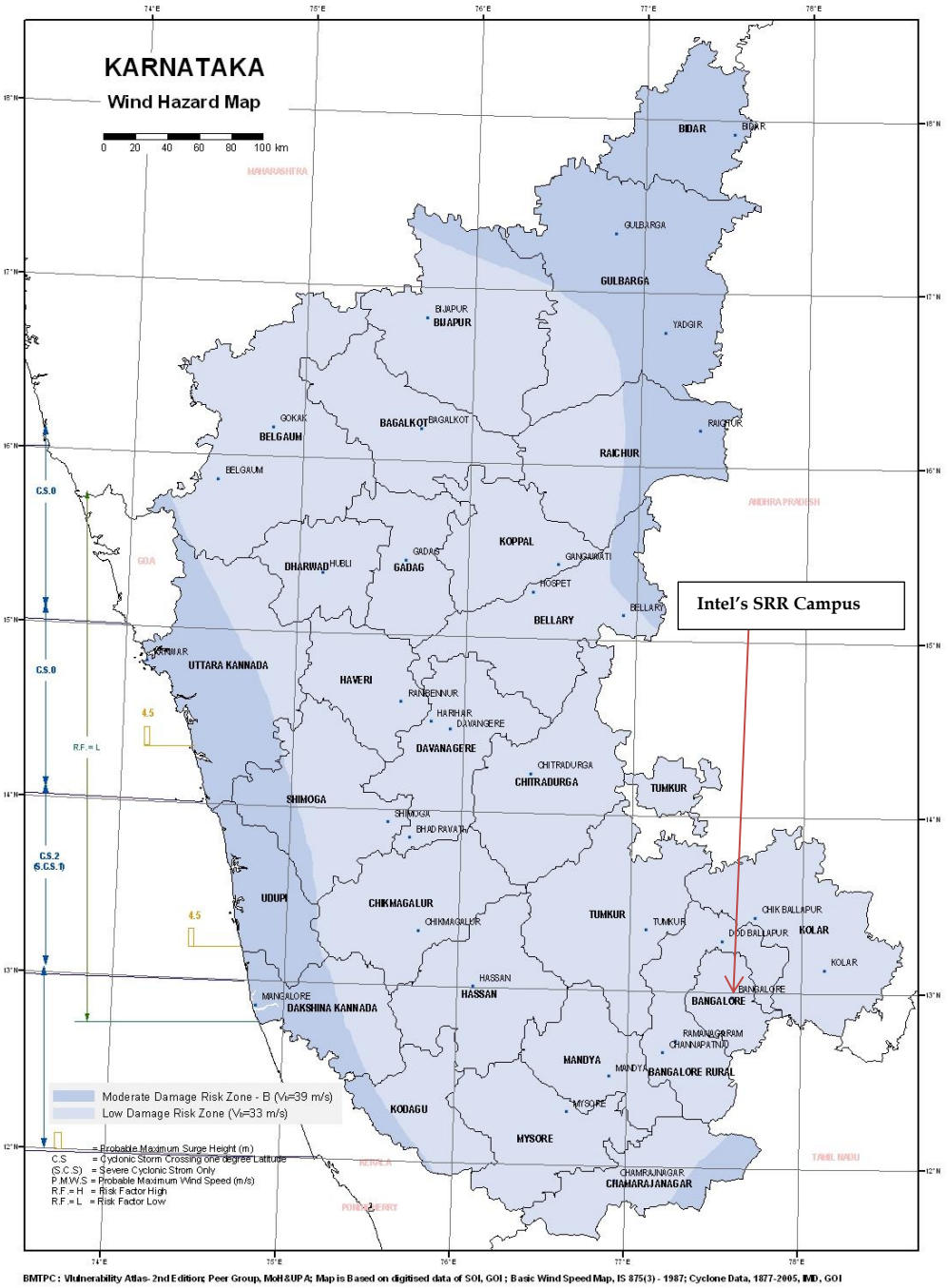


BMTPC : Vulnerability Atlas - 2nd Edition; Peer Group, MoHSUPA; Map is Based on digitised data of SOI, GOI; Seismic Zones of India Map IS:1893 - 2002; Seismotectonic Atlas of India, GSI, GOI

Source: BMTPC

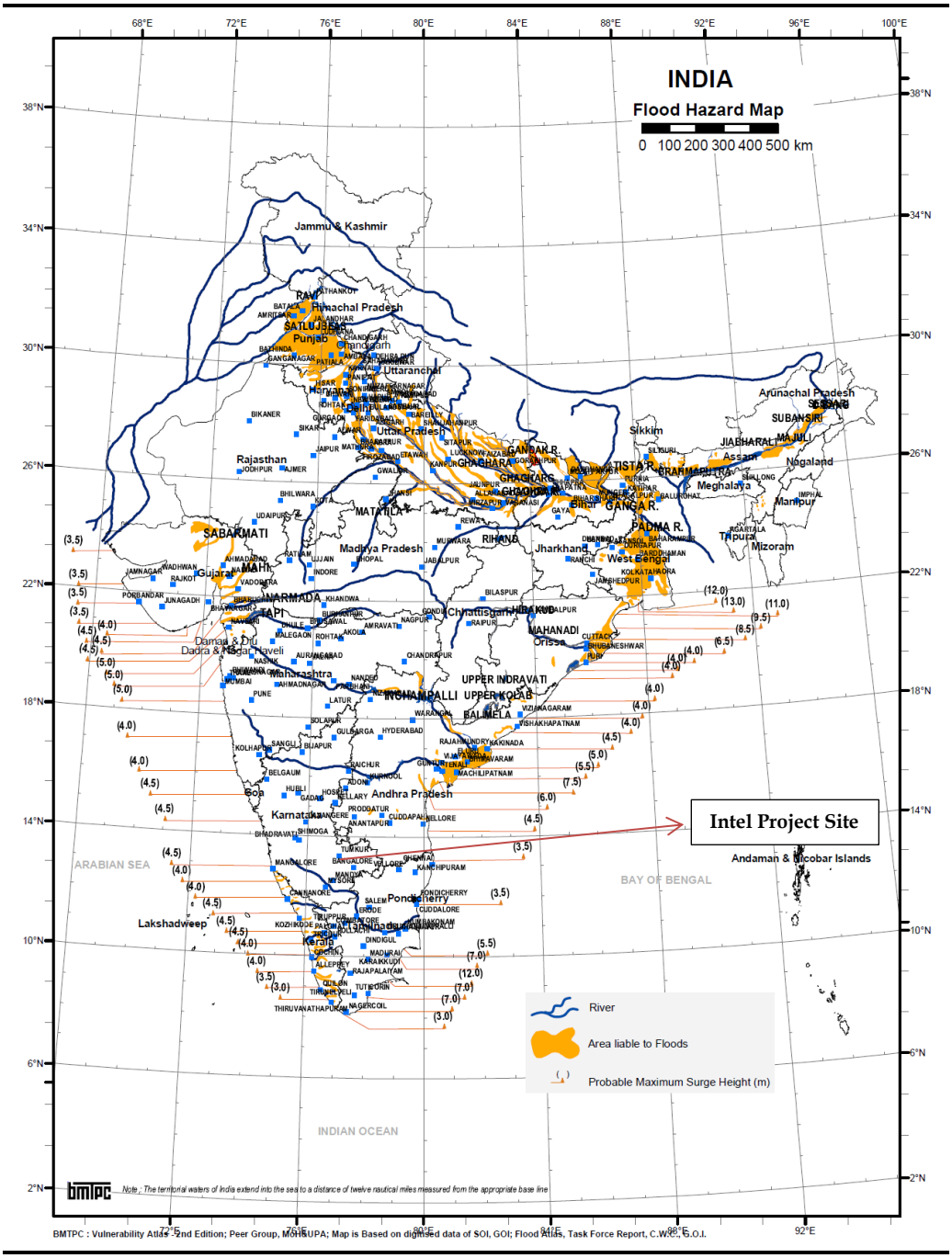
As per wind and cyclone hazard map and Flood hazard map prepared by BMTPC the SRR campus is located in Low Damage Risk Zone (Vb=33 m/s) for cyclones and the site is not liable to floods as shown in ***Figure 1.16*** and ***Figure 1.17.***

Figure 1.16 Wind Hazard Map of India



Source: Map developed by BMTPC

Figure 1.17 Flood Hazard Map of India



Source: Map developed by BMTPC

1.5 WILL THE PROPOSAL INVOLVE ALTERATION OF NATURAL DRAINAGE SYSTEMS? (GIVE DETAILS ON A CONTOUR MAP SHOWING THE NATURAL DRAINAGE NEAR THE PROPOSED PROJECT SITE)

1.5.1 Topography and Drainage Pattern

The topography of the SRR campus is fairly levelled land with elevation difference of ~3 m across SRR campus (821m -824m). Drainage patterns of the study area of 10 km, and 5km radii from the SRR Project site are presented in

Figure 1.18 and ***Figure 1.19*** respectively.

The Conceptual Master Plan has been prepared for the SRR Project site which follows the existing drainage pattern of the study area. Existing drain onsite will be retained as such.

Figure 1.18 Drainage Pattern of the 10 km Study Area

Figure 1.19 Drainage Pattern of the 5 km Study Area

1.6 *WHAT ARE THE QUANTITIES OF EARTHWORK INVOLVED IN THE CONSTRUCTION ACTIVITY-CUTTING, FILLING, RECLAMATION ETC. (GIVE DETAILS OF THE QUANTITIES OF EARTHWORK INVOLVED, TRANSPORT OF FILL MATERIALS FROM OUTSIDE THE SITE ETC.)*

Total earth work involved for establishment of MLCB Building is estimated to be ~85,000 m^3. Excavated earth will be sold to other construction site or disposed the through authorised landfill site.

Major construction materials required for the proposed MLCP Project is provided in **Table 1.14.**

Table 1.14 Details of Construction Raw Materials

S.N	Material	Unit	Propose d MLCP	Sources
1	Soil	m^3	65000	Govt. Approved local borrow areas/other construction sites
2	Aggregates (sand in concrete)	m^3	22500	Govt. Approved local supplier
3	Aggregates (stone in concrete)	m^3	45000	Govt. Approved local quarry
4	Cement	tonnes	8800	Local suppliers
5	Re-bar steel	tonnes	1800	Local suppliers
6	Structural Steel	tonnes	5500	Suppliers in Karnataka

Source: Intel

Common construction materials like aggregate, cement, sand and structural steel shall be sourced from Bengaluru and neighbouring areas.

The construction material required for the construction of proposed Project will be transported from the source to Project site by road transportation. During construction phase, there will be deployment of 10 to 20 dumpers/trucks (HMVs) and 20-30 tempos (MMVs) for transport of construction material and other related materials

1.7 *GIVE DETAILS REGARDING WATER SUPPLY, WASTE HANDLING ETC. DURING THE CONSTRUCTION PERIOD.*

1.7.1 *Water requirement during construction phase*

Water requirement during construction phase will be 35 m^3/day. Construction water requirement will be met through use of treated wastewater from STP of existing SRR 1 & 2 buildings and domestic water requirement will be met through BWSSB supply. The water required for domestic use during construction phase will be stored at the campsite in temporary storage tanks. Breakup of water requirement during construction phase is given in ***Table 1.15.***

Table 1.15 Water Requirement - Construction Phase

S.N	Water Requirement	Proposed MLCP Project	
		Average Quantity (m^3/day)	Peak Quantity (m3/day)
1.	Construction	8	12
2.	Human Consumption	27	54
	Total	35	66

Source: Intel

1.7.2 Waste Handling during Construction Period

The expected solid waste during construction phase will include construction debris, scrap metal, packaging waste, domestic solid waste and hazardous waste. The type and quantities of the solid waste generation during construction phase is detailed in ***Table 1.16***.

Table 1.16 Details of Solid Waste Generation and Handling

S.N	Waste	Estimated Quantity *	Method of Disposal
1	Construction Debris	50 TPA (4.16 (TPM)	The recyclable waste materials such as metal scrap, plastics will be sold out to vendors and remaining waste will be disposed at KSPCB approved sites
2	Domestic Solid Waste	43 TPA (3.6 TPM)	The waste will be segregated into biodegradable and non-biodegradable waste and will be disposed offsite through vendors.
3	Packaging Waste	3TPA (0.5 TPM)	To be sold to vendors

Note: * The quantity will be for the entire construction phase, TPA = tonnes per annum, TPM = tonnes per month.

Disposal arrangement for construction phase related wastes will be made to conform to Karnataka State Pollution Control Board norms.

Types and quantities of the hazardous waste generation during construction phase are given in ***Table 1.17***.

Table 1.17 Details of Hazardous Waste Generation and Handling

S.N	Waste	Estimated Quantity (per annum)	Method of Disposal
1	Waste/used oil	1 m^3	To be disposed to Authorised recycler
2	Oil soaked cotton waste	500 kg	To be stored in secured manner and handed over to authorised recycler

Source: Intel

A Waste Management Plan for Construction Phase will be for collection, storage and disposal arrangements to minimize potential adverse environmental impact of the wastes generated from the Project. An indicative waste tracking system has been included to maintain records of wastes likely to be generated from the Project site. Disposal arrangements for the construction phase related wastes will made to conform to KSPCB and Central Pollution Control Board (CPCB) norms.

1.8 WILL THE LOW LYING AREAS & WETLANDS GET ALTERED? (PROVIDE DETAILS OF HOW LOW LYING AND WETLANDS ARE GETTING MODIFIED FROM THE PROPOSED ACTIVITY)

The proposed MLCP Project site has elevation different of ~3 m across MLCP Project site. The highest point within the site is 824 m amsl towards Northeast of Project site and lowest point is 821 m towards Southwest of the MLCP Project site.

The proposed MLCP building will be located within the already allotted and fenced area of Intel's SRR campus. The SRR-1 & SRR-2 and SRR-K buildings are already operative and SRR-3 building is in the final stage of construction. MLCP Project with an area of 1.49 ha of is located to the North of SRR Campus. Prior to start of construction activities, adequate drainage will be provided to minimize potential impact during monsoon season and earthwork related activities will not be taken up during monsoon season. To minimize adverse impact of hindered water flow, Intel will implement the suggested mitigation measure in the EMP by maintaining natural drainage.

No alternation to surrounding area will be done due to proposed MLCP Project.

1.9 WHETHER CONSTRUCTION DEBRIS & WASTE DURING CONSTRUCTION CAUSE HEALTH HAZARD? (GIVE QUANTITIES OF VARIOUS TYPES OF WASTES GENERATED DURING CONSTRUCTION INCLUDING THE CONSTRUCTION LABOUR AND THE MEANS OF DISPOSAL)

The expected solid waste generation and disposal during construction is expected to be as per ***Table 1.16.***

The potential health hazard expected from construction debris includes fugitive dust generation. The proposed Project will ensure the following:

- Use of personal protective equipment including dust mask, hand gloves, safety goggles and helmet;
- Covering of loose construction waste by tarpaulin during transportation;
- Storage of construction debris in designated area onsite and shielded, and ;
- Construction debris to be kept in moist condition.

2 WATER ENVIRONMENT

2.1 GIVE THE TOTAL QUANTITY OF WATER REQUIREMENT FOR THE PROPOSED PROJECT WITH THE BREAKUP OF REQUIREMENTS FOR VARIOUS USES. HOW WILL THE WATER REQUIREMENT MET? STATE THE SOURCES & QUANTITIES AND FURNISH A WATER BALANCE STATEMENT.

Construction Phase

Water requirement for the proposed MLCP Project during construction phase will be xxxm^3/day. Construction water requirement will be met through use of treated wastewater from STP of existing SRR 1 & SRR-2 buildings and domestic water will be made available through BWSSB supply. The breakup of water requirement during construction phase for the proposed expansion project is given in *Table 2.1*.

Table 2.1 Daily Water Requirement- Construction Phase

S.N	Water Requirement	Proposed MLCP Project	
		Average Quantity (m^3/day)	Peak Quantity (m3/day)
1.	Construction	8	12
2.	Human Consumption	27	54
	Total	35	66

Source: Intel

Operation Phase

a) Proposed MLCP Project

Fresh water requirement for the MLCP will be 0.9 m^3/day, which will be met through existing BWSSB water supply. Intel is also committed to use rain harvested water collected predominantly during monsoon season and use of treated sewage in landscape and greenbelt development. The breakup of daily water requirement for operation phase is given in ***Table 2.5.***

Table 2.2 Daily Water Requirement during Operation Phase for MLCP Project

S.N	Area	Total Water Requirement (m^3/day)	Reuse of water from STP (m^3/day)	Net Fresh water Requirement (m^3/day)
1	Domestic	0.9	0	0.9
2	Gardening	0.5	0.5	0
Total		**1.4**	**0.5**	**0.9**

b) SRR Campus

b.1) Existing SRR-1 & 2 Buildings

Total fresh water consumption in existing SRR-1 & 2 buildings is 175m^3/day, which is being met through existing water supply by BWSSB. The breakup of

daily water requirement for operation phase is given in ***Table 2.3. Figures 2.1*** presents water balance of the existing SRR buildings.

Table 2.3 Daily Water Requirement during Operation Phase for existing SRR-1 & SRR-2 Buildings

S.N	Area	Water Requirement (m^3/day)		
		Total Water Requirement	Recycled water from STP	Net freshwater Requirement
1	Domestic	88*	0	88
2	Cooling	87	0	87
3	Landscaping	80*	80	0
	Total	**255**	**80**	**175**

Note:*12 m^3/day consumption loss and 3 m^3/day with loss in sludge.

b.2) SRR-K Building

Fresh water consumption in SRR-K building is approximately 20 m^3/day, which is being met through existing BWSSB water supply. Intel is also use rain harvested water collected predominantly during monsoon season and use of treated sewage in landscape and greenbelt development. The breakup of daily water requirement for operation phase is given in **Table 2.4.**

Table 2.4 Daily Water Requirement during Operation Phase for SRR-K Project

S.N	Area	Total Water Requirement (m^3/day)	Reuse of water from STP (m^3/day)	Net Fresh water Requirement (m^3/day)
1	Domestic	20*	0	20
2	Landscaping	9	9	0
Total		**29**	**9**	**20**

Note:*Consumption loss of 11 m^3/day in cooking in the Kitchen

Approximately 32.2% of the total water requirement for SRR –K Project is being reused in landscape and greenbelt development.

b.3) SRR-3 Building under Construction

Fresh water requirement for the SRR-3 Building (once operational) will be 430 m^3/day, which will be met through existing BWSSB water supply. Intel is also committed to use rain harvested water collected predominantly during monsoon season and use of treated sewage in landscape and greenbelt development. The breakup of daily water requirement for operation phase is given in ***Table 2.5.***

Table 2.5 Daily Water Requirement during Operation Phase for SRR-3 Project

S.N	Area	Total Water Requirement (m^3/day)	Reuse of water from STP (m^3/day)	Net Fresh water Requirement (m^3/day)
1	Domestic	130*	0	130
2	Cooling	80	0	80
3	Landscaping	107*	107	0
Total		**317**	**107**	**210**

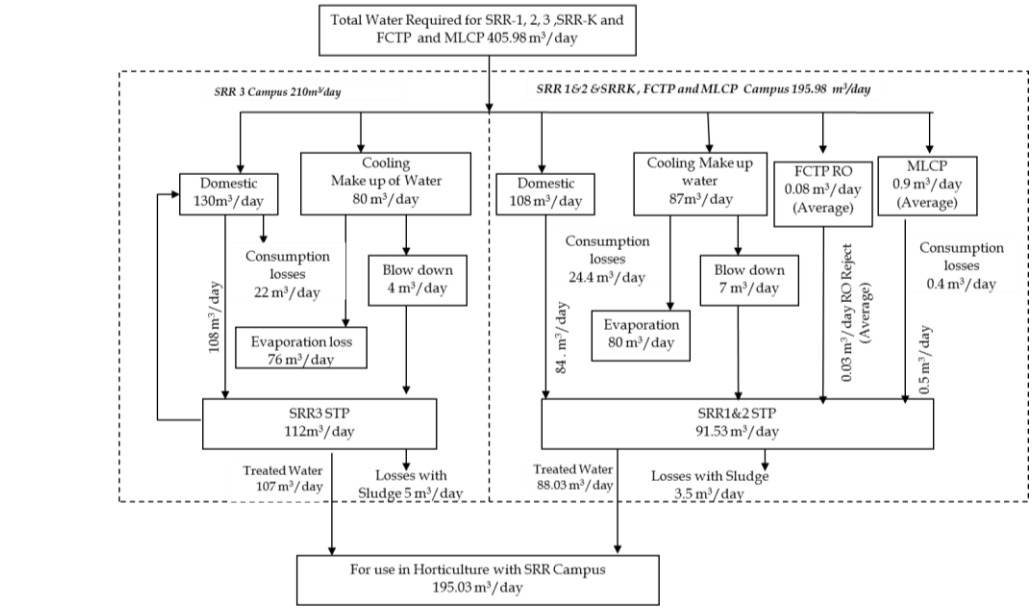
Note: *Consumption loss of 22 m^3/day and loss with sludge is 5 m^3/day.

SRR Campus Combined

With the MLCP Project requirement of 0.9 m^3/day, the total fresh water requirement for the SRR campus of 405.98 m^3/day, which will continue to be met through already approved water supply from BWSSB, rainwater harvesting (during monsoon) and reuse of treated wastewater. Intel has got an approval for supply of 705.6 m^3 of water from BWSSB (refer to ***Annex D of Form 1***).

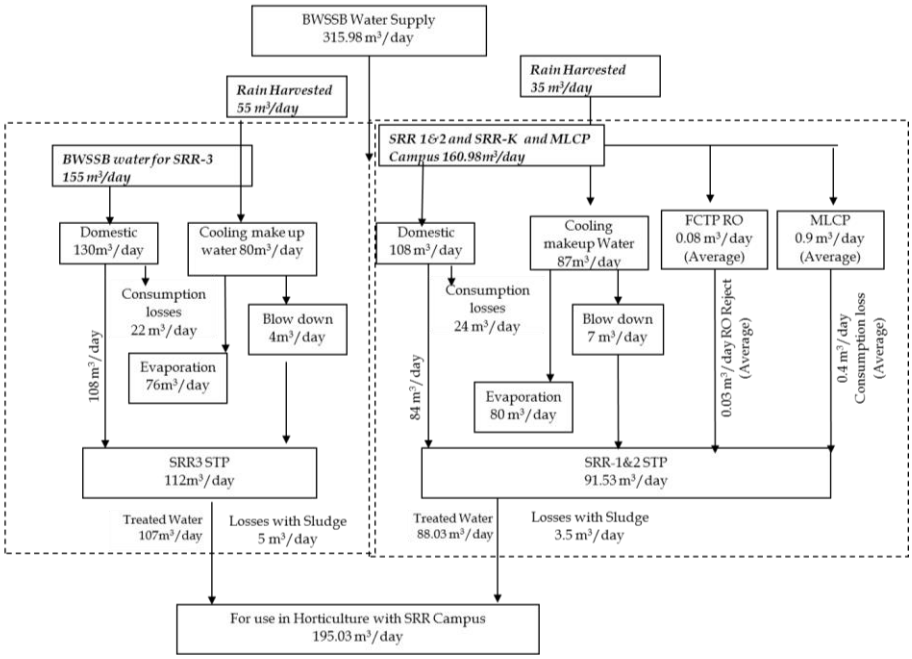
Figures 2.1 present water balances of existing SRR Project.

Figure 2.1 Water Balance Diagram for Combined SRR Campus applicable during Non-Monsoon season



Source: Developed based on Information provided by Intel. The total occupancy of SRR 3 Building once operational will be approximately 3200 fixed population and approximately 150 of floating population of contractors and personnel from other Intel offices. Domestic water requirement for fixed population is considered to be 40 litres per capita per day (lpcd) while for floating population it is considered to be 15 lpcd.

Figure 2.2 ***Water Balance Diagram for SRR Campus Combined applicable during Monsoon Season***



Source: Developed based on Information provided by Intel. The total occupancy of SRR 3 Building once operational will be approximately 3200 fixed population and approximately 150 of floating population of contractors and personnel from other Intel offices. Domestic water requirement for fixed population is considered to be 40 litres per capita per day (lpcd) while for floating population it is considered to be 15 lpcd

Water Treatment

Raw water supplied from BWSSB is currently being treated through pretreatment facility at SRR- 1 and SRR-2. The additional water requirement will be met from the existing facility.

2.2 WHAT IS THE CAPACITY (DEPENDABLE FLOW OR YIELD) OF THE PROPOSED SOURCE OF WATER?

No use of groundwater is envisaged at the Project Site. Water will be supplied by Bangalore Water Supply and Sewerage Board (BWSSB).

2.3 WHAT IS THE QUALITY OF WATER REQUIRED, IN CASE, THE SUPPLY IS NOT FROM A MUNICIPAL SOURCE? (PROVIDE PHYSICAL, CHEMICAL, BIOLOGICAL CHARACTERISTICS WITH CLASS OF WATER QUALITY)

The water supply for the proposed expansion Project will be met through water supply from BWSSB as per already sanctioned /approved quantity of 705.6 m^3 sourced from River Cauvery.

The water quality (groundwater and surface water) of the study area has been assessed to understand the baseline water quality conditions of the area during summer season 2013 as part of SRR-3 expansion. The quality of

groundwater was compared with IS: 10500 -2012 for drinking purposes while surface water was compared with CPCB surface water quality norms. The details of the sampling locations identified in the study area for water quality monitoring are as given in ***Table 2.4*** (as shown in ***Figure 2.7***) and the results of groundwater and surface water quality are presented in ***Tables 2.6 & 2.7*** respectively. ***Table 2.8*** shows the categorisation of various class of surface water as per the CPCB norms.

Surface and groundwater sampling at the same locations has been done during the month of May 2016 for the proposed expansion and the same will be included in the EIA report.

Table 2.6 Ground Water and Surface Water Sampling Locations

S.N.	Sampling Location	Code	Geographical Location	Distance and Direction from Project site	Justification for Location of Sampling
Ground Water Sampling Locations					
1	Near Project site	GW1	12°55'48.12"N, 77°40'57.36"E	0.5 km, N	Representing site condition as this location is near to the Project site
2	Deverabeesanahalli	GW3	12°55'41.16"N 77°41'10.86"E	0.7 km, SE	Representing groundwater quality for use in domestic services by village located in east of vicinity to the Project site.
3	Munireddy Garden, Bellandur	GW2	12°55'29.92"N 77°40'43.77"E	0.63 km NW	Representing groundwater quality for use in domestic services by village located in close vicinity to the Project site.
Surface Water Sampling					
1	Deverabeesanahalli Lake	SW1	12°55'24.90"N 77°41'15.73"E	0.03 km, E	Representing surface water quality towards East of the site. The lake is being used for bathing, cattle drinking purposes.
2	Bellandur Lake	SW2	12°55'53.26"N 77°40'37.45"E	At 1.35 km NW	Representing surface water quality in North western portion of the study area.
3	Kaikondrahalli Lake	SW-3	12°55'2.04"N 77°40'46.26"E	At 1.47 km, W	Representing surface water quality in Western portion of the study area and is used for recreational purposes.

Figure 2.3 Map Showing Ground and Surface Water Quality Sampling Locations

Parameters for analysis of water quality were selected based on the utility of the particular source of water. The quality of groundwater was compared with IS: 10500 meant for drinking purposes and surface water quality was compared with CPCB surface water quality criteria. Grab water samples were collected from locations in a 5 litre sampling bottles and 250 ml sterilized clean glass/pet bottle for complete physico-chemical and bacteriological tests respectively. Method of analysis for water quality is given in ***Table 2.5***.

Table 2.7 Method for Water Quality Analysis

S.N	Parameter	Method
1.	pH Value	APHA 4500 H+ (B)
2.	Colour	APHA 2120 B
3.	Temperature	APHA 2550 B
4.	Turbidity, NTU	APHA 2130 C
5.	Electrical Conductivity (µS/Cm)	APHA 2510 B
6.	Total Hardness (as $CaCO_3$), mg/l	APHA 2340 – Hardness ©
7.	Magnesium Hardness	APHA 2340 C
8.	Calcium Hardness	APHA 2340 C
9.	Total Dissolved Solids, mg/l	APHA-2540-C
10.	Total Suspended Solids	APHA -2540-D
11.	Total Nitrogen , mg/l	APHA(4500) N (B)
12.	Total Phosphorous	APHA-4500-P (D)
13.	Alkalinity (as $CaCO_3$), mg/l	APHA 2320-B
14.	Calcium (as Ca), mg/l	APHA 3111 B
15.	Magnesium (as Mg), mg/l	APHA 3111 B
16.	Iron (as Fe), mg/l	APHA 3111 Fe (B)
17.	COD	APHA 5220 B
18.	BOD	IS:3025 (P-44)
19.	Nickel as Ni, mg/l	APHA 3111 B
20.	Cyanide	APHA 4500 CN-(C&E)
21.	Arsenic	IS:3025(P-48)
22.	Cadmium	APHA 3111B
23.	Selenium	IS:3025(P-56)
24.	Manganese	APHA 3111B
25.	Aluminium	APHA 3111B
26.	Boron	APHA 4500
27.	Barium	APHA 3111 B
28.	Copper (as Cu), mg/l	APHA 3111B
29.	Sulphate (as SO_4), mg/l	IS:3025 (P-24)
30.	Nitrate (as NO_3^-), mg/l	IS:3025 (P-24)
31.	Fluoride (as F), mg/l	APHA 4500 F- (D)
32.	Phenol	APHA 5530 C
33.	Mercury (as Hg), mg/l	IS:3025(P-37)
34.	Lead (as Pb), mg/l	APHA 3111B
35.	Zinc (as Zn), mg/l	APHA 3111B
36.	Chromium (as Cr^{+6}), mg/l	APHA 3111B
37.	Total Coliforms, Nos. / 100 ml	APHA9221 (B&C)
38.	Sodium	APHA 3111B
39.	Potassium	APHA 3111B
40.	Chlorides	APHA 4500 Cl (B)
41.	Nickel	APHA 3111B
42.	Salinity	APHA 2520 B
43.	Fecal Coliforms	APHA 9221 (C&E)

Table 2.8 Ground water Quality within 10 km radius of Study Area

SN	Parameters	Unit	Adjacent IBIS Novotel (near Project Site)	Deverabeesanahalli	Munireddy Garden, Bellandur	Acceptable limit as per IS:10500, 2012	Permissible limit in absence of alternate sources s per IS:10500 2012
			GW-1	GW-2	GW-3		
1	pH	--	7.12	7.01	7.31	6.5 to 8.5	No relaxation
2	Colour	Hazen	< 5	< 5	< 5	5	15
3	Turbidity	NTU	< 1	< 1	< 1	1	5
4	Total Dissolved Solids (TDS)	mg/L	715	1145	1010	500, Max	2000
	General Parameters						
5	Total Hardness	mg/L	402	855	675	200, Max	600
6	Total Alkalinity	mg/L	270	290	240	200, Max	600
7	Chloride	mg/L	134.8	112.8	162.8	250, Max	1000
8	Sulphate	mg/L	3.4	2	1.7	200, Max	400
9	Nitrate	mg/L	0.31	1.36	5.35	45, Max	No relaxation
10	Fluoride	mg/L	BDL	BDL	BDL	1.0, Max	1.5
11	Phenols	mg/L	BDL	BDL	BDL	0.001, Max	0.002
12	Magnesium	mg/L	16.62	58.55	50.68	30, Max	100
13	Calcium	mg/L	132.27	244.14	186.43	75, Max	200
14	Copper	mg/L	BDL	0.02	BDL	0.05, Max	1.5
15	Zinc	mg/L	0.493	BDL	BDL	5, Max	15
16	Selenium	mg/L	BDL	BDL	BDL	0.01, Max	No relaxation
17	Iron	mg/L	BDL	BDL	0.19	0.3	No relaxation
18	Manganese	mg/L	0.02	0.06	BDL	0.1, Max	0.3
19	Barium	mg/L	BDL	BDL	0.396	0.7	No relaxation
20	Aluminum	mg/L	BDL	BDL	BDL	0.03	0.2
21	Boron	mg/L	BDL	BDL	BDL	0.5	1
22	Mercury	mg/L	BDL	BDL	BDL	0.001, Max	No relaxation
23	Lead	mg/L	BDL	BDL	BDL	0.01, Max	No relaxation
24	Cadmium	mg/L	BDL	BDL	BDL	0.003, Max	No relaxation
25	Cyanide	mg/L	BDL	BDL	BDL	0.05, Max	No relaxation
26	Nickel	mg/L	BDL	BDL	BDL	0.02, Max	No relaxation
27	Arsenic	mg/L	BDL	BDL	BDL	0.01, Max	No relaxation
28	Chromium	mg/L	BDL	BDL	BDL	0.05, Max	No relaxation
Bacteriological Quality of Drinking Water							
29	Total Coliform	MPN/100 Ml	Absent	Absent	8	Shall not be	No Relaxation

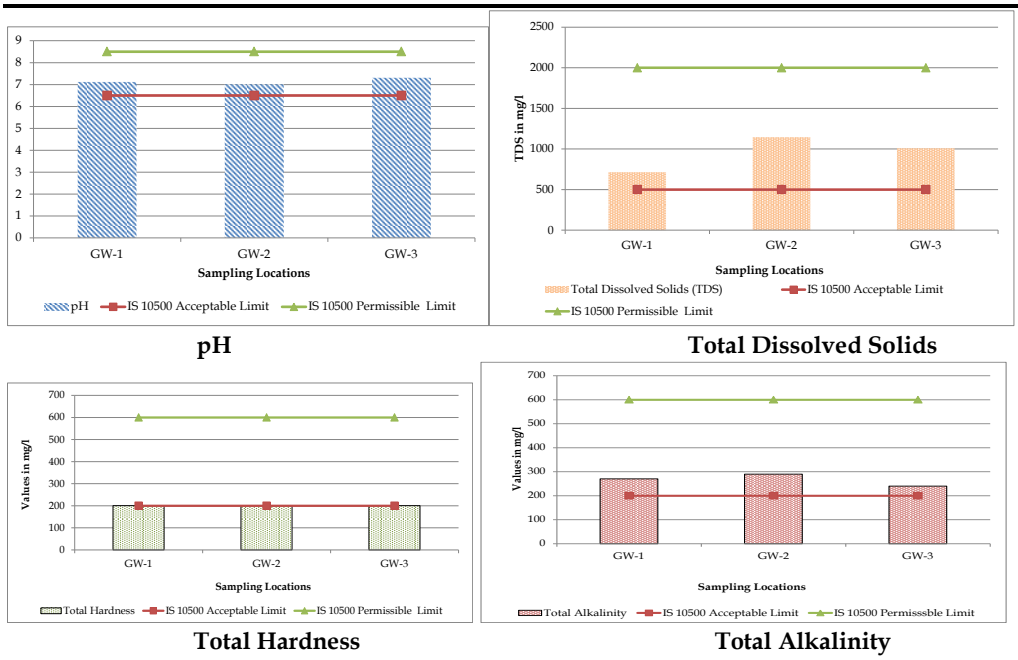
SN	Parameters	Unit	Adjacent IBIS Novotel (near Project Site)	Deverabeesanahalli	Munireddy Garden, Bellandur	Acceptable limit as per IS:10500, 2012	Permissible limit in absence of alternate sources
						detectable in any 100 ml sample	
30	Fecal Coliform	MPN/100 Ml	Absent	Absent	Absent	Shall not be detectable in any 100 ml sample	No Relaxation
	Additional Parameters						
31	Temperature	^{0}C	31	28	29	-	-
32	Electrical Conductivity	µS/cm	1120	1791	1581	-	-
33	Magnesium Hardness	mg/L	68.4	241.1	208.7	-	-
34	Calcium Hardness	mg/L	330.27	609.6	465.4	-	-
35	Sodium	mg/L	165.35	160.31	144.98	-	-
36	Potassium	mg/L	4.08	6.87	2.72	-	-
37	Salinity	PPT	0.5543	0.9051	0.7942	-	-
38	Total Nitrogen	mg/L	8.5	9.2	10.5	-	-
39	Total Phosphorus	mg/L	0.14	0.16	0.17	-	-
40	Biological Oxygen Demand (5 days)	mg/L	3	2.5	2	-	-
41	Chemical Oxygen Demand (COD)	mg/L	6	8	8	-	-
42	Dissolved Oxygen	mg/L	4.9	5.5	5.7	-	-
43	Total Suspended Solids	mg/L	2.9	2.1	5.2	-	-

Note: BDL- Below Detectable Limit: Fluoride 0.1 mg/l, Phenols 0.001 mg/l; Copper as Cu 0.01 mg/l; Zinc (as Zn) 0.2 mg/l; Selenium (as Se) 0.01mg/l; Iron (as Fe) 0.01 mg/l; Manganese (as Mn) 0.02 mg/l; Barium (as Ba) 0.01 mg/l; Aluminium (as Al) 0.01 mg/l; Boron (as B) 0.002 mg/l; Mercury (as Hg)0.01 mg/l; Lead (as Pb) 0.01 mg/l; Cadmium (as Cd) 0.002 mg/l; Cyanide (as CN) 0.002 mg/l; Nickel (as Ni) 0.01 mg/l; Arsenic (as As) 0.01 mg/l; and Chromium (as Cr)0.01 mg/l;

Physico-Chemical Parameters

- pH of the groundwater samples were found in the range of 7.01 to 7.31 as against the drinking water norm of 6.5 to 8.5 ;
- The level of dissolved solids in the groundwater samples varied from 715 mg/l to 1,145 mg/l. All the samples exceeded the desirable limits as per IS: 10500 (500 mg/l) but were within the permissible limit.
- Total hardness in the groundwater samples varied from 402 mg/l to 855 mg/l. Groundwater at Project site was within the permissible limit of 600 mg/l whereas Groundwater sample at Deverabeesanahalli and Bellandur exceeded the permissible limit.
- The chloride concentration ranged from 112.8 mg/l to 162.8 mg/l in the groundwater samples. All the samples had chloride concentration below the desirable limits (250 mg/l).
- Alkalinity varied from 240 mg/l to 270 mg/l in the groundwater samples. Total alkalinity exceeded the desirable limit (200 mg/l) in all the water samples.
- The fluoride level in the water samples was observed to be Below Detectable Limits in all groundwater samples.
- The sulphate and nitrate concentration in the groundwater samples was observed to be in the range of 1.7 mg/l to 3.4 mg/l (for sulphates) and from 0.31 mg/l to 5.35 mg/l (for nitrate) which are below corresponding desirable limits.
- Level of Phenolic compounds is observed to be <0.001 mg/l in all the groundwater samples.

Figure 2.4 Graphical Representation of Select Parameters in Groundwater Samples



pH **Total Dissolved Solids**

Total Hardness **Total Alkalinity**

Heavy Metals

- Iron concentration in all groundwater samples was observed within desirable limit;
- Copper, Mercury, Lead, Zinc and Chromium contents in all ground water samples were well below their corresponding desirable limits.

Bacteriology

- Total coliforms in the water samples varied from absent at near Project site (GW-1) and GW-2 (Deverabeesanahalli) to 8 per 100 ml at GW-3 (Bellandur);
- Faecal Coliforms were observed absent in all the groundwater samples collected from the study area.

Surface Water Quality

Surface water quality characteristic were also assessed against water quality criteria as per CPCB guidelines for aquatic resources. The result of surface water quality is given in ***Table 2.7*** which shows that all the three lake water samples were unfit for drinking purposes.

Table 2.9 Surface Water Quality in the Study Area

S. N	Parameters	Unit	Deverabeesanahalli Lake	Bellandur Lake	Kaikondrahalli Lake
			SW-1	SW-2	SW-3
1	pH	--	7.04	7.06	6.97
2	Colour	Hazen	< 5	15	10
3	Turbidity	NTU	26.5	15.9	15.1
4	Total Dissolved Solids (TDS)	mg/L	932	892	810
5	Total Hardness	mg/L	570	315	246
6	Total Alkalinity	mg/L	170	280	250
7	Chloride	mg/L	183.8	403.9	250
8	Sulphate	mg/L	1.32	6.15	3.8
9	Nitrate	mg/L	0.44	18.36	0.68
10	Fluoride	mg/L	1.22	2	1.15
11	Phenols	mg/L	BDL	0.033	BDL
12	Magnesium	mg/L	31.05	50.43	23.13
13	Calcium	mg/L	176.64	37.56	40.96
14	Copper	mg/L	BDL	BDL	0.013
15	Zinc	mg/L	0.29	BDL	BDL
16	Selenium	mg/L	BDL	BDL	BDL
17	Iron	mg/L	0.11	0.257	0.32
18	Manganese	mg/L	BDL	0.03	0.013
19	Barium	mg/L	0.51	BDL	BDL
20	Aluminium	mg/L	BDL	BDL	BDL
21	Boron	mg/L	BDL	BDL	BDL
22	Mercury	mg/L	BDL	BDL	BDL
23	Lead	mg/L	BDL	BDL	BDL
24	Cadmium	mg/L	BDL	BDL	BDL
25	Cyanide	mg/L	BDL	BDL	BDL
26	Nickel	mg/L	BDL	BDL	0.017

S. N	Parameters	Unit	Deverabeesanahalli Lake	Bellandur Lake	Kaikondrahalli Lake
27	Arsenic	mg/L	BDL	BDL	BDL
28	Chromium	mg/L	BDL	BDL	0.021
29	Total Coliform	MPN/100 Ml	68,000	140,000	21,000
30	Fecal Coliform	MPN/100 Ml	14,000	93,000	93,000
31	Temperature	^{0}C	26	27	28
32	Electrical Conductivity	µS/cm	1459	1390	1270
33	Magnesium Hardness	mg/L	127.86	207.67	40.96
34	Calcium Hardness	mg/L	441	93.78	102.27
35	Sodium	mg/L	143.33	92.92	271.02
36	Potassium	mg/L	19.91	20.53	34.32
37	Salinity	PPT	0.7302	0.6942	0.6318
38	Total Nitrogen	mg/L	38.4	91	46.4
39	Total Phosphorus	mg/L	1.52	3.44	0.43
40	Biological Oxygen Demand (5 days)	mg/L	22	42	34
41	Chemical Oxygen Demand (COD)	mg/L	104	240	200
42	Dissolved Oxygen	mg/L	2.6	0	2.4
43	Total Suspended Solids	mg/L	57.6	30	14.4

Note: BDL- Below Detectable Limit: Fluoride 0.1 mg/l, Phenols 0.001 mg/l; Copper as Cu 0.01 mg/l; Zinc (as Zn) 0.2 mg/l; Selenium (as Se) 0.01mg/l; Iron (as Fe) 0.01 mg/l; Manganese (as Mn) 0.02 mg/l; Barium (as Ba) 0.01 mg/l; Aluminium (as Al) 0.01 mg/l; Boron (as B) 0.002 mg/l; Mercury (as Hg)0.01 mg/l; Lead (as Pb) 0.01 mg/l; Cadmium (as Cd) 0.002 mg/l; Cyanide (as CN) 0.002 mg/l; Nickel (as Ni) 0.01 mg/l; Arsenic (as As) 0.01 mg/l; and Chromium (as Cr)0.01 mg/l;

Table 2.10 Primary Water Quality Criteria for Designated-Best-Use-Classes

Designated-Best-Use	Class	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	Total Coliforms Organism MPN/100ml shall be 50 or less pH between 6.5 and 8.5 Dissolved Oxygen 6mg/l or more Biochemical Oxygen Demand 5 days 20^{o}C 2mg/l or less
Outdoor bathing (Organised)	B	Total Coliforms Organism MPN/100ml shall be 500 or less pH between 6.5 and 8.5 Dissolved Oxygen 5mg/l or more Biochemical Oxygen Demand 5 days 20^{o}C 3mg/l or less
Drinking water source after conventional treatment and disinfection	C	Total Coliforms Organism MPN/100ml shall be 5000 or less pH between 6 to 9 Dissolved Oxygen 4mg/l or more Biochemical Oxygen Demand 5 days 20^{o}C 3mg/l or less
Propagation of Wild life and Fisheries	D	pH between 6.5 to 8.5 Dissolved Oxygen 4mg/l or more Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial Cooling, Controlled Waste disposal	E	pH between 6.0 to 8.5 Electrical Conductivity at 25^{o}C micro mhos/cm Max.2,250 Sodium absorption Ratio Max. 26 Boron Max. 2mg/l
	Below E	Not Meeting A, B, C, D & E Criteria

Source: Central Pollution Control Board

2.4 *How Much Of The Water Requirement Can Be Met From The Recycling Of Treated Wastewater? (Give The Details Of Quantities, Sources And Usage)*

Total water requirement for proposed MLCP project will be about 1.4 m^3/day, of this approximately 35.7% (0.5 m^3/day) of the total water would be reused from STP in landscape and greenbelt development. The MLCP Project has planned to collect rainwater through 2 X 150 m^3 rain water harvesting tank to be provided on site.

Domestic wastewater generated at site will be treated in existing Sewage Treatment Plant of 100 m^3/day capacity. Treated wastewater (91.53 m^3/day) will continue to meet the discharge limits as stipulated by KSPCB and continued to be reused for gardening and landscaping. The SRR campus facility will be a zero discharge facility.

The combined operation of SRR1 & 2, SRR-K, under construction SRR-3 buildings and the proposed MLCP Project will have a total water requirement of 602.48 m^3/day. Approximately 33% of water requirement of SRR Campus will be reused from STP in landscape and greenbelt development.

2.5 *Will There Be Diversion Of Water From Other Users? (Please Assess The Impacts Of The Project On Other Existing Uses And Quantities Of Consumption)*

No surface and groundwater use is planned for the SRR Project. The proposed MLCP Project will use water from BWSSB as per already approved capacity of 705.6 m^3/day. A rainwater harvesting scheme will also be implemented to reuse of rainwater through 2x150 m^3 tank in the Project.

2.6 *What Is The Incremental Pollution Load From Wastewater Generated From The Proposed Activity? (Give Details Of The Quantities And Composition Of Wastewater Generated From The Proposed Activity)*

The proposed MLCP Project does not involve additional deployment of any manpower for the existing operational and under construction capacity except 15 to 20 number of additional security to be deployed, which will generate about 0.5 m^3/day. This will be discharged for treatment into existing STP of SRR-1 & SRR-2. The incremental average TDS load due to MLCP Project will be less than 5 mg/litres for 100 m^3/day of STP.

Table 2.11 Wastewater generated from Project

S.N	Domestic Wastewater	Liquid Waste generated (m^3/Day)					
		SRR-1&2 Buildings	SRR-K	FCTP	MLCP Project	SRR-3 Building	Total
1	Domestic wastewater generation	82	9	0.030	0.5	112	203.53
2	STP capacity	100				150	250

An STP of 100 m^3/day capacity has been operational for treatment of domestic wastewater generation from SRR-1, SRR-2, SRR-K and FCTP of SRR campus. The additional wastewater generated from proposed MLCP project will be treated in existing operational STP. The treated wastewater will continue to be used in landscaping and greenbelt area within SRR Campus.

Another STP of 150 m^3/day capacity will be provided to treat the domestic wastewater generation from SRR-3. The STP for SRR-3 will be operational once SRR-3 Building construction is complete. The treated wastewater from STP will be reused in landscaping development purposes in SRR Campus.

The treated wastewater will conform to KSPCB prescribed norms and will be reused in landscape development. The STP will be based on the extended aerobic activated sludge processes. The quality of domestic wastewater before *a*nd after treatment is given in**Table 2.12**.

Table 2.12 Quality of sewage water before and after Treatment

Parameters	Raw Sewage	After Treatment	Irrigation water Norm of KSPCB
pH	6.0 – 7.5	7.0– 8.5	6.0 to 9.0
TSS	400 mg/l	30 mg/l	Not Specified
BOD5	300 – 350 mg/l	<10 mg/l	<10 mg/l
COD	450 – 500 mg/l	80 mg/l	Not Specified
Turbidity	-	< 2 NTU	< 2 NTU
E-coli	-	None	None
Residual Chlorine	-	>= 1mg/l	>= 1 mg/l

2.7 *GIVE DETAILS OF THE WATER REQUIREMENTS MET FROM WATER HARVESTING? FURNISH DETAILS OF THE FACILITIES CREATED.*

Roof top rainwater harvesting system is in place for the existing SRR-1 & SRR-2 Buildings with capacity of 80 m^3 and 200 m^3 respectively, roof top rainwater collection provided at SRR-K facility has been connected with existing SRR-2 collection tank and is used for cooling purposes after necessary treatment. Rainwater collection sump of 1,540 m^3 capacity to be provided for under construction SRR-3 Building.

It is also proposed to establish rooftop rainwater harvesting collection tank for the proposed MLCP site. The details of rainwater collection tank exists and proposed is given below

Table 2.13 Rainwater Harvesting System in SRR Campus

Building	Capacity of Rainwater Harvesting Sump (m^3)
SRR-1	80
SRR-2	200
SRR_K	Connected with SRR-2 sump
SRR-3	1540
Proposed MLCP	150 x 2 =300

2.8 *WHAT WOULD BE THE IMPACT OF THE LAND USE CHANGES OCCURRING DUE TO THE PROPOSED PROJECT ON THE RUNOFF CHARACTERISTICS (QUANTITATIVE AS WELL AS QUALITATIVE) OF THE AREA IN THE POST CONSTRUCTION PHASE ON A LONG TERM BASIS? WOULD IT AGGRAVATE THE PROBLEMS OF FLOODING OR WATER LOGGING IN ANY WAY?*

The proposed MLCP Project would involve construction that would lead to increase in impervious areas and thus the runoff from the Project site is expected to increase. However, the increased runoff will not cause flooding or water logging because a well-designed storm water network will be provided within the entire site premises, which will be used to store rain water. Further, the site is located in well-developed urban area of the district having well-designed storm water network to cater to the excess storm water discharge from the site.

2.8.1 *Would it aggravate the problems of flooding or water logging in anyway?*

With the MLCP Project design incorporating well planned drainage network and adequate landscaping, no localised flooding or water logging is anticipated. The existing natural drainage within the Intel's SRR Campus will be maintained to avoid flooding or water logging situation in the area.

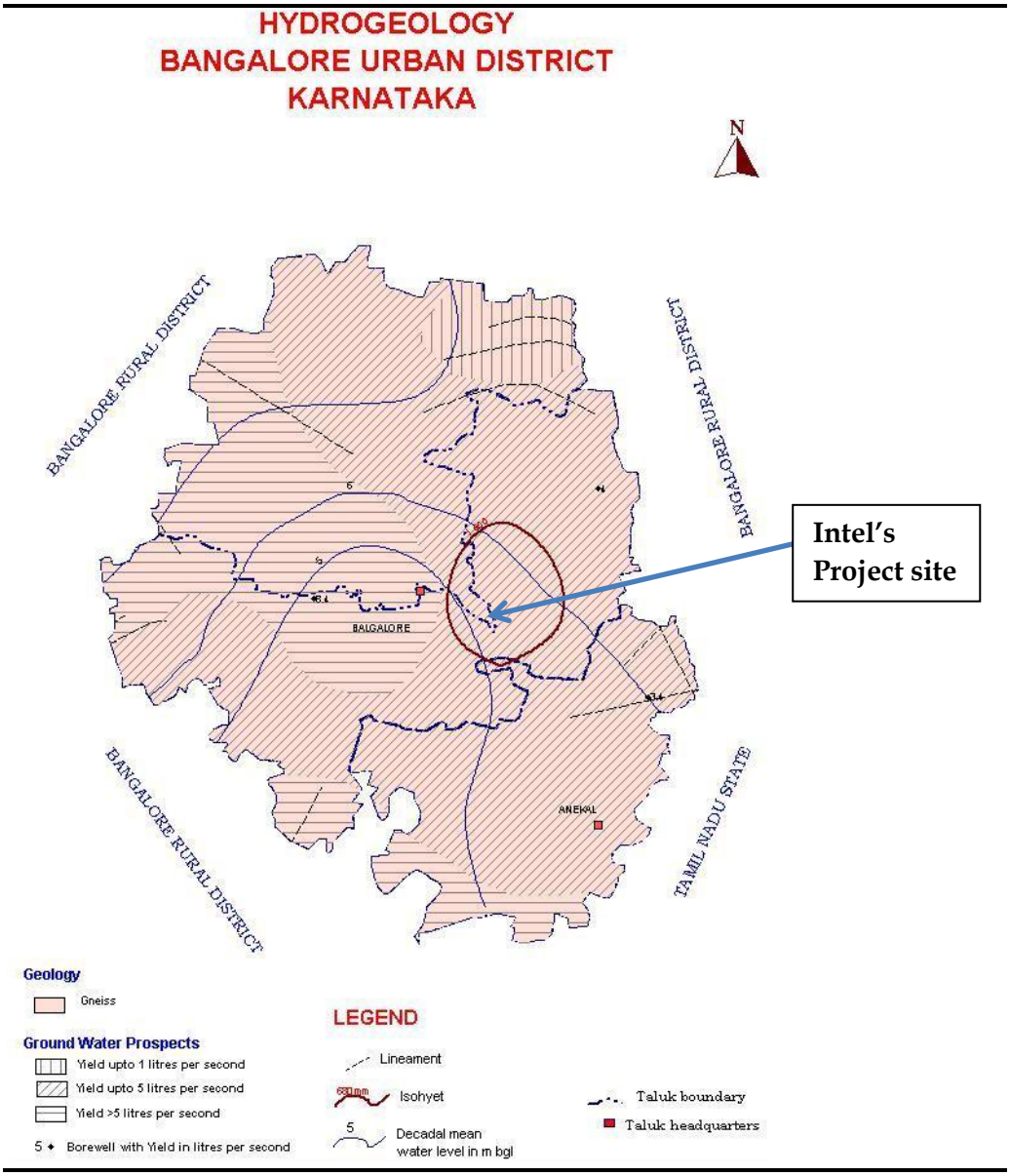
2.9 *WHAT ARE THE IMPACTS OF THE PROPOSAL ON THE GROUND WATER? (WILL THERE BE TAPPING OF GROUND WATER; GIVE THE DETAILS OF GROUND WATER TABLE, RECHARGING CAPACITY, AND APPROVALS OBTAINED FROM COMPETENT AUTHORITY, IF ANY)*

No groundwater use is proposed for MLCP Project as water supply will be ensured through BWSSB supply.

Hydrogeology of the Region

Granite and Gneisses of peninsular gneisses group constitute major aquifers in the region which comprises of secondary inter-granular porosity and fractures. The ground water in the region occurs in pheratic conditions in the weathered zone and under semi confined to confined conditions in fractured and joint rock formations. ***Figure 2.5*** shows the hydrogeology map of the area.

Figure 2.5 Hydrogeology Map



Source: CGWB-2008

2.10 *What Precautions/Measures Are Taken To Prevent The Run-Off From Construction Activities Polluting Land & Aquifers? (Give Details Of Quantities And The Measures Taken To Avoid The Adverse Impacts)*

Adequate control measures have been proposed to check the surface runoff, as well as uncontrolled flow of water outside the Project site. The following management measures will be taken to protect the water quality during the construction phase:

- Demarcation of construction activities and ensuring due provision of necessary infrastructure services;
- Maintaining existing natural drainage within the MLCP Project site to avoid flooding or water logging situation in the area;
- Restoring land surface contours in relation to the surroundings followed by developing drains and providing adequate slopes across the site prior

to start of excavation work thereby ensuring adequate cross drainage for quick evacuation of catchment water;
- Construction of diversion dykes to channel runoff around the excavated site to avoid surface runoff of excavated material;
- Topsoil removed to be protected and reused for landscape development onsite;
- Stacking of excavated soil material in an earmarked area and every care shall be taken to prevent soil erosion;
- Site shall be properly fenced and provided with proper drainage pattern;
- Retention wall/bund shall be provided around the storage areas for excavated soil and other construction material to check the flow of solid with storm water in case of rain;
- No piling of construction material to be permitted outside the MLCP site;
- Construction waste i.e. non- hazardous civil concrete waste/ debris to be crushed and reused in road/ pavement within the site;
- Proper storage of machine oil, used oil and grease on impervious bunded surface to avoid any soil contamination;
- All the hazardous waste to be disposed of as per the CPCB guidelines and conditions of authorization issued to the Project by KSPCB;
- Completed earthworks will be sealed and/ or re- vegetated as soon as reasonably practicable with the help of landscape expert.

2.11 HOW IS THE STORM WATER FROM WITHIN THE SITE MANAGED? (STATE THE PROVISIONS MADE TO AVOID FLOODING OF THE AREA, DETAILS OF THE DRAINAGE FACILITIES PROVIDED ALONG WITH A SITE LAYOUT INDICATING CONTOUR LEVELS)

The proposed development would incorporate provision of storm water drainage network. Rainwater harvesting will be carried out in order to storage of rainwater in storm water storage tank of 300 m^3 capacity. The storm water, generated within the site will be channelized through planned drainage network. Proper management will be done to make it free of obstacles/contamination. A detailed Storm Water Management will incorporate following best management practices:

- Regular inspection and cleaning of storm water drains;
- Oil - water separators (oil traps)will be installed in all the parking areas;
- Cover waste storage areas;
- Avoid application of pesticides and herbicides before monsoon season;
- Conducting routine inspections to ensure cleanliness;
- Provision of silt traps in storm water drains.

Storm Water Drainage Plan of the proposed MLCP Project is provided as **Figure 2.6.**

Figure 2.6 Storm water Drainage Plan for the Proposed MLCP Project

Source: Intel

2.12 WILL THE DEPLOYMENT OF CONSTRUCTION LABOURERS PARTICULARLY IN THE PEAK PERIOD LEAD TO UNSANITARY CONDITIONS AROUND THE PROJECT SITE (JUSTIFY WITH PROPER EXPLANATION)

Intel will ensure through its contractor that health and hygienic conditions be maintained at the construction site). The construction and commissioning of the MLCP Project will be completed in approximately 24 months. It is expected that at any point of time labour deployment at the construction site there will be 400 nos. which may increase to 800 during peak construction period. The provision for temporary labour camp will be made outside the Project site with the necessary prior permission to be obtained by the construction contractor from KSPCB and local administration.

Temporary readymade toilets will be provided onsite connected to septic tanks. Intel will ensure that the construction contractor provide sufficient potable water for construction workers. Intel will ensure through contractors that suitable system for garbage collection and disposal is adopted onsite. Arrangements shall be made for daily collection of food waste. Intel will also ensure that first aid boxes with sufficient equipment are provided at the construction site with a trained person to be in-charge of it.

2.13 WHAT ON-SITE FACILITIES ARE PROVIDED FOR THE COLLECTION, TREATMENT & SAFE DISPOSAL OF SEWAGE? (GIVE DETAILS OF THE QUANTITIES OF WASTEWATER GENERATION, TREATMENT CAPACITIES WITH TECHNOLOGY & FACILITIES FOR RECYCLING AND DISPOSAL)

Construction Phase

On an average 400 labourers will be engaged at site for construction activities. The peak labour deployment is expected to reach 800 (expected to last for 2 months). At the construction site, approximately 11 m^3/day of sewage is expected to be generated during normal construction activities and 21 m^3/day of sewage is expected to be generated during peak labour deployment which will be collected onsite in septic tanks. The septic tanks will be emptied periodically through truck mounted tanker for onsite treatment and disposal through SRR1 & 2 STP or offsite treatment and disposal by approved vendors.

Operation Phase

The proposed MLCP Project involves deployment additional 15-20 security personal for the current operational and planned facilities and is expected to generate about 0.5 m^3/day, which will be discharged for treatment into existing STP of SRR-1 & 2.

An STP of 100 m^3/day capacity has been operational for treatment of domestic wastewater generation from SRR-1, SRR-2, SRR-K Buildings, FCTP

and the proposed MLCP Project. The treated wastewater will continue to be used in landscaping and greenbelt area within SRR Campus.

Another STP of 150 m^3/day capacity will be provided to treat the domestic wastewater generation from SRR-3 Building under construction. The STP for SRR-3 will be operational once SRR-3 Building construction is complete. The treated wastewater from STP will be reused in landscaping development purposes in SRR Campus.

2.14 GIVE DETAILS OF DUAL PLUMBING SYSTEM IF TREATED WASTE WATER IS USED FOR FLUSHING OF TOILETS OR ANY OTHER USE.

As the treated water from STP fully gets utilized in landscape and greenbelt development, no dual plumbic system is planned for the MLCP Project.

3 VEGETATION

3.1 IS THERE ANY THREAT OF THE PROJECT TO THE BIODIVERSITY? (GIVE A DESCRIPTION OF THE LOCAL ECOSYSTEM WITH ITS UNIQUE FEATURES, IF ANY)

3.1.1 *Core Zone-Project Site*

Activity Area (Energy Servers)

The MLCP Project foot print is small area (14,900 m^2) compared to the entire Intel SRR Campus of 17.275 Ha. The proposed land for the MLCP is currently being utilised for landscape and landscape parking.

The proposed MLCP Project site comprises of open surface parking with landscape area having trees, shrubs and herbs. Dominant shrubs and herbs present at the MLCP Project site include *Ricinum communis, Solanum nigerum, Argemone Mexicana, Euphorbia hirta, Parthenium hysterophorous, and Achyranthus aspera*. The dominant tree vegetation of the MLCP Project site comprises of *Variegata Tabebuia impetiginosa, Roystonea, Tamarindus indica, Albizia saman, Calliandra, Ficus elastic, Millettia pinnata, Tabubia chrisotricha*. A total of 148 individuals (> 30 cm GBH) of 9 species and 58 individuals of 5 species of < 30 cm of tree form were recorded.

The plantation in existing SRR1 and SRR1 buildings comprise of 750 trees of 49 different species (SRR1-527 trees and SRR2 -223 trees). Most of the trees in SRR1 & 2 building areas were observed as well grown.

3.1.2 *Buffer Zone-10 km radius area*

The 10 km surrounding area of SRR Campus was surveyed for ecological assessment during 10th to 13th August 2015. The weather was clear on all the survey days with temperature ranging from 26-29°C in the day time and 22-20°C in the night time. The study covered the following objectives:

- Identification of floral and faunal species (terrestrial and aquatic), sensitive habitats, endangered species and forestland falling within the study area (including Project site);
- Classification of any endangered or protected species or endemic floral and faunal species prevailing in the study area (including Project site) based on field survey;
- Identification of floral and faunal species based on presence and absence data
- Identification of areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value; and

- Description of forest type, forest vegetation, fauna, and physiographic features.

3.1.3 *Study Area*

The Project site was considered as core zone while area of 10 km radius from the Project site boundary was considered as buffer zone. The study area is an urban setup with urbanization at high scale being undertaken. A lot of office and residential complex construction activity was evident all along the SRR Campus . Although, study area was taken as 10 km radius, more intensive survey was undertaken within 5 km radius area as likely effect of the Project activity will be confined to limited area. The habitats in general available for study are represented in ***Figure 3.1.***

Figure 3.1 Available area Habitats and GAIL gas pipeline development activities in the study area

Kaikondrahalli Lake

Agara Lake

GAIL Gas Station and Pipeline on Ring Road

Pipeline laying in progress by GAIL near Ring Road

Acacia plantation near Varthur lake

Source: ERM Survey 10th to 13th August 2015

3.1.4 Approach and Methodology

Sample plots of quadrat size 20 m x 20 m size were established in order to enumerate the vegetation in the study area. Same plots have been selected as undertaken during ecological survey undertaken for SRR3 complex in May 2013. Details of the sample plots surveyed is given in ***Table 3.1*** and shown in ***Figure 3.1***

Table 3.1 Details of the Sampled Area

Location Code	Location	Coordinates of centre of the Plot surveyed		Aerial Distance /Direction wrt SRR campus	Landuse of the surveyed area
SP1	Pond Adjacent to Project Site	12°55'24.36"N	77°41'18.03"E	0.31 Km/E	Near Water body
SP2	Bellandur Lake near Kempapura	12°56'27.60"N	77°40'35.46"E	2.1 Km/NNW	Near Water body
SP3	Agara Lake	12°55'25.54"N	77°38'38.52"E	4.5 Km/W	Near Water body
SP4	Kaikondrahalli	12°54'48.54"N	77°41'34.43"E	1.3 Km/SW	Plantation
SP5	Madivala Lake	12°54'25.14"N	77°36'50.30"E	7.8 Km/ WSW	Near Water body
SP6	Reserve Forest Near Kadugodi Industrial Area	12°59'18.15"N	77°44'21.20"E	9.3 Km/NE	Forest land
SP7	Near Gunjur Lake	12°54'52.43"N	77°44'24.70"E	6 Km/ESE	Dry water body and Eucalyptus Plantation
SP8	Plantation near ITPL Main road	12°58'20.20"N	77°42'37.43"E	6 Km/NE	Near Coconut Plantation
SP9	Near Saul Lake	12°54'58.05"N	77°40'44.71"E	1 Km/SW	Near Water body
SP10	Near Kaikondrahalli Lake	12°54'38.50"N	77°40'13.96"E	2.2 Km/SW	Near Water body

SP = Sample plot

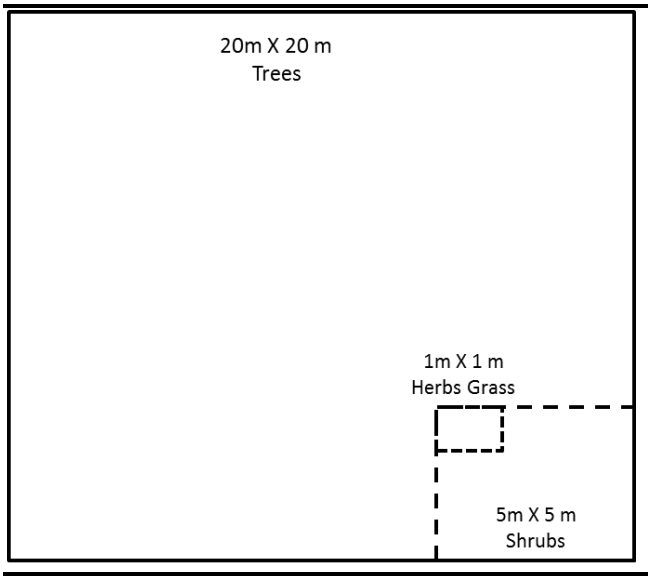
The area around SRR Campus was observed highly modified and disturbed as lots of construction activity was undertaken in the area. Isolated patches of vegetation around the lakes and plantation areas were covered in order to establish the baseline.

Figure 3.2 Map showing Ecological Sampling Locations in the Study Area (10 km radius)

Status of Flora

Status of floral species was assessed in the representative habitat types like; forest/plantation land/open scrub land, fallow land and wetlands, which includes area adjacent to large water bodies (lakes) prevailing within 10 km. Sampling quadrate of sample plot size 20 m x 20 m for trees, 5 m x 5 m for shrubs and 1 m x 1 m for herbs and grasses were used. As the project footprint is very low and associated impact will be limited to project site, survey was undertaken to assess number of floral species in each sample plot to provide a representative list of flora in study area. 3-4 quadrates were laid at each sample plot. Sample plot size is described in ***Figure 3.3.***

Figure 3.3 Description of Sample Plot



3.1.5 Vegetation Observed & Analysis for the Study area surrounding the SRR Campus

The study area has characteristic vegetation falling in the habitats such as vegetation around water bodies (lakes), Coconut, *Eucalyptus* and Sapodilla (Cheekoo, *Manilkara zapota*) and *Acacia auriculiformis* plantation and Forest land. Besides survey of these habitats, other vegetation such as avenue plantations, and natural growing vegetation near water bodies and aquatic plants was also enumerated.

The vegetation in the study area is described as "*Southern Tropical Dry and Thorn Scrub Forest* "as per Champion and Seth Classification [(1)]. Vegetation survey locations are provided in ***Figure 3.1.***

Presence and absence of trees, shrubs and herb species are presented in **Table 3.2 *to* Table 3.4.**

(1) Champion, H. G., and S. K. Seth. 1968. A revised survey of the forest types of India. Government of India Press

Table 3.2 Presence/Absence of Tree Species in the Study Area

Trees	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10
Euclalyptus torticornis	+	+	+	+	+	+	+	+	-	+
Pongamia pinnata	-	+	+	-	+	+	+	-	+	+
Pithecellobium dulce	+	+	+	-	+	+	+	+	+	+
Azadiracta indica	+	+	+	+	+	+	-	-	-	-
Leucaena leucocephala	-	-	+	-	+	+	-	+	-	-
Tamarindus indica	-	-	-	-	-	+	-	-	-	-
Syzygium cumini	-	+	-	-	-	+	-	-	+	-
Psidium guajava	-	+	-	-	-	-	-	+	-	-
Acacia nilotica	-	-	-	-	+	+	+	-	+	-
Ficus glomerata	-	+	+	-	-	+	-	-	-	-
Atrocarpus heterophyllus	-	-	-	-	-	-	-	-	-	-
Mangifera indica	-	+	+	-	-	+	-	+	-	-
Acacia auriculiformis	-	-	+	-	+	-	+	-	-	-
Casurina equisitifolia	-	-	-	-	-	-	+	-	-	-
Ficus religiosa	-	-	-	-	-	-	-	-	-	+
Terminalia arjuna	-	-	-	-	+	-	-	-	-	-
Aegle marmelos	-	-	-	-	-	-	-	-	-	+
Albizia odorotissma	-	-	+	-	-	+	-	+	+	-
Bambusa arundinacea	-	-	-	-	+	-	+	-	-	-
Cassia simea	-	-	-	-	+	+	-	-	+	-
Cocos nucifera	+	+	-	+	+	-	-	+	-	-
Cordia myxa	-	-	-	-	-	+	-	-	-	-
Delonix regia	-	-	+	-	+	+	-	-	-	-
Ficus benghalensis	-	-	-	-	-	+	-	-	-	-
Jacaranda mimosifolia	-	-	-	-	+	-	-	-	-	-
Peltaphorum pterocarpum	-	-	-	-	+	-	-	-	-	-
Tectona grandis	-	-	-	-	-	+	-	+	-	-
Terminalia belerica	-	-	-	-	-	+	-	-	-	-
Erythrina indica	-	-	-	-	-	+	-	-	-	-
Ficus racemosa	-	-	-	-	-	+	-	-	-	-
Melia dubia	-	-	-	-	-	+	-	-	-	-
Phoenix sylvestris	-	-	-	-	-	+	+	-	-	-
Adenanthera pavonina	-	-	-	-	-	+	-	-	-	-
Anthocephalus cadamba	-	-	+	-	+	+	-	-	-	-
Butea monosperma	-	-	-	-	-	+	-	-	-	-
Dalbergia sisso	-	-	-	-	-	+	-	-	-	-
Lagerstremia flos-reginae	-	-	-	-	-	-	-	-	-	+
Mimosops elengi	-	-	-	-	-	-	-	-	-	+
Zizyphus jujuba	-	-	-	-	-	+	-	-	-	-
Annona squamosa	-	-	-	-	-	-	-	-	-	+
Bridelia retusa	-	-	-	-	-	-	-	-	-	+
Buchnania lanzan	-	-	-	-	+	+	-	-	-	-
Cassia fistula	-	-	-	-	+	-	-	-	-	-

Trees	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10
Chloroxylon sweitiana	-	-	-	-	-	-	-	-	-	+
Embelia officianalis	-	-	-	-	-	+	-	-	-	-
Gmenlina arborea	-	-	-	-	-	-	-	-	-	+
Murraya koenigii	-	-	-	-	-	+	-	-	-	-
Wrightia tinctoria	-	-	-	-	-	+	-	-	-	-
Prosopis juliflora	+	-	+	-	+	-	-	-	+	-
Manilkara zapota	-	+	-	-	-	-	-	+	-	-
Callistemon lanceolatus	-	-	+	-	+	-	-	-	-	-
Careya arborea	-	-	+	-	-	+	-	-	-	-
Cassia javanica	-	-	+	-	-	-	-	-	-	-
Cassia spectabilis	-	-	+	-	+	+	-	-	-	-
Enterolobium cyclocarpum	-	-	-	-	-	+	-	-	-	-
Glyceridia sepium	-	-	-	-	-	+	-	-	-	-
Anacardium occidentale	-	-	-	+	-	-	-	-	-	-

Table 3.3 Presence/Absence of Shrubs Species in the Study Area

Shrubs	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10
Ricinus cummunis	-	+	+	-	+	-	+	-	+	-
Acalypha alnifolia	-	-	-	-	-	+	-	-	-	-
Adathoda vasica	-	-	-	-	-	+	-	-	-	-
Barleria buxifolia	-	-	-	-	-	+	-	-	-	-
Calotropis gigantea	-	+	+	-	+	+	+	-	+	-
Canthium parviflorum	-	-	-	-	-	+	-	-	-	-
Euphorbia tirucalli	-	-	-	-	-	-	-	-	-	+
Capparis divaricata	-	-	-	-	-	-	-	-	-	+
Opuntia dillenii	-	-	-	-	-	+	+	-	-	-
Lantana camara	-	+	+	+	+	+	-	+	+	-
Cassia augustifolia	-	-	+	-	+	+	-	-	-	-
Crotolaria mucronata	-	-	+	-	-	+	-	-	-	-
Pterolobium hexapetalum	-	-	-	-	-	+	-	-	-	-
Solanum indicum	-	-	-	-	-	+	-	-	-	-
Canthium parviflorum	-	-	-	-	+	-	-	-	-	-
Cassia auriculata	-	-	-	+	-	+	-	-	+	-
Cassia octidentalis	-	-	+	+	-	-	-	-	-	-
Datura metel	+	-	+	-	+	-	-	-	-	-
Ixora parviflora	-	-	+	-	+	+	-	-	+	-
Nerium indicum	-	-	-	-	-	+	-	-	-	-
Techoma stans	-	-	-	-	-	+	-	-	-	-
Ziziphus nummularia	-	-	-	-	-	-	-	+	+	-
Cadaba fruiticosa	-	-	-	-	-	+	-	-	-	-
Commiflora wightii	-	-	+	-	+	+	-	-	-	-
Grewia hirsuta	-	-	+	-	+	+	-	-	-	-
Ipomea carnea	+	+	-	-	+	-	-	-	-	-
Jatropha curcas	+	+	+	-	+	+	-	-	-	-

Table 3.4 Presence/Absence of Herbs and Climbers in the Study Area

Herbs & Climbers	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10
Euphorbia hirta	+	+	+	+	-	+	-	-	+	-
Achyranthus aspera	+	+	+	-	+	+	+	-	+	-
Argemone mexicana	+	+	+	+	+	+	+	-	+	-
Tridax prcumbans	+	+	+	+	+	+	+	+	+	-
Mimosa pudica	-	-	+	-	+	-	-	-	-	-
Sida acuta	-	-	+	-	+	-	-	-	-	-
Parthenium hysterophorasis	-	+	+	-	+	+	+	+	+	-
Desmoduim triflorum	-	-	-	-	-	-	-	+	-	-
Euphorbia geniculata	-	-	-	-	-	-	-	-	-	+
Kyllinga brevifolia	-	-	-	-	-	-	-	-	-	+
Ocimum adscendens	-	-	+	-	-	-	-	-	-	-
Oldenlaldia fruiticosa	-	-	-	-	+	-	-	-	-	-
Cynodon dactylon	+	+	+	+	+	+	+	+	+	-
Evolvus alsinoides	-	-	-	-	+	-	-	-	-	-
Leucas aspera	-	-	-	-	-	+	-	-	-	-
Leucas urticifolia	-	-	-	-	+	+	-	-	-	-
Solanum niger	+	+	+	+	+	+	-	+	-	-
Hemidesmus indicus	-	-	-	-	-	+	-	-	-	-
Pterolobium indicum	-	-	+	-	-	+	-	+	-	-
Abrus precatorius	-	-	-	-	-	+	-	+	-	-

Among tree species *Euclalyptus torticornis* and *Pithecellobium dulce* was observed to be predominantly present all over in the study area. *Cocos nucifera* was also observed to be widely spread in form of plantation all along the study area. Shrubs species were commonly observed near the water bodies and plantation areas mainly for *Lantana camara* followed by *Ricinus communis, Calotropis gigantea* and *Jatropha curcas*. Among the herbaceous flora *Tridex procumbens* dominated the study area followed by *Argemone mexicana* and *Achyranthus aspera* and *Parthenium hysterophorasis*.

None of the species of trees, shrubs and herbs falls under category of Rare, Endangered or Threatened (RET) as per Red Data List for Flora of India. No impact of the proposed FCTP Project related activity is likely to impact the study area.

3.1.6 Avenue Plantation

Besides the quadrate sampling various other species were observed to be planted all along the major roads as avenue plantation which includes native as well as exotic species mainly of *Albizia lebbek*, *Anthocephalaus cadamba*, *Bauhinia variegata*, *Bauhinia purpurea*, *Bombax malabaricum*, *Brassaia actinophylla*, *Butea frondosa*, *Callistemon lanceolatus*, *Careya arborea*, *Cassia fistula*, *Cassia*

spectabilis, *Delonix regia*, *Erythrina indica*, *Gliricidia sepium*, *Grevillea robusta*, *Jacaranda mimosaefolia*, *Lagerstroemia flos-reginae* and *Peltophorum pterocarpum*.

Maps showing vegetation in 10 km radius map at **Figure 3.4.**

Figure 3.4 Forest and Vegetation in the 10 km Study Area

3.1.7 Aquatic flora

Aquatic flora was enumerated qualitatively. Six water bodies (Pond s) adjacent to SRR Campus, were surveyed and based on that aquatic flora was enumerated given in ***Table 3.5.***

Table 3.5 Aquatic weed flora in the Study Area

S.N.	Botanical Name	Common Name
1.	*Eichhornia crassipes*	Water Hyacinth
2.	*Typha latifolia*	Broadleaf Cattail
3.	*Cyprus rotundus*	Java Grass
4.	*Chara vulgaris*	-
5.	*Hydrilla verticillata*	Esthwaite Waterweed
6.	*Nymphaea stellata*	Red and blue water lily
7.	*Nelumbo nucifera*	Indian lotus
8.	*Nymphoides hydrophylla*	-
9.	*Vallisnaria americana*	Wild Celery
10.	*Potamogeton crispus*	Curly Leaf Pond Weed
11.	*Najas* spp.	-
12.	*Ipomea aquatica*	Water Morning Glory
13.	*Salvinia molesta*	Common Duckweed
14.	*Phragmites* spp.	Reeds
15.	*Lemna minor*	Duckweed
16.	*Sagittaria guayanensis*	Arrowhead
17.	*Spirodela polyrhiza*	-
18.	*Polygonum glabrum*	Denseflower Knotweed
19.	*Sphaeranthus indicus*	-
20.	*Alternanthera philoxeroides*	Alligator weed
21.	*Nymphoides indica*	Water snowflake
22.	*Utricularia gibba*	Floating Bladderwort
23.	*Centella asiatica*	Centella

3.2 WILL THE CONSTRUCTION INVOLVE EXTENSIVE CLEARING OR MODIFICATION OF VEGETATION? (PROVIDE A DETAILED ACCOUNT OF THE TREES & VEGETATION AFFECTED BY THE PROJECT)

The proposed FCTP Project foot print is spread over an area of 14,900 m^2 compared to the entire project area of 17.28 ha comprising SRR-1, SRR-2, and SRR-K buildings, and under construction area for SRR-3. The proposed MLCP Project site comprises of open surface parking with landscape area having trees, shrubs and herbs. Dominant shrubs and herbs present at the MLCP Project site include *Ricinum communis, Solanum nigerum, Argemone Mexicana, Euphorbia hirta, Parthenium hysterophorous, and Achyranthus aspera*. The dominant tree vegetation of the MLCP Project site comprises of *Variegata Tabebuia impetiginosa, Roystonea, Tamarindus indica, Albizia saman, Calliandra, Ficus elastic, Millettia pinnata, Tabubia chrisotricha*. A total of 148 individuals (> 30 cm GBH) of 9 species and 58 individuals of 5 species of < 30 cm of tree form were recorded.

The existing landscaped area within existing SRR 1 and 2 and SRR-K buildings in SRR Campus is 31,840 m² (31.85%) and with the under construction SRR-3 and proposed MLCP Project, the total landscape area would be 63,469 m² (37.19%) of total area.

3.3 *WHAT ARE THE MEASURES PROPOSED TO BE TAKEN TO MINIMIZE THE LIKELY IMPACTS ON IMPORTANT SITE FEATURES (GIVE PROPOSAL FOR TREE PLANTATION, LANDSCAPING, CREATION OF WATER BODIES ETC ALONG WITH A LAYOUT PLAN TO AN APPROPRIATE SCALE)*

The entire SRR Campus (including SRR-1, SRR-2, SRR-K and under construction SRR-3) is being planned with an organized open and green area. The total project is developed with about 37.19% of the total site area designated for landscaping & greenbelt. An indicative list of trees that can be planted is included in ***Table 3.7.***

Green Belt and Landscaping Plan

The existing practice as applied for SRR-1 and SRR-2 campus shall be followed for the SRR-3 campus. The plantation detail for the SRR-1 and SRR-2 campus is given in ***Table 3.6.***

Table 3.6 Plantation Details for SRR-1 and SRR-2 Campus

S.N.	Tree Names	Family	SRR-1 Building	SRR-2 Building
			Individuals	
1	*Magnolia champaca*	Magnoliaceae	21	0
2	*Spathodea campanulata*	Bignoniaceae	16	1
3	*Terminalia catappa*	Combretaceae	1	0
4	-	*Putosparma*	18	0
5	*Ficus religiosa*	Moraceae	11	1
6	*Ficus benjamina*	Moraceae	28	9
7	*Roystonea regia*	Arecaceae	34	1
8	*Cordia sebestena*	Boraginaceae	24	0
9	*Delonix regia*	Fabaceae	2	2
10	*Plumeria rubra*	Apocynaceae	5	6
11	*Bauhinia variegate*	Fabaceae	3	81
12	*Callistemon viminalis*	Myrtaceae	2	35
13	*Acacia auriculiformis*	Fabaceae	4	0
14	*Lagerstroemia speciosa*	Lythraceae	17	0
15	*Millettia pinnata*	Fabaceae	57	11
16	*Caesalpinia pulcherrima*	Caesalpiniaceae	2	0
17	*Ficus elastica*	Moraceae	1	0
18	*Cassia fistula*	Fabaceae	1	0
19	*Psidium guajava*	Myrtaceae	1	0
20	*Tabebuia impetiginosa*	Bignoniaceae	8	0
21	*Albizia saman*	Fabaceae	2	15
22	*Tecoma stans*	Bignoniaceae	32	3
23	*Cassia javanica*	Fabaceae	31	0

S.N.	Tree Names	Family	SRR-1 Building	SRR-2 Building
			Individuals	
24	*Peltophorum pterocarpum*	Fabaceae	37	16
25	*Polyalthia longifolia*	Annonaceae	6	0
26	*Dracaena reflexa var. angustifolia*	Asparagaceae	6	0
27	*Phoenix sylvestris*	Arecaceae	13	1
28	*Jacaranda mimosifolia*	Bignoniaceae	9	0
29	*Millingtonia hortensis*	Bignoniaceae	13	0
30	*Azadirachta indica*	Meliaceae	1	0
31	*Tabebuia rosea*	Bignoniaceae	1	26
32	*Trevesia palmata*	Araliaceae	61	0
33	*Nyctanthes arbortristics*	Oleaceae	14	0
34	*Chamaecyparis lawsoniana*	Cupressaceae	12	8
35	*Areca catechu*	Arecaceae	10	1
36	*Casuarina equisetifolia*	Casuarinaceae	23	0
37	*Swietenia mahagoni*	Meliaceae	0	2
38	*Ficus aurea*	Moraceae	0	1
39	*Schefflera actinophylla*	Araliaceae	0	1
40	*Tamarindus indica*	Fabaceae	0	1
41	*Ficus benghalensis*	Moraceae	0	1
			527	**223**
				750

Source: Intel

Green belt and landscape development plan is suggested to increase the vegetation cover in the SRR-3 campus with plantation of native species is suggested. List of proposed indicative species and their numbers is given below in ***Table 3.7***.

Table 3.7 Tree species proposed for Greenbelt and Landscaping in SRR-3 Building under Construction area.

Botanical Name	Common Name	Flowering Season	Height (m)	Crown Shape	Category	No. of Individuals
Albizia lebbeck	Woman's Tongue Tree	April - May	20	Round/Spreading	Tree	30
Anthocephalus chinensis	Common bur-flower	October to July	20	Spreading	Tree	30
Bauhinia variegata	Variegated Bauhinia	Feb.-April	5	Oblong	Tree	30
Bauhinia purpurea	Purple Bauhinia	June-October	5	Oblong	Tree	30
Butea monosperma	Flame of the Forest	January - March	10	Oblong/Ovoid	Tree	40
Callistemon lanceolatus	Bottle Brush	February – May; October	5	Conical	Tree	40
Careya arborea	Slow Match Tree	March - April	15	Round	Tree	30
Cassia fistula	Golden Shower	February - March	12	Round	Tree	40

Botanical Name	Common Name	Flowering Season	Height (m)	Crown Shape	Category	No. of Individuals
Cassia javanica	Java Cassia	April – May	12	Round	Tree	30
Cassia spectabilis	Golden Cassia	September - November	12	Round	Tree	30
Cochlospermum gossypium	Yellow Silk Cotton	February - March	5	Oblong/Ovoid	Tree	30
Cordia sebestena	Scarlet Sebesten	Throughout the year	8	Round	Tree	30
Colvillea racemosa	Colville's Glory	August - October	15	Round	Tree	40
Delonix regia	Gulmohur	March-May	15	Spreading/ Flat topped	Tree	40
Erythrina variegata	Indian Coral Tree	February - March	10	Oblong	Tree	30
Grevillea robusta	Silver Oak	February - March	20	Oblong	Tree	30
Jacaranda mimosaefolia	Jacaranda	February-March	10	Round	Tree	30
Lagerstroemia flos-reginae	Queen's Flower	March - May	10	Oblong	Tree	30
Madhuca longifolia	The Butter Tree	Feb-April	15	Round/Oblong	Tree	30
Peltophorum pterocarpum	Copper Pod	March - September	15	Round/Oblong	Tree	30
Plumeria rubra	Temple Tree	February to October	8	Round/Oblong	Tree	30
Polyalthia longifolia	Mast Tree	March - May	15	Conical/Rounded	Tree	30
Pterospermum acerifolium	Dinner Plate Tree	February – March	30	Round	Tree	40
Santalum album	Sandal Wood Tree	Throughout the year	10	Round	Tree	30
Saraca asoca	Ashoka Tree	Throughout the year	5	Spreading	Tree	30
Terminalia arjuna	Arjun	-	15	Oblong/Round	Tree	30
Total						840

Landscape plan for the SRR-Campus with Building under construction and proposed MLCP Project is provided in ***Figure 3.5.*** No further addition of Landscape are planned to be undertaken for proposed development.

Figure 3.5 Landscape and Green Belt Plan

Source: Intel

Approach and Methodology

The area around project site at SRR campus was found rapid urbanization; the area is highly modified and disturbed as lots of construction activity was undertaken in the area. Isolated patches of vegetation around the lakes and plantation areas were covered in order to establish the baseline. Faunal species in the study area were enumerated based on visual observation and indirect evidences such as pug marks, scats, reports from local residents. Based on direct and indirect evidences list of fauna in the SRR Campus surrounding study area were enlisted. The locations of the assessment predominantly concentrated in the habitats surveyed as part of floral assessment as described in ***Table 3.1***. Secondary information was also collected based on review of published literature, past studies and discussions with wildlife experts working in Bangalore and surrounding areas in the past.

Herpetofauna

Intensive search was made along the hedges of all the aquatic habitats open wells located in the study area to identify and list the amphibians. Status of reptiles was assessed using Intensive Time Constrained Search Methods [(1) (2)] covering different micro habitats surveyed within the core and buffer zones of the study site.

Avifauna and Aquatic Birds

Avifauna and aquatic birds were enumerated by habitat surveys at the sample plots. Avian nomenclature was established using Standard Field Guide [(3)].

Mammals

Habitat survey for presence of mammals was established using standard literature. [(4)(5)]

Secondary literature from published books and research publications were also consulted for the flora and fauna of the study area. The enumerated list of faunal species is compared with species listed in IUCN Red Data List and

(1) Welsh, H.H., jr. 1987. Monitoring herpetofauna in woodlands of north western California and south west Oregon: a comparative strategy. Pp. 203-213. In. Multiple – Use Management of Califirnia's hardwood resources. T.R. Plumb, N.H. Pillisbury (eds. Gen. Tech. Regional Environmental Planning. PSW – 100) US Department of Agriculture, Forest Service.

(2)Welsh, H.H. Jr. and Lind, A. 1991. The structure of the herpetofaunal assemblage in the Douglas-fir/hardwood forests of northwestern California and south western Oregon. Pp: 395-411. In: Wildlife and vegetation of unmanaged Douglas-fir forests. (Tech.Coords). L.F. Ruggiero, K.B. Aubry, A.B. Carey and M.H. Huff. Ge. Tech. Rep. PNW-GTR-285. Portland, OR: US. Department of Agriculture, Forest Service.

(3) Birds of India, Srilanka, Pakistan, Nepal, Bhutan, Bangladesh and Maldives. 2000. Krys Kazmeierczak and Ber Van `Perlo. Om Field Guides

(4) Prater. S. H. 2005. The Book of Indian Animals. Bombay Natural History Society and Oxford University press 12th Edn. pp. 316.

(5) Menon, V. 2003. A field guide to Indian Mammals. Dorling Kindersley (India) Ltd. New Delhi. 201 p.

species listed in schedule 1to 6 of Wildlife Protection Act, 1972 to confirm their conservation status.

4.1.2 *Faunal Species observed at the Proposed Project Site*

The mammalian fauna observed at the project site has Five Striped Palm Squirrel (*Funambulus pennantii*).

The common avifauna such as Jungle Myna (*Acridotheres fuscus*), , Red Vented Bulbul (*Pycnonotus cafer*), Red Whiskered Bulbul (*Pycnonotus jocosus*) and Purple-rumped Sunbird (*Leptocoma zeylonica*) were observed visiting the SRR Campus.

The common herpetofauna observed at the project site was Oriental Garden Lizard (*Calotes vesicular*).

4.1.3 *Fauna in the Study Area*

The faunal species observed /reported from the study area include the following:

Herpetofauna

The herpetofauna (amphibians and reptiles) was surveyed in different habitats such as water-bodies, reserve forest areas and plantations areas.

Amphibians

Four (04) species of 03 genera belonging to two (02) families was observed in the study area. Southern Hill Toad (*Duttaphrynus microtympanum)* is listed as vulnerable as per IUCN Red Data List category. None of the species is listed in the Wildlife Protected Act, 1972 for their conservation status. Biodiversity aspects of Amphibians in the study area is given below in ***Table 4.1***

Table 4.1 ***Biodiversity aspects of Amphibians in the Study Area***

Common Name	**Zoological Name**	**Family**	**Occurrence**	**WPA Schedule / IUCN Status**
Southern Hill Toad	*Duttaphrynus microtympanum*	Bufonidae	Rare	- / VU
Common Indian Toad	*Duttaphrynus melanostictus*	Bufonidae	Common	-/ LC
Painted Frog	*Kaloula pulchra*	Microhylidae	Common	-/ LC
Marbled Baloon Frog	*Uperodon systoma*	Microhylidae	Common	-/-

Note: VU-Vulnerable, LC-Least Concern

Reptiles

Sixteen (16) species of sixteen (16) genera belonging to seven (07) families were observed from the study area. Russell's Viper (*Daboia russelii*),

Indian Cobra (*Naja naja*), Checkered keelback (*Xenochrophis piscator*), Rat Snake (*Ptyas mucosa*) and Indian Monitor Lizard (*Varanus benghalensis*) were listed as Sch.II species as per Wildlife Protected Act, 1972 were observed in Reserve Forest near Kadugodi Industrial Area. None of the species were listed as threatened as per IUCN Red Data List category. Biodiversity aspects of Reptiles in the study area is given below in ***Table 4.2***

Table 4.2 Biodiversity aspects of Reptiles in the Study Area

Common Name	Zoological Name	Family	Occurrence	WPA Schedule /IUCN Status
Saw Scaled Viper	*Echis carinatus*	Viperidae	Rare	-/-
Russell's Viper	*Daboia russelii*	Viperidae	Rare	Sch.II/-
Common Krait	*Bungarus caeruleus*	Elapidae	Moderate	Sch.IV/-
Indian Cobra	*Naja naja*	Elapidae	Moderate	Sch.II/-
Checkered keelback	*Xenochrophis piscator*	Colubridae	Moderate	Sch.II/-
Rat Snake	*Ptyas mucosa*	Colubridae	Moderate	Sch.II/-
Buffstriped Keelback	*Amphiesma stolatum*	Colubridae	Moderate	Sch.IV/-
Wolf Snake	*Lycodon capucinus*	Colubridae	Moderate	Sch.IV/-
Vine Snake	*Ahaetulla nasuta*	Colubridae	Moderate	Sch.IV/-
Common Kukri	*Oligodon arnensis*	Colubridae	Moderate	Sch.IV/-
Trinket Snake	*Coelognathus helena helena*	Colubridae	Moderate	Sch.IV/-
Blind Snake	*Ramphotyphlops braminus*	Typhlopidae	Moderate	Sch.IV/-
Spotted House Gecko	*Hemidactylus maculatus*	Gekkonidae	Common	-/-
Indian Monitor Lizard	*Varanus benghalensis*	Varanidae	Rare	Sch.II / LC
Oriental Garden Lizard	*Calotes versicolor*	Agamidae	Common	-/-
South Indian Rock Agama	*Psammophilus dorsalis*	Agamidae	Rare	-/-

Note: LC-Least Concern

Avifauna

Fifty Five (55) species were observed from the study area. One (01) species were recorded as winter visitor while fifty one (51) species have been reported as resident. Three (03) species namely Spot-billed Pelican (*Pelecanus philippensis*), Painted Stork (*Mycteria leucocephala*) and Oriental Darter (*Anhinga melanogaster*) were listed as Near Threatened as per IUCN Red Data List category. Brahminy Kite (*Haliastur indus*) and Black Kite (*Milvus migrans)* are listed as Schedule I species of Indian Wildlife Protection Act, 1972. All the species were listed in schedule IV of the Wildlife Protected Act, 1972. Biodiversity aspects of Avifauna in the study area is given below in ***Table 4.3*** and shown in ***Figure 4.1.***

Table 4.3 Biodiversity aspects of Avifauna in the Study Area

Sn	Common Name	Scientific Name	Family	Migratory Status	IUCN Status/WPA Schedule
1	Ashy Prinia	*Prinia socialis*	Cisticolidae	R	Sch.IV/LC
2	Asian Koel	*Eudynamys scolopaceus*	Cuculidae	R	Sch.IV/LC
3	Asian Openbill	*Anastomus oscitans*	Ciconiidae	R	Sch.IV/LC

Sn	Common Name	Scientific Name	Family	Migratory Status	IUCN Status/WPA Schedule
4	Red Napped Ibis	*Pseudibis papillosa*	Threskiornithidae	R	Sch.IV/LC
5	Black Headed Ibis	*Threskiornis melanocephalus*	Threskiornithidae	R	Sch.IV/NT
6	Black Shouldered Kite	*Elanus axillaris*	Accipitridae	R	Sch.IV/LC
7	Blue Rock Pigeon	*Columba livia*	Columbidae	R	Sch.IV/LC
8	Blue Tailed Beeeater	*Merops philippinus*	Meropidae	R	Sch.IV/LC
9	Brahminy Kite	*Haliastur indus*	Accipitridae	R	Sch.I/LC
10	Cattle Egret	*Bubulcus ibis*	Ardeidae	R	Sch.IV/LC
11	Common Coot	*Fulica atra*	Rallidae	WV	Sch.IV/LC
12	Common Kingfisher	*Alcedo atthis*	Alcedinidae	R	Sch.IV/LC
13	Common Moorhen	*Gallinula chloropus*	Rallidae	R	Sch.IV/LC
14	Common Myna	*Acridotheres tristis*	Sturnidae	R	Sch.IV/LC
15	Oriental Darter	*Anhinga melanogaster*	Anhingidae	R	Sch.IV / NT
16	Greater Coucal	*Centropus sinensis*	Cuculidae	R	Sch.IV/LC
17	Grey Francolin	*Francolinus pondicerianus*	Phasianidae	R	Sch.IV/LC
18	Grey Heron	*Ardea cinerea*	Ardeidae	R	Sch.IV/LC
19	House Crow	*Corvus splendens*	Corvidae	R	Sch.IV/LC
20	House Sparrow	*Passer domesticus*	Passeridae	R	Sch.IV/LC
21	Indian Pond Heron	*Ardeola grayii*	Ardeidae	R	Sch.IV/LC
22	Indian Robin	*Saxicoloides fulicatus*	Muscicapidae	R	Sch.IV/LC
23	Intermediate Egret	*Mesophoyx intermedia*	Ardeidae	R	Sch.IV/LC
24	Jungle Myna	*Acridotheres fuscus*	Sturnidae	R	Sch.IV/LC
25	Jungle Babler	*Turdoides striata*	Leiothrichidae	R	Sch.IV/LC
26	Lesser Whistling Duck	*Dendrocygna javanica*	Anatidae	R	Sch.IV/LC
27	Little Cormorant	*Microcarbo niger*	Phalacrocoracidae	R	Sch.IV/LC
28	Little Egret	*Egretta garzetta*	Ardeidae	R	Sch.IV/LC
29	Little Grebe	*Tachybaptus ruficollis*	Podicipedidae	R	Sch.IV/LC
30	Green Bee-eater	*Merops orientalis*	Meropidae	R	Sch.IV/LC
31	Indian Pond Heron	*Ardeola grayii*	Ardeidae	R	Sch.IV/LC
32	Night Heron	*Nyctiothorax nyctiothorax*	Ardeidae	R	Sch.IV/LC
33	Paddy-field Pipit	*Anthus rufulus*	Motacillidae	R	Sch.IV/LC
34	Painted Stork	*Mycteria leucocephala*	Ciconiidae	R	Sch.IV / NT
35	Asian Palm Swift	*Cypsiurus balasiensis*	Apodidae	R	Sch.IV/LC
36	Pariah / Black Kite	*Milvus migrans*	Accipitridae	R	Sch.I/LC
37	Pied Bushchat	*Saxicola caprata*	Muscicapidae	R	Sch.IV/LC
38	Pied Kingfisher	*Ceryle rudis*	Cerylidae	R	Sch.IV/LC
39	Purple Heron	*Ardea purpurea*	Ardeidae	R	Sch.IV/LC
40	Purple-rumped Sunbird	*Leptocoma zeylonica*	Nectariniidae	R	Sch.IV/LC
41	Purple Sunbird	*Cinnyris asiaticus*	Nectariniidae	R	Sch.IV/LC
42	Purple Swamphen	*Porphyrio porphyrio*	Rallidae	R	Sch.IV/LC
43	Red-vented Bulbul	*Pycnonotus cafer*	Pycnonotidae	R	Sch.IV/LC
44	Red-watted Lapwing	*Vanellus indicus*	Charadriidae	R	Sch.IV/LC
45	Red-whiskered Bulbul	*Pycnonotus jocosus*	Pycnonotidae	R	Sch.IV/LC
46	Rose-ringed Parakeet	*Psittacula krameri*	Psittaculidae	R	Sch.IV/LC
47	Shikra	*Accipiter badius*	Accipitridae	R	Sch.IV/LC
48	Spot-billed Duck	*Anas poecilorhyncha*	Anatidae	R	Sch.IV/LC
49	Spot-billed Pelican	*Pelecanus philippensis*	Pelecanidae	R	Sch.IV / NT
50	Spotted Dove	*Spilopelia chinensis*	Columbidae	R	Sch.IV/LC
51	Spotted Owlets	*Athene brama*	Strigidae	R	Sch.IV/LC
52	White–breasted Waterhen	*Amaurornis phoenicurus*	Rallidae	R	Sch.IV/LC
53	White-browed Wagtail	*Motacilla maderaspatensis*	Motacillidae	R	Sch.IV/LC
54	White-cheeked Barbet	*Megalaima viridis*	Megalaimidae	R	Sch.IV/LC
55	White-throated Kingfisher	*Halcyon smyrnensis*	Halcyonidae	R	Sch.IV/LC

Note: NT-Near Threatened, LC-Least Concern, R-Resident, WV-Winter Visitor,

Figure 4.1 Avifaunal species observed in Study Area


Purple Heron


Spot billed Duck


Common Coot

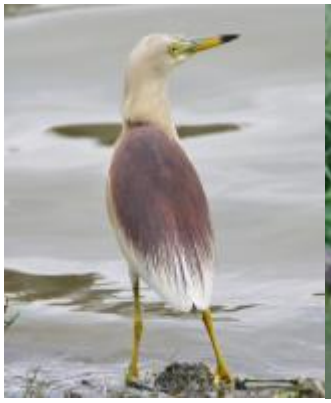

Little Grebe


Purple Swamphen


White Throated Kingfisher

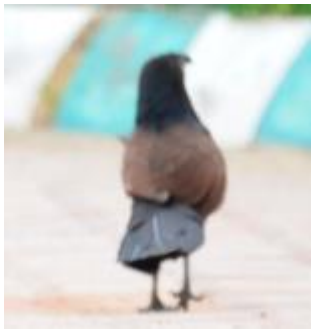

Oriental Darter


Grey Heron


Indian Pond Heron


Black headed Ibis


Little Cormorant


Greater Caoucal


Green Bee-eater


Red Whiskered Bulbul

White cheeked Barbet

Spotted Dove

Spot Billed Pelican

Brahminy Kite

Black Kite

Source: ERM Survey 10th to 13th August 2015

Mammals

A total of nine (09) species of nine (09) genera belonging to eight (08) families were observed from the study area. All the nine species were listed as least concern as per IUCN Red Data List category. Out of the nine species Golden Jackal (*Canis aureus*) and Indian Crested Porcupine (*Hystrix indica*)observed near Gunjur Lake, Bonnet Macaque (*Macaca radiate*) and Common Langur (*Semnopithecus entellus*) observed near *Eucalyptus* plantation south east of project site were listed in Schedule II of the Wildlife Protected Act, 1972. Biodiversity aspects of mammals in the study area are given below in ***Table 4.4.***

Table 4.4 Biodiversity aspects of Mammals in the Study Area

Common Name	**Scientific Name**	**Family**	**WPA Schedule / IUCNStatus**
Black Naped Hare	*Lepus nigricollis*	Leporidae	Sch.IV / LC
Golden Jackal	*Canis aureus*	Canidae	Sch.II / LC
Bonnet Macaque	*Macaca radiata*	Cercopithecidae	Sch.II / LC
Small Indian Mongoose	*Herpestes auropunctatus*	Herpestidae	Sch.IV / LC
Three Striped Palm Squirrel	*Funambulus palmarum*	Sciuridae	-/ LC
House Shrew	*Suncus murinus*	Soricidae	Sch.V / LC
Fruit bat	*Rousettus leschenaultii*	Pteropodidae	Sch.V / LC
Common langur	*Semnopithecus entellus*	Cercopithecidae	Sch. II / LC
Indian Crested Porcupine	*Hystrix indica*	Hystricidae	Sch. II / LC

Note: LC-Least Concern

4.2 ANY DIRECT OR INDIRECT IMPACTS ON THE AVIFAUNA OF THE AREA? PROVIDE DETAILS.

A minor impact on the avifauna is expected due to the increase in ambient noise during construction of the MLCP Project. There will be a temporary loss of habitat for small mammals and birds during construction period. The list of avifaunal species found in the study area of 10 km radius is given in ***Table 4.5.***

The Proposed Project is being planned with organized open and green areas. The Project will be developed with about 37.19% of the area under landscaping and greenbelt. In long term, the proposed plantation will attracts the avifauna of the area by providing nesting and roosting sites.

4.3 PRESCRIBE MEASURES SUCH AS CORRIDORS, FISH LADDERS ETC. TO MITIGATE ADVERSE IMPACTS ON FAUNA

No water body is available within SRR Campus. The nearest water body to the MLCP Project site is at Deverabeesanahalli Lake located at 85 m to the east of the site. In absence of any significant terrestrial and aquatic fauna in the Project site, no specific mitigation measures such as corridors, fish ladders etc. are required to mitigate adverse impacts on fauna. However, mitigation measures as suggested to control pollution due to construction and operation of MLCP Building Project such as treatment of sewage, management of solid waste etc. are necessary to be implemented to minimize potential impacts on water bodies and related fauna of the area.

5 AIR ENVIRONMENT

5.1 WILL THE PROJECT INCREASE ATMOSPHERIC CONCENTRATION OF GASES & RESULT IN HEAT ISLANDS? (GIVE DETAILS OF BACKGROUND AIR QUALITY LEVELS WITH PREDICTED VALUES BASED ON DISPERSION MODELS TAKING INTO ACCOUNT THE INCREASED TRAFFIC GENERATION AS A RESULT OF THE PROPOSED CONSTRUCTIONS)

The prevailing ambient air quality and increase in atmospheric concentration of ambient air quality is predicted using AERMOD View 6.7 model are defined in the following subsections:

5.1.1 Ambient Air Quality

The prevailing ambient air quality is included as following:

- Intel collected ambient air quality monitoring for the period during March to June 2015; and
- AAQ monitoring conducted by ERM through Avon Food Lab for the period from Ambient Air Quality within Project site of SRR-3 and surrounding area for the period from March to May 2013.

The ambient air quality monitored conducted by Intel as part of EMP monitoring plan of under SRR-3 Building under construction at 4 locations within and surrounding the SRR Campus is as per ***Table 5.1*** while the AAQ collected earlier during March – May 2013 for approval of SRR – Building is given in ***Table 5.2***.

Table 5.1 Ambient Air Quality Monitoring during March to June 2015

Parameters	Unit		AAQ-1	AAQ-2	AAQ-3	AAQ-4
PM_{10}	µg/m³	Range	65.4 - 70.6	61.4 - 65.4	60.5 - 67.0	65.4 - 76.3
		Average	67.9	63.3	62.5	72.0
		98 Percentile	70.5	65.4	66.8	76.2
		NAAQS	**100**	**100**	**100**	**100**
$PM_{2.5}$	µg/m³	Range	22.0 - 31.0	27.4 - 33.6	20.1 - 26.9	29.6 - 35.8
		Average	27.1	30.2	24.2	33.0
		98 Percentile	30.9	33.4	26.8	35.7
		NAAQS	**60**	**60**	**60**	**60**
SO_2	µg/m³	Range	6.1 - 6.9	7.6 - 9.0	7.2 - 8.7	6.9 - 8.0
		Average	6.5	8.4	8.0	7.3
		98 Percentile	6.9	9.0	8.7	7.9
		NAAQS	**80**	**80**	**80**	**80**
NOX	µg/m³	Range	10.3 - 12.0	12.1 - 15.0	11.0 - 13.5	12.4 - 15.8
		Average	11.1	13.3	11.9	13.8
		98 Percentile	12.0	15.0	13.4	15.7
		NAAQS	**80**	**80**	**80**	**80**

Source: Intel; Note: The locations AAQ 1 = SRR Campus (at 12°55'24.42"N; 77°41'5.15"E); AAQ2 = SRR Campus (at 12°55'31.27"N; 77°41'5.49"E), AAQ 3 = Near Adarsh Palm Layout 0.35 km towards SE (at 12°55'17.14"N; 77°41'17.70"E); AAQ 4 = Near Honeywell building at 50 m towards E (at 12°55'29.79"N; 77°41'10.08"E)

Table 5.2 Ambient Air Quality Monitoring Results during March – May 2013

Parameters		AQ-1	AQ-2	AQ-3	AQ-4	AQ-5	AQ-6
		SRR Campus 12°55'31.56"N 77°41'5.34"E -	**Bellandur** 12°55'27.24"N 77°40'41.88"E (0.65km to W)	**Kaikon-drahalli** 12°54'46.08"N 77°40'39.90"E (1.4km to SW)	**Doddakanahalli** 12°54'24.30"N 77°41'42.34"E (2.3km to SE)	**Adarsh Palm Retreat** 12°55'6.78"N 77°41'53.22"E (1.7km to E)	**Kadubeesana halli** 12°56'20.16"N 77°41'51.78"E (2.3km to NE)
PM_{10} µg/m³	Range	54.6 - 76.2	44.4 – 69	52.2 - 68.6	53.4 - 70.2	55.6 – 72	46.8 - 63.6
	Average	63.5	55.5	61.3	65.6	65.6	55.8
	95 Percentile	70.7	67.6	67.5	69.8	70.3	62.7
	98 Percentile	74.0	68.4	68.1	70.0	71.3	63.2
	NAAQS	**100**	**100**	**100**	**100**	**100**	**100**
$PM_{2.5}$ µg/m³	Range	29.0 - 47.4	22.8 - 41.4	25.8 - 42.6	30.2 - 43.4	30.2 – 45.0	24.6 - 41.4
	Average	36.81	31.42	34.96	36.33	38.05	31.98
	95 Percentile	42.84	39.69	41.46	42.64	44.62	40.26
	98 Percentile	45.57	40.72	42.14	43.09	44.84	40.94
	NAAQS	**60**	**60**	**60**	**60**	**60**	**60**
SO_2, µg/m³	Range	6.2 - 14.7	4.3 – 8.5	5.27 - 12.6	5.8- 15.3	7.5 - 19.4	4.9 - 9.7
	Average	9.5	5.9	8.3	8.9	13.9	6.8
	95 Percentile	14.5	8.0	11.9	13.9	19.3	9.4
	98 Percentile	14.6	8.3	12.3	14.7	19.4	9.6
	NAAQS	**80**	**80**	**80**	**80**	**80**	**80**
NOx, µg/m³	Range	16.4 - 27.3	11.6 - 22.7	17.9 - 26.7	16.2 - 29.8	16.9 - 32.5	14.8 - 21.6
	Average	21.7	17.5	22.0	22.6	23.8	18.5
	95 Percentile	26.5	21.4	25.7	27.5	27.8	21.6
	98 Percentile	27.0	22.2	26.3	28.9	30.6	21.6
	NAAQS	**80**	**80**	**80**	**80**	**80**	**80**
CO, mg/m³	Range	0.439-0.599	0.387-0.593	0.397-0.578	0.424-0.595	0.439-0.589	0.417-0.596
	Average	0.508	0.480	0.483	0.512	0.520	0.503
	95 Percentile	0.570	0.555	0.572	0.593	0.575	0.574
	98 Percentile	0.587	0.578	0.576	0.594	0.583	0.587
	NAAQS	**2**	**2**	**2**	**2**	**2**	**2**
HC (as CH_4) ppm	Range	0.021- 0.036	0.009-0.019	0.017-0.081	0.015-0.028	0.006-0.037	0.014-0.038
	Average	0.027	0.015	0.029	0.022	0.023	0.026
	95 Percentile	0.035	0.018	0.058	0.027	0.037	0.036
	98 Percentile	0.035	0.019	0.072	0.028	0.037	0.037
Non CH_4 NMHC ppm	Range	0.013-0.027	0.006-0.006	0.010 - 0.017	0.012- 0.019	0.007- 0.022	0.007- 0.022
	Average	0.018	0.006	0.013	0.016	0.016	0.015
	95 Percentile	0.026	0.007	0.017	0.019	0.022	0.021
	98 Percentile	0.026	0.007	0.017	0.019	0.022	0.022

Source: ERM collected baseline through Avon Food Lab, March – May 2013 for Intel

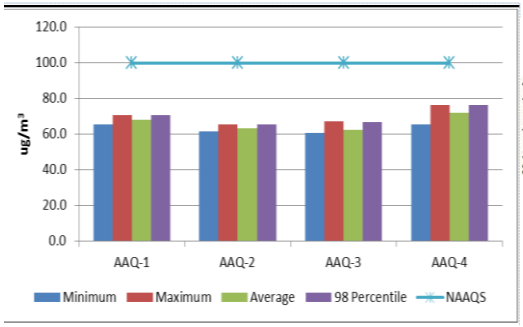
A description of observed AAQ is described as following:

PM_{10}

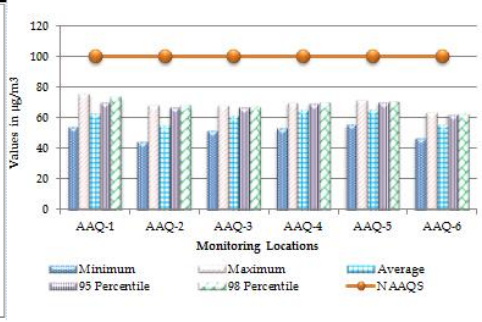
March – June 2015: The monitored average PM_{10} concentration varied from 62.5 µg/m³ to 72.0µg/m³. The monitoring location AAQ-3 Residential area was observed with minimum concentration (60.5 µg/m³), the maximum was observed at AAQ4 –near Honeywell (of 76.3 µg/m³). The 98 percentile concentration of PM_{10} at all the monitoring locations was observed to be within the prescribed NAAQS limits for industrial, residential, rural and other areas (of 100µg/m³).

March – May 2013: The monitored average PM_{10} concentration varied from 55.8µg/m³ to 65.6µg/m³. The monitoring location AAQ2 (Bellandur) observed the minimum PM_{10} concentration (of 44.4µg/m³), whereas the maximum was observed at AAQ 1, at Project Site (of 76.2µg/m³). The 98 percentile concentration of PM_{10} at all the monitoring locations was observed to be within the prescribed NAAQS limits for industrial, residential, rural and other areas (of 100µg/m³).

Figure 5.1 ***Graphical Representation PM10***



March – June 2015



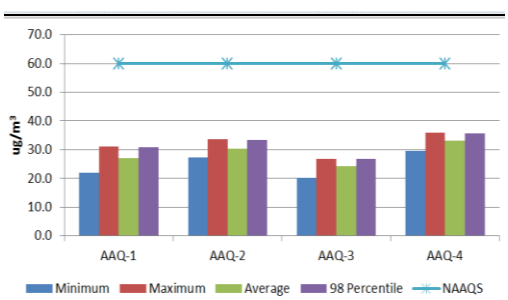
March – May 2013

$PM_{2.5}$

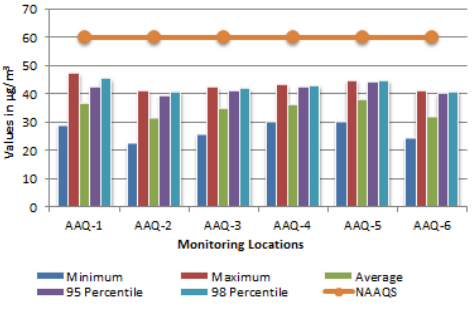
March – June 2015: The monitored average $PM_{2.5}$ concentration varied from 24.2 µg/m³ to 33.0µg/m³. The monitoring location AAQ-3 Residential area was observed with minimum concentration (20.1 µg/m³), the maximum was observed at AAQ4 –near Honeywell (of 35.8 µg/m³).. The 98 percentile concentration of $PM_{2.5}$ at all the monitoring locations was observed to be within the prescribed NAAQS limits for industrial, residential, rural and other areas (of 60µg/m³).

March – May 2013: The monitored average $PM_{2.5}$ concentration varied from 31.42µg/m³ to 38.05µg/m³. The monitoring location AAQ-2 (Bellandur) observed the minimum $PM_{2.5}$ concentration (of 22.8µg/m³), whereas the maximum was observed at AAQ 2, at Project Site (of 47.4µg/m³). The 98 percentile concentration of $PM_{2.5}$ at all the monitoring locations was observed to be within the prescribed NAAQS limits for industrial, residential, rural and other areas (of 60µg/m³).

Figure 5.2 ***Graphical Representation of PM2.5***



March – June 2015



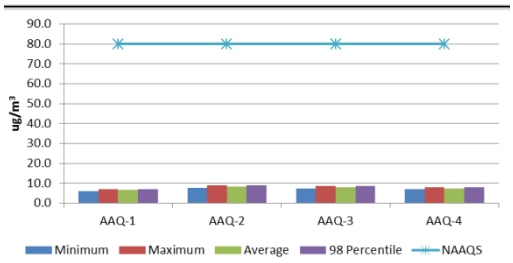
March – May 2013

Sulphur di-Oxide (SO_2)

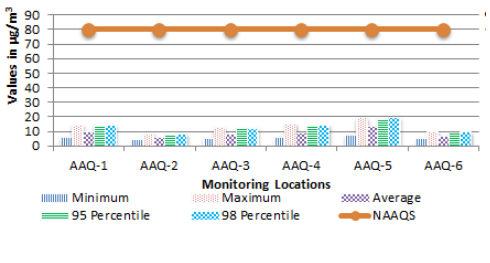
March – June 2015: The monitored average SO_2 concentration varied 6.5µg/m³ to 8.4 µg/m³. The monitoring location AAQ-1 (Industrial) observed the minimum SO_2 concentration (of 6.1 µg/m³) whereas the maximum concentration was observed at AAQ -2 Commercial (of 9.0µg/m³). The 98 percentile concentration of SO_2 at all the monitoring locations was observed to be below the prescribed NAAQS limits for industrial, residential, rural and other areas (of 80µg/m³).

March – May 2013: The monitored average SO_2 concentration varied from 5.9µg/m³ to 13.9µg/m³. The monitoring location AAQ-2 (Bellandur) observed the minimum SO_2 concentration (of 4.3µg/m³) whereas the maximum concentration was observed at AAQ -5 Adarsh Palm Layout (of 19.4µg/m³). The 98 percentile concentration of SO_2 at all the monitoring locations was observed to be below the prescribed NAAQS limits for industrial, residential, rural and other areas (of 80µg/m³).

Figure 5.3 Graphical Representation of SO_2



March – June 2015



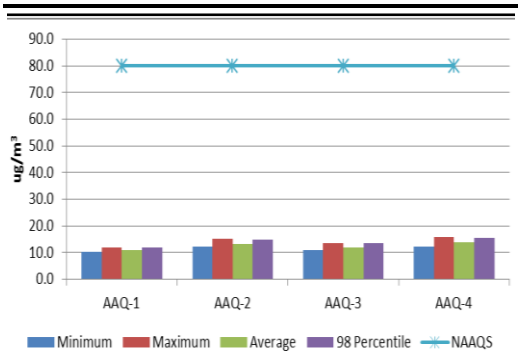
March – May 2013

Oxides of Nitrogen (NO_x)

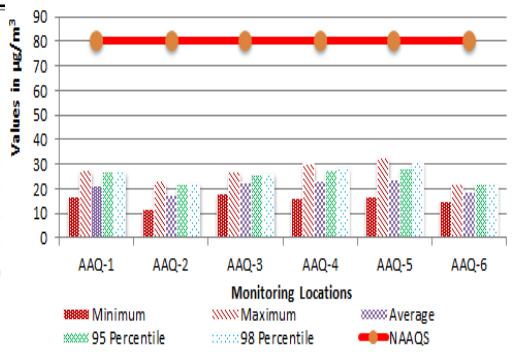
March – June 2015: The monitored average NOx concentration varied from 11.1µg/m³ to 13.8µg/m³. The monitoring location AAQ-1 observed the minimum NOx concentration (of 10.3µg/m³), whereas the maximum was observed at AAQ -5, (of 15.8µg/m³). The 98 percentile concentration of NOx at all the monitoring locations was observed to be below the prescribed NAAQS limits for industrial, residential, rural and other areas (of 80 µg/m³)t all the monitoring locations.

March – May 2013: The monitored average NOx concentration varied from 17.5µg/m³ to 23.8µg/m³. The monitoring location AAQ-2 observed the minimum NOx concentration (of 11.6µg/m³), whereas the maximum was observed at AAQ -5, (of 32.5µg/m³). The 98 percentile concentration of NOx at all the monitoring locations was observed to be below the prescribed NAAQS limits for industrial, residential, rural and other areas (of 80 µg/m³)t all the monitoring locations.

Figure 5.4 ***Graphical Representation of NOx***



March – June 2015

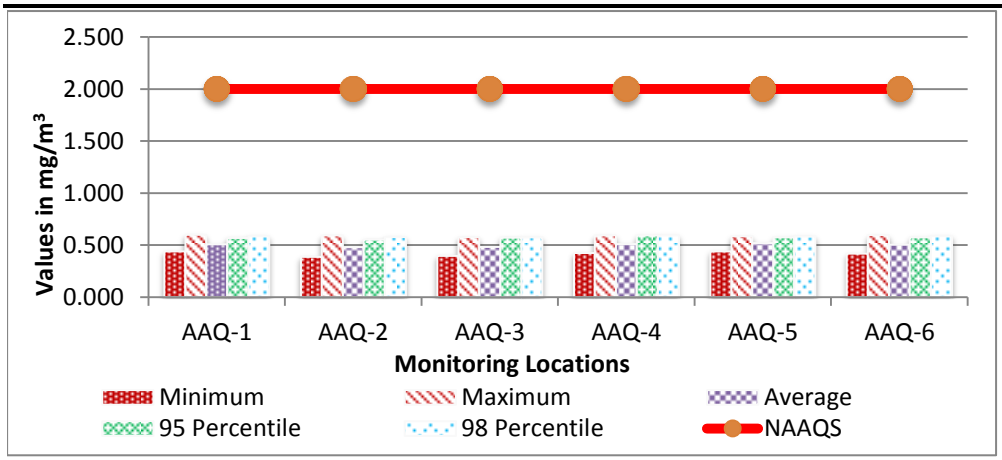


March – May 2013

Carbon Monoxide (CO)

March – May 2013: The monitored average CO concentration varied from 0.48mg/m³ to 0.52mg/m³. The monitoring location AAQ-3 observed the minimum CO concentration (of 0.387mg/m³) whereas the maximum was observed at AAQ -1, Project Site (of 0.599 mg/m³). The 98 percentile concentration of CO at all the monitoring locations was observed to be below the prescribed NAAQS limits for industrial, residential, rural and other areas (of 2mg/m³) at all the monitoring locations. The graphical representation of CO concentration of the study area is shown in ***Figure 5.5***.

Figure 5.5 ***Graphical Representation of Carbon Monoxide***



March – May 2013

Hydrocarbons

March – May 2013: The monitoring location AAQ-5 observed the minimum HC (as CH4) concentration (of 0.006 ppm) whereas the maximum was observed at AAQ -3 (of 0.081 ppm). The 98 percentile concentration of HC as (CH4) varied from 0.019 ppm at AAQ-2 to 0.072 ppm at AAQ-3. The monitoring location AAQ-2 observed the minimum HC (as NMHC) concentration (of 0.006 ppm) whereas the maximum was observed at AAQ -1 (of 0.027 ppm). The 98 percentile concentration of HC as (NMHC) varied from 0.007 ppm at AAQ-2 to 0.026 ppm at AAQ-1.

Additional Parameters Monitored in SRR Campus

March – May 2013: The additional parameters monitored in SRR Campus showed average concentration of 53.8 µg/m^3 for Ammonia, 38.6 µg/m^3 for Ozone, 0.12 µg/m^3 for Lead and 0.11 ng/m^3 for Nickel. Benzene, Benzo-o-pyrene and Arsenic were observed below their corresponding detection limit. All the measured parameters were below their NAAQS limit for industrial, residential, rural and other areas.

Table 5.3 Additional Ambient Air Quality Parameters monitored in SRR Campus

Parameters	Unit	NAAQS	Min.	Max.	Avg.	95Percentile	98Percentile
O_3 (8 Hr)	µg/m^3	**100**	32	45	38.6	44.05	44.6
NH_3 (8 Hr)	µg/m^3	**400**	48	66	53.8	60.3	63.7
Benzene (24 Hr)	µg/m^3	**5**	BDL	BDL	BDL	BDL	BDL
Benzo-α-pyrene (24 Hr)	ng/m^3	**1**	BDL	BDL	BDL	BDL	BDL
Pb (24 Hr)	µg/m^3	**1**	0.05	0.2	0.12	0.2	0.2
Ni (24 Hr)	ng/m^3	**20**	BDL	0.16	0.11	0.16	0.16
As (24 Hr)	ng/m^3	**6**	BDL	BDL	BDL	BDL	BDL

Source: ERM collected baseline through Avon Food Lab, March – May 2013 for Intel

Note: BDL – Below Detection Limit, Detection Limit - HC = 0.0001 ppm, NMHC = 0.0001 ppm, Benzene = 1.0 µg/m^3, Benzo-α-Pyrene = 0.1 ng/m^3, Arsenic = 0.06 ng/m^3, Nickel = 0.08 ng/m^3 NS= Not Specified

5.1.2 Climate and Micro-meteorology of the Study Area

The climate of the study area is classified as tropical climate with following four main seasons:

- Winter season : January to February
- Summer season : March to May
- Monsoon season : June to September
- Post monsoon season : October to December

Project Area Specific Micro-Meteorology

The micrometeorology of the site was observed for a period of 10 weeks during summer season from 11 March 2013 to 21 May 2013. The parameters observed during the monitoring period were wind speed, wind direction, temperature, relative humidity, ambient pressure, rainfall, solar radiation and cloud cover. An automated weather monitoring station was positioned at the site for the period of monitoring and observations were recorded.

The predominant wind direction during the monitoring period for 24 hours was SW and SSW. Calm period was recorded as 18%. During daytime predominant wind was from SW and WNW directions and the calm period recorded was 16.1% and during night time predominant wind was observed from SW and SSW directions and the calm period recorded was 20.3%.The site specific wind rose for 24 hours, day time and night time is presented in ***Figure 5.7***.

Figure 5.6 Plan showing Sampling locations for Meteorology and Air Quality, in the Study Area

Table 5.4 Hourly Average Meteorological Data Collected during Pre monsoon Season of 2013

Hour	Average Ambient Air Temperature (°C)	Average Relative Humidity (%)	Average Wind Speed (m/s)	Predominant Wind Direction (From)
01	27.8	65.0	1.5	SSW
02	27.2	68.8	1.4	SSW
03	26.7	72.1	1.3	SW
04	26.2	75.2	1.1	SW
05	25.7	78.2	1.0	SW
06	25.4	80.2	1.0	WSW
07	25.1	81.9	1.0	WSW
08	24.9	83.3	0.9	WSW
09	25.4	82.5	0.9	SW
10	26.8	77.0	1.2	SW
11	28.4	68.9	1.4	SSW
12	30.0	61.4	1.6	SSE
13	31.5	53.9	1.6	SE
14	32.7	48.4	1.6	E
15	33.7	43.9	1.8	ESE
16	34.4	41.0	1.7	ESE
17	34.7	39.1	1.8	ESE
18	34.6	38.1	1.9	ESE
19	33.7	40.5	2.0	SE
20	32.7	43.3	1.8	S
21	31.4	47.4	1.7	S
22	30.1	52.8	1.7	S
23	29.2	57.7	1.7	SSW
24	28.5	61.5	1.6	SSW

Source: Primary data collected at monitoring station near SRR-3 site from 11 March to 21 May 2013.

Climatological data of representing the SRR Campus site has been collected from Lakes Environment for the period 1 January 2014 to 31 December 2014. The annual and seasonal wind roses based on meteorology of the year 2014 are shown in ***Figure 5.7***.

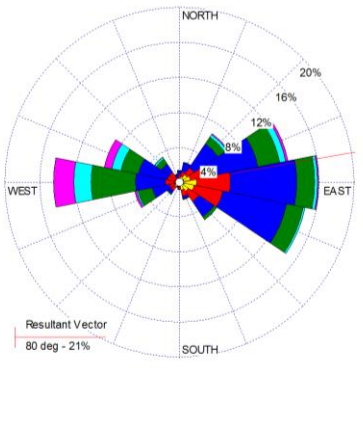
5.1.3 Impact on Air Quality – Construction Phase

Emission sources from the proposed expansion of MLCP project during construction phase will include the following:

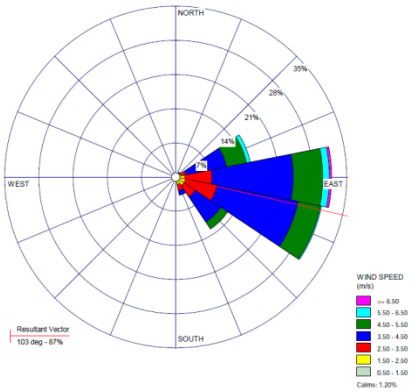
- Vehicular emission from vehicles involved in construction activities ; and
- Fugitive dust emissions during excavation, filling, handling of materials, transportation, use of construction machinery.

The fugitive emissions from construction material loading and unloading are likely to remain highly localized and confined to the Project area, but would require adequate mitigation measures to prevent their spread in the surrounding area. The impact of emissions from vehicles bringing construction material need to be minimized by proper upkeep of maintenance of vehicles, using only PUC certified vehicles for material transportation, sprinkling of water on unpaved paths at the construction site and planned movement of such vehicles.

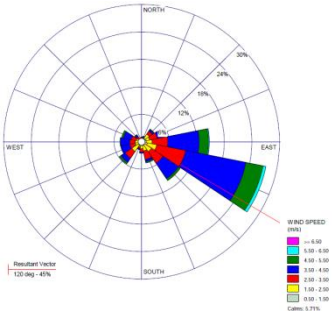
Figure 5.7 Wind Rose Diagrams of Region surrounding SRR Campus



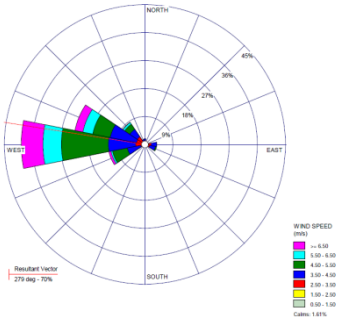
Annual 2014



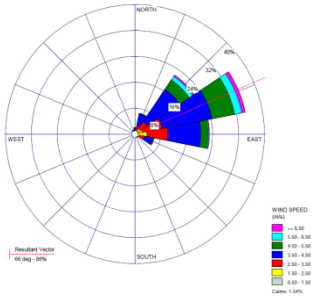
Winter 1 Jan – 28 Feb 2014



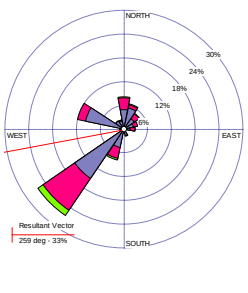
Summer 1 March – 31 May 2014



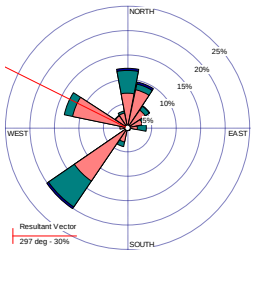
Monsoon 1 June – 30 Sep 2014



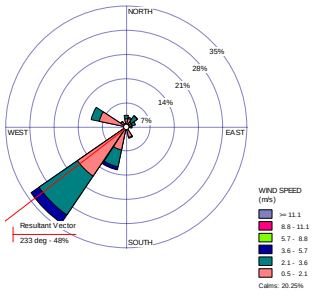
Post Monsoon 1 Oct – 31 Dec 2014



24hr Wind Rose



Day Time Wind Rose



Night time Wind Rose

Site Specific Wind roses March – May 2013

5.1.4 *Impact on Air Quality - Operation Phase*

Sources of Emissions and Emission Estimation

The MLCP Project is a multilevel car parking for the vehicles currently being used for the existing and under construction facilities of SRR campus including SRR-1, SRR-2, SRR-K and SRR-3 and no additional vehicular traffic or emission is anticipated due to proposed MLCP.

5.2 *WHAT ARE THE IMPACTS ON GENERATION OF DUST, SMOKE, ODOROUS FUMES OR OTHER HAZARDOUS GASES? (GIVE DETAILS IN RELATION TO ALL THE METEOROLOGICAL PARAMETERS).*

5.2.1 *Dust*

Dust will be generated during construction activities but the impact will be localised and restricted mostly within site boundary. Regular sprinkling will be carried out at all potential dust generation points. All loose construction material will be kept covered during temporary storage and transportation.

5.2.2 *Impact on Air Quality – Construction Phase*

Emission sources from the proposed expansion of MLCP facility during construction phase will include the following:

- Emissions from emergency power diesel generators (4 nos of 50kVA) - a maximum of three of the four to be operative in case of power supply failure from BESCOM;
- Emission from operation of 30 m^3 Batching Plant;
- Vehicular emission from vehicles involved in construction activities ; and
- Fugitive dust emissions during excavation, filling, handling of materials, transportation, use of construction machinery.

The fugitive emissions from construction material loading and unloading are likely to remain highly localized and confined to the Project area, but would require adequate mitigation measures to prevent their spread in the surrounding area.

The impact of emissions from vehicles bringing construction material need to be minimized by proper upkeep of maintenance of vehicles, using only PUC certified vehicles for material transportation, sprinkling of water on unpaved paths at the construction site and planned movement of such vehicles.

The emissions from a maximum of three diesel generators of 50 kVA each (meant for emergency power for construction activities) will be only in case of failure of power supply from BESCOM. To minimize adverse impact, the operation is to be ensured through optimized utilization, orientation onsite together with providing adequate stack height meant for wider dispersion of gaseous pollutants.

5.3 *WILL THE PROPOSAL CREATE SHORTAGE OF PARKING SPACE FOR VEHICLES? FURNISH DETAILS OF THE PRESENT LEVEL OF TRANSPORT INFRASTRUCTURE AND MEASURES PROPOSED FOR IMPROVEMENT INCLUDING THE TRAFFIC MANAGEMENT AT THE ENTRY & EXIT TO THE PROJECT SITE.*

5.3.1 *Existing and Proposed Parking Arrangements*

As per MoEFCC norms, provision is to be made for 1 ECS per 50 m² on FAR for commercial facilities. The requirement of minimum parking arrangement will be as per ***Table 5.1***6.

Table 5.5 Minimum Parking Required as per MoEFCC & Bangalore Bye Laws Norms

S.N.	Parameter	SRR1 & 2	SRR3	SRR-K	FCTP Project	Total
1	Total FAR	41800.8	58,450.0	1417	0	101667.8
2	Norm for 1 ECS#	1 per 50 m² of FAR				
3	Minimum ECS required	836	1,169	28	0	2033

Note: # As per MoEFCC & Bangalore Bye Laws norms for parking

Open surface parking has been provided for 372 cars for SRR-1 & SRR-2, 655 two wheelers, 3 truck/buses in the existing SRR Campus and 464 cars in MLCP. For the SRR-3 Building under construction open surface parking for 77 cars remaining 1092 in the proposed MLCP building. Also it has been proposed to establish provision for additional 1169 parking spaces for future expansion of SRR-4.

Table 5.6 Parking Details –Existing SRR-1 & 2 Buildings and SRR-3 Project

S.N	Vehicle Type	Existing SRR1 &2 and SRR-K(nos.)	SRR-3 Buildings under construction (nos.)	SRR-4 (future expansion)	Combined (SRR1+SRR2+SRR3) nos.
1	Open Space parking	372*	77*	0	449
2	MLCP	492	1092	1169	2753
3	2-wheelers	655*	578*		1038
4	Truck/buses	3	0		3
	Total (total should be presented as ECS)	**873**	**1169**	**1169**	**3211**

Note:* Includes 655 and 578 number of Two wheeler parking at SRR-1&2 and SRR-3 Buildings respectively

For employee vehicles, the primary entry/ exit at Northeast gate as is being used for the existing set up will also be used for the SRR-3 Building under construction. A secondary entry exists at the Northwest of the Intel SRR Campus for the entry of service /subcontractor vehicle will also be used for the proposed FCTP Project and under SRR-3 Building under construction. The existing SRR Campus operates 14 number of shuttle buses hired from Bangalore Metropolitan Transport Corporation (BMTC) in morning and evening. There will also be restricted traffic movement timings during night

time only for the non-essential utility related heavy movement vehicles (i.e. trucks).

Due to proposed MLCP project, no additional traffic is anticipated, as the proposed MLCP project is a multi -level car parking for the existing operational, under construction SRR campus and no change in traffic is anticipated. However, the vehicular movement plan of the existing arrangement will be changed with the proposed MLCP Project; the main entry is proposed through west gate and exit through north gate. Refer ***Figure 1.8*** for proposed vehicle movement plan of the Project

No SRR Campus related traffic will be allowed to park outside the main road to ensure smooth flow of traffic on the approach service road.

No Additional traffic is anticipated to be generated due to proposed MLCP Project. The proposed MLCP Project does not involve deployment of any manpower except 15-20 additional security personnel to be deployed at site to guard the MLCP.

Level of Transport Infrastructure in the Area

Being located in the well-developed urban centre of the district, the site is well connected through different means of surface transportation, viz. road and rail network. The nearest metro station is Indira Nagar metro terminus located at about 7.5 km to the NW direction of the site. Nearest railway station is Baiyanapalli railway station located at about 8 km to the NW direction of the proposed MLCP site.

The site is bounded by existing 45 m wide outer ring road on northern side. The map showing road and rail network within the radius of 10 km of study area is given as **Figure 5.8**.

Figure 5.8 ***Road and Rail Networks within 10 km Radius***

A traffic survey was conducted during April and May 2013 at two approach roads to assess the baseline traffic scenario in the area. The details of traffic survey locations are given in **Table 5.7.** For the proposed expansion study traffic survey also proposed to be conducted at the same location during the month of May 2016.

Table 5.7 Details of Traffic Count Survey Locations

S. N.	Sampling Location	Station Code	Geographical Coordinates	Direction wrt SRR-3 Project Site	Distance wrt SRR-3 Project (km)	Remarks
1	SRR-3 Project site access service Road	TD1	12°55'46.61"N 77°41'4.86"E	N	0.100	Main access road to site
2	ORR access road to site (BRT Road)	TD2	12°55'47.83"N 77°41'5.42"E	N	0.250	Main approach road to Intel SRR Campus from Marthahalli and Silk Road

The summarised details of the traffic survey are given in **Table 5.8** and **Table 5.9.**

Table 5.8 Existing Traffic (Motorised) Volumes measured during April and May 2013

Description	April 2013		May 2013	
	TD1	TD2	TD1	TD2
Traffic (Nos.)/24 hours (To & fro)	19,278	38,553	19,576	33,419
Average Traffic Flow/hour	803	1,606	815.6	1,392
Max Traffic Flow (nos.)/hour	1,797	2,546	1,687	2,624
Min Traffic Flow (nos.)/hour	78	833	95	725
Max Traffic Flow (Time- hours)	1700-1800	0900-1000	1700-1800	0900-1000
Min Traffic Flow (Time-hours)	4.00-5.00	23.00-24.00	4.00-5.00	23.00-24.00
% of Day (24 hours) for Max. Traffic Flow	9.3%	6.6	8.6	7.9
% of Day (24 hours) for Min. Traffic Flow	0.4%	2.1	0.5	2.2

The existing traffic volume (motorised) at access road (Service road below flyover (TD1) and approach road to Project site road (ORR) (TD2) for 24 hours is shown in **Figure 5.9** ***and*** **Figure 5.10.**

Figure 5.9 Traffic Volume Observations - Motorised Vehicles during April 2013

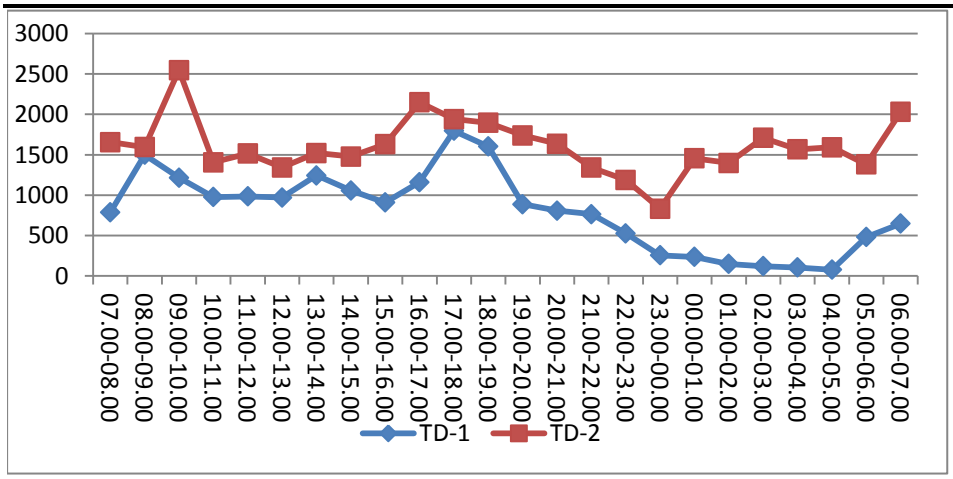


Figure 5.10 Traffic Volume Observations - Motorised Vehicles during May 2013

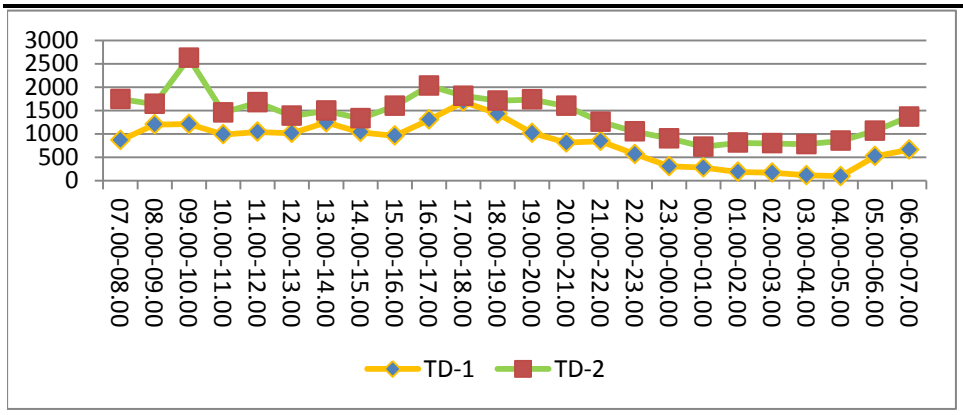


Table 5.9 Percentage Composition of Vehicles in Study Area during April and May 2013

Location	% Composition during April 2013				% Composition during May 2013			
	Non-Motorised	Two/three Wheeler	LMV	HMV	Non-Motorised	Two/three Wheeler	LMV	HMV
TD1	0	42.9	34.8	22.2	0	45.2	35.7	19.1
TD2	0	43.5	40	16.4	0	47.3	39.4	13.3

Figure 5.11 Percentage Composition of Vehicle Categories during April 2013

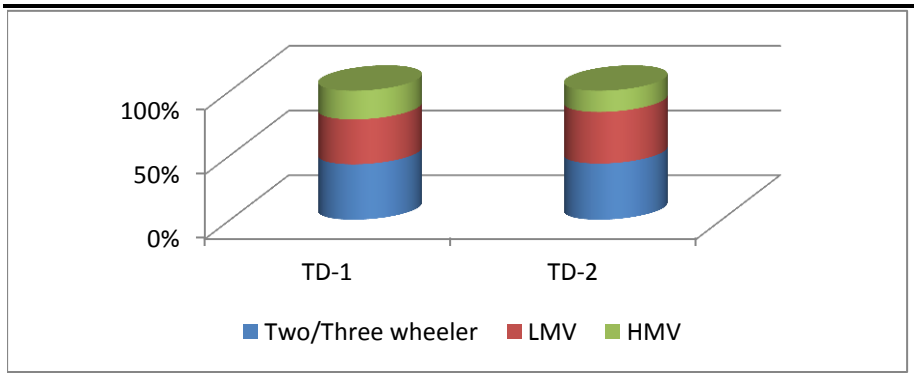


Figure 5.12 Percentage Composition of Vehicle Categories during May 2013

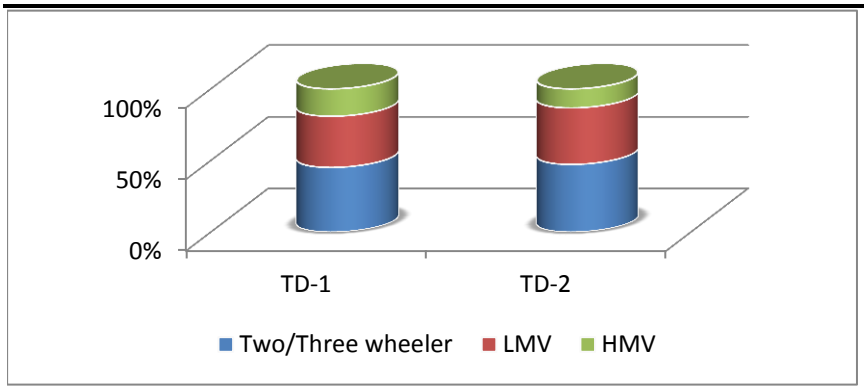


Table 5.10 Traffic Volume Count of Approach Road (TD1) during April 2013

Time	Two / Three wheeler	LMV	HMV	Non - Motorised	Total Vehicles/ hr	Total PCU/ hr
07.00-08.00	404	245	140	0	789	867
08.00-09.00	650	510	339	0	1499	1852
09.00-10.00	585	490	142	0	1217	1208.5
10.00-11.00	447	420	110	0	977	973.5
11.00-12.00	360	425	199	0	984	1202
12.00-13.00	372	395	205	0	972	1196
13.00-14.00	535	415	294	0	1244	1564.5
14.00-15.00	425	350	283	0	1058	1411.5
15.00-16.00	425	295	189	0	909	1074.5
16.00-17.00	552	407	202	0	1161	1289
17.00-18.00	829	622	346	0	1797	2074.5
18.00-19.00	700	540	363	0	1603	1979
19.00-20.00	386	280	221	0	887	1136
20.00-21.00	333	245	230	0	808	1101.5
21.00-22.00	258	250	258	0	766	1153
22.00-23.00	167	225	135	0	527	713.5
23.00-00.00	105	25	126	0	256	455.5
00.00-01.00	75	82	80	0	237	359.5
01.00-02.00	33	51	66	0	150	265.5
02.00-03.00	33	48	40	0	121	184.5
03.00-04.00	33	43	30	0	106	149.5
04.00-05.00	23	26	29	0	78	124.5
05.00-06.00	213	148	122	0	483	620.5
06.00-07.00	340	175	134	0	649	747

Table 5.11 Traffic Volume Count of Approach Road (TD1) during May 2013

Time	Two / Three wheeler	LMV	HMV	Non - Motorised	Total Vehicles/ hr	Total PCU/ hr
07.00-08.00	448	273	143	0	864	926
08.00-09.00	649	401	151	0	1201	1178.5
09.00-10.00	570	535	107	0	1212	1141
10.00-11.00	428	483	77	0	988	928
11.00-12.00	420	481	141	0	1042	1114
12.00-13.00	443	398	176	0	1017	1147.5
13.00-14.00	657	509	80	0	1246	1077.5
14.00-15.00	440	285	311	0	1036	1438
15.00-16.00	462	328	170	0	960	1069

Time	Two / Three wheeler	LMV	HMV	Non - Motorised	Total Vehicles/ hr	Total PCU/ hr
16.00-17.00	660	464	177	0	1301	1325
17.00-18.00	820	618	249	0	1687	1775
18.00-19.00	652	443	335	0	1430	1774
19.00-20.00	433	314	271	0	1018	1343.5
20.00-21.00	339	244	230	0	813	1103.5
21.00-22.00	295	309	242	0	846	1182.5
22.00-23.00	201	221	146	0	568	759.5
23.00-00.00	125	29	155	0	309	556.5
00.00-01.00	89	96	96	0	281	428.5
01.00-02.00	47	62	80	0	189	325.5
02.00-03.00	30	96	46	0	172	249
03.00-04.00	34	38	45	0	117	190
04.00-05.00	35	23	37	0	95	151.5
05.00-06.00	223	162	137	0	522	684.5
06.00-07.00	337	184	141	0	662	775.5

Additional Traffic Generation from the Project

No Additional traffic is anticipated to be generated due to proposed MLCP Project. The proposed MLCP Project does not involve deployment of any manpower except 10-15 additional security personnel to be deployed at site to guard the MLCP. Details of current traffic and additional traffic to be generated due to the under construction SRR-3 building are as given in **Table 5.12.**

Table 5.12 Projected Traffic for Movement of Project Personnel

Vehicle Category	Proposed MLCP	FCTP	Under construction SRR3	Existing SRR1 & 2 and SRR-K	Combined SRR1, 2, & 3
Cars	0	0	1019 (1019)	856 (856)	1875 (1875)
2 wheelers	0	0	578 (289)	460 (230	1038 (519)
City Bus	0	0	22 (66)	5 (15)	27 (81)
Shuttle	0	0	40 (120)	13 (39)	53 (159)
	0	**0**	**1659 (1494)**	**1334 (1370)**	**2993 (2634)**

Note: It is to be noted that the traffic related to existing SRR1 and 2 buildings is already inbuilt in the traffic count studies conducted. Equivalent PCU considered 1 Cars = 1 PCU; 1 2-Wheeler = 0.5 PCU; 1 City Bus = 3 PCU; and 1 Shuttle Bus = 3 PCU; Figures given in parenthesis represents equivalent PCUs

Traffic Related Impact and Management Measures

A detailed traffic impact study and management measures was conducted in April 2013 by MS Consortia of Infrastructure Engineers, Bangalore. The study includes road connectivity, road geometrics, existing traffic flow, projected traffic for next 5 years and calculation of volume to capacity ratio (V/C) and level of service.

Existing traffic scenarios monitored at the Outer Ring Road (ORR) is given in **Table 5.13.**

Table 5.13 Existing Traffic Scenario of ORR

Road	Towards	V	C	Existing V/C	LOS
ORR	Marathhalli (Existing BRT route)	1028	2200	0.46	C
	Marathhalli (Service road)	495	2200	0.22	B
	Silk board (Existing BRT route)	1125	2200	0.51	C
	Silk board (Service road)	462	2200	0.21	B

V= Volume; C = Capacity; V/C = Volume to Capacity ratio; LOS = Level of Service which is classified into A to F classes, Class A represents excellent with V/C = 0 to 0.2; Class B represents very good with V/C = 0.2 to 0.4; Class C represents average with V/C = 0.4 to 0.6; Class D represents poor with V/C = 0.6 to 0.8; Class E represents very poor with V/C = 0.8 to 1.0; Class F represents worst with V/C = 1 and above.
Source: Traffic Impact and Management Measures study conducted in April 2013 by MS Consortia of Infrastructure Engineers, Bangalore.

Projected traffic for next 5 years (worked out based on individual vehicular growth as per IRC 37-2001) is given in **Table 5.14.**

Table 5.14 Projected Traffic for Next 5 Years

Road	Towards	Vehicle Type	2Wh	3 Wh	4Wh	Bus/Lorries	Total
		% Growth	9.36	7.7	13.49	11.66	
ORR	Marathhalli (Existing BRT route)	463 (232)	142 (107)	800 (800)	220 (660)	1625 (1799)	463 (232)
	Marathhalli (service road)	310 (155)	74 (56)	403 (403)	83 (249)	870 (863)	310 (155)
	Silk board (Existing BRT route)	400 (200)	129 (97)	921 (921)	255 (765)	1705 (1983)	400 (200)
	Silk board (service road)	296 (148)	70 (53)	459 (459)	50 (150)	875 (810)	296 (148)

Source: Traffic Impact and Management Measures study conducted in April 2013 by MS Consortia of Infrastructure Engineers, Bangalore; Note: Figures given in parenthesis represents equivalent PCUs

Modified V/C and LOS based on projected and the proposed SRR3 Project is given in ***Table 5.23***. The proposed commercial activity will include ingress and egress of vehicles will move from and to the project site. Ingress will be from 07:00 AM to 10:00 AM and egress from 05:00 PM to 08:00 PM.

The total traffic generated based on the total parking provided for project which will be 1494 PCUs, which is distributed over 3 hours in the morning and 3 hours in the evening i.e. 1494/3 = 498 PCU per hour. The 498 PCUs per hour will move along ORR, which have option of moving on either side of the road i.e., almost 50% towards Marathalli and 50% towards Silk Board as per the following split:

- 0.33 x 498 = 164 PCUs/hour towards Marathhalli (existing BRT route).
- 0.15 x 498 = 75 PCUs/hour towards Marathhalli (service road).
- 0.36 x 498 = 179 PCUs/hour towards Silk Board (existing BRT route).
- 0.16 x 498 = 80 PCUs/hour towards Silk Board (service road).

Table 5.15 Modified V/C and LOS for projected and proposed SRR3 Project Traffic

Road	Towards	Projected vehicular growth for 5 years	Modified

Road	Towards	Projected vehicular growth for 5 years				Modified		
		V	C	V/C	LOS	V	V/C	LOS
ORR	Marathhalli (Existing BRT route)	1799	2200	0.81	E	1799+164= 1963	0.89	E
	Marathhalli (service road)	863	2200	0.39	B	863+75= 938	0.42	C
	Silk board (Existing BRT route)	1983	2200	0.90	E	1983+179= 2162	0.98	E
	Silk board (service road)	810	2200	0.36	B	810+80= 890	0.40	B

Source: Traffic Impact and Management Measures study conducted in April 2013 by MS Consortia of Infrastructure Engineers, Bangalore.

Following changed scenarios are expected for the ORR:

- Changed Scenario 1: Introduction of BRT System along the dedicated corridor of ORR;
- Changed Scenario 2: On-going grade separator for through traffic

The modified V/C and LOC for changed scenarios 1 & 2 are given in ***Tables 5.24 & 5.25***.

Table 5.16 Modified V/C and LOS for Changed Scenario 1

Road	Towards	Modified			Changed Scenario I		
		V	V/C	LOS	V	V/C	LOS
ORR	Marathhalli (Existing BRT route)	1799+164= 1963	0.89	E	1963-785= 1178	0.53	C
	Marathhalli (service road)	863+75= 938	0.42	C	938-375= 563	0.25	B
	Silk board (Existing BRT route)	1983+179= 2162	0.98	E	2162-865= 1297	0.59	C
	Silk board (service road)	810+80= 890	0.40	B	890-356= 534	0.24	B

Note: As the BRT system is introduced along the dedicated corridor of ORR, at the extreme right side lane from the median, 40 % of the volume of vehicles will be reduced as per the BMTC studies and projections. Simultaneously all the IT companies along the corridor (ORRCA) will be introducing Bus Transport to each activity by ferry almost 50% to 70% of work force to their respective offices

Source: traffic impact study and management measures were conducted in April 2013 by MS Consortia of Infrastructure Engineers, Bangalore.

Table 5.17 Modified V/C and LOS for Changed Scenario 2

Road	Towards	Modified			Changed Scenario 2		
		V	V/C	LOS	V	V/C	LOS
ORR	Marathhalli (Existing BRT route)	1963-785= 1178	0.53	C	1178-177= 1001	0.46	C
	Marathhalli (service road)	938-375= 563	0.25	B	563-84= 478	0.22	B

Road	Towards	Modified			Changed Scenario 2		
	Silk board (Existing BRT route)	2162-865= 1297	0.59	C	1297-194= 1102	0.50	C
	Silk board (service road)	890-356= 534	0.24	B	534-80= 454	0.21	B

Note: Already BDA has implemented the seamless traffic flow along this corridor with number of underpasses and flyovers ensuring continuous flow. Due to this development, higher speeds can be achieved for non-stop movement thus improving the carrying capacity and higher occupancy. With this arrangement an additional 15% to 20% capacity will be enhanced achieving the desired speed of about 60 kmph, thereby 15% allowance in traffic volume.
Source: traffic impact study and management measures was conducted in April 2013 by MS Consortia of Infrastructure Engineers, Bangalore.

Measures Proposed for Traffic Management during Construction Phase

- Ensure daily management of construction related vehicles and restricted vehicular movement during night time. Also to ensure that vehicles follow all traffic rules;
- HMV holding areas to be provided for vehicles waiting to deliver loads at work sites so as to avoid queuing at other connecting roads;
- Vehicle movement and parking within the premises shall be manned properly to avoid accidents;
- Routes for use by construction traffic to be planned to minimize impact on residential areas and unsuitable parts of the road network;
- Provision of dedicated path within the site for exclusive entry and exit of the construction vehicles;
- Necessary training to the driver of construction vehicles for speed restrictions and to crew members on do's and don'ts during construction vehicles movements;
- Arrangements and routes for abnormal loads to be agreed in advance with the police, emergency services and the roads authority; and
- Construction vehicles to be routed only during non- peak hours.

Measures Proposed for Traffic Management during Operation Phase

The traffic study conducted in 2013 highlights structural and non-structural interventions for the smooth traffic flow as per the following measures.

Structural Interventions

- All possible infrastructure facilities to make the road for seamless flow between Silk board junction to Hebbal along ORR via Marathhalli junction, K R Puram etc;
- The BRT system will shortly introduced along the dedicated corridor already created exclusively for this purpose, for both up and down flow. And no other vehicles are allowed along with BRT;
- Already elevated corridors (flyover) are constructed in front of the project site so that no direct access is given to the main carriage way from service road;

- The service road should be asphalted for better serviceability. The drainage work is under progress for service roads; and
- To establish smooth entry & exit of vehicles, bell mouth shape geometry is provided at the gates. This ensures smooth transition for merging of vehicles.

Non Structural Interventions

- Parking along the service roads are strictly prohibited and road will be made available for vehicular movement. No parking boards are erected and also enforced by traffic police as well as agencies like ORRCA
- The Government is seriously thinking to prohibit HTVs along ORR and allow there HTVs along STRR-IRR in the future.
- Till then the HTVs are proposed to use ORR from 9 pm to 7 am and the issue is with the transport department.
- ORRCA/BTP are seriously working on making all the IT work force to use public transport and arranged by BMTC and PTS arranged by various companies for their purpose.
- Rubber humps will be introduced for the outgoing vehicles at the exit gate drive way. Not more than 3m from the gate.
- Road studs / solar blinkers / reflectors are not present which is very essential during night times.
- Merging of vehicles will be performed only to left traffic from the exit gates, this ensures safety.

5.4 PROVIDE DETAILS OF THE MOVEMENT PATTERNS WITH INTERNAL ROADS, BICYCLE TRACKS, PEDESTRIAN PATHWAYS, FOOTPATHS ETC., WITH AREAS UNDER EACH CATEGORY.

A conceptual employee vehicle, service vehicle and pedestrian movement plan within the proposed site is included in **Figure 1.8.**

5.4.1 Roads/ Walkways

The SRR Campus is bounded by existing 45 m wide road on northern boundary. The existing SRR-1, SRR-2 and SRR-K Buildings have well established road for internal vehicular and pedestrian movement. In addition, a 6 to 8 m internal driveway is planned all around the SRR-3 Building under construction and proposed MLCP for smooth vehicle circulation.

Separate service vehicle movement and pedestrian movement are planned inside the WILL THERE BE SIGNIFICANT INCREASE IN TRAFFIC NOISE & VIBRATIONS? GIVE DETAILS OF THE SOURCES AND THE MEASURES PROPOSED FOR MITIGATION OF THE ABOVE.

5.4.2 Baseline Noise Level

Noise Monitoring conducted in 2015 at SRR-1 & SRR-2 Buildings

As part of compliance report monitoring, Intel has conducted noise monitoring at different locations within the SRR-1 & SRR-2 Buildings at eight different locations during 2015. The details of monitoring locations and the monitored results were given below in **Table 5.18.**

Table 5.18 Noise Monitoring conducted at SRR-1 and SRR-2 buildings

S.N	Location	Monitored Noise levels in dB(A) Leq	Noise Limit
I	**SRR-1**		
1	Near STP	64.9	75
2	Near Main entry Gate	65.5	75
3	AHU Room outside First floor	47.8	75
4	Near DG Room	76.5	75
II	**SRR-2**		
1	Near Chiller Room	67.7	75
2	Near Cooling Tower	67.5	75
3	AHU Room outside Ground floor	50.6	75
4	Near DG Room	74.3	75

Source: Intel

The result of the noise monitoring at SRR-1 and SRR-2 building shows that the noise level at different locations were within the noise limit of 75 d B(A), except near DG sets.

Table 5.19 Noise monitoring result conducted at under construction SRR-3 Project site locations

Location	Day time dB(A)			Permissible limit Industrial area Day Time	Night Time dB(A)			Permissible limit Industrial area Night Time
	L Min	L Max	leq Day		L Min	L Max	Leq Night	
7-May-15								
Near DG set	62.1	65.8	63.9	**75**	40.1	43.8	41.9	**70**
Near Batching plant	59	62.3	60.6	**75**	37.6	41.9	39.6	**70**
Construction Place	63.8	68.1	65.9	**75**	43	45.7	44.3	**70**
30-Jun-15								
DG set	60.6	64.9	62.7	**75**	38.7	41.1	39.8	**70**
Batching plant	56	60.4	58.1	**75**	40.3	43	41.6	**70**
Construction Place	65.1	69.8	67.4	**75**	41.8	44.7	43.2	**70**
10-Jul-15								
DG set	60.6	63.9	62.2	**75**	44.5	48.2	46.3	**70**
Batching plant	56.4	60.4	60.4	**75**	35.2	36.8	36.8	**70**
Construction Place	65.1	69.2	69.2	**75**	40.1	44.9	42.4	**70**
10-Aug-15								
DG set	62.6	65	63.7	**75**	41.3	44.7	42.9	**70**
Batching plant	52.1	56.9	54.4	**75**	37.5	40.6	39	**70**
Construction Place	61	66.5	63.6	**75**	42	45.1	43.5	**70**

Source: Intel

Details of noise measurement locations in the study area are given in **Table 5.20**. The recorded noise levels in the study area are summarised in **Table 5.21**. For the proposed expansion project, it is also proposed to conduct noise monitoring at same locations during the summer season of 2016.

Table 5.20 Details of Noise Sampling Locations

S.N	Sampling Locations	Sampling Code	Type of Activity	Geographic Coordinate	Distance and directions
1	Project Site	NQ-1	Project Site	12°55'31.56"N 77°41'5.34"E	N
2	Munireddy Garden, Bellandur	NQ-2	Residential	12°55'27.24"N 77°40'41.88"E	0.65km, W
3	Hosa Road, Sarjapur Road.	NQ-3	Residential	12°54'46.08"N 77°40'39.90"E	1.4 km, SW
4	Doddakanahalli	NQ-4	Residential	12°54'24.30"N 77°41'42.34"E	2.33 km, SE
5	Adarsh Palm Layout	NQ-5	Residential	12°55'6.78"N 77°41'53.22"E	1.7 km, E
6	Kadubeesaranahalli	NQ-6	Residential	12°56'20.16"N 77°41'51.78"E	2.3 km, NE

Table 5.21 Noise Level in the Study Area during April 2013

Sampling Locations	Landuse	Leq day	Leq Night	Ldn	Lmax	Lmin	CPCB Limits Leq dBA	
							Day	Night
NQ-1	Industrial	54.2	41.3	49.9	59.5	35.1	75	70
NQ-2	Residential	52.0	40.0	48.0	54.4	34.2	55	45
NQ-3	Residential	54.2	43.4	50.6	59.6	34.4	55	45
NQ-4	Residential	53.9	43.2	50.4	62.8	34.8	55	45
NQ-5	Residential	54.6	43.6	51.0	61.2	34.9	55	45
NQ-6	Residential	52.5	39.7	48.3	56.8	34.0	55	45

Figure 5.13 Hourly Variation of Noise Levels during April 2013

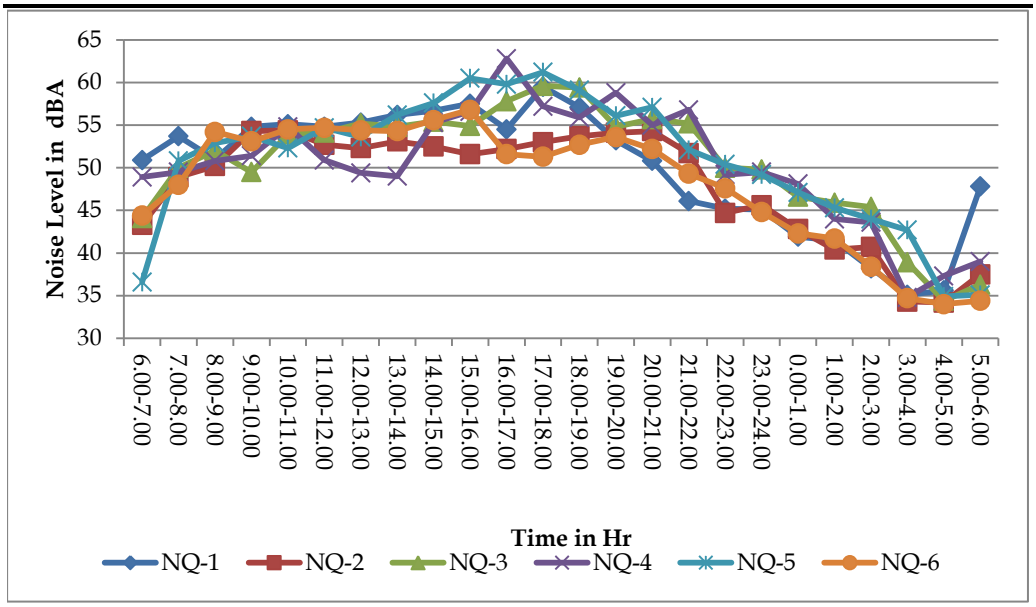


Figure 5.14 Day Time Noise Level during April 2013

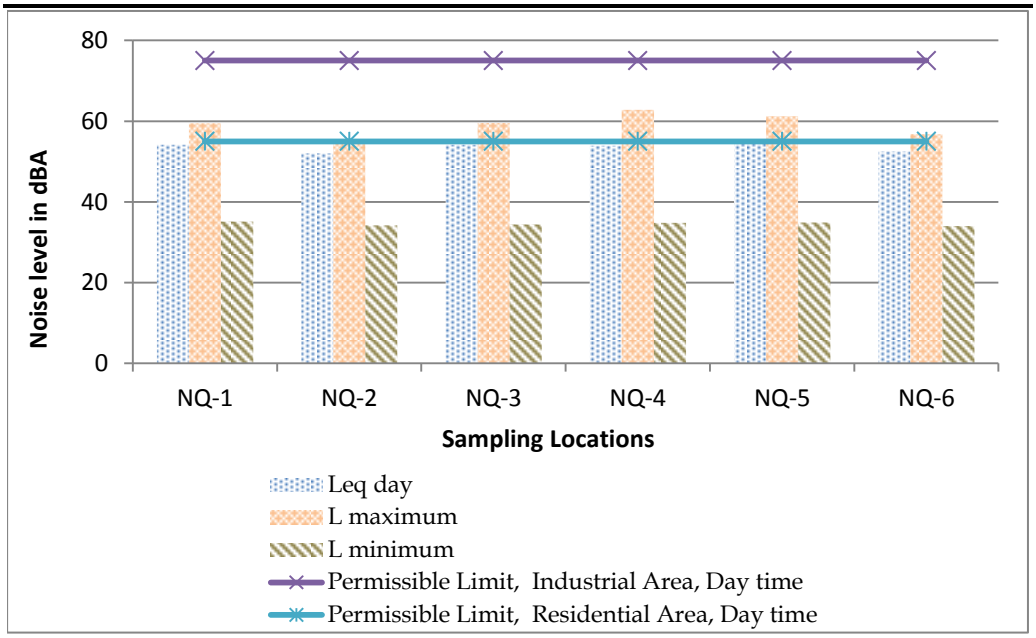


Figure 5.15 Night Time Noise Level during April 2013

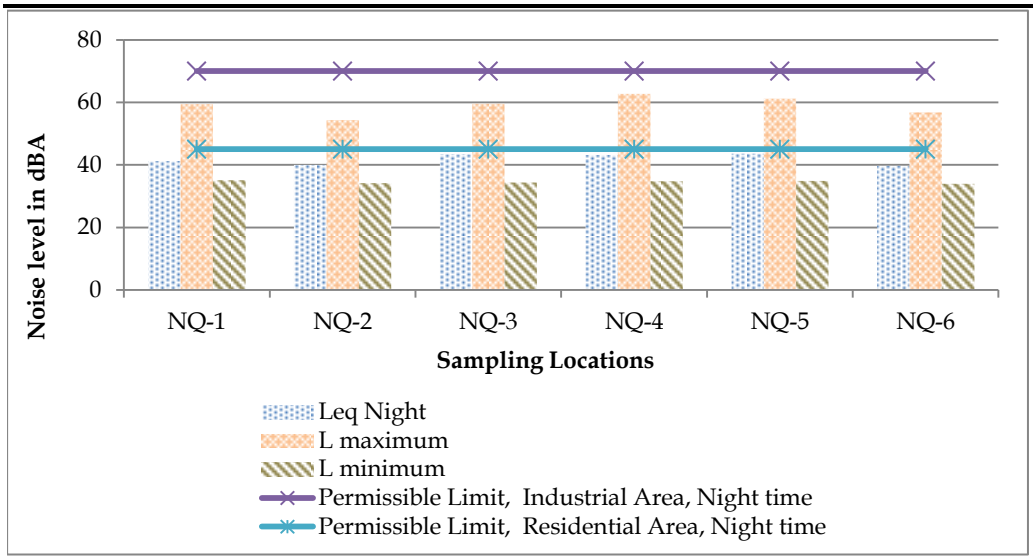


Table 5.22 Noise Level in the Study Area during May 2013

Sampling Locations	Landuse	Leq day	Leq Night	Ldn	Lmax	Lmin	Day	Night
NQ-1	Industrial	52.1	39.6	47.9	56.1	34.0	75	70
NQ-2	Residential	52.7	39.6	48.3	56.1	34.4	55	45
NQ-3	Residential	54.5	41.3	50.1	60.1	33.3	55	45
NQ-4	Residential	52.7	42.3	49.2	60.8	34.9	55	45
NQ-5	Residential	53.8	41.7	49.8	60.2	34.9	55	45
NQ-6	Residential	51.7	39.8	47.8	55.2	34.0	55	45

Figure 5.16 Hourly Variation of Noise Levels during May 2013

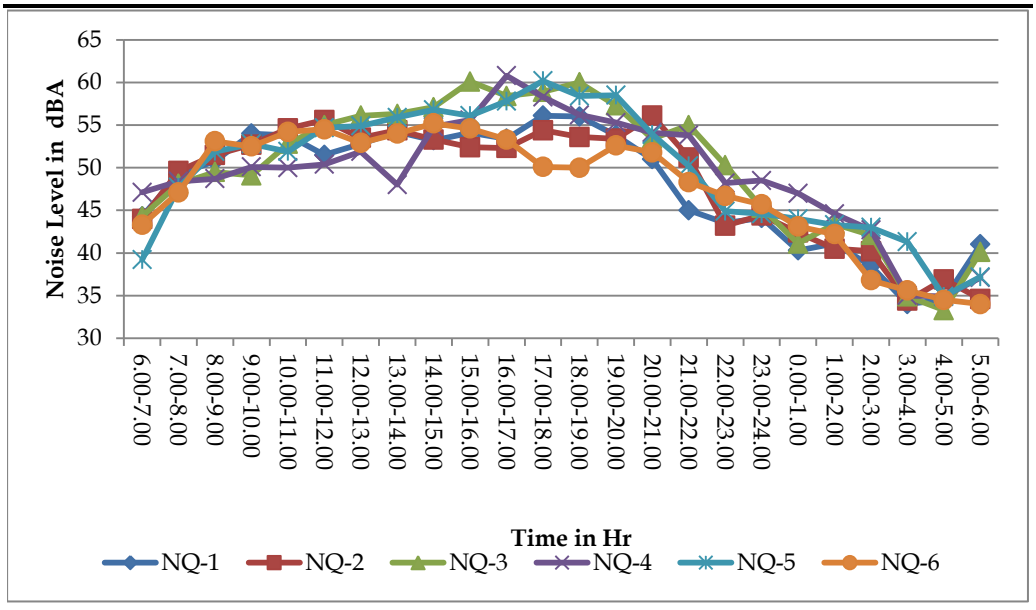


Figure 5.17 Day Time Noise Level during May 2013

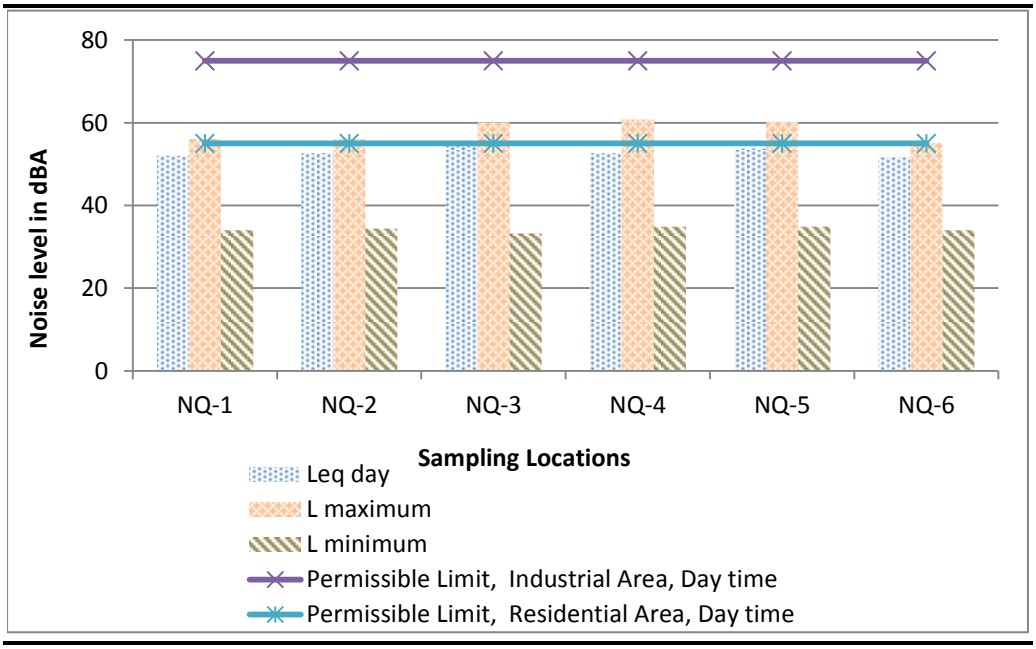
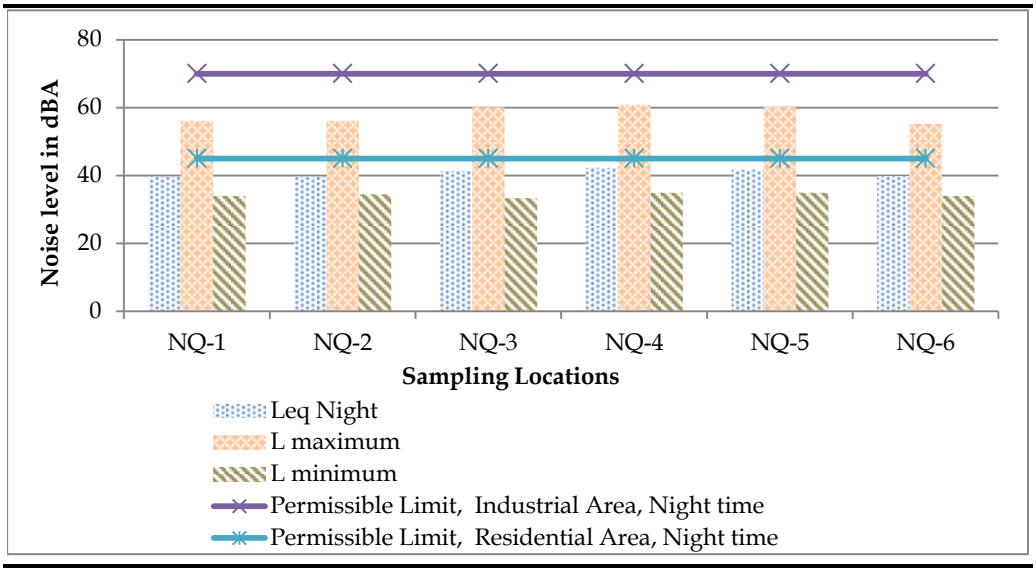


Figure 5.18 Night Time Noise Level during May 2013



5.4.3 Impact of Noise Quality due to Vehicular Noise

No vehicular noise is anticipated to be generated from Proposed MLCP Project and it does not involve deployment of any additional manpower except 15-20 security personal.

5.4.4 Impact on Noise Quality

Construction Phase

Noise generation during construction phase will be from:

- Operation of construction equipment and machinery like dozers, excavators, generators, pumps, compressors, pneumatic tools, saw, vibrators, concrete mixers (batch plant), cranes; and
- Vehicular movement in the project area.

It is expected that operation of these construction equipment will generate noise levels between 75 - 80 dB (A). The combined effect of these sources may reach 95 dB(A) at the construction site, however noise dissipates as it spreads in area beyond. The sound pressure level generated by a noise source decreases with increasing distance from the source due to wave divergence. Noise attenuation with respect to distance in all directions over horizontal distance can be given by the following equation:

Sound level dB(A) = Lw = -20 log10 R – 8

where, Lw = Sound level of source, dB(A) and R= Source distance, m

For an approximate estimation of dispersion of noise in the ambient air from the source point, above mentioned mathematical model for sound wave propagation is used by considering 95 dB(A) as the resultant noise level generated from the construction activities.

The nearest settlement is *Deverabeesanahalli* located at approximately 0.5 km towards Northeast of the SRR3 Project site. Other settlements in the vicinity of the Project site include *Bellandur* at a distance of about 1 km to the Western direction. A green belt exists for SRR1 & 2 and is also proposed for SRR3 site which will reduce the impact of noise. The major noise generating construction activities to be restricted to day time only.

Operation Phase

For the proposed operations, no other noise source is anticipated.

b) Occupational Noise

The other impact of noise generation can be on occupational exposure to the security personal guarding the MLCP the facility and will be limited to during shift changing time only and small number of visitor vehicles during the day time. The noise levels in many situations would be below time weighted average and may not have any serious impact on the health.

5.5 WHAT WILL BE THE IMPACT OF DG SETS & OTHER EQUIPMENT ON NOISE LEVELS & VIBRATION IN & AMBIENT AIR QUALITY AROUND THE PROJECT SITE? PROVIDE DETAILS.

As described above.

6 AESTHETICS

6.1 *WILL THE PROPOSED CONSTRUCTIONS IN ANY WAY RESULT IN THE OBSTRUCTION OF A VIEW, SCENIC AMENITY OR LANDSCAPES? ARE THESE CONSIDERATIONS TAKEN INTO ACCOUNT BY THE PROPONENTS?*

The impact on scenic amenities or landscape due to construction is expected to be insignificant. The proposed construction activity will be well planned and confined to the site area. Deverabeesanahalli Lake is situated at about 85m to the east of the MLCP Project site which is surrounded by different existing IT Parks commercial buildings, and ongoing constructions on South. The vehicular movement during construction and operation phase will be through Outer ring road existing in the north of the MLCP Project site. Hence, there will be no obstruction to the scenic amenities or landscape due to proposed development. Also there are no archaeological sites or artifacts in the site or immediate surroundings which could be impacted by the proposed MLCP construction. However, due to the development of greenbelt and landscape within proposed MLCP project will significantly improve the scenic and landscape of the surrounding area.

6.2 *WILL THERE BE ANY ADVERSE IMPACTS FROM NEW CONSTRUCTIONS ON THE EXISTING STRUCTURES? WHAT ARE THE CONSIDERATIONS TAKEN INTO ACCOUNT?*

During construction phase, the construction site will be barricaded and isolated from the existing buildings. The transportation of raw materials, construction machinery and related vehicular movement will be planned so that it would not impact any existing building and cause hindrance in the regular activities in the existing buildings.

The proposed expansion of MLCP project site is located adjacent to the existing Intel SRRI & SRR2 and SRR-K buildings. At present, three building exists within SRR campus. The land to be developed as MLCP comprises of open land with plantation along the site boundary. There exist a parking shed at the proposed land and would require demolition, which may generate very small quantity of waste and which will be disposed through authorised vendor.

6.3 *WHETHER THERE ARE ANY LOCAL CONSIDERATIONS OF URBAN FORM & URBAN DESIGN INFLUENCING THE DESIGN CRITERIA? THEY MAY BE EXPLICITLY SPELT OUT.*

The proposed development is being planned in accordance with the National Building Code 2005 and bylaws of Bangalore. Proposed development is benchmarked to international standards. The space distribution proposed in

the Project is in accordance to guidelines of Bangalore Development Authority for zoning of landuse and regulations as part of revised Master Plan- 2015.

6.4 ARE THERE ANY ANTHROPOLOGICAL OR ARCHAEOLOGICAL SITES OR ARTEFACTS NEARBY? STATE IF ANY OTHER SIGNIFICANT FEATURES IN THE VICINITY OF THE PROPOSED SITE HAVE BEEN CONSIDERED.

None

7 SOCIO-ECONOMIC ASPECTS

7.1 WILL THE PROPOSAL RESULT IN ANY CHANGES TO THE DEMOGRAPHIC STRUCTURE OF LOCAL POPULATION? PROVIDE THE DETAILS.

The nearest villages to the SRR project site are villages Deverabeesanahalli and Bellandur, which are unlikely to be significantly affected due to the project. During construction phase, the population to be engaged will be about 400 workers during peak time and 800 on an average, most of which will reside in labour camp to be located outside the Project site. The proposed MLCP Project site is located in the well-developed urban area of the district.

During operation phase of the proposed MLCP project no inflow of working population is anticipated except 15-20 security personnel, as the MLCP Project is for the existing facility.

The socio economic baseline profile of the study area provided below is a representation of the secondary data of the villages within a radius of 5 km from the site in the Bangalore Urban district in the state of *Karnataka*, India.

As per the Indian Census 2011 records, there are 25 revenue villages and 25 urban wards of Bangalore Municipal Corporation spread across five talukas of Bangalore Urban District which fall within a 10 km radius of the project site. Of these, 5 revenue villages and 5 urban wards are located in close vicinity (0-5 km radius) of the project site, while 20 revenue villages and 20 wards of Bangalore Municipal Corporation are located within a radius of 5-10 km.

For the purpose of preparing the socio-economic baseline, secondary data from various sources has been utilized, such as the Primary Census Abstract data 2011, Village Directory 2011, Town directory 2011 and the district profiles of Census of India; 2011.

Figure 7.1 below represents study region in the Talukas and Districts as per their distance from the Project site.

Figure 7.1 Villages within 10 km Radius

7.1.1 *Demographic Profile of the Study Area*

Population and Social Classification

As can be seen in ***Table 7.1***, the total population in the district has increased to 96, 21,551 in census 2011 with 47% decadal growth rate. The district population as per 2001 census was 65, 37,124. Substantial proportion is categorised as urban population. One of the Taluka of Bangalore district as per census 2011, classified as 'Area not under sub-district' is inhabited with 100 percent urban population and it comprises of about 88% of total district population.

Table 7.1 Demographic profile of district and the taluks in the Study Area

Indicators	Bangalore District	Bangalore North	Bangalore South	Bangalore East	Anekal	Area not under any Sub-district
Total Population	9621551	352420	205274	102607	517575	8443675
Number of households	2393845	85722	51094	24537	130661	2101831
Average Household Size	4	4	4	4	4	4
Proportion of urban population %	90.9	23.3	24.7	7.9	31.9	100.0
Sex Ratio	916	895	879	911	835	923
Proportion of SC %	12.5	19.0	17.6	24.4	21.3	11.4
Proportion of ST %	2.0	3.6	3.3	2.3	2.7	1.8
Literacy Rate %	87.7	80.8	78.4	79.4	80.7	88.7
Female Literacy Rate %	84.0	74.0	71.3	72.3	73.8	85.4
Work Participation Rate %	44.1	44.0	47.5	44.0	49.6	43.7

Source: Census of India 2011.

About 88% district population are literate. Female literacy rate of the district stands at 84%. Of the total district population, a small proportion belongs to the SC category, 12.5% on an average. The proportion of the ST population is much lower at an average of 2%.

Table 7.2 Demographic profile of villages within 5 km radius

Town/Village Name	Total HHs	Total Population	Sex Ratio	SC (%)	ST (%)
Jakkasandra (Ward No-0173)	9040	33521	861	10.9	2.8
Bellanduru (Ward No-0150)	22368	80180	821	11.3	2.3
Agara (Ward No-0114)	7734	36916	736	31.1	0.7
Konena Agrahara (Ward No-0113)	10725	38108	906	12.0	0.8
Marathahalli (Ward No-0086)	11051	39768	763	13.6	1.8
Chalaghatta village	815	3071	874	8.5	2.4
Hadosiddapura village	228	915	852	32.1	4.0
Kannahalli village	385	1579	1017	8.0	12.9
Halanayakanahalli village	926	3648	876	16.7	1.9
Chikkanayakanahalli village	323	1315	857	27.8	2.0

Source: Census 2011 data

The last few years have seen significant change even in the administrative profile of the area. The villages identified in the vicinity of the Project site,

now come under the ward number 149, and ward No. 150 of BBMP. The Bangalore East Taluk in itself is a new creation. The revised City Development Plan CDP) of 2009, classifies Bangalore North, Bangalore South and Anekal as the taluks of the Bangalore urban District; Bangalore East taluk is the recent addition to the list of the taluks under the Bangalore urban District.

As can be seen in the above given table, Bellanduru (Ward No: 150 of BBMP) is the largest human settlement in the immediate vicinity of the project location. There are many housing societies coming up in 5 km radius of project location. Demography of the surrounding areas has changed a lot with the migrant population coming in from other states is staying in these areas.

Literacy Rate

The average literacy rate in the villages/urban settlements in the immediate vicinity of the site is 91%, significantly higher than the national average of 74.04% or the state average of 75.6%. The highest literacy rate was recorded for *Agara* ward at 97.2%, while the lowest was recorded for the village *Halanayakanahalli* village at 83.1%. In terms of male and female literacy, percentage of literate female is slightly lower than male literacy level. Overall literacy level has increased significantly, compare to 2001 census.

Table 7.3 Literacy Rate in the villages in the 5 km radius

Village Name	Male Literacy Rate (%)	Female Literacy Rate (%)	Total Literacy Rate (%)
Jakkasandra (Ward No-0173)	95.5	88.5	92.2
Bellanduru (Ward No-0150)	91.9	84.5	88.6
Agara (Ward No-0114)	97.2	91.7	94.9
Konena Agrahara (Ward No-0113)	95.2	89.6	92.6
Marathahalli (Ward No-0086)	92.6	84.4	89.1
Chalaghatta village	86.3	78.4	82.6
Hadosiddapura village	91.1	79.9	86.0
Kannahalli village	86.4	82.4	84.4
Halanayakanahalli village	88.4	76.9	83.1
Chikkanayakanahalli village	86.2	71.3	79.5

Source: Census 2011 data

Bangalore Urban District as per Census data 2011, has the highest number of literate females in the State.

Details on Working Population

Worker Participation Rate (WPR) refers to the percentage of people (16 years or above) who are engaged in different occupations either at the household, commercial or agricultural level, as main or marginal workers. WPR is calculated using the following formula:

$$WPR = \frac{total\ working\ population}{total\ population} \times 100$$

Work is defined as the participation in any economically productive capacity with or without compensation, wages or profit. Thus, the WPR provides a direct indication of the dependency levels and also indirectly indicates the employment opportunities that exist in non-agricultural sectors such as household industries, industrial and commercial activities.

Table 7.4 Workers Participation Ratio in the villages in the 5 km radius

Village/Ward Name	Main Workers[1] (%)	Marginal Workers[2] (%)	Non Workers[3] (%)	WPR (Overall)
Jakkasandra (Ward No-0173)	42.4	2.5	55.1	44.9
Bellanduru (Ward No-0150)	48.1	4.7	47.2	52.8
Agara (Ward No-0114)	46.7	1.8	51.5	48.5
Konena Agrahara (Ward No-0113)	44.6	4.1	51.3	48.7
Marathahalli (Ward No-0086)	45.2	4.3	50.5	49.5
Chalaghatta village	45.3	1.5	53.2	46.8
Hadosiddapura village	11.0	38.9	50.1	49.9
Kannahalli village	43.6	1.5	54.8	45.2
Halanayakanahalli village	35.3	9.3	55.4	44.6
Chikkanayakanahalli village	32.0	14.1	53.9	46.1

Source: Census 2011 data

The WPR in the immediate vicinity of the site is on an average 49.5%. The highest recorded WPR is for Bellanduru Ward at 52.8%, while the lowest was of *Halanayakanahalli* at 45.2%. The livelihood profile in the area has changed in the last 15 years. Local economy has shifted from agriculture sector to service sector largely.

7.2 *GIVE DETAILS OF THE EXISTING SOCIAL INFRASTRUCTURE AROUND THE PROPOSED PROJECT.*

7.2.1 *Access to Infrastructure*

Educational Infrastructure

Looking at educational infrastructure of study area, it was observed that private schools and colleges are preferred by local populace. Although there are government schools available and easily accessible to mostly villages in study area. Census 2011 data indicates each village in the vicinity of project location (in 5km of the study area), has a primary school in its own periphery.

(1) [1] main workers are those who had worked for the major part of the reference period (that is, 6 months or more)

(2) [2] marginal workers are those who had worked for less than 6 months in the reference year

(3) [3] non workers are those who have not been involved in any form of income generating period during the reference period

Health Infrastructure

Health Infrastructure and its access has improved in the study area. According to the data of the Census of India 2011, Primary Health Centre (PHC) is accessible within 5 km all villages in the project vicinity except for village *Kannahalli* where PHC is located within village boundary. Besides this, access to private health care centres & hospitals has also improved in view of urbanisation of surrounding areas.

Table 7.5 Rural Health Infrastructure in 0-5 km radius

Heath Care facilities	Chalaghatta village	Hadosiddapura village	Kannahalli village	Halanayakana halli village	Chikkanayaka nahalli village
Community Health Centre	>10 km	< 5 km	>10 km	< 5 km	5 to 10 km
Primary Health Centre	5 to 10 km	< 5 km	Available	< 5 km	< 5 km
Primary Health Sub-Centre	5 to 10 km	5 to 10 km	Available	< 5 km	5 to 10 km
Maternity And Child Welfare Centre	5 to 10 km	< 5 km	Available	< 5 km	< 5 km
TB Clinic	5 to 10 km	< 5 km	Available	< 5 km	< 5 km
Mobile Health Clinic	5 to 10 km	< 5 km	5 to 10 km	< 5 km	>10 km

Source: Census 2011 data

Sanitation and Drinking water supply

Sanitation and drinking water supply is one of key concerns of the people living in all these localities. Not speaking of the residential apartments, access to sanitation facility in the project area varies. Though toilet exists in most of the localities, open defecation practices cannot be totally ruled out. However condition is gradually improving with the effect of increased urbanisation. Census 2011 data indicates one village in close vicinity of the project i.e. *h*census 2011 indicates that village *Challagatta* and *Hadosiddapura* have covered drainage system, where remaining villages in close vicinity have open drainage.

Access to water supply has also improved over the last decade. Census 2011 data shows that each village in 5 km radius of project location have access to treated tap water except for the village *Kannahalli*. Hand pump is additional source for water for each of these villages.

Postal Services, Bank, Telecom. Road etc.

As per the Census 2011 data, each of the villages in 5km radius of project location, are well connected with bus service. These villages are also close to National Highways. Banking facilities are within 10 km distance.
Access to common facilities

Table 7.6 Access to infrastructures in the 5 km radius villages

Facilities	Chalaghatta village	Hadosiddapura village	Kannahalli village	Halanayakana halli village	Chikkanayakanahalli village
Post Office	5 to 10 km	< 5 km	< 5 km	< 5 km	< 5 km
Public call office/Mobile (PCO)	Available	Available	Available	Available	Available
Private Courier Facility	Available	>10 km	>10 km	Available	>10 km
Public Bus Service	Available	Available	Available	Available	Available
Railway Station	5 to 10 km	>10 km	5 to 10 km	< 5 km	>10 km
Taxi service	Available	Available	Available	Available	Available
National Highway	>10 km	5 to 10 km	5 to 10 km	5 to 10 km	5 to 10 km
ATM	< 5 km	5 to 10 km	5 to 10 km	< 5 km	5 to 10 km
Commercial Bank	5 to 10 km	5 to 10 km	5 to 10 km	< 5 km	5 to 10 km
Cooperative Bank	5 to 10 km	5 to 10 km	5 to 10 km	5 to 10 km	5 to 10 km
Agriculture credit societies	5 to 10 km	5 to 10 km	5 to 10 km	5 to 10 km	5 to 10 km
Self Help Group	Available	Available	Available	Available	Available
PDS Shop	Available	Available	Available	Available	Available
Mandi/Regular Market	5 to 10 km	>10 km	>10 km	5 to 10 km	5 to 10 km

Source: Census 2011 data

7.2.2 *Influx of Population due to the Proposed Project*

Construction Phase

During construction about 400 labours during normal construction period and 800 during peak construction will be employed at the MLCP Project site, which will be sourced locally.

Operation Phase

The operation of MLCP Project does not require any onsite support person, except 15-20 security personal to guard the Project.

7.3 *WILL THE PROJECT CAUSE ADVERSE EFFECTS ON LOCAL COMMUNITIES, DISTURBANCE TO SACRED SITES OR OTHER CULTURAL VALUES? WHAT ARE THE SAFEGUARDS PROPOSED?*

The proposed MLCP Project is not likely to have any significant adverse impacts since it will generate job opportunities during the construction phase for local communities. As a policy locals with right skills will be preferred for the jobs during the construction phase.

There are no historical or archaeological monuments of significance within or nearby the project area and hence no negative impact in this regard is anticipated.

No additional traffic is anticipated to be increased due to proposed MLCP project, hence no impacts is anticipated due to traffic too.

Mitigation Measures- Construction Phase

- Ensure maximum employment opportunities to local people;
- No movement of construction workers to be allowed to the neighbouring land. Instructions will be given to the contractors engaged in the construction activities for prohibiting any such movement.

8 BUILDING MATERIALS

8.1 MAY INVOLVE THE USE OF BUILDING MATERIALS WITH HIGH-EMBODIED ENERGY. ARE THE CONSTRUCTION MATERIALS PRODUCED WITH ENERGY EFFICIENT PROCESSES? (GIVE DETAILS OF ENERGY CONSERVATION MEASURES IN THE SELECTION OF BUILDING MATERIALS AND THEIR ENERGY EFFICIENCY)

The construction material to be used will include both renewable and non-renewable resources including gravel, stones, aggregates, sand, steel, concrete, fly ash mix cement, clay and fly ash bricks, paints, tiles, electrical wares, adhesives. Aerocon blocks (Autoclaved Aerated Concrete Blocks will be used for wall constructions. Wood alternatives will be used in the Project with minimal use of timber. The materials will be procured from reputed manufacturers with test certificates as per BIS specifications.

The MLCP Project will also use some of the following criteria for selection of green building material and practices:

- Locally available materials and materials with recycled content would be considered to the extent possible;
- Paints, adhesives and sealants would be with low VOC (Volatile Organic compound) content.
- Materials with reusable and recyclable potential will be used.
- Use of over-deck insulation for the roof to achieve minimum R-value of R-15 e.g. 3-inches of Extruded polystyrene.
- Use of Aerated Aerocon (AAC) blocks for wall construction.
- The project proponent to ensure that the contractors hired implement best management practices to conserve renewable resources.
- Open grid pavement would be used wherever possible to reduce hardscapes and reduce run-offs which will help in heat island mitigation.

8.2 TRANSPORT AND HANDLING OF MATERIALS DURING CONSTRUCTION MAY RESULT IN POLLUTION, NOISE & PUBLIC NUISANCE. WHAT MEASURES ARE TAKEN TO MINIMIZE THE IMPACTS?

8.2.1 *Temporary Concrete Batching Plant*

A temporary concrete batching plant of 30 m^3/hour capacity will be set up by the Project for construction activities. Generation of wastewater, dust emissions and noise are the key potential impacts associated with operation of concrete batching plant. To minimise adverse impacts on surrounding environment, following mitigation measures will be adopted by the Project:

- The Plant would be set up at a location within the construction site away from any residential set up at a sufficient distance;
- The Plant would be set up away from any drain inlet and a perimeter bund would be erected all around the batching plant. The drainage from

the bund would be subjected to a sump which will be cleaned on periodic basis to minimise potential surface runoff from stockpiles;
- The Plant would be enclosed with temporary barriers (of 3 m of height) to minimise spread of emissions of noise and dust particles;
- Unloading from cement delivery trucks would be done on pallets which would be covered with tarpaulin sheets during non-working periods; and
- The Plant would be operated under supervision and periodical monitoring of dust levels and noise would be conducted at the periphery of the construction site;
- The area surrounding the temporary concrete Batching Plant would be swept on daily basis;
- All stockpiles would be covered while uncovered stockpiles and transfer points will be periodically water sprinkled to minimise fugitive dust generation.

8.2.2 Other Construction & Transport Activities

Following mitigation measures will be implemented together with detail given for other mitigation measures in the Environmental Management Plan under ***Section 10*** of this Form 1A.

- Entry/exit routes and transportation timings for heavy transport vehicles will be planned to minimize disturbance to the surrounding locality;
- Trucks/ dumpers will be covered by tarpaulin sheets during off site transportation;
- Construction waste generated -debris, concrete, metal cuttings wastes will be collected and disposed of as per the norms;
- The construction site will be provided with temporary tin sheet barrier all around to isolate it from the surroundings;
- Construction equipment with idling control technologies will be used;
- PUC certificates will be required for the vehicles entering the premises as per the guidelines for the subcontractors;
- Regular maintenance of the equipment will be carried out;
- The construction activities will be carried out during daytime only;
- Hazardous waste will be collected and disposal will be as per the Hazardous Waste Rules, 2016;
- The workers exposed to high noise generating equipment would be provided with earplugs and earmuffs.

8.3 ARE RECYCLED MATERIALS USED IN ROADS AND STRUCTURES? STATE THE EXTENT OF SAVINGS ACHIEVED?

Yes, during construction excavated material and construction waste will be used for road construction and onsite backfilling. Locally available materials and materials with recycled content would be considered to the extent possible.

8.4 GIVE DETAILS OF THE METHODS OF COLLECTION, SEGREGATION & DISPOSAL OF THE GARBAGE GENERATED DURING THE OPERATION PHASES OF THE PROJECT.

The waste generation and their disposal options during operation phase are given in the following sub sections.

8.4.1 Domestic Waste Generation and Disposal during Operation Phase

The domestic waste generation and disposal is as given ***Table 8.1***:

Table 8.1 Estimated Solid Waste Generation during Operation Phase of the Existing SRR-1 &2 and SRR-K Buildings and under construction SRR-3 Project

SN	Waste Type	Quantity (kg/month)					Method of Disposal
		Existing SRR-1 & SRR-2	Under construction SRR-3	SRR-K	Proposed MLCP	Combined (SRR-1 + SRR-2+ SRR-K+ SRR-3 and MLCP)	
1	Wet garbage - food waste from canteen and Kitchen	1750.00	4,150	2,100 food waste +850 food waste oil & grease	10	8860	Through Organic Waste converter, reducing waste as compost to 60% (i.e. compost of 5,850 kg/month). Part of compost will be used in gardening within SRR campus and part to be given to NGO's for their own use.
2	Wooden Scrap, Paper and Packing materials	1,435 + 2,691 = 4,126	3150	260	0	7,536	To be sold to vendors for reuse/recycle
3	STP Sludge	400	600	0	0	1,000	To be reused in Gardening as manure

Source: Intel; The food waste generation is as per current operations of SRR1 and 2 buildings, where food waste generation on an average is approximately 59 g per capita per day, accordingly, food waste generation for 3200 personnel worked out for 22 days per month of working in SRR-3

8.4.2 Hazardous Wastes Generation and Disposal during Operation Phase

The detail of hazardous waste generation is given in ***Table 8.2*** as follows:

Table 8.2 Hazardous Waste Generation during Operation Phase of the Existing SRR-1 &2 Buildings and Proposed SRR-3 Project

SN	Waste Type	Category as per Haz. Waste Rules 2008	Quantity (Per/Month)				Method of Disposal
			Existing SRR-1 & SRR-2 &SRR-K buildings	Under Construction SRR-3 building	Proposed MLCP	Combined SRR-1+SRR-2 +SRR-3+SRR-K)	
1	Waste /used oil (Litres)	5.1	140	240	0	385	To KSPCB approved recyclers
2	Oil soaked cotton wasters (Kg)	5.2	20	25	5	50	To KSPCB approved vendors
3	Spent catalyst		<1.5 TPA	0	0	<1.5	To Approved vendor

Source: Intel

Following measures will be adopted for safe disposal of solid wastes generated during operation phase of the Project:

- During the collection stage, the bio-degradable and non-recyclable/ non-biodegradable waste will be stored and collected separately. Only the non-recyclable and non- biodegradable waste will be transported to the waste disposal site. The segregation, transportation and disposal of wastes will be done by the authorized agency that will take care of the waste management during the operational phase of the project;
- To minimize littering and odours, waste will be stored in well-designed containers/bins that will be located at strategic locations to minimize the associated ill effects;
- Care will be taken so that the collection vehicles are well maintained and minimize noise and emissions. During transporting of the waste, it will be covered to avoid littering;
- Packaging wastes from the material packaging and unpacking of raw materials will be collected in a well demarcated area and sent to authorized vendors for its recycling; and
- All the hazardous waste will be disposed of as per authorisation from KSPCB. The storage, handling, transportation and disposal will be strictly as per the requirement of authorisation by KSPCB and Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2016 and amendments. The waste will be stored into closed containers under covered area provided with concrete flooring and for disposal by sending it to CHWTSDF facility.

9 ENERGY CONSERVATION

9.1 GIVE DETAILS OF THE POWER REQUIREMENTS, SOURCE OF SUPPLY, BACKUP SOURCE ETC. WHAT IS THE ENERGY CONSUMPTION ASSUMED PER SQUARE FOOT OF BUILT-UP AREA? HOW HAVE YOU TRIED TO MINIMIZE ENERGY CONSUMPTION?

9.1.1 Power Requirement

Construction Phase

The power requirement during construction phase will be for operation of construction equipment, lightening of working areas and is estimated to be peak of 1000 kVA and normal of 600 kVA, to be sourced from BESCOM. Emergency power backup arrangement will be maintained through four diesel generators of 50 kVA capacity each.

Approximately 40 litres/hour of diesel will be required for operation of diesel generators for construction activities. Approximately 1 m^3 of high speed diesel will be stored at the construction site in 5 x 200 liters MS drums.

Operation Phase

The power requirement for the Project including existing operational SRR-1, SRR-2, SRR-K, under construction SRR-3 and proposed MLCP is discussed under **in section 1.2.5** in **Table 1.6.**

9.1.2 Energy Resource Conservation

Following energy conservation measures are proposed:

Building Envelope

- Solid RCC/Steel frame structure.
- façade as per design intent
- Solid block and masonry for wall panels and partitions.
- Minimum 75mm CC flooring
- Toilet flooring wall daddoing with quality ceramic / vitrified tiles.
- Granite flooring of lobbies, and corridors.
- Glass doors main lobby/gf only and hard wood framed flush doors for toilets.
- Staircase with antiskid Treads, Raisers, Skirting and MS railing as per norm requirement.

Lighting

- All lights are LED type, smart lighting.

- The 10% of the total lighting shall be on Inverter.
- All parking level lights shall be control through MCB at DB & each floor level.
- The parking area lux level considered as per NBC i.e. 70Lux.
- 100% dg back up has been considered except Fire loads, during fire only diesel eng. works as back up.
- In case fire load needs to considered in DG as well transformer, the both the capacities need to be changed to 500kVA.
- The main LT panel shall be located in GF & dg and transformer shall be located at ground floor level inside the building foot print.
- Smart Parking with Intel based architecture.
- 5% of the total car shall be provided with electrically charging type sockets as per LEED & evenly distributed in all levels of parking

Renewable Energy

- External lighting will be catered through solar PVs

Water Efficiency

- Sewage treatment plant will be incorporated to treat all wastewater generated onsite;
- Treated water will be used for irrigation, this will reduce daily freshwater requirement;
- Rain water harvesting by way of 4 number of percolation pits and storage tank of 150 X 2 m^3 capacity will be incorporated;
- Low flow plumbing fixtures with aerators / mixers will be used;
- Flow rates for fixtures will be benchmarked as per requirements of USGBC/IGBC-LEED Rating system. This will result in water savings to a tune of approx. 20%;
- Landscape design will incorporate drought tolerant and native species to reduce water consumption;
- Turf / Lawn will be reduced to the extent possible since they require lot of water; and
- Drip irrigation will be incorporated to the extent possible.

Building Materials

- Locally available materials and materials with recycled content will be considered to the extent possible;
- Use of rapidly renewable materials and products for 2.5% of the total value of all building materials and products will be used to reduce the use of finite raw materials and
- Paints, adhesives and sealants will be specified with low VOC (Volatile Organic Compounds) content.

9.2 ***WHAT TYPE OF, AND CAPACITY OF, POWER BACK-UP TO YOU PLAN TO PROVIDE?***

Power Back-up

The power requirement for the Project including existing operational SRR-1, SRR-2, SRR-K, under construction SRR-3 and proposed MLCP is discussed under in **section 1.2.5** in **Table 1.6.**

9.3 ***WHAT ARE THE CHARACTERISTICS OF THE GLASS YOU PLAN TO USE? PROVIDE SPECIFICATIONS OF ITS CHARACTERISTICS RELATED TO BOTH SHORT WAVE AND LONG WAVE RADIATION?***

The proposed Project is multilevel car parking and does not involve use of glass and hence not applicable

9.4 ***WHAT PASSIVE SOLAR ARCHITECTURAL FEATURES ARE BEING USED IN THE BUILDING? ILLUSTRATE THE APPLICATIONS MADE IN THE PROPOSED PROJECT.***

The organization of building structures has been planned in such a way so as to take advantage of the local climate. The proposed Project is multilevel car parking and floor plate dimensions have been open on four sides to deliver natural daylight to the maximum area to minimize artificial lighting requirements.

9.5 ***DOES THE LAYOUT OF STREETS & BUILDINGS MAXIMISE THE POTENTIAL FOR SOLAR ENERGY DEVICES? HAVE YOU CONSIDERED THE USE OF STREET LIGHTING, EMERGENCY LIGHTING AND SOLAR HOT WATER SYSTEMS FOR USE IN THE BUILDING COMPLEX? SUBSTANTIATE WITH DETAILS.***

- External lighting will be catered through solar PVs.
- No hot water requirement for the Project and as the proposed project is a multilevel car parking.

9.6 ***IS SHADING EFFECTIVELY USED TO REDUCE COOLING/HEATING LOADS? WHAT PRINCIPLES HAVE BEEN USED TO MAXIMIZE THE SHADING OF WALLS ON THE EAST AND THE WEST AND THE ROOF? HOW MUCH ENERGY SAVING HAS BEEN EFFECTED?***

The organization of building structures has been planned in such a way so as to take advantage of the local climate. The proposed Project is multilevel car parking and floor plate dimensions have been open on four sides to deliver natural daylight to the maximum area to minimize artificial lighting requirements.

9.7 ***DO THE STRUCTURES USE ENERGY-EFFICIENT SPACE CONDITIONING, LIGHTING AND MECHANICAL SYSTEMS? PROVIDE TECHNICAL DETAILS. PROVIDE DETAILS OF THE TRANSFORMERS AND MOTOR EFFICIENCIES, LIGHTING INTENSITY AND AIR-CONDITIONING LOAD ASSUMPTIONS? ARE YOU USING CFC AND HCFC FREE CHILLERS? PROVIDE SPECIFICATIONS.***

- The basement ventilation considered for basement car parking since the basement floor is below the ground level and there is no peripheral opening available around the building.
- The total area considered for ventilation is 14500m² excluding staircases etc., and height is 3.9 m.
- The number of air changes per hour (ACPH) considered for normal mode is 6 and for fire mode is 12 ACPH as per NBC norms.
- Normal Mode fans – 34,000 cfm x 6 nos. of axial fans with VFD
- Fire mode fans - 50,000 cfm x 4 nos. of axial fans with constant speed.
- The number of jet fans considered for basement car parking is 23.
- The natural fresh air intake shall be considered through ramps for fresh air and forced exhaust through mechanical fans considered for exhaust air.
- For Ground and upper floors, only jet fans shall be considered for better air circulation inside the building considering peripheral openings available.
- The number of jet fans considered for each level is around 19 for normal operation only.
- Entire ventilation system shall be based on INTEL based architecture.
- The CO sensor to be considered for each level is 15 nos.
- The louvered openings shall be considered for all staircase, lift lobbies and basement exhaust air
- Treated water will be used for irrigation;
- Rain water harvesting by way of storage tank of 300 m^3 capacity will be incorporated;
- Landscape design will incorporate drought tolerant and native species to reduce water consumption;
- Turf / Lawn will be reduced to the extent possible since they require lot of water; and
- Drip irrigation will be incorporated to the extent possible.

9.8 ***WHAT ARE THE LIKELY EFFECTS OF THE BUILDING ACTIVITY IN ALTERING THE MICRO-CLIMATES? PROVIDE A SELF-ASSESSMENT ON THE LIKELY IMPACTS OF THE PROPOSED CONSTRUCTION ON CREATION OF HEAT ISLAND & INVERSION EFFECTS?***

At present, the MLCP Project site is open land with surface parking and landscape area. The project being well-planned will result in organized open spaces and green areas. The design concept of the project incorporates a combination of open area and water bodies with buildings being the islands surrounded by well-planned green areas. About 37.19% of the area is designated for landscaping. Open spaces will allow for natural ventilation and a lot of natural light into the buildings.

Heat island effect will be minimised by adoption of following measures:

- Provide shade from terrace covered by solar panels;
- Use of open grid pavement wherever possible to reduce hardscapes and reduce run-offs and which will help in heat island mitigation; and
- Use of a combination of terrace garden / china mosaic tiles / high albedo (reflective) paint on the roof for reducing heat island effect.

9.9 WHAT ARE THE THERMAL CHARACTERISTICS OF THE BUILDING ENVELOPE? (A) ROOF; (B) EXTERNAL WALLS; AND (C) FENESTRATION? GIVE DETAILS OF THE MATERIAL USED AND THE U-VALUES OR THE R VALUES OF THE INDIVIDUAL COMPONENTS.

The proposed Project is multilevel car parking hence not applicable.

9.10 WHAT PRECAUTIONS & SAFETY MEASURES ARE PROPOSED AGAINST FIRE HAZARDS? FURNISH DETAILS OF EMERGENCY PLANS.

System Description

- MLCP is used to shelter the cars and there is no clear identification of category under NBC, Will be considered under storage category
- Building will be planned with Sprinklers for each car one no and in driveway at coverage area of 9 to 12 sq.m based on layout
- Double headed Hydrant will be provided as per NBC for every 1000 sq.m one nos.
- All hydrants will be connected to pump and sump and ground level and also will be connected to overhead tank and pump and roof level
- Manual call point and hooters cum strobe will be planned at the exits like staircase and lift lobby.
- Underground level 300 cum sump with 1 set of pump with electrical hydrant and sprinkler pump of 2850 LPM and diesel pump as common standby of 2850 LPM and common jockey pump of 180 LPM is planned.
- Roof level 900 LPM - 2 pumps is planned with OHT capacity of 30 cum.
- Fire extinguishers will be planned based on IS requirements and type of fire application.
- Fire Signage's will be planned at floor level, entry exit and fire instructions with emergency contact numbers

Portable Fire Extinguishers

- The number and location of portable fire extinguishers depends on the size and use of the building. Different types of Extinguishers such as Dry Chemical Powder, Carbon-di-oxide and Water type Carbon di-oxide type will be provided;
- Different types of fire extinguishers have different characters and therefore, an appropriate type of Fire Extinguisher is required to be used;
- Portable fire extinguishers will be provided at locations mentioned below:

- Water expelled carbon-dioxide type fire extinguisher of capacity 9 liters fitted with gunmetal cap, high-pressure carbon-dioxide gas cartridge, with brackets, conforming to IS 940 located in different types of rooms and areas.
- Carbon dioxide type fire extinguishers of capacity 4.5 kilograms fitted with valve, discharge horn, conforming to IS 2878, located in different types of rooms and areas.
- Dry chemical powder type fire extinguishers of capacity 5 kilograms fitted with valve, discharge horn, conforming to IS 2878, located in in different types of rooms and areas.

9.11 IF YOU ARE USING GLASS AS WALL MATERIAL PROVIDES DETAILS AND SPECIFICATIONS INCLUDING EMISSIVITY AND THERMAL CHARACTERISTICS.

The proposed Project is multilevel car parking hence not applicable

9.12 WHAT IS THE RATE OF AIR INFILTRATION INTO THE BUILDING? PROVIDE DETAILS OF HOW YOU ARE MITIGATING THE EFFECTS OF INFILTRATION.

- The basement ventilation considered for basement car parking since the basement floor is below the ground level and there is no peripheral opening available around the building.
- The total area considered for ventilation is 14500m² excluding staircases etc., and height is 3.9m.
- The number of air changes per hour (ACPH) considered for normal mode is 6 and for fire mode is 12 ACPH as per NBC norms.
- Normal Mode fans – 34,000 cfm x 6 nos of axial fans with VFD
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- The number of jet fans considered for basement car parking is 23.
- The natural fresh air intake shall be considered through ramps for fresh air and forced exhaust through mechanical fans considered for exhaust air.
- For Ground and upper floors, only jet fans shall be considered for better air circulation inside the building considering peripheral openings available.
- The number of jet fans considered for each level is around 19 for normal operation only.
- Entire ventilation system shall be based on INTEL based architecture.
- The CO sensor to be considered for each level is 15 nos.
- The louvered openings shall be considered for all staircase, lift lobbies and basement exhaust air.

Schematic view of fire fighting scheme is provided in ***Figure 9.1***.

Figure 9.1 Fire Fighting Layout on Basement Floor Plan

9.13 ***TO WHAT EXTENT THE NON-CONVENTIONAL ENERGY TECHNOLOGIES ARE UTILISED IN THE OVERALL ENERGY CONSUMPTION? PROVIDE DETAILS OF THE RENEWABLE ENERGY TECHNOLOGIES USED.***

The following systems shall be incorporated in the buildings and the site planning:

- Thermal facades;
- Ventilated facades;
- External lighting will be catered through solar panels.

10 ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

10.1 INTRODUCTION

The Environmental Management and Monitoring Plan (EMMP) is required to minimize impact of adverse environmental impacts by implementing suggested mitigation measures with suggested timelines and responsibilities during the Project life cycle.

The EMMP covers management program for mitigation measures suggested to counter likely impact from proposed project activities. Monitoring measures are suggested for effective implementation of the mitigation measures. It also addresses the management program to minimize adverse impacts identified from the associated activity such as resource use, material transportation and storage.

The EMMP addresses the potential impacts from both the construction and operation phases. The proposed EMMP will be required to ensure effective management of the potential impacts through following implementation aspects:

- Prevention and control measures to be implemented along with its time of implementation during the project;
- Roles and responsibilities for implementation; and
- Monitoring activities in terms of inspection, measurement.

The environmental monitoring will help in assessing the changes in environmental conditions by monitoring the effective implementation of mitigation measures, and measuring deteriorations in environmental quality for further preventive actions.

EMMP includes four major elements:

- Commitment and Policy: Intel will strive to provide and implement the Environmental Management Plan;

- Planning: This includes identification of environmental impacts, legal requirements and setting environmental objectives. The various potential impacts are discussed in ***Table 10.1 & 10.2***;

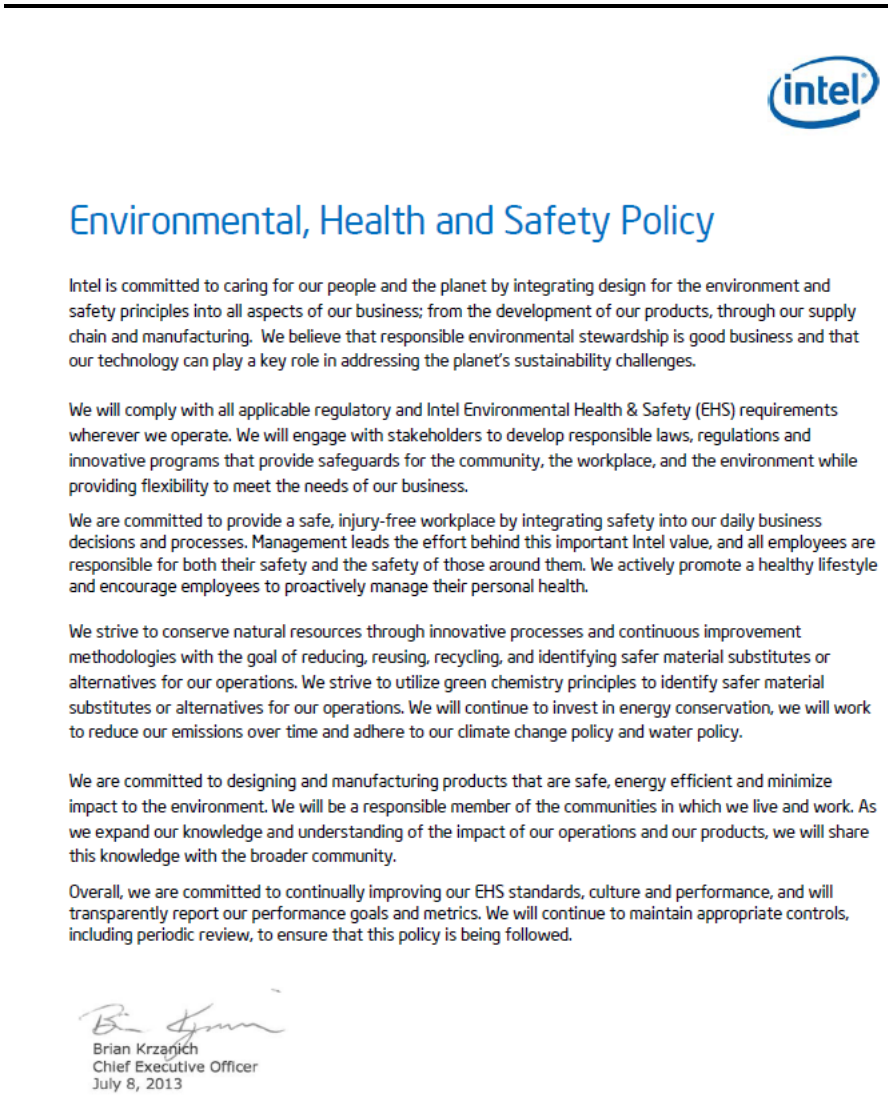
- Implementation: This comprises of resources available for the project, accountability of contractors, documentation of measures to be taken; and

- Measurement & Evaluation: This includes monitoring, corrective actions and record keeping.

10.2 COMMITMENT & POLICY

Intel's commitment & policy on environment, health and safety is given in ***Figure 10.1***.

Figure 10.1 Intel's EHS Policy



Environmental, Health and Safety Policy

Intel is committed to caring for our people and the planet by integrating design for the environment and safety principles into all aspects of our business; from the development of our products, through our supply chain and manufacturing. We believe that responsible environmental stewardship is good business and that our technology can play a key role in addressing the planet's sustainability challenges.

We will comply with all applicable regulatory and Intel Environmental Health & Safety (EHS) requirements wherever we operate. We will engage with stakeholders to develop responsible laws, regulations and innovative programs that provide safeguards for the community, the workplace, and the environment while providing flexibility to meet the needs of our business.

We are committed to provide a safe, injury-free workplace by integrating safety into our daily business decisions and processes. Management leads the effort behind this important Intel value, and all employees are responsible for both their safety and the safety of those around them. We actively promote a healthy lifestyle and encourage employees to proactively manage their personal health.

We strive to conserve natural resources through innovative processes and continuous improvement methodologies with the goal of reducing, reusing, recycling, and identifying safer material substitutes or alternatives for our operations. We strive to utilize green chemistry principles to identify safer material substitutes or alternatives for our operations. We will continue to invest in energy conservation, we will work to reduce our emissions over time and adhere to our climate change policy and water policy.

We are committed to designing and manufacturing products that are safe, energy efficient and minimize impact to the environment. We will be a responsible member of the communities in which we live and work. As we expand our knowledge and understanding of the impact of our operations and our products, we will share this knowledge with the broader community.

Overall, we are committed to continually improving our EHS standards, culture and performance, and will transparently report our performance goals and metrics. We will continue to maintain appropriate controls, including periodic review, to ensure that this policy is being followed.

Brian Krzanich
Chief Executive Officer
July 8, 2013

10.3 PLANNING

Various components of planning for the Proposed Project will include as per the following sub sections.

10.3.1 *Organization, Roles and Responsibilities*

Role of Intel

Intel will have ultimate responsibility for implementing the provisions of the EMMP. This role will include the ongoing management of environmental

impacts, monitoring of contractor performance as well as development of mechanisms for dealing with environmental problems.

Intel will also ensure that the activities of its contractors are conducted in accordance with 'good practice' measures, implementation of which will be required through contractual documentation. In order to facilitate this, and to demonstrate commitment to the EMMP, Intel /Contractor will conduct regular internal site inspections, the results of which will be documented.

10.3.2 Role of Intel Contractors

Intel management will be responsible for the performance of all its contractors and ensuring that all Intel commitments in the EIA are translated into contractors' requirements and that these requirements are implemented to the full intent and extent of Intel commitment.

Contractors will be responsible for implementation of, or adherence to, all the mitigation measures outlined in the EIA. All contractors will be required to comply with the provisions of the EMMP and with any environmental and other codes of conduct required by Intel. Intel will require all contractors to introduce regular environmental inspection and reporting to the concerned departments to enable monitoring their performance.

The Organizational set up for EHS management for construction phase is given in **Figure 10.2** and operation phase is given in **Figure 10.3.**

Figure 10.2 Environmental Health and Safety Organisation Structure for Construction Phase

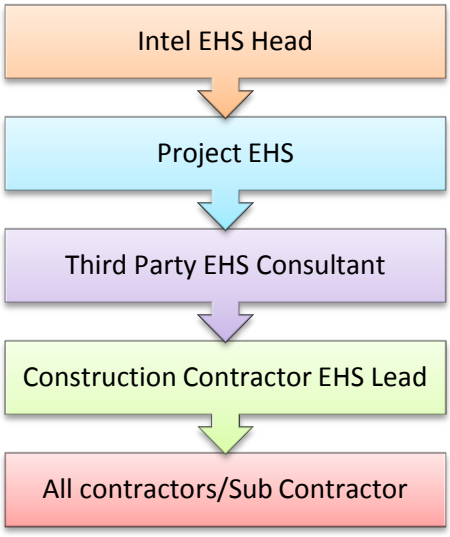
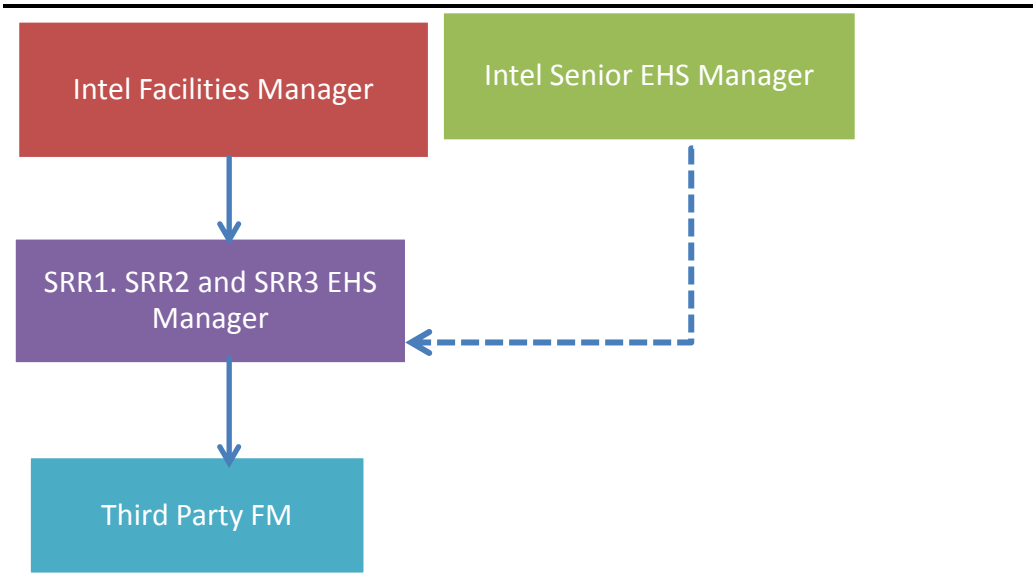


Figure 10.3 Environmental Health &Safety Organisation Structure for Operation Phase



10.3.3 *Inspection, Monitoring and Audit*

Inspection and monitoring of the environmental impacts of the Project activities will increase the effectiveness of EMP. Through the process of inspection and auditing, Intel will ensure that the conditions stipulated in Consent for Establishment, Consent to Operate, storage of petroleum products are complied with. It is proposed that the audit will be conducted by Audit Team (comprising of Contractor, EMC and Intel) for implementation of management system. The entire process of inspections and audits will be documented and inspection and audit findings will be implemented by jointly by contractor and EMC.

10.3.4 *Monitoring, Reporting and Documentation*

Intel will develop and implement a programme of reporting through all stages of the project life cycle. Delegated personnel will be required to fully comply with the reporting programme in terms of both timely submissions of reports as per acceptable level of detail.

External Monitoring, Reporting and Communication

Intel will hire an external agency to conduct monitoring for air emissions and domestic wastewater quality for submission to KSPCB.

Half yearly compliance statements and annual environmental report known as 'Environmental Statement' as per Form V of EPA Rules, 1986 are to be submitted to the regulatory agencies. Facility Manager will be the responsible person for ensuring that communication with regulatory agencies is maintained as per the requirement. All complaints and enquiries are to be appropriately dealt with and records be maintained in a Complaint/Enquiry Register by the delegated staff of EHS.

Internal Monitoring, Reporting and Communication

Internal monitoring will focus on measuring and reporting progress of implementing EMP activities. The EHS Manager of Intel will be responsible for internal monitoring. Inspection and audits finding along with their improvement program will be regularly reported to the senior management for their consideration.

Documentation

Intel is to establish a documentation and record keeping system to ensure recording and updating of documents per the requirements specified in EMP.

10.3.5 EMP Review & Amendments

The EMP would be reviewed periodically to update it addressing any changes in the organization, process or regulatory requirements.

10.4 IMPLEMENTATION

The implementation mainly comprises of resources available for the project, accountability of contractors and documentation of measures to be taken. It is proposed to create Environment Management Cell under Facility Manager for effective implementation of EMMP. The Cell will have following functions:

- To implement the environmental management plan;
- To assure regulatory compliance with all relevant rules and regulations;
- To initiate environmental monitoring as per approved schedule;
- Coordination with regulatory agencies, external consultants, monitoring laboratories.

10.5 ENVIRONMENTAL MANAGEMENT & MONITORING PROGRAMME (EMMP)

Table 10.1 ***and*** **Table 10.2** provide environmental management and monitoring plans to be followed up during construction and operation phases of the MLCP Project.

Table 10.1 EMP for Construction Phase

S.N.	Aspects	Impact	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/Monitoring/ External Reporting
1.	Land Acquisition					
i.	Social	▪ No impact on local community	▪ No land acquisition is involved as the project site is located within KIADB allotted land. KIADB is responsible for all land acquisition. ▪ Implementation of CSR commitment	Review status of implementation of planned CSR activities	Project Head	Once a Fortnight
2.	Site Clearing					
i.	Topography and Drainage	Change of topography and disturbance to drainage pattern.	▪ Disturbance to land surface contours to be kept to minimum. ▪ Maintaining natural drainage pattern. ▪ Adequate drains and slopes to be laid across the proposed project prior to start of excavation work to ensure adequate cross drainage for quick evacuation of catchment water; ▪ All necessary measures will be taken while working close to cross drainage channels to prevent earthwork, stonework, materials and appendage as well as the method of operation from impeding cross-drainage at existing drainage systems such as natural drains, streams, water reservoirs. ▪ Construct diversion dykes to channel runoff around the excavated site to avoid surface runoff of excavated materials; ▪ Restoring all areas affected by the establishment of MLCP project or other area under the direct control of Construction Contractor; ▪ Construction footprint to be well	Review of implementation of mitigation measures	Construction Contractor & Supervisors to be supervised by Project Manager Contractor	Audit by Team (Intel' Environment Manager and Construction Contractor), quarterly

S.N.	Aspects	Impact	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/Monitoring/ External Reporting
			defined and construction work to be carried out within the footprints only.			
ii.	Landuse, vegetation and landscaping	▪ No change of landuse. Landuse within Industrial High Tech Zone ▪ Loss of vegetation ▪ Loss of habitat for small mammals and birds	▪ Vegetation removal from the Project site will be done only for essential areas only. Vegetation along the periphery of the Project site will be maintained as such. All works will be carried out such that the damage or disruption to flora is minimum. Only ground cover / shrubs that impinge directly on the permanent works or necessary for temporary works will be removed. ▪ Follow up of overall architecture and landscaping design of the proposed project; ▪ Transplantation of the existing trees required to be dislocated for the project in the green areas; ▪ Trees felling to be avoided wherever possible; ▪ Prior approval for tree felling to be obtained	Review of implementation of mitigation measures	Construction Contractor Intel Manager Environment, Project Manager	(Intel' Environment Manager and Construction Contractor), quarterly
3.	Establishment of Labour Camp					
i.	Social issues	Conflict of culture Regional bias. Women's safety and security may be adversely affected due to influx of outside labour force.	▪ Maximum number of unskilled labours to be employed from local areas having their residences in the nearby areas; ▪ Establishment of labour camps by construction contractor will be outside the project site. The camps will be managed by construction contractor; ▪ Campsite activities to be monitored.	Review of implementation of mitigation measures and Construction Labour Management Plan	Construction Supervision and Engineer Manager HR;	Inspection by Intel Facility Manager - once a fortnight
ii.	Health Risks	Potential sanitation and	▪ Provision of portable toilet facilities and septic tank for construction workers;	Review of implementation of	Construction Supervision	Inspection by Intel Facility Manager -

S.N.	Aspects	Impact	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/Monitoring/ External Reporting
		hygiene issues due to any unplanned waste dumping and disposal. Chances of spread of sexually transmittable disease like AIDS;	▪ Provision of portable water for drinking and bathing; ▪ Awareness programmes on HIV/AIDS, Malaria, Tuberculosis; ▪ Garbage bins must be provided in the camp and shall be regularly emptied and the garbage should be disposed off in a hygienic manner. ▪ The contractors shall instruct all staff to use the ablution facilities and under no circumstances shall indiscriminate excretion and urinating be allowed other than in the provided facilities; ▪ Arrangement for kitchen waste disposal- identify locations for establishing humus pits, which can be covered with soil for anaerobic composting; ▪ The site shall be kept visually and aesthetically pleasing, especially in and around the campsite. The workforce shall also be sensitized about the general health issues.	mitigation measures and Management Plan	and Engineer Manager HR;	once a fortnight
4.	Construction Activity					
A	Concrete Batching plant	▪ Dust emissions from stockpiles ▪ Noise emission due to operation of machines ▪ Surface runoff from stockpiles	▪ The concrete mixer would be set up away from any drain inlet to minimise surface runoff; ▪ All stockpiles would be covered while uncovered stockpiles and transfer points will be periodically water sprinkled to minimise fugitive dust generation; ▪ Unloading from cement delivery trucks would be done on pallets which would be covered with tarpaulin sheets during non-working periods. ▪ Temporary barrier around the batching plant to minimise spread of dust and noise;	Review of status of implementation of suggested mitigation measures.	Construction Contractor Overall supervision by Intel Manager Environment	Daily inspections by Intel Manager Environment

S.N.	Aspects	Impact	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/Monitoring/ External Reporting
			▪ Noise limits for construction equipment used in this project (measured at one metre from the edge of the equipment in free field) such as concrete mixers, cranes (moveable), vibrators and saws will not exceed 75 dB(A), as specified in the Environment (Protection) Rules, 1986; ▪ Monitoring of the noise levels will be carried out by an accredited Environmental Monitoring agency for the Project.			
B	Other construction Activities					
i.	Air Quality	Dust from loose soil, construction material and movement of vehicles Emission from generators	▪ Dust generating activities to be avoided in conditions of high wind (particularly during summer season) and covers to be provided for loose construction material at construction site; ▪ Provision of enclosure around the site to minimise fugitive dust emission from construction activities; ▪ Vehicle speed to be restricted to 15 km/hr at site to minimize potential for dust generation in the surroundings; ▪ Trucks/ dumpers to be covered by tarpaulin sheets during off site transportation of friable construction materials and spoil; ▪ Surfaced roads to be cleaned and un-surfaced roads to be stabilized to reduce offsite transport of soils and avoid dust generation; ▪ Diesel generators meant for emergency power supply to be optimally operated and regularly maintained so as to ensure that emissions from fuel combustion	Review of status of implementation of suggested mitigation measures. Arrange Ambient Air Quality monitoring at three locations outside the premises for PM_{10}, $PM_{2.5}$, SO_2, NOx, CO Carryout vehicle pollution check programme	Construction Contractor Overall supervision by Intel Manager Environment KSPCB (Regulatory Agency)	Daily inspections by Intel Manager Environment Six monthly ambient air & noise monitoring and pollution under control check – EMC.

S.N.	Aspects	Impact	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/Monitoring/ External Reporting
			remain at design levels. Also to ensure stack height of 3 m above the roof level of the shed meant for diesel generators to meet the stack height requirement as specified by CPCB; ▪ It is to be ensured that construction equipment are properly maintained to minimise smoke in the exhaust emissions; ▪ Machinery to be turned off when not in use; ▪ Housekeeping of the area to be maintained by deputing sweepers to remove dirt/debris from the floors/sites on daily basis; ▪ Paints, polishes, building fittings and flooring material to be procured carefully to ensure that these have low VOC generation potential; ▪ All the vehicles entering the site will be asked to have updated PUC (Pollution under control) certificate; ▪ The Contractor will ensure that the AAQ concentrations at the construction sites is within the acceptable limits of industrial uses in case of concrete mixers and crushers and residential uses around labour camp. ▪ Monitoring of the exhaust gases and noise levels will be carried out by an accredited Environmental Monitoring agency for the project.			
ii.	Surface Water Quality	Sewage generated by workers Surface run-off	▪ Sufficient and suitable toilet facilities for workers to be maintained for proper standards of hygiene; ▪ Bund to be provided around excavated	Review of status of implementation of suggested mitigation	Construction Contractor Overall	Daily inspections by Construction Supervisor

S.N.	Aspects	Impact	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/Monitoring/ External Reporting
		to downstream areas	soil or loose construction material to prevent runoff to nearly water bodies; ▪ Storage area to be kept away from the storm water to prevent any wash away; ▪ All the debris resulting from construction activities to be removed from the site on regular basis to prevent their runoff. ▪ Silt fencing will be provided around stockpiles at the construction sites close to open wells and natural drainages. The fencing needs to be provided prior to commencement of earthworks.	measures	supervision by Intel Manager Environment Project Manager KSPCB (Regulatory Agency)	
iii.	Water Resource	Wastage of water	▪ No use of groundwater envisaged ▪ Water usage to be optimised by creating awareness among the labour force through construction supervisors; ▪ Proper storage and internal supply facilities to be developed before undertaking construction activities; and ▪ Ensure water for construction phase is procured through BWSSB/Government approved vendors.	Review of status of implementation of suggested mitigation measures	Construction Contractor Overall supervision by Intel Manager Environment	Daily inspections by Construction Supervisor
iv.	Land and Soil and Solid Waste	Loss of topsoil; Contamination of Soil; Disposal of debris; Disposal of solid waste generated	▪ Topsoil removed to be protected and reused for landscape development onsite; ▪ Stacking of excavated soil material in an earmarked area and every care to be undertaken to prevent soil erosion; ▪ Completed earthworks will be sealed and/or re-vegetated as soon as reasonably practicable with the help of landscape expert; ▪ Project site is to be properly fenced and provided with proper drainage pattern; ▪ Retention wall/bund to be provided	Review of status of implementation of suggested mitigation measures	Construction Contractor Overall supervision by Intel Manager Environment	Daily inspection by Construction Supervisor C and weekly Audit by Intel Manager Environment

S.N.	Aspects	Impact	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/Monitoring/ External Reporting
			around the storage areas for excavated soil and other construction material to check the flow of solid with storm water in case of rain; ▪ The contractor to provide adequate number of bins at proper locations for collection of solid waste generated; ▪ Collection and disposal of waste generated during construction phase such as debris, plastic packing material, wooden logs; ▪ Ensure construction waste i.e. non-hazardous civil concrete waste/debris are crushed and reused in road/pavement within the site; ▪ Where possible drums and other packaging materials to be returned to the supplier for reuse; ▪ Waste steel to be sold to a scrap metal dealer for recycling; ▪ Any metal that is unsuitable for reuse to be separated and stored on site for transport to an appropriately licensed recycling facility.			
v.	Hazardous waste	Waste oil from machinery Spills from machinery	▪ Obtain prior authorization for collection, storage and disposal of construction phase related hazardous wastes; ▪ Ensure proper covered shed is provided with impervious floor for storage of used oil and any other identified hazardous wastes to avoid any soil contamination; ▪ All the hazardous waste to be disposed off as per the requirement and guidelines of KSPCB;	Review of status of implementation of suggested mitigation measures	Construction Contractor Overall supervision by Intel Manager Environment	Daily inspection by EMC and weekly Audit by Intel Manager Environment

S.N.	Aspects	Impact	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/Monitoring/ External Reporting
			▪ Intel would ensure that the contractors provide fuel to the construction workers for cooking purpose to restrict any such material use, which will cause damage to the environment; ▪ During servicing/repair of equipment or vehicles, a suitable drip tray shall be used to prevent oil/grease spills onto the soil, especially in case of emergency repairs; ▪ Leaking equipment shall be repaired immediately or be removed from the site to facilitate repair.			
vi.	Traffic, Transport and Access	Traffic congestion due to movement of heavy machinery Increased potential for traffic hazard	▪ Vehicle movement and parking within the premises shall be manned properly to avoid accidents; ▪ Routes for use by construction traffic to be planned to minimize impact on residential areas and unsuitable parts of the road network; ▪ Heavy Vehicle holding areas to be provided for vehicles waiting to deliver loads at work sites so as to avoid queuing outside the site or at other connecting roads; ▪ Providing dedicated path within the site for entry and exit of the construction vehicles; ▪ Necessary training to the driver of construction vehicles for speed restrictions and to crewmembers on do's and don'ts during construction vehicles movements; ▪ Arrangements and routes for abnormal loads to be agreed in advance with the police, emergency services and the	Review of status of implementation of suggested mitigation measures	Construction Contractor Overall supervision by Intel Manager Environment	Daily inspection by Construction Supervisor and weekly Audit by Intel Manager Environment

S.N.	Aspects	Impact	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/Monitoring/ External Reporting
			roads authority; ▪ Construction vehicles to be routed only during non- peaking hours i.e. other than during 0800 to 1000 hours and 1700 to 1900 hours. Heavy vehicles should be operated only after 2100 hours; ▪ Movement of vehicles owned by local to be completely restricted; ▪ The contractor shall properly mark all access roads with proper signage.			
Vii	Ambient Noise and Vibrations	Disturbance to nearby habitation Occupational hazard to workers	▪ Equipment such as cranes, earth moving equipment and heavy vehicles to be routed in such a way that there is minimum disturbance to receptors along the route; ▪ Use of inherently quiet equipment's (as far as reasonably practicable) and regular maintenance to ensure noise levels are maintained at design level; ▪ Avoid loud, sudden noises wherever possible. Fixed noise sources to be located away- more than 50 m away from the site fencing; ▪ Integral noise shielding (including provision of tin sheets as noise barrier) to be used where practicable and fixed noise sources to be acoustically treated, for example with silencers, acoustic louvers and enclosures. All diesel generators to be installed in conformance with the statutory requirement of acoustic enclosure to achieve the required norm 75 dB(A) level at 1 m from its enclosure; ▪ Provision of rubber paddings/ noise	Review of status of implementation of suggested mitigation measures Noise monitoring to be done on monthly basis	Construction Contractor Overall supervision by Intel Manager Environment	Daily inspection by Construction supervisor and weekly Audit by Intel Manager Environment

S.N.	Aspects	Impact	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/Monitoring/ External Reporting
			isolators at equipment/machinery used for construction; ▪ Noise prone activities need to be restricted to the extent possible during night particularly during 2200 to 0600 hours to reduce the noise impact. There is also requirement of providing make shift noise barriers surrounding the high noise generating construction equipment; ▪ Provision to be made for vegetative noise barrier at locations exceeding construction stage noise levels. ▪ Site workers working near high noise equipment to use personal protective devices to minimise their exposure to high noise levels; ▪ Construction vehicles to be well maintained and not idling equipment or vehicles when not in use; and ▪ Regular maintenance of vehicles to be taken up.			
viii.	Energy	▪ Utilisation of non-renewable resources; ▪ Heat gain in building	▪ Adoption of measures such as low embedded energy building materials, passive heating and ventilation systems, site layout and building orientation to minimise energy requirement; ▪ Proper ventilation system to be provided to all part of the building; ▪ Energy Conservation Building Code to be followed.	Review of status of implementation of suggested mitigation measures	Construction Contractor	Monthly review by Intel Team
ix..	Socio-economic	Opportunity for Job	▪ To the extent possible sourcing of construction labour from local region; ▪ Encourage purchase of goods and services for construction related	Review of status of implementation of suggested mitigation	Construction Contractor	Monthly status by Intel Team

S.N.	Aspects	Impact	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/Monitoring/ External Reporting
			activities to be sourced from local market; ▪ Preference based on skill set available in the area shall be given to local people in recruitment up to possible extent by the construction contractor. ▪ The employment offered by construction contractor would ensure considerable opportunity for the local economy.	measures		
x.	Housekeeping and Health and Safety	Aesthetics accident risk	▪ Regular inspection is required for housekeeping and HSE issue; ▪ Attempts shall be made to keep the construction site clean by providing extra manpower for the purpose; ▪ Unauthorised dumping of used oil and other hazardous wastes to be prohibited; ▪ All the required safety measures based on individual job profile will be provided (as per working guidelines, use of personal protective equipment like gloves, helmets, ear muffs, safety belts e) for construction labour through the contractors. Personal protective equipment for everybody present at site to be made available; ▪ For safety of people occupying the site, regulations concerning fire safety to be followed. Some of the requirements include: ▪ Installation of fire extinguishers; ▪ Provision of water sprinklers for in unpaved sections; ▪ Emergency exit; ▪ Proper labelling of exit and place of	Review of status of implementation of suggested mitigation measures	Construction Contractor	Daily inspection by Construction supervisor

S.N.	Aspects	Impact	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/Monitoring/ External Reporting
			fire protective system installation; ▪ Trained personnel to use fire control systems; and Display of phone numbers of the city/ local fire services. ▪ Construction contractors to provide first aid as well generate awareness programmes on health and communicable diseases			
xi.	Demobilisation of construction material , Ware house. having impact on Aesthetics & EHS		▪ To prepare site restoration prior to demobilization. ▪ On completion of the works, all temporary structures will be cleared away, all rubbish burnt, excreta or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy. ▪ Remove all construction equipment from construction site with due care on health, safety and environment; ▪ Remove all demobilisation waste from the construction site and dispose of non-hazardous civil waste in low lying area within the site, while any hazardous waste is to be disposed as the requirement of KSPCB; ▪ Re-vegetate bare area as per the landscape development plan.	Review of status of implementation of suggested mitigation measures	Construction Contractor	Daily inspection and Audit at start and end of demobilization of construction equipment by Team
xii.	Commissioning of the Project	Air, Water, Noise, Soil Pollution	▪ Commissioning to be done only after implementation of all the recommended measures as specified in the project design; ▪ Obtain permit like CtO (Consent to Operate) prior to the project commissioning from KSPCB (by applying for it at least 90 days in advance of project commissioning).	Auditing immediately before commissioning phase.	▪ Construction Engineer ▪ Manager Environment ▪ Manager/ Operation In-charge	

Table 10.2 EMP for Operation Phase

S. N.	Aspects	Impact	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of monitoring/ Audits
1.	Water Use	Impact on water resource	▪ Project has planned use of BWSSB water supply; ▪ The proposed project to be designed for higher water efficiency through a careful combination of design and water saving technology; ▪ Design of Low flow toilets, like urinals flushing capacity to be kept around 6 litres per use to conserve water; ▪ Infrared sensors to be installed in urinals to control wastage of water; ▪ Provision of rainwater harvesting system together with catchment water harvesting; collection through rainwater harvesting	Review of status of implementation of suggested mitigation measures	Facility Manager	Six Monthly review of reporting by Intel Facility Manager
2.	Wastewater generation	Potential contamination of surface and groundwater quality if used untreated	▪ Regular maintenance of STP to avoid clogging; ▪ Treated effluent quality monitoring will be carried out to ensure reuse/ discharge wastewater compliance requirements.	Review of status of implementation of suggested mitigation measures Monitoring of essential parameters to be done in house through EMC Treated wastewater monitoring will be carried out to ensure compliance.	▪ Intel Manager EHS	Intel Facility Manager to ▪ Daily review of STP log books and reporting; ▪ Review of results of essential parameters and results of monthly collected treated water samples by external laboratory ▪ Ensure compliance of

S. N.	Aspects	Impact	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of monitoring/ Audits
						conditions of Consent to Operate issued under Water Act ▪ Annual renewals of CTO and filing of cess returns; ▪ Monthly reporting of quality of treated wastewater
4.	Solid and hazardous waste generation	Sanitation and hygiene problem due to waste generated MLCP and sludge from STP	▪ Food packing waste disposal would be disposed to municipal disposal system; ▪ Ensure prior authorization available onsite for collection, storage and disposal of hazardous wastes; ▪ Waste generated during operation phase to be segregated and disposed off as per standard practices acceptable to regulatory bodies. General paper wastes, wood wastes, boxes, packing material to be sold to vendors for recycling or reuse for other purposes; ▪ Waste bins to be provide in sufficient numbers all across the project site; ▪ Arrangement for regular collection of waste; ▪ Preparation of impervious floors provided with sheds for used oil storages. The sheds and all the contents of the storage bins/ drums must be clearly marked and identified for their hazards; ▪ Biomedical waste to be collected with	Review of status of implementation of suggested mitigation measures Monthly review of non-hazardous and hazardous waste generated from the MLCP Review conditions of storage location and records related to hazardous wastes as per the conditions of authorization Maintain records on disposal of hazardous wastes	Facility Manager	Intel Facility Manager to monthly review of waste logs. Also ensure compliance of conditions of authorization or annual filing of hazardous wastes returns

S. N.	Aspects	Impact	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of monitoring/ Audits
			all precautions and sent for incineration; and ▪ Hazardous material, to be kept in isolated area located away from the active working zone. ▪ Hazardous wastes to be disposed to KSPCB approved recyclers.			
5.	Ambient Noise	Increase in noise due to operation of Processing equipment's, treatment plants, generators, pumps, HVAC Movement of vehicles inside the project site	▪ The building and its wall designing to be made in such a so as to absorb the indoor noise to great extent; ▪ Ear plugs to be provided to the personnel working in high noise area; ▪ Unwanted honking of horns to be restricted through signage. ▪ Provision of green belt of 7.0 to 12 m width all along the periphery of SRR Project	Review of status of implementation of suggested mitigation measures Ambient noise monitoring at four locations outside the project site in the immediate vicinity to be done through external laboratory on monthly basis	Intel Facility Manager	Six Monthly review by Intel Facility Manager Six monthly monitoring of ambient noise
6.	Socio-economic	Employment opportunities	▪ Most of the material required for the day –to-day basis to be procured from local area only, which will provide direct and indirect employment and business opportunities to locals. ▪ Implement CSR programmes in the nearby villages.	Review status of implementation of planned CSR activities	Intel Project/Facility Manager	Once a month
7.	House keeping	Aesthetics Blockage of Rain water harvesting pit	▪ System to upkeep housekeeping and general cleanliness by providing adequate manpower; ▪ Maintain clean curb cuts to avoid soil and vegetation build up; ▪ Green belt and landscape maintenance; ▪ Inspections of drains and area	Review of status of implementation of suggested mitigation measures	Intel Facility Manager/Manager EHS	Monthly review by Intel Facility Manager

S. N.	Aspects	Impact	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of monitoring/ Audits
			surrounding cooling tower to check any water logging situation.			
8.	Energy	Utilization of non renewal resources Heat gain in the building	▪ Building to be constructed with up-to-date standards for energy efficient design; ▪ Orientation of building to avoid direct heating, with maximum provision for natural light; ▪ Adoption of measures such as low embedded energy building materials, passive heating and ventilation systems, site layout and building orientation to minimise energy use; ▪ Proper ventilation system to be provided to all part of the building; ▪ Energy Conservation Building Code to be followed.	Review of status of implementation of suggested mitigation measures	Intel Facility Manager/Manager EHS	Monthly review by Intel facility manager
9.	EHS including associated risks of flammables	Fire risk Health hazards	▪ Proper marking to be made for identification of locations of flammable storages; ▪ Proper system for collection and disposal of domestic and hazardous waste; ▪ Follow up of all the required safety measures (working guideline, use of personal protective equipment like gloves, helmets, ear muffs, safety belts) for any repair and maintenance work within the proposed facility ; ▪ For safety of people occupying the building, regulations concerning fire safety to be followed. Some of the requirements are: ▪ Installation of fire extinguishers all over the building, ▪ This plan will be reviewed and	Review of status of implementation of suggested mitigation measures	Intel Manager EHS	Six monthly review by Intel Facility Manager

S. N.	Aspects	Impact	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of monitoring/ Audits
			amended when needed to ensure that all parties concerned are furbished with up-to-date information. The Site Operations Manager shall carry out exercises of part of the Emergency Response Plan at a regular interval as deemed necessary. The lesson learnt from these exercises shall be documented and used during the updating of the Emergency Response Plan. ▪ Provision of water hydrants in operative conditions; ▪ Emergency exit; ▪ Proper labelling of exit and place of the protective system installation; ▪ Conducting mock drills; ▪ Trained personnel to use the fire control systems; ▪ Display of emergency evacuation maps in each floor; ▪ Regular training and awareness programs to be conducted for people as per training modules formulated by the management for efficient control and management of environmental, safety and health related issues.			
12.	Disaster Management	Risk of damage due to fire, natural disaster and other emergency situations	▪ During operation phase, potential risks will be mainly related to accidental fire from leaks of flammable materials like LPG and HSD storage, maintenance activities by working at height and movement of traffic.. ▪ Ensure adequate Fire Fighting system established onsite prior to commissioning of the Project as per the Fire Fighting Plan covering following	Review of status of implementation of suggested mitigation measures	Intel Facility Manager/Manager EHS	Monthly review of reporting by Intel EHS Manager

S. N.	Aspects	Impact	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of monitoring/ Audits
			aspects: ▪ Fire Prevention Measure and Systems ▪ Signage ▪ Fire Detection & alarm System ▪ Fire Fighting System and devices ▪ Annually, update Emergency Response Plan ▪ Responsibilities of Emergency Response Co-ordination Team members to be provided in the Emergency Response Plan			
13.	Decommissioning (Building closure, dismantling of equipment's, transportation and site restoration)	▪ Socio-economic aspects ▪ Impact on air quality ▪ Noise generation ▪ Soil/groundwater contamination	▪ Decommissioning process for the plant to be developed prior to the culmination of the Intel Plant life / on expiry of lease or agreement; ▪ Adequate decommissioning plan to be formulated in accordance with the requirements.	Auditing immediately after decommissioning phase.	Facility Manager/Manager EHS	Once after decommissioning

10.6 ENVIRONMENTAL MONITORING & EVALUATION PROGRAM

10.6.1 Monitoring Programme

The monitoring programme will be required to ensure effectiveness of implementation of suggested mitigation measures. The environmental monitoring will help in assessing the changes in environmental conditions by monitoring the effective implementation of mitigation measures, and measuring deteriorations in environmental quality for further preventive actions.

The site will carry out monitoring, the details of which are provided in subsequent sections. The monitoring framework proposes both internal and external monitoring. The aspects to be covered include the following:

10.6.2 Monitoring Schedule and Parameters

To evaluate the effectiveness of environmental management programme, regular monitoring of the important environmental parameters will be taken up. The schedule, duration and parameters to be monitored are shown in**Table 10.3** and **Table 10.3**.

Table 10.3 Monitoring Schedule – Pre-Construction & Construction Phase

Type of Monitoring	Parameters for Monitoring	Frequency	Equipment and [Responsibility]	Monitoring Locations
Pre-Construction Phase				
Tree Cutting	Tree cutting only after obtaining necessary approval from local forest department	Before construction and after construction	▪ Site In-charge ▪ Facility Manager	Proposed Project Site
Emergency Response Plan	Preparation for Emergency situations such as: ▪ Medical emergency ▪ Bomb threats ▪ Road accidents ▪ Flash floods or inundation ▪ Earthquake ▪ Handling of Flammable Substances	During design stage Implementation throughout Construction Phase	▪ Facility Manager ▪ Project Manager ▪ HR Manager ▪ Local administration	Proposed Project Site

Type of Monitoring	Parameters for Monitoring	Frequency	Equipment and [Responsibility]	Monitoring Locations
Training plan	Preparation of training plan for aspects such as health and safety, fire, emergency evacuation, communication with external agencies.	During design stage Implementation throughout Construction Phase	▪ Construction Contractors	Proposed Project Site
Construction Phase				
Ambient air quality	PM_{10}, $PM_{2.5}$, SO_2, NOX, CO, HC	Once a quarter	Construction Contractor	▪ Proposed Project site
Dust generation	Adequacy of dust suppression techniques	Daily	Construction Contractor/EMC	▪ Proposed Project Site ▪ Access road
Noise	Ambient noise levels	Once a quarter	Construction Contractor	▪ Along fencing of Project Site in northern, eastern, western and southern directions
Noise	Occupational exposure	Once a quarter	Construction Contractor	▪ For personnel working in high noise areas i.e. areas generating noise levels more than 85 dB(A).
Water Quality	Drinking water quality (as per IS:10500-2012)	Six monthly	Construction Contractor	Source of drinking water at ▪ Labour camp and ▪ Project site
Waste generation	Records of waste generation, handling and disposal methods	Monthly	Construction Contractor	▪ Labour camp and ▪ Project site
Soil Erosion	Measures to prevent runoff from site including bunding around loose construction material	Monthly	Construction Contractor	Unprotected excavated Areas within construction site
Drainage	▪ Check clogging of drains ▪ Check cleanliness of drains ▪ Ensure no water logging ▪ Ensure contour levels are restored	Monthly	Construction Contractor	▪ Project Site

Type of Monitoring	Parameters for Monitoring	Frequency	Equipment and [Responsibility]	Monitoring Locations
Soil contamination	▪ Inspection of storage areas of fuel, paints and thinners ▪ Inspection of stores to see storage conditions	Monthly	Construction Contractor	▪ Project Site
General Hygiene	▪ General cleanliness ▪ Periodical removal of garbage and clearing of roads.	Monthly	Construction Contractor	▪ Project Site
Hygiene in toilets/sanitary system	▪ Inspection to check hygienic conditions and general cleanliness.	Weekly	Facility Manager/Manager Environment	▪ Proposed Project site
Health	▪ General health check-up (random sampling of construction workers) ▪ Identification of water logged areas having disease vector carrier like mosquitoes	Quarterly Monthly	Facility Manager/Manager EHS	▪ Proposed Project Site
Occupational health and safety	Usage of protective clothing and PPEs	Monthly	Facility Manager/ Manager EHS	Proposed Project Site
Security	General security - preventing un-authorized access to the site by fencing and deployment of night security guard	Every Shift Site Inspections	Security Officer	Proposed Project Site
Ecology	Status of plantation of green belt development	Quarterly Survey and Inspections	Facility Manager	Proposed Project site

NOx – Oxides of Nitrogen, SO_2 – Sulphur Dioxide, PM – Particulate Matter

Table 10.4 Monitoring Schedule - Operation Phase

Type of Monitoring	Parameters for Monitoring	Frequency	Responsibility	Monitoring Locations
Ambient air quality monitoring	PM_{10}, $PM_{2.5}$, SO_2, NO_X, CO, HC	Monthly/ as per consent conditions	Facility Manager/ Manager EHS	▪ Proposed Project Site
Stack emission (Diesel Generators)	PM, SO_2, NOx and CO	Six monthly / as per condition of Consent	Facility Manager/ Manager EHS	DG sets
Ambient Noise	Ambient noise levels	Six monthly / As per consent issued by KSPCB	Facility Manager/ Manager EHS	▪ At Proposed Project site
Water Quality	Drinking water quality (as per IS:10500)	Six monthly / As per consent issued by KSPCB	Facility Manager/ Manager EHS	Source of drinking water at ▪ Project site
Treated wastewater Quality	pH, suspended solids, COD, BOD, total dissolved solids, suspended solids	Six monthly / As per consent issued by KSPCB	Facility Manager/ Manager EHS	▪ STP
Soil Quality	Physical and chemical parameters, including organic content and heavy metals	Six monthly	Facility Manager/ Manager EHS	▪ Selected location near onsite Hazardous waste storage site
General Hygiene	General cleanliness e.g removal of garbage, clearing of roads.	Monthly	Facility Manager/ Manager EHS	▪ Proposed Project Site
Ecology	Greenbelt Development Status	Six monthly	Project Manager/ Manager EHS	Greenbelt

Type of Monitoring	Parameters for Monitoring	Frequency	Responsibility	Monitoring Locations
Emergency Response Plan	Fire ▪ Fire Prevention Measure and Systems ▪ Signage ▪ Fire Detection & alarm System ▪ Fire Fighting System and devices ▪ Evacuation Plan Emergency Procedures covering response to: ▪ Fire of fuels ▪ Electrical Emergency ▪ Emergency in neighbouring facilities ▪ Medical emergency ▪ Bomb threats ▪ Road accidents ▪ Flash floods or inundation ▪ Earthquake	Once in 6 months	▪ Mock drills ▪ Intel EHS Manager ▪ HR Manager ▪ Local administration]	Project Site

NOx – Oxides of Nitrogen, SO_2 – Sulphur Dioxide, PM – Particulate Matter

10.7 BUDGET ALLOCATION FOR ENVIRONMENTAL MANAGEMENT PLAN

Budget for the EMP Implementation will be included as part of EIA report

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