BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,
PRINCIPAL BENCH, NEW DELHI
Original Application No. 279/2024

IN THE MATTER OF DILDEEP SINGH …APPLICANT (S)

VS.

STATE OF PUNJAB & ORS. …RESPONDENT(S)

NEXT DATE 02.09.2025

INDEX

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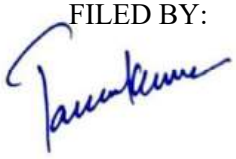

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DATE: 26.08.2025

PLACE: CHANDIGARH

IN THE HON'BLE NATIONAL GREEN TRIBUNAL, NEW DELHI

Original Application No. 279 of 2024

Dildeep Singh.

.....Petitioner

Versus

State of Punjab & Ors.

.....Respondents

Status Report by way of affidavit of Geetika Singh, PCS, Member Secretary, SEIAA, Punjab (Witness), in compliance to the orders of Hon'ble National Green Tribunal (NGT) dated 02.07.2025.

Respectfully Showeth:

1. That the present original application is pending adjudication before this Hon'ble Tribunal and is fixed for hearing on 02.09.2025.
2. That during proceedings in the said application, this Hon'ble Tribunal, vide its order dated 24.03.2025, was pleased to summon the then Member Secretary, SEIAA/deponent to appear in person along with the relevant records for examination as a witness. In compliance with the said order, the then Member Secretary, SEIAA duly appeared before this Hon'ble Tribunal on 02.07.2025 alongwith available requisite record.
3. That thereafter on 02.07.2025, this Hon'ble tribunal had passed the following order:

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"7. Copy of Environment Impact Assessment Report taken into consideration by SEIAA, Punjab for the grant of environmental clearances has not

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been produced as the same stated to have been weeded out on the other hand copy of Environment Impact Assessment Report dated 25.06.2025 has been filed."

9. As suggested by learned Counsels, instead of examining Vice Chairman/Member Secretary, GMADA, Managing Director, M/s Janta Land Promoters and Developers Limited and Member Secretary, SEIAA, Punjab on oath, they are given opportunity to file their own affidavits with respect to the material averments made in the original application as well as the environmental questions involved which will be treated to have been tendered by way of their evidence for adjudication of questions involved in the case."

4. That, in compliance with the directions issued by this Hon'ble Tribunal, the present status report is being submitted by way of an affidavit for the kind perusal and appropriate cognizance of this Hon'ble Tribunal.
5. That at the outset, it is respectfully submitted that the Environment Impact Assessment (EIA) Report dated 25.06.2025, as filed by GMADA before the Hon'ble National Green Tribunal (NGT), has not been submitted to the State Environment Impact Assessment Authority (SEIAA). Consequently, no appraisal of the said EIA Report has been undertaken by SEIAA to date.
6. That, the application for obtaining Environmental Clearance for development of a Township namely "Knowledge Park" in Sector 66, 82 81 83, SAS Nagar by M/s Greater Mohali Area Development Authority (GMADA) was considered during 98th meeting of SEAC held on 08.08.2014 and it was observed that category 8 (b) projects are required to be appraised on the basis of EIA study report. After detailed deliberations, the SEAC decided to constitute a sub-committee comprising of the following members to examine the EIA study report submitted by GMADA.

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- Er. Malvinder Singh, Member (SEAC)
- Dr. Akepati Sivarami Reddy, Member (SEAC)
- Dr. V.K. Singhal, Member (SEAC)
- Er. Samarjit Goyal, Secretary (SEAC)

It was also decided in the meeting that the project proponent will make a presentation of the EIA study report before the above-noted sub-committee on 11.08.2014 and the sub-committee will submit its recommendations to SEAC. The following aspect was considered regarding the drain passing through the project:

> *"To another query by the sub-committee regarding change in the natural course of drain passing through the project site as shown in the layout map, the project proponent clarified that initially there was a plan to divert the drain outside the project site by changing its course. However, as already committed during previous SEAC and SEIAA meetings, the idea has now been dropped and natural course of drain will not be altered under any circumstances. He further clarified that due to this, the overall impact on environment will be less as development area will be reduced. The project proponent agreed to submit revised layout map with changes in area to be developed including width of drain and 30 m green belt proposed to be developed on both sides of drain duly marked."*

It was further reported by the sub-committee that *"After going through the presentation made by the project proponent and subsequent detailed* discussions, *the Sub-Committee felt that the EIA study report prepared and submitted by the project proponent is though based on the model ToRs as given in the EIA Manual of MoEF for Building, Construction & Area Development Projects, however, it covers all the aspects had the project specific ToRs been issued by the SEAC. Therefore, the Sub-Committee decided that the SEAC may accept the EIA study report prepared and submitted by The project proponent"*

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7. That, the sub-committee report was considered by SEAC during its 99th meeting held on 21.08.2014, wherein the SEAC further observed that in case of the changed stance of the GMADA, it is required to submit the change in impact on the environment due to the change in the course of the natural drain passing through the project site and suggest the mitigation measures accordingly.

Further, "

To this query of SEAC, the project proponent clarified that:

"The part of the natural drain passing through Sector 82-A and 83-A will have to be re-aligned to meet with the provisions of the approved Master Plan of Mohali. It is further brought on record that the Master Plan of Mohali was prepared by M/s Jurong Consultants (P) Ltd., Singapore after studying all the aspects of the area with respect to Drainage & Environment and they had proposed to re-align the part of Jagatpura drain. After their proposal has been approved by the Competent Authority and the Master Plan has been notified, it has to be implemented in toto as referred to in the notification No. 6312 CTP(Pb)/SP-421 dated 11.08.2009 of Govt. of Punjab, Deptt. Of Housing & Urban Development stating that:

" .....that after the notification of Master Plan, further developments & constructions are to be guided by a single Master Plan document and not by any other circular/order/guidelines issued by different departments of Govt."

As such, although the area presently under the course of natural Jagatpura Drain has been planned for plotted development, yet it will be kept as "reserved" till the time the Master Plan proposal regarding re-alignment of this portion of drain is implemented.

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As far as the impact of this aspect is concerned, it is brought on record that presently the drain being a "Katcha drain" (unlined drain) had been changing its course during the past. It may be noticed that presently this part of the drain is meandering in a curvy course in proposed sector 82-A and 83-A. If the choe is not re-aligned and lined on its banks, it may further result into erosion of soil along its bank and may cause s negative impact on the surrounding area, but after the re alignment of the Choe it will be lined on its banks, thus the risk of soil erosion will be eliminated and it will make a positive impact.

Further, the natural drainage pattern and gradient is towards choe, which will be preserved rather improved after construction of the project, as such, it will also result into positive impact.

Moreover, 30 m wide strip on both sides of the proposed alignment of drain is proposed to be "No Construction Area" and will be developed as green area, it will add to the green cover, check erosion of soil and improve its ambience. This is going to make a positive impact on the environment".

DTP, SAS Nagar confirmed the assertion of GMADA with respect to change in alignment of part of the drain passing through the project site."

The Committee also observed that the project proponent has provided adequate and satisfactory replies/clarifications to the observations raised by it. Therefore, the Committee awarded '**Silver Grading**' to the project proposal and decided to forward the case to the SEIAA with the recommendation to grant environmental clearance to the project proponent for development of a Township namely "Knowledge Park" consisting of residential, commercial and Institutional in an area of 7,098,226.62 sqm (709.82 hectares) in Sector 66, 82 & 83, SAS Nagar,

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subject to the following conditions in addition to the proposed measures:

> ***"PART A- Specific conditions***
>
> ***I. Construction Phase***
>
> *i) The project proponent will provide a green cover of 30 m width on both sides of the drain passing through the project site including the portion to be re-aligned, as committed during the presentation."*

8. That the matter was considered during 68th meeting of SEIAA and it was decided to accept the recommendations of SEAC and grant environmental clearance for development of Township.

9. That, the complete proceedings, as mentioned in paras above, have been recorded in the minutes of 68th meeting of SEIAA held on 28.08.2014. The copy of the proceedings is annexed herewith as **Annexure-W/1.** The Environmental Clearance to the project was granted to the project vide letter no. 2634 dated 30.08.2014, subject to the following conditions:

> ***"PART A- Specific conditions***
>
> ***I. Construction Phase***
>
> *i) The project proponent will provide a green cover of 30 m width on both sides of the drain passing through the project site including the portion to be re-aligned, as committed during the presentation."*

10. That the project file submitted by GMADA was weeded out on 05.12.2023. Furthermore, the Environment Impact Assessment (EIA) report related to the said project, which was considered during the earlier appraisal process, could not be traced in the digitized records. However, the minutes of the 68th meeting of SEIAA indicate that the EIA report had indeed been submitted and was duly appraised during the processing of the said application.

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11. That, in the year 2017, GMADA had submitted an application for revised Environmental Clearance, as GMADA had revised its layout plan and had proposed to include Green and Orange Industry. The EIA study report by the project proponent was submitted alongwith the application. The copy of the EIA Study report considered during the application for revised Environmental clearance is annexed herewith as **Annexure W/2.**

12. That, the application was considered during 174th meeting of SEAC and 143rd & 144th meeting of SEIAA. The revised environmental clearance was granted to the project proponent vide letter no. 302 dated 28.03.2019.

Therefore, it is most respectfully prayed that the deponent may kindly be allowed to place on record the present affidavit for kind consideration and appropriate orders of this Hon'ble Tribunal.

Date:

Place:

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Deponent

Geetika Singh, PCS
Member Secretary,
State Environment Impact Assessment Authority, Punjab.

VERIFICATION:

Verified that the contents of paras no. 01 to 12 of the reply are true and correct to my knowledge and based on the information as derived from official records. No part of it is false and no material has been kept concealed there from.

Date:

Place:

Attested as Identified
GURMIT SINGH
Notary, S.A.S. Nagar (Mohali)
(CHANDIGARH)

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Deponent

Geetika Singh, PCS,
Member Secretary,
State Environment Impact Assessment Authority, Punjab.

Through Counsel
Dr. Tarun Sharma, Advocate

The contents of this Affidavit/Document has been explained to the deponent/executant. He/She has admitted the same in the correct. The deponent/executant has signed/affixed at Sr. No. 9555 P. No. 86 Date 25/8/2025

Extract pertaining to Table Item No. 68.14 from the proceedings of the 68th meeting of SEIAA held on 23.08.2014 at Patiala.

Table Item No. 68.14: Application for obtaining Environmental Clearance for development of a Township namely "Knowledge Park" in Sector 66, 82 & 83, SAS Nagar by M/s Greater Mohali Area Development Authority (GMADA).

The SEIAA observed that:

1. M/s Greater Mohali Area Development Authority (GMADA) vide letter dated NIL (received on 26.03.2013) had applied for obtaining environmental clearance as required under EIA notification dated 14/9/2006 development of a Township namely "Knowledge Park" in Sector 66, 82 & 83, SAS Nagar.
2. The case was considered by the SEAC in its 69th meeting held on 18.04.2013, wherein, Sh. Devinder Singh, Divisional Engineer, (PH-1), GMADA, Mohali informed that there is a proposal to develop a Knowledge Park in Sector 66,82 83 of Mohali in an area of 709 hectares, which will be developed into following components:
   a. Residential plotted accommodation.
   b. Group Housing
   c. Commercial Establishments
   d. Institutions
   e. Industrial Units of Green Category

   He also informed that the proposed site of the project falls within a radius of 10 kms from the boundary of UT, Chandigarh.

   The SEAC noted that as per EIA notification dated 14.09.2006, the 'Industrial Park' of area more than 500 hectares are covered under category 7 (C) of the Schedule appended to the said notification and 'General Condition' is applicable to this category. The SEAC further noted that in the 'General Condition' of the EIA notification, it has been mentioned that any project or activity specified in Category-B will be treated as Category-A, if located in whole or in part within 10 kms from the Inter-State boundaries. Since the site of this project is located within a radius of 10 kms from the boundary of UT, Chandigarh, as such, this project falls in the competence of Ministry of Environment & Forests being Category–A project.

   After detailed deliberations, the SEAC decided to recommend to SEIAA to return the case to the project proponent being a **Category–A** project.
3. The case was considered by the SEIAA in its 47th meeting held on 15.05.2013, wherein, after deliberations, the SEIAA decided to accept the recommendations of the SEAC. The decision of the SEIAA was conveyed to the project proponent vide letter no. 22314 dated 24.05.2013.
4. Thereafter, the project proponent vide letter dated 27.01.2014 applied afresh for obtaining environmental clearance under EIA notification dated 14/9/2006 for

development of a Township namely "Knowledge Park" in Sector 66, 82 & 83, SAS Nagar, stating that the case was considered by the EAC in its 127th meeting held on 29.10.2013 and observed that the total plot area is greater than 500 hectares & there is no Category A and B. The project proponent had further informed that the EAC advised the Ministry to refer the case back to SEIAA/SEAC, Punjab for considering the project as Category (8b).

However, no such correspondence of MoEF was attached with the application to corroborate the contentions regarding fresh grounds for resubmission of application with the SEIAA. As such, the incomplete application was returned back to the project proponent in original vide letter no. 2005 dated 06.02.2014, with a request to resubmit the same after attending the aforesaid observation.

5. Consequently, the project proponent vide letter no. 1886 dated 05.05.2014 (received on 07.05.2014) applied afresh along with the minutes of 127th meeting of EAC held on 28th-30th October, 2013 wherein it was mentioned that the project is covered under category 8(b).

6. The project proponent was requested by the SEAC vide letter no. 27592 dated 10.06.2014 to attend its 94th meeting on 12.06.2014. Following were present in the meeting on behalf of the project proponent:

- Sh. Devinder Singh, Executive Engineer (PH), GMADA
- Sh. Pankaj Bawa, District Town Planner, GMADA
- Dr. Rekha Singh (Coordinator) of M/s GRC India Pvt. Ltd, Environmental Consultant of the project proponent
- Mr. Puneet Bhardwaj, Assistant Manager, Environmental Consultant of the project proponent

Dr. Rekha Singh (Coordinator) of M/s GRC India Pvt. Ltd, Environmental Consultant of GMADA, presented the project proposal before the SEAC as under:

- The total plot area is 7,098,226.62 sqm, which will be developed for residential, commercial and institutional areas. The GMADA vide letter no. 14860 dated 11.06.2014 has intimated that the principal change of land (CLU) for an area of 709 hectares has been granted to Secretary, Housing and Urban Development, Punjab and the letter regarding approval of the same will be sent later on.
- 30% of fresh water will be abstracted from groundwater and rest of 70% will be taken from canal water at Kajoli Headworks.
- The total water requirement during summer season will be 20,291 KLD, out of which 16108 KLD will be met from fresh water and 4183 KLD will be met from recycling of treated wastewater. The total wastewater generation will be 8266 KLD, which will be treated in an STP of capacity 10,000 KLD to be

installed within the project premises. Out of the total 8266 KLD of treated wastewater, 4183 KLD will be used for flushing purpose and remaining 3256 KLD will be used for irrigation of green area.

- The total water requirement during winter season will be 11401 KLD, out of which 7218 KLD will be met from fresh water and 4183 KLD will be met from recycling of treated wastewater. The total wastewater generation will be 8266 KLD, which will be treated in a STP. Out of the total 8266 KLD of treated wastewater, 4183 KLD will be used for flushing purpose and remaining 3256 KLD will be used for irrigation of green area.
- The total water requirement during winter season will be 10332 KLD, out of which 6149 KLD will be met from fresh water and 4183 KLD will be met from recycling of treated wastewater. The total wastewater generation will be 8266 KLD, which will be treated in a STP. Out of the total 8266 KLD of treated wastewater, 4183 KLD will be used for flushing purpose, 1201 KLD will be used for irrigation of green area and remaining 2055 KLD will be discharged into choe.
- Deputy Commissioner, SAS Nagar vide letter no. 18456 dated 22.11.2013 informed that Mohali city does not fall under the 43 notified critical/ over exploited zones, therefore, it does not require permission from this office to install the tubewell.
- The total quantity of MSW has been estimated as 38,257 Kg/day. The biodegradable and non-biodegradable solid waste will be segregated at source. The biodegradable organic waste will be treated inside the premises. The recyclable and non-recyclable wastes will be disposed through approved Govt. Agency.
- The hazardous wastes such as used oil from the D.G. sets will be sold to authorized recyclers.
- The total power requirement will be 100 MVA, which will be taken from Punjab State Power Corporation Ltd. The project promoter has also made provision to provide DG sets as standby arrangement of power supply.
- The ambient air quality monitoring has been got done from M/s GRC India Training & Analytical Lab. which is NABL accredited and the analysis results indicate that the concentration of various pollutants such as PM_{10}, $PM_{2.5}$, Sulphur dioxide, Nitrogen dioxide and CO have been measured. Also, ambient noise monitoring has been got done from the said firm and the analysis results indicate that the noise levels during day times, have been measured as 51.4 dB(A)leq and during night time have been measured as 41.7 dB(A)leq against the prescribed standards of 55 dB(A) leq and 45 dB(A)leq, respectively. The groundwater of the area is potable in nature as per analysis report of groundwater.

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- Adequate parking facilities will be provided by individual plot owner, within the plots.
- Rs.400 Lacs will be earmarked for environmental monitoring and Rs.100 Lacs will be spent as recurring cost for implementation of Environment Management Plan. Since the project is being developed by Govt. Agency, EMP will be implemented by Govt. Department for the life time of this project.
- Public facilities like Hospital, school, playground, community centre etc. will be provided by the GMADA under Corporate Social Responsibility.
- The traffic circulation plan has been prepared and the same has been submitted alongwith application.
- Disaster/Risk Assessment & Management Plan has been prepared and the same has been submitted alongwith application.
- NOC from Airports Authority of India is not required as this the 'Area Development Project' and no building is being erected under this project.
- No construction/development activity has been started at the proposed site.

The Executive Engineer (PH) GMADA submitted the following documents during the meeting which were taken on record by the SEAC:

(i) Letter No. 14860 dated 11.06.2014 mentioning that in principle approval for change of land use (CLU) has been granted by the Competent Authority for developing 'Knowledge Park' in Sector 66-B, 82-A, 83-A and 101 A.

(ii) Layout plan duly approved by the Competent Authority.

(iii) Proper photographs of the project site showing construction status of the project.

(iv) Topographical map of the area showing contour plan.

(v) 500 meter radius map of the area from periphery of project site clearly indicating the various industries and structures etc.

(vi) Site plan of the project showing the following:

- Location of STP ;
- Solid waste storage area.
- Green belt
- Location of Tubewells

(vii) Permission of Competent Authority for:

- Water & Sewerage connection.
- Collection of solid waste.
- Letter no. 18456 dated 22.11.2013 issued by Deputy Commissioner, SAS Nagar to the effect that Mohali city does not fall under the 43 notified critical/ over exploited zones, therefore, it does not require permission to install the tubewell.

(viii) Analysis reports of ambient air, groundwater and noise levels of M/s GRC India Training & Analytical Lab. which is NABL accredited Laboratory.

(ix) Environmental Management Plan.

(x) Corporate Social Responsibility programme.

(xi) Traffic circulation system.

To a query raised by the SEAC, the project proponent categorically stated that the natural and original course of the storm water drain passing through the project site will not be altered rather it will be lined and beautified by providing a green cover of 30 m width on both sides of the drain.

The SEAC observed that during the rainy season there will be excess of storm water and hence the project proponent should provide a holding reservoir for the storage of this storm water with a storage capacity of atleast two days and utilize the same for horticulture and other purposes.

The Committee observed that the project proponent has provided adequate and satisfactory replies/clarifications to the observations raised by it. Therefore, the Committee awarded **'Silver Grading'** to the project proposal and forwarded the case to the SEIAA with the recommendation to grant environmental clearance to the project proponent for development of a Township **namely "Knowledge Park" in Sector 66, 82 & 83, SAS Nagar, subject to certain** conditions as mentioned in the proceedings of 94th meeting of SEAC held on 12.06.2014 in addition to the proposed measures.

7. The case was considered by the SEIAA in its 65th meeting on 04.07.2014, which was attended by the following on behalf of the corporation:

- Sh. Devinder Singh, Executive Engineer (PH), GMADA
- Sh. Pankaj Bawa, District Town Planner, GMADA
- Mr. Marvyn Gilbert, Senior Manager, of M/s GRC India Pvt. Ltd, Environmental Consultant of the project proponent
- Mr. Puneet Bhardwaj, Assistant Manager, Environmental Consultant of the project proponent

Mr. Marvyn Gilbert, Environmental Consultant of GMADA, presented the salient features of the project before the Authority.

Sh. Devinder Singh, Executive Engineer (PH), GMADA submitted an undertaking during the meeting to the effect that:

(i) Under Corporate Social Responsibility programmes, in addition to the already proposed activities, GMADA undertakes to provide water supply and sewage facility in the villages namely Chau Majra, Saini Majra and Rurka falling under their project scheme.

(ii) The treated wastewater will be used for HVAC system in addition to the flushing, horticulture and non-potable uses by the IT industries as and when the same are set up in the project site.

During discussions, the representative of the project promoter agreed to comply fully with all the conditions as mentioned by SEAC and he requested to grant environmental clearance for the proposed project.

The SEIAA observed that the case stands recommended by SEAC and that the Committee has awarded **'Silver Grading'** to the project proposal. The SEIAA looked into the details of the case and was satisfied with the same. Therefore, the Authority decided to grant environmental clearance for development of a Township namely "Knowledge Park" consisting of residential, commercial and institutional in an area of 7,098,226.62 sqm (709.82 hectares) in Sector 66, 82 & 83, SAS Nagar, subject to conditions as proposed by the SEAC in addition to the proposed measures and to amend the condition (i) of 'Operation Phase' and condition No. (xv) of 'General Conditions' as mentioned in the proceedings of 65th meeting of SEIAA held on 04.07.2014.

7. The proceedings of the 65th meeting of SEIAA held on 04.07.2014 were issued and the action for grant of environmental clearance to the above said project was under process. In the meanwhile, it came to the notice that the Ministry of Environment & Forests, New Delhi vide notification No. S.O. 562 (E) dated 26.02.2014 has issued an amendment in the EIA notification No. S.O. 1533 (E) dated 14.09.2006, the same is produced as under:

> ***In the said notification, in paragraph 7, in sub para II, in item (i), in the first proviso, for item (i), the following item shall be substituted, namely: -***
>
> ***"(i) all projects or activities listed under category, 'B' against item 8 (a) of the Schedule".***

The case was considered by the SEIAA in its 67th meeting held on 23.07.2014. The Authority deliberated upon the notification dated 26.02.2014 of Ministry of Environment & Forests, New Delhi and decided to remand the case to SEAC for re-examining the same in light of the said notification.

8. The case was considered by the SEAC in its 98th meeting held on 08.08.2014. The SEAC observed that as per the amendment dated 26.02.2014 issued by the MoEF, now all the projects covered under category 8 (b) of the Schedule appended with the EIA notification dated 14.09.2006, are required to be appraised on the basis of EIA study report instead of Form-1, 1A and conceptual plan only, as was being done earlier.

The meeting was attended by the following on behalf of the project proponent:

- Er. Devinder Singh, Executive Engineer (PH), GMADA
- Mr. Puneet Bhardwaj, Assistant Manager of M/s GRC India Pvt. Ltd, Environmental Consultant of GMADA

Er. Devinder Singh, Executive Engineer (PH), GMADA stated that the EIA study for the proposed project has already been carried out during the month of October, 2013 to December, 2013 based on the model TORs prepared by the MoEF. He submitted a copy of the same during the meeting, which was taken on record by the SEAC.

The project proponent was requested to present the findings of the EIA study before the SEAC, but he submitted that he has not come prepared with the presentation and requested that some time may be given to them to prepare and make the presentation.

After detailed deliberations, the SEAC decided to constitute a sub-committee comprising of the following members to examine the EIA study report submitted by the project proponent. The project proponent will present the EIA study report before the said sub-committee on 11.08.2014 in the Committee Room, Punjab Pollution Control Board, Patiala:

- Er. Malvinder Singh, Member (SEAC)
- Dr. Akepati Sivarami Reddy, Member (SEAC)
- Dr. V.K. Singhal, Member (SEAC)
- Er. Samarjit Goyal, Secretary (SEAC)

The sub-committee was asked to submit its recommendations to the SEAC before the next meeting of SEAC.

The sub-committee constituted by the SEAC has submitted the report and the same is re-produced as under:

Report of sub-committee constituted by the SEAC for examining the presentation of M/s Greater Mohali Area Development Authority (GMADA) for development of a Township namely "Knowledge Park" in Sector 66, 82 & 83, SAS Nagar.

BACKGROUND

The SEAC in its 98th meeting held on 08.08.2014 observed that as per the amendment dated 26.02.2014 issued by the MoEF, now all the projects covered under category 8 (b) of the Schedule appended with the EIA notification dated 14.09.2006, are required to be appraised on the basis of EIA study report instead of Form-1, 1A and conceptual plan only, as was being done earlier. The case of GMADA for development of a Township namely "Knowledge Park" in Sector 66, 82 & 83, SAS Nagar was one of such projects listed in the agenda of the said meeting.

Er. Devinder Singh, Executive Engineer (PH), GMADA, who attended the meeting on behalf of GMADA stated that the EIA study for the proposed project has already been carried out during the month of October, 2013 to December, 2013 based on the model TORs prepared by the MoEF. He submitted a copy of the same during the meeting, which was taken on record by the SEAC. The project proponent was requested to present the findings of the EIA study before the SEAC, but he submitted that he has

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not come prepared with the presentation and requested that some time may be given to them to prepare and make the presentation.

After detailed deliberations, the SEAC decided to constitute a sub-committee comprising of the following members to examine the EIA study report submitted by GMADA

- Er. Malvinder Singh, Member (SEAC)
- Dr. Akepati Sivarami Reddy, Member (SEAC)
- Dr. V.K. Singhal, Member (SEAC)
- Er. Samarjit Goyal, Secretary (SEAC)

It was also decided in the meeting that the project proponent will make a presentation of the EIA study report before the above noted sub-committee on 11.08.2014 and that the sub-committee will submit its recommendations before the next meeting of SEAC.

Report of Sub Committee

In compliance to the above noted decision of the SEAC, a meeting of the sub-committee was held on 11.08.2014 at 4.00 pm in the Committee Room, Punjab Pollution Control Board, Nabha Road, Patiala. The meeting was attended by the following:

(A) Members of Sub-Committee

- Er. Malvinder Singh, Member (SEAC)
- Dr. Akepati Sivarami Reddy, Member (SEAC)
- Dr. V.K. Singhal, Member (SEAC)
- Er. Samarjit Goyal, Secretary (SEAC)

(B) Representatives of GMADA

- Er. Devinder Singh, XEN (PH), GMADA
- Mr. Puneet Bhardwaj, Assistant Manager of M/s GRC India Pvt. Ltd, Environmental Consultant of GMADA
- Ms. Sonu Thakur, Associate Functional Area Expert of M/s GRC India Pvt. Ltd, Environmental Consultant of GMADA

Er. Devinder Singh, XEN (PH), GMADA and Environmental Consultant of GMADA presented the salient features of EIA study report before the Sub-Committee.

The Sub-Committee observed that the presentation made by the project proponent is general in nature and no specific quantification & assessment of various aspects and issues having impact on the environment of the area has been made. As such, the presentation was found not upto the mark and requirements.

After detailed deliberations, the Sub-Committee asked the project proponent to make a proper presentation of EIA study covering all the aspects including quantification and assessment of impact due to proposed project activities. The

representatives of the project proponent requested that some more time may be given to them to prepare a comprehensive presentation of the EIA report and present the same after attending to the observations of the sub-committee. Accordingly, the sub-committee asked the project proponent to make the presentation of the EIA study report before it on 19.08.2014 at 10.00 am, in the Committee Room, Punjab Pollution Control Board, Patiala.

As decided, a meeting of the sub-committee was again held on 19.08.2014 at 10.00 AM in the Committee Room, Punjab Pollution Control Board, Nabha Road, Patiala. The meeting was attended by the following:

(A) Members of Sub-Committee

- Er. Malvinder Singh, Member (SEAC)
- Dr. Akepati Sivarami Reddy, Member (SEAC)
- Dr. V.K. Singhal, Member (SEAC)
- Er. Samarjit Goyal, Secretary (SEAC)

(B) Representatives of GMADA

- Er. Devinder Singh, XEN (PH), GMADA
- Mervyn Gilbert, Senior Manager, of M/s GRC India Pvt. Ltd, Environmental Consultant of GMADA
- Mr. Puneet Bhardwaj, Assistant Manager of M/s GRC India Pvt. Ltd, Environmental Consultant of GMADA

Er. Devinder Singh, XEN (PH), GMADA and Environmental Consultant of GMADA again presented the salient features of EIA study report before the Sub-Committee, the details of which are as under:

- The total land area of the project is 7,098,226.62 sqm including Residential plotted, Group housing, EWS, Commercial, Institution, Expo, and Industry located at -66B, 82A, 83A and 101 A, Mohali, Punjab. The CLU has been approved by competent Authority vide sanction letter No. 14860 dated 11.06.2014.
- The permission for change of land use (CLU) has been granted by Secretary, Housing and Urban Development vide letter No. 14860 dated 11.06.14 for an area measuring 709 Acres.
- No forest land is involved in the project.
- The cost of the project is Rs.4,000 crores.
- Airport NOC is not required as it is an area development project.
- Disaster/Risk Assessment & Management Plan has been prepared and the same has been submitted
- No construction activity has been started at the proposed site.
- The total population of the project including residential, institutional, industrial, and commercial will be 1,17,757 persons. The density of population has been

taken as 175 persons/acre/day which is maximum permitted as per the Zoning Regulations of notified Master Plan of SAS Nagar.

- During construction phase, approx. 1000 water tankers are required for a span of 1.5 years supplied through private water agencies. Drinking water demand for construction workers will be 14 KLD. Wastewater @ 15 KLD will be generated.
- The total water requirement for the project will be 16,108 KL/day, out of which 6149 KL/day (~ 40%) will be met through own tubewell and remaining 9949 KL/day will be met through Canal water. Deputy Commissioner SAS Nagar Vide letter no: 18456 dated 22.11.13 has informed that Mohali city does not fall under the 43 notified critical zones, therefore, does not require permission to install tubewell.
- The total wastewater generation from the project will be 8266 KL/day, which will be treated in a STP of capacity 10,000 KLD to be installed within the project premises. The project proponent has proposed to use 4183 KL/day of treated wastewater for flushing purpose, 3256 KL/day will be used for irrigation of green area. In winter season, 4183 KL/day of treated wastewater will be used for flushing purpose, 3256 KL/day will be used for irrigation of green area. In rainy season, 4183 KL/day of treated wastewater will be used for flushing purpose and remaining 2055 KL/day will be discharged into Choe namely Jagatpura drain which passes through the project site. The project proponent has obtained the permission for water and sewerage from the competent Authority.
- **Drainage pattern**: As the project site is very huge and a drain is also passing through the project site, the potential runoff during rainy season may increase. As the gradient of the site is natural and in accordance to the land use of the site which gets a positive impact of the drain on to the site. Presently sullage is being discharged into the Jagatpura drain by UT Administration, which is proving to be a health hazard for the area.
- It is proposed to maintain the existing natural gradient so as to keep the existing topography and course of drain passing though the site not be changed.
- After the issuance of environmental clearance and obtaining Consent to Establish, GMADA will take up the issue of prohibiting the illegal disposal of sullage in the Jagatpura drain with UT Administration. This will lead to a positive impact for our project and also for the nearby surrounding areas.
- The surplus rainwater from the project site will be disposed off in the natural seasonal drain at 10 different points.
- The Bed level of drain ranges from 290.64 mts to 284.71 mts in the project area whereas the invert level of outfall storm water drainage pipes varies from 293.97 mts to 289.43 mts. The aforesaid proposed invert levels of storm water pipes are above the HFL.
- Rainwater harvesting is designed as per the CGWA guidelines. Individual plot owner has to provide own rain water harvesting pit as per the Rule 45 (A):- Notification 25th August, 2010, Govt. of Punjab, Dep. Of housing and Urban

development.

- Surface runoff potential is expected to be 340 cusecs and from roof top area it is 338 cusecs. Net extra surface runoff will be to the tune of 300 cusecs during operation.
- GMADA has proposed to provide 50 Groundwater Recharging Structures and holding tanks of 4.5 ML capacity.
- Natural gradient as well as natural course of the drain will not be changed. It will be maintained for free flow of water down the stream. The storm water will be treated adequately before recharging.
- **Ground water**: During construction phase, groundwater quality may be affected while excavation of soil and earth cutting and Wastewater during construction can contaminate ground water aquifers if discharged on surface directly.
- Groundwater quality has been monitored for 3 months at three different sites including the project site. The total hardness and the TDS values of groundwater at project site has been found to be a bit higher than the desirable limits, though are less than the permissible limits.
- GMADA is going to abstract app. 40% of potable water requirement from groundwater and will mix it with balance 60% water requirement drawn from canal water. This mixing will dilute the values of TDS and Total Hardness and bring the values down within the desirable limits.
- As currently, paddy is being cultivated throughout the year, per acre water requirement for paddy cultivation @ 9 inch thick water sheet and 15 waterings per crop, the total water requirement comes out to be 3 million gallons per acre per season.
- For 1752 acres of plot area 238.6 MLD of water was being used for paddy cultivation. However, during operation phase, maximum fresh water requirement for the project will be 16 MLD (summer season). Therefore, this will have an overall positive impact on the groundwater of the area.
- The pesticide and herbicide usage is leading to both soil and groundwater contaminant in present agricultural landuse. However, after the development of project site, this will be substantially reduced.
- **Soil:** Soil Nature: Sandy Clay Loam, Soil PH: Slight Basic, Water Holding Capacity: Poor
- GMADA has proposed that no excavation will be carried out as it is an area development project. Surplus soil will be brought from other project sites. Construction wastes will not be disposed off into Nala.
- Total soil required for earth filling that will be brought from outside would be 8,000 m3 which will be arranged from the other running projects of GMADA like PURAB PREMIUM APARTMENTS, where surplus earth from the proposed by basement is available. Therefore, no impact is anticipated as it is an area development project. Earth cutting will be avoided during rainy days.

- Some trees along side the metalled road will be cut down. It is estimated that approx. 13 nos. of trees are required to fell down (eucalyptus and kikar). Trees will not be cut down if they are lying within the plot boundary.
- Green belt will be developed in an area of 2,402,740.06 sqm which is 33.85% of the total plot area, which will be irrigated with treated wastewater and bore well water during summer season. Plantation will be done during construction and operation phase of the project. 17000 trees and 35000 shrubs will be planted within the project site.
- The total load of electricity required for project will be 100 MVA which will be taken from the PSPCL. There is a proposal to install 1 No. of DG sets of 1,000 KVA as standby for STP running and borewells power back.
- **Solid waste:** The total quantity of solid waste generation will be 38,257 kg/day, which will be segregated at source as biodegradable and non-biodegradable components as per the Municipal Solid Waste (Management & Handling) Rules, 2000. The biodegradable waste would be sent to the approved site. The non-biodegradable and recyclable waste will be sold to recyclers.
- Construction waste such as bricks, concrete, MS rods, tiles, etc. is expected to be generated. Construction material stone, sand, cement, bitumen, steel reinforcement etc. will be managed properly as the contamination of waste will lead to unhygienic conditions, giving grounds to the spreading of communicable diseases.
- Construction yards are proposed for storage of construction materials. Recyclable material and products will be recycled to maximum extent.
- The e-waste generated will be stored in an isolated room and will be sold to the manufacturers.
- Used oil to be generated from the DG sets will be managed & handled as per the provisions of the Hazardous Wastes (Management, Handling & Transboundary Movement) Rules, 2008.
- **Socio Economic:** Once the development and construction of Knowledge Park is completed, there will be some long-term positive impact on the economic structure of the area. People in the area will get direct and indirect employment opportunities and other benefits from the Knowledge Park Township Project. Therefore, overall positive impact is anticipated on economy of the area due to development and construction activity of the Knowledge Park Project.
- **Traffic:** The traffic circulation plan has been prepared and the same has been submitted.
- Total no. of trucks to be required for carrying the construction material during 2 years of construction phase will be 13764.
- Average no. of daily trucks expected for movement = 25.
- Since no. of trucks added to the existing traffic volume is very low, therefore no significant impact is envisaged.

- Parking proposed: Each plot holder will have to make provisions for adequate parking as per PUDA Building Bylaws. The proposed site is an agricultural land which has currently no traffic density.
- As the Population will be in fluxed, traffic density will also be increased. Although the project site is well connected to the NH-64 and PR9 which ultimately connects to the Airport.
- It is proposed to provide internal roads with minimum width of 40 feet upto 200 feet to avoid congestion due to the traffic circulation within the project site.
- Air: During construction and operation phase, source of air pollution will be due to construction activities, Vehicular movement, operation of DG sets and Green IT Industries.
- As the total area is very huge no impact is anticipated from the project.
- Noise: During construction phase, noise will be generated due to movement of vehicles carrying materials and loading & unloading activities, excavation and from machines. The construction workers will be provided with Personal protective equipments to safeguard from the noise being generated due to the construction activities.
- During operation phase, noise will be generated from vehicular movements and DG sets. However, DG sets will be provided with suitable acoustic enclosures.
- Since there is sparse inhabitated area in and around the project area, the impact of noise pollution will be insignificant and negligible.
- The ambient air monitoring has been got done from M/s GRC India Training & Analytical Lab, which is NABL accredited lab and various parameters such as PM2.5, PM10, SO2, NO2, and CO have been measured and the analysis results indicate that the concentration of various pollutants under permissible limits. Also, ambient noise monitoring has been got done from the said firm from Oct to Dec, 2013 and the analysis results indicate that the noise levels during day and night times, have been measured as 51.4 dB(A) leq and 41.7 dB(A) leq, respectively, against the prescribed standards of 75 and 70 dB(A) leq. The groundwater of the area in respect of PH, Hardness, TDS etc. parameters has also been monitored from Oct to Dec, 2013 and the total hardness and the TDS values of groundwater at project site has been found to be a bit higher than the desirable limits, though are less than the permissible limits. GMADA is going to extract app. 40% of potable water needs from groundwater and will mix it with balance 60% water requirement drawn from canal water. This mix will dilute the values of TDS and Total Hardness and bring the values down within the desirable limits.
- As per the Punjab Regional and Planning and Development Act 1995, the role of GMADA is restricted to the development activities only, post development, the projects are handed over to local municipal authorities for operation and maintenance.

- During development stage, Executive Engineers (PH) alongwith its supporting staff is responsible for environmental issues relating to the projects and during operation and maintenance the concerned municipal authorities as responsible.
- Rs. 4900 lacs will be utilized for implementation of EMP during operational phase and Rs. 1300 lacs will be incurred on account of recurring charges. Since the project is being developed by Govt. Agency, EMP will be implemented by Govt. Department.
- In addition to this, GMADA has provided funds for the development activities in various villages falling in the surrounding areas of Mohali.
- GMADA also proposes to develop the villages, which fall within the boundary of this project area.
- GMADA will undertake CSR activities in Village Rourka, Saina Majra, Manauli and Chau Majra. GMADA will provide water supply and sewerage system in these villages and will fix pavers in the village streets and will also provide village drains.
- GMADA will spend an app. amount of Rs. 8 crores for the culmination of above mentioned developmental CSR activities, which may vary depending upon the preparation of estimates on actual basis.

To a query of sub-committee regarding mitigation measures to be adopted to have minimum impact on groundwater aquifer with the coming up of the proposed project, the project proponent clarified that 60% of fresh water requirement will be met from canal water supply and groundwater will be abstracted to meet with the remaining 40% fresh water requirement only. For this purpose, GMADA has already a proposal under implementation namely Kajoli Water Works Scheme. Under this scheme, 40 MLD of canal water from Bhakhra Main Line (BML) will be supplied to Mohali Area and a pipeline of 25 kms length is being laid for providing the water, out of which 23 km of length has already been completed and remaining 2 kms is likely to be completed within a period of 1½ - 2 years. The water treatment plant for this project is also likely to be completed during this period of 1½ - 2 years.

To another query by the sub-committee regarding change in the natural course of drain passing through the project site as shown in the layout map, the project proponent clarified that initially there was a plan to divert the drain outside the project site by changing its course. However, as already committed during previous SEAC and SEIAA meetings, the idea has now been dropped and natural course of drain will not be altered under any circumstances. He further clarified that due to this, the overall impact on environment will be less as development area will be reduced. The project proponent agreed to submit revised layout map with changes in area to be developed including width of drain and 30 m green belt proposed to be developed on both sides of drain, duly marked on the map.

To a query of sub-committee regarding likely impact on the drainage system of the area due to coming up of proposed project and mitigation measures

including storm water management to be adopted so as to avoid/reduce flooding of the area outside the project site, the project proponent clarified that presently 340 cusecs of storm water from the project site is discharged into drain. After completion of this project, the discharge into the drain with almost double. However, to reduce and delay the release of storm water into drain to avoid flooding, they have adopted rainwater harvesting system, besides they will provide a holding tank of 4.5 ML capacity to harvest rainwater and will provide recharging wells in the holding tanks as well. This system will be developed scientifically and storm water will be treated adequately. Provision will be made to ensure that water does not enter the recharge wells directly and passes through treatment facility by default.

To another query of the sub-committee regarding organizational set up for the implementation of Environment Management Plan, the project proponent clarified that project is being developed by GMADA, which is a State Govt. Department and is committed towards the implementation of Environment Management Plan and all other statutory requirements for the protection of environment. Concerned Executive Engineer of the area is responsible for the overall implementation of environment laws / regulations including Environment Management Plan. He is assisted by Sub-Divisional Engineers and Junior Engineers working under his control.

Conclusion

After going through the presentation made by the project proponent and subsequent discussions, the Sub-Committee felt that the EIA study report prepared and submitted by the project proponent is though based on the model ToRs as given in the EIA Manual of MoEF for Building, Construction & Area Development Projects, however, it covers all the aspects that would have been specified had the project specific ToRs been issued by the SEAC. Therefore, the Sub-Committee decided that the SEAC may accept the EIA study report prepared and submitted by the project proponent.

The case was considered by the SEAC in its 99th meeting held on 21.08.2014, which was attended by the following on behalf of GMADA:

- Sh. Devinder Singh, Executive Engineer (PH), GMADA
- Sh. Pankaj Bawa, District Town Planner, SAS Nagar
- Dr. Rekha Singh, Coordinator of M/s GRC India Pvt. Ltd, Environmental Consultant of GMADA
- Mr. Puneet Bhardwaj, Assistant Manager, of M/s GRC India Pvt. Ltd, Environmental Consultant of GMADA

Sh. Devinder Singh, Executive Engineer (PH), GMADA stated that a portion of the natural drain passing through the project site has to be re-aligned in consonance with the provisions contained in the notified Master Plan of the area.

The SEAC observed that as per the report submitted by the sub-committee, the natural course of the drain was not to be changed and the project proponent was required to submit revised layout map with changes in area to be developed including width of drain and 30 m green belt proposed to be developed on

both sides of drain duly marked. The SEAC further observed that in case of the changed stance of the GMADA, it is required to submit the change in impact on the environment due to the change in the course of the natural drain passing through the project site and suggest the mitigation measures accordingly.

To this query of SEAC, the project proponent clarified that:

"The part of the natural drain passing through Sector 82-A and 83-A will have to be re-aligned to meet with the provisions of the approved Master Plan of Mohali. It is further brought on record that the Master Plan of Mohali was prepared by M/s Jurong Consultants (P) Ltd., Singapore after studying all the aspects of the area with respect to Drainage & Environment and they had proposed to re-align the part of Jagatpura drain. After their proposal has been approved by the Competent Authority and the Master Plan has been notified, it has to be implemented in toto as referred to in the notification No. 6312 CTP (Pb)/SP-421 dated 11.08.2009 of Govt. of Punjab, Deptt. Of Housing & Urban Development stating that:

"---------- that after the notification of Master Plan, further developments & constructions are to be guided by a single Master Plan document and not by any other circular/order/guidelines issued by different departments of Govt."

As such, although the area presently under the course of natural Jagatpura Drain has been planned for plotted development, yet it will be kept as "reserved" till the time the Master Plan proposal regarding re-alignment of this portion of drain is implemented.

As far as the impact of this aspect is concerned, it is brought on record that presently the drain being a "Katcha drain" (unlined drain) had been changing its course during the past. It may be noticed that presently this part of the drain is meandering in a curvy course in proposed sector 82-A and 83-A. If the choe is not re-aligned and lined on its banks, it may further result into erosion of soil along its bank and may cause a negative impact on the surrounding area, but after the re-alignment of the Choe it will be lined on its banks, thus the risk of soil erosion will be eliminated and it will make a positive impact.

Further, the natural drainage pattern and gradient is towards choe, which will be preserved rather improved after construction of the project, as such, it will also result into positive impact.

Moreover, 30 m wide strip on both sides of the proposed alignment of drain is proposed to be "No Construction Area" and will be developed as green area, it will add to the green cover, check erosion of soil and improve its ambience. This is going to make a positive impact on the environment".

DTP, SAS Nagar confirmed the assertion of GMADA with respect to change in alignment of part of the drain passing through the project site. A set of documents such as copy of Notified Master Plan of the area, layout plan showing the portion of the drain to be re-aligned and copy of the notification dated

11.08.2009 of Govt. of Punjab, Deptt. Of Housing & Urban Development, jointly signed by Executive Engineer, GMADA and DTP, SAS Nagar was submitted during the meeting and the same was taken on record.

After detailed deliberations, the SEAC decided that as recommended by the sub-committee, the EIA report submitted by GMADA be accepted.

The Committee also observed that the project proponent has provided adequate and satisfactory replies/clarifications to the observations raised by it. Therefore, the Committee awarded **'Silver Grading'** to the project proposal and decided to forward the case to the SEIAA with the recommendation to grant environmental clearance to the project proponent for development of a Township namely "Knowledge Park" consisting of residential, commercial and institutional in an area of 7,098,226.62 sqm (709.82 hectares) in Sector 66, 82 & 83, SAS Nagar, **subject to the following** conditions in addition to the proposed measures:

PART A – Specific conditions

I. Construction Phase

i) The project proponent will provide a green cover of 30 m width on both sides of the drain passing through the project site including the portion to be re-aligned as committed during the presentation.

ii) The project proponent will provide a storage reservoir for the storage of storm water runoff with a capacity of 4.5 ML and will provide recharging wells in the said reservoir. This system should be developed scientifically and storm water be treated adequately so as to ensure that pollutants such as silt, oil & grease etc. do not enter the groundwater. Further, a provision should be made to ensure that water does not enter the re-charge wells directly and passes through the treatment facility by default. use this water for horticulture and other purposes subsequently.

iii) "Consent to establish" shall be obtained from Punjab Pollution Control Board under Air (Prevention & Control of Pollution) Act, 1981 and Water (Prevention & Control of Pollution) Act, 1974 and a copy of the same shall be submitted to the Ministry of Environment & Forests / State Level Environment Impact Assessment Authority before the start of any construction work at site.

iv) All required sanitary and hygienic measures should be in place before starting construction activities and to be maintained throughout the construction phase.

v) A first aid room will be provided in the project both during construction and operation phase of the project.

vi) All the topsoil excavated during construction activities should be stored for use in horticulture / landscape development within the project site.

vii) Disposal of muck during construction phase should not create any adverse effect on the neighbouring communities and be disposed off after taking the necessary precautions for general safety and health aspects of people with the approval of competent authority.

viii) Construction spoils, including bituminous material and other hazardous material, must not be allowed to contaminate watercourses and the dump sites for such material must be secured, so that they should not leach into the groundwater.

ix) The diesel generator sets to be used during construction phase should be of low sulphur diesel type and should conform to the provisions of Environment (Protection) Act, 1986 prescribed for air and noise emission standards.

x) Vehicles hired for bringing construction material to the site and other machinery to be used during construction should be in good condition and should conform to applicable air and noise emission standards.

xi) Ambient noise levels should conform to prescribed standards both during day and night. Incremental pollution loads on the ambient air and noise quality should be closely monitored during construction phase.

xii) Fly ash should be used as construction material in the construction as per the provisions of Fly Ash Notification of September, 1999 and as amended on August, 2003 (This condition is applicable only if the project is within 100 Km of Thermal Power Station).

xiii) Ready mixed concrete should be used in building construction as far as possible.

xiv) Water demand during construction should be reduced by use of premixed concrete, curing agents and other best practices.

xv) Separation of drinking water supply and treated sewage supply should be done by the use of different colours.

xvi) Fixtures for showers, toilet flushing and drinking should be of low flow either by use of aerators or pressure reducing devices or sensor based control.

xvii) Adequate steps shall be taken to conserve energy by limiting the use of glass, provision of proper thermal insulation and taking measures as prescribed under the Energy Conservation Building Code.

xviii) The approval of competent authority shall be obtained for structural safety of the buildings due to earthquakes, adequacy of fire fighting equipments etc. as per National Building Code including protection measures from lightning.

xix) Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, disposal of waste water & solid waste in an environmentally sound manner, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

II. Operation Phase

i) The installation of sewage treatment plant (STP) and adequacy of disposal system should be certified by Punjab Pollution Control Board and a report in this regard should be submitted to the Ministry of Environment & Forests/State Level Environment Impact Assessment Authority before the project is commissioned for operation. The discharge of treated sewage shall conform to the norms and standards prescribed by Punjab Pollution Control Board for such discharges. The project proponent shall discharge not more than 2055 KLD of treated wastewater into choe during rainy season.

ii) The project proponent shall provide electromagnetic flow meter at the outlet of the water supply, outlet of the STP and any pipeline to be used for re-using the treated wastewater back into the system for flushing and for horticulture purpose/green etc. and shall maintain a record of readings of each such meter on daily basis.

iii) Adequate & appropriate pollution control measures should be provided to control fugitive emissions to be emitted within the complex.

iv) Adequate treatment facility for drinking water shall be provided, if required.

v) Rainwater harvesting for roof run-off should be implemented. Before recharging the roof run-off, pretreatment must be done to remove suspended matter, oil and grease. However, no run off from gardens/green area/roads/pavements shall be connected with the ground water recharging system.

vi) The solid waste generated should be properly collected and segregated. The recyclable solid waste shall be sold out to the authorized vendors and inerts shall be sent to disposal facility. The Bio-degradable solid waste shall be adequately treated as per the scheme submitted by the project proponent. Prior approval of competent authority should be obtained, if required.

vii) Hazardous waste/E-waste should be disposed off as per Rules applicable and with the necessary approval of the Punjab Pollution Control Board.

viii) The green belt along the periphery of the plot shall achieve attenuation factor conforming to the day and night noise standards prescribed for residential land use. The open spaces inside the plot should be suitably landscaped and covered with vegetation of indigenous species/variety.

ix) The project proponent should take adequate and appropriate measures to contain the ambient air quality within the prescribed standards. The proposal regarding mitigation measures to be taken at site should be submitted to the Ministry of Environment & Forests/ State Level Environment Impact Assessment Authority within three months.

x) Incremental pollution loads on the ambient air quality, noise and water quality should be periodically monitored after commissioning of the project.

xi) Application of solar energy should be incorporated for illumination of common areas, lighting for gardens and street lighting in addition to provision for solar water heating.

xii) Traffic congestion near the entry and exit points from the roads adjoining the proposed project site must be avoided. Parking should be fully internalized and no public space should be utilized.

xiii) A report on the energy conservation measures conforming to energy conservation norms finalized by Bureau of Energy Efficiency should be prepared incorporating details about machinery of air conditioning, lifts, lighting, building materials, R & U Factors etc. and submitted to the respective Regional office of MoEF, the Zonal Office of CPCB and the SPCB/SEIAA in three months time.

xiv) Environmental Management Cell shall be formed during operation phase which will supervise and monitor the environment related aspects of the project.

PART B – General Conditions :

i) This environmental clearance will be valid for a period of five years from the date of its issue or till the completion of the project, whichever is earlier.

ii) The environmental safeguards contained in the application of the promoter / mentioned during the presentation before State Level Environment Impact Assessment Authority/State Expert Appraisal Committee should be implemented in letter and spirit.

iii) The entire cost of the environmental management plan (i.e. capital cost as well as recurring cost) will continue to be borne by the project proponent until the responsibility of environmental management plan is transferred to the occupier/residents society under proper MOU after obtaining prior permission of the Punjab Pollution Control Board.

iv) The project proponent shall also submit six monthly reports on the status of compliance of the stipulated EC conditions including results of monitored data (both in hard copies as well as by mail) to the respective Regional office of MoEF, the Zonal Office of CPCB and the SPCB/SEIAA.

v) Officials from the Regional Office of Ministry of Environment & Forests, Chandigarh / State Level Environment Impact Assessment Authority / State Level Expert Appraisal Committee / Punjab Pollution Control Board who would be monitoring the implementation of environmental safeguards should be given full cooperation, facilities and documents / data by the project proponents during their inspection. A complete set of all the documents submitted to State Environment Impact Assessment Authority should be forwarded to the CCF, Regional Office of Ministry of Environment & Forests, Chandigarh/State Level Environment Impact Assessment Authority.

vi) In the case of any change(s) in the scope of the project, the project would require a fresh appraisal by State Environment Impact Assessment Authority.

vii) Separate distribution pipelines be laid down for use of treated effluent / raw water for horticultural/gardening purposes with different colour coding.

viii) All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives, Fire Department, Civil Aviation Department, Forest (Conservation) Act, 1980 and Wildlife (Protection) Act, 1972 etc. shall be obtained, by project proponents from the competent authorities including Punjab Pollution Control Board and from other statutory bodies as applicable. The project proponent shall also obtain permission from the NBWL, if applicable.

ix) The project proponent should advertise in at least two local newspapers widely circulated in the region, one of which shall be in the vernacular language informing that the project has been accorded environmental clearance and copies of clearance letters are available with the Punjab Pollution Control Board. The advertisement should be made within seven days from the day of issue of the clearance letter and a copy of the same should be forwarded to the Regional Office, Ministry of Environment & Forests, Chandigarh.

x) These stipulations would be enforced among others under the provisions of Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Pollution) Act, 1981, Environmental (Protection) Act, 1986, the Public Liability (Insurance) Act, 1991 and EIA Notification, 2006.

xi) Environmental clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) No. 460 of 2004 as may be applicable to this project and decisions of any competent court, to the extent applicable.

xii) At-least 60% of the total fresh water requirement i.e. 9949 KLD will be met through canal water supply and the remaining 40% i.e. 6149 KLD may be abstracted from groundwater.

xiii) The project proponent shall comply with the conditions to be imposed in the Change of land use issued by the Competent Authority.

xiv) A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zilla Parishad/ Municipal Corporation, Urban local body and the local NGO, if any, from whom suggestions / representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.

xv) The proponent shall upload the status of compliance of the stipulated EC conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MoEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; $PM_{2.5}$, PM_{10}, SO_2, NO_x, CO, Pb, Ozone (ambient air as well as stack emissions) shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.

xvi) The project proponent shall adhere to the commitments made in the Environment Management Plan and Corporate Social Responsibility. GMADA will develop the villages falling within the boundary of the project area under Corporate Social Responsibility. Further, will undertake Corporate Social Responsibility activities in Village Rourka, Saina Majra, Manauli and Chau Majra and will provide water supply and sewerage system in these villages, fix pavers in the village streets and will provide village drain. An approximate amount of Rs.8 Crores will be spent by GMADA for the culmination of the Corporate Social Responsibility activities, which may vary depending upon the preparation of estimates on actual basis.

xvii) The State Environment Impact Assessment Authority reserves the right to add additional safeguards/ measures subsequently, if found necessary, and to take action including revoking of the environmental clearance under the provisions of the Environmental (Protection) Act, 1986, to ensure effective implementation of the suggested safeguards/ measures in a time bound and satisfactory manner.

xviii) Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

The case was considered by the SEIAA in its 68th meeting held on 23.08.2014, which was attended by the following on behalf of GMADA:

- Sh. Devinder Singh, Executive Engineer (PH), GMADA
- Sh. Puneet Bhardwaj, Assistant Manager, of M/s GRC India Pvt. Ltd, Environmental Consultant of GMADA

The SEIAA observed that as mentioned on page 9 of the EIA study report submitted by GMADA, EIA study has been prepared based on the baseline data generated during the period October, 2013 to December, 2013 and on the basis of standard ToRs as applicable for such projects, which is much before the date of application to the SEIAA and before the issuance of TORs to the project proponent. To this query of SEIAA, the GMADA submitted that they had allotted the work of Rapid Environmental Impact Assessment including collection of data, preparation of reports and obtaining environmental clearance from MoEF, to the contractors namely M/s Grassroots Researach & Creation India (P) Ltd., Noida vide letter no. 5306 dated 15.11.2012, as during that time category 8(b) projects required EIA study to be carried out. He submitted a copy of the letter to SEIAA in support of his contention. Thereafter, the GMADA applied to SEIAA, Punjab for obtaining environmental clearance on 26.03.2013 and the project was considered by the SEAC, Punjab in its 69th meeting held on 18.04.2013. During the meeting, the SEAC decided to recommend to SEIAA to return the case as the project falls under category 7(c) and the competency of such projects lies with the MoEF. The SEIAA, Punjab in its 47th meeting held on 15.05.2013 accepted the recommendations of SEAC and returned the case to the GMADA. The GMADA then applied to MoEF, New Delhi with the request for issuance of ToRs for the EIA study becasude during this period, there was requirement of EIA report for such projects. The case was considered by the EAC in its 127th meeting held on 29.10.2013, wherein, the EAC advised the MoEF that the project is an area development project and falls under category 8(b). In the meanwhile, GMADA generated baseline data during the period October, 2013 to December, 2013 as already stated in the EIA study report submitted by it. Thereafter, the GMADA vide letter dated 27.01.2014 applied afresh to SEIAA, Punjab. Since, as per the OM dated 22.08.2013 category (b) of item 8 of the Schedule did not require scoping and therefore the application did not include the detailed EIA study including the detailed impact and assessment and only EIA monitoring reports were submitted with the application.

During discussions, the representative of the project promoter agreed to comply fully with all the conditions as mentioned by SEAC and he requested to grant environmental clearance for the proposed project.

The SEIAA observed that the case stands recommended by SEAC and the Committee has awarded **'Silver Grading'** to the project proposal. The SEIAA looked into the details of the case and was satisfied with the same. Therefore, the Authority decided to grant environmental clearance for development of a Township namely

"Knowledge Park" consisting of residential, commercial, industrial and institutional in an area of 7,098,226.62 sqm (709.82 hectares) in Sector 66, 82 & 83, SAS Nagar, subject to conditions as proposed by the SEAC in addition to the proposed measures.

Member Secretary(SEIAA)

173.09 AEE(SEAC)

GREATER MOHALI AREA DEVELOPMENT AUTHORITY
PUDA BHAWAN, SECTOR – 62, S.A.S.NAGAR

State Environment Impact Assessment Authority (PB.) Dairy No. 337 Date 3.10.18

To,

The Member Secretary,
State Level Environment Impact Assessment Authority,
O/o Punjab Pollution Control Board,
Vatavaran Bhawan, Nabha Road,
Patiala, Punjab- 147001

Memo No: GMADA-DE(PH-1)/2018/4859 Dated: 21-9-18

Sub:- **Seeking Revised Environmental Clearance for our project "Proposed area development and Township namely "IT City" within area of 6769200.00 sqm (1671.72 acre) in Sector 66-B, 82-A, 83-A, 101-A, Mohali (Punjab)".**

Ref:- **Your letter no. SEIAA/2018/ 795 dated 16-07-2018 regarding issuance of TOR's (copy enclosed)**

Sir,

In the light of issuance of Tors for our above said project "Proposed area development and Township namely "IT City" within area of 6769200.00 sqm (1671.72 acre) in Sector 66-B, 82-A, 83-A, 101-A, Mohali (Punjab)" which comes under category 8(b) of EIA gazatte notification, 2006 for seeking revised Environmental Clearance for the said project.

We are enclosing herewith the EIA & EMP report alongwith annexure for your kind perusal.

We request you to kindly consider our case in upcoming SEAC meeting.

Thanking you,

For Greater Mohali Area Development Authority

21/9/18

Er. Vasudev Anand
Divisional Engineer (PH-1)
GMADA, SAS Nagar

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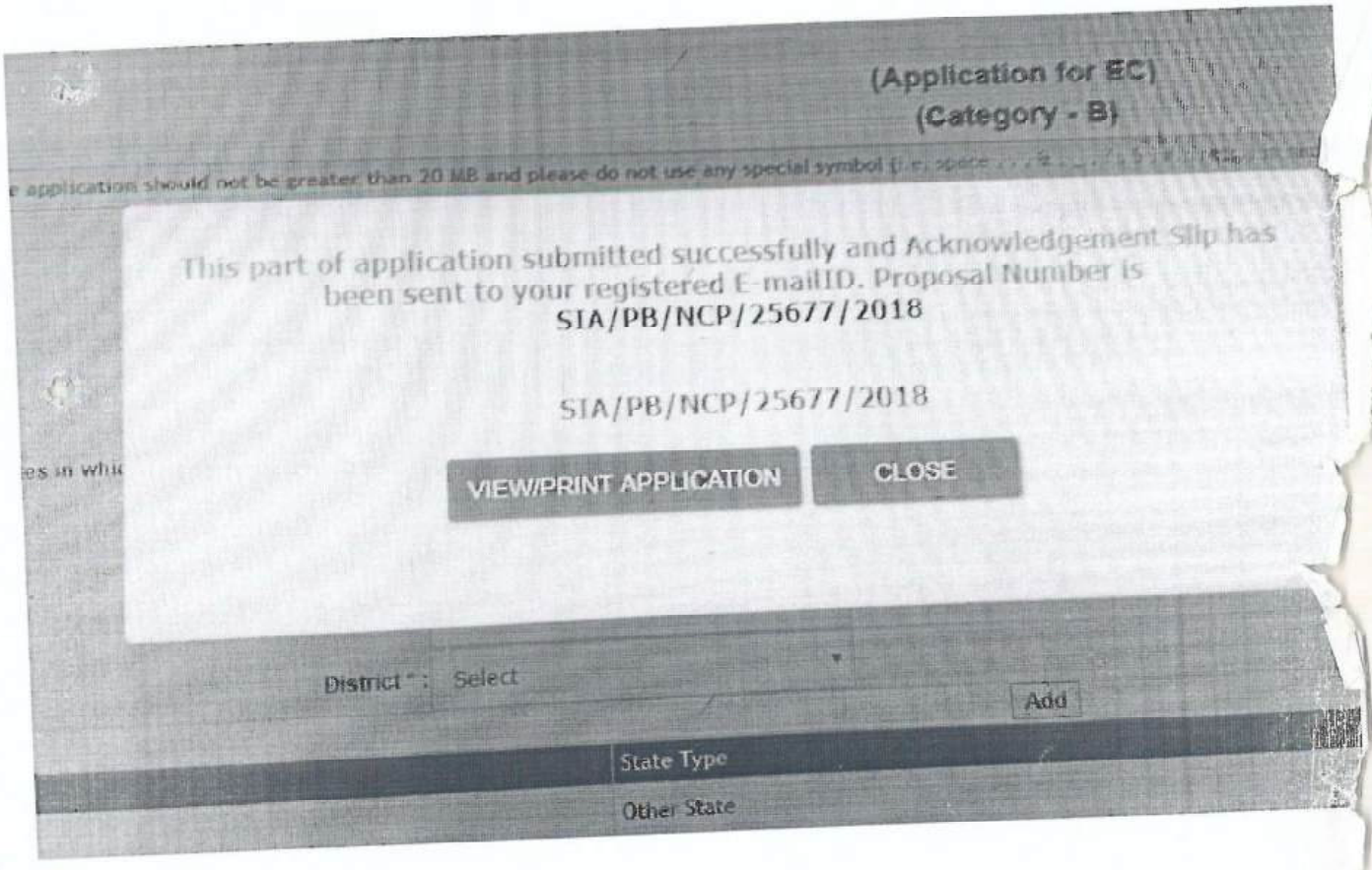
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(Category - B)
application should not be greater than 20 MB and please do not use any special symbol
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CHAPTER - 1

1. CHAPTER- I

INTRODUCTION

1.1. Preamble

This section of the manual provides information and guidance on Environmental Impact Assessment (EIA) in townships and area development projects. It is intended as a resource for those who are involved in EIA practice. Particular emphasis is given to concepts, procedures and tools that are used currently or are potentially relevant in preparing environmental impact assessment reports for clearance from regulatory agencies.

EIA is a technical exercise, to predict environmental impacts, assess their significance, and provide recommendations for their mitigation. The assessment covers construction and operation of the development and can consider site decommissioning. EIA report covers a wide range of technical disciplines and covers areas such as noise and vibration, air quality, ecology, contamination, water quality & hydrology, archaeology & cultural heritage, landscape & visual character, sustainability and socio-economics. The EIA report will describe how the project has been improved through the EIA process and what alternatives were considered.

1.2. General Information on Township and Area Development Projects

Township in general, is self contained and integrated in the social infrastructure needs, services, shopping, entertainment and waste management. Infrastructure and services include road network, water supply and management, electricity supply and management and proper communication services. Social infrastructure includes schools, Medicare, recreation and community centre. Shopping centre with adequate facilities should be housed in the township itself.

Proper waste management including garbage collection, segregation, treatment and disposal with the township should be provided. Maintenance of infrastructure and proper security and safety of the residents is to be ensured.

1.3. Environmental clearance process

Proposed project will be developed on a total land area of 6769200.0 sq m. The proposed project is categorized under **category "A"** of **8 (b)** of Schedule (Township & Area development Projects) of Gazette Notification dated December 9th, 2016 (Covering an area of ≥ 150 ha and or built up area ≥ 3, 00,000 sq m), it shall, therefore to be appraised as Category "A" project requiring Environmental

clearance. The environmental clearance process as per EIA notification of 2006 and later amendments as under:

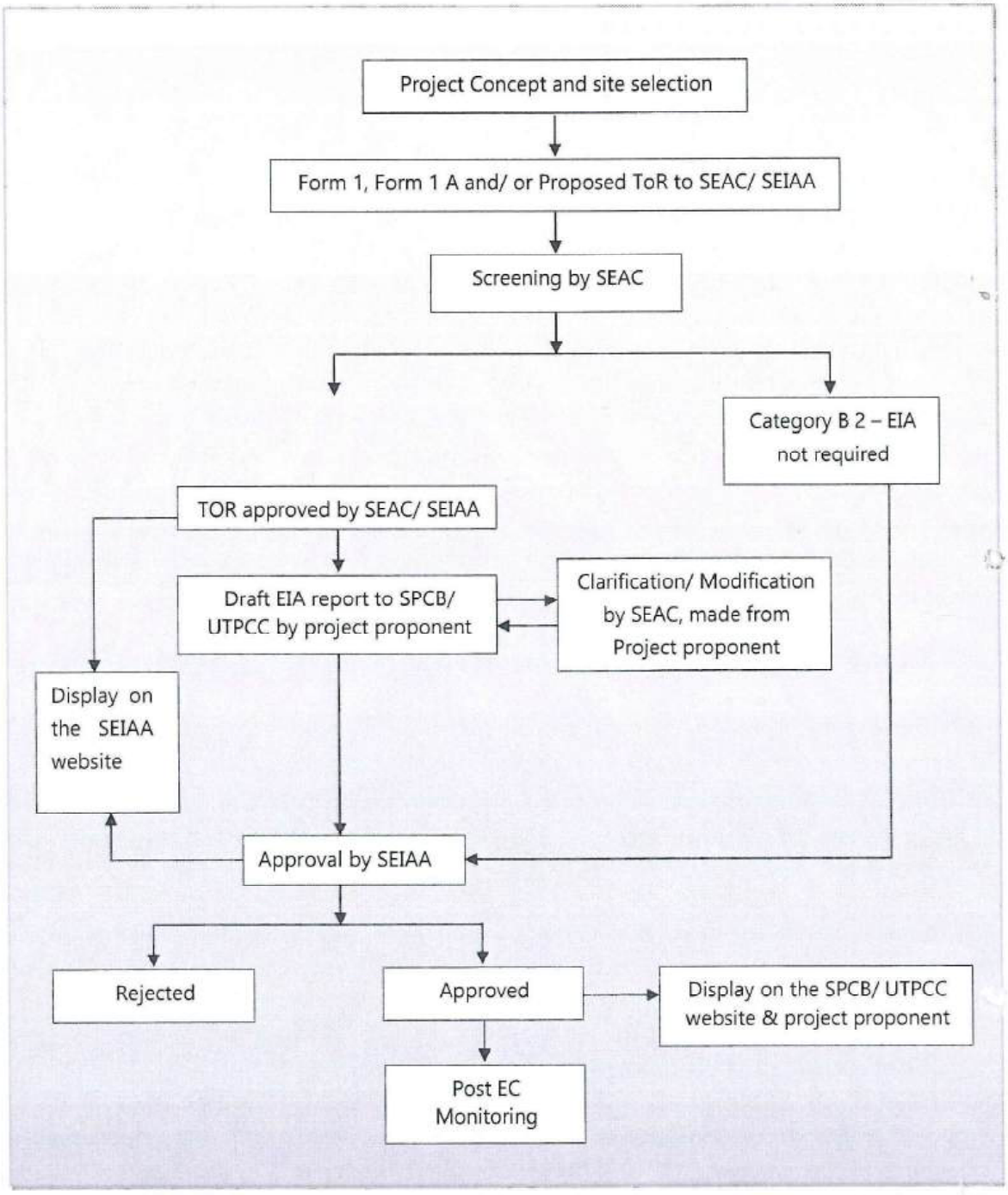

Figure: 1.1 Processes for Environment Clearance

1.4. Terms of Reference (TOR) and point wise compliances

The State Level Expert Appraisal Committee (SEAC), Punjab considered the project during its 166th meeting held on 24th May 2018. The State Level Environmental Impact Assessment Authority was considered the project in 133rd meeting on 6th July 2018 and 134th meeting on 9th July 2018, SEIAA, Punjab has been issue the Terms of Reference (TOR) . Compliance of TOR is as below:-

S No	Items in the letter of the TORs	Reply / Response by the PP
A. Construction Stage		
1	The project falls under category **B-1** under item 8 (b) Township and Area Development projects and requires an Environmental Impact Assessment Study for the entire site area.	The Environmental Impact assessment study has been carried out within 10 km radius of the project site during March to May 2018. Detail has been described in chapter 3.
2	Examine details of land use as per Master Plan and land use around 10 km radius of the project site. Analysis should be made based on latest satellite imagery for land use with raw images. Check on flood plain of any river.	Analysis has been made based on latest satellite imagery. The imagery of land use has been added in chapter 3 as figure no. 3.4 at page no. 3-7 and figure no 3.5 at page no 3-8.
3	Examine and submit the details of the environmental impacts at the stage of land acquisition including aspects such as displacement of families, rehabilitation, acquiring of agricultural/forest land, acquiring of ecologically important lands and water bodies.	The proposed project is applied for revised Environmental clearance for existing Township namely "Knowledge Park". Thus, there is land already developed as mix use and no further land acquisition including aspects such as displacement of families, rehabilitation, acquiring of agricultural/forest land, acquiring of ecologically important lands and water bodies. Required.
4	Examine baseline environmental quality along with projected incremental load due to the project.	The baseline environmental quality has been examined and the parameters are under prescribed limit as per CPCB and SPCB.
5	Environmental data to be considered in relation to the project development would be (a) land, (b) groundwater, (c) surface water, (d) air, (e) bio-diversity, (f) noise and vibrations, (g) socio economic and health. However, the project proponent has to fill the prescribed field data sheets (available on website of SEIAA i.e. www.seiaapunjab.co.in) which are required to be attached with the analysis reports along with exact location of sampling / monitoring point marked on the layout map. Monitoring started for study of	Environmental data has been considered in relation to the project development for (a) land, (b) groundwater, (c) surface water, (d) air, (e) bio-diversity, (f) noise and vibrations, (g) socio economic and health. Prescribed field data sheets have been attached with analysis report along with exact location of sampling / monitoring point marked on the layout map.

	significant environmental parameter by project proponent from 10.03.2018 may be accepted	
6	Examine and submit the details of the environmental impacts due to change of land use and land cover including aspects such as hydrological characteristics, imperviousness of land and drainage pattern being altered.	Detail has been described in chapter 4 of the environmental impacts due to change of land use and land cover including aspects such as hydrological characteristics, imperviousness of land and drainage pattern being altered
7	Submit the details of the trees to be felled for the project.	There is not falling trees in proposed project, if there need to be cut the tree, it will be cut down after getting NOC from relative authority.
8	Action plan for the green belt development in 33 % area with not less than 1, 500 trees per ha. giving details of species, width of plantation, planting schedule post plantation and maintenance plan for 3 years shall be included. The green belt shall be around the boundary and a scheme for greening of the roads used for the project shall also be incorporated.	About 11% of the total project area (~ 746887.82 sq m) to be developed as green belt and not less than 1500 trees/ hectare will be kept. Plantation and maintenance for 3 years also include. Green belt has been proposed around the boundary and along with the road.
9	Submit the present land use and permission required for any conversion such as forest, agriculture etc.	Present land use has been added in chapter 2 in table no 2.1 at page no. 2.5. Conversation of the land is not proposed.
10	Examine the details of Source of water, water requirement, use of treated waste water and prepare a water balance chart.	Source of water, water requirement use of treated waste water and prepare a water balance chart are added in chapter 2 at page no. 2-7 and 2-8.
11	Examine and submit impact due to ground water abstraction on ambient ground water on ambient ground water.	During initial stage of project operational ground water abstraction will be about 5829.16 KLD (about 40 % of the total water requirement) and later on the total fresh water will be met from canal water. Thus there will be no negative impact on ground water due to project.
12	Examine soil characteristics and depth of ground water table for rainwater harvesting.	The major soil type of the district is weakly solonized tropical arid brown soil and ground water table (depth) range is between 2.14 mbgl to 32.24 mbgl.
13	Examine and submit the details of the environmental impacts at the stage of construction of boundaries & fencing including its impact on the pattern of natural drainage and flooding pattern and barriers being constructed for restricting wildlife movement into project area.	Compliance report will be submit along with test report to measure the environmental impacts at the stage of construction of boundaries & fencing including its impact on the pattern of natural drainage and flooding pattern and barriers will be constructed for restricting

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		wildlife movement into project area.
14	Examine and submit the details of the environmental impacts due to levelling and landscaping including aspects such as excavation & filling of soil, clearing of vegetation, change of topography, development of plantation, green belt, lawns & parks and development of impervious areas.	Detail will be submitted with compliance report. The proposed land is almost flat thus topography will not take place and top soil will be removed separately and use for plantation and green area development. Soil will be excavated for drainage and for foundation work only.
15	Examine and submit the details of the environmental impacts due to excavation, transportation and filling of earth including aspects such as excavation, filling, sourcing, transportation and disposal of soil.	Detail will be submitted with compliance report along with testing report.
16	Examine and submit the details of the construction material to be used at the construction stage including aspects such as quarries and transportation, stone crushing and screening, mining & transportation of sand, soil excavation, transportation and filling.	Detail of the construction material has been added to chapter 5 at page no. 5-3. Stone crushing and screening, mining & transportation of sand will have not been carried out at project site; soil will be excavated for drainage and for foundation work only.
17	Examine and submit the impacts being caused due to transportation of construction materials and men such as increase in traffic and load on public transportation facility, destruction and damage of transportation infrastructure, increase of risk due to road accident, pollution caused due to dust and tail pipe emissions and consumption of fuel by transport vehicles. A detailed traffic and transportation study should be made for existing and projected passenger and cargo traffic.	During construction work the construction material will be transported with all safety measures like material will cover during transportation, all vehicles will be maintained and PUC certified, vehicles running under prescribed limit. Existing and proposed traffic load study has been carried out and added in chapter 3.
18	Examine and submit the details of the temporary housing and amenities to be created and used by the work force including aspects such as water supply, electrical energy and fuel supply.	Temporary housing and all basic amenities to be provided to the workers. Water will be met from Bore wells and electricity supply will be provided by state electricity Board Punjab govt. major work will be done with electricity operated machineries. For emergency power back up DG set is proposed.
19	Examine and submit the details of the environmental impacts at the stage of creation of roads, transportation facility and other physical infrastructure including aspects such as use of construction materials, excavation and /or filling	During road construction major pollution will be due to SPM and vehicle emission. To control the SPM regular water spray will be done at haul road all vehicles will be maintained and PUC certified. Construction waste will be

	of soil, generation of construction waste, creation of impervious surfaces, noise & suspended dust pollution and accidental risk.	generated during road construction reused in leveling and foundation work of road. To prevent accident vehicles speed will be under limit and road safety indication used at work palace.
20	Examine and submit the details of the noise pollution, air pollution, consumption of fuel and generation of scrap being caused due to operation and maintenance of construction machinery and equipment.	All machineries will be maintained timely and work will be carried out in day time to control noise pollution used oil will send to authorized recycler.
21	Examine and submit the details of the source and supply of water for construction activity.	150 KLD water will be used during construction work and met through Bore wells.
22	Examine and submit the details of the source and quantity of power for construction activity	Power requirement will be 100 kW and will be met from Punjab State electricity Board.
23	Examine and submit the details of the fuel consumption, noise pollution, emissions of the exhaust gas, engine & coolant oil and batteries being discarded due to captive and emergency power generation.	To minimize fuel consumption more electric operated machineries will be used. To minimize the air emission and noise pollution all machine will properly maintained. Used engine oil, coolant oil and batteries will be handover to authorized recycler.
24	Examine and submit the details of the handling of wastewater during construction including the domestic wastewater being generated from amenities.	Waste water from domestic uses will be treated in mobile STP. Spillage of oil and fuels used for construction machinery and waste water generate from construction process will kept separate to prevent surface water body.
25	Examine and submit the details of the environmental impacts at the stage of development of residential buildings, commercial, institutional and industrial infrastructure including aspects such as construction materials to be used, earth work (excavation and/or soil filling), generation of construction waste, lighting, HVAC units, waste generation from packaging, residual paints and chemicals and their cans, Generation of wooden, glass, metal and other scrap materials, plumbing and sanitary waste generation, creation of impervious surfaces, noise pollution, suspended dust pollution and risk of accidents.	During development of infrastructure all kind of waste will be managed as per waste management rules 2016. To prevent dust pollution using the barrier of about 6 – 8 meter hight.
26	Examine and submit the details of the environmental impacts due to the laying of the water supply system including aspects such as use of piping, fittings ad pumps, water pumping	Surface water body will not be affected during development of water supply system. Pipe and pump fittings will be done properly to prevent seepage/ leakage from supply line. Soil

	stations, earth work and water treatment plant.	excavation and transportation done with preventive measure.
27	Examine and submit the details of the environmental impacts due to the laying of the sewerage and sewage treatment and disposal system including aspects such as use of construction material, piping, fittings ad pumps, earth work, laying of sewers & manholes, sewage pumping stations and sewage treatment plant.	There will be temporary impact on air and noise environment due to earth work for laying of sewer line.
28	Examine and submit the details of the environmental impacts due to the laying of the storm water drainage system including aspects such as use of construction material, piping, fittings and pumps, earth work, storm drains, storm water inlets and catch basins and storm water outfalls.	There will be temporary impact on air and noise environment due to earth work for laying of storm water line.
29	Examine and submit the details of the environmental impacts due to the electrical power system and street lighting to be provided including aspects such as construction materials to be used, distribution lines, cables, control panels, transformers and meters.	All electric line will be underground, so there will be temporary effect on environment due to earth work.
30	Examine and submit details of use of solar energy and alternative source of energy to reduce the fossil energy consumption. Energy conservation and energy efficiency.	Solar energy will be use equal to 1 % of total power demand.
31	DG sets are likely to be used during construction and operational phase of the project. Emissions from DG sets must be taken into consideration while estimating the impacts on air environment. Examine and submit details.	DG set will be install with appropriet stack hieght and acoustic enclosure.
B. Operation stage		
1	Examine and submit the details of the environmental impacts due to the residential, commercial, institutional, industrial, recreational, social, cultural &religious activities to be carried out.	There will be imoact on air, soil ,noise and water environment due to operational conditionof the project. All protective measure will be adopted to control the pollution.
2	Examine and submit the details of the environmental impacts due to the facilities to be provided such as water supply, electrical power	There will be impact due to transportation system, to control the pollution plantation will be done as barrier and will be speed limit with

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	supply, fuel supply & consumption including LPG, transportation and communication.	sufficient carriage way for smoth traffic.
3	Examine and submit the details of the environmental impacts due to the sewerage & sewage treatment and its disposal systems and storm water & its drainage system.	Storm water will be dicharge into ground wter recharge pit and sewer water will be treated into STP. Over flow will be dicharge into main drainage of GMADA.
4	Examine and submit the details of the environmental impacts caused due to the generation of captive power & emergency power.	There will be pollution due to power backup. To control this proper stack and acaustic encloser will be fitted with DG set.
5	Submit the details of the management & handling of municipal solid waste, e-waste, hazardous waste, scrap, estate management, construction and demolition waste management.	Municipal solid waste will be handover to municipal and other hazardous, e waste and C7 D waste will be handover to authorized recycler.
6	Submit the details of the socio economic impact due to the employment to be generated from the household activities.	There will be positive impact on socio-economic environment due to the proposed project.
7	Rain water harvesting proposals should be made with due safeguards for ground water quality. Maximize recycling of water and utilization of rain water. Examine details.	Rain water harvesting has been proposed and desgin map attached as annexure. Detail also proide in chapter 9.
C. General		
1	Other details as indicated in Appendix III of EIA Notification 2006 and the manual titled as "EIA guidance Manual-Building, Construction, Township and area Development projects" published by the Ministry of Environment & Forests, New Delhi, should also be attended.	Noted and complied.
2	Environmental aspects identified under some of the project activities may not be comprehensive and some of the significant aspects under some of the activities of the project in question might not have been identified. All such environmental aspects may be added to the list.	Noted and complied
3	Some of the activities with their associated environmental aspects of the project in question might be of significant magnitude and not included in the list project activities. All such activities may be added to the list of project activities.	Noted and complied

4	The project proponent may add additional project activities and environmental aspects, if any, fill the impact matrix (copy attached) and carryout significance analysis for identifying the significant environmental aspects. Scale, sensitivity and duration of impacts; type, size and frequency of environmental aspects; applicable legal requirements; and concerns of interested parties and local public may be used as the basis for the significance analysis of the environmental aspects.	Noted and complied.
5	In the EIA study each of the environmental aspects listed in the TOR should be quantified, their positive and negative impacts on different areas of impacts should be identified and assessed and the results of such assessment should be reported in the EIA report.	Noted and complied.
6	In the Environment Management Plan, management of each of the significant environmental aspects (with identified and assessed significant environmental impacts) for mitigating the impacts should be objectively stated.	Noted and complied in the 9th chapter of the EIA EMP report.
	Submit Roles and responsibility of the developer etc. for compliance of environmental regulations under the provisions of EP Act.	Role and resposbilities has been added to chapter 6 (environmental monitoring program).
8	Ground water classification as per the Central Ground Water Authority.	As per CGWA area is not comes under notified and over exploited zone.
9	Environment Management Plan should include technical and institutional aspects for pre-treatment by constituent units.	Noted and included in chapter 9.
10	Environmental Management Plan should be accompanied with Environmental Monitoring Plan and environmental cost and benefit assessment. The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	Environmental Management Plan has been accompanied with Environmental Monitoring Plan and environmental cost and benefit assessment. EMP capital cost and reccuring cost has been added to chapter 9.
11	Examine separately the details for construction and operation phases both for Environmental Management Plan and Environmental Monitoring Plan with cost and	Noted and complied.

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	parameters.	
12	Submit details of a comprehensive Disaster Management Plan including emergency evacuation during natural and man-made disaster.	Disaster management plan has been added to chapter 7 (additional studies)
13	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given	NO litigation pending aggainst the project an affidavit has been submitted regarding this.
14	Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.	Laid down of the environment policy has been attached in EIA report.
15	Does the Environment policy prescribe for standard operating process /procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.	Environment policy has prescribe for standard operating process /procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions
16	What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the EC conditions? Details of this system may be given.	hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the EC conditions is added in the 6th chapter.
17	Does the company have a system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and / or shareholders or stakeholders at large? This reporting mechanism should be detailed in the EIA report.	Yes, company have a system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and / or shareholders or stakeholders at large. Same has been added to EIA report at chapter no. 6.
18	Delineate the concrete proposal regarding activities to be undertaken under Corporate Social Responsibility programme, which should be long lasting in nature and should be as per the needs of a particular Village/area/ local habitats/ stakeholders to be adopted by the promoter company, which can be done by involving a person having knowledge and experience of socio-economic activities.	Corporate Environmental Responsibility (CER) programme, is long lasting in nature and as per the needs of a particular Village/area/ local habitats/ stakeholders. Amount of CER will be spent on works after consulting the local administration.
19	Study to be carried out shall include expansion related issues like structural safety (in case there is increase in number of storey), specifying the adequacy of existing internal water supply system,	Noted and complied.

	sewer line & STP for the proposed expansion. The existing building plan shall be superimposed with the proposed building plan for expansion projects and marked with different colours.	
Additional Specific TOR		
1	The project proponent will submit a copy of the Memorandum of Article & Association/Partnership deed/ undertaking of sole proprietorship/ list of Directors and names of other persons responsible for managing the day to day affairs of the project, whichever is applicable.	Copy of Memorandum of Article has been attached as annexure in the EIA report.

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During the meeting, the observations of SEIAA and reply thereto by the project proponent are as under:-

S No	Observations raised by the SEIAA	Reply given by the project proponent	Remark
1	GMADA has proposed to allow the establishment of green & orange category of industries in the proposed project mixed with other uses such as residential, commercial & educational institutes, however, the land use permitted in the proposals as per zoning plans of notified Master Plan of area is for industrial use only.	The project proponent submitted that the mixed land uses allowed are as per Super Mega Mixed Use Integrated Industrial Park Projects Policy of the State Govt. approved by Empowered Committee framed in its meeting 27.02.2008 under the Chairmanship of Hon'ble Chief Minister, Punjab. Moreover, revised layout plan of the project has been approved by Planning & Design Committee in its meeting on 06.12.2013.	It is stated that, adequate green buffer zone is proposed in proposed layout plan.
2	The SEIAA observed that Super Mega Mixed Use Integrated Industrial Park Projects Policy has been approved by the State Govt. in the year 2008 whereas Master Plan of the area wherein project site is located has been notified in the year 2009. Once the Master Plan of the area has been notified, it is the only statutory document to be followed. In case, the mixed land uses as permitted in the above said policy of year 2008, were to be allowed to be continued then the provisions for the same should have been The project proponent again reiterated his position as narrated in para No. 1 above mentioned in the Zoning Plans of notified Master Plan. As such, the proposals of notified Master Plan are required to be amended suitably so as to adjust the allowing of mixed land use.	The project proponent again reiterated his position as narrated in para No. 1 above.	It is stated that, according to the letter from CTP (PB) office vide no. 2505 CTP (PB) SP-42 (PB) dated 14.06.2017 punjab government grant the permission to GMADA to change the land use of 1686.0619 acre area to developed the super mega mixed used integrated industrial park at sector 66- B, 82- A and 101- A, S. A. S. Nagar.beside this, govt. Bounded to follow the conditions of Master plan SAS Nagar. Futher cleared that, according to report of notified zonal plan S. A. S. Nagar green and orange industries are permissible in above said sectors. there is not any provision to specify the green and orange industries separately, so according to condistions of

			Master/ Zonal plan S. A. S. Nagar designated by Punjab pollution control board are permissible. That why, there is no need to amend the conditions of Master/ zonal plan S. A. S. Nagar.
3	Besides, green category of industries, there are 104 types of orange category of industries in the list approved by Punjab Pollution Control Board. The industries can be water polluting, air polluting or both water & air polluting in nature. The type & category of industry to be allowed to be established in the proposed project need to be specified as otherwise it will not be possible to assess the various infrastructure requirements and impacts on various environmental parameters. In case type of industry to be allowed is not known, total water requirement, waste water generation, power requirement, air quality mathematical modelling etc. will not be able to be carried.	GMADA stated that they will specify the green & orange category of industry to be allowed and prepare the EIA study report accordingly.	GMADA will permit to all 104 types of the orange category of industries in the list approved by Punjab pollution control board after make sure that the upcoming industries will not have any major impact on air and water environment and use all protective measures to control the air and water pollution at their end.
4	Adequate green buffer zone is also required to be provided between industrial & other establishments such as residential, commercial & educational Institutions.	GMADA stated that they will ensure this in the EIA study report.	An adequate green buffer zone has been proposed between the polluting industries and residential and commercial. It is also mentioned in layout plan.

1.5. Validity of Environmental Clearance

The prior environmental clearance granted is valid for a period of Seven years. In the case of Area Development projects and Townships [item 8 (b), the validity period shall be limited only to such activities as may be the responsibility of the applicant as a developer. The regulatory authority concerned may extend this validity period by a maximum period of five years provided an application is made to the regulatory authority by the applicant within the validity period, together with an updated Form 1, and Supplementary Form 1A, for construction projects or activities (item 8 of the schedule)

(Ref: Gazette Notification dated 14.9.2006 and 29th April 2015 by MoEF & CC)

1.6. Post Environmental Clearance Monitoring

For category B projects, irrespective of its clearance by MoEF/SEIAA, the project proponent shall prominently advertise in the newspapers indicating that the project has been accorded environmental clearance and the details of MoEF website where it is displayed. The Project management shall submit half-yearly compliance reports in respect of the stipulated prior environmental clearance terms and conditions on 1st June and 1st December of each calendar year. All such reports shall be public documents.

1.7. Transferability of Environmental Clearance

A prior environmental clearance granted for a specific project or activity to an applicant may be transferred during its validity to another legal person entitled to undertake the project or activity on application by the transferor or the transferee with a written "no objection" by the transferor, to, and by the regulatory authority concerned, on the same terms and conditions under which the prior environmental clearance was initially granted, and for the same validity period.

1.8. Structure of Environmental Impact Assessment and Environmental Management Plan Report

The Environmental Impact Assessment/Environmental Management Plan Report has been prepared as per format described in the EIA Notification-2006 and contains following chapters.

- Introduction
- Project Description
- Description of the Environment

- Anticipated Environmental Impacts & Mitigation Measures
- Analysis of Alternatives (Technology and site)
- Environmental Monitoring Programme
- Additional Studies
- Project Benefits
- Environmental Management Plan
- Summary & Conclusion
- Disclosure of Consultants engaged

1.9. Environmental Standards and Code of Practices

Documents studied for the present environment assessment exercise is presented below.

- EIA Guidance Manual – Building, Construction, Townships and Area Development, MoEF & CC 2010.
- Environment and Forest (MoEF & CC), Government of India EIA notification 2006 and its subsequent amendments till date.

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CHAPTER - 2

2. CHAPTER- II

PROJECT DISCRIPTION

2.1. General (Type of Project)

Proposed project will be developed on a total land area of 6769200.0 sq m. The proposed project is categorized under **category "A"** of **8 (b)** of Schedule (Township & Area development Projects) of Gazette Notification dated December 9th, 2016

The purpose of proposed projects is to plan, design and construct residential, commercial, institutional areas and non polluting IT industries. Mohali is a commercial hub lying to the city of Chandigarh in Punjab. It is the one of the six Municipal Corporation of the state. It is developing rapidly as an IT hub of the state. Special emphasis has been made by the state government to make this city the best place to live in the Punjab.

Greater Mohali Area Development Authority (GMADA) had obtained the Environmental Clearance from SEIAA, Punjab for the development of Township and Area Development project namely "IT City" enclosing an area of 709.82 Hectare (7098226.62 sq m). Environmental Clearance was accorded in the year 2014 vide letter no SEIAA/2014/2634 dated 30-8-2014 for the following categories as per layout plan bearing drawing no. D.T.P. (SAS Nagar) 785/13 dated 21-01-2013.

- Residential area
- Commercial area
- Institutional area
- Non- polluting IT industries

Now the GMADA Authority has revised its layout plan approved on 10/01/2018 bearing no D.T.P. (SAS Nagar) 2315/18 and has change the land use pattern with following category-

- Residential area
- Commercial area
- Institutional area
- Non- polluting IT industries
- Green Category Industries
- Orange Category Industries (Specified by GMADA)
- Ware house

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Therefore in view of inclusion of green, orange industry and Warehouse GMADA are seeking revised E.C for the said project namely "IT City".

2.2. Location of Project

The project is located At Sector 66-B, 82-A, 83-A, 101-A Mohali (Punjab). The site is well connected by NH-22, NH- 21, NH- 64, SH- 4 and SH- 12A which is running at a distance of about 1.75 km to 5.0 km from the project site. The project site is located at about 1.5 km from S.A.S. Nagar Railway Station in South & about 3.5 km from Chandigarh Airport in SW. The project site coordinates are shown in Table 1.1. The site route map is show in figure 1.2 and location map of the project site is shown in figure 1.3.

Table 1.1: project site coordinates

S No	Direction	Latitude	Longitude
1	SW Corner	30°37'21.10"N	76°42'35.04"E
2	WSW Corner	30°37'54.28"N	76°42'15.11"E
3	NE Corner	30°39'35.77"N	76°45'27.25"E
4	ENE Corner	30°39'07.74"N	76°45'58.72"E

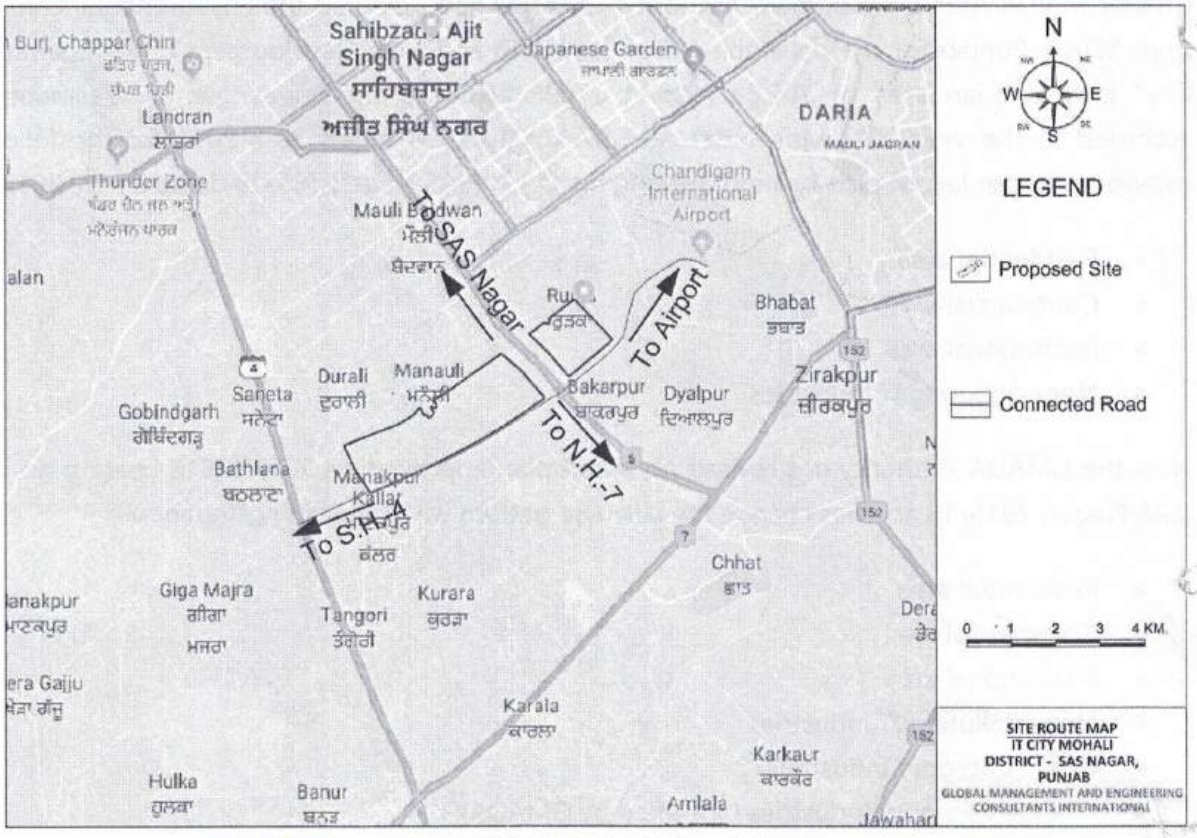

Figure 1.0: Project Site Rout Map

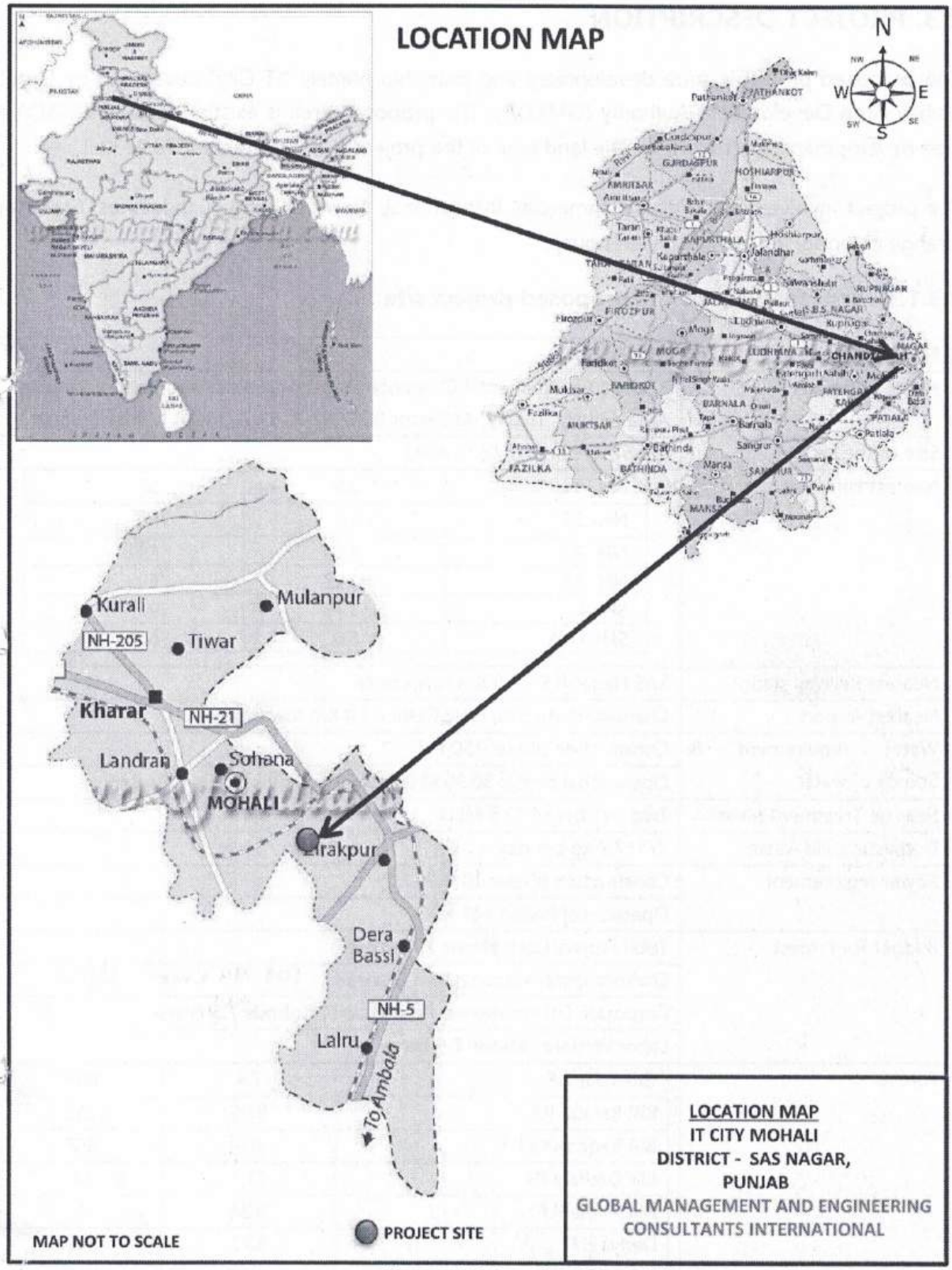

Figure 1.2: Location Map of site

2.3. PROJECT DESCRIPTION

The proposed project is area development and township namely "IT City" developed by Greater Mohali Area Development Authority (GMADA). The proposed area is existing land of GMADA for area development and township. The land area of the project is 1671.72 acre (676.92 ha.).

The project involves residential, commercial, Institutional, Non polluting IT industries, Green and Orange category industry and warehouse.

2.3.1. Salient features of the proposed project site

Feature	Details		
Name of project	Revised Environmental Clearance for proposed development of Township Area namely "IT City" At Sector 66-B, 82-A, 83-A, 101-A Mohali (Punjab)		
Size of the project	676.92 hectare (1672.71 acre)		
Nearest Highway	NH -64	3.9	SE
	NH- 22	5.3	E
	NH- 21	4.9	ENE
	NH- 73	11.3	E
	SH- 4	1.75	W
	SH- 12 A	6.0	N
Nearest Railway station	SAS Nagar R.S – 1.5 Km towards N		
Nearest Airport	Chandigarh Airport, New Delhi – 3.4 Km towards NE		
Water requirement & Source of water	Construction phase: 150 KLD		
	Operational phase: 30.36 KLD From Bore well and Canal water		
Sewage Treatment plant	Two number of 12.5 MLD		
Domestic solid waste	47187.9 kg per day		
Power requirement	Construction phase: 10 kVA		
	Operational Phase: 141 MVA		
Budget for Project	Total Project Cost: **about 750 crore**		
	Environmental Management Program: 108.94 Crore		
	Corporate Environmental Responsibility: **about 7.5 crore**		
	Labor Welfare : **about 7.5 crore**		
Forests	Gidarpur P.F.	7.4	NW
	BIR Barauli P.F.	9.95	SSE
	BIR Baqarpura P.F.	9.6	SSE
	BIR Dadrala P.F.	11.1	SE
	Machhela R.F.	9.24	E
	Dariya R.F.	5.27	NE
	Lake R.F.	11.52	NNE

	Nepli R.F.	13.3	NE
	Kansal Ki Koh R.F.	13.2	NE
	Kholhai Raitan R.F.	11.9	ENE
Water Body	Sukhna Lake	10.6	NE
	Ghagghar River	6.4	SSE
	Choi and Choa Nala	Within the Project Site (IT City)	
State/ National Boundary	Chandigarh Territroy Boundary	~2.25	N
	Haryana State Boundary	~5.85	E

2.3.2. Land Requirement

The proposed area is converted for Industrial area and industrial park for mix use as per master plan of SAS Nagar area of Greater Mohali. The total land available for the project is 676.92 hectare (1672.71 acre). The land use breakup of the proposed project is given in table 2.1 below:

Table 2.1: Land use breakup

S No	Particular	Area (Acre)	Area (Hectare)	Area (sq m)
1	Residential area	304.94	123.40	1234048.4
2	Commercial area	81.97	33.17	331720.82
3	Institutional area	89.71	36.31	363043.49
4	Non polluting It Industries, Ware house and Green Industries	211.27	85.50	854979.36
5	Orange Category area	55.58	22.49	224924.28
6	Green area	184.56	74.69	746887.82
7	Road area	529.89	214.44	2144388.75
8	Mixed use area	214.79	86.92	869224.30
Total		**1672.71**	**676.92**	**6769217.00**

2.3.3. Project Cost

The total estimated cost of the Group Housing project is approximately Rs. 700 Crore.

2.3.4. Parking Requirements

Adequate parking facility has been provided in the form of surface and stilt parking. There shall also be additional parking provisions for visitors so as not disturb the traffic and allow smooth movement at the site. In all type of buildings parking facility will be provide as per building by laws, govt. of Punjab dated 25.10.2013.

Parking facility details are as below:

S No	Particular	Unit ECS	Area/Unit	Total no of ECS
1	Residential area	1.5 ECS/ DU (up to 1200 sq feet)	1110 unit	1665 ECS
		2.0 ECS/ DU (1200 sq feet to 3000 Sq feet)	2053 unit	4106 ECS
		3.0 ECS/ DU (above 3000 sq feet	1038 unit	3114 ECS
	(Additional 10% guest parking)			889 ECS
	Total			**9774 ECS**
2	Commercial activities			
	Booking agency/ Parking/ Weigh bridge	20% of total available space; 23 sq m/ ECS for open parking	6313.09	55 ECS
	Petrol Pump	2ECS/ 100 sq m	5384 sq m (40% covered area)	108 ECS
	Dispensary- 1	2.0 ECS/100 sq m covered area	2784 sq m (40% covered area)	56 ECS
	Dispensary- 2	2.0 ECS/100 sq m covered area	1862 sq m (40% covered area)	37 ECS
	Hospital/ Health Centre	2.0 ECS/100 sq m covered area	4257 sq m (40% covered area)	85 ECS
	Other commercial area	2.0 ECS/100 sq m covered area	132688.32 sq m (40% covered area)	2654 ECS
	Total			**2995 ECS**
3	Institutional area	1.5 ECS/100 sq m covered area	145217.39 sq m (40% covered area)	**2178 ECS**
4	IT Industrial area	2.0 ECS/100 sq m covered area	144747.96 sq m (40% covered area)	**2895 ECS**
5	Industry & Ware houses	1.0 ECS/100 sq m covered area	52820.82 sq m (65% covered area for plot size below 425 sq m)	528 ECS
		1.0 ECS/100 sq m covered area	35199.4 sq m (60% covered area for plot size from 425 to 850 sq m)	352 ECS
		1.0 ECS/100 sq m covered area	1133.44 sq m (50% covered area for plot size above 850 sq m)	11ECS
	Total			**891 ECS**
6	Public Building	1.5 ECS/ 100 sq m covered area	28263.24 sq m (40 % covered area)	**424 ECS**
7	Sports complex	1.0 ECS/100 sq m covered area	2201.49 sq m (10% covered area)	**22 ECS**
	Grand Total			**19179 ECS**

Ref: Gazette notification of department of housing and urban development, Govt. of Punjab dated 29th Oct.' 2013

2.3.5. Water Requirement

Construction Phase

It is estimated that total water demand during construction phase is 150 KLD. The water requirements for construction and domestic activities are 100 KLD and 50 KLD respectively. The daily fresh water demand is met through bore well.

Operational Phase

It is estimated that the total water demand during the operation phase will be **30369.77 KLD.** The fresh water requirement is calculated to **14572.9 KLD** whereas treated water in the tune of **15796.87 KLD** will be used for the landscaping, flushing and miscellaneous purpose. Out of fresh water at initial stage of the project operation about 40% of the fresh water demand will be met from bore well and about 60% of the fresh water demand will be met canal water and later on the total fresh water demand will be met from canal water. NOC/ permission will be obtained if required for ground water abstraction. Excess water will be discharge into Drainage system to supply treated water for agriculture purpose to nearby villages. Details of total water demand and break – up of water requirement are given below in Table 2.4 & Table 2.5 respectively.

Table 2.4: Water Demand during Operational phase

S No	Type of Water	Water demand in KLD
1.	Fresh Water	14572.9
2.	Treated Water	15796.87
Total		30369.77 KLD

Table 2.5: Break up of Water Demand

S No	Particular	Water Demand (KLD)
1.	Total Water Demand	30369.77 KLD
2.	Fresh Water Requirements	14572.9
3.	Total Waste water Generation	Total 17552.07 (15071.72 from project activity and 2480.35 from outside)
4.	Total Treated Water	15796.87
5.	Treated Water Reused	15796.87
6.	Flushing	3413.4
7.	Landscaping	4107.88 (peak demand)
8.	STP Proposed	2 X (12.5 MLD)
Total		5758 KLD

Water Balance

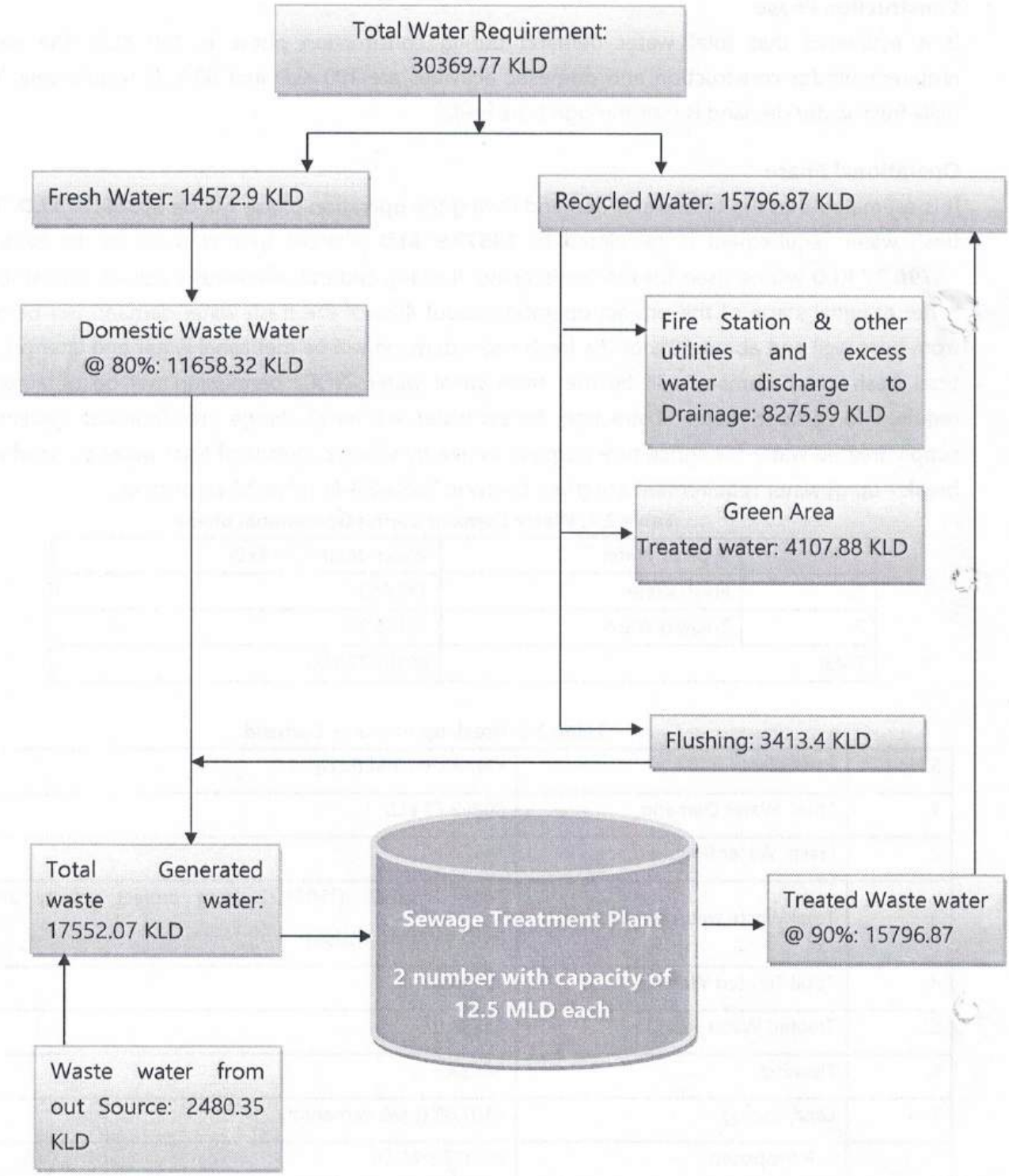

Figure: Water Balance Chart

Water requirement for green belt:

Water requirement for green area development is vary in different season:

Season of watering	Rate of watering	Plantation area	Total Water required
summer season	5.5 liter per sq m	746887.82 sq m	4107.88 KLD
winter season	1.8 liter per sq m	746887.82 sq m	1344.40 KLD
monsoon season	0.5 liter per sq m	746887.82 sq m	373.44 KLD

Excess water remaining after used at project will be discharged into drainage passes nearby IT City developed by GMADA to supply the treated water for agriculture purpose to nearby villagers.

2.3.6. WASTE WATER TREATMENT & DISPOSAL

Construction Phase:

75 KLD of wastewater will be generated during construction phase from the domestic activities. The sanitation facilities will be provided in terms of Mobile Toilet.

Operation Phase:

Approximately 15071.72 KLD of wastewater will be generated from the fresh water and about 2480.35 KLD waste water will be met from M/s Janta Land Promoters. Overall 17552.07 KLD of waste water will generated during the operation phase. Two sewage treatment Plants of 12.5 MLD each are proposed to be constructed within the proposed project with MBBR/ SBR technology base.

Sewage Treatment Plant:

The sewage Treatment Plant (STP) of **24 MLD** based on **SBR technology** is proposed is to be constructed within the proposed project. The treated wastewater will be used for flushing, landscaping, road washing, water sprinkling, car washing and miscellaneous purposes. There will not be any incremental pollution load on nearby surface water bodies due to proposed project. Table 2.6 shows the expected characteristics of generated wastewater from proposed project.

Table 2.6 Characteristics of Waste Water & Treated Waste Water

Parameters	Value	
	Expected wastewater characteristics	Treated wastewater characteristics after SBR treatment
pH	6.5-8.5	6.0- 8.0

BOD in mg/L	250-450	Less than 20
Suspended solids in mg/L	250-400	Less than 10
COD in mg/L	600-800	Less than 60
Oil and grease in mg/L	50-100	Less than 5
Detergents in mg/L	50-100	Less than 5

STP location is shown in Annexure XX.

Process Description:

Sequential Batch Reactor (SBR):

The Plant is based on Sequential Batch Reactor Technology popularly known as SBR Technology. Unlike various processes of treatments the raw sewage as obtained for the treatment undergoes Physico-Chemical & Biological Treatments. The first part of Physico- Chemical treatment is the Primary Treatment to the raw sewage, which covers the physical activities like screening, de-gritting, flow measurement, flow distribution etc. The plant is designed in accordance with the characteristics of influent and effluent as provided and according to the guidelines set up by the 'CPHEEO Manual', published by the Govt. of India.

SBR is a sequential batch reactor process. It provides highest treatment efficiency possible in a single step biological process. **SBR** – System is operated in a batch reactor mode which eliminates all the inefficiencies of the continuous processes. A batch reactor is a perfect reactor, which ensures 100% treatment. Two modules are provided to ensure continuous treatment. The complete process takes place in a single reactor, within which all biological treatment steps take place sequentially.

The complete biological operation is divided into cycles. Each cycle is of 3 – 5 hr duration, during which all treatment steps take place.

Cyclic operation:

A basic cycle comprises:

- Fill-Aeration (F/A)
- Settlement (S)
- Decanting (D)

During the period of a cycle, the liquid is filled in the SBR Basin up to a set operating water level. Aeration Blowers are started for aeration of the effluent. After the aeration cycle, the biomass settles under perfect settling conditions. Once Settled the supernatant is removed from the top using a DECANTER. Solids are wasted from the tanks during the decanting phase. These phases in a sequence constitute a cycle, which is then repeated.

Chlorine Contact Tank

The Effluent from the SBR basins will be collected in Chlorine Contact Tank .The supernatant thus collected will get disinfected in Chlorine Contact Tank by adding suitable dose of chlorine and finally it is utilized for flushing, general washing and green belt development.

Sludge Handling System:

The sludge as collected from SBR basins is collected into sludge sump and conveyed to centrifuge unit for dewatering the same. The necessary centrifuge feed pumps & Centrifuges will be provided. There will be an arrangement of dosing polyelectrolyte if necessary.

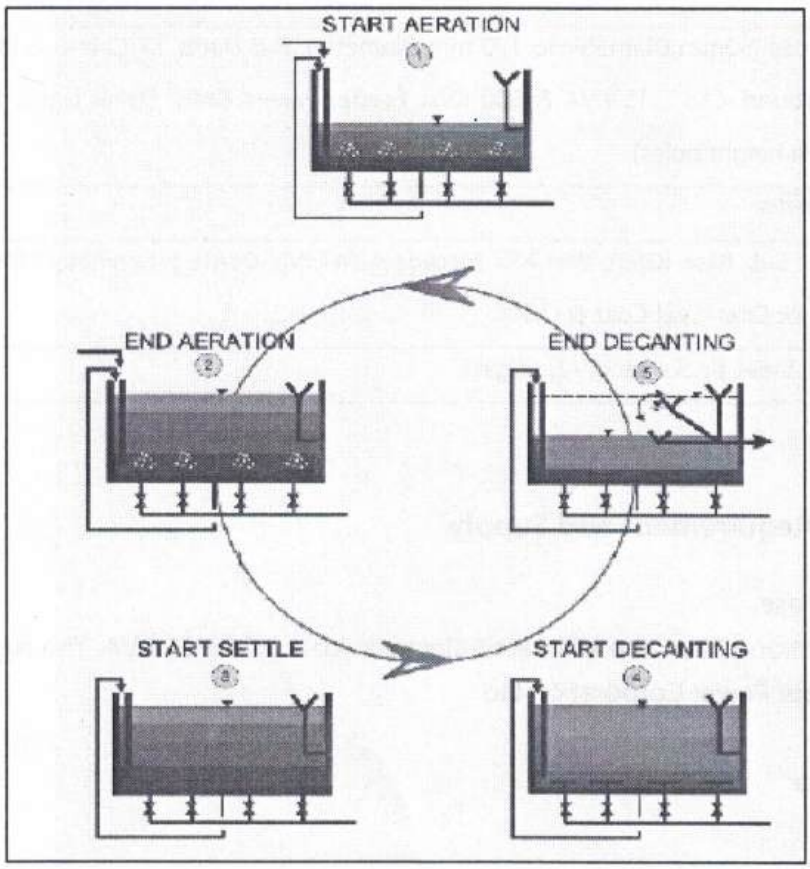

Figure 2.2: SBR Cycle and Process Flow

During the period of a cycle, the liquid is filled in the SBR Basin up to a set operating water level. Aeration Blowers are started for aeration of the effluent. After the aeration cycle, the biomass settles under perfect settling conditions. Once Settled the supernatant is removed from the top using a DECANTER. Solids are wasted from the tanks during the decanting phase. These phases in a sequence constitute a cycle, which is then repeated.

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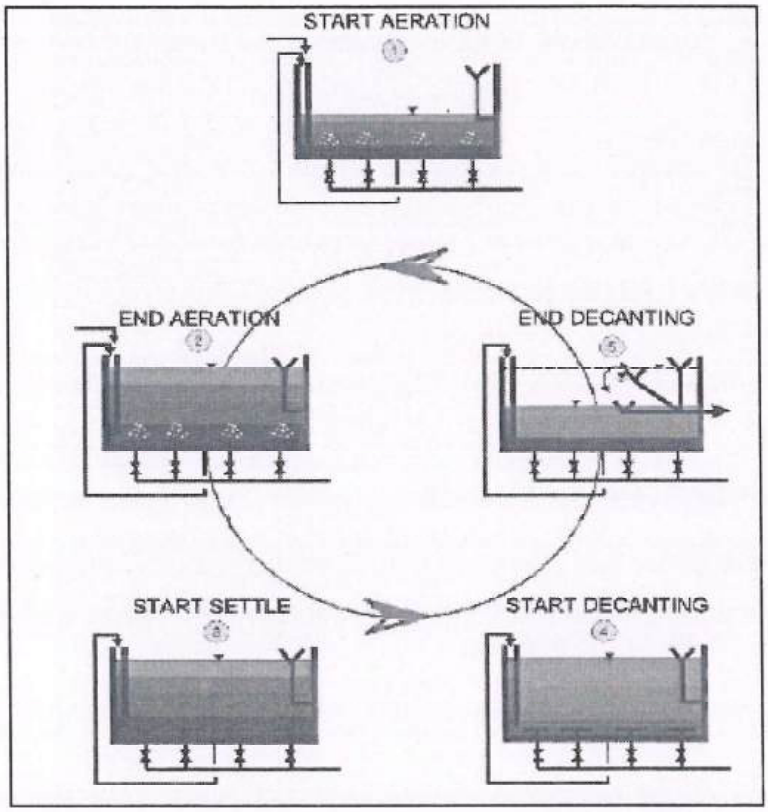

Figure 2.2: SBR Cycle and Process Flow

2.3.7. Construction Material

Construction materials as concrete, aggregates, bricks, , electrical ware, will be purchased from reputed manufactures. Only IS approved building materials will be used for construction. Construction materials will be selected based on their thermal characteristic.

Table: construction material to be used in area development

S No	Work Type	Detail
1	**PH work**	
	Storm Water	RCC Pipes (250mm Diameter to 2200 mm Diameter)
	Sewer	SW Pipes (200mm Diameter to 450 mm Diameter) HDPE Pipes (630mm Diameter to 1000 mm Diameter)
	Water Supply	DI Pipes (90mm Diameter to 400 mm Diameter)
	Tertiary Treated water	DI Pipes (90mm Diameter to 300 mm Diameter)
	Tube wells	MS Pipes (200mm Diameter to 300 mm Diameter)
2	**Electric Works**	
	DWC Pipes (50mm Diameter to 180 mm Diameter), PLB Ducts, LT Cables Underground, HT cables Underground, CSS (315 KVA & 500 KVA, Feeder Panels, RMU, Street Lights Poles & Fixture (6m, 9m, 10 m height poles)	
3	**Civil Works**	
	Granular Sub Base (GSB), Wet Mix Mecadam (WMM), Dense Bituminous Mecadam (DBM), Prime Coat, Tock Coat, Seal Coat & OGPC	
	Cement, Steel, Bricks Sand, Aggregate	

2.3.8. Power Requirement and Supply

Construction Phase:

During construction phase, the estimated electrical load will be 50 KVA. The supply will be sourced from Punjab state Power Corporation Ltd.

Operation Phase:

During Operation phase, the estimated electrical load is 141 MW. The supply will be sourced from Punjab state Power Corporation Ltd. Appropriate for drawing power from Electrical sub stations (ESS) and suitable distribution arrangements will be made.

****

CHAPTER - 3

3. CHAPTER- III

Description of the Environment

3.1. GENERAL

The anthropogenic activities related to large infrastructure sector may cause impacts on environmental components in and around the project site. However, the intensity of environmental impacts vary from project to project, depends upon several factors like; Physical, & other etc., Involved in the project capacity (scale/size of the project), type and extent of pollution control measures, project location surrounding geomorphology etc. To assess environmental impacts from proposed project (specific), it is essential to monitor the environmental quality prevailing in the surrounding area prior to implementation of the proposed project. The environmental status (baseline status) within the study area is used for prediction of anticipated environmental impact assessment study.

This section contains the description of baseline studies of the study area. The monitoring locations are shown in figure 3.1. The data collected has been used to define the existing environment scenario around the proposed project against which, the potential impacts of the project has been assessed.

The baseline data collection was carried out to cover the following aspects:

- Ambient Air Quality
- Water Quality
- Ambient Noise Quality
- Soil Quality
- Land Environment
- Biodiversity
- Socio-economic status

3.2. STUDY AREA

The study area of the project site falls in Survey of India Topo-sheet no. 53B/10 and 53B/14, and is located at Sector 66-B, 82-A, 83-A, 101-A Mohali (Punjab). Site coordinates are as table 3.1, topographical map is show in figure 3.1 and Google Map is show as figure 3.2:

Table 3.1: project site coordinates

S No	Direction	Latitude	Longitude
1	SW Corner	30°37'21.10"N	76°42'35.04"E
2	WSW Corner	30°37'54.28"N	76°42'15.11"E
3	NE Corner	30°39'35.77"N	76°45'27.25"E
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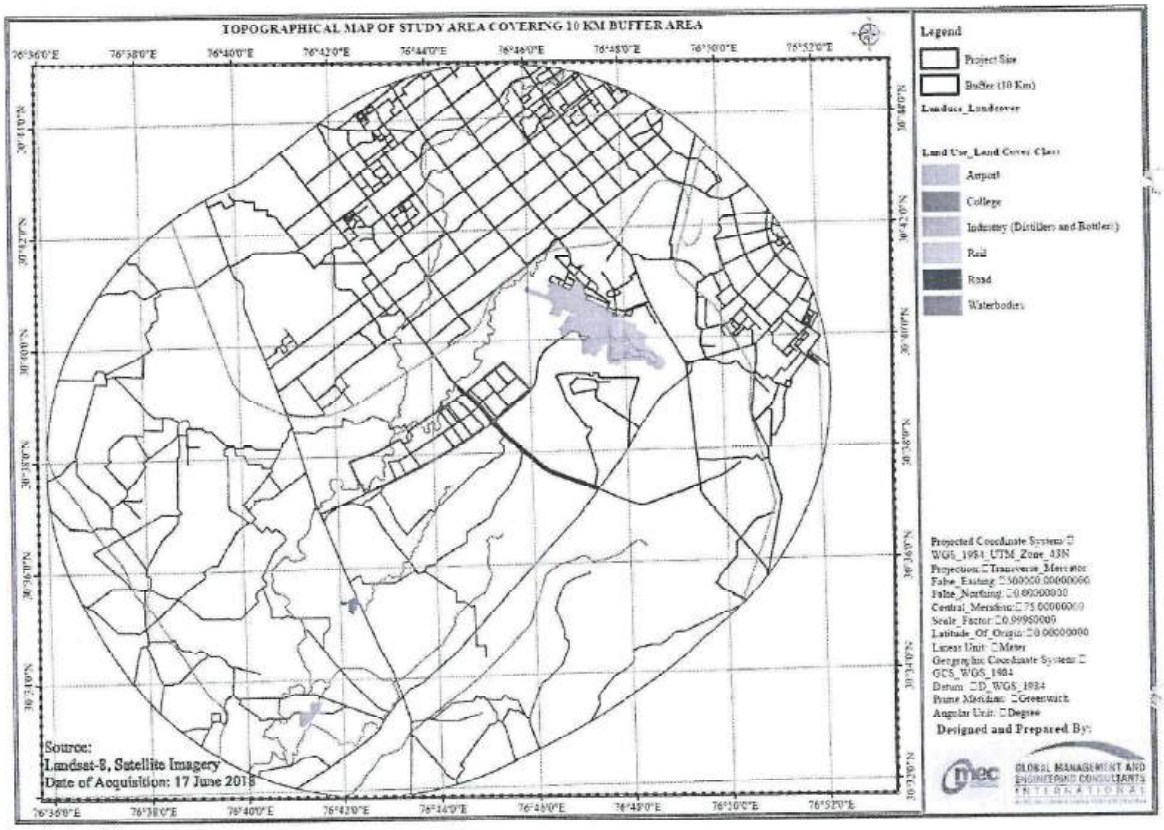

Figure 3.1: Topographical map of the study area

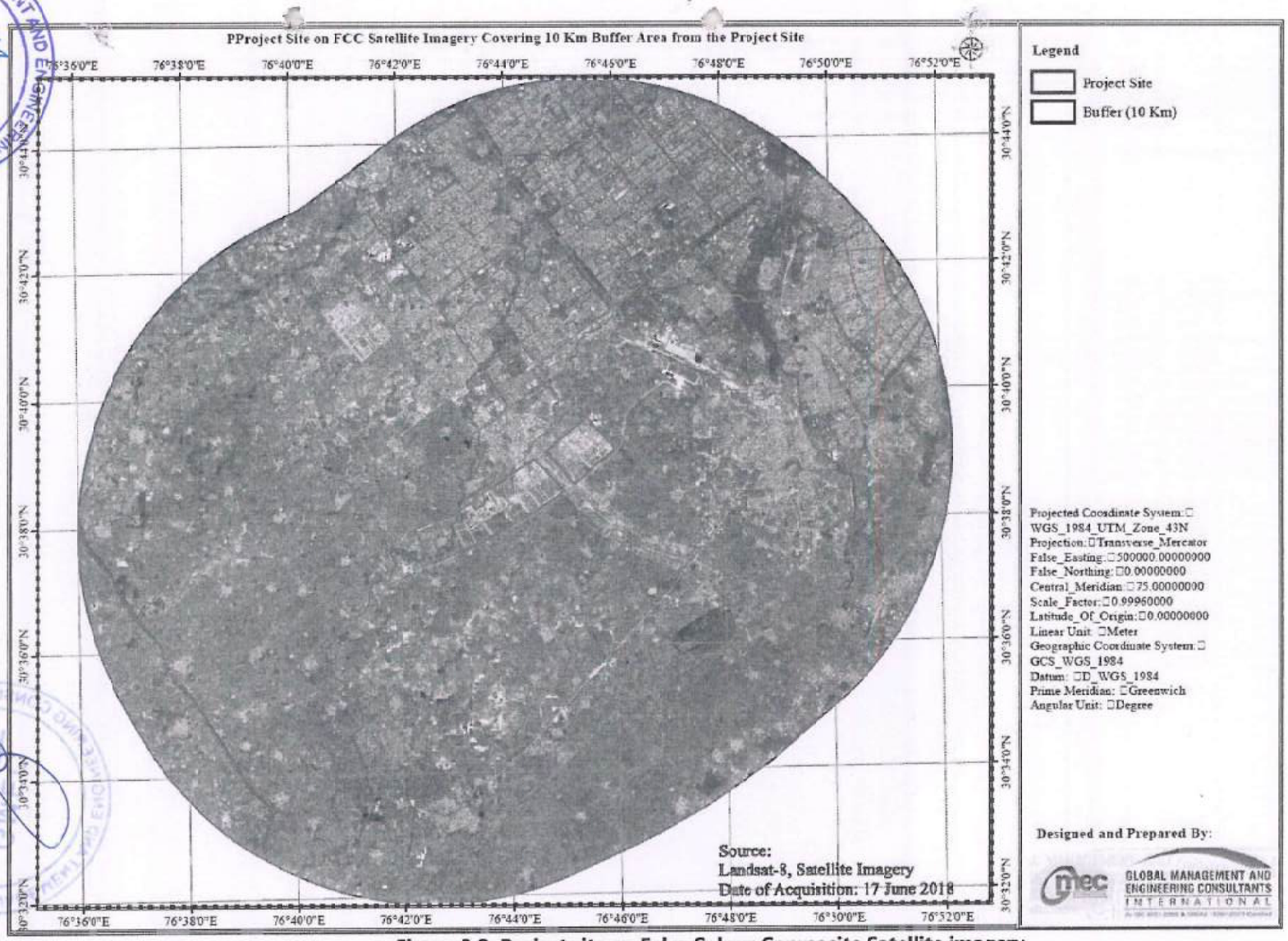

Figure 3.2: Project site on False Colour Composite Satellite imagery

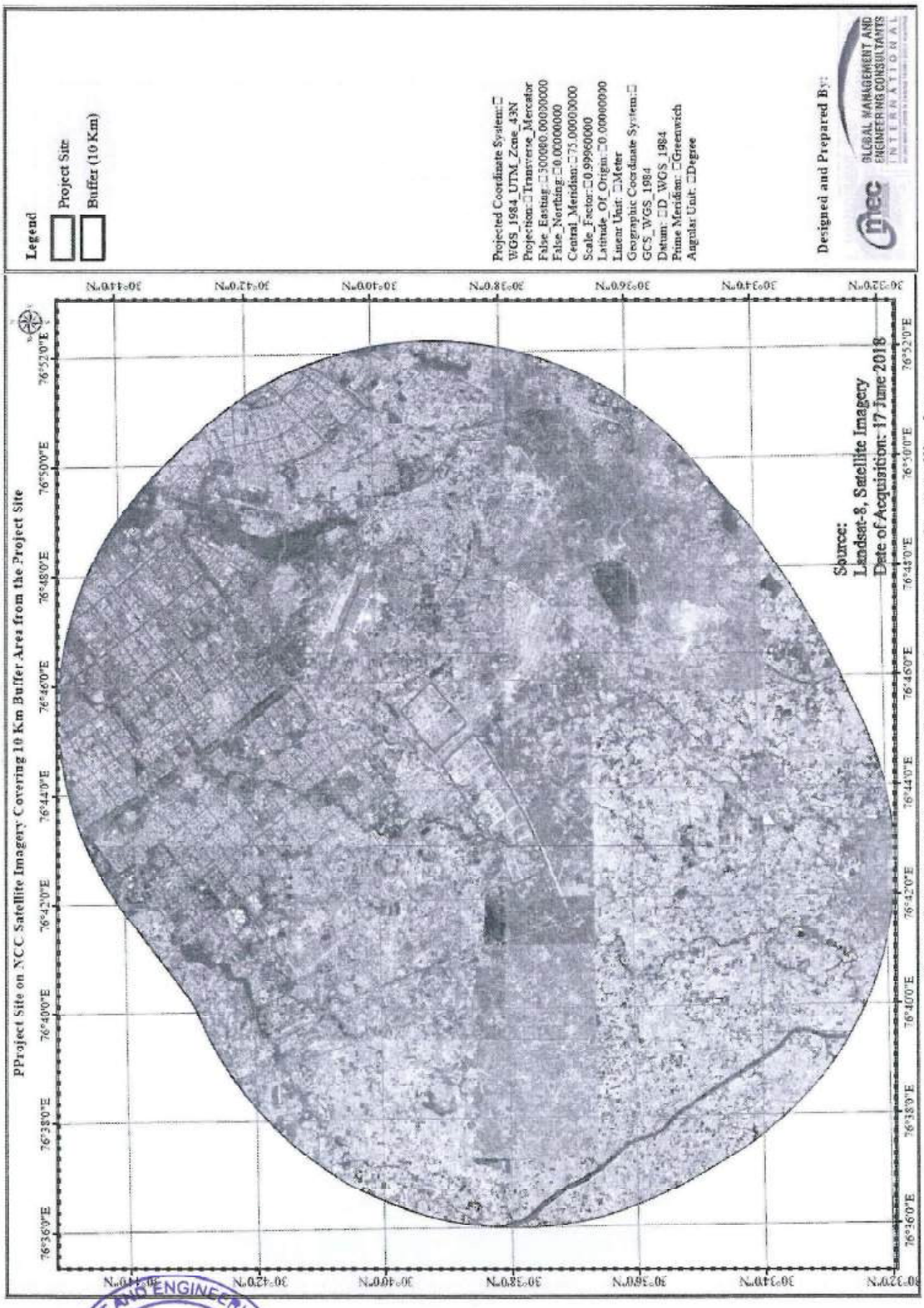

Figure 3.3: Project site on False Colour Composite Satellite imagery

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Area Development Authority
GMADA

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Divisional Engineer
Public Health Division No.1
GMADA, S.A.S. Nagar

3.3. Study period

The present report covers baseline environmental data generated in the study area (10km radius all around the project site) for land use and the sample selection for monitoring. Baseline environmental data generation for air, water, noise and soil quality monitoring around the project site was conducted from March 2018 to May 2018 (Pre-Monsoon season).

Table 3.2 gives various environmental attributes considered for formulating environmental baseline.

Table 3.2: Various Environmental Attributes

S No	Attribute	Parameter	Source of Data
1.	Land Use	Trend of land use change for different categories	Master Plan.
2.	Water Quality	Physical, Chemical and Biological Parameters	Data collected from secondary sources and water sampling at Seven locations.
3.	Ambient Air Quality	PM_{10}, $PM_{2.5}$, SO_2, NO_x, CO	Data collected from secondary sources and Ambient air quality monitoring at two locations.
4.	Noise Levels	Noise levels in dB(A)	Noise level monitoring at 1 location and Data collected from secondary sources.
5.	Ecology and Biodiversity	Survey of flora and fauna within the 10 Km radius of project influence area	Secondary sources.
6.	Geology	Geological history	Secondary sources.
7.	Soil Quality	Physical and chemical parameters	Data collected from secondary sources and soil sampling at one location.
8.	Socio –economic aspects	Socio –economic characteristics of the study area	Based on field survey and data collected from secondary sources.

3.4. LAND ENVIRONMENT

The project or an activity influences the land use pattern of the neighbourhood. Study of land use for the proposed project has been carried out using secondary data from Govt. Data sources such as Survey of India Topo-sheet for the habitation, forest cover and various surrounding environmental features. The project location being in Moradabad district, Land use of the project site has been established.

3.4.1. Land use in 10 km surroundings of the Project Site

Land use depicts the use and pattern of the land in the district. Hence, the land use map acts as the most important map of planning and site allocation. The existing land use is showing 10 Km surrounding area of the project site from its boundary. Area details showing proposed uses as residential, commercial, parks, parking, roads, other services, facilities of the project. An area detail showing the proposed uses of land in % is shown in Table 3.3. Land use map of the 10 Km radius of the project site is shown in figure 3.4 and 3.5. Project site with Natural Colour composite and false colour composite are showing in figure 3.6 and 3.7 respectively.

Table 3.3: land use area of 10 km surrounding of the project site

S No	Class Name	Area (Hectare)	Area (Percentage)
1	Agriculture Crop/Grass Land Area	7155.63	14.96
2	Agriculture Fallow Land	15213.03	31.80
3	Airport	962.56	2.01
4	College	15.84	0.03
5	Forest/Dense Tree Area	2836.09	5.93
6	Industry (Distillers and Bottlers)	58.54	0.12
7	Rail	131.16	0.27
8	Residential/Industrial Area	17646.01	36.88
9	Road	1679.72	3.51
10	Water Bodies	2144.03	4.48
Total		47842.61	100

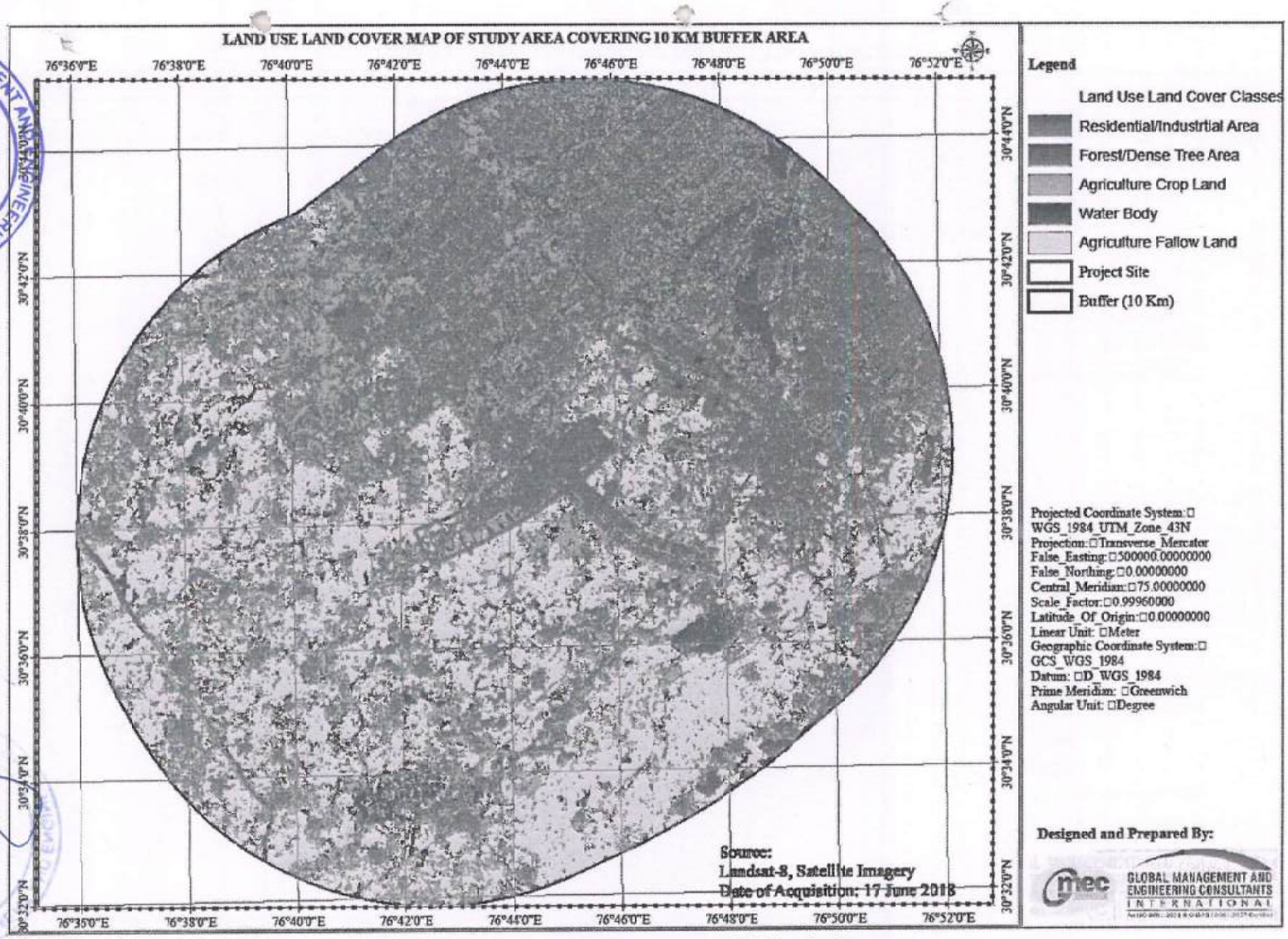

Figure 3.4: Land use land cover map of 10 km buffer area

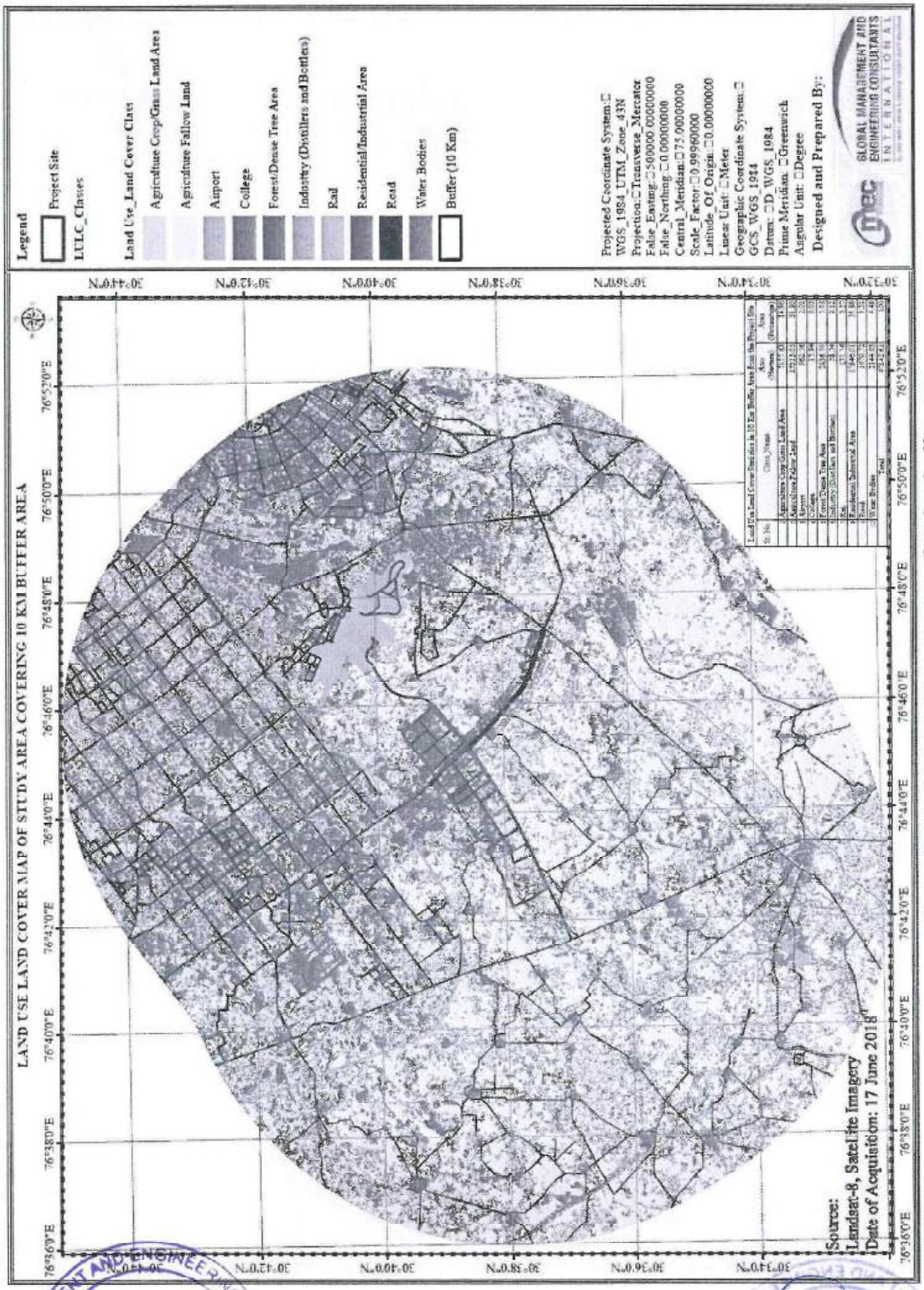

Figure 3.5: Land use land cover map of 10 km buffer area

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Divisional Engineer
Public Health Division No.1
GMADA, S.A.S. Nagar

Table 3.6: Main Surrounding Features

Size of the project	676.92 hectare (1672.71 acre)		
Nearest Highway	NH -64	3.9	SE
	NH- 22	5.3	E
	NH- 21	4.9	ENE
	NH- 73	11.3	E
	SH- 4	1.75	W
	SH- 12 A	6.0	N
Nearest Railway station	SAS Nagar R.S – 1.5 Km towards N		
Nearest Airport	Chandigarh Airport, New Delhi – 3.4 Km towards NE		
Water requirement & Source of water	Construction phase: about 150 KLD		
	Operational phase: 30.36 KLD From Bore well and Canal water		
Sewage Treatment plant	Two number of 12.5 MLD		
Domestic solid waste	47187.9 kg per day		
Power requirement	Construction phase: 10 kVA		
	Operational Phase: 141 MVA		
Budget for Project	Total Project Cost: **about 752.72 crore**		
	Environmental Management Program:		
	Corporate Environmental Responsibility: **about 7.5 crore**		
	Labor Welfare : **about 7.5 crore**		
Forests	Gidarpur P.F.	7.4	NW
	BIR Barauli P.F.	9.95	SSE
	BIR Baqarpura P.F.	9.6	SSE
	BIR Dadrala P.F.	11.1	SE
	Machhela R.F.	9.24	E
	Dariya R.F.	5.27	NE
	Lake R.F.	11.52	NNE
	Nepli R.F.	13.3	NE
	Kansal Ki Koh R.F.	13.2	NE
	Kholhai Raitan R.F.	11.9	ENE
Water Body	Sukhna Lake	10.6	NE
	Ghagghar River	6.4	SSE
	Choi and Choa Nala	Within the Project Site (IT City)	
State/ National Boundary	Chandigarh Territroy Boundary	~2.25	N
	Haryana State Boundary	~5.85	E

The land use shows availability of land for infrastructure development and the present use of land.

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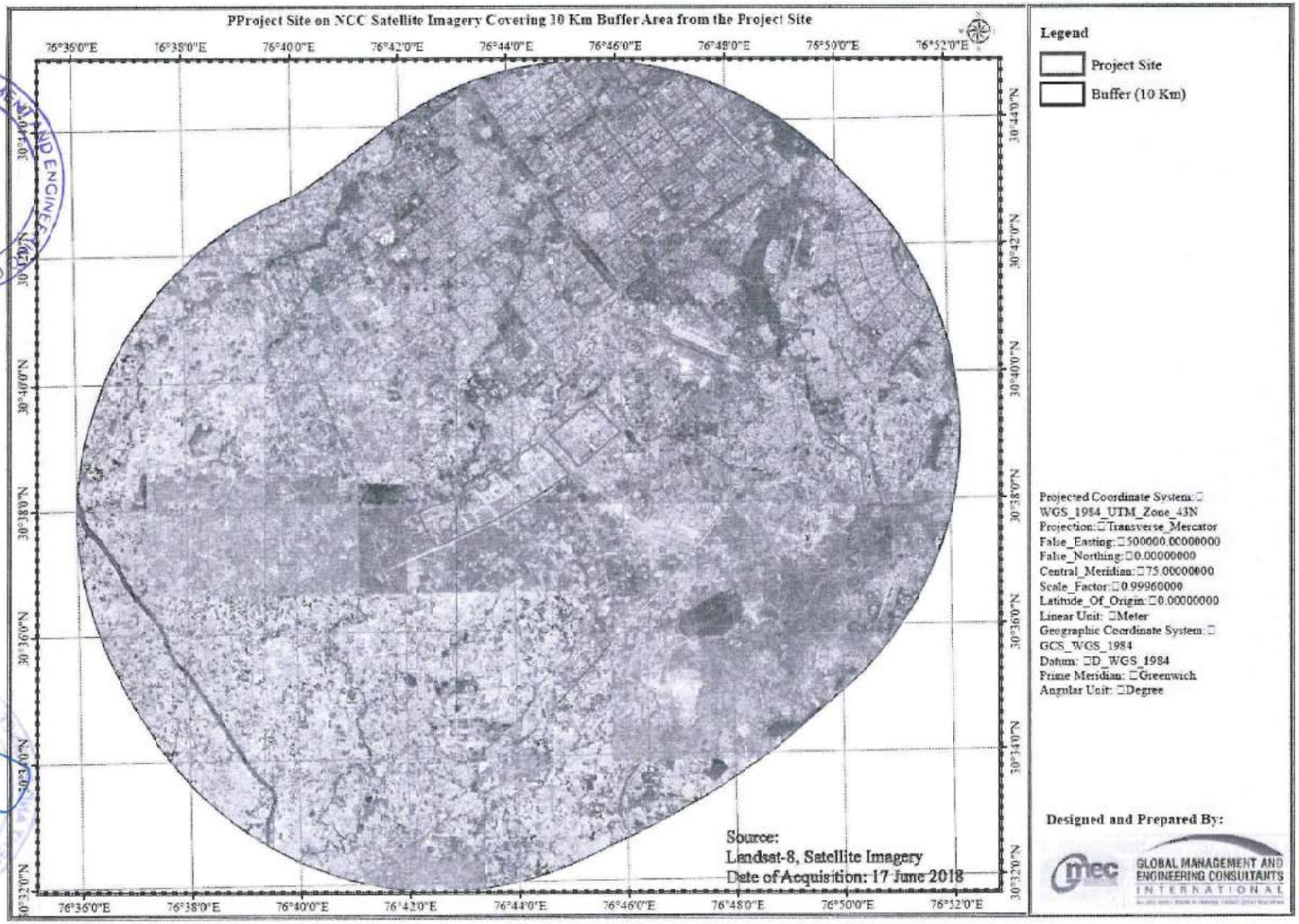


Figure 3.6: Project site on natural colour composit setallite imagery

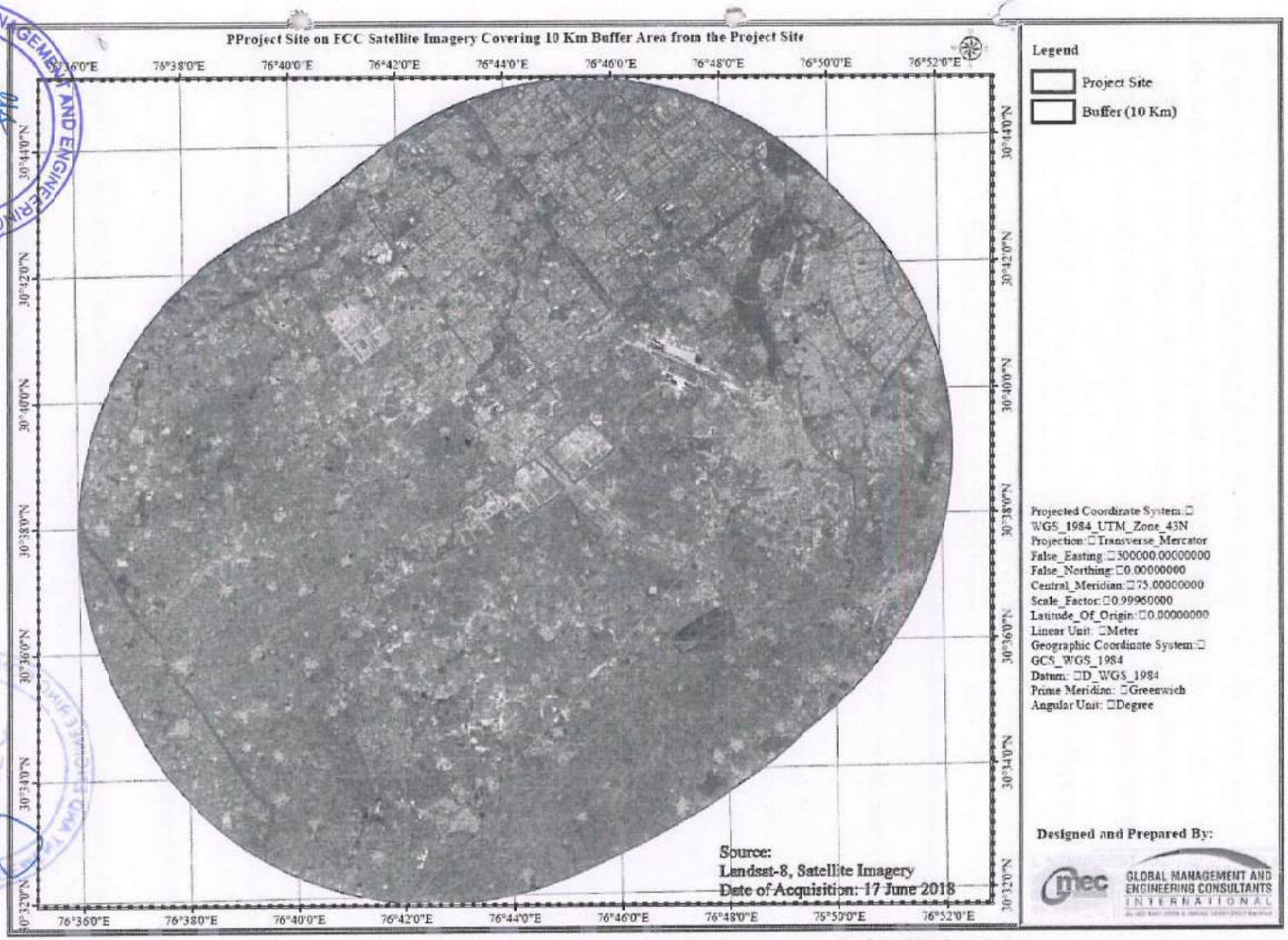


Figure 3.6: Project site on natural colour composit setallite imagery

3.4.2. Rainfall and Climate

The climate of S.A.S district can be classified as subtropical monsoon. The normal annual rainfall of the district is 1061 mm which is unevenly distributed over the area in 49 days. The south west monsoon contributes about 80% of annual rainfall. The temperature in summer may rise to a maximum of 47 °C (117 °F) @2014. Temperatures generally remain between 30 and 40 °C whereas average temperatures in winter (November to February) remain at (maximum) 7 to 15 °C (45 to 59 °F) and (minimum) 1 and 5 °C.

3.4.3. Site Topography & Contour

The project site is well connected through roads, railways and airport. Nearest Highway is NH -5 (0.35 Km, NE from project site). The nearest airport is Chandigarh International Airport, which is approximate 2.5 Km in the NE direction, from the project site.

Project site is approximately flat terrain. A natural Drainage namely Chao Nalla will be realigned and NOC for this has been obtained from related authority. No adverse impacts are envisaged due to proposed project on the runoff characteristics of the area as adequate arrangements have been made to store roof top rainwater and suitable storm water drainage system has been provided. During the post – construction phase, maximum runoff from the project will not be allowed to stand or enter into the roadside. Adequate measures shall be taken to collect such run-off and recharge the ground water. Treated water will be used in project area as per requirement and access water will be discharge into drainage developed by GMADA to supply the treated water for nearby agriculture land.

3.4.4. Geology

The area can be broadly grouped into two depending upon its geomorphic features as alluvial fan and alluvial plains. Alluvial fans are deposited by hill torrents with a wavy plain rather than a steep slope. Adjacent to the alluvial fan are the alluvial plains which forms a part of large Indo-Gangetic Quaternary basin comprises of thick sand and silty sand layers interbedded with silt and clay beds. The alluvial plains are of vital economic value as it supports the dense population of the district. The soils are mainly developed on alluvium under the dominant influence of climate followed by topography and time. The major soil type of the district is weakly solonized tropical arid brown soils. *(Source: SAS Nagar CGWA district profile)*

3.4.5. Soil Characteristics of the Area

To study the soil characteristics of the study area, 4 sampling locations were selected to assess the baseline soil conditions at and around the project site.

3.4.6. Soil Analysis

To understand the soil characteristics and best utility, the sampling of soils was done at eight locations during the study periods. The samples were examined for various physical and chemical parameters. The present study on the soil quality establishes the baseline characteristics. The objective of the sampling is:-

- To determine the baseline soil characteristics
- To monitor the impact on soil (pollutant deposition/other) in long run

Monitoring Location

Soil sample was collected from project site to assess the soil condition in the project influenced area is shown in **Table no. 3.7**

Table 3.7: Soil monitoring location

S No	Location	Coordinates of the Location	
1.	Project site (Rurka)	30° 39' 28.13" N	76° 45' 29.90" E
2.	Project site (Chao Majra)	30° 37' 48.84" N	76° 42' 43.90" E
3.	Village Bhabat	30° 39' 15.37" N	76° 48' 15.89" E
4.	Sector 30 Chandigarh	30° 42' 53.68" N	76° 48' 15.89" E
5.	Sector 60 SAS Nagar (Mohali)	30° 42' 41.60" N	76° 43' 24.52" E
6.	Village Khijergarh	30° 35' 23.48" N	76° 45' 23.96" E
7.	Town Hawai Bassi	30° 34' 05.13" N	76° 42' 37.90" E
8.	Village Chudiala	30° 38' 33.70" N	76° 39' 10.55" E

Figure 3.8: Photographs of soil sampling within study area

Monitoring results

The results of soil monitoring are shown in table 3.8 (a) & 3.8 (b).

Table 3.8 (a): Soil Analysis Results (At Project Site)

S No	Parameter	Units	Protocol
1.	pH	-	IS 2720 (Part 26)
2.	Electrical Conductivity	ms/cm	IS 14767
3.	Calcium carbonate	%	IS 2720 (Part 23)
4.	Organic Matter	%	IS 2720 (Part 22)
5.	Bulk Density	gm/cc	IS 2720 (Part 8)
6.	Sodium as Na	mg/kg	IS 9497
7.	Potassium as K	mg/kg	IS 9497
8.	Moister Content	%	IS 2720(Part 9
9.	Chloride*	Meq/L	USDA-NRCS-6K 1, Nov.2004
	T.K.N	%	IS: 14684

Table 3.8 (b): Soil Analysis Results (Secondary Data)

S No	Parameter	Unit	Project site (Rurka)	Project site (Chao Majra)	Village Bhabat	Sector 30 Chandigarh	Sector 60 SAS Nagar (Mohali)	Village Khijergarh	Town Hawai Bassi	Village Chudiala
1.	pH	-	9.29	8.82	8.44	8.78	8.24	8.80	8.28	8.20
2.	Electrical Conductivity	ms/cm	22.84	27.37	40.07	28.03	23.83	27.01	24.03	21.62
3.	Calcium carbonate	%	5.18	4.60	4.71	4.10	4.9	4.12	4.10	3.8
4.	Organic Matter	%	1.91	0.12	0.12	0.13	0.10	0.17	0.10	0.08
5.	Bulk Density	gm/cc	1.31	1.28	1.13	1.12	1.22	1.13	1.20	1.18
6.	Sodium as Na	mg/kg	0.8	0.9	1.0	1.4	1.4	1.2	1.2	1.20
7.	Potassium as K	mg/kg	3.6	3.8	4.1	4.2	3.7	4.3	4.0	3.68
8.	Moister Content	%	0.68	0.57	0.85	0.74	0.62	0.80	0.64	0.48
9.	Chloride*	Meq/L	0.25	0.25	0.25	0.15	0.12	0.21	0.12	0.10
10.	N.K.N	%	0.06	0.05	0.04	0.02	0.07	0.03	0.01	0.06

3.4.7. Results & Discussions

The analysis result shows that soil is basic in nature with pH value 8.20 to 9.29. Electrical Conductivity is within the range of 21.62 ms/ to 40.07 ms/cm in the nearby area. The concentration of Nitrogen and Potassium has been found to be in good amount in the soil samples.

3.5. WATER ENVIRONMENT

3.5.1. Hydrogeology:

S.A.S Nagar district is located in the eastern part of the Punjab state. The district is bounded by Patiala and Fatehgrah Sahib district in the south-west, Ropar (Roop Nagar) district in the northwest, Chandigarh and Panchkula in the east and Ambala district of Haryana state in the south. Irrigation in the district is mainly by means of tube wells. The area irrigated under tube wells constitutes about 67% of the gross irrigated area.

The S.A.S Nagar district is occupied by Quaternary Alluvial deposits belonging to the vast Indo-Gangetic alluvial plains, which forms the main aquifer system. Groundwater occurs under

phreatic conditions in the shallow aquifers while leaky confined to confine conditions occur along the deeper aquifers of Quaternary alluvial deposits.

In major part of the district, the water level ranges between 5 and 10 m while the water level in the north western and eastern part is between 10 to 20 meters, in the extreme western part of the district water levels are around 30 meters. In the southern part of the district water level ranges from 2 to 5 meters. Seasonal fluctuation shows that, in general, there is an overall decline in the water level except few isolated patches. *(Source: SAS Nagar CGWA district profile)*

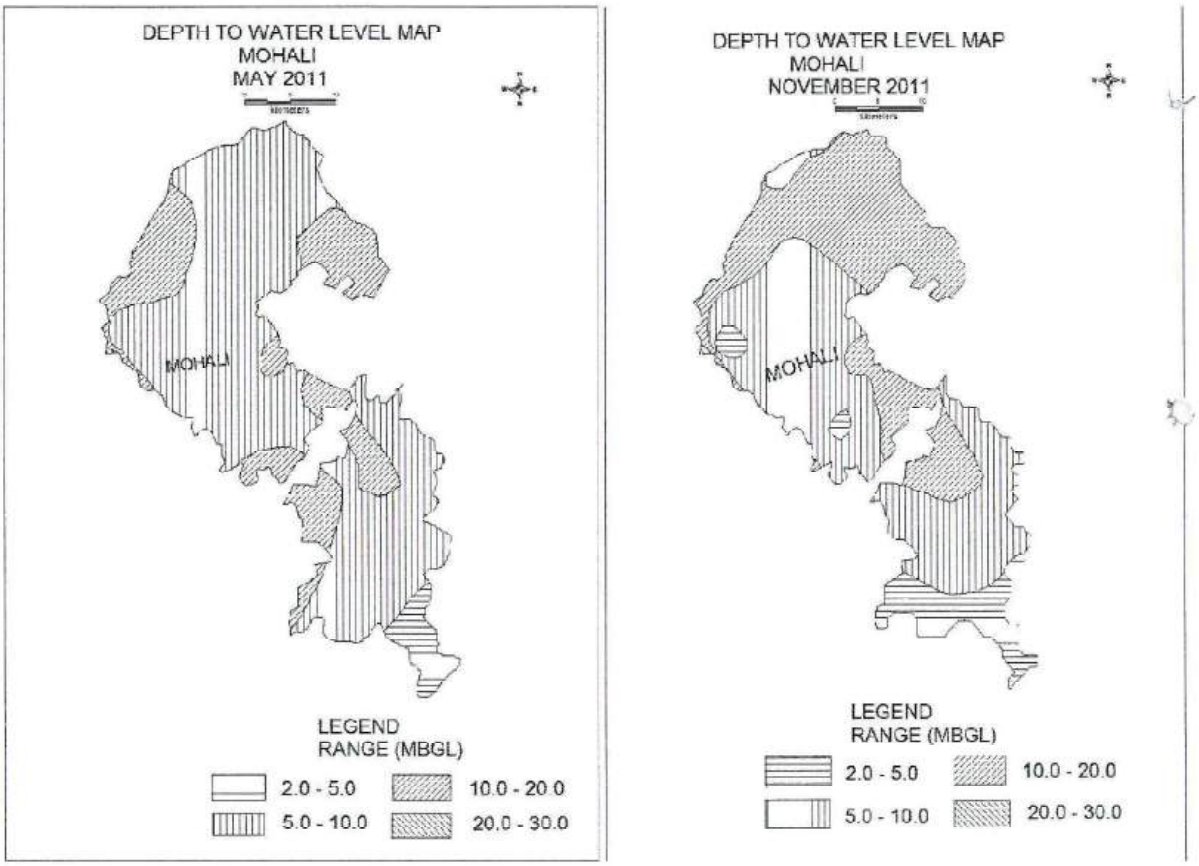


Figure 3.9: Water level before and after Monsoon season in the district

3.5.2. Flood plain of the SAS Nagar:

The Ghaggar River and its tributaries form the natural drainage system on Derabassi block of the district. While north-eastern part is drained by Siswan Nadi, Jainti Devi Ki Rao and Patiali Rao, which emerge from the Siwalik Hills. The Siswan Nadi drains the northern part of the district and finally converges with Sutlej River in the Ropar district. While Jainti Devi Ki Rao and Patiali Rao drains in NE-SW direction and joins the Ghaggar River. The proposed project not falls under the flood plain area. *(Source: SAS Nagar CGWA district profile).*

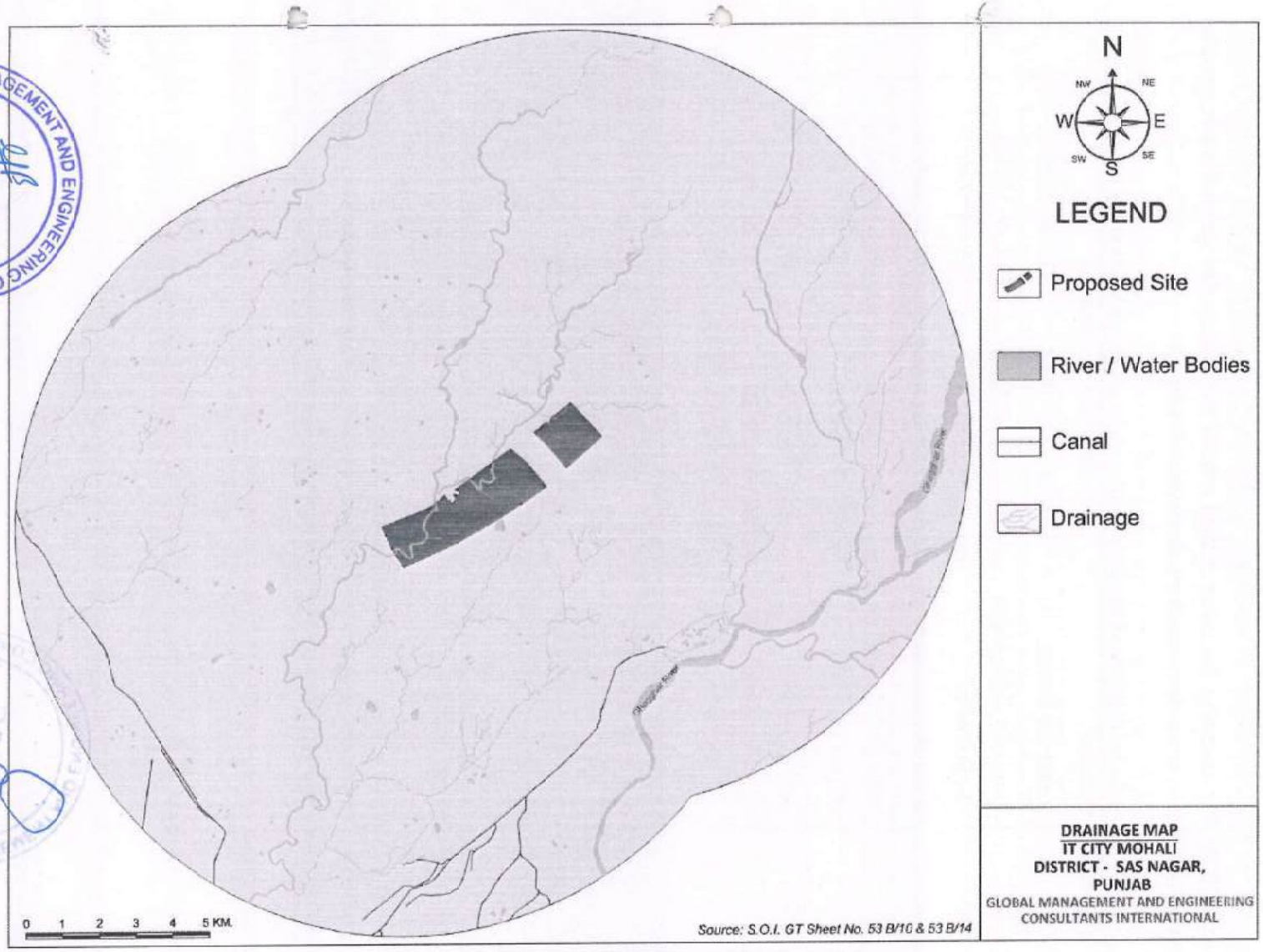


Figure 3.7: Drainage Map of the Project Area

3.5.3. Water Sampling and Analysis:

The water samples were collected and analysed as per the procedures specified in the standard methods for the examination of water and wastewater published by Central Pollution Control Board (CPCB). For assessing the water quality around the project site, ground water samples were collected from 8 locations which are described in Table 3.11.

Table 3.11: Locations of Ground/ surface water sampling in the study area

S No	Location	Coordinates of the Location	
1.	Project site (Rurka)	30° 39' 28.17" N	76° 45' 30.21" E
2.	Project site (Chao Majra)	30° 37' 48.32" N	76° 42' 58.15" E
3.	Village Bhabat	30° 39' 15.51" N	76° 48' 14.30" E
4.	Sector 30 Chandigarh	30° 42' 53.63" N	76° 47' 24.77" E
5.	Sector 60 SAS Nagar (Mohali)	30° 42' 41.40" N	76° 43' 24.62" E
6.	Village Khijergarh	30° 35' 24.65" N	76° 45' 23.83" E
7.	Town Hawai Bassi	30° 34' 03.46" N	76° 42' 38.39" E
8.	Village Chudiala	30° 38' 35.88" N	76° 39' 11.66" E

Figure 3.9: Photographs of Water Sampling (Project Site)

Table 3.10: Surface Water Quality Analysis results

S No	Parameters	Units of Measurements	Village Chao Majra (Drainage)	Rurka Village (Pond)	Protocol
1	pH Value	--	7.95	7.44	IS : 3025 (Part 11) - (RA 2006)
2	Odor	--	unobjectionable	unobjectionable	IS : 3025 (Part 5) – 1983 (RA 2012)
3	Turbidity	NTU	8.20	7.90	IS : 3025 (Part 10) – 2006
4	Total Dissolve Solids	mg/L	330	740	IS : 3025 (Part 16) – 2008
5	Total Hardness as $CaCO_3$	mg/L	174.80	536	IS : 3025 (Part 21) – 2009
6	Dissolved Oxygen	mg/l	6.5	6.8	IS : 3025 (Part 38) - 1989 (RA 2014)
8	BOD (3 Days at 27°C), mg/l	mg/l	6.0	6.0	IS : 3025 (Part 44) - 1993 (RA 2014)
9	Calcium as Ca	mg/L	42.65	104.00	IS : 3025 (Part 40) - 1991 (RA 2014)
10	Magnesium as Mg	mg/L	16.62	67.0	IS : 3025 (Part 46) – 1994 (RA 2014)
11	Chloride as Cl^-	mg/L	24.99	34.99	IS : 3025 (Part 32) - (RA 2007)
12	Fluoride as F^-	mg/L	1.06	1.26	APHA (23rd Edition) 4500 D: 2017
13	Sodium as Na	mg/L	81.0	86	IS : 3025 (Part 45) – 1993 (RA 2014)
14	Sulphates as SO_4^-	mg/L	37.0	40.0	APHA (23rd Edition) 4500 SO4-E; 2017
15	Nitrate as NO_3	mg/L	5.0	6.0	APHA (23rd Edition) 4500NO3-B; 2017
16	Total alkalinity as	mg/L	415	445	IS : 3025 (Part 23) – 1986 (RA 2003)

	$CaCO_3$				
17	Chemical Oxygen Demand (COD)		24.6	26.4	IS : 3025 (Part 58) - 2006 (RA 2012)
18	Total coli form per 100 Ml in MPN		800	990	IS: 1622 -1981-1989 RA 2009

Table 3.12: Ground Water Quality Analysis results

S No	Parameter	Unit	Village Bhabat	Sector 30 Chandigarh	Sector 60 SAS Nagar	Village Khijergarh	Town Hawai Bassi	Village Chudiala
1	pH Value	--	7.51	7.7	7.8	7.51	7.51	7.46
2	Turbidity	NTU	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)
3	Total Dissolve Solids	mg/L	525	599	471	528	534	654
4	Total Hardness as $CaCO_3$	mg/L	300.2	285.0	159.6	308	288	292.6
5	Calcium as Ca	mg/L	62.44	59.40	47.21	59.40	56.35	51.78
6	Magnesium as Mg	mg/L	35.09	33.24	10.16	38.83	35.82	39.71
7	Chloride as Cl^-	mg/L	104.97	89.97	34.99	94.97	79.98	99.97
8	Fluoride as F^-	mg/L	0.92	0.86	1.01	0.90	0.86	0.73
9	Sodium as Na	mg/L	121.6	114.5	94.0	116.6	110.6	126.02
10	Sulphate as SO_4^-	mg/L	46.26	56.24	46.0	42.26	41.25	53.57
11	Nitrate as NO_3	mg/L	32.14	23.45	8.23	29.14	30.14	38.3
12	Total alkalinity as $CaCO_3$	mg/L	545	585	445	520	505	560

3.6. AIR ENVIRONMENT

3.6.1. Meteorological Environment

The Meteorology of the area plays an important role in the air quality surveillance programmes. The micrometeorological parameters regulate the transport and diffusion of pollutants into the atmosphere. Metrological data collected from various secondary sources are presented in this section.

Air pollutants upon discharge to atmosphere pass through a number of mechanisms, which include diffusion and transportation leading to dispersion. These mechanisms are governed by the local atmospheric conditions. All these results in the necessity to collect the meteorological parameters like ambient temperature, wind speed, wind direction and other weather conditions (relative humidity, atmospheric pressure etc.), which will be ultimately used for the prediction of ground level concentrations of the air pollutants through mathematical modelling.

Meteorological Data

Metrological data collected from secondary sources.

Table 3.11: Meteorological Data

Month	Temperature		Relative Humidity		Average Velocity (mph)	Precipitation (mm)
	Max ^{0}C	Min ^{0}C	Max %	Min %		
March	36	17	56	8	6.46	35.6
April	40	22	52	7	7.06	25.9
May	44	24	44	4	7.94	28.5

Wind rose Diagram

Wind speed and wind direction plays a vital role in predicting the extent of air pollution. It gives a clear view about the extent to which air pollutants are carried before they touch the ground. Wind rose is diagrammatic representation of wind speed in a specified direction with its arms representing sixteen directions; each arm gives a clear frequency distribution of wind speed.

Wind roses are generated with the site meteorological information's initially collected. These raw data are processed with certain interpolation and stability classes and joint frequency function are developed to eventually reach to the development of wind roses. A Wind rose has been plotted for average of 24 hours for 3 successive months that shows the predominant wind direction and has been presented in **figure 3.10.**

3.6.2. Ambient Air Quality (AAQ)

Prevailing air environment i.e. base line conditions in an area is primarily governed by the different activities going on in that area including industrial, agricultural, domestic and commercial activities. The pollutant concentrations in the atmosphere is also governed by the meteorology, topography, natural settings in terms of plantation, forest cover, vegetation etc. as these factors in combination with each other are responsible for dispersion, diffusion, transportation and assimilation of pollutants in the local air shed. The pollutants selected for ambient air quality status are PM_{10}, $PM_{2.5}$, SO2, NOx, and CO.

3.6.3. Methodology

Ambient air sampling was done at specified locations for 24 hours at each location and the samples collected from various locations were brought to laboratory to analyze the prescribed parameters as per standard methods given in IS 5182 / CPCB guidelines.

3.6.4. Reconnaissance Survey

The main objective of the AAQ survey within the project site is to establish the existing levels for various air pollutants.

3.6.5. Selection of sampling locations

The baseline status of the air quality within the project area was assessed though CPCB recommended procedures. The ambient air quality locations are given in Table 3.13 and the result of the air monitoring are given in the table 3.14

Table 3.12: Monitored Parameters and Frequency of Sampling

S No	Parameters	Sampling frequency
1	PM 10	24 hourly
2	PM 2.5	24 hourly
3	Sulphur dioxide (SO_2)	24 hourly
4	Oxides of Nitrogen (NO_X)	24 hourly
5	CO	8 hourly

Table 3.13: Ambient Air Quality Monitoring Locations

S No	Location	Coordinates of the Location	
1.	Project site (Rurka)	30° 39′ 21.94″ N	76° 45′ 04.94″ E
2.	Project site (Chao Majra)	30° 37′ 46.81″ N	76° 42′ 44.33″ E
3.	Village Bhabat	30° 39′ 32.55″ N	76° 48′ 13.06″ E
4.	Sector 30 Chandigarh	30° 42′ 54.03″ N	76° 47′ 24.63″ E
5.	Sector 60 SAS Nagar (Mohali)	30° 42′ 41.60″ N	76° 43′ 24.52″ E
6.	Village Khijergarh	30° 35′ 00.73″ N	76° 45′ 06.23″ E
7.	Town Hawai Bassi	30° 33′ 49.51″ N	76° 42′ 54.67″ E
8.	Village Chudiala	30° 38′ 28.81″ N	76° 38′ 45.13″ E

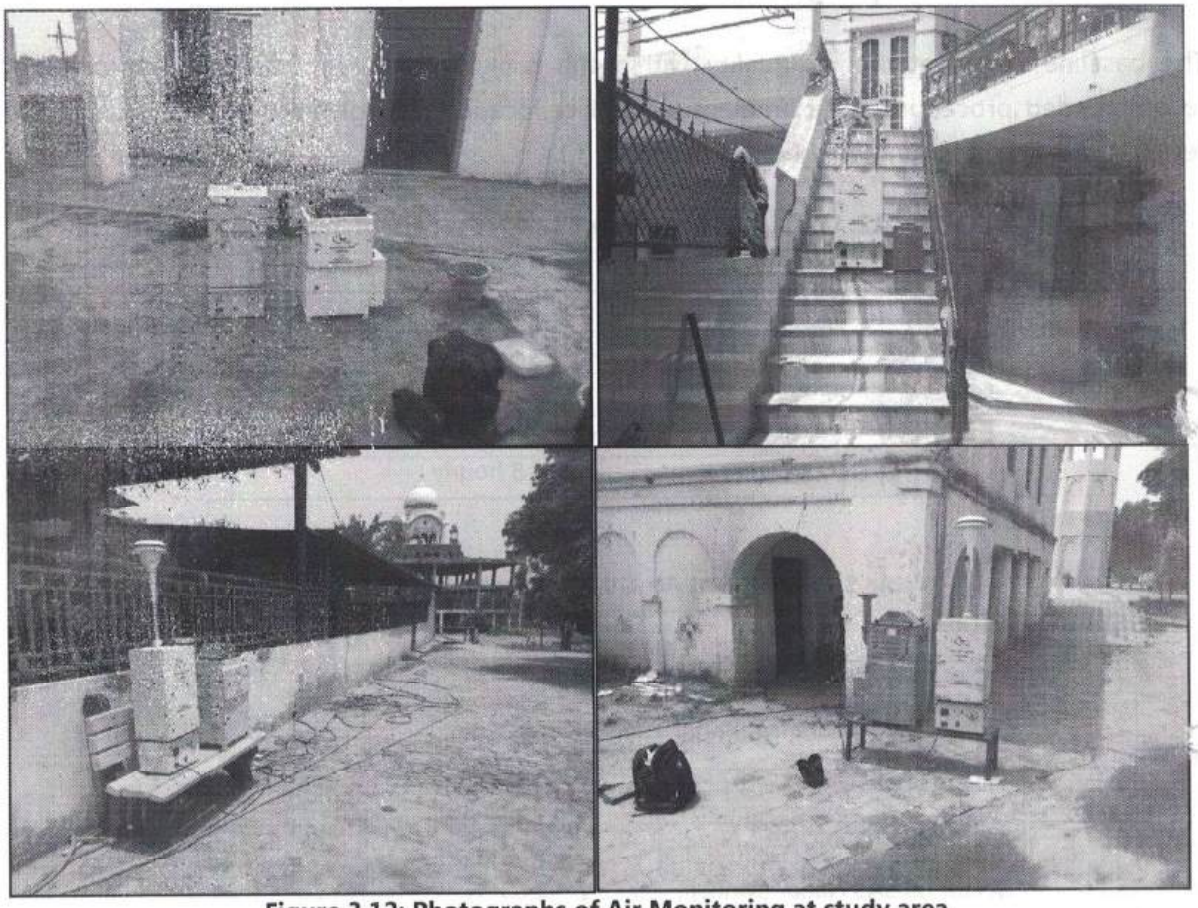


Figure 3.12: Photographs of Air Monitoring at study area

Table 3.14: Ambient Air Quality monitoring results

Name of Location	PM_{10} (µg/m³)		$PM_{2.5}$ (µg/m³)		NO_2 (µg/m³)		SO_2 (µg/m³)		CO (mg/m³)
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
Project site (Rurka)	88.41	78.75	43.6	41.46	16.84	12.25	9.46	6.26	420
Project site (Chao Majra)	69.35	55.42	32.46	25.16	13.26	6.85	8.14	3.98	360
Village Bhabat	66.14	55.47	37.61	26.87	12.36	8.63	7.46	4.28	320
Sector 30 Chandigarh	78.82	64.52	42.56	31.22	14.84	10.05	8.26	5.25	410
Sector 60 SAS Nagar	73.16	62.17	34.16	26.14	13.94	9.84	7.66	5.15	390
Village Khijergarh	69.96	56.48	31.78	25.17	12.44	8.63	7.96	4.96	320
Town Hawai Bassi	77.54	64.32	37.61	10.94	13.4	9.86	7.91	5.38	380
Village Chudiala	68.26	60.17	34.56	26.38	10.36	7.86	7.06	4.35	310
CPCB Norms	100		60		80		80		2000

3.10.1. Results:

A result of Ambient Air quality monitoring reveals that the concentration of PM_{10} is 55.42 µg/m^3 to 88.41µg/m^3 and $PM_{2.5}$ 40.1 µg/m^3 to 37.5µg/m^3. All parameters are well within the Norms prescribed by CPCB. The values are little high due to the proximity of industrial area and traffic.

3.11. NOISE ENVIRONMENT

Noise can be defined as an unwanted sound. Noise beyond a certain level has an adverse impact on human beings and their environment. If intense enough it can damage hearing or is otherwise annoying. Noise can also disturb natural wildlife and Ecological systems. The physical description of sound concerns its loudness as a function of frequency. Noise in general is sound, which is composed of many frequency components of various types of loudness distributed over the audible frequency range. The most common and universally accepted scale is the A weighted scale, which is measured as dB (A). This is more suitable for audible range of 20 to 20,000 Hz. The scale has been designed to weigh various components of noise according to the response of human ear.

3.11.1. Noise Analysis within the Study Area

Noise survey of the study area was carried out to understand the existing status of the noise level in the area. Noise analysis data collected from primary and secondary sources are presented in this section. The detail of the monitoring locations is given in Table 3.15 (a) & 3.15 (b).

Table 3.15: Ambient noise monitoring location

S No	Location	Coordinates of the Location	
1.	Project site (Rurka)	30° 39′ 28.23″ N	76° 45′ 29.74″ E
2.	Project site (Chao Majra)	30° 37′ 49.10″ N	76° 42′ 44.16″ E
3.	Village Bhabat	30° 39′ 15.77″ N	76° 48′ 14.43″ E
4.	Sector 30 Chandigarh	30° 42′ 52.79″ N	76° 47′ 25.49″ E
5.	Sector 60 SAS Nagar (Mohali)	30° 42′ 41.56″ N	76° 43′ 24.51″ E
6.	Village Khijergarh	30° 35′ 07.78″ N	76° 45′ 09.91″ E
7.	Town Hawai Bassi	30° 34′ 04.05″ N	76° 42′ 38.27″ E
8.	Village Chudiala	30° 38′ 34.64″ N	76° 39′ 06.50″ E

Figure 3.12: Photographs of Ambient Noise Monitoring in study area

Table 3.16: Ambient Noise Level monitoring results

S No	Location	Day Leq dB(A)	Night Leq dB(A)
1.	Project site (Rurka)	54.30	44.10
2.	Project site (Chao Majra)	51.90	42.00
3.	Village Bhabat	51.80	41.70
4.	Sector 30 Chandigarh	50.80	40.60
5.	Sector 60 SAS Nagar (Mohali)	53.20	43.10
6.	Village Khijergarh	50.50	41.50
7.	Town Hawai Bassi	50.70	41.10
8.	Village Chudiala	53.10	42.80
CPCB Standards			
a.	Industrial	75	70
b.	Commercial	65	55
c.	Residential	55	45
d.	Silence Zone	50	40

3.11.2. Result:

From the above study, noise levels at all locations were observed to be within the prescribed limits. It can be concluded that noise levels in the study area are well within the prescribed limits as prescribed by the CPCB and State Pollution Control Board.

3.12. BIOLOGICAL ENVIRONMENT

Biodiversity reflects the potential of a regional ecosystem. Biota of a particular area is considered as indicators of the environment as they quickly respond not only to one environmental factor but also an interactive group of factors. These communities influence and react sensitively to changes in the balance of environmental stresses.

Biological diversity comprises the variability of genus, species and ecosystems and is very crucial for maintaining the basic processes on which the life depends. On the basis of biological physiology biodiversity broadly can be divided into two category i.e. the floral diversity and faunal diversity. Conservation of the biodiversity is essential for the sustainable development as it not only provides the food, fodder and medicine, but also contributes to improvement of essential environmental attributes like air, water, soil, etc. Before starting any Environmental Impact Assessment study, it is necessary to identify the baseline of relevant environmental parameters which are likely to be affected as a result of the operation of the proposed project. A similar approach has been adopted for conducting the study on Biological Environment for this

Project. Both terrestrial and aquatic ecosystems have been studied to understand the biological environment nearby the project site.

The biological study was under taken as a part of the EIA study report to understand the present status of ecosystem prevailing in the study area, to compare it with past condition with the help of available data, to predict changes in the biological environment as a result of present activities and to suggested measures for maintaining its health.

In the study area Sukhna Lake present at about 10.6 km, Ghaghar River is present at about 6.4 km, Chou nala is run through the project site, there are 4 protected forests and 6 reserve forests as listed below-

Name	Distance (km)	Direction
Gidarpur P.F.	7.4	NW
BIR Barauli P.F.	9.95	SSE
BIR Baqarpura P.F.	9.6	SSE
BIR Dadrala P.F.	11.1	SE
Machhela R.F.	9.24	E
Dariya R.F.	5.27	NE
Lake R.F.	11.52	NNE
Nepli R.F.	13.3	NE
Kansal Ki Koh R.F.	13.2	NE
Kholhai Raitan R.F.	11.9	ENE

3.12.1. FLORA

The data of plant species found in the study area from primary source is given in **Table 3.17**

Table 3.17: Plant Species Recorded in the Study Area (Primary Sources)

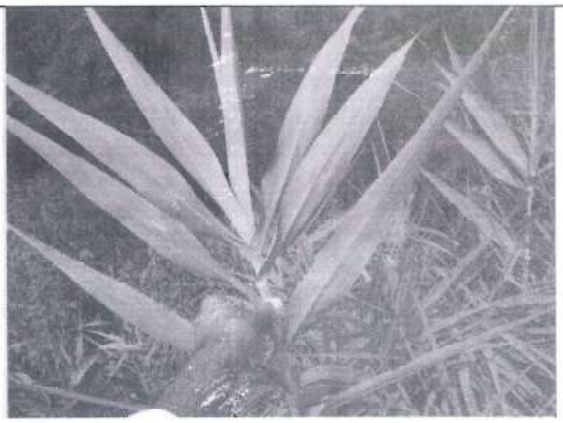
S No	Local Name	Botanical Name
1	Aak	*Calotropis* gigantea
2	Chrot, Chkora	*Cassia* tora
3	Dub	*Cynodon* dactylon
4	Harsingar	*Nyctanthes* arbortristis
5	Kala Siras	*Albizia* lebbeck
6	Munj	*Erianthus* munja
7	Peepal	*Ficus* religiosa

9	Teak	*Tectona* grandis
10	Aam	*Mangifera* indica
11	Jamun	*Syzygium* cumini
12	Neem	*Azadirachta* indica
13	Amla	*Embelica* officinalis
14	Arjun	*Terminalia* arjuna
15	Imli	*Tamarindus* indica
16	Khair	*Acacia* catechu
17	Dhak	*Butea* monosperma
18	Bahera	*Terminalia* belerica
19	Bel	*Aegle* marmelos
20	Safed Siris	*Albizzia* procera
21	Sagwan	*Tectona* grandis
22	Gulmohar	*Delonix* regia
23	Subabool	*Leucaena* leucocephala
24	Amaltash	*Cassia* fistula
25	Kachnar	*Bauhinia* variegata
26	Bottle brush	*Callistemon* lanceolatus
27	Nirguri	*Vitex* negundo
28	Bhatkatya	*Solanum* nigrum
29	Bans	*Dendrocalamus* strictus
30	Sugarcane	*Saccharum* sp.
31	Nimbu	*Citrus* medica
32	Amrood	*Psidium* guajava
33	Ashok	*Polyalthia* longifolia
34	Babool	*Accia* Arabica
35	Shisham	*Delbergia* sissoo
36	Bar (Banyan)	*Ficus* benghalensis

Source: Field Survey Report

Aprthenium hysterophorus

Mangifera Indica

	
Leucaena leucocephala	Eichhomia crassipes
	
Datura metel	Achyranthus aspera
	
Polyalthia longifolia	Murraya Koenigii

	
Psidium guajava	Eucalyptus globulus
	
Ziziphus nummularia	Syzygium cumini

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Ipomoea Camea

Cassia tora (Charota)

Figure 3.14: Photos of flora in the study area

3.8.2. FAUNA

The fauna comprises domesticated animals (cattle, goats, pigs etc). Primary faunal studies were conducted during study in and around the project site. Physical observation by the survey method conducted in the study area for the faunal diversity study. Secondary data were gathered from the local habitant with the discussion and govt. bodies.

Table 3.18: List of fauna in the study area (Primary source)

S No	Local name	Scientific Name	Schedule as per Indian Wildlife protection act 1972
1	Bull frog	*Rana tigrina*	IV
2	Common mongoose	*Herpestes edwardsi*	IV
3	Goat	*Capra aegagrus hircus*	IV
4	Cat	*Felis cattus*	IV
5	Buffalo	*Bubalus bubalis*	IV
6	Toad	*Bufo malanostictus*	IV
7	Nilgai	*Boselaphus tragocamelus*	III
8	Bat	*Cynopterus sphinx vahl.*	V
9	Common garden lizard	*Calotes vesicolor*	IV
10	Dog	*Canis lupus*	IV
11	Myna	*Acridotheres tristis*	IV
12	Blue rock pigeon	*Columba livia*	IV
13	Woodpecker	*Dinopium benghalense*	IV
14	Parrot	*Psittacula krameri*	IV
15	House crow	*Corvus splendens.*	V
16	Monkey	*Macaca mulatta*	II

17	Jackal	*Canis aureus*	II
18	five Stripped Squirrel	*Funambulus pennantii*	IV
19	Koyal	*Eudynamys scolopacea*	IV
20	Papiha	*Cuculus varius*	IV
21	Owl	*Bubo bubo*	IV

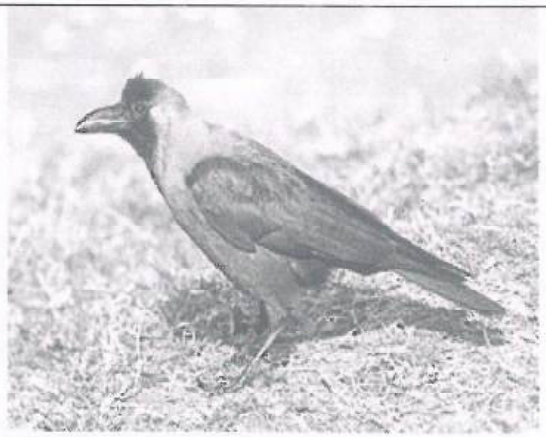
Avifauna

A walk through survey and observation has been conducted during the study period; breeding and nesting habitat of bird species were mainly studied. A few common bird species were recorded during the survey from the study area. These include house sparrow (*Passer domesticus*), house crow (*Corvus splendens*), Pariah kite (Milvus migrans govinda), Black drongo (Dicrurus adsimilis), Babbler (Turdoides caudatus), Common myna (*Acridotheres tristis*) etc. No endangered, threatened or rare bird species were recorded from the study area.

Acridotheres tristis

Turdoides striata

Dicrurus adsimilis



Corvus splendens

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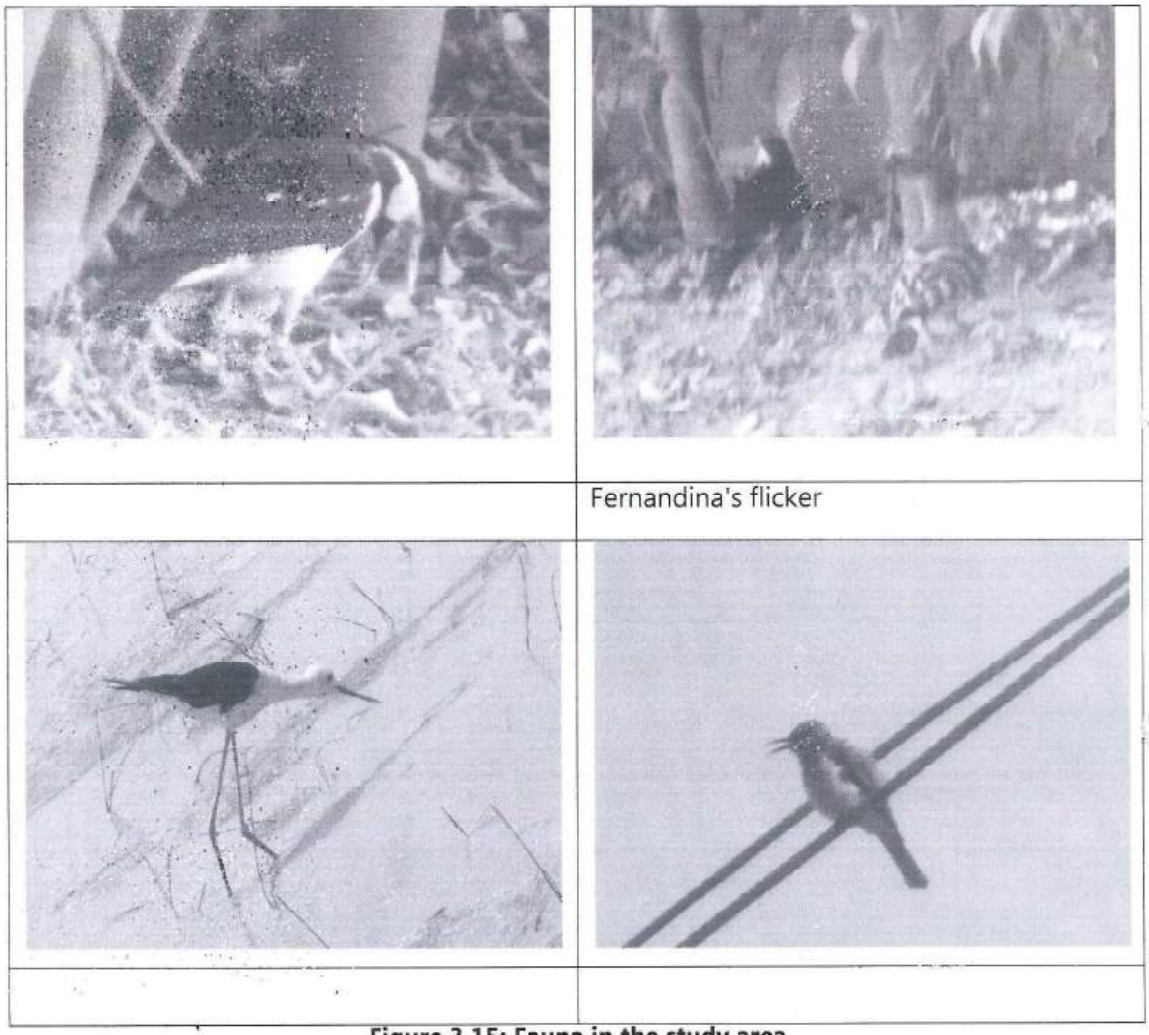

Figure 3.15: Fauna in the study area

Butterflies

A few butterfly species were recorded during the survey and these include Psyche (*Leptosia nina nina*), Plain tiger (*Danaus chrysippus*), tawny coster (*Acraea violae*).

Butterflies

Danaus chrysippus	Acraea violae

Figure 3.16: Butterflies in the study area

3.9. SOCIO-ECONOMIC ENVIRONMENT

The study area includes the 92 villages and sectors of Districts SAS Nagar, Fategarh Sahib, Panchkula, Patiala and Chandigarh within radius of 10.0 km. from Proposed Project. Out of 92 villages and sectors 2 villages are come within core zone and 90 Villages and sectors are comes under buffer zone of the project area.

SAS Nagar is a district in the Eastern part of the state of Punjab and bounded by Patiala in the South, Panchkula in the East, Fatehgarh Sahib in the West and Rupnagar in the North. SAS Nagar is still known and popular as 'Mohali' among local people and other parts of India, Mohali has emerged as one of the most important cities in Punjab and the rest of northern India; it is developing rapidly as an IT Hub of the state. Special emphasis has been made by the state government to make this city the best place to live in the Punjab. The city also has many international sporting venues consisting of a magnificent cricket stadium, hockey stadium, indoor stadiums, and golf course. An International Airport and projects like World Trade Centre, Aero city are also coming up.

3.9.1. OBJECTIVES

The broad objectives of the socio-economic impact assessment are:

- To study the socio-economic status of the people living in the study area.
- To assess the impact on socio-economic environment due to the project concerned.
- To evaluate the community development measures proposed to be taken up by the Project Proponent, if any.
- To suggest community development measures that needs to be taken for the study area with stakeholder engagement.
- The studies carried out are descriptive and exploratory in nature.

3.9.2. Data Collection

The information analyzed for the proposed project has been collected from various secondary sources, and has been supported by the site visits and field observations.

Secondary: Review of secondary data (2011 census and latest available district statistical Hand Books) with respect to population and occupational structure. Various research papers of the concerned area.

Primary: A social survey for examination of the respective site and specific region in reference to its general character. Extensive site visits and observations of the socio economic environment.

Figure 3.17: photos of social survey

3.9.3. Demographic profile of the study area

3.9.3.1. Population Profile

The total population of the buffer zone is 607,266 accommodating in households 134,673 with an average households size of approx. 4 members per family. Details are given in the Table 3.22

Table 3.19: Population Composition of Study Area

S No	Name	Households	Population	Male	Females
1	Alipur	57	353	186	167
2	Bahora	35	216	120	96
3	Bahori	17	97	49	48
4	Bakarpur	420	2,292	1,243	1,049
5	Bari	93	507	271	236
6	Bartana	175	936	492	444
7	Bathlana	135	796	403	393
8	Bhago Majra	321	1,600	825	775
9	Bhankharpur	2,176	10,768	5,776	4,992
10	Bharatpur	71	430	230	200
11	Bhatiras	50	313	167	146
12	Biromajri	55	253	134	119
13	Chapar Chiri Kalan	65	343	179	164

14	Chapar Chiri Khurd	141	706	363	343
15	Chau Majra	183	989	546	443
16	Chhat	845	4,499	2,392	2,107
17	Chudiala	283	1,498	793	705
18	Chuhar Majra	161	875	463	412
19	Devi Nagar	119	679	373	306
20	Dhanauni	164	955	521	434
21	Dharamgarh	461	2,367	1,263	1,104
22	Dharamgarh	88	477	253	224
23	Dhurali	385	2,128	1,136	992
24	Dialpura	544	3,013	1,581	1,432
25	Fatehpur	296	1,737	891	846
26	Fatehpur	128	707	380	327
27	Garolian	170	899	499	400
28	Gidarpur	71	396	219	177
29	Giga Majra	351	1,889	981	908
30	Gobindpura	280	1,395	737	658
31	Gobindpura	413	2,166	1,131	1,035
32	Hadaitpura	129	700	357	343
33	Ibrahimpura	127	714	387	327
34	Isapur	256	1,267	687	580
35	Jagadhri	240	1,179	617	562
36	Jagatpur	1,454	6,673	3,586	3,087
37	Jansla	365	1,935	1,005	930
38	Jhanjheri	591	3,269	1,743	1,526
39	Kailon	223	1,304	679	625
40	Kambala	300	1,519	834	685
41	Kambali	298	1,306	748	558
42	Kandala	270	1,309	695	614
43	Karkaur	236	1,236	666	570
44	Khanpur Baring	304	1,615	850	765
45	Khera Gajju	892	4,552	2,380	2,172
46	Khizerpur	67	389	200	189
47	Kurara	121	694	378	316
48	Kurari	358	2,033	1,092	941
49	Lakhnaur	182	1,055	552	503
50	Landiali	158	932	492	440
51	Landran	460	2,338	1,240	1,098
52	Machhli Kalan	570	3,292	1,712	1,580
53	Machhli Khurd	61	323	168	155

54	Manak Majra	223	1,067	581	486
55	Manakpur	730	3,734	2,006	1,728
56	Manakpur Kallar	149	826	429	397
57	Manauli	755	3,919	2,087	1,832
58	Matran	69	382	208	174
59	Maujpur	133	714	396	318
60	Mirpur	169	895	470	425
61	Nagla	459	2,584	1,336	1,248
62	Nanu Majra	122	650	340	310
63	Naraina	96	524	281	243
64	Naraingarh	87	601	319	282
65	Nogiari	190	1,097	586	511
66	Panchkula (M Cl)	48,772	2,11,355	1,11,731	99,624
67	Papri	55	293	152	141
68	Paragpur	227	1,291	700	591
69	Patran	104	529	279	250
70	Patton	94	548	301	247
71	Pawala	363	1,974	1,036	938
72	Raipur	131	687	371	316
73	Rajo Majra	178	1,039	551	488
74	Ramgarh Urf Rurki	192	1,101	581	520
75	Rampur	242	1,294	671	623
76	Rurka	219	1,062	561	501
77	S.A.S. Nagar	39,894	1,66,864	87,380	79,484
78	Sambalki	134	655	356	299
79	Sanauli	135	699	366	333
80	Saneta	407	2,258	1,222	1,036
81	Sekhan Majra	213	1,165	619	546
82	Shafipur	93	507	245	262
83	Shatabgarh	116	724	365	359
84	Sheikhpura	54	356	194	162
85	Shiamipur	27	130	71	59
86	Siau	119	650	360	290
87	Singhpura	233	1,067	571	496
88	Sohana	1,869	9,306	4,921	4,385
89	Sukhgarh	166	860	448	412
90	Tangauri	286	1,475	779	696
91	Uncha Khera	166	918	479	439
92	Zirakpur	20,587	95,553	50,497	45,056
Total		**134,673**	**607,266**	**320,511**	**286,755**

Census of India, 2011

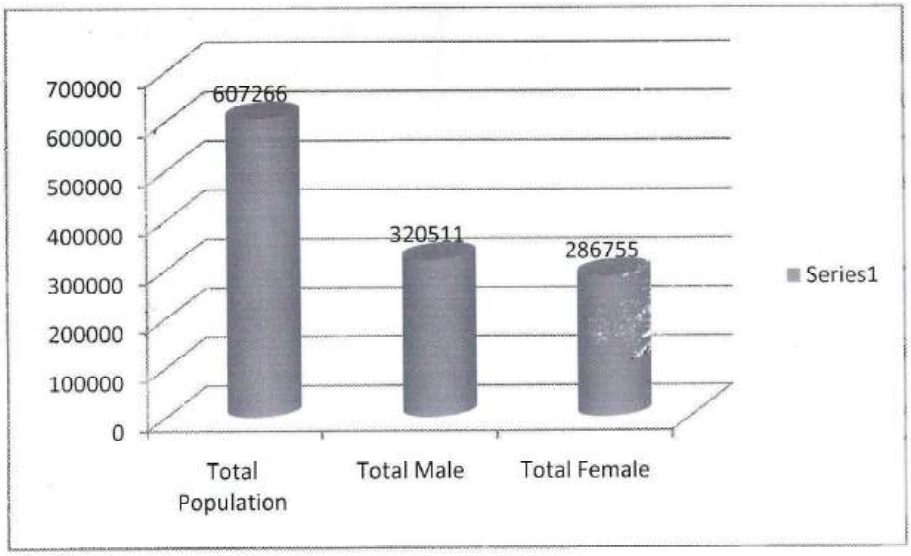

Figure 3.18: Bar chart of Demographic profile of study area

Gender Distribution in the Buffer Zone

The males in the study area constitute 52.78% and females constitute 47.22%. The gender ratio of the study area is 894.68 per thousand male, little poor as compared to the district SAS Nagar (909) and also very poor as compared to the State Punjab (940) according to the Census of India, 2011. It is tabulated below:

Table 3.20: Gender Ratio of the Study Area

S No	Location	Gender Ratio
1.	Gender Ratio of the Study Area	894.68
2.	Gender Ratio in the Children (0-6 Age Group) of Study Area	854.11
3.	Gender Ratio of District SAS Nagar	909
4.	Gender Ratio of Punjab State	940
5.	Gender Ratio of India	943

Census of India, 2011

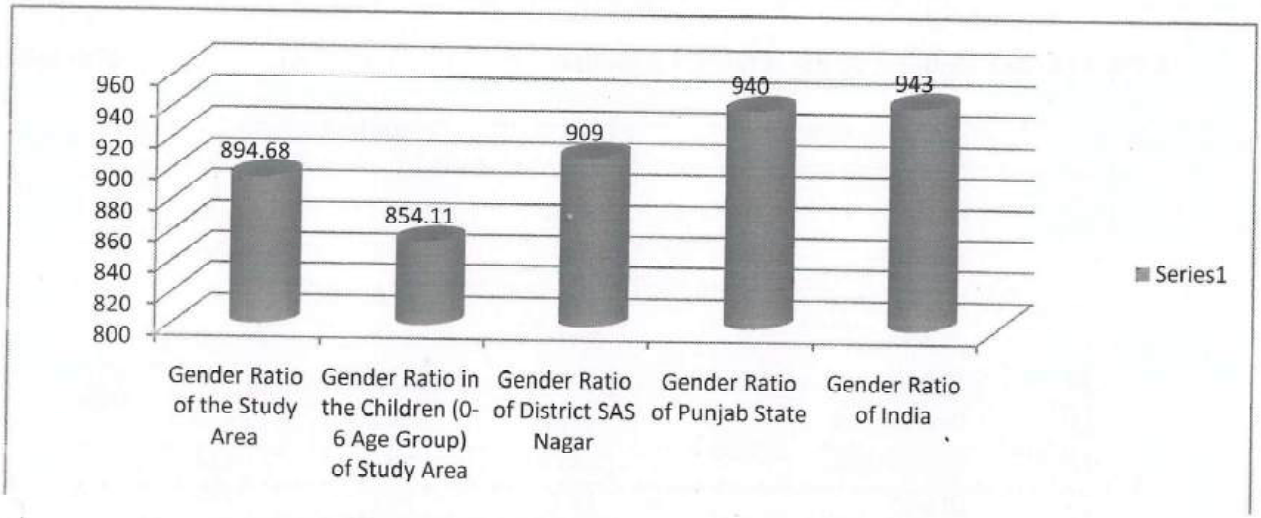

Figure3.19: Bar Chart of Gender ratio at study level to India level

3.9.3.2. Literacy Profile in Buffer Zone

The average literacy rate of the study area is 86.57% as per Census of India, 2011. The male literacy is 89.82% with respect to male population and the female literacy is 82.96% with respect to female population. The literacy gap between male & female is approx. 6.87%. There are 13.43% people in our study area is illiterate. In the buffer zone of the project the literacy is as reflected from the following table:-

Table 3.21: Literacy Profile of the Study Area

S No	Name	Literates		
		Total	Male	Female
1	Alipur	249	138	111
2	Bahora	105	63	42
3	Bahori	62	26	36
4	Bakarpur	1636	935	701
5	Bari	334	176	158
6	Bartana	667	363	304
7	Bathlana	574	302	272
8	Bhago Majra	1108	600	508
9	Bhankharpur	7,856	4,442	3,414
10	Bharatpur	363	199	164
11	Bhatiras	230	129	101
12	Biromajri	178	101	77
13	Chapar Chiri Kalan	263	147	116

14	Chapar Chiri Khurd	553	304	249
15	Chau Majra	730	406	324
16	Chhat	3029	1755	1274
17	Chudiala	956	529	427
18	Chuhar Majra	640	356	284
19	Devi Nagar	443	253	190
20	Dhanauni	673	396	277
21	Dharamgarh	1712	963	749
22	Dharamgarh	265	151	114
23	Dhurali	1651	903	748
24	Dialpura	2250	1241	1009
25	Fatehpur	1059	609	450
26	Fatehpur	403	224	179
27	Garolian	629	365	264
28	Gidarpur	294	169	125
29	Giga Majra	1305	706	599
30	Gobindpura	972	546	426
31	Gobindpura	1641	882	759
32	Hadaitpura	458	251	207
33	Ibrahimpura	531	311	220
34	Isapur	976	554	422
35	Jagadhri	758	417	341
36	Jagatpur	3,740	2,306	1,434
37	Jansla	1299	715	584
38	Jhanjheri	2192	1232	960
39	Kailon	971	533	438
40	Kambala	893	542	351
41	Kambali	841	536	305
42	Kandala	934	521	413
43	Karkaur	848	475	373
44	Khanpur Baring	1080	619	461
45	Khera Gajju	3084	1694	1390
46	Khizerpur	258	139	119
47	Kurara	469	267	202
48	Kurari	1386	764	622
49	Lakhnaur	796	441	355
50	Landiali	742	414	326
51	Landran	1721	956	765
52	Machhli Kalan	2212	1206	1006
53	Machhli Khurd	227	117	110

54	Manak Majra	757	454	303
55	Manakpur	2667	1516	1151
56	Manakpur Kallar	530	271	259
57	Manauli	2817	1606	1211
58	Matran	283	161	122
59	Maujpur	552	310	242
60	Mirpur	673	384	289
61	Nagla	1666	919	747
62	Nanu Majra	513	287	226
63	Naraina	367	220	147
64	Naraingarh	446	248	198
65	Nogiari	748	420	328
66	Panchkula (M Cl)	1,62,031	88,982	73,049
67	Papri	211	116	95
68	Paragpur	903	516	387
69	Patran	364	209	155
70	Patton	357	212	145
71	Pawala	1423	778	645
72	Raipur	493	277	216
73	Rajo Majra	722	399	323
74	Ramgarh Urf Rurki	821	462	359
75	Rampur	884	498	386
76	Rurka	751	427	324
77	S.A.S. Nagar	1,39,675	74,315	65,360
78	Sambalki	463	261	202
79	Sanauli	464	258	206
80	Saneta	1594	933	661
81	Sekhan Majra	762	423	339
82	Shafipur	353	186	167
83	Shatabgarh	509	273	236
84	Sheikhpura	212	120	92
85	Shiamipur	91	55	36
86	Siau	450	261	189
87	Singhpura	763	443	320
88	Sohana	6,697	3,686	3,011
89	Sukhgarh	610	325	285
90	Tangauri	1018	571	447
91	Uncha Khera	374	218	156
92	Zirakpur	73,715	40,189	33,526
Total		**467975**	**255578**	**212395**

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Census of India, 2011

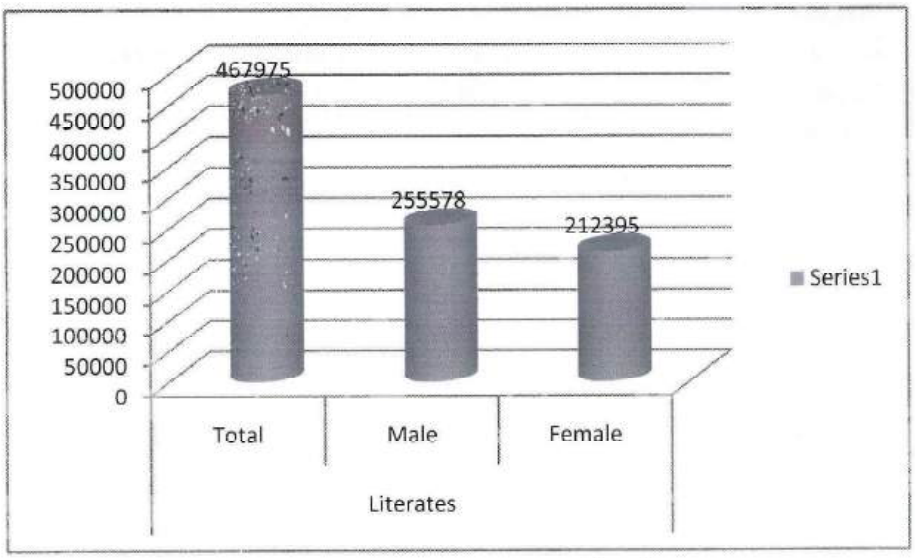


Figure 3.20: Bar chart of literacy rate of study area

3.9.3.3. Occupational Structure in Buffer Zone

Occupational structure of the workforce indicates the economic activity of the region. The occupational patterns include cultivators, agricultural labourers, and household industry workers. The work participation rate is 37.11% in which males are 53.47% with respect to the male population and females are 18.81% with respect to the female population. The employment rate in the 10.0 Km. periphery for main workers, marginal workers and non workers are as follows:

- The Main workers constitute 91.06% in which male worker's participation is 93.09% with respect to the male working population whether as female worker's participation is 84.28% with respect to the female working population.
- The Marginal workers constitute 8.76% with the male workers of 6.91% with respect to the male working population and female workers of 14.56% with respect to the female working population.
- The Non Workers constitute 62.89%; and there is distribution of men 46.43% with respect to the male population and women 81.19% with respect to the female population.

Table 3.21: Occupational Structure of the Study Area

S No	Name of the Village	Main Workers			Marginal Workers			Non Workers		
		Total	Males	Female	Total	Males	Female	Total	Males	Female
1	Alipur	113	104	9	1	1	0	81	158	239

2	Bahora	66	60	6	4	0	4	60	86	146
3	Bahori	26	25	1	0	0	0	24	47	71
4	Bakarpur	603	503	100	147	124	23	616	926	1542
5	Bari	171	115	56	7	6	1	150	179	329
6	Bartana	240	216	24	55	31	24	245	396	641
7	Bathlana	204	190	14	10	8	2	205	377	582
8	Bhago Majra	475	447	28	11	8	3	370	744	1114
9	Bhankharpur	3005	2690	315	493	388	105	2698	4572	7270
10	Bharatpur	140	115	25	13	7	6	108	169	277
11	Bhatiras	97	96	1	1	1	0	70	145	215
12	Biromajri	128	85	43	8	6	2	43	74	117
13	Chapar Chiri Kalan	101	93	8	4	3	1	83	155	238
14	Chapar Chiri Khurd	182	153	29	31	27	4	183	310	493
15	Chau Majra	296	285	11	6	6	0	255	432	687
16	Chhat	1,205	892	313	589	467	122	1033	1672	2705
17	Chudiala	443	422	21	12	0	12	371	672	1043
18	Chuhar Majra	266	254	12	3	3	0	206	400	606
19	Devi Nagar	138	130	8	81	80	1	163	297	460
20	Dhanauni	281	256	25	9	8	1	257	408	665
21	Dharamgarh	752	601	151	173	91	82	571	871	1442
22	Dharamgarh	145	134	11	0	0	0	119	213	332
23	Dhurali	623	591	32	25	21	4	524	956	1480
24	Dialpura	1,502	813	689	84	50	34	718	709	1427
25	Fatehpur	438	384	54	201	120	81	387	711	1098
26	Fatehpur	130	118	12	75	70	5	192	310	502
27	Garolian	387	241	146	55	51	4	207	250	457
28	Gidarpur	101	92	9	26	26	0	101	168	269
29	Giga Majra	500	449	51	63	54	9	478	848	1326
30	Gobindpura	299	266	33	53	37	16	434	609	1043
31	Gobindpura	615	564	51	37	25	12	542	972	1514
32	Hadaitpura	232	204	28	5	3	2	150	313	463
33	Ibrahimpura	224	206	18	13	9	4	172	305	477
34	Isapur	349	322	27	29	18	11	347	542	889
35	Jagadhri	386	311	75	60	30	30	276	457	733
36	Jagatpur	2,714	1,933	781	502	297	205	1356	2101	3457
37	Jansla	527	489	38	50	32	18	484	874	1358
38	Jhanjheri	60	428	32	518	481	37	834	1457	2291
39	Kailon	497	324	173	8	8	0	347	452	799
40	Kambala	470	426	44	3	3	0	405	641	1046
41	Kambali	549	414	135	48	21	27	313	396	709
42	Kandala	476	364	112	53	24	29	307	473	780
43	Karkaur	384	354	30	6	4	2	308	538	846
44	Khanpur Baring	343	315	28	160	134	26	401	711	1112

45	Khera Gajju	1,405	1,279	126	59	20	39	1081	2007	3088
46	Khizerpur	118	113	5	5	4	1	83	183	266
47	Kurara	244	235	9	12	4	8	139	299	438
48	Kurari	896	621	275	32	17	15	454	651	1105
49	Lakhnaur	387	246	141	89	64	25	242	337	579
50	Landiali	308	288	20	7	4	3	200	417	617
51	Landran	700	615	85	2	0	2	625	1011	1636
52	Machhli Kalan	826	758	68	157	119	38	835	1474	2309
53	Machhli Khurd	116	103	13	1	0	1	65	141	206
54	Manak Majra	410	335	75	21	15	6	231	405	636
55	Manakpur	1,141	1,052	89	55	51	4	903	1635	2538
56	Manakpur Kallar	180	170	10	7	7	0	252	387	639
57	Manauli	1,610	1,113	497	214	103	111	871	1224	2095
58	Matran	113	102	11	26	22	4	84	159	243
59	Maujpur	236	217	19	18	17	1	162	298	460
60	Mirpur	257	225	32	48	15	33	230	360	590
61	Nagla	757	701	56	30	18	12	617	1180	1797
62	Nanu Majra	190	176	14	6	3	3	161	293	454
63	Naraina	280	158	122	19	14	5	109	116	225
64	Naraingarh	223	165	58	53	24	29	130	195	325
65	Nogiari	324	309	15	14	5	9	272	487	759
66	Panchkula (MC)	73,570	56,757	16,813	6648	3676	2972	51298	79839	131137
67	Papri	195	97	98	48	30	18	25	25	50
68	Paragpur	397	377	20	33	24	9	299	562	861
69	Patran	176	152	24	23	2	21	125	205	330
70	Patton	157	154	3	9	6	3	141	241	382
71	Pawala	579	522	57	59	34	25	480	856	1336
72	Raipur	199	174	25	29	27	2	170	289	459
73	Rajo Majra	216	197	19	85	84	1	270	468	738
74	Ramgarh Urf Rurki	356	307	49	53	24	29	250	442	692
75	Rampur	422	349	73	4	4	0	318	550	868
76	Rurka	246	227	19	54	50	4	284	478	762
77	S.A.S. Nagar	58,429	43,080	15,349	4548	2467	2081	41,833	62,054	103887
78	Sambalki	140	124	16	65	55	10	177	273	450
79	Sanauli	215	185	30	24	13	11	168	292	460
80	Saneta	1,397	797	600	180	94	86	331	350	681
81	Sekhan Majra	390	297	93	92	56	36	266	417	683
82	Shafipur	162	129	33	34	15	19	101	210	311
83	Shatabgarh	262	191	71	26	7	19	167	269	436
84	Sheikhpura	119	111	8	0	0	0	83	154	237
85	Shiamipur	47	44	3	1	1	0	26	56	82
86	Siau	222	209	13	2	0	2	151	275	426
87	Singhpura	318	277	41	46	38	8	256	447	703

88	Sohana	2,644	2,233	411	336	249	87	2439	3887	6326
89	Sukhgarh	225	196	29	60	38	22	214	361	575
90	Tangauri	483	391	92	20	12	8	376	596	972
91	Uncha Khera	310	244	66	3	2	1	233	372	605
92	Zirakpur	31,136	25,276	5,860	2599	1519	1080	23389	37804	61193
Total		**204616**	**159552**	**45464**	**19688**	**11836**	**7852**	**148810**	**233127**	**381937**

Census of India, 2011

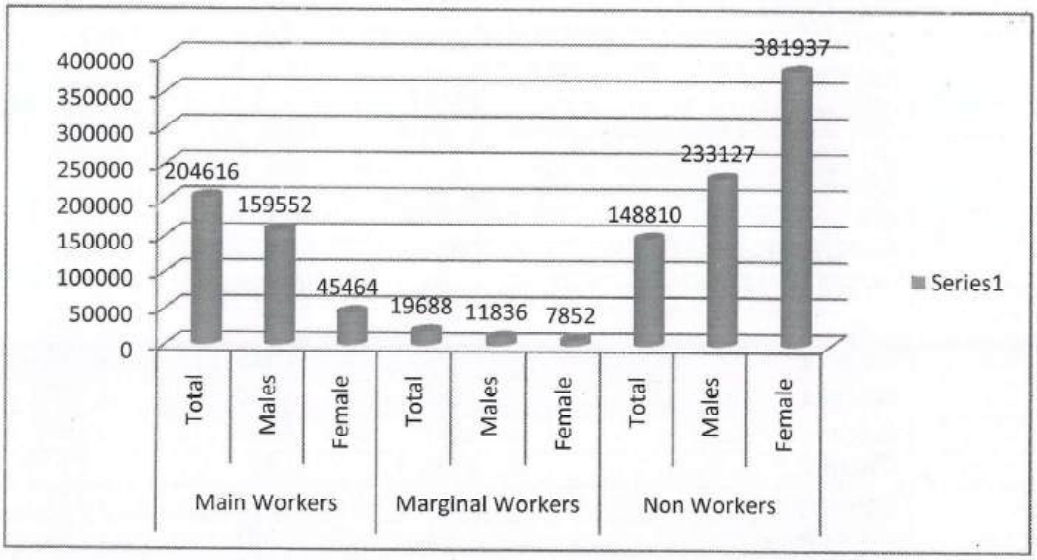


Figure3.21: Bar chart of Workers profile of the study area

3.9.3.4. Demographic Profile of SC & ST in the Study Area

The total population of Schedule Caste in Study area is 86,407(14.23%) in which 53.09% is male and 46.78% is female. There is none population of Schedule Tribes in the study area. Details are given in the table below:

Table 3.22: Demographic Profiles of SC & ST in the Study Area

S No	Name of the Village	Schedule Caste		
		Total	Male	Female
1	Alipur	18	8	10
2	Bahora	0	0	0
3	Bahori	6	3	3
4	Bakarpur	851	451	400
5	Bari	111	65	46
6	Bartana	69	37	32
7	Bathlana	205	99	106
8	Bhago Majra	674	350	324
9	Bhankharpur	1,576	841	735
10	Bharatpur	95	53	42

11	Bhatiras	18	12	6
12	Biromajri	29	15	14
13	Chapar Chiri Kalan	191	100	91
14	Chapar Chiri Khurd	562	293	269
15	Chau Majra	121	63	58
16	Chhat	1134	594	540
17	Chudiala	841	440	401
18	Chuhar Majra	259	138	121
19	Devi Nagar	398	214	184
20	Dhanauni	411	228	183
21	Dharamgarh	247	130	117
22	Dharamgarh	48	24	24
23	Dhurali	309	170	39
24	Dialpura	474	248	226
25	Fatehpur	314	165	149
26	Fatehpur	445	238	207
27	Garolian	387	221	166
28	Gidarpur	145	82	63
29	Giga Majra	367	192	175
30	Gobindpura	369	198	171
31	Gobindpura	222	116	106
32	Hadaitpura	89	47	42
33	Ibrahimpura	95	56	39
34	Isapur	161	86	75
35	Jagadhri	788	417	371
36	Jagatpur	1,359	677	682
37	Jansla	946	488	458
38	Jhanjheri	1422	756	664
39	Kailon	573	285	288
40	Kambala	686	376	310
41	Kambali	348	208	140
42	Kandala	380	205	175
43	Karkaur	410	214	196
44	Khanpur Baring	668	345	323
45	Khera Gajju	882	471	411
46	Khizerpur	52	25	27
47	Kurara	198	106	92
48	Kurari	562	319	243
49	Lakhnaur	307	162	145
50	Landiali	174	96	78
51	Landran	431	226	205
52	Machhli Kalan	725	376	349
53	Machhli Khurd	51	27	24
54	Manak Majra	271	145	126
55	Manakpur	1085	577	508
56	Manakpur Kallar	214	111	103

57	Manauli	693	367	326
58	Matran	127	69	58
59	Maujpur	150	80	70
60	Mirpur	493	256	237
61	Nagla	810	411	399
62	Nanu Majra	0	0	0
63	Naraina	159	87	72
64	Naraingarh	0	0	0
65	Nogiari	333	176	155
66	Panchkula (M Cl)	28,325	15,167	13,158
67	Papri	0	0	0
68	Paragpur	338	182	156
69	Patran	214	110	100
70	Patton	173	99	74
71	Pawala	896	475	421
72	Raipur	224	127	97
73	Rajo Majra	353	181	172
74	Ramgarh Urf Rurki	0	0	0
75	Rampur	463	240	223
76	Rurka	598	318	280
77	S.A.S. Nagar	14,756	7,849	6,907
78	Sambalki	182	96	86
79	Sanauli	104	47	57
80	Saneta	542	301	241
81	Sekhan Majra	541	291	250
82	Shafipur	225	105	120
83	Shatabgarh	118	59	59
84	Sheikhpura	153	84	69
85	Shiamipur	0	0	0
86	Siau	220	124	96
87	Singhpura	304	154	150
88	Sohana	2,050	1,084	966
89	Sukhgarh	131	68	63
90	Tangauri	763	404	359
91	Uncha Khera	464	230	234
92	Zirakpur	7,732	4,044	3,688
Total		**86407**	**45874**	**40425**

Census of India, 2011

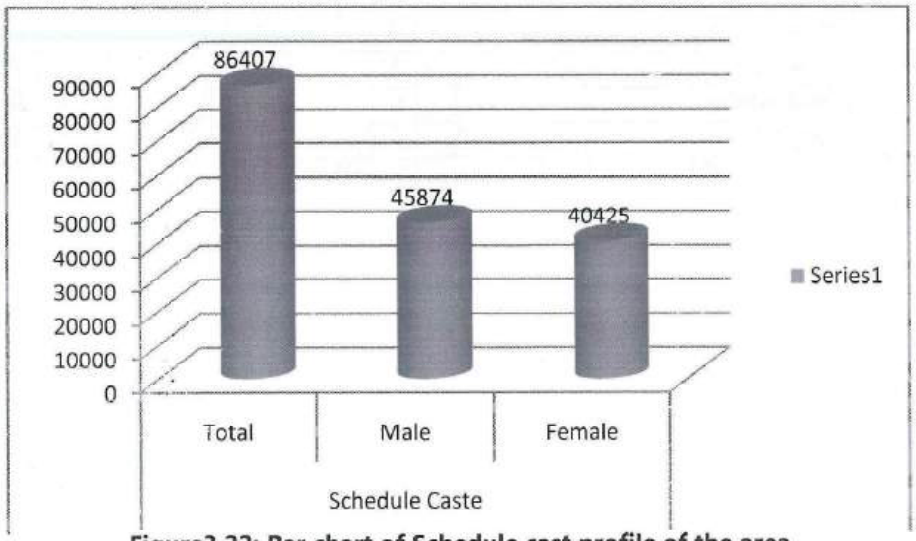


Figure3.22: Bar chart of Schedule cast profile of the area

3.9.3.5. Social Infrastructure

Educational Facilities

Due to the Proposed Project activities in the area, the educational institutions have also come up. All of the villages have a Primary School. Following educational institutions have been observed during site visit:

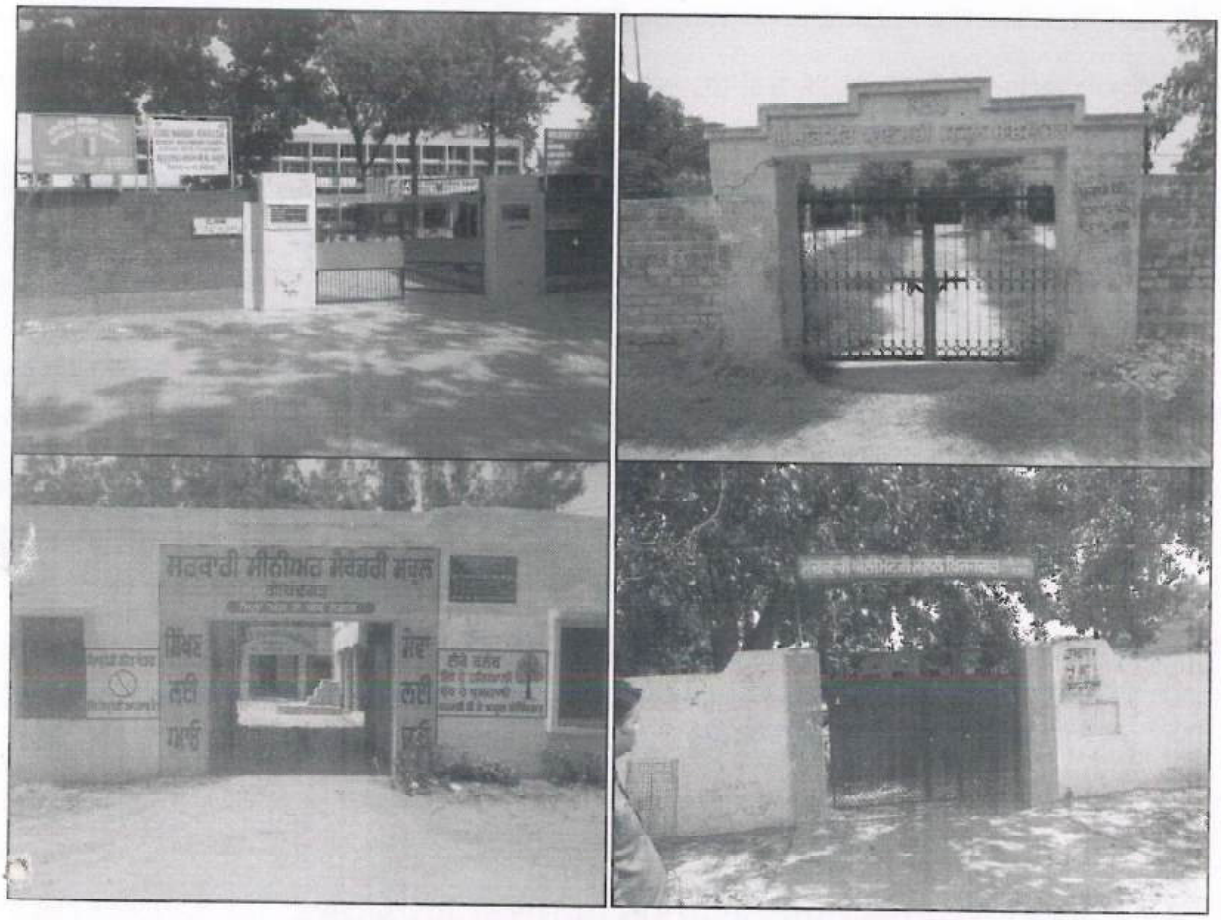


Figure 3.23: Photos of education facilities in study area

Religious Places

There are following religious places are found in the study area:

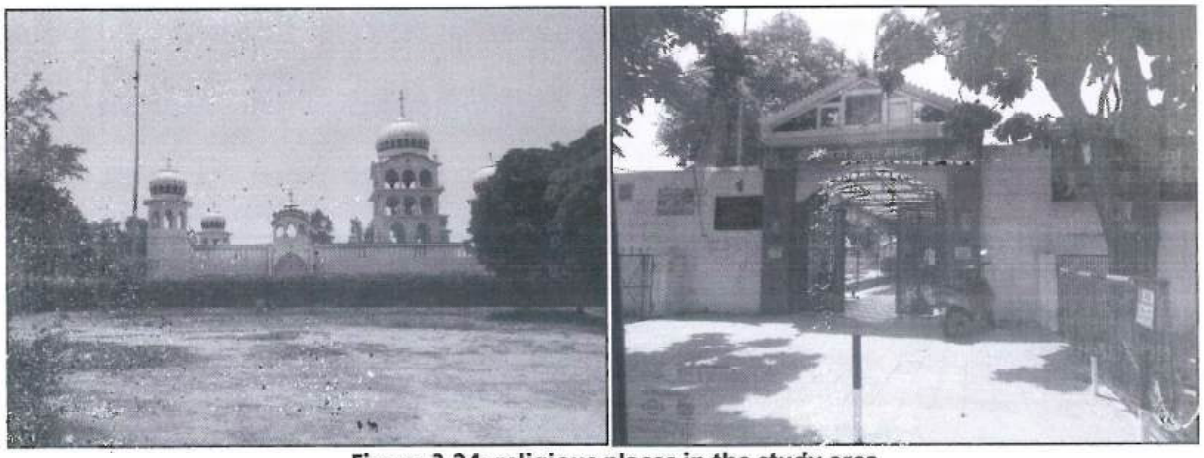


Figure 3.24: religious places in the study area

Others

Wells, tabs and hand pumps are sources of drinking water and other domestic consumption. SAS Nagar (1.50 Km, N) is the nearest Railway Station and Mohali (3.40 km. NE) is the nearest Air Port from the core zone.

3.9.4. SOCIO-ECONOMIC OBSERVATION IN THE STUDY AREA

- Proposed project will be established in the Govt. land converted for area development, therefore there is no loss of any residential/commercial/community/religious structures. There is also no loss of any agricultural/forest land.
- R & R also does not applicable for this project.
- Local people are supporting to the proposed project and not have any problem with proposed project. There has not been seen any critical issue in the periphery of the project.
- Government run health programmes are organized in the villages falling in the study area but people fail to gain this facility.
- The majority of the population of the study area depends on agriculture and govt employment. Few engaged in industry works also.
- Literacy of women in the study area is much below in comparison to their male counterparts.
- Women education and employment in the study area is low. Girl child education is predominantly promoted and women empowerment programs are running by govt.
- Personal hygiene and awareness of cleanliness is average in villages. There is need to improve drainage system. Dirty water of drains flow on the village road caused many infective diseases.
- Wells and taps are the main source of drinking water and household activities.

- Public toilets are missing in public places.
- Electricity supply in the villages is available for about 20 hours.
- Television, News Paper, internet facility and radio is the medium of mass communication.

3.9.5. Major Issues in the Region

- Need of women empowerment programme, women right awareness programme, women-skill development programme in the villages.
- Girl education should be promoted in the study area.
- Vocational and Skill-development training should be provided to unemployed youth and they should also be provided employment opportunity.
- Agriculture in the study area is being with good quantity, but there should be organise awareness programs to promote the organic farming for qualitative and quantitative products and promote to use bio-compost instead of urea compost or chemical uses in crops.
- Gender ratio (Below 6 Year) of the study area is low. Gender equality awareness programme require in the study area.

3.10. Traffic study of the project area

3.10.1. Introduction

Traffic Data Collection and projections thereof of traffic volumes are basic requirements for planning of road development and management schemes. Traffic Data forms an integral part in the science of descriptive national economics and such knowledge is essential in drawing up a national transport policy for movement of passengers and goods by both government and the private sectors. Traffic flow data is important in planning of a particular section of the road network and for its subsequent maintenance. Traffic flow pattern appears to be random in distribution, as it reflects people's motivation in terms of different composition of vehicles on different types of roads under varying environmental conditions. The proposed project site "IT City" is lies at Sector 66-B, 82-A, 83-A, 101-A Mohali (Punjab). Total estimated population of the project will be159161 persons and parking facility to be provided at project about ESC is 19179 ECS. Thus due to proposed project additional load of 19179 ECS will be added.

3.10.2. Approach to the project site

The site is well connected by NH-22, NH- 21, NH- 64, SH- 4 and SH- 12A which is running at a distance of about 1.75 km to 5.0 km from the project site. The project site is located at about 1.5 km from S.A.S. Nagar Railway Station in South & about 3.5 km from Chandigarh Airport in SW.

Site approach route map is as figure 3.10

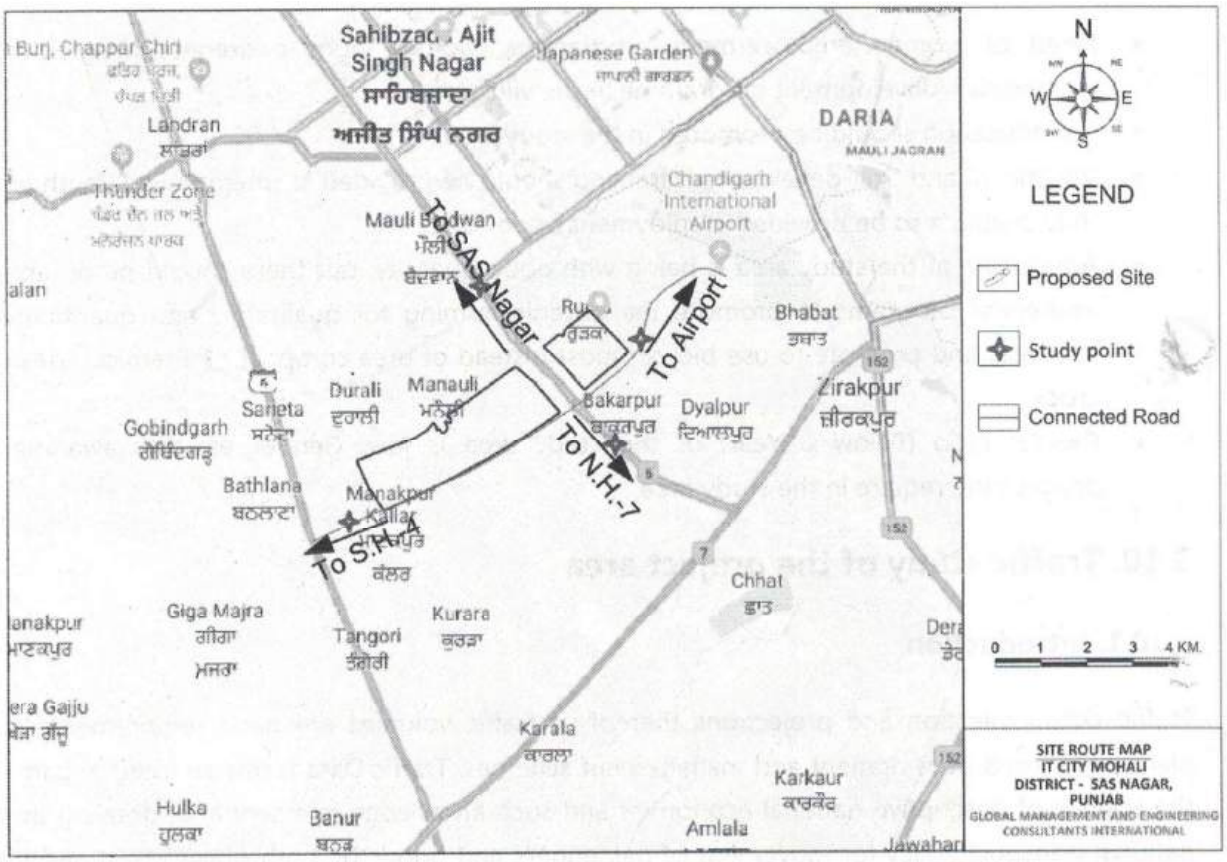


Figure 3.25: Site route map and study point for the proposed project

3.10.3. Traffic study

Study has been carried out manually for two way traffic during peak hour of the day in morning from 8:00 am to 11:00 am and in evening from 5:00 PM to 8:00 PM at three point i.e. **(i)** between Airport chowk Mohali to Mohali airport road **(ii)** Between airport chowk mohali to SAS Nagar road **(iii)** between airport chowk mohali to SH- 4 Road. Data has been collected to predict the future traffic growth and the load on the plant road and surroundings due to the proposed project. Photographs of traffic data collection are shown in figure 3.11.

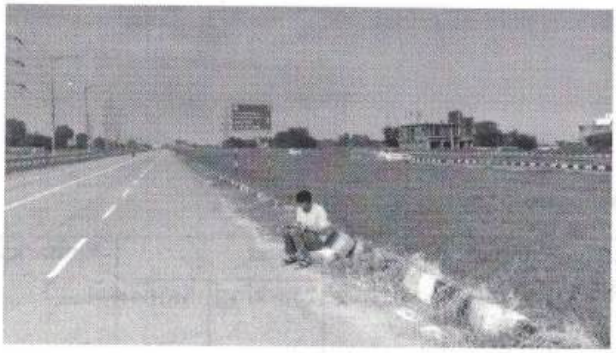
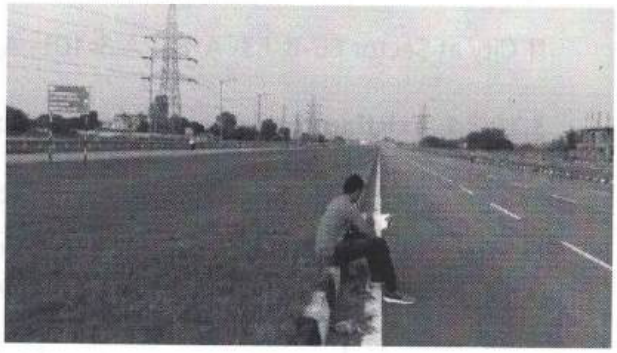
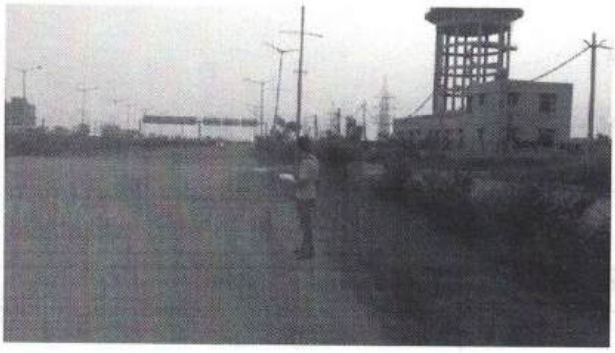
	
Airport chowk Mohali to Mohali Airport	Mohali Airport to Airport chowk Mohali
	
SAS Nagar to Airport chowk Mohali	Airport chowk Mohali to SAS Nagar
	
SH- 4 to Airport chowk Mohali	Airport chowk Mohali to SH - 4

Figure 3.26: Photos of traffic data collection

3.10.3.1. Existing road geometric scenario

Table 3.23: geometric scenario of exixting road

Road	ROW (m) / CW (m) / Lanes	Surface Condition	Street Lights	Drainage	Road Marking	Road Signs	Remarks
Airport chowk to Moali Airport Road	91.44 / 7 + 14 + 14 + 7 / 2 + 4 + 4 + 2	Very Good	NA	A	A	A	--
SH- 4 to Airport chowk connecting road	60.96 / 7.3 + 14 + 14 + 7.3 / 2 + 3 + 3 + 2	Good	A	NA	NA	A	--
Airport chowk Mohali to NH – 64 Road	112.9 / 9.14 + 14 + 14 +9.14 / 2 + 3 + 3 + 2	Very Good	A	A	NA	A	--
Airport chowk to SAS Nagar road	60.96 / 14 + 14 / 3 + 3	Very Good	A	A	NA	A	--

Note: A – Available, **NA** – Not Available, **ROW** – Right of Way, **CW** – Carriage Way

3.10.3.2. Peak hour volume for different road

Table 3.24: Peak hours traffic count at different approach road to site

Real time Traffic scenario at Airport chowk, Mohali to Mohali International Airport Road (main carriage way 8 lane and 4 service lane):

Time	Two wheeler	Four wheeler	Three wheeler	Bus/ Truck	Others	Total
08.00 - 09.00	155	250	1	17	00	**423**
09.00 - 10.00	178	288	5	19	00	**490**
10.00 - 11.00	124	16	3	12	00	**155**
17.00 - 18.00	158	274	3	12	00	**447**
18.00 - 19.00	142	256	0	24	00	**422**
19.00 - 20.00	160	234	2	21	00	**417**

Note: The highest peak observed is 490 PCU's /hr during 09:00 hours to 10:00 hours.

Real time Traffic scenario at Airport chowk, Mohali to SAS Nagar Road (main carriage way 6 lane):

Time	Two wheeler	Four wheeler	Three wheeler	Bus/ Truck	Others	Total
08.00 - 09.00	1012	2210	108	114	5	**3449**

09.00 - 10.00	1218	2590	163	151	10	**4132**
10.00 - 11.00	904	2300	92	114	17	**3427**
17.00 - 18.00	1102	2460	138	142	3	**3845**
18.00 - 19.00	1124	2572	140	136	16	**3988**
19.00 - 20.00	1060	2504	132	124	11	**3831**

Note: The highest peak observed is 4132 PCU's /hr during 09:00 hours to 10:00 hours.

Real time Traffic scenario at Airport chowk, Mohali to National Highway - 64 Road (main carriage way 6 lane and service way 4 lane):

Time	Two wheeler	Four wheeler	Three wheeler	Bus/ Truck	Others	Total
08.00 - 09.00	988	2064	91	110	4	**3257**
09.00 - 10.00	1179	2505	145	144	8	**3981**
10.00 - 11.00	952	2243	80	98	14	**3387**
17.00 - 18.00	1063	2404	126	121	2	**3716**
18.00 - 19.00	1130	2550	142	105	15	**3942**
19.00 - 20.00	975	2402	150	112	7	**3646**

Note: The highest peak observed is 3981 PCU's /hr during 09:00 hours to 10:00 hours.

Real time Traffic scenario at Airport chowk, Mohali to SH - 4 Road (main carriage way 6 lane and service way 4 lane):

Time	Two wheeler	Four wheeler	Three wheeler	Bus/ Truck	Others	Total
08.00 - 09.00	218	218	54	26	2	**518**
09.00 - 10.00	245	890	27	45	10	**1217**
10.00 - 11.00	233	683	42	13	12	**983**
17.00 - 18.00	225	594	34	58	1	**912**
18.00 - 19.00	200	636	28	68	4	**936**
19.00 - 20.00	168	601	47	42	0	**858**

Note: The highest peak observed is 1217 PCU's /hr during 09:00 hours to 10:00 hours.

3.10.3.3. Level of service (LOS) for traffic study road during peak hour

Table 3.25: Level of service at study road during peak hour

Road	V	C	Existing V/C	LOS
Airport chowk, Mohali to Mohali Airport	424.8	10200	0.041	A

Road	V	C	Existing V/C	LOS
Airport chowk, Mohali to SAS Nagar	3766.8	5400	0.69	D

Road	V	C	Existing V/C	LOS
Airport chowk, Mohali to NH - 64	3617.3	8400	0.43	C

Road	V	C	Existing V/C	LOS
Airport chowk, Mohali to State Highway - 4	1183.9	8400	0.14	A

V = Volume in PCU's /hr, **C**= Capacity PCU's /hr, **LOS** = Level of Service

V/C	LOS	Performance
0.0 – 0.2	A	Excellent
0.2 – 0.4	B	Very Good
0.4 – 0.6	C	Good
0.6 – 0.8	D	Fair/ Average
0.8 – 1.0	E	Poor
1.0 & Above	F	Very Poor

Note: IRC is accepting the fact that, in Indian roads the real congestion starts when V/C ratio is >1, i.e. for forced flow. Till this limit the road is free for traffic movement without any impediments. Hence it is acceptable as normal upto V/C = 1 and the performance will be taken as good only.

3.10.4. Impact on Traffic due to proposed project

3.10.4.1. During construction phase

- The addition of 10 trucks per day carrying construction material doesn't change any significantly the traffic flow. Hence OK.
- The present level of service will remain "A, B & F" of Road towards Mohali airport, SAS Nagar and State Highway- 4 from Airport Chowk respectively.
- Number of trucks coming to the site (Off peak hours); Day Time – 10 no's
- The addition volume of PCU's doesn't make any significant change for traffic movement at any given time.

- Vehicles carrying construction materials will be well covered to prevent any spillage.
- Vehicles hired for construction material will be in good condition and conforms to noise and air emission standards.
- Vehicles will operate only during non peak hours.

3.10.4.2. During Operational Phase

- Since the project is Township project, thus the most of traffic will be move from 6:00 am to 10:00 pm.
- Total traffic generated from this Proposed project = 19179 PCU's/ECS's.
- Therefore, the hourly volume in PCU's/ hr will be 19179/16 = 1198.68 or says 1200 PCU's/ hr.
- This hourly generated traffic of 1200 PCU's/ hr will move towards SAS Nagar Road, National Highway 4, National highway - 64 and Mohali International Airport Road.

Changed Level of Service by additional traffic count:

Table 3.26: level of service after additional traffic by the project

Road	Existing				Modified		
	V	C	V/C	LOS	V	V/C	LOS
Airport chowk, Mohali to Mohali Airport	424.8	10200	0.041	A	428.8 + 57	0.047	A

Road	Existing				Modified		
	V	C	V/C	LOS	V	V/C	LOS
Airport chowk, Mohali to SAS Nagar	3766.8	5400	0.69	D	3766.8 + 502	0.79	D

Road	Existing				Modified		
	V	C	V/C	LOS	V	V/C	LOS
Airport chowk, Mohali to National Highway - 64	3617.3	8400	0.43	C	3617.3 + 483	0.48	C

Road	Existing	Modified

	V	C	V/C	LOS	V	V/C	LOS
Airport Circle, Mohali to State Highway - 4	1183.9	8400	0.14	A	1183.9 + 158	0.16	A

3.10.5. Conclusion:

- The level of Service Airport circle to Mohali International Airport Road and Airport Circle to State Highway 4 Road is Excellent (A), LOS of Airport Circle to National Highway – 64 is Good (C) and Airport Circle to SAS Nagar Road has the Fair/ Average level of service .
- The project is seen to have minimal adverse effect on the surrounding area traffic and measures are to be put in place for an efficient traffic management during and after the project construction.
- Parking and travel movement have been scrutinized and they are seen to be efficiently designed.
- Adequate sign & guide posts for traffic as per IRC (Indian Roads Congress) to be installed.
- Road marking (edge markings in white and lane markings in broken white) must be clearly painted so as to guide the drivers along study road.

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CHAPTER - 4

4. Chapter- IV

Anticipated Environmental Impacts & Mitigation Measures

4.1. INTRODUCTION

Prediction of impacts is the most important component in any environmental impact assessment study as it is purpose of deriving contribution in environment from the proposed project in the surrounding region. The primary function of an environmental impact assessment study is to predict and quantify the magnitude of impacts, evaluate and assess the importance of the identified changes, present information and monitor actual changes. Environmental impacts could be positive or negative, direct or indirect, local or regional and also reversible or irreversible. Several mathematical/ statistical techniques and methodologies are available for predicting impacts due to developmental activities on physico – chemical, ecological and socio – economic components of environment. The results obtained from the predictions are to be superimposed over the baseline (pre- project) status of environmental quality to derive the ultimate (post –project) scenario of environmental quality status.

4.2. POTENTIAL IMPACTS

All the potentially significant environmental impacts from the project are grouped as below:

Air Environment

Impact on ambient air quality

Impact on ambient noise

Water Environment

Impacts on surface water quality

Impacts on ground water quality

Land Environment

Impacts on land use

Impacts on soil fertility

Impacts on agriculture

Ecological Impacts

Impacts on tree/ vegetation
Impacts on forests and wildlife

Socio – Economic Impacts
Impacts on other infrastructure
Impacts on employment
Impacts on public health and safety
Impacts on aesthetics

Table 4.1: Overview of Potential Impacts due to the Proposed Project

S.No	Components	Aspect	Potential Impact
CONSTRUCTION PHASE			
1.	Ambient Air Quality	Dust emissions from site preparation, excavation, material handling and other construction activities at site.	Minor negative impact inside the premises. No negative impact outside. Impact for Short term
2.	Noise	Noise generated from construction activities, operation of construction equipment and traffic.	Minor negative impact near noise generation sources inside premise. No significant impact on ambient noise levels at sensitive receptors. Impact for Short term
3.	Water Quality	Surface runoff from project site Discharge of sewage from labour camp.	No significant negative impact Short term impact
4.	Land use and Aesthetics	Land development	Minor positive impact
5.	Topography & Geology	Site development	No Significant Impacts
6.	Soil	Construction activity leading to topsoil removal and erosion.	Minor negative impact
7.	Ecology Flora & Fauna	Habitat disturbance during construction activity	Minor negative impact Short term impact
8.	Socio – economy	Increased job opportunity for locals. Economy related to commercial real estate development, material supply etc. expected to boom.	Overall positive impact
9.	Traffic Pattern	Haul truck movement and possibility of traffic congestion.	Minor negative impact. Short term impact
OPERATION PHASE			
1.	Ambient Air Quality	Particulate and gaseous emissions from vehicle movement Emission from industrial activities and from DG set to be used for power back up.	Minor Negative Impact
2.	Noise	Noise from vehicle movement Machinery operating in Industrial area	Minor negative impact near noise generation sources inside premise. No significant impact on ambient noise levels at sensitive receptors.

3.	Water Quality	Discharge of sewage Discharge of contaminated storm water Discharge of effluent from industrial area	No significant adverse impact
4.	Water usage	Use of over 30369.77 KLD water at peak demand (Fresh water demand – 14572.9 KLD)	Minor negative impact
5.	Solid waste	Storage and disposal of solid and hazardous wastes	No negative impact
6.	Ecology Flora & Fauna		No negative impact
7.	Socio – economy	Increased job opportunity in the proposed project for the locals.	Overall positive impact
8.	Traffic Pattern	The proposed project is likely to add significantly to the predicted traffic during peak hours.	Moderate negative impact

4.2.1. Air Environment

Air emissions have no boundaries and can migrate from area to area depending upon the wind direction and speed. The sources of air emission can be grouped into three categories of point, area and line sources:

A **point source** is a single source of emission with an identified location, such as an industry;

An **area source** is when the sources of emission are many widely distributed point sources having relatively comparable significance; and

A **line source** is when the sources of emissions from a number of fixed or moving facilities have relatively comparable significance, such as roads.

4.2.1.1. Construction Phase

Air Impacts

During the construction phase, SPM is expected to be the main pollutant associated with on-site roads (paved and unpaved), stockpiles and material handling. In this case, pollution emission sources shall be distributed throughout the project site and shall fall under the category of area source. Other air pollutant source will be DG set for power backup, vehicular movement, loading and unloading, transportation of goods and material.

Mitigation measure

A dust control plan will be implemented viz. regular daily spraying of water on the roads and dust emission area in the project site.

Regular maintenance of vehicles and equipment will be carried out. The vehicles having PUC will be used during the construction period. Vehicles will run under limited speed to prevent SPM generation. DG set with proper stack height will be used at site.

4.2.1.2. Operational Phase

Impacts

During the operational phase, the major air pollution sources will under focus: emission from industries, the rise in vehicular activity within the project site and diesel generator sets to be operated for back-up power supply would also be important source of air pollution. The major pollutant from vehicular sources is expected to be Carbon monoxide. In the operation phase of the project, pollution sources Particulate and gaseous emissions would be from vehicl movement.

Mitigation measures

- All industries will adapt to air pollution preventive measure to control air pollution.
- A buffer zone of green belt will be kept between the residential area and industrial area to minimize the air pollution effect.
- The green area will be developed in 33% area in the project area to minimize the pollution effect.
- All DG set has proper stack heights as per CPCB norms.
- All vehicles running under limit speed.
- To avoid air pollution in the parking space not only be well ventilated but also will be designed such that the total time required for vehicles to move in and out of the parking area is minimum.
- Regular monitoring of air polluting concentrations

4.2.2. Noise Environment

Any unpleasant sound is classified as noise pollution. Sound possesses three definite properties: intensity, frequency and duration. Intensity is loudness of a sound, or the pressure it experts through the ear. It is measured in decibels (dB). In assessing noise, a special measurement empirical parameter called "dB (A)" is used to assess the impacts on the human ear. The higher the dB (A) number, the greater is the risk of damage to hearing.

Loud noise may adversely affect people in many ways. For example noise may interfere with sleep, speech, communication and cause annoyance and other physiological problems. Occupational noise exposure is also the most common cause of Noise- included Hearing Loss (NIHL), threatens the hearing loss among the individuals exposed to noise pollution for longer periods of the time, at a less intense level.

The assessment of the impacts of noise on the surrounding community depends upon:

- Characteristics of noise source (instantaneous, intermittent, or continuous in nature)
- Time of day at which noise occurs
- Location of noise source with respect to noise receptor

For an approximate estimation of propagation of noise in the ambient air from the area or point source, a standard mathematical model for sound wave propagation used is as follows:

$$Noise_{(Receptor)} = Noise_{(Source)} - 20 \text{ Log } [distance_{(Receptor)} / distance_{(Source)}]$$

For the modeling purposes, terrain is considered flat and there is no sound absorptive materials are present in the direction of the sound wave propagation so as to formulate the worst –case scenario. For predicting noise emissions impacts due to proposed project, the noise emission sources are examined during both construction and operational phases.

4.2.2.1. Construction Phase

Impacts

The description of construction activity pertinent to the noise emitted in the construction phase is discussed here. Sources of noise emissions are expected from various construction equipments. General noise levels generated from the operation of equipment and machinery are provided in **Table 4.2**.

TABLE 4.2: Noise Levels Generated From Construction Equipment

Name of Source	Noise Level at 16 m (50 ft) from Source in dB (A)*	Noise Level at 1 m from source (calculated) in dB (A)
Air Compressor	87	111
Back Hoe/Loader	81	105
Concrete Mixer Truck	85	109
Concrete Pumper	70	94
Concrete Vibrators	77	101
Cranes - mobile	81	105
Dump Truck	83	107
Hammering	86	110
Jackhammer	88	112
Pile Driver	100	124
Radial Arm Saw	80	104

(Source: www.gvrd.bc.ca/education/pdf04/ColumbiaWorkshop1-ConstructionNoise.pdf)

The MoEF&CC has not yet prescribed noise emission specifications for construction equipment. However, the limited information available is provided in **Table 4.3**.

TABLE 4.3: NOISE LIMITS FOR APPLIANCES AND EQUIPMENTS AT CONSTRUCTION STAGE

Equipment	Noise Limit dB (A)
Window Air Conditioner	68
Air Cooler	60
Diesel Generators (without acoustic enclosures)	85-90
Compactors (rollers), Front Loaders, Concrete Mixers, Cranes, Vibrators, and Saws	75

(Source: CPCB -Domestic Appliances and Construction Equipments at the)

The resultant noise emission level, as calculated from information provided in Table 4.3 is 100 dB (A), considering all pertinent equipment to be in operation.

Mitigation Measures:

- Construction work will be carried out during day time only.
- The workers working near noise producing machine will be provided ear plugs.
- Construction equipment and vehicles will be maintained in good running condition.
- Vehicles will run under controlled limit, thus the engine noise will under limit.

4.2.2.2. Operation Phase

Impacts

During operation phase of the major sources of noise pollutant are Industrial activities, vehicular traffic, DG set for power back up.

Vehicular parking is being provided in the open space where noise levels are likely to increase significantly during the morning and evening hours due to starting, idling and roaring of vehicles.

Mitigation measures

- Use of suitable muffler systems/enclosures/sound-proof glass paneling on heavy equipment/pumps/blowers.
- The noise producing machinery will be placed in acoustic enclosures/acoustic rooms to reduce the noise levels.
- Workers working near noisy area shall be provided with ear plugs.
- Usage of well-maintained construction equipment meeting the regulatory standards
- Periodic maintenance of equipments/replacing whenever necessary/lubrication of rotating parts, etc.
- Roads will be maintained in good condition to reduce the noise due to traffic.
- Peripheral green belt will absorb the noise.

4.2.3. Water Environment

4.2.3.1. Construction Phase

Construction activities for the proposed development can have minor impact on hydrology and ground water quality of the area if the construction waste leaches into ground. The main source of water to the site is ground water supply.

Impacts

- The wastewater produced from labour colony may be a concern for the public health
- Storm water drainage system to collect surface runoff
- Surface runoff from project Site, oil/fuel and waste spills. Improper debris disposal.
- Improper disposal of construction debris leading to off-site contamination of water resources.

Mitigation measures

- During the construction phase, the modular septic tanks will be provided.
- Care will be taken to securely store the excavated material and to reuse it as early as possible in construction or for land filling during landscaping.
- However, hazardous chemicals as waste Oil will be handled properly and send to authorized recycler.

4.2.3.2. Operational Phase

Impacts

- The nearest surface water body is Chao Nala within the project site and it can be effected.
- There are green and orange category industries in the project area so, Industrial effluent can contaminate to the surface and ground water in the area.
- Surface runoff from the area can contaminate to surface and ground water
- Waste water generated from domestic areas can contaminate to surface water and ground water.
- The water requirement of project in huge amount as about 31 MLD and it has impact on ground water level of the nearby area.

Mitigation measures

All industries that will come in the project area will be

Two number of Sewage Treatment Plant (STP) each of 12.5 MLD based on SBR/ MBBR technology planned for proposed establishment.

The actual total fresh water demand is expected to be 14572.9 KLD from which only about 40 % of ground water will be used remaining fresh water will fulfill from canal water. The make-up water for gardening, flushing and miscellaneous work will be provided from the treated sewage water. No negative impact is anticipated in terms of water availability.

Proper drainage system will developed for Storm water, waste water.

4.2.4. Impact on Soil Environment

Topsoil would be removed and will be used for landscaping in the proposed project area. Also, ready mix construction method will be followed for the construction, which will reduce stress on soil environment of the site.

During the operation phase, carefully designed landscaped areas and plantation will be maintained. No significant impact is expected on the soil on and around the site.

Sewage water will be treated and recycled for gardening and miscellaneous purpose etc.

Sludge from the STP would be compacted and used for gardening as natural fertilizers or collected by Municipal Council.

The entire site area will be well paved and thus there will be no leaching of any substances in case of accidental spills.

Hence, no negative impact is expected on soil quality of the project site.

4.2.5. Solid & Hazardous Wastes

Waste quantification and characterization exercise has been carried out to estimate the quantum and type of waste that would be generated by different activities due to proposed township project during construction and operation phases of the project.

Description of solid and hazardous wastes generated from the site during construction and operation phases of the project is given in Table 4.4

Table 4.4: expected waste characteristics

S No	Activity / Area	Waste Generated and Quantity	Waste Characteristics	Frequency of Generation
1.	Earth Work and Construction	Construction Wastes	Earth, Stones, concrete, bricks, lumber etc.	Larger quantities will be generated in phases
OPERATION PHASE				
1.	Office area	Rubbish	Combustible (cardboard, rags, cloth, packing material) and Non-combustible (metals, glass bottles, stones/ceramics) etc.	Daily
2.	Residential area	Domestic waste	Food waste	Daily
3.	Sewage Treatment Plant	STP Sludge	Stabilized sludge – to be used as manure	after sludge drying and compaction

Table 4.5: Quantification of solid wastes during operation phase (kg/day)

pre & post construction phase:				
bins	Particulars	Quantity	Treatment	Disposal
Green (households)	Compostable waste Kitchen waste Garden waste	11,000 kg/day 270 kg/day	No in situ treatment. Collected and stored at designated places.	Municipal Corporation.
Dark grey bins (households)	Non-biodegradable waste + recyclable waste: Plastics Metal cans Glassware	Not quantified	No in-situ treatment. Collected and stored at designated places.	Municipal Corporation disposal sites.
Blue (households)	Paper waste Paper Newspaper Cardboards Packing material	Not quantified	Efforts to recycle to the best possible extent. Will be collected on daily basis.	Sent to the vendors for recycling.
Black	Plastic waste	Not quantified	Efforts to recycle to the best possible extent. Will be collected on daily basis.	Sent to the vendors for recycling.
	E waste	Cannot be quantified	Collected and stored at designated places.	Sent to the vendors for recycling.

Construction Phase

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Division Engineer Public Health Division No.1 GMADA, S.A.S. Nagar

Construction activities create solid wastes that need to be disposed. Such wastes include sand, concrete, gravel, stone, bricks etc. Topsoil will be separately stacked under tarpaulin cover and reused for landscape. The waste would be utilized in the site for filling of the low lying area as well as for road construction. Workers handling the solid waste shall be provided with protective gear.

Operational Phase

As per the Central Public Health and Environmental Engineering Organization (CPHEEO) Manual on municipal solid waste, the estimated quantity of solid waste generation from the project during operation phase is 47.19 TPD. The solid waste will comprise of biodegradable waste i.e. domestic waste, food waste, horticultural waste etc. and recyclable waste like plastic, paper, tin, glass etc. Different colored bins will be used for collection of biodegradable and non – biodegradable waste as per MSW rules, 2000. Private sweepers and MSW handlers will be appointed by the RWA for door to door collection. Bio-degradable wastes will be composted in onsite organic waste converter. Non –biodegradable fraction like plastic, tin, glass etc. will be sold to local recyclers. Horticultural waste shall be collected and disposed off with biodegradable waste. Rest inert MSW will be handed over to Municipal Corporation for final disposal.

Population of IT City			
S No	Type of population	No of population	Municipal Solid waste
1	Residential	93255	*0.4 kg= 37302 kg/ day
2	Floating	58891	*0.15 = 8833.65 kg/ day
3	Staff & Workers	7015	*0.15 = 1052.25 kg/ day
Total		**159161**	**47187.9 kg/ day**

Table 2.15: Composition of Solid Waste

S No	Category of waste	Description	Treatment / disposal of waste	Solid waste (in kg/day)
1	Biodegradable or wet waste @ 45%	Green waste, food waste, paper waste and biodegradable plastics	Collected by Municipal Council	21234.55
2	Non-biodegradable or dry waste @53%	Combustible waste, sanitary waste like diapers, sanitary pads; recyclable waste etc.	Collected by Municipal Council	25009.59
3	Domestic hazardous waste @ 2%	Discarded paint drums, pesticide cans, CFL bulbs, tube lights, expired medicines, broken mercury thermometers, used batteries and contaminated gauge, etc.	Collected by Municipal Council	943.76
	Total Solid Waste Generated			**47187.96**

E-Waste and Hazardous Wastes

From the project, E-wastes in the form of CFL lights, LED, unused mobile, computer appliances etc. will be generated; these will be stored in isolated place and disposed to authorised recyclers. Occasionally, used oil will be generated during maintenance of DG sets, same is categorised as hazardous waste. Used oil will be stored in barrels and handed over to MOEF/PPCB authorised waste oil recyclers.

Process of Solid Waste Management

This solid waste needs to be properly managed for avoiding diseases, epidemic and foul odor. The activity associated with the management of solid waste from the point of generation to disposal can be grouped into five functional elements

Waste generation
Waste handling, sorting, storage and processing
Collection
Transformation
Disposal
The solid waste generated from the houses shall be stored in waste bins and to be collected and segregated at source as organic & inorganic waste before transporting to the processing unit. The segregated organic waste shall be transported to the MC disposal sites.

4.2.6. Impact on Biological Environment

There are four number of protected forest, five numbers of reserve forests, a lake namely "sukhna" and Ghagghar River in the study area and a nala namely "chao" present within project site. There is not any National Park and Protected Sanctuaries within the study area, no impact is anticipated on the same. For estimation the adverse impact of the proposed project on sensitive area, air quality modeling has done and Air quality modeling results shows that no adverse impact on sensitive area.

In spite of there being no impact, efforts will be made not only to maintain the ecological balance of the surroundings but also to improve upon the same.

The attributes that are identified to describe ecology are animals, birds, fish, field crops, threatened species, natural vegetation etc. The study area does not have any identified endangered species, Forest, National Park, Sanctuaries and hence there is no question of any adverse impact on the same.

Emphasis will be placed on social forestry program wherein tree plantation would be undertaken within the plant premises. The tree plantation under this program would help in absorbing atmospheric heat, noise as well as pollutants.

Hence, all efforts will be put-up by the project proponent to maintain the ecological balance and improve the environmental in terms of ecology and Green Belt development. Hence, no adverse impacts of the project will be on surrounding ecology.

Green Area Development:

Green area will be done in approximately 746887.82 sq m (about 11.03 % out of total project area). Plantation will be done as per 1500 trees per hectare and developed as green belt, road side plantation, buffer zone between the industrial area & residential area and green parks. Following trees are to be planted in project area:-

Table: list of trees to be planted during green area development

S No	Local Name	Botanical Name
1	Teak	*Tectona* grandis
2	Aam	*Mangifera* indica
3	Jamun	*Syzygium* cumini
4	Neem	*Azadirachta* indica
5	Amla	*Embelica* officinalis
6	Arjun	*Terminalia* arjuna
7	Imli	*Tamarindus* indica
8	Khair	*Acacia* catechu
9	Dhak	*Butea* monosperma
10	Bahera	*Terminalia* belerica
11	Safed Siris	*Albizzia* procera
12	Gulmohar	*Delonix* regia
13	Amaltash	*Cassia* fistula
14	Ashok	*Polyalthia* longifolia
15	Babool	*Accia* Arabica
16	Shisham	*Delbergia* sissoo
17	Bar (Banyan)	*Ficus* benghalensis

4.2.7. Impact on Socio-Economic Environment

This section discusses the project activities and the extent of the potential socio-economical impacts expected from the various activities. The impacts have been analyzed for the population

in the surrounding locality and the transient labour population living in the periphery of the proposed site. **Table 4.8** shows the social impacts

Table 4.6: social impact assessment

Impact	Degree of Impact	Description
Population	Positive & Long Term	The expected rise in population is more than 93,000.
Employment Generation	Positive & Long Term	**Construction Phase-** 140 (approx) people Employment from industrial and commercial sector Increase of vendors such as stationary, grocery, water connections, electricity connections, phones etc.
Construction Phase	Negative & Short Term	The construction phase might create negative impacts around the site area such as litter, noise, influx of people from outside.
Increase in Land Value	Positive & Long Term	The prices of the land are likely to increase with the coming up of the project. Hence the proposed project will have beneficial impact.
Traffic and Transport	Negative & Long Term	The increase in traffic may create congestion, potential delays and inconvenience for pedestrians and residents accessing the localities.

Thus, the said project will have overall positive impact on Socio- economic pattern of the surrounding region.

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CHAPTER - 5

5. CHAPTER - V

Analysis of Alternatives (Technology & Site)

5.1. GENERAL

The consideration of alternatives of a development project is one of the more proactive sides of environmental assessment - enhancing the project design through examining options instead of only focusing on the more defensive task of reducing adverse impacts of a single design. This calls for the systematic comparison of feasible alternatives for the project site, technology and operational alternatives. Alternatives are compared in terms of their potential environmental impacts, capital and recurrent costs, suitability under local conditions and institutional, training and monitoring requirements.

Examining alternative means of carrying out a project involves answering the following three questions:

(i) What are the alternatives?

(ii) What are the environmental impacts associated with each alternative? and

(iii) What is the rationale for selecting the preferred alternative?

5.1.1. BUILDING MATERIALS

The use of the alternatives for building materials will help reduce the use of non-renewable resources and impact on natural resources .The building materials which will be used during the construction are:

Brick and block products with waste and recycled contents such as fly ash (waste from coal burning plants), blast furnace slag & waste wood fiber etc.

- Fly ash based lightweight aerated concrete blocks for walls.
- Perforated bricks for wall structures.
- Some of the alternative materials which will be used for opening in construction are:
- Use of steel manufactured from recycled content
- Aluminum from verified recycled content
- Saw dust based doors and window frames
- PVC doors and windows, Natural fiber- reinforced polymer composite door panels

- Alternatives for finishes include Fly ash, Ceramic tiles, Terrazzo floors

Building material will be selected with characteristics which will limit the heat ingress into the building are given in the table 5.1. The thermal characteristics of the building material are given in table 5.2.

Table 5.1: Building Material Characteristics

S. No.	Materials	U Value W/m^2 deg K	R Value m^2 deg K/W
1	Walls	0.352	2.35
2	Roof	0.261	3.5
3	Glass	3.3 or lower	0.59

Source: ECBC Code

Table 5.2: Thermal Characteristics of the Building Material

S.N.	Material	Thickness (mm)	Thermal Conductivity (W/mK)	R-Value (m^2K/W)
1	Cement Plaster	20	0.740	0.027
2	Brick Masonry	230	0.700	0.328
3	Cement Plaster	20	0.740	0.027
4	POP	10	0.430	0.023
5	Outside Film	--	--	0.050
6	Inside Film	--	--	0.100
7	Brick Tiles	50	0.790	0.063
8	PCC	40	0.930	0.063
9	Brick Bal	120	0.710	0.171
10	RCC	150	0.930	0.161
11	Polyurethane	50	0.040	1.200

For roads and open spaces permeable paving will be used to control surface water runoff by allowing storm water to infiltrate the soil and return to the ground water.

Energy Conservation

The project consists of mixed use development like Residential Units, Educational Institute, Commercial Buildings and Public Amenities.

The total power requirement of the project is 141 MVA.

In order to cater the same the fuel used for producing this energy are proposed to use following renewable source of energy.

- To install solar panels on the roof of residential units as well as other commercial and public amenity buildings wherever it is feasible.
- To install solar based street lights.
- Other Energy Conservation Measures.
- To use LED lamps in place of high pressure discharge lamps for the street lights.

- To use time based circuits for street light to switch off part of the light during night hours.
- To use dimmer to reduce the illumination level to reduce the energy consumption.
- To use automation for all the mechanical plants like STP, Transmission lines etc.
- To use start rated high efficiency motors for all the plants.

Awareness Program

- To bring a strict discipline in the end user, an awareness program will be conducted to educate all type of users to use.
- LED Lights wherever possible.
- To use dimmers and automation for all the lights.
- To use thermal insulation for building envelope to reduce the heat input.
- To activate lights, A/C or any other equipment on occupancy basis.

Environmental Attributes Management and Mitigation

Adequate environmental management measures will be incorporated during the entire planning, pre- construction, construction, and operational stages of the project to minimize any adverse environmental impact and assure sustainable development of the area. The mitigation measures which have been suggested for the construction and operational stages of the proposed development will include the following elements:

- Air Pollution Control and Management
- Noise Control and Management
- Water treatment and management
- Strom water management
- Hazardous and Solid Waste Management
- Plantation and Landscaping
- Sewage Treatment Recycle and reuse Energy Conservation
- Environmental Management Plan

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CHAPTER - 6

6. Chapter - VI

Environmental Monitoring Program

6.1. Environmental Monitoring Program

Environmental monitoring provides feedback about the actual environmental impacts of a project. Monitoring results help judge the success of mitigation measures in protecting the environment. They are also used to ensure compliance with environmental standards, and to facilitate any needed project design or operational changes. A monitoring program, backed up by powers to ensure corrective action when the monitoring results show it necessary, is a proven way to ensure effective implementation of mitigation measures. By tracking a project's actual impacts, monitoring reduces the environmental risks associated with that project, and allows for project modifications to be made where required.

Technical aspects of monitoring the effectiveness of mitigation measures (incl. Measurement methodologies, frequency, location, data analysis, reporting schedules, emergency procedures, detailed budget & procurement schedules)

- To establish a baseline; that is, gathering information on the basic site characteristics prior to development or to establish current conditions;
- To estimate inherent variation within the environment, which can be compared with the variation observed in another specific area;
- To make comparisons between different situations (pre-development and post development; upstream and downstream; at different distances from a source) to detect changes; and
- To make comparisons against a standard or target level.
- Compliance monitoring is a commonly practiced form of environmental monitoring.
- The purpose of compliance monitoring is to ensure that the quality or quantity of an environmental component is not altered by a human activity beyond specified regulatory standards.

Table: 6.1: Environmental monitoring program

S No	Parameters	Location	Reporting Schedule
1	Ambient Air Quality: PM10, PM2.5, SO2, NOx	Project site	Once in six months

	CO		
2	Noise	Project boundary	Once in six months
3	Ground water Color, Hazen Units Odour Taste Turbidity, NTU pH Total Hardness as CaCO3 Iron as Fe Chloride as Cl Residual Free Chlorine Dissolved Solids Calcium as Ca Magnesium as Mg Copper as Cu Manganese as Mn Sulphate as SO4 Nitrate as NO3 Fluoride as F Chromium as Cr+6 Alkalinity Aluminum as Al Boron as B Microbiological parameters Total Coliform/100 ml	Bore well locations within the project	Once in six months
4	Treated water from STP pH BOD COD Total Suspended Solids Oil & Grease Microbiological parameters Total Coliform E-coli	STP 2* (12.5 MLD proposed)	Once in six months
5	Soil quality pH, Appearance, Texture, Water Holding Capacity, Conductivity (mS/cm), Iron as Fe (mg/kg).	STP sites locations	Once a year

	Zinc as Zn(mg/kg), Copper as Cu(mg/kg), Cadmium as Cd(mg/kg), Nitrogen as N (%), Phosphorus as P (%), Potassium as K (%), Sodium as Na (%), Chlorides as Cl (%), Total Alkalinity (mg/kg), Moisture content(%		

6.2. Compilation and Analysis of Data and Reporting System

Record keeping and reporting of performance is an important management tool for ensuring sustainable operation of the project. The monitoring shall be carried out through MoEF & CC/ NABL approved laboratory. All records shall be maintained for regulatory, monitoring and operational issues. Typical record keeping requirements for the proposed project is summarized in **Table – 6.2.**

Table: 6.2: Record Keeping Requirements

Parameter	Particulars
Solid Waste Handling & Disposal	Daily quantity of waste collected. Daily quantity treated and recycled. Daily quantity sent for disposal through agency.
Hazardous Wastes	Quantity of waste generated. Quantity of waste sold to authorize recyclers. Waste manifests and record keeping as per rules.
Sewage Treatment	Daily quantity of raw and treated sewage. Quantity and point of usage of treated waste water. Treated waste water quality.
Regulatory Licenses (Environmental)	Consents from State Pollution Control Board. Copy of Waste manifests as per requirement.
Monitoring & Survey	Records of all monitoring carried out as per the finalized monitoring protocol.
Other	Log book of maintenance and compliance. Equipment inspection and calibration records, where applicable.

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CHAPTER - 7

7. Chapter - VII

ADDITIONAL STUDIES

7.1. GENERAL

For preparation of EIA /EMP report as per requirement of EIA Notification 2006 and subsequent amendments additional studies like risk assessment & disaster management plan was carried out to assess the impacts due to the proposed project.

7.2. RISK ASSESSMENT

These kinds of project are not a threat to environment. However due care shall be taken to minimize all possible causes. The primary objective of risk assessment study is to propose a simple approach to carry out risk analysis and conduct feasibility studies for the project, planning and management of hazard analysis study. Quantitative Risk Assessment requires the following.

Physical and Health Occupational Hazards can be broadly classified into the categories as shown in table 7.1 below:

Table 7.1 Classification of Physical and Health Occupational Hazards

Type of Risk	Identification of Hazards
Mechanical Risks	Injuries to the head, Limbs, eyes, etc usually as a results of negligence like; • Improper handling, • Not following prescribed safety procedures • Neglect the use of personal protective wear.
Electrical Risks	Electrical hazards leading to fire and explosion mainly due to failure of circuit breakers, insulators, fuses, bus bars, and poor maintenance. Accidents may also occur in transformer due to open arcing, flashover above oil level, insulator failure, overloading, failure of air cooling system, lighting etc. these hazards leads to localized accidents only
Fire/Explosion Risks	Fire prone areas in the plant require adequate firefighting equipment. Like DG area, transformer oil storage area & gas storage area (kitchen) other
Chemicals Exposure Risks	The storage (HSD) tanks in the isolated zone and will have fire water hydrant system.

Table 7.2 Risk identified in particular area

S No	Area	Risks Identified
1	HSD	Fire, spontaneous combustion
2	Transformer & D.G. Sets.	Explosion and fire
3	Switch – yard Control Room	Fire in cable galleries and Switchgear/ Control Room.

Table 7.3 Preliminary Hazard Analyses for the Whole Project In General

S No	Preliminary hazard analysis Category	Possible Hazard	Provision
1	Environmental factors	leakage and eventuality of source of ignition (transformers/ DG sets)	All electrical fittings and cables as per specified standards. • Fire protection including dry powder, CO2 and foam extinguisher. • Fire extinguisher of small size and big size are provided at all potential fire hazard places.

7.3. SAFETY MEASURES

- Following safety measures will be provided to ensure safe operations:
- Fire alarm system will be provided in identified risk areas
- Adequate Personal Protective Equipment (PPE)
- First aid and fire fighting training will be provided to all the employees.

Table 7.4 Fire Fighting system arrangements

S No	Item No.	Applicability
1	Fire extinguisher	Required
2	Hose reel	Required
3	Dry riser	Not required
4	Wet riser	Not Required
5	Down comer	Not required
6	Yard hydrant	Not required
7	Automatic sprinkler system	Required
8	Manually operated fire alarm system	Not required

9	Automatic detection & alarm system	Not required
10	Underground water tank	Not required
11	Terrace water tank	Required

7.4. DISASTER MANAGEMENT PLAN (DMP)

7.4.1. Introduction

Group housing encompasses the lives of a large number of people. It also involves installation of various structures and machineries that meet the comfort and need of its population but may also pose serious threat to the occupants in case of an accident. It is thus considered necessary to carry out a risk assessment and disaster management plan for the project.

Hazard analysis involves the identification and quantification of the various hazards (unsafe conditions) that exist in the proposed project. On the other hand, risk analysis deals with the recognition and computation of risks, the equipment in the project site and habitants are prone to, due to accidents resulting from the hazards present in the project site.

Risk analysis follows an extensive hazard analysis. It involves the identification and assessment of risks the neighboring populations are exposed to as a result of hazards present. This requires a thorough knowledge of failure probability, credible accident scenario, vulnerability of population etc. Much of this information is difficult to get or generate. Consequently, the risk analysis is often confined to maximum credible accident studies.

In the sections below, the identification of various hazards, probable risks in the proposed project, maximum credible accident analysis, consequence analysis are addressed which gives a broad identification of risks involved in the project.

7.4.2. Approach to the Study

Risk involves the occurrence or potential occurrence of some accidents consisting of an event or sequence of events. The risk assessment study covers the following:

- Identification of potential hazard areas;
- Identification of representative failure cases;
- Visualization of the resulting scenarios in terms of fire (thermal radiation) and explosion;
- Assess the overall damage potential of the identified hazardous events and the impact zones from the accidental scenarios;

- Assess the overall suitability of the site from hazard minimization and disaster mitigation Point of view.
- Furnish specific recommendations on the minimization of the worst accident possibilities; and
- Preparation of broad Disaster Management Plan (DMP), which includes Occupational and Health Safety Plan.

7.4.3. Risk Hazard & its control measures

It is attempted to plan and construct the buildings following all safety norms. However, it is not always possible to totally eliminate such eventualities and random failures of equipment or human errors. An essential part of major hazard control has therefore, to be concerned with mitigating the effects of such emergency and restoration of normalcy at the earliest. A detailed Table showing activity during construction and operation phase along with mitigation measures are given in Table 7.5.

Table 7.5: Activities during Construction and Operation Along With Mitigation Measures

Hazards Associated with Activities (During Construction & Operation)	Control/ Mitigation Measures
Fire Flammable liquid/ Gases like LPG, Diesel storage area and combustible building materials – poor housekeeping – grinding sparks – open flames, absence of fire hydrant net work.	Combustible/flammable materials properly stored / used – good housekeeping – fire extinguishers made available & fire hydrant network as per approval – Emergency plan in case of fire or collapse of structure.
Absence of Personal Protective Equipment Lack of adequate footwear, gloves –goggles –head protection - hearing/ eye protection – respiratory protection.	Use of personal protective equipment and awareness training.
Electricity Electrocution – overhead/ underground services – any leads damaged or poorly insulated – temporary repairs – no testing and tagging – circuits overloaded – non use of protective devices.	Leads good condition and earthed – no temporary repairs – no exposed wires – good insulation – no overloading – use of protective devices – testing and tagging – no overhead/ underground services.
Excavations Trench collapse – materials falling in undetected underground services – falls – hazardous	Soil stability know – no water accumulation – existing services know – clear of suspended loads – hardhats/ PPE – ladders – public protection –

atmosphere struck by traffic and mobile plant.	atmospheric testing – traffic controls – Emergency Plan.
Noise Unknown noise levels – known noise levels exceeding the limits applicable.	Level below 85 decibels – proper protection.
Falling Material Fall during carrying/ lifting materials – dislodged tools and materials from overhead work areas.	Materials to be secured – kept away from edge – toe boards – use of hard hats.
Crane & Lifts Display of carrying capacity i.e., load (no. of person), incorrectly slung, defective lifting equipment, unsecured loads, craning in close proximity o building people and plant – falls – falling materials.	Periodic testing by competent authority – correctly slung/ secured loads, lifting equipment good condition – use of proper hand signals – falls while unloading controlled.
Visitors Presence at Site Falls – struck by – dropped materials – road accidents – insufficient warning signage, fencing – pedestrian access.	Sufficient hoarding – fencing and barricades – safe pedestrian access past site traffic management for loading and delivery – construction separated from occupied area of projects.

7.5. EMERGENCY RESPONSE PLAN (ERP)

Despite all efforts, it is within the realm of possibility that emergencies and accidents could take place. It is the objective of emergency management to prevent the accidents and to minimize losses that occur due to such accidents by technical and organizational measures. It is also a responsibility of effective management to be able to restore normalcy as quickly as possible. In preparation of the ERP, the following elements have been considered to make it effective.

- Leadership and administration for emergency management.
- Prompt activation of Emergency Management Plan to minimize loss.
- Communication arrangements for warring/ notification and requesting external help.
- Lighting and stand-by power for various combat operations
- Setting up of an emergency control center to act as a command and control point during an emergency.
- Provision for Medical care to the injured and response personnel
- Protection of vital records

- Preparation and use of checklists for various emergency management functions for pre, post and in emergency activities.
- Conducting regular training programs for all level of employees.

Main hazards identified for the project include hazards pertaining to fires in buildings and fire in diesel storage areas, earthquake and LPG leakage at residences and an ERP pertaining to these is described in the following section.

- Response in case of Earthquake
- Response Procedures for Occupants
- If Indoors:
- Take cover under a piece of heavy furniture or against an inside wall and hold on.
- Stay inside: The most dangerous thing to do during the shaking of an earthquake is to try to leave the building because object can fall on you.

If Outdoors:

Move into the open, away from buildings, streetlights and utility wires. Once in the open, stay there until the shaking stops.

If in a moving vehicle:

Stop quickly and stay in the vehicle. Move to a clear area away from buildings, trees, overpasses or utility wires. One the shaking has stopped processed with caution. Avoid bridges or ramps that might have been damaged by the quake.

After the quake:

After quake to be prepare for aftershocks. Although smaller than the main block, aftershocks cause additional damage and bring weakened structures down. Aftershocks can occur in the first hours, days, weeks or even months after the quake.

Help injured or trapped persons:

- Provide first aid where appropriate and not to move seriously injured persons unless they are in immediate danger of further injury. Call for help.
- Remember to help those first who may require special assistance – infants, the elderly, and people with disabilities.
- Stay out of damaged buildings.
- Use the telephone only for emergency calls.
- Response Procedures for Emergency Team:
- Formulate an Emergency Response Team for earthquake response.

- Using the public address system, inform residents of response procedures discussed above.
- Inform the necessary authorities for aid.
- Ensure no person is stuck beneath any debris, in case of a structural failure.
- Ensure that all occupants standing outside near the buildings are taken to open areas.
- Ensure that the first aid ambulance and fire tender vehicles are summoned if necessary.
- Inform the nearby hospitals if there are any injuries.
- Check the utilities and storage tanks for any damage.

7.5.1. Response in case of Fire:

- Required response during in the event of a fire should be described in signs located in the lobby.
- On sighting a fire, it should be immediately informed to the facility manager giving the exact location and type of fire in detail.
- Initiate the Emergency Response Team for fires.
- If the fire is small, engage in extinguishing the fire using the nearest fire extinguisher.
- Guide the Emergency Response Team staff to the emergency assembly point.
- The Emergency Response Team should immediately inform the nearest dispensary and security force. If required a fire tender should be summoned.
- The response team should immediately move to the point of fire and take all necessary steps to stop the fire. If the fire is not controllable and spreads then the manager in charge should inform the district authorities and call for external help.
- The emergency response team will provide immediate relief to the injured residents at the scene of incident. Any injured persons should be evacuated on priority to the dispensary or one of the nearest hospitals based on their condition.

7.5.2. Instructions for Occupants:

- Get out of buildings as quickly and as safely as possible.
- Use the stairs to escape. When evacuating, stay low to the ground.
- If possible, cover mouth with a cloth to avoid inhaling smoke and gases.
- Close doors in each room after escaping to delay the spread of the fire.
- If in a room with a closed door.
- If smoke is pouring in around the bottom of the door or if it feels hot, keep the door closed.
- Open a window to escape or for fresh air while awaiting rescue.
- If there is no smoke at the bottom or top and the door is not hot, then open the door slowly.
- If there is too much smoke at the bottom or fire in the hall, slam the door shut.

- Stay out of damaged buildings.

Adequate fire fighting system is proposed for the project as per norms to prevent and control fire outbreaks. The fire fighting system will consist of portable fire extinguishers, hose reel wet riser, yard hydrant, automatic sprinkler system for group hosing and manual fire alarm system.

Table 7.6: List of Emergency Number of Moradabad District

Administration	**Office**	**Residence**
Commissioner, Mohali Division	01722219500	--
District Magistrate	01722219502	--
Police		
Senior Superintendent of Police	172 2219211-212	--
Emergency		
Fire Brigade	101	
Ambulance	102, 108	
Control Room	100	
Women Power Line	1090	
Child Helpline	1098	
Health		
Chief Medical Officer	0172-2226343, 2274343(F)	--

7.6. RESETTLEMENT AND REHABILITATION

- The project will not result in displacement of any local population and hence, doesn't require a resettlement and rehabilitation study.

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CHAPTER - 8

8. Chapter – VIII

Project Benefits

8.1. General

The development projects have varied embedded connotations, like the backbone of modern economy. Development projects promote good residential facilities in planned manner, amenities, employment opportunities, improving earning and thereby, enhancing the quality of life. This in turn enhances the demand for development projects. This two-way interaction works through a host of inter-sectoral forward and backward linkages effects and dynamic externalities, services and labour and thus helps to shape the economic geography of the region.

The project road will have many benefits for the area and the region in various ways. The benefits of the project are described below in following subsections. The development project plays a significant role in changing the socio-economic condition of the living of people of a region through dynamic externalities that such development often generates. The benefits of the development project may also be seen from a different angle, viz., the local benefit and the wider regional or national level benefit. The entire regional and national economy lying beyond this neighbourhood will also be benefited from the development projects. Such effect may be called as the local, regional or national level benefits. Further the benefit may be direct or indirect in nature.

The project is located At Sector 66-B, 82-A, 83-A, 101-A Mohali (Punjab). The site is well connected by NH-22, NH- 21, NH- 64, SH- 4 and SH- 12A which is running at a distance of about 1.75 km to 5.0 km from the project site. The project site is located at about 1.5 km from S.A.S. Nagar Railway Station in South & about 3.5 km from Chandigarh Airport in SW.

8.2. Physical Infrastructure

Proposed group housing will help in meeting the growing residential needs of people; it also provides state – of –the –art apartments and modern terms of comfort and safety of its residential units along with commercial space, nursing homes and educational institute. Care has been taken to provide the occupants and visitors with necessary facilities as power, water supply, parking spaces and wide roads. Residential group housing project will provide encouragement to other housing projects. Adjoining roads will be widened and strengthened and lined to local markets. Market will be developed to meet the daily needs of people of the

living units. This will certainly improve the status of the people in the areas. The IT industries and micro and small scale industries fulfill be the related needs.

8.3. Economic Benefits

Building construction project requires a large number of manpower in the form of labors. Though the surrounding area is urbanized, there are still plenty of unpowered persons who can be engaged as local labors. The total number of persons required for construction of the project will be around 400 including skilled, semi skilled and unskilled persons, thus same number of persons will have earnings from this project.

In addition, industrial and commercial zone provide the employment to nearby population. The community can look forward to benefit due to more jobs and also better access to utilities. Jobs would be created for unskilled, semi skilled as well as skilled labour category, for which locals would be given preference and there by the overall development of the region is envisaged.

8.4. Corporate Social Responsibility

Following points will be covered under CSR

- Promotion of Education
- Gender equity and woman empowerment
- Employment enhancing vocational skills
- Eradication of extreme hunger and poverty

8.5. Increase in Land Value

The prices of the land are likely to increase with the coming up of the project. Hence the proposed project will have beneficial impact.

8.6. Wider Economic Growth

The proposed project will increase the economic activities around the area, creating avenues for direct/ indirect employment in the post project period. There would be a wider positive economic impact in terms of generating opportunities for other business too.

CHAPTER - 9

9. Chapter - IX

Environmental Management Plan

9.1. ENVIRONMENT MANAGEMENT PLAN

The Environment Management Plan (EMP) is a site specific plan developed to ensure that the project is implemented in an environmentally sustainable manner where all stakeholders including the project proponents, contractors and subcontractors, including consultants, understand the potential environmental risks arising from the proposed project and take appropriate actions to properly manage that risk. Adequate environmental management measures need to be incorporated during the entire planning, construction and operating stages of the project to minimize any adverse environmental impact and assure sustainable development of the area.

The key benefits of the EMP are that it provides the organization with means of managing its environmental performance thereby allowing it to contribute to improved environmental quality. The other benefits include cost control and improved relations with the stake holders.

EMP includes four major elements:

Commitment & Policy: The proposed project management will strive to provide and implement the Environmental Management Plan that incorporates all issues related to air, land and water.

Planning: This includes identification of environmental impacts, legal requirements and setting environmental objectives. The various potential impacts are discussed under Chapter 4.0.

Implementation: This comprises of resources available to the Project proponent, accountability of contractors, training of operational staff associated with environmental control facilities and documentation of measures to be taken.

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

The EMP that will be put into place consists of those during construction and operating stages of the project and includes the following elements:

- Sewage Treatment and Management
- Hazardous and Solid Waste Management
- Air Pollution Control and Management
- Noise Control and Management

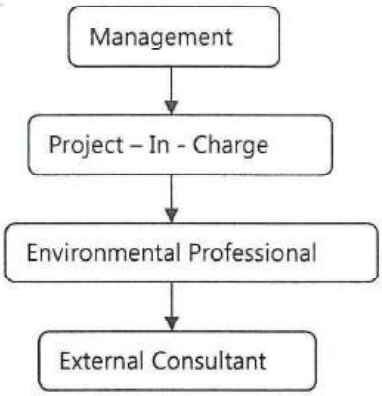
- Storm water management
- Plantation, Landscaping and Land Management
- Management of Social Issues
- Occupational, Safety and Health issues
- Best Management Practices
- Energy conservation
- Environmental monitoring
- Emergency Response Plans for emergency scenarios
- Environmental Management System

A summary of project activities, expected environmental impacts and proposed environmental management measures for controlling the likely impacts are presented in the end of this Chapter.

9.2. ENVIRONMENTAL MANAGEMENT SYSTEM

The Environmental Management System constitutes provision of an Environmental Division, which should be supervised by the project – in – charge of the site and assisted by environmental professionals and external consultancy organization. The task assigned should include compliances to all statutory guidelines, conditions put forth under Environmental Clearance, Compliance to Consent to Establish and Consent to Operate from UPPCB, co-ordination of studies, monitoring and implementation of environmental mitigation measures and any other conditions as requires to be maintained under Environmental Norms & Guidelines.

The Environmental Management Plan shall be implemented in phases, so that optimum benefit could be achieved and it should be synchronized with the construction schedules.



9.3. AIR POLLUTION CONTROL AND MANAGEMENT

9.3.1. CONSTRUCTION PHASE

Air emissions from construction sites can pose health risks to workers, and sensitive receptors surrounding the site, if not managed properly. It is the responsibility of the contractor to provide appropriate safety training; information equipment, signage, security and emergency response plans on the site.

To mitigate the impact of SPM (dust), the following measures are recommended for implementation:

- A dust control plan; and
- Procedural changes to construction activities.

TABLE 9.1 – Dust Control Plan

Fugitive Dust Source Category	Dust Control Actions
Disturbed surface areas	Applying water to at least 80 percent of all inactive accessible disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust.
Unpaved roads	Watering all roads used for any vehicular traffic at least twice per day of active operations; OR Water all roads used for any vehicular traffic once daily and restrict vehicle speed to 15 mph.
Track-out control	Downwash of trucks (especially tyres) prior to departure from site.
Construction Material	Construction material will be covered during transportation and during store at site.

The most cost-effective dust suppressant is water, because a source of water tends to be readily available on a construction site. Water can be applied using water trucks, handheld sprays and automatic sprinkler systems. Furthermore, incoming loads could be covered to avoid loss of material in transport, especially if material is transported off-site.

Procedural Changes to Construction Activities

Electrically operated machinery – Using electrically operated construction machinery is the best way to avoid all externalities produced by diesel engines. This procedural change reduces problems related to emission, idling and maintenance.

Emission Control and Maintenance: The diesel generators used on site, in case of power failure, are maintained properly.

Reduction of On-site Construction Time - Rapid on-site construction is reducing the duration of traffic interference and therefore, reducing emissions from traffic delay. Off-site fabrication of structural components also enhanced the quality of work, as the production takes place in controlled settings and external factors such as weather and traffic do not interfere.

9.3.2. OPERATIONAL PHASE

To mitigate the impact of pollutants from Industrial activities, diesel generator sets and vehicular traffic during operational phase, the following measures are recommended for implementation:

- Vehicle emission controls and alternatives
- At all industries essential air pollution protective measure will be adopted.
- D.G set air pollution control measures
- Use of good quality fuel with low sulphur content
- Periodic maintenance of DG sets as per defined schedule of manufacturer
- Maintaining adequate stack heights
- Vehicle emission controls and alternatives
- Green area development to control air pollution.

Anti-Idling – The underground parking provided in the building will carry signs warning the vehicle driver against idling within the parking lot.

Smooth Flow of Traffic – Sudden acceleration or de-acceleration of vehicles produces more pollution than a vehicle maintaining a constant speed. Smoother flow of traffic within the building premises would ensure lesser pollution from the vehicles.

9.4. NOISE CONTROL AND MANAGEMENT PLAN

9.4.1. CONSTRUCTION PHASE

As indicated in Chapter 4, the construction stage causes an increase in ambient noise levels of the region due to traffic movement and construction machineries and DG set. The particular location of the building ensures that there are fewer receptors for the noise pollution produced by the construction activity. The following mitigation measures will result in the reduction of noise emissions:

- Earplugs are provided to those working very close to the noise generating machinery.

- Strict codes for construction will be implemented where unnecessary noise generating activity such as honking is avoided wherever possible.
- Proposed DG set will be enclosed by acoustic enclose to reduce the noise effect.
- Timely maintenance & service will be done of all machineries and vehicles to control the noise effect.
- To mitigate the noise effect construction work will be done most of day time.

9.4.2. OPERATIONAL PHASE

The impact of the site during the operational phase will be done by industrial activities, traffic movement and Proposed DG set. Possible mitigation measure for further reduction could include:

- All industries will adopt the mitigate measures for noise pollution effect.
- All transporter vehicles engaged in industrial activities will maintain properly.
- At all vehicular parking is being provided in the open space where noise levels are likely to increase significantly during the morning and evening hours due to starting, idling and roaring of vehicles.
- Approach road and sector road will be according to Indian Road Congress.
- Plantation will be done along with road and also develop green belt in industrial periphery.

9.5. WASTEWATER TREATMENT AND MANAGEMENT

9.5.1. Construction Phase

To prevent degradation and maintain the quality of the water source, adequate control measures have been proposed to check the surface run-off, as well as uncontrolled flow of water into any water body. Following management measures are implemented to protect the water quality during the construction phase.

- Avoiding excavation during monsoon season
- Secondary containment is provided in oil/ fuel storage areas. All such storages are on impervious flooring.
- Any wash off from the oil/ grease handling area or workshop is drained through impervious drains. Oil and Grease traps are constructed and water is allowed to leave site only after passing through them.
- All stacking and loading areas are provided with proper garland drains to prevent run off from the site.
- Waste from sanitation facility and domestic waste water will be collect in septic tank.

9.5.2. Operation Phase

Disposal of Wastewater

Sewage wastewater generated by the project area will be treated in Sewage Treatment Plant. The treated water will be used for non-potable application like horticulture and toilet flushing. Effluent generated from industrial area will be treated at every industrial unit level and reused in the unit process, thus the industries will work on zero liquid discharge (ZLD) process. This will not only prevent pollution of receiving water bodies but also will help in conserving fresh water. Water quality norms for effluent are as given in **Table 9.2.**

TABLE 9.2: Discharge Norms for Sewage Treatment Plan

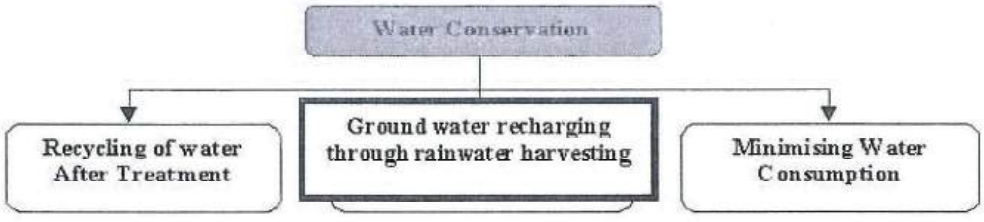
Parameter	Raw Sewage (mg/l)	Treated Sewage (mg/l)
pH	Actual	7 to 7.5 units
Total Suspended Solids	200	<10
Oil & Grease	Actual	<5
Biological Oxygen Demand (BOD 5 days @ 20 C)	250	<20
Chemical Oxygen Demand (COD)	375	<50

To prevent from pollution to ground water and surface water body proper storm water channel and sewer line will developed and maintain regularly.

Thus along with planning for water supply, planning for wastewater treatment and disposal/reclamation is also required. Proposed office building have infrastructure for collection conveyance treatment and environmentally safe disposal of wastewater.

9.6. WATER CONSERVATION AND DEVELOPMENT

The water conservation plan consists of a combination of three major steps depicted below:



Water conservation shall be practiced to the extent possible by use of recycled water for non-potable application like gardening, watering lawns and to make up evaporation losses for cooling towers.

9.6.1. RECYCLING OF WASTEWATER

This treated water will be used in a variety of non-potable uses such as horticulture and flushing. Separate pipelines will be laid for using this water.

The daily water requirement will be about 30369.77 KLD, out of which fresh water requirement is 14572.9 KLD and remaining water will be treated water by MBBR/SBR based STP and re-used for flushing and landscaping purpose. Fresh water will be met through about 40 % from bore wells and 60% water from canal.

9.6.2. MINIMIZING WATER CONSUMPTION

A combination of water saving appliances and water management measures will be planned in all the toilets in the commercial buildings. The message of water conservation will be spread to all users by way of awareness campaigns and circulars. Specific measures that will be implemented include the following:

- Promote awareness on water conservation and reducing water wastage.
- Quick fixing of leaking taps, pipes and toilet cisterns;
- Sweep with a broom and pan where possible, rather than hose down external areas;
- For gardening and flushing: use of recycled water from STP after treatment
- Reduce water delivery in taps, through the installation of aerators on taps;
- A manually pressed button flush valve which stops on release of button;
- Water Efficient Plumbing Fixtures.

9.6.3. ENHANCEMENT OF WATER ENVIRONMENT

Water development shall be practiced by installation of scientifically designed collection chambers. The objective of the exercise will be to reduce surface runoff.

9.6.4. RAIN WATER HARVESTING SCHEME

In the present scenario management and distribution of water has become centralized. People depend on government system, which has resulted in disruption of community participation in water management and collapse of traditional water harvesting system.

As the water crisis continues to become severe, there is a dire need of reform in water management system and revival of traditional systems. A scientific and technological study

needs to be carried out to assess present status so as to suggest suitable mitigative measures for the revival to traditional system/wisdom. Revival process should necessarily be backed by people's initiative and active public participation.

System of collection rainwater and conserving for future needs has traditionally been practiced in India. The traditional systems were time-tested wisdom of not only appropriate technology of Rainwater Harvesting, but also water management systems, where conservation of water was the prime concern. Traditional water harvesting systems were Bawaries, step wells, jhiries, lakes, tanks etc. These were the water storage bodies to meet domestic and irrigation demands. People were themselves responsible for maintenance of water sources and optimal use of water that could fulfill their need.

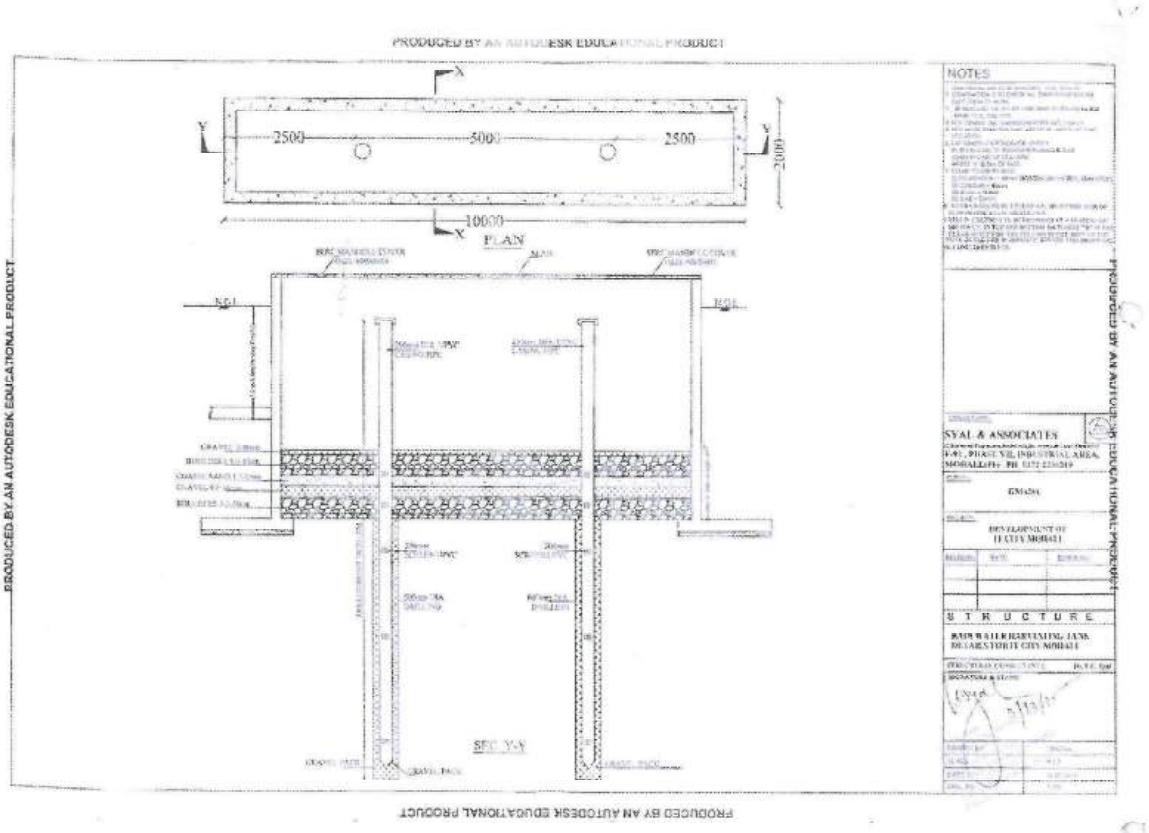


Fig 9.1: Design of Rain water harvesting structure

What is Rain Water Harvesting?

The term rainwater harvesting is being frequently used these days; however, the concept of water harvesting is not new for India. Water harvesting techniques had been evolved and developed centuries ago.

Ground water resource gets naturally recharged through percolation. But due to indiscriminate development and rapid urbanization, exposed surface of soil has been reduced drastically with resultant reduction in percolation of rainwater, thereby depleting ground water resource. Rainwater harvesting is the process of augmenting the natural filtration of rainwater in to the underground formation by some artificial methods. "Conscious collection and storage of rainwater to cater to demands of water, for drinking, domestic purpose & irrigation is termed as Rainwater Harvesting."

Why harvest rainwater?

This is perhaps one of the most frequently asked questions, as to why one should harvest rainwater. There are many reasons but following are some of the important points.

- To arrest ground water decline and augment ground water table
- To beneficiate water quality in aquifers
- To conserve surface water runoff during monsoon
- To reduce soil erosion
- To inculcate a culture of water conservation

How to harvest rainwater:

Broadly there are two ways of harvesting rainwater:

i. Surface runoff harvesting
ii. Roof top rainwater harvesting

(i) Surface run-off harvesting:

In urban area rainwater flows away as surface runoff. This runoff could be caught and used for recharging aquifers by adopting appropriate methods.

(ii) Roof top rainwater harvesting (RTRWH):

It is a system of catching rainwater where it falls. In rooftop harvesting, the roof becomes the catchments, and the rainwater is collected from the roof of the house/building. It can either be stored in a tank or diverted to artificial recharge system. This method is less expensive and very effective and if implemented properly helps in augmenting the ground water level of the area. Components of the roof top rainwater harvesting system

Catchment
Transportation
First flush
Filter

Catchment:

The surface that receives rainfall directly is the catchment of rainwater harvesting system. It may be terrace, courtyard, or paved or unpaved open ground. The terrace may be flat RCC/stone roof or sloping roof. Therefore the catchment is the area, which actually contributes rainwater to the harvesting system

Transportation:

Rainwater from rooftop should be carried through down take water pipes or drains to storage/harvesting system. Water pipes should be UV resistant (ISI HDPE/PVC pipes) of required capacity. Water from sloping roofs could be caught through gutters and down take pipe. At terraces, mouth of the each drain should have wire mesh to restrict floating material.

First flush:

First flush is a device used to flush off the water received in first shower. The first shower of rains needs to be flushed-off to avoid contaminating storable/rechargeable water by the probable contaminants of the atmosphere and the catchment roof. It will also help in cleaning of silt and other material deposited on roof during dry seasons Provisions of first rain separator should be made at outlet of each drainpipe

Filter:

There is always some skepticism regarding Roof Top Rainwater harvesting since doubts are raised that rainwater may contaminate groundwater. There is remote possibility of this fear coming true if proper filter mechanism is not adopted. Secondly all care must be taken to see that underground sewer drains are not punctured and no leakage is taking place in close vicinity. Filters are used for treatment of water to effectively remove turbidity, colour and microorganisms. After first flushing of rainfall, water should pass through filters. There are different types of filters in practice, but basic function is to purify water.

Methods of roof-top rain water harvesting:

Re-Charging ground water aquifers:

Ground water aquifers can be recharged by various kinds of structures to ensure percolation of rainwater in the ground instead of draining away from the surface. Commonly used recharging methods are:-

a. Recharging of bore wells
b. Recharging of dug wells.
c. Recharge pits

d. Recharge Trenches
e. Soak ways or Recharge Shafts
f. Percolation Tanks

Method Adopted for the Project:

The roof top rainwater harvesting through recharge pit process will be used for the recharge of the water at the project site. Rainwater harvesting design has to consider managing collection of water. Recharge pits will be constructed for harvesting rainwater, Mesh will be provided at the roof so that leaves or any other solid waste/debris will be prevented from entering the pit rainwater from roofs will be taken to collection/desisting chambers located on ground. These collection chambers are interconnected to the filter pit through pipes. The filter pit will be circular in shape and will be back-filled with graded material, boulder at the bottom, gravel in the middle and sand at the top. The final disposal of storm /rain water shall be in multiple recharge / rain harvesting pits as per MOEF & CC guidelines to recharge the ground water. The water collected will be used for replenishing the ground water aquifers and creating surface storages for utilization in non-rainy season.

DESIGN BASIS FOR RAIN WATER CALCULATION

RUN – OFF [DISCHARGE]

Q = CIA

Where

Q = run-off (discharge) in cubic meters per hour (m^3/hour).

C = Co-efficient /Impermeability factor of the surface.

I = Intensity of rainfall = Taking 50 mm/hour.

A = Total Catchment area in Hectare.

9.7. SOLID & HAZARDOUS WASTE MANAGEMENT

Solid waste would be generated both during the construction as well as during the operational phase.

9.7.1. CONSTRUCTION PHASE

Wastes from construction activity include construction debris and other waste. The solid waste expected to be generated during the construction phase will comprise of excavated materials, used bags, bricks, concrete, MS rods, tiles, wood etc. Being predominantly inert in nature construction and demolition waste does not cause chemical or biological pollution. Hence, maximum effort will be done to reuse the waste.

Saleable items such as metal scrap will be kept separately and cleared off as soon as possible.

Large unusable material will be sent for land filling in designated areas of Municipal Corporation.

Recycled aggregate will be used for filler application, and as a sub-base for road construction. Mixed debris with high gypsum, plaster, shall not be used as fill, as they are highly susceptible to contamination, and will be given to recyclers.

The following steps (Figure 9.1) are proposed to be followed for the management of solid waste:

- Construction yards are proposed for storage of construction materials
- The excavated material such as topsoil and stones will be stacked for reuse during later stages of construction
- Excavated top soil will be stored in temporary constructed soil bank and will be reused for landscaping for the proposed project.
- Remaining soil shall be utilized for refilling / road work / rising of site level at locations/ selling to outside agency for construction of roads etc.

The municipal solid waste generation during the construction phase at Proposed Project site is expected to be 100 kg/day (considering 400 laborers). The waste collected will be segregated in terms of Bio degradable and Inert Waste. The segregated waste will be transported to nearby waste dumping site.

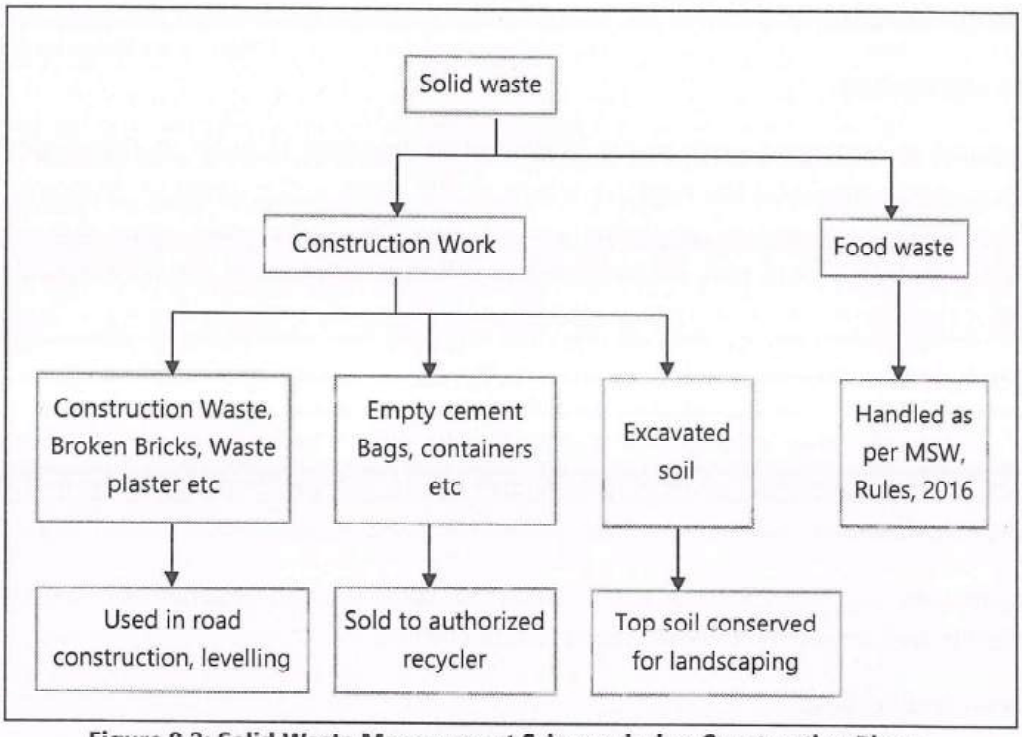


Figure 9.2: Solid Waste Management Scheme during Construction Phase

Other Waste

Construction sites are sources of some toxic substances, such as paints, solvents, adhesives and sealants. Empty containers of these substances shall be returned back to the manufacturers or dealers as the case may be. Some management practices that will be followed;

Paintbrushes and equipment for water and oil based paints shall be cleaned within a contained area and shall not be allowed to contaminate site soils, watercourses, or drainage systems.
Adequate storage facilities for hazardous waste materials will be provided and balance material after use, if any, will be taken away by the supplier.
All hazardous waste containers with the waste being stored, including date of generation, will be labeled
Students and Employees will be educated on hazardous waste storage.
Students and Employees will be instructed for identification of hazardous and solid waste.

9.7.2. OPERATIONAL PHASE

During the operation phase, waste will generate from LIG units, EWS units, Community hall, School, Retail area, Clinic, Beauty parlor, ATM, Community Centre and Dispensary.

Municipal solid Waste will be handled as per Municipal Solid Waste (Management and Handling) Rules 2016.

Waste segregation

Segregation or sorting of waste at its source will be practiced in order to encourage reuse/ recycling and to maximize the negative effects of the waste and increase its economic value. With segregation at source recyclables do not lose their commercial value due to cross contamination. Dedicated bins will be placed to collect biodegradable and non-biodegradable wastes.

Collection bins

Daily and door to door collection of waste will take place. Daily sweeping and collection of waste from roads and other common facility area would also be done daily in the morning by the same operator.

For waste collection either carts or a dedicated truck could be used. Separate collection for bio-degradable and non-biodegradable wastes will be ensured.

Management Scheme:

- Solid waste management scheme is discussed below:
- Three bin waste collection system will be used within the complex – green bins for biodegradable wastes, blue bins for non-biodegradable recyclable wastes and grey for non-biodegradable non-recyclable wastes will be provided.
- The waste will be transferred to transfer station.
- Personnel engaged in the collection, segregation and composting will be trained and demonstrated to make them proactive and efficient in the solid waste management practices. Grass clippings from the mowing of the lawns shall be collected separately and converted into manure.
- The waste shall be handled according to Municipal Solid Waste (Management and Handling) Rules 2016.
- Bio-medical wastes to be generated from the health centers, shall be handled as per the Biomedical wastes (management and Handling) Rules, 2003. These wastes will not be stored or disposed with other municipal wastes and stored at the facility for no more than 24hours.
- E-waste shall be collected stored and disposed in accordance with E-waste Management Guidelines.
- Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 will be strictly followed.

- Horticultural waste which will be collected at the secured location such that it will not hinder daily activity schedule or washed away by the surface run off causing choking of drains, etc. and will be separately disposed off along with biodegradable waste.

Bio-medical waste:

There will be a hospital and 2 dispensaries as a source of Bio-medical Waste in the project area. Biomedical waste will be handled as per Bio-medical waste (Management and Handling) Rules 2016. Bio-medical waste generated at project site will be handover to authorized recycler/ controller.

The bio-medical waste shall be segregated into containers or bags at the point of generation prior to its storage, transportation, treatment and disposal as per BMW rules 2016.

The operator of common bio-medical waste treatment facility will transport the bio-medical waste from the premises of an occupier to any off-site bio-medical waste treatment facility only in the vehicles having label.

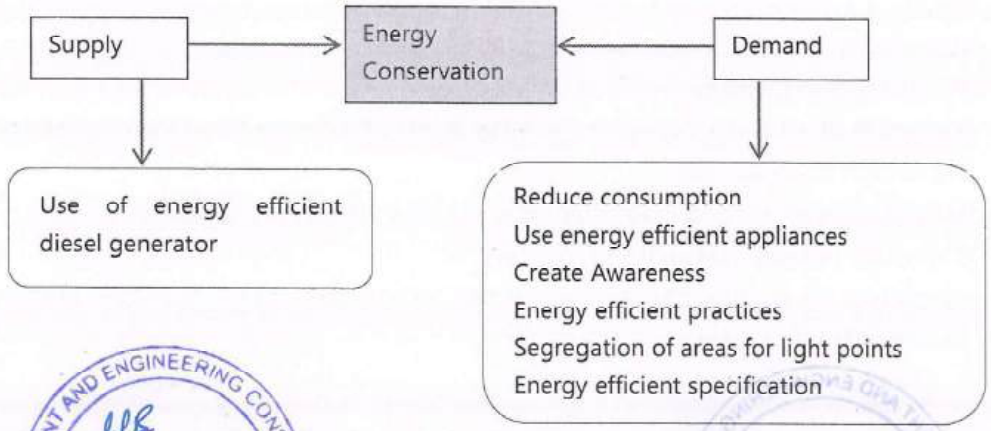
E- waste:

From the project, E-wastes in the form of CFL lights, LED, unused mobile, computer appliances etc. will be generated, these will be stored in isolated place and disposed to authorized recyclers.

9.8. Energy Conservation

Energy conservation measures are often the easiest, quickest and cheapest way to reduce costs and be environmentally pro-active.

Energy conservation program will be implemented through measures taken both on energy demand and supply.



Energy conservation will be one of the focuses during the complex planning and operation stages. The conservation efforts would consist of the following:

- Architectural design
- Efficient use of air-conditioning through Building Management System and use of highly efficient screw chillers for AC and VFD (variable frequency drive) controlled chilled water pumps.
- Use of gravity-feed system & regular flush tanks
- Maximum use of natural lighting through design of the building (having maximum permissible floor to floor height
- High performance glazing - hermetically sealed double-glazing on West facade
- Insulation of solid walls
- Energy Saving Practices
- Use of energy efficient appliances
- Constant monitoring of energy consumption and defining targets for energy conservation
- Use of compact fluorescent lamps.
- Use of high reflective glasses to reduce transfer of heat inside the building and reduction in load on Air Conditioning system.
- Behavioral Change on Consumption
- Promoting employees awareness on energy conservation
- Training staff on methods of energy conservation and to be vigilant to such opportunities

9.9. Plantation, Landscaping and Ecological Management

A green belt or tree plantation helps to arrest the effects of particulate matter and gaseous pollutants in the area besides playing a major role in environmental conservation efforts. Contribution of plants and trees can be summarized as follows:

- Plants clean and purify existing air as well as manufacture oxygen.
- Plants are good absorbers of Sulphur di-oxide.
- Reduction in wind velocity resulting in the arrest of movements of sand and soil particles.
- Prevention of soil erosion
- Modification of micro-climate; change in air temperature are moderated.
- Reduction in evaporation of soil moisture.
- Air created through photosynthesis dilutes polluted air and increases the ratio of "clean to dirty" air.

- Moisture that plants give off traps airborne particles and acts as a filter for some pollutants.
- Leaves of plants trap airborne particles and hold them until they are washed to the ground by rain.
- Noise can be reduced. Plant parts break up sound waves, changing their direction and reduce their intensity. Densely grown plants are best for sound control.
- In this scheme 746887.82 sq m area (about 11% of the total project area) to be developed as green area.

9.9.1. Construction phase:

The proposed project site is barren land and has few shrubs which will be preserved as a part of greenbelt development. During the construction period, it is to be ensured that there is no exploitation of trees around the project area especially for obtaining fuel wood by the workers. Guards may be deputed to ensure the same.

9.9.2. Operation phase:

An area of 746887.82 m2 has been identified for greenbelt development. The green area should be properly maintained and dead plants should be regularly replaced.

9.10. EMP For Socio-Economic Environment

The Social management plan has been designed to take proactive steps and adopt best practices, which are sensitive to the social and economical cultural setting of the region.

9.10.1. Impact on Socio Economic Environment

Proposed project will have positive impacts on the local people. The adverse impact includes safety risk due to project transportation, influx of population. The project will benefit the people living in neighboring villages by giving preference to them in relation to direct and indirect employment associated with various project activities and boosts the local economy.

There is a good opportunity for us to showcase the housing development in the country, improve efforts in addressing the need of decent project. This begins by making sure that every family lives in decent house. The proposed project will fulfill the housing requirements of elite urban masses besides generating revenue for state government and development authorities.

They are providing the affordable housing for all income group people. The proposed project will create direct employment opportunities to at least 400 people during the construction phase. The project is targeted for the low and middle income group people, the project will

cater to the good quality affordable housing demands of the city. Increased income security will contribute to the empowerment of the most vulnerable sections of the society.

9.10.2. EMP Budget

The EMP budget for the project is given in table 9.4 below.

Table 9.3: EMP Budget

S No	Particulars	Proposed Capital Cost (In lacs)	Recurring Cost in (In lacs)
1.	Management of Air pollution	25.0	4.0
2.	Sewage Treatment Plant sewerage laying	9784	25
3.	Environment Monitoring and Management	4.0	4.0
4.	Energy conservation plan	150	15
5.	Rain Water Harvesting (Recharge Pits & Drains)	331	10
6.	Green Belt & Park Development	600	100
Total		**10894**	**158**

CHAPTER - 10

10. Chapter - X

Summary and Conclusions

10.1. Introduction

This section of the manual provides information and guidance on Environmental Impact Assessment (EIA) in townships and area development projects. It is intended as a resource for those who are involved in EIA practice. Particular emphasis is given to concepts, procedures and tools that are used currently or are potentially relevant in preparing environmental impact assessment reports for clearance from regulatory agencies.

EIA is a technical exercise, to predict environmental impacts, assess their significance, and provide recommendations for their mitigation. The assessment covers construction and operation of the development and can consider site decommissioning. EIA report covers a wide range of technical disciplines and covers areas such as noise and vibration, air quality, ecology, contamination, water quality & hydrology, archaeology & cultural heritage, landscape & visual character, sustainability and socio-economics. The EIA report will describe how the project has been improved through the EIA process and what alternatives were considered.

10.2. Project Description

Greater Mohali Area Development Authority (GMADA) had obtained the Environmental Clearance from SEIAA, Punjab for the development of Township and Area Development project namely "IT City" enclosing an area of 709.82 Hectare (7098226.62 sq m). Environmental Clearance was accorded in the year 2014 vide letter no SEIAA/2014/2634 dated 30-8-2014 for the following categories as per layout plan bearing drawing no. D.T.P. (SAS Nagar) 785/13 dated 21-01-2013.

- Residential area
- Commercial area
- Institutional area
- Non- polluting IT industries

Now the GMADA Authority has revised its layout plan approved on 10/01/2018 bearing no D.T.P. (SAS Nagar) 2315/18 and has change the land use pattern with following category-

- Residential area
- Commercial area
- Institutional area

- Non- polluting IT industries
- Green Category Industries
- Orange Category Industries (Specified by GMADA)
- Ware house

Salient features of the proposed project site

Feature	Details		
Name of project	Revised Environmental Clearance for proposed development of Townsh Area namely "IT City" At Sector 66-B, 82-A, 83-A, 101-A Mohali (Punjab)		
Size of the project	676.92 hectare (1672.71 acre)		
Nearest Highway	NH -64	3.9	SE
	NH- 22	5.3	E
	NH- 21	4.9	ENE
	NH- 73	11.3	E
	SH- 4	1.75	W
	SH- 12 A	6.0	N
Nearest Railway station	SAS Nagar R.S – 1.5 Km towards N		
Nearest Airport	Chandigarh Airport, New Delhi – 3.4 Km towards NE		
Water requirement & Source of water	Construction phase: 150 KLD		
	Operational phase: 30.36 KLD From Bore well and Canal water		
Sewage Treatment plant	Two number of 12.5 MLD		
Domestic solid waste	47187.9 kg per day		
Power requirement	Construction phase: 10 kVA		
	Operational Phase: 141 MVA		
Budget for Project	Total Project Cost: **about 750 crore**		
	Environmental Management Program:		
	Corporate Environmental Responsibility: **about 7.5 crore**		
	Labor Welfare : **about 7.5 crore**		
Forests	Gidarpur P.F.	7.4	NW
	BIR Barauli P.F.	9.95	SSE
	BIR Baqarpura P.F.	9.6	SSE
	BIR Dadrala P.F.	11.1	SE
	Machhela R.F.	9.24	E
	Dariya R.F.	5.27	NE
	Lake R.F.	11.52	NNE
	Nepli R.F.	13.3	NE
	Kansal Ki Koh R.F.	13.2	NE
	Kholhai Raitan R.F.	11.9	ENE
Water Body	Sukhna Lake	10.6	NE
	Ghagghar River	6.4	SSE
	Choi and Choa Nala	Within the Project Site (IT City)	

State/ National Boundary	Chandigarh Territroy Boundary	~2.25	N
	Haryana State Boundary	~5.85	E

10.3. Description of the Environment

This section contains the description of baseline studies of the study area. The data collected has been used to define the existing environment scenario around the proposed project against which, the potential impacts of the project has been assessed.

The baseline data collection was carried out to cover the following aspects:

- Ambient Air Quality
- Water Quality
- Ambient Noise Quality
- Soil Quality
- Land Environment
- Biodiversity
- Socio-economic status

10.4. Anticipated Environmental Impacts & Mitigation Measures

Prediction of impacts is the most important component in any environmental impact assessment study as it is purpose of deriving contribution in environment from the proposed project in the surrounding region. The primary function of an environmental impact assessment study is to predict and quantify the magnitude of impacts, evaluate and assess the importance of the identified changes, present information and monitor actual changes. Environmental impacts could be positive or negative, direct or indirect, local or regional and also reversible or irreversible. Several mathematical/ statistical techniques and methodologies are available for predicting impacts due to developmental activities on physico – chemical, ecological and socio – economic components of environment. The results obtained from the predictions are to be superimposed over the baseline (pre- project) status of environmental quality to derive the ultimate (post – project) scenario of environmental quality status.

10.5. Analysis of Alternatives (Technology & Site)

The consideration of alternatives of a development project is one of the more proactive sides of environmental assessment – enhancing the project design through examining options instead of only focusing on the more defensive task of reducing adverse impacts of a single design. This calls

for the systematic comparison of feasible alternatives for the project site, technology and operational alternatives. Alternatives are compared in terms of their potential environmental impacts, capital and recurrent costs, suitability under local conditions and institutional, training and monitoring requirements.

Examining alternative means of carrying out a project involves answering the following three questions:

(i) What are the alternatives?
(ii) What are the environmental impacts associated with each alternative? and
(iii) What is the rationale for selecting the preferred alternative?

10.6. Environmental Monitoring Program

Environmental monitoring provides feedback about the actual environmental impacts of a project. Monitoring results help judge the success of mitigation measures in protecting the environment. They are also used to ensure compliance with environmental standards, and to facilitate any needed project design or operational changes. A monitoring program, backed up by powers to ensure corrective action when the monitoring results show it necessary, is a proven way to ensure effective implementation of mitigation measures. By tracking a project's actual impacts, monitoring reduces the environmental risks associated with that project, and allows for project modifications to be made where required.

Technical aspects of monitoring the effectiveness of mitigation measures (incl. Measurement methodologies, frequency, location, data analysis, reporting schedules, emergency procedures, detailed budget & procurement schedules)

- To establish a baseline; that is, gathering information on the basic site characteristics prior to development or to establish current conditions;
- To estimate inherent variation within the environment, which can be compared with the variation observed in another specific area;
- To make comparisons between different situations (pre-development and post-development; upstream and downstream; at different distances from a source) to detect changes; and
- To make comparisons against a standard or target level.
- Compliance monitoring is a commonly practiced form of environmental monitoring.

The purpose of compliance monitoring is to ensure that the quality or quantity of an environmental component is not altered by a human activity beyond specified regulatory standards.

10.7. Additional Studies

For preparation of EIA /EMP report as per requirement of EIA Notification 2006 and subsequent amendments additional studies like risk assessment & disaster management plan was carried out to assess the impacts due to the proposed project.

10.8. Project Benefits

The development projects have varied embedded connotations, like the backbone of modern economy. Development projects promote good residential facilities in planned manner, amenities, employment opportunities, improving earning and thereby, enhancing the quality of life. This in turn enhances the demand for development projects. This two-way interaction works through a host of inter-sectoral forward and backward linkages effects and dynamic externalities, services and labour and thus helps to shape the economic geography of the region.

The project road will have many benefits for the area and the region in various ways. The benefits of the project are described below in following subsections. The development project plays a significant role in changing the socio-economic condition of the living of people of a region through dynamic externalities that such development often generates. The benefits of the development project may also be seen from a different angle, viz., the local benefit and the wider regional or national level benefit. The entire regional and national economy lying beyond this neighbourhood will also be benefited from the development projects. Such effect may be called as the local, regional or national level benefits. Further the benefit may be direct or indirect in nature.

10.9. ENVIRONMENT MANAGEMENT PLAN

The Environment Management Plan (EMP) is a site specific plan developed to ensure that the project is implemented in an environmentally sustainable manner where all stakeholders including the project proponents, contractors and subcontractors, including consultants, understand the potential environmental risks arising from the proposed project and take appropriate actions to properly manage that risk. Adequate environmental management measures need to be incorporated during the entire planning, construction and operating stages of the project to minimize any adverse environmental impact and assure sustainable development of the area.

The key benefits of the EMP are that it provides the organization with means of managing its environmental performance thereby allowing it to contribute to improved environmental quality. The other benefits include cost control and improved relations with the stake holders.

EMP includes four major elements:

Commitment & Policy: The proposed project management will strive to provide and implement the Environmental Management Plan that incorporates all issues related to air, land and water.

Planning: This includes identification of environmental impacts, legal requirements and setting environmental objectives. The various potential impacts are discussed under Chapter 4.0.

Implementation: This comprises of resources available to the Project proponent, accountability of contractors, training of operational staff associated with environmental control facilities and documentation of measures to be taken.

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

The EMP that will be put into place consists of those during construction and operating stages of the project and includes the following elements:

- Sewage Treatment and Management
- Hazardous and Solid Waste Management
- Air Pollution Control and Management
- Noise Control and Management
- Storm water management
- Plantation, Landscaping and Land Management
- Management of Social Issues
- Occupational, Safety and Health issues
- Best Management Practices
- Energy conservation
- Environmental monitoring
- Emergency Response Plans for emergency scenarios
- Environmental Management System

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CHAPTER - 11

11. Chapter - X

Disclosure of Consultant Engage

DECLARATION BY CONSULTANT

Declaration by Experts contributing to the "EIA/EMP Studies for Proposed Development of township and area development namely "IT City": at sec. 66-B, 82- A, 83- A & 101- A Mohali (Punjab) by Greater Mohali Area Development Authority".

I, hereby, certify that I was a part of the EIA team in the following capacity that developed the above EIA.

EIA coordinator: **Dr. Meena Bhaduri**

Signature:

Date:

Period of involvement: **September 2017 – till date**

Contact information: info@gmecinternational.com

Functional Area Experts:

S. No.	Functional Areas	Name of the Expert/s	Involvement (Period and Task**)	Signature and Date
1.	FAE - AP	Mr. Yogesh Poonia	**March 2018 to August 2018** Site visits followed by selection of monitoring locations, supervision of air quality monitoring, identification of impacts on Air quality, suggesting mitigation measures and contribution to EIA documentation.	
	TMs	Mr. Omprakash Kumar		
		Miss Kamod Rathore		
2.	FAE - WP	Mr. Yogesh Poonia	**March 2018 to August 2018** Site visit & supervision & checking of sampling locations for surface water & ground water samples & their analysis results, identification of impacts, evaluation of water pollution control management, finalization of mitigation measures and contribution to EIA documentation.	
	TMs	Mr. Omprakash Kumar		
		Miss Kamod Rathore		

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3.	FAE - SHW	Dr. Alok Pandey	**March 2018 to August 2018** Identification of waste generated from the site, studying adequacy of mitigation measures for management of hazardous waste and contribution to EIA documentation.	
	FAA	Mr. Omprakash Kumar		
4.	FAE - SE	Dr. Meena Bhaduri	**March 2018 to August 2018** Site visit and collection of secondary and primary from surrounding area/villages of the proposed project. For impact identification and mitigation measures, identified village wise amenities and needs.	
	FAA	Mr. Raj Kumar Tailor		
5.	FAE - EB	Dr. Alok Pandey	**March 2018 to August 2018** Site visit and collected secondary data from forest/ fisheries/ agricultural department. conduct of ecological survey, assessment of these impacts of proposed project activities on the biological environment, and contribution to EIA documentation.	
		Miss Kamod Rathore		
	FAA	Mr. Sunil Lamba		
6.	FAE - HG	Dr. Meena Bhaduri	**March 2018 to August 2018** Designing of ground water table measurement and monitoring network, computation of ground water recharge, flow rate and direction. Determination of impact of withdrawal of ground water. Preparation of water budget for the project.	
7.	FAE - SC	Dr. Sita Ram Bhakar	**March 2018 to August 2018** Collection of primary data, finalization of soil sampling locations, sampling of soil in study area. Identification of impacts on soil and suggesting mitigation measures like soil erosion management. Finalization of technical environmental monitoring and management plan.	
		Mr. U.N. Seth		
8.	FAE - AQ	Dr. Meena Bhaduri	**March 2018 to August 2018** Ambient Air Quality monitoring at the selected locations. Collection of micro meteorological data from the proposed site. Developing micro meteorological data for use in modelling to predict incremental pollution load due to proposed project.	
	FAA	Mr. Yogesh Poonia		

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9.	FAE - NV	Dr. Shishir Chandra Bhaduri	**March 2018 to August 2018** Checking of noise sampling results, analysis of data, identification of impacts and mitigation measures.	
10.	FAE- LU	Mr. Vikas Kumar Samaria	**March 2018 to August 2018** Collection of GPS readings of proposed well, Georeference of toposheets and satellite images, preparation of base map from Toposheet, preparation of Landuse/ land cover from satellite imagery.	
	TM	Mr. Omprakash Kumar		
11.	FAE - RH	Mr. Pawan Sut Sharma	**March 2018 to August 2018** Identification of process & storage tank hazards by using FETI criteria, Pool Fire accidents from Diesel storage and lethality damages, DMP and EPP for onsite & offsite were provided.	
	TM	Mr. Sunil Lamba		

Declaration by the Head of the accredited consultant organization/ authorized person

I, **Vinod Kumar Saharan**, hereby, confirm that the above mentioned experts prepared the **"EIA/EMP Studies for Proposed Development of township and area development namely "IT City": at sec. 66-B, 82- A, 83- A & 101- A Mohali (Punjab) by Greater Mohali Area Development Authority".** I also confirm that the consultant organization shall be fully accountable for any mis-leading information mentioned in this statement.

Signature:

Name: **Vinod Kumar Saharan**

Designation: **CEO**

Name of the EIA consultant organization: **Global Management And Engineering Consultants International**

Saharan Tower, 308, Officers Campus Extension, Near Sanskar School, Sirsi Road, Khatipura, Jaipur -302012 (Rajasthan)

NABET Certificate No & Issue Date: **NABET/EIA/1619/IA 007 Valid Up to: February 03, 2019**

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ANNEXURE

LOCATION MAP
IT CITY MOHALI
DISTRICT - SAS NAGAR,
PUNJAB

MAP NOT TO SCALE

PROJECT SITE

To Ambala
Lalru
NH-5
Dera Bassi
Zirakpur
MOHALI
Sohana
Landran
Kharar
NH-21
Tiwar
NH-205
Kurali
Mulanpur

LOCATION MAP

N S E W NE NW SE SW

Annx - 1

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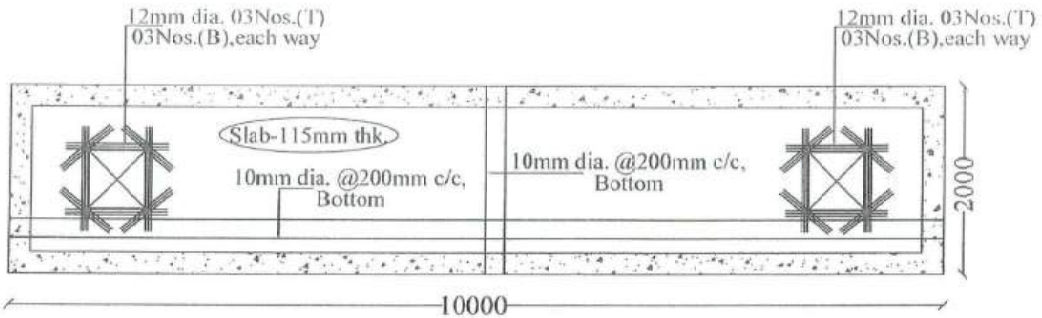
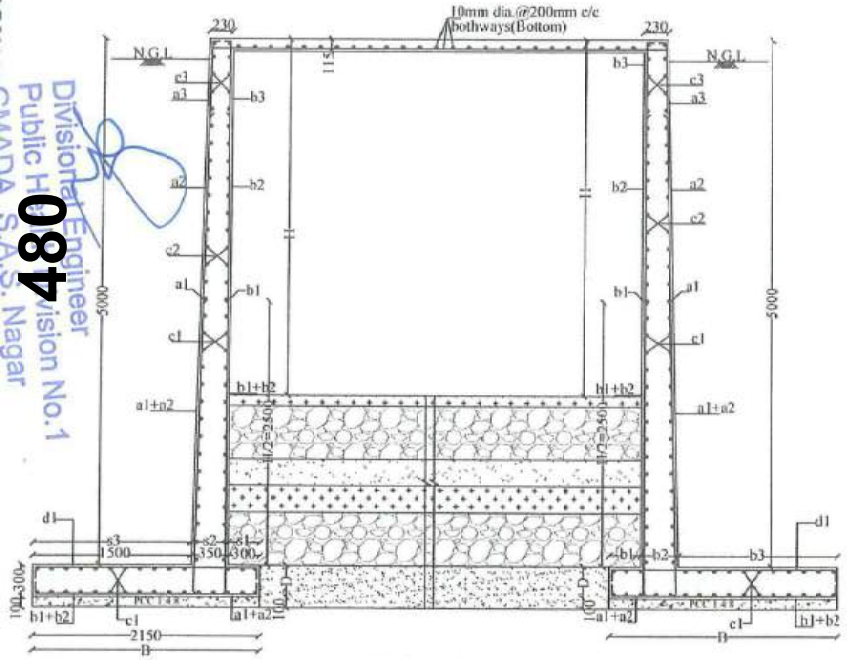


ROOF SLAB



SEC. X-X

Height of wall	Schedule of Reinforcement Bars & dimensions													
H	B(mm)	s1(mm)	s2(mm)	s3(mm)	D(mm)	a1(c/c)	a2(c/c)	a3(c/c)	b1(c/c)	b2(c/c)	b3(c/c)	c1(c/c)	c2(c/c)	c3(c/c)	d1(c/c)
5.0M	2150	300	350	1500	300	16mm dia.@100mm	12mm dia.@100mm		12mm dia.@200mm	12mm dia.@200mm		10mm dia.@150mm	10mm dia.@200mm		10mm dia.@200mm
6.0M	2500	300	450	1750	400	16mm dia.@100mm	12mm dia.@100mm		12mm dia.@200mm	12mm dia.@200mm		10mm dia.@150mm	10mm dia.@200mm		10mm dia.@200mm
7.0M	3350	600	750	2000	600	20mm dia.@140mm	16mm dia.@280mm	16mm dia.@280mm	16mm dia.@140mm	16mm dia.@280mm	16mm dia.@280mm	16mm dia.@100mm	12mm dia.@150mm	12mm dia.@200mm	16mm dia.@100mm

NOTES

1. DIMENSIONS ARE TO BE READ NOT TO BESCALED.
2. CONTRACTOR IS TO CHECK ALL DIMENSIONS BEFORE EXECUTION OF WORK.
3. Ø INDICATES THE DIA OF HYSD BARS OF GRADE Fe 500 REFER TO IS: 1786-1979
4. FOR CENTER LINE DIMENSIONS REFER ARCH.DRG'S.
5. NOT MORE THAN 50% BARS ARE TO BE LAPPED AT ONE LOCATION.
6. LAP LENGTH / ANCHORAGE LENGTH:
   (i) 50d IN CASE OF FOUNDATION,BEAM & SLAB
   (ii) 45d IN CASE OF COLUMNS
   WHERE 'd' IS DIA OF BARS.
7. CLEAR COVER TO REINF.:
   (i) FOUNDATION = 60mm (BOTTOM), 30mm(SIDE), 25mm(TOP)
   (ii) COLUMN = 40mm
   (iii) BEAM = 30mm
   (iv) SLAB = 25mm
8. EXTRA BARS TO BE EXTEND 0.3L ON EITHER SIDE OF SUPPORTING BEAM OR COLUMN.
9. THIS IN COLUMNS TO BE PROVIDED AT A SPACING OF 100MM C/C IN TOP AND BOTTOM 1/6 WHERE "H" IS THE CLEAR HEIGHT OF THE COLUMN IN THE REST OF THE ZONE OTHER TIES IS 100MM C/C & INNER TIES 200MM C/C.
10. CONC USED IS M25.

CONSULTANTS :

SYAL & ASSOCIATES
(Chartered Engineers,Architects,Surveyors & Land Planners)
F-91 , PHASE VII, INDUSTRIAL AREA,
MOHALI.(Pb) PH 0172-2236219

CLIENT :-
GMADA

PROJECT:-
DEVELOPMENT OF
IT CITY MOHALI

REVISION :	DATE:	REMARKS :

S T R U C T U R E

RAIN WATER HARVESTING TANK
DETAILS FOR IT CITY MOHALI

STRUCTURAL CONSULTANT : Dr. L C Syal

SIGNATURE & STAMP:

DRAWN BY	UPASNA
SCALE	N.T.S
DATE	14-10-2015
DRG. NO.	S-102

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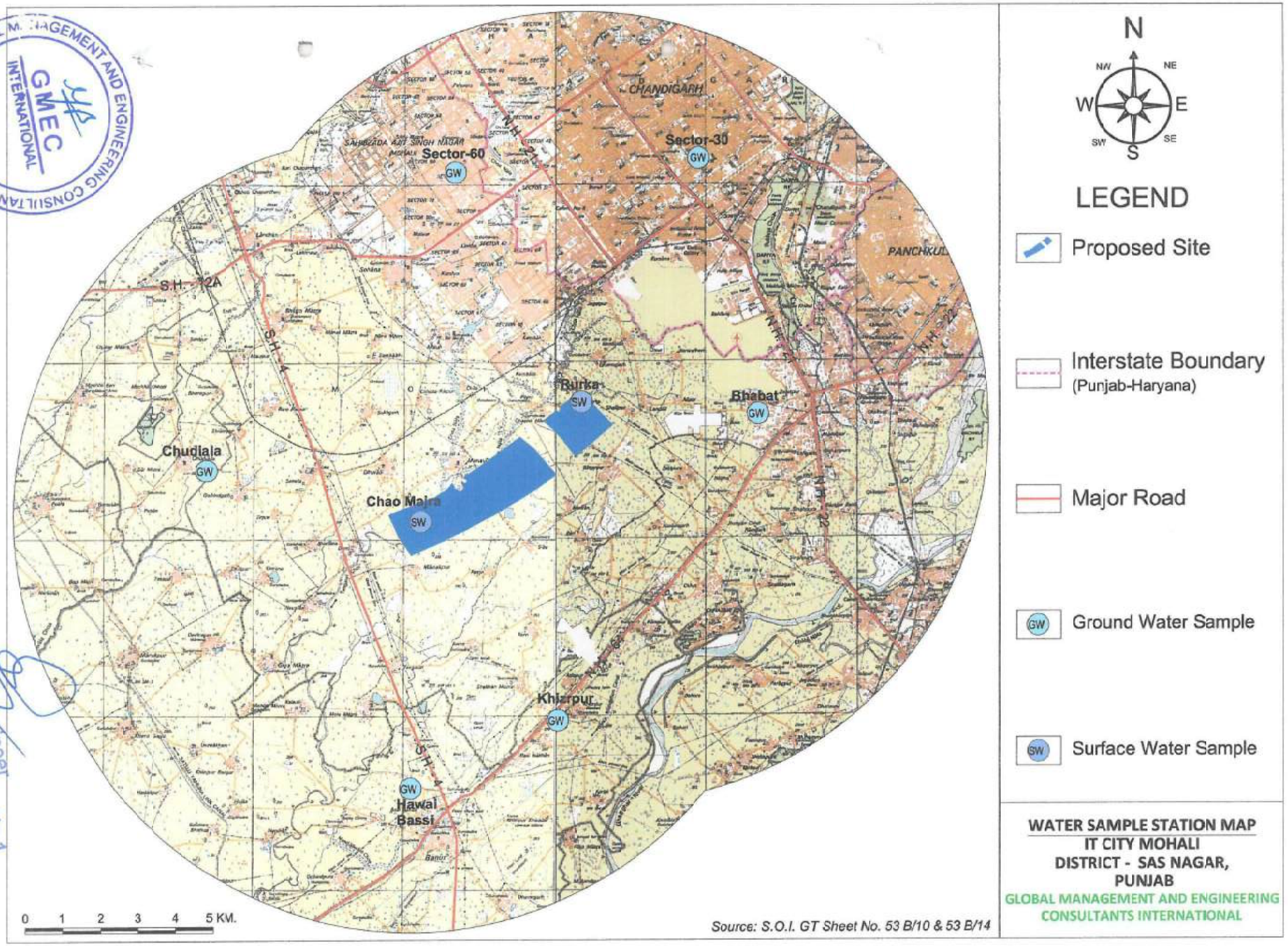

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GMADA, S.A.S. Nagar

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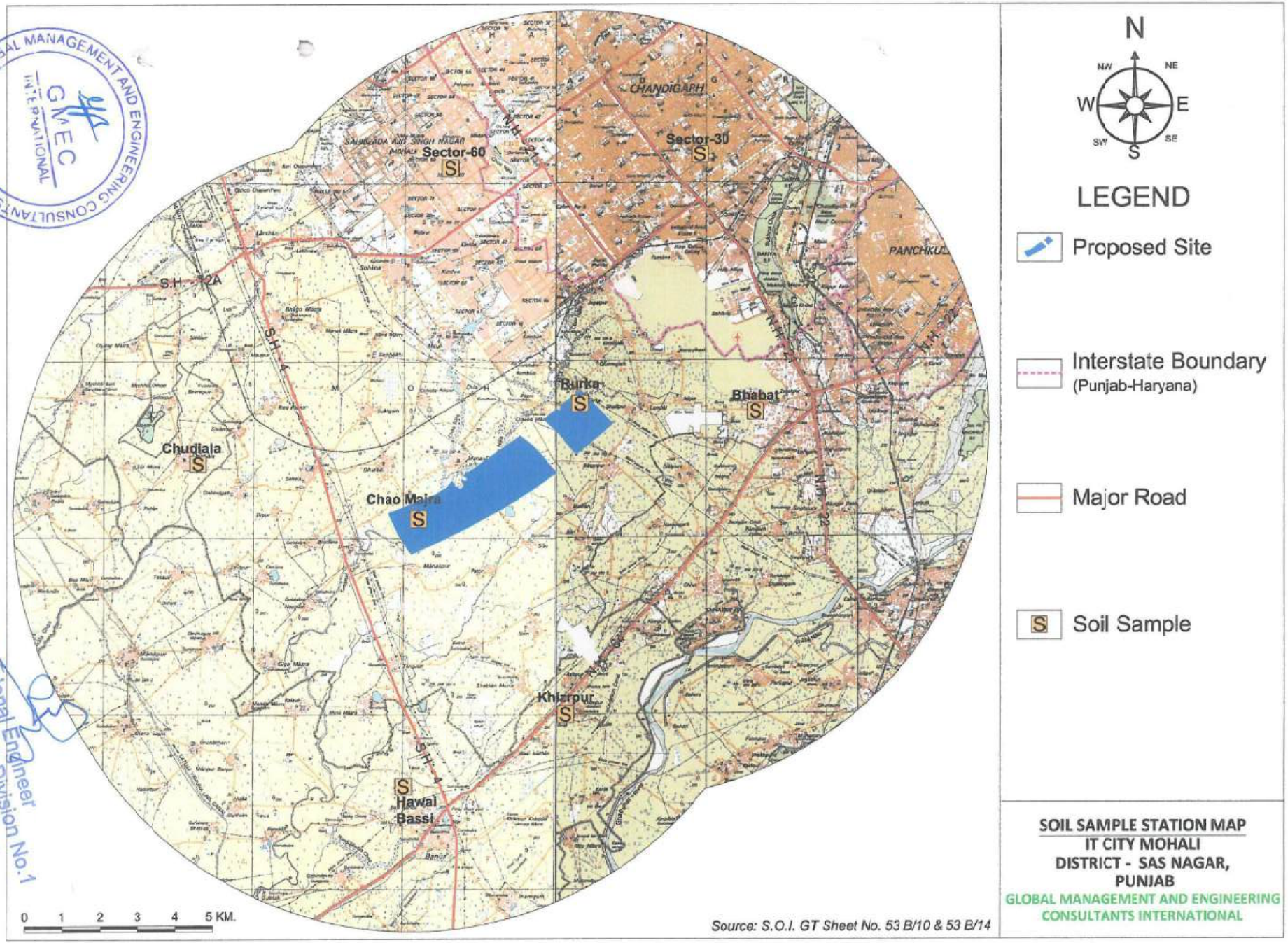

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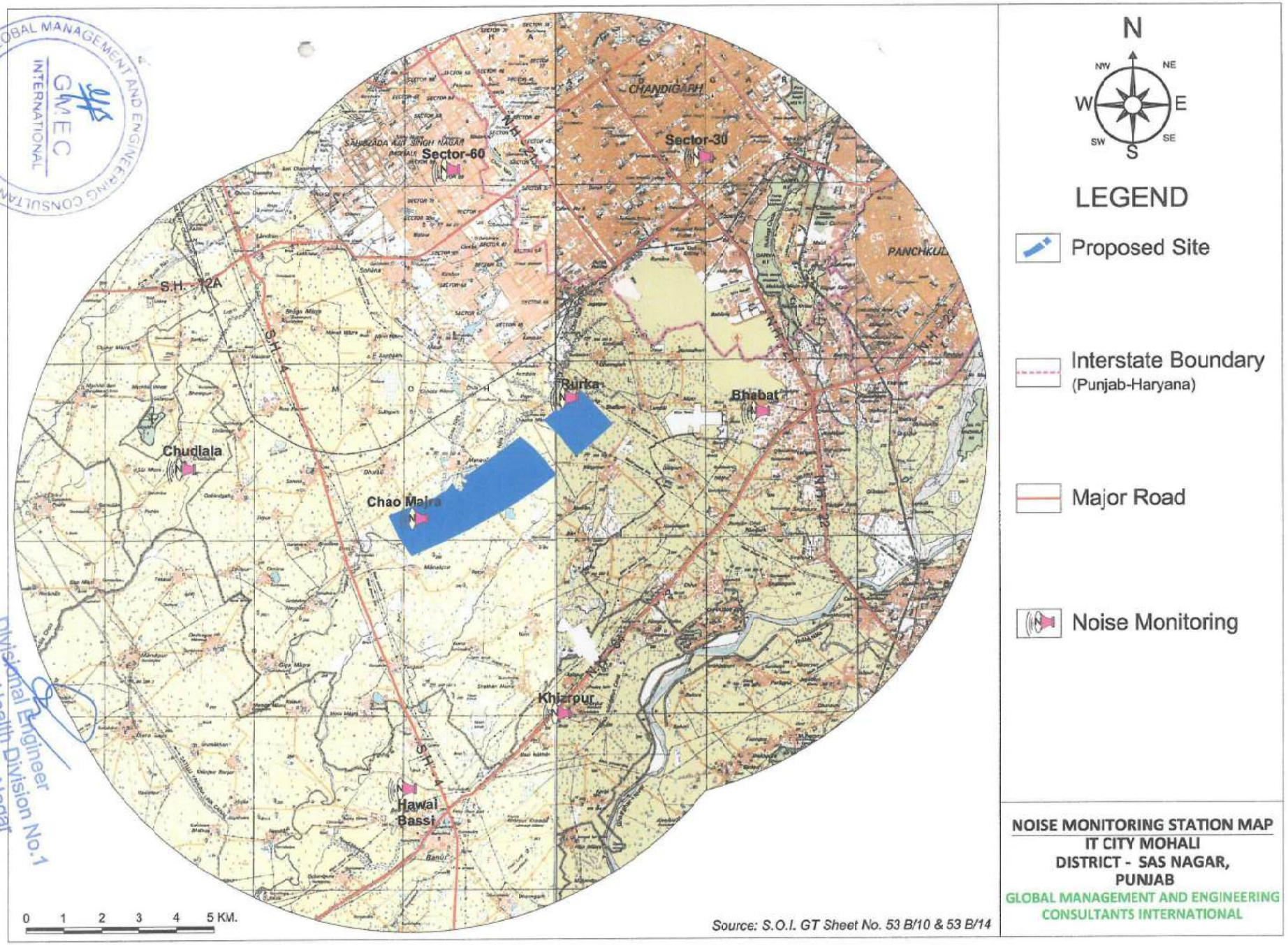

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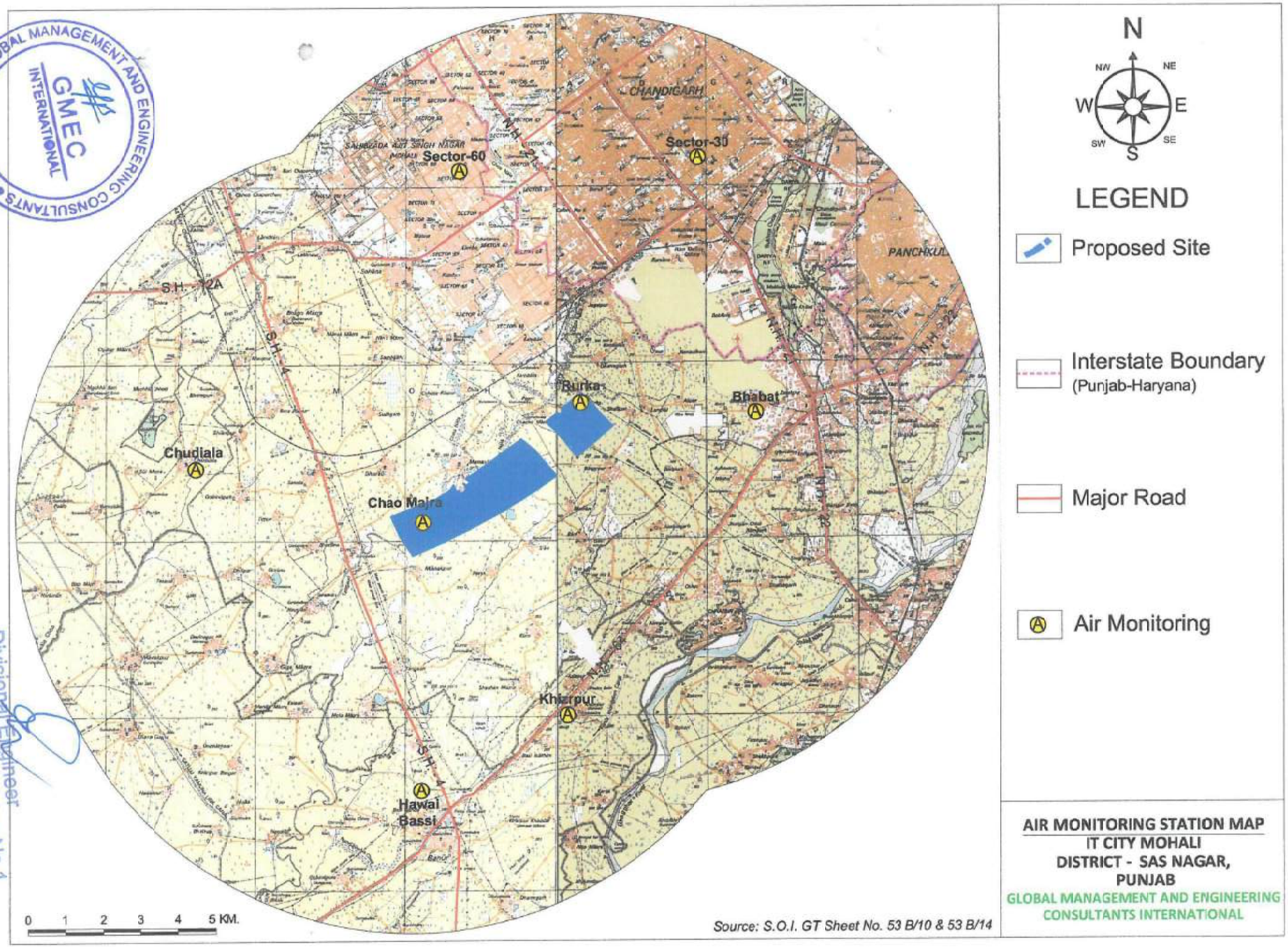

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GMADA - Knowledge Park, Sector 66, 82 & 83 Mohali.doc

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY PUNJAB
Ministry of Environment and Forests, Government of India
O/O Punjab Pollution Control Board,
Vatavaran Bhawan, Nabha Road,
Patiala – 147 001
Telefax:- 0175-2215636

No. SEIAA/2634 Dated: 30.8.14

Registered

To

Sh. Devinder Singh,
The Divisional Engineer (PH-1),
Greater Mohali Area Development Authority (GMADA),
PUDA Bhawan, Sector-62,
SAS Nagar (Mohali)-160062

Subject: Environmental Clearance for development of a Township namely "Knowledge Park" in Sector 66-B, 82-A, 83-A, 101-A Mohali by M/s Greater Mohali Area Development Authority (GMADA).

This has reference to your application for obtaining environmental clearance under EIA notification dated 14.09.2006 for development of a Township namely "Knowledge Park" in Sector 66-B, 82-A, 83-A, 101-A Mohali and subsequent presentation given before the State Level Expert Appraisal Committee (SEAC) for seeking prior environmental clearance for subject cited project as required under the EIA Notification, 2006. The proposal has been appraised as per procedure prescribed under the provisions of EIA Notification dated 14.09.2006 on the basis of the mandatory documents enclosed with the application viz., Form-1, 1-A, conceptual plan, rapid EIA report and the additional clarifications furnished in response to the observations of the SEAC.

It is inter-alia noted that the proposal involves developing of a Township namely "Knowledge Park" Sector 66-B, 82-A, 83-A, 101-A Mohali. The total plot area is 7,098,226.62 sqm, which will be developed for residential, commercial, institutional areas and non-polluting IT industries. The GMADA vide letter no. 14860 dated 11.06.2014 has intimated that the principal change of land (CLU) for an area of 709 hectares has been granted to Secretary, Housing and Urban Development, Punjab and the letter regarding approval of the same will be sent later on. The layout plan has been approved by the DTP, S.A.S. Nagar vide no. 785/13 dated 21.01.2013.

The total water requirement will be 20,291 KLD, out of which 16,108 KLD will be met from fresh water and 4183 KLD will be met from recycling of treated wastewater. 40% of fresh water i.e. 6149 KLD will be met through own tubewell and

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the remaining 9949 KLD will be met through canal water. The GMADA has submitted a letter no. 18456 dated 22.11.2013 issued by Deputy Commissioner, SAS Nagar to the effect that Mohali city does not fall under the 43 notified critical/ over exploited zones, therefore, it does not require permission to install the tubewell. The total wastewater generation will be 8266 KLD, which will be treated in an STP of capacity 10,000 KLD to be installed within the project premises. Out of the total 8266 KLD of treated wastewater, 4183 KLD will be used for flushing purpose and remaining 3256 KLD will be used for irrigation of green area in summer season. In winter season, 4183 KLD will be used for flushing purpose and remaining 3256 KLD will be used for irrigation of green area. In rainy season, 4183 KLD will be used for flushing purpose, and remaining 2055 KLD will be discharged into choe namely Jagatpura drain passing through the project site. Green belt will be developed in an area of 24,02,740.06 sqm and the water demand for development of the same will be 13,215.07 KLD in summer season out of which 3256 KLD will be met through treated wastewater and remaining 9959.07 KLD will be met from fresh water. In winter season, the water demand for horticulture will be 4,324.9 KLD, out of which 3256 KLD will be met through treated wastewater and remaining 1068.9 KLD will be met from fresh water. In rainy season, the water demand for horticulture will be 1,201.37 KLD which will be met from fresh water.

The total quantity of MSW has been estimated as 38,257 Kg/day. The biodegradable and non-biodegradable solid waste will be segregated at source and will be sent to the common Municipal Solid Waste Management facility to be developed at village Samgauli, Tehsil Dera Bassi. The hazardous wastes such as used oil from the D.G. sets will be sold to authorized recyclers. The total power requirement will be 100 MVA, which will be taken from Punjab State Power Corporation Ltd. The project promoter has also made provision to provide DG sets as standby arrangement of power supply. Adequate parking facilities will be provided by individual plot owner, within the plots.

Rs.4900 Lacs will be utilised for implementation of EMP during operation phase and Rs.1300 Lacs will be incurred on account of recurring charges. Since the project is being developed by Govt. Agency, EMP will be implemented by Govt. Department. Public facilities like Hospital, school, playground, community centre etc. will be provided by the GMADA under Corporate Social Responsibility. Also, GMADA has undertaken to provide water supply and sewage facility in the villages namely

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Chau Majra, Saini Majra and Rurka falling under their project scheme. The traffic circulation plan and Disaster/Risk Assessment & Management Plan has been prepared and submitted alongwith application.

The case was considered by the SEIAA in its 68th meeting held on 23.08.2014 and the Authority based on the recommendations made by the SEAC in its 99th meeting held on 21.08.2014 and after consideration of the relevant documents submitted by the project proponent and additional clarifications furnished in response to its observations, the SEIAA, Punjab, hereby, accords environmental clearance to the said project under the provisions of Environmental Impact Assessment Notification No. 1533 (E) dated 14.9.2006 and subsequent amendments subject to the strict compliance of following terms and conditions in addition to the proposed measures.:

PART A – Specific conditions

I. Construction Phase

i) The project proponent will provide a green cover of 30 m width on both sides of the drain passing through the project site including the portion to be re-aligned as committed during the presentation.

ii) The project proponent will provide a storage reservoir for the storage of storm water runoff with a capacity of 4.5 ML and will provide recharging wells in the said reservoir. This system should be developed scientifically and storm water be treated adequately so as to ensure that pollutants such as silt, oil & grease etc. do not enter the groundwater. Further, a provision should be made to ensure that water does not enter the re-charge wells directly and passes through the treatment facility by default. use this water for horticulture and other purposes subsequently.

iii) "Consent to establish" shall be obtained from Punjab Pollution Control Board under Air (Prevention & Control of Pollution) Act, 1981 and Water (Prevention & Control of Pollution) Act, 1974 and a copy of the same shall be submitted to the Ministry of Environment & Forests / State Level Environment Impact Assessment Authority before the start of any construction work at site.

iv) All required sanitary and hygienic measures should be in place before starting construction activities and to be maintained throughout the construction phase.

v) A first aid room will be provided in the project both during construction and operation phase of the project.

vi) All the topsoil excavated during construction activities should be stored for use in horticulture / landscape development within the project site.

vii) Disposal of muck during construction phase should not create any adverse effect on the neighbouring communities and be disposed off after taking the necessary precautions for general safety and health aspects of people with the approval of competent authority.

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viii) Construction spoils, including bituminous material and other hazardous material, must not be allowed to contaminate watercourses and the dump sites for such material must be secured, so that they should not leach into the groundwater.

ix) The diesel generator sets to be used during construction phase should be of low sulphur diesel type and should conform to the provisions of Environment (Protection) Act, 1986 prescribed for air and noise emission standards.

x) Vehicles hired for bringing construction material to the site and other machinery to be used during construction should be in good condition and should conform to applicable air and noise emission standards.

xi) Ambient noise levels should conform to prescribed standards both during day and night. Incremental pollution loads on the ambient air and noise quality should be closely monitored during construction phase.

xii) Fly ash should be used as construction material in the construction as per the provisions of Fly Ash Notification of September, 1999 and as amended on August, 2003 (This condition is applicable only if the project is within 100 Km of Thermal Power Station).

xiii) Ready mixed concrete should be used in building construction as far as possible.

xiv) Water demand during construction should be reduced by use of premixed concrete, curing agents and other best practices.

xv) Separation of drinking water supply and treated sewage supply should be done by the use of different colours.

xvi) Fixtures for showers, toilet flushing and drinking should be of low flow either by use of aerators or pressure reducing devices or sensor based control.

xvii) Adequate steps shall be taken to conserve energy by limiting the use of glass, provision of proper thermal insulation and taking measures as prescribed under the Energy Conservation Building Code.

xviii) The approval of competent authority shall be obtained for structural safety of the buildings due to earthquakes, adequacy of fire fighting equipments etc. as per National Building Code including protection measures from lightning.

xix) Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, disposal of waste water & solid waste in an environmentally sound manner, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

II. Operation Phase

i) The installation of sewage treatment plant (STP) and adequacy of disposal system should be certified by Punjab Pollution Control Board and a report in this regard should be submitted to the Ministry of Environment & Forests/State Level Environment Impact Assessment Authority before the project is commissioned for operation. The discharge of treated sewage shall conform to the norms and standards prescribed by Punjab Pollution Control Board for such discharges. The project proponent shall discharge not more than 2055 KLD of treated wastewater into choe during rainy season.

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ii) The project proponent shall provide electromagnetic flow meter at the outlet of the water supply, outlet of the STP and any pipeline to be used for re-using the treated wastewater back into the system for flushing and for horticulture purpose/green etc. and shall maintain a record of readings of each such meter on daily basis.

iii) Adequate & appropriate pollution control measures should be provided to control fugitive emissions to be emitted within the complex.

iv) Adequate treatment facility for drinking water shall be provided, if required.

v) Rainwater harvesting for roof run-off should be implemented. Before recharging the roof run-off, pretreatment must be done to remove suspended matter, oil and grease. However, no run off from gardens/green area/roads/pavements shall be connected with the ground water recharging system.

vi) The solid waste generated should be properly collected and segregated. The recyclable solid waste shall be sold out to the authorized vendors and inerts shall be sent to disposal facility. The Bio-degradable solid waste shall be adequately treated as per the scheme submitted by the project proponent. Prior approval of competent authority should be obtained, if required.

vii) Hazardous waste/E-waste should be disposed off as per Rules applicable and with the necessary approval of the Punjab Pollution Control Board.

viii) The green belt along the periphery of the plot shall achieve attenuation factor conforming to the day and night noise standards prescribed for residential land use. The open spaces inside the plot should be suitably landscaped and covered with vegetation of indigenous species/variety.

ix) The project proponent should take adequate and appropriate measures to contain the ambient air quality within the prescribed standards. The proposal regarding mitigation measures to be taken at site should be submitted to the Ministry of Environment & Forests/ State Level Environment Impact Assessment Authority within three months.

x) Incremental pollution loads on the ambient air quality, noise and water quality should be periodically monitored after commissioning of the project.

xi) Application of solar energy should be incorporated for illumination of common areas, lighting for gardens and street lighting in addition to provision for solar water heating.

xii) Traffic congestion near the entry and exit points from the roads adjoining the proposed project site must be avoided. Parking should be fully internalized and no public space should be utilized.

xiii) A report on the energy conservation measures conforming to energy conservation norms finalized by Bureau of Energy Efficiency should be prepared incorporating details about machinery of air-conditioning, lifts, lighting, building materials, R & U Factors etc. and submitted to the respective Regional office of MoEF, the Zonal Office of CPCB and the SPCB/SEIAA in three months time.

xiv) Environmental Management Cell shall be formed during operation phase which will supervise and monitor the environment related aspects of the project.

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PART B – General Conditions :

i) This environmental clearance will be valid for a period of five years from the date of its issue or till the completion of the project, whichever is earlier.

ii) The environmental safeguards contained in the application of the promoter / mentioned during the presentation before State Level Environment Impact Assessment Authority/State Expert Appraisal Committee should be implemented in letter and spirit.

iii) The entire cost of the environmental management plan (i.e. capital cost as well as recurring cost) will continue to be borne by the project proponent until the responsibility of environmental management plan is transferred to the occupier/residents society under proper MOU after obtaining prior permission of the Punjab Pollution Control Board.

iv) The project proponent shall also submit six monthly reports on the status of compliance of the stipulated EC conditions including results of monitored data (both in hard copies as well as by mail) to the respective Regional office of MoEF, the Zonal Office of CPCB and the SPCB/SEIAA.

v) Officials from the Regional Office of Ministry of Environment & Forests, Chandigarh / State Level Environment Impact Assessment Authority / State Level Expert Appraisal Committee / Punjab Pollution Control Board who would be monitoring the implementation of environmental safeguards should be given full cooperation, facilities and documents / data by the project proponents during their inspection. A complete set of all the documents submitted to State Environment Impact Assessment Authority should be forwarded to the CCF, Regional Office of Ministry of Environment & Forests, Chandigarh/State Level Environment Impact Assessment Authority.

vi) In the case of any change(s) in the scope of the project, the project would require a fresh appraisal by State Environment Impact Assessment Authority.

vii) Separate distribution pipelines be laid down for use of treated effluent / raw water for horticultural/gardening purposes with different colour coding.

viii) All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives, Fire Department, Civil Aviation Department, Forest (Conservation) Act, 1980 and Wildlife (Protection) Act, 1972 etc. shall be obtained, by project proponents from the competent authorities including Punjab Pollution Control Board and from other statutory bodies as applicable. The project proponent shall also obtain permission from the NBWL, if applicable.

ix) The project proponent should advertise in at least two local newspapers widely circulated in the region, one of which shall be in the vernacular language informing that the project has been accorded environmental clearance and copies of clearance letters are available with the Punjab Pollution Control Board. The advertisement should be made within seven days from the day of issue of the clearance letter and a copy of the same should be forwarded to the Regional Office, Ministry of Environment & Forests, Chandigarh.

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x) These stipulations would be enforced among others under the provisions of Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Pollution) Act, 1981, Environmental (Protection) Act, 1986, the Public Liability (Insurance) Act, 1991 and EIA Notification, 2006.

xi) Environmental clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) No. 460 of 2004 as may be applicable to this project and decisions of any competent court, to the extent applicable.

xii) At-least 60% of the total fresh water requirement i.e. 9949 KLD will be met through canal water supply and the remaining 40% i.e. 6149 KLD may be abstracted from groundwater.

xiii) The project proponent shall comply with the conditions to be imposed in the Change of land use issued by the Competent Authority.

xiv) A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zilla Parishad/ Municipal Corporation, Urban local body and the local NGO, if any, from whom suggestions / representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.

xv) The proponent shall upload the status of compliance of the stipulated EC conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MoEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; $PM_{2.5}$, PM_{10}, SO_2, NO_x, CO, Pb, Ozone (ambient air as well as stack emissions) shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.

xvi) The project proponent shall adhere to the commitments made in the Environment Management Plan and Corporate Social Responsibility. GMADA will develop the villages falling within the boundary of the project area under Corporate Social Responsibility. Further, will undertake Corporate Social Responsibility activities in Village Rourka, Saina Majra, Manauli and Chau Majra and will provide water supply and sewerage system in these villages, fix pavers in the village streets and will provide village drain. An approximate amount of Rs.8 Crores will be spent by GMADA for the culmination of the Corporate Social Responsibility activities, which may vary depending upon the preparation of estimates on actual basis.

xvii) The State Environment Impact Assessment Authority reserves the right to add additional safeguards/ measures subsequently, if found necessary, and to take action including revoking of the environmental clearance under the provisions of the Environmental (Protection) Act, 1986, to ensure effective implementation of the suggested safeguards/ measures in a time bound and satisfactory manner.

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xviii) Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

REGISTERED

Member Secretary (SEIAA)

Endst. No._____ **Dated_____**

A copy of the above is forwarded to the following for information & further necessary action please.

1. The Secretary to Govt. of India, Ministry of Environment and Forest, Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi.
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD-cum-office Complex, East Arjun Nagar, New Delhi.
3. The Member Secretary, Punjab State Power Corporation Ltd.,The Mall, Patiala.
4. The Deputy Commissioner, SAS Nagar.
5. The Member Secretary, Punjab Pollution Control Board, Vatavaran Bhawan, Nabha Road, Patiala.
6. The Chief Conservator of Forests (North), Ministry of Environment and Forest, Regional Office, Bays No.24-25, Sector-31-A, Chandigarh.
7. The Chief Town Planner, Pb., Department of Town & Country Planning, 6th Floor, PUDA Bhawan, Phase-8, Mohali
8. Monitoring Cell, Ministry of Environment and Forest, Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi.
9. The Director (Environment), Ministry of Environment and Forest, Northern Regional Office, Bays No.24-25, Sector-31-A, Chandigarh. The detail of the project proponent is as under:

a)	Name of the applicant	Greater Mohali Area Development Authority (GMADA)
b)	Telephone Number	0172-2215202-204
c)	E-mail	dephi@gmada.gov.in

10. The Environmental Engineer (Computers), Punjab Pollution Control Board, Head Office, Patiala for displaying the environmental clearance on the website of the State Level Environment Impact Assessment Authority.

Member Secretary (SEIAA)

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PSPCL Punjab State Power Corporation Limited

O/O CHIEF ENGINEER / COMMERCIAL , PSPCL , PATIALA
Fax: 0175-2210320, E-Mail: ce-commercial@pspcl.in

To

Regd.

Divisional Engineer (Electrical), GMADA,
PUDA Bhawan, Sector-62, Mohali

Memo No....2971...../ IT City, GMADA/ RID-14757

Dated ...13.../...05.../ 2016

Sub: NOC to GMADA, Mohali for 1700 Acres Mega Project namely IT CITY in Sector 66B, 82A, 83A and 101A Mohali (RID-14757).

Ref: 1. Your online request dated 21.02.2015 for issuance of NOC against RID-14757.
2. Approval of project granted vide agenda no. 7.19 of the 7th meeting of GMADA held under the Chairmanship of Hon'ble CM Punjab on 01.09.2010.

With reference to subject and online application received vide RID No. 14757, the NOC for release of electricity connections to individual consumers by PSPCL in subject cited Mega Project being developed as per approved layout plan and Electrical Layout Plan approved by the field Office of PSPCL (copy enclosed) is hereby given subject to the following terms & conditions:-

1. As per Load Sheet and Electrical Layout Drawing approved by the PSPCL, the total load of the project shall be 114393 KVA. 47 no. 500 KVA and 36 no. 300 KVA distribution transformers (total 34300 KVA) have been proposed for the project. The total load of the project has been estimated as 114393 KVA and Distribution transformer capacity required to be installed at 80% loading on residential/commercial sites and 100% loading on industrial sites, comes out to be 134400KVA. The distribution transformers have been proposed for residential area and industrial plots of half acre or lesser size only. However distribution transformers for Commercial load, Group Housing sites, Malls, Hotels, Institutions, Schools, and other common services etc. have not been proposed as these plot holders shall be having connection at 11KV or 66KV for which Distribution transformers shall be installed by concerned plot holders. As per undertaking submitted by you vide memo no. 865 dated 26.04.2016 GMADA shall lay the complete LD system i.e. Cables, RMU etc. up to the door step of these plot holders at its own cost. In case any of the above plot holders require power supply on LT voltage or temporary supply on LT voltage below 100KVA for construction etc. GMADA shall make arrangements to feed such loads at its own cost.

   In case the distribution transformers are not installed by the plot holders, the same shall have to be installed by GMADA at its own cost.
2. The release of electric connection to the proposed project shall be governed by Clause 6.7.1 of Supply Code-2014 effective from 1.1.2015 as amended from time to time.
3. As per technical proposal received from Dy. CE/DS Mohali, to give supply to the IT City, One no. 220 KV substation and 4 no. 66 KV substations have been proposed. Further GMADA has proposed supply to new proposed 220 KV S/Stn. at sector 101A from the existing 220 KV line feeding 220 KV Sub Station Banur by taking off LILO lines from a location somewhere near

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Saneta village through approx. 3.5KM D/C 220 KV line. Brief description of electrical system is given below:

A) **Provision of 220 KV S/Stn. and related transmission lines:**
The 220 KV S/Stn to be erected in Sec-101A shall consist of 2 No. 220/66 KV,100 MVA Power Transformers. The required land for the substation and cost of this substation will be borne by GMADA. Right of way for the transmission lines will also be provided by the GMADA.

B) **Provision of 66 KV S/Stn. and related transmission lines:**
4 no. 66KV Substations namely S/Stn. No. 16, 15A, 15B and 17 have been proposed for feeding the load of IT City. Detail of Power Transformers to be installed at these substations is as follows:-

Sr. No.	Name of the S/Stn.	Location	Power T/F's Capacity
1	SS-16	Sec-101A	1x20+1x16 MVA (36 MVA)
2	SS-15A	Sec-82 A	1x16+1x12.5MVA (28.5 MVA)
3	SS-15B	Sec-82 A	3x16 MVA (48 MVA)
4	SS-17	Sec-66B	1x16+1x12.5 MVA (28.5 MVA)
		Total	**141 MVA**

The Substation at serial No. 2 & 3 shall be constructed at a single location in Sec-82A. Required land for all the 4 substations and cost of these substations will be borne by GMADA. Right of way for the transmission lines will also be provided by the GMADA.

C) **Provision of 11 KV feeders:**
Approximately 29 nos. 11 KV feeders shall be erected from the above mentioned 4 no. 66 KV Substations for feeding the load of IT City.

As per undertaking given by GMADA vide memo no. 5567 dated 26.12.2014, all the charges related to 220 KV Grid Substations, 66 KV grid sub-stations, 66 KV transmission line, external 11 KV feeders etc. shall be borne by GMADA.

4. 15% of Supervision charges on total labour cost (Rs.3,31,68,000/-) of LD system, which amounts to Rs.49,75,200/- (Rupees Porty nine lacs, seventy five thousand and two hundred only) shall have to deposited by you before release of connection to the project.
5. The estimated expenditure for layout of electrical LD system alongwith allied transmission system shall be Rs.109,79,09,000/- (Rupees one hundred nine crores, seventy nine lacs, nine thousand only) without establishment charges. The estimated expenditure for layout of electrical LD system has been indicated as Rs.9,72,16,000/- (Rupees Nine crores, seventy two lacs, sixteen thousand only) subject to change as per rates prevailing at the time of execution of work. The estimated time period for complete development of the electrical LD system of the project is 18 months from the date of issue of NOC. In case you request for energisation of incomplete LD system, the same shall be allowed provided you furnish a Bank Guarantee (BG valid for 5 years) equivalent to 150% of the estimated cost of balance works. This amount of Bank Guarantee shall keep on reducing with the completion of remaining works of the LD system.
6. You shall obtain separate connection for common services under relevant category. You shall also be responsible to lay service cables up to the metering point of individual occupier's premises/ common service connection points at your cost. In case meter is installed outside the consumer's premises, the service cable from the meter up to the main switch of the consumer shall also be provided at your own cost. PSPCL shall not recover any Service Connection Charges from individual consumers. However, applicant shall deposit Security (consumption) and Security (meter) as per Schedule of General Charges.
7. Poles for laying HT/LT lines in the proposed project shall be so erected that no pole comes in front of the entrance of any plot or causes any hindrance to the residents in easy & free entrance to the plot. As far as possible, the poles may be erected at the junction of two plots. In case any pole comes in front of the entrance / main gate of the plot, the same shall be got shifted by you at your own cost.

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GLOBAL MANAGEMENT AND ENGINEERING CONSULTANTS INTERNATIONAL GMEC INTERNATIONAL

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Divisional Engineer
Public Health Division No.1
GMADA, S.A.S. Nagar

8. It will be ensured that length of the LT line/ capacity of distribution transformer does not exceed the specified limits of PSPCL as per approved plan / guidelines of PSPCL.
9. Distribution transformer(s) and other allied material shall be installed / purchased as per approved specifications of PSPCL.
10. The expense of shifting of HT & LT lines inside the project shall be borne by you.
11. As per your undertaking dated 21.02.2015, no construction shall be allowed under the HT/EHT lines and a no construction corridor shall be provided below the HT/EHT lines and that appropriate clearance from existing lines / buildings shall be maintained as per the IE Rules-1956 (amended to date). You shall be solely responsible for any violation of IE Rules and relevant act/rules in view of the undertakings submitted to PSPCL.
12. If at any stage, the Government/ developer revises the layout plan of the project due to extension of the project, you shall be liable to take the revised NOC and payment of charges as per norms of PSPCL.
13. For erection of HT / LT lines & Distribution Transformers, the instructions of PSEB Manual on Standard Instructions on Distribution System & Construction Practices must strictly be followed.
14. Due to non-development of the requisite electrical LD system or deposit of costs to PSPCL by you, if PSPCL is not able to give electric connection(s) to the prospective consumer(s) (owners/ residents of the plots), the responsibility of such inaction/ delay in release of connections shall solely rest on you.
15. The clearance from Chief Electrical Inspector, Punjab for electrical installations inside the project shall have to be obtained by you.
16. You shall be responsible for any fatal / non-fatal accident during the electrification work of the project inside the site.
17. The issue of NOC shall not mean any commitment on the part of PSPCL to release the connections, which shall be subject to rules, seniority and other policy/ regulations prevalent at the time of release of connections.
18. The NOC for release of electricity connections is being issued keeping in view the provision of electricity installations only and does not mean grant of clearances from other departments as per requirement under relevant rules/ laws prevalent in their case.
19. The validity of this NOC shall be five years from the date of issue and if the connectivity of the project is not availed during the period, application for issue of revised NOC shall have to be submitted which shall be considered on merits based on the then prevalent loading conditions and other policy/ regulations of PSPCL.

13.8.16
Dy. CE/ Regulation,
for Chief Engineer/ Commercial,
PSPCL, Patiala.

Endstt no 1837 Dated:- 9-8-16
Copy of above sent to SE/Op for info.

Divisional Engineer (Elect.)
GMADA, S.A.S. Nagar

NOC-7

GMADA PROJECT MANAGEMENT AND ENGINEERING CONSULTANTS GMEC INTERNATIONAL

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Divisional Engineer
Public Health Division No.1
GMADA, S.A.S. Nagar

xiii. Promoter shall make provision for the disposal of rain/storm water the project area at its own cost and shall not obstruct the flow of rain/storm water of the surrounding area and shall obtain the NOC from the Drainage/ Irrigation Department regarding drain/choe passing through the site.

xiv. Promoter would make its own suitable provision for drinking water supply and disposal of sewage & solid waste management.

xv. Promoter shall obtain any other permission required under any other Act at his own level.

xvi. Promoter shall not use underground water for construction of development works in the notified area and should also incorporate such condition in the allotment letter of plots/ apartments directing the allottees not to use the underground water for construction purpose. They shall use surface water sources or treated sewage from nearby Sewage Treatment Plant.

xvii. Promoter shall develop the site as per the proposals of Master Plan, SAS Nagar and shall keep the proposed roads, green buffer, choe reserve, green pylon reserve etc. under H.T. lines intact in his site.

The CLU charges amounting Rs. 80,93,09,750/- have been adjusted by the Government on account of Development works undertaken by the GMADA on behalf of the Govt. as per the Govt. approval dt. 06.05.2017 (on the main file).

Chief Town Planner,
Punjab, Chandigarh.

Endst. No. CTP(Pb) Dated:

A copy is forwarded to Chief Administrator PUDA, SAS Nagar for information and necessary action.

Sd/-
Chief Town Planner,
Punjab, Chandigarh.

Endst. No. CTP(Pb) Dated:

A copy is forwarded to the Chief Administrator, GMADA, SAS Nagar for information & necessary action.

Sd/-
Chief Town Planner,
Punjab, Chandigarh.

Endst. No. CTP(Pb) Dated:

A copy is forward to the following for information and necessary action:-

1. Chairman, Punjab Pollution Control Board, Patiala.
2. Chief Conservator of Forests, Punjab, Chandigarh.
3. Senior Town Planner, S.A.S Nagar.
4. Distt. Town Planner, S.A.S Nagar.

Sd/-
Chief Town Planner,
Punjab, Chandigarh.

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Public Health Division No.1
GMADA, S.A.S. Nagar

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DEPARTMENT OF TOWN & COUNTRYPLANNING, PUNJAB
PUDA Bhawan, 6TH Floor, Sector 62, SAS NAGAR.

15.6.17

To

Chief Administrator,
GMADA, S.A.S.Nagar.

Memo No. 2505 CTP(PB)/ SP-432-M
Dated Chandigarh, the 14-06-2017

19/6/17

Subject: Change of Land Use for IT City Knowledge Park at Sector 66-2, 82-A and 101-A, SAS Nagar (Area 1686.0619 Acre).

Ref: Your request dated Nil.

2. The application for change of land use for an area of 1686.0619 acres falling in Sector 66-B, 82-A and 101-A, SAS Nagar for developing Knowledge Park has been considered at the Government level and permission is hereby granted to use the said land for above said Purpose on the following terms and conditions as per the details of Khasra No's as mentioned in the award received from your office.

i. The Change of Land Use shall be in the hands of GMADA, SAS Naga..
ii. Promoter shall deposit EDC/License/permission Fee and all other charges levied or to be levied by the Housing and Urban Development Department from time to time.
iii. The issue of ownership of land is independent and exclusive of permission of Change of Land Use. Therefore, this permission of CLU does not in any manner grant or effect ownership right of this land, which have to be determined by grant or effect ownership right of this land which have to be determined by Competent Authority.
iv. Promoter shall be develop the site as per the provisions of Super Mega Mixed use Integrated Industrial Park.
v. Thorough revenue rastas/khals and pucca roads if any, passing through the site shall be kept unobstructed till the acquisition of these rastas.
vi. Promoter shall be responsible for any litigation, if any, regarding land in any court of law.
vii. The promoter shall obtain approval/NOC from Competent Authority to fulfill the requirement of notification dated 14.09.2006 of Ministry of Environment and Forest, Government of India before starting the development works of the colony.
viii. Promoter shall obtain NOC from PPCB under the Water (Prevention and Control of Pollution) Act, 1974, Municipal Solid Waste Management and Handling Rules, 2000 or any other relevant act before undertaking the development at the site.
ix. Layout plans of the entire project shall be got approved from the Competent Authority.
x. Promoter shall not make any construction under H.T. electric lines passing through the colony or shall get these lines shifted by applying to the concerned authority and shall maintain green pylon reserve as per the provisions of Master Plan, SAS Nagar under these H.T. lines.
xi. This permission will not provide any immunity from any other Act/Rules/Regulations applicable to the land in question.
xii. Promoter shall obtain permission from the Forest Deptt. Government of India under Forest Act 1980.

18534 15.6.17

18534 19.6.17

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Divisional Engineer
Public Health Division No. 1

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E-mail id : customercare@shriraminstitute.org

Annx- 18

TEST CERTIFICATE NO. : C1/0000058268

Issued To:
Client Code : G0031
GREATER MOHALI AREA DEVELOPMENT AUTHORITY (GMADA)
ROOM NO. 726, PUDA BHAWAN,SECTOR-62,SAS NAGAR
MOHALI
PUNJAB-160062
Kind Attn: MR. DHARAM PAL

Date 13/10/2016
Job No. 1609-1-401-2441
Booking No. RG1617/1/5628
Booking Date 20/09/2016
Customer Ref No.
Customer Ref Date 20/09/2016

Sample Description :
OneE Sample of Drinking Water drawn by our representative on 20/09/2016 from RD 83026 HEAD REGULATER KAJOULI, Punjab was received.

(As per IS: 10500-2012, Except virus)

S. No.	Tests	Results	Requirements / Acceptable limits	Conformity	Detection Limit	Protocol
A.	Organoleptic & Physical Parameter					
1.	True Colour, Hazen Unit	Not Detected	5 Max	Yes	5	IS: 3025, Pt - 4 - 2012
2.	Odour	Agreeable	Agreeable	Yes	-	IS: 3025 Pt - 5 - 2012
3.	Taste	See Note	Agreeable	yes	-	IS: 3025 Pt-7-2012
4.	Turbidity, NTU	14	1 Max(2)	No	-	IS: 3025 Pt-10-2012
5.	pH Value	8.0	6.5 to 8.5	Yes	-	IS: 3025 Pt-11-2012
6.	Total Dissolved Solids, mg/l	125	500 Max	Yes	-	IS: 3025 Pt-16-2012
B.	General Parameter, mg/l					
1.	Aluminium (as Al)	Not Detected	0.03 Max	Yes	0.02	APHA 22nd Ed. 3500Al
2.	Ammonia (as Total Ammonia as N)	Not Detected	0.5 Max	Yes	0.1	IS: 3025 Pt-34-2009

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EMPLOYEE CODE :(6081)

GC-01(Rev-05) Page 1 of 3

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SR1-C1 (Rev. 02)

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Divisional Engineer
Public Health Division No.1
GMADA, S.A.S. Nagar

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3.	Anionic Detergents (as MBAS)	Not Detected	0.2 Max	Yes	0.01	Annex. K of IS:13428- 2005
4.	Barium (as Ba)	Not Detected	0.7 Max	Yes	0.05	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
5.	Boron (as B)	Not Detected	0.5 Max	Yes	0.1	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
6.	Calcium (as Ca)	21	75 Max	Yes	-	IS: 3025 Pt-40-2009
7.	Chloramine (as Cl2)	Not Detected	4 Max	Yes	0.1	IS: 3025 Pt-26-2009
8.	Chlorides (as Cl)	11	250 Max	Yes	-	IS: 3025 Pt-32-2009
9.	Copper (as Cu)	Not Detected	0.05 Max	Yes	0.01	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
10.	Fluoride (as F)	0.4	1.0 Max	Yes	-	APHA 22nd Ed.4500F
11.	Iron (as Fe)	0.2	0.3 Max	Yes	-	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
12.	Magnesium (as Mg)	10	30 Max	Yes	-	IS: 3025 Pt-46-2009
13.	Manganese (as Mn)	Not Detected	0.1 Max	Yes	0.1	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
14.	Iron + Manganese	0.2	0.3 Max	Yes	-	By Calculation
15.	Mineral Oil	Not Detected	0.5 Max	Yes	0.01	IS: 3025 Pt-39-2009
16.	Nitrate (as NO3)	6	45 Max	Yes	-	IS: 3025 Pt-34-2009
17.	Phenolic Compounds (as C6H5OH)	Not Detected	0.001 Max	Yes	0.001	IS: 3025 Pt-43-2009

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TEST CERTIFICATE NO. : C1/0000058268

18.	Selenium (as Se)	Not Detected	0.1 Max	Yes	0.005	IS: 3025 Pt-56-2009
19.	Silver (as Ag)	Not Detected	0.1 Max	Yes	0.01	SRI/ INST (FF)/ 01
20.	Sulphate (as SO4)	25	200 Max	Yes	-	IS: 3025 Pt-24-2009
21.	Sulphide (as H2S)	Not Detected	0.05 Max	Yes	0.05	IS: 3025 Pt-29-2009
22.	Total Alkalinity (as CaCO3)	60	200 Max	Yes	-	IS: 3025 Pt-23-2009
23.	Total Hardness (as CaCO3)	95	200 Max	Yes	-	IS: 3025 Pt-21-2011
24.	Zinc (as Zn)	0.01	5 Max	Yes	-	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
C.	Toxic Parameters, mg/l					
1.	Cadmium (as Cd)	Not Detected	0.003 Max	Yes	0.001	SRI/ INST (FF)/ 01
2.	Cyanide (as CN)	Not Detected	0.05 Max	Yes	0.01	IS: 3025 Pt-27-2009
3.	Lead (as Pb)	Not Detected	0.01 Max	Yes	0.01	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
4.	Mercury (as Hg)	Not Detected	0.001 Max	Yes	0.001	IS: 3025 Pt-48-2009
5.	Molybdenum (as Mo)	Not Detected	0.07 Max	Yes	0.01	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
6.	Nickel (as Ni)	Not Detected	0.02 Max	Yes	0.01	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
7.	Total Arsenic (as As)	Not Detected	0.01 Max	Yes	0.005	IS: 3025 Pt-37-2009

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Divisional Engineer
Public Health Division No.1
GMADA, S.A.S. Nagar

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TEST CERTIRCATE NO. : C1/0000058268

8.	Total Chromium (as Cr	Not Detected	0.05 Max	Yes	0.01	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
D.	Radioactive Parameters, Bq/l					
1.	'Alpha' emitters	Less than Minimum Detection Limit	0.1 Max	Yes	0.04	IS: 14194 Part-2 2013
2.	'Beta' emitters	Less than Minimum Detection Limit	1 Max	Yes	0.45	IS: 14194 Part-1 2013
E.	Bacteriological Tests, per 100 ml					
1.	Total Coliform Bacteria	23 Organisms	Not Detectable	No	-	IS: 1622 - 2003
2.	Test for Detection Of E.coli	Not Dectected	Not Dectectable	Yes	-	IS: 1622 - 2003
F.	Pesticide Residues, µg/l				Limit of Quantification	SOP- Residue/water & waste water/00
1.	Alachlor	Not Detected	20	Yes	0.025	
2.	Atrazine	Not Detected	2	Yes	0.01	
3.	Aldrin/Dieldrin	Not Detected	0.03	Yes	0.01	
4.	Alpha HCH	Not Detected	0.01	Yes	0.01	
5.	Beta HCH	Not Detected	0.04	Yes	0.01	
6.	Butachlor	Not Detected	125	Yes	0.025	
7.	Chloropyriphos	Not Detected	30	Yes	0.01	
8.	Delta HCH	Not Detected	0.04	Yes	0.01	
9.	2, 4 Dichloro-phenoyacetic acid	Not Detected	30	Yes	0.01	

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Divisional Engineer
Public Health Division No.1
GMADA, S.A.S. Nagar

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TEST CERTIFICATE NO. : C1/0000058268

10.	DDT (o, p and p, p Isomers of DDT, DDE & DDD)	Not Detected	1	Yes	0.025
11.	Endosulfan (alpha, beta & sulphate)	Not Detected	0.4	Yes	0.025
12.	Ethion	Not Detected	3	Yes	0.01
13.	Gamma HCH (Lindane)	Not Detected	2	Yes	0.01
14.	Isoproturon	Not Detected	9	Yes	0.01
15.	Malathion	Not Detected	190	Yes	0.025
16.	Methyl Parathion	Not Detected	0.3	Yes	0.025
17.	Monocrotophos	Not Detected	1	Yes	0.01
18.	Phorate	Not Detected	2	Yes	0.025
19.	Poly Chlorinated Biphenyl (PCBs)	Not Detected	0.5	Yes	0.01
20.	Poly Arometic Hydrocarbon (PAHs)	Not Detected	0.1	Yes	0.05
21.	Trihalomethane				
a	Bromoform	Not Detected	100	Yes	50
b.	Dibromochloro-methanes	Not Detected	100	Yes	50
c.	Bromodichloro-methanes	Not Detected	60	Yes	50
d.	Chloroform	Not Detected	200	Yes	50

REMARKS: With respect to Turbidity and Total Coliform tests, Water does not conform to IS: 10500-2012 and cannot be considered fit for drinking purpose.

Note: 1.Test for the taste could not be carried out as sample is unfit for Human consumption.
2. Values given in the brackets are permissible limit in the absence of alternate sources.
3. The visual colour of the sample is Whitish. However, Colour test has been carried out after filteration of the sample as per relevant protocol.

****

D.O.R :20.09.2016
D.O.C: 13.10.2016

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TEST CERTIFICATE NO. : C1/0000058715

Issued To:
Client Code : G0031
GREATER MOHALI AREA DEVELOPMENT AUTHORITY (GMADA)
ROOM NO. 726, PUDA BHAWAN,SECTOR-62,SAS NAGAR
MOHALI
PUNJAB-160062
Kind Attn: MR. DHARAM PAL

Date 17/10/2016
Job No. 1609-1-401-1642
Booking No. RG1617/1/5412
Booking Date 14/09/2016
Customer Ref No. -
Customer Ref Date 12/09/2016

Sample Description :
ONE SAMPLE OF RAW WATER DRAWN BY OUR REPRESENTATIVE ON 19.09.2016 FROM SITE ADDRESS: GMADA, SAS NAGAR, PUNJAB MARKED AS 'RAW WATER FROM R.D.83026 HEAD REGISTER KAJOULI PUNJAB' WAS RECEIVED.

S. No.	Test	Result	Detection Limit	Protocol
1.	Biochemical Oxygen Demand (at 27°C for 3 days),mg/l	Not Dctected	1	IS: 3025 Pt-44-2009
2.	Chemical Oxygen Demand, mg/l	Not Detected	2	APHA 22nd Ed. 5220
3.	Ammoniacal Nitrogen (as N),mg/l	0.3	-	IS: 3025 Pt-34-2009
4.	Nitrate Nitrogen (as N),mg/l	1.0	-	IS: 3025 Pt-34-2009
5.	Total Suspended Solids,mg/l	2	-	IS: 3025 Pt-17-2012
6.	Volatile Suspended Solids,mg/l	Not Detected	1	IS: 3025 Pt-15-2012
7.	Fixed Suspended Solids,mg/l	2	-	IS: 3025 Pt-15-2012
8.	Phosphate (as PO4),mg/l	Not Detected	0.05	IS: 3025 Pt-31-2009
9.	Dissolved Oxygen, mg/l	8.1	-	APHA 22nd Ed. 4500-O

****

D.O.R.: 20.09.2016
D.O.C.: 17.10.2016

AUTHORISED SIGNATORY
EMPLOYEE CODE : (6081)

Phone : 91-11-27667267, 27667983, 27667860 Fax : 91-11-27667676, 27667207

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Website : www.shriraminstitute.org
E-mail Id : customercare@shriraminstitute.org

17-8-2016

TEST CERTIRCATE NO. : C1/0000051564

Issued To:
Client Code : G0349
GREATER MOHALI DEVELOPMENT AUTHORITY
ROOM NO. 534
5TH FLOOR
PUDA BHAWAN

SAS NAGAR
PUNJAB--
Kind Attn: MR. BHAGWAN DAS

Date 17/08/2016
Job No. 1607-1-401-3525
Booking No. RG1617/1/3969
Booking Dat. 30/07/2016
Customer Ref No.
Customer Ref Dat. 30/07/2016

Sample Description :
ONE SAMPLE OF RAW WATER FOR WTP IN MOHALI DRAWN BY OUR REPRESENTATIVE ON 02.08.2016 FROM RAJOULI INTAKE POINT SITE ADDRESS: 55 MGD (ULTIMATE) CAPACITY WATER TREATMENT PLANT AT VILLAGE SIANPUR SAS NAGAR IN MOHALI WAS RECEIVED.

(As per IS: 10500-2012, Except virus)

S. No.	Tests	Results	Requirements / Acceptable limits	Conformity	Detection Limit	Protocol
A.	Organoleptic & Physical Parameter					
1.	True Colour, Hazen Unit	Not Detected	5 Max	Yes	5	IS: 3025, Pt - 4 - 2012
2.	Odour	Agreeable	Agreeable	Yes	-	IS: 3025 Pt - 5 - 2012
3.	Taste	See Note 1	-	-	-	IS: 3025 Pt-7-2012
4.	Turbidity, NTU	40	1 Max (5)	No	-	IS: 3025 Pt-10-2012
5.	pH Value	7.9	6.5 to 8.5	Yes	-	IS: 3025 Pt-11-2012
6.	Total Dissolved Solids, mg/l	130	500 Max	Yes	-	IS: 3025 Pt-16-2012
B.	General Parameter,	mg/l				
1.	Aluminium (as Al)	Not Detected	0.03 Max	Yes	0.02	APHA 22nd Ed. 3500Al
2.	Ammonia (as Total Ammonia as N)	Not Detected	0.5 Max	Yes	0.1	IS: 3025 Pt-34-2009

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EMPLOYEE CODE : 6081

GC-01(Rev-05)

Phone : 91-11-27657267, 27667983, 27667860 Fax : 91-11-27667676, 27667207

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Divisional Engineer
Public Health Division No.1
GMADA, S.A.S. Nagar

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TEST CERTIFICATE NO. : C1/0000051564

3.	Anionic Detergents (as MBAS)	Not Detected	0.2 Max	Yes	0.01	Annex. K of IS: 13428-2005
4.	Barium (as Ba)	Not Detected	0.7 Max	Yes	0.05	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
5.	Boron (as B)	Not Detected	0.5 Max	Yes	0.1	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
6.	Calcium (as Ca)	16	75 Max	Yes	-	IS: 3025 Pt-40-2009
7.	Chloramine (as Cl2)	Not Detected	4 Max	Yes	0.1	IS: 3025 Pt-26-2009
8.	Chlorides (as Cl)	6	250 Max	Yes	-	IS: 3025 Pt-32-2009
9.	Copper (as Cu)	Not Detected	0.05 Max	Yes	0.01	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
10.	Fluoride (as F)	0.4	1.0 Max	Yes	-	APHA 22nd Ed.4500F
11.	Iron (as Fe)	0.8	0.3 Max	No	-	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
12.	Magnesium (as Mg)	11	30 Max	Yes	-	IS: 3025 Pt-46-2009
13.	Manganese (as Mn)	Not Detected	0.1 Max	Yes	0.1	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
14.	Iron + Manganese	0.8	0.3 Max	No	-	By Calculation
15.	Mineral Oil	Not Detected	0.5 Max	Yes	0.01	IS: 3025 Pt-39-2009
16.	Nitrate (as NO3)	3	45 Max	Yes	-	IS: 3025 Pt-34-2009
17.	Phenolic Compounds (as C6H5OH)	Not Detected	0.001 Max	Yes	0.001	IS: 3025 Pt-43-2009

AUTHORISED SIGNATORY
EMPLOYEE CODE : (6081)

GC-01(Rev-05)

Page 2 of 5

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Divisional Engineer
Public Health Division No.1
GMADA, S.A.S. Nagar

SHRIRAM INSTITUTE FOR INDUSTRIAL RESEARCH
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Website : www.shriraminstitute.org
E-mail id : customercare@shriraminstitute.org

TEST CERTIFICATE NO.: C1/0000051564

18.	Selenium (as Se)	Not Detected	0.1 Max	Yes	0.005	IS: 3025 Pt-56-2009
19.	Silver (as Ag)	Not Detected	0.1 Max	Yes	0.01	SRI/ INST (FF)/ 01
20.	Sulphate (as SO4)	36	200 Max	Yes	-	IS: 3025 Pt-24-2009
21.	Sulphide (as H2S)	Not Detected	0.05 Max	Yes	0.05	IS: 3025 Pt-29-2009
22.	Total Alkalinity (as CaCO3)	58	200 Max	Yes	-	IS: 3025 Pt-23-2009
23.	Total Hardness (as CaCO3)	83	200 Max	Yes	-	IS: 3025 Pt-21-2011
24.	Zinc (as Zn)	0.02	5 Max	Yes	-	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
C.	Toxic Parameters, mg/l					
1.	Cadmium (as Cd)	Not Detected	0.003 Max	Yes	0.001	SRI/ INST (FF)/ 01
2.	Cyanide (as CN)	Not Detected	0.05 Max	Yes	0.01	IS: 3025 Pt-27-2009
3.	Lead (as Pb)	Not Detected	0.01 Max	Yes	0.01	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
4.	Mercury (as Hg)	Not Detected	0.001 Max	Yes	0.001	IS: 3025 Pt-48-2009
5.	Molybdenum (as Mo)	Not Detected	0.07 Max	Yes	0.01	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
6.	Nickel (as Ni)	Not Detected	0.02 Max	Yes	0.01	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
7.	Total Arsenic (as As)	Not Detected	0.01 Max	Yes	0.005	IS: 3025 Pt-37-2009

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Divisional Engineer
Public Health Division No.1
GMADA, S.A.S. Nagar

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TEST CERTIFICATE NO.: C1/0000051564

8.	Total Chromium (as Cr	Not Detected	0.05 Max	Yes	0.01	SOP/ Instrumental/ ICP/ 00 Dated 01.04.2014
D.	Radioactive Parameters, Bq/l					
1.	'Alpha' emitters	Less than Minimum Detection Limit	0.1 Max	Yes	0.04	IS: 14194 Part-2 2013
2.	'Beta' emitters	Less than Minimum Detection Limit	1 Max	Yes	0.45	IS: 14194 Part-1 2013
E.	Bacteriological Tests, per 100 ml					
1.	Total Coliforms	94 Organisms	Not Detectable	No	-	IS: 1622 - 2003
2.	E. coli	Not Detected	Not Detectable	Yes	-	IS: 1622 - 2003
F.	Pesticide Residues, µg/l				Limit of Quantification	SOP/ SRI/ RES_Water & Wastewater/ 012
1.	Alachlor	Not Detected	20	Yes	0.025	
2.	Atrazine	Not Detected	2	Yes	0.01	
3.	Aldrin/Dieldrin	Not Detected	0.03	Yes	0.01	
4.	Alpha HCH	Not Detected	0.01	Yes	0.01	
5.	Beta HCH	Not Detected	0.04	Yes	0.01	
6.	Butachlor	Not Detected	125	Yes	0.025	
7.	Chloropyriphos	Not Detected	30	Yes	0.01	
8.	Delta HCH	Not Detected	0.04	Yes	0.01	
9.	2, 4 Dichloro-phenoyacetic acid	Not Detected	30	Yes	0.01	
10.	DDT (o, p and p, p Isomers of DDT, DDE & DDD)	Not Detected	1	Yes	0.025	

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Divisional Engineer
Public Health Division No.1
GMADA, S.A.S. Nagar

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TEST CERTIFICATE NO. : C1/0000051564

11.	Endosulfan (alpha, beta & sulphate)	Not Detected	0.4	Yes	0.025
12.	Ethion	Not Detected	3	Yes	0.01
13.	Gamma HCH (Lindane)	Not Detected	2	Yes	0.01
14.	Isoproturon	Not Detected	9	Yes	0.01
15.	Malathion	Not Detected	190	Yes	0.025
16.	Methyl Parathion	Not Detected	0.3	Yes	0.025
17.	Monocrotophos	Not Detected	1	Yes	0.01
18.	Phorate	Not Detected	2	Yes	0.025
19.	Poly Chlorinated Biphenyl (PCBs)	Not Detected	0.5	Yes	0.01
20.	Poly Arometic Hydrocarbon (PAHs)	Not Detected	0.1	Yes	0.1
21.	Trihalomethane				
a	Bromoform	Not Detected	100	Yes	50
b.	Dibromochloro-methanes	Not Detected	100	Yes	50
c.	Bromodichloro-methanes	Not Detected	60	Yes	50
d.	Chloroform	Not Detected	200	Yes	50

REMARKS: With respect to Turbidity, Iron, Iron + Manganese & Total Coliform Tests, water does not conform to IS: 10500- 2012 and cannot be considered fit for drinking purpose.

Note: 1. Test for taste could not be carried out, as the sample is unfit for human consumption.
2. Protocols for Ag and Cd are not covered in our NABL Scope.
3. Values given in the brackets are permissible limits in the absence of alternate sources.
4. The visual colour of the sample is Light Yellow. However, Colour test has been carried out after filteration of the sample as per relevant protocol.

****

D.O.R: 03.08.2016
D.O.C: 17.08.2016

AUTHORISED SIGNATORY
EMPLOYEE CODE : (8061)

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GC-01(Rev-05)

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Divisional Engineer
Public Health Division No.1
GMADA, S.A.S. Nagar

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Report No. – GMEC12032018S148

Date: 6/06/2018

TEST REPORT SOIL

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Soil
Location of the Sampling	Sector-60 Mohal (SAS Nagar)
Name of Project	Gamada IT City Town Ship
Date of Sample Receipt	18/03/2018
Sample Collected by	GMEC Team
Sample Condition	OK
Date of Analysis Completion	24/03/2018
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	25±2 55%±5

Sl. No.	Parameters	Units of Measurements	Results	Protocol
1	pH	-	8.24	IS 2720 (Part 26)
2	Electrical Conductivity	ms/cm	23.83	IS 14767
3	Calcium carbonate	%	4.9	IS 2720 (Part 23)
4	Organic Matter	%	0.10	IS 2720 (Part 22)
5	Bulk Density	gm/cc	1.22	IS 2720 (Part 8)
6	Sodium as Na	mg/kg	1.4	IS 9497
7	Potassium as K	mg/kg	3.7	IS 9497
8	Moister Content	%	0.62	IS 2720(Part 9
9	Chloride*	Meq/L	0.12	USDA-NRCS-6K 1, Nov.2004
10	T.K.N	%	0.07	IS: 14684

END OF TEST REPORT

GMEC International Technical Manager Test House and Research Centre

VERIFIED BY

AUTHORIZED SIGNATORY

Note:

1. The result given above is related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.
3. The test samples will be disposed off after 90 days of Sample Received, unless until specified by the customer.
4. Parameter mark with * is not cover under our NABL scope

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Divisional Engineer
Public Health Division No.1
GMADA, S.A.S. Nagar

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URL : www.gmecinternational.com

Report No. – GMEC12032018S142 Date: 6/06/2018

TEST REPORT SOIL

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Soil
Location of the Sampling	Village Chau Majra
Name of Project	Gamada IT City Town Ship
Date of Sample Receipt	18/03/2018
Sample Collected by	GMEC Team
Sample Condition	OK
Date of Analysis Completion	24/03/2018
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Sl. No.	Parameters	Units of Measurements	Results	Protocol
1.	pH	-	8.82	IS 2720 (Part 26)
2.	Electrical Conductivity	ms/cm	27.37	IS 14767
3.	Calcium carbonate	%	4.60	IS 2720 (Part 23)
4.	Organic Matter	%	0.12	IS 2720 (Part 22)
5.	Bulk Density	gm/cc	1.28	IS 2720 (Part 8)
6.	Sodium as Na	mg/kg	0.9	IS 9497
7.	Potassium as K	mg/kg	3.8	IS 9497
8.	Moister Content	%	0.57	IS 2720(Part 9
9.	Chloride*	Meq/L	0.25	USDA-NRCS-6K 1, Nov.2004
10.	T.K.N	%	0.05	IS: 14684

END OF TEST REPORT

VERIFIED BY

AUTHORIZED SIGNATORY

GMEC International Test House and Research Centre

Note:

1. The result given above is related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.
3. The test samples will be disposed off after 90 days of Sample Received, unless until specified by the customer.
4. Parameter mark with * is not cover under our NABL scope

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Divisional Engineer
Public Health Division No.1
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Report No. – GMEC12032018S143 Date: 6/06/2018

TEST REPORT SOIL

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Soil
Location of the Sampling	Village Rurka
Name of Project	Gamada IT City Town Ship
Date of Sample Receipt	18/03/2018
Sample Collected by	GMEC Team
Sample Condition	OK
Date of Analysis Completion	24/03/2018
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Sl. No.	Parameters	Units of Measurements	Results	Protocol
1	pH	-	9.29	IS 2720 (Part 26)
2	Electrical Conductivity	ms/cm	22.84	IS 14767
3	Calcium carbonate	%	5.18	IS 2720 (Part 23)
4	Organic Matter	%	1.91	IS 2720 (Part 22)
5	Bulk Density	gm/cc	1.31	IS 2720 (Part 8)
6	Sodium as Na	mg/kg	0.8	IS 9497
7	Potassium as K	mg/kg	3.6	IS 9497
8	Moister Content	%	0.68	IS 2720(Part 9
9	Chloride*	Meq/L	0.25	USDA-NRCS-6K 1, Nov.2004
10	T.K.N	%	0.06	IS: 14684

END OF TEST REPORT

VERIFIED BY

AUTHORIZED SIGNATORY

GMEC International Test House and Research Centre

Note:

1. The result given above is related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.
3. The test samples will be disposed off after 90 days of Sample Received, unless until specified by the customer.
4. Parameter mark with * is not cover under our NABL scope

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Report No. – GMEC12032018S144 Date: 6/06/2018

TEST REPORT SOIL

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Soil
Location of the Sampling	Village Bhabat
Name of Project	Gamada IT City Town Ship
Date of Sample Receipt	18/03/2018
Sample Collected by	GMEC Team
Sample Condition	OK
Date of Analysis Completion	24/03/2018
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Sl. No.	Parameters	Units of Measurements	Results	Protocol
1	pH	-	8.44	IS 2720 (Part 26)
2	Electrical Conductivity	ms/cm	40.07	IS 14767
3	Calcium carbonate	%	4.71	IS 2720 (Part 23)
4	Organic Matter	%	0.12	IS 2720 (Part 22)
5	Bulk Density	gm/cc	1.13	IS 2720 (Part 8)
6	Sodium as Na	mg/kg	1.0	IS 9497
7	Potassium as K	mg/kg	4.1	IS 9497
8	Moister Content	%	0.85	IS 2720(Part 9
9	Chloride*	Meq/L	0.25	USDA-NRCS-6K 1, Nov.2004
10	T.K.N	%	0.04	IS: 14684

END OF TEST REPORT

VERIFIED BY

AUTHORIZED SIGNATORY

GMEC International Test House and Research Centre

Note:

1. The result given above is related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.
3. The test samples will be disposed off after 90 days of Sample Received, unless until specified by the customer.
4. Parameter mark with * is not cover under our NABL scope

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Report No. – GMEC12032018S145 Date: 6/06/2018

TEST REPORT SOIL

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Soil
Location of the Sampling	Village Khirjpur
Name of Project	Gamada IT City Town Ship
Date of Sample Receipt	18/03/2018
Sample Collected by	GMEC Team
Sample Condition	OK
Date of Analysis Completion	24/03/2018
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Sl. No.	Parameters	Units of Measurements	Results	Protocol
1	pH	-	8.80	IS 2720 (Part 26)
2	Electrical Conductivity	ms/cm	27.01	IS 14767
3	Calcium carbonate	%	4.12	IS 2720 (Part 23)
4	Organic Matter	%	0.17	IS 2720 (Part 22)
5	Bulk Density	gm/cc	1.13	IS 2720 (Part 8)
6	Sodium as Na	mg/kg	1.2	IS 9497
7	Potassium as K	mg/kg	4.3	IS 9497
8	Moister Content	%	0.80	IS 2720(Part 9
9	Chloride*	Meq/L	0.21	USDA-NRCS-6K 1, Nov.2004
10	T.K.N	%	0.03	IS: 14684

END OF TEST REPORT

GMEC International Technical Manager Test House and Research Centre

VERIFIED BY

AUTHORIZED SIGNATORY

Note:

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2. This test report will not be used for any publicity/legal purpose.
3. The test samples will be disposed off after 90 days of Sample Received, unless until specified by the customer.
4. Parameter mark with * is not cover under our NABL scope

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Report No. – GMEC12032018S146 Date- 6/06/2018

TEST REPORT SOIL

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Soil
Location of the Sampling	Sector 30 Chandigarh
Name of Project	Gamada IT City Town Ship
Date of Sample Receipt	18/03/2018
Sample Collected by	GMEC Team
Sample Condition	OK
Date of Analysis Completion	24/03/2018
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Sl. No.	Parameters	Units of Measurements	Results	Protocol
1	pH	-	8.78	IS 2720 (Part 26)
2	Electrical Conductivity	ms/cm	28.03	IS 14767
3	Calcium carbonate	%	4.10	IS 2720 (Part 23)
4	Organic Matter	%	0.13	IS 2720 (Part 22)
5	Bulk Density	gm/cc	1.12	IS 2720 (Part 8)
6	Sodium as Na	mg/kg	1.4	IS 9497
7	Potassium as K	mg/kg	4.2	IS 9497
8	Moister Content	%	0.74	IS 2720(Part 9
9	Chloride*	Meq/L	0.15	USDA-NRCS-6K 1, Nov.2004
10	T.K.N	%	0.02	IS: 14684

END OF TEST REPORT

VERIFIED BY

AUTHORIZED SIGNATORY

GMEC International Test House and Research Centre Authorised Signatory Manager

Note:

1. The result given above is related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.
3. The test samples will be disposed off after 90 days of Sample Received, unless until specified by the customer.
4. Parameter mark with * is not cover under our NABL scope

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Report No. – GMEC12032018S147 Date: 6/06/2018

TEST REPORT SOIL

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Soil
Location of the Sampling	Village Hawai Bassi
Name of Project	Gamada IT City Town Ship
Date of Sample Receipt	18/03/2018
Sample Collected by	GMEC Team
Sample Condition	OK
Date of Analysis Completion	24/03/2018
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Sl. No.	Parameters	Units of Measurements	Results	Protocol
1	pH	-	8.28	IS 2720 (Part 26)
2	Electrical Conductivity	ms/cm	24.03	IS 14767
3	Calcium carbonate	%	4.10	IS 2720 (Part 23)
4	Organic Matter	%	0.10	IS 2720 (Part 22)
5	Bulk Density	gm/cc	1.20	IS 2720 (Part 8)
6	Sodium as Na	mg/kg	1.2	IS 9497
7	Potassium as K	mg/kg	4.0	IS 9497
8	Moister Content	%	0.64	IS 2720(Part 9
9	Chloride*	Meq/L	0.12	USDA-NRCS-6K 1, Nov.2004
10	T.K.N	%	0.01	IS: 14684

END OF TEST REPORT

VERIFIED BY

AUTHORIZED SIGNATORY

GMEC International Technical Manager Test House and Research Centre

Note:

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Report No. – GMEC12032018S149 Date: 6/06/2018

TEST REPORT SOIL

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Soil
Location of the Sampling	Village Chudalia
Name of Project	Gamada IT City Town Ship
Date of Sample Receipt	18/03/2018
Sample Collected by	GMEC Team
Sample Condition	OK
Date of Analysis Completion	24/03/2018
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Sl. No.	Parameters	Units of Measurements	Results	Protocol
1	pH	-	8.20	IS 2720 (Part 26)
2	Electrical Conductivity	ms/cm	21.62	IS 14767
3	Calcium carbonate	%	3.8	IS 2720 (Part 23)
4	Organic Matter	%	0.08	IS 2720 (Part 22)
5	Bulk Density	gm/cc	1.18	IS 2720 (Part 8)
6	Sodium as Na	mg/kg	1.20	IS 9497
7	Potassium as K	mg/kg	3.68	IS 9497
8	Moister Content	%	0.48	IS 2720(Part 9
9	Chloride*	Meq/L	0.10	USDA-NRCS-6K 1, Nov.2004
10	T.K.N	%	0.06	IS: 14684

END OF TEST REPORT

VERIFIED BY

AUTHORIZED SIGNATORY

GMEC International Test House and Research Centre

Note:

1. The result given above is related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.
3. The test samples will be disposed off after 90 days of Sample Received, unless until specified by the customer.
4. Parameter mark with * is not cover under our NABL scope

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URL : www.gmecinternational.com

Report No. – GMEC12032018N150 Date: 06/06/2018

TEST REPORT AMBIENT NOISE

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Noise Monitoring
Location of the Sampling	Project Site
Name of Project	Gamada IT City Town Ship
Date of Sampling	12/03/2018
Sample Collected by	GMEC Team
Sample Condition	N.A.
Datc of Analysis Completion	N. A
Environment Condition (During Monitoring) **a. Temp °C :** **b. Relative Humidity %:**	 Max 27^0 C Min. 20^0 C

Sr. No.	Parameters	Units of Measurements	Value	Specified Limits As per EPA	Protocol
1.	Ambient Noise Level (Day Time)	dB(A)	60.15	75	IS: 9989-1981 (RA 2008)
2.	Ambient Noise Level (Night Time)	dB(A)	47.40	70	IS: 9989-1981 (RA 2008)

END OF TEST REPORT

VERIFIED BY **AUTHORISED SIGNATORY**

GMEC International Technical Manager Test House and Research Centre

Note:
1. The result given above is related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.

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URL : www.gmecinternational.com

Report No. – GMEC12032018N151 Date: 06/06/2018

TEST REPORT AMBIENT NOISE

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Noise Monitoring
Location of the Sampling	Sector .30 Chandigarh
Name of Project	Gamada IT City Town Ship
Date of Sampling	12/03/2018
Sample Collected by	GMEC Team
Sample Condition	N.A.
Date of Analysis Completion	N. A
Environment Condition (during Monitoring) **a. Temp °C :** **b. Relative Humidity %:**	 Max 27^0 C Min. 20^0 C

Sr. No.	Parameters	Units of Measurements	Value	Specified Limits As per EPA	Protocol
1.	Ambient Noise Level (Day Time)	dB(A)	54.1	75	IS: 9989-1981 (RA 2008)
2.	Ambient Noise Level (Night Time)	dB(A)	45.9	70	IS: 9989-1981 (RA 2008)

END OF TEST REPORT

VERIFIED BY **AUTHORISED SIGNATORY**

GMEC International Test House and Research Centre

Note:
1. The result given above is related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.

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URL : www.gmecinternational.com

Report No. – GMEC12032018N152 Date: 06/06/2018

TEST REPORT AMBIENT NOISE

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Noise Monitoring
Location of the Sampling	Sector 60 Mohali
Name of Project	Gamada IT City Town Ship
Date of Sampling	12/03/2018
Sample Collected by	GMEC Team
Sample Condition	N.A.
Date of Analysis Completion	N. A
Environment Condition (during Monitoring) **a. Temp °C :** **b. Relative Humidity %:**	 Max 27^0 C Min. 20^0 C

Sr. No.	Parameters	Units of Measurements	Value	Specified Limits As per EPA	Protocol
1.	Ambient Noise Level (Day Time)	dB(A)	51.70	75	IS: 9989-1981 (RA 2008)
2.	Ambient Noise Level (Night Time)	dB(A)	46.95	70	IS: 9989-1981 (RA 2008)

END OF TEST REPORT

VERIFIED BY **AUTHORISED SIGNATORY**

Note:
1. The result given above is related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.

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URL : www.gmecinternational.com

Report No. – GMEC12032018N153 Date: 06/06/2018

TEST REPORT AMBIENT NOISE

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Noise Monitoring
Location of the Sampling	Bhabat village
Name of Project	Gamada IT City Town Ship
Date of Sampling	13/03/2018
Sample Collected by	GMEC Team
Sample Condition	N.A.
Date of Analysis Completion	N. A
Environment Condition (during Monitoring) **a. Temp °C :** **b. Relative Humidity %:**	 Max 27^0 C Min. 20^0 C

Sr. No.	Parameters	Units of Measurements	Value	Specified Limits As per EPA	Protocol
1.	Ambient Noise Level (Day Time)	dB(A)	54.55	75	IS: 9989-1981 (RA 2008)
2.	Ambient Noise Level (Night Time)	dB(A)	46.30	70	IS: 9989-1981 (RA 2008)

END OF TEST REPORT

VERIFIED BY **AUTHORISED SIGNATORY**

GMEC International Technical Manager Test House and Research Centre

Note:
1. The result given above is related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.

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Report No. – GMEC12032018N154 Date: 06/06/2018

TEST REPORT AMBIENT NOISE

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Noise Monitoring
Location of the Sampling	Chaudiala village
Name of Project	Gamada IT City Town Ship
Date of Sampling	13/03/2018
Sample Collected by	GMEC Team
Sample Condition	N.A.
Date of Analysis Completion	N. A
Environment Condition (during Monitoring) **a. Temp °C :** **b. Relative Humidity %:**	 Max 27^0 C Min. 20^0 C

Sr. No.	Parameters	Units of Measurements	Value	Specified Limits As per EPA	Protocol
1.	Ambient Noise Level (Day Time)	dB(A)	45.15	75	IS: 9989-1981 (RA 2008)
2.	Ambient Noise Level (Night Time)	dB(A)	39.90	70	IS: 9989-1981 (RA 2008)

END OF TEST REPORT

VERIFIED BY **AUTHORISED SIGNATORY**

GMEC International Test House and Research Centre

Note:
1. The result given above is related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.

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Report No. – GMEC12032018N155 Date: 06/06/2018

TEST REPORT AMBIENT NOISE

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Noise Monitoring
Location of the Sampling	Village Hawai Bassi
Name of Project	Gamada IT City Town Ship
Date of Sampling	14/03/2018
Sample Collected by	GMEC Team
Sample Condition	N.A.
Date of Analysis Completion	N. A
Environment Condition (during Monitoring) **a. Temp °C :** **b. Relative Humidity %:**	 Max 27^0 C Min. 20^0 C

Sr. No.	Parameters	Units of Measurements	Value	Specified Limits As per EPA	Protocol
1.	Ambient Noise Level (Day Time)	dB(A)	46.55	75	IS: 9989-1981 (RA 2008)
2.	Ambient Noise Level (Night Time)	dB(A)	41.40	70	IS: 9989-1981 (RA 2008)

END OF TEST REPORT

VERIFIED BY

GMEC International Technical Manager Test House and Research Centre

AUTHORISED SIGNATORY

Note:
1. The result given above is related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.

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Report No. – GMEC12032018N156 Date: 06/06/2018

TEST REPORT AMBIENT NOISE

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Noise Monitoring
Location of the Sampling	Village Khijergarh
Name of Project	Gamada IT City Town Ship
Date of Sampling	14/03/2018
Sample Collected by	GMEC Team
Sample Condition	N.A.
Date of Analysis Completion	N. A
Environment Condition (during Monitoring) **a. Temp °C :** **b. Relative Humidity %:**	 Max 27^0 C Min. 20^0 C

Sr. No.	Parameters	Units of Measurements	Value	Specified Limits As per EPA	Protocol
1.	Ambient Noise Level (Day Time)	dB(A)	46.95	75	IS: 9989-1981 (RA 2008)
2.	Ambient Noise Level (Night Time)	dB(A)	39.92	70	IS: 9989-1981 (RA 2008)

END OF TEST REPORT

VERIFIED BY **AUTHORISED SIGNATORY**

GMEC International Test House and Research Centre Manager

Note:
1. The result given above is related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.

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Report No. – GMEC12032018N157 Date: 06/06/2018

TEST REPORT AMBIENT NOISE

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Noise Monitoring
Location of the Sampling	village Chao Majara
Name of Project	Gamada IT City Town Ship
Date of Sampling	13/03/2018
Sample Collected by	GMEC Team
Sample Condition	N.A.
Date of Analysis Completion	N. A
Environment Condition (during Monitoring) **a. Temp °C :** **b. Relative Humidity %:**	 Max 27^0 C Min. 20^0 C

Sr. No.	Parameters	Units of Measurements	Value	Specified Limits As per EPA	Protocol
1.	Ambient Noise Level (Day Time)	dB(A)	48.26	75	IS: 9989-1981 (RA 2008)
2.	Ambient Noise Level (Night Time)	dB(A)	40.38	70	IS: 9989-1981 (RA 2008)

END OF TEST REPORT

VERIFIED BY **AUTHORISED SIGNATORY**

GMEC International Test House and Research Centre

Note:
1. The result given above is related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.

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URL : www.gmecinternational.com

Report No. – GMEC12032018A221 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Project Site
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
12.03.18	86.46	39.22	9.46	14.26	390
15.03.18	87.48	41.26	8.43	15.46	330
18.03.18	84.82	42.8	7.84	14.81	360
21.03.18	88.41	39.33	8.16	13.46	380
25.03.18	88.11	41.2	7.44	12.98	310
28.03.18	87.78	41.46	8.26	14.17	390

End of Test Report

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VERIFIED BY

AUTHORIZED SIGNATORY

GMEC International Test House and Research Centre

Note:

1. The result given above is related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.
3. The test samples will be disposed off after complete Analysis, unless until specified by the customer

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Report No. – GMEC12032018A222 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Project Site
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
01.04.18	84.24	38.44	6.26	16.24	310
04.04.18	86.94	39.78	7.44	14.16	410
08.04.18	85.36	38.51	7.06	13.85	380
11.04.18	82.16	39.22	6.46	14.66	360
15.04.18	84.32	39.32	7.58	14.28	370
18.04.18	84.78	42.76	6.76	12.25	420

End of Test Report

GMEC International Test House and Research Centre Manager

VERIFIED BY **AUTHORIZED SIGNATORY**

Note:
1. The result given above is related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.
3. The test samples will be disposed off after complete Analysis, unless until specified by the customer

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URL : www.gmecinternational.com

Report No. – GMEC12032018A223 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officcrs campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Project Site
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
01.05.18	78.75	43.08	7.36	12.48	390
03.05.18	83.51	42.11	7.16	13.26	330
06.05.18	81.61	42.68	6.89	13.14	360
09.05.18	84.28	42.58	8.26	12.96	410
13.05.18	81.16	39.84	6.44	13.26	340
16.05.18	85.42	43.58	6.88	14.32	340
20.05.18	87.78	43.04	7.06	13.28	320
23.05.18	88.4	39.43	8.16	14.16	360
27.05.18	87.66	40.42	9.44	13.85	310
30.05.18	83.56	43.18	6.96	16.84	360

End of Test Report

VERIFIED BY **AUTHORIZED SIGNATORY**

GMEC International Test House and Research Centre Manager

Note:
1. The result given above is related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.
3. The test samples will be disposed off after complete Analysis, unless until specified by the customer

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Report No. – GMEC12032018A224 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Sectar 30 Chandigarh
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
12.03.18	72.33	34.62	7.56	12.46	410
15.03.18	68.26	40.28	6.16	10.44	340
18.03.18	64.52	34.04	5.31	10.05	340
21.03.18	71.26	32.46	5.62	10.76	390
25.03.18	70.88	31.24	6.89	11.48	360
28.03.18	70.22	41.18	7.22	11.87	340

End of Test Report

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GMEC International Technical Manager Test House and Research Centre

AUTHORIZED SIGNATORY

Note:
1. The result given above is related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.
3. The test samples will be disposed off after complete Analysis, unless until specified by the customer

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Report No. – GMEC12032018A225 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Sectar 30 Chandigarh
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
01.04.18	74.11	33.41	6.44	10.96	310
04.04.18	78.82	35.96	7.24	10.46	360
07.04.18	74.26	31.56	6.88	12.16	320
10.04.18	74.59	31.22	7.72	10.56	390
15.04.18	72.84	33.78	5.88	11.82	340
18.04.18	77.37	35.66	7.86	12.25	330
22.04.18	70.46	32.92	6.24	12.36	310
25.04.18	71.84	36.89	7.12	13.25	310

End of Test Report

VERIFIED BY **AUTHORIZED SIGNATORY**

GMEC International Technical Manager Test House and Research Centre

Note:
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M. (0) : +91-9928793002 | E-mail : info@gmecinternational.com
URL : www.gmecinternational.com

Report No. – GMEC12032018A226 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Sectar 30 Chandigarh
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
01.05.18	70.48	31.75	5.36	12.48	320
03.05.18	75.28	38.2	8.26	14.84	390
06.05.18	68.24	33.18	5.25	14.18	290
09.05.18	68.24	32.46	6.45	10.86	280
13.05.18	70.44	32.44	6.26	14.56	320
16.05.18	72.57	41.22	6.46	13.42	310
20.05.18	69.35	36.48	8.04	11.42	330
23.05.18	70.06	31.79	8.26	10.32	370
27.05.18	71.26	40.08	7.96	12.53	340
30.05.18	70.88	42.56	7.44	12.88	330

End of Test Report

VERIFIED BY

AUTHORIZED SIGNATORY

GMEC International • Technical Manager • Test House and Research Centre

Note:

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URL : www.gmecinternational.com

Report No. – GMEC12032018A227 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Sector 60 Mohali (SAS Nagar)
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
12.03.18	66.34	28.47	6.85	13.46	340
15.03.18	73.16	29.48	7.15	12.56	320
18.03.18	68.91	32.18	5.15	10.04	310
21.03.18	66.41	31.08	6.35	11.66	280
25.03.18	67.58	32.75	7.15	12.56	260
28.03.18	62.49	30.18	6.06	11.46	270

End of Test Report

VERIFIED BY

AUTHORIZED SIGNATORY

GMEC International Technical Manager Test House and Research Centre

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A-61

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URL : www.gmecinternational.com

Report No. – GMEC12032018A228 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Sectar 60 Mohali (SAS Nagar)
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
01.04.18	69.28	29.18	7.66	11.2	260
04.04.18	62.17	28.46	6.65	11.88	290
07.04.18	67.06	29.18	7.22	10.62	270
10.04.18	64.22	28.42	6.44	10.35	320
15.04.18	69.46	27.32	6.56	11.39	260
18.04.18	68.82	27.62	7.24	12.25	390
22.04.18	70.44	30.51	7.44	13.42	280
25.04.18	62.78	31.49	6.11	10.39	280

End of Test Report

VERIFIED BY

AUTHORIZED SIGNATORY

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Report No. – GMEC12032018A229 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Sectar 60 Mohali (SAS Nagar)
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
01.05.18	69.95	32.64	7.34	12.36	270
03.05.18	68.33	31.75	6.22	11.66	260
06.05.18	66.08	31.07	5.98	11.22	280
09.05.18	71.48	33.14	7.22	12.36	360
13.05.18	62.84	30.46	6.82	9.84	260
16.05.18	67.88	29.43	7.36	11.62	280
20.05.18	67.94	28.64	5.72	12.25	290
23.05.18	69.58	26.14	6.49	13.94	280
27.05.18	67.14	31.46	5.44	11.05	290
30.05.18	68.42	34.16	6.65	11.96	260

End of Test Report

VERIFIED BY **AUTHORIZED SIGNATORY**

GMEC International Test House and Research Centre Manager

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URL : www.gmecinternational.com

Report No. – GMEC12032018A230 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Village - Chao Majra
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
13.03.18	64.22	26.18	6.69	10.88	320
16.03.18	68.49	29.92	5.98	9.85	290
19.03.18	69.18	30.62	6.24	6.85	280
22.03.18	64.62	28.49	6.69	10.25	260
26.03.18	69.35	29.48	8.14	10.56	320
29.03.18	64.52	25.12	4.26	9.89	310

End of Test Report

VERIFIED BY

AUTHORIZED SIGNATORY

GMEC International Technical Manager Test House and Research Centre

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Report No. – GMEC12032018A231 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Village - Chao Majra
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
02.04.18	62.36	27.36	5.82	12.25	300
05.04.18	59.28	30.42	6.25	10.36	360
08.04.18	55.42	29.68	6.5	9.92	330
11.04.18	58.83	30.08	6.82	8.86	340
16.04.18	69.23	26.89	5.92	10.76	290
19.04.18	68.36	26.41	5.72	9.26	280
23.04.18	67.26	27.74	6.49	11.25	280
26.04.18	65.98	28.46	5.22	10.96	240

End of Test Report

VERIFIED BY

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URL : www.gmecinternational.com

Report No. – GMEC12032018A232 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Village - Chao Majra
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
02.05.18	56.36	29.42	6.65	10.46	290
04.05.18	59.84	32.46	5.92	9.85	300
07.05.18	61.32	32.16	3.98	7.75	280
10.05.18	58.77	30.11	5.25	10.86	260
14.05.18	56.36	28.94	5.76	10.39	240
17.05.18	57.22	27.6	6.36	8.55	250
21.05.08	66.14	29.52	6.46	8.4	270
24.05.18	67.86	32.18	6.15	10.32	260
28.05.18	68.12	28.42	6.4	13.26	320
31.05.18	61.26	28.44	5.18	10.86	320

End of Test Report

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GMEC International Test House and Research Centre

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Report No. – GMEC12032018A233 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Chaudiala - village
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
13.03.18	64.56	31.27	6.44	10.28	310
16.03.18	62.94	28.38	4.37	9.42	300
19.03.18	66.71	28.63	4.76	8.56	310
22.03.18	64.56	31.27	5.58	9.72	290
26.03.18	62.34	30.84	5.48	8.95	310
29.03.18	64.58	30.95	5.74	8.62	270

End of Test Report

VERIFIED BY

AUTHORIZED SIGNATORY

GMEC International Test House and Research Centre

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URL : www.gmecinternational.com

Report No. – GMEC12032018A234 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Chaudiala - village
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
02.04.18	61.74	27.33	4.62	9.82	300
05.04.18	68.26	29.61	5.62	10.36	280
08.04.18	62.85	26.48	6.78	8.52	260
11.04.18	63.75	30.52	4.35	8.26	270
16.04.18	64.85	31.42	6.45	9.85	240
19.04.18	64.96	31.28	7.06	8.63	280
23.04.18	66.05	29.75	6.29	8.72	270
26.04.18	67.46	25.38	5.86	9.86	310

End of Test Report

VERIFIED BY **AUTHORIZED SIGNATORY**

GMEC International Test House and Research Centre Jaipur

Note:
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URL : www.gmecinternational.com

Report No. – GMEC12032018A235 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Chaudiala - village
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
02.05.18	61.52	30.63	6.15	10.25	270
04.05.18	61.05	32.58	5.25	8.61	260
07.05.18	62.44	33.67	6.45	8.85	260
10.05.18	60.87	29.74	6.26	9.96	260
14.05.18	62.17	33.55	5.86	8.72	280
17.05.18	66.84	34.56	5.48	9.83	290
21.05.08	65.48	31.62	4.89	9.41	270
24.05.18	63.49	30.34	4.78	8.66	290
28.05.18	61.25	32.56	5.29	7.86	290
31.05.18	60.17	29.85	6.27	9.68	280

End of Test Report

VERIFIED BY **AUTHORIZED SIGNATORY**

GMEC International Technical Manager Test House & Research Centre

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M. (0) : +91-9928793002 | E-mail : info@gmecinternational.com
URL : www.gmecinternational.com

Report No. – GMEC12032018A236 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Bhabat - village
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
13.03.18	62.31	29.86	4.28	12.36	280
16.03.18	66.14	32.25	5.2	11.44	210
19.03.18	60.18	37.46	6.26	10.54	290
22.03.18	59.48	29.68	6.38	9.84	310
26.03.18	62.49	32.84	6.49	9.46	320
29.03.18	63.43	37.61	6.78	9.78	280

End of Test Report

VERIFIED BY

AUTHORIZED SIGNATORY

GMEC International Test House and Research Centre Manager

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Report No. – GMEC12032018A237 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Bhabat - village
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
02.04.18	64.12	29.46	7.24	10.44	260
05.04.18	56.87	33.76	6.12	10.78	270
08.04.18	59.22	32.74	7.46	11.22	260
11.04.18	57.06	28.17	5.62	10.06	280
16.04.18	58.47	34.68	6.78	10.96	280
19.04.18	60.07	30.25	4.35	9.04	290
23.04.18	59.23	32.64	6.45	8.63	240
26.04.18	55.47	33.16	5.84	8.72	270

End of Test Report

VERIFIED BY

AUTHORIZED SIGNATORY

GMEC International Test House and Research Centre Manager

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Report No. – GMEC12032018A238 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Bhabat - village
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
02.05.18	56.17	34.52	6.29	9.86	250
04.05.18	60.87	32.4	5.86	10.25	280
07.05.18	62.17	32.64	5.62	8.63	270
10.05.18	59.36	33.16	6.78	8.72	310
14.05.18	58.16	26.87	4.35	9.86	270
17.05.18	59.49	32.4	6.45	10.25	260
21.05.08	60.11	32.64	6.24	10.02	240
24.05.18	59.44	33.16	6.29	11.44	250
28.05.18	58.36	34.52	5.86	9.86	290
31.05.18	56.87	32.4	6.24	10.22	280

End of Test Report

VERIFIED BY **AUTHORIZED SIGNATORY**

GMEC International Test House and Research Centre Jaipur

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URL : www.gmecinternational.com

Report No. – GMEC12032018A239 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Village Khijergarh
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
14.03.18	68.4	26.36	5.28	11.24	280
17.03.18	65.26	25.98	6.18	11.84	290
20.03.18	64.87	27.12	6.44	10.74	300
23.03.18	68.22	26.66	7.26	10.46	290
27.03.18	64.71	25.17	6.94	9.84	280
30.03.18	60.44	28.06	6.77	10.62	280

End of Test Report

VERIFIED BY

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GMEC International Technical Manager Test House and Research Centre

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Report No. GMEC12032018A240 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Village Khijergarh
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
03.04.18	61.38	28.26	5.88	10.8	310
06.04.18	66.94	29.44	6.49	12.44	300
09.04.18	67.56	29.87	6.81	11.44	320
12.04.18	60.48	30.11	7.28	10.54	320
17.04.18	69.96	31.78	7.96	9.84	320
20.04.18	67.46	29.68	7.44	9.46	280
24.04.18	64.84	28.36	6.26	9.78	280
27.04.18	62.98	29.42	6.46	10.44	210

End of Test Report

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Report No. – GMEC12032018A241 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
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Sample	Ambient Air Quality Monitoring
Location of the Sampling	Village Khijergarh
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
03.05.18	58.16	28.38	5.62	10.78	290
05.05.18	56.48	26.48	6.78	9.44	310
08.05.18	59.47	28.52	4.96	10.96	320
11.05.18	61.33	28.46	6.45	9.04	280
15.05.18	67.49	29.41	7.06	8.63	260
18.05.18	64.08	26.67	6.29	8.72	270
22.05.18	65.14	27.34	5.86	9.86	270
25.05.18	60.48	28.49	6.15	10.25	26
29.05.18	59.48	27.42	5.24	8.63	280
01.06.18	62.36	30.12	7.22	8.72	290

End of Test Report

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Report No. – GMEC12032018A242 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Village Hawai Bassi
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
14.03.17	75.33	33.14	6.24	12.48	360
17.03.18	77.54	30.46	7.22	9.86	380
20.03.18	76.84	29.43	7.48	9.86	260
23.03.18	71.22	28.64	6.58	10.02	340
27.03.18	69.56	26.14	7.84	10.25	360
30.03.18	70.28	31.46	7.78	10.49	320

End of Test Report

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Report No. – GMEC12032018A243 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Village Hawai Bassi
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
03.04.18	71.08	29.22	6.34	10.78	340
06.04.18	72.41	37.61	5.84	10.98	350
09.04.18	68.46	32.44	6.18	11.16	340
12.04.18	68.73	32.65	7.91	11.44	310
17.04.18	69.43	31.48	7.22	11.46	320
20.04.18	72.81	30.64	6.49	11.56	360
24.04.18	67.94	32.98	6.04	11.69	360
27.04.18	69.58	31.48	5.38	12.06	380

End of Test Report

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AUTHORIZED SIGNATORY

GMEC International Test House and Research Centre Manager

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Report No. – GMEC12032018A244 Date: 6/06/2018

TEST REPORT AMBIENT AIR

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ambient Air Quality Monitoring
Location of the Sampling	Village Hawai Bassi
Name of Project	Gamada IT City Town Ship
Sample Collected by	GMEC Team
Sample Condition	OK
Environment Condition (during analysis) a. Room Temp° C : b. Relative Humidity %:	 25±2 55%±5

Date of Sampling	PARAMETERS WITH UNIT AND NAAQ STANDARDS				
	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Di – Oxide (SO2)	Nitrogen Oxides (NOx)	Carbon Mono Oxide (CO)
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
	100 Max.	60 Max	80 Max	80 Max	2000 Max
	TEST METHOD PROTOCOL & RESULT				
	IS : 5182 (Part 23) – 2006 (RA 2012)	GMEC/SOP/03	IS : 5182 (Part 2) – 2001 (RA 2012)	IS : 5182 (Part 6) – 2006 (RA 2012)	IS 5182 (Part 10): 1999
03.05.18	67.14	30.29	6.64	12.42	290
05.05.18	73.33	29.48	7.07	12.48	320
08.05.18	74.89	31.78	7.44	13.04	310
11.05.18	69.02	32.4	6.11	13.4	290
15.05.18	69.35	32.05	7.34	10.22	310
18.05.18	64.52	33.09	6.22	12.16	320
22.05.18	66.46	29.48	5.98	11.28	310
25.05.18	64.32	10.94	6.24	11.48	310
29.05.18	70.14	30.18	6.81	10.96	290
01.06.18	69.58	29.98	7.36	11.34	280

End of Test Report

VERIFIED BY

AUTHORIZED SIGNATORY

GMEC International Pvt. Ltd. Manager Test House and Research Centre

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URL : www.gmecinternational.com

Report No. – GMEC12032018W141 Date: 06/06/2018

TEST REPORT WATER

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura.
Sample	Surface Water (Pond)
Location of Sampling	Rurka Village
Name of Project	Gamada IT City Town Ship
Date of Sample Receipt	16/03/2018
Sample Provided by	Customer
Sample Condition	Ok
Date of Analysis Completion	20/03/2018
Environment Condition (during analysis) a. Room Temp°C : b. Relative Humidity %:	 25±2 55%±5

Sr. No.	Parameters	Units of Measurements	Results	Protocol
1	pH Value	--	7.44	IS : 3025 (Part 11) - (RA 2006)
2	Odor	--	unobjectionable	IS : 3025 (Part 5) – 1983 (RA 2012)
3	Turbidity	NTU	7.90	IS : 3025 (Part 10) – 2006
4	Total Dissolve Solids	mg/L	740	IS : 3025 (Part 16) – 2008
5	Total Hardness as $CaCO_3$	mg/L	536	IS : 3025 (Part 21) – 2009
6	Dissolved Oxygen	mg/l	6.8	IS : 3025 (Part 38) - 1989 (RA 2014)
8	BOD (3 Days at 27°C), mg/l	mg/l	6.0	IS : 3025 (Part 44) - 1993 (RA 2014)
9	Calcium as Ca	mg/L	104.00	IS : 3025 (Part 40) - 1991 (RA 2014)
10	Magnesium as Mg	mg/L	67.0	IS : 3025 (Part 46) – 1994 (RA 2014)
11	Chloride as Cl^-	mg/L	34.99	IS : 3025 (Part 32) - (RA 2007)
12	Fluoride as F^-	mg/L	1.26	APHA (23rd Edition) 4500 D: 2017
13	Sodium as Na	mg/L	86	IS : 3025 (Part 45) – 1993 (RA 2014)
14	Sulphates as SO_4^-	mg/L	40.0	APHA (23rd Edition) 4500 SO4-E; 2017
15	Nitrate as NO_3	mg/L	6.0	APHA (23rd Edition) 4500NO3-B; 2017
16	Total alkalinity as $CaCO_3$	mg/L	445	IS : 3025 (Part 23) – 1986 (RA 2003)
17	Chemical Oxygen Demand (COD)	mg/l	26.4	IS : 3025 (Part 58) - 2006 (RA 2012)
18	Total coli form per 100 Ml in MPN	MPN	990	IS: 1622 -1981-1989 RA 2009

End of Test Report

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VERIFIED BY **AUTHORISED SIGNATORY**

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M. (0) : +91-9928793002 | E-mail : info@gmecinternational.com
URL : www.gmecinternational.com

Report No. – GMEC12032018W140 Date: 06/06/2018

TEST REPORT WATER

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ground Water
Location of Sampling	Hawai Bassi
Name of Project	Gamada IT City Town Ship
Date of Sample Receipt	16/03/2018
Sample Provided by	Customer
Sample Condition	Ok
Date of Analysis Completion	20/03/2018
Environment Condition (during analysis) a. Room Temp°C : b. Relative Humidity %:	 25±2 55%±5

Sr. No.	Parameters	Units of Measurements	Results	Limits as per IS:10500-2012		Protocol
				Desirable Limit	Permissible Limit	
1	pH Value	--	7.51	6.5-8.5	No relaxation	IS : 3025 (Part 11) - (RA 2006)
2	Turbidity	NTU	BDL (<0.5)	1	5	IS : 3025 (Part 10) – 2006
3	Total Dissolve Solids	mg/L	534	500	2000	IS : 3025 (Part 16) – 2008
4	Total Hardness as $CaCO_3$	mg/L	288	200	600	IS : 3025 (Part 21) – 2009
5	Calcium as Ca	mg/L	56.35	75	200	IS : 3025 (Part 40) - 1991 (RA 2014)
6	Magnesium as Mg	mg/L	35.82	30	100	IS : 3025 (Part 46) – 1994 (RA 2014)
7	Chloride as Cl^-	mg/L	79.98	250	1000	IS : 3025 (Part 32) - (RA 2007)
8	Fluoride as F^-	mg/L	0.86	1	1.5	APHA (23rd Edition) 4500 D: 2017
9	Sodium as Na	mg/L	110.6	--	--	IS : 3025 (Part 45) – 1993 (RA 2014)
10	Sulphates as SO_4^-	mg/L	41.25	200	400	APHA (23rd Edition) 4500 SO4-E; 2017
11	Nitrate as NO_3	mg/L	30.14	45	No relaxation	APHA (23rd Edition) 4500NO3-B; 2017
12	Total alkalinity as $CaCO_3$	mg/L	505	200	600	IS : 3025 (Part 23) – 1986 (RA 2003)

End of Test Report

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VERIFIED BY **AUTHORISED SIGNATORY**

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Report No. – GMEC12032018W139 Date: 06/06/2018

TEST REPORT WATER

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ground Water
Location of Sampling	Bhabat Village
Name of Project	Gamada IT City Town Ship
Date of Sample Receipt	16/03/2018
Sample Provided by	Customer
Sample Condition	Ok
Date of Analysis Completion	20/03/2018
Environment Condition (during analysis) a. Room Temp°C : b. Relative Humidity %:	 25±2 55%±5

Sr. No.	Parameters	Units of Measurements	Results	Limits as per IS:10500-2012		Protocol
				Desirable Limit	Permissible Limit	
1	pH Value	--	7.51	6.5-8.5	No relaxation	IS : 3025 (Part 11) - (RA 2006)
2	Turbidity	NTU	BDL (<0.5)	1	5	IS : 3025 (Part 10) – 2006
3	Total Dissolve Solids	mg/L	525	500	2000	IS : 3025 (Part 16) – 2008
4	Total Hardness as $CaCO_3$	mg/L	300.2	200	600	IS : 3025 (Part 21) – 2009
5	Calcium as Ca	mg/L	62.44	75	200	IS : 3025 (Part 40) - 1991 (RA 2014)
6	Magnesium as Mg	mg/L	35.09	30	100	IS : 3025 (Part 46) – 1994 (RA 2014)
7	Chloride as Cl^-	mg/L	104.97	250	1000	IS : 3025 (Part 32) - (RA 2007)
8	Fluoride as F^-	mg/L	0.92	1	1.5	APHA (23rd Edition) 4500 D: 2017
9	Sodium as Na	mg/L	121.6	--	--	IS : 3025 (Part 45) – 1993 (RA 2014)
10	Sulphates as SO_4^-	mg/L	46.26	200	400	APHA (23rd Edition) 4500 SO4-E; 2017
11	Nitrate as NO_3	mg/L	32.14	45	No relaxation	APHA (23rd Edition) 4500NO3-B; 2017
12	Total alkalinity as $CaCO_3$	mg/L	545	200	600	IS : 3025 (Part 23) – 1986 (RA 2003)

End of Test Report

VERIFIED BY **AUTHORISED SIGNATORY**

Note:
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3. The test samples will be disposed off after 15 days from the date of sample received, unless until specified by the customer

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Report No. – GMEC12032018W138 Date: 06/06/2018

TEST REPORT WATER

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ground Water
Location of Sampling	Chandigarh Sector-30
Name of Project	Gamada IT City Town Ship
Date of Sample Receipt	16/03/2018
Sample Provided by	Customer
Sample Condition	Ok
Date of Analysis Completion	20/03/2018
Environment Condition (during analysis) a. Room Temp°C : b. Relative Humidity %:	 25±2 55%±5

Sr. No.	Parameters	Units of Measurements	Results	Limits as per IS:10500-2012		Protocol
				Desirable Limit	Permissible Limit	
1	pH Value	--	7.7	6.5-8.5	No relaxation	IS : 3025 (Part 11) - (RA 2006)
2	Turbidity	NTU	BDL (<0.5)	1	5	IS : 3025 (Part 10) – 2006
3	Total Dissolve Solids	mg/L	599	500	2000	IS : 3025 (Part 16) – 2008
4	Total Hardness as $CaCO_3$	mg/L	285.0	200	600	IS : 3025 (Part 21) – 2009
5	Calcium as Ca	mg/L	59.40	75	200	IS : 3025 (Part 40) - 1991 (RA 2014)
6	Magnesium as Mg	mg/L	33.24	30	100	IS : 3025 (Part 46) – 1994 (RA 2014)
7	Chloride as Cl^-	mg/L	89.97	250	1000	IS : 3025 (Part 32) - (RA 2007)
8	Fluoride as F^-	mg/L	0.86	1	1.5	APHA (23rd Edition) 4500 D: 2017
9	Sodium as Na	mg/L	114.5	--	--	IS : 3025 (Part 45) – 1993 (RA 2014)
10	Sulphates as SO_4^-	mg/L	56.24	200	400	APHA (23rd Edition) 4500 SO4-E; 2017
11	Nitrate as NO_3	mg/L	23.45	45	No relaxation	APHA (23rd Edition) 4500NO3-B; 2017
12	Total alkalinity as $CaCO_3$	mg/L	585	200	600	IS : 3025 (Part 23) – 1986 (RA 2003)

End of Test Report

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3. The test samples will be disposed off after 15 days from the date of sample received, unless until specified by the customer

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Report No. – GMEC12032018W137 Date: 06/06/2018

TEST REPORT WATER

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ground Water
Location of Sampling	Chudiala village
Name of Project	Gamada IT City Town Ship
Date of Sample Receipt	16/03/2018
Sample Provided by	Customer
Sample Condition	Ok
Date of Analysis Completion	20/03/2018
Environment Condition (during analysis) a. Room Temp°C : **b.** Relative Humidity %:	 25±2 55%±5

S No.	Parameters	Units of Measurements	Results	Limits as per IS:10500-2012		Protocol
				Desirable Limit	Permissible Limit	
1	pH Value	--	7.46	6.5-8.5	No relaxation	IS : 3025 (Part 11) - (RA 2006)
2	Turbidity	NTU	BDL (<0.5)	1	5	IS : 3025 (Part 10) – 2006
3	Total Dissolve Solids	mg/L	654	500	2000	IS : 3025 (Part 16) – 2008
4	Total Hardness as $CaCO_3$	mg/L	292.6	200	600	IS : 3025 (Part 21) – 2009
5	Calcium as Ca	mg/L	51.78	75	200	IS : 3025 (Part 40) - 1991 (RA 2014)
6	Magnesium as Mg	mg/L	39.71	30	100	IS : 3025 (Part 46) – 1994 (RA 2014)
7	Chloride as Cl^-	mg/L	99.97	250	1000	IS : 3025 (Part 32) - (RA 2007)
8	Fluoride as F^-	mg/L	0.73	1	1.5	APHA (23rd Edition) 4500 D: 2017
9	Sodium as Na	mg/L	126.02	--	--	IS : 3025 (Part 45) – 1993 (RA 2014)
10	Sulphate as SO_4^-	mg/L	53.57	200	400	APHA (23rd Edition) 4500 SO4-E; 2017
11	Nitrate as NO_3	mg/L	38.3	45	No relaxation	APHA (23rd Edition) 4500NO3-B; 2017
12	Total alkalinity as $CaCO_3$	mg/L	560	200	600	IS : 3025 (Part 23) – 1986 (RA 2003)

End of Test Report

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Report No. – GMEC12032018W134

Date: 06/06/2018

TEST REPORT WATER

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ground Water
Location of Sampling	Sector-60 Mohali (SAS Nagar)
Name of Project	Gamada IT City Town Ship
Date of Sample Receipt	16/03/2018
Sample Provided by	Customer
Sample Condition	Ok
Date of Analysis Completion	20/03/2018
Environment Condition (during analysis) a. Room Temp°C : b. Relative Humidity %:	25±2 55%±5

Sr. No.	Parameters	Units of Measurements	Results	Limits as per IS:10500-2012		Protocol
				Desirable Limit	Permissible Limit	
1	pH Value	--	7.8	6.5-8.5	No relaxation	IS : 3025 (Part 11) - (RA 2006)
2	Turbidity	NTU	BDL (<0.5)	1	5	IS : 3025 (Part 10) – 2006
3	Total Dissolve Solids	mg/L	471	500	2000	IS : 3025 (Part 16) – 2008
4	Total Hardness as $CaCO_3$	mg/L	159.6	200	600	IS : 3025 (Part 21) – 2009
5	Calcium as Ca	mg/L	47.21	75	200	IS : 3025 (Part 40) - 1991 (RA 2014)
6	Magnesium as Mg	mg/L	10.16	30	100	IS : 3025 (Part 46) – 1994 (RA 2014)
7	Chloride as Cl^-	mg/L	34.99	250	1000	IS : 3025 (Part 32) - (RA 2007)
8	Fluoride as F^-	mg/L	1.01	1	1.5	APHA (23rd Edition) 4500 D: 2017
9	Sodium as Na	mg/L	94.0	--	--	IS : 3025 (Part 45) – 1993 (RA 2014)
10	Sulphates as SO_4^-	mg/L	46.0	200	400	APHA (23rd Edition) 4500 SO4-E; 2017
11	Nitrate as NO_3	mg/L	8.23	45	No relaxation	APHA (23rd Edition) 4500NO3-B; 2017
	Total alkalinity as $CaCO_3$	mg/L	445	200	600	IS : 3025 (Part 23) – 1986 (RA 2003)

End of Test Report

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URL : www.gmecinternational.com

Report No. – GMEC12032018W135

Date: 06/06/2018

TEST REPORT WATER

Report Details	
Name & Address of the Customer	GMEC International 308 Saharn Tower Officers campus extensions sirsi Road Khatipura
Sample	Ground Water
Location of Sampling	Khizpur Village
Name of Project	Gamada IT City Town Ship
Date of Sample Receipt	16/03/2018
Sample Provided by	Customer
Sample Condition	Ok
Date of Analysis Completion	20/03/2018
Environment Condition (during analysis) a. Room Temp°C : b. Relative Humidity %:	25±2 55%±5

Sr. No.	Parameters	Units of Measurements	Results	Limits as per IS:10500-2012		Protocol
				Desirable Limit	Permissible Limit	
1	pH Value	--	7.51	6.5-8.5	No relaxation	IS : 3025 (Part 11) - (RA 2006)
2	Turbidity	NTU	BDL (<0.5)	1	5	IS : 3025 (Part 10) – 2006
3	Total Dissolve Solids	mg/L	528	500	2000	IS : 3025 (Part 16) – 2008
4	Total Hardness as $CaCO_3$	mg/L	308	200	600	IS : 3025 (Part 21) – 2009
5	Calcium as Ca	mg/L	59.40	75	200	IS : 3025 (Part 40) - 1991 (RA 2014)
6	Magnesium as Mg	mg/L	38.83	30	100	IS : 3025 (Part 46) – 1994 (RA 2014)
7	Chloride as Cl^-	mg/L	94.97	250	1000	IS : 3025 (Part 32) - (RA 2007)
8	Fluoride as F^-	mg/L	0.90	1	1.5	APHA (23rd Edition) 4500 D: 2017
9	Sodium as Na	mg/L	116.6	--	--	IS : 3025 (Part 45) – 1993 (RA 2014)
10	Sulphates as SO_4^-	mg/L	42.26	200	400	APHA (23rd Edition) 4500 SO4-E; 2017
11	Nitrate as NO_3	mg/L	29.14	45	No relaxation	APHA (23rd Edition) 4500NO3-B; 2017
12	Total alkalinity as $CaCO_3$	mg/L	520	200	600	IS : 3025 (Part 23) – 1986 (RA 2003)

End of Test Report

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ਨਗਰ ਅਤੇ ਗਰਾਮ ਯੋਜਨਾਬੰਦੀ ਵਿਭਾਗ, ਪੰਜਾਬ।

ਵੱਲੋਂ,

ਮੁੱਖ ਨਗਰ ਯੋਜਨਾਕਾਰ, ਪੰਜਾਬ, ਚੰਡੀਗੜ੍ਹ,
ਐਂਟ ਪੁੱਡਾ ਭਵਨ, ਛੇਵੀਂ ਮੰਜ਼ਿਲ, ਬਲਾਕ-ਏ,
ਸੈਕਟਰ-62, ਐਸ.ਏ.ਐਸ.ਨਗਰ।

ਵੱਲ

ਮੰਡਲ ਇੰਜੀਨੀਅਰ(ਜ.ਸ.1)
ਗਮਾਡਾ, ਐਸ.ਏ.ਐਸ.ਨਗਰ।

ਪੱਤਰ ਨੰ: 5603 ਸੀਟੀਪੀ(ਪਬ) SP-350A/MPM-171
ਮਿਤੀ: 20/09/18

ਵਿਸ਼ਾ: **Issuance of TORs for carrying out EIA study for obtaining revised Environmental clearance under EIA notification dated 14.09.2016 for development of Township and Area Development Project namely IT City"having an ara of 709.82 hectare (8098226.62 sqm) in the sector 66-B, 82-A, 83-Am 101-A Mohali(Punjab) by Greater Mohali Area Developmet Authority (Proposal No. SIA/PB/NCP/25677/2018)**

ਹਵਲਾ: **ਆਪ ਦੇ ਦਫਤਰ ਦਾ ਪੱਤਰ ਨੰ:GMADA-DE(PH-1)/2018/4186-92 dated 31.07.18**

ਉਪਰੋਕਤ ਵਿਸ਼ੇ ਤੇ ਹਵਾਲੇ ਅਧੀਨ ਪੱਤਰ ਦੇ ਸਬੰਧ ਵਿੱਚ ਨੁਕਤਾਵਾਇਜ਼ ਟਿੱਪਣੀ ਹੇਠ ਲਿਖੇ ਅਨੁਸਾਰ ਹੈ:

ਨੁਕਤਾ ਨੰ: 1 ਦੇ ਸਬੰਧੀ ਦੱਸਿਆ ਜਾਂਦਾ ਹੈ ਕਿ ਪ੍ਰਵਾਨਤ ਲੇ ਆਊਟ ਪਲੈਨ ਵਿੱਚ ਲੋੜੀਦਾ ਗਰੀਨ ਬਫਰ ਤਜਵੀਜ ਕੀਤਾ ਹੋਇਆ ਹੈ।

ਨੁਕਤਾ ਨੰ: 2 ਦੇ ਸਬੰਧੀ ਦੱਸਿਆ ਜਾਂਦਾ ਹੈ ਕਿ ਇਸ ਦਫਤਰ ਵੱਲੋ ਜਾਰੀ ਮੀਮੋ ਨੰ: 2505 ਸੀਟੀਪੀ(ਪਬ) ਐਸਪੀ-432 (ਐਮ) ਮਿਤੀ 14.6.2017 ਅਨੁਸਾਰ ਸੈਕਟਰ 66-ਬੀ, 82-ਏ ਅਤੇ 101-ਏ ਐਸ.ਏ.ਐਸ.ਨਗਰ ਵਿਖੇ ਗਮਾਡਾ ਨੂੰ Super Mega Mixed use Integrated Industrial Park ਸਥਾਪਿਤ ਕਰਨ ਲਈ 1686.0619 ਏਕੜ ਰਕਬੇ ਦੀ ਕੋ ਮੰਤਵ ਤਬਦੀਲੀ ਦੀ ਪ੍ਰਵਾਨਗੀ ਸਰਕਾਰ ਪਾਸੋ ਪ੍ਰਵਾਨਗੀ ਪ੍ਰਾਪਤ ਕਰਦੇ ਹੋਏ ਜਾਰੀ ਕੀਤੀ ਗਈ ਸੀ। ਇਸ ਤੋ ਇਲਾਵਾ ਮਾਸਟਰ ਪਲੈਨ ਐਸ.ਏ.ਐਸ ਨਗਰ ਦੀਆਂ ਸਿਫਿਆਵਾਂ ਨੂੰ ਮੰਨਣ ਸਬੰਧੀ ਵੀ ਪਾਬੰਦ ਕੀਤਾ ਗਿਆ ਸੀ। ਇਥੇ ਇਹ ਸਪਸ਼ੱਟ ਕੀਤਾ ਜਾਂਦਾ ਹੈ ਕਿ ਨੋਟੀਫਾਈਡ ਜੋਨਲ ਪਲੈਨ ਐਸ.ਏ.ਐਸ ਨਗਰ ਦੀ ਰਿਪੋਰਟ ਅਨੁਸਾਰ ਇਹਨਾਂ ਸੈਕਟਰਾਂ ਵਿੱਚ Green and Orange Industries ਆਗਿਆ ਯੋਗ ਹਨ। ਇਸ ਲਈ

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Divisional Engineer
Public Health Division No.1
GMADA, S.A.S. Nagar

Green and Orange Industries ਨੂੰ ਵੱਖਰੇ ਤੌਰ ਤੇ specify ਕਰਨ ਸਬੰਧੀ ਕੋਈ ਵੀ ਉਪਬੰਧ ਕਰਨਾ ਨਹੀਂ ਬਣਦਾ ਹੈ ਅਤੇ ਮਾਸਟਰ/ਜੋਨਲ ਪਲੈਨ ਐਸ.ਏ.ਐਸ ਨਗਰ ਦੀਆਂ ਮਿਥਿਆਵਾਂ ਅਨੁਸਾਰ Green and Orange Industries as designated by PPCB ਹੀ ਆਗਿਆਯੋਗ ਹਨ।

ਨੁਕਤਾ ਨੰ: 3 ਸਬੰਧੀ ਦੱਸਿਆ ਜਾਂਦਾ ਹੈ ਕਿ ਇਸ ਦਫਤਰ ਵੱਲੋ ਜਾਰੀ ਮੀਮੋ ਨੰ: 2505 ਸੀਟੀਪੀ(ਪਬ) ਐਸਪੀ-432 (ਐਮ) ਮਿਤੀ 14.6.2017 ਅਨੁਸਾਰ ਸੈਕਟਰ 66-ਬੀ, 82-ਏ ਅਤੇ 101-ਏ ਐਸ.ਏ.ਐਸ.ਨਗਰ ਵਿਖੇ Super Mega Mixed use Integrated Industrial Park ਸਥਾਪਿਤ ਕਰਨ ਲਈ ਮਾਸਟਰ ਪਲੈਨ ਐਸ.ਏ.ਐਸ.ਨਗਰ ਦੀਆਂ ਮਿਥਿਆਵਾਂ ਦੀ ਰੋਸ਼ਨੀ ਵਿੱਚ ਭੌ ਮੰਤਵ ਤਬਦੀਲੀ ਦੀ ਪ੍ਰਵਾਨਗੀ ਜਾਰੀ ਕੀਤੀ ਗਈ ਸੀ। ਇਸ ਲਈ ਮਾਸਟਰ ਪਲੈਨ ਐਸ.ਏ.ਐਸ ਨਗਰ ਦੀਆਂ ਮਿਥਿਆਵਾਂ ਵਿੱਚ ਸੋਧ ਦੀ ਜ਼ਰੂਰਤ ਨਹੀਂ ਜਾਪਦੀ ਹੈ।

ਨੁਕਤਾ ਨੰ: 4 ਦਾ ਸਬੰਧ ਗਮਾਡਾ ਨਾਲ ਹੈ, ਇਸ ਲਈ ਇਸ ਸਬੰਧੀ ਟਿੱਪਣੀ ਗਮਾਡਾ ਪਾਸੋ ਪ੍ਰਾਪਤ ਕਰਨੀ ਬਣਦੀ ਹੈ।

ਨੁਕਤਾ ਨੰ: 5 ਦਾ ਸਬੰਧ ਗਮਾਡਾ ਨਾਲ ਹੈ, ਇਸ ਲਈ ਇਸ ਸਬੰਧੀ ਟਿੱਪਣੀ ਗਮਾਡਾ ਪਾਸੋ ਪ੍ਰਾਪਤ ਕਰਨੀ ਬਣਦੀ ਹੈ।

ਮੁੱਖ ਨਗਰ ਯੋਜਨਾਕਾਰ,
ਪੰਜਾਬ,ਚੰਡੀਗੜ੍ਹ।

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Divisional Engineer
Public Health Division No.1
GMADA, S.A.S. Nagar

GMADA - Knowledge Park, Sector 66, 82 & 83 Mohali

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY PUNJAB
Ministry of Environment, Forest & Climate Change, New Delhi

O/O Punjab Pollution Control Board,
Vatavaran Bhawan, Nabha Road,
Patiala – 147 001
Telefax:- 0175-2215636

No. SEIAA/20 .8/ 775 **REGISTERED** **Dated:** 16-7-18

To,

The Divisional Engineer (PH-1),
Greater Mohali Area Development Authority (GMADA),
PUDA Bhawan, Sector-62,
S.S Nagar (Mohali)-160062

Subject: Issuance of TORs for carrying out EIA study for obtaining revised Environmental clearance under EIA notification dated 14.09.2006 for development of Township and Area Development Project namely "IT City" having an area of 709.82 hectare (7098226.62 sqm) in the Sector 66-B, 82-A, 83-A, 101-A Mohali (Punjab) by Greater Mohali Area Development Authority (Proposal No. SIA/PB/NCP/25677/2018)

This has reference to your application for issuance of TORs for carrying out EIA study for obtaining revised Environmental clearance under EIA notification dated 14.09.2006 for development of Township and Area Development Project namely "IT City" having an area of 709.82 hectare (7098226.62 sqm) in the Sector 66-B, 82-A, 83-A, 101-A Mohali (Punjab). The project is covered under category 8 (b) of the Schedule appended to the EIA notification, 2006.

The case was considered by the SEAC in its 166th meeting held on 24.05.2018 and decided to categorize the project into B-1 and finalized & recommended Terms of Reference" for preparation of the draft Rapid EIA report.

The case was considered by the SEIAA in its 134th meeting held on 09.07.2018 and decided to accept the recommendations of SEAC and to issue the following Terms of References to the project proponent, as proposed by the SEAC:-

Construction stage

1. The project falls under category **B-1** under item 8(b) Township and Area Development projects and requires an Environmental Impact Assessment Study for the entire site area.

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2. Examine details of land use as per Master Plan and land use around 10 km radius of the project site. Analysis should be made based on latest satellite imagery for land use with raw images. Check on flood plain of any river.

3. Examine and submit the details of the environmental impacts at the stage of land acquisition including aspects such as displacement of families, rehabilitation, acquiring of agricultural/forest land, acquiring of ecologically important lands and water bodies.

4. Examine baseline environmental quality along with projected incremental load due to the project.

5. Environmental data to be considered in relation to the project development would be (a) land, (b) groundwater, (c) surface water, (d) air, (e) bio-diversity, (f) noise and vibrations, (g) socio economic and health. However, the project proponent has to fill the prescribed field data sheets (available on website of SEIAA i.e. www.seiaapunjab.co.in) which are required to be attached with the analysis reports alongwith exact location of sampling / monitoring point marked on the layout map. Monitoring started for study of significant environmental parameter by project proponent from 10.03.2018 may be accepted

6. Examine and submit the details of the environmental impacts due to change of land use and land cover including aspects such as hydrological characteristics, imperviousness of land and drainage pattern being altered.

7. Submit the details of the trees to be felled for the project.

8. Action plan for the green belt development in 33 % area with not less than 1, 500 trees per ha. giving details of species, width of plantation, planting schedule post plantation and maintenance plan for 3 years shall be included. The green belt shall be around the boundary and a scheme for greening of the roads used for the project shall also be incorporated.

9. Submit the present and use and permission required for any conversion such as forest, agriculture etc.

10. Examine the details of Source of water, water requirement, use of treated waste water and prepare water balance chart

11. Examine and submit impact due to ground water abstraction on ambient ground water on ambient ground water.

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12. Examine soil characteristics and depth of ground water table for rainwater harvesting.

13. Examine and submit the details of the environmental impacts at the stage of construction of boundaries & fencing including its impact on the pattern of natural drainage and flooding pattern and barriers being constructed for restricting wildlife movement into project area.

14. Examine and submit the details of the environmental impacts due to leveling and landscaping including aspects such as excavation & filling of soil, clearing of vegetation, change of topography, development of plantation, green belt, lawns & parks and development of impervious areas.

15. Examine and submit the details of the environmental impacts due to excavation, transportation and filling of earth including aspects such as excavation, filling, sourcing, transportation and disposal of soil.

16. Examine and submit the details of the construction material to be used at the construction stage including aspects such as quarries and transportation, stone crushing and screening, mining & transportation of sand, soil excavation, transportation and filling.

17. Examine and submit the impacts being caused due to transportation of construction materials and men such as increase in traffic and load on public transportation facility, destruction and damage of transportation infrastructure, increase of risk due to road accident, pollution caused due to dust and tail pipe emissions and consumption of fuel by transport vehicles. A detailed traffic and transportation study should be made for existing and projected passenger and cargo traffic

18. Examine and submit the details of the temporary housing and amenities to be created and used by the work force including aspects such as water supply, electrical energy and fuel supply.

19. Examine and submit the details of the environmental impacts at the stage of creation of roads, transportation facility and other physical infrastructure including aspects such as use of construction materials, excavation and /or filling of soil, generation of construction waste, creation of impervious surfaces, noise & suspended dust pollution and accidental risk.

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20. Examine and submit the details of the noise pollution, air pollution, consumption of fuel and generation of scrap being caused due to operation and maintenance of construction machinery and equipment.

21. Examine and submit the details of the source and supply of water for construction activity.

22. Examine and submit the details of the source and quantity of power for construction activity.

23. Examine and submit the details of the fuel consumption, noise pollution, emissions of the exhaust gas, engine & coolant oil and batteries being discarded due to captive and emergency power generation.

24. Examine and submit the details of the handling of wastewater during construction including the domestic wastewater being generated from amenities.

25. Examine and submit the details of the environmental impacts at the stage of development of residential buildings, commercial, institutional and industrial infrastructure including aspects such as construction materials to be used, earth work (excavation and/or soil filling), generation of construction waste, lighting, HVAC units, waste generation from packaging, residual paints and chemicals and their cans, Generation of wooden, glass, metal and other scrap materials, plumbing and sanitary waste generation, creation of impervious surfaces, noise pollution, suspended dust pollution and risk of accidents.

26. Examine and submit the details of the environmental impacts due to the laying of the water supply system including aspects such as use of piping, fittings ad pumps, water pumping stations, earth work and water treatment plant.

27. Examine and submit the details of the environmental impacts due to the laying of the sewerage and sewage treatment and disposal system including aspects such as use of construction material, piping, fittings ad pumps, earth work, laying of sewers & manholes, sewage pumping stations and sewage treatment plant.

28. Examine and submit the details of the environmental impacts due to the laying of the storm water drainage system including aspects such as use of construction material, piping, fittings and pumps, earth work, storm drains, storm water inlets and catch basins and storm water outfalls.

29. Examine and submit the details of the environmental impacts due to the electrical power system and street lighting to be provided including aspects such

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as construction materials to be used, distribution lines, cables, control panels, transformers and meters.

30. Examine and submit details of use of solar energy and alternative source of energy to reduce the fossil energy consumption. Energy conservation and energy efficiency.

31. DG sets are likely to be used during construction and operational phase of the project. Emissions from DG sets must be taken into consideration while estimating the impacts on air environment. Examine and submit details.

B. Operation stage

1. Examine and submit the details of the environmental impacts due to the residential, commercial, institutional, industrial, recreational, social, cultural & religious activities to be carried out.

2. Examine and submit the details of the environmental impacts due to the facilities to be provided such as water supply, electrical power supply, fuel supply & consumption including LPG, transportation and communication.

3. Examine and submit the details of the environmental impacts due to the sewerage & sewage treatment and its disposal systems and storm water & its drainage system.

4. Examine and submit the details of the environmental impacts caused due to the generation of captive power & emergency power.

5. Submit the details of the management & handling of municipal solid waste, e-waste, hazardous waste, scrap, estate management, construction and demolition waste management

6. Submit the details of the socio economic impact due to the employment to be generated from the household activities.

7. Rain water harvesting proposals should be made with due safeguards for ground water quality. Maximize recycling of water and utilization of rain water. Examine details.

C. General

1. Other details as indicated in Appendix III of EIA Notification 2006 and the manual titled as "EIA guidance Manual-Building, Construction, Township and

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area Development projects" published by the Ministry of Environment & Forests, New Delhi, should also be attended.

2. Environmental aspects identified under some of the project activities may not be comprehensive and some of the significant aspects under some of the activities of the project in question might not have been identified. All such environmental aspects may be added to the list.

3. Some of the activities with their associated environmental aspects of the project in question might be of significant magnitude and not included in the list project activities. All such activities may be added to the list of project activities.

4. The project proponent may add additional project activities and environmental aspects, if any, fill the impact matrix and carryout significance analysis for identifying the significant environmental aspects. Scale, sensitivity and duration of impacts; type, size and frequency of environmental aspects; applicable legal requirements and concerns of interested parties and local public may be used as the basis for the significance analysis of the environmental aspects.

5. In the EIA study each of the environmental aspects listed in the TOR should be quantified, their positive and negative impacts on different areas of impacts should be identified and assessed and the results of such assessment should be reported in the EIA report.

6. In the Environment Management Plan, management of each of the significant environmental aspects (with identified and assessed significant environmental impacts) for mitigating the impacts should be objectively stated.

7. Submit Role and responsibility of the developer etc. for compliance of environmental regulations under the provisions of EP Act.

8. Ground water classification as per the Central Ground Water Authority.

9. Environment Management Plan should include technical and institutional aspects for pre-treatment by constituent units.

10. Environmental Management Plan should be accompanied with Environmental Monitoring Plan and environmental cost and benefit assessment. The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.

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11. Examine separately the details for construction and operation phases both for Environmental Management Plan and Environmental Monitoring Plan with cost and parameters.

12. Submit details of a comprehensive Disaster Management Plan including emergency evacuation during natural and man-made disaster.

13. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given

14. Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.

15. Does the Environment policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.

16. What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the EC conditions. Details of this system may be given.

17. Does the company have a system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and / or shareholders or stakeholders at large? This reporting mechanism should be detailed in the EIA report.

18. Delineate the concrete proposal regarding activities to be undertaken under Corporate Social Responsibility programme, which should be long lasting in nature and should be as per the needs of a particular Village/area/ local habitats/ stakeholders to be adopted by the promoter company, which can be done by involving a person having knowledge and experience of socio-economic activities.

19. Study to be carried out shall include expansion related issues like structural safety (in case there is increase in number of storey), specifying the adequacy of existing internal water supply system, sewer line & STP for the proposed expansion. The existing building plan shall be superimposed with the proposed building plan for expansion projects and marked with different colors.

Additional Specific FOR

a. The project proponent will submit a copy of the Memorandum of Article & Association/Partnership deed/ undertaking of sole proprietorship/ list of

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Directors and names of other persons responsible for managing the day to day affairs of the project, whichever is applicable.

b. The project proponent shall ensure that adequate green buffer zone is also required to be provided between industrial & other establishments such as residential, commercial & educational Institutions. (1)

c. The project proponent shall specify the green & orange category of industry to be allowed and prepare the EIA study report accordingly. (2)

d. The project proponent has proposed to allow the establishment of green & orange category of industries in the proposed project mixed with other uses such as residential, commercial & educational institutes, however, the land use permitted in the proposals as per zoning plans of notified Master Plan of area is for industrial use only. The project proponent then submitted that the mixed land uses allowed are as per Super Mega Mixed Use Integrated Industrial Park Projects Policy of the State Govt. approved by Empowered Committee framed in its meeting 27.02.2008 under the Chairmanship of Hon'ble Chief Minister, Punjab. Moreover, revised layout plan of the project has been approved by Planning & Design Committee in its meeting on 06.12.2013. However, Super Mega Mixed Use Integrated Industrial Park Projects Policy has been approved by the State Govt. in the year 2008 whereas Master Plan of the area wherein project site is located has been notified in the year 2009. Once the Master Plan of the area has been notified, it is the only statutory document to be followed. In case, the mixed land uses as permitted in the above said policy of year 2008, were to be allowed to be continued then the provisions for the same should have been mentioned in the Zoning Plans of notified Master Plan. As such, the proposals of notified Master Plan are required to be amended suitably so as to adjust the allowing of mixed land use. (3)

The aforesaid 'Terms of Reference' will be valid for a period of three years from its issuance. The project proponent should prepare rapid EIA / EMP Report for its project based on above Terms of Reference and submit the same to the SEIAA for its appraisal.

Member Secretary

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Endst. No. ____ _____ **Dated** _____

A copy of the above is forwarded to the following for information and necessary action :-

1. The Secretary to Govt. of India, Ministry of Environment, Forest & Climate Change, Indira Paryavaran Bhavan, Jorbagh Road, New Delhi - 110003.
2. The Advisor, Northern Regional Office, Ministry of Environment & Forests, Bays No. 24-25, Sector 31-A, Dakshin Marg, Chandigarh.

a) Name of the applicant — Divisional Engineer (PH-1), GMADA

b) Phone Number — 0172-5093176

c) Email ID — dephl@gmada.gov.in

Member Secretary

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