

I/119729/2022(1)



HARYANA STATE POLLUTION CONTROL BOARD
C-11, SECTOR-6, PANCHKULA
Ph-0172-577870-73, Fax No. 2581201

To

The Member Secretary,
SEIAA, (Haryana)
Bays No. 55 - 58, Parytan Bhawan,
1st floor, Sector 2, Panchkula - 134115

Subject: Proceeding of Public Hearing held on 18.05.2022 regarding sand mining from Yamuna river (Minor mineral) project of M/s Dev & Div Solutions pvt ltd, at Village Makhanpur Tehsil Faridabad Haryana.

Kindly refer to the subject noted above.

In this connection, I have been directed to enclose herewith the proceedings of public hearing (**in original**) conducted on 18.05.2022 at 11:A.M at the project site under Environment Impact Assessment Notification dated 14.09.2006 for the purpose of obtaining Environmental Clearance under the provisions of EIA notification dated 14.09.2006 for sand mining project from Yamuna River (minor mineral) at Village Makhanpur, Tehsil & District, Faridabad (lease area measuring 66.32 Hectares with production capacity of 24,00,000 MTPA) by M/s Dev & Div Solutions pvt ltd, at Village Makhanpur Tehsil Faridabad Haryana along-with pen drive of video recording, photographs, and attendance sheet etc. for information and further necessary action please.

DA/ As Above

**Sr. Env. Engineer (HQ)
For Member Secretary**

Endst:

A copy of above is forwarded to the following for information and further necessary action:-

1. Sr. EE (IT) HSPCB, for uploading the proceeding on website of the Board.
2. Regional Officer, Ballabgarh Region w.r.t. his letter dated No. 477 dated 31.05.2022 for information and further necessary action.
3. M/s Dev & Div Solutions pvt ltd, at Village Makhanpur Tehsil Faridabad Haryana.

Signed by Satinder Pal
Date: 20-06-2022 15:59:32
Reason: Approved

I/115894/2022



HARYANA STATE POLLUTION CONTROL BOARD
Ballabgarh Region, Opp. Hewo Appmt., Sector-16A, Faridabad Website:
www.hspcb.gov.in

NO. HSPCB/BR/2022 477

Dated:

31/5/22
28/5/22

To

The Chairman,
Haryana State Pollution Control Board,
Panchkula.

Sub: Proceeding of Public Hearing held on 18.05.2022 regarding sand mining from Yamuna river (minor mineral) project of M/s Dev & Div Solutions Pvt. Ltd., at village Makhanpur, Tehsil & District Faridabad, Haryana.

In this connection, please find enclosed herewith the proceeding of public hearing held on 18.05.2022 at 11:00 AM of M/s Dev & Div Solutions Pvt. Ltd., at village Makhanpur, Tehsil & District Faridabad, Haryana in original duly signed by the Additional Deputy Commissioner, Faridabad along with the following documents:

| Sr. No. | Particular | Quantity |
|---------|--|--|
| 1. | Proceeding of Public Hearing | One number in original duly signed by Additional Deputy Commissioner, Faridabad. |
| 2. | Photographs & Videos of Public Hearing | One pen drive |
| 3. | Attendance register of Public Hearing | One number in original |
| 4. | Attendance of Officers attended the Public Hearing | One number in original |
| 5. | Copy of project report | One number |

It is submitted for you information & further necessary action please.

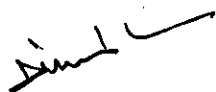
DA/ as above

Signed by Dinesh Kumar
Regional Officer
Date: 28.05.2022, 18:38:37
Ballabgarh Region
Reason: Approved

Proceeding of Public Hearing conducted on 18.05.2022 at 11:00 AM as per EIA notification dated 14.09.2006 regarding M/s Dev & Div Solutions Pvt. Ltd. at village Makhanpur, Tehsil & District Faridabad, Haryana

1.0 Background

- 1.1 The unit M/s Dev & Div Solutions Pvt. Ltd. is engaged in the business of sand mining. The unit proposed for sand mining project from Yamuna river (minor mineral) at village Makhanpur, Tehsil & District Faridabad, Haryana. The lease area for the mining will be 66.32 Hectares with production capacity of 24,00,000 MTPA for the said project.
- 1.2 The project covers under category 'A-1', project of activity 1 (a)(3) as per Environment Impact Notification (EIA) dated 14.09.2006 amended till date for which the project requires to obtain Environment Clearance from the Ministry of Environment and Forest.
- 1.3 The said unit had applied for the conduct of public hearing in Haryana State Pollution Control Board vide their letter dated 11.01.2022 along with prescribed fee for conduct of public hearing. A letter in this regard was written to the Deputy Commissioner, Faridabad vide this office letter no. HSPCB/BR/2022/7222-23 dated 24.03.2022 to give convenient date & time for conduct of Public Hearing & was fixed on 18.05.2022 at 11:00 AM at site after obtaining due approval from Deputy Commissioner, Faridabad vide their E-Office dated 04.04.2022. After that a letter has been sent to Member Secretary, HSPCB, Panchkula regarding proposal conduct of public hearing of the said project vide this office E-office letter dated 04.04.2022.
- 1.4 As per procedure a letter was written to the Director General, Information, Public relations and culture affairs department, Haryana by the Board vide letter no. I/106798/2022 dated 11.04.2022 to publish the notice of public hearing in leading newspaper i.e. one major national daily English newspaper and one region vernacular daily newspaper in Hindi and the notice of Public hearing was published in leading newspaper on 12.04.2022 in English Newspaper (Indian Express) & on 12.04.2022 in Hindi Newspaper (Dainik Jagran).
- 1.5 As per EIA Notification September 14, 2006 para no. 7(iii) public hearing is required so today this public hearing is conducted.





2.0 Officers attended the Public Hearing on 18th May, 2022.

2.1 The public hearing was conducting under the Chairmanship of Mohd. Imran Raza, IAS, Additional Deputy Commissioner, Faridabad. The following officers/ Public representative are also present during the time of Public Hearing:

1. Sh. Dinesh Kumar, Regional Officer, HSPCB, Ballabgarh Region
2. Sh. Ujjwal Kumar, Assistant Environment Engineer, HSPCB, Ballabgarh Region
3. Sh. Balram Singh, Mining Officer, Mining and Geology Department, Faridabad
4. Sh. Chandar Sekhar, Mining Accountant, Mining and Geology Department, Faridabad
5. Sh. Ankur Agrawal, Environment Consultant, M/s Vardan Environet
6. Ms. Avi Tomar, Environment Consultant, M/s Vardan Environet
7. Ms. Manvi Mishra, Environment Consultant, M/s Vardan Environet

2.2 Total 47 persons from nearby villages attended the Public hearing at site for the mining.

3.0 Question/Answers Session for General Public who attended the Public Hearing on 18.05.2022.

Ms. Avi Tomar, Environment Consultant, M/s Vardan Environet starts presentation and briefed in detail about the proposed mining project. After presentation of the project, Regional Officer, Haryana State Pollution Control Board, described the importance of Public Hearing to the people present during Hearing and informed that it is a platform to ask/raise any question/queries/suggestions related to Environment on the occasion so that their queries could be taken into consideration and implementation of the same could be done before the start & during the project. After obtaining due permission from the Additional Deputy Commissioner, Faridabad the question & answer sessions get started. The details of question & answers session are given as following:

| S. No. | Name and address of Stakeholder | Question | Reply |
|--------|---------------------------------------|---|-------|
| 1. | Sh. Harpal Singh S/o Jaswant Singh | First of all he welcomed Additional Deputy Commissioner, Govt. Officers and the local public: | |

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| | | | |
|----|-----------------------|---|--|
| | Vill- Jeet Singh Farm | | |
| a. | | He questioned that while the transportation of the mineral from the road dust will be generated, what measures will be taken by Project proponent to reduce the Dust. | The Environment Consultant, replied that no transportation of minerals will be done by village roads, bypass roads will be constructed by the PP for the transportation of minerals and dust suppression measures such as sprinkling water on the road will be done before and after the sand/minor minerals are transported. |
| b. | | He further questioned that the village road condition are very poor entire road are destructed and broken, transportation of the mineral will cause the effect hence the mineral transportation will not be possible from this road. | The Environment Consultant and project proponent replied that no transportation of minerals will be done from the village road, bypass roads will be constructed by the PP for the transportation of minerals so there won't be any kind of destruction to village roads, since the roads are still destructed and broken project proponent will repair the village roads under the CER Expenditure. |
| c. | | He further questioned that Our children goes to school via the village roads if the mineral will be transported from the village road then it will be unsafe for the children going to the school, who will be responsible if some miss happening occurs to our children. | The Environment Consultant replied that no transportation of sand will be done during the school hours, so the children will completely safe. |
| d. | | He requested to ADC Mr Imran Raza to do something about the stray cows/cattle as they roam here and there in the entire village road which is very dangerous for the villagers as they killed one of the village lady, no cows/cattle are kept in local Gaushala. | ADC Mr. Imran Raza replied that this question is not related to the mining project, still write down your concern in the form of application, he ensured that he will be taking adequate steps on the same. |
| e. | | He further questioned that How maintenance of roads will be done. Will it be repaired after 7 years? What is the procedure? | The Environment Consultant and project proponent replied that maintenance of roads will be done during the mining operation. |
| f. | | He further said that If any vehicle of loading of transportation is seen during the school hours and any miss happening occurs to the children then PP will be | The Environment Consultant and project proponent replied that the point is already cover and entire conversation is being recorded in front of ADC sir, Mining department official and Pollution Board RO and |

Jeet Singh

[Signature]

| | | | |
|----|---|---|--|
| | | entirely responsible for it. He also said to keep this conversation in records. | officials. |
| 2. | Sh. Ratnam Singh S/o:, Jaswant Singh Vill- Jeet Singh Farm | He said that the village road is single lane very narrow (3m) hence the transportation of sand will be difficult, in this regard we are rising objection today and again will arise again, as this is very narrow road. | The Environment Consultant and project proponent replied that no transportation of minerals will be done from the village road, outer village/ approach roads will be constructed by the PP for the transportation of minerals. |
| 3. | Sh. Harpal Singh S/o Jaswant Singh Vill- Jeet Singh Farm | He questioned that will the PP use the village road or any new road will be constructed from outside the village. | The Environment Consultant again replied that no transportation of minerals will be done within the village road, bypass approach roads will be constructed by the PP for the transportation of minerals. |
| 4. | Sh. Ratnam Singh S/o:, Jaswant Singh Vill- Jeet Singh Farm | He said that no transportation should be done from the road going through the village (Jeet Singh Farm) kindly choose the road outside the village as it is a single lane narrow road. | The Environment Consultant replied that we have noted your concern and the mineral transportation will be done outside the village road. |
| 5. | Mr. Dinesh Kumar, Regional Officer, Faridabad | He questioned that what measures will be taken to avoid the dust and air pollution on the mining site also after the loading done how will be the minerals kept during transportation. | The Environment Consultant and project proponent has replied that to suppress the dust partial and to control the air pollution water sprinkling will be done on the road before and after the sand/minor minerals are transported plantations will be done on both the sides of the river bank to avoid the dust and air pollution on the mining site. The mineral loaded trucks will be covered with tarpaulin and the vehicles will not exceed the speed of 20 km/hr. |
| | | He suggested that the plantation will be done on both side of the river bank also in the nearby villages, and try to include the Ayurvedic plants and trees beneficiary for the human health. | The Environment Consultant replied that project proponent will planned to plant 11000 saplings per year, which will be planted both side of the river bank, along the road side and govt buildings such as schools, hospitals, offices etc. The PP has also ensured and agreed to the suggestion of RO. |
| 6. | Mr. Ujjwal | He suggested that the | |

Dinesh

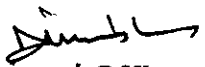
Ujjwal

| | | | |
|-----|--|---|---|
| | Kumar, Assistant Environment Engineer, HSPCB | Ayurvedic trees need to be planted along the both side of the roads through which the transportation will be done. He further suggested that the CETP or STP treated water should be used for dust suppression. | The project proponent has agreed on the suggestion. |
| 7. | Sh. Harpal Singh S/o Jaswant Singh Vill- Jeet Singh Farm | He asked for proper electricity supply in village as there is irregular electrical supply in their village. He said the department asked Rs. 9 lakhs for 800m line. | Additional Deputy Commissioner, Faridabad Mohd. Imran Raza replied that this question is not related to the mining and public hearing organized here for the environment related issues still write down your this concern on a piece of paper as in the form of application and ensured that he will be taking adequate steps regarding it. He suggested that the project proponent will ensure that the mining will be done by the mutual understanding with the villagers. He further suggested that the mining department has allotted the lease for a particular area, however the project proponent will make sure that the social development will be done under the CER activity. |
| 8. | Sh. Harpal Singh S/o Jaswant Singh Vill- Jeet Singh Farm | He said that the villagers will not pay money for the sand which will be utilized for the construction of houses within the village all the villagers | Project proponent has replied that the price of the sand will be decided mutually before start of the mine. |
| 9. | Sh. Satveer Singh S/o Dadar Singh Vill- Jeet Singh Farm | He question that the village road is single land it need to be developed and converted into two lane. If the transportation will done from the single road they will not provide the route to the ambulance etc. | The Environment Consultant replied that no transportation of minerals will be done from the village road. Project proponent has replied that all the matter will be undertake and mining will be done on mutual understanding. |
| 10. | Sh. Harpal | He suggested that mining is | Project proponent has replied that |

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| | | | |
|--|--|--|---|
| | <p>Singh S/o Jaswant Singh Vill- Jeet Singh Farm</p> | <p>possible only with the mutual understating if the project proponent will support us we will also support to him.</p> <p>He further requested that the employment will be provided to the local villagers.</p> <p>He further requested that a board with the contact no. of the mining owner and other mining partners need to be displayed at the mine site, so that at the time of emergency, we will contact to the mining officer.</p> | <p>the mining will be done by the mutual understanding and the employment will be provided to the local villagers on the basis of their qualification.</p> <p>Project proponent has agreed.</p> |
| <p>After the suggestion and their replies Chairman of public hearing concluded the meeting, the Regional Officer, Haryana State Pollution Control Board, Ballabgarh Region thanked the entire participants for their presence and participation.</p> | | | |


Regional Officer
Ballabgarh Region


Additional Deputy Commissioner
Faridabad

(Par Dove)

Photographs of

Vidua

Vill. Makhaipur,
Ferozabad

(6)

(6)

दिनांक 18/05/2022

परियोजना अंशिक - मैसर्स देव एण्ड विव सोल्यूशंस
 प्रा. लि. (मोहनपुर)

गांव मोहनपुर जिला - फरीदाबाद (हरियाणा)
 क्षेत्रफल: 66-32 है. (यमुना नदी के तट पर रेत खनन)

परियोजना में गांव लैने वाले हितधारक जन सुनवाई
 के लिए।

| क्र.सं. | नाम | पिता का नाम | गांव | हस्ताक्षर |
|---------|--------------|---------------|-------------|--------------|
| 1 | कृ. न. शर्मा | सोहन सिंह | नीतसीह बाबा | कृ. न. शर्मा |
| 2 | शकीब | अरुण | नीतसीह बाबा | शकीब |
| 3 | अरुण | गंगा सिंह | नीतसीह बाबा | अरुण |
| 4 | Gurmande | balv singh | jeet singh | Gurmande |
| 5 | vishakh | vinod bhati | jeet singh | vishakh |
| 6 | sharjeet | karthar bhati | jeet singh | sharjeet |
| 7 | gito bai | Sodagar Singh | jeet singh | gito bai |
| 8 | keishu bai | sharich singh | jeet singh | keishu bai |
| 9 | Pinki | Sharban Singh | jeet singh | Pinki |
| 10 | Kajal | sharban singh | jeet singh | Kajal |
| 11 | gopesh | sharban singh | jeet singh | gopesh |
| 12 | Sonu | sharban singh | jeet singh | Sonu |
| 13 | vinod bhat | Haran singh | jeet singh | vinod bhat |
| 14 | Gurjant | Gurman Singh | jeet singh | Gurjant |
| 15 | Mangal | kramesh Singh | jeet singh | Mangal |
| 16 | shinder | Kamal Singh | jeet singh | shinder |
| 17 | राज | सोहन सिंह | - | राज |
| 18 | सुरज | सुरज | - | सुरज |
| 19 | जोता | इमर सिंह | इमर | जोता |
| 20 | सुरजात | दिवान सिंह | - | सुरजात |
| 21 | हरन | सोहन सिंह | - | हरन |
| 22 | | | | |

| क्रमांक | नाम | पिता का नाम | गांव | हस्ताक्षर |
|---------|---------------|------------------|----------------------|--------------|
| 23 | इन्दर सिंह | पुम सिंह | पं. सुग्गी जीर फार्म | इन्दर सिंह |
| 24 | मंगल सिंह | पुम सिंह | जीत सिंह फार्म | मंगल सिंह |
| 25 | राजेश सिंह | मदन सिंह | | |
| 26 | सुरजीत सिंह | दरबार सिंह | | |
| 27 | काशमिर सिंह | जीत सिंह | | |
| 28 | गुरमीत सिंह | सुरजीत सिंह | जीत सिंह फार्म | |
| 29 | Gurjeet | Surjeet | | Gurjeet |
| 30 | केशमिर | गुरमीत | | केशमिर |
| 31 | राजेश सिंह | गुरमीत | | राजेश सिंह |
| 32 | क्याच | राजेश | | |
| 33 | बन्ती | सिंह/गुरमीत सिंह | जीत सिंह फार्म | |
| 34 | Harshul | Singh/Jamant | जीत सिंह | Harshul |
| 35 | Ayan Singh | Kashmir Singh | पं. सुग्गी जीर फार्म | Ayan Singh |
| 36 | Gurnam Singh | Kulwant Singh | जीत सिंह फार्म | Gurnam Singh |
| 37 | कुशमिर | मदन सिंह | | कुशमिर |
| 38 | Lalchand | मदन सिंह | | Lalchand |
| 39 | Sohan Singh | | नानागुज्जर | Sohan |
| 40 | Jagdish Singh | Singh | JAWANI | Jagdish |
| 41 | Shikhar | मदन सिंह | | Shikhar |
| 42 | Sukhdev | Nirmanjan | जीत सिंह फार्म | Sukhdev |
| 43 | Ganesh Singh | Bachchan Singh | पं. सुग्गी जीर फार्म | Ganesh |
| 44 | Jagdeep Singh | Gurdeep Singh | पं. सुग्गी जीर फार्म | Jagdeep |
| 45 | Nirmanjan | HARJAN | | Nirmanjan |
| 46 | Jagdeep | श्री शंकर | | Jagdeep |
| 47 | Shivam | Vijay | Jeet Singh | Shivam |
| 48 | केशमिर | अमल सिंह | पं. सुग्गी जीर फार्म | केशमिर |
| 49 | | | | |

Jan,
2022

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PLAN

RIVER SAND MINING FROM YAMUNA RIVER (MINOR MINERAL) OF
MAKHANPUR UNIT
TOTAL PRODUCTION 24,00,000 MTPA MINOR MINERAL (RIVER SAND)

VILLAGE: MAKHANPUR, TEHSIL & DISTRICT: FARIDABAD, HARYANA

STUDY PERIOD: OCTOBER TO DECEMBER, 2021

[The proposed project is listed under Schedule 1 (a) Mining of Minerals under the Schedule of EIA
Notification, 2006 and categorized as Category B]

PROJECT PROPONENT

M/S DEV & DIV SOLUTIONS PVT. LTD

3rd floor KCG Heritage Farm, Satberi, New Delhi-110074

laxmanbinani165@gmail.com

ENVIRONMENT CONSULTANT

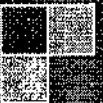
(QCI/NABEP ACCREDITED NO. NABEP/EIA/1977/RA0165)

PLOT NO.: 82 A SECTOR 5, IIM MANESAR, GURUGRAM-122052, HARYANA

Email: mlindia@vardanaviro.net

Contact: (91) 9899651572, (91) 9810355569

DOCUMENT NO. 2021_VM_009_DRAFT EIA



M/s Dev &
Div Solutions
Pvt. Ltd.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

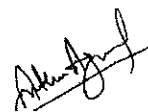

REVIEW AND REVISION HISTORY

History of revisions of the present report:

Table I: History of the Revisions

| S.No. | Rev. | Date | Modifications | Remarks |
|-------|---------------|------------|-----------------------|---|
| 1. | Rev. 00 Draft | 24.01.2022 | Draft EIA /EMP Report | Report has been prepared by team Vardan and all comments of reviewers have been incorporated in the Draft EIA/EMP Report. |

Table II: Record of Review

| Rev. | Date | Description | Review-1 | Approval |
|-------------|------------|---|---|--|
| Rev.00Draft | 24.01.2022 | Draft EIA/EMP Report | Mr. Ankur Agarwal | Mr. R.S. Yadav |
| - | - | The draft EIA EMP report has been prepared by Mr. Neetish Kumar (EIA coordinator) and assisted by Ms. Avi (FAE) and other team members. |  |  |

This Report has been prepared by **Vardan EnviroNet** on behalf of and for the use of M/s Dev & Div Solutions Pvt. Ltd due consideration and skill as per our general terms and conditions of business and terms of agreement with M/s Dev & Div Solutions Pvt. Ltd.



DISCLAIMER

Vardan EnviroNet has taken all reasonable precautions in the preparation of this report as per its auditable quality plan. Vardan EnviroNet also believes that the facts presented in the report are accurate as on the date it was written. However, it is impossible to dismiss absolutely, the possibility of errors or omissions. Vardan EnviroNet therefore specifically disclaims any liability resulting from the use or application of the information contained in this report. The information is not intended to serve as legal advice related to the individual situation.

NABET ANNEXURE – VII

Declaration by Experts contributing to the EIA of M/s Dev & Div Solutions Pvt. Ltd. located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana.

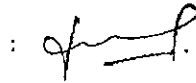
Declaration by Experts contributing:

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

EIA Co-ordinator:

Name : Mr. Neetish Kumar

Signature & Date




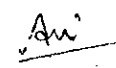
Period of involvement : Feb, 2021 - Till date

Contact information : Plot no.-82 A, Sector-5, IMT Manesar, Gurugram, Haryana

Contact no: 9899651342

Email: mining@vardanenvironet.com


Functional Area Experts (FAEs):

| S. No. | Functional Areas | Name of the Expert/s | Involvement | Signature & Date |
|--------|------------------|-----------------------|---|---|
| 1. | AP | Mr. Manoj Kumar Saini | a) Identifying the sources of emissions and mitigation measures. b) Site-specific micro meteorology monitoring. c) Ambient Air Quality (AAQ) monitoring d) Impact predictions and mitigations. e) Impact Identification |  |
| 2. | WP | Ms. Avi | f) selection of sampling locations g) Ground water quality monitoring and assessment, impacts on water environment and mitigations. h) Identification, characterization of effluent and treatments there of |  |

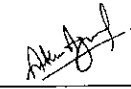
DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | | | | |
|-----|--------|--------------------|---|----------------|
| | | | i) Water balance and conservation measures | |
| 3. | SHW | Ms. Avi | a) Identification of haz, solid w.g, and their disposal and mitigation measure. b) Recycling and disposal | <u>Avi</u> |
| 4. | SE | Ms. Shilpa Mishra | a) Determination of demographic profile including socio economy & livelihood b) Assessing the changes in socio economic pattern | <u>Shilpa</u> |
| 5. | EB | Mr. Niteesh Kumar | a) Biological environment status in respect of terrestrial fauna and aquatic eco system. b) Impact on ecological environment. | <u>Niteesh</u> |
| 6. | HG/Geo | Mr. R.S. Yadav | a) Ground water resource assessment. b) Impact on ground water potential and mitigation measures for avoiding ground water contamination. | <u>RS</u> |
| 7. | AQ | Ms. Avi | a) Processing of site specific micro-meteorological data. b) Collection and use of data for modelling. c) Air dispersion modelling for prediction of GLCS due to PM ₁₀ , SO ₂ and Nox | <u>Avi</u> |
| 8. | NV | Neeraj Parihar | a) Analysis of ambient noise quality data b) Impact due to plant noise and abatement measures | <u>Neeraj</u> |
| 9. | LU | Mr. Ankur Agarwal | a) Analysis of data related to land use pattern b) Land use map development. c) Impact on land environment in respect to land form change | <u>Ankur</u> |
| 10. | RH | Ms. Ashwini Ganvir | a) Identification of hazardous prone areas b) Environment risk evaluation c) On-site and Off-site emergency | <u>Ashwini</u> |

| | | | | |
|-----|----|--|--|---|
| | | | planning | |
| 11. | SC | Sameer Vilasrao Deshpande TM-Avi Tomar | a) Monitoring, analysis and characterization of soil. b) Assessment of impact on soil quality and mitigation measure. |  |

List of Team Members

| | |
|-------------------|--|
| Mr. Ankur Agarwal |  |
| Ms. Avi Tomar |  |

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

I, R.S. Yadav, hereby, confirm that the above mentioned project for Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

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

I also confirm that I shall be fully accountable for any mis-leading information mentioned in this statement.

Name: **R.S. Yadav**



Signature

Designation: **Managing Director**

Name of the EIA Consultant Organization: Vardan EnviroNet, QCI/NABET Accredited Environment Consultancy.

NABET Certificate No. & Issue Date: NABET/EIA/1922/RA0166 valid up to 06.11.2022.

Table of Contents

| | |
|--|-----------|
| Review of revision history | i |
| NABET Annexure | ii |
| Table of content | V |
| TOR Compliance | XII |
| 1. INTRODUCTION | 1 |
| 1.1. Introduction | 1 |
| 1.2. Purpose of report | 1 |
| 1.3. Details of mining | 2 |
| 1.4. Identification of project and project proponent | 2 |
| 1.5. Brief description of nature, size, location of the project | 2 |
| 1.6. Importance of the project for country or region | 9 |
| 1.7. Scope of study | 9 |
| 1.8. EIA Methodology | 9 |
| 1.9. Preparation of EIA | 10 |
| 1.10. Laws applicable to this project | 10 |
| 2. PROJECT DESCRIPTION | 12 |
| 2.1. General | 12 |
| 2.2. Type of the project | 12 |
| 2.3. Need for the project | 12 |
| 2.4. Description and location of mine lease area | 12 |
| 2.4.1 Site Location | 12 |
| 2.4.2 Mining project present in 500 m radius | 14 |
| 2.5. Size or magnitude of operation | 15 |
| 2.6. Physiography | 16 |
| 2.6.1 Geology | 16 |
| 2.6.2 Local Geology | 17 |
| 2.6.3 Drainage pattern | 17 |
| 2.6.4 Depth to water level | 17 |
| 2.6.5 Rainfall & Climate | 17 |
| 2.6.6 Seismicity of the area | 18 |
| 2.7. Exploration and reserves | 18 |
| 2.7.1 Proved reserves | 18 |
| 2.7.2 Reserves calculation- river bed area | 19 |
| 2.7.3 Life of mine | 20 |
| 2.8. Details of Production for Five Years | 20 |
| 2.8.1 Proposed Year wise development for Soil & Overburden for 5 years | 20 |
| 2.9. Mining Methodology | 20 |
| 2.9.1 Proposed method of mining | 20 |
| 2.10. Reclamation of Mined out Area | 21 |
| 2.10.1 Extent of mechanization | 21 |
| 2.11. Waste management | 21 |
| 2.12. Land Use Pattern of mining area at various Stages | 21 |
| 2.13. Utilities and site facilities | 22 |
| 2.14. Litigation | 23 |
| 2.15. Summary | 23 |
| 3.1 INTRODUCTION | 24 |
| 3.2 STUDY AREA AND PERIOD | 24 |
| 3.3 STUDY PERIOD | 24 |
| 3.3.1 Components & Methodology | 25 |

| | | |
|--------|---|----|
| 3.4 | Air Environment | 26 |
| 3.4.1 | Micro-meteorological data | 26 |
| 3.4.2 | Secondary Data | 26 |
| 3.4.3 | Primary Data | 27 |
| 3.4.4 | Comparison of Primary Meteorological data with IMD data | 28 |
| 3.5 | Ambient Air Quality | 28 |
| 3.5.1 | Selection of Sampling Locations | 28 |
| 3.5.2 | Methodology | 30 |
| 3.5.3 | Data Analysis | 30 |
| 3.5.4 | Interpretation: | 32 |
| 3.6 | Noise Environment | 33 |
| 3.6.1 | Methodology of noise measurement | 33 |
| 3.6.2 | Equivalent Sound Pressure Level (Leq) of Day and Night. | 33 |
| 3.6.3 | Data Analysis | 34 |
| 3.6.4 | Interpretation | 37 |
| 3.7 | Traffic Study | 37 |
| 3.7.1 | Data Analysis | 37 |
| 3.7.2 | Existing traffic scenario | 37 |
| 3.7.3 | Interpretation | 39 |
| 3.8 | Water Environment | 41 |
| 3.8.1 | Methodology | 41 |
| 3.8.2 | Interpretation | 46 |
| 3.9 | Soil Environment | 46 |
| 3.9.1 | Methodology | 46 |
| 3.9.2 | Data Analysis | 46 |
| 3.9.3 | Interpretation | 50 |
| 3.10 | Land Use and Land Cover | 50 |
| 3.10.1 | Land Use of the Study area | 50 |
| 3.10.2 | Results: | 51 |
| 3.10.3 | Interpretation | 51 |
| 3.11 | Hydrology | 56 |
| 3.11.1 | Geomorphology: | 56 |
| 3.11.2 | Hydrogeology: | 58 |
| 3.11.3 | Hydrogeological Input | 58 |
| 3.11.4 | Aquifer Geometry: | 59 |
| 3.11.5 | Ground Water Level: | 59 |
| 3.11.6 | Ground Water Management Strategy: | 59 |
| 3.11.7 | Water Conservation and Artificial Recharge: | 60 |
| 3.11.8 | Hydrogeological Impacts and its Mitigation Measure: | 60 |
| 3.11.9 | Ecology and Biodiversity | 60 |
| 3.12 | SOCIO-ECDNOMIC ENVIRONMENT | 65 |
| 3.12.1 | Baseline Status | 65 |
| 3.12.2 | Occupational Pattern/ Economic Resource Base | 68 |
| 3.12.3 | Socio-economic Survey | 72 |
| 3.12.4 | Employment Generation | 73 |
| 3.12.5 | Impact on Socio-Economic Environment | 74 |
| 3.12.6 | Mitigation Measures of Socio- Economic Environment | 75 |
| 3.12.7 | Following Activities can be proposed in the Study Area | 76 |
| 3.13.2 | Summary | 78 |
| 4. | ANTICIPATED ENVIRONMENTAL IMPACT AND ITS MITIGATION MEASURES | 80 |
| 4.1 | INTRODUCTION | 80 |
| 4.2 | ENVIRONMENTAL IMPACT ASSESSMENT | 80 |
| 4.2.1 | CONSTRUCTION PHASE | 80 |
| 4.2.2 | OPERATION PHASE | 80 |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | | |
|--------|---|------------|
| 4.2.3 | PREDICTION OF IMPACTS AND MITIGATION MEASURES | 81 |
| 4.3 | AIR QUALITY MODELING | 81 |
| 4.3.1 | Dispersion Model | 81 |
| 4.3.2 | Meteorological Data | 84 |
| 4.3.3 | Conclusion | 90 |
| 4.3.4 | Mitigation Measures | 90 |
| 4.4 | IMPACTS OF AIR POLLUTION AND MITIGATION MEASURES | 91 |
| 4.4.1 | Conclusion | 92 |
| 4.5 | Air Quality Index | 92 |
| 4.5.1 | Conclusions | 95 |
| 4.6 | IMPACTS OF NOISE/VIBRATIONS AND MITIGATION MEASURES | 95 |
| 4.6.1 | Conclusion | 96 |
| 4.7 | IMPACTS OF WATER POLLUTION AND ITS MITIGATION MEASURES | 96 |
| 4.7.1 | Impact on Surface Water and ground water Environment | 96 |
| 4.7.2 | Management of generated domestic Waste | 98 |
| 4.7.3 | Conclusion | 100 |
| 4.8 | IMPACTS ON LAND USE AND MITIGATION MEASURES | 100 |
| 4.8.1 | Conclusion | 100 |
| 4.9 | IMPACTS ON SOIL ENVIRONMENT AND MITIGATION MEASURES | 100 |
| 4.10 | IMPACTS ON HYDROLOGY AND MITIGATION MEASURES | 101 |
| 4.10.1 | Conclusion | 101 |
| 4.11 | IMPACTS ON ECOLOGY & BIODIVERSITY AND ITS MITIGATION MEASURES | 102 |
| 4.12 | Conclusion | 106 |
| 4.13 | SOCIO ECONOMIC IMPACT OF THE PROJECT AND SAFETY MEASURES | 107 |
| 4.14 | IMPACTS DUE TO SOLID WASTE/OVERBURDEN AND MITIGATION MEASURES | 109 |
| 4.15 | IMPACTS ON OCCUPATIONAL HEALTH AND SAFETY | 109 |
| 4.16 | TRAFFIC ENVIRONMENT | 109 |
| 4.17 | IMPACTS ON GEOLOGY AND MITIGATION | 111 |
| 4.18 | MINE CLOSURE PLAN | 111 |
| 4.18.1 | General | 111 |
| 5. | ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE) | 114 |
| 5.1 | INTRODUCTION | 114 |
| 5.2 | ALTERNATIVE FOR MINE LEASE | 114 |
| 5.3 | ALTERNATIVE FOR TECHNOLOGY AND OTHER PARAMETERS | 114 |
| 5.4 | Summary | 115 |
| 6. | ENVIRONMENTAL MONITORING PROGRAM | 116 |
| 6.1 | INTRODUCTION | 116 |
| 6.2 | ENVIRONMENTAL MANAGEMENT CELL | 116 |
| 6.3 | ENVIRONMENTAL MONITORING AND REPORTING PROCEDURE | 116 |
| 6.3.1 | Ambient Air Quality | 116 |
| 6.3.2 | Fugitive Emissions Monitoring | 117 |
| 6.3.3 | Effluent Quality - Not Applicable | 117 |
| 6.4 | Budget allocation for monitoring | 119 |
| 6.5 | ENVIRONMENTAL POLICY: Environment policy is provided below: | 120 |
| 6.6 | MONITORING SCHEDULE | 125 |
| 6.7 | SUMMARY | 125 |
| 7. | ADDITIONAL STUDIES | 126 |
| 7.1 | General | 126 |
| 7.2 | PUBLIC CONSULTATION | 126 |
| 7.3 | RISK ASSESSMENT | 126 |
| 7.3.1 | INTRODUCTION | 126 |
| 7.3.2 | Methodology & Risk Assessment For Mining Of Sand Operation | 127 |
| 7.3.3 | Model For Risk Assessment | 127 |
| 7.4 | Hazard identification and risk assessment | 128 |

| | | |
|--------|--|------------|
| 7.4.1 | Major Risks Involved In River Bed Mining Are Following: | 128 |
| 7.4.2 | Other Hazards | 129 |
| 7.5 | Mitigation Measures And Disaster Management Plan: | 129 |
| 7.6 | Possible Risks Due to Fire & Its Control | 130 |
| 7.6.1 | Measures to Prevent Accidents Due to Trucks and Dumpers | 130 |
| 7.6.2 | Oil Spill Management | 131 |
| 7.6.3 | Haul roads | 131 |
| 7.6.4 | Other Possible Measures to Avoid Risks/ Disaster Due to River Bed Mining | 131 |
| 7.7 | Natural Hazards in the Haryana District | 132 |
| 7.7.1 | EARTHQUAKE | 134 |
| 7.7.2 | Floods | 136 |
| 7.8 | Occupational Health and Safety in River Bed Mining | 136 |
| 7.8 | Annual Replenishment Of Mineral | 139 |
| 7.9 | REHABILITATION AND RESETTLEMENT (R & R) | 139 |
| 7.10 | Conclusion | 139 |
| 7.11 | Summary | 139 |
| 8. | PROJECT BENEFITS | 142 |
| 8.1 | General | 142 |
| 8.2 | Improvements in the physical infrastructure | 142 |
| 8.3 | Improvements in the social infrastructure | 142 |
| 8.5 | ECOLOGICAL BENEFITS | 143 |
| 8.6 | CORPORATE ENVIRONMENT RESPONSIBILITY | 143 |
| 8.7 | SUMMARY | 143 |
| 9. | ENVIRONMENTAL COST BENEFIT ANALYSIS | 144 |
| 10. | ENVIRONMENTAL MANAGEMENT PLAN | 145 |
| 10.1 | INTRODUCTION | 145 |
| 10.2 | PURPOSE OF ENVIRONMENTAL MANAGEMENT CELL | 145 |
| 10.3 | ENVIRONMENT MANAGEMENT POLICY & ENVIRONMENT COMMITTEE | 145 |
| 10.3.1 | Interaction with State Pollution Control Board | 148 |
| 10.3.2 | Training | 148 |
| 10.3.3 | Prevention of illegal mining and pilferage of mineral | 149 |
| 10.3.4 | Specific Diesel Consumption Reduction Plan | 149 |
| 10.3.5 | Standard Operating Process | 151 |
| 10.3.6 | Responsibilities for Environmental Management Cell (EMC) | 152 |
| 10.4 | AIR ENVIRONMENT MANAGEMENT | 152 |
| 10.4.1 | Control of Gaseous Pollution | 152 |
| 10.5 | NOISE AND VIBRATION | 153 |
| 10.5.1 | Noise Abatement and Control | 153 |
| 10.6 | WATER MANAGEMENT | 153 |
| 10.6.1 | Surface and Ground Water Management | 153 |
| 10.6.2 | Water Conservation | 154 |
| 10.7 | SOLID WASTE MANAGEMENT | 154 |
| 10.8 | RECLAMATION PLAN | 154 |
| 10.9 | Green Belt Development | 156 |
| 10.9.1 | Miyawaki Methodology | 157 |
| 10.9.2 | Green Belt in Haul Road | 161 |
| 10.9.3 | Plantation in the Buffer zone | 161 |
| 10.9.4 | Plantation Programme | 162 |
| 10.9.5 | Plan For Link Road And Haulage Road | 163 |
| 10.10 | IMPLEMENTATION OF ENVIRONMENT MANAGEMENT PLAN | 165 |
| 10.11 | DETAIL OF RAIN WATER HARVESTING PLAN | 166 |
| 10.12 | CONSERVATION PLAN FOR SCHEDULED FAUNA IN THE STUDY AREA | 167 |
| 10.13 | Summary | 167 |

| | | |
|-----------|---|------------|
| 11 | SUMMARY & CONCLUSION | 169 |
| 11.1 | GENERAL | 169 |
| 11.2 | DETAILS OF THE PROJECT | 169 |
| 11.3 | INTRODUCTION | 172 |
| 11.4 | PROJECT DESCRIPTION | 172 |
| 11.5 | DESCRIPTIDN OF THE ENVIRONMENT | 172 |
| 11.6 | ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES | 173 |
| 11.7 | ANALYSIS OF ALTERNATIVES | 174 |
| 11.8 | ENVIRONMENTAL MDNITORING PROGRAM | 174 |
| 11.9 | ADDITIOINAL STUDIES | 175 |
| 11.10 | PROJECT BENEFIT | 175 |
| 11.11 | ENVIRONMENTAL MANAGEMENT PLAN | 175 |
| 11.12 | CONCLUSION | 176 |
| 12 | DISCLOSURE OF CONSULTANT | 177 |
| 12.1 | INTRODUCTION | 177 |
| 12.2 | SERVICES OF VARDAN ENVIRONET | 177 |
| 12.3 | RECOGNITIONS | 178 |
| 12.4 | LIST OF SOFTWARE MODELS FOR ENVIRONMENTAL STUDIES | 178 |
| 12.5 | KEY MANAGEMENT PERSONNEL OF VARDAN | 178 |
| 12.6 | EMINENT CLIENTELE OF VARDAN | 178 |
| 12.7 | CERTIFICATIONS OF VARDAN GROUP | 179 |
| | ENVIRONMENTAL MONITORING AND ANALYSIS LABORATORY | 179 |

List of Figure

| | | |
|--------------|---|----|
| Figure 1 1 | Key Plan showing the Environmental Settings | 7 |
| Figure 1 2 | Google Image of Proposed Sand Mine Lease | 8 |
| Figure 1 3 | Flow Chart - EIA/EMP Methodology | 10 |
| Figure 2 1: | Location Map of the Project Site | 13 |
| Figure 2 2: | Route Map | 13 |
| Figure 2 3: | Google Image (Short View) of the Project Site | 14 |
| Figure 2 4: | Google image (Long View) of the Project Site | 14 |
| Figure 3 1: | Wind Rose Diagram of Study Period (Oct to Dec 2021) | 28 |
| Figure 3 2: | Ambient Air Quality Monitoring Location | 29 |
| Figure 3 3 | Graphical representations of Particulate Pollutants (PM10 and PM 2.5) | 31 |
| Figure 3 4 | Graphical representation of NO2 and SO2 pollutant | 32 |
| Figure 3 5 | Graphical representation of CO pollutant | 32 |
| Figure 3 6 | Equivalent Noise Levels at all locations | 35 |
| Figure 3 7 | Noise Quality Monitoring Locations | 36 |
| Figure 3 8:- | Transportation Map of 10 km Buffer Area | 40 |
| Figure 3 9 | Map showing Water Sampling Location | 43 |
| Figure 3 10 | Map showing Soil sampling locations | 48 |
| Figure 3 11 | Satellite imagery of 10 km study area | 52 |
| Figure 3 12 | Land use land cover | 53 |
| Figure 3 13 | contour map | 54 |
| Figure 3 14 | Drainage map | 55 |
| Figure 3 15: | Geomorphological map of part of Haryana state including Faridabad | 57 |
| Figure 3 16: | Soil Map of Faridabad | 58 |
| Figure 3 17: | Location Map of Nearest WLS/N | 64 |
| Figure 3 18: | Bar diagram representing the ratio of population in the study area | 67 |

| | |
|---|-----|
| Figure 3 19: Literacy rate of the study area | 67 |
| Figure 3 20: Occupational pattern of the study area | 69 |
| Figure 4 1 – Spatial distribution of predicted GLCs of PM 10 due to Mining | 85 |
| Figure 4 2 – Spatial distribution of predicted GLCs of PM 2.5 due to Mining | 86 |
| Figure 4 3 – Spatial distribution of predicted GLCs of SOx due to Mining | 87 |
| Figure 4 4 – Spatial distribution of predicted GLCs of NOx due to Mining | 88 |
| Figure 4 5 – Spatial distribution of predicted GLCs of SOx due to Mining | 89 |
| Figure 4 6 Model of septic tank for waste water treatment | 98 |
| Figure 7 1: Model for Risk Assessment | 128 |
| Figure 7 2: Earthquake Hazard Map of Uttar Pradesh | 135 |

List of Table

| | |
|---|----|
| Table 1 1: Brief Description of the Project | 3 |
| Table 2 1: Details of Mining | 15 |
| Table 2 2 Regional stratigraphic sequence | 16 |
| Table 2 3: Details of Site Elevation | 17 |
| Table 2 4: Geological Reserves | 19 |
| Table 2 5: Five Years Proposed Production Details (MT/A) | 20 |
| Table 2 6: List of Machinery | 21 |
| Table 2 7: Land Use Pattern at Various Stages | 21 |
| Table 2 8: Employment Details | 22 |
| Table 3 1 Environmental components and their methodologies | 25 |
| Table 3 2 Secondary Meteorological Data for Delhi (1981-2010) | 27 |
| Table 3 3 Onsite Meteorological Data (Period: October to December 2021) | 27 |
| Table 3 4: Showing Ambient Air Monitoring Locations | 29 |
| Table 3 5 Techniques Adopted/Protocols for Ambient Air Quality Monitoring | 30 |
| Table 3 6 Ambient Air Quality Data | 30 |
| Table 3 7: Showing Noise Monitoring Locations | 34 |
| Table 3 8: Noise level data | 34 |
| Table 3 9: CPCB Noise Standards | 37 |
| Table 3 10: Roads and Highways in the Study Area | 37 |
| Table 3 11: Summarized Traffic data | 38 |
| Table 3 12: Existing Traffic Scenario and LOS | 38 |
| Table 3 13 Additional Traffic Scenario and LOS | 38 |
| Table 3 14 Additional Traffic Scenario and LOS | 39 |
| Table 3 15 Monitoring Location of Surface Water and Ground Water | 41 |
| Table 3 16 Ground Water Quality Data | 44 |
| Table 3 17: Surface water quality data | 45 |
| Table 3 18: Soil sampling locations | 46 |
| Table 3 19 Physico-chemical Properties of Soil | 49 |
| Table 3 20 Classification system of Land Use | 50 |
| Table 3 21: Land use/ land cover analysis | 51 |
| Table 3 22 Mode of data collection and parameters considered during the Survey | 61 |
| Table 3 23: Budget for Conservation/Management Plan | 63 |
| Table 3 24: List of the Villages for Field Survey of Socio-Economic Environment | 65 |
| Table 3 25: Summarized Demographic Structure of the Study Area | 66 |
| Table 3 26 Educational Facility near the Project Site | 70 |
| Table 4 1:Emissions Rates | 83 |
| Table 4 2: Predicted GLC of PM10 at Ambient Air Quality Monitoring Stations | 84 |
| Table 4 4: AQI Category based on pollutants concentration | 92 |
| Table 4 5:: Health impacts based on the AQI values | 93 |
| Table 4 6: Sub-index values for each air pollutant at selected sites | 93 |

| | |
|---|-----|
| Table 4 7: Cumulative effect of all pollutants based on AQI values | 95 |
| Table 7 1: List of Machineries | 129 |
| Table 7 2: Risk Ranking Matrix for risk assessment | 129 |
| Table 7 3: Vulnerability Profile of the district | 132 |
| Table 7 4: Flood Prone Villages in Faridabad District | 136 |
| Table 7 5: Impacts on Health | 136 |
| Table 7 6: Budget for Occupational Health and Safety of the workers (Lakhs) | 138 |

List of Annexure

- Annexure I: ToR Letter Issued by MoEF&CC
- Annexure II: Letter of intent and Board resolution
- Annexure III: Mining plan submission letter
- Annexure IV: Lab data
- Annexure V: EB Report
- Annexure VI: Conservation plan
- Annexure VII: Environment Policy
- Annexure VIII: Affidavit
- Annexure IX : District Survey Report
- Annexure X: Replenishment Report

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

M/s Dev & Div Solutions Pvt. Ltd.
Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhampur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

M/s Dev & Div Solutions Pvt. Ltd.

COMPLIANCE TO TOR CONDITIONS

Point wise compliance of ToR issued by State Environmental Impact Assessment Authority, Haryana vide file No. SEIAA/HR/2019/2030n dated 22.07.2019.

| ToR | Description | Reply | Citation Chapter No. |
|-----|--|--|-------------------------|
| 1 | Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification, 1994 came into force w.r.t. the highest production achieved prior to 1994. | This is a fresh Mining Lease area auctioned by Department of Mines & Geology, Govt. of Haryana issued the letter of intent for LOI grant (Annexure-II) vide letter no. DMG/HY/Makhampur Unit/FBD/2021/3176 dated Panchkula 16.08.2021 in favor of M/s Dev & Div Solutions Pvt. Ltd. attached as Annexure II . Year-wise production details since 1994 is given as Annexure-XII. | Annexure-II |
| 2 | A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given. | The copy of Letter of Intent (LoI) of mining lease issued by Department of Mines & Geology, Govt. of Haryana vide letter no. DMG/HY/Makhampur Unit/FBD/2021/3176 dated Panchkula 16.08.2021 in favor of M/s Dev & Div Solutions Pvt. Ltd. who has applied for Environmental Clearance, is enclosed as Annexure-II . | Annexure-II |
| 3 | All documents including approved mine plan, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management and mining technology and should be in the name of the lessee. | All documents are synchronizing with one another in terms of mine lease area, production levels, waste generation, its management and mining technology and both the Approved mining plan and Mine Lease area in the name of M/s Dev & Div Solutions Pvt. Ltd., Proponent Mr. Laxman Kumar Binani, who is the lessee of this project. | Annexure-II |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

M/s Dev & Div Solutions Pvt. Ltd.
Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhampur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | | |
|---|---|---|
| <p>4</p> <p>All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/Toposheet should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).</p> | <p>All corners of the coordinates of ML area are superimposed on Toposheet of survey of India Toposheet (OSM) No. H43X7. Coordinates of the mine lease area given in chapter 1.</p> <p>Imagery of the proposed area clearly shows the land use and other ecological features of the study area (core and buffer zone) for Land use and High resolution Imagery FCC maps are prepared with use of RS-GIS Technique.</p> | <p>Chapter-1 Chapter-3,</p> |
| <p>5</p> <p>Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.</p> | <p>All maps are provided superimposed on Toposheet of survey of India in 1:50,000 scale showing all land forms of the area, important water bodies, streams and rivers etc.</p> <p>Geological and Geomorphology of Haryana is incorporated in this report.</p> | <p>Chapter-1 Chapter-2</p> |
| <p>6</p> <p>Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.</p> | <p>Land proposed for the mining is 66.32 Ha, at Village Makhampur, Tehsil: & District: Faridabad, Haryana. There is no need of land diversion in this case.</p> | <p>----</p> |
| <p>7</p> <p>It should be clearly stated whether the proponent company has a well-laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the</p> | <p>Yes, The company has formulated Environmental policy which is approved by M/s Dev & Div Solutions Pvt. Ltd. has been incorporated in EIA report. The operating process or the implementation of policy will be as follows:</p> <ul style="list-style-type: none"> ▪ Compliance with all applicable environmental laws and regular maintenance of their records. ▪ Acquaintance of all employees and contractors with their | |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

M/s Dev & Div Solutions Pvt. Ltd.

| | | | |
|-----------------|--|---|--|
| | <p>environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The 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 may also be detailed in the EIA report.</p> | <p>environmental responsibilities.</p> <ul style="list-style-type: none"> ▪ Focus on continuous improvement. ▪ Continuous review of environmental achievements. ▪ Half yearly submission of Compliance reports. ▪ Closing of NCs and Conducting MRM. <p>The Policy contains the hierarchical system of the company to deal with the environmental issues and for ensuring the compliance with EC conditions. All the non-compliances/ violations of environmental laws will as per QMS.</p> | <p>Chapter-6 Annexure VII</p> |
| <p>8</p> | <p>Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.</p> | <p>Mines safety for workers working at the site has been taken care of. Safety measures related to risks during mining activity, natural disasters, etc has been proposed. The details are incorporated in the EIA/EMP Report.</p> <p>Slope Study As working will be done in the river bed to maximum depth of 3.0 m only, thus slope study is not required.</p> <p>Blasting Study This is a River Sand (minor mineral) mining project, no blasting is proposed.</p> | <p>Chapter -7</p> <p>Chapter 3</p> <p>Chapter 4</p> |
| <p>9</p> | <p>The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc should be for the life of the mine/ lease period.</p> | <p>Study area comprises of 10 Km radius around the mine lease boundary. Map showing 10 Km radius of the ML area has been furnished in the EIA report and 10 Km radius of mine lease. All the data contained in the EIA/EMP Report are for lease period of mine. There is no generation of Overburden/waste material in case of river bed mining. Lease period is 7 years.</p> | <p>Chapter-1</p> <p>Chapter-2</p> |



DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhampur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

M/s Dev & Div Solutions Pvt. Ltd.

| <p>10</p> | <p>Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and Post-operational phases and submitted. Impact, if any, of change of land use should be given.</p> | <p>Land Use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, National park, migratory routes of fauna, water bodies, human settlements and other ecological features has been incorporated.</p> <table border="1" data-bbox="451 692 808 1428"> <thead> <tr> <th>Land-use Classification</th> <th>Area in Hectare</th> <th>Area in %</th> </tr> </thead> <tbody> <tr> <td>Water body</td> <td>461</td> <td>1.2</td> </tr> <tr> <td>Sandy Area</td> <td>458</td> <td>1.2</td> </tr> <tr> <td>Industry</td> <td>34</td> <td>0.1</td> </tr> <tr> <td>Forest</td> <td>65</td> <td>0.2</td> </tr> <tr> <td>Builtup</td> <td>2458</td> <td>6.5</td> </tr> <tr> <td>Crop Land</td> <td>17322</td> <td>45.7</td> </tr> <tr> <td>Fallow Land</td> <td>7400</td> <td>19.5</td> </tr> <tr> <td>Open Scrub</td> <td>7226</td> <td>19.1</td> </tr> <tr> <td>Waste Land</td> <td>2475</td> <td>6.5</td> </tr> </tbody> </table> | Land-use Classification | Area in Hectare | Area in % | Water body | 461 | 1.2 | Sandy Area | 458 | 1.2 | Industry | 34 | 0.1 | Forest | 65 | 0.2 | Builtup | 2458 | 6.5 | Crop Land | 17322 | 45.7 | Fallow Land | 7400 | 19.5 | Open Scrub | 7226 | 19.1 | Waste Land | 2475 | 6.5 | <p style="text-align: center;">Chapter-3</p> |
|-------------------------|---|--|--|-----------------|-----------|------------|-----|-----|------------|-----|-----|----------|----|-----|--------|----|-----|---------|------|-----|-----------|-------|------|-------------|------|------|------------|------|------|------------|------|-----|---|
| Land-use Classification | Area in Hectare | Area in % | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Water body | 461 | 1.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sandy Area | 458 | 1.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Industry | 34 | 0.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Forest | 65 | 0.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Builtup | 2458 | 6.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Crop Land | 17322 | 45.7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Open Scrub | 7226 | 19.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Waste Land | 2475 | 6.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>11</p> | <p>Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.</p> | <p>Land use plan of the mine lease area showing the preoperational, operational and post operational phases is incorporated in the EIA/EMP Report.</p> <p>River Bed: There is no generation of Overburden / waste material in case of river bed mining. There is no human settlement in lease area. Hence R&R is not applicable on this project. Hence, there is no need of R&R Plan. However, as per the point 4.15 of Lol the lease holder will deposit 7.5% of the annual contract money to the Mines and Minerals Development, Restoration and Rehabilitation Fund.</p> | <p style="text-align: center;">Chapter-2 (Annexure-II)</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>12</p> | <p>A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest</p> | <p>The Mining Lease area does not involve any forest land. It is a riverbed mining Project.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

M/s Dev & Div Solutions Pvt. Ltd.

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| | <p>land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.</p> | | |
| 13 | <p>Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.</p> | <p>The land of the Mining lease area is Government land on the river bed of Yamuna River In Faridabad district and this area is free from any reservation of Forest Department Haryana Government. No forest diversion is required for the proposed mining area.</p> | - |
| 14 | <p>Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.</p> | <p>Not applicable.</p> | |
| 15 | <p>The vegetation in the RF/ PF areas in the study area, with necessary details, should be given.</p> | <p>Project area not falling under forest reserve. So, no approval is required. There is no National Park, Wild Life Sanctuary Biosphere Reserve within 10 km of project site.</p> | |
| 16 | <p>A study shall be got done to ascertain the impact of the Mining Project on</p> | <p>EB Study has been carried out by the Ecology and Biodiversity Expert (NABET/QCI Approved) in and around the lease area to</p> | <p>Chapter 3</p> |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

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| | <p>wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly detailed mitigative measures required, should be worked out with cost implications and submitted.</p> | <p>study the wild life of the area. 1 species of Schedule I was recorded. The conservation plan has been prepared along with budgetary provision of Rs. 10.00 Lakhs to conserve wildlife. The proper mitigation measures have been proposed to mitigate negative impacts.</p> | <p>Annexur-V (EB Report) Annexure-VI</p> |
| <p>17</p> | <p>Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Tiger/ Elephant Reserves/ (existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the State Wildlife Department/ Chief Wildlife Warden under the Wildlife (Protection) Act, 1972 and copy furnished.</p> | <p>No National Parks, Sanctuaries, Biosphere Reserves Wildlife Corridors, Tiger/ Elephant Reserves/Critically Polluted areas/Aravali are falling within 10 Km of the study area.</p> | <p>Chapter-3</p> |
| <p>18</p> | <p>A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in</p> | <p>A detailed biological study (of 10 Km radius study area) was conducted by Ecology and Biodiversity Expert and the details are incorporated in the EIA/EMP Report. List of Flora and Fauna has been prepared based on primary survey. 1 species of Schedule-I was recorded in the study area. Conservation plan for the same has been prepared and submitted to Forest department for its authentication.</p> | <p>Chapter 3 Annexure VI</p> |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

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| | the study area, the necessary plan for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost. | |
| 19 | Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered. | The project site is neither falling in proximity to area declared as Critically Polluted nor falling in Aravalli Range. |
| 20 | Similarly, for coastal projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t. CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority). | Not Applicable, since the project site does not comes under coastal area. |
| 21 | R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/ National | Chapter-1 |
| | | There is no Project Affected Person (PAP) by the proposed mining activities. Hence, there is no need of R&R Plan. However, as per the point 4.15 of LoI the lease holder will deposit 7.5% of the annual contract money to the Mines and Minerals |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT
 Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhampur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

M/s Dev & Div Solutions Pvt. Ltd.

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| | <p>Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action program prepared and submitted accordingly, integrating the sectoral program of line departments of the State Government. It may be clearly brought out whether the village located in the mine lease area will be shifted or not. The issues relating to shifting of Village including their R&R and socio-economic aspects should be discussed in the report.</p> | <p>Development, Restoration and Rehabilitation Fund.</p> | |
| 22 | <p>One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season)]; December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant Downwind</p> | <p>Baseline data of study area within 10 Km radius of the project site was collected from October to December 2021 as per ToR letter approved from SEIAA.</p> | Chapter-3 |
| | | <p>Site specific meteorology data was collected and incorporated in EIA/EMP Report.</p> | Chapter-3 |
| | | <p>The location of Air Monitoring stations was selected to represent the whole mine lease area (10 Km radius). One Location is also selected in 500m as it is sensitive receptor.</p> | Chapter-3 |
| | | <p>Mineralogical composition of PM₁₀ particularly for Free silica is incorporated as annexure IV in the EIA/EMP Report.</p> | Chapter 3 Annexure IV |



DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

M/s Dev & Div Solutions Pvt. Ltd.

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| | <p>direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM₁₀, particularly for free silica, should be given.</p> | | |
| <p>23</p> | <p>Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing predominant wind direction may also be indicated on the map.</p> | <p>Air quality modeling was carried out and impact of Air quality has been incorporated in the EIA/EMP report. The maximum cumulative GLC of PM₁₀ is 94.661 ug/m³ and PM_{2.5} is 54.506 ug/m³</p> <p>The predominant wind direction recorded during study period was from NNW Direction as per Wind rose diagram.</p> | <p>Chapter 4</p> <p>Chapter 3,</p> |
| <p>24</p> | <p>The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.</p> | <p>Water requirement in this project site is 87 KLD. Water will be taken from existing water sources from nearby villages or tanker supplier.</p> <p>The details are incorporated in the EIA/EMP report.</p> <p>Total Water Requirement = 87 KLD Dust Suppression = 1.00 KLD Plantation = 82 KLD Domestic Purpose = 4.00 KLD</p> <p>Note: Water requirement is fulfilled through hired tankers. Therefore, there is no need of clearance from the competent</p> | <p>Chapter 2</p> |
| <p>25</p> | <p>Necessary clearance from the Competent Authority for drawl of</p> | | |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

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M/s Dev & Div Solutions Pvt. Ltd.

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| | requisite quantity of water for the Project should be provided. | authority as there will be no ground water withdrawal by the project proponent. | |
| 26 | Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided. | The project do not consume any process water except for drinking, dust suppression and plantation. Plantation is proposed, which will increase the water holding capacity and help in recharging of ground water. Artificial rainwater harvesting is proposed for the project. | Chapter 10 |
| 27 | Impact of the project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided. | Surface Water No permanent infrastructure will be developed which may obstruct the river flow, the proposed river sand (minor mineral) mining will not be done in rainy days hence there will not be any adverse impact on the surface water. Ground Water The ground water quality will not be changed because mining activity will not intersect the ground water table as it is restricted to 3m depth in river bed. Impact of the project on the water quality and its mitigation measures has been incorporated in the EIA/EMP report. | Chapter 4 |
| 28 | Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished. | The maximum working depth of mining will be 3 m bgl in river bed, where the groundwater table exists at an average depth of 8-10 m bgl. So mining depth will not intersect the ground water table. | Chapter |
| 29 | Details of any stream, seasonal or | There is no stream modification/ diversion due to proposed | ---- |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

M/s Dev & Div Solutions Pvt. Ltd.

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| | <p>otherwise, passing through the lease area and modification /diversion proposed, if any, and the impact of the same on the hydrology should be brought out.</p> | <p>mining activity. It is opencast mining Sand (minor mineral) located on the river bed and mining is permitted only up to depth of 3 meter; hence there will be no stream diversion/ modifications.</p> | |
| <p>30</p> | <p>Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.</p> | <p>Maximum Working Depth : 3m bgl Ground water Table: 8-10 m bgl Site elevation: 189 to 195 mRL Schematic diagram of mining depth also incorporated in Chapter-4.</p> | <p>Chapter 4</p> |
| <p>31</p> | <p>A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.</p> | <p>A suitable combination of trees that can grow fast and also have good leaf cover shall be adopted to develop the greenbelt. It is proposed to plant 55,000 number/annum of native species during the plan period. Schedule of Plantation for the Five Years has been given in EIA/EMP Report.</p> | <p>Chapter 10</p> |
| <p>32</p> | <p>Impact on local transport infrastructure due to the Project should be indicated.</p> | <p>Impact on local transport infrastructure due to the project has been assessed. There will not be much impact on local transport.</p> | <p>Chapter-3</p> |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhampur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

M/s Dev & Div Solutions Pvt. Ltd.

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| | <p>Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.</p> | <p>Total 203 PCU/hr (Yamuna Express) & 68 PCU/hr (Metalled Road Chhainsa) will be increased in current traffic Scenario.</p> <p>Traffic density from the proposed mining activity has been incorporated in the EIA/EMP report</p> | |
| 33 | <p>Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.</p> | <p>Because it is riverbed mining project so there is no any provision of adequate infrastructure and other facilities will be provided to mine worker within mine lease area. Some office and rest shelter will be made outside the mine lease area on private land.</p> | Chapter 2. |
| 34 | <p>Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.</p> | <p>The land use of the lease area will remain same as the proposed activity for extraction of deposited minerals from river bed which will get replenished during succeeding monsoon seasons.</p> | Chapter 2 |
| 35 | <p>Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities</p> | <p>The impact on occupational health & safety (OH&S) of employee and proper mitigation along with budgetary provision incorporated in the EIA/EMP Report.</p> <p>Person protective measures, pre-placement medical examination and periodical medical examination schedules, management plan have been furnished in the EIA/EMP Report.</p> | Chapter 4 Chapter-7. |



DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

M/s Dev & Div
Solutions Pvt. Ltd.

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

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| | proposed in the mining area May be detailed. | | |
| 36 | Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations. | Public health implication like respiratory disorder, noise induced problems are major issues which will be addressed properly. Study has been performed which includes to gain an understanding of the source, identification of exposure pathway and determination of likely receptor. The impact will not be concentrated and confined to particular zone. A budget of Rs. 4.0 lakhs has been kept aside for OH&S. | Chapter-7 |
| 37 | Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation. | Socio economic measures for the local people have been proposed under the component of the Environmental Social Commitment along with the budgetary allocation have been incorporated in the EIA/EMP Report. Proposed project will provide the employment opportunity to the local community hence project will have positive impact on the surrounding local community. | Chapter-8 |
| 38 | Detailed environmental management plan to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project. | Environmental management plan to mitigate the environmental impacts which inter-alia included the impacts of change of land use, loss of agricultural and grazing land, occupational health, air, water soil, noise, Socioeconomic and ecology; incorporated in chapter 4 and 10 of EIA/EMP. | Chapter-10 Chapter 4 |
| 39 | Public hearing points raised and commitment of the project proponent on the same along with time bound action plan to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project. | This is the Draft Report. After submission of it the public hearing will be done at mine site and incorporated in chapter-7. | Chapter-7, |



DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

M/s Dev & Div Solutions Pvt. Ltd.
Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhannpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

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| 40 | Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the project should be given. | There is no court case or litigation pending against this project in any court of law. Affidavit Attached as Annexure-XIV. | - |
| 41 | The cost of the project (capital cost and recurring cost) as well as the cost towards implementation of EMP should clearly be spelt out. | Project cost: 7 crore Cost of EMP: (25.94 lakhs/yr recurring cost and 3.50 lakhs is capital cost) | Chapter-10 |
| 42 | A Disaster Management Plan shall be prepared and included in the EIA/EMP report. | The Disaster Management Plan been prepared and incorporated in EIA/EMP report. | Chapter-7 |
| 43 | Benefits of the project if the project is implemented should be spelt out. The benefits of the project shall clearly indicate environmental, social, economic, employment potential etc. | Physical, social and ecological benefits of the mining project has been prepared and incorporated in the EIA/EMP report. | Chapter-11 |
| General Points | | | |
| 44. | Besides the above, the below mentioned general points are also to be followed:- | | |
| a) | Executive Summary of the EIA/EMP Report. | | |
| b) | All documents to be properly referenced with index and continuous page numbering. | | |
| c) | Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated. | | |
| d) | Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF& CC/NABL accredited laboratories. All original analysis/testing reports should be available during appraisal of the project. | | |
| e) | Where the documents provided are in language other than English, an English translation should be provided. | | |
| f) | The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall be filled and submitted. | | |
| g) | While preparing the EIA report, the instructions for the proponents and instructions for the Consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the | | |
| | | | Enclosed as Annexure-IV |
| | | | Provided |
| | | | Enclosed |
| | | | Followed |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORTM/s Dev & Div
Solutions Pvt. Ltd.

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhampur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | website of this Ministry, should be followed. | No Modifications done | |
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| h) | Changes, if any made in the basic scope and project parameters (as submitted in Form-1 and the PFR for securing TOR) should be brought to the attention of MoEF& CC with reasons for such changes and the permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the Final EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation. | Not Applicable for New Project | |
| i) | As per the circular No.-J-11011/618/2010-IA,II (I) dated 30.05.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable. | Included | |
| j) | The EIA report also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area. | | |
| Additional Points | | | |
| | Additional Points | Additional Points Reply | Citation |
| 1. | The PP shall submit the Approved Mining Plan and Closure Plan. | Mining Plan and Progressive Mine Closure Plan has been prepared and submitted to mining department on dated 29.09.2021 for their approval. | Annexure III |
| 2. | The PP shall submit the approved DSR from the Mining Department. | Complied (DSR Attached as Annexure-ix) | Annexure-IX |
| 3. | The PP shall submit the actual replenishment study approved by the Competent Authority. | Replenishment study is attached with the mining plan and same has been submitted to mining department for their approval. | Annexure X |
| 4. | The PP shall submit the Green plan along with Miyawaki forest details. | Green plan along with Miyawaki forest details is given in chapter-10. | Chapter-10 |
| 5. | The PP shall submit the copy of LOI. | Department of Mines & Geology, Govt. of Haryana issued the letter of intent for LOI grant (Annexure-II) vide letter no. | Annexure-II |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

M/s Dev & Div Solutions Pvt. Ltd. Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

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| M/s Dev & Div Solutions Pvt. Ltd. | DMG/HY/Makhanpur Unit/FBD/2021/3176 dated Panchkula 16.08.2021. attached as Annexure II. | | |
| 6. | The PP shall submit the exact days of mining. | According to mining plan total days for mining will be 270. | - |
| 7. | The PP shall submit the hydrological study. | Hydrological study is incorporated in chapter III. | Chapter 3 |
| 8. | A Sub-Divisional Committee comprising of Sub-Divisional Magistrate, Officers from Irrigation department, State Pollution Control Board or Committee, Forest department, Geology or mining officer, revenue department shall visit the site and make recommendation on suitability of site for mining or prohibition thereof after | PP has submitted the letter to mining department regarding visit of site. Report for the same will be submitted after the site visit. | - |
| A) | identification of the areas of aggradations or deposition where mining can be allowed; | Mining will be done as per approved mining plan | |
| B) | identification of areas of erosion and proximity to infrastructural structures and installations where mining should be prohibited; | Proposed project is river bed mining project and the mining will be done as per the approved mining plan. | |
| C) | verify the mining lease boundary; | Mining lease boundary has been verified by the mining department and allotted the LOI as per the verification. | Annexure-III |
| D) | verify the area of the mining lease | Mining lease area has been verified by the mining department and allotted the LOI as per the verification. | Annexure-II |
| E) | suggest the route for transportation of the mineral so that to cause minimum impact on the nearby habitation & agricultural fields | Transportation detail is incorporated in chapter 3 of the EIA report. | Chapter 3 |
| F) | identify the safety zone/restricted area and the area that can be consider for mining after excluding the area as per recommendation of EAC, after considering the other restrictions mentioned in the Sustainable Sand Mining | Mining will be done as per the approved mining plan and recommendation of mining department. | - |

M/s Dev & Div
Solutions Pvt. Ltd.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

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| | Management Guidelines 2016, S.O. 141(E) dated 15 01.2016' Letter of Intent & District Survey Report; | | |
| G) | finalize the specific gravity of the material to be mined by the mining lease holders; | Specific gravity of the material id 2. | - |
| H) | proposed location for the installation weigh bridge; | location for the installation weigh bridge has been marked on KML site and shown to the SEAC during the Final presentation. | - |
| I) | verification of the initial level of the mining lease already collected by the PP; | The upper level of the mine is 192 MRL | - |
| J) | Verification of the baseline air quantity data collected by the PP and any other point to be considered for the protection environment and health of the nearby habitation. Recommendation of the Committee needs to be annexed with EIA/EMP Report. | EMP plan has been prepared and described in Chapter 10 of the EIA report. | Chapter 10 |
| 9. | EIA/EMP report should be prepared for the entire cluster. | This is a single mine of river sand mining of 66.32 ha. | |
| 10. | The Replenishment Study needs to be conducted by an authorized agency and report of the same needs to be submitted. | Replenishment study has been carried out and submitted to mining department along with the mining plan for their approval. | Annexure-X |
| 11. | High Powered Committee was constituted under the orders of Hon'ble NGT, headed by Secretary, MOEF&CC, which has given its report dated September, 2016. The PP needs to submit the details that how the PP will comply with the recommendation of the Committee. | Mining will be done as per Sustainable sand mining management guidelines 2016. Replenishment study will be carried out every year. | - |
| 12. | The Proponent should collect the baseline data in respect of initial level of the mining lease. For this permanent bench marks (BM) needs to be established at prominent location preferably close to mining leases in question and should have precisely known relationship to the level datum of the area, typically mean sea level. The entire mining lease should be divided suitably in the grids of 25 Meter x 25 Meters with the help of sections | Completed, Replenishment report is attached as Annexure X. | Annexure X. |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhampur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

M/s Dev & Div
Solutions Pvt. Ltd.

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| | <p>across the width of river and along the direction of flow of the river. The levels (MSL & RL) of the corner point of each grid need to be recorded. Each Grid should be suitably numbered for identification. PP should identify grids which will be worked out and grids which will come under no mining zone i.e. safety barriers from the river bank, safety barrier at lease boundary, restrictions as per condition of Lol/Mining Lease deed, restriction as Mineral Concession Rule of the Haryana State, restrictions as per sustainable sand mining management guidelines 2016, restriction as per DSR etc. The PP should ascertain the level of the river bed with the help of sections drawn across the width of the rivers and along the direction of flow of the river and based on this define the depth of mining of each grid. The PP should provide in tabular format the details of the grid viz. wise material availability, dimension of grid, location of grid (latitude, longitude, MSL and level from outside ground level of the corner points), average level of grid (AMSL and RL), depth of mining in each grid, area, volume, grids under mining zone and those left under no mining zone etc. The PP should submit surveyed data so collected in the excel or CSV file so that the same can be readily used for verification in CAD or Data mine Software. In addition to this soft & hard copy of all the plan & section needs to be submitted.</p> | | |
| <p>13.</p> | <p>PP should suitably name each section line. Section Plan for both sections drawn across the river and along the direction of the river needs to be submitted. Each Section should have level on vertical axis and distance from the bank of river on horizontal axis. For the section along the direction of the river the levels to be shown on vertical</p> | <p>Complied, Replenishment report is attached Annexure X.</p> | <p>Annexure X.</p> |



DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

M/s Dev & Div
Solutions Pvt. Ltd.

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

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| | axis and distance from upstream to downstream should be shown on horizontal axis. | | |
| 14. | The PP should prepare the Mining Plan based on the above survey. The information sought above needs to be a part of the mining plan. In the mining plan year wise production plan should be prepared in three plates for each year. Plat-1 show the mine working for the pre-monsoon period (1 st APR- 30 th June), Plate-2 should for the period 11 th July-15 th Sep) as the mining lease area needs to be left for the replenishment of the river bed mineral and no mining should be proposed in thus period and plat-3 show the mine working after replenishment of the river bed i.e. post monsoon period (16 th Sep 31 st March). The period of monsoon may also be defined in consultation with State Government. | Complied, Replenishment report is attached Annexure X. | Annexure X. |
| 15. | PP should specifically mention in the mining plan that in the subsequent scheme of mining/review of mining plan, the year wise data pertaining to replenishment study (all five years) shall be provided which include the level (AMSL & RL) of river bed recorded before and after the monsoon, year wise replenishment quantity, all plan & sections of the replenishment study for the past five years. | Mining Plan completed | |
| 16. | PP should also submit an undertaking to the effect that each year after the replenishment study the plan & section shall be submitted to concerned Department of Mining & Geology of the State for verification and official record. | Undertaking attached as Annexure VIII. | Annexure VIII. |
| 17. | PP should submit an undertaking by way of affidavit as required as per Ministry's O.M No 3- 5012017 -IA. IMJ dated 30.05.2018 to comply with all the statutory requirements and judgment of Hon'ble Supreme Court | Undertaking attached as Annexure VIII. | Annexure VIII. |



DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhampur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

M/s Dev & Div Solutions Pvt. Ltd.

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| | dated the 2nd August 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India and Ors. | | |
| 18. | PP should include in EIA Report details of all the statutory clearances, permissions. No objection certificates, consents etc. required for this project under various Acts, Rules and regulations and their status or estimated timeline after grant of EC. | Complied | |
| 19. | The PP should submit the revenue plan, revenue plan superimposed on the satellite imaginary clearly demarcate the Govt land, private land, agricultural land. | Proposed project is riverbed sand mining project and the entire area is government land. | |
| 20. | The PP should clearly bring out the protective and mitigative measures to be taken for the nearby habitation and religious structures in line with the Ministry's O.M. No. Z- 11013/57/2014- I.A.II (M) dated 29.10.2014. | Mining will be done as per Sustainable sand mining management guidelines 2016. | |
| 21. | The PP should submit the detailed plan in tabular format (year-wise for life of mine) for afforestation and green belt development in and around the mining lease. The PP should submit the number of saplings to be planted, area to be covered under afforestation & green belt, location of plantation, target for survival rate and budget earmarked for the afforestation & green belt development. In addition to this PP should show on a surface plan (5 year interval for life of mine) of suitable scale the area to be covered under afforestation & green belt clearly mentioning the latitude and longitude of the area to be covered during each 5 years. | A time bound Progressive Greenbelt Development Plan has been prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and given in Chapter 10. A suitable combination of trees that can grow fast and also have good leaf cover shall be adopted to develop the greenbelt. As per statutory norms total 33% area will be cover by plantation which is 11000 plant, so there is total 55000 plants will be planted. | Chapter-10 |
| 22. | The PP should submit the quantity of surface or ground water to be used for this project. The complete water balance cycle need to be submitted. In addition to this PP should submit a detailed plan for rain water harvesting | Water requirement in this project site is 87 KLD. Water will be taken from existing water sources from nearby villages or tanker supplier. The details are incorporated in the EIA/EMP | Chapter 2 |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

M/s Dev & Div
Solutions Pvt. Ltd.

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

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| | measures to be taken. The PP should submit the year wise target for reduction in consumption of ground water by developing alternative source of water through rain water harvesting measures. The capital and recurring expenditure to be incurred needs to be submitted. | report. Total Water Requirement = 87 KLD | |
| 23. | The PP should clearly bring out the details of the manpower to be engaged for this project with their roles /responsibilities/designations. In addition to this PP should mention the number and designation of person to be engaged for implementation of environmental management plan (EMP). | Direct- 98 employment Indirect- 100-150 employment | Chapter 2 |
| 24. | The PP should submit the year-wise, activity wise and time bound budget earmarked for EMP, occupational health surveillance &. Corporate Environmental Responsibility needs to be submitted. | The year-wise, activity wise and time bound budget earmarked for EMP, occupational health surveillance &. Corporate Environmental Responsibility has been incorporated in EIA/EMP Report. | Chapter-10 |
| 25. | PP should submit the measures to be adopted for prevention of illegal mining and pilferage of mineral. | Mining will be done as per Approved Mining plan. Measures to be adopted for prevention of illegal mining and pilferage of mineral is given in chapter 10. | Chapter-10 |
| 26. | PP should submit the detailed mineralogical and chemical composition of the mineral and percentage of free silica from a NABL/MoEF&CC accredited laboratory. | Mineralogical and chemical composition of the mineral and percentage of free silica has been done by from a NABL/MoEF&CC accredited laboratory and attached as Annexure IV. | Annexure IV. |
| 27. | PP should clearly show the transport route of the mineral and protection and mitigative measure to be adopted while transportation of the mineral. The impact from the center line of the road on either side should be clearly brought out supported with the line source modeling and isopleths. Further, frequency of testing of Poly Achromatic Hydrocarbon needs to be submitted | Traffic study was carried out to predict the magnitude and effects that a proposed project, generates on the existing transportation network. Transportation route is given in Chapter-3. | Chapter-3 |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhampur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

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Solutions Pvt. Ltd.

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| | along with budget. Based on the above study the compensation to be paid in the event of damage to the crop and land on the either side of the road needs to be mentioned. | | |
| 28. | PP should clearly bring out that what is the specific diesel consumption and steps to be taken for reduction of the same. Year-wise target for reduction in the specific diesel consumption needs to be submitted. | Average specific diesel consumption per tonne of total excavation is 0.35 Litre/tonne of total excavation which has been planned to be reduced to 0.31 litre/tonne in next five years, gradually in a phased manner, year wise target for reduction in specific diesel consumption and measure steps to be taken for reduction is given Chapter 10 of EIA/EMP report. | Chapter-10 |
| 29. | PP should bring out the awareness campaign to be carried out on various environmental issues, practical training facility to be provided to the environmental engineers/diploma holders, mining engineers/diploma holders, geologists, and other trades related to mining operations. Target for the same needs to be submitted. | PP agrees to conduct awareness campaign to be carried out on various environmental issues, practical training facility to be provided to the environmental engineers/diploma holders, mining engineers/diploma holders, geologists, and other trades related to mining operations. Target plan is given in chapter 10. | Chapter-10 |
| 30. | PP should specifically mention in the mining plan that the method of mining should be as proposed by EAC i.e. by use only Scrapers for mining to ensure that the mining depth be maintained as 3.0 meters. No other heavy machinery like bucket excavators, back-ho, shovel, JCB machines etc. shall not be used for excavation/digging. | No heavy Machinery will be used and the depth will be 3.0 m. Undertaking is Also attached as Annexure VIII | Chapter-1 Annexure VIII |
| 31. | The safeguards which are suggested in sustainable sand mining guidelines as well as notification dated 15.01.2016 ought to be scrupulously followed and taken into consideration while preparing EIA/EMP Report. | Complied and undertaking by Project Proponent is attached for the same. | Annexure VIII |
| 32. | The Project Proponent shall apply for NBWL Clearance for the project, if applicable, as per office | Not Applicable. | |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

M/s Dev & Div
Solutions Pvt. Ltd.

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhampur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

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| | Memorandum/Guidelines issued by MoEF&CC in this regard from time to time. | | |
| 33. | The PP should submit the MoU between State government and Project Proponent. | Department of Mines & Geology, Govt. of Haryana issued the letter of intent for LOI grant (Annexure-I) vide letter no. DMG/HY/Makhampur Unit/FBD/2021/3176 dated Panchkula 16.08.2021. attached as Annexure II | Annexure-III |
| 34. | The PP should give the Mining plan duly approved by the competent authority before preparing EIA/EMP report | Mining Plan and Progressive Mine Closure Plan has been prepared and submitted to mining department on dated 29.09.2021 for their approval | Annexure-XI |
| 35. | The project proponent shall get approve the conservation plan from chief wildlife Warden, Haryana and submit during the appraisal of the project. | Only 1 Schedule-1 species have been reported from the study area for which wildlife conservation plan has been prepared and submitted for its authentication. | Annexure VIII |
| 36. | The PP should give an affidavit that the mining was not mined to any person complied including minor minerals and sand. | Affidavit attached as Annexure. | Annexure IX |
| 37. | The PP should submit GoI Assessment of Mineral Resources. | Completed DSR is Attached as Annexure ix. | Annexure VI |
| 38. | The PP shall carry out the study of Ecological effect of particulate matter on the flora and fauna. | Biological study was completed and attached as Annexure. | Mining Plan |
| 39. | The Detailed reclamation plan of the project area to be submitted. | Included in Mining Plan. | Annexure VIII |
| 40. | The PP shall submit the undertaking that mining will be carried out in accordance with all other provisions as applicable under the Mines Act, 1952, Mines and Minerals (Development and Regulation) Act, 1957, Forest (Conservation) Act, 1980 and Environment (Protection Act), 1986 and the rules made there under, wild life (Protection) Act 1972, water (Prevention and | Undertaking Attached as Annexure VIII | |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

M/s Dev & Div Solutions Pvt. Ltd.
Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhampur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

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| | control of pollution) Act 1974 and Air (Prevention and Control of Pollution) Act, 1981. | | |
| 41. | The PP should submit an affidavit that no JCB will be used for mining and only semi-mechanized mining will be carried out | Affidavit attached as Annexure VIII | Annexure VIII |
| 42. | The PP shall submit that no illegal mining has taken place in the mining lease area and no illegal mining will be allowed during operation of mine. | Affidavit attached as Annexure VIII | Annexure VIII |
| 43. | The PP shall get the EIA study conducted by accredited agency for the use of large number of trucks/tippers including the impact of load and frequency of large number of machinery in the mining lease area. | Complied | |
| 44. | The PP shall also submit an affidavit that additional minerals mined during the mining shall be stored as mining burden and same will be intimated to the State Mines & Geology Department. | Affidavit attached as Annexure VIII . | Annexure VIII |



1. INTRODUCTION

1.1. Introduction

The Mining industry in India is a major economic activity which contributes significantly to the economy of India. The GDP contribution of the mining industry varies from 2.2% to 2.5% only but as per the GDP of the total industrial sector it contributes around 10% to 11%. Even mining done on a smaller scale contributes to 6% of the entire cost of mineral production. Indian mining industry provides significant job opportunities.

The properties of sand make it one of the most widely used minerals. Building huge infrastructure such as Road and housing sector requires basic construction raw materials in which sand is one of primary raw material required for the purpose. The mining activities as proposed are the backbone of all construction and infrastructure projects as the raw material for construction is made available only from such mining project. The sand to be excavated is in high demand at the local market for real estate and infrastructure industry.

Environmental Impact Assessment (EIA) is a planning tool for assessing the environmental concerns of a project at an early stage of project planning and design, so that it can assure the environmental feasibility of the project. An Environment management plan is prepared which will identify and address the impacts, where these are adverse in nature, and thereafter design mitigative measures to manage such impacts in a manner as to conserve environment and ecology of the area. The EMP has been prepared with a view to ultimately ensure that the adverse impacts are minimized if these cannot be prevented altogether.

1.2. Purpose of report

As per the Environmental Impact Assessment (EIA) Notification dated 14th September 2006, as amended from time to time; it is mandatory to have the prior Environmental Clearance for any new or expansion of the project from Ministry of Environment, Forests and Climate Change (MoEF&CC), Government of India, New Delhi for which EIA is required. The Environmental Impact Assessment has been prepared to assess the current environmental scenario of the area and then based on the activities of the mining proposed, to carry out Environment Management Plan (EMP). This plan will identify and address the impacts, where these are adverse in nature, and thereafter design mitigative measures to manage such impacts in a manner as to conserve environment and ecology of the area. The EMP has been prepared with a view to ultimately ensure that the adverse impacts are minimized if these cannot be prevented altogether.

Category "B1"- As Per EIA Notification of MOEF&CC, GOI, 14th September 2006 & amendment dated 12.12.2018, The Project Falls in Category 'B1' and required EIA under project type 1(a) and requires Environmental Clearance (EC) from SEAC/SEIAA before the commencement of any ground activity. In this regard, the proponent have submitted Form-I and the Pre - Feasibility Report to SEAC/SEIAA Haryana dated 01.12.2021 requesting for the issue of "Terms of Reference" (ToR) subsequently the proposal was considered in 228th Meeting SEAC and the ToR was granted by SEIAA haryana vide letter



no SEIAA(132)/HR/2021/1394 dated 27.12.2021 (Copy of enclosed as **Annexure-I**).The baseline studies were carried out for specific environmental components from October 2021 to December 2021.

1.3. Details of mining

Project is proposed for the mining of minor mineral(s) sand from the Riverbed Yamuna River with 24,00,000 MTPA over an area of 66.32 Hectare Located in Village- Makhanpur, Tehsil & District- Faridabad, State- Haryana by M/s Dev & Div Solutions Pvt.

M/s Unicore Recycling Pvt. Ltd. had been declared as successful bidder dated 19.07.2021 by offering highest bid of Rs 9,98,00,000/- in the auction conducted by Department of Mines & Geology, Govt. of Haryana for Makhanpur Unit for extraction of Sand having total area of 66.32 hectare. Further, the Department of Mines & Geology, Haryana issued LOI for the same in favour of M/s Dev & Div Solutions Pvt. Ltd, after successful auction vide letter no. DMG/HY/Makhanpur Unit/FBD/2021/3176 dated Panchkula 16.08.2021 (**Copy of enclosed as Annexure-II**). As per the LOI, the period of contract shall be 07 years and same shall commence w.e.f. the date of grant of Environmental Clearance by the competent authority and Consent to Operate by the State Pollution Control Board.

Mine Plan and Progressive Mine Closure Plan: Mining Plan and Progressive Mine Closure Plan has been prepared and submitted to mining department on dated 29.09.2021 for their approval. (Copy of enclosed as **Annexure-III**).

1.4. Identification of project and project proponent

M/s Dev & Div Solutions Pvt. Ltd is one of the pioneer company in sand mining in the state of Haryana having vast experience in operating sand mines, Road - Building Construction and Marketing of building material in Faridabad and other parts of the state. M/s Dev & Div Solutions Pvt. Ltd is one of the leading and technically skilled company having technical staffs and resources to work in mining. The promoters of company have an experience of producing sand, marketing and manufacturing of aggregates in the region since 15 years.

| | |
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| Name | : Mr.Laxman Kumar Binani |
| Designation | : Director |
| Mailing Address | : R/o- 31/1,3rd floor KCG Heritage Farm, Satberi, New Delhi-110074 |
| E-mail | : devanddivsolutions@gmail.com |
| Telephone | : 9818162912 |

1.5. Brief description of nature, size, location of the project and its importance to the country region

Nature of Project

The proposed project is a mechanized open-cast mining project having an area of 66.32 Ha. and is classified as "Category-B" as per the EIA Notification dated 14thSeptember 2006 and its amendments dated 12.12.2018 and falls in schedule 1 (a) (i) Mining of Minerals of Category 'B' as mining lease area less than 100 Ha.



Size of Project

Proposed Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MT production capacity over an area of 66.32 Hectare. The total proved geological reserves, have been estimated as 39,79,200 MT and Mineable reserves of sand is 26,00,000 MT.

Location of the project: The proposed project is located at village Makhanpur, Tehsil & District- Faridabad, and State- Haryana; The Makhanpur unit for river sand mine area is connected through approach road which will connect to NH-19, Faridabad to Palwal road and Yamuna Expressway Roads. The quarry is well connected by metalled road. Faridabad is about 10 kms and Palwal is about 32 kms and New Delhi is about 24 Kms from the lease area. Nearest Railway station is Faridabad railway station which is situated at a distance of 17.45 Km in NW direction. The salient features of the project are presented in **Table 1.1.**

Table 1-1: Brief Description of the Project

| S. No. | Particulars | Details |
|--------|--|--|
| A. | Nature and Size of the Project. | Mining of minor mineral Sand (Makhanpur Unit) from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur unit, Tehsil- Faridabad, District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd. |
| B. | Location | |
| | Khasra Number | 6//7Min,12Min,13,14,17,18,19,20min,21,22,23 7//16 min,17 min,22 min,23 min ,24 min,25 11//23 min,24 min,25 min 12//22 min, 23,24,25 13//4min,5min,6,7min,8 min,9 min,11 min,12 min,13,14,15,16,17,18,19,20,21,22,23,24,25min 14//1min,2min,3,4,5,6,7,8,9,10,11,12,13,14, min,15 min,18 min,19 min ,20,21min 15//1,2,3 min,9 min,10 min 18//1,2,3 min,4 min,8 min,9 min,10 min,11min 19//1,2,3,4,5,6,7,8,9,10,11,12,13,14min,17min ,18 min ,19,20min 20//3,4,5,6,7,8,9,12,13,14,15,16,17,18,19,20,21,22,23,24,25, 22//5,6,7,8,12,13,14,15,16 min,17,18,19,20,21,22,23 23//1,2,3,4 min,5 min,8 min,9 min,10,11 min, 33//1,2,3,4 min,8 min,9,10,11,12,13 min,18 min,19, 20,21,22,23 min 36//1,2 min,10 min,11 min,20 min,21 min 47//1 min,10 min,11 min For Ancillary area 4//11,12,13,14,15,16,17,18,19,20,21,22,23,24,25 7//1,2,3,4,5,6,7,8,9,10,11,12,13,14,15 |

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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | | | | |
|---------------------------------|---|---|-------------------|-------------------|
| | Village | Makhanpur unit | | |
| | District | Faridabad | | |
| | State | Haryana | | |
| Geographical Coordinates | Latitude and Longitude of Project Area | Point No. | Longitude | Latitude |
| | | A | 28° 16' 18.96" N | 77° 29' 24.98" E |
| | | B | 28° 16' 17.6" N | 77° 29' 19.56" E |
| | | C | 28° 16' 16.47" N | 77° 29' 13.21" E |
| | | D | 28° 16' 14.66" N | 77° 29' 3.87" E |
| | | E | 28° 16' 11.64" N | 77° 29' 52.38" E |
| | | F | 28° 16' 9.75" N | 77° 29' 36.11" E |
| | | G | 28° 16' 59.29" N | 77° 29' 23.11" E |
| | | H | 28° 16' 54.6" N | 77° 29' 13.35" E |
| | | G | 28° 15' 59.29" N | 77° 29' 23.11" E |
| | | I | 28° 15' 45.2" N | 77° 29' 11.25" E |
| | | J | 28° 15' 34.27" N | 77° 29' 12.11" E |
| | | A1 | 28° 16' 17.491" N | 77° 29' 46.37" E |
| | | A2 | 28° 16' 9.653" N | 77° 29' 41.873" E |
| | | B1 | 28° 16' 11.56" N | 77° 29' 19.42" E |
| | | C1 | 28° 16' 10.33" N | 77° 29' 15.2" E |
| | | D1 | 28° 16' 9.65" N | 77° 29' 12.11" E |
| | | E1 | 28° 16' 7.08" N | 77° 29' 3.49" E |
| | | F1 | 28° 16' 3.00" N | 77° 29' 51.14" E |
| | | G1 | 28° 16' 0.52" N | 77° 29' 43.44" E |
| | | H1 | 28° 16' 57.26" N | 77° 29' 32.93" E |
| | | I1 | 28° 16' 55.01" N | 77° 29' 27.18" E |
| | | J1 | 28° 16' 52.99" N | 77° 29' 23.8" E |
| | | K1 | 28° 16' 52.16" N | 77° 29' 23.14" E |
| L1 | 28° 16' 44.06" N | 77° 29' 18.54" E | | |
| M1 | 28° 16' 42.16" N | 77° 29' 16.32" E | | |
| N1 | 28° 16' 32.23" N | 77° 29' 15.94" E | | |
| O1 | 28° 16' 32.67" N | 77° 29' 15.78" E | | |
| | Toposheet (OSM) No. | H43X7, H43X8, H43X11, H43X12 | | |
| C. | Lease Area Details | | | |
| | Lease Area | 66.32 Hectare | | |
| | Type of Land | Govt. Land | | |
| | Topography | Riverbed | | |
| | Site Elevation Range | 185mRL to 192mRL Source: Mining Plan | | |
| D. | Cost Details | | | |
| | Cost of the | Rs 7 Crores | | |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | | |
|-----------|--|--|
| | project | |
| | Cost for EMP | Rs. 151 lakhs for 5 years |
| | OH&S | Rs. 4 Lakhs/- for 5 years |
| | Cost For Biodiversity Conservation | Rs.10.00 Lakhs/ -(Life of Mine) |
| E. | Environmental Settings of the area | |
| | Ecological Sensitive Areas (National Park, Wild Life Sanctuary, Biosphere Reserve, Reserve/ Protected Forest etc.) within 10 Km radius | Only Protected forest present within 10 km of the mine lease area and list for the same is given below: Karauli Khadra PF 8.5 km in SSE |
| | Interstate boundary within 5 Km radius | Haryana -Uttar Pradesh~0.4 km, in E |
| | Archaeological Important Place | None within 10km of the study area. |
| | Nearest Habitation | Makhanpur - 0.3 km in E direction. |
| | Nearest Town/City | Faridabad at a distance of 16 km of direction NW |
| | Nearest Railway Station | Faridabad railway station is 20.14 Km in NW |
| | Nearest State/ National Highway | NH -19 at ~17.4 KM km in W |
| | Nearest Airport | Indira Gandhi International Airport (nearest Airport) is 48.44 km in North West direction. |
| | Nearest Police Station | Police station Chhinsa- ~950 in W direction |
| | Medical Facilities | Primary Health Center Chhainsa ~400 m in W direction. |
| | Education | Nehru Convennt public school ~ 800 m in W direction. Community |

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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | | |
|--|--------------|---|
| | Facilities | |
| | Seismic Zone | Zone IV |
| | Water Body | Yamuna River onsite, GhuriyaNala 4.5 km in E direction KundNala 3.4 km in NNE direction |
| <i>No mining activity exists within 50 m from forest boundaries, national highway and habitation</i> | | |

(Source: Site visit /Baseline Data/Mining Plan and Pre-feasibility Report)

All corners-coordinates of the ML area are superimposed on Toposheet(OSM No.) H43X6, H43X7, H43X10, & H43X11 of survey of India **Figure-1.1**.



M/s Dev & Div
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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

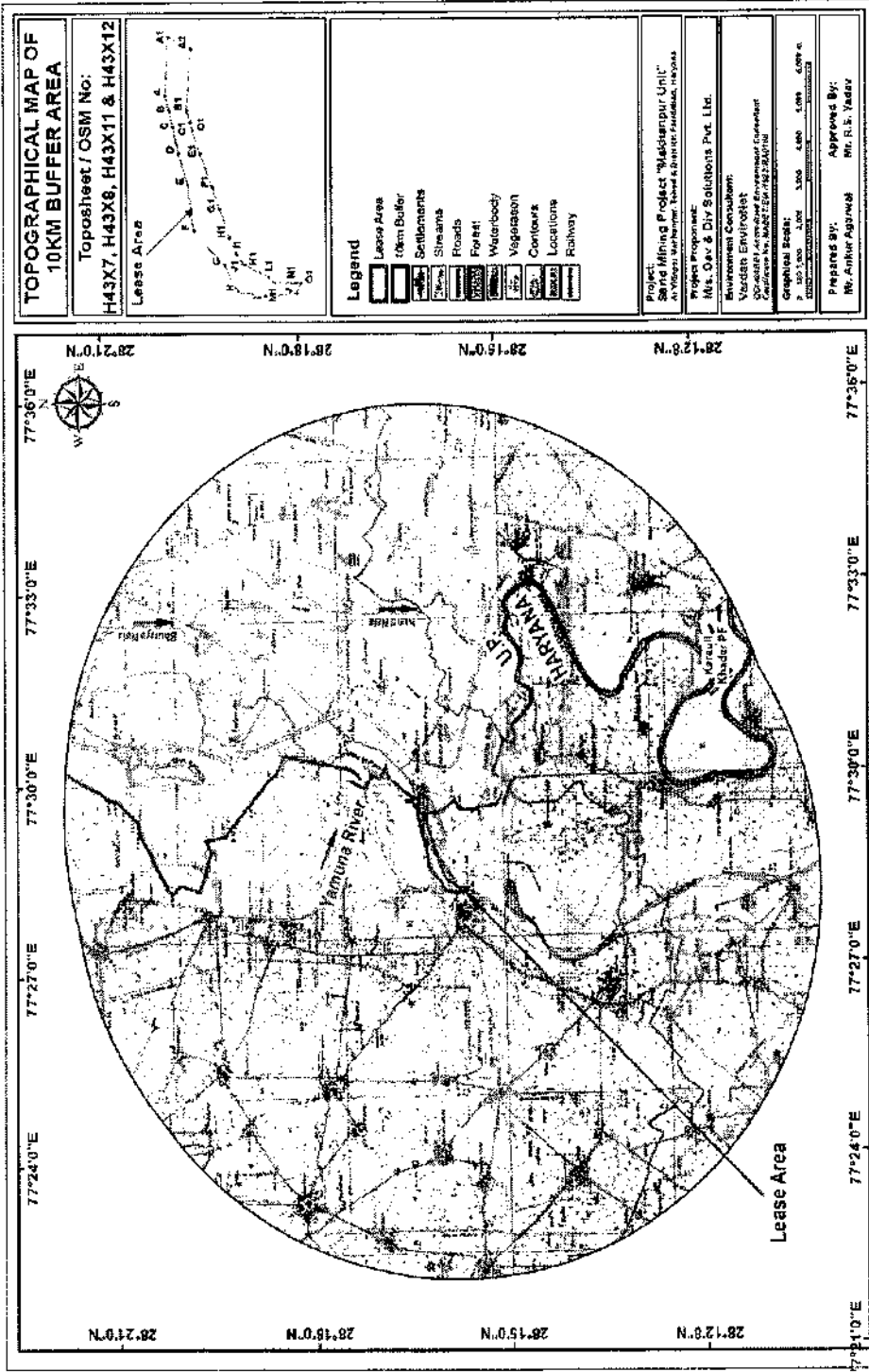


Figure1-1 Key Plan showing the Environmental Settings of the Study area along with the Coordinates of Mine Lease area

1.6. Importance of the project for country or region

The said project plays a significant role in the domestic as well as infrastructural market. The lessee supply Sand to various grinding industries which are situated near by area. It is used as a construction material, abrasive, agricultural soil treatment, construction aggregate, pigment, pharmaceutical etc. Quartzites is use in building and road works.

The proposed project will generate direct and indirect employment for the locals of nearby villages. The State Government will be benefitted from the royalty taxes received from the mining activities in the region. The proponents will imply suitable EMP which will act as the aesthetic and social upliftment of the area.

1.7. Scope of study

The Environmental Impact Assessment (EIA) studies are aimed to identify and analyze the aspects that affect the environmental conditions within the mine lease area and surrounding areas around 10 km radius from its boundry. The project scope includes detailed characterization of various environmental components like air, noise, water, land and socio-economic within this project study area and around the proposed mine site.

The objectives set for carrying out this EIA study are based upon the requirements that fulfill the EIA Notification 2006 and there subsequent amendments under the guidelines of MoEF&CC. These objectives are described as follows:

- To carry out environmental monitoring in order to establish a baseline environmental status of the study area
- To identify various existing pollution loads due to industrial and domestic activities in the ambient zone.
- To predict the impacts on environmental attributes.
- To evaluate the predicted impacts on the various environmental attributes in the study area by using scientifically developed and widely accepted Environmental Impact Assessment (EIA) Methodologies.
- Preparation of an Environmental Management Plan (EMP) outlining the measures for improving the environmental quality.
- To identify critical environmental attributes required to be monitored.
- To conduct literature review that includes identification of relevant data and articles from various publications, various government agencies and other sources.
- To collect available secondary data.

1.8. EIA Methodology

Environmental Impact Assessment study is conducted within an area of 10 km radius in and around the mine area involved following three phases.

- Identification of significant environmental parameters and assessing the status within the impact zone.
- Prediction of impacts envisaged due to proposed mining activity on various environmental parameters.

- Evaluation of impacts after superimposing the predicted scenario over the baseline scenario to prepare Environmental Management Plan.

During screening, significant environmental issues were examined for all the alternatives. Primary and secondary data were collected to describe the existing environmental set-up. The methodology adopted is presented in the form of a flow chart. Keeping in view the activities envisaged and size of the mining activities, the work carried out is briefly reported below and has been described in detail in the subsequent sections.

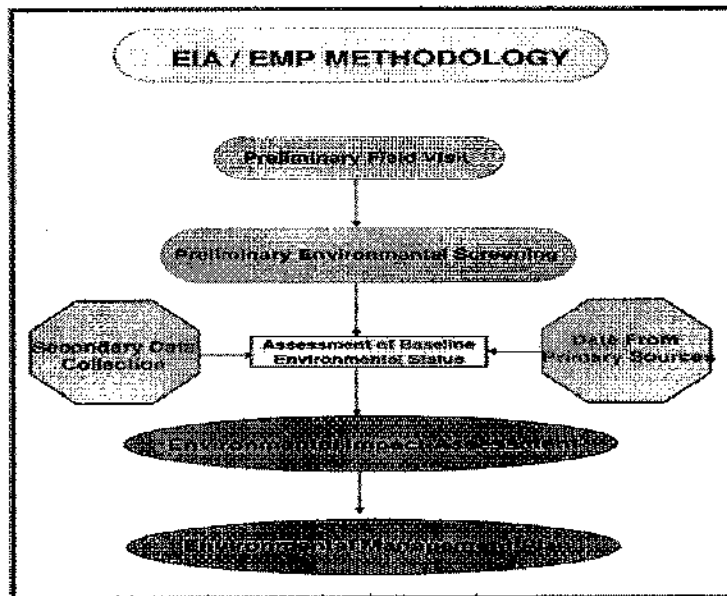


Figure 1-3 Flow Chart - EIA/EMP Methodology

1.9. Preparation of EIA

This EIA Report is prepared in accordance with has been divided into twelve chapters (in addition to Executive Summary) as briefed hereunder:

Chapter 1 – Introduction

Chapter 2 – Project Description

Chapter 3– Description of the Environment

Chapter 4 – Anticipated Environmental Impacts and Mitigation Measures

Chapter 5 – Analysis of Alternatives (Technology and Site)

Chapter 6 – Environmental Monitoring Program

Chapter 7 – Additional Studies

Chapter 8 – Project Benefits

Chapter 9 – Environmental Cost Benefit Analysis

Chapter 10 – Environmental Management Plan

Chapter 11 – Summary & Conclusion

Chapter 12 – Disclosure of Consultant

1.10. Laws applicable to this project

The Acts, Notifications, Rules and Amendments applicable for setting up a new mining project.

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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT
Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| Legal Channel | Responsible Ministries/Bodies | Objective of Legislation | Action Plan |
|---|-------------------------------|---|---|
| The Water (Prevention & Control of Pollution) Acts 1974/ Rules 1975 | CPCB, SPCB | The prevention and control of water pollution and also maintaining or restoring the wholesomeness of water. | Not to discharge any effluent, not confirming to standards, prescribed by SPCB into any stream, well, sewers or land, Not to discharge air pollutant(s) in excess of standards, prescribed by the State PCB. |
| The Air (Prevention & Control of Pollution) Acts 1981/ Rules 1982 | CPCB, SPCB | The prevention, control and abatement of air pollution. | Obtain 'Consent to Establish' prior to establish any process, operation or treatment system. Obtain 'Consent to Operate' prior to operation of system which is likely to discharge effluent. Apply for renewal of the 'Consent to Operate' before the expiry. Comply with conditions as prescribed under consents. |
| The Environment (Protection) Acts 1986/Rules 1986 The Environmental Impact Assessment (EIA) Notification, 2006 | MoEF&CC, CPCB, SPCB | Protection and Improvement of the Environment | Prevent discharge or emission of environment pollutants in excess of the prescribed standards Submit 'Environmental Statement' every year Obtain prior 'Environmental Clearance' from MoEF&CC in case of new project or for Modernization / Expansion. |
| Haryana Minor Mineral Concession Rules, 1986. | DMG, Haryana | Guidelines for mining of minerals in the lease area | Mineral will be extract as per the mining plan approved by DMG. |
| Mines minerals Development and Rehabilitation Act 1957 | DMG, Haryana | Regulation of mines and the development of minerals | Development Restoration and Rehabilitation fund will be spend as per the LOI/Lease conditions. |
| Wildlife protection Act 1972 | Forest Department, PPCCF | protection of plants and animal species | Wildlife conservation plan has been prepared to protect the Schedule species in the study area. |
| Solid Waste Management Rules, 2016 | CPCB | Management of solid waste | Waste will be managed as per the SWMR 2016. |

2. PROJECT DESCRIPTION

2.1. General

Proposed proposal pertains to Mining of sand minor minerals from the Riverbed Yamuna River with 24,00,000 MT Located in Village- Makhanpur, Tehsil & District- Faridabad, State- Haryana by M/s Dev & Div Solutions Pvt. Ltd. The total allotted Mine lease area for the proposed project is 66.32 Hectare. This chapter deals with the broad description of the project, location, type of mineral deposit(s), quality of reserve, Mining methodology, various site utilities and infrastructure, etc. This chapter deals with the lease details, geology of the mining lease area, evaluation of the deposit, estimation of reserves, proposed method of mining, mining machineries, year wise extraction details, details on infrastructure, various sources of pollution.

2.2. Type of the project

The project is proposed for “mining of sand minor mineral”. As Per EIA Notification of MOEF&CC, GOI, 14th September 2006 & amendment dated 12.12.2018, The Project Falls in Category ‘B1’ and required EIA under project type 1(a) and requires Environmental Clearance (EC) from SEAC/SEIAA before the commencement of any ground activity.

2.3. Need for the project

Building huge infrastructure as envisaged by Government of India/Haryana Government particularly in road and housing sector requires basic building and construction raw materials. The sand is one of primary building material required for the purpose. The mining activities as proposed are the backbone of all construction and infrastructure projects as the raw material for construction is made available only from such mining. The sand to be excavated is in high demand at the local market for real estate and infrastructure industry. This project will also provide employment to local people helping them earn livelihood. In addition to this, it will further prevent widening of the Yamuna River bed due to the deposition of sediments which if not mined out will result in raising of the river bed causing flooding, damage to the adjoining areas, destruction of life and

property.

2.4. Description and location of mine lease area

Project is proposed for mining of sand from riverbed of Yamuna river with 24,00,000 MTPA over an area of 66.32 He

ctare Located in Village- Makhanpur, Tehsil & District- Faridabad, State- Haryana. In the Survey of India Toposheet (OSM) no H43X7, H43X8, H43X11, H43X12.

2.4.1 Site Location

The proposed project is located at Village Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd. nearest Railway station is Faridabad railway station which is situated at a distance of 20.14 Km in NW direction. Mine area is connected through approach road which will connect to NH-19, Faridabad to Palwal road and Yamuna Expressway Roads. The



DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

quarry is well connected by metalled road. Faridabad is about 10 kms and Palwal is about 32 kms and New Delhi is about 24 Kms from the lease area.

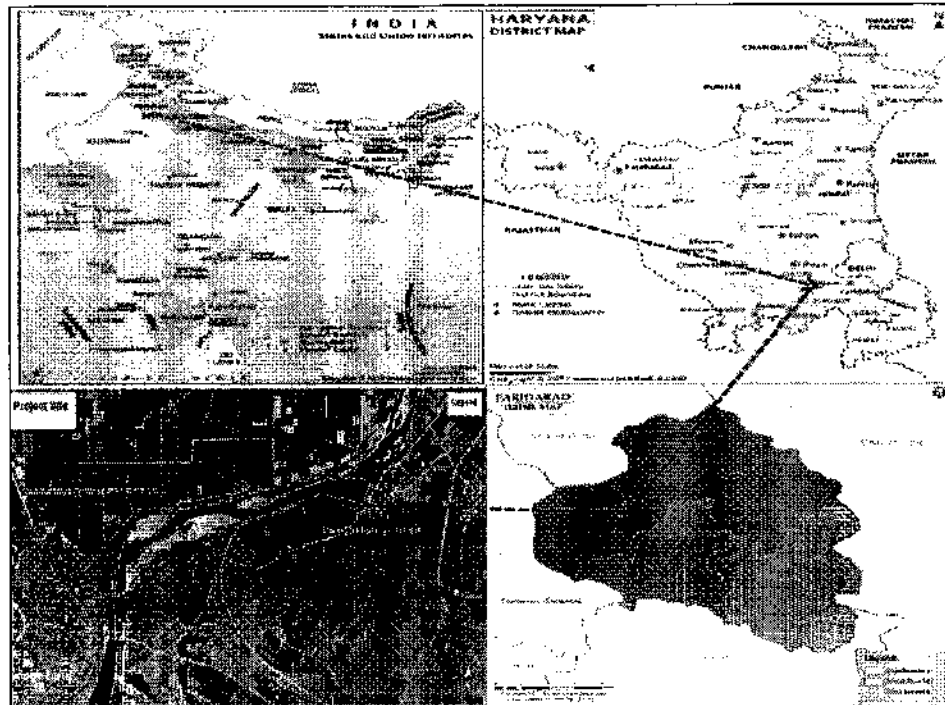


Figure 2-1: Location Map of the Project Site

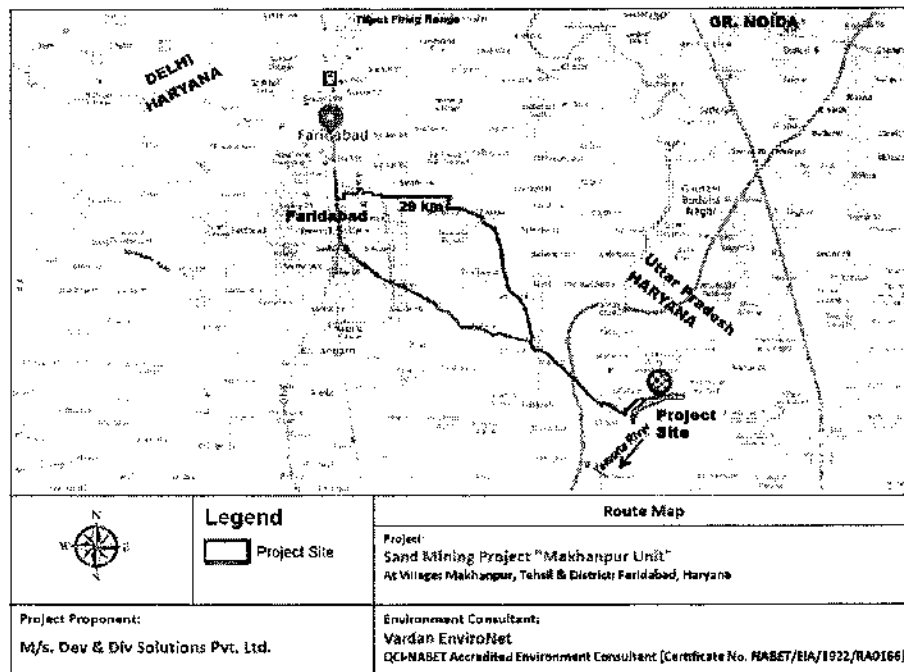


Figure 2-2: Route Map

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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

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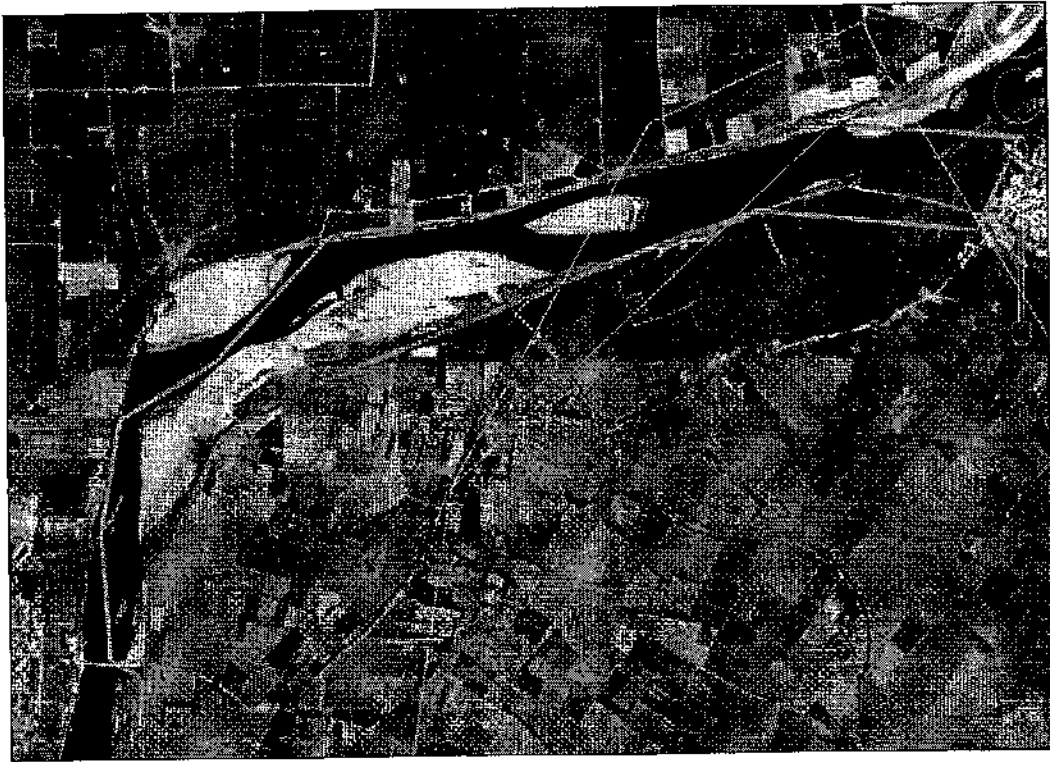


Figure 2-3: Google Image (Short View) of the Project Site



Figure 2-4: Google image (Long View) of the Project Site



2.4.2 Mining project present in 500 m radius

M/s Dev & Div Solutions Pvt. Ltd. does not attract the cluster situation as no mine leases are present within the 500m radius of the proposed lease area.

2.5. Size or magnitude of operation

The proponent has taken an area of 66.32 Hectare on contract as per mining lease. The mine lease area is land in the river section and the project is contemplated to win the mineral sand by mechanized open cast method of mining without blasting. The daily production has been contemplated as 8,889 MT/Day. The details of project are shown in Table 2.1.

Table 2-1: Details of Mining

| S. No. | Particulars | Details |
|--------|----------------------------------|--------------------------------|
| 1. | Method of Mining | Open cast Mechanized mining |
| 2. | Total Geological Reserves | 39,79,200 MT |
| 3. | Mineable Reserves | 26,00,000 MT |
| 4. | Proposed Production Capacity | 24,00,000 MT |
| 5. | Elevation Range of the Mine Site | From 185mRL to 192mRL |
| 6. | Bench Height | 3 m in Riverbed |
| 7. | Bench Width (Average) | Width of the bench around 20 m |

(Source: Mining Plan and Progressive Mine Closure Plan)

2.6. Physiography

Hydrogeology, Drainage and Climate The area of is marked by flat topography of sedimentary formations, which are surrounded by fine-grained blown soil overlying the sand deposits. Highest elevation is 185mRL & lowest 192mRL in the proposed lease area. The Yamuna river flows from N to S direction. The alluvial ground surface area over lying sand some distance away from the riverbed is under cultivation. It is believed that in the past, the River Yamuna used to flow closer to the present GT road which has now moved about 5-15 kms towards east.

2.6.1 Geology

The regional geology of District-Faridabad (Haryana) is represented by varieties of formation belonging to Delhi Super Group. Stratigraphically the rock formations of Delhi super group are composed of erinaceous, argillaceous & calcareous sediments. These sediments have been placed by Heron (1923) in the Alwar & Ajabgarh series of Delhi system & intruded by basic granitic rocks. The general succession of Delhi system can be represented as follows: (Das, Gupta S.P. 1968). A general Regional stratigraphic sequence in the area is given in Table 2-2.

Table 2-2: Regional stratigraphic sequence

| Series | Rock Types |
|------------------|---|
| Recent intrusive | Alluvium, dune sand, soil, ankerite, chert, quartz veins, younger basic dykes. Granites, Pegmatites, Quartz veins Older basic rocks. |
| Ajabgarh series | Carbonaceous phyllites & schists etc. (Local). |
| | Massive Quartzites. |
| | Phyllites, Mica-shists (Local). |



| | |
|--------------|---|
| | Marble, calc-gneiss, amphibolite etc. |
| | Schist with or without garnet. Stauroite, Kyanite, Sillimenite, Andalusite, phyllites, sandy phyllites. |
| Alwar series | Amphibole quartzite, marble, Amphibolites. |
| | Arkosic quartzites, quartzites & Interealated phyllite & schists. Magnetite & Hametite quartzites etc. |
| | Phyllite & schists. |

2.6.2 Local Geology

The sediments of the river bed are of recent nature. These sediments have been brought by river water and deposited in the bed of Yamuna River. The following sequence of formations has been observed in the area:

- Soil /Alluvium
- Sand.

Descriptions of formations found in the area are as under:

Soil/Alluvium: The finer sediments have been deposited in the flood plains of the River Yamuna.

Sand: Sediments of less than 1-3 mm size are predominantly deposited in the riverbed by flood waters during rainy season. There is no perfect classification between Sand and Silt. They have been deposited in a mixed state. As usual the larger size sediments are deposited at the bottom and the smaller sizes are deposited at the top, on the edges/flanks of the riverbed. However, during the course of shifting of the river course towards East about five hundred years back, silt was deposited on top in thicker layers up to 3 meters in some cases underlain by about 6-15 meters of sand. Sediments of various sizes and in mixed form are predominantly deposited in the river bed and there is no perfect classification between sediments. These may be called as coarse sand, medium sand and fine sand. The term sand is used to denote an aggregate of mineral or rock grains greater than 1/16mm and less than 2 mm in diameter.

2.6.3 Drainage pattern

The general slope of the land surface is from NE to SW. Elevation of the lease area varies from 185 to 192 mRL. The Yamuna provides the major drainage in the lease area. The general Physiography of the Lease area is gently sloping from NE to SW side indicating the flow of direction of river.

There is no flow of water in the river bed in post monsoon period. Area is having 1057 mm rainfall in a year. During rainy season, catchment water flows in the river. During dry period the sand is excavated which gets replenished during rainy period. No mining activities will be carried out during rainy season when there is water flowing in the working area.

2.6.4 Depth to water level

The elevation of the mining area varies from 185 m RL to 192mRL. There will be no intersection of water table as working will be carried out up to 3.0 m depth only from surface of river bed while the water level is 8-10 m below the surface of river bed. Working Bottom level of River Bed varies from 184 to 187 mRL.

Table 2-3: Details of Site Elevation

| Lowest Elevation | Highest Elevation | Working Depth (in meters) | Ground Water Table |
|------------------|-------------------|---------------------------|--------------------|
| 185 m RL | 192m RL | River Bed : 3m | River Bed: 8-10m |

(Source: Mining Plan and Progressive Mine Closure Plan)

2.6.5 Rainfall & Climate

The climate of Faridabad district can be classified as tropical steppe, semiarid and hot which is mainly characterized by the extreme dryness of the Air except during monsoon months. During three months of south west monsoon from last week of June to September, the moist air of oceanic penetrate into the district and causes high humidity, cloudiness and monsoon rainfall. The period from October to December constitutes post monsoon season. The cold weather season prevails from January to the beginning of March and followed by the hot weather or summer season which prevails up to the last week of June. The normal annual rainfall in Faridabad district is about 542 mm spread over 27 days. The south west monsoon sets in the last week of June and withdraws towards the end of September and contributes about 85% of the annual rainfall. July and August are the wettest months 15% of the annual rainfall occurs during the non-monsoon months in the wake of thunder storms and western disturbances.

Normal Annual Rainfall: 542 mm

Normal Monsoon Rainfall: 460 mm

Temperature

Mean Maximum: 41° C (May & June)

Mean Minimum: 8° C (January)

2.6.6 Seismicity of the area

In the seismic zoning map of Haryana, the district comes in a Zone-IV.

The detailed report on natural disaster has been discussed in Chapter seven under Risk and Hazard section.

2.7 Exploration and Reserves

2.7.1 Proved reserve

- Replenishment Survey by Drone technology was conducted in the granted area and incremental in reserves were estimated 24,00,000 MTPA.
- Following special conditions those are applicable for excavation of minor mineral(s) from river beds in order to ensure safety of river-beds, structures and the adjoining areas are considered while calculating the reserves of this area
 - i. No mining would be permissible in a river-bed up to a distance of five times of the span of a bridge on up-stream side and ten times the span of such bridge on downstream side, subject to a minimum of 250 meters on the up-stream side and 500 meters on the down-stream side;



- ii. There shall be maintained an un-mined block of 50 meters width after every block of 1000 meters over which mining is undertaken or at such distance as may be directed by the Director or any officer authorized by him.
- iii. The maximum depth of mining in the river-bed shall not exceed three meter from the un-mined bed level at any point in time with proper bench formation;
- iv. Mining shall be restricted within the central 3/4th width of the river/ rivulet;
- v. In case of areas permitted for excavation outside river/rivulets i.e. areas adjoining to rivers/rivulets, no mining shall be permissible in an area up to a width of 500 meters from the active edges of embankments in case of river Yamuna, 250 metres in case of Tangri, and Ghaggar river and 100 meters on either side of all other rivers/rivulets;
- vi. Any other condition(s), as may be required by the Irrigation Department of the state from time to time for river-bed mining in consultation with the Mines & Geology, a safety margin of two meters (2m) shall be maintained above the ground water table while undertaking mining and no mining operations shall be permissible below this level unless a specific permission is obtained from the competent authority in this behalf.
- vii. The contractor shall not undertake any mining operations in the area granted on mining contract without obtaining requisite permission from the competent authority as required for undertaking mining operations under relevant laws.
- viii. A barrier of 7.5 m width will be left from the mining area boundary.

2.7.2 Mineral Reserves Calculation - In River Bed Area

- Mineral Reserves falling in the river bed area has been calculated taking the maximum permissible depth of 3 m from the river bed surface RL.
- The bulk density of Sand is considered 2.0.
- Volumetric method is adopted for calculating reserves of Sand.
- The mineable reserves are calculated by deducting "Blocked Geological Reserves on account of river banks, lease boundary, railway line, highways, bridges, anicuts (wherever applicable) from total proved Geological Reserves".
- It is considered that river bed Sand shall be replenished every year.

Table 2-4: Geological Reserve

| Sr. No. | Nature of Land | Lease Area in Hectare | Total Proved Geological reserves MT=Area×Depth×BD (A) | Ancillary Area in Hect | Ancillary Area Geological Reserves in T (B) | Total reserves IN RIVER BED A-B=C MT |
|---------|----------------|-----------------------|---|------------------------|--|--|
| 1 | River bed | 66.32 | 3979200 | 12.0 | 720000 MT | 3259200 MT |

2.7.3 Mineable Reserves

- Total geological reserves of Sand: 39,79,200 MT
- Blocked Reserve = 6,39,600 MT
- Mineable reserves of Sand = 26,00,000 MT

2.7.4 Life of mine

For Balance reserves it is presumed that the mineral will be replenished every Year during the rainy season. New mineral will be added every year in the river bed. Period of Anticipated life of mine in each village/zone cannot be estimated accurately in the riverbed since the quantum of sand replenished every year will depend on the intensity of flood waters from upstream side and proposed rate of production.

2.8 Details of Production for Five Years

Table 2-5: Five Years Proposed Production Details (MT/A)

| Year | Production proposed TPA | Area (ha) required per year |
|---------|----------------------------|-----------------------------|
| 2021-22 | 24,00,000 | 40.00 |
| 2022-23 | 24,00,000 | 40.00 |
| 2023-24 | 24,00,000 | 40.00 |
| 2024-25 | 24,00,000 | 40.00 |
| 2025-26 | 24,00,000 | 40.00 |

(Source: Mining Plan and Progressive Mine Closure Plan)

2.8.1 Proposed Year wise development for Soil & Overburden for 5 years

There will be no OB removal and waste generation during the plan period. No dumping area is needed. No outside material will be filled up in the extracted zone

2.9 Mining Methodology

In pursuant to River sand mining Guide lines 2020 and as per provisions of Haryana Minor Mineral Concession, Storage, Transportation and Prevention of illegal Mining Rules -2012 extraction is limited to 3.0 m depth only. River bed is partly dry 44.00 ha. Approx. out of allotted Lease area 66.32 ha in district -Faridabad. Mining activity will be carried out in allocated areas only.

The production plan for each year is proposed to be 24,00,000 MT but for second year onward the same shall be dependent upon the rate of replenishment of the mineral during preceding year. In case due to any reason the replenishment of mineral (sand) is not taken place up depth the of mined out area (which would not be more than 3 meter of existing level of bed) in that case the working depth of mine for said year shall be such that shall be restricted up to the actual depth of replenishment. for example - in case during any year only 2.5 m or 2 m or 1.5 m, of the mined out area is refilled after rainy season- the production for said year shall be accordingly adjusted and mining depth will be reduced accordingly.

Proposed method of mining

- Mining activity will be carried out by opencast semi-mechanized method.
- Light weight excavators will be used for digging & loading of mineral in tippers.
- No OB/ waste material will be produced.
- No drilling/ blasting are required as the material is loose in nature.
- Proper benching of 3.0 m height will be maintained.
- Roads will be properly made and sprayed by water for suppression of dust.



- Roads in the lease area for the movement of loaded trippers/ trucks will not have slopes more than 1 in 20.
- Total extent of lease is 2.6 km including prohibited area.
- Extraction activities will start in the blocks from the upstream side to downstream side. This will not obstruct the movement of water, if any, during monsoon period in the river course.
- Approach roads from the various blocks as already described earlier will be merging with permanent tar roads on both sides of the river for transportation of the mineral to final destinations.

2.10 Reclamation of Mined out Area

There is no generation of OB/ waste material. No backfilling has been proposed in the excavated zone. River bed will be replenished by sediments during rainy season.

2.10.1 Extent of mechanization

The machineries required for mining are tabulated below. This is a new mining lease. Following equipment is proposed to be deployed for the desired production.

Table 2-6: List of Machinery

| S. No. | Name of machinery | Capacity | Nos. |
|--------|-------------------|-------------|------|
| 1 | Tippers/ Trucks | 25 tons | 40 |
| 2 | Water Tanker | 4000 liters | 2 |
| 3 | Light vehicles | -- | 2 |

2.11 Waste management

As stated in mining method, there will be no OB/ waste generation and there will not be any OB/ waste dumps.

2.12 Land Use Pattern of mining area at various Stages

Table 2-7: Land Use Pattern at Various Stages

| Sr. No | Head | Present Land Use (ha) | After Five Year Land Use (ha) |
|--------|---|-----------------------|-------------------------------|
| 1. | Area under mining | 0.00 | 40.0 |
| 2. | Storage for top soil | 0.00 | 0.00 |
| 3. | Waste dump site | 0.00 | 0.00 |
| 4. | Mineral storage | 0.00 | 0.00 |
| 5. | Infrastructure workshop, administrative building etc. | 0.00 | 0.30 |
| 6. | Roads | 0.00 | 0.00 |
| 7. | Railways | 0.00 | 0.00 |
| 8. | Un worked Area | 0.00 | 0.00 |
| 9. | Plantation | 0.00 | 10.0 |
| 10. | Mineral Separation Plant | 0.00 | |

| | | | |
|--------------------|--|--------------|--------------|
| 11. | Ancillary Area (Used for plantation and site services) | 0.00 | 12.00 |
| 12. | Others (to specify) | 66.32 | 4.02 |
| Grand Total | | 66.32 | 66.32 |

(Source: Mining Plan and Progressive Mine Closure Plan)

2.13 Utilities and site facilities

Water Requirement

The water requirement for dust suppression: During operation phase the dust suppression will be done for which the water calculated by including haul road on the basis of 1.5 Litre water requires for 1 m²haul road. The total length of haul road is 100m maximum. Water requirement for dust suppression of (Road length*litre/m²*width of the road) (100*1.5*6) ~1 KLD.

Domestic water requirement: Domestic water requirement has been calculated on the basis of total 98 men @ 45 L/day each/shift = 4410 L/day). The mine will operate in one shifts Thus total water requirement will be approximately equals to 4KLD.

Plantation: Water requirement is calculated as 1.5 litre of water is required for watering of plants. Plantation will be done on mine lease area i.e.21.88ha @ of 2500 tree/ Ha, so the total trees will be planted (54700 *1.5 = 82050litre per day) ~82KLD.

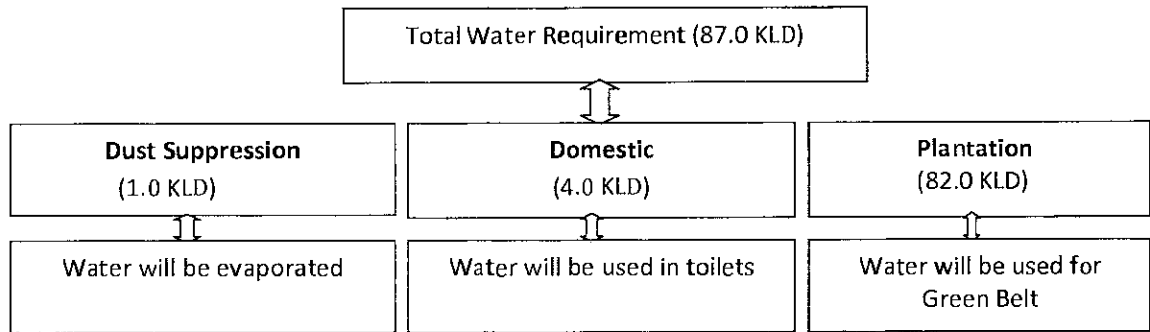


Figure 2.5: Water Balance

Man Power

The proposed sand mining project will generate employment for about 98 (Skilled-48, Semi-skilled- 40 & unskilled-10). In addition, more than 100-150 people will be benefited indirectly, preference of the employment will be given to the nearby villagers.

Table 2-8: Employment Details

| S.No. | Category | Numbers |
|-------|-------------------------------------|---------|
| 1. | Manager (I/II Class/Permit Manager) | 1 |
| 2. | Foreman/Mates | 2 |
| 3. | Skilled personnel | 20 |
| 4. | Operators | 25 |
| 5. | Semi-skilled personnel | 40 |
| 6. | Unskilled | 10 |

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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | |
|--------------|-----------|
| Total | 98 |
|--------------|-----------|

Power: The mine will get dedicated power supply from Dakshin Haryana Bijli Vitaran Nigam (DHBVN).

2.14 Summary

Project is proposed for the Mining of sand minor minerals from the Riverbed Yamuna River with 24,00,000 MT over an area of 66.32 Hectare Located in Village- Makhanpur, Tehsil & District- Faridabad, State- Haryana by M/s Dev & Div Solutions Pvt. Ltd. Govt. Mineral will be transported by trucks/dumpers. Total water requirement for the project is **87.0 KLD**. Total man power requirement for the project is **98**. The site facilities like canteen, rest-shelter, first aid facility, water and electricity supply etc. will be provided as per requirement. There is no litigation pending against this project.



3. DESCRIPTION OF THE ENVIRONMENT

3.1. INTRODUCTION

This chapter illustrates the description of the existing environmental status of the study area with reference to the major environmental attributes. The existing environmental setting is considered to establish the baseline conditions which are described with respect to physical environment, air environment, water environment, noise environment, traffic pattern and density, land environment, biological environment and socio economic environment.

The monitoring of environmental parameters was conducted within the core zone and buffer zone (10 km radial distance) from project site located at village Makhanpur, Tehsil & District-Faridabad, State- Haryana, in accordance with the guidelines issued by the MoEF&CC, CPCB, and SPCB during the study period (**Oct to Dec-2021**).

Baseline Environmental status in and around the proposed sand (Minor Mineral) mining project, depicts the existing quality of Air, Noise, Water, Soil, Ecology & Biodiversity and Socio-economic environment. Based on the baseline data, environmental impact assessment is carried out and Environmental Management Plan is prepared.

This baseline environmental study reveals information on existing environmental scenario.

- Delineation of project site and study area.
- Delineation of the environmental components and methodology.
- Delineation of study period.
- Delineation of the location of the site and description of its surroundings based on secondary data. After delineation of the above for the present case the following studies were conducted.
- Baseline data generation/establishment of baseline for different environmental components.
- Baseline status of the existing site operating facilities.
- Traffic density at the inter-phase of project site and study area.

3.2. STUDY AREA AND PERIOD

Studies of various environmental parameters have been done within 10 km radius area of the proposed project site. The study area is located at district Faridabad, Haryana. The impact identification always commences with the collection of baseline data such as Ambient Air Quality, Micro-Meteorology, Ground and Surface Water Quality, Noise levels, Soil Quality, Land use pattern, Biological Environment, Socio-economic Environment, Geology and Hydrology within the study zone of 10 km radius.

3.3. STUDY PERIOD

The baseline environmental study has been done for the period of Oct-Dec 2021 by M/s. Vardan Enviro Lab, Gurgaon, NABL Accredited Lab, and Certificate No. TC-6299 (Certificate enclosed in Chapter 12) in accordance with the Guidelines for EIA issued by the Ministry of Environment Forests and Climate Change, Govt. of India and CPCB, New Delhi. Secondary data was also collected from different government sources/Authorities.



3.3.1 Components & Methodology

The data was collected from both primary and secondary sources. Secondary meteorological data of the nearest IMD station, Delhi (~31.4 km from project site) was considered for the selection of air monitoring stations. Micrometeorological data at site was also recorded using Automatic Weather Station. Apart from these, secondary data have been collected from Census Handbook, Revenue Records, Statistical Department, Soil Survey and Land use Organization, District Industries Centre, Forest Department, Central Ground Water Authority, etc.

The studies involved in conducting field studies and analyzing various parameters that might be affected due to the industry and conducting socio-economic survey among the people. For reconnaissance survey the sampling locations were identified based on:

- Existing topography and meteorological conditions.
- Location of human habitation and other sensitive areas present in the vicinity of the proposed project site.
- Representative areas for baseline conditions.
- Accessibility for sampling

The scoping and the extent of data generation were formulated based on interdisciplinary team discussions, and professional judgment keeping in view of TOR assigned by SEAC, Haryana. The various parameters surveyed and studied for the baseline study are tabulated below.

Table 3-1: Environmental components and their methodologies

| S.N. | Environmental components | Parameters | Methodology |
|------|--------------------------|---|---|
| 1 | Air | Meteorology (Temp., RH, WS, WD, RF) | USEPA (Meteorological Monitoring guidance for regulatory modeling applications) |
| | | Ambient Air Quality (PM ₁₀ , PM _{2.5} , SO ₂ , NO _x , CO) | IS-5182, CPCB (guidelines for measurement of Ambient Air Pollutants). |
| 2 | Water | Water Quality (Surface & Ground) | Standard limits: Surface-IS:2296 Ground-IS 10500:2012 Sampling Methodology-IS: 3025 |
| 3 | Noise | Ambient Noise Quality (L _{max} , L _{min} , Leq) | IS:9989 (Assessment of noise with respect to community response) |
| 4 | Soil | Soil Quality (pH, EC, BD, Infiltration, Texture, SAR, Key nutrients, OM, OC, Fe, Zn and Cu) | Sampling Methodology and Analysis- IS: 2720/soil chemical analysis by M.L Jackson |
| 5 | Land Use | Land use types, Land schedules, Satellite imagery | Bhuvan, NRSA |
| 6 | Ecology | Ecology studies (Floristic diversity, Terrestrial ecosystem) | Field Study / Secondary Data |

| S.N. | Environmental components | Parameters | Methodology |
|------|--------------------------|---|---|
| | | sustainability, Green belt development, sinking capacity of pollutants) | |
| 7 | Socio Economic | Demography and Occupational details, agricultural situation etc. | Census, District report Public Consultation by Questionnaire survey |
| 8 | Hydrology & Geology | Geological, Hydrological, Geomorphological studies | Geological Survey of India, NRSC, CGWA |
| 9 | Traffic Study | PCU/hr, LOS | IRC 64:1990, ARAL/CPCB. |

3.4. Air Environment

Dispersion of different air pollutants released into the atmosphere have significant impacts on the neighborhood air environment of an mining project and forms an important part of impact assessment studies. The ambient air quality status with respect to the study zone of 10 km radial distance from the site will form the base line information over which the predicted impacts due to the proposed project can be super imposed to find out the net (Final) impacts on air environment. From the final impacts a viable Environmental Management Plan (EMP) can be prepared based on the impact statement for the air environment. The design of monitoring network in the air quality surveillance program has to be based on the following considerations.

- Meteorological conditions on synoptic scale
- Topography of the study area.
- Representation of regional background levels.
- Representation of site.
- Representation of cross sectional distribution in the downward direction.
- Inclusion of major distinct villages to collect the baseline status.

3.4.1 Micro-meteorological data

Micro-meteorological data within the project area during the air quality survey period is an indispensable part of air pollution study. Assessment of the micro and macro meteorology is important from the standpoint of understanding the nature and extent of air pollution in the study area.

The study area is located in district Faridabad. The climate of Faridabad district is mild, and generally warm and temperate. Faridabad records an average temperature around 15.20-26.35 degree during the course of the year. June is the hottest recorded month while January is the coldest one. There is a large variation in rainfall in space and time. The district is endowed with typical climate with extremes in summer as in winters. Summers enter in the month of March. Winters commence in the month of October and stay on till February. In the present studies, to understand the site specific meteorological conditions Primary data is collected at site.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhampur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

3.4.2 Secondary Data

Historical data of meteorological parameters also plays an important role in identifying the general meteorological status of the region before the start of baseline study. The data generated in the field is compared with the historical data in order to identify changes, which may have taken place during the course of time. The latest and updated secondary data for 30 years (1981-2010) is procured from IMD, Delhi for observing parameters like Temperature, Relative humidity, Rainfall, Wind speed and Wind direction at IMD Delhi. The IMD data collected is given in Table 3-2.

Table 3-2 Secondary Meteorological Data for Delhi (1981-2010)

| Month | Air Temperature (°C) | | Humidity (%) | | Monthly Rainfall Total (mm) | Mean Wind Speed (Kmph) | Predominant Wind Direction |
|-----------|----------------------|------------|--------------|----------|-----------------------------|------------------------|----------------------------|
| | Daily Max. | Daily Min. | 0830 IST | 0530 IST | | | |
| January | 24.6 | 3.4 | 84 | 58 | 13.3 | 1.5 | W |
| February | 29 | 6 | 80 | 45 | 15.8 | 2.3 | W |
| March | 36.2 | 10.3 | 68 | 34 | 8.8 | 2.1 | W |
| April | 41.6 | 16.3 | 49 | 24 | 10.4 | 2.1 | W |
| May | 43.9 | 19.6 | 49 | 27 | 23.8 | 2.3 | W |
| June | 43.3 | 22.4 | 60 | 42 | 66.7 | 2.5 | W |
| July | 39.5 | 24.2 | 75 | 63 | 187.2 | 1.8 | W |
| August | 37.1 | 23.4 | 77 | 67 | 182.4 | 1.7 | W |
| September | 37 | 21.5 | 75 | 59 | 93 | 1.7 | W |
| October | 36.1 | 14.4 | 72 | 50 | 20.5 | 1.6 | W |
| November | 32.5 | 7.1 | 77 | 54 | 1.9 | 1.2 | W |
| December | 27.4 | 4.4 | 82 | 58 | 6.7 | 1.5 | W |
| Annual | 44.4 | 3.1 | 70 | 47 | 630.4 | 1.9 | W |

(Source: Climatologically Normal's 1981-2010, IMD New Delhi)

3.4.1. Primary Data

The meteorological data recorded during study period is very useful for proper interpretation of the baseline information as well as for input, to predictive models for air quality impacts for collection of Primary data an Automatic Weather Station was installed at the site, For three months (Oct to Dec) and it has recorded hourly observations for the parameters like Maximum and Minimum Temperatures (°C), Relative Humidity (%), Wind Speed (km/hr), Wind direction and Rainfall (mm). The hourly-recorded observations (wind velocity and wind directions) during 12 weeks study period are used in computing percentage frequencies and are depicted in the form of "wind roses" (Figure. 3.1). The summarized meteorological data is provided in Table 3-3.

Table 3-3 Onsite Meteorological Data (Period: October to December 2021)

| Month | | Temp. (°C) | WS (kmph) | WD (Blowing to) | Mixing Height (m) |
|-------|-----|------------|-----------|-----------------|-------------------|
| Oct | Min | 15.65 | 0 | N | 89.0 |

| | | | | | |
|-----|------|-------|-------|-----|--------|
| | Max | 37.35 | 20.88 | N | 1891.0 |
| | Avg. | 26.35 | 3.96 | S | 349.1 |
| Nov | Min | 7.25 | 0 | N | 89.0 |
| | Max | 37.35 | 18 | N | 1985.0 |
| | Avg. | 20.55 | 3.6 | SSW | 356.4 |
| | Min | 5.05 | 0 | N | 89 |
| Dec | Max | 30.95 | 25.56 | N | 2173.0 |
| | Avg. | 15.35 | 2.52 | SSW | 459.6 |

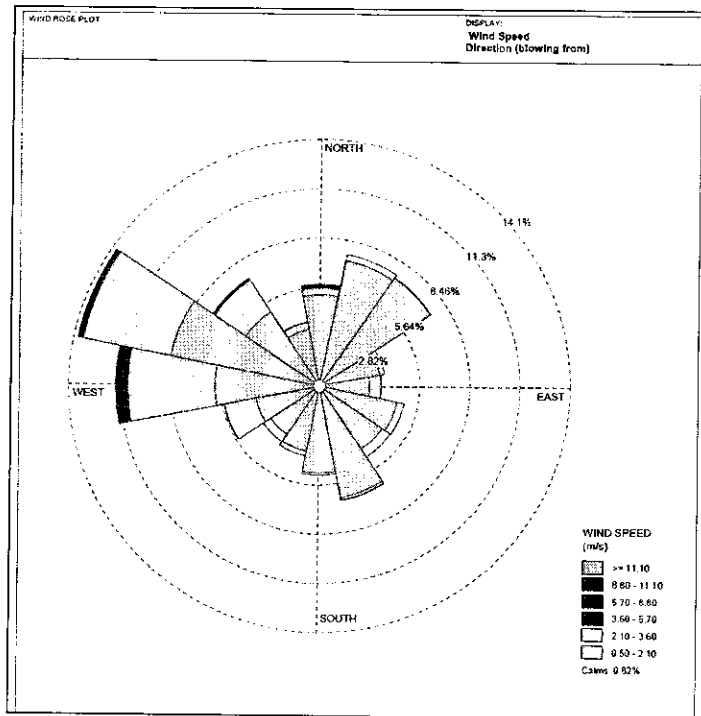


Figure 3-1: Wind Rose Diagram of Study Period (Oct to Dec 2021)

3.4.2. Comparison of Primary Meteorological data with IMD data

The meteorological data recorded on site is compared with the available IMD data. The maximum and average temperature for primary data was found to be 37.35°C and 15.35°C respectively and follows the similar trends as in secondary data. The average wind speed during the study period was observed to be 1.16 m/s with predominant direction in WNW and followed by W. This data was found to be fairly consistent with IMD data.

3.5. Ambient Air Quality

Ambient air quality monitoring is done to determine the general background concentration levels of pollutant. The prime objective of the ambient air quality study is to assess the existing air quality of study area and to establish the existing ambient air quality within the study area and its conformity to NAAQS.

3.5.1. Selection of Sampling Locations

The sources of air pollution in the region are small scale and medium scale industries, mining activity, vehicular traffic, dust arising from unpaved village roads and domestic fuel burning. The due consideration during the selection of sampling locations was given to the likely affected zones during mining activity. Eight (8) numbers of monitoring stations were set up to assess the existing air quality of the study area. One station was located inside the proposed project site (core zone) and remaining seven others, outside (buffer zone) the proposed project site. The locations of the monitoring stations were based on the frequent wind directions (secondary data) in order to site the stations as close as feasible to the anticipated maximum pollutant deposition areas moreover duly considering human habitation and proximity to sensitive zones within the study area. Logistic considerations as ready accessibility, security, availability of reliable power supply etc. were examined while finalizing the monitoring locations. The Ambient Air Quality Monitoring locations have been presented in Figure. 3.2.

Table 3-4: Showing Ambient Air Monitoring Locations

| Station s | Name | Latitude | Longitude | Distan ce (km) | Direct ion | Criteria |
|--------------|------------------|--------------|--------------|----------------------|---------------|--|
| A1 | Project Site | 28°16'09.9"N | 77°28'49.1"E | -- | -- | Project site |
| A2 | Makanpur Khadar | 28°16'04.1"N | 77°29'25.1"E | 0.2 | S | Near Project Site |
| A3 | Chhainsa | 28°15'42.8"N | 77°27'43.8"E | 0.8 | W | 2 nd predominant upwind direction |
| A4 | Shopura | 28°18'16.9"N | 77°27'32.5"E | 4.2 | NW | 1 st predominant upwind direction |
| A5 | Near Moujpur | 28°16'30.0"N | 77°26'41.7"E | 2.7 | WNW | 2 nd predominant upwind direction |
| A6 | Qadirpur | 28°16'49.5"N | 77°31'28.5"E | 2.9 | WNW | Cross wind of 1 st predominant |
| A7 | Mohna | 28°13'35.4"N | 77°26'32.2"E | 4.5 | SW | Cross wind of 1 st predominant and near highway |
| A8 | Panchayati Juggi | 28°14'22.7"N | 77°29'15.2"E | 3.4 | S | 1 st predominant downwind direction |

3.5.2. Methodology

As per the scope of work, 8 ambient air quality monitoring stations were monitored for specific air pollutants during the study period. All the instruments (samplers) were installed between 1 to 4 m above ground level which was free from any obstructions. The sampling and analysis of the required parameters were carried out as per IS: 5182 methodology entitled "Methods of Measurement of Air Pollution" and AWMA entitled "Methods of Air sampling and analysis". Following are the parameters monitored during the study period.

Particulate Matter (PM₁₀ and PM_{2.5})

Sulphur dioxide (SO₂)

Nitrogen dioxide (NO₂)

Carbon Monoxide (CO)

Table 3-5 Techniques Adopted/Protocols for Ambient Air Quality Monitoring

| S.No | Parameters | Techniques | Technical Protocol |
|------|------------------------------------|--------------------|----------------------------|
| 1 | Sulphur Dioxide(SO ₂) | West & Gaeke | IS:5182(P2) |
| 2 | Nitrogen Dioxide(NO ₂) | Jacob & Hochheiser | IS:5182(P6) |
| 3 | ParticulateMatterPM ₁₀ | Gravimetric | IS:5182(P15) |
| 4 | ParticulateMatterPM _{2.5} | Gravimetric | VEL/SOP/01,section no SP63 |
| 5 | Carbon-monoxide as CO | NDIR | IS:5182(P-10) |

3.5.3. Data Analysis

The Ambient Air Quality survey has been carried out at 8 locations within 10 km radius around the proposed project site. Measurement of Particulate pollutant (PM₁₀ & PM_{2.5}) and gaseous pollutants (SO₂, NO_x and CO) levels helps to understand the existing environmental scenario. The results of all the locations were further computed for statistical parameters like Minimum, Maximum concentrations and Arithmetic mean (AM). The results are shown in Table No. 3.6. The detailed air quality reports are given in Annexure IV.

Table 3-6 Ambient Air Quality Data

| Pollutant | Location Codes | Max. | Min. | Avg. | 98 Percentile | NAAQS |
|---|----------------|------|------|------|---------------|-------|
| PM ₁₀ (µg/m ³) | A-1 | 94.6 | 86.0 | 90.9 | 94.5 | 100 |
| | A-2 | 91.5 | 84.0 | 87.9 | 91.4 | |
| | A-3 | 89.0 | 82.2 | 86.0 | 88.9 | |
| | A-4 | 79.3 | 72.2 | 75.3 | 79.0 | |
| | A-5 | 87.8 | 80.3 | 84.1 | 87.8 | |
| | A-6 | 84.8 | 78.1 | 81.5 | 84.4 | |
| | A-7 | 77.6 | 70.2 | 73.3 | 77.5 | |
| | A-8 | 81.3 | 75.1 | 77.7 | 81.1 | |
| PM _{2.5} (µg/m ³) | A-1 | 54.5 | 47.1 | 51.0 | 54.5 | 60 |
| | A-2 | 51.6 | 44.0 | 47.9 | 51.5 | |
| | A-3 | 49.0 | 42.4 | 46.1 | 48.7 | |
| | A-4 | 44.3 | 38.8 | 41.3 | 44.1 | |
| | A-5 | 48.8 | 41.1 | 44.8 | 48.7 | |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| Pollutant | Location Codes | Max. | Min. | Avg. | 98 Percentile | NAAQS |
|----------------------------|----------------|------|------|------|---------------|-------|
| | A-6 | 46.5 | 40.2 | 43.3 | 46.5 | |
| | A-7 | 43.9 | 36.1 | 39.5 | 43.8 | |
| | A-8 | 45.9 | 39.2 | 42.0 | 45.7 | |
| NO ₂ (µg/m3) | A-1 | 28.6 | 21.4 | 24.4 | 28.5 | 80 |
| | A-2 | 25.9 | 20.1 | 22.6 | 25.8 | |
| | A-3 | 23.8 | 19.3 | 21.0 | 23.8 | |
| | A-4 | 25.6 | 15.6 | 19.0 | 24.5 | |
| | A-5 | 22.8 | 19.0 | 20.8 | 22.8 | |
| | A-6 | 21.8 | 18.4 | 20.3 | 21.8 | |
| | A-7 | 21.3 | 16.2 | 18.4 | 21.0 | |
| | A-8 | 21.5 | 18.0 | 20.3 | 21.5 | |
| SO ₂ (µg/m3) | A-1 | 17.4 | 12.3 | 15.2 | 17.3 | 80 |
| | A-2 | 15.8 | 11.1 | 13.1 | 15.7 | |
| | A-3 | 15.1 | 10.2 | 12.3 | 14.9 | |
| | A-4 | 13.1 | 7.0 | 10.2 | 13.1 | |
| | A-5 | 14.6 | 10.0 | 12.1 | 14.6 | |
| | A-6 | 19.9 | 13.1 | 15.9 | 19.6 | |
| | A-7 | 12.8 | 8.0 | 10.3 | 12.6 | |
| | A-8 | 13.5 | 9.2 | 11.5 | 13.5 | |
| CO (mg/m3) | A-1 | 1.94 | 0.90 | 1.52 | 1.91 | 02 |
| | A-2 | 1.50 | 0.80 | 1.02 | 1.47 | |
| | A-3 | 1.10 | 0.70 | 0.84 | 1.09 | |
| | A-4 | 0.85 | 0.52 | 0.62 | 0.83 | |
| | A-5 | 0.90 | 0.60 | 0.72 | 0.88 | |
| | A-6 | 1.02 | 0.77 | 0.90 | 1.01 | |
| | A-7 | 0.77 | 0.52 | 0.61 | 0.75 | |
| | A-8 | 0.81 | 0.56 | 0.74 | 0.81 | |

(Source: Vardan EnviroLab)

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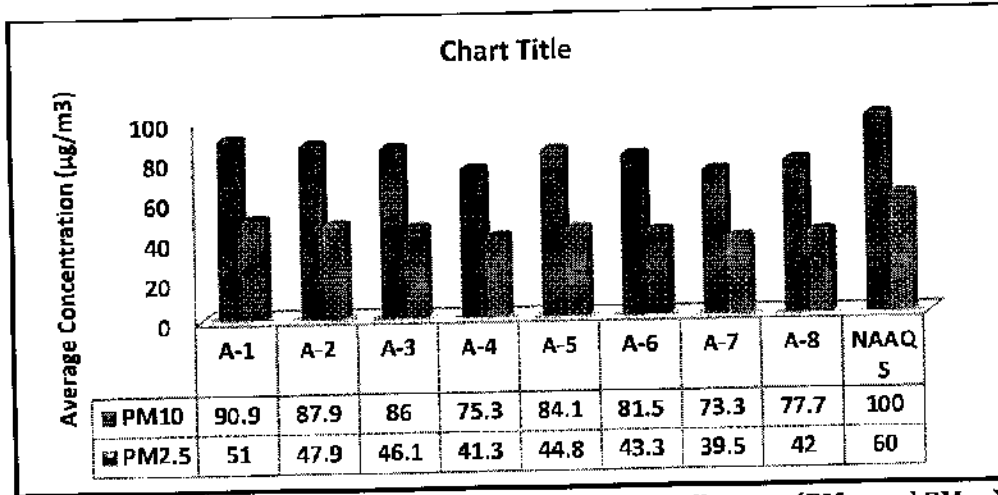


Figure 3-3 Graphical representations of Particulate Pollutants (PM₁₀ and PM_{2.5})

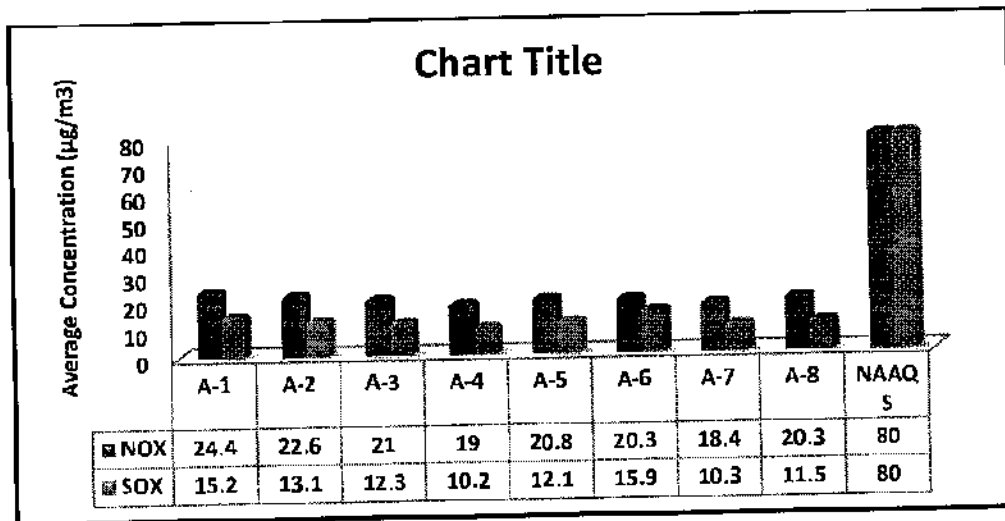


Figure 3-4 Graphical representation of NO₂ and SO₂ pollutant

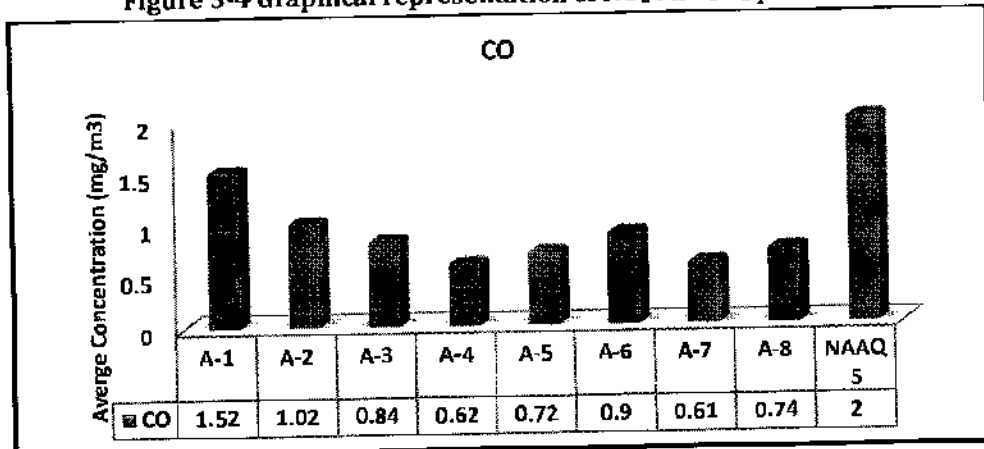


Figure 3-5 Graphical representation of CO pollutant



3.5.4. Interpretation:

- Ambient Air Quality Monitoring reveals that the concentrations of PM₁₀ and PM_{2.5} for all the 8 AAQM stations were found between 70.2 to 94.6 µg/m³ and 36.1 to 54.5 µg/m³ respectively.
- Maximum concentration of particulate pollutant (both PM₁₀ and PM_{2.5}) was found at location A-1 due to presence of Yamuna Express and nearby other mining activity.
- The concentrations of SO₂ and NO_x were found to be in range of 7.0 to 17.4 µg/m³ and 15.6 to 28.6 µg/m³ respectively.
- The high concentration of SO₂ was found at A1 which is due to the presence of highly population in this area.
- The high concentration of NO_x was found at A7 due to the highly population in this area.
- The CO level was in range of 0.52 to 1.94 mg/m³. The high concentration of CO was found at A1 which is due to the mining activity in this area and MDR.
- The proposed project is mining of sand in which particulate pollutant are major contributors to the environment. The baseline status of existing condition suggested that the ambient air quality is well below NAAQS limits.

As per the analytical reports of the project site and the surrounding areas, the ambient air quality is well below the NAAQS limits, however after commissioning of the project the prevailing baseline status of area will be distributed so to maintain the ambient air quality of the area, the latest / modern air pollution control measurements along with suitable EMP will be adopted, which will be elaborated in detail in Chapter-4 of the report.

3.6. Noise Environment

Noise often defined as unwanted sound, interferes with speech communication, causes annoyance, distraction from work; disturb sleep, thus deteriorating quality of human environment. Noise Pollution survey has therefore been carried out.

The noise level variation can be temporal, spectral and spatial. From environment point of view, higher noise levels may affect health of human beings and disturbance to animals if they are close to the noise generating sources. In order to know the baseline noise levels, in and around the project site, noise levels were measured at the site and also at villages in the study area.

3.6.1. Methodology of noise measurement

For noise measurement calibrated and integrated sound level meter manufactured by Lutron (SL-4001) was used. SLM (Sound Level Meter) was mounted on a tripod stand as per the standard methodology for noise measurements. Special care was taken while recording the noise levels and also ensure to the least amount of reflective surface is exposed from the body to the meter.

Noise levels were recorded at 8 locations by Sound Level Meter in dB (A). Noise levels were recorded as per IS: 9989 entitled "Assessment of noise with respect to community response" methodology. Noise levels were recorded at approximately 1.5 meter above the ground level. The measurements were carried out 1 m away from the sources and 1 m away from the edge of the roads. In order to reduce the disturbances from standing waves, the noise levels measurements were averaged over + 0.5 m each of at least three positions. The mean values



were taken for reporting. Ambient noise levels were compared with National Ambient Air Quality Standards in respect to noise.

3.6.2. Equivalent Sound Pressure Level (Leq) of Day and Night.

The Leq is the equivalent continuous sound level, which is equivalent to the same sound energy as the actual fluctuating sound measured in the same period. This is necessary because sound from noise source often fluctuates widely during a given period of time.

This is calculated from the following equation:

$$Leq = L_{50} + (L_{10} - L_{90}) / 2$$

Lday is defined as the equivalent noise level measured over a period of time during day (6 am to 10 pm). Lnight is defined as the equivalent noise level measured over a period of time during night (10 pm to 6 am). Hourly noise recorded data and Lday values (16 hours) Lnight (8 hours) and Ldn (24 hours) are computed and tabulated.

3.6.3. Data Analysis

The statistical analysis (Table 3.7) is done for recorded noise levels at 8 locations. The location of Noise Quality Monitoring stations are depicted in Figure. 3.6. The lab results are given in Annexure IV.

Table 3-7: Showing Noise Monitoring Locations

| Stations | Name | Latitude | Longitude | Distance (km) | Direction | Criteria |
|----------|------------------|--------------|--------------|---------------|-----------|--|
| N1 | Project Site | 28°16'09.9"N | 77°28'49.1"E | -- | -- | Project site |
| N2 | Makanpur Khadar | 28°16'04.1"N | 77°29'25.1"E | 0.2 | S | Near Project Site |
| N3 | Chhainsa | 28°15'42.8"N | 77°27'43.8"E | 0.8 | W | 2 nd predominant upwind direction |
| N4 | Panchayati Juggi | 28°14'22.7"N | 77°29'15.2"E | 3.4 | S | 1 st predominant upwind direction |
| N5 | Shopura | 28°18'16.9"N | 77°27'32.5"E | 4.2 | NW | 2 nd predominant upwind direction |
| N6 | Qadirpur | 28°16'49.5"N | 77°31'28.5"E | 2.9 | WNW | Cross wind of 1 st predominant |
| N7 | Near Moujpur | 28°16'30.0"N | 77°26'41.7"E | 2.7 | WNW | Cross wind of 1 st predominant and near highway |
| N8 | Mohna | 28°13'35.4"N | 77°26'32.2"E | 4.5 | SW | 1 st |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | | | | | | |
|--|--|--|--|--|--|--------------------------------------|
| | | | | | | predominant downwind direction |
|--|--|--|--|--|--|--------------------------------------|

Table 3-8: Noise level data

| S.No. | Locations | Lmax | | Lmin | | Leq | | Limit | |
|-------|------------------|------|-------|------|-------|-------|-------|------------------|-------|
| | | Day | Night | Day | Night | Day | Night | Day | Night |
| 1 | Project Site | 80.4 | 64.2 | 56.3 | 50.1 | 72.30 | 61.41 | (Mining Area) | |
| | | | | | | | | 75 | 70 |
| 2 | Makanpur Khadar | 62.8 | 53.5 | 46.5 | 37.4 | 54.65 | 44.04 | Residential Area | |
| | | | | | | | | 55 | 45 |
| 3 | Chhainsa | 59.1 | 50.2 | 44.8 | 36.4 | 51.95 | 43.30 | | |
| 4 | Panchayati Juggi | 60.4 | 50.6 | 42.2 | 35.7 | 51.08 | 42.18 | | |
| 5 | Shopura | 58.8 | 49.9 | 41.8 | 36.5 | 50.88 | 42.84 | | |
| 6 | Qadirpur | 57.9 | 47.2 | 43.6 | 38.3 | 49.95 | 43.89 | | |
| 7 | Near Moujpur | 57.4 | 47.9 | 40.5 | 37.5 | 48.95 | 42.96 | | |
| 8 | Mohna | 64.6 | 51.6 | 45.1 | 38.2 | 53.85 | 43.24 | | |

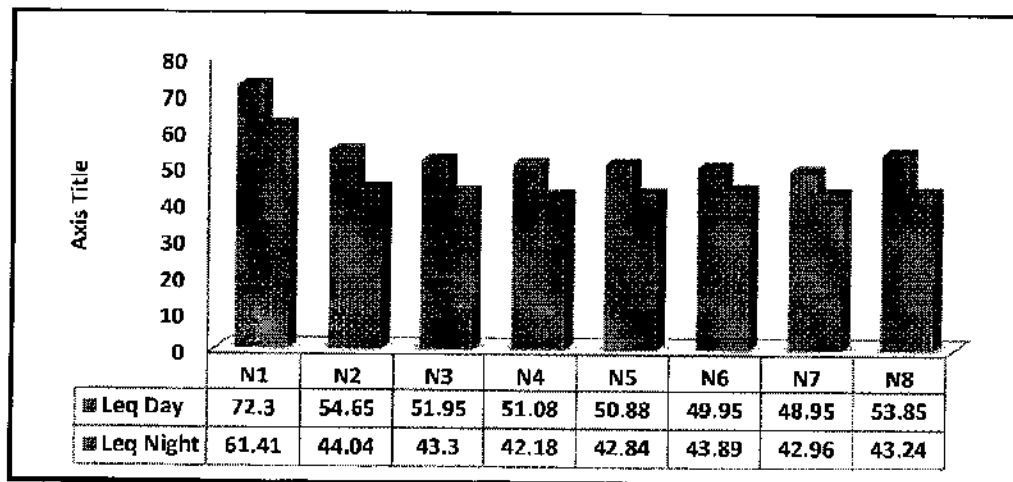


Figure 3-6 Equivalent Noise Levels at all locations

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT
 Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhampur, Tehsil- District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

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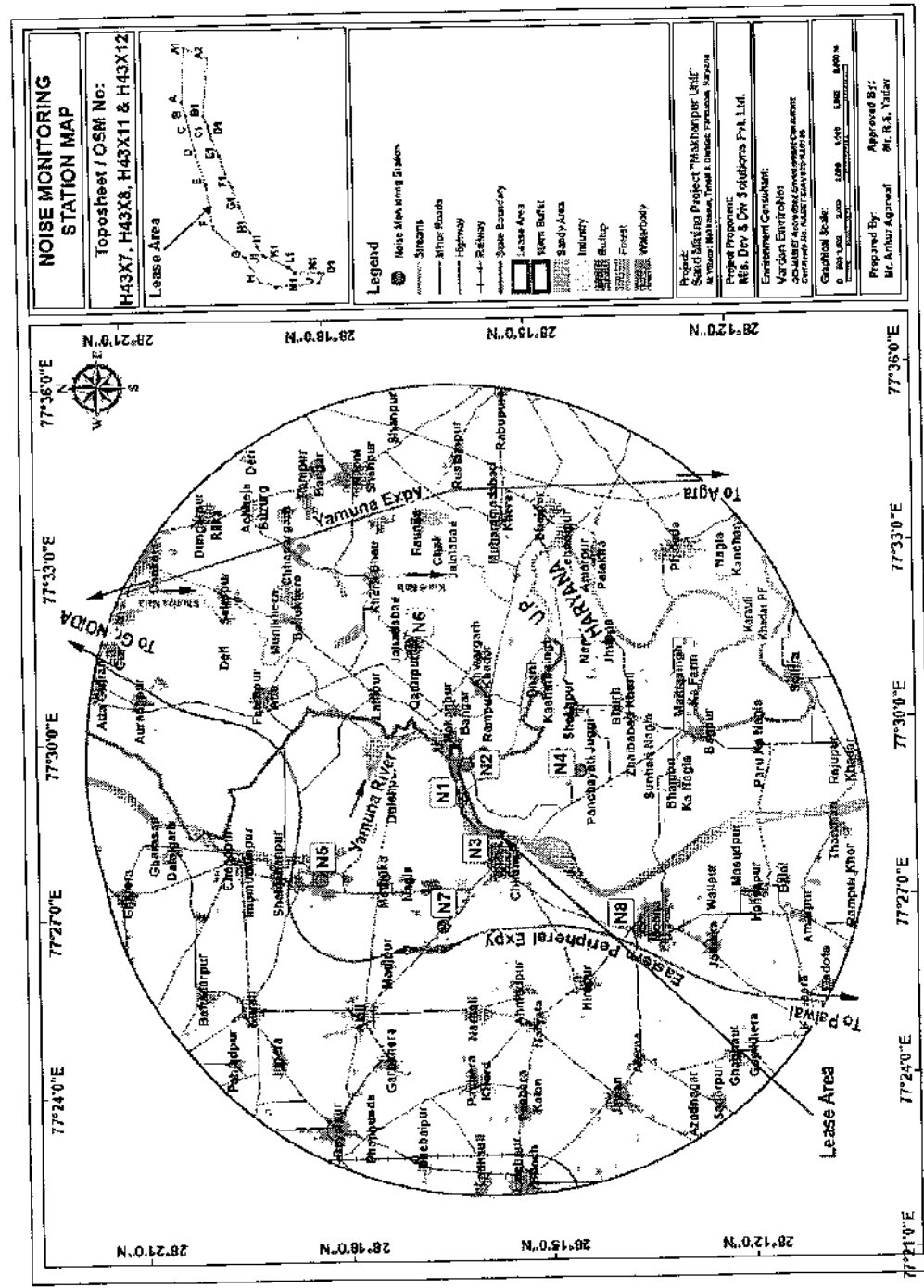


Figure 3-7 Noise Quality Monitoring Locations

Table 3-9: CPCB Noise Standards

| Category of Zones | Categorization of locations | Leq in dB(A) | |
|---------------------|-----------------------------|--------------|-------|
| | | Day | Night |
| Industrial (Mining) | N1, N2, N6 | 75 | 70 |
| Residential | N2, N3, N4, N5, N6, N7, N8 | 55 | 45 |
| Silence Zone | - | 50 | 40 |

3.6.4. Interpretation

- The high levels of Leq in day for project site can be attributed due to presence of other nearby mining activities and vehicular activities. The night levels of Leq are low since the mining is carried out only in day time.
- The (Leq) noise level from residential areas varies from 48.95 to 54.65 during day time and 42.18 to 44.04 during night time.
- The baseline noise levels are within stipulated limits but with the commissioning of project the noise levels are bound to increase.
- However, with suitable control
- Measures and EMP, the noise levels will be reduced and the impacts will be minimized for the proposed projects which are discussed in chapter-4.

3.7. Traffic Study

Traffic remains the concealed component of the impact analysis of any new development project. Therefore the impact of certain projects on traffic and transportation is too far reaching to be subsumed under a generalized EIA study. Traffic Analysis is a study carried out to predict the magnitude and effects that a proposed project, generates on the existing transportation network. Traffic analysis can also be used to evaluate whether the proposed project is appropriate and what type of transportation facility improvements would be necessary.

The three main types of automobile vehicles being used in the country are Passenger cars powered by four strokes gasoline engines. Motor cars, scooters and auto rickshaws powered mostly by small two stroke diesel engines. Large trucks and buses powered by mostly 4 stroked engines.

3.7.1. Data Analysis

The traffic study was carried out for Yamuna Expressway and Metalled Road near Chhainsa for 24 hours which is near to the proposed site and is a medium for transportation of sand and associated minor mineral Stone to local market.

Table 3-10: Roads and Highways in the Study Area

| Name of National Highway | Dispatched Ratio in Percentage |
|-----------------------------|--------------------------------|
| Yamuna Expressway | 75 |
| Metalled Road near Chhainsa | 25 |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

3.7.2. Existing traffic scenario

The Level of Service (LOS) and the capacity of the Roadway segments computed is based on the Indian Roads Congress (IRC) standards sourced from Guidelines for Capacity of Urban Roads in Plain Areas IRC 64-1990. Following table provides the LOS standards adopted based on the volume to capacity (V/C) ratios at the intersections and its performance.

| V/C | LOS | Performance |
|---------|-----|---------------------|
| 0.0-0.2 | A | Excellent |
| 0.2-0.4 | B | Very Good |
| 0.4-0.6 | C | Good/ Average/ Fair |
| 0.6-0.8 | D | Poor |
| 0.8-1.0 | E | Very Poor |

Table 3-11 Summarized Traffic data

| Type of Vehicles | Equivalent PCU | | Equivalent PCU | PCU/day | |
|--------------------------|-------------------|---------------|----------------|-------------------|---------------|
| | Yamuna Expressway | Metalled Road | | Yamuna Expressway | NH-19 |
| Trucks | 357 | 89 | 3 | 1071 | 267 |
| Agriculture tractors/LCV | 139 | 58 | 1.5 | 208.5 | 87 |
| Bus | 254 | 128 | 3 | 762 | 384 |
| Cars | 3754 | 352 | 1 | 3754 | 352 |
| 3 Wheeler | 28 | 375 | 1 | 28 | 375 |
| 2 Wheeler | 589 | 483 | 0.5 | 294.5 | 241.5 |
| Total PCU/day | | | | 6118 | 1706.5 |

(Source: IRC 64:1990)

Table 3-12: Existing Traffic Scenario and LOS

| Type of Road | Existing Volume (PCU/hr) | Capacity in (PCU/hr) | V/C Ratio | LOS |
|-----------------------------|--------------------------|----------------------|-----------|-----|
| Yamuna Expressway | 6118/24=254.92 | 5400 | 0.05 | A |
| Metalled Road near Chhainsa | 1706.5/24=71.10 | 2400 | 0.03 | A |

| During Mine Operation | |
|---|--------------|
| Total Capacity of mine | 24,00,000 |
| No. of working days | 270 |
| Extraction and Transportation of mineral | 8,889 MT/day |
| Working hours per day | 8 hour |
| Truck Capacity | 25 Tons |
| Frequency of trucks deployed/day (40 x 9 trips/day x 2 up/down) | 720 |
| Increase in PCU/day (Yamuna Expressway) [540 x 3] i.e. 75% | 1,620 |

| | |
|---|-----|
| transportation | |
| Increase in PCU/hr | 203 |
| Increase in PCU/day (Metalled Road near Chhainsa) [180 x 3] i.e. 25% | 540 |
| transportation | |
| Increase in PCU/hr (Metalled Road near Chhainsa) | 68 |

Mineral will be transport through Yamuna Express, NH-19 and Metalled Road near Chhainsa out of which the total PCU 75% will move on Yamuna Expressway i.e. 203 PCU/hr and 25% on Metalled Road i.e. 68 PCU/hr. The LOS study shows that the existing traffic scenario is "excellent" and the free flow of vehicles is observed during the study period.

Due to the mine project the traffic density will increase as the entire mineral will be transported through the Yamuna Express and Metalled Road near Chhainsa and the value of LOS would remain same i.e. excellent for both road.

| Road | Increased PCU's/hr | Volume (V) | Capacity/hr(C) | Modified V/C Ratio | LOS |
|-----------------------------|--------------------|---------------|----------------|--------------------|-----|
| Yamuna Express | 203 | 203+ 255= 458 | 5400 | 0.08 | A |
| Metalled Road near Chhainsa | 68 | 68+ 71= 139 | 2400 | 0.06 | A |

| Daily Emissions from Transportation | | | | |
|--------------------------------------|--------------------------|-----|-------|------|
| Vehicle Type | Emission factors (gm/km) | | | |
| | CO | NOx | HC | PM |
| Heavy Diesel Vehicles | 1.5 | 3.5 | 0.96 | 0.02 |
| <i>CPCB Bharat Stage IV emission</i> | | | | |
| Vehicle Type and no of Vehicles | Parameters (gm/km/day) | | | |
| | CO | NOx | HC | PM |
| Trucks/Dumper : 40 | 60 | 140 | 38.4 | 0.8 |
| Parameters (gm /day) | | | | |
| Haul road length is 1.1 Km | 66 | 154 | 42.24 | 0.88 |

3.7.3. Interpretation

- Out of the total traffic vehicles, 2 wheelers are very high followed by light and medium vehicles. The movement of two wheelers and light vehicles are largely found in daytime.
- The difference of heavy vehicle movement both day and night time was very marginal. The density of heavy vehicles was comparatively low. The LOS study shows that the existing traffic scenario is "Excellent" and the free flow of vehicles is observed during the study period.



DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

- Due to the mine project the traffic density will increase as the entire mineral will be transported through the Yamuna Express and metalled road and the value of LOS would remain same i.e. excellent for both road.



3.8. Water Environment

Water of high quality is essential to human life, and water of acceptable quality is essential for agricultural, industrial, domestic and commercial uses; in addition, most recreation is water based; therefore, major activities having potential effects on surface water are certain to be of appreciable concern to the consumers.

3.8.1. Methodology

Water samples were collected from 16 locations (8 Ground Water & 8 Surface Water)(Figure3.9). Samples were collected as per IS: 3025 (Part 1) methodology. Necessary precautions were taken while collecting, preserving and transporting. The parameters like pH, temperature and DO were measured at the site while collecting the sample. For analyzing other parameters the samples were brought to Head Laboratory situated in Gurugram. All the parameters were analyzed as per "Methods of Sampling and Test (Physical and Chemical) for water and waste water" IS: 3025 and 'Standard Methods for the Examination of Water and Wastewater' APHA. The results are then compared with the standards (IS 10500 & IS 2296) as per the quality of water. About 8 ground water and 8 surface water samples were collected from the study area to assess the water quality during the study period.

Table 3-13 Monitoring Location of Surface Water and Ground Water

| Stations | Name | Latitude | Longitude | Distance (km) | Direction |
|----------|--|--------------|--------------|---------------|-----------|
| SW1 | Yamuna River Near Latifpur (Up-Stream) | 28°17'31.9"N | 77°29'47.7"E | 2.2 | N |
| SW2 | Yamuna River Near Mohna (Down-Stream) | 28°13'13.6"N | 77°27'30.8"E | 4.4 | SSW |
| SW3 | Pond Near Naryala | 28°15'10.5"N | 77°25'05.9"E | 5.1 | WSW |
| SW4 | Pond Near Bhaipur | 28°14'43.6"N | 77°33'46.0"E | 7.1 | ESE |
| SW5 | Pond Near Jawan | 28°14'04.5"N | 77°23'43.8"E | 7.8 | SW |
| SW6 | Pond Near Qadirpur | 28°16'59.0"N | 77°31'34.0"E | 3.2 | ENE |
| SW7 | Pond Near Chandpur | 28°19'36.6"N | 77°27'50.6"E | 6.5 | NNW |
| SW8 | Pond Near Amarpur | 28°11'13.6"N | 77°26'41.9"E | 8.3 | SSW |
| GW1 | Makanpur Khadar | 28°16'17.2"N | 77°29'56.1"E | 0.3 | E |
| GW2 | Chhainsa | 28°15'42.8"N | 77°27'43.8"E | 0.8 | W |
| GW3 | Panchayati Juggi | 28°14'22.7"N | 77°29'15.2"E | 3.4 | S |
| GW4 | Near Moujpur | 28°16'30.0"N | 77°26'41.7"E | 2.7 | WNW |
| GW5 | Shopura | 28°18'16.9"N | 77°27'32.5"E | 4.2 | NW |
| GW6 | Qadirpur | 28°16'49.5"N | 77°31'28.5"E | 2.9 | WNW |
| GW7 | Mohna | 28°13'35.4"N | 77°26'32.2"E | 4.5 | SW |
| GW8 | Shekhpur | 28°14'29.3"N | 77°30'24.6"E | 3.2 | SE |

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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhnampur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

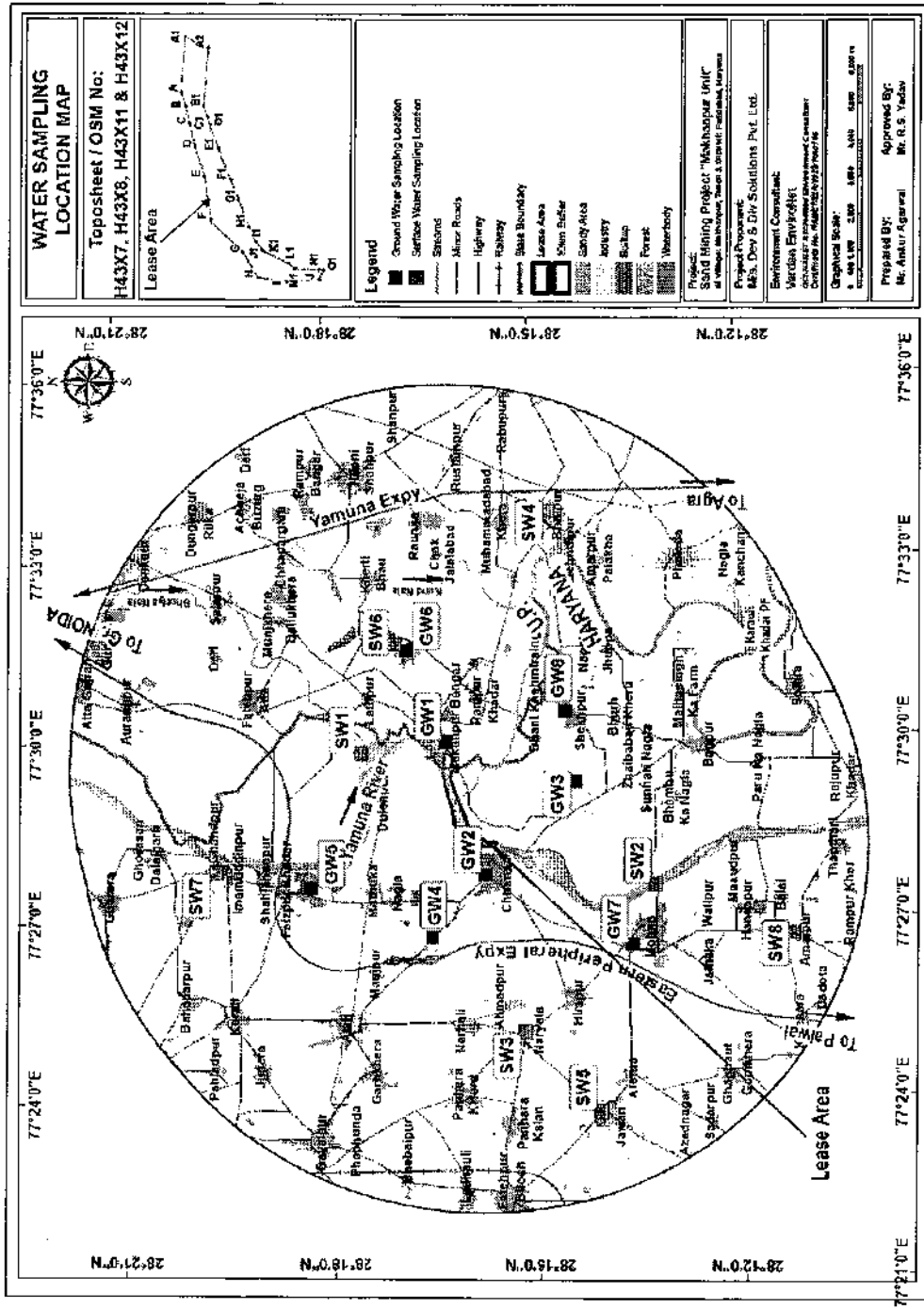


Figure 3-9 Map showing Water Sampling Location

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

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Mining of sand, minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

Table 3-14 Ground Water Quality Data

| S. No. | Parameter | GW1 | GW2 | GW3 | GW4 | GW5 | GW6 | GW7 | GW8 | Unit | Limits of IS:10500 -2012 Requirement (Acceptable Limit) | Permissible limit in the Absence of Alternate Source |
|--------|-------------------------------------|-----------|--------|--------|--------|--------|--------|--------|--------|------------|--|--|
| | | 7.72 | 7.78 | 7.69 | 7.70 | 7.72 | 7.65 | 7.64 | 7.60 | | | |
| 1. | pH (at 25 °C) | 7.72 | 7.78 | 7.69 | 7.70 | 7.72 | 7.65 | 7.64 | 7.60 | -- | 6.5 to 8.5 | No Relaxation |
| 2. | Odour | Agreeable | | | | | | | | -- | Agreeable | Agreeable |
| 3. | Taste | Agreeable | | | | | | | | -- | Agreeable | Agreeable |
| 4. | Total Hardness as CaCO ₃ | 272.00 | 283.00 | 286.00 | 245.00 | 213.00 | 222.00 | 273.00 | 217.00 | mg/l | 200 | 600 |
| 5. | Calcium as Ca | 68.42 | 53.00 | 57.58 | 52.19 | 46.25 | 45.21 | 55.61 | 43.79 | mg/l | 75 | 200 |
| 6. | Alkalinity as CaCO ₃ | 238.00 | 243.00 | 314.00 | 301.00 | 223.45 | 247.00 | 234.00 | 220.00 | mg/l | 200 | 600 |
| 7. | Chloride as Cl | 74.65 | 59.63 | 66.18 | 60.23 | 58.14 | 64.15 | 75.23 | 64.19 | mg/l | 250 | 1000 |
| 8. | Magnesium as Mg | 24.61 | 36.64 | 34.59 | 27.89 | 23.72 | 26.54 | 32.62 | 26.18 | mg/l | 30 | 100 |
| 9. | Total Dissolved Solids | 430.00 | 391.00 | 493.00 | 476.00 | 386.00 | 421.00 | 409.00 | 377.00 | mg/l | 500 | 2000 |
| 10. | Sulphate as SO ₄ | 44.58 | 39.76 | 46.51 | 43.15 | 32.41 | 33.12 | 31.18 | 28.36 | mg/l | 200 | 400 |
| 11. | Fluoride as F | 0.49 | 0.32 | 0.51 | 0.37 | 0.48 | 0.36 | 0.47 | 0.33 | mg/l | 1.0 | 1.5 |
| 12. | Nitrate as NO ₃ | 15.47 | 11.30 | 15.24 | 20.13 | 26.31 | 27.46 | 21.58 | 19.68 | mg/l | 45 | No Relaxation |
| 13. | Iron as Fe | 0.37 | 0.27 | 0.35 | 0.26 | 0.37 | 0.21 | 0.30 | 0.25 | mg/l | 1.0# | No relaxation |
| 14. | Conductivity (at 25°C) | 662 | 602 | 758 | 733 | 594 | 647 | 629 | 580 | µS/cm | -- | -- |
| 15. | Zinc as Zn | 1.35 | 1.16 | 1.23 | 1.20 | 1.09 | 1.05 | 1.14 | 0.86 | mg/l | 5 | 15 |
| 16. | Copper as Cu | 0.08 | 0.07 | 0.10 | 0.08 | 0.05 | 0.09 | 0.07 | 0.04 | mg/l | 0.05 | 1.5 |
| 17. | Total Coliform | <2 | | | | | | | | MPN/100 ml | -- | Shall not be detectable in any 100 ml sample |
| 18. | E. Coli | Absent | | | | | | | | MPN/100 ml | -- | Shall not be detectable in any 100 ml sample |

Note: - CN, AL, Br, Cr⁶⁺, Phenolic Compound, MO, Anionic Detergent, Cd, pb, Se, As, Hg, Total Coliform and E-coli all are Below Detection Limit.

**DL- Detection Limit, NS- Not specified **N.R- No Relaxation

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

M/s Dev & Div
Solutions Pvt. Ltd.

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

Table 3-15: Surface water quality data

| S. No. | Parameter | SW1 | SW2 | SW3 | SW4 | SW5 | SW6 | SW7 | SW8 | Unit |
|--------|-------------------------------------|--------|---------|--------|---------|--------|--------|--------|--------|-----------|
| 1. | pH (at 25 °C) | 7.84 | 7.82 | 7.79 | 7.76 | 7.73 | 7.69 | 7.66 | 7.54 | -- |
| 2. | Colour | 13.0 | 11.0 | 10.0 | 9.0 | 10.0 | 8.0 | 11.0 | 6.0 | Hazen |
| 3. | Turbidity | 33.00 | 39.00 | 32.00 | 35.00 | 28.00 | 21.00 | 22.00 | 30.00 | NTU |
| 4. | Total Hardness as CaCO ₃ | 713.00 | 725.00 | 709.00 | 720.00 | 671.00 | 654.00 | 641.00 | 700.00 | mg/l |
| 5. | Calcium as Ca | 209.33 | 212.47 | 197.66 | 211.44 | 191.45 | 187.54 | 174.52 | 194.53 | mg/l |
| 6. | Alkalinity as CaCO ₃ | 440.00 | 452.00 | 437.00 | 451.00 | 422.00 | 411.00 | 401.00 | 424.00 | mg/l |
| 7. | Chloride as Cl | 214.36 | 224.13 | 217.33 | 220.49 | 207.49 | 203.15 | 200.12 | 208.33 | mg/l |
| 8. | Magnesium as Mg | 46.34 | 47.36 | 52.45 | 46.77 | 46.98 | 45.22 | 49.95 | 52.16 | mg/l |
| 9. | Total Dissolved Solids | 985.00 | 1013.00 | 966.00 | 1009.00 | 919.00 | 895.00 | 867.00 | 929.00 | mg/l |
| 10. | Total Suspended solids | 56.00 | 54.00 | 48.00 | 53.00 | 37.00 | 36.00 | 33.00 | 42.00 | mg/l |
| 11. | Dissolved Oxygen | 6.9 | 6.7 | 6.2 | 6.5 | 5.6 | 5.5 | 5.3 | 5.9 | mg/l |
| 12. | Sulphate as SO ₄ | 127.00 | 129.0 | 121.00 | 128.00 | 111.00 | 106.00 | 104.00 | 119.00 | mg/l |
| 13. | Fluoride as F | 0.40 | 0.46 | 0.38 | 0.42 | 0.28 | 0.25 | 0.22 | 0.31 | mg/l |
| 14. | BOD (3 Days at 27°C) | 12.00 | 14.00 | 11.00 | 10.00 | 11.00 | 10.00 | 9.76 | 11.00 | mg/l |
| 15. | COD | 48.00 | 52.00 | 40.00 | 38.00 | 46.00 | 36.00 | 34.00 | 48.00 | mg/l |
| 16. | Conductivity(at 25 °C) | 151 | 155 | 148 | 156 | 141 | 137 | 133 | 143 | mS/cm |
| 17. | Nitrate as NO ₃ | 28.49 | 27.59 | 25.41 | 31.55 | 23.44 | 22.74 | 20.88 | 27.44 | mg/l |
| 18. | Sodium as Na | 79.00 | 81.00 | 74.00 | 84.00 | 75.00 | 73.00 | 70.00 | 67.00 | mg/l |
| 19. | Potassium as K | 20.63 | 23.15 | 15.4 | 0.49 | 10.5 | 8.6 | 7.3 | 6.2 | mg/l |
| 20. | Iron as Fe | 0.75 | 0.94 | 0.73 | 0.84 | 0.41 | 0.34 | 0.15 | 0.54 | mg/l |
| 21. | Boron | 0.46 | 0.54 | 0.42 | 0.49 | 0.19 | 0.16 | 0.12 | 0.21 | mg/l |
| 22. | Zinc as Zn | 2.75 | 2.88 | 2.46 | 2.76 | 1.81 | 1.46 | 1.30 | 1.76 | mg/l |
| 23. | Copper as Cu | 0.19 | 0.18 | 0.11 | 0.14 | 0.10 | 0.07 | 0.08 | 0.12 | mg/l |
| 24. | Total Coliform | 900 | 1000 | 1200 | 900 | 700 | 1000 | 1200 | 1600 | MPN/100ml |
| 25. | Fecal Coliform | 300 | 600 | 400 | 500 | 300 | 600 | 700 | 900 | MPN/100ml |

Note: - Residual free chlorine, CN, Al, Cr, Phenolic Compound, MO, Antionic Detergents, Mn, Cd all are Below Detection Limit, **DL- Detection Limit

3.8.2. Interpretation

1. Analysis results of ground water reveal the following:

- pH varies from to 7.60 to 7.78
- Total Hardness varies from 213.0 to 286.0 mg/L.
- Total Dissolved Solids varies from 377 to 493 mg/L.
- Chlorides – 58.14 to 75.23 mg/l
- Fluoride – 0.32 to 0.51 mg /l

2. Analysis results of surface water reveal the following:

- pH varies from to 7.54 to 7.84.
- Total Hardness varies from 641 to 725 mg/L.
- Total Dissolved Solids varies from 867 to 1013 mg/L.
- Dissolved Oxygen – 5.3 to 6.9 mg/l
- BOD – 9.76 to 14 mg/l
- COD – 34.0 to 52.0 mg/l
- In study area, water quality has been observed to vary considerably between the sampling locations. Mostly the parameters fall within the permissible limits of drinking water standards (IS 10500:2012). The detailed water quality reports are given in **(Annexure IV)**.
- The water will be supplied from the available sources from nearby villages through tankers.
- Rain Water Harvesting Scheme will be adopted outside the mine lease area to supplement the ground water recharge.

3.9. Soil Environment

In the study area sand is the dominant soil throughout the area. Soil is the media for supplying the nutrient for plant growth. Nutrients are available for a plant at certain pH of soils can be reflected by addition of pollutants in it either by air, water or by solid waste. In order to establish the baseline status of soil characteristic, soil sampling is conducted in the study area based on the land classification.

3.9.1 Methodology

Soil Sampling was carried out at 8 sites to understand the soil quality. Meticulous attention was paid to collect adequate amount of composite soil samples for analysis. After removing the surface vegetation cover, visible roots, plant litter, gravel, plastic materials and other foreign materials, samples were collected by using Agar at a depth of 50, 150 and 300 cm and mixed thoroughly and analyzed as a single unit sample.

3.9.2 Data Analysis

The soil samples were collected from eight locations around the 10 km radius of proposed project. The samples were collected during the summer season from the selected locations (Figure. 3.10).

Table 3-16: Soil sampling locations

| Stations | Name | Latitude | Longitude | Distance (km) | Direction |
|----------|------------------|--------------|--------------|---------------|-----------|
| S1 | Project Site | 28°16'09.9"N | 77°28'49.1"E | -- | -- |
| S2 | Makanpur Khadar | 28°16'04.1"N | 77°29'25.1"E | 0.2 | S |
| S3 | Panchayati Juggi | 28°14'22.7"N | 77°29'15.2"E | 3.4 | S |
| S4 | Chhainsa | 28°15'42.8"N | 77°27'43.8"E | 0.8 | W |
| S5 | Qadirpur | 28°16'49.5"N | 77°31'28.5"E | 2.9 | WNW |
| S6 | Near Moujpur | 28°16'30.0"N | 77°26'41.7"E | 2.7 | WNW |
| S7 | Shopura | 28°18'16.9"N | 77°27'32.5"E | 4.2 | NW |
| S8 | Mohna | 28°13'35.4"N | 77°26'32.2"E | 4.5 | SW |

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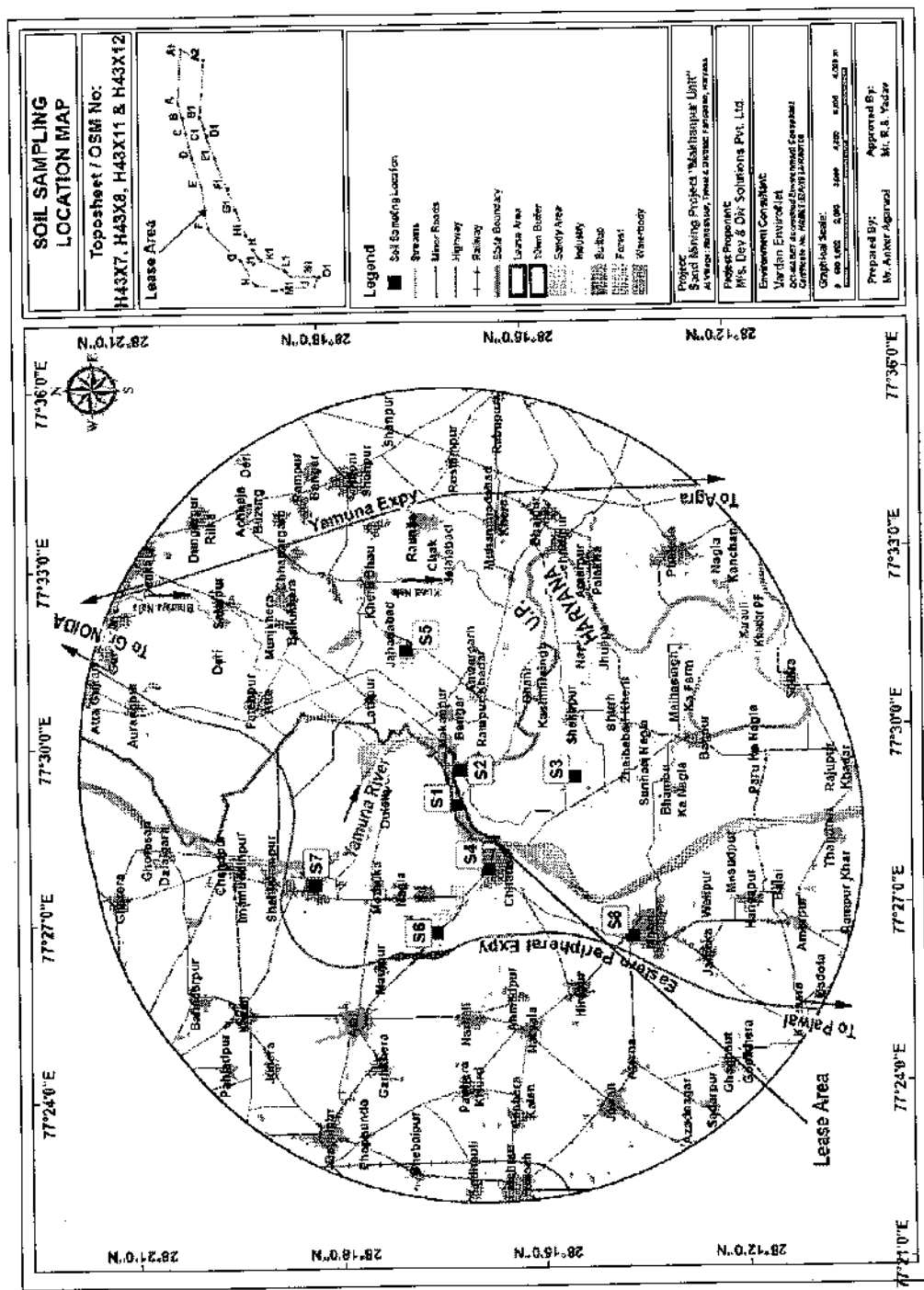


Figure 3-10 Map showing Soil sampling locations

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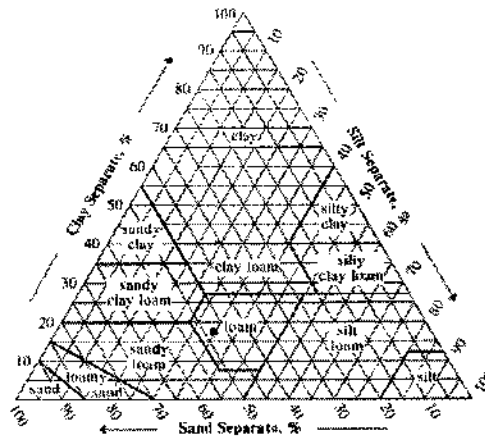
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Table 3-17 Physico-chemical Properties of Soil

| S.N | Parameters | Unit | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 |
|-----|-------------------------|----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1. | pH (at 25°C) | -- | 7.63 | 7.83 | 7.67 | 7.80 | 7.71 | 7.76 | 7.64 | 7.60 |
| 2. | Conductivity | mS/cm | 0.296 | 0.349 | 0.264 | 0.332 | 0.274 | 0.305 | 0.406 | 0.386 |
| 3. | Soil Texture% | % | Sand - 56 | Sand - 49 | Sand - 48 | Sand - 45 | Sand - 49 | Sand - 51 | Sand - 47 | Sand - 46 |
| | | % | Silt - 31 | Silt - 34 | Silt - 36 | Silt - 40 | Silt - 35 | Silt - 34 | Silt - 37 | Silt - 37 |
| | | % | Clay - 13 | Clay - 17 | Clay - 16 | Clay - 15 | Clay - 16 | Clay - 15 | Clay - 16 | Clay - 17 |
| 4. | Color | -- | Yellowish Brown | Yellowish Brown | Yellowish Brown | Yellowish Brown | Yellowish Brown | Yellowish Brown | Yellowish Brown | Yellowish Brown |
| 5. | Water holding capacity | % | 33.16 | 39.25 | 34.17 | 38.45 | 35.24 | 37.15 | 37.81 | 35.49 |
| 6. | Bulk density | gm/cc | 1.53 | 1.52 | 1.41 | 1.49 | 1.43 | 1.45 | 1.35 | 1.43 |
| 7. | Chloride as Cl | mg/100g | 36.23 | 35.43 | 34.27 | 39.74 | 37.54 | 38.87 | 32.48 | 31.20 |
| 8. | Calcium as Ca | mg/100g | 44.78 | 31.26 | 41.85 | 45.56 | 42.12 | 43.14 | 39.96 | 37.69 |
| 9. | Sodium as Na | mg/kg | 48.52 | 58.31 | 47.28 | 59.78 | 50.71 | 49.46 | 46.57 | 45.33 |
| 10 | Potassium as K | kg/hect. | 108.00 | 126.00 | 167.00 | 183.49 | 172.00 | 179.00 | 163.00 | 150.00 |
| 11 | Organic Matter | % | 0.25 | 0.42 | 0.43 | 0.46 | 0.44 | 0.47 | 0.48 | 0.45 |
| 12 | Magnesium as Mg | mg/100g | 15.78 | 13.56 | 16.71 | 17.47 | 14.89 | 16.59 | 18.56 | 19.56 |
| 13 | Available Nitrogen as N | kg/hect. | 105.00 | 113.47 | 107.15 | 121.56 | 110.23 | 112.35 | 114.00 | 121.00 |
| 14 | Available Phosphorus | kg/hect. | 10.52 | 10.53 | 12.14 | 12.31 | 10.47 | 11.58 | 14.89 | 13.55 |
| 15 | Zinc (as Zn) | mg/kg | 0.79 | 1.63 | 0.84 | 0.97 | 0.91 | 0.95 | 0.80 | 0.76 |
| 16 | Manganese (as Mn) | mg/kg | 2.90 | 7.23 | 4.28 | 5.21 | 4.41 | 4.63 | 4.23 | 4.17 |
| 17 | Lead (as Pb) | mg/kg | 0.86 | 0.74 | 0.60 | 0.70 | 0.63 | 0.66 | 0.53 | 0.46 |
| 18 | Cadmium (as Cd) | mg/kg | 0.45 | 0.48 | 0.27 | 0.37 | 0.31 | 0.34 | 0.24 | 0.21 |
| 19 | Chromium (as Cr) | mg/kg | 0.32 | 0.35 | 0.19 | 0.26 | 0.20 | 0.23 | 0.17 | 0.16 |
| 20 | Copper (as Cu) | mg/kg | 0.85 | 0.83 | 0.79 | 0.82 | 0.80 | 0.81 | 0.78 | 0.77 |

3.9.3 Interpretation

- The analysis results show that soil is basic in nature as pH value ranges from 7.60 to 7.83 with organic matter 0.25 % - 0.48 %.
- Water holding capacity is found to be in range of 33.16 to 39.25 %.
- The concentration of Nitrogen (105 Kg/ha. to 121.56 Kg/ha.) Phosphorus (10.47 to 14.89 Kg/ha.) and Potassium (108 to 183.49 Kg/ha.) has been found to be in good amount in the soil samples. The soil is found to be suitable for the agricultural purpose. Analysis result is attached as **(Annexure IV)**.
- The soil will not be affected by proposed mining project since sand will not affect the nearby



3.10. Land Use and Land Cover

3.10.1. Land Use of the Study area

The objective of land use study is to provide the baseline status of the study area covering 10 km radius around the proposed mine site so that temporal changes due to mining activities on surrounding can be assessed in future.

Data Used

The data in this work is collected from the following

- United States Geological Survey (USGS) satellite data: Landsat 8 cloud free data.
- Satellite sensor – OLITIRS multi spectral digital data.
- Survey of India reference map on 1:50000 scale.
- Ground truthing of area.

All the data used in this work have been provided by NRSC, Hyderabad.

Table 3-18 Classification system of Land Use

| S.No. | Primary Classification | Secondary Classification |
|-------|----------------------------|--------------------------|
| 1 | Primary up area/habitation | Residential/Commercial |
| | | Industrial area |
| 2 | Agriculture land | Crop Land |
| | | Plantation |

| | | |
|---|------------------|----------------------------|
| 3 | Wastelands | Land without scrub |
| | | Mud flat |
| | | Rocky area |
| | | Sandy area |
| 4 | Water bodies | Reservoir/lakes/pond/tanks |
| | | River beds |
| 5 | Vegetation cover | Scrubs |
| | | Open vegetation |
| | | Close vegetation |
| 6 | Forest | Open forest |
| | | Forest blank |
| 7 | Others | Mining area |

3.10.2. Results:

A standard False Color Composite (FCC) image has also been generated on the same scale. The proposed project site is located on land with scrub land use class. Results are given in Table 3.18

Table 3-19: Land use/ land cover analysis

| Landuse Classification | Area in Hectare | Area in % |
|------------------------|-----------------|---------------|
| Waterbody | 461 | 1.2 |
| Sandy Area | 458 | 1.2 |
| Industry | 34 | 0.1 |
| Forest | 65 | 0.2 |
| Builtup | 2458 | 6.5 |
| Crop Land | 17322 | 45.7 |
| Fallow Land | 7400 | 19.5 |
| Open Scrub | 7226 | 19.1 |
| Waste Land | 2475 | 6.5 |
| Total | 37899 | 100.00 |

(Source: Land Use Map)

3.10.3. Interpretation

- The study area is dominated by agriculture/crop land which is approximately 45.7% of study area followed by Fallow land and Open Scrub which comprises mainly open or degraded small bushes.
- The builtup area is 6.5% of total land use area which comprises of major residential areas of Faridabad and Noida
- The land use covers agricultural/crop land which makes up to 45.7 % of total land use area. The irrigation of such land is through borewell.
- 1.2 % of the land use area is covered by water bodies which are mostly covered by Yamuna River spreading in the study area.
- 0.2 % of total land use area covered by forest land which is notified by forest department. The satellite imagery FCC and land use map of the study area is depicted in figure 3.11 and 3.12 respectively.



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Mining of sand, minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhampur, Tehsil- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

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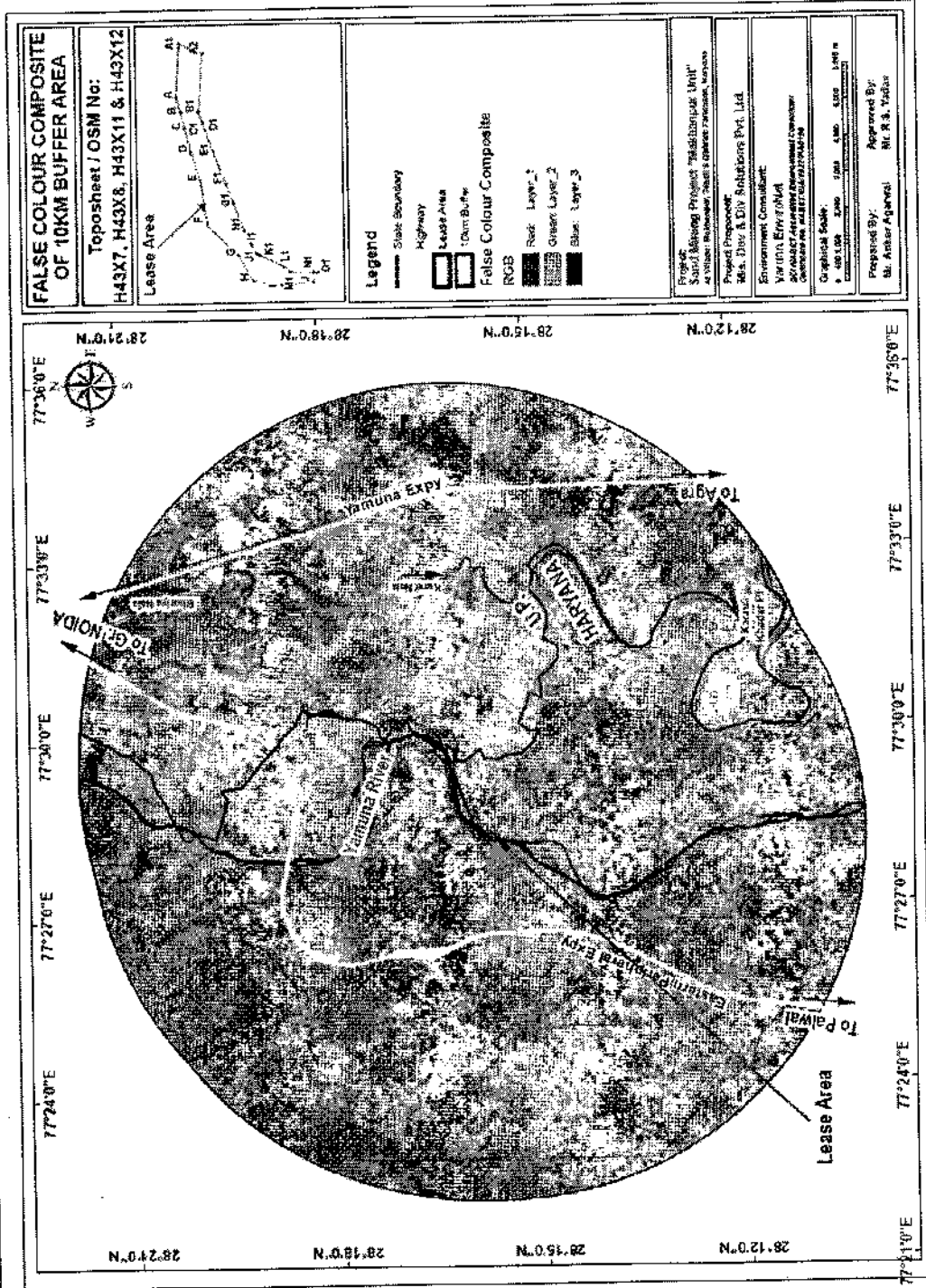


Figure 3-1.1 Satellite imagery of 10 km study area

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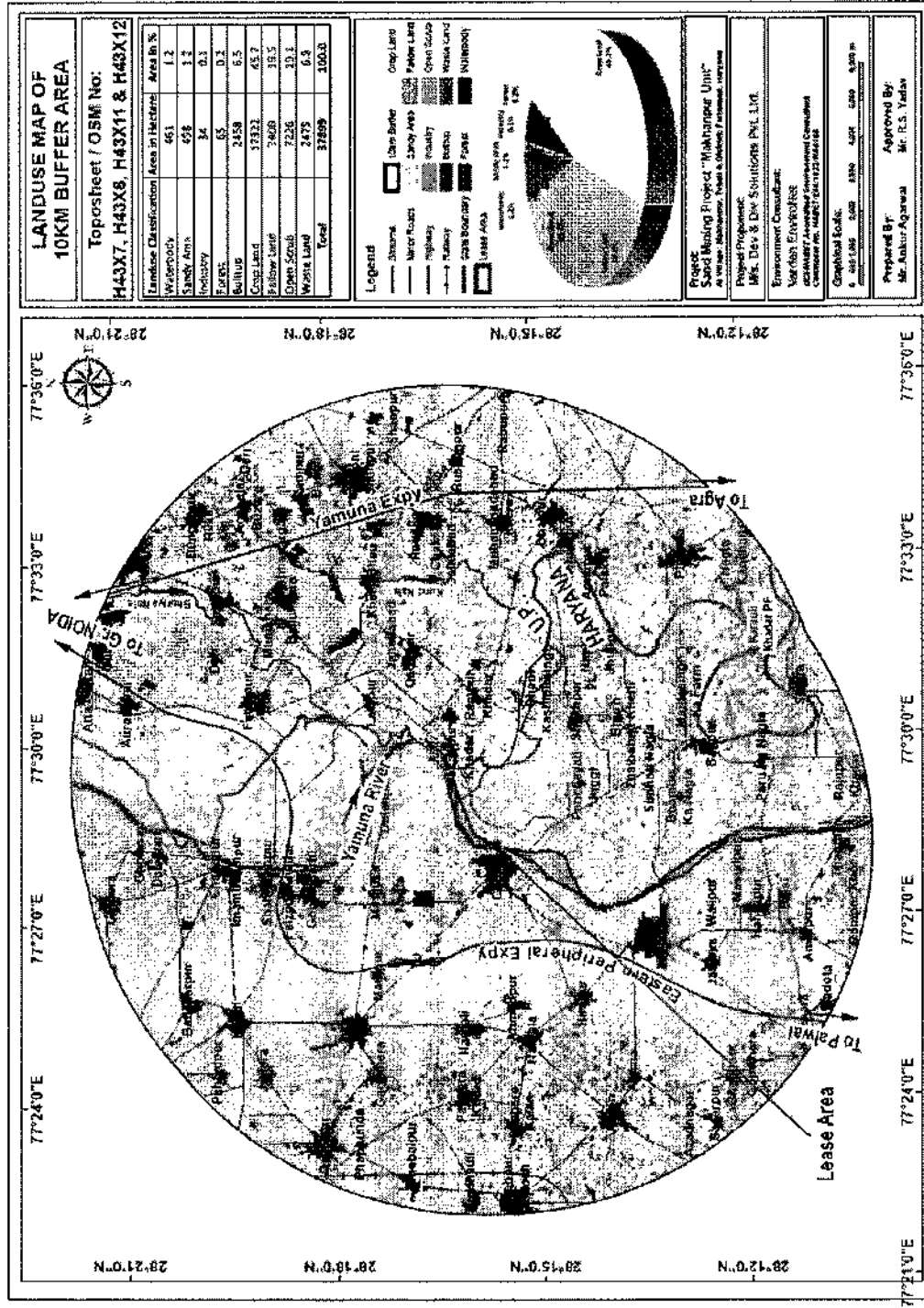


Figure 3-1.2 Land use land cover

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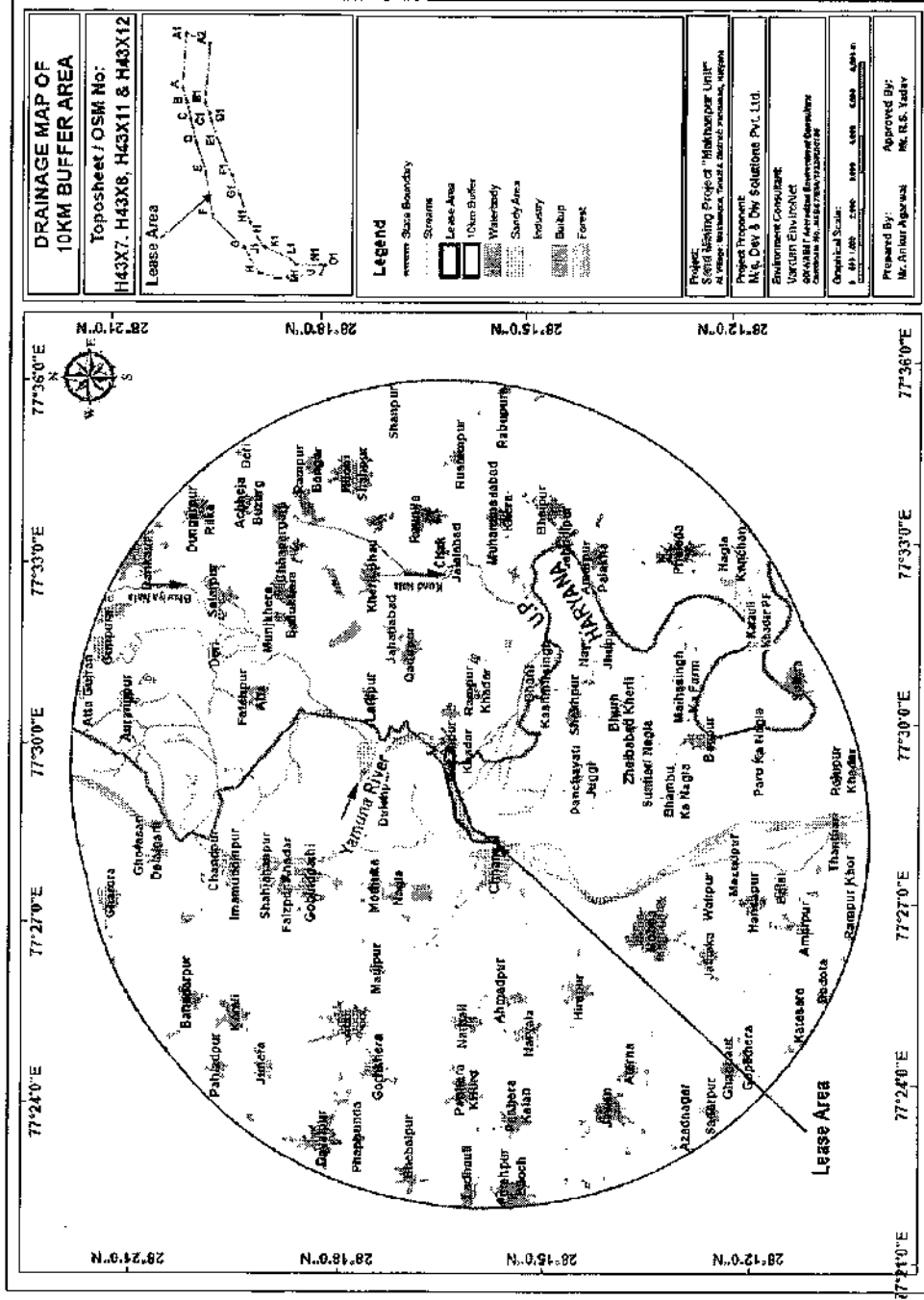


Figure 3-14 Drainage map

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3.11. Hydrology

3.11.1. Geomorphology:

Faridabad district of Haryana located on south eastern part of Haryana state lies between 27° 39', 28° 31' north latitude and 76° 40' and 77° 32' east longitudes. In the north it is bordered by the Union Territory of Delhi in the east by Uttar Pradesh, in the North West by Mewat Gurgaon districts of Haryana and in the west. Topographically, it has a flat topography with altitude varying from 190 to 480 m above the mean sea level. Northern part of the state generally slopes from the north-east to south-west, but the southern part has undulating topography due to the hills of the Aravalli System and existence of sand dunes. Based on topographic, drainage and lithological characteristics, three major geomorphological units, namely Structural and Denudational Hills, Alluvial Plains and Aeolian Plains can be identified. Much of the surface area is constituted of Late Quaternary deposits. The area of is marked by flat topography of sedimentary formations, which are surrounded by fine-grained blown soil overlying the sand deposits

The following geomorphic units plays important role:

- Structural Plain
- Structural Hill
- Structural Ridge
- Denudation Ridge & Valley
- Plain & Plateau of Gangetic plain
- Highly Dissected pediment
- Un dissected pediment

The Yamuna River is the biggest tributary of the river Ganga in North India. The Yamuna also forms natural boundary between the states of Uttarakhand & HP and also amid the states of UP and Haryana. Together with the Ganga to which it flows almost parallel once it meets the Indo-Gangetic plateau, the biggest Alluvial productive area in the World, it forms the Ganges-Yamuna Doab are stretched across 69,000 square Km which is 33% of the whole area.



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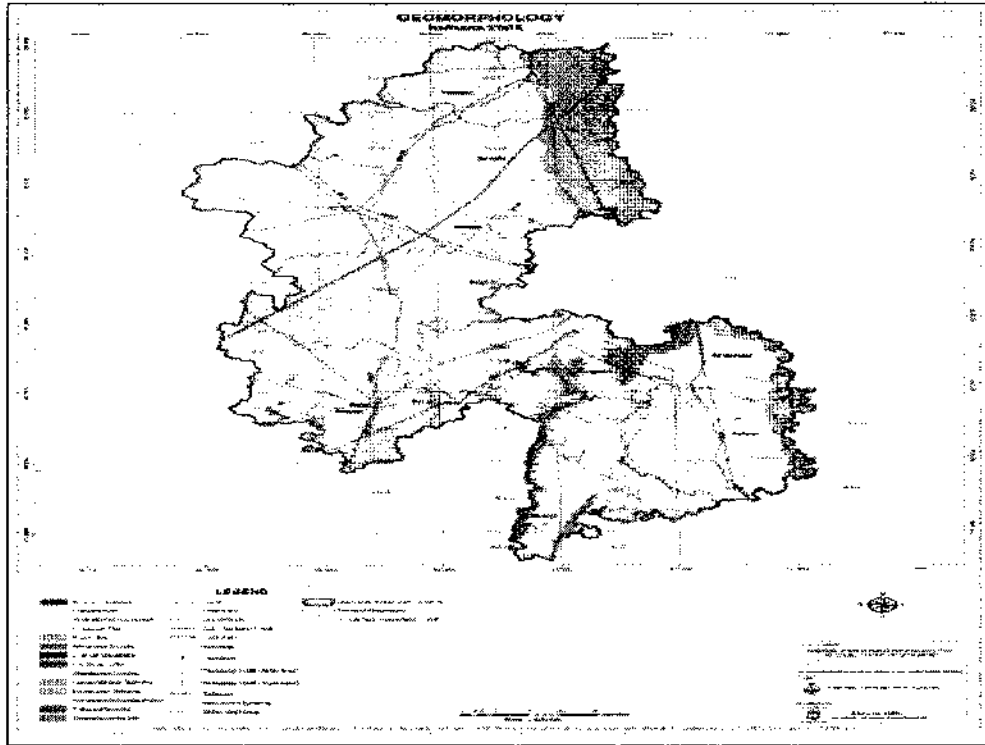


Figure 3-15 Geomorphological map of part of Haryana state including Faridabad

3.11.2. Soil Type:

Soils of Faridabad district are classified as:-

1. Tropical Soil and
2. Brown soils

Both Tropical and Brown soils are ranging from 0.41 to 0.75 percent which is of medium category. In other area organic contents is 0.2 to 0.4 percent which falls in Low category. The average conductivity of the soil is not more than 0.80 $\mu\text{mhos/cm}$ and average pH of the soil is between 6.5 and 8.7. The area comprises almost flat plains traversed by one ridge running N-S to NNE-SSW direction, divides the alluvium into two parts. The major river is Yamuna which is a perennial river



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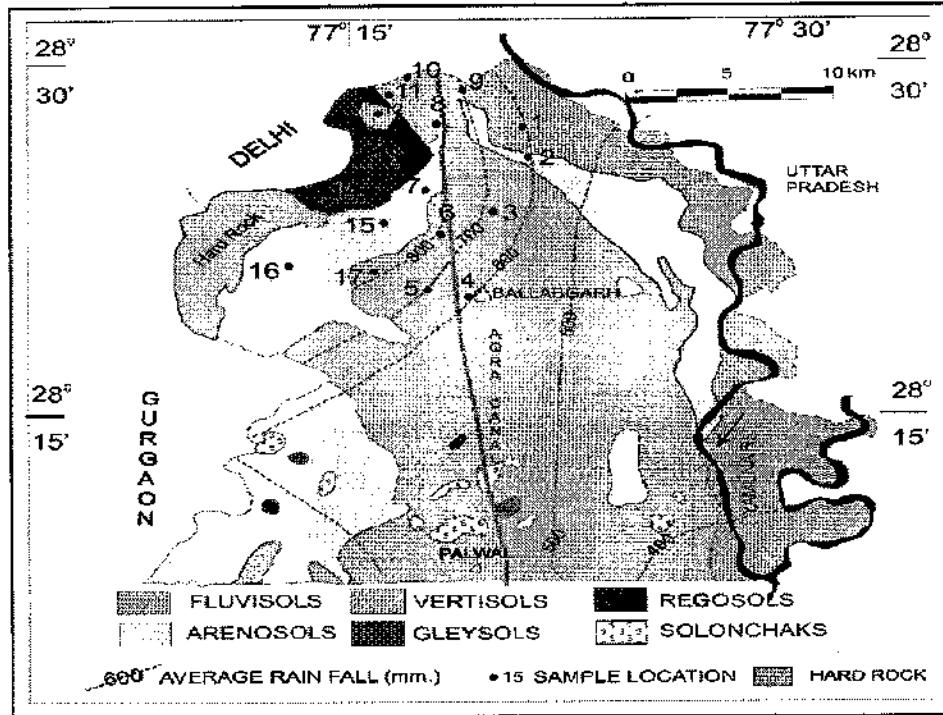


Figure 3-16: Soil Map of Faridabad

3.11.3. Hydrogeology:

Ground water occurs in alluvium and the underlying weathered/fractured quartzites. Alluvium comprises sands, silt, Kankar and gravel which form the principal ground water bearing horizon. In Quartzite formation, occupying the north- western part of the district, ground water occurs in weathered and jointed fractured horizons. Weathering and fracturing have resulted in formation of semi-consolidated sand beds (BADARPUR SANDS) which form potential aquifer zones. This quartzite formation has not been explored for ground water occurrence.

The ground water exploration in Faridabad district has been undertaken at 17 places. Out of these, 17 exploratory wells one slim hole and 2 piezometers were constructed in the district. In general, 6-14 granular zones mainly comprise fine sand, silt, clay and kankar. The discharge of successful exploratory wells varies between 200 and 6629 lpm with draw down of 2-9m. The Transmissivity values in the area vary between 125 and 1645m²/ day. The Depth to water level lies.

3.11.4. Aquifer Geometry

The Physiography setting of the districts of the Haryana is such that it has a thick deposition of alluvium consisting of sand, silt, clay and kankar, mainly transported from the Siwaliks in the North and Proterozoic rocks representing Delhi Super Group from the South. During the process of the transport from the Siwaliks, the sediments were initially more rudaceous with boulders and gravels with sand. The gravels disappeared gradually towards the south and



the sediments became finer and finer on their transport giving rise to a thick deposition of brown sand, mud, clay and silt

These alluvial deposits have formed four aquifer groups with their depth ranges and thicknesses. All group is on the basis of 254 boreholes drilled in the region in the form of exploratory wells, slim holes and piezometers, in the southern direction it goes on decreasing and is up to a depth of 50-80 m adjoining the Aravalli Ridges. Ground water is

| Aquifer Group | Depth Range (m) | Thickness | |
|---------------|-----------------|-----------|-------------|
| | | Range (m) | Average (m) |
| I | up to 150 | 20 - 150 | 82 |
| II | 45 - 284 | 5 - 154 | 50 |
| III | 101 - 421 | 3 - 171 | 59 |
| IV | 168 - 475 | 6 - 132 | 54 |

3.11.5. Ground Water Level:

District Scenario:

The Depth to water level lies between 2 to 50 mbgl during pre-monsoon the depth of water level ranges 6.30 mbgl to 18.61 mbgl and during the post-monsoon period the varies from 6.12 to 19mbgl. Deeper water level, in the depth range of 10m to 15 m occurs in the south-eastern parts of Faridabad blocks. Water level elevation range from 220 to 180 m amsl and the general groundwater flow is towards southeast and east. In general water table has declined all over the district over the past decade. The Pre monsoon and Post monsoon depth of water level map is given below: -

3.11.6. Ground Water Management Strategy:

Status of Ground Water Development:

The Hydrogeological data generated through exploratory drilling has proved a vital information regarding identification of aquifer system, demarcation of their vertical and lateral extent, and delineation of potential aquifer characteristics and this Hydrogeological data also provide information on well design and drilling techniques. Reverse /Direct circulation rig is suitable for carrying out the drilling in alluvial parts of district whereas percussion or Down the Hole Hammer (DTH) technique with Odex attachment are suitable for drilling in boulder formation

Water Conservation and Artificial Recharge:

There are certain areas in the district, which have recorded water level decline in recent past. Since ground water is the only source of irrigation in major part of the district, ground water aquifers are under great stress due to increased demand in irrigation and industrial sector. Necessary remedial measures need to be taken up to arrest further declining of water levels in the areas and suitable methodology to be adopted to recharge the aquifers.



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Irrigation potential generated by irrigation project is negligible being scanty rainfall and high evaporation rate. Ani-cuts, tanks and check dams are surface water storage structures and these structures augment recharge to ground water bodies during monsoon period. The rain water during monsoon period can be used for artificial recharge through various techniques feasible in alluvial hard rock terrains. In hard rock terrain nala bunding and anicuts, dug wells, percolation tanks etc. are feasible structures which may be used to recharge the ground water body.

- Roof top/paved area rainwater harvesting for recharge to ground water in urban and industrial areas
- The crops consuming less quantity of water may be grown in place of crops requiring more water in the over-exploited block.
- Construction of recharge shafts with Gabbian structures in Nalas.
- The abandoned dug wells may be cleaned and should be used for recharging the ground water by utilizing the surface monsoon runoff. Recharge by dug well/percolation pit in agriculture farm.
- Local population to be educated regarding consequences of mining of ground water and need for effective and economic use.

3.11.7. Hydrogeological Impacts and its Mitigation Measure:

Appropriate mitigation measures can enormously reduce the damage caused by Hydrogeology is listed below.

| Hydro-geological Impacts | Mitigation Measure |
|---|--|
| 1. Due to over extraction of ground water, there will be chances of depletion of water level. | 1. Adopted water saving technologies in the premises and adopted the rain water harvesting for the recharge of ground water |
| 2. Due to release of the chemical ether will be chance of contamination of ground water | 2. Any waste water will not be allowed to release on any open surface. It will be utilized in greenbelt area after proper treatment. |
| 3. Existing drainage pattern will be changed due to topographical alteration. | 3. There is no natural watercourse passing through the project site. Hence natural drainage pattern will not be affected. |

3.12. Ecology and Biodiversity

Study of biological environment is one of the important aspects for the Environmental Impact Assessment, in view of the need for conservation of Environmental quality and biodiversity of particular geographical area. Ecological systems show complex interrelationship between biotic and Abiotic components including dependence, competition and mutualism. Biotic components comprises of plant and animal communities which interact not only within and between themselves but also with the Abiotic components viz. Physical and Chemical; components of the environment. Detail has been attached as Annexure V.



3.12.1. Objectives of Biological Study:

The main objectives of biological study were:

- To collect the baseline data for the study along with a description of the existing terrestrial, wetland and aquatic biodiversity.
- To assess the scheduled species in the proposed site (rare, endangered, critically endangered, endemic and vulnerable).
- To identify the locations and features of ecological significance.
- To identify the Impacts of proposed project before, after and during development phase.

Table 3-20 Mode of data collection and parameters considered during the Survey

| S.No. | Aspect | Mode of Data collection | Parameters monitored | Remarks |
|-------|--------------------------|--|---|---|
| 1. | Terrestrial Biodiversity | By field survey | Floral and Faunal diversity | For Floral Diversity: Random survey, sapling survey/forest inventory, walking transect, collection and identification with the help of relevant literature. For Faunal Diversity: direct and indirect sampling, walking transect, point sampling and nest sampling etc. |
| 2. | | From authentic sources like Forests department of Haryana and available published literatures from ZSI, BSI etc. | Floral and Faunal diversity and study of vegetation, forest type, importance etc. | Data collected from the working plan of the region, forest types from the authentic literature of Champion & Seth. |
| 3. | Aquatic Biodiversity | By field survey | Floral and Faunal diversity | For Plankton Study- Lackey's drops method and light microscope For other aquatic- Random survey, opportunistic observations |
| 4. | | From authentic sources like Forests department of Haryana. | Floral and Faunal diversity and study of vegetation, forest type, importance | Desktop literature review to identify the representative spectrum of threatened species, population and ecological |



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| | | | | |
|--|--|--|------|--------------|
| | | | etc. | communities. |
|--|--|--|------|--------------|

For proposed project, mining activities will be carried out in a manner so that there is no obstruction to the movement of water flow. The study area is divided into two parts i.e.:

- a) **Core Zone:** Project Site i.e. Mine Lease Area.
- b) **Buffer Zone:** Area within 10 Km radius from the project site.

3.12.2. Study Area

The proposed Project is for the Mining of sand minor minerals from the riverbed Yamuna River with 24,00,000 MT over an area of 66.32 Hectare Located in Village- Makhanpur, Tehsil & District- Faridabad, State- Haryana by M/s Dev & Div Solutions Pvt. Ltd. M/s Dev & Div Solutions Pvt. Ltd is one of the pioneer company in sand mining in the state of Haryana having vast experience in operating sand mines, Road - Building Construction and Marketing of building material in Faridabad and other parts of the state.

3.12.3. Summary

The study area comprises of Faridabad district of Haryana State. The baseline study was conducted for the evaluation of the floral and faunal biodiversity of the terrestrial environment of the study area (10 Km radius from the lease mine area). The study area falls under the category of Tropical Desert Thorn and comprise predominantly of xerophytes. Though natural vegetation of this area is very poor except some degraded patches of evergreen scrub or thorny forests, but overall floral diversity is fairly high. Usually through mass strip plantation programme along the railway line, road, canal bank, drain bank, and also even in degraded notified forest land, a considerable volume of wood biomass was expected in this area. Four major plant categories were used for this purpose viz. Shisam, Kikar, Eucalyptus, and other mixed types. No endangered and endemic flora was recorded from core and buffer zone of the project area. 67 species of vertebrates could be seen in the vicinity of the proposed project. Only one Schedule I i.e. *Pavo cristatus*, under Wildlife Protection Act, 1972, have been reported from the study area. Hence, conservation Plan has been prepared for the same (Annexure VI).

Table 3-21: Budget for Conservation/Management Plan

| S.No. | Component | Budget in Rs (Lakh) |
|--------------|--|---------------------|
| 1 | Artificial nests, feeding and watering arrangement for animals | 5 |
| 2 | Workshops, Training and awareness programs | 1.5 |
| 3 | Water supply | 2 |
| 4 | Contingency | 1.5 |
| Total | | 10 |



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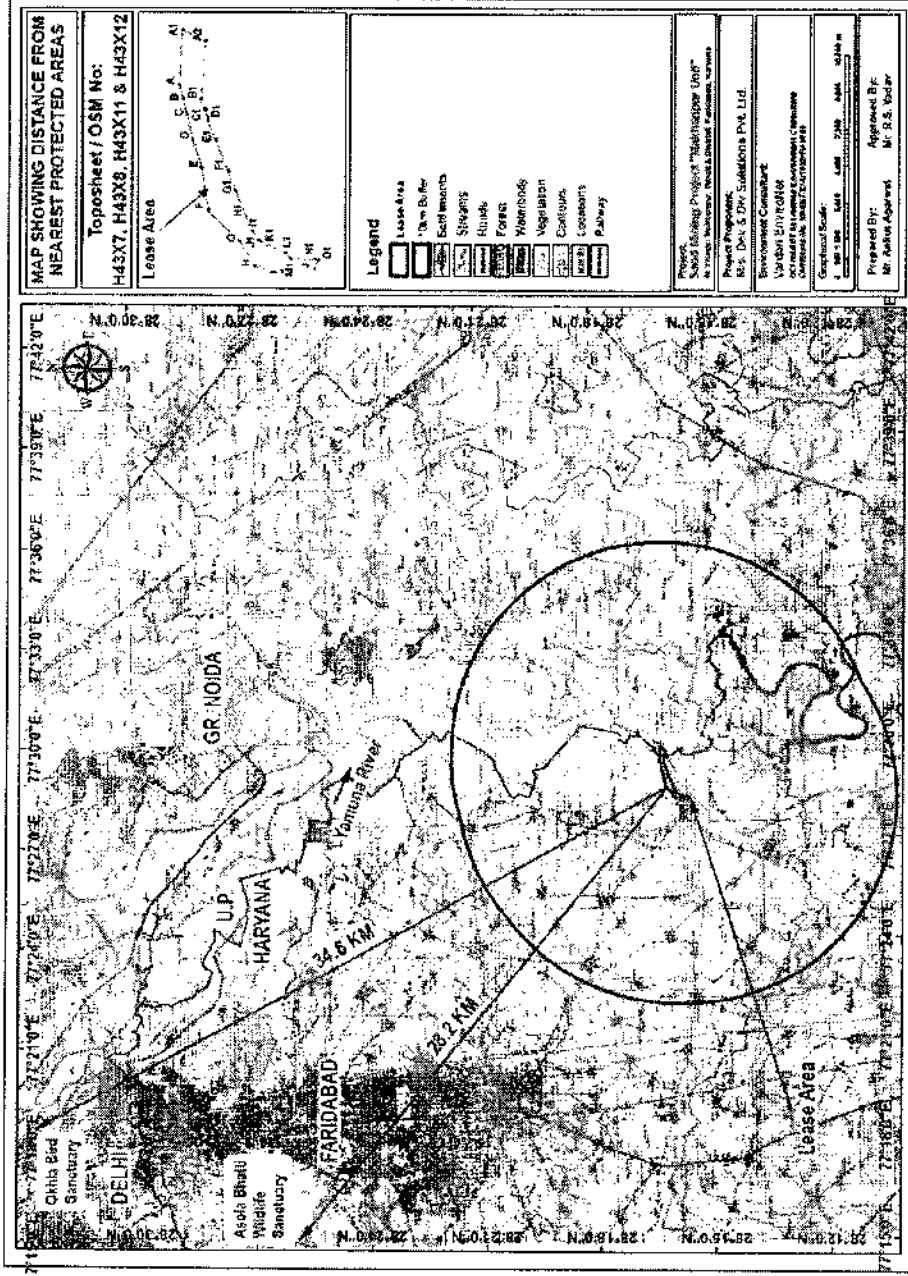


Figure 3-17: Location Map of Nearest WLS/NP

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3.13. SOCIO-ECONOMIC ENVIRONMENT

Any developmental activity exerts a direct impact on the socio-economic environment of the region. Usually, the beneficial impacts such as better job opportunities, improved education, communication, energy, housing, health, transportation facilities etc. outweighs the adverse impacts, if any.

The study of socio-economic component of environment is incorporating various facets, viz. demographic structure, availability of basic amenities such as housing, education, health and medical services, occupation, water supply, sanitation, communication and power supply, prevailing diseases in the region as well as features such as places of tourist attraction and monuments of archaeological importance. The study of these parameters helps in identifying predicting and evaluating the likely impacts due to project activity in the surrounding region. Project is proposed for the Mining of sand minor minerals from the riverbed Yamuna river with 24,00,000 MT over an area of 66.32 Hectare Located in Village- Makhanpur, Tehsil & District- Faridabad, State- Haryana by M/s Dev & Div Solutions Pvt. Ltd. Govt. of Haryana, Department of Mines and Geology conducted auction of Sand minor mineral mine of "Makhanpur Unit and M/s Dev & Div Solutions Pvt. Ltd was considered as highest bidder by paying Rs.9,98,00,000 /- , for the Makhanpur Unit.

Baseline data such as demographic pattern, occupational status, educational, health and other amenities as existing in the study area have been studied..

3.13.1. Baseline Status

The latest available data has been compiled to generate the existing socio-economic scenario of the study area. Information on socio-economic profile was collected from the Primary Census Abstract CD 2011 of Haryana State including the population details of the region. The Socio-Economic Status of the study areas is mentioned below and the villages surveyed are enlisted in Table 3-30.

Table 3-22 List of the Villages for Field Survey of Socio-Economic Environment

| Sr. No. | Villages |
|---------|-----------------|
| 1. | Makhanpur |
| 2. | Chhainssa |
| 3. | Latifpur Khadar |
| 4. | Shaikpur |
| 5. | Atali |
| 6. | Panhera Khurd |
| 7. | Panhera Kalan |
| 8. | Makhanpur |

Village

The basic unit for rural areas is the revenue village which has definite surveyed boundaries. The revenue village may comprise of one or more hamlets but the entire village is treated as one unit for presentation of data.



Study Area

The study area was defined as an area within 10 km radius around the proposed sand mining project site covers 60 villages of Ballabgarh and Palwal tehsil of Faridabad District of Haryana and Jewar and Gautam Buddha Nagar tehsil of Gautam Buddha Nagar district of Uttar Pradesh State:

Demographic Structure

Demographic structure of the study area was estimated for the selected parameters as households, population, sex ratio, scheduled caste, scheduled tribes, literacy from primary census abstract, CD 2011. The summarized demographic structure of the study area is presented in **Table 3-30**, while the details of the parameters of demographic structure village wise within the 10 km radius are given in **Table 3-34**.

Table 3-23: Summarized Demographic Structure of the Study Area

| Sr.No. | Parameter | Study Area |
|--------|--------------------------|---------------|
| 1. | No. of Villages | 60 |
| 2. | Households | 21201 |
| 3. | Household Ratio | 5.8 |
| 4. | Total Population | 123785 |
| 5. | Male Population | 65728(53.09%) |
| 6. | Female Population | 58057(46.90%) |
| 7. | Population (0-6 Years) % | 20832(16.82%) |
| 8. | Sex Ratio | 883 |
| 9. | Child Sex Ratio | 866 |
| 10. | Scheduled Caste % | 23647(19.10%) |
| 11. | Scheduled Tribe % | Nil |
| 12. | Literates % | 72667(58.70%) |
| 13. | Main Workers % | 26211(21.17%) |
| | ➤ Cultivators | 9414(35.91%) |
| | ➤ Agriculture Labourers | 4515(17.22%) |
| | ➤ Household Labourers | 1284(4.98%) |
| | ➤ Other Workers | 10998(41.95%) |
| 14. | Marginal Workers % | 10439(8.43%) |
| 15. | Non-Workers % | 87135(70.39%) |

Source: PCA Census 2011, Haryana State

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village-Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

Demographic Profile of Villages

- Total number of households are about 21201
- Total population of villages under the study area is 123785 out of which having males are 65728(53.09%) and females are 58057 (46.90%)
- The average family size is about 5.8 persons per family
- Sex ratio (No. of females per 1000 males) is 883 which indicates that females are more in number than their male counterpart in the study area
- Out of the total population, the population of children within the age of 0-6 age-group is about 20832 (16.82%)
- Child Sex ratio is 866 i.e. no. of female child per 1000 male child
- Scheduled caste population is 23647 (18.36%) and Scheduled tribes population are Nil in the area.
- Out of the total population in the region 72667 i.e. 58.70% are literates out of Male literates are about 45243(62.26%) and Female literates are 27424(37.73%).

It can be inferred from the data that the study area that the density of population is on an average. There is a huge difference on the male-female population and also the female child ratio is low as compared to the adult female ratio. It is observed that the scheduled caste population is higher than the scheduled tribe population is nil in the region. The female literacy rate is good as urban area is coming within the study area and educational facilities are good in the area.

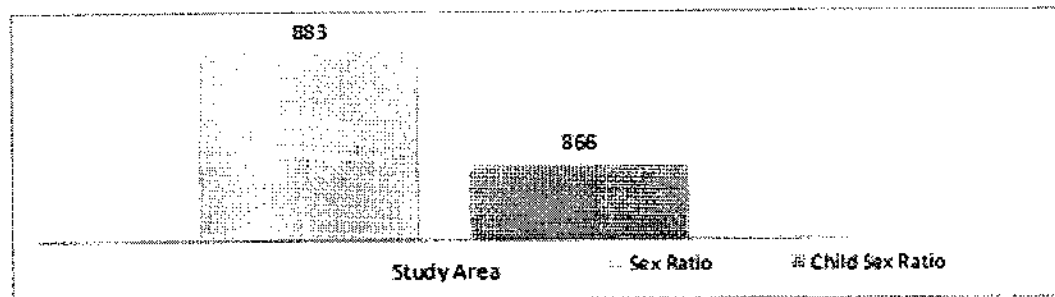


Figure 3-18: Bar diagram representing the ratio of population in the study area

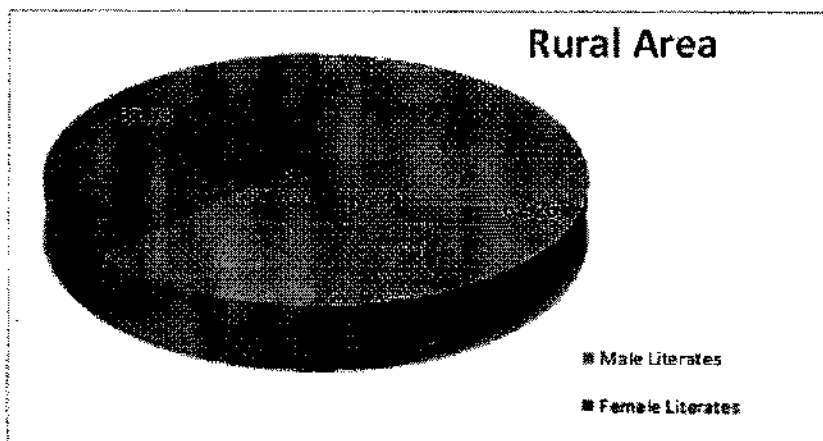


Figure 3-19: Literacy rate of the study area

3.13.2. Occupational Pattern/ Economic Resource Base

'Work' has been defined as participation in any economically productive activity. Such participation may be physical or mental. Persons on leave and under training are also treated as workers. However, rent receivers and pensioners are not treated as workers.

I. Total Workers

Occupational pattern of the villages within 10 km is presented in Table 3-35. Occupational pattern of any region mainly depends upon its economically active group i.e. the working populations involved in different economically productive activities. The total workers further categorized as main worker, marginal and the non-working population.

The workers coming under the main and marginal workers category are cultivators, agricultural labors and those engaged in livestock, forestry, fishing, hunting, and plantations, orchards and allied activities, mining and quarrying, manufacturing, processing, servicing and repairs in household industry, construction trade and commerce, transport, storage & communication, and other services

Different types of workers in total worker population may be classified as -

A. Main Workers

Main workers are those who have worked for a major part of the year (i.e. at least six months or 183 days). Main activity of a person who was engaged in more than one activity was reckoned in terms of time disposition. 26211 i.e. 21.17% of the total population comes under the main workers category. Main workers are further classified into 4 categories viz., cultivators, agricultural laborers and household workers and other main workers

Cultivators

For purposes of the Census a person is classified as cultivator if he or she is engaged in cultivation on land owned or held from government or held from private persons or for payment in money, kind or share. The person who is engaged either as employer, single worker or family worker in cultivation of land is recognized as a cultivator. Cultivation

involves ploughing, sowing, harvesting and production of cereals and millet crops such as wheat, paddy, jowar, bajra, ragi, etc., and other crops such as sugarcane, tobacco, ground-nuts, tapioca, etc., and pulses, raw jute and kindred fiber crop, cotton, cinchona and other medicinal plants, fruit growing, vegetable growing or keeping orchards or groves, etc. Cultivation does not include the following plantation crops—tea, coffee, rubber, coconut and betel-nuts (areca).

Maximum populations in the study area are engaged as Cultivators i.e. depended on agriculture. The cultivator population within the study area is 9414 (35.91%)

Agricultural Laborers

Persons working on land owned by others for wages or share in the yield have been treated as agricultural laborers. Out of the total main worker category agricultural laborers population is about 4515 i.e. 17.22%.

Laborers in Household Industry

The laborers engaged in household activity are quite low in all the study area. Among the total main workers 1284 (4.89%) workers are engaged in Household activity.

Other Workers

All main workers i.e. those who have been engaged in some economic activity during the last one year and who are neither cultivators nor agricultural laborers or household industry workers are classified as other main workers. The type of workers that come under this category includes factory workers, plantation workers, those in trade, commerce, business, transport, construction, political or social works, all government servants, municipal employees, teachers, priests, entertainers, artists etc. The other worker category includes 10998 workers i.e. 41.95%.

B. Marginal Workers

Marginal workers are those who have worked any time in the year for less than six months or 183 days but have not worked for a major part of the year. The population of marginal workers within the 10 km from the mine site comprises of about 10439 i.e. 8.43% of the total population.

C. Non-Workers

Non-Workers are those who have not worked any time at all in the year. Non-workers constitute householders, students, dependents, retired persons etc.

The economy of the study area is primarily based on agriculture. The agriculture sector has thus absorbed a major portion of the working force.

The categories of main workers, marginal workers & non workers are complementary to each other. Therefore, in areas where the proportion of main workers & marginal workers are high, the proportion of non workers would be naturally low. At present main workers category outweighs the marginal and non workers in the study area.

The proportion of female main worker population is high as compared to their male worker counterpart because in general rural areas offer more opportunities for men & women to

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

work in agriculture & animal husbandry etc. In view of the labor- intensive nature of agricultural economy, a large number of women are required to participate in work especially during the peak seasons of agricultural operations like sowing & harvesting which are to be carried out in a short span of time covering large areas in each village. The non-worker population includes 87135 (70.39%) population of the total population of the study area.

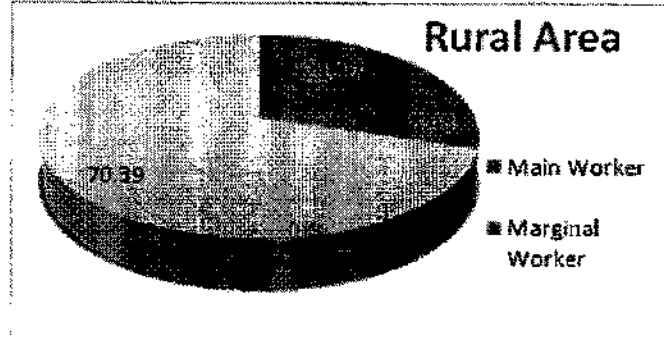


Figure 3-20 Occupational pattern of the study area

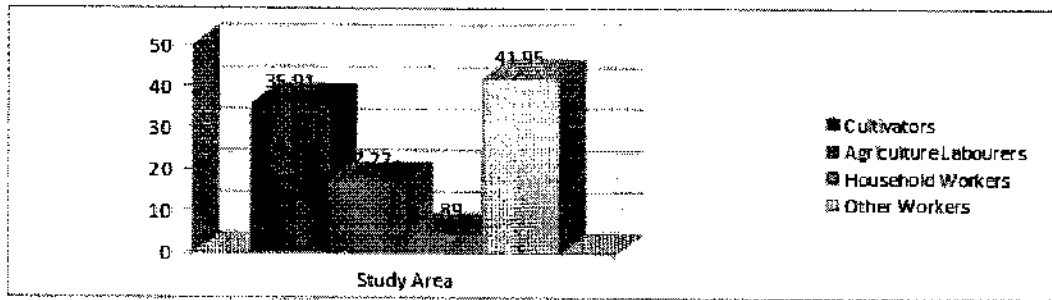


Figure 3-21 Category of main workers within the study area

Infrastructure Resource Base

The details of infrastructure resources base of the study area with reference to education, medical facility, water supply, post and telegraph, transportation, communication facility, power supply, existence of nearest town etc. are presented in Table 3-30. The significant features of these important parameters for each study area are discussed as below:

Table 3-24 Educational Facility near the Project Site

| |
|--|
| Gurukul Chhainsa, School, Ballabhgarh |
| Radha Bal High school, Chhainssa |
| Nehru Convent Public School Chhainsa |
| Govt Boys.school |
| Nav Jyoti Public School |
| Govt. Ser.Sec. School Chhainsa (Faridabad) |
| Gold Field school |

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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

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Drinking Water Facility

The numbers of major sources of drinking water in the study area are available through Hand Pumps Tank water and tube wells.

Sanitation & Drainage Facility

Sanitation facility is poor in the villages of the study area. Most of the villages have the open drainage system available while very few have the closed drainage system.

Communication Facility

Communication facility is available in the study area in the form of Post office in Chhainsa post office, Post Office Falaida Bangar are near the study area.

Economic Resource Base

Faridabad is the industrial capital of Haryana. As of 2013, out of a total of 11,665 registered working factories in Haryana, 2,499 were in Faridabad which was followed by Gurgaon with 2,116 factories. According to a study, the growth of Faridabad has been declining in the last 2 decades, the share of Faridabad in investment is less than 1% and 93% of investment is in the paper industry. The industrial contribution of Faridabad to Haryana's revenue was declined from 29% to 22% in 2012-13.

The major kharif crops of the district are Paddy, Bajra, Jowar, kharif pulses and kharif vegetables. The major rabi crops include wheat, barley, rabi oilseeds, vegetables and sugarcane.

Cultural and Aesthetic Attributes

As such no culturally and aesthetically important places are located within the 10 km of the study area.

Health Status

Health of the people is not only a desirable goal, but it is also an essential investment in human resources. As per the National Health Policy (1983), Primary Health Care has been accepted as main instrument for achieving this goal of development and strengthening rural health infrastructure through a three-tier system, viz., Primary Health Center (PHCs), Primary Health Subcentres (PHS) and Community Health Centers have been established to provide health care facility not only to the resident population of the concerned villages but also to the neighboring villages.

Primary Health Centers - PHC is the first contact point between village community and the Medical Officer. The PHCs were envisaged to provide an integrated curative and preventive health care to the rural population with emphasis on preventive and promotive aspects of health care.

Primary Health Sub-Centers - Sub-Centers are assigned tasks relating to interpersonal communication in order to bring about behavioral change and provide services in relation to maternal and child health, family welfare, nutrition, immunization, diarrhea control and control of communicable diseases programmes.



Community Health Centre - Community Health Centre (CHCs) are being established and maintained by the State Government under MNP/BMS programme. As per minimum norms, a CHC is required to be manned by four medical specialists i.e. Surgeon, Physician, Gynecologist and Pediatrician supported by 21 paramedical and other staff.

Lack of building, shortage of manpower and inadequate provision of drug supplies are hampering the operation of these units. The standards to be met according to National Rural Health Care System are given below:

| Population | Medical Facility & Infrastructure | Personnel |
|-----------------|--|---|
| 3000-5000 | 1 Sub centre (Contact Unit of PHC and Community) | 1 Health Worker (Female)/ Auxiliary Nurse Midwives & 1 Health Worker (Male) |
| 20,000-30,000 | 1 PHC (Unit of 6 Sub-Centers)- 6 beds | Medical officers & 14 Paramedical Staff |
| 80,000-1,20,000 | Community Health Centre (Referral Unit-4 PHCs)- 30 Bedded Hospital | Medical superintendent |

Source: National Rural Health Care System in India (2005-12)

Medical Facility

Medical institutions in rural parts of the region are inadequate, as per the data recorded in the village amenities CD 2011 in the 10 kms radius of the project site there PHC Chhainssa AIIMS, Community health centre, Fatak Rd, Asoati, Haryana, Community health centre, Panhera Khurd. Atali Primary Health Centre and Shri Atal Bihari Vajpayee Government medical college Chhainsa:

3.13.3. Socio-economic Survey

In order to access and evaluate likely impacts arising out of any development projects on socio economic environment, it is necessary to gauge the apprehensions of the people in the study areas.

3.13.1.1 Methodology applied for selection of sample & data collection

The methodology which is applied for primary source of data collection i.e. gathering data through field survey for socio-economic environment is depicted below:

Sampling Method

A judgmental and purposive sampling method was used for choosing respondents of various sections of the society i.e. Sarpanch, adult males and females, teachers, medical practitioners, businessmen, agriculture laborers, unemployed group etc. Judgmental and purposive sampling method includes the right cases from the total population that helps to fulfill the purpose of research needs.

Data Collection Method

For the process of data collection through primary source certain methods are used among that are:



Field Survey and Observations

Field survey and observations is made at each sampling village and the socioeconomic status of that region is studied. Visits are made at hospitals, primary health centers and sub-centers to know the health status of the region. Various governmental organizations such as statistical department, department of census operations are visited to collect the population details of that region.

Interview Method

Structured interview method is used to collect data regarding the awareness and opinion from the samples selected of the various socio- economic sections of the community. Structured interviews involve the use of a set of predetermined questions that includes fixed and alternative questions. The questionnaire mainly highlights the parameters such as income, employment and working conditions, housing, food, water supply, sanitation, health, energy, transportation and communication, education, environment and pollution to assess the standard of living of that particular region and general awareness, opinion and expectation of the respondents about the proposed project. Interview method helps to collect more correct and accurate information as the interviewer is present during the field survey.

Socio-economic survey was conducted in the villages within the study areas located in all directions with reference to the project site. 8 villages were surveyed from study area.

The respondents were asked for their awareness / opinion about the existing Sand Mining and also of their opinion about the impacts of the Sand Mining which are an important aspect of socio-economic environment, viz. job opportunities, education, health care, housing, transportation facility and economic status.

The salient observations recorded during socio economic survey in the study areas are depicted below:

- More than 52% villager occupation is primarily based on agriculture. Majority of main workforce are engaged either as cultivators in the sampling villages.
- Majority of workers are practicing farming activities through irrigation source of Tube wells and Wells
- About 40% villages have Primary School (PS), 15 % have Middle School (MS) and only 7%Secondary school while very few have senior secondary schools. Further education villagers go to the town places at Chhainsa, Ballabgarh, Pahera Khurd, Faridabad town.
- The main source of drinking water supply is through uncovered well and Hand Pump, Tube wells, Tap water treated and untreated tap water. But majority of respondents expressed dissatisfaction about the availability of drinking water facility.
- Power supply is available in mostly all the sampling villages. Street lights are also available in all villages Power supply is available for 18-20 hours a day for domestic purpose

3.13.4. Employment Generation

The proposed sand mining project will generate employment for about 98 (Skilled-48, Semi-skilled- 40 & unskilled-10). In addition, more than 100-150 people will be benefited indirectly, preference of the employment will be given to the nearby villagers.

3.13.5. Impact on Socio-Economic Environment

Critically analyzing the existing environmental status of the socio-economic profile and visualizing the scenario with the project, the impacts of the project would be varied and will generate both positive and negative impacts of the proposed mining in the region are stated below.

Positive Impacts

Increase in Job Opportunities

As per the survey it has been observed that the population in general do not have opportunities of earning from employment and the non worker population is higher in the region so the mining operations in general will help to provide direct job opportunities to about 81 personnel skilled and Unskilled workers and will indirectly give jobs for auxiliary and ancillary works. Hence jobs and business opportunities in logistical activities will come up. The mining operation will provide employment to mostly the local people in

As the influx of population such as truck drivers, attendants, contractors and labourers will increase in the area. Many auxiliary jobs will also increase such as Dhabbas/ hotels, Tea stalls, vehicle repairing shops etc ultimately increasing the economic status of the area.

Minimal burden in the existing Infrastructure Facilities

Local work force will be given first preference in the mining activity due to which influx of the outsiders will be very minimal. If sufficient number of local workers will not be available, then workers from outside will be engaged.

Improvement in Infrastructure

Continued mining activities will benefit the local people due to provision of more infrastructural facilities (developments of approach routes within the village area, street light, health facilities etc.)

Improvement in local economy

Growth in the revenue generation to the local gram panchayats is very much anticipated.

Adverse Impacts:

- Productivity of crops will be deteriorated affecting the agriculture based livelihood due to the pollution arising out of the mines, if proper mitigation measures are not implemented.
- Mining generates extra vehicle traffic, which negatively impairs the environment and also the local environment may be impacted. But to mitigate the impact trees will be planted in the area of mine site.
- With the influx of population (truck drivers, attendant, and labour etc.) at the site, the risk



of sexually transmitted diseases will increase in the area.

- Risks of accidents are expected during loading of minerals into truck/tractors-trolley and during transportation. This can be avoided by adopting good safety measures and practices.

3.13.6. Mitigation Measures of Socio- Economic Environment

- Adequate measures have been envisaged in the project design to control dust & noise. Proposed adequate & effective control measures will be provided which include dust suppression
- Well maintained tarpaulin covered trucks etc shall be used. Therefore, the likely adverse impacts on people, health, social and economic factors will be minimized
- Female population in the study area must be given education about the awareness of sex education and health education and safety through awareness camps in collaboration with the local NGOs
- Periodic health checkup camps shall be organized by project authority for villagers of Mahawatpur and Dhadar villages
- Apart from the normal health check up, emphasis shall also be given to prevent specific diseases originating due to emission of different pollutants such as respiratory ailments, skin problems, water borne diseases, hearing abilities etc.
- Job oriented training courses must be organized through industrial / technical training institutions for educated youth like electrical, tailoring, plumbing, type writing, shorthand and machine repairing, welding fabrication, and other skill developing trades
- Whenever necessary, collaboration between project authority and local bodies will be done on regular basis with an objective to build and maintain a good relationship which is necessary for smooth functioning of the project as well as progress and welfare of the people in the study area

Following Activities Can Be Proposed In the Study Area Corporate Social Responsibility (CSR)

Section 135 of the Companies Act, 2013, mandates all companies, having net worth of 500 crore, or turnover of 1000 crore or more or a net profit of 500 crore or more during a financial year to constitute a Corporate Social Responsibility (CSR) Committee Board. The responsibilities of the Board are enumerated thereunder, with the object of ensuring that every company spends, in each financial year, at least 2% of the average net profits of the company, in pursuance of its CSR policy.

Simply put, it is the responsibility of all companies, which have a net worth of 500 crore or more, turnover of 1000 crore or more, or net profit of 500 crore, to :

- a) Constitute a CSR Company Board;
- b) Ensure that 2% of annual net profit is invested in activities enumerated under clauses (i) to (xii) of Schedule VII of the Companies Act, 2013.

Section 135 has to be read with Schedule VII of the Act. It is here that the activities, which would fall under CSR, have been enumerated. Clauses (i) – (xii) set out the various sectors which may be targeted through CSR contributions. It includes, inter alia, healthcare, socio-economic policies, environment and ecological sustenance, gender equality, education.

We are concerned primarily with clause (i) and clause (xii) of the said Schedule. The clauses have been extracted below:-

- (i) Eradicating hunger, poverty and malnutrition, promoting health care including preventive health care and sanitation including contribution to the Swach Bharat Kosh set-up by the Central Government for the promotion of sanitation and making available safe drinking water.
- (xii) Disaster management, including relief, rehabilitation and reconstruction activities

3.13.7. Following Activities can be proposed in the Study Area

As per the socio economic survey in the study area, following activities can be proposed in the surrounding areas of the plant in consent of the Gram Panchayat and by identifying the priorities needs of the villagers.

| Sr. No. | Proposed Planned Activities under CSR | |
|---------|---------------------------------------|--|
| 1. | HEALTH FACILITY | <ul style="list-style-type: none"> • Providing infrastructure facilities such as beds, medical instruments etc. to the Health centre near project site. |
| 2. | INFRASTRUCTURAL DEVELOPMENT | <ul style="list-style-type: none"> • Installation of water coolers in Government schools primary school • Distribution of computers in government high schools in villages • Lab Equipments in Government High school • Rain shelter and Benches in Villages |
| 3. | EMPLOYMENT DEVELOPMENT | <ul style="list-style-type: none"> • Establishment of Vocational training centre for unemployed youth • Training centres for Ladies (stitching, Embroidery, tailoring etc.) |
| 4. | SANITATION AND HYGIENE | <ul style="list-style-type: none"> • Construction of Nallas for proper drainage system • Distributions of Dust Bins and arrangement of Garbage disposal |
| 5. | AFFORESTATION PROGRAMS | <ul style="list-style-type: none"> • Plantation of trees at road side of project site |

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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

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| Sr.No. | Villages | Households | Total Population | Population 0-6 Years | Scheduled Caste | Scheduled Tribes | Literates |
|---------------------------|------------------------------|--------------|------------------|----------------------|-----------------|------------------|--------------|
| Haryana State | | | | | | | |
| Faridabad District | | | | | | | |
| Ballabgarh Tehsil | | | | | | | |
| 1. | Kurali(90) | 729 | 4089 | 624 | 522 | 2700 | 522 |
| 2. | Garhi Bagampur(182) | 0 | 0 | 0 | 0 | 0 | 0 |
| 3. | Ghorasan(183) | 104 | 756 | 93 | 25 | 503 | 25 |
| 4. | Dalelgarh(186) | 83 | 383 | 79 | 0 | 211 | 0 |
| 5. | Nangla Majra Chandpur(187) | 10 | 53 | 14 | 43 | 12 | 43 |
| 6. | Chandpur(190) | 446 | 2766 | 495 | 412 | 1623 | 412 |
| 7. | Imamuddinpur(191) | 168 | 935 | 182 | 304 | 512 | 304 |
| 8. | Shahjahanpur(189) | 420 | 2393 | 429 | 552 | 1431 | 552 |
| 9. | Faizupur Khadar(192) | 218 | 1194 | 207 | 99 | 668 | 99 |
| 10. | Sahupura(195) | 194 | 1090 | 177 | 89 | 667 | 89 |
| 11. | Makanpur(200) | 14 | 73 | 17 | 0 | 26 | 0 |
| 12. | Bhikuka(198) | 14 | 69 | 20 | 0 | 19 | 0 |
| 13. | Jafarpur Majra Chhainsa(199) | 25 | 134 | 20 | 2 | 79 | 2 |
| 14. | Walipur(201) | 3 | 16 | 2 | 0 | 10 | 0 |
| 15. | Mohiapur(203) | 6 | 43 | 6 | 0 | 31 | 0 |
| 16. | Chhainsa(202) | 2483 | 14216 | 2344 | 2849 | 8141 | 2849 |
| 17. | Maojpur(88) | 331 | 1763 | 251 | 1058 | 1171 | 1058 |
| 18. | Atali(89) | 1193 | 6640 | 986 | 1180 | 4228 | 1180 |
| 19. | Garhkhera (67) | 717 | 3878 | 606 | 1298 | 2457 | 1298 |
| 20. | Phophunda(68) | 97 | 537 | 80 | 0 | 298 | 0 |
| 21. | Bahbalpur(69) | 450 | 2612 | 442 | 218 | 1705 | 218 |
| 22. | Ahmadpur(62) | 184 | 911 | 137 | 221 | 565 | 221 |
| 23. | Panehra Kalan(64) | 599 | 3382 | 476 | 724 | 2245 | 724 |
| 24. | Panehra Khurd(65) | 598 | 3346 | 449 | 465 | 2199 | 465 |
| 25. | Narhaoli(66) | 542 | 2934 | 518 | 820 | 1628 | 820 |
| 26. | Naryala(63) | 490 | 2855 | 444 | 545 | 1916 | 545 |
| 27. | Ahmadpur(62) | 184 | 911 | 137 | 221 | 565 | 221 |
| 28. | Hirapur(61) | 519 | 3145 | 446 | 528 | 2167 | 528 |
| 29. | Aterna(60) | 282 | 1791 | 390 | 497 | 749 | 497 |
| 30. | Jawan(59) | 946 | 5493 | 794 | 1165 | 3551 | 1165 |
| 31. | Mohna(204) | 1667 | 9843 | 1552 | 2194 | 6211 | 2194 |
| Total | | 13716 | 78251 | 12417 | 16031 | 48288 | 16031 |
| Palwal Tehsil | | | | | | | |
| 32. | Jalhaka(59) | 374 | 2300 | 339 | 362 | 1497 | 362 |
| 33. | Kulina(178) | 311 | 1861 | 283 | 276 | 1206 | 276 |
| 34. | Masudpur(179) | 11 | 72 | 5 | 0 | 48 | 0 |
| 35. | Hansapur(181) | 209 | 1427 | 286 | 171 | 815 | 171 |



DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

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| | | | | | | | |
|-------------------------------------|----------------------|--------------|---------------|--------------|--------------|--------------|--------------|
| 36. | Bagpur Kalan(191) | 765 | 4515 | 783 | 1280 | 2337 | 1280 |
| 37. | Zaibabad Kherli(193) | 139 | 809 | 151 | 0 | 406 | 0 |
| 38. | Bagpur Khurd(190) | 131 | 752 | 106 | 0 | 484 | 0 |
| 39. | Solra(189) | 732 | 4683 | 878 | 591 | 2640 | 591 |
| 40. | Bholra(188) | 285 | 1729 | 332 | 475 | 817 | 475 |
| 41. | Bhud(194) | 100 | 635 | 116 | 185 | 382 | 185 |
| 42. | Shaikhpur(195) | 252 | 1580 | 293 | 481 | 944 | 481 |
| 43. | Ronija(162) | 255 | 1439 | 178 | 198 | 984 | 198 |
| Total | | 3564 | 21802 | 3750 | 4019 | 12560 | 4019 |
| Gautam Buddha Nagar District | | | | | | | |
| Jewar Tehsil | | | | | | | |
| 44. | Mohammadabad Khoda | 427 | 2491 | 405 | 249 | 1513 | 249 |
| 45. | Taquipur Bangar | 70 | 413 | 71 | 8 | 239 | 8 |
| 46. | Anavargarh Bangar | 183 | 1342 | 373 | 75 | 465 | 75 |
| 47. | Anvargarh Khadar | 0 | 0 | 0 | 0 | 0 | 0 |
| 48. | Taquipur Khadar | 0 | 0 | 0 | 0 | 0 | 0 |
| 49. | Mahadipur Khadar | 89 | 419 | 91 | 0 | 170 | 0 |
| 50. | Bhaipur Brahmanan | 460 | 2572 | 353 | 116 | 1590 | 116 |
| 51. | Mahadipur Bangar | 667 | 4338 | 1059 | 190 | 1470 | 190 |
| Total | | 1896 | 11575 | 2352 | 638 | 5447 | 638 |
| Gautam Buddha Nagar Tehsil | | | | | | | |
| 52. | Kadarpur Mojampur | 380 | 2723 | 566 | 213 | 1018 | 213 |
| 53. | Makanpur Bangar | 269 | 1423 | 264 | 489 | 826 | 489 |
| 54. | Makanpur Khadar | 251 | 1510 | 230 | 0 | 962 | 0 |
| 55. | Rampur Khader | 191 | 1109 | 222 | 138 | 644 | 138 |
| 56. | Mathurapur | 9 | 36 | 8 | 0 | 22 | 0 |
| 57. | Salarpur | 314 | 1799 | 333 | 787 | 1084 | 787 |
| 58. | Munj Kheda | 596 | 3516 | 683 | 1332 | 1803 | 1332 |
| 59. | Bela Khurd | 11 | 32 | 6 | 0 | 9 | 0 |
| 60. | Bela Kalan | 4 | 9 | 1 | 0 | 4 | 0 |
| Total | | 2025 | 12157 | 2313 | 2959 | 6372 | 2959 |
| Grand Total | | 21201 | 123785 | 20832 | 23647 | 72667 | 23647 |

Source: Primary Census Abstract Census 2011, Haryana State

| Sr.No | Villages | Total Main Workers | Main Workers | | | | Marginal Workers | Non-Workers |
|---------------------------|---------------------|--------------------|--------------|-----------------------|--------------------|---------------|------------------|-------------|
| | | | Cultivators | Agricultural Laborers | Household Laborers | Other Workers | | |
| Haryana State | | | | | | | | |
| Faridabad District | | | | | | | | |
| Ballabgarh Tehsil | | | | | | | | |
| 1. | Kurali(90) | 884 | 261 | 72 | 16 | 535 | 505 | 2700 |
| 2. | Garhi Bagampur(182) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3. | Ghorasan(183) | 165 | 104 | 10 | 1 | 50 | 3 | 588 |
| 4. | Dalelgarh(186) | 97 | 29 | 40 | 7 | 21 | 2 | 284 |



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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village-Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | | | | | | | | |
|----------------------|------------------------------|--------------|-------------|-------------|------------|-------------|-------------|--------------|
| 5. | Nangla Majra Chandpur(187) | 13 | 0 | 7 | 0 | 6 | 3 | 37 |
| 6. | Chandpur(190) | 582 | 134 | 167 | 7 | 274 | 132 | 2052 |
| 7. | Imamuddinpur(191) | 192 | 15 | 38 | 29 | 110 | 63 | 680 |
| 8. | Shahjahanpur(189) | 454 | 230 | 59 | 26 | 139 | 99 | 1840 |
| 9. | Faizupur Khadar(192) | 395 | 113 | 223 | 5 | 54 | 32 | 767 |
| 10. | Sahupura(195) | 402 | 8 | 318 | 23 | 53 | 13 | 675 |
| 11. | Makanpur(200) | 27 | 17 | 1 | 3 | 6 | 1 | 45 |
| 12. | Bhikuka(198) | 18 | 0 | 0 | 1 | 17 | 1 | 50 |
| 13. | Jafarpur Majra Chhainsa(199) | 43 | 8 | 5 | 14 | 16 | 2 | 89 |
| 14. | Walipur(201) | 3 | 0 | 3 | 0 | 0 | 0 | 13 |
| 15. | Mohiapur(203) | 8 | 7 | 1 | 0 | 0 | 0 | 35 |
| 16. | Chhainsa(202) | 2972 | 1127 | 632 | 294 | 919 | 1620 | 9624 |
| 17. | Maojpur(88) | 234 | 19 | 9 | 14 | 192 | 183 | 1346 |
| 18. | Atali(89) | 1300 | 199 | 234 | 158 | 709 | 509 | 4831 |
| 19. | Garhkhera (67) | 713 | 105 | 10 | 46 | 552 | 627 | 2538 |
| 20. | Phophunda(68) | 100 | 67 | 10 | 2 | 21 | 23 | 414 |
| 21. | Bahbaipur(69) | 359 | 108 | 19 | 18 | 214 | 300 | 1953 |
| 22. | Ahmadpur(62) | 219 | 41 | 5 | 0 | 173 | 154 | 538 |
| 23. | Panehra Kalan(64) | 752 | 70 | 72 | 20 | 590 | 112 | 2518 |
| 24. | Panehra Khurd(65) | 777 | 147 | 56 | 17 | 557 | 276 | 2293 |
| 25. | Narhaoli(66) | 631 | 177 | 234 | 9 | 211 | 289 | 2014 |
| 26. | Naryala(63) | 634 | 158 | 28 | 8 | 440 | 70 | 2151 |
| 27. | Ahmadpur(62) | 219 | 41 | 5 | 0 | 173 | 154 | 538 |
| 28. | Hirapur(61) | 729 | 210 | 35 | 20 | 464 | 85 | 2331 |
| 29. | Aterna(60) | 490 | 170 | 183 | 4 | 133 | 39 | 1262 |
| 30. | Jawan(59) | 1066 | 361 | 23 | 23 | 659 | 319 | 4108 |
| 31. | Mohna(204) | 2269 | 801 | 265 | 107 | 1096 | 654 | 6920 |
| Total | | 16747 | 4727 | 2764 | 872 | 8384 | 6270 | 55234 |
| Palwal Tehsil | | | | | | | | |
| 32. | Jalhaka(59) | 534 | 215 | 19 | 6 | 294 | 138 | 1628 |
| 33. | Kulina(178) | 442 | 197 | 86 | 4 | 155 | 26 | 1393 |
| 34. | Masudpur(179) | 18 | 15 | 3 | 0 | 0 | 7 | 47 |
| 35. | Hansapur(181) | 239 | 103 | 28 | 14 | 94 | 122 | 1066 |
| 36. | Bagpur Kalan(191) | 1004 | 479 | 284 | 12 | 229 | 503 | 3008 |
| 37. | Zaibabad Kherli(193) | 153 | 128 | 8 | 0 | 17 | 183 | 473 |
| 38. | Bagpur Khurd(190) | 170 | 127 | 4 | 0 | 39 | 29 | 553 |
| 39. | Solra(189) | 1078 | 588 | 273 | 14 | 203 | 264 | 3341 |
| 40. | Bholra(188) | 397 | 166 | 218 | 2 | 11 | 190 | 1142 |
| 41. | Bhud(194) | 171 | 14 | 113 | 0 | 44 | 134 | 330 |



DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | | | | | | | | |
|-------------------------------------|--------------------|--------------|-------------|-------------|-------------|--------------|--------------|--------------|
| 42. | Shaikhpur(195) | 333 | 176 | 79 | 9 | 69 | 27 | 1220 |
| 43. | Ronija(162) | 377 | 139 | 94 | 15 | 129 | 96 | 966 |
| Total | | 4916 | 2347 | 1209 | 76 | 1284 | 1719 | 15167 |
| Gautam Buddha Nagar District | | | | | | | | |
| Jewar Tehsil | | | | | | | | |
| 44. | Mohammadabad Khoda | 510 | 340 | 65 | 5 | 100 | 119 | 1862 |
| 45. | Taquipur Bangar | 118 | 71 | 18 | 0 | 29 | 98 | 197 |
| 46. | Anavargarh Bangar | 58 | 25 | 10 | 1 | 22 | 233 | 1051 |
| 47. | Anvargarh Khadar | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 48. | Taquipur Khadar | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49. | Mahadipur Khadar | 117 | 40 | 63 | 0 | 14 | 37 | 265 |
| 50. | Bhaipur Brahmanan | 540 | 327 | 40 | 5 | 168 | 37 | 1995 |
| 51. | Mahadipur Bangar | 791 | 340 | 87 | 11 | 353 | 434 | 3113 |
| Total | | 2134 | 1143 | 283 | 22 | 686 | 958 | 8483 |
| Gautam Buddha Nagar Tehsil | | | | | | | | |
| 52. | Kadarpur Mojampur | 637 | 130 | 30 | 219 | 258 | 537 | 1549 |
| 53. | Makanpur Bangar | 221 | 128 | 19 | 22 | 52 | 196 | 1006 |
| 54. | Makanpur Khadar | 400 | 284 | 32 | 0 | 84 | 43 | 1067 |
| 55. | Rampur Khader | 145 | 83 | 33 | 3 | 26 | 249 | 715 |
| 56. | Mathurapur | 7 | 5 | 0 | 2 | 0 | 4 | 25 |
| 57. | Salarpur | 480 | 253 | 43 | 62 | 122 | 15 | 1304 |
| 58. | Munj Kheda | 496 | 314 | 76 | 4 | 102 | 448 | 2572 |
| 59. | Bela Khurd | 22 | 0 | 20 | 2 | 0 | 0 | 10 |
| 60. | Bela Kalan | 6 | 0 | 6 | 0 | 0 | 0 | 3 |
| Total | | 2414 | 1197 | 259 | 314 | 644 | 1492 | 8251 |
| Grand Total | | 26211 | 9414 | 4515 | 1284 | 10998 | 10439 | 87135 |

Source: Primary Census Abstract Census 2011, Haryana State

3.13.1 CONCLUSION

The proposed mining project will generate employment for 98 people in the area. The people in the area are deprived of economic sources; therefore the mining project will benefit the locals by providing direct and indirect employment opportunities and thereby increasing the economic status of the area. As the influx of population such as truck drivers, attendants, contractors and labourers will increase in the area. Many auxiliary jobs will also increase such as Dhabbas/ hotels, Tea stalls, vehicle repairing shops etc. ultimately increasing the economic status of the area.

The only employment to depend on is agriculture, which is seasonal. In the absence of any high employment potential activities, the people are economically backward. The mining operation will provide employment to mostly the local people.



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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

3.14 SUMMARY

The generation of primary data, as well as collection of secondary data and information from the site and surroundings was carried out during Oct to Dec 2021. The EIA study is being done for the Mine Lease (core zone) and are within 10 Km distance from the mine boundary (buffer zone), both of which together comprise the study area. The mine lease area exhibits plain to undulated topography. Ambient Air Quality Monitoring reveals that the concentrations of PM₁₀ and PM_{2.5} for all the 8 AAQM stations were found between 70.2 to 94.6 µg/m³ and 36.1 to 54.5 µg/m³ respectively. The concentrations of SO₂ and NO_x were found to be in range of 7.0 to 17.4 µg/m³ and 15.6 to 28.6 µg/m³ respectively. The CO level was in range of 0.52 to 1.94 mg/m³. The (Leq) noise levels at project site is found to be 72.30 for day and 61.41 for night time respectively. The values are found to be fairly low w.r.t. Industrial (mining). However the recorded noise levels were found to be within the limits (75 dB(A)). Analysis results of ground water reveal that pH varies from 7.60 to 7.78. Total Hardness varies from 213 to 286 mg/L. Analysis results of surface water reveal the pH varies from 7.54 to 7.84. Total Hardness varies from 641 to 725 mg/L. Due to the proposed project the traffic density will increase as the entire excavated mineral will be transported through the road under study and the vale LOS will remain same as Excellent for both roads. The analysis results show that soil is basic in nature as pH value ranges from 7.60 to 7.83 with organic matter 0.25 % - 0.48. The concentration of Nitrogen (105.0 Kg/ha. to 121.56 Kg/ha.) Phosphorus (10.47 to 14.89 Kg/ha.) and Potassium (108.0 to 183.49 Kg/ha.) has been found to be in good amount in the soil samples. The soil is found to be suitable for the agricultural purpose. During the Ecology study 1 Schedule-I species have been observed within the 10 Km radius of the study area and a budget of Rs. 10 Lakh kept aside for the conservation of species. The proposed mining project will generate employment for 98 people in the area. The people in the area are deprived of economic sources; therefore the mining project will benefit the locals by providing direct and indirect employment opportunities and thereby increasing the economic status of the area.



4. ANTICIPATED ENVIRONMENTAL IMPACT AND ITS MITIGATION MEASURES

4.1 INTRODUCTION

The environmental parameters likely to be affected by mining are related to many factors, *i.e.* physical, social, economic, agriculture and aesthetic. The excavated mineral will be transported via trucks to outsiders. The operations may disturb environment of the area in various ways, such as removal of the mass, change of landscape, flora and fauna of the area, surface drainage, and change in air, water, Noise and soil quality. While for the purpose of development and economic upliftment of people, there is a need for establishment of mining industries but these should be environmentally friendly. Therefore, it is essential to assess the impacts of mining on different environmental parameters before starting the mining operations, so that abatement measures could be planned in advance for eco-friendly mining in the area.

4.2 ENVIRONMENTAL IMPACT ASSESSMENT

The environment and development should be considered as mutually complementary, interdependent, and an instrument of reinforcing the quality of life. Environmental Impact Assessment (EIA) is the important aspect of overall environmental management strategy and an important tool for sustainable development. It identifies major impacts of mining and associated activities on the environment and provides guideline to prepare the necessary control measure termed as Environmental Management Plan (EMP).

Alteration or modification of the above attributes may cause hazardous impact on ecological equilibrium of the site. Besides this there will be some other reasons which will affect the environment *viz.* traffic network route, and other vehicular movements, impacts on flora and fauna of that area, surface drainage, and change in air, water and soil quality. The increasing awareness among the people about ecological imbalance and environmental degradation has raised many apprehensions. The impacts on different environmental parameters due to this mining project are discussed below.

4.2.1 CONSTRUCTION PHASE

This is a Sand mining project in riverbed. There will be no impacts as no construction stage is envisaged in this project.

4.2.2 OPERATION PHASE

Some of the impacts identified in various phases of the operation are insignificant and do not warrant much attention, whereas some others are important especially with respect to the present context.

Therefore, objective is to identify those impacts, which are significant and require a detailed analysis for decision making or formulating adequate management measures. This section deals with an assessment of the impact of various mining activities on the existing environmental conditions. The methodology of assessment is based upon identification and description of the existing project activities as well as environmental components followed by evaluating the impact of mining and associated activities on the environment. The environmental components that are likely to be influenced or modified by the continuation of project activities are:

- Air Environment,
- Noise and Vibration Environment,
- Water Environment,
- Land use
- Soil Environment
- Hydrology
- Geology
- Biological Environment,
- Socioeconomic status of the area,
- Solid Waste/overburden

4.2.3 PREDICTION OF IMPACTS AND MITIGATION MEASURES

The air pollution is in the form of dust, fumes and gases generated by mining machineries and during different mining operations. The dust once allowed to go into the atmosphere cannot be controlled hence it's desirable not to allow them to be formed and Suppressed at the generating source.

4.3 AIR QUALITY MODELING

4.3.1 Dispersion Model

The Gaussian Dispersion Modeling (GDM) is used for prediction of dispersion of air emission and the computation of Ground Level Concentration (GLC) up to a specified distance from source. The fundamental model is given below:

$$c(x, y, z) = \frac{Q}{2\pi\sigma_y\sigma_z u} \exp\left(\frac{-y^2}{2\sigma_y^2}\right) \left(\exp\left(\frac{-(z-h)^2}{2\sigma_z^2}\right) + \exp\left(\frac{-(z+h)^2}{2\sigma_z^2}\right) \right)$$

Where c is a concentration at a given position, Q is the source term, x is the downwind, y is the crosswind and z is the vertical direction and u is the wind speed at the h height of the release. The σ_y , σ_z deviations describe the crosswind and vertical mixing of the pollutant. The above equation describes a mixing process that results in a Gaussian concentration distribution both in crosswind and in vertical direction, centered at the line downwind from the source. Gravitational settling and chemical or radioactive decays are neglected.

The model computes the pollutant concentration dispersed in microgram per cubic meter for any point source with the location coordinated x, y and z.

Approach & Methodology

The "Gaussian Dispersion Model" version formed the basic frame work of the computer model used for the computations of concentration of pollutants at ground level.

The model assumptions

- Steady State Condition - Ideal gas, continuous uniform emission rate, homogenous horizontal wind field, representative wind velocity, no directional wind shear in the vertical, infinite plume, no plume history and normal distribution of eddy turbulences.
- Pollutants Characteristics - The pollutant emitted are stable gases or aerosol which remains suspended in the air and particulates in the turbulent movement of the atmosphere and none of the material is removed as the plume advances and diffuses down wind and there is complete reflection at the ground.
- Gaussian distribution - The pollutant material within the plume takes on a Gaussian distribution in both the horizontal cross wind and vertical directions described by empirical dispersion parameters σ_y , and σ_z .
- It has been assumed that the pollutant does not undergo any physicochemical transformations.
- Gravitational settling of pollutants has not been considered.
- Reflection factor from any surface has not been considered.
- Control measures applied during calculation.
- PM2.5 has been assumed 65% of PM10.

Model Setup

Emission of PM₁₀

The major sources of PM10 emission in case of Sand mining project are the loading activity at mine site (loading of material over trucks / trucks by excavators) and the movement of vehicles on unpaved haul roads. The emission rates for these sources are given in the latest USEPA's AP-42 guidelines.

Loading of Material

The River Sand will be loaded on dumpers using excavators. The PM₁₀ emission rate due to loading activity is calculated using below equation.

$$E = k X E = k X 0.0016 X \left(\frac{U}{2.2} \right)^{1.3} \left(\frac{M}{2} \right)^{1.4} \quad \text{--- AP42 (Nov 2006)}$$

Where,

E = Emission Factor, kg/ton

k = Particle size multiplier, 0.35 for PM₁₀

M = Moisture Content, %

u = Mean wind speed, m/s



Emission of PM₁₀ due to Transportation

The hauling of mineral from the mine lease area to the end users via haul road (unpaved road) will cause emission of particulate matters. The following empirical expressions is used to estimate the quantity in pounds (lb) of size-specific particulate emissions from an unpaved road in industrial sites, per vehicle mile traveled (VMT)

$$E = k \left(\frac{s}{12}\right)^a \left(\frac{W}{3}\right)^b + C \quad \text{--- AP42 (Nov 2006)}$$

Where

k, a, b are empirical constants i.e. different for different particle size.

E = size-specific emission factor (lb/VMT)

s = surface material silt content (%)

W = mean vehicle weight (tons)

C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear, 0.0047 lb/VMT for PM₁₀. The source characteristics s and W are referred to as correction parameters for adjusting the emission estimates to local conditions.

Emission of CO from Vehicles

The Sand will be transported outside the mining area for end use. In order to estimate the emission of CO from these vehicles exhaust ARAI-2007 emission factors were used in model. The ARAI emission factors for CO emitting from heavy vehicles (diesel) is 1.5 gm/km.

Summary of calculating Emission Rates

Table 4-1: Emissions Rates

| S. No. | Activities | Units | Emission Rates |
|--------|--|-------|----------------|
| 1. | Loading of material (PM ₁₀ Emission) | g/s | 0.00004 |
| 2. | Loading of material (PM _{2.5} Emission) | g/s | 0.000002 |
| 3. | Transportation on Haul Road (PM ₁₀ Emission) | g/s | 0.00174 |
| 4. | Transportation on Haul Road (PM _{2.5} Emission) | g/s | 0.00017 |

4.3.2 Meteorological Data

The meteorology of the project area plays very important role in dispersion of pollutants and buildup of pollution within the atmosphere. In the present study, one season (Oct to Dec 2021) meteorological data has been taken to find the dispersion of pollutant concentration. The mixing height for study period, which is an important parameter to express the dispersive potential of atmosphere, has been taken from the atlas of hourly mixing height and assimilative capacity of atmosphere in India (S.D. Attri et al., 2008). Wind Rose diagram of one season meteorological data used for modelling is shown in Chapter-3.

Results

The maximum incremental concentration of PM₁₀ and PM_{2.5} viz. 0.0606 µg/m³ and 0.0063 µg/m³ was predicted at A1 location, respectively due to mining activities. The predicted maximum cumulative GLC of PM₁₀ and PM_{2.5} was found to be 94.66 µg/m³ and 54.506µg/m³ at A1 location; which is slight lower than the permissible NAAQ standard for PM₁₀ and PM_{2.5} concentration (100 µg/m³ and 60 µg/m³).



DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

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Table 4-2: Predicted GLC of PM₁₀ at Ambient Air Quality Monitoring Stations

| Max Baseline Concentrations | | | | Predicted GLC - AERMOD | | | | | | |
|----------------------------------|-----------------------------------|---------------------------------|---------------------------------|--------------------------------|----------------------------------|-----------------------------------|---------------------------------|---------------------------------|----------------------------|--|
| PM10 (µg/ m ³) | PM2.5 (µg/ m ³) | NO2 (µg/ m ³) | SO2 (µg/ m ³) | CO (mg/ m ³) | PM10 (µg/ m ³) | PM2.5 (µg/ m ³) | NO2 (µg/ m ³) | SO2 (µg/ m ³) | CO (mg/m ³) | |
| 94.6 | 54.5 | 28.6 | 17.4 | 1.94 | 0.060 | 0.006 | 0.002 | 0.003 | 0.000001 | |
| 91.5 | 51.6 | 25.9 | 15.8 | 1.5 | 0.019 | 0.002 | 0.000 | 0.001 | 0.000005 | |
| 89 | 49 | 23.8 | 15.1 | 1.1 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000000 | |
| 79.3 | 44.3 | 44.3 | 13.1 | 0.85 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000000 | |
| 87.8 | 48.8 | 48.8 | 14.6 | 0.9 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000000 | |
| 84.8 | 46.5 | 46.5 | 19.9 | 1.02 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000000 | |
| 77.6 | 43.9 | 43.9 | 12.8 | 0.77 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000000 | |
| 81.3 | 45.9 | 45.9 | 13.5 | 0.81 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000000 | |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

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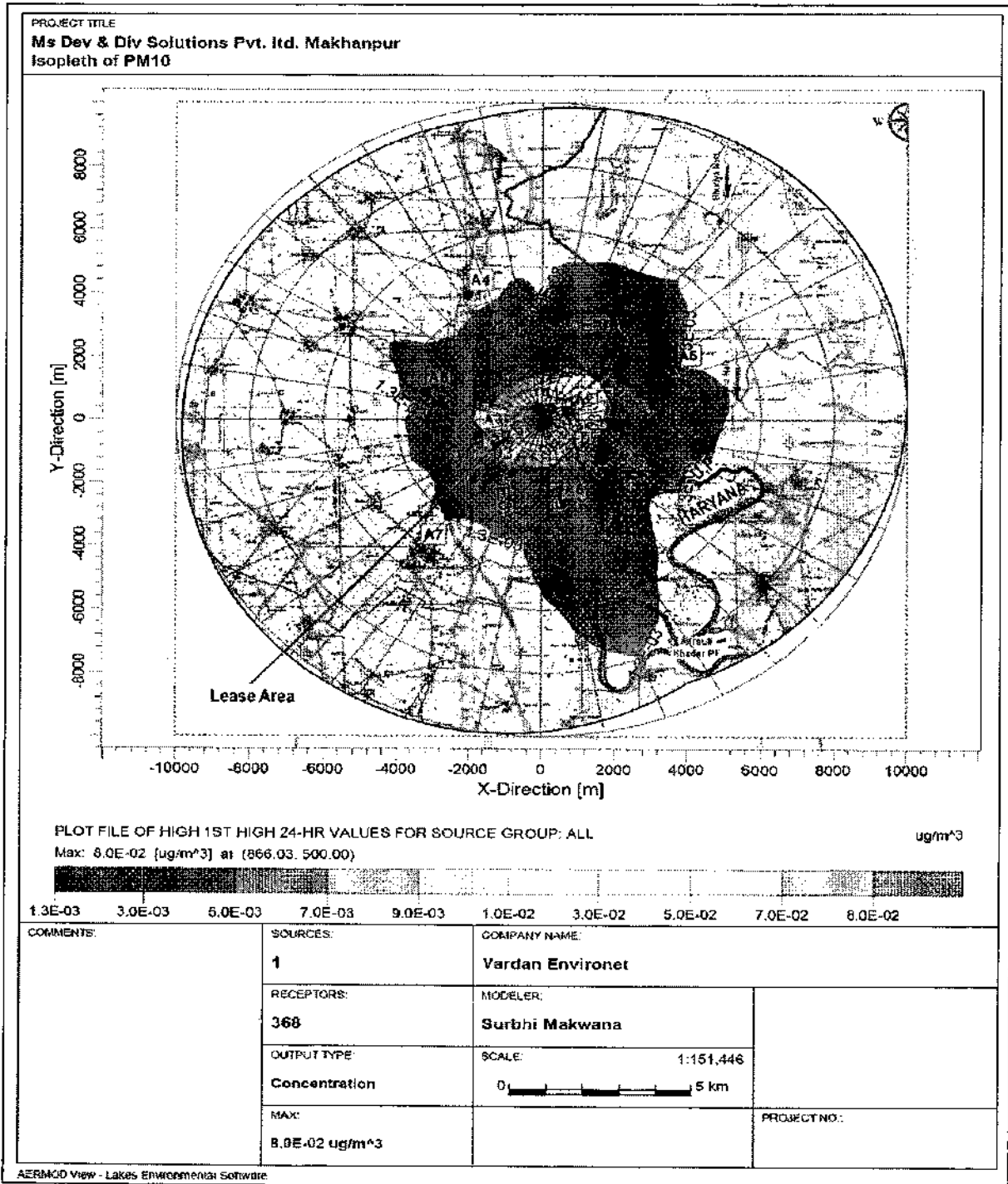


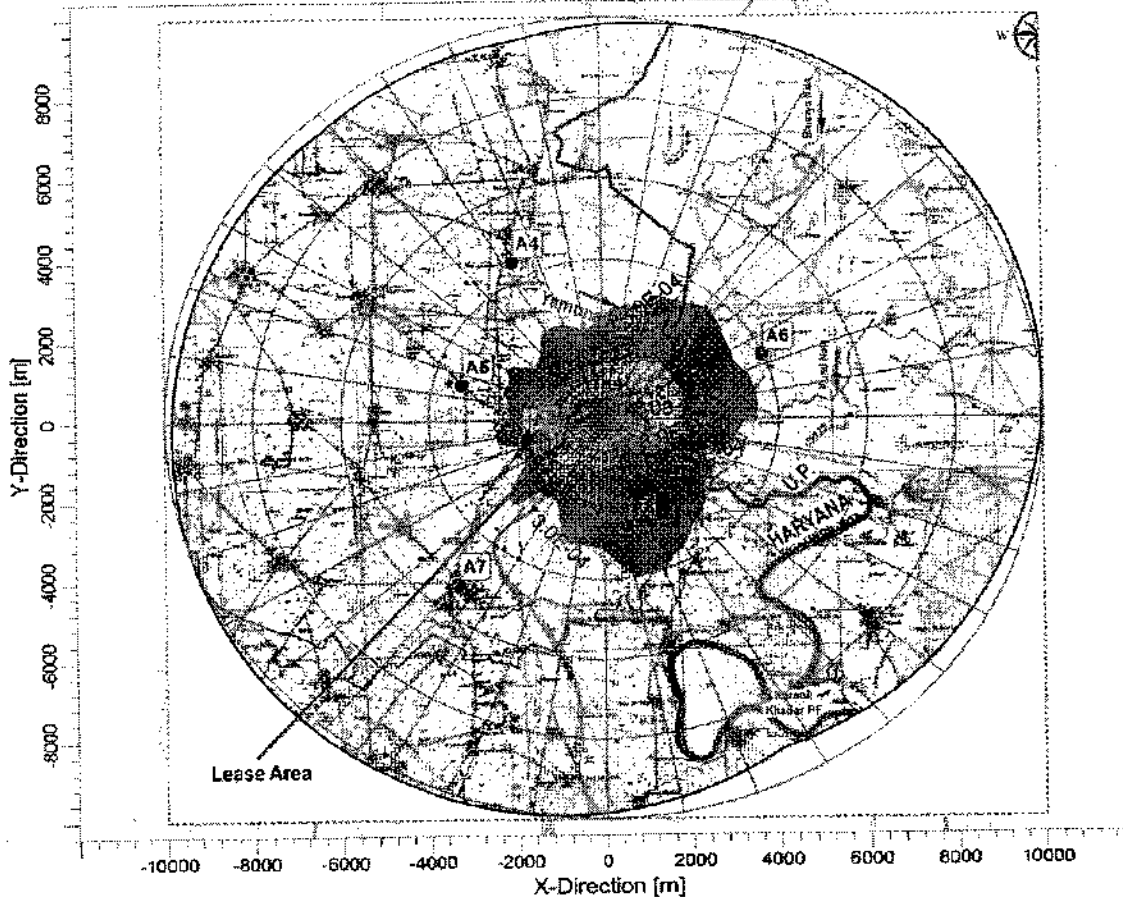
Figure 4-1 – Spatial distribution of predicted GLCs of PM₁₀ due to Mining

M/s Dev & Div Solutions Pvt. Ltd.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

PROJECT TITLE:
**Ms Dev & Div Solutions Pvt. Ltd. Makhanpur
 Isopleth of PM2.5**



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP. ALL
 Max: 8.3E-03 [$\mu\text{g}/\text{m}^3$] at (866.03, 500.00)

$\mu\text{g}/\text{m}^3$



| | | | |
|-----------|--|--|--------------|
| COMMENTS: | SOURCES: 1 | COMPANY NAME: Vardan Environet | |
| | RECEPTORS: 368 | MODELER: Surbhi Makwana | |
| | OUTPUT TYPE: Concentration | SCALE: 1:151,446 0 5 km | |
| | MAX: 8.3E-03 $\mu\text{g}/\text{m}^3$ | | PROJECT NO.: |

AERMOD View - Lases Environmental Software

Figure 4-2 – Spatial distribution of predicted GLCs of PM_{2.5} due to Mining

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

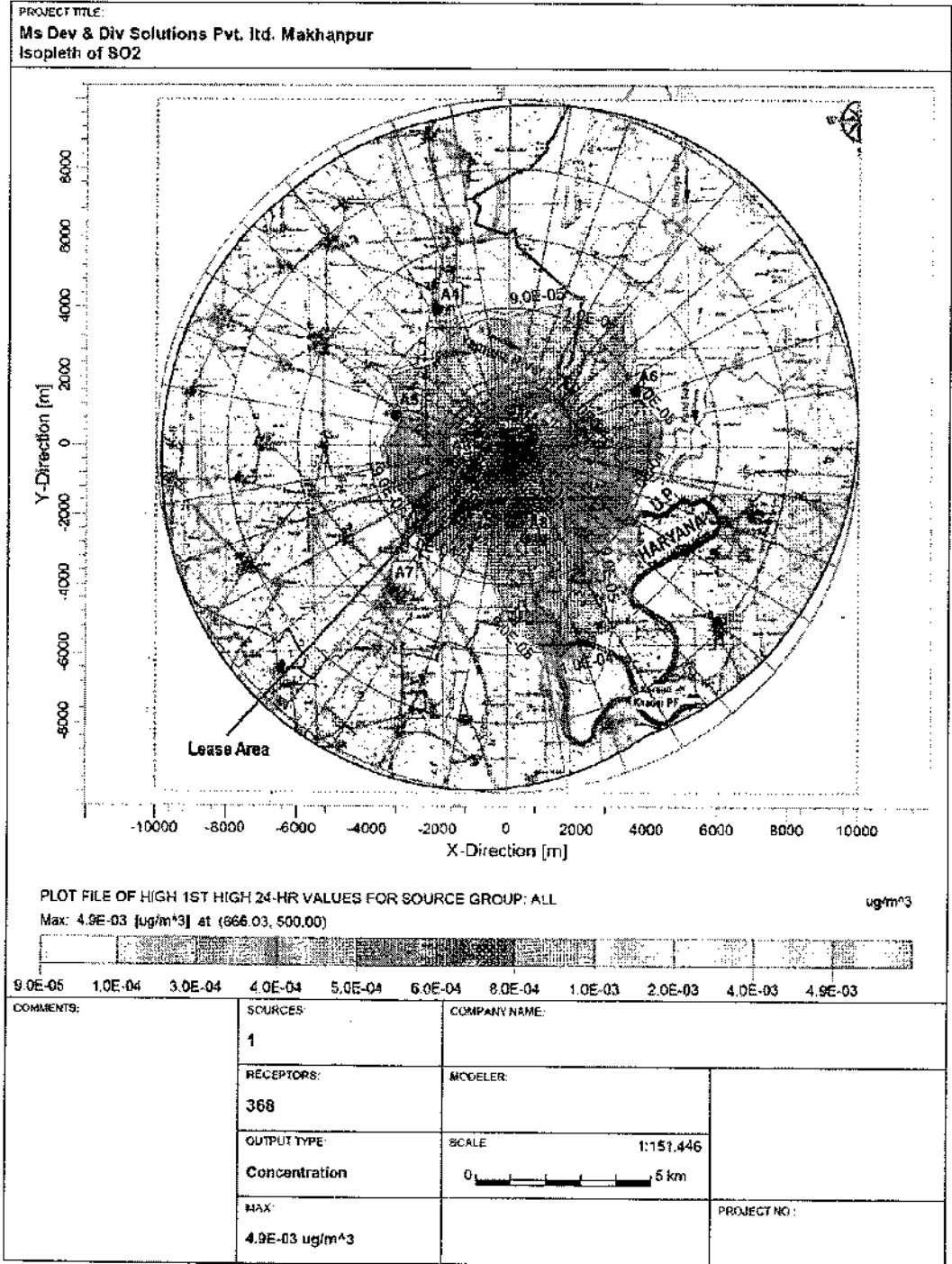


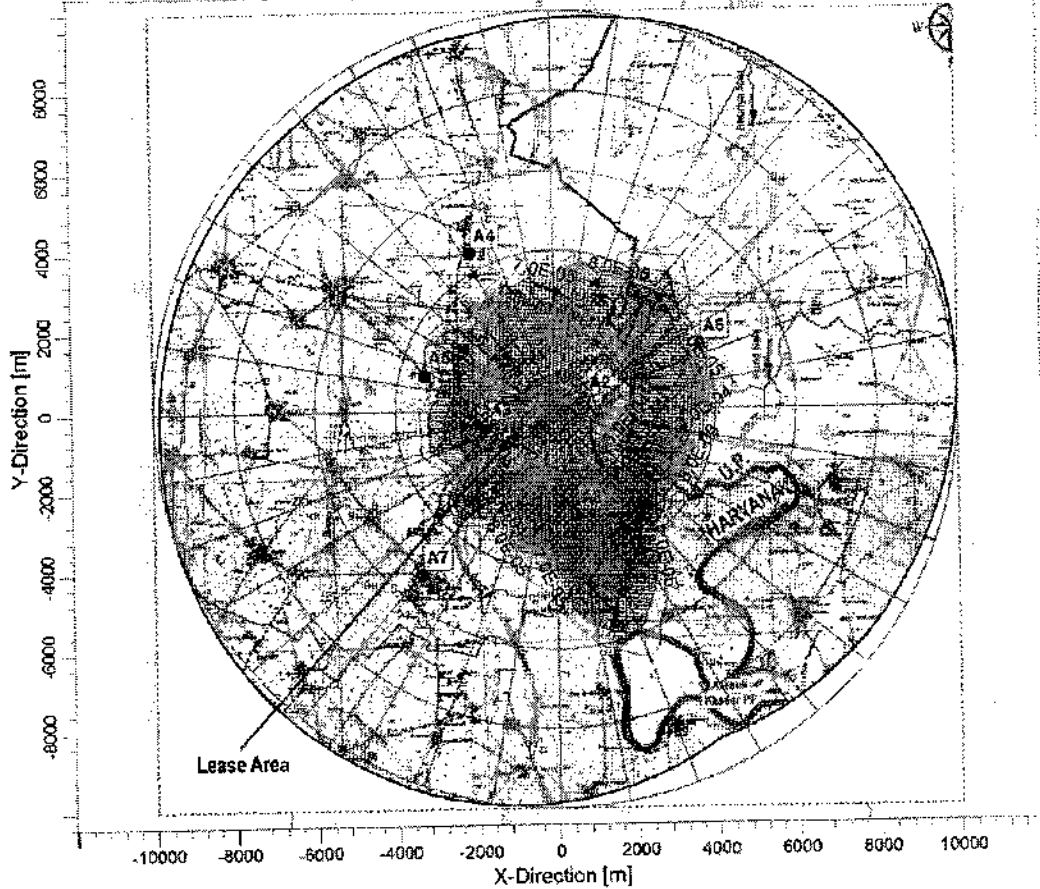
Figure 4-3 – Spatial distribution of predicted GLCs of Sox due to Mining

M/s Dev & Div Solutions Pvt. Ltd.

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Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

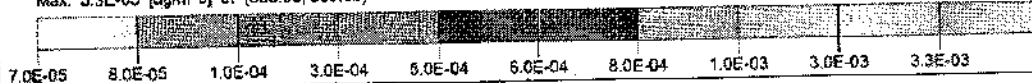
PROJECT TITLE:
Ms Dev & Div Solutions Pvt. Ltd. Makhanpur
Isopleth of NO2



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m³

Max: 3.3E-03 [ug/m³] at (866.03, 500.00)



| | | | |
|-----------|-----------------------------------|---------------------|---------|
| COMMENTS: | SOURCES: 1 | COMPANY NAME: | |
| | RECEPTORS: 368 | MODELER: | |
| | OUTPUT TYPE: Concentration | SCALE: 1:151,446 | 0 5 km |
| | MAX: 3.3E-03 ug/m ³ | PROJECT NO.: | |

Figure 4-4 – Spatial distribution of predicted GLCs of Nox due to Mining



DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

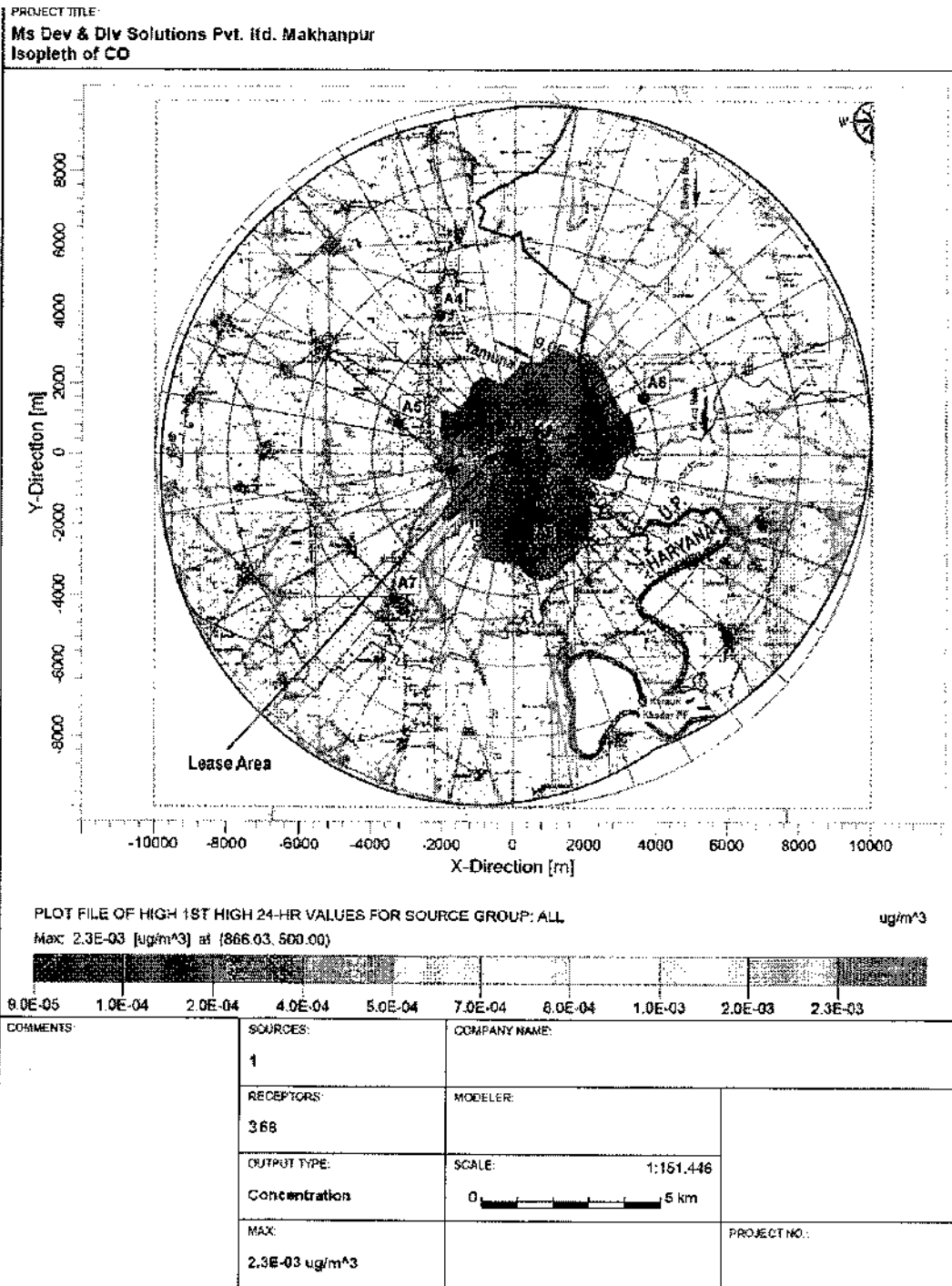


Figure 4-5 – Spatial distribution of predicted GLCs of CO due to Mining

4.3.3 Conclusion

From the results of AERMOD, it is concluded that the maximum cumulative concentrations of PM₁₀ and PM_{2.5} both due to mining activities and transportation are within the prescribed standards for PM₁₀ and PM_{2.5}. However, in case of mining activities the maximum incremental concentration was predicted within the 500m of mining lease area. Beyond mine lease boundary the concentration of PM₁₀ and PM_{2.5} due to mining activities are expected to be lower due to settlement of PM₁₀ and PM_{2.5} particles over short distances.

The concentrations of SO_x and NO_x generated from mining area are expected to be low due to absence of any major source. The concentration of CO due to vehicle exhaust is also low due to small number of vehicles plying on haul road.

4.3.4 Mitigation Measures

The proposed mining operations are not anticipated to raise the concentration of the pollutants beyond prescribed limits. However, the following measures are suggested mitigate any harmful impacts of pollutants –

- Plantation of trees along haul roads to help to reduce the impact of dust in the nearby villages;
- Planning transportation routes of mined material so as to reach the nearest paved roads by shortest route. (minimize transportation over unpaved road);
- Dust mask shall be provided to the workers engaged at dust generation points like excavations and loading points;
- Regular water sprinkling on unpaved roads to avoid dust generation during transportation;
- Transportation of material shall be carried out during day time only;
- The speed of dumpers plying on the haul road should limited to avoid generation of dust;
- Haul road shall be covered with gravels; and
- Covering of material during transportation on dumpers to prevent spillage of Sand from the dumpers. The dumpers shall be covered by tarpaulin. Overloading shall be avoided.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. ltd.

4.4 IMPACTS OF AIR POLLUTION AND MITIGATION MEASURES

| Attributes | Impact | Mitigation Measure | Budget |
|------------|---|---|--|
| Human | <p>A predicted cumulative GLC of PM₁₀ was 94.661 µg/m³ at A1 (Ambient Air Quality Monitoring Station) against the threshold limit of 100 µg/m³ which can cause adverse effect on human health of neighboring villagers and predicted cumulative GLC of PM_{2.5} was 54.506 µg/m³ at A1 (Ambient Air Quality Monitoring Station) against the threshold limit of 60 µg/m³.</p> <p>Dust generation due to loading and unloading of mineral and due to transportation can also affect the workers as well as nearby villagers.</p> | <p>1.0 KLD water will be proposed for sprinkling on unpaved roads to avoid dust generation during transportation.</p> <p>Safety equipment for the mining worker Dust mask will be provided to the workers engaged at dust generation points like excavation and loading points.</p> <p>Planning transportation routes of Sand so as to reach the nearest paved roads by shortest route (minimize transportation over unpaved road). Alternatively, graveled road may be constructed between mine lease area and nearest paved road connectivity.</p> <p>The speed of trucks plying on the haul road will be limited to avoid generation of dust and covering of material during transportation on trucks to prevent Sand leak from the trucks. The trucks will be covered by tarpaulin.</p> <p>Overloading will be avoided.</p> <p>It is proposed to plant 55,000 Nos. of local species till the end of 5th year along the haul roads and community level and school premises etc. to prevent the impact of dust in the nearby village.</p> | <p>Rs. 15 Lakhs under Dust Suppression for 5 years is proposed.</p> <p>OHS. Rs. 4.00 Lakhs</p> |
| Animal | Grazing land will be reduced. | | |
| Plant | Stomatal index may be minimized due to dust deposit on leaf. | | |
| Crops | Crop yield will be reduced. | | |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | | | |
|----------------|---|--|--|
| Infrastructure | There is no major impact on infrastructure due this mining operation. | | |
|----------------|---|--|--|

4.4.1 Conclusion

In this mining project the only source of emission of air pollution is excavation, transportation, loading, hauling operation and handling of sand. The proposed mining operations are not anticipated to raise the concentration of the pollutants beyond prescribed limits. However, the measures are suggested to mitigate any harmful impacts of pollutants like plantation of trees along haul roads, specially near settlements, to help to reduce the impact of dust on the nearby villages; planning transportation routes of mined material so as to reach the nearest paved roads by shortest route (minimize transportation over unpaved road); regular water sprinkling on unpaved roads to avoid dust generation during transportation etc.

4.5 Air Quality Index

An air quality index (AQI) is a number used by government agencies to communicate to the public how polluted the air currently is or how polluted it is forecast to become. As the AQI increases, an increasingly large percentage of the population is likely to experience increasingly severe adverse health effects.

There are six AQI categories, namely Good, Satisfactory, Moderately polluted, Poor, Very Poor, and Severe. The AQI for proposed project will consider five pollutants (PM₁₀, PM_{2.5}, NO₂, SO₂ and CO) for which short-term (up to 24-hourly averaging period) National Ambient Air Quality Standards are prescribed. Based on the measured ambient concentrations, corresponding standards and likely health impact, a sub-index is calculated for each of these pollutants. The worst sub-index reflects overall AQI.

AQI will be calculated by using the following formula.

$$I = [I_{high} - I_{low} / C_{high} - C_{low}] (C - C_{low}) + I_{low}$$

Where,

- I - The Air Quality Index
- C - The pollutant concentration
- C_{low} - The concentration breakpoint that is ≤ C
- C_{high} - The concentration breakpoint that is ≥ C
- I_{low} - The index breakpoint corresponding to C_{low}
- I_{high} - The index breakpoint corresponding to C_{high}

The AQI values and corresponding ambient concentrations (health breakpoints) as well as associated likely health impacts for the identified eight pollutants are as follows

Table 4-3: AQI Category based on pollutants concentration

| AQI Category, Pollutants and Health Breakpoints | | | | | | | | |
|---|------------------------|-------------------------|-----------------------|---------------------|---------|-----------------------|-----------------------|----------|
| AQI Category (Range) | PM ₁₀ 24-hr | PM _{2.5} 24-hr | NO ₂ 24-hr | O ₃ 8-hr | CO 8-hr | SO ₂ 24-hr | NH ₃ 24-hr | Pb 24-hr |
| | | | | | | | | |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| Category | 0-50 | 51-100 | 101-150 | 151-200 | 201-250 | 251-300 | 301-350 | 351-400 |
|----------------------|------|---------|---------|---------|---------|---------|---------|----------|
| Moderately (101-200) | | 101-250 | 61-90 | 81-180 | 101-168 | 2-1-10 | 81-380 | 401-800 |
| Poor (201-300) | | 251-350 | 91-120 | 181-280 | 169-208 | 10-17 | 381-800 | 801-1200 |
| Severe (401-500) | | 430+ | 250+ | 400+ | 748+* | 34+ | 1600+ | 1800+ |

(Ref: Table Info acquired from Ministry of Environment, Forests & Climate Change)

Table 4-4:: Health impacts based on the AQI values

| AQI | Associated Health Impacts |
|-----------------------|---|
| Good (0-50) | Minimal Impact |
| Satisfactory (51-100) | May cause minor breathing discomfort to sensitive people. |
| Moderate (101-200) | May cause breathing discomfort to people with lung disease such as asthma, and discomfort to people with heart disease, children and older adults. |
| Poor (201-300) | May cause breathing discomfort to people on prolonged exposure and discomfort to people with heart disease. |
| Severe (401-500) | May cause respiratory impact even on healthy people, and serious health impacts on people with lung/heart disease. The health impacts may be experienced even during light physical activity. |

(Ref: Associated health effects taken by the MoEF&CC.)

In the present study only 5 parameters are taken such as PM₁₀, PM_{2.5}, SO₂, NO₂ and CO. By considering the above 5 pollutants the calculated AQI at 8 locations are given.

Table 4-5:: Sub-Index values for each air pollutant at selected sites

| Site | Avg. Conc. | Sub-Index | Category | Color | Health Impact |
|--|------------|-----------|--------------|-------------|--|
| Name of the pollutant: PM ₁₀ (µg/m ³) | | | | | |
| A1 | 90.9 | 91 | Satisfactory | Light green | May cause discomfort to sensitive people |
| A2 | 87.9 | 88 | Satisfactory | Light green | May cause discomfort to sensitive |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. ltd.

| Site | Avg. Conc. | Sub-Index | Category | Color | Health Impact |
|---|------------|-----------|--------------|-------------|--|
| | | | | | people |
| A3 | 86.0 | 86 | Satisfactory | Light green | May cause discomfort to sensitive people |
| A4 | 75.3 | 75 | Satisfactory | Light green | May cause discomfort to sensitive people |
| A5 | 84.1 | 84 | Satisfactory | Light green | May cause discomfort to sensitive people |
| A6 | 81.5 | 82 | Satisfactory | Light green | May cause discomfort to sensitive people |
| A7 | 73.3 | 73 | Satisfactory | Light green | May cause discomfort to sensitive people |
| A8 | 77.7 | 78 | Satisfactory | Light green | May cause discomfort to sensitive people |
| Name of the pollutant: PM_{2.5} (µg/m³) | | | | | |
| A1 | 51.0 | 85 | Satisfactory | Light green | May cause discomfort to sensitive people |
| A2 | 47.9 | 80 | Satisfactory | Light green | May cause discomfort to sensitive people |
| A3 | 46.1 | 77 | Satisfactory | Light green | May cause discomfort to sensitive people |
| A4 | 41.3 | 69 | Satisfactory | Light green | May cause discomfort to sensitive people |
| A5 | 44.8 | 75 | Satisfactory | Light green | May cause discomfort to sensitive people |
| A6 | 43.3 | 72 | Satisfactory | Light green | May cause discomfort to sensitive people |
| A7 | 39.5 | 66 | Satisfactory | Light green | May cause discomfort to sensitive people |
| A8 | 42.0 | 70 | Satisfactory | Light green | May cause discomfort to sensitive people |
| Name of the pollutant: SO₂ (µg/m³) | | | | | |
| A1 | 15.2 | 19 | Good | Green | Minimal Impact |
| A2 | 13.1 | 16 | Good | Green | Minimal Impact |
| A3 | 12.3 | 15 | Good | Green | Minimal Impact |
| A4 | 10.2 | 13 | Good | Green | Minimal Impact |
| A5 | 12.1 | 15 | Good | Green | Minimal Impact |
| A6 | 15.9 | 20 | Good | Green | Minimal Impact |
| A7 | 10.3 | 13 | Good | Green | Minimal Impact |
| A8 | 11.5 | 14 | Good | Green | Minimal Impact |
| Name of the pollutant: NO₂ (µg/m³) | | | | | |
| A1 | 24.4 | 31 | Good | Green | Minimal Impact |
| A2 | 22.6 | 28 | Good | Green | Minimal Impact |
| A3 | 21.0 | 26 | Good | Green | Minimal Impact |
| A4 | 41.3 | 52 | Satisfactory | Light green | May cause discomfort to sensitive people |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhampur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| Site | Avg. Conc | Sub-Index | Category | Color | Health Impact |
|--|-----------|-----------|--------------|-------------|--|
| A5 | 44.8 | 56 | Satisfactory | Light green | May cause discomfort to sensitive people |
| A6 | 43.3 | 54 | Satisfactory | Light green | May cause discomfort to sensitive people |
| A7 | 39.5 | 49 | Good | Green | Minimal Impact |
| A8 | 42.0 | 53 | Satisfactory | Light green | May cause discomfort to sensitive people |
| Name of the pollutant: CO (mg/m3) | | | | | |
| A1 | 1.52 | 76 | Satisfactory | Light green | May cause discomfort to sensitive people |
| A2 | 1.02 | 51 | Satisfactory | Light green | May cause discomfort to sensitive people |
| A3 | 0.84 | 42 | Good | Green | Minimal Impact |
| A4 | 0.62 | 31 | Good | Green | Minimal Impact |
| A5 | 0.72 | 36 | Good | Green | Minimal Impact |
| A6 | 0.90 | 45 | Good | Green | Minimal Impact |
| A7 | 0.61 | 31 | Good | Green | Minimal Impact |
| A8 | 0.74 | 37 | Good | Green | Minimal Impact |

After assessing the impacts from each pollutant, the cumulative effect of all 5 pollutant AQI values and their health impacts for each site is summarized in following Table.

Table 4-6:: Cumulative effect of all pollutants based on AQI values

| Site | AQI value | Category | Color | Health Impact |
|------|-----------|--------------|-------------|--|
| A1 | 91 | Satisfactory | Light green | May cause Discomfort to sensitive people |
| A2 | 88 | Satisfactory | Light green | May cause Discomfort to sensitive people |
| A3 | 86 | Satisfactory | Light green | May cause Discomfort to sensitive people |
| A4 | 75 | Satisfactory | Light green | May cause Discomfort to sensitive people |
| A5 | 84 | Satisfactory | Light green | May cause Discomfort to sensitive people |
| A6 | 82 | Satisfactory | Light green | May cause Discomfort to sensitive people |
| A7 | 73 | Satisfactory | Light green | May cause Discomfort to sensitive people |
| A8 | 78 | Satisfactory | Light green | May cause Discomfort to sensitive people |

4.5.1 Conclusions

From the above interpretation of Air Quality Index for study area responsible parameter for pollution is PM₁₀, PM_{2.5} and CO. The AQI of study area falls under satisfactory categorization as per the data obtained during baseline studies. The health impact due to this AQI is very less and it may only cause discomfort to sensitive people.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

4.6 IMPACTS OF NOISE/VIBRATIONS AND MITIGATION MEASURES

| Attributes | Impact | Mitigation Measure | Budget |
|----------------|--|---|------------------------------|
| Human | Noise from the machinery can cause Hypertension, high stress level, hearing loss, sleep disturbance etc due to prolonged exposure. | The machinery will be maintained in good running condition so that noise will be reduced to minimum possible level. | |
| Animal | 203 PCU/hr (Yamuna Express) & 68 PCU/hr (Metalled Road Chhainsa) will increase in the existing traffic due to this mining activity hence vehicle collision may occur unwanted sound and can also cause impact on human health. | Vehicles with PUC Certificate will be hired. Regular maintenance of vehicles will be done to ensure smooth running of vehicle. Awareness will be imparted to the workers about the permissible noise level and effect of maximum exposure to those levels. Personal protective equipment will be provided to prevent the noise exposure. Personal Protective Equipment will be provided during mining activity. | Rs. 4 lakhs for OHS |
| Crops | Accidents may occur due to fast movement of vehicles. There is no major impact on plants and crops due to this mining operation. | In addition, truck drivers will be instructed to make minimum use of horns in the village area and sensitive zones. It is proposed to plant 55,000 Nos. of local species till 5th year of mine, along the haul roads, outer periphery within the lease area to reduce the impact of noise in the study area. | Rs. 76.0 Lakh for plantation |
| Infrastructure | There is no major impact on infrastructure due to this mining operation. | -- | -- |

4.6.1 Conclusion

In summary, it can be stated that the impact on the present noise levels due to mining operations will be restricted to the work zone areas only. The impact on the ambient noise levels will not be felt at the settlement areas due to masking effect with the existing noise levels. There is no drilling and blasting envisaged in the Sand mining so there is no impact of vibration due to this project.

Hence, the noise levels and vibration impact due to the proposed mining operations on community will be minimal.

4.7 IMPACTS OF WATER POLLUTION AND ITS MITIGATION MEASURES

| Attributes | Impact | Mitigation Measues | Budget |
|------------|---|--|---------------------------------------|
| Human | The mining in the riverbed area may cause the ground water contamination due to intersection of the water table. The municipal waste water disposed from the mining activity may cause contamination of surface water. Ground Water contamination due to discharge of mine runoff. | The water table will not be intersected during mining in the riverbed as ultimate depth is limited upto 3 meters as the water table is 8-10 m bgl. | Rs. 3.00 Lakhs/ year |
| Animal | | Proper analysis/Monitoring will be done to check the ground water. The municipal wastewater will be disposed off into septic tanks. | |
| Crops | Waste water discharges through mining operation direct affect the crops and plants | No chemical having toxic elements will be used for carrying out mining activity. | Rs.7.00 Lakhs (Waste Water Treatment) |
| Plants | | Waste water will be disposed off in septic tank. There are 1 Nos. of septic tank of capacity 5 KL. Water required for domestic use = 4.0 KLD. Waste water generation= 3.2 KLD. The design of septic tank has been given in figure- 4.4. Rain water harvesting is Proposed in community building/School, etc and is given in Chapter-10. | |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

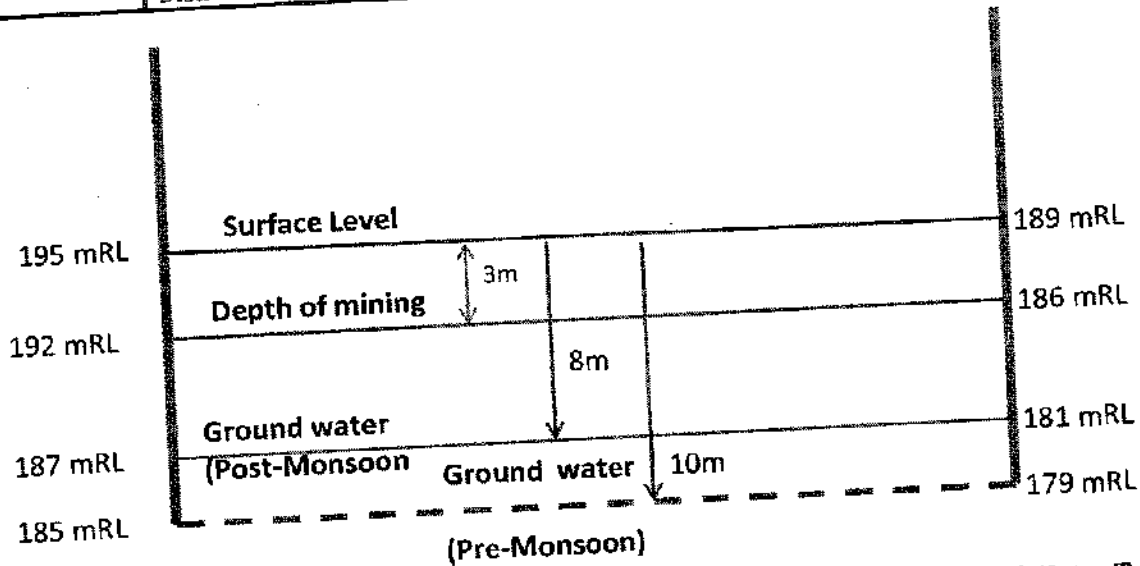
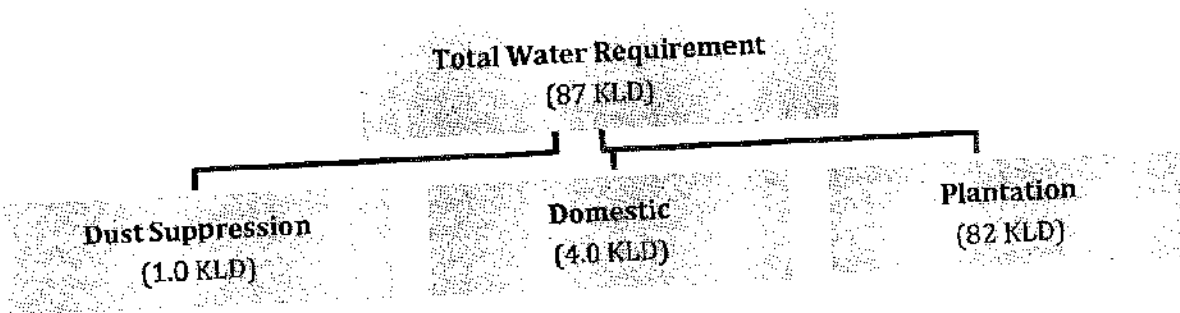


Figure 4-6: Site Specific Ground Water Table along with Schematic Diagram of Water Table

4.7.1 Management of generated domestic Waste

The proposed manpower on the mine site is 98 and estimated Domestic Water Requirement 4.0 KLD out of which waste water generated is 3.2 KLD. Movable Toilets will be used for the purpose of Sanitation. The treated water will be used in greenbelt development. A very small quantity of waste will be derived & used as manure & green belt development within mine site. The total water requirement will be 87 KLD/day.



Generated waste water will be disposed off in septic tank/Movable Toilets. There are 1 Nos. of septic tank of capacity of 5 KLD each.

Waste Water Generation
Septic Tank Requirement

: 3.2 KLD
: 1 Nos.

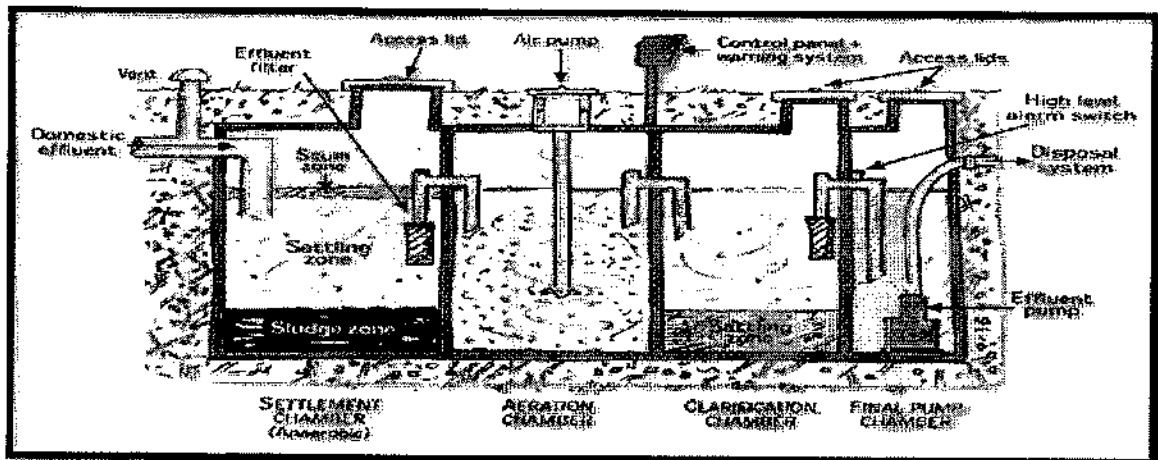


Figure 4-7: Model of septic tank for waste water treatment

Septic Tanks

A septic tank is a key component of a septic system, a small-scale sewage treatment system common in areas that lack connection to main sewage pipes provided by local governments or private corporations. Other components, generally controlled by local governments, may include pumps, alarms, sand filters, and clarified liquid effluent disposal methods such as a septic drain field, ponds, natural stone fiber filter plants or peat moss beds.

The project proponent has proposed 1 septic tanks of capacity 5000 liters.
The total retention time is 22 hours.

Description

A septic tank consists of three concrete tanks of between 400 and 1200 litres capacity. One end of the first tank (anaerobic settling chamber) is connected to an inlet wastewater pipe and the outlet end of the tank is connected to aeration chamber. The relatively clear water passes to the clarification tank from which the clear effluent is disposed to the septic drain field with the help of an effluent pump.

Generally these pipe connections are made with a T pipe, allowing liquid to enter and exit without disturbing any crust on the surface. The design of the tank usually incorporates three chambers; each equipped with a manhole cover, and separated by a dividing wall with openings located about midway between the floor and roof of the tank.

The retention time (RT) of the septic tank is usually 1 to 3 days. A longer retention time is chosen to minimize cleaning frequency (running costs). A shorter retention time is chosen to minimize tank size and initial cost. Larger tanks allow the sewage more time to digest and thus reduce the load on



DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhampur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

the drainage system. Smaller tanks (< 6m³) need longer retention times due to increased turbulence (i.e. 2 or 3 days.)

Settlement Chamber

Wastewater enters the first chamber of the tank, allowing solids to settle and scum to float. The time taken by the wastewater is about 3 hrs after which the comparatively clear water (from the settling zone) enters to the aeration chamber. The retention time for this stage is taken as 5hours.

Aeration Chamber

The settled solids are aerobically digested, reducing the volume of solids. The liquid component flows through the dividing wall into the third chamber i.e. clarification chamber where further settlement takes place. The retention time for this stage is taken as 7 hours.

Clarification Chamber

The excess liquid, now in a relatively clear condition, passes to the final pump chamber. The retention time for this stage is taken as 10 hours.

Final Pump chamber

The liquid from the clarification Chamber, then drains from the outlet into the septic drain field, with the help of an effluent pump. The disposable site is also referred to as a leach field, drain field or seepage field, depending upon locality.

4.7.2 Conclusion

In this mining project in the entire lease period the ground water table will not be intersected hence there will be no impact on the water environment.

4.8 IMPACTS ON LAND USE AND MITIGATION MEASURES

The project area does not consist of any forest land. It does not consist of any human habitations. Land use plan of the mining lease area during pre-operational, operational and post operational is shown in the Chapter 2.

| Impact | Mitigation Measure | Budget |
|--|--|--|
| The mining activity in the mine site will be converted into the pit. which may cause soil erosion, soil degradation etc. | It is proposed to plant 55,000 Nos. of trees till in 5 th years, local trees will be plant along the haul roads, and outside the mining area which enhances the binding property of the soil. | 76.0 Lakhs for 5 year. (Plantation budget as explained in Chapter-10) |

| | | |
|---|--|---|
| Reclamation of land affected by mining activities during and at the end of the mining lease period. | It is proposed to improve the effected land wherever possible for better land use, so as to support forestry and creation of water reservoir, etc. Accordingly, the land reclamation portion shall be done by planting trees along the roads and outside the lease area. | — |
|---|--|---|

4.8.1 Conclusion

The most of the land of this lease area is in the riverbed and the entire excavated land will get replenished every year hence there will be no impact on the land use. Every year the sediments in the riverbed accumulates, if these are not removed / excavated then riverbed level may be increased and the river may change its course which may cause heavy losses to the life of nearby villagers and habitants

4.9 IMPACTS ON SOIL ENVIRONMENT AND MITIGATION MEASURES

| Attributes | Impact | Mitigation Measure | Budget |
|------------|---|--|---------|
| Human | Mining in the riverbed may change the complete land use pattern, including channel geometry, bed elevation, sediment transportation capacity which can reduce flow of the river and downstream erosion. | The mining is planned in non monsoon seasons only so that the excavated area will be replenished naturally during the subsequent rainy season for the river bed mining block. The regular health checkup camp will be organized. | 3 lakhs |
| Animals | | | |
| Crops | Mining activity may increase the soil erosion and soil degradation which have adverse impact on soil fertility. | The mine lease area has been proposed leaving a safety distance of 1/4th of the width of the river from the bank inwards, which will protect the banks so channel geometry will not be disturbed. Pre and post monsoon survey for sedimentation in the riverbed will be done regularly. | |
| Plantation | | | |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhampur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | | | |
|---------------|---|----|--|
| Infrastruture | There is no major impact on infrastructure due this mining operation. | -- | |
|---------------|---|----|--|

4.10 IMPACTS ON HYDROLOGY AND MITIGATION MEASURES

| Impact | Mitigation Measure | Budget |
|--|---|---------------|
| The mining in the riverbed area may cause the ground water contamination due to the intersection of the water table. | The water table will not be intersected during mining in the riverbed as ultimate depth is limited up to 3 meters as the water table is 8-10 m bgl. Proper analysis/Monitoring will be done to check the ground and surface water. | 3 lakhs/ year |
| Change the topography will divert the water flow. | There is no proposal of any stream modification/diversion due to this mining activity hence there will be no any impact on flow of water. | |

4.10.1 Conclusion

The flow of surface/ground water (sub surface flow) is following the trend of topography, which is in the North to South direction. There is no proposal of any stream modification/diversion. Hence, there will be no impact on the hydrology of the study area. The depth of excavation in the riverbed where the ground water table is at 8-10 m bgl hence the water table is not expected to be intersected at any stage of mining.

4.11 IMPACTS ON ECOLOGY & BIODIVERSITY AND ITS MITIGATION MEASURES

Table 4-8: Ecological Impact Assessment

| Ecologic al Criteria | Identifie d Impacts | Ecological significance of Impact | Magnit ude | Duratio n /Timin g/ Freque ncy | Revers ibility | Mitigation | Cumulat ive Impact |
|----------------------|----------------------------------|---|------------|--------------------------------|----------------|------------|-----------------------|
| Zone of Influenc e | Project site habitat Due to Site | The proposed mining lease is located in Yamuna River. No site clearance | Low impact | - | Revers ible | - | No Cumulat ive impact |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | | | | | | | |
|--------------------------|--|---|--------------------------------------|--|-------------------|--|-----------------------------|
| | clearance. | is required. Only some scrub area will be cleared. | | | | | |
| Zone of Influence | Ecological Impact Surrounding habitat due to fugitive emission. | Not much impact on the surrounding habitat is envisaged due to the transportation activity except some fugitive emission. | Temporary Impact | Only during the transportation activity. | Reversible | The green belt/community forestry approach road will restrict the fugitive emission. | No cumulative impact |
| Accessibility | Ecological Impact due to road construction | Haul Road is available between mine site to nearest approach road/highway. | No impact | - | - | - | No Impact |
| Zone of Influence | Ecological Impact on Surrounding/ Eco sensitive habitat due to waste water generated from the project activity. | During operation phase daily water requirement of the proposed mining activity will be 87 KLD out of which 4.0 KLD will be required for drinking. No waste water will be discharged in the nearby area. | No impact | During operation Phase | No | The waste water will be disposed off into septic tanks. | No impact |
| Zone of Influence | Ecological Impact on Surrounding/ Eco sensitive habitat due to Noise generated from the project | The Noise level during the operation phase is around 75dB. The impact on ambient noise level will be restricted only on the mine site. The ambient air quality of the surrounding villages may not | Low impact on Flora and fauna | During operation Phase | No | As given in The EMP section. | No impact |

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Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | | | | | | | |
|--------------------------|---|--|------------------------|-------------------------------|-----------|--|------------------------------|
| | activity. | have any significance increase due to the project activity. | | | | | |
| Zone of Influence | Ecological Impact on Surrounding/Eco sensitive habitat due to Transportation | Transportation of Sand in the trucks/dumper will disturb the movement of Wild animals. Fugitive emission from vehicle movement will form a layer in leaves thus reducing the gaseous exchange process. This ultimately affects the growth of plants. Chances of vehicle collisions with wildlife attempting to cross roads are possible. | Moderate Impact | During operation Phase | No | As given in EMP. Access roads will not encroach into the riparian zones. To the extent practicable, the right-of-way (ROW) to avoid residential areas and important wildlife habitat areas (e.g. rookeries, raptor nesting areas, and calving areas) will be provided. | Low Cumulative impact |

| S.No | Impact | Mitigative Measures | Budget |
|------|--|--|---|
| | Mining on the streambed, braided flow or subsurface inter-sand flow may hinder the Movement of fishes between pools. Transportation of Sand in the trucks/dumper will disturb the movement of Wild animals and reptiles. | Transportation of mineral will be minimize in the morning and evening and cannot be done in night. Access roads will not encroach into the riparian zones. Plantation will be carried out along the approach roads and nearby community land and govt. lands. It is proposed to include Carica papaya, Ficus religiosa, Pongamiaglabra and Ficus | Rs. 76 Lakhs (Plantation budget as explained in Chapter-10) |



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| | | | |
|--|--|--|---|
| | | recinosa in the plantation program as they serve as sinks for gaseous emission | |
| | Fugitive emission from vehicle movement will form a layer on leaves, thus reducing the gas exchange process. This ultimately affects the growth of plants. | Haul roads will be sprinkled with water, which would reduce the dust emission, thus avoiding damage to the crops. Annual bio-monitoring of roadside plants exposed to vehicular pollution will be done to check the dust load and Air Pollution Tolerance Index (APTI). | Rs. 15.0 Lakhs for 5 years under Dust Suppression |
| | Chances of vehicle collisions with wildlife attempting to cross roads are possible. | Transportation of mineral will be minimized in the morning and evening and cannot be done at night. | -- |
| | Any human settlement in the mining area will disturb the vegetation cover and reptiles. | No human settlement will be permitted in the lease mining or the nearby area. | -- |
| | Indiscriminate mining from active channels of rivers causes many adverse effects on the benthic fauna, which inhabits the bottom sandy substratum. | Scientific mining will be done. | -- |
| | Excessive mineral extraction from rivers affects the ecobiology of many terrestrial insects whose initial life history begins in aquatic environments. | No mining will be carried out during the rainy season to minimize impact on aquatic life. | -- |
| | Mining may drive away the wildlife from their habitat, and significantly affect wildlife and nearby residents. | Green belt and community forestry should be encouraged to mitigate the noise level. The plantation will be carried out on approach roads and nearby vicinity at river bank areas. If wildlife is noticed crossing the area, they will not be disturbed at all. An awareness program about wildlife and its importance will be | Rs. 10.00 Lakhs (conservation Plan Budget) |

M/s Dev & Div
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Ltd.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

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| | | | |
|--|--|--|--|
| | | conducted for workers and nearby residents so that they will not disturb the wildlife at all. Sign boards will be displayed as mentioned in the conservation plan. | |
|--|--|--|--|

4.12 Conclusion

A scheduled-1 species i.e. *Pavo cristatus*, has been found in the study area for which conservation plan has been prepared and for that a budget of Rs. 10 lakh (life of Mine) is proposed.

4.13 SOCIO ECONOMIC IMPACT OF THE PROJECT AND SAFETY MEASURES

Critically analyzing the existing environmental status of the socio-economic profile and visualizing the scenario with the project, the impacts of the project would be varied and will generate both positive and negative impacts of the proposed mining in the region are stated below.

Positive Impacts

Increase in Job Opportunities

As per the survey it has been observed that the population in general do not have opportunities of earning from employment and the non worker population is higher in the region so the mining operations in general will help to provide direct and indirect job opportunities for auxiliary and ancillary works to about Around 98 workers will be employed directly in the proposed project. Transportation is required. Hence jobs and business opportunities in logistical activities will come up.

As the influx of population such as truck drivers, attendants, contractors and labourers will increase in the area. Many auxillary jobs will also increase such as Dhabbas/ hotels, Tea stalls, vehicle repairing shops etc ultimately increasing the economic status of the area.

The only employment to depend on is agriculture, which is seasonal. In the absence of any high employment potential activities, the people are economically backward. The mining operation will provide employment to mostly the local people.

Minimal burden in the existing Infrastructure Facilities

Local work force will be given first preference in the mining activity due to which influx of the outsiders will be very minimal. If sufficient number of local workers will not be available, then workers from outside will be engaged.

Improvement in Infrastructure

Continued mining activities will benefit the local people due to provision of more infrastructural facilities (developments of approach routes within the village area, street light, health facilities etc.)



Improvement in local economy

Growth in the revenue generation to the local gram panchayats is very much anticipated.

Agriculture

The agricultural activities are seen in the areas where there is sufficient soil cover. The buffer zone will remain undisturbed and no adverse impact is envisaged.

Adverse Impacts:

- Productivity of crops will be deteriorated affecting the agriculture based livelihood due to the pollution arising out of the mines, if proper mitigation measures are not implemented.
- Mining generates extra vehicle traffic, which negatively impairs the environment and also the local environment may be impacted. But to mitigate the impact trees will be planted in the area of mine site.
- With the influx of population (truck drivers, attendant, and labour etc.) at the site, the risk of sexually transmitted diseases will increase in the area.
- Risks of accidents are expected during loading of minerals into truck/tractors-trolley and during transportation. This can be avoided by adopting good safety measures and practices..

Table 4-7:IMPACTS ON SOCIO ECONOMY AND MITIGATION MEASURES

| Impact | Mitigation Measure | Budget |
|--|--|--|
| Due to mining and transportation of sand will generate the opportunity of indirect employments like small shops, dhabas, garage, and restaurant, vegetable shops etc. | Positive Impact | --- |
| Mining activity will committed to generate direct employment by recruiting 98 people which will be employed locally and preference will be given to local people. | Positive Impact | --- |
| Productivity of crops will be deteriorated affecting the agriculture based livelihood due to the pollution arising out of the mines, if proper mitigation measures are not implemented | 1.0 KLD water will be proposed for dust suppression at mine site and haul road (Motorable Connecting road) by sprinklers to avoid dust generation during mining activity and transportation. It is proposed to plant 55,000 no of | Rs. 15 Lakhs for 5 years (Dust suppression) Rs. 76 lakhs for 5 years (Plantation) |

M/s Dev & Div
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Ltd.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

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| | | |
|--|---|---|
| | local tree species during Plan period with consultation of local administration and Forest department which help to reduce in the pollution level. | |
| <p>Extraction from river banks and beds and the resultant generation of fugitive dust cause workers of the mine to suffer from occupational hazards like skin allergies, eye and respiratory problems etc.</p> <p>Further, the deep pits created in the channel also can contribute to an increase in accidents in the working environment.</p> <p>This creates serious threat to residents in the area who depend on river water for their domestic purposes.</p> | <p>Mine lease area has been proposed leaving a safety distance of 1/4th of the width of the river from the bank inwards which will protect the banks.</p> <p>Dust mask will be provided to the workers engaged at dust generation points like excavation and loading points.</p> <p>Regular water sprinkling on unpaved roads to avoid dust generation.</p> <p>The mined out area in river bed block will be reclaimed naturally every year.</p> <p>The mining is planned in nonmonsoon seasons only so that the excavated area will be replenished naturally during the subsequent rainy season for the river bed mining block.</p> | Rs. 15 Lakhs for 5 years (Dust suppression) |
| <p>The major source of socio-health impacts of transportation will generate from truck, dust etc.</p> <p>Increase in accidents as a result of rash driving of dumpers carrying mineral through the roads may be possible.</p> | <p>It is proposed to plant 55,000 Nos. of local tree species with consultation of Forest department with some fruit bearing and medicinal trees, along the haul roads, community land and government building to control the dust.</p> | Rs. 76.0 Lakhs for 5 years |

4.14 IMPACTS DUE TO SOLID WASTE/OVERBURDEN AND MITIGATION MEASURES

| Impact | Mitigation Measure | Budget |
|---|---|---|
| The mine worker will generate municipal solid waste of about 24 Kg per day (@0.25kg per person) which will have adverse impact on human health. | 5 Nos. (5 Kg each) of Garbage bins will be provided for the safe disposal of solid waste. | Rs 7.00 lakhs for 5 years for Solid waste and waste water treatment |

4.15 IMPACTS ON OCCUPATIONAL HEALTH AND SAFETY

| Impact | Mitigation Measure | Budget |
|---|---|--------------------|
| The mining of sand (minor mineral) from the river bed can cause the lung disease and respiratory disorder due to dust exposure. | Dust masks will be provided as additional personal protection equipment (helmet and safety shoes) to the workers working in the dust prone area. Regular water sprinkling will be done and dust masks will be provided to the workers. | 4 lakhs OHS Budget |
| Due to noise exposure, hearing disorder may be resulted. | Ear-muffs will be provided to the workers and good maintenance of vehicles will be provided. | |
| The accident at the site due to mining operation may be anticipated. | Workers are informed, kept aware and trained about possible accidents during the mining operation and personal protective equipments will be provided viz. gloves, safety shoes, dust mask, safety jackets, helmet etc. In addition to, the awareness about the occupational health hazards due to mining activities to avoid any incident will be provided to the workers. Pre-placement health checkup will be made mandatory and periodic health checkup will be done quarterly. | |

The details of the proposed budget for the Occupational Health and Safety are given as in Chapter 7 of this EIA/EMP report.

4.16 TRAFFIC ENVIRONMENT

The materials from the site are transported mainly through lorry vehicles. These vehicles move mainly through Yamuna express & Metalled Road. There will be slight increase in road traffic. Traffic volume on nearby roads will increase due to movement of medium and heavy vehicles however considering the overall size and nature of the project, the increase in traffic will not have any significant effect.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

Interpretation

- Out of the total traffic vehicles, 2 wheelers are very high followed by light and medium vehicles. The movement of two wheelers and light vehicles are largely found in daytime.
- The difference of heavy vehicle movement both day and night time was very marginal. The density of heavy vehicles was comparatively low.
- The LOS study shows that the traffic scenario will remain same as "Excellent".

Mitigation Measures

- It is proposed to plant 55,000 trees in 5 years with consultation of local administration and Forest department along the River banks, haul roads to prevent the impact of dust in the nearby village.
- To avoid accidents the speed of vehicles will be low near habitation areas.
- All trucks are to be used for transportation will be covered with tarpaulin, maintained, optimally loaded and have Pollution test certificates.
- In peak hours the transportation of dumpers will be suspended. Dumpers will be transported during day time only.
- All vehicles and their exhausts would be well maintained and regularly tested for emission concentration.
- Transportation will be through covered trucks and wagons.
- Truck/tippers shall be parked in designated parking area only.
- Minimize use of roads at any particular time by planning vehicles movements.

From above statements, it can be concluded that proposed mining project will have insignificant effect on the traffic and proper management plan will further reduce the negative impacts.

| S. No. | Road Name | Road Length (m) | Road Connectivity | | Total Number of Trucks/Day(8Hrs.) | Total Trips (Up/Down) | Total Volume of Mineral Transported (MT/Day) |
|--------|-----------|-----------------|-------------------|----------------|-----------------------------------|-----------------------|--|
| | | | From | To | | | |
| 1. | Haul Road | Appro x 100 | Mine Site | Yamuna Express | 40 | 9 | 8,889 |

| | | |
|---------------------------|---|----------------|
| Total Production Capacity | = | 24,00,000 MTPA |
| Production/ day | = | 8,889 MT/ Day |
| Dumper Capacity | = | 25 MT |
| Total No. of Haul Roads | = | 1 |



In this mining project there is 1 haul roads from mine site and connecting to village road. The details of haul roads with the length and transportation of dumpers (trips)/MT/Day are mentioned in the above table.

Budget

A budget of Rs. 5 Lakhs for 5 years has been proposed for the maintainace of haul road under EMP budget.

4.17 IMPACTS ON GEOLOGY AND MITIGATION

| Impact | Mitigation Measure | Budget |
|--|---|--|
| Slope of mining area will change which can create soil erosion and divert rain water runoff channel. | The maximum depth of mining in the river bed will not exceed 3 meters and the maximum depth of mining. In riverbed, 100% replenishment will be done naturally every year. | |
| Soil weathering due to dumping and mining | The mine lease area has been proposed leaving a safety distance of 1/4 th of the width of the river from the bank inwards which will protect the banks. It is proposed to plant 55,000 Nos of sepling till 5 th year of mine along the haul roads. 1.0 KLD water will be proposed for sprinkling on unpaved roads to avoid soil weathering. | Rs. 76.0 Lakhs (Plantation budget as explained in Chapter-10). Rs. 15.00 Lakhs for 5 Years for dust suppression |
| Change in topography can change the river flow and flood may occur. | Scientific mining has been proposed hence no any topographical change will occur during mining activity. Mining will be prohibited in monsoon season. | |

4.18 MINE CLOSURE PLAN

4.18.1 General

The mine closure plan is one of the most important requirements in the environmental management of mining projects. The closure operation is a continuous series of activities right from the commencement to decommissioning of the project. Therefore, the progressive mine closure plan is specifically included in the mining plan, which is to be reviewed every five years in the scheme of mining. The primary aim is to ensure that the following broad objectives along with the abandonment of the mine can be successfully achieved:

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

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- Creation of a productive and sustainable after-use for the site, acceptable to mine owners, regulatory agencies, and most importantly to the community.
- Protection of public health and safety of the surrounding habitation.
- Minimization of environmental damage.
- Conservation of valuable attributes and aesthetics.
- Counter balancing the adverse socioeconomic impacts.

Disposal of Mining Machinery

Initially all machinery has arranged on hire basis by the authorized contractors. There is no proposal of disposal of mining machinery during the Scheme of Mining.

Safety and security

Safety measures to be implemented to prevent access to excavations area by un-authorized persons as per Mines Act 1957, MMR, 1960.

- Safety measures will be implemented as per Mines Act 1957, MMR, 1960, Mines Rules 1955.
- Provision of MMR, 1960 will be followed strictly and all roads will be 10 m wide and have a gradient of not more than 1 in 20.
- Excavation will not be more than 3 m in river bed.
- Width of bench will be kept around 20.0 m for ease of operations and provide sufficient room for the movement of equipments.
- Protective equipment like dust masks, ear plugs / muffs and other equipments will be provided for use by the work persons.
- Notice giving warning to prevent inadvertent entry of persons will be displayed at all conspicuous places and in particular near mine entries.
- Danger signs will be displayed near the excavations.
- Security guards will be posted.
- In the event of temporary closer, approaches will be fenced off and notice displayed.

Time Scheduling for Abandonment

The mining area has enormous potential for continuance of operations even after the expiry of the awarded period. The details of time schedule of all abandonment will be given at the time of final closer plan.

4.19 SUMMARY

The proposed mining operations are not anticipated to raise the concentration of the pollutants beyond prescribed limits. However, the measures are suggested to mitigate any harmful impacts of pollutants like a plantation of trees along haul roads, especially near settlements, to help to reduce the impact of dust on the nearby villages; planning, transportation routes of mined material so as to



reach the nearest paved roads by the shortest route; regular water sprinkling on unpaved roads to avoid dust generation during transportation etc. Some of impacts may be due to increase in the PCU/hr which are **203 PCU/hr** (Yamuna Express) & **68 PCU/hr** (Metalled Road Chhainsa). Transportation of Sand should be minimized in the morning and evening and cannot be done in night. Access roads will not encroach into the riparian zones. Fugitive emission from vehicle movement will form a layer on leaves, thus reducing the gas exchange process. The impact on the present noise levels due to mining operations will be restricted to the work zone areas only. The impact on the ambient noise levels will not be felt at the settlement areas due to masking effect with the existing noise levels. There is no drilling and blasting envisaged in the Sand mining so there is no impact of vibration due to this project. Hence, the noise levels and vibration impact due to the proposed mining operations on the community will be minimal. The percentage of replenishment is more than 100% every year. In view of this huge amount of sedimentation there are fair chances of replenishment of the river bed annually. There will be no waste water generated from the proposed mining activity except a sanitary waste water generation that will be treated in septic tanks and will be used for plantation purpose. There will be no overburden due to mining in the riverbed area. The mining activities will be done in a systematic manner by maintaining the road infrastructure and vehicle transport, which will be a protective measure for preserving the topography and drainage in the area. The ownership will not be changed as the land has been taken on contract which will be returned as it is after the contract period is over. No human settlement should be permitted in the lease mining or the nearby area. No mining will be carried out during the rainy season to minimize impact on aquatic life. There is only 1 specie of Schedule I, observed during the study period hence, for the same conservation plan has been prepared. Subsequently, a budget of Rs.10.00 lakhs has allotted for the conservation of wildlife species. The mining of Sand is likely to increase the per capita income of local people by which the socioeconomic status of the people will be improved. The local people have been provided with either direct employments or indirect employment such as business, contract works and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc. Except dust generation, there is no source which can show a probability for health related diseases. Regular water sprinkling will be done with sprinkles mounted tankers and dust masks will be provided to the workers. All workers will be subjected to a medical examination as per Mines Rule 1955 both at the time of appointment and at least once in a year. Medical camps will be organized for this activity. Insurance for all employees as per the rules will also be carried out.



5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

5.1 INTRODUCTION

Consideration of alternatives to a project proposal is a requirement of the EIA process. During the scoping process, alternatives to a proposal can be considered or refined, either directly or by reference to the key issues identified. A comparison of alternatives helps to determine the best method of achieving the project objectives with minimum environmental impacts or indicates more environmentally friendly and cost effective options.

5.2 ALTERNATIVE FOR MINE LEASE

During monsoon season, when rivers reach high stage, Yamuna River also bears significant catchment area and it transports river bed material (sand) which gets accumulated at such stretch which widens the river width and concave banks. Thus, it is evident that the proposed site will be mined for the purpose of preventing land cutting during heavy rainfall and floods. Sand (Minor Mineral) deposits are site specific. It is present in Yamuna river bed (66.32 Ha.). The mining of the material will be done by open-cast semi-mechanized method in riverbed. The mining will be done as per procedures laid down by Haryana Minor Mineral Concession Rules, 2012 and River sand mining Guide lines 2020. The mined out area in river bed block will get replenished annually after monsoon. Therefore, no alternate site is suggested as existing land use of mine lease classified as "River Body".

5.3 ALTERNATIVE FOR TECHNOLOGY AND OTHER PARAMETERS

Some alternatives considered during the EIA study are discussed below:

| S.No. | Particular | Alternative Option 1 | Alternative Option 2 | Remarks |
|-------|---------------------|------------------------------|----------------------------------|---|
| 1 | Technology | Open-cast mechanized mining. | Open-cast semi mechanized mining | Open-cast mechanized is preferred Benefits: <ul style="list-style-type: none"> • less time consuming • No electric power requirement • Minimal noise will be generated • Minimal air pollution will be generated • Overburden will not be generated. |
| 2 | Employment | Local employment | Outsource employment | Local employment is preferred Benefits: <ul style="list-style-type: none"> • Provides employment to local people along with financial benefits • No residential building/housing is required |
| 3 | Laborer transportat | Public transport | Private transport | Local labors will be deployed so they will either reach the site by bicycle or by foot. |

| | | | | |
|---|--------------------------|-----------------|------------------------------------|--|
| | ion | | | <p>Benefits:</p> <ul style="list-style-type: none"> • Cost of transportation of men will be negligible. |
| 4 | Material transportat ion | Truck transport | Rail transport | <p>Material will be transported through trucks on the contract basis</p> <p>Benefits:</p> <p>It will give indirect employment</p> |
| 5 | Water requiremen t | Tanker supplier | Ground water/surface water supply. | <p>Tanker supply will be preferred.</p> <p>Benefits:</p> <p>No change in the surface water or ground water quality</p> |
| 6 | Road | Haul road | Metalled road. | <p>Haul road will be considered for linking mine sites from metalled roads for transportation purpose</p> <p>Minimum distance will be measured along with less number of trees for considering optimum haul road routes.</p> <p>Benefits:</p> <p>Less distance, less fuel used, minimum or negligible no. of trees will be cut in best opted haul road route.</p> |

5.4 Summary

The project proponent have analyzed all the option for alternatives of the proposed mine site. This project is a Sand (Minor Mineral) specific project and existing land use of mine lease classified as River Body which will continue to be so even after the current mining project is over, hence no alternate site is suggested for this project.



6. ENVIRONMENTAL MONITORING PROGRAM

6.1 INTRODUCTION

Regular monitoring of the various environmental parameters is necessary to evaluate the effectiveness of the management program so that the necessary corrective measures can be taken in case there are some drawbacks in the proposed program. Since environmental quality parameters at work zone and surrounding area are important for maintaining sound operating practices of the project in conformity with environmental regulations, the post project monitoring work forms part of Environmental Monitoring Program. The Environmental Monitoring Program will be implemented once the project activity commences. The Environmental Monitoring Program includes: (i) environmental surveillance (ii) analysis and interpretation of data (iii) preparation of reports to support environmental management system and (iv) organizational set up responsible for the implementation of the program.

6.2 ENVIRONMENTAL MANAGEMENT CELL

In order to maintain the environmental quality within the stipulated standards, by M/s Dev & Div Solutions Pvt. Ltd. has taken decision to formulate an Environment Policy (**Annexure VII**) for the Environmental Management Cell of the proposed mine which will forsee the regular monitoring of various environmental components and its compliance as per specified conditions.

6.3 ENVIRONMENTAL MONITORING AND REPORTING PROCEDURE

Monitoring shall confirm that commitments are being met. This may take the form of direct measurement and recording of quantitative information, such as amounts and concentrations of discharges and wastes, for measurement against corporate or statutory standards, consent limits or targets. It may also require measurement of ambient environmental quality in the vicinity of a site using ecological/biological, physical and chemical indicators. Monitoring may include socio-economic interaction, through local liaison activities or even assessment of complaints.

The key aims of environmental monitoring are:

- To ensure that results/ conditions are as forecast during the planning stage, and where they are not, to pinpoint the cause and implement action to remedy the situation.
- To verify the evaluations made during the planning process, in particular with risk and impact assessments and standards and target setting and measure operational and process efficiency.
- Monitoring will also be required to meet compliance with statutory and corporate requirements.
- Finally, monitoring results provide the basis for auditing, *i.e.* to identify unexpected changes.

6.3.1 Ambient Air Quality

Further efforts shall be made to install 8 Ambient Air Quality monitoring station, in consultation with HSPCB. Ambient air quality monitoring in and around the premises will be done as per direction by HSPCB. The selected parameters shall be monitored as per National Ambient air quality Standard, 2009.

Table 6.1: Proposed Ambient Air Quality Monitoring (Frequency and Parameters)

| Description | Number of Monitoring Stations | Frequency |
|---|-------------------------------|-----------|
| Ambient Air Quality | 8 | Monthly |
| Parameters – PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , CO, PAH (both side of the road) | | |

6.3.2 Fugitive Emissions Monitoring

Fugitive emissions shall be monitored in predominant down wind direction for Particulate Matters at a distance of 25 + 2 meters from the source of pollution, at following locations:

Table 6.2: Fugitive Emissions Monitoring Location

| Area | Monitoring Location |
|--------------------------|--------------------------|
| Mine Face | loading |
| Haul Road / Service Road | Haul road, Loading Areas |
| Storage and loading | Truck loading area |

Effluent Quality - Not Applicable

There will be no effluent generation from the mine as the proposed mine has adopted Zero Liquid Discharge (ZLD). Domestic waste water is being treated in Septic tank, followed by Soak pit. Discharge if any from the Soak Pit is being used for plantation.

Ground and Surface Water Quality

Ground water quality of the Borewells / Hand pumps near the active mine area shall be measured, once in a year, to check for the quality of ground water for any contamination due to mining activities. Results of the ground water will be compared with IS: 10500:2012, drinking water standard. Surface Water Samples will be collected and compared with IS: 2296 surface water standard.

Noise Monitoring

Work-Zone Noise

Noise monitoring shall be carried out at near to the high noise generating areas like loading, unloading and haul roads etc., once in a month.

Plantation

Plant growth, its maintenance and survival rate will be monitored.

Occupational Health & Safety Monitoring

Surveillance of workers health: A systematic program for medical check-up at regular intervals is being followed at the Occupational Health Centre (OHC) of the Mine for all workers (including contractor workers) to ascertain any changes in the health condition of workers due to the working conditions. Employees health is being checked at the time of joining and at regular interval, thereafter

Inspection and Testing of Safety Appliances: All safety appliances shall be regularly inspected and tested as hazard control measures for mine operation. The inspection shall verify that issued personal protective equipment (PPE) continues to provide adequate protection and is being worn as required.

Training

Training activities for employees and visitors shall be adequately monitored and documented (curriculum, duration, and participants). Emergency exercises, including fire drills shall be documented adequately.

Periodic Inspection of Effectiveness of Pollution Control Facilities

A detailed inspection schedule shall be drawn for checking the effectiveness all pollution control systems. The maintenance shall be done strictly as per schedule and guidelines furnished by equipment manufacturer.

Socio-Economic Development

The mining activities have improved the socio-economic conditions in the surrounding area. The proposed project will improve the infrastructure, economic conditions. The communities, benefited by the mine, are the key stakeholders of the mining. It is suggested that M/s Dev & Div Solutions Pvt. Ltd. should have structured interactions with the community to disseminate the measures taken by the mine and also to elicit suggestions for overall improvement for the development of the area.

Accidents and Diseases Monitoring

M/s Dev & Div Solutions Pvt. Ltd. shall establish procedures and systems for reporting and recording of Occupational accidents and diseases and dangerous occurrences and incidents.

These systems shall enable workers to report immediately to their immediate supervisor any situation they believe presents a serious danger to life or health. The systems and the employer shall further enable and encourage workers to report to management all:

- Occupational injuries and near misses;
- Suspected cases of occupational disease; and
- Dangerous occurrences and incidents.

All reported occupational accidents, occupational diseases, dangerous occurrences and incidents together with near misses shall be investigated with the assistance of a person knowledgeable/competent in occupational safety. The investigation shall:

- Establish what happened;
- Determine the cause of what happened; and
- Identify measures necessary to prevent a recurrence

6.4 Budget allocation for monitoring

In order to maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary. For this the project proponent has constituted an Environmental Management Cell. The Cell will make appropriate budget for the purpose. Regular record review for any change in financial requirement of environment management will be done and appropriate budgetary provisions will be made. Along with other budgets, Budget for environmental monitoring will be prepared and revised regularly as per requirement.

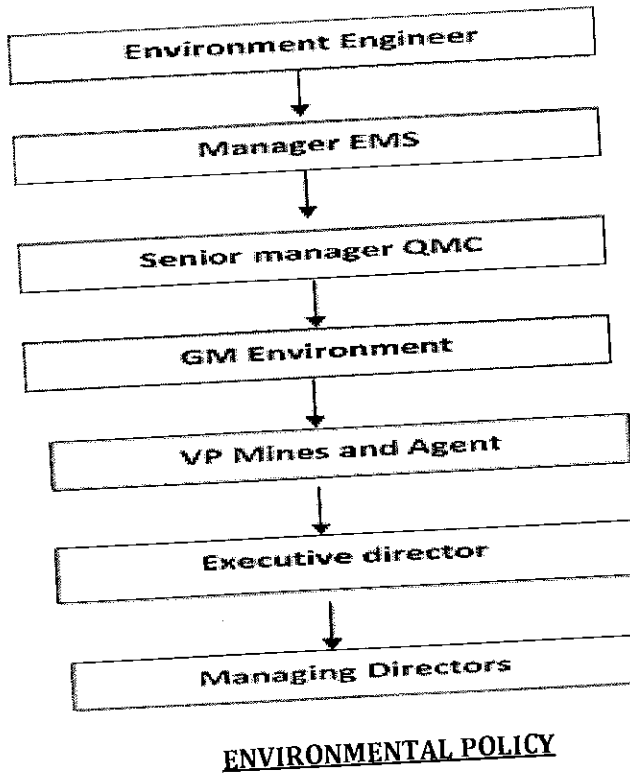
Table 6.3: Cost of Environmental Monitoring Program

| S. No. | Item | Cost in Rs. Per year |
|--------------|---|----------------------|
| 1. | Cost of monitoring of environmental parameters for Air, Water, Noise and Soil | 3,00,000 |
| 3. | Efficiency monitoring of Pollution Control Equipment | 1,00,000 |
| 4. | Occupational Health & Safety | 1,00,000 |
| 5 | Plantation | 2,00,000 |
| 6 | Socio-economic development | 1,00,000 |
| Total | | 8,00,000 |

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

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6.5 ENVIRONMENTAL POLICY: Environment policy is provided below:



EMC will serve the following purpose:

- Identification of any environmental problem, which may occur in the mine or surrounding area
- Initiating or providing solutions to those problems through designated channels and verification of the implementation status
- Control of activities inside the mine, until the environmental problem has been corrected
- Suitably respond to emergency situations. Provide details of the emergency and the actions taken to the top management
- Suitably make modifications or alterations in the mine to meet regulatory standards as amended from time to time.

Monitoring & responsibility

The cell will responsible for monitoring of the mine environment related requirements which include:

Interaction with the State Pollution Control Board

EMC shall be in regular touch with HSPCB and shall send them environmental monitoring reports regularly in the prescribed format, as per the prevailing practice. Any new regulations considered by State/Central Pollution Control Board for the mine shall be taken care of by EMC.

Providing Training

EMC would be responsible for the implementation of the EMP, needs to be trained on the effective implementation of the environmental issues. To ensure the success of the implementation set up proposed, there is a high requirement of training and skill up-gradation. For the proposed expansion project, additional training facilities will be developed for environmental control. For proper implementation of the EMP, the officials responsible for EMP implementation will be trained accordingly.

To achieve the overall objective of pollution control it is essential not only to provide latest pollution control and monitoring systems but also to provide trained man power resources to operate and maintain the same. So far, the practice with many mines is to utilize the mine operations and maintenance crew for operation of systems. This has shown adverse results due to lack of specialized knowledge in addition to priority selection. Therefore, apart from the ECD, specific training will be provided to personnel handling the operation and maintenance of different pollution control equipment.

In-mine training facilities will be developed for environmental control. Specialized courses at various Research / Educational institutes will be organized. The training will be given to employees to cover the following fields:

- Awareness of pollution control and environmental protection to all.
- Operation and maintenance of specialized pollution control equipment.
- Organize field monitoring, maintenance and calibration of pollution monitoring instruments.
- Laboratory testing of pollutants.
- Repair of pollution monitoring instruments.
- Occupational health/safety.
- Disaster management.
- Environmental management.
- Afforestation / plantation and post care of mine.
- Knowledge of norms, regulations and procedures.
- Risk assessment and Disaster Management.

The cell will also be responsible for monitoring of the mine safety and safety related systems which include

- Checking of safety related operating conditions.
- Visual inspection of safety equipment
- Preparation of a maintenance plan and documentation of maintenance work specifying different maintenance intervals and the type of work to be performed

Other responsibilities of the cell will include

- A HSPCB registered agency will be retained to generate the environment quality data in respect of air, water, noise, soil and meteorology and prepare the Environmental report.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

- Submitting environmental monitoring report to HSPCB. The cell will also take mitigative or corrective measures as required or suggested by the Board.
- Timely renewal of Consents & Authorization will be taken care of.
- File the Cess returns to the State PCB under the Water (Prevention and Control of Pollution) Cess Act, 1977.
- Conduct and submit annual Environmental Statement to HSPCB to the State Pollution Control Board in Form V under Rule 14 of the Environment (Protection) Second Amendment Rules 1992 of the Environment (Protection) Act, 1986.
- Prepare and submit six monthly report on the compliance with the conditions of the environmental clearance and submit to the Regional Office of MoEF&CC
- Comply with the conditions prescribed under the Consents and Authorization
- File timely return under Hazardous and Other Wastes (Management and Trans-boundary Movement) Rules, 2016, E-Waste (Management) Rules, 2016 and Batteries (Management and Handling) Rules, 2001.
- Keeping the management updated on regular basis about the findings / results of monitoring activities and proposes measures to improve environmental performance.
- Conducting regular safety drills and training programs to educate employees on safety practices. A qualified and experienced safety officer will be responsible for the identification of the hazardous conditions and unsafe acts of workers and advise on corrective actions, organize training programs and provide professional expert advice on various issues related to occupational safety and health.
- Conducting safety and health audits to ensure that recommended safety and health measures are followed.

Responsibilities for Environmental Management Cell (EMC) under Integrated Management System of the Mine

The responsibilities of the EMC include the following:

- Green belt development and inventory of flora
- Ensuring minimal use of water.
- Proper implementation of pollution control measures.
- Access the risk area.
- Implementation of QMS.
- Conducting Internal Audits.
- Closing of NCs and conduction of Management Review Meetings.
- Implementation of the control and protective measures.
- Coordination related to environment related activities within the project area as well as related outside agencies.
- Collection of health statistics of workers.
- Monitoring the progress of implementation of environmental management programme.
- Management of drainage system, dumps, reclamation and restoration etc.
- To make continuous efforts to improve environment.

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Table 6.4: Responsibility Matrix for Implementation of Environmental Management

| Attributes | Environmental Management | | | | | Reporting and Receiving Feedback from Statutory Authority | |
|---|--|---|---|--|---|---|------------------------|
| | Primary Responsibility and Report Generation | Short Term and Time Series Analysis and Generation of Status Report | Approval of Status Report and Decision on Actions | Implementation of Follow up Action | Verification of Follow up Action and Reporting Back to Approval Authority | Who will do? | Whom to report? |
| Environment Monitoring (Air, Water & Noise) | EMC [Monitoring cell] | Head (EMC) | GM (EMC) | EMC [Monitoring cell] | GM (EMC) | EMC | Regional MoEF&CC/SPC B |
| Plantation & Greenbelt development | EMC [Plantation cell] | | | EMC [Plantation cell] | | | |
| Replenishment progress | EMC cell] | | | EMC cell] | | | |
| Social Welfare | CSR cell | | | CSR cell | | CSR cell | State Government |
| Drainage cleaning | Civil | | | Civil | | NA | |
| Water and Energy Utilization | Mechanical, Electrical and Civil Maintenance | | | Mechanical, Electrical and Civil Maintenance | | NA | |
| Occupational Health Monitoring | Health unit | | | Mining & Excavation | | NA | |
| Environmental and safety related training | Vocational training centre | Vocational training centre | DGMS | | | | |

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6.7 MONITORING SCHEDULE

Regular Monitoring of all the environmental parameters viz., air, water, noise and soil as per the formulated program based on CPCB and MoEF&CC guidelines will be carried out every year in order to detect any changes from the baseline status.

Table 6-5: Monitoring Schedule

| S. No. | Description | Schedule Of Monitoring |
|--------|--|------------------------|
| 1. | Air Quality | Twice in a week |
| 2. | Water Quality (Surface and Ground Water) | Twice in a week |
| 3. | Noise Level | Quarterly |
| 4. | Soil Quality | Yearly |
| 5. | Socioeconomic Condition | Quarterly |
| 6. | Plantation Monitoring | Yearly |

6.8 SUMMARY

In order to maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary which will comply as per conditions. For this lessee by M/s Dev & Div Solutions Pvt. Ltd. has taken the decision to formulate an Environment Policy of the mine and constitute an Environmental Management Cell and committed to operate the proposed mine with the objectives mentioned in approved Environment Policy. EMP may also require measurement of ambient environmental quality in the vicinity of a site using ecological/biological, physical and chemical indicators. Monitoring may include socioeconomic interaction, through local liaison activities or even assessment of complaints. Regular Monitoring of all the environmental parameters viz., air, water, noise and soil as per the formulated program based on CPCB and MoEF&CC guidelines will be carried out every year. The location of the monitoring stations was selected on the basis of prevailing micro meteorological conditions of the area like; wind direction and wind speed, relative humidity, temperature.



7. Contents

| | | |
|-------|--|-----|
| 6. | ENVIRONMENTAL MONITORING PROGRAM..... | 121 |
| 6.1 | INTRODUCTION | 121 |
| 6.2 | ENVIRONMENTAL MANAGEMENT CELL | 121 |
| 6.3 | ENVIRONMENTAL MONITORING AND REPORTING PROCEDURE | 121 |
| 6.3.1 | Ambient Air Quality..... | 122 |
| 6.3.2 | Fugitive Emissions Monitoring | 122 |

| | | |
|---|--|-----|
| 6.4 | Budget allocation for monitoring | 124 |
| 6.5 | ENVIRONMENTAL POLICY: Environment policy is provided below:..... | 125 |
| 6.7 | MONITORING SCHEDULE..... | 129 |
| 6.8 | SUMMARY..... | 129 |
| | | |
| Table 6.1: Proposed Ambient Air Quality Monitoring (Frequency and Parameters)... | | 122 |
| Table 6.2: Fugitive Emissions Monitoring Location | | 122 |
| Table 6.3: Cost of Environmental Monitoring Program..... | | 124 |
| Table 6.4: Responsibility Matrix for Implementation of Environmental Management | | 128 |
| Table 6-5: Monitoring Schedule..... | | 129 |



7. ADDITIONAL STUDIES

7.1 General

Mining operations are associated with several potential hazards that affect adversely the human health and environment. It would normally require the assistance of emergency services to handle it effectively. The mining operation will be taken up under the supervision and control of qualified staff including Mine Manager (Grade I). Similarly sand mines also have impending dangers and risk which need to be addressed for which a disaster management plan has been prepared with an aim of taking precautionary steps to avert disasters and also to take such action after the disaster which limits the damage to the minimum.

7.2 PUBLIC CONSULTATION

Public hearing is very significant part of the process of public participation envisaged under the guidelines issued by MoEF&CC, Government of India. It facilitates involvement of all the stake holders of the project which is essential for ensuring smooth running of project and benefitting all sections of society in the process of economic development of the region. The Final EIA/EMP will include all the public issues along with action plan and its subsequent budget after conducting the public hearing.

7.3 RISK ASSESSMENT

7.3.1 INTRODUCTION

Mining are associated with several hazards that pose impacts on employees & surrounding area necessitating adequate implementation of Safety and health measures. Hence, mine safety is one of the most essential aspects. Proposed Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MT production capacity over an area of 66.32 Hectare by M/s Dev & Div Solutions Pvt. Ltd. It is an open-cast semi mechanized mining project. Envisaged mining operation will be carried out in the River bed of Yamuna River. There will be no mining activities when there is flow of water in the working zones. During rainy season, the activities will be stopped.

Besides resource extraction, following activities will be kept in view:

- Protection and restoration of ecological system.
- Prevent damages to the river regime
- Protect riverine configuration such as bank erosion, change of water course gradient, flow regime etc.
- Prevent contamination of ground water.

The size of the sediments is variable. The grains, whether small or large, are round in shape. Sand is grey, brown in color, coarse to fine grained. The present deposits are of good quality and can be used for building industries. There is no other use of this materials.

7.3.2 Methodology & Risk Assessment For Mining Of Sand Operation

Mining is among the most hazardous activities all around the world, being always accompanied with different incidents, injuries, loss of lives, and property damages. Dimension stone quarrying constitutes a big portion of mining activities. Risk assessment is all about prevention of accidents and there is a need

to be aware that there is the risk of an accident before steps can be taken to prevent it happening. It may not always be obvious that a workplace task could lead to an accident. This is why risk assessments are carried out. In risk assessment the words Hazards and Risks are often used and it is necessary to be clear what Hazards and Risks are: -

- A hazard is anything that has the potential to cause harm.
- The risk is how likely it is that a hazard will cause actual harm.

Having defined the work to be undertaken risk assessment will give a clearer picture of what could go

wrong and how serious an accident could be. It will depend upon following a set model which will enable the risk to be assessed.

7.3.3 Model For Risk Assessment

This model (shown in Fig 7.1) is best understood by working through the steps listed below;

1. **Identify the hazard** - How an accident might happen? Consider what or how things could go wrong when the activity is carried out.
2. **Identify who is at risk** - Who is involved in the activity? Who else could be at risk.
3. **Remove the hazard** - Can the activity be carried out in another way so as to eliminate the hazard.
4. **Evaluate the risk** - How likely is an accident to happen? How serious would the injury be if there is an accident while carrying out the activity?
5. **Decide on control measures** - Look at what measures have been taken already to ensure that persons do not have an accident. For example, have suitable and sufficient guards been fitted? Decide whether anything else needs to be done. For example, it may be necessary to provide extra training in the safe use of machinery and only allow trained workers to use it.
6. **Record the assessment** - The risk assessment should be recorded.
7. **Review** - The assessment will need to be reviewed every time there are changes in the workplace, for example new members of staff, new equipment, new systems of work and new location.

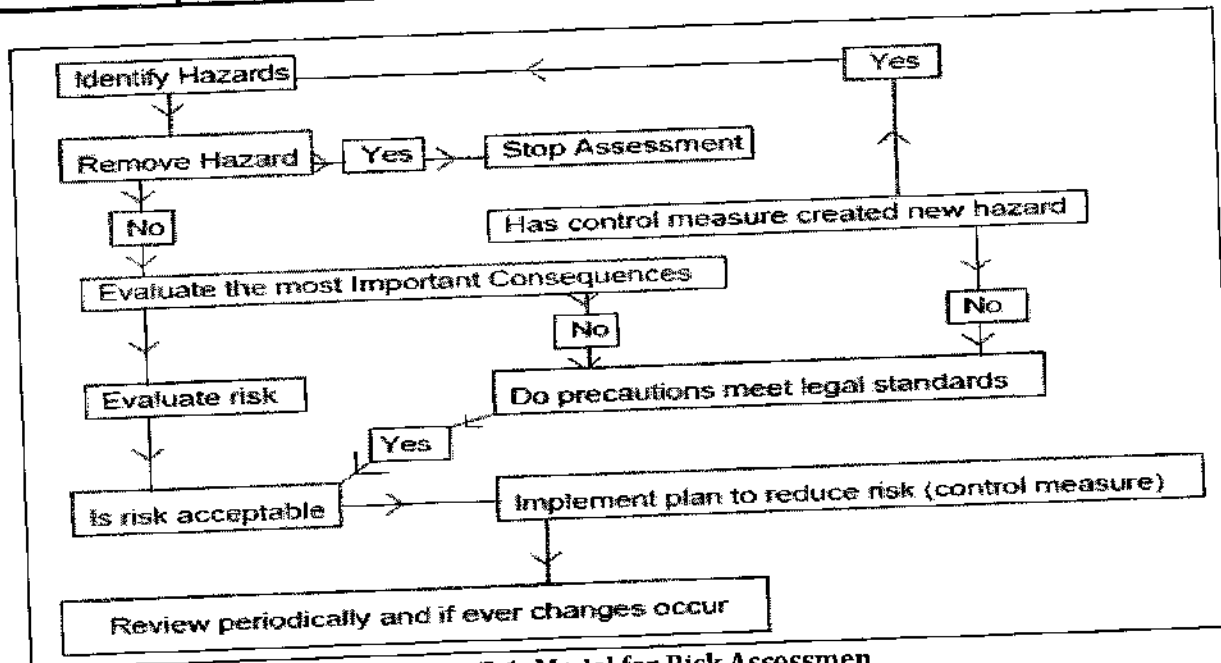


Figure 7-1: Model for Risk Assessment

7.4 Hazard identification and risk assessment

7.4.1 Major Risks Involved In River Bed Mining Are Following:

1. River Bed Inundation
2. Soil Erosion
3. Uneven/ Irregular mining of sand may result in ponds
4. Disturbance of Ground water Level
5. Damage of River bank due to access of Ramps
6. River bank collapse due to close proximity of river bed mining
7. Surface degradation due to road network
8. Sand storage stacks stability Failure
9. Failure of Pit slope
10. Occupational Health Hazard
11. Accident at site/crusher
12. Transportation
13. Natural hazards (At the Project Site, Tehsil-Loni)
 - I. Earthquake
 - II. Flood
 - III. Cloud Burst
 - IV. Severe Storms, including lightning and high winds (Thunderstorms)
 - V. Heat and Cold Wave
 - VI. Severe Storms, including lightning and high winds (Thunderstorms)

7.4.2 Other Hazards

Machines used for desired Production.



This is a new mining project. Following equipments are proposed to be deployed for the desired production and has been shown in below table no. 7.1.

Table 7.1: List of Machineries

| S. No. | Name of machinery | Capacity | Nos. |
|--------|-------------------|-------------|------|
| 1 | JCB | 200 Hp | 08 |
| 2 | Tippers/ Trucks | 25 tons | 40 |
| 3 | Water Tanker | 4000 liters | 2 |
| 4 | Light vehicles | -- | 2 |

(Source: Mining Plan and Progressive Mine Closure Plan)

Table 7.2: Risk Ranking Matrix for risk assessment M/s Dev & Div Solutions Pvt. Ltd.

| S.No | Activities | Human Risk | | | Ecological Risk | | |
|------|--------------------------|---------------------------|-------------|------------|-----------------|-----|-------|
| | | Probability of Occurrence | Consequence | Risk Level | Land | Air | Water |
| 1. | Sand Loading | Possible | Critical | 6 | 0 | 0 | 0 |
| 2. | Sand Transport | Possible | Critical | 6 | 0 | 0 | 0 |
| 3. | Sand Dumping and Storage | Possible | Critical | 6 | 0 | 1 | 0 |
| 4. | Induction/Flooding | Possible | Minor | 3 | 1 | 0 | 0 |
| 5. | Earthquake | Possible | Minor | 3 | 1 | 0 | 1 |
| 6. | Food | Possible | Minor | 3 | 1 | 0 | 1 |
| 7. | Quick Sand Condition | Possible | Minor | 3 | 0 | 0 | 0 |
| 8. | Drowning | Possible | Critical | 4 | 0 | 0 | 0 |
| 9. | Vehicular Movement | High | Critical | 8 | 1 | 2 | 0 |

7.5 Mitigation Measures And Disaster Management Plan:

1. Possible Risks Due to Inundation & Its Control

Mining will be done during the non-monsoon periods so there shall be no problem of inundation is likely

to happen. Mining is done by excavating the mineral in 1½ meter slice at a time with a maximum of 2 such slices.

2. Soil Erosion

Top Soil Excavated shall be reused in plantation and green belt development. No mining will be done within 10 m from the either side of river banks to maintain its protection. Mining will proceed along the river in the direction from downstream to upstream in each block. No mining will be done across the river-nalla.

3. Uneven/ Irregular mining of sand

Due to uneven/ irregular thickness of sand bed, river bed mining may result in ponds to develop. Proper management of even excavation can overcome this. Mining will be done for ½ metre thick strip at a time in the direction of river, to avoid ponding effect and maintaining the uniform surface.

4. Disturbance of Ground water Level

Excavation will be carried out up to a maximum depth of 3 meters from surface of sand deposit and not less than one meter from the water level of the River channel whichever is reached earlier. Work is to be

done from dip towards rise side and also laterally towards the boundary with 1.5 m slice every time, so as not to touch the river bed water level.

5. Possible Risks Due to Failure of Pit Slope & Its Control

sand should not be collected within 2.5 to 5 m from the bank. Pit will be created of limited depth only i.e. 3 m thus the chance of failure of pit slope does not exist.

6. Possible Risks Due to Failure of waste Dump & Its Control

No waste dump is created therefore the question of failure of waste dump does not exist.

7. Possible Risks Due to Fire & Its Control

The operation does not anticipate any fire disaster (only use excavators that are diesel based engines onsite for sand collection and storage).

7.5.1 Measures to Prevent Accidents Due to Trucks and Dumpers

- All transportation within the main working should be carried out directly under the supervision and control of management & Oil spill contro.
- The vehicles will be maintained in good condition and checked thoroughly at least once a month by the competent person authorized for the purpose by the management.
- Road signs will be provided at each and every turning point up to the main road (wherever required).
- To avoid danger while reversing the trackless vehicles especially at the embankment and tipping points, all areas for reversing of trucks/ tippers should as far as possible be made man free.
- A statutory provision of the fences, constant education, training etc. will go a long way in reducing the incidents of such accidents.
- Haul trucks should be oriented essentially perpendicular to the berm, while unloading.

7.5.2 Oil Spill Management

Mining sites commonly experience hydraulic oil spills from vehicles and machinery. Left unattended hydrocarbons can reach water in the river . Total nine trips (9 trips/day X 2 up & down) of Trucks in the mine site in a day. As there is no statics available for failure probability of Incoming Trucks at Mine site. Oily Waste Generated after containment will be given to HSPCB Approved Recyclers. Following arrangement will be made at site for to Contain Small and Major oil Leak.

Common spill products shall be made Readily Available for mining sites include following:

- Drip and Spill Tray
- Oil Spill kits

7.5.3 Haul roads:

1. All the haul and service roads shall be well maintained.
2. haul roads shall be free of ruts and pot holes.
3. All haul roads and surface roads shall be regularly sprayed with water.
4. Plantation alongside haul roads (avenue plantation) shall be carried out done.
5. Mined material receiving pits are shall be located close to the quarry to reduce the haul length of the dumper.

7.5.4 Other Possible Measures to Avoid Risks/ Disaster Due to River Bed Mining

- Identification & determination of safe clearances by the height of river bed & thickness of sand to be extracted from the close vicinity of bank.
- Unused material including sand or spillage (if any) should not be stocked on the banks as it will hinder the flow of river in monsoon season.
- At least 2.5-5m sand bed should be left in situ while harvesting sand from river bed.
- Collection of minerals/working shall be started from the centre towards the bank periphery in ½ meter slice so that the river course could not get affected.
- The minerals will be mined out in a uniform way so that the river flow/course shall not get disturbed in its uniformity.
- River bank areas, under operation will be protected by avoiding unauthorized gravel excavation along rivers as that may cause instability to the river bank.
- River banks will not be excavated to form access ramps.
- Only excavated river gravel should be used to deposit against the river bank to form access ramps.

7.6 Natural Hazards in the Haryana District

Hazard in district Faridabad. The following are the hazards that have a probability of occurrence in Faridabad, based on the history of their occurrence in the district and their probability:

1. Earthquake
2. Flood
3. Fire/ Forest Fire
4. Landslide
5. Winds
6. Accidents
7. Epidemics
8. Industrial/Chemical Hazard
9. Lightening & Cloud Burst
10. Nuclear Attack
11. TerroristAttack

Table 7.3: Vulnerability Profile of the district

| S.No | Hazard Risk | Name of Hazard | Risk Elements | Remarks |
|------|-------------|----------------|--------------------|--------------------------|
| 1. | High Risk | Earthquake | Human Life, Cattle | The whole district comes |

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| | | | | |
|----|-----------------------|----------------|---|--|
| | Hazards | | Life, Transport, Houses, Infrastructure, Development Activities etc. | under zone IV. District has no any experience of any high intensity of EQ |
| | | Flood | Agriculture crops, Transport, construction activity, Drinking water, Cattle & its food, Vulnerable groups, Electricity, Rice mills, Livelihood, Trees (Plantation). | The river passes through district are Yamuna & Hidon River |
| | | Fire | Human Life, Cattle Life, Houses & Property, Crops in fields, Malls. | Fire incidents are more frequent in the forests and generally occur during summer season. Fires in the Industrial areas, Garbage bins, and Urban areas are also common. |
| | | Landslide | Human Loss, Infrastructural damage, vegetation cover | Deforestation due to urbanization growth rate is increasing the risk. Landslidewould take place in hilly region but it would affect the daily lives of people down the hills, in the plain areas of district in terms of transportation and resources accessibility. |
| 2. | Moderate Risk Hazards | Road Accidents | Human Life, Transport network. | Road accidents are very frequent in the district. Road safety measures at identified spots where road accidents have been frequent must be exercised without fail. |
| | | Cold waves | Human Life, Cattle Life, small Animals, crops, Trees, Livelihood, vulnerable groups. | Cold wave during the winter season and heat waves during summers are seasonal and affect largely to economically weaker section. |
| | | Heat waves | Human Life, cattle Life, Trees, Electricity supply, | |

| | | | | |
|----|---------------------|---------------------------------|---|---|
| | | | Houses, school and colleges. | |
| | | lightening/cloud burst | Human Life, Agriculture crops, Transport, cattle and its food, Vulnerable groups, Electricity. | Lightening can strike to any human or animals in open space. Could burst create situation of flooding. |
| | | Rail Accidents | Human Life, Transport network, Transported Goods | Rail accident has low probability but preparedness against such disaster is important to consider, as once it happens, damage would be huge. |
| 3. | Low risk hazards | Industrial/Chemical disaster | Human Life, Cattle Life, Environment & Eco system | Industrial area is located in the Faridaabad city area. So, prepareness against such disaster is important to consider due to the vicinity |
| | | Terrorist attack | Human Life, Property, Mental stress | Terrorist attacks are rare phenomena. But they can strike at important buildings to the government and crowded places. Not only lives and property damage Is cause by terrorist attack but psychological Trauma and depression engraves the victims and relatives that becomes a big challenge to deal with and bring the state back to normally. |

7.6.1 EARTHQUAKE

Earthquake Faridabad lies in Seismic Zone IV. This means only one-step less from the highest degree of vulnerability. An earthquake strikes suddenly, without an early warning and may cause

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huge building or infrastructural damage leading to human or personal loss. Therefore, preventive measures for ensuring safety of buildings, structures, communication facilities, water supply lines, electricity and life are of utmost priority.

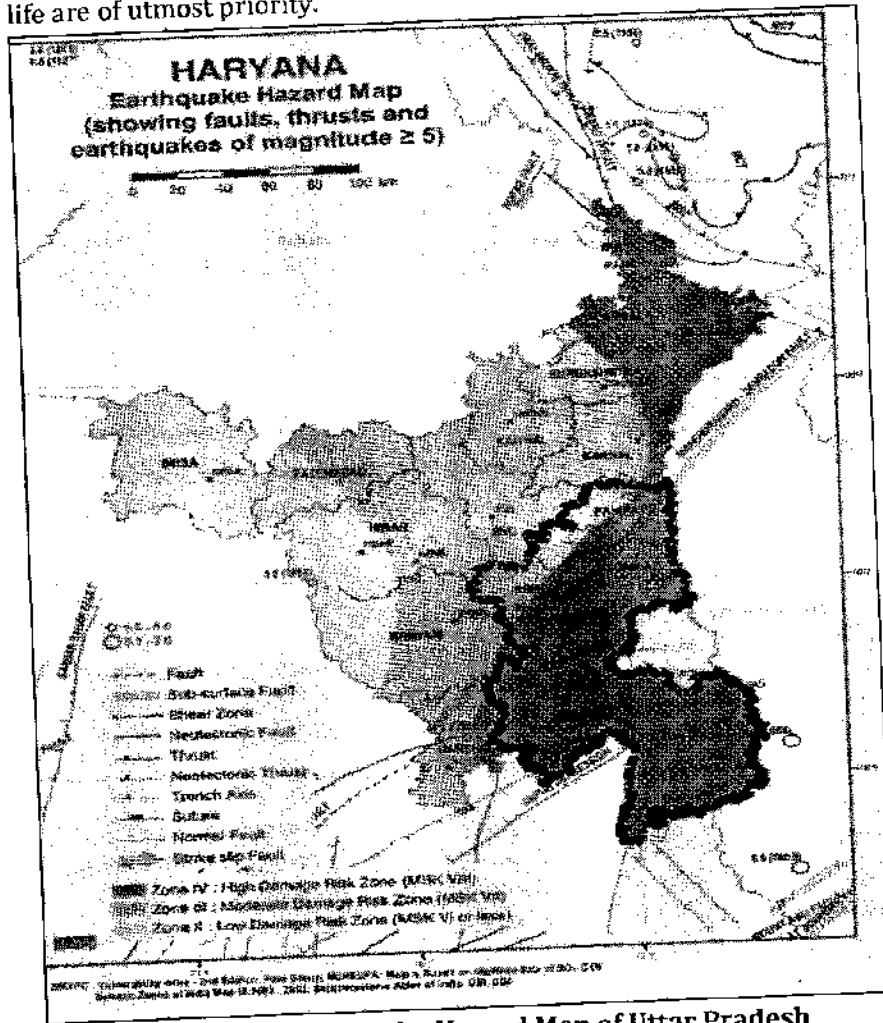


Figure 7-2: Earthquake Hazard Map of Uttar Pradesh

History of Seismicity in the Haryana State

Eastern parts of Haryana along with Delhi lie in the Gangetic Plain. It is a down warp of the Himalayan foreland, of variable depth, converted into flat plains by long-vigorous sedimentation. This is known as a geosynclines and the Gangetic Plain is the Indo-Gangetic Geosynclines. It has shown considerable amounts of flexure and dislocation at the northern end and is bound on the north by the Himalayan Frontal Thrust. The floor of the Gangetic trough (if seen without all the sediments) is not an even plain, instead shows corrugated inequalities and buried ridges (shelf faults). The region sits atop the Delhi-Haridwar ridge, which is a sub-surface ridge, trending NE-SW. There are numerous faults in this region, like the Moradabad, Panipat and Sohna faults. Delhi, Chandigarh and many parts of Haryana lie in Zone IV and thus they are extremely vulnerable to earthquakes. Most earthquakes in this region are shallow, though a few earthquake of intermediate depth have been recorded in Haryana. The alluvial cover of the Indo-Gangetic plain makes even distant earthquake felt here quite strongly. This region often feels deep-seated earthquakes that are



centered on the Pakistan-Afghanistan Border and in the Hindukush mountains in Afghanistan. However, it must be stated that proximity to faults does not necessarily translate into a higher hazard as compared to areas located further away, as damage from earthquakes depend on numerous factors such as subsurface geology and adherence to the building codes.

7.6.2 Floods

Flood is a temporary inundation of large region due to increase in reservoir levels, or of rivers flooding their banks because of heavy rains, high winds, cyclones, storm surge along coast, tsunami, melting snow or dam bursts. In the sub-region of Haryana, the propensity of flooding is more as a hazard rather than a disaster. The areas under low-lying contour zone (heterogeneous topography) and along the river of Yamuna are subject to flood hazard. There are number of instances when several districts faced flood hazard primarily due to heavy rain in monsoon and discharge in Yamuna.

History of Flood in Faridabad

River Yamuna causes recurrent floods in the district, particularly in the eastern boundary of Faridabad and Ballabgarh tehsils. Other than Yamuna, there are several barsati nallahs spread across the district. Overflowing of some of these local streams also increase the quantum of floods in the area. Excessive rainfall and excessive discharge of water from Tajewala head main leads to the over flooding in Yamuna. Flashfloods on the upstream of Yamuna might result into sudden and devastating floods in the district. Flow of the river is checked by Dakpathhar Barrage, Asan Barrage, Hathnikund Barrage, Tajewala barrage and Okhla barrage before it enters Faridabad

Table 7.4: Flood Prone Villages in Faridabad District

| Faridabad | | | |
|-------------------|-----------------------------|-----|----------------------------------|
| S.N | Vulnerable Villages (Flood) | S.N | More Vulnerable Villages (Flood) |
| Tehsil- faridabad | | | |
| 1 | Dhadhar | 1 | Basantpur |
| 2 | Chirsi | 2 | Agwanpur |
| 3 | Tilori Khadar | 3 | Kidawali |
| 4 | Mojmabad | 4 | Lalpur |
| 5 | Nacholi | 5 | Dadsiya |

7.7 Occupational Health and Safety in River Bed Mining

Occupational health and safety (OHS) are a cross-disciplinary area concerned with protecting the safety, health and welfare of people engaged in work or employment. A total of 98 will be involved for Work at Mine Site. DGFASLI working under the Ministry of Labor provides assistance to the State enforcing agencies, training and educating them in the field of occupational health and safety in the industries.

Occupational Health Impact on health

Table 7.5: Impacts on Health

| Type of diseases | Causes | Protective measures |
|------------------|-----------------------------|--|
| Lung diseases | Inhalation of dust | Suppression of dust and protective equipments |
| Stomach diseases | Water pollution | Proper treatment of surface water / stored water in the M.L area |
| Hearing | Working at high noise areas | Measures to suppress noise, and protective equipments |
| Body ache | Ground Vibration | Provision of Safety belt in operating machines |

A. Pre-Placement and Periodical Health Status

Pre /post-employment checkup will be carried out and following test will be conducted

- Hematological Test
- Biochemical Test
- Urine
- E C G
- Spirometer (Lung Function Test)
- Audiometry
- Color Vision
- Health Review System
- Medical Fitness From FMO
- Medical Record of Each Employee will be maintained and updated with finding

B. Frequency of Medical Examination

For Mines Employee= Once in three Year

For Technical and non-Technical=Once in 6 Month

C. Personal Protective Devices and Measures

- Mask for prevention of dust
- Ear Muff
- Safety Helmets
- Safety Belts
- Leather Hand Gloves

- Safety Shoes/Gum boots

D. Anticipated Occupational & Safety Hazards

- Musculo-skeletal disorder
- Noise Induced Hearing Losses
- Health impact due to diesel particulates from emission of diesel operated vehicles and equipment
- Physical Activity
- Silicosis due to sand mining
- Dehydration
- Skin Disorder
- Dust Exposure

7.7.1 The Occupational Health Surveillance Programme:

A team of qualified doctors and nurses will visit periodically for health checkup of all the workers, team and its record will be maintained properly.

Table 7.6: Budget for Occupational Health and Safety of the workers (Lakhs)

| S.N | OHS Requirement | Capital Cost (in Lakhs) |
|--------------|--|-------------------------|
| 1. | Measure to prevent Accidents due to Trucks/Dumpers etc | 1.50 |
| 2. | Education awareness and First aid Kit | 1.50 |
| 3. | Medical Examination Schedule | 1.00 |
| Total | | 4.0 Lakh |

7.7.2 Impact on Human Health

This project will have an impact on the human health due to increased dust, creation of breeding grounds for disease vectors, population influx which might introduce new diseases in the area, and inadequate sanitation facilities may result in severe health Impact. Following measures can be taken to eradicate Impact of the project.

7.7.3 Implementation of Occupational Health and Safety Measures

Occupational Health & Safety measures result in improving the conditions under which workers are employed and work. It improves not only their physical efficiency, but also provides protection to their life and limb. Management will consider the following safety measures:

- Safety clauses in contract order
- Dedicated Environment Health and Safety system
- Inspection and maintenance of equipment's and accessories
- Pre placement and periodic health check up

- Removal of unsafe conditions and prevention of unsafe acts
- Detailed analysis of each and every incident
- To provide standard PPEs and ensure its uses for mining safety
- Periodic inspection by internal and external safety experts
- Celebrations of various safety events for awareness
- Medical facilities & first aid boxes will be established in the mine premises.
- Pits, Sumps, openings in floor etc. which may be a source of danger, will be either securely covered or securely fenced. Securely fencing a pit means covering or fencing it in such a way that it ceases to be a source of danger.
- Health Awareness Programmes and camps will be organized
- The mine workers will be provided all necessary PPE, especially dust masks for their safe guard from dust, Ear Plugs/Ear Muffs for noise, boots etc. and measures for other hazards.
- Under initial vocational training, the workers will be given training related to all safety and health aspects.

7.8 Annual Replenishment Of Mineral

The proposed project is on Yamuna Riverbed as this is a perennial river which is being replenished continuously throughout the year especially during the monsoon as per the ToR study of replenishment is required for this project. As per State Expert appraisal committee of MoEF&CC New Delhi, GOI meeting dated October 24-25, 2016. It was decided that this study can be submitted within 2 yr from the date of Environment clearance because it requires actual data for replenishment. In view of SEAC, Haryana, GOI the detailed replenishment study shall be submitted within 02 years after grant of EC. (Replenishment Study Report is attached as **Annexure XI**).

7.9 REHABILITATION AND RESETTLEMENT (R &R)

There is no displacement of the population within the project area and the adjacent nearby area and the complete lease area is a Govt. land. However Social development of the village will be considered as per social activities. Reclamation and rehabilitation by back filling the worked out area, Provision and maintenance of protective works like drains, parapet walls, retaining walls, check dams, Management of Air and water quality, Management of Waste, top soil, infrastructure and mining machinery disposal, Safety and security. The resources required for management of these operations will be supervised, raw materials (mainly sand available at the mines), gates, fencing, transport and Communication. All the above operations will be carried out in three months time.

7.10 Conclusion

River Bed Mining does not involve hazardous process with no risk related to Fire and Explosion.
HIRA



shows no major Impact and can be mitigated with proper maintenance and use of PPE to avoid likely accidental scenario.

7.11 SUMMARY

The public hearing will be conducted and the final minutes will be incorporated in the Final EIA/EMP Report. Risk assessments will help mine operators to identify high, medium and low risk levels. This is a requirement of the Occupational Health and Safety Act 2000. Risk assessments will help to prioritize the risks and provide information on the need to safely control the risks. In this way, mine owners and operators will be able to implement safety improvements. At the same time the environmental conditions also will not impair his working efficiency. This is possible only when there is adequate safety in mines. Hence mine safety is one of the most essential aspects of any working mine. There is no displacement of the population within the project area and adjacent nearby area. This mining project has a positive impact on social and economic well being of the community because this project provides employment opportunities to local people and many social welfare works done by project proponent.



8. PROJECT BENEFITS

8.1 General

The execution of the project brings overall improvement in the locality, neighborhood and the State by bringing industry, roads, employment and hence improving living standard and economic growth.

8.2 Improvements in the physical infrastructure

The proposed project will enhance the following physical infrastructure facilities in the adjoining areas:

- a. **Road Transport:** The existing road will be maintain regularly to improve the road communication.
- b. **Market:** Generating useful economic resource for construction. Excavated mineral will provide a good market opportunity.
- c. **Infrastructure:** Creation of community assets (infrastructure) like provision of drinking water, village roads/ linked roads, dispensary and health center, market place etc., as a part of corporate environment responsibility.
- d. **Green Belt Development:** A suitable combination of trees that can grow fast and also have good leaf cover will be adopted to develop the green belt area. It is proposed to plant 55,000 trees in 5 years .
- e. **Local Employment:** This project will enhance the opportunities of employment for the local villagers near the lease area due to which their economic status will becomes better.

8.3 Improvements in the social infrastructure

The mining in the area will create rural employment. The mining activity in the region will have a positive impact on the social, economic condition of the area by way of providing employment to the local inhabitants; wages paid to them will increase the per capita income, housing, education, medical and transportation facilities, economic status, health and agriculture.

A detailed program for socio economic development of the area has been framed. The salient features of the program are as follows:

- i) Social welfare programs like provision of medical facilities, educational facilities, water supply for the employees as well as for nearby villagers will be under taken.
- ii) A well laid plan for employment of the local people has been prepared by giving priority to local people.
- iii) Supplementing Govt. efforts in health monitoring camps, social welfare and various awareness programs among the rural population.

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Solutions Pvt.
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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

- iv) Assisting social forestry program.
- v) Development of facilities within villages like roads, etc.

8.4 Employment and unskilled

The propose project will generate so many employment opportunities in both direct and indirect way. As per approved mining plan 98 persons will get direct employment due to proposed project . Apart from this so many indirect employment will also be generated i.e. many hotels, workshop repair, tea stalls, general store will be established and so many employment opportunities will be generated. About 100-150 people will be get indirect employment through this opportunity.

8.5 ECOLOGICAL BENEFITS

As per the Office Memorandum issued by MoEF&CC on 30.09.2020, The activities proposed under CER shall be worked out based on the issues raised during the Public Hearing and social need assessment. The details of the activities to be undertaken and the budget allocated shall be prepared after Public Hearing is conducted.

8.6 CORPORATE ENVIRONMENT RESPONSIBILITY

As per the Office Memorandum issued by MoEF&CC on 30.09.2020, The activities proposed under CER shall be worked out based on the issues raised during the Public Hearing and social need assessment. The details of the activities to be undertaken and the budget allocated shall be prepared after Public Hearing is conducted.

8.7 SUMMARY

The management will recruit the semi-skilled and unskilled workers from the nearby villages. The project activity and the management will definitely support the local Panchayat and provide other form of assistance for the development of public amenities in this region. The company management will contribute to the local schools, dispensaries for the welfare of the villagers. A suitable combination of trees that can grow fast with good leaf cover will be adopted to develop the green belt..

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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. ltd.

9. ENVIRONMENTAL COST BENEFIT ANALYSIS

As per ToR granted by SEIAA Haryana Cost Benefit Analysis study is not required for the proposed project.



10. ENVIRONMENTAL MANAGEMENT PLAN

10.1 INTRODUCTION

The Environmental Management Plan consists of the set of mitigation, management, monitoring and institutional measures to be taken during the implementation and operation of the project, to eliminate adverse environmental impacts or reduce them to acceptable levels. The present environmental management plan addresses the components of environment, which are likely to be affected by the different operations in a mine area. The Environmental Management Plan (EMP) is a site specific plan developed based on the base line environmental status, mining methodology and environmental impact assessment.

10.2 PURPOSE OF ENVIRONMENTAL MANAGEMENT CELL

The Environment Policy along with Environment Management Cell is discussed in **Chapter-6**. The EMP provides a delivery mechanism to address potential adverse impacts and to introduce standards of good practice to be adopted for all project works. For each stage of the program, the EMP lists all the requirements to ensure effective mitigation of every potential biophysical and socio-economic impact identified in the EIA. For each operation, this could otherwise give rise to impact. The Environmental Management Plan provided information for each impact or operation, which could otherwise give rise to impact. The EMP aims at following:

1. Abatement treatment and disposal off all the pollutants viz. liquid, gaseous and solid waste so as to meet statutory requirements (Relevant Pollution Control Acts) with appropriate technology.
2. To support and implement work to achieve environmental standards and to improve the methods of environmental management.
3. To promote green-belt development.
4. To encourage good working conditions for employees.
5. To reduce fire and accident hazards.
6. Budgeting and allocation of funds for environment management system.

10.3 ENVIRONMENT MANAGEMENT POLICY & ENVIRONMENT COMMITTEE

The Company is very much oblivious of its responsibility in protecting the Environment. Thus, various mitigation measures as given in the report shall be taken-up and effort will be made to reduce the impact of the Project on the Environment. Any action or effort remains incomplete, if it is not monitored properly at regular intervals and corrective measures taken, wherever necessary. Regular monitoring has thus, been provided.

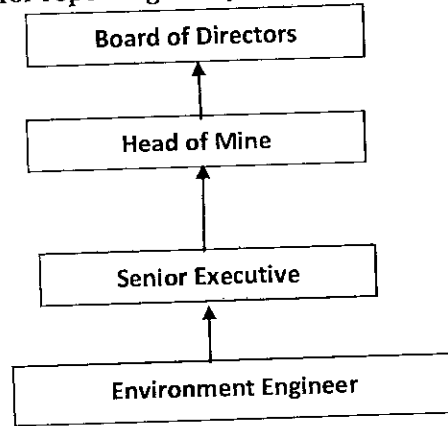
To achieve this objective, **M/s Dev & Div Solutions Pvt. Ltd.** has implemented Integrated Management System (IMS) across all units. The Company has well defined policy under IMS committed to operate the project with the objectives mentioned in the approved Policy. The system of reporting of Non-conformances /violation of any Environmental Law/Policy will be as per the SOP defined under the EMP. As per the SOP, any non-conformances/violation of Environmental Law/Policy, either identified during Internal Audits or reported by any authority or received through any source, will be discussed during Management Review Meetings with Board of Directors/Partners. Under the system designated persons at all hierarchy level have been identified for ensuring adherence to the policy and compliance with the environmental laws and regulations. Also, system has been developed to take adequate measures.

M/s Dev & Div
Solutions Pvt.
Ltd.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

The Organizational set-up for reporting of any deviation is as follows



SOP in case of any Violation is observed

1. The cases of violations/non-compliances of Environment or Forest Laws, if any, shall be reported to the Board of Directors through EHS Manager and shall identify designate responsible person for ensuring compliance with the Environmental Laws and Regulations.
2. Comply with all relevant environmental laws and regulations to minimize risks to health, safety and the environment.

Work with local government, regulatory authorities and communities

The main aims under the said Policy are to

1. Effectively manage, monitor, improve and communicate the environmental performance.
2. Take all reasonable steps to prevent pollution.
3. Set realistic and measurable objectives and targets for continual improvement of the environmental performance.
4. Ensure that all employees and contractors are trained to understand their environmental responsibilities and create an environment that adheres to the Company's Policies, procedures and applicable regulations.
5. Hold leadership accountable for good environment performance of our operations and projects. Inherent in that accountability will be the commitment of management to provide resources and successfully create an appropriate environment.
6. Comply fully with all relevant legal requirements, codes of practice and regulations.
7. Reduce, recycle and reuse natural resources.
8. Minimize waste generation and increase reuse within the framework of waste management procedures.
9. Identify and manage environmental risks and hazards.
10. The project proponent shall regularly review this policy and ensure the effectiveness of the policy in the present context.
11. That corrective and preventative actions are taken in order to ensure continual improvement.



DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

12. To treat all the pollutants viz. air, gaseous and noise, which contribute to the degradation of the environment, with appropriate technologies.
13. To comply with all regulations stipulated by the Central / State Pollution Control Boards related to air emissions and liquid effluent discharge as per air and water pollution control laws.
14. To handle hazardous wastes as per the Hazardous Waste Hazardous & Other Wastes Rules, 2016 of the Environment (Protection) Act, 1986
15. To encourage support and conduct developmental work for the purpose of achieving environmental standards and to improve the methods of environmental management.
16. To make continuous efforts to improve environment.
17. The system of reporting of Non-conformances/ violation of any Environmental Law/Policy will be as per the management system.

For successful implementation of the Environmental Management Plan, other agencies of the State are also involved by M/s Dev & Div Solutions Pvt. Ltd., if required (for regulatory requirement or technical support). The coordinating agencies, which may be involved for specific environmental and project related activities.

Table 10.1: Manpower at EMC

| Description | Man power |
|-----------------------------------|-----------|
| Senior Manager, Quality & Control | 1 |
| Environmental Engineer | 1 |
| Horticultural supervisor | 1 |
| Chemist | 2 |
| Laboratory assistant | 2 |
| Field assistant | 1 |
| Labours | 2 |
| Total | 10 |

Table 10.2: List of Coordinating Agencies, Involved for Specific Environmental Activities

| State/ Regional Level Agency | SFD | SPCB | MoEF&CC | DGMS | RPDAC | WRD | DoH |
|--|-----|------|---------|------|-------|-----|---------------|
| District / Local Level Agency | DFO | - | - | RO | DCAC | RO | Civil Surgeon |
| Project Area: Plantation Programme | ✓ | | | | | | |
| Study Area: Air, noise, water quality, waste water discharge quality monitoring. | | ✓ | ✓ | | | ✓ | |
| Project Area: Ambient air monitoring, work-zone air, work-zone noise, fugitive emissions | | ✓ | ✓ | | | ✓ | |

M/s Dev & Div
Solutions Pvt.
Ltd.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| State/ Regional Level Agency | SFD | SPCB | MoEF&CC | DGMS | RPDAC | WRD | DoH |
|--------------------------------------|-----|------|---------|------|-------|-----|---------------|
| District / Local Level Agency | DFO | - | - | RO | DCAC | RO | Civil Surgeon |
| Project Area: Solid waste (Domestic) | | ✓ | | ✓ | | | |
| Project Area: Human Health | | ✓ | ✓ | | | | ✓ |

Index:

- SFD** - State Forest Department
- HSPCB** - Haryana State Pollution Control Board
- MoEF&CC** - Ministry of Environment, Forest & Climate Change
- DGMS** - Director General of Mines Safety
- WRD** - Water Resource Department
- DoH** - Department of Health
- RDA** - Regional Development Authority
- DFO** - Divisional Forest Officer
- RO** - Regional Office

10.3.1 Interaction with State Pollution Control Board

EMC always remains in regular touch with SPCB/Regional Office, MoEF&CC and sends them periodic compliance report on EMP compliance in the prescribed format. Any new regulations/guidelines considered by SPCB / CPCB shall be taken care of by EMC.

10.3.2 Training

For proper implementation of the EMP, the environmental officers, mining engineers, geologists, horticulturists, field executives etc. responsible for EMP implementation are trained as per the need.

The training is given to employees covering the following areas:

1. Awareness of pollution control and environmental protection (for all employees)
2. Operation and maintenance of specialized pollution control equipment/methodology.
3. Field monitoring, maintenance and calibration of pollution monitoring instruments
4. Repair of pollution monitoring instruments.
5. Environmental management.
6. Afforestation / plantation and post care of plants.



M/s Dev & Div
Solutions Pvt.
Ltd.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

7. Knowledge of norms, regulations and procedures.
8. Risk assessment and Disaster Management.
9. ISO 9001:2015
10. OSHAS 45001:2018
11. EMS 15001: 2015



10.3.3 Prevention of illegal mining and pilferage of mineral

In order to prevent illegal mining and pilferage of mineral, only registered vehicles with authorized transporters will be deployed. Upon indenting for no. of trucks requirement by **M/s Dev & Div Solutions Pvt. Ltd.**, the authorized representative of transporters will issues a transport slip indicating registration details of the vehicle, on the basis of which authorized person of **M/s Dev & Div Solutions Pvt. Ltd.** issues a gate pass. Without gate pass, entry of any transport vehicle inside the lease is not allowed. Upon entering inside the lease, previous loading/unloading status of the trucks is checked. registration details, owner details, tare weight etc. is displayed. After loading, weighment of loaded truck is carried out and driver is satisfied with the loaded quantity, a weighment slip is generated indicating tare weight, loaded weight, type of material, source of dispatch and destination of transport etc.

The loaded trucks are covered with Tarpaulin and sealed. CCTV cameras have been installed at the entry gate, weighbridges and exit gate.

A vigilance cell has also been formed at mines to monitor the movement of vehicles and prevent illegal mining.

10.3.4 Specific Diesel Consumption Reduction Plan

Existing Specific Diesel Consumption of **M/s Dev & Div Solutions Pvt. Ltd.** is 0.44 litre/tonne of total excavation. Following major site specific measures will be taken to reduce the specific diesel consumption in a phased manner in the Aridongri Iron Ore Mines.

1. Regular monitoring of equipment-wise diesel consumption, running hours of equipment and their hourly production to check any abnormal change in the diesel consumption pattern.
2. Reduction of idling of the dumpers at face, Dumpers shall be in OFF position during idling except for the 1st dumper near excavator for loading.
3. Reducing the unnecessary movement of dumpers during shift change time by using separate vehicle for collecting operators of different benches and keeping the dumpers at mine face.
4. Prevention of diesel leakage.
5. Regular check-up of tyre pressure to maintain it as per manufacturers recommendations.
6. Implementation of maintenance schedule and fixation of equipment -wise norms for diesel consumption based on periodic review of collected data.
7. Maintaining proper haul road width & gradient, removing pot holes in the road.
8. Maximising the backfilling and reducing the lead distance by proper haul road planning.
9. As effectiveness of implementation measures depend mostly upon the attitude of operators, awareness programmes will be conducted for conservation of fuels.

Year-wise proposed rate of Specific Diesel Consumption for the proposed excavation plan for the 1st five years of plan period is given below.

Table 10.4: Year-Wise Proposed Rate of Specific Diesel Consumption

| Year | Total Excavation, TPA | Diesel Consumption, l | Diesel Consumption, kl | Specific Diesel Consumption, Litre/t |
|------|-----------------------------|--------------------------|---------------------------|--|
| | | | | |

M/s Dev & Div
Solutions Pvt.
Ltd.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | | | | |
|-------------|-----------|------|------|------|
| First Year | 24,00,000 | 5880 | 5.88 | 0.35 |
| Second Year | 24,00,000 | 5880 | 5.88 | 0.33 |
| Third Year | 24,00,000 | 5880 | 5.88 | 0.31 |
| Fourth Year | 24,00,000 | 5880 | 5.88 | 0.29 |
| Fifth Year | 24,00,000 | 5880 | 5.88 | 0.27 |

It is vividly indicated from above table that average specific diesel consumption over the FY First to fifth will be 0.31 litre per tonne of total excavation. No JCB or other heavy machinery will not be used by M/s Dev & Div Solutions Pvt. Ltd. For the excavation of Mineral from Yamuna Riverbed. The proposed consumption of fuel is only for the transportation of mineral and water tanker for watering to greenbelt.

10.3.5 Standard Operating Process

M/s Dev & Div Solutions Pvt. Ltd. Will implement the following Standard operating procedures (SOP) in the Mining project:

- Procedure for work zone and ambient air quality monitoring and control measures.
- Procedure for work zone and ambient noise level measurement and control measures
- Procedure for greenbelt development.
- Procedure for developing social amenities.
- Procedure for environmental reporting system.
- Procedure for environment auditing.
- Procedure for review and updating EIA/EMP.
- Procedure for environment related communication with stakeholders.
- Procedure for evaluating continual improvement in environment quality.
- Procedure for access to updated norms and standards.
- Replenishment study on every alternate year.

10.3.6 Responsibilities for Environmental Management Cell (EMC)

The responsibilities of the EMC include the following:

- Environmental Monitoring of the surrounding area.
- Green belt development and inventory of flora
- Ensuring minimal use of water.
- Proper implementation of pollution control measures.
- Access the risk area.
- Implementation of QMS.
- Conducting Internal Audits.
- Closing of NCs and conduction of Management Review Meetings.
- Implementation of the control and protective measures.
- Coordination related to environment related activities within the project area as well as related outside agencies.

- Collection of health statics of workers.
- Monitoring the progress of implementation of environmental management programme.
- Ambient noise level, Air, Water and Soil monitoring.
- Management of drainage system, dumps, reclamation and restoration etc.
- To make continuous efforts to improve environment.

10.4 AIR ENVIRONMENT MANAGEMENT

Mitigativemeasures suggested for air emission control will be based on the baseline ambient air quality monitoring data and air quality modelling. From the point of view of maintenance of an acceptable ambient air quality in the region, it is desirable that the air quality needs to be monitored on a regular basis to check it in respect with the NAAQS prescribed by MoEF&CC and in cases of non-compliance, appropriate mitigative measures will be adopted. In order to minimize impacts of mining on air and to maintain it within the prescribed limits of CPCB/SPCB, an Environmental Management Plan (EMP) has been prepared. This will help in resolving all environmental and ecological issues likely to cause due to mining in the area. During the course of mining no toxic substances are released into the atmosphere as such there seems to be no potential threat to health of human beings. In the mining activities, the only source of gaseous emissions is from the engines of vehicles. The reasons may be quality of fuel, improper operation of the engine, etc; proper maintenance of engines will improve combustion process and brings reduction in gaseous pollutants.

10.4.1 Control of Gaseous Pollution

In mining activities, the only source of gaseous emissions is from the engines of transport vehicles. The emissions from the diesel engines of the machinery can be controlled by proper maintenance and monitoring of machines.

10.4.2 Control of Dust Pollution

The main pollutant in the air is PM, which is generated due to mining activities and transportation of mineral. However to reduce the impact of dust pollution the following steps have been taken during various mining activities.

a) During loading operation

- i) Latest loading equipment will be used with dumpers. This reduces the number of buckets to fill from height and thus have comparatively less dust generation. The propagation of this dust is confined to loading point only and does not affect any person both the operators of excavator and dumpers who will sit in closed chamber and will be equipped with dust mask.
- ii) Skilled operators will operate excavators.
- iii) Avoid overloading of dumpers and consequent spillage on the roads.

b) During Transport operation

- i) All the haulage roads including the main ramp be kept wide, leveled, compacted and properly maintained and watered regularly to prevent generation of dust due to movement of dumpers, and other vehicles.

M/s Dev & Div
Solutions Pvt.
Ltd.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

- ii) Mineral carrying trucks will be effectively covered by Tarpaulin to avoid escape of fines to atmosphere.
- iii) Regular Compaction and grading of haul roads to clear accumulation of loose material.
- iv) Air quality will be regularly monitored both in the core zone and the buffer zone.

c) Plantation work carried out

In order to reduce air pollution in the surroundings, green belt will be developed around mines office, mine approach road.

d) Monitoring of air pollution

Periodic air quality survey will be carried out to monitor the changes consequent upon mining activities as per the norms of Haryana State Pollution Control Board.

10.5 NOISE AND VIBRATION

The ambient noise level monitoring carried out in and around the proposed mine lease area shows that ambient noise levels are well within the stipulated limits of MoEF&CC. There will be no drilling and blasting for mineral extraction. Noise pollution due to transportation will cause some problem to the inhabitants of this area because there is human settlement in close proximity to the link roads in lease area. Effective steps will be taken to keep the noise level well below the DGMS prescribed limit of 75 dBA.

10.5.1 Noise Abatement and Control

- i. Proper maintenance of all machines will be carried out, which help in reducing the generation of noise during operations.
- ii. No other equipments except the transportation vehicles, excavator and Loaders (as and when required) for loading are allowed.
- iii. Noise generated by these equipments is intermittent and does not cause much adverse impact.
- iv. Periodical monitoring of noise will be done to adopt corrective actions wherever needed.
- v. Plantation will be taken up along the approach roads. The plantation minimizes propagation of noise and also arrests dust.

10.6 WATER MANAGEMENT

There will be no wastewater generated from the mining operations.

10.6.1 Surface and Ground Water Management

- i. Mining will not intersect the ground water table during the plan period.
- ii. The mining does not have any impact on the topography and the natural drainage of the surrounding area.
- iii. Rain water harvesting pits are proposed within the nearby villages of mine lease area.

10.6.2 Water Conservation

The project does not consume any process water except for drinking, dust suppression and plantation. Plantation is proposed, which will increase the water holding capacity and help in recharging of ground water.



M/s Dev & Div
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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

10.7 SOLID WASTE MANAGEMENT

No waste will be generate due to mining operation. There will be no OB removal and waste generation during the plan period. No dumping area is needed. No outside material will be filled up in the extracted zone.

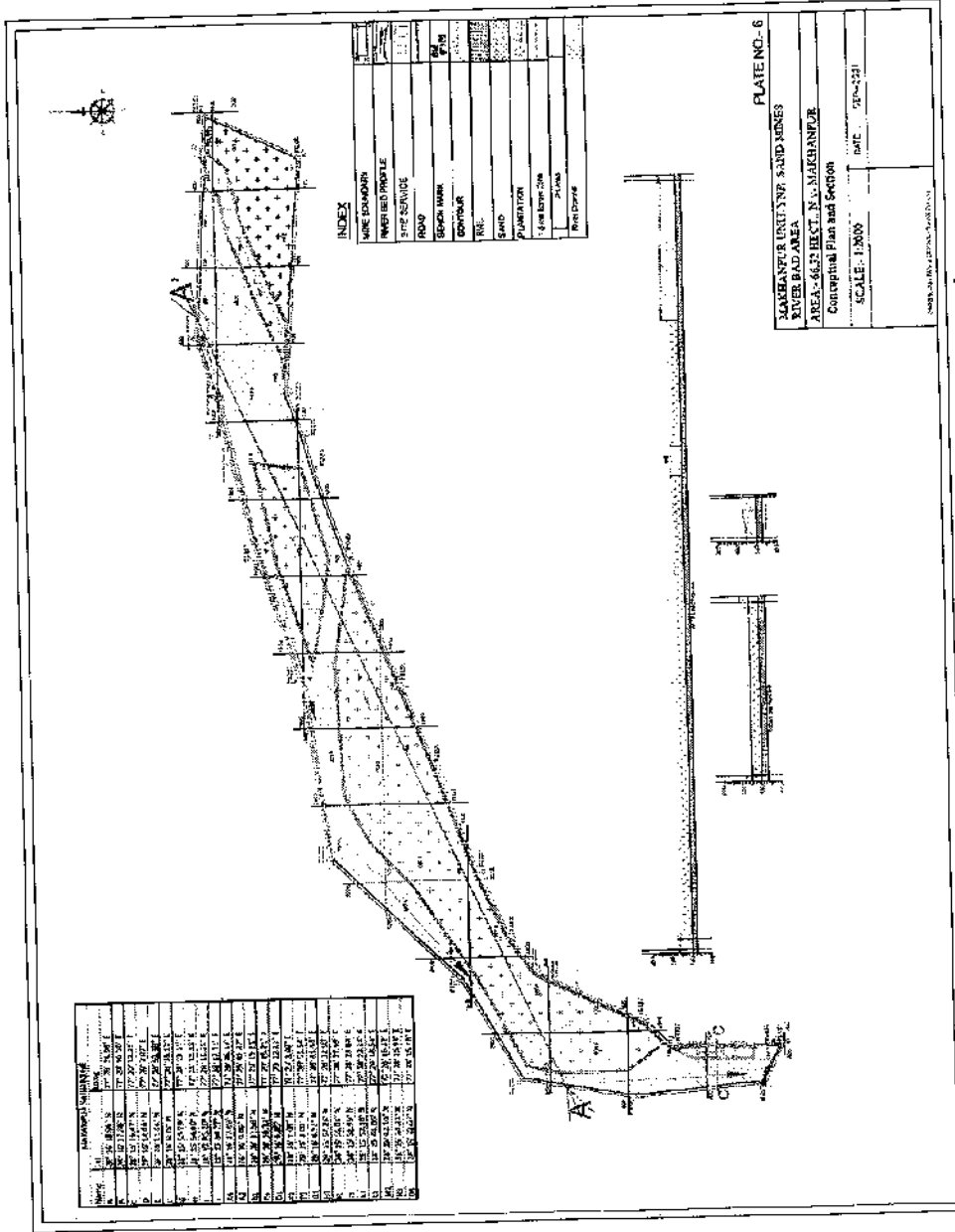
10.8 RECLAMATION PLAN

The Mining area will be worked in blocks for ease of operation. The depth would be restricted to 3.0 m only from the exiting level of the river bed. Regular monitoring of the bed level would be ensured by taking the bed level after fixed intervals, including after the rainy season. The mined out area would be refilled by the mineral (sand) after every rainy. Hence even after completion of the five year period of mining plan or even on expiry of the period of contract the status of the contracted area / area to be used for mining in the river bed would remain unchanged.

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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhampur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

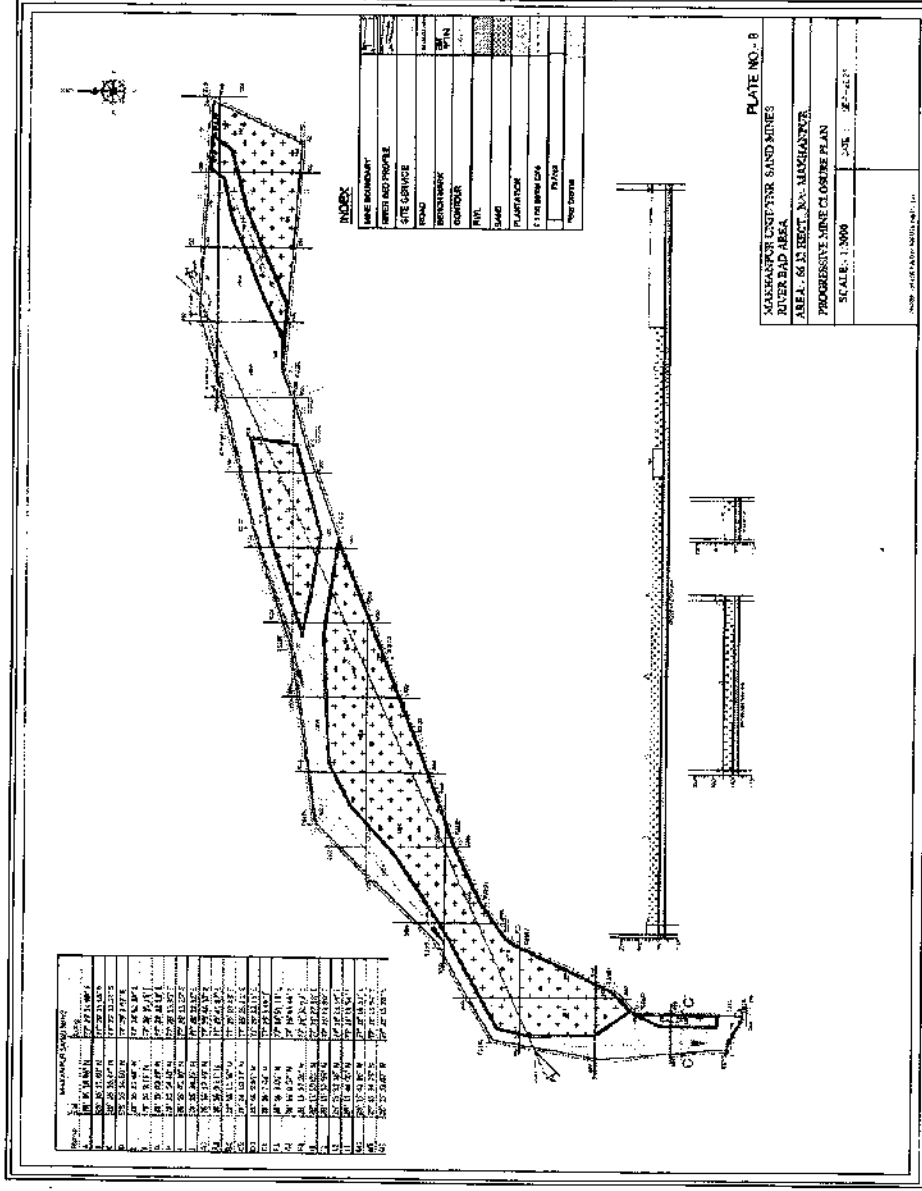


Conceptual Plan

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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

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Progressive Mine Closure Plan

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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

10.9 Green Belt Development

In order to mitigate and minimize the environmental impacts, arising due to mine project especially from air pollution, noise pollution, soil erosion etc. the Greenbelt development around the project sites can provides the best mitigation option. The green canopy not only absorbs some of these pollutants but also improves the aesthetic environment. Therefore, a "Green Belt Development Plan" has been proposed.

A green belt has been developed along the boundary of the haul road beside the mining lease area. The area for green belt plantation consists of undisturbed soil; hence plantation can be made in any garden or along the road. Green belt is erected not from biodiversity or conservation point of view, but is basically developed as a screen to check the spread of dust pollution. A green belt will be developed by using Miyawaki methodology for plantation. Referring to potential natural vegetation (PNV) (a concept he studied in Germany), he (Akira Miyawaki) developed, tested and refined a method of ecological engineering today known as the "Miyawaki method" to restore native forests from seeds of native trees on very degraded soils which were deforested and without humus.

OBJECTIVE OF GREEN BELT DEVELOPMENT PLAN

The main purpose of this plan is to develop greenbelt and landscape at project site so that following specific purpose is met with after completion of the project:

- a. General pollution abatement.
- b. Air pollution attenuation.
- c. Dust absorption.

10.9.1 Miyawaki Methodology

According to Miyawaki Methodology following steps will be followed for Greenbelt development:

Step-1: Determine the soil texture and quantify biomass

Soil texture helps determine water holding capacity, water infiltration, root perforation capacity, nutrient retention and erodibility. Check if the texture is sandy, loamy or clayey.

What to add to the soil

Perforator materials help to improve perforation and allow roots to grow quickly. For this, we can use biomass that is spongy and dry in nature. Husk is a by-product and easily available at grain mills and animal feed stores. Other options include: Rice husk, wheat husk, corn husk (chipped) or groundnut shells (chipped).

Water retainer helps soil retain more moisture and water, as compared to its natural water retention capacity. Natural materials such as coco-peat or dry sugarcane stalk can be used. A good test is to dip the material into water for some time, and take it out and squeeze. If water oozes out during squeezing, then the material can be used as water retainer.

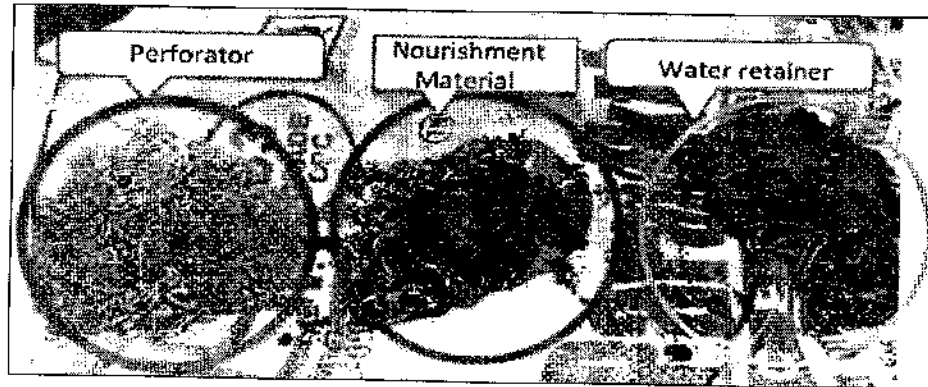
Organic fertilisers are required for nourishment. Different materials can be used depending on region and availability, such as cow manure, goat manure or vermin-compost. Compared to vermin-compost, manure is a slow nutrient-releasing plant fertiliser. Manure provides small amounts of nutrients over an extended period, whereas vermin-compost gives high doses of nutrition initially but very little later on.



DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

Mulch insulates and protects the soil. It prevents sunlight from falling directly on the soil. Direct sunlight will make soil dry and make conditions difficult for the young saplings. This is especially important in the first 6-8 months, as the plants are young. Mulch also plays a huge role in preventing water from evaporating. Options include rice straw, wheat straw, corn stalk or barley stalk.



Step-2: Select tree species for plantation

We should try to plant as many species as possible for biodiversity.

- Make a database of all native species of study area. Identify its type (Evergreen, Deciduous or Perennial), advantages, maximum height and assign layer.
- Check the native species saplings availability in the nursery, their age and sapling height. Ideal height is 60 to 80 centimeters.
- **Major species:** Choose five different species to be the major forest species; these should be the species that commonly find in the study area. This will constitute 40-50 percent of number of trees in the forest.
- **Supporting species:** other common species of the area will constitute 25-40 percent, and minor native species will make up the rest.

| Sample Database | | | | | | | | | |
|-----------------|---------------------------|-------------|-----------|-----------|-------|---------|-------|--------------|----|
| S. No. | Botanical Name | Common Name | Type | Advantage | | Ht. (M) | Layer | Availability | % |
| | | | | 1 | 2 | | | | |
| 1 | <i>Azadirachta indica</i> | Neem | Evergreen | Medicinal | | 25 | Tree | Yes | 15 |
| 2 | <i>Delonix regia</i> | Gulmohar | Evergreen | Shed | birds | 20 | Tree | Yes | 10 |
| 3 | <i>Syzygium cumini</i> | Jamun | Evergreen | Fruit | Birds | 15 | Tree | Yes | 8 |

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Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.



Step-3: Design the forest

- **Master Plan:** Identify the exact area for afforestation so as to procure materials and execute the project. The minimum width of the plantation area should be 3 meters, but 4 meters is recommended.
- **Watering Plan:** The water pipeline layout may need to be designed by an architect based on the daily water requirement for the area, backed by bore wells and overhead tanks. The forest should be watered regularly for the first 2-3 years.
- **Planning Project Execution:** We also need to identify spaces such as the material/sapling/equipment storage areas, site office and resting area for labourers. There should also be approach roads to the afforestation area for earthmover access, and to the materials/saplings storage areas for truck access, if the project area is large.

Step-4: Preparing the area

- **Site inspection:** Visit the site to determine the feasibility and scope of the project. Take pictures of the site, and confirm the availability of fencing, maintenance staff, running water and sunlight. The site should get sunlight for a minimum of 8-9 hours a day. No pipes/drains/wires or debris should be present in the area.
- **Removing debris and weeds:** Weeds take away nutrition of the soil, and also restrict movement of materials and people. Hence they should be cleaned either manually, or using a JCB/Tractor if the area is huge. Ensure that the pulled out weeds are disposed away from the site; else they may re-grow.
- **Watering facility installation:** There should be a main line with watering outlets for hoses, which can reach the entire area of the forest. Watering should be done everyday manually using a hosepipe with a shower, and not by drip irrigation, sprinklers etc. The requirement is around 5 litres/sq metre per day.
- **Physical demarcation of areas:** The areas should be marked (with limestone powder or wooden peg/rope) before earthwork starts. Ensure that the marking of areas matches 100 percent with the master plan.
- **Making approach roads to marked areas:** Clear weed growth, big stones and boulders. The path could be of any material (soil, sand, gravel, tar etc.), but trucks/tractors should be able to use it.
- **Mound identification:** The forests are usually created on 100 sq metre mounds, and each of these need a serial number in the order in which they will be created. Only after one mound is created and plantation completed on it, can the next mound be created.

Step-5: Plat the Trees



- **Mixing materials:** Perforator, water retainer and fertilizer, all without clumps, should be mixed together. They should be mixed in the exact ratio as was decided initially, for each mound.
- **Preparing the ground for plantation:** Each plantation should be created on a 100 sqm mound. Using an earthmover machine, first dig the earth to a depth of 1 metre on the 100 sqm land. Put half the earth back into the pit and spread it uniformly. This is to make the soil loose. Mix with the soil half the biomass prepared in the previous step. Then put the remaining soil back into the pit and spread it uniformly. Now mix the remaining biomass with this soil evenly. Afterwards, shape the soil into a mound. In the Miyawaki method, all saplings will be planted together on a mound, unlike conventional plantations where individual pits are dug up for each sapling.
- **Selecting trees for plantation:** Place plants on the mound to create a multi-layered, natural forest. Try to group plants that grow into different layers – shrub, sub tree, tree and canopy – in each sqm. Try not to place two trees of the same kind next to each other; also, don't follow a pattern while planting the trees. Try to maintain a distance of 60 cm between saplings. The goal is to have random, dense plantation of native tree species.
- **Plantation:** To plant the tree, dig a small pit on the mound with a trowel, remove the root bag in which the plant was growing, and gently place the plant in the pit. Level the soil outside gently around the stem of the plant, but do not press or compact the soil. There should not be more than 8-10 people on a mound at a time, since the idea is to plant on loose, aerated soil.
- **Support the plants with sticks:** Saplings need support during the initial months so that they don't droop or bend. Insert support sticks into the soil close to the plant, without damaging the roots of the plant. For plants shorter than 1 metre, use 1 metre-long bamboo sticks. For taller plants, use slightly thicker 2-2.5 metre-long bamboo sticks. Tie the sticks to the plant stems using thin jute strings. Support sticks will be needed for at least every alternate plant.
- **Mulching:** Mulch should be evenly laid out on the soil, in a 5-7 inch layer. To ensure that the mulch stays on the ground and does not fly around, it should be tied down with jute ropes. For this, bamboo pegs should be nailed at the periphery of the forest. Tie the pegs to each other with rope, pressing down on the mulch. There should be 30 pegs, each around 2 ft long, around every 100 sqm mound.
- **First watering:** The first time, the forest should be watered for an hour. Minimum water requirement is 5 litres per sqm, or 500 litres per 100 sqm mound.

Step-6: look after the plantation for three years

- **Monitoring:** The plantation should be monitored once in 1-2 months, to check if the targets have been achieved and if any changes should be made to improve results. This should be done the first 8-12 months. Count the number of saplings that have survived, and record the data. Growth of selected species should also be monitored.
- **Maintenance:**
 - Water the saplings with hose pipe once a day.
 - Keep the saplings weed-free for the first 2-3 years. Once the saplings starts growing, weed growth will stop.

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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

- Ensure that the plants stay straight, are not buried under the mulch, and are only loosely tied to the support stick.
- Keep the plantation clean, and free of plastic, paper etc.
- Maintain proper drainage system so that water does not get accumulated anywhere in the area. Do not build bunds in the greenbelt area, as accumulated water can kill plant roots.
- Mortality rate of plants is usually 2-5 percent. Mortality is to be checked only after 3-4 months of planting.
- Do not use any chemicals like pesticides or inorganic fertilizers. If you notice pests, leave them undisturbed. The saplings will slowly build its own mechanism to keep itself healthy.
- Mulching should be maintained for at least one year. The soil should be re-mulched with time, since dry soil is detrimental to forest health. Also, never remove organic matter like fallen leaves from the forest floor, as it will kill good soil microbes.
- As the tree grows taller, longer support sticks may be needed so that the tree shoot does not bend and become weak.
- Never cut or prune the forest as it could make the forest weaker.

10.9.2 Green Belt in Haul Road

A green belt, 2-3 m in width is being developed around the haul / motorable road.

- Green belt plantation has been started with the onset of the mining and has been completed within the first year.
- Seedlings of native plants are being procured for plantation.
- Green belt is being watered through tanker.
- Compost for plantation is being obtained through vermin-composting.
- Green belt plantation is being protected properly. The saplings are being protected with tree guards.
- However, only local species are being used in the plantation.
- Green belt is helping in reducing the spread of any dust and noise pollutant from the transportation of minerals.
- Selection of plants for green belt plantation has been made on following criteria:
 - The plant should be a fast growing species
 - It should have deep root system
 - Should bear the leaves for a longer period
 - Should be a local species
 - Should have good survival rate.

With these above considerations following, local plant species are being taken for green belt plantation.

10.9.3 Plantation in the Buffer zone

Trees are being planted in the buffer zone also. This plantation is being done at selected places only and only local species are being used in the plantation. Plantation of such tree species is ensuring provision for food to the herbivores, which in turn would be the food source for the



carnivores. Water, particularly during drier seasons, becomes the most important factor to all types of wild animals including the mammals, birds and reptiles. If water is available safely, then all other factors become secondary for the presence and survival of the wild life in any forested area. Places suitable for mini watersheds have been identified in the core as well as in the buffer zone to store rainwater. Further, to make water available at all the times, throughout the year, some of these water holes are being recharged through artificial means. Proper slope has been given to approach these water sources so that the wild animals would be able to drink water without any difficulty. Proper cover through vegetation or any other type of even artificial cover has been developed near these water sources so that the prey species would be able to hide themselves from the predators, at the time of approaching the water sources. To attract the birds, plants yielding food to the birds have been planted on priority basis. If water and food are available to the birds without any anthropogenic disturbances the area can become an ideal place for bird watching.

10.9.4 Plantation Programme

The tree plantation has been made all along the mine approach roads surrounding the site services and dumps.

The survival rate is 80%. The dead plants will be replaced by fresh plants in next year and 20% as replacement from second year. From third year onwards plantation will be carried out in the nearby school, hospital, police station, community center and other public utility places.

The PP will plant 11,000 saplings per year. The total mine lease area is 66.32 Ha, out of which, 33% should be maintained under greenbelt, i.e., 22.0 Ha should be under green cover within mine lease. As per MoEF Guidelines, number of plants per hectare within the green belt should not be less than 2500. In line with such guidelines, the number of plants has been calculated as 55,000 for 22.0 Ha area. Based on the local land quality and climatic conditions, around 20% mortality in the plantation has been observed. The same number of plants is being replaced annually to compensate the mortality.

As per the guideline, local mortality rate has been calculated and given in the table below.

Table 10.5 Schedule of plantation for the five year

| S.No. | Year of Plantation | Target of Plantation | Budget @ Rs 100 Per Plant (In Lakhs) |
|-------|--------------------|----------------------|---|
| 1. | I Yr. | 11,000 | 11.0 |
| 2. | II Yr. | 11,000 | 11.0 |
| 3. | III Yr. | 11,000 | 11.0 |
| 4. | IV Yr. | 11,000 | 11.0 |
| 5. | V Yr. | 11,000 | 11.0 |

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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. ltd.

| | | |
|--|--------------|-------------|
| Total | 55000 | 55.0 |
| The survival rate is 80%. The dead plants will be replaced by fresh plants during next year and 20% as replenishment during second year. | | |

Table 10.6 List of plant species using in plantation program

| S. No. | Scientific Name | Plant Name |
|--------|---------------------------------|------------------|
| 1 | <i>Citrus limon</i> | Nimbu |
| 2 | <i>Azadiracta indica</i> | Neem |
| 3 | <i>Pongamia pinnata</i> | Papdadi |
| 4 | <i>Delonix regia</i> | Gul Mohar |
| 5 | <i>Terminalia arjuna</i> | Arjun |
| 6 | <i>Dalbergia latifolia</i> | Shisham |
| 7 | <i>Polyalthia longifolia</i> | China Ashoka |
| 8 | <i>Ficus religiosa</i> | Pipal |
| 9 | <i>Artocarpus heterophyllus</i> | Kathal |
| 10 | <i>Ficus virens</i> | Pilkan |
| 11 | <i>Ailanthus exalsa</i> | Maharukh |
| 12 | <i>Thevitia nerifolia</i> | Kaner |
| 13 | <i>Ficus varigata</i> | Ornamental ficus |
| 14 | <i>Syzygium cumini</i> | Jamun |
| 15 | <i>Cordia dichotoma</i> | Lasoda |
| 16 | <i>Aegle Marmalos</i> | Bel |
| 17 | <i>Neolamarckia cadamba</i> | Kadam |
| 18 | <i>Ficus benghalensis</i> | Bad |
| 19 | <i>Ficus glomarata</i> | Gular |
| 20 | <i>Grevillea robusta</i> | Silver oak |
| 21 | <i>Chukrasia tabularis</i> | Chakrasia |
| 22 | <i>Melia azadirach</i> | Bakain |
| 23 | <i>Psidium guajava</i> | Amrud |
| 24 | <i>Morus alba</i> | Sahtut |
| 25 | <i>Mangifera indica</i> | Aam |
| 26 | <i>Punica granatum</i> | Anar |
| 27 | <i>Manilkara zapota</i> | Chiku |
| 28 | <i>Pterocarpus marsupium</i> | Bija |
| 29 | <i>Plumaria alba</i> | Kanak champa |
| 30 | <i>Callistemon lanceolatus</i> | Bottle brush |
| 31 | <i>Phyllanthes amarus</i> | Aonla |
| 32 | <i>Alstonia scholaris</i> | Chatwan |
| 33 | <i>Thuja occidentalis</i> | Vidya Tree |
| 34 | <i>Cassia fistula</i> | Amaltas |

10.9.5 Plan For Link Road And Haulage Road

In order to mitigate and minimize the environmental impacts, arising due to mine project especially from air pollution, noise pollution, soil erosion etc. the Greenbelt development around the project sites can provides the best mitigation option. The green canopy not only absorbs some of these pollutants but also improves the aesthetic environment. Therefore, a "Green Belt Development Plan" has been proposed.

The Mining is located Amipur, Tehsil & District- Faridabad, State- Haryana and the site haul road is connected to Yamuna Express and Metalled Road near Chirsi, which will be maintain by its annual maintenance cost of Rs. 3.0 Lakhs, which will be utilized from EMP budget.

Selection Of Plants For Greenbelts

The main limitation for plants to function as scavenger of pollutants are, plant's interaction to air pollutants, sensitivity to pollutants, climatic conditions and soil characteristics. While making choice of plants species for cultivation in green belts, due consideration has to be given to the natural factor of bio-climate. Xerophytes plants are not necessarily good for greenbelts; they with their sunken stomata can withstand pollution by avoidance but are poor absorber of pollutants. Character of plants mainly considered for affecting absorption of pollutant gases and removal of dust particle are as follows.

For Absorption of Gases

- Tolerance towards pollutants in question, at concentration, that are not too high to be instantaneously lethal.
- Longer duration of foliage.
- Freely exposed foliage.
- Adequate height of crown.
- Openness of foliage in canopy.
- Big leaves (long and broad laminar surface)
- Large number of stomatal apertures.

For Removal of Suspended Particular Matter

- Height and spread of crown.
- Leaves supported on firm petiole.
- Abundance of surface on bark and foliage.
- Roughness of bark.
- Abundance of auxiliary hairs.
- Hairs or scales on laminar surface.
- Protected Stomata.

Plantation Program

Total 55,000 trees will be planted in 5 years along the river banks, haul roads, Gram Panchayat & Schools. The plantation will be done on 22.0 Hectare and the spacing between the trees is 3m. A suitable combination of native trees that can grow fast, have good leaf cover, along with some fruit bearing and medicinal trees shall be planted.

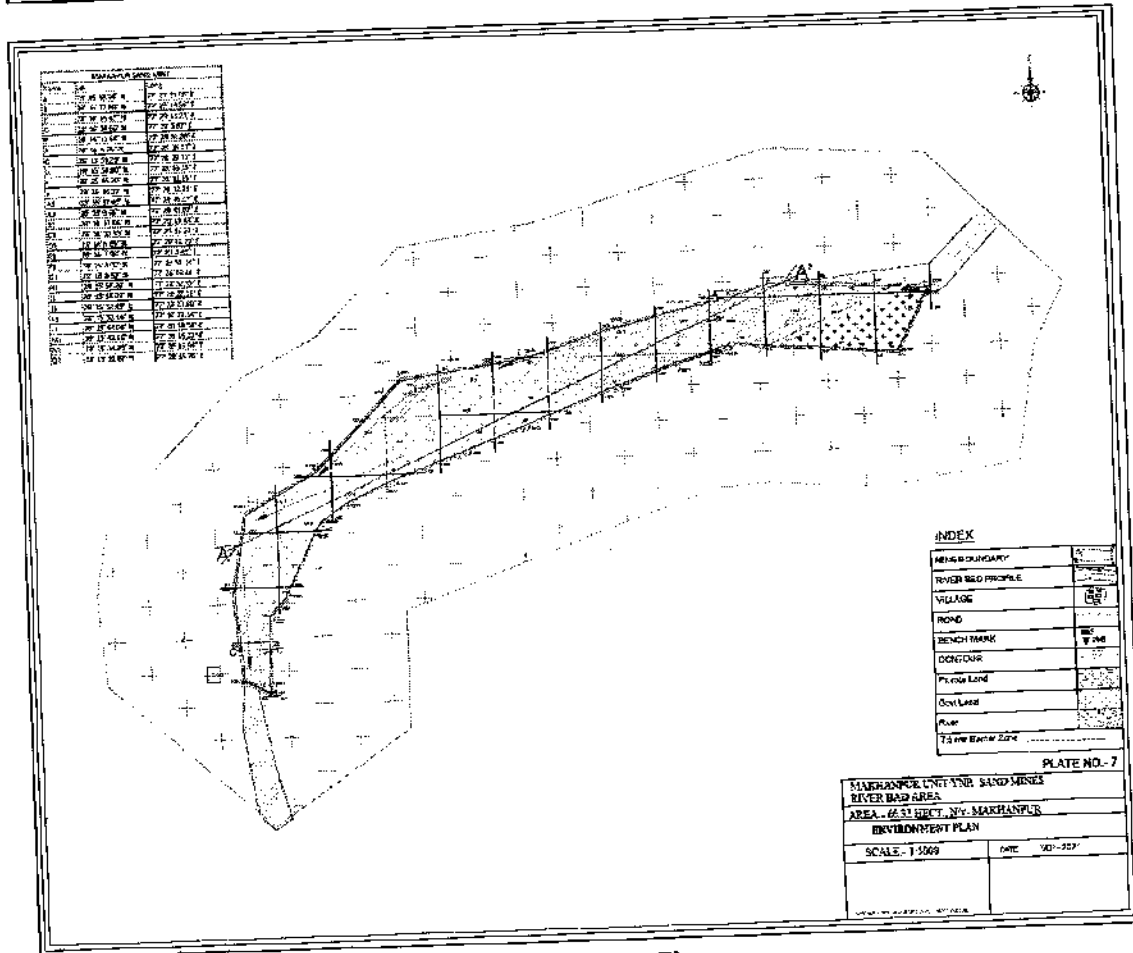
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Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

Table 10.7: Outlets of Greenbelt Development

| | |
|--|--|
| Mine Lease Area (Ha.) | 66.32 |
| 33% Plantation area (Ha.) | 22.0 |
| Total No of plants @ 2500/ha | 55,000 (Total survived species @ 80% i.e. 44,000 plant will survive) |
| Lease Period | 7 years |
| Length of Proposed Road (m) | 100 |
| Total Length of Road for Plantation (m) | 100*2=200 |
| Plantation on both side of the road (3mt spacing) | 200/3m = 66 plants |
| Total plantation in Safety zone Village, School and Gram panchayat area. | 55,000-66=54,934 plants |



Environment Plan

10.10 IMPLEMENTATION OF ENVIRONMENT MANAGEMENT PLAN

Following provisions are proposed to be taken for improving, controlling and monitoring of environment protection measures. Managing Director will also be monitor the related concerns and its implementation.

Table 10.8: Environmental Management Plan

| S. No. | Particulars | Capital Cost (In Lakhs) One time | Recurring cost In lakhs Per year | Total cost in Lakhs for 5 years |
|--------------|--|----------------------------------|----------------------------------|---------------------------------|
| 1. | Dust Suppression | 0 | 3 | 15 |
| 2. | Environmental Monitoring – Air, Water, Noise and Soil | 0 | 3 | 15 |
| 3. | Haul road and other roads construction and Maintenance | 3 | 2 | 13 |
| 4. | Plantation | 11 | 13 | 76 |
| 5. | Waste water & solid waste treatment (domestic waste) | 2 | 1 | 7 |
| 6. | Pre-monsoon & post-monsoon survey for sedimentation in the river bed | 0 | 4 | 16 |
| 7. | Rainwater recharging (outside the project site) | 4 | 1 | 9 |
| Total | | 20 | 27 | 151 |

| S. No. | Particulars | 1 st | 2 nd | 3 rd | 4 th | 5 th | Total |
|--------------|--|-----------------|-----------------|-----------------|-----------------|-----------------|------------|
| 1 | Dust Suppression | 3 | 3 | 3 | 3 | 3 | 15 |
| 2 | Environmental Monitoring – Air, Water, Noise and Soil | 3 | 3 | 3 | 3 | 3 | 15 |
| 3 | Haul road and other roads construction and Maintenance | 5 | 2 | 2 | 2 | 2 | 13 |
| 4 | Plantation | 24 | 13 | 13 | 13 | 13 | 76 |
| 5 | Waste water & solid waste treatment (domestic waste) | 3 | 1 | 1 | 1 | 1 | 7 |
| 6 | Pre-monsoon & post-monsoon survey for sedimentation in the river bed | 0 | 4 | 4 | 4 | 4 | 16 |
| 7 | Rainwater recharging (outside the project site) | 5 | 1 | 1 | 1 | 1 | 9 |
| Total | | 43 | 27 | 27 | 27 | 27 | 151 |

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10.11 DETAIL OF RAINWATER HARVESTING PLAN

Determination of available rainwater for harvesting:

The storm water disposal system for the premises shall be self-sufficient to avoid any collection/stagnation and flooding of water. Storm water drainage plan of the project is enclosed. The amount of storm water run-off depends upon many factors such as intensity and duration of precipitation, characteristics of the tributary area and the time required for such flow to reach the drains. Storm water from various plots/shall be connected to adjacent drain by a pipe through catch

basins. Therefore, it has been calculated to provide 1 rainwater harvesting pit at selected locations, which will catch the maximum run-off from the area.

The rain water harvesting is proposed by Project Proponent and has allocated a budget of Rs. 10.00 Lakhs/ year under EMP budget. There are 1 No. of rainwater harvesting pit which will be the proposed for installation within Panchayat building or School Building.

| S.N | Type of Surface | Catchment's Area (m ²) [A] | Runoff Coeff. [C] | Rainfall Intensity [I] (M/hr)* | Discharge (Run Off) [Q=CIA] m ³ /hr |
|-----|-----------------|--|-------------------|--------------------------------|--|
| 1. | River Bed | 125150 | 0.20 | 0.0030 | 75.09 |

(*taking average time of rainfall in 1 day = 5 hrs during monsoon period assuming 70 days of rainy days in a year)

Taking 20 minutes retention time, total volume of storm water = $75.09 \times 0.21 = 15.8 \text{ m}^3 = 16 \text{ m}^3$

Volume of a single Recharge pit (lbh) = $3 \times 3 \times 2 = 18 \text{ m}^3$

Hence No. of pits required = $16/18 = 0.83 = 1 \text{ Pits}$

1 no. of Rain Water Harvesting pits are being proposed for artificial rain water recharge at community building/School etc.

10.12 CONSERVATION PLAN FOR SCHEDULED FAUNA IN THE STUDY AREA

As per the biological environment study and the data of forest department there are one species viz., *Pavocristatus*, in the area for food and water. The conservation plan for documented Scheduled fauna of the study area has been given separately as wildlife conservation plan. The total proposed cost of Wildlife Conservation Plan is Rs.10,00,000/- has been allocated towards conservation of scheduled fauna in the area for the implementation of conservation proposal and the same is attached as Annexure XVII.

10.13 Summary

As per Above discussion there is no major impact on the environment due to mining except fugitive emission in the form of dust generated during handling of mineral. The adequate preventive measures will be adopted to contain the various pollutants within permissible limits.



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DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

Plantation development will be carried out in the mine premises, along the approach roads, around Govt. buildings, schools. The conservation plan suggested here is for scheduled fauna (Animal and Bird) which will be implemented by the mining lease holder and the budgetary provision is discussed and given in detail for the implementation of the same in the area. It will prove an effective pollution mitigate technique, and help avoid soil erosion during monsoon season. Employment opportunities will be provided to the locals only as providing extraction of minerals from the mine site is the only prevailing occupation for them for their livelihood.



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11. SUMMARY & CONCLUSION

11.1 GENERAL

The chapter discusses about the summary of whole EIA/EMP report along with recommendation and conclusion. The proposed mining lease area falls in the Survey of India Toposheet No. H43X7, H43X8, H43X11, H43X12. The lease area is located Village- Village- Makhanpur, Tehsil &, District- Faridabad, State- Haryana by M/s Dev & Div Solutions Pvt. Ltd.

11.2 DETAILS OF THE PROJECT

| S. No. | Particulars | Details |
|--------|--|--|
| A. | Nature and Size of the Project. | Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur unit, Tehsil- & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd. |
| B. | Location | |
| | Khasra Number | 6//7Min,12Min,13,14,17,18,19,20min,21,22,23 7//16 min,17 min,22 min,23 min ,24 min,25 11//23 min,24 min,25 min 12//22 min, 23,24,25 13//4min,5min,6,7min,8 min,9 min,11 min,12 min,13,14,15,16,17,18,19,20,21,22,23,24,25min 14//1min,2min,3,4,5,6,7,8,9,10,11,12,13,14, min,15 min,18 min,19 min ,20,21min 15//1,2,3 min,9 min,10 min 18//1,2,3 min,4 min,8 min,9 min,10 min,11min 19//1,2,3,4,5,6,7,8,9,10,11,12,13,14min,17min ,18 min ,19,20min 20//3,4,5,6,7,8,9,12,13,14,15,16,17,18,19,20,21,22,23,24,25, 22//5,6,7,8,12,13,14,15,16 min,17,18,19,20,21,22,23 23//1,2,3,4 min,5 min,8 min,9 min,10,11 min, 33//1,2,3,4 min,8 min,9,10,11,12,13 min,18 min,19, 20,21,22,23 min 36//1,2 min,10 min,11 min,20 min,21 min 47//1 min,10 min,11 min For Ancillary area 4//11,12,13,14,15,16,17,18,19,20,21,22,23,24,25 7//1,2,3,4,5,6,7,8,9,10,11,12,13,14,15 |
| | Village | Makhanpur unit |
| | District | Faridabad |
| | State | Haryana |

M/s Dev & Div
Solutions Pvt.
Ltd.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| Geographical Coordinates | Latitude and Longitude of Project Area | Point No. | Longitude | Latitude |
|--------------------------|--|---------------------------------|------------------|------------------|
| | | A | 28° 16' 18.96" N | 77° 29' 24.98" E |
| B | 28° 16' 17.6" N | 77° 29' 19.56" E | | |
| C | 28° 16' 16.47" N | 77° 29' 13.21" E | | |
| D | 28° 16' 14.66" N | 77° 29' 3.87" E | | |
| E | 28° 16' 11.64" N | 77° 29' 52.38" E | | |
| F | 28° 16' 9.75" N | 77° 29' 36.11" E | | |
| G | 28° 16' 59.29" N | 77° 29' 23.11" E | | |
| H | 28° 16' 54.6" N | 77° 29' 13.35" E | | |
| G | 28° 15' 59.29" N | 77° 29' 23.11" E | | |
| I | 28° 15' 45.2" N | 77° 29' 11.25" E | | |
| J | 28° 15' 34.27" N | 77° 29' 12.11" E | | |
| A1 | 28° 16' 17.491" N | 77° 29' 46.37" E | | |
| A2 | 28° 16' 9.653" N | 77° 29' 41.873" E | | |
| B1 | 28° 16' 11.56" N | 77° 29' 19.42" E | | |
| C1 | 28° 16' 10.33" N | 77° 29' 15.2" E | | |
| D1 | 28° 16' 9.65" N | 77° 29' 12.11" E | | |
| E1 | 28° 16' 7.08" N | 77° 29' 3.49" E | | |
| F1 | 28° 16' 3.00" N | 77° 29' 51.14" E | | |
| G1 | 28° 16' 0.52" N | 77° 29' 43.44" E | | |
| H1 | 28° 16' 57.26" N | 77° 29' 32.93" E | | |
| I1 | 28° 16' 55.01" N | 77° 29' 27.18" E | | |
| J1 | 28° 16' 52.99" N | 77° 29' 23.8" E | | |
| K1 | 28° 16' 52.16" N | 77° 29' 23.14" E | | |
| L1 | 28° 16' 44.06" N | 77° 29' 18.54" E | | |
| M1 | 28° 16' 42.16" N | 77° 29' 16.32" E | | |
| N1 | 28° 16' 32.23" N | 77° 29' 15.94" E | | |
| O1 | 28° 16' 32.67" N | 77° 29' 15.78" E | | |
| | Toposheet (OSM) No. | H43X7, H43X8, H43X11, H43X12 | | |
| C. | Lease Area Details | | | |
| | Lease Area | 66.32 Hectare | | |
| | Type of Land | Govt. Land | | |
| | Topography | Riverbed | | |
| | Site Elevation Range | 185mRL to 192mRL | | |
| | | Source: Mining Plan | | |
| D. | Cost Details | | | |
| | Cost of the project | Rs 7 Crores | | |
| | Cost for EMP | Rs. 151 lakhs for 5 years | | |
| | OH&S | Rs. 4 Lakhs/- for 5 years | | |
| | Cost For | Rs.10.00 Lakhs/ -(Life of Mine) | | |

M/s Dev & Div
Solutions Pvt.
Ltd.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | | |
|--|--|--|
| | Biodiversity Conservation | |
| E. | Environmental Settings of the area | |
| | Ecological Sensitive Areas (National Park, Wild Life Sanctuary, Biosphere Reserve, Reserve/ Protected Forest etc.) within 10 Km radius | Only Protected forest present within 10 km of the mine lease area and list for the same is given below: Karauli Khadra PF 8.5 km in SSE |
| | Interstate boundary within 5 Km radius | Haryana -Uttar Pradesh~0.4 km, in E |
| | Archaeological Important Place | None within 10km of the study area. |
| | Nearest Habitation | Makhanpur - 0.3 km in E direction |
| | Nearest Town/City | Faridabad at a distance of 16 km of direction NW |
| | Nearest Railway Station | Faridabad railway station is 20.14 Km in NW |
| | Nearest State/ National Highway | NH -19 at ~17.4 KM km in W |
| | Nearest Airport | Indira Gandhi International Airport (nearest Airport) is 48.44 km in North West direction. |
| | Nearest Police Station | Police station Chhinsa- ~950 in W direction |
| | Medical Facilities | Primary Health Center Chhainsa ~400 m in W direction. |
| | Education Facilities | Nehru Convennt public school ~ 800 m in W direction. Community |
| | Seismic Zone | Zone IV |
| | Water Body | Yamuna River onsite, GhuriyaNala 4.5 km in E direction KundNala 3.4 km in NNE direction |
| <i>No mining activity exists within 50 m from forest boundaries, national highway and habitation</i> | | |

11.3 INTRODUCTION

The project is classified as Category-B" as per the EIA Notification dated 14thSeptember 2006 and its amendments dated 12.12.2018 and falls in schedule 1 (a) (i) Mining of Minerals of Category 'B' as mining lease area less than 100 Ha.

M/s Dev & Div
Solutions Pvt.
Ltd.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

11.4 PROJECT DESCRIPTION

Project is proposed for the Mining of sand minor minerals by open cast semi-mechanized method from the Riverbed Yamuna River with 24,00,000 MTPA over an area of 66.32 Hectare Located in Village- Makhanpur, Tehsil &, District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd. Govt. of Haryana, Department of Mines and Geology conducted auction of Sand minor mineral mine of "Makhanpur Unit and M/s Dev & Div Solutions Pvt. Ltd was considered as highest bidder by paying Rs. 9,98,00,000 /-, for the Makhanpur Unit, accordingly LOI was issued for tentative area 66.32 Hectares for 7 years.

Subsequent to auction process by Department of Mines & Geology, Govt. of Haryana issued the letter of intent for LOI grant (Annexure-I) vide letter no. DMG/HY/MakhanpurUnit/FBD/2021/3176 dated Panchkula 16.08.2021 in favor of M/s Dev & Div Solutions Pvt. Ltd was issued. The period of lease shall be 07 years & the same shall commence with effect from the date of grant of Environment Clearance by Competent Authority.

11.5 DESCRIPTION OF THE ENVIRONMENT

Environmental data have been collected in relation to proposed mining for Air, Noise, Water, Soil, Ecology and Biodiversity. The generation of primary data, as well as collection of secondary data and information from the site and surroundings was carried out during post monsoon, Winter Season, i.e. October to December 2021. The EIA study is being done for the Mine Lease (core zone) and area within 10 Km distance from the mine lease boundary (buffer zone), both of which together comprise the study area.

Table 11-1: Baseline Environment Status

| Parameters | Baseline Status |
|--------------------------|---|
| Ambient Air Quality | PM ₁₀ -70.2 to 94.6 µg/m ³ PM _{2.5} - 36.1 to 54.5 µg/m ³ SO ₂ - 7.0 to 17.4 µg/m ³ NO _x - 15.6 to 28.6 µg/m ³ |
| Noise Level | Noise Level During Day Time at project site - 72.30 L _{eq} dB Noise Level During Night Time at project site -61.41 L _{eq} dB |
| Water Quality | Ground Water: All the Parameters Like TDS (377 to 493 mg/L), pH (7.60 to 7.78), Total Hardness (213 to 286.0mg/L) etc. are found within the permissible limits. Surface Water: All the Parameters Like TDS (867 to 1013 mg/L), pH (7.54 to 7.84), Total Hardness (641 to 725 mg/L) etc. are found within the permissible limits. |
| Soil Quality | pH - 7.60 to 7.83, Organic Matter - 0.25 % - 0.48 %. |
| Ecology And Biodiversity | There is no wildlife sanctuary/biosphere reserve/national parks present within 10 Km radius of the study area. One species of schedule-I were observed during study. Subsequently, a budget of Rs.10.00 Lakhs has been earmarked for conservation of Wildlife for the life of the mine. |
| Socio Economic | The proposed project will provide positive impact to the nearby area. |

M/s Dev & Div
Solutions Pvt.
Ltd.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | |
|--------------|--|
| | The project will provide direct employment to the 98 persons which will be hired through the nearby villages |
| Traffic | The proposed project will not cause major impacts due to increase in the PCU/hr which are 203 PCU/hr (Yamuna Express) & 68 PCU/hr (Metalled Road). The LOS study shows that the existing traffic scenario is "Excellent" and the free flow of vehicles is observed during the study period. Due to the mine project the traffic density will increase as the entire mineral will be transported through the MDR under study and the value of LOS would remain same i.e. Excellent. |
| Hydrogeology | There is no proposal of any stream modification/diversion. Hence, there will be no impact on the hydrology of the study area. Sand mining will be carried out upto 3m depth only from surface of river water and the depth of the ground water table is at 8-10 m bgl hence the water table is not expected to be intersected at any stage of mining. |

11.6 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The proposed mining operations are not anticipated to raise the concentration of the pollutants beyond prescribed limits. However, the measures are suggested to mitigate any harmful impacts of pollutants, like the plantation of trees along haul roads, especially near settlements, to help to reduce the impact of dust on the nearby villages; planning, transportation routes of mined material so as to reach the nearest paved roads by shortest route; regular water sprinkling on unpaved roads to avoid dust generation during transportation etc. Some of impacts may be due to increase in the PCU/hr which are **203 PCU/hr** (Yamuna Express) & **68 PCU/hr** (Metalled Road). Transportation of Sand should be minimized in the morning and evening and cannot be done at night. Access roads will not encroach into the riparian zones. Fugitive emission from vehicle movement will form a layer on leaves, thus reducing the gas exchange process. The impact on the present noise levels due to mining operations will be restricted to the work zone areas only. The impact on the ambient noise levels will not be felt in the settlement areas due to masking effect with the existing noise levels. There is no drilling and blasting envisaged in the Sand mining so there is no impact of vibration due to this project. Hence, the noise levels and vibration impact due to the proposed mining operations on the community will be minimal. There will be no impact on water environment due to mining in the riverbed as well as in the riverbed since there is no intersection of the water table due to mining activity. There will be no waste water generated from the proposed mining activity except a sanitary waste water generation that will be treated in septic tanks and will be used for plantation purpose. The mine worker will generate municipal solid waste of about 24 Kg per day, which will have an adverse impact on human health. There will be 5 Nos. of garbage, provided for domestic waste collection. There will be no overburden due to mining in the riverbed area. The mining activities will be done in a systematic manner by maintaining the road infrastructure and vehicle transport, which will be a protective measure for preserving the topography and drainage in the area. The ownership will not be changed as the land has been taken on contract which will be returned as it is after the contract period is over. No human settlement should be permitted in the lease mining or the nearby area. No mining will be carried out during the rainy season to minimize impact on aquatic life. There is only 1 specie of Schedule I observed during the study period hence, for the same conservation plan was prepared. Subsequently, a budget of Rs. 10 Lakhs has allotted for the conservation of wildlife

species. The mining of Sand is likely to increase the per capita income of local people by which the socioeconomic status of the people will be improved. The local people have been provided with either direct employments or indirect employment such as business, contract works and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc. Except dust generation, there is no source which can show a probability for health related diseases. Regular water sprinkling will be done with sprinkles mounted tankers and dust masks will be provided to the workers. All workers will be subjected to a medical examination as per Mines Rule 1955 both at the time of appointment and at least once in a year. Medical camps will be organized for this activity. Insurance for all employees as per the rules will also be carried out.

11.7 ANALYSIS OF ALTERNATIVES

We have analyzed all the option for alternatives of the proposed mine site. This project is a sand specific project and existing land use of my lease classified as River Body which will continue to be so even after the current mining project is over, hence no alternate site is suggested for this project.

11.8 ENVIRONMENTAL MONITORING PROGRAM

In order to maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary which will comply as per conditions. For this the lessee M/s Dev & Div Solutions Pvt. Ltd. has taken the decision to formulate an Environment Policy of the mine and constitute an Environmental Management Cell and committed to operate the proposed mine with the objectives mentioned in approved Environment Policy. EMP may also require measurement of ambient environmental quality in the vicinity of a site using ecological/biological, physical and chemical indicators. Monitoring may include socioeconomic interaction, through local liaison activities or even assessment of complaints. Regular Monitoring of all the environmental parameters viz., air, water, noise, SE, EB and soil, as per the formulated program based on CPCB and MoEF&CC guidelines will be carried out every year. The location of the monitoring stations was selected on the basis of prevailing micro meteorological conditions of the area like; wind direction and wind speed, relative humidity, temperature. A budget for monitoring of Air, water, Noise and Soil will be Rs. 3 Lakhs per annum which is to be incurred by the project proponent for undertaking pollution prevention measures during the mining activity.

11.9 ADDITIONAL STUDIES

The public hearing will be conducted and the final minutes will be incorporated in the Final EIA/EMP Report. Risk assessments will help mine operators to identify high, medium and low risk levels. This is a requirement of the Occupational Health and Safety Act 2000. Risk assessments will help to prioritize the risks and provide information on the need to safely control the risks. In this way, mine owners and operators will be able to implement safety improvements. Mining and allied activities are associated with several potential hazards to both the employees and the public at large. A worker in a mine will be able to work under conditions, which are adequately safe and healthy. At the same time the environmental conditions also will not impair his working efficiency. This is possible only when there is adequate safety in mines. Hence mine safety is one of the most essential aspects of any working mine. The conservation plan suggested here is for scheduled fauna (Animal and Bird) will be implemented by the mining lease holder and the budgetary provision is discussed and given in detail for the implementation of the same in the area. It is very important to conserve the scheduled fauna

M/s Dev & Div
Solutions Pvt.
Ltd.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

in the area by the local authority as well as by the forest officials. A green belt will be developed around the core zone. The Green belt plantation will be started with the beginning of the mining and will be completed within five years from the beginning. This plantation will be done at selected places only and only local species will be used in the plantation.

11.10 PROJECT BENEFIT

The management will recruit the semi-skilled and unskilled workers from the nearby villages. The project activity and the management will definitely support the local Panchayat and provide another form of assistance for the development of public amenities in this region. The company management will contribute to the local schools, dispensaries for the welfare of the villagers. A suitable combination of trees that can grow fast and also have good leaf cover will be adopted to develop the green belt. Total 55,000 trees will be planted in 5 years within the barrier zone of mining lease area and Govt. school building, hospitals, Panchayat land etc. outside the mine lease area. The officers of the Haryana State pollution control Board will strictly monitor the compliance of the lease holder in this regard. Other than this social development of the village will be considered as per social requirement of locality.

11.11 ENVIRONMENTAL MANAGEMENT PLAN

As per Above discussion there is no major impact on the environment due to mining except fugitive emission in the form of dust generated during handling of mineral. The adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Plantation development will be carried out, along the approach roads, around Govt. buildings, schools. It will prove an effective pollution mitigate technique, and help avoid soil erosion during monsoon season. Employment opportunities will be provided to the locals only occupational from the mine site is the only prevailing source of income for their livelihood. A budget of Rs.151 Lakhs for plan period has been kept for EMP .

11.12 CONCLUSION

From the baseline study and various above discussions on the probable impacts of all the operational activity, it has been concluded that this project will have more positive impact and will generate the revenue and employment in the area. On the above facts and baseline study, the proposed activity is recommended for the commencement with proper mitigation measure as suggested.



12 . DISCLOSURE OF CONSULTANT

12.1 INTRODUCTION

Vardan Environet is a pioneer consulting organisation of India specializing in Environmental Protection, Industrial Pollution Control, Environmental & Mechanical testing and engineering field. Vardan assists clients in comprehensive environmental and engineering services ranging from conceptual planning and preliminary investigation to detailed engineering designs. Local knowledge coupled with national and international experience of proven technical know-how and a strong commitment from our team of experts enables Vardan to assist in solving the clients environmental and engineering problems successfully with competence by first analysing then visualizing and finally utilizing technically strong and dedicated skill.

Vardan has successfully completed a wide range of multi-disciplinary assignments/reports. The company's project formulation requires preliminary and detailed project investigation. The objective of the investigation is to assess the technical viability and cost effectiveness of the proposals vis-à-vis the objective and benefit. Vardan was founded in 2012 and brought together a number of consultancy services with a track record of performance in the environmental Science and Engineering field.

Headquartered in Gurugram, Vardan has prominent presence in Delhi-NCR, Rajasthan, Maharashtra, Madhya Pradesh, West Bengal and Jharkhand. With a man-power of over 125 professionals, the organization comprises of senior retired government officers from various departments like Pollution Control Board, Mines & Geology, Civil Services, SAIL, GAIL, NEERI who have decades of experience in the field of environmental management. The team also Comprises of young, dynamic and progress driven Environment, Civil, Mechanical & Chemical engineers, Geologists, GIS experts, Ecologists and Auditors.

Vardan Envirolab, a sister concern provides reliable and precise testing services for a wide range of Environmental, Chemical, Food testing, Microbiology and Building Materials with in-house Equipment/Instruments of advance technology along with experienced technical staff.

12.2 SERVICES OF VARDAN ENVIRONET

- Environmental Impact Assessment (EIA), Environmental Management Plan (EMP), Environmental Compliance, Mining Plan, Social Impact Assessment,
- Testing of water, Waste water, Ambient & work zone air, stack emissions, noise, soil, limestone, dolomite, iron ore, coal, cement, bricks, concrete, blocks, steel bars & wires, Indoor Air Quality monitoring, Sludge.
- Hydrological surveys for ground water clearance.
- Approvals/NOC/Clearances from various Government Authorities.
- Detailed Project report/Feasibility report/Plans/Designs.
- Environmental Quality Monitoring and analysis.
- Geotechnical investigations, Topographical Survey, Planning and Designs.
- EHS, Energy and water Audit, risk/hazard studies and disaster management plan (both onsite and off-site)

M/s Dev & Div
Solutions Pvt.
ltd.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. ltd.

12.3 RECOGNITIONS

- Approved by NABET in 17 sectors for preparation of EIA/EMP reports.
- Vardan EnviroLab is recognized by Ministry of Environment, Forest & Climate Change, Govt. of India under Environmental Protection Act 1986.
- Vardan EnviroLab is accredited by NABL in the field of Testing.
- Vardan EnviroLab is certified by OHSAS 18001:2007.
- Vardan EnviroLab is certified by ISO 14001:2015.
- Vardan EnviroLab is certified by ISO 9001:2015.
- Vardan EnviroLab is approved by HSPCB & RSPCB.

12.4 LIST OF SOFTWARE MODELS FOR ENVIRONMENTAL STUDIES

- Multisource Dispersion Model based on Gaussian Model (ISCST3, AERMOD)
- Noise Propagation Model (Dhawani Pro)
- Risk and Hazard studies through Aloha model
- GIS mapping through Arc GIS, watershed & area drainage mapping, cadastral mapping, DGPS survey, 3D modelling, Urban/Rural area planning & management and Digital Elevation Model.
- Transect and line intercepts for Ecology and Biodiversity studies
- Extrapolative method & Intuitive technique (Delphi technique) in socio-economic assessment.

12.5 KEY MANAGEMENT PERSONNEL OF VARDAN

| S. No. | Name | Designation | Experience (Years) |
|--------|----------------------|------------------------|--------------------|
| 1. | R.S. Yadav | Managing Director | 31 |
| 2. | Aman Sharma | President | 13 |
| 3. | Roopika Sharma | CEO | 11 |
| 4. | Anshul Yadav | General Manager | 7 |
| 5. | K.M. Khare | EIA Coordinator | 38 |
| 6. | Ankur Agarwal | EIA Coordinator | 13 |
| 7. | Shurbhi Makhwana | EIA Coordinator | 7 |
| 8. | Nemi Chand Choudhary | General Manager-Jaipur | 11 |

12.6 EMINENT CLIENTELE OF VARDAN

Vardan has executed around 1000 projects across all over India in a short span of time covering both public and private sectors. Following are some of our reputed clients.
Indian Oil, HPCL, NTPC, NHPC, BPCL, Delhi Metro, GAIL, SAIL, NHAI, APCPL, RITES, MPPGCL, Indian Railways, JK Lakshmi Cement Ltd., L&T, Tata, Adani, Hero, Honda, HCL,



M/s Dev & Div
Solutions Pvt.
Ltd.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt Ltd.

Panasonic, Jaypee group, DLF, Godrej, Haldiram's, Unitech, JBM, Trident hotels, Lanco, Mangalam cement, JW Marriot, Eros group and many others.

12.7 CERTIFICATIONS OF VARDAN GROUP



Quality Council of India

National Accreditation Board for Education & Training

Certificate of Accreditation


Vardan Environet, Gurugram
Plot No. 82-A, Sector 5, IMT Manesar, Gurugram, Haryana

Accredited as Category - 'A' organization under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations: Version 3 for preparing EIA-EMP reports in the following Sectors:

| Sl. No. | Sector Description | Sector [as per] | | Cat. |
|---------|--|-----------------|-----------|------|
| | | NABET | MOEFCC | |
| 1 | Mining of minerals including open cast/ underground mining | 1 | 1 (a) (i) | A |
| 2 | Offshore & Onshore Oil and gas exploration, development & production | 2 | 1 (b) | A |
| 3 | River Valley projects | 3 | 1 (c) | A |
| 4 | Thermal power plants | 4 | 1 (d) | B |
| 5 | Mineral beneficiation | 7 | 2 (b) | A |
| 6 | Metallurgical industries (ferrous & nonferrous)- both primary & secondary | 8 | 3 (a) | A |
| 7 | Cement plants | 9 | 3 (b) | A |
| 8 | Coke oven plants | 11 | 4 (b) | A |
| 9 | Petrochemical based processing | 20 | 5 (e) | B |
| 10 | Synthetic organic chemicals industry | 21 | 5 (f) | A |
| 11 | Distilleries | 22 | 5 (g) | A |
| 12 | Sugar industry | 25 | 5 (j) | B |
| 13 | Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG Terminal | 27 | 6 (a) | A |
| 14 | Air ports | 29 | 7 (a) | A |
| 15 | Bio-medical waste treatment facilities | 32A | 7 (da) | B |
| 16 | Highways | 34 | 7 (f) | A |
| 17 | Common Effluent Treatment Plants (CEPTs) | 36 | 7 (h) | B |
| 18 | Building and construction projects | 38 | 8 (a) | B |
| 19 | Townships and Area development projects | 39 | 8 (b) | B |

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Feb 28, 2020 and Supplementary assessment minutes dated December 24, 2020, May 7 and July 20, 2021 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in NABET's letter of accreditation bearing no. QCI/NABET/EN/ACC/20/1559 dated December 9, 2020. The accreditation needs to be renewed before the expiry date by Vardan Environet, Gurugram following due process of assessment.



Sr. Director, NABET
Dated: September 14, 2021

Certificate No.
NABET/EIA/1922/RA 0166(Rev.01)

Valid till
Nov 06, 2022

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

12.8 ENVIRONMENTAL MONITORING AND ANALYSIS LABORATORY

Environmental Baseline data generation has been carried out by NABL Accredited laboratory Vardan Envirolab, Sector-5, IMT Manesar, Gurgaon, Haryana. The laboratory has also been accorded recognition as Environment Laboratory by MoEF & CC. NABL Accreditation Certificate of Vardan Envirolab is given below.

M/s Dev & Div
Solutions Pvt.
Ltd.

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

परिचय नं. डी.एन.-33004/89

REGD. No. D. L.-33004/89


भारत का राजपत्र
The Gazette of India

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असाधारण
EXTRAORDINARY
भाग II—खण्ड 3—उप-खण्ड (II)
PART II—Section 3—Sub-section (II)
प्रकाशक से प्रकाशित
PUBLISHED BY AUTHORITY

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No. 1977]

नई दिल्ली, बुधवार, जून 2, 2021/ज्येष्ठ 12, 1943
NEW DELHI, WEDNESDAY, JUNE 2, 2021/JYAISHTHA 12, 1943

पर्यावरण, वन और जलवायु परिवर्तन विभाग

अधिसूचना

नई दिल्ली, 1 जून, 2021

का.आ. 2131(अ)—केंद्रीय सरकार, पर्यावरण (संरक्षण) विधम, 1986, के नियम 10 के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 12 की उप-धारा (1) के खंड (ख) और धारा 13, द्वारा प्रस्तुत शक्तियों का प्रयोग करते हुए सत्कारणीय पर्यावरण और वन संरक्षण का.आ. 1174 (अ), तारीख 18, जुलाई, 2007, द्वारा भारत सरकार की अधिसूचना में विज्ञापित और संशोधन करती है अर्थात्:-

उक्त अधिसूचना की सारणी में -

(i) क्रम संख्या 23, 36, 40, 44, 46, 48, 50, 51, 57, 67, 68, 70, 74, 99, 101, 106, 112, 119, 127 और 138 और उससे संबंधित प्रविष्टियों के स्थान पर, क्रमशः विज्ञापित क्रम संख्या और प्रविष्टियां रखी जाएं, अर्थात्:-

सारणी

| क्र.सं. | प्रयोजनार्थ का नाम | सरकारी विज्ञापक के नाम | विज्ञापित तारीख तक वैध मान्यता |
|---------|--|---------------------------|--------------------------------|
| (1) | (2) | (3) | (4) |
| 23 | मेसर्स विट्रो लैम्स, # 2-2-647/ 1/3, 3 | (i) श्री जी. नरविन्हा राव | 01 जून, 2021 |

2952 GE2021

(1)

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Mining of sand minor mineral from the riverbed of Yamuna river with 24,00,000 MTPA production capacity over an area of 66.32 Hectare located at Village- Makhanpur, Tehsil & District- Faridabad, and State- Haryana proposed by M/s Dev & Div Solutions Pvt. Ltd.

| | | | |
|-----|---|--|--------------------------------------|
| 127 | मैसर्स वर्धन एनरोलैब प्लॉट नंबर 82 / ए. सेक्टर -5, एनएसआईआईडीसी, आईएमटी, मानेसर, गुडगांव -122051, हरियाणा | (i) श्री एस. शर्मा (ii) श्री गौर प्रताप सिंह (iii) डॉ. शिव प्रकाश सिंह | 01 जून , 2021 से 6 जनवरी, 2023 |
| 138 | मैसर्स फूड हाइजीन एंड हेल्थ प्रयोगशाला, को सर्वे नंबर 126/10, प्लॉट नं. -1, हडपसर इंडस्ट्रियल एस्टेट, हडपसर, ताल - हवेवी, जिला - पुणे -1013, महाराष्ट्र | (i) श्री रोहन देशपांडे (ii) सुश्री सीमा सतीश बाकडे (iii) सुश्री सुपमा महेश | 01 जून, 2021 से 29 मार्च, 2024 |

(iii) क्रम संख्या 201 और उससे संबंधित प्रविष्टियों के पश्चात, निम्नलिखित क्रम संख्या और प्रविष्टियां रखी जाएंगी, अर्थात:-

| क्र.सं. | प्रयोगशाला का नाम | सरकारी विद्वेषक के नाम | निम्नलिखित तारीख तक वैध मान्यता |
|---------|--|--|---|
| (1) | (2) | (3) | (4) |
| 202 | 209 मैसर्स अजीस लैब्स प्लॉट नं -एम-43 सेक्टर -3, पीठमपुर जिला धार -454774, मध्य प्रदेश | (i) श्री रविशंकर महाय (ii) श्री मनोज रामनीया (iii) सुश्री निकिता भंड | 01 जून , 2021 से 28 फरवरी 2023 |
| 203 | मैसर्स क्रिपटिव एनवायरो सर्विसेज, 42, बुर संचार नगर, सेवॉय कॉम्प्लेक्स अरेरा कॉलोनी के निकट घोपाल -462039, मध्य प्रदेश | (i) डॉ. जी.के. जैस (ii) श्री संतोष खंडल (iii) सुश्री अमृता मिश्रा | 01 जून , 2021 से 11 अक्टूबर, 2021 |
| 204 | मैसर्स एशिया एनवायरो लैब, एच1-837, प्रदूषण बोर्ड के पास, चरण- II, निको औद्योगिक क्षेत्र, भिवाड़ी, जिला- अलवर- 301019, राजस्थान | (i) श्री विक्रम सिंह (ii) श्री गेहताश | 01 जून , 2021 से 23 दिसंबर, 2023 |
| 205 | मैसर्स क्वालिटी रिसर्च और एनालिटिकल लैब्स, 341, ग्राउंड फ्लोर, कार्यात्मक औद्योगिक क्षेत्र, पटफडगंज, नई दिल्ली -110092 | (i) डॉ. गौरव माहेश्वरी (ii) भिस अनीता सिंह | 01 जून , 2021 से 21 अक्टूबर, 2023 |
| 206 | मैसर्स दिल्ली एनालिटिकल रिसर्च प्रयोगशाला, प्लॉट नंबर 2, टिम्बर ब्लॉक, झिलमिल औद्योगिक क्षेत्र, दिल्ली-110095 | (i) डा. प्रियंका मिश्रा (ii) श्री वित्तय गुप्ता (iii) श्री नाजो ज्योति कुमार गुप्त | 01 जून , 2021 से 12 नवंबर, 2021 |
| 207 | मैसर्स वर्धन एनरोलैब, प्लॉट नंबर - 24 और 25, नारायण विहार, बीब्लॉक, मानसरोवर, जयपुर- 302035, राजस्थान | (i) श्री राजेंद्र सिंह यादव (ii) श्री राज कुमार यादव (iii) श्री नेमी चंद चौधरी | 01 जून , 2021 से 6 जनवरी, 2023 |
| 208 | मैसर्स पर्यावरण परीक्षण लैब, दुकान नंबर 1, देना बैंक के पास, बास रोड, रामनगर, बदरहेरा, रेवाड़ी -123106, हरियाणा | (i) श्री करतार सिंह (ii) श्री हेमराज | 01 जून , 2021 से 23 मार्च, 2024 |
| 209 | मैसर्स अल्टीमेट एनवायरोलाइटिकल समाधान, एचडीडी 272, चरण-3, जेपी | (i) श्री अनुराग के. श्रीवास्तव | 01 जून, 2021 से |



M/s Dev & Div
Solutions Pvt.
Ltd.

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**National Accreditation Board for
Testing and Calibration Laboratories**

CERTIFICATE OF ACCREDITATION

VARDAN ENVIRO LAB

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

**"General Requirements for the Competence of Testing &
Calibration Laboratories"**

and fulfills the requirements of FSSAI

for its facilities at

Plot No. 82A, Sector 5, IMT Manesar,
Gurgaon, Haryana

in the field of

TESTING

Certificate Number

TC-6289 (Integrated)

Issue Date

28/08/2019

Valid Until 27/08/2021*

FSSAI: 28/08/2019

*The validity of accreditation is extended from 23.10.2021 to 27.08.2022

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : VARDAN ENVIRO LAB

Signed for and on behalf of NABL



0907697010003000312

N. Venkateswaran
Chief Executive Officer

M/s Dev & Div
Solutions Pvt.
Ltd.

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**CERTIFICATE
OF
REGISTRATION**



This is to certify that the management system of
M/S VARDAN ENVIROLAB

has been formally assessed by
INTERNATIONAL CERTIFICATION & INSPECTION UK LTD.
and found to comply with the requirements of

ISO 9001:2015

(Quality Management Systems)

Scope of Registration:

PROVISION OF TESTING DISCIPLINE FOR ENVIRONMENTAL, CHEMICAL,
FOOD MICROBIOLOGICAL AND MECHANICAL SAMPLES.

Registered Site (s):

PLOT NO.82-A, SECTOR-5, IMT MANESAR, GURUGRAM - 122051, HARYANA, INDIA.

:: Certificate No :: ICIINDI/3807/XX

Date of initial registration: 07 January 2020

First Surveillance Audit on or before: 10 December 2020

Second Surveillance Audit on or before: 10 December 2021

Re-certification Due: 06 January 2023

**This Certificate is property of ICI UK Ltd. and remains valid
subject to satisfactory surveillance audits.**

Peter Collins

Executive Director

International Certification & Inspection UK Limited.

71-75 Shelton Street Covent Garden London, WC2H 9JQ United Kingdom



ACCREDITED
MEMBER
BOARD FOR
CERTIFICATION
BODIES



To check validity of the certificate please visit at www.ici-uk.co

This certification of registration is issued by International Certification & Inspection UK Limited accredited with Accreditation Board For Certification bodies (www.ab-cb.org). This certificate remains the property of International Certification & Inspection UK Limited and must be returned upon request.

Consultant- M/s Vardan Environet, Plot no.-82 A, Sector-5, IMT Manesar, Gurugram, Haryana (Mob: 09899651342)

M/s Dev & Div
Solutions Pvt.
Ltd.

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CERTIFICATE OF REGISTRATION



This is to certify that the management system of

VARDAN ENVIROLAB

has been formally assessed by
INTERNATIONAL CERTIFICATION & INSPECTION UK LTD.
and found to comply with the requirements of

ISO 14001:2015

Environmental Management Systems

Scope of Registration:

Testing of Environmental Parameters, Food Products, Pharmaceuticals, Building Materials, Disinfection Services, Auditing and Other Technical Services.

Registered Site (s):

Plot No. 82-A, Sector - 5, IMT Manesar, Gurugram - 122051, (Haryana), India.

:: Certificate No :: ICIINDI/4534/XX

Date of initial registration: 20 June 2020

First Surveillance Audit on or before: 10 May 2021

Secoud Surveillance Audit on or before: 10 May 2022

Re-certification Due: 19 June 2023

**This Certificate is property of ICI UK Ltd. and remains valid
subject to satisfactory surveillance audits.**

Peter Collins

Executive Director

International Certification & Inspection UK Limited.
27 Old Gloucester Street, London, WC1N 3AX, United Kingdom



To check validity of the certificate please visit at www.ici-uk.co

This certification of registration is issued by International Certification & Inspection UK Limited accredited with Accreditation Board For Certification bodies (www.ab-cb.org). This certificate remains the property of International Certification & Inspection UK Limited and must be returned upon request.



ANNEXURE-1

STATE ENVIRONMENT IMPACT ASSESSMENT AUTHORITY HARYANA
Bay No. 55-58, Prayatan Bhawan, Sector-2, PANCHKULA.

Tel: 0172-2565232, 4043956
 E-mail Id: seiaa-21.env@hry.gov.in

No. SEIAA(132)/HR/2021/ 1394

Dated: 27/12/2021

To

M/s Dev & Div Solutions Pvt. Ltd.
R/o- 31/1, 3rd floor KCG Heritage Farm,
Satberi, New Delhi-110074
Email Id: devanddivsolutions@gmail.com

Subject: ToR for proposed Makanpur Unit (Minor Mineral) Sand Mining Project – 24,00,000 MT area 66.32 ha. near Village Makhanpur, Faridabad, Haryana.

This has reference to your Proposal No. SIA/HR/MIN/68081/2021 dated 01.12.2021 for the approval of ToR (Terms of Reference) for undertaking detailed EIA Study for the purpose of obtaining Environment Clearance in accordance with the provisions of EIA Notification, 2006 along with Scrutiny Fee amounting to Rs. 1,50,000 vide DD No. 740653 dated 10.11.2021 in compliance of Haryana Government, Environment & Climate Change Notification No. DE&CCH/3060 dated 14th October, 2021. The proposal has been appraised as per prescribed procedure in the light of provisions under the EIA Notification, 2006 on the basis of the mandatory documents by the State Expert Appraisal Committee (SEAC) constituted by MoEF & CC, GoI vide their Notification dated 30.01.2019, in its 228th meeting held on 03.12.2021 and recommended to SEIAA for grant of Terms of Reference.

The details of the proposal as under:

| | | |
|----|--|--|
| 1. | Online Proposal No: | SIA/HR/MIN/68081/2021 |
| 2. | Name of the Project Proponent: | M/s Dev & Div Solutions Pvt. Ltd. |
| 3. | Nature of the project: | (Minor Mineral) Sand Mining Project |
| 4. | Category of the proposal: | 1(a) |
| 5. | Date of online acceptance of Project | 19.11.2021 |
| 6. | Date of submission of Hard Copy by PP of the Project | 01.12.2021 |

In this connection, it is intimated that Project Proposal for approval of Terms of Reference was placed before the State Environment Impact Assessment Authority (SEIAA) in its 132nd Meeting held on 20.12.2021.

The Authority approved the "Terms of Reference" and it was decided that you have to prepare Environment Impact Assessment Report and Environment Management Plan for obtaining Environment Clearance by using Model Terms of Reference as per MoEF & CC with the additional

Terms of Reference as recommended by SEAC in its 228th meeting held on 03.12.2021 along with public consultation:

Standard Terms of Reference

- 1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
- 2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
- 3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.
- 4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
- 5) Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.
- 6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
- 7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The 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, may also be detailed in the EIA Report.
- 8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.
- 9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.
- 10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
- 11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
- 12) A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.
- 13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project Including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

- 14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.
- 15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.
- 16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.
- 17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.
- 18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled- I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.
- 19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.
- 20) Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).
- 21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.
- 22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.
- 23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

- 24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.
- 25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.
- 26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
- 27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.
- 28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.
- 29) Details of any stream, seasonal or otherwise, passing through the lease area and modification /diversion proposed, if any, and the impact of the same on the hydrology should be brought out.
- 30) Information on site elevation, working depth, groundwater table etc. should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.
- 31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.
- 32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.
- 33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.
- 34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plan sand with adequate number of sections) should be given in the EIA report.
- 35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
- 36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
- 37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
- 38) Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.
- 39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.

- 40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
- 41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
- 42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.
- 43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
- 44) Besides the above, the below mentioned general points are also to be followed:-
- a) Executive Summary of the EIA/EMP Report
 - b) All documents to be properly referenced with index and continuous page numbering.
 - c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.
 - d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.
 - e) Where the documents provided are in a language other than English, an English translation should be provided.
 - f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.
 - g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(1) dated 4th August,2009, which are available on the website of this Ministry, should be followed.
 - h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.
 - i) As per the circular no. J-11011/618/2010-IA.II(1) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.
 - j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

Additional ToR

1. The PP shall submit the Approved Mining Plan and Closure Plan.
2. The PP shall submit the approved DSR from the Mining Department.
3. The PP shall submit the actual replenishment study approved by the Competent Authority.
4. The PP shall submit the Green plan along with Miyawaki forest details.
5. The PP shall submit the copy of LOL.
6. The PP shall submit the exact days of mining.
7. The PP shall submit the hydrological study.
8. A Sub-Divisional Committee comprising of Sub-Divisional Magistrate, Officers from Irrigation department, State Pollution Control Board or Committee, Forest department, Geology or mining officer, revenue department shall visit the site and make recommendation on suitability of site for mining or prohibition thereof after {a} identification of the areas of aggradations or deposition where mining can be allowed; (b) identification of areas of erosion and proximity to infrastructural structures and installations where mining should be prohibited; (c) verify the mining lease boundary; (d) verify the area of the mining lease; (e) suggest the route for transportation of the mineral so that to cause minimum impact on the nearby habitation & agricultural fields; (f) identify the safety zone/restricted area and the area that can be consider for mining after excluding the area as per recommendation

- of EAC , after considering the other restrictions mentioned in the Sustainable Sand Mining Management Guidelines 2016, S.O. 141(E) dated 15.01.2016, Letter of Intent & District Survey Report; (g) finalize the specific gravity of the material to be mined by the mining lease holders; (h) proposed location for the installation weigh bridge; (i) verification of the initial level of the mining lease already collected by the PP; (j) verification of the baseline air quantity data collected by the PP and any other point to be considered for the protection environment and health of the nearby habitation. Recommendation of the Committee needs to be annexed with EIA/EMP Report.
9. EIA/EMP report should be prepared for the entire cluster.
 10. The Replenishment Study needs to be conducted by an authorized agency and report of the same needs to be submitted.
 11. High Powered Committee was constituted under the orders of Hon'ble NGT, headed by Secretary, MOEF&CC, which has given its report dated September, 2016. The PP needs to submit the details that how the PP will comply with the recommendation of the Committee.
 12. The Proponent should collect the baseline data in respect of initial level of the mining lease. For this permanent bench marks (BM) needs to be established at prominent location preferably close to mining leases in question and should have precisely known relationship to the level datum of the area, typically mean sea level. The entire mining lease should be divided suitably in the grids of 25 Meter x 25 Meters with the help of sections across the width of river and along the direction of flow of the river. The levels (MSL & RL) of the corner point of each grid need to be recorded. Each Grid should be suitably numbered for identification. PP should identify grids which will be worked out and grids which will come under no mining zone i.e. safety barriers from the river bank, safety barrier at lease boundary, restrictions as per condition of Lol/Mining Lease deed, restriction as Mineral Concession Rule of the Haryana State, restrictions as per sustainable sand mining management guidelines 2016, restriction as per DSR etc. The PP should ascertain the level of the river bed with the help of sections drawn across the width of the rivers and along the direction of flow of the river and based on this define the depth of mining of each grid. The PP should provide in tabular format the details of the grid viz. wise material availability, dimension of grid, location of grid (latitude, longitude, MSL and level from outside ground level of the corner points), average level of grid (AMSL and RL), depth of mining in each grid, area, volume, grids under mining zone and those left under no mining zone etc. The PP should submit surveyed data so collected in the excel or CSV file so that the same can be readily used for verification in CAD or Datamine Software. In addition to this soft & hard copy of all the plan & section needs to be submitted.
 13. PP should suitably name each section line. Section Plan for both sections drawn across the river and along the direction of the river needs to be submitted. Each Section should have level on vertical axis and distance from the bank of river on horizontal axis. For the section along the direction of the river the levels to be shown on vertical axis and distance from upstream to downstream should be shown on horizontal axis.
 14. The PP should prepare the Mining Plan based on the above survey. The information sought above needs to be a part of the mining plan. In the mining plan year wise production plan should be prepared in three plates for each year. Plat-1 show the mine working for the pre- monsoon period (1st APR- 30th June), Plate-2 should for the period (1st July-15th Sep) as the mining lease area needs to be left for the replenishment of the river bed mineral and no mining should be proposed in this period and plat-3 show the mine working after replenishment of the river bed i.e. post monsoon period (16th Sep-31st March). The period of monsoon may also be defined in consultation with State Government.
 15. PP should specifically mention in the mining plan that in the subsequent scheme of mining/review of mining plan, the year wise data pertaining to replenishment study (all five years) shall be provided which include the level (AMSL & RL) of river bed recorded before and after the monsoon, year wise replenishment quantity, all plan & sections of the replenishment study for the past five years.

16. PP should also submit an undertaking to the effect that each year after the replenishment study the plan & section shall be submitted to concerned Department of Mining & Geology of the State for verification and official record.
17. PP should submit an undertaking by way of affidavit as required as per Ministry's O.M No 3- 50/2017 -IA. IM) dated 30.05.2018 to comply with all the statutory requirements and judgment of Hon'ble Supreme Court dated the 2nd August 2017 in Writ Peution (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India and Ors.
18. PP should include in EIA Report details of all the statutory clearances, permissions, No objection certificates, consents etc. required for this project under various Acts, Rules and regulations and their status or estimated timeline after grant of EC.
19. The PP should submit the revenue plan, revenue plan superimposed on the satellite imaginary clearly demarcate the Govt. land, private land, agricultural land.
20. The PP should clearly bring out the protective and mitigative measures to be taken for the nearby habitation and religious structures in line with the Ministry's O.M. No. Z- 11013/57/2014- IA. II (M) dated 29.10.2014.
21. The PP should submit the detailed plan in tabular format (year-wise for life of mine) for afforestation and green belt development in and around the mining lease. The PP should submit the number of saplings to be planted, area to be covered under afforestation & green belt, location of plantation, target for survival rate and budget earmarked for the afforestation & green belt development. In addition to this PP should show on a surface plan (5 year interval for life of mine) of suitable scale the area to be covered under afforestation & green belt clearly mentioning the latitude and longitude of the area to be covered during each 5 years.
22. The PP should submit the quantity of surface or ground water to be used for this project. The complete water balance cycle need to be submitted. In addition to this PP should submit a detailed plan for rain water harvesting measures to be taken. The PP should submit the year wise target for reduction in consumption of ground water by developing alternative source of water through rain water harvesting measures. The capital and recurring expenditure to be incurred needs to be submitted.
23. The PP should clearly bring out the details of the manpower to be engaged for this project with their roles /responsibilities/designations. In addition to this PP should mention the number and designation of person to be engaged for implementation of environmental management plan (EMP).
24. The PP should submit the year-wise, activity wise and time bound budget earmarked for EMP, occupational health surveillance & Corporate Environmental Responsibility needs to be submitted.
25. PP should submit the measures to be adopted for prevention of illegal mining and pilferage of mineral.
26. PP should submit the detailed mineralogical and chemical composition of the mineral and percentage of free silica from a NABL/MoEF&CC accredited laboratory.
27. PP should clearly show the transport route of the mineral and protection and mitigative measure to be adopted while transportation of the mineral. The impact from the center line of the road on either side should be clearly brought out supported with the line source modeling and isopleths. Further, frequency of testing of Poly Achromatic Hydrocarbon needs to be submitted along with budget. Based on the above study the compensation to be paid in the event of damage to the crop and land on the either side of the road needs to be mentioned.
28. PP should clearly bring out that what is the specific diesel consumption and steps to be taken for reduction of the same. Year-wise target for reduction in the specific diesel consumption needs to be submitted.
29. PP should bring out the awareness campaign to be carried out on various environmental issues, practical training facility to be provided to the environmental engineers/diploma holders, mining engineers/diploma holders, geologists, and other trades related to mining operations. Target for the same needs to be submitted.
30. PP should specifically mention in the mining plan that the method of mining should be as proposed by EAC i.e. by use only Scrapers for mining to ensure that the mining depth be maintained as 3.0 meters. No other heavy machinery like bucket excavators, back-hov, shovel, JCB machines etc. shall not be used for

- excavation/digging.
31. The safeguards which are suggested in sustainable sand mining guidelines as well as notification dated 15.01.2016 ought to be scrupulously followed and taken into consideration while preparing EIA/EMP Report.
 32. The Project Proponent shall apply for NBWL Clearance for the project, if applicable, as per Office Memorandum/Guidelines issued by MoEF&CC in this regard from time to time.
 33. The PP should submit the MoU between State government and Project Proponent.
 34. The PP should give the Mining plan duly approved by the competent authority before preparing EIA/EMP report.
 35. The project proponent shall get approve the conservation plan from Chief Wildlife Warden, Haryana and submit during the appraisal of the project.
 36. The PP should give an affidavit that the mining was not mined to any person including minor minerals and sand.
 37. The PP should submit GoI Assessment of Mineral Resources.
 38. The PP shall carry out the study of Ecological effect of particulate matter on the flora and fauna.
 39. The Detailed reclamation plan of the project area to be submitted.
 40. The PP shall submit the undertaking that mining will be carried out in accordance with all other provisions as applicable under the Mines Act, 1952, Mines and Minerals (Development and Regulation) Act, 1957, Forest (Conservation) Act, 1980 and Environment (Protection Act), 1986 and the rules made there under, wild life (Protection) Act 1972, water (Prevention and control of pollution) Act 1974 and Air (Prevention and Control of Pollution) Act, 1981.
 41. The PP should submit an affidavit that no JCB will be used for mining and only semi-mechanized mining will be carried out.
 42. The PP shall submit that no illegal mining has taken place in the mining lease area and no illegal mining will be allowed during operation of mine.
 43. The PP shall get the EIA study conducted by accredited agency for the use of large number of trucks/tippers including the impact of load and frequency of large number of machinery in the mining lease area.
 44. The PP shall also submit an affidavit that additional minerals mined during the mining shall be stored as mining burden and same will be intimated to the State Mines & Geology Department.

The Project Proponent will submit Environment Impact Assessment Report and Environment Management Plan by incorporating the Terms of References (ToR) as approved by the Authority within a time schedule in compliance of EIA Notification dated 14.09.2006. It was also decided that your project will be considered as received only after receipt of complete information.

S. Tanay
27/12
Member Secretary,
SEIAA, Haryana

ANNEXURE-2

**Director General
Mines and Geology, Haryana**

Speed/Registered Post

From

The Director General,
Mines and Geology Haryana,
Plot No. 9, I.T. Park, Sector-22,
Panchkula.

To

M/s Dev & Div Solutions Pvt. Ltd.,
31/1, 3rd Floor KCG Heritage Park, Satberi,
New Delhi - 110 074

Memo No. DMG/HY/Makhanpur Unit/Fbd/2021/3176
Dated Panchkula, the 16.08.2021

Subject: Acceptance of the highest bid in respect of the minor mineral Sand contract of "Makhanpur Unit" having tentative area of 66.32 hectares in the district Faridabad, offered in e-auction held on 19.07.2021/issuance of Letter of Intent (LoI)- regarding.

You participated in the e-auction held on 19.07.2021 on the e-Auction web portal (<https://minesharyana.c1auctions.com/>) for grant of mining contract of minor mineral sand mines after accepting the terms and conditions of the auction notice issued vide notification no. DMG/HY/e-Auction/FBD/2021/2140 dated 16.06.2021 and corrigendum issued vide notification no. DMG/HY/e-Auction/FBD/2021/2263 dated 30.06.2021 in order to obtain mining contract of minor mineral sand mine of the district Faridabad.

2. You offered the highest bid of Rs. 9,98,00,000/- (Rs. Nine Crores Ninety Eight Lakhs only) per annum against the Reserve Price of Rs. 9,78,00,000/- for obtaining the Mining Contract of Minor Mineral Mine namely 'Makhanpur Unit' for extraction of 'Sand' having total area of 66.32 hectares. The details of the khasra number of the area under above said Mining Unit (54.32 hectares in riverbed for mining and 12.00 hectares for ancillary activities) is attached as Annexure 'A'.

3. You are hereby informed that the State Government has accepted the highest bid of Rs. 9,98,00,000/- per annum offered by you in respect of 'Makhanpur Unit' under the provision of Haryana Minor Mineral Concession, Stocking, Transportation of Minerals & Prevention of Illegal Mining Rules, 2012 (State Rules, 2012). Accordingly, you have become the successful bidder in respect of above said mine.

4. The State Government having accepted the aforementioned highest bid of Rs. 9,98,00,000/- offered by you, the Department is pleased to issue this Letter of Intent (LoI) in your favour in respect of the Mining Unit/area namely 'Makhanpur Unit' subject to the following terms and conditions:

4.1 The period of the contract shall be 07 years and the same shall commence w.e.f. the date of grant of Environmental Clearance by the competent authority and the Consent to Operate (CTO) by the State Pollution Control

Annexure-II

**Director General
Mines and Geology, Haryana**

Board, whichever is later, or on expiry of the period of 12 months from the date of issuance of Lol, whichever is earlier;

- 4.2 You may note that the detail of the area of the mining unit is tentative and was notified on "as is where is basis" (refer condition no. 3.4 of the auction notice). In case of any inadvertent mistake in the area detail/Khasra number etc., the same shall be got rectified/corrected before execution of the contract agreement (refer condition no. 3.3 of the auction notice);
- 4.3 No request regarding reduction in bid amount on account of reduction in land/area of the Mining Block/ Unit, on any other account including that of change in description of Khasra numbers / location etc. at any stage will be entertained on any ground. This shall also include any loss/reduction of area for actual mining for want of compliance of applicable laws/restrictions for mining or part of the contracted area had already been operated in the past. Needless to state that this also includes the changes, if any, as per condition no. 3.4 of the auction notice.
- 4.4 You offered bid after having gone through the terms and conditions of auction notice and also the applicable Acts and Rules for undertaking mining. The State government shall not be responsible for any kind of loss to you being the highest bidders/contractor at any point of time (before or after grant of contract) on any account including on account of reduction of land/ area/ production/ non grant of permission for mining in part area or otherwise on account of any condition stipulated for undertaking mining by any competent authority.
- 4.5 The amount of the highest bid i.e. Rs. 9,98,00,000/- (Rs. Nine Crores Ninety Eight Lakhs only) per annum shall be the "Annual Contract Money" payable by you as the contractor money in the manner prescribed in the contract agreement to be executed on form MC-1 appended to State Rules.
- 4.6 The above said annual contract money shall be increased at the rate of 10% on completion of each block of three years. Accordingly, the year-wise amount of the annual contract money shall be as per details given below:

| Sr. No. | Year of the contract Period | Annual Contract Money [in Rs.] |
|---------|-----------------------------|--------------------------------|
| 1 | First Year | 9,98,00,000/- |
| 2 | Second Year | 9,98,00,000/- |
| 3 | Third Year | 9,98,00,000/- |
| 4 | Fourth Year | 10,97,80,000/- |
| 5 | Fifth Year | 10,97,80,000/- |
| 6 | Sixth Year | 10,97,80,000/- |
| 7 | Seventh Year | 12,07,58,000/- |

- 4.7 As per the terms and conditions of the grant, you are liable to deposit Rs. 2,49,50,000/- i.e. equal to 25% of the annual bid amount as "Security".

**Director General
Mines and Geology, Haryana**

out of which you have already deposited an amount of Rs. 99,80,000/- (Rs. Ninety Nine Lakhs Eighty Thousand only) i.e. equal to 10% of the annual bid amount as 'initial bid security' after the conclusion of e-auction. The balance amount of Rs. 1,49,70,000/- of the bid security i.e. 15% of the annual bid amount shall be deposited before commencement of the mining operation or before expiry of the period of 12 months from the date of issuance of Letter of Intent (LoI), whichever is earlier;

Provided that in case having taken all steps on your part, if you fails to obtain required environmental clearance and consent to operate(CTO) for undertaking mining operations within the said period of 12 months from the date of issuance of LoI, such letter of intent holder/contractor on a specific application submitted to the Director, at least thirty days prior to the end of the period mentioned above, giving details of the action already taken may seek additional time up to another twelve months, over and above the time of 12 months already allowed for commencement of the period of contract, on payment of a non-refundable fee as per the following:-

| | | |
|---|--|--|
| 1 | Extension of further period up to six months | On payment of a non-refundable fee at the rate of one percent per month of the annual bid for each month of requested extension period |
| 2 | Extension for a second period up to six months | On payment of a non-refundable fee at the rate of two percent per month of the annual bid for each month of requested extension period |
| <p>Note: Extension shall be allowed only in month (s) and any request for period less/part of the month shall be summarily rejected and shall apply along with advance amount of the fee for such requested period of extension.</p> | | |

- 4.8 You are directed to execute the Contract Agreement in Form MC-1 appended to the State Rules, 2012 within a period of 90 days from the date of order of issuance of this LoI.

Note: 90 days period is for execution of Contract Agreement. Therefore, It is advised to submit draft agreement along with all relevant documents preferably within 45 days, so that agreement could be executed within 90 days after completing all the formalities of scrutiny and verification.

- 4.9 In case of the Partnership Deed (where bidding entity is a partnership firm) or Articles of Association (where bidding entity is a registered Company) or an Affidavit (where bidding entity is a sole proprietorship firm and the bidder is participating as an Individual), no transfer or addition or deletion of the Partners/Directors will be permissible before execution of the agreement;
- 4.10 The Contract Agreement executed shall be got duly Registered under relevant laws with concerned Registering Authority and you will be liable to pay applicable stamp duty and registration fee etc. as per the applicable

Director General
Mines and Geology, Haryana

rates and as demanded by the Registering Authority/Revenue Department at the time of Registration.

- 4.11 In case of failure to execute the agreement, after issuance of this acceptance of bid/LOI within the prescribed period of 90 days, this LoI shall be deemed to have been revoked and 10% amount of the highest bid deposited as initial bid security shall be forfeited and you, will be debarred from participation in any future auctions/tenders/competitive bidding process in respect of any area for obtaining mineral concession in the State for a period of 5 years.
- 4.12 You shall also furnish a solvent surety for a sum equal to the amount of the annual bid for execution of the Agreement. The documents in support of solvency of the surety shall be submitted duly evaluated by the concerned Revenue Authority along with Non Encumbrance Certificate from the concerned Revenue Authority. In case the surety offered by the contractor(s) during the subsistence of the contract is not found solvent, the contractor(s) shall offer another solvent surety and a supplementary deed shall be executed to this effect.
- 4.13 After execution of agreement, either before commencement of the mining operation or before expiry of the time allowed, if any, as per condition No. 4.7 above, in case of failure to deposit the balance 15% amount towards security (as required under clause 4.7 above), the acceptance of bid/issuance of LoI/execution of agreement shall be deemed to have been revoked and 10% amount deposited towards as initial bid security after the conclusion of auction shall stand forfeited. Further, such bidder shall be debarred from participation in any future auctions/Tenders/competitive bidding process in respect of any area for obtaining mineral concession in the State for a period of 5 years.
- 4.14 You shall be liable to deposit the contract money in advance at monthly intervals as per provisions of Contract Agreement i.e. from the date of commencement of the contract period.
- 4.15 You shall also deposit/ pay an additional amount equal to 7.5% of the due contract money along with the monthly instalments towards the 'Mines and Mineral Development, Restoration and Rehabilitation Fund'.
- 4.16 You shall also deposit/ pay an additional amount equal to 2.5% of the due contract money along with the monthly instalments towards the 'District Mineral Fund'.
- 4.17 You shall also be liable to pay advance Income Tax as per provisions of Section 206(c) of Income Tax Act in addition to contract money, payable as per terms and conditions of contract agreement.
- 4.18 On enhancement of the contract money with the expiry of every three years period, you shall deposit the balance amount of security so as to upscale the security amount equal to 10% of the revised annual contract money as

Director General
Mines and Geology, Haryana

applicable for one year with respect to the next block of three years. No interest, whatsoever, shall be payable on the security amount deposited under the prescribed security head of the government;

- 4.19 You shall prepare a Mining Plan along with the Mine Closure Plan (Progressive & Final) from the Recognized Qualified Person as per chapter 10 of the State Rules, 2012 for the "Mining Unit" and shall not commence mining operations in any area except in accordance with such Mining Plan duly approved by an officer authorised by the Director, Mines & Geology, in this behalf.
- 4.20 Further, the actual mining will be allowed to be commenced only after prior Environment Clearance is obtained by you as the LoI holder/ Mining contractor for the Mining Unit from the Competent Authority as required under EIA notification dated 14/09/2006 issued by Ministry of Environment, Forests and Climate Change, Government of India or as amended from time to time and also other required approvals for mining including Consent to Establish and Consent to Operate from the Haryana State Pollution Control Board before commencement of actual mining operations.
- 4.21 You will also be liable to pay the following to the landowners to undertake mining operations:
- (a) Annual rent in respect of the land area blocked under the concession but not being operated; and
 - (b) Rent Plus compensation in respect of the area used for actual mining operations.
- 4.22 The amount of annual rent and the compensation shall be settled mutually between the landowner and the mining contractor. In case of non-settlement of the rent and compensation, the same shall be decided by the District Collector concerned in accordance with the provisions contained in Chapter 9 of the "State Rules, 2012";
- 4.23 The total mineral excavated and stacked by the concession holder within the area granted on mining contract shall not exceed three times of the average monthly production as per approved Mining Plan and/or quantity approved under Environmental Clearance, at any point of time.
- 4.24 The Mining Contractor shall not stock any mineral outside the concession area granted on mining contract, without obtaining a valid Mineral Dealer Licence as per provisions contained in Chapter 14 of the State Rules, 2012.
- 4.25 The contractor shall not carry out any mining operations in any reserved/ protected forest or any area prohibited by any law in force in India, or prohibited by any authority without obtaining prior permission in writing from such authority or officer authorized in this behalf. In case of refusal of permission by such authority or officer authorised in this behalf,

**Director General
Mines and Geology, Haryana**

contractor(s) shall not be entitled to claim any relief in payment of contract money on this account;

- 4.26 Following are the general/ special conditions applicable for excavation of minor mineral(s) from river beds in order to ensure safety of riverbeds, structures and the adjoining areas:
- i. No mining would be permissible in a river-bed up to a distance of five times of the span of a bridge structure on up-stream side and ten times the span of such bridge structure on down-stream side, subject to a minimum of 250 meters on the up-stream side and 500 meters on the down-stream side;
 - ii. There shall be maintained an un-mined block of 50 meters width after every block of 1000 meters over which mining is undertaken or at such distance as may be directed by the Director or any officer authorised by him;
 - iii. The maximum depth of mining in the river-bed shall not exceed three meters from the un-mined bed level at any point in time with proper bench formation;
 - iv. Mining shall be restricted within the central 3/4th width of the river/ rivulet;
 - v. Any other condition(s), as may be required by the Irrigation Department of the state from time to time for river-bed mining in consultation with the Mines & Geology Department, may be made applicable to the mining operations in river-beds.
 - vi. No mining operation may be carried out from 1st July to 15th September every year (rainy season).
- 4.27 No mining operation shall be allowed in the urbanize zone of area notified by Town and Country Planning Department. Further, in case of the agriculture zone notified by Town and Country Planning Department mining shall be permissible only after obtaining prior permission from the competent authority;
- 4.28 The contractor shall not undertake any mining operation in the area granted on mining contract without obtaining requisite permission from the competent authority as required for undertaking mining operations under relevant laws;
- 4.29 The contractor shall be under obligation to carry out mining in accordance with all other provisions as applicable under the Mines Act, 1952, Mines and Minerals (Development and Regulation) Act, 1957, Indian Explosive Act, 1884, Forest (Conservation) Act, 1980 and Environment (Protection) Act, 1986 and the rules made thereunder, Wild life (Protection) Act, 1972, Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981;

**Director General
Mines and Geology, Haryana**

4.30 All other terms and conditions shall remain as per auction notice and the provisions of the Mines and Minerals (Development and Regulation) Act, 1957 and Rules made thereunder shall prevail over all the terms and conditions.

5. Accordingly, you are advised to submit the Draft Contract Agreement along with other requisite documents including a solvent surety(s) for a sum equal to the amount of the annual bid for execution of the agreement, within a period of 90 days from the date of issue of this bid acceptance letter and the LoI.



Mining Engineer
for Director General, Mines & Geology,
Haryana.

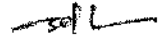
Speed/Registered Post

Endst. No. DMG/HY/ Makhanpur Unit/Fbd/2021/3177

Dated 16.08.2021

A copy is forwarded to the following for information and necessary action please:-

1. Additional Chief Secretary to Government Haryana, Mines and Geology Department.
2. The Chairman, Haryana State Pollution Control Board, Panchkula.
3. The Deputy Commissioner, Faridabad.
4. The Mining Officer, Mines & Geology Department, Faridabad. He is directed to ensure that proper and complete 'Draft Contract Agreement Documents' as required are submitted within stipulated period.



Mining Engineer
for Director General, Mines & Geology,
Haryana.

Annexure-II

**Director General
Mines and Geology, Haryana**

Annexure 'A'.

| Sr. No. | Name of Block/ Block No. | Name of Village | Details of Khasra No/Killa No | Total Mineral Concession Area (in hect) | Period (in years) |
|---------|-----------------------------|-----------------|---|---|-------------------|
| 1 | Makanpur | Makanpur | <p>For Mining</p> <p>6//7 min, 12 min, 13, 14, 17, 18, 19, 20 min, 21, 22, 23 7//16 min, 17 min, 22 min, 23 min, 24 min, 25 11//23 min, 24 min, 25 min 12//22 min, 23, 24, 25 13//4 min, 5 min, 6, 7 min, 8 min, 9 min, 11 min, 12 min, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25 min 14//1 min, 2 min, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 min, 15 min, 18 min, 19 min, 20, 21 min. 15//1, 2, 3 min, 9 min, 10 min 18//1, 2, 3 min, 4 min 8 min, 9 min, 10 min, 11 min 19//1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 min, 17 min, 18 min, 19, 20 min 20//3, 4, 5, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25 22//5, 6, 7, 8, 12, 13, 14, 15, 16 min, 17, 18, 19, 20, 21, 22, 23 23//1, 2, 3, 4 min, 5 min, 8 min, 9 min, 10, 11 min, 33//1, 2, 3, 4 min, 8 min, 9, 10, 11, 12, 13 min, 18 min, 19, 20, 21, 22, 23 min</p> <p>36//1, 2 min, 10 min, 11 min, 20 min, 21 min 42//1 min, 10 min, 11 min</p> <p>For Ancillary area</p> <p>4//1, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25 7//1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15</p> | 66.32 | 97 |

ANNEXURE-3

Annexure-III

DEV & DIV SOLUTIONS PRIVATE LIMITED

CIN: U14100DL2020PTC365823

31/1, 3RD Floor KCG Heritage Farm, Satberi New Delhi DL 110074 IN

Email: devanddivsolutions@gmail.com, Mobile: +91 9818162912

Date:15/09/2021

To,
Directorate of Mines and Geology,
DHL Square, Plot No.9, Sector-22,
Panchkula, Haryana

Subject: Draft Submission of Mining Plan along with PMCP of "Makhanpur Unit Sand Mine, Faridabad, Haryana for, Sand Mine over an Area 66.32 Ha of M/s Dev & Div Solutions Pvt. Ltd.

Dear Sir,

Kindly find attached here with Draft Mining Plan in respect of minor mineral mines of "Makhanpur Unit Sand Mine" of "M/s Dev & Div Solutions Pvt. Ltd." over an area of 66.32ha. In village Makhanpur district Faridabad, Haryana submitted under Haryana Minor Mineral Concession, Stocking, Transportation of Minerals and Prevention of Illegal Mining Rules, 2012.

In reference to your Memo No. DMG/HY Makhanpur Unit/Fbd/2021/3176 dated,16.08.2021 with ,we are submitting herewith two copies of draft Mining Plan along with text, plates and DD of INR 5000/-annexure for kind perusal and approval please.

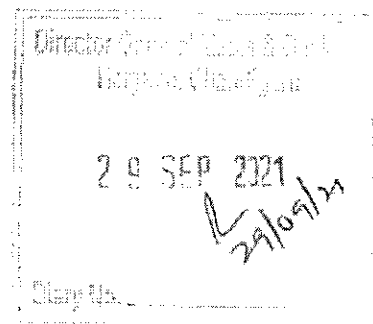
Regards,

For M/s Dev & Div Solutions Pvt. Ltd.


(Director)

Encl:

1. Two Sets of mining plan along with Text & Plates
2. DD of INR 5000/- No. 740651 on Bank of India



ANNEXURE-4



Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

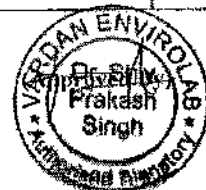
| | | | |
|-------------------------------|--|--------------------|--------------------------------|
| Sample No.: | VEL/AA/DDSPL/01 | Report No.: | VEL/AA/001-027 |
| Name & Address of the Project | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Reporting Date: | 07/01/2022 |
| | | Ref. No: | NIL |
| | | Monitoring Period: | Oct 2021 to Dec 2021 |
| | | Equipment Used: | RDS & FPS with all accessories |
| | | Protocol Used: | IS-5182 |
| Sample Collected By: | Vardan EnviroLab Representative | Parameter Required | As per TOR Letter |
| Sample Description: | Ambient Air Quality Monitoring | | |
| Location: | Project Site (A1) | | |

RESULTS

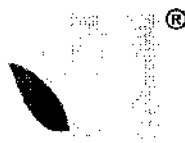
| Date | PM ₁₀ (µg/m ³) | PM _{2.5} (µg/m ³) | NO ₂ (µg/m ³) | SO ₂ (µg/m ³) | CO (mg/m ³) | PAH (ng/m ³) |
|------------|--|---|---|---|----------------------------|-----------------------------|
| 01.10.2021 | 94.5 | 54.5 | 22.5 | 13.5 | 1.66 | *ND |
| 02.10.2021 | 86.4 | 47.4 | 21.8 | 14.7 | 1.76 | *ND |
| 08.10.2021 | 91.3 | 51.3 | 22.2 | 14.6 | 1.20 | *ND |
| 09.10.2021 | 86.5 | 47.5 | 28.5 | 17.4 | 1.69 | *ND |
| 15.10.2021 | 89.2 | 49.2 | 23.8 | 14.2 | 1.74 | *ND |
| 16.10.2021 | 92.1 | 52.4 | 26.2 | 15.1 | 1.55 | *ND |
| 22.10.2021 | 89.4 | 49.3 | 23.4 | 14.7 | 0.92 | *ND |
| 23.10.2021 | 90.3 | 50.3 | 28.6 | 17.2 | 1.34 | *ND |
| 29.10.2021 | 86.3 | 47.2 | 23.7 | 16.2 | 1.81 | *ND |
| 30.10.2021 | 92.2 | 52.2 | 25.1 | 15.3 | 0.90 | *ND |
| 05.11.2021 | 94.6 | 54.5 | 22.6 | 13.5 | 1.73 | *ND |
| 06.11.2021 | 91.4 | 51.3 | 23.1 | 16.4 | 1.66 | *ND |
| 12.11.2021 | 93.0 | 53.1 | 22.6 | 13.6 | 1.78 | *ND |
| 13.11.2021 | 90.4 | 50.4 | 23.2 | 14.2 | 1.53 | *ND |
| 19.11.2021 | 93.2 | 53.2 | 27.2 | 17.3 | 1.85 | *ND |
| 20.11.2021 | 89.3 | 49.3 | 22.3 | 13.1 | 1.47 | *ND |
| 26.11.2021 | 86.0 | 47.1 | 28.2 | 17.2 | 0.92 | *ND |
| 27.11.2021 | 94.4 | 54.5 | 23.3 | 15.5 | 1.94 | *ND |
| 03.12.2021 | 90.1 | 50.1 | 22.1 | 17.1 | 1.89 | *ND |
| 04.12.2021 | 93.3 | 53.2 | 27.3 | 16.5 | 0.97 | *ND |
| 10.12.2021 | 91.2 | 51.2 | 24.3 | 14.7 | 1.30 | *ND |

Signature
RISHI DEVI

ARJUN RAWAT
Checked by
Signature



www.vardan.co.in



Test Report

| Report No.: | VEL/AA/001-027 | | | | | |
|-------------|--|---|---|---|----------------------------|-----------------------------|
| Date | PM ₁₀ ($\mu\text{g}/\text{m}^3$) | PM _{2.5} ($\mu\text{g}/\text{m}^3$) | NO ₂ ($\mu\text{g}/\text{m}^3$) | SO ₂ ($\mu\text{g}/\text{m}^3$) | CO (mg/m ³) | PAH (ng/m ³) |
| 11.12.2021 | 93.8 | 53.8 | 22.2 | 13.8 | 0.97 | *ND |
| 17.12.2021 | 88.3 | 48.2 | 28.4 | 17.3 | 1.79 | *ND |
| 18.12.2021 | 91.1 | 51.2 | 24.1 | 15.1 | 1.50 | *ND |
| 24.12.2021 | 89.1 | 49.1 | 28.3 | 12.3 | 1.65 | *ND |
| 25.12.2021 | 92.4 | 52.3 | 21.4 | 13.7 | 1.70 | *ND |
| 31.12.2021 | 94.2 | 54.2 | 23.2 | 15.4 | 1.74 | *ND |

Note:-PAH- Polynuclear Aromatic Hydrocarbons, *ND- Not Detected

Chemical Composition of PM 10

| Date | Parameter | PM10 ($\mu\text{g}/\text{m}^3$) | Free Silica % | Ca ($\mu\text{g}/\text{m}^3$) | Mg ($\mu\text{g}/\text{m}^3$) | Ni (ng/m ³) | Pb ($\mu\text{g}/\text{m}^3$) |
|------------|-----------|--------------------------------------|------------------|------------------------------------|------------------------------------|----------------------------|------------------------------------|
| 05.11.2021 | -- | 94.6 | 2.4 | 1.61 | 0.52 | <0.5 | 0.14 |

Nishat Devi
NISHAT DEVI
Sr. Lab Analyst

ARJUN RAWAT
(Checked By)
Arjun Rawat





Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| | | | |
|--------------------------------|--|---------------------|--------------------------------|
| Sample No.: | VEL/AA/DDSPL/02 | Report No.: | VEL/AA/028-054 |
| Name & Address of the Project: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Reporting Date: | 07/01/2022 |
| | | Ref. No: | NIL |
| | | Monitoring Period: | Oct 2021 to Dec 2021 |
| Sample Collected By: | Vardan EnviroLab Representative | Equipment Used: | RDS & FPS with all accessories |
| Sample Description: | Ambient Air Quality Monitoring | Protocol Used: | IS-5182 |
| Location: | MakanpurKhadar (A2) | Parameter Required: | As per ToR Letter |

RESULTS

| Date | PM ₁₀ (µg/m ³) | PM _{2.5} (µg/m ³) | NO ₂ (µg/m ³) | SO ₂ (µg/m ³) | CO (mg/m ³) | PAH (ng/m ³) |
|------------|--|---|---|---|----------------------------|-----------------------------|
| 01.10.2021 | 88.2 | 48.2 | 22.3 | 13.2 | 0.82 | *ND |
| 02.10.2021 | 84.5 | 44.5 | 21.9 | 11.5 | 1.30 | *ND |
| 08.10.2021 | 91.4 | 51.4 | 25.7 | 12.4 | 1.23 | *ND |
| 09.10.2021 | 88.7 | 48.7 | 22.8 | 13.0 | 0.84 | *ND |
| 15.10.2021 | 84.3 | 44.8 | 21.6 | 11.3 | 1.27 | *ND |
| 16.10.2021 | 87.6 | 47.8 | 20.8 | 12.6 | 0.82 | *ND |
| 22.10.2021 | 90.4 | 50.0 | 25.4 | 14.3 | 0.8 | *ND |
| 23.10.2021 | 87.2 | 47.4 | 21.4 | 12.1 | 0.86 | *ND |
| 29.10.2021 | 90.1 | 50.9 | 25.1 | 14.5 | 0.85 | *ND |
| 30.10.2021 | 91.0 | 51.0 | 25.9 | 15.2 | 0.82 | *ND |
| 05.11.2021 | 85.1 | 45.3 | 20.1 | 11.4 | 0.91 | *ND |
| 06.11.2021 | 91.5 | 51.6 | 25.5 | 15.8 | 0.86 | *ND |
| 12.11.2021 | 89.4 | 49.4 | 21.8 | 14.2 | 0.84 | *ND |
| 13.11.2021 | 85.8 | 45.2 | 23.9 | 12.5 | 1.36 | *ND |
| 19.11.2021 | 84.0 | 44.0 | 22.3 | 11.1 | 0.92 | *ND |
| 20.11.2021 | 89.7 | 49.8 | 21.6 | 14.5 | 1.14 | *ND |
| 26.11.2021 | 84.4 | 44.9 | 20.3 | 12.8 | 1.45 | *ND |
| 27.11.2021 | 85.3 | 45.3 | 21.9 | 11.7 | 0.88 | *ND |
| 03.12.2021 | 87.6 | 46.1 | 22.9 | 12.6 | 0.85 | *ND |
| 04.12.2021 | 90.8 | 50.8 | 24.8 | 15.6 | 0.94 | *ND |
| 10.12.2021 | 86.4 | 46.4 | 20.8 | 12.4 | 0.87 | *ND |

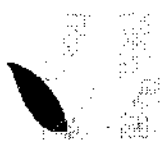
NISHA DEVI
Lab Analyst

ARJUN RAWAT
Checked By



www.vardan.co.in

Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardan.co.in, bd@vardan.co.in



Test Report

| Report No.: | VEL/AA/028-054 | | | | | |
|-------------|--|---|---|---|----------------------------------|-----------------------------------|
| Date | PM ₁₀ ($\mu\text{g}/\text{m}^3$) | PM _{2.5} ($\mu\text{g}/\text{m}^3$) | NO ₂ ($\mu\text{g}/\text{m}^3$) | SO ₂ ($\mu\text{g}/\text{m}^3$) | CO (mg/m^3) | PAH (ng/m^3) |
| 11.12.2021 | 89.1 | 49.0 | 22.4 | 14.8 | 0.84 | *ND |
| 17.12.2021 | 86.5 | 46.9 | 20.6 | 11.5 | 1.32 | *ND |
| 18.12.2021 | 89.6 | 49.7 | 21.8 | 14.8 | 1.41 | *ND |
| 24.12.2021 | 90.7 | 50.1 | 24.6 | 13.4 | 0.86 | *ND |
| 25.12.2021 | 85.8 | 45.8 | 20.7 | 11.8 | 1.50 | *ND |
| 31.12.2021 | 87.4 | 47.1 | 21.6 | 12.4 | 0.87 | *ND |

Note:-PAH- Polynuclear Aromatic Hydrocarbons, *ND- Not Detected

Chemical Composition of PM 10

| Date | Parameter | PM10 ($\mu\text{g}/\text{m}^3$) | Free Silica % | Ca ($\mu\text{g}/\text{m}^3$) | Mg ($\mu\text{g}/\text{m}^3$) | Ni (ng/m^3) | Pb ($\mu\text{g}/\text{m}^3$) |
|------------|-----------|--------------------------------------|------------------|------------------------------------|------------------------------------|----------------------------------|------------------------------------|
| 12.11.2021 | -- | 89.4 | 2.6 | 1.68 | 0.57 | <0.5 | 0.07 |

Prachi Devi
Prachi Devi
Sr. Lab Analyst

ARJUN RAWAT
Sr. Analyst





Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| | | | |
|--------------------------------|--|--------------------|--------------------------------|
| Sample No. | VEL/AA/DDSPL/03 | Report No.: | VEL/AA/055-081 |
| Name & Address of the Project: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Reporting Date: | 07/01/2022 |
| | | Ref. No: | NIL |
| | | Monitoring Period: | Oct 2021 to Dec 2021 |
| | | Equipment Used: | RDS & FPS with all accessories |
| | | Protocol Used: | IS-5182 |
| Sample Collected By: | Vardan EnviroLab Representative | Parameter Required | As per ToR Letter |
| Sample Description: | Ambient Air Quality Monitoring | | |
| Location: | Chhainsa (A3) | | |

RESULTS

| Date | PM ₁₀ ($\mu\text{g}/\text{m}^3$) | PM _{2.5} ($\mu\text{g}/\text{m}^3$) | NO ₂ ($\mu\text{g}/\text{m}^3$) | SO ₂ ($\mu\text{g}/\text{m}^3$) | CO (mg/m^3) | PAH (ng/m^3) |
|------------|--|---|---|---|----------------------------------|-----------------------------------|
| 01.10.2021 | 85.8 | 44.1 | 20.9 | 10.2 | 0.71 | *ND |
| 02.10.2021 | 82.2 | 42.5 | 22.5 | 11.5 | 0.80 | *ND |
| 08.10.2021 | 84.9 | 46.7 | 21.2 | 12.4 | 0.83 | *ND |
| 09.10.2021 | 86.8 | 48.2 | 20.6 | 10.8 | 0.75 | *ND |
| 15.10.2021 | 84.2 | 45.2 | 19.3 | 12.7 | 0.90 | *ND |
| 16.10.2021 | 86.5 | 48.3 | 21.5 | 11.6 | 0.83 | *ND |
| 22.10.2021 | 85.4 | 43.9 | 22.5 | 14.3 | 0.88 | *ND |
| 23.10.2021 | 88.8 | 48.5 | 23.8 | 13.1 | 0.75 | *ND |
| 29.10.2021 | 87.2 | 47.3 | 20.1 | 14.5 | 0.84 | *ND |
| 30.10.2021 | 83.4 | 42.7 | 19.5 | 10.5 | 0.77 | *ND |
| 05.11.2021 | 88.7 | 48.5 | 22.2 | 10.4 | 0.71 | *ND |
| 06.11.2021 | 85.8 | 46.1 | 21.1 | 14.8 | 0.86 | *ND |
| 12.11.2021 | 88.5 | 43.8 | 22.8 | 10.7 | 0.78 | *ND |
| 13.11.2021 | 86.2 | 46.3 | 19.3 | 12.5 | 0.84 | *ND |
| 19.11.2021 | 85.8 | 48.5 | 23.8 | 11.1 | 1.10 | *ND |
| 20.11.2021 | 83.9 | 44.2 | 21.7 | 14.5 | 0.91 | *ND |
| 26.11.2021 | 86.2 | 46.5 | 22.4 | 12.2 | 0.85 | *ND |
| 27.11.2021 | 83.8 | 42.4 | 19.8 | 10.4 | 0.73 | *ND |
| 03.12.2021 | 87.5 | 47.8 | 21.5 | 11.6 | 1.08 | *ND |
| 04.12.2021 | 85.4 | 46.9 | 19.8 | 14.6 | 0.73 | *ND |
| 10.12.2021 | 89.0 | 49.0 | 21.4 | 15.1 | 0.85 | *ND |

MEENA DEVI
Jr. Lab Analyst

ARJUN RAWAT
(In-charge)



www.vardan.co.in





Test Report

| Report No.: | VEL/AA/055-081 | | | | | |
|-------------|--|---|---|---|----------------------------------|-----------------------------------|
| Date | PM ₁₀ ($\mu\text{g}/\text{m}^3$) | PM _{2.5} ($\mu\text{g}/\text{m}^3$) | NO ₂ ($\mu\text{g}/\text{m}^3$) | SO ₂ ($\mu\text{g}/\text{m}^3$) | CO (mg/m^3) | PAH (ng/m^3) |
| 11.12.2021 | 86.9 | 46.8 | 20.1 | 14.0 | 0.70 | *ND |
| 17.12.2021 | 88.5 | 48.1 | 19.8 | 10.3 | 0.97 | *ND |
| 18.12.2021 | 87.7 | 47.3 | 19.4 | 12.8 | 0.84 | *ND |
| 24.12.2021 | 85.3 | 42.9 | 20.8 | 10.9 | 0.86 | *ND |
| 25.12.2021 | 82.6 | 44.5 | 19.6 | 11.2 | 1.0 | *ND |
| 31.12.2021 | 84.1 | 46.5 | 20.5 | 12.9 | 0.85 | *ND |

Note:-PAH- Polynuclear Aromatic Hydrocarbons, *ND- Not Detected

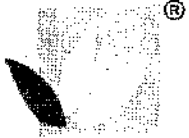
Chemical Composition of PM 10

| Date | Parameter | PM10 ($\mu\text{g}/\text{m}^3$) | Free Silica % | Ca ($\mu\text{g}/\text{m}^3$) | Mg ($\mu\text{g}/\text{m}^3$) | Ni (ng/m^3) | Pb ($\mu\text{g}/\text{m}^3$) |
|------------|-----------|--------------------------------------|------------------|------------------------------------|------------------------------------|----------------------------------|------------------------------------|
| 29.10.2021 | -- | 87.2 | 2.5 | 1.59 | 0.47 | <0.5 | 0.12 |

NISHA DEVI
Lab Analyst

ARJUN RAWAT
(Checked-By)





Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.
Name & Address of the
Project:

VEL/AA/DDSPL/04
M/s Dev & Div Solutions Pvt. Ltd.
Sand Mining Project "Makhanpur
Unit" At Village: Makhanpur, Tehsil &
District: Faridabad, Haryana

Report No.: VEL/AA/082-107
Reporting Date: 07/01/2022
Ref. No: NIL
Monitoring Period: Oct 2021 to Dec 2021
Equipment Used: RDS & FPS with all accessories
Protocol Used: IS-5182

Sample Collected By:
Sample Description:
Location:

Vardan EnviroLab Representative
Ambient Air Quality Monitoring
Shupura (A4)

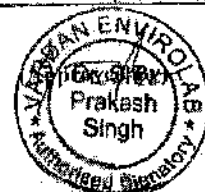
Parameter Required As per ToR Letter

RESULTS

| Date | PM ₁₀ (µg/m ³) | PM _{2.5} (µg/m ³) | NO ₂ (µg/m ³) | SO ₂ (µg/m ³) | CO (mg/m ³) | PAH (ng/m ³) |
|------------|--|---|---|---|----------------------------|-----------------------------|
| 04.10.2021 | 74.2 | 40.8 | 15.7 | 10.2 | 0.56 | *ND |
| 05.10.2021 | 79.3 | 44.3 | 18.2 | 9.5 | 0.61 | *ND |
| 11.10.2021 | 77.5 | 42.8 | 22.3 | 12.4 | 0.57 | *ND |
| 12.10.2021 | 73.1 | 39.4 | 17.1 | 10.8 | 0.66 | *ND |
| 18.10.2021 | 76.2 | 42.5 | 16.7 | 8.7 | 0.73 | *ND |
| 19.10.2021 | 74.3 | 40.5 | 18.3 | 9.6 | 0.64 | *ND |
| 25.10.2021 | 78.2 | 43.9 | 21.4 | 8.3 | 0.52 | *ND |
| 26.10.2021 | 75.4 | 42.8 | 16.8 | 13.1 | 0.80 | *ND |
| 01.11.2021 | 73.3 | 39.3 | 23.3 | 9.5 | 0.56 | *ND |
| 02.11.2021 | 77.1 | 42.1 | 19.7 | 9.2 | 0.85 | *ND |
| 08.11.2021 | 78.2 | 43.7 | 20.5 | 10.4 | 0.52 | *ND |
| 09.11.2021 | 73.5 | 39.1 | 18.7 | 9.8 | 0.61 | *ND |
| 15.11.2021 | 78.2 | 43.2 | 20.2 | 10.2 | 0.58 | *ND |
| 16.11.2021 | 74.3 | 40.5 | 16.2 | 8.5 | 0.53 | *ND |
| 22.11.2021 | 76.9 | 42.5 | 20.1 | 11.1 | 0.68 | *ND |
| 23.11.2021 | 74.2 | 40.2 | 16.3 | 10.5 | 0.64 | *ND |
| 29.11.2021 | 72.4 | 42.3 | 20.0 | 9.8 | 0.60 | *ND |
| 30.11.2021 | 75.3 | 41.1 | 15.6 | 9.7 | 0.72 | *ND |
| 06.12.2021 | 76.4 | 42.6 | 21.5 | 11.6 | 0.68 | *ND |
| 07.12.2021 | 77.3 | 42.3 | 25.6 | 13 | 0.56 | *ND |

NISHA DEVI
Analyst

ARJUN RAWAT
Checked By



www.vardan.co.in



Test Report

| Report No.: | VEL/AA/082-107 | | | | | |
|-------------|--|---|---|---|----------------------------------|-----------------------------------|
| Date | PM ₁₀ ($\mu\text{g}/\text{m}^3$) | PM _{2.5} ($\mu\text{g}/\text{m}^3$) | NO ₂ ($\mu\text{g}/\text{m}^3$) | SO ₂ ($\mu\text{g}/\text{m}^3$) | CO (mg/m^3) | PAH (ng/m^3) |
| 13/12/2021 | 72.2 | 38.8 | 15.7 | 10.2 | 0.56 | *ND |
| 14.12.2021 | 73.2 | 39.1 | 21.6 | 9.8 | 0.61 | *ND |
| 20.12.2021 | 78.6 | 43.3 | 20.2 | 10.3 | 0.54 | *ND |
| 21.12.2021 | 74.1 | 40.2 | 19.5 | 12.8 | 0.72 | *ND |
| 27.12.2021 | 72.4 | 38.8 | 17.4 | 7.0 | 0.59 | *ND |
| 28.12.2021 | 72.2 | 38.8 | 15.7 | 10.2 | 0.58 | *ND |

Note:-PAH- Polynuclear Aromatic Hydrocarbons, *ND- Not Detected

Chemical Composition of PM 10

| Date | Parameter | PM10 ($\mu\text{g}/\text{m}^3$) | Free Silica % | Ca ($\mu\text{g}/\text{m}^3$) | Mg ($\mu\text{g}/\text{m}^3$) | Ni (ng/m^3) | Pb ($\mu\text{g}/\text{m}^3$) |
|------------|-----------|--------------------------------------|------------------|------------------------------------|------------------------------------|----------------------------------|------------------------------------|
| 08.11.2021 | -- | 78.2 | 2.4 | 1.43 | 0.32 | <0.5 | 0.12 |

NISHA DEVI
 Jr. Lab Analyst

ARJUN RAWAT
 Checked by





Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No. VEL/AA/DDSPL/05
 Name & Address of the Project: M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana

Sample Collected By: Vardan EnviroLab Representative
 Sample Description: Ambient Air Quality Monitoring
 Location: Near Moujpur(A5)

Report No.: VEL/AA/108-133
 Reporting Date: 07/01/2022
 Ref. No: NIL
 Monitoring Period: Oct 2021 to Dec 2021
 Equipment Used: RDS & FPS with all accessories

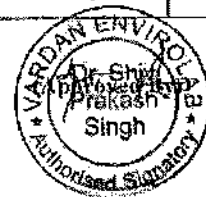
Protocol Used: IS-5182
 Parameter Required: As per ToR Letter

RESULTS

| Date | PM ₁₀ (µg/m ³) | PM _{2.5} (µg/m ³) | NO ₂ (µg/m ³) | SO ₂ (µg/m ³) | CO (mg/m ³) | PAH (ng/m ³) |
|------------|--|---|---|---|----------------------------|-----------------------------|
| 04.10.2021 | 80.8 | 41.1 | 20.9 | 10.0 | 0.67 | *ND |
| 05.10.2021 | 81.2 | 42.5 | 22.5 | 11.5 | 0.68 | *ND |
| 11.10.2021 | 84.9 | 45.7 | 21.2 | 12.4 | 0.83 | *ND |
| 12.10.2021 | 85.8 | 46.2 | 20.6 | 10.8 | 0.75 | *ND |
| 18.10.2021 | 83.2 | 43.2 | 19.3 | 12.7 | 0.64 | *ND |
| 19.10.2021 | 80.5 | 41.3 | 21.5 | 11.6 | 0.66 | *ND |
| 25.10.2021 | 84.4 | 45.9 | 20.5 | 14.3 | 0.62 | *ND |
| 26.10.2021 | 87.8 | 48.5 | 22.8 | 13.1 | 0.75 | *ND |
| 01.11.2021 | 86.2 | 47.3 | 20.1 | 14.5 | 0.84 | *ND |
| 02.11.2021 | 80.4 | 41.5 | 19.5 | 10.2 | 0.77 | *ND |
| 08.11.2021 | 87.7 | 48.5 | 22.2 | 10.4 | 0.71 | *ND |
| 09.11.2021 | 84.8 | 45.1 | 21.1 | 14.1 | 0.86 | *ND |
| 15.11.2021 | 87.5 | 48.8 | 22.8 | 10.2 | 0.60 | *ND |
| 16.11.2021 | 85.2 | 46.3 | 19.1 | 12.5 | 0.84 | *ND |
| 22.11.2021 | 80.8 | 41.8 | 22.8 | 11.1 | 0.61 | *ND |
| 23.11.2021 | 82.9 | 43.2 | 21.7 | 14.5 | 0.69 | *ND |
| 29.11.2021 | 85.2 | 46.5 | 22.4 | 12.2 | 0.85 | *ND |
| 30.11.2021 | 81.4 | 42.4 | 19.8 | 10.4 | 0.73 | *ND |
| 06.12.2021 | 86.5 | 47.8 | 21.5 | 11.6 | 0.65 | *ND |
| 07.12.2021 | 84.4 | 45.1 | 19.8 | 14.6 | 0.83 | *ND |

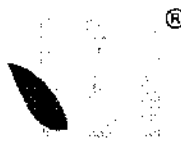
NISHA DEVI
 Jr. Lab Analyst

ARJUN RAWAT
 (checked by)



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Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardan.co.in, bd@vardan.co.in



Test Report

| Report No.: | VEL/AA/108-133 | | | | | |
|-------------|--|---|---|---|----------------------------|-----------------------------|
| Date | PM ₁₀ (µg/m ³) | PM _{2.5} (µg/m ³) | NO ₂ (µg/m ³) | SO ₂ (µg/m ³) | CO (mg/m ³) | PAH (ng/m ³) |
| 13/12/2021 | 85.9 | 42.8 | 20.1 | 14.0 | 0.60 | *ND |
| 14.12.2021 | 87.5 | 46.1 | 19.8 | 10.3 | 0.61 | *ND |
| 20.12.2021 | 86.7 | 47.3 | 19.4 | 12.8 | 0.63 | *ND |
| 21.12.2021 | 80.3 | 41.9 | 20.8 | 10.9 | 0.90 | *ND |
| 27.12.2021 | 81.6 | 42.5 | 19.0 | 11.2 | 0.65 | *ND |
| 28.12.2021 | 83.1 | 44.5 | 20.5 | 12.9 | 0.85 | *ND |

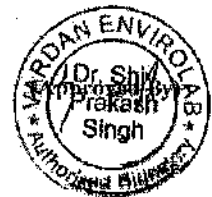
Note:-PAH- Polynuclear Aromatic Hydrocarbons, *ND- Not Detected

Chemical Composition of PM 10

| Date | Parameter | PM10 (µg/m ³) | Free Silica % | Ca (µg/m ³) | Mg (µg/m ³) | Ni (ng/m ³) | Pb (µg/m ³) |
|------------|-----------|------------------------------|------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| 15.11.2021 | -- | 87.5 | 2.6 | 1.64 | 0.48 | <0.5 | 0.15 |

NISHI DEVI
Jr. Lab Analyst

ARJUN RAWAT
(Collected By)





Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No. VEL/AA/DDSPL/06 Report No.: VEL/AA/134-159
 Name & Address of the Project: M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana Reporting Date: 07/01/2022 Ref. No: NIL Monitoring Period: Oct 2021 to Dec 2021 Equipment Used: RDS & FPS with all accessories Protocol Used: IS-5182 Parameter Required: As per ToR Letter

Sample Collected By: VardanEnviroLab Representative
 Sample Description: Ambient Air Quality Monitoring
 Location: Qadlrpur (A6)

RESULTS

| Date | PM ₁₀ (µg/m ³) | PM _{2.5} (µg/m ³) | NO ₂ (µg/m ³) | SO ₂ (µg/m ³) | CO (mg/m ³) | PAH (ng/m ³) |
|------------|--|---|---|---|----------------------------|-----------------------------|
| 04.10.2021 | 79.6 | 40.2 | 19.9 | 14.8 | 0.94 | *ND |
| 05.10.2021 | 80.7 | 41.7 | 20.5 | 13.1 | 0.85 | *ND |
| 11.10.2021 | 82.0 | 42.5 | 21.2 | 16.2 | 0.81 | *ND |
| 12.10.2021 | 80.6 | 45.9 | 20.6 | 13.8 | 0.99 | *ND |
| 18.10.2021 | 81.9 | 42.6 | 19.3 | 16.4 | 0.97 | *ND |
| 19.10.2021 | 83.4 | 46.5 | 21.5 | 17.9 | 0.85 | *ND |
| 25.10.2021 | 79.4 | 44.6 | 19.5 | 19.9 | 0.77 | *ND |
| 26.10.2021 | 80.5 | 44.7 | 21.8 | 16.7 | 0.79 | *ND |
| 01.11.2021 | 79.5 | 46.4 | 20.1 | 15.6 | 0.98 | *ND |
| 02.11.2021 | 81.8 | 42.1 | 19.5 | 14.3 | 0.85 | *ND |
| 08.11.2021 | 80.2 | 46.4 | 20.2 | 18.7 | 0.79 | *ND |
| 09.11.2021 | 83.9 | 44.1 | 21.1 | 13.7 | 0.82 | *ND |
| 15.11.2021 | 80.5 | 45.4 | 20.8 | 18.1 | 0.99 | *ND |
| 16.11.2021 | 83.6 | 41.1 | 19.1 | 19.2 | 1.02 | *ND |
| 22.11.2021 | 78.1 | 45.4 | 18.8 | 17.2 | 0.98 | *ND |
| 23.11.2021 | 83.1 | 43.5 | 21.7 | 19.3 | 1.0 | *ND |
| 29.11.2021 | 79.3 | 40.3 | 18.4 | 18.4 | 0.85 | *ND |
| 30.11.2021 | 80.5 | 41.7 | 19.8 | 13.6 | 0.89 | *ND |
| 06.12.2021 | 83.2 | 43.9 | 21.5 | 14.7 | 0.98 | *ND |
| 07.12.2021 | 81.9 | 41.1 | 19.8 | 14.3 | 0.77 | *ND |

RISHA DEVI
Sr. Lab Analyst

ARJUN RAWAT
(Checked By)



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Test Report

| Report No.: | VEL/AA/134-159 | | | | | |
|-------------|--|---|---|---|----------------------------|-----------------------------|
| Date | PM ₁₀ (µg/m ³) | PM _{2.5} (µg/m ³) | NO ₂ (µg/m ³) | SO ₂ (µg/m ³) | CO (mg/m ³) | PAH (ng/m ³) |
| 13/12/2021 | 83.0 | 41.0 | 20.0 | 14.0 | 0.81 | *ND |
| 14.12.2021 | 82.4 | 42.6 | 19.8 | 14.3 | 0.98 | *ND |
| 20.12.2021 | 84.8 | 44.1 | 21.4 | 14.8 | 0.84 | *ND |
| 21.12.2021 | 80.7 | 40.9 | 20.8 | 13.8 | 0.92 | *ND |
| 27.12.2021 | 81.7 | 42.3 | 19.0 | 14.8 | 0.89 | *ND |
| 28.12.2021 | 83.4 | 43.5 | 20.5 | 15.4 | 0.98 | *ND |

Note:-PAH- Polynuclear Aromatic Hydrocarbons, *ND- Not Detectable

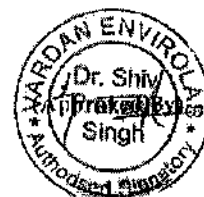
Chemical Composition of PM10

| Date | Parameter | PM10 (µg/m ³) | Free Silica % | Ca (µg/m ³) | Mg (µg/m ³) | Ni (ng/m ³) | Pb (µg/m ³) |
|------------|-----------|------------------------------|------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| 29.11.2021 | -- | 79.3 | 2.3 | 1.43 | 0.32 | <0.5 | 0.07 |

Nisha Devi
NISHA DEVI
Jr. Lab Analyst

ARJUN RAWAT

Checked by
Arjun Rawat





Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

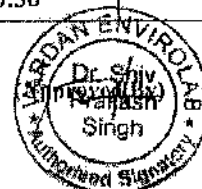
| | | | |
|--------------------------------|---|--------------------|--------------------------------|
| Sample No. | VEL/AA/DDSPL/07 | Report No.: | VEL/AA/160-185 |
| Name & Address of the Project: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Reporting Date: | 07/01/2022 |
| | | Ref. No: | NIL |
| | | Monitoring Period: | Oct 2021 to Dec 2021 |
| Sample Collected By: | VardanEnviroLab Representative | Equipment Used: | RDS & FPS with all accessories |
| Sample Description: | Ambient Air Quality Monitoring | Protocol Used: | IS-5182 |
| Location: | Mohna(A7) | Parameter Required | As per ToR Letter |

RESULTS

| Date | PM ₁₀ (µg/m ³) | PM _{2.5} (µg/m ³) | NO ₂ (µg/m ³) | SO ₂ (µg/m ³) | CO (mg/m ³) | PAH (ng/m ³) |
|------------|--|---|---|---|----------------------------|-----------------------------|
| 06.10.2021 | 70.9 | 36.8 | 18.7 | 10.2 | 0.56 | *ND |
| 07.10.2021 | 77.3 | 43.4 | 17.2 | 9.5 | 0.61 | *ND |
| 13.10.2021 | 75.5 | 42.8 | 20.3 | 12.4 | 0.57 | *ND |
| 14.10.2021 | 71.1 | 37.4 | 18.0 | 10.8 | 0.66 | *ND |
| 20.10.2021 | 70.2 | 36.5 | 18.7 | 8.7 | 0.73 | *ND |
| 21.10.2021 | 74.3 | 40.5 | 16.3 | 9.6 | 0.64 | *ND |
| 27.10.2021 | 76.2 | 43.9 | 20.4 | 8.0 | 0.52 | *ND |
| 28.10.2021 | 72.4 | 38.8 | 16.8 | 12.1 | 0.77 | *ND |
| 03.11.2021 | 71.3 | 37.3 | 21.3 | 9.5 | 0.56 | *ND |
| 04.11.2021 | 75.1 | 42.1 | 18.7 | 9.2 | 0.62 | *ND |
| 10.11.2021 | 76.5 | 43.7 | 16.5 | 10.4 | 0.52 | *ND |
| 11.11.2021 | 70.5 | 36.1 | 17.7 | 8.9 | 0.61 | *ND |
| 17.11.2021 | 76.2 | 43.2 | 16.2 | 10.2 | 0.58 | *ND |
| 18.11.2021 | 72.3 | 37.5 | 18.2 | 8.5 | 0.53 | *ND |
| 24.11.2021 | 74.9 | 40.5 | 19.1 | 11.1 | 0.68 | *ND |
| 25.11.2021 | 72.2 | 37.2 | 18.3 | 10.5 | 0.64 | *ND |
| 01.12.2021 | 70.4 | 36.3 | 19.0 | 9.8 | 0.60 | *ND |
| 02.12.2021 | 73.3 | 39.1 | 16.6 | 9.7 | 0.72 | *ND |
| 08.12.2021 | 74.4 | 40.6 | 20.5 | 11.6 | 0.68 | *ND |
| 09.12.2021 | 75.3 | 41.3 | 19.6 | 12.0 | 0.56 | *ND |
| 15.12.2021 | 72.5 | 37.3 | 18.4 | 12.4 | 0.54 | *ND |
| 16.12.2021 | 70.9 | 36.8 | 18.7 | 10.2 | 0.56 | *ND |

MIS. W. DEVI
Analyst

ARJUN RAWAT
(Checked By)



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Test Report

| Report No.: | VEL/AA/160-185 | | | | | |
|-------------|--|---|---|---|----------------------------------|-----------------------------------|
| Date | PM ₁₀ ($\mu\text{g}/\text{m}^3$) | PM _{2.5} ($\mu\text{g}/\text{m}^3$) | NO ₂ ($\mu\text{g}/\text{m}^3$) | SO ₂ ($\mu\text{g}/\text{m}^3$) | CO (mg/m^3) | PAH (ng/m^3) |
| 22.12.2021 | 70.2 | 36.8 | 17.7 | 10.2 | 0.56 | *ND |
| 23.12.2021 | 73.2 | 39.1 | 20.6 | 8.8 | 0.61 | *ND |
| 29.12.2021 | 77.6 | 43.6 | 17.2 | 10.3 | 0.54 | *ND |
| 30.12.2021 | 72.1 | 38.2 | 18.5 | 12.8 | 0.72 | *ND |

Note:-PAH- Polynuclear Aromatic Hydrocarbons, *ND- Not Detected

Chemical Composition of PM 10

| Date | Parameter | PM10 ($\mu\text{g}/\text{m}^3$) | Free Silica % | Ca ($\mu\text{g}/\text{m}^3$) | Mg ($\mu\text{g}/\text{m}^3$) | Ni (ng/m^3) | Pb ($\mu\text{g}/\text{m}^3$) |
|------------|-----------|--------------------------------------|------------------|------------------------------------|------------------------------------|----------------------------------|------------------------------------|
| 24.11.2021 | -- | 74.9 | 2.5 | 1.41 | 0.38 | <0.5 | 0.08 |

[Signature]
N. Singh
Jr. Lab Analyst

ARJUN RAWAT

(Checked By)

[Signature]





Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

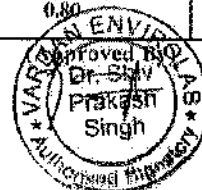
| | | | |
|--------------------------------|---|--------------------|--------------------------------|
| Sample No. | VEL/AA/DDSPL/08 | Report No.: | VEL/AA/186-211 |
| Name & Address of the Project: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Reporting Date: | 07/01/2022 |
| | | Ref. No: | NIL |
| | | Monitoring Period: | Oct 2021 to Dec 2021 |
| Sample Collected By: | Vardan EnviroLab Representative | Equipment Used: | RDS & FPS with all accessories |
| Sample Description: | Ambient Air Quality Monitoring | Protocol Used: | IS-5182 |
| Location: | Panchayati Juggi (A8) | Parameter Required | As per ToR Letter |

RESULTS

| Date | PM ₁₀ ($\mu\text{g}/\text{m}^3$) | PM _{2.5} ($\mu\text{g}/\text{m}^3$) | NO ₂ ($\mu\text{g}/\text{m}^3$) | SO ₂ ($\mu\text{g}/\text{m}^3$) | CO (mg/m^3) | PAH (ng/m^3) |
|------------|--|---|---|---|----------------------------------|-----------------------------------|
| 06.10.2021 | 75.1 | 39.2 | 19.9 | 10.9 | 0.79 | *ND |
| 07.10.2021 | 77.9 | 40.7 | 20.5 | 11.2 | 0.80 | *ND |
| 13.10.2021 | 75.7 | 39.5 | 21.2 | 10.1 | 0.76 | *ND |
| 14.10.2021 | 79.8 | 45.9 | 20.6 | 13.4 | 0.77 | *ND |
| 20.10.2021 | 75.4 | 42.6 | 19.3 | 10.5 | 0.76 | *ND |
| 21.10.2021 | 80.6 | 40.5 | 21.5 | 13.3 | 0.56 | *ND |
| 27.10.2021 | 78.1 | 44.6 | 19.5 | 12.1 | 0.68 | *ND |
| 28.10.2021 | 77.7 | 44.7 | 21.1 | 13.5 | 0.81 | *ND |
| 03.11.2021 | 80.0 | 40.4 | 20.1 | 12.2 | 0.76 | *ND |
| 04.11.2021 | 75.3 | 42.1 | 19.5 | 10.5 | 0.71 | *ND |
| 10.11.2021 | 79.2 | 40.4 | 20.2 | 10.1 | 0.72 | *ND |
| 11.11.2021 | 77.1 | 44.1 | 21.1 | 12.7 | 0.70 | *ND |
| 17.11.2021 | 79.1 | 45.4 | 20.8 | 10.6 | 0.74 | *ND |
| 18.11.2021 | 75.2 | 41.1 | 19.1 | 9.2 | 0.79 | *ND |
| 24.11.2021 | 80.9 | 45.4 | 18.8 | 13.5 | 0.72 | *ND |
| 25.11.2021 | 81.3 | 41.5 | 21.2 | 12.8 | 0.81 | *ND |
| 01.12.2021 | 75.8 | 39.7 | 18 | 9.6 | 0.76 | *ND |
| 02.12.2021 | 77.1 | 42.3 | 19.8 | 11.2 | 0.75 | *ND |
| 08.12.2021 | 78.5 | 41.9 | 21.5 | 12.3 | 0.69 | *ND |
| 09.12.2021 | 80.3 | 40.1 | 19.8 | 13.5 | 0.74 | *ND |
| 15.12.2021 | 75.1 | 39.2 | 21.4 | 10.9 | 0.79 | *ND |
| 16.12.2021 | 75.1 | 39.2 | 19.9 | 10.9 | 0.80 | *ND |

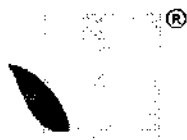
Tested By:
NISHA DIXI
JK Lab Analyst

ARJUN RAWAT
[Signature]



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Test Report

| Report No.: | VEL/AA/186-211 | | | | | |
|-------------|--|---|---|---|----------------------------------|-------------------------------------|
| Date | PM ₁₀ ($\mu\text{g}/\text{m}^3$) | PM _{2.5} ($\mu\text{g}/\text{m}^3$) | NO ₂ ($\mu\text{g}/\text{m}^3$) | SO ₂ ($\mu\text{g}/\text{m}^3$) | CO (mg/m^3) | PAH ($\mu\text{g}/\text{m}^3$) |
| 22.12.2021 | 78.8 | 44.6 | 20.1 | 11.3 | 0.67 | *ND |
| 23.12.2021 | 76.6 | 42.6 | 19.8 | 10.2 | 0.75 | *ND |
| 29.12.2021 | 79.5 | 45.1 | 21.5 | 12.1 | 0.71 | *ND |
| 30.12.2021 | 75.7 | 39.9 | 20.8 | 10.2 | 0.81 | *ND |

Note:-PAH- Polynuclear Aromatic Hydrocarbons, *ND- Not Detected

Chemical Composition of PM 10

| Date | Parameter | PM10 ($\mu\text{g}/\text{m}^3$) | Free Silica % | Ca ($\mu\text{g}/\text{m}^3$) | Mg ($\mu\text{g}/\text{m}^3$) | Ni (ng/m^3) | Pb ($\mu\text{g}/\text{m}^3$) |
|------------|-----------|--------------------------------------|------------------|------------------------------------|------------------------------------|----------------------------------|------------------------------------|
| 25.11.2021 | -- | 81.3 | 2.8 | 1.69 | 0.52 | <0.5 | 0.06 |

NISHA DEVI
Jr. Lab Analyst

ARJUN RAWAT
(Checked By)





Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: **VEL/AN/DDSPL/01**
Name & Address of the Project: **M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana**

Report No.: **VEL/AN/2112/21/001**
Format No.: **7.8 F-01**
Party Reference No.: **NIL**
Reporting Date: **24/12/2021**
Receipt Date: **21/12/2021**

Sample Description: **AMBIENT NOISE LEVEL MONITORING**

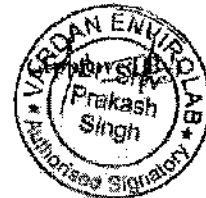
General Information:-

| | |
|--|-----------------------------------|
| Sample collected by | : Vardan EnviroLab Representative |
| Sampling Location | : Project Site (N1) |
| Instrument Used | : Sound Level Meter- 01 |
| Instrument Calibration Status | : Calibrated |
| Meteorological condition during monitoring | : Clear Sky |
| Date of Monitoring | : 20/12/2021-21/12/2021 |
| Time of Monitoring | : 06:00 AM to 06:00AM |
| Surrounding Activity | : Human & Vehicular Activities |
| Scope of Monitoring | : Regulatory Requirement |
| Sampling & Analysis Protocol | : IS-9989 |
| Sampling Duration | : 24 Hours |
| Parameter Required | : As per TOR Letter |

RESULT

| Sl. No. | Parameter | Standard | Result in dB(A) | | Unit |
|---------|--|----------|-----------------|------------|-------|
| | | | 20/12/2021 | 21/12/2021 | |
| 1. | L_{max} | IS 9989 | 80.4 | 64.2 | dB(A) |
| 2. | L_{min} | IS 9989 | 56.3 | 50.1 | dB(A) |
| 3. | L_{eq} | IS 9989 | 72.30 | 61.41 | dB(A) |
| 4. | CPCB Limits in dB(A) Leq (Mining Area) | | 75.0 | 70.0 | dB(A) |

Checked By
(Signature)



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Test Report

| | | | |
|----------------------------------|---|----------------------|--------------------|
| Sample Number: | VEL/AN/DDSPL/02 | Report No.: | VEL/AN/2112/21/002 |
| 02Name & Address of the Project: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| | | Party Reference No.: | NIL |
| | | Reporting Date: | 24/12/2021 |
| | | Receipt Date: | 21/12/2021 |

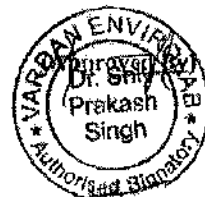
Sample Description: **AMBIENT NOISE LEVEL MONITORING**

| | |
|--|-----------------------------------|
| General Information:- | |
| Sample collected by | : Vardan EnviroLab Representative |
| Sampling Location | : MakhanpurKhadar(N2) |
| Instrument Used | : Sound Level Meter- 02 |
| Instrument Calibration Status | : Calibrated |
| Meteorological condition during monitoring | : Clear Sky |
| Date of Monitoring | : 20/12/2021-21/12/2021 |
| Time of Monitoring | : 06:00 AM to 06:00AM |
| Surrounding Activity | : Human & Vehicular Activities |
| Scope of Monitoring | : Regulatory Requirement |
| Sampling & Analysis Protocol | : IS-9989 |
| Sampling Duration | : 24 Hours |
| Parameter Required | : As per TOR Letter |

RESULT

| Sl. No. | Parameter | Standard | Test Result (dB(A)) | | Unit |
|---------|--|----------|---------------------|--------------------|-------|
| | | | 20.00pm to 06.00am | 06.00am to 06.00pm | |
| 1. | L _{max} | IS 9989 | 62.8 | 53.5 | dB(A) |
| 2. | L _{min} | IS 9989 | 46.5 | 37.4 | dB(A) |
| 3. | L _{eq} | IS 9989 | 54.65 | 44.04 | dB(A) |
| 4. | CPCB Limits in dB(A) Leq (Mining Area) | - | 55.0 | 45.0 | dB(A) |

Wishu DEVI
(Tested By)





Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/AN/DDSPL/03 Report No.: VEL/AN/2112/21/003
 Name & Address of the Project: M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana
 Format No.: 7.8 F-01
 Party Reference No.: NIL
 Reporting Date: 24/12/2021
 Receipt Date: 21/12/2021

Sample Description: AMBIENT NOISE LEVEL MONITORING

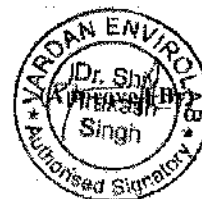
General Information:-

Sample collected by : Vardan EnviroLab Representative
 Sampling Location : Chhainsa(N3)
 Instrument Used : Sound Level Meter- 03
 Instrument Calibration Status : Calibrated
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 20/12/2021-21/12/2021
 Time of Monitoring : 06:00 AM to 06:00AM
 Surrounding Activity : Human & Vehicular Activities
 Scope of Monitoring : Regulatory Requirement
 Sampling & Analysis Protocol : IS-9989
 Sampling Duration : 24 Hours
 Parameter Required : As per TOR Letter

RESULT

| S.No. | Parameter | Standard | Observed Value | Permissible Limit (dB(A)) | Unit |
|-------|---|----------|----------------|---------------------------|-------|
| 1. | L_{max} | IS 9989 | 59.1 | 50.2 | dB(A) |
| 2. | L_{min} | IS 9989 | 44.8 | 36.4 | dB(A) |
| 3. | L_{eq} | IS 9989 | 51.95 | 43.30 | dB(A) |
| 4. | CPCB Limits in dB(A) Leq (Residential Area) | | 55.0 | 45.0 | dB(A) |

(Tested By)



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Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardan.co.in, bd@vardan.co.in

Test Report

| | | | |
|--------------------------------|---|----------------------|--------------------|
| Sample Number: | VEL/AN/DDSPL/04 | Report No.: | VEL/AN/2112/21/004 |
| Name & Address of the Project: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| | | Party Reference No.: | NIL |
| | | Reporting Date: | 24/12/2021 |
| | | Receipt Date: | 21/12/2021 |

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

| | |
|--|-----------------------------------|
| Sample collected by | : Vardan EnviroLab Representative |
| Sampling Location | : Panchayati Juggi (N4) |
| Instrument Used | : Sound Level Meter- 04 |
| Instrument Calibration Status | : Calibrated |
| Meteorological condition during monitoring | : Clear Sky |
| Date of Monitoring | : 20/12/2021-21/12/2021 |
| Time of Monitoring | : 06:00 AM to 06:00 AM |
| Surrounding Activity | : Human & Vehicular Activities |
| Scope of Monitoring | : Regulatory Requirement |
| Sampling & Analysis Protocol | : IS-9989 |
| Sampling Duration | : 24 Hours |
| Parameter Required | : As per TOR Letter |

RESULT

| Sl. No. | Parameter | Standard | Observed Value (dB(A)) | | Unit |
|---------|---|----------|---------------------------------|-----------------------------------|-------|
| | | | Day Time (06:00 AM to 06:00 PM) | Night Time (06:00 PM to 06:00 AM) | |
| 1. | L_{max} | IS 9989 | 60.4 | 50.6 | dB(A) |
| 2. | L_{min} | IS 9989 | 42.2 | 35.7 | dB(A) |
| 3. | L_{eq} | IS 9989 | 51.08 | 42.18 | dB(A) |
| 4. | CPCB Limits in dB(A) Leq (Residential Area) | - | 55.0 | 45.0 | dB(A) |

NISHA DEVI
 (Checked By) Analyst





Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| | | | |
|--------------------------------|---|----------------------|--------------------|
| Sample Number: | VEL/AN/DDSPL/05 | Report No.: | VEL/AN/2112/21/005 |
| Name & Address of the Project: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| | | Party Reference No.: | NIL |
| | | Reporting Date: | 24/12/2021 |
| | | Receipt Date: | 21/12/2021 |

Sample Description: AMBIENT NOISE LEVEL MONITORING

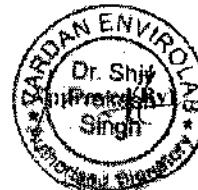
General Information:-

| | |
|--|-----------------------------------|
| Sample collected by | : Vardan EnviroLab Representative |
| Sampling Location | : Shopura (N5) |
| Instrument Used | : Sound Level Meter- 05 |
| Instrument Calibration Status | : Calibrated |
| Meteorological condition during monitoring | : Clear Sky |
| Date of Monitoring | : 20/12/2021-21/12/2021 |
| Time of Monitoring | : 06:00 AM to 06:00AM |
| Surrounding Activity | : Human & Vehicular Activities |
| Scope of Monitoring | : Regulatory Requirement |
| Sampling & Analysis Protocol | : IS-9989 |
| Sampling Duration | : 24 Hours |
| Parameter Required | : As per TOR Letter |

RESULT

| Sl. No. | Parameters | IS (2009) | Test Result dB(A) | | Unit |
|---------|--|-----------|------------------------------------|--------------------------------------|-------|
| | | | Day Time (06:00 am to 10:00 pm) | Night Time (10:00 pm to 06:00 am) | |
| 1. | L_{max} | IS 9989 | 58.8 | 49.9 | dB(A) |
| 2. | L_{min} | IS 9989 | 41.8 | 36.5 | dB(A) |
| 3. | L_{eq} | IS 9989 | 50.88 | 42.84 | dB(A) |
| 4. | CPCB Limits in dB(A) Leq (Residential Area) | | 55.0 | 45.0 | dB(A) |

NISHA DEVI
Analyst



www.vardan.co.in

Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardan.co.in, bd@vardan.co.in



Test Report

| | | | |
|--------------------------------|--|----------------------|--------------------|
| Sample Number: | VEL/AN/DDSPL/06 | Report No.: | VEL/AN/2112/21/006 |
| Name & Address of the Project: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| | | Party Reference No.: | NIL |
| | | Reporting Date: | 24/12/2021 |
| | | Receipt Date: | 21/12/2021 |

Sample Description: AMBIENT NOISE LEVEL MONITORING

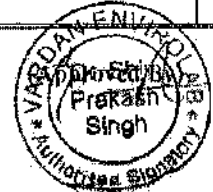
General Information:-

| | |
|--|-----------------------------------|
| Sample collected by | : Vardan EnviroLab Representative |
| Sampling Location | : Qadirpur (N6) |
| Instrument Used | : Sound Level Meter- 06 |
| Instrument Calibration Status | : Calibrated |
| Meteorological condition during monitoring | : Clear Sky |
| Date of Monitoring | : 20/12/2021-21/12/2021 |
| Time of Monitoring | : 06:00 AM to 06:00 AM |
| Surrounding Activity | : Human & Vehicular Activities |
| Scope of Monitoring | : Regulatory Requirement |
| Sampling & Analysis Protocol | : IS-9989 |
| Sampling Duration | : 24 Hours |
| Parameter Required | : As per TOR Letter |

RESULT

| Sl. No. | Parameter | Protocol | Noise Level (dB(A)) | | Unit |
|---------|---|----------|------------------------|------------------------|-------|
| | | | 20:00 hrs to 06:00 hrs | 06:00 hrs to 20:00 hrs | |
| 1. | L _{max} | IS 9989 | 57.9 | 47.2 | dB(A) |
| 2. | L _{min} | IS 9989 | 43.6 | 38.3 | dB(A) |
| 3. | L _{eq} | IS 9989 | 49.95 | 43.89 | dB(A) |
| 4. | CPCB Limits in dB(A) Leq (Residential Area) | | 55.0 | 45.0 | dB(A) |

Tested by
ANISHA DEVI
Jr. Lab Analyst





Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: **VEL/AN/DDSPL/07**
Name & Address of the Project: **M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project
"Makhanpur Unit" At Village: Makhanpur, Tehsil &
District: Faridabad, Haryana**

Report No.: **VEL/AN/2112/21/007**
Format No.: **7.8 F-01**
Party Reference No.: **NIL**
Reporting Date: **24/12/2021**
Receipt Date: **21/12/2021**

Sample Description: **AMBIENT NOISE LEVEL MONITORING**

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : **Near Moujpur (N7)**
Instrument Used : **Sound Level Meter- 07**
Instrument Calibration Status : **Calibrated**
Meteorological condition during monitoring : **Clear Sky**
Date of Monitoring : **20/12/2021-21/12/2021**
Time of Monitoring : **06:00 AM to 06:00AM**
Surrounding Activity : **Human & Vehicular Activities**
Scope of Monitoring : **Regulatory Requirement**
Sampling & Analysis Protocol : **IS-9989**
Sampling Duration : **24 Hours**
Parameter Required : **As per TOR Letter**

RESULT

| Sl. No. | Parameters | Protocol | Test Results (dB(A)) | | Unit |
|---------|--|----------|---------------------------------|--------------------------------------|-------|
| | | | Day Time (06:00 to 06:00 pm) | Night Time (06:00 pm to 06:00 am) | |
| 1. | L _{max} | IS 9989 | 57.4 | 47.9 | dB(A) |
| 2. | L _{min} | IS 9989 | 40.5 | 37.5 | dB(A) |
| 3. | L _{eq} | IS 9989 | 48.95 | 42.96 | dB(A) |
| 4. | CPCB Limits in dB(A) Leq (Residential Area) | | 55.0 | 45.0 | dB(A) |

Prakash Singh
Tested By
Jr. Lab Analyst



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Test Report

| | | | |
|--------------------------------|--|----------------------|--------------------|
| Sample Number: | VEL/AN/DDSPL/08 | Report No.: | VEL/AN/2112/21/008 |
| Name & Address of the Project: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| | | Party Reference No.: | NIL |
| | | Reporting Date: | 24/12/2021 |
| | | Receipt Date: | 21/12/2021 |

Sample Description: AMBIENT NOISE LEVEL MONITORING

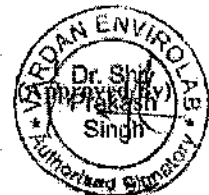
General Information:-

| | |
|--|-----------------------------------|
| Sample collected by | : Vardan EnviroLab Representative |
| Sampling Location | : Mohna (N8) |
| Instrument Used | : Sound Level Meter- 08 |
| Instrument Calibration Status | : Calibrated |
| Meteorological condition during monitoring | : Clear Sky |
| Date of Monitoring | : 20/12/2021-21/12/2021 |
| Time of Monitoring | : 06:00 AM to 06:00AM |
| Surrounding Activity | : Human & Vehicular Activities |
| Scope of Monitoring | : Regulatory Requirement |
| Sampling & Analysis Protocol | : IS-9989 |
| Sampling Duration | : 24 Hours |
| Parameter Required | : As per TOR Letter |

RESULT

| Sl. No. | Parameter | Standard | Result (dB(A)) | | Unit |
|---------|---|----------|----------------------------|------------------------------|-------|
| | | | Day (06:00 am to 06:00 pm) | Night (10:00 pm to 06:00 am) | |
| 1. | L_{max} | IS 9989 | 64.6 | 51.6 | dB(A) |
| 2. | L_{min} | IS 9989 | 45.1 | 38.2 | dB(A) |
| 3. | L_{eq} | IS 9989 | 53.85 | 43.24 | dB(A) |
| 4. | CPCB Limits in dB(A) Leq (Residential Area) | - | 55.0 | 45.0 | dB(A) |

NISHA DEVI
 Test Analyst





Vardan EnviroLab

Annexure-IV

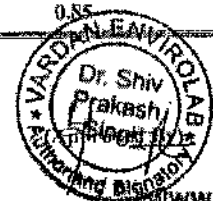
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

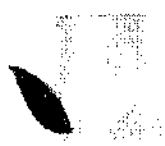
| | | | |
|---------------------------------|---|----------------------|-------------------------|
| Sample Number: | VEL/DDSPL/S/01 | Report No.: | VEL/S/2112/14/001 |
| Name & Address of the Party: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| Sample Description: | SOIL SAMPLE | Party Reference No.: | NIL |
| Sample Location: | Project Site (S1) | Reporting Date: | 18/12/2021 |
| Sample Collected by: | Vardan EnviroLab Representative | Period of Analysis: | 14/12/2021 - 18/12/2021 |
| Sampling and Analysis Protocol: | IS 2720, USEPA 3050B & SOP | Receipt Date: | 14/12/2021 |
| | | Sampling Date: | 13/12/2021 |
| | | Sample Quantity: | 2.0 Kg |
| | | Sampling Type: | Composite |
| | | Packing Status: | Temp Sealed |
| | | Parameter Required: | As Per ToR Letter |

| No. | Parameter | Test Method | Result | Unit |
|-----|-------------------------|---------------------------------------|-------------------------------------|----------|
| 1. | pH (at 25 °C) | IS : 2720 (P-26) by pH Meter | 7.63 | -- |
| 2. | Conductivity | IS:14767, 2000, RA | 0.296 | mS/cm |
| 3. | Soil Texture | SOP, SP-87, Issue No.-01 | Sand - 56 Silt - 31 Clay - 13 | % |
| 4. | Color | SOP, SP-78, Issue No.-01 | Yellowish Brown | -- |
| 5. | Water holding capacity | SOP, SP-81, Issue No.-01 | 33.16 | % |
| 6. | Bulk density | SOP, SP-80, Issue No.-01 | 1.53 | gm/cc |
| 7. | Chloride as Cl | SOP, SP-85, Issue No.-01 | 36.23 | mg/100g |
| 8. | Calcium as Ca | SOP, SP-82, Issue No.-01 | 44.78 | mg/100g |
| 9. | Sodium as Na | SOP, SP-84, Issue No.-01 | 48.52 | mg/kg |
| 10. | Potassium as K | SOP, SP-84, Issue No.-01 | 108.00 | kg/hect. |
| 11. | Organic Matter | IS:2720 (P-22) Titrimetric Method, RA | 0.25 | % |
| 12. | Magnesium as Mg | SOP, SP-83, Issue No.-01 | 15.78 | mg/100g |
| 13. | Available Nitrogen as N | IS:14684 Distillation Method, RA | 105.00 | kg/hect. |
| 14. | Available Phosphorus | SOP, SP-86, Issue No.-01 | 10.52 | kg/hect. |
| 15. | Zinc (as Zn) | USEPA 3050B | 0.79 | mg/kg |
| 16. | Manganese (as Mn) | USEPA 3050B | 2.90 | mg/kg |
| 17. | Lead (as Pb) | USEPA 3050B | 0.86 | mg/kg |
| 18. | Cadmium (as Cd) | USEPA 3050B | 0.45 | mg/kg |
| 19. | Chromium (as Cr) | USEPA 3050B | 0.32 | mg/kg |
| 20. | Copper (as Cu) | USEPA 3050B | 0.55 | mg/kg |

(Signature)



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Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| | | | |
|---------------------------------|--|----------------------|------------------------|
| Sample Number: | VEL/DDSPL/S/02 | Report No.: | VEL/S/2112/14/002 |
| Name & Address of the Party: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| Sample Description: | SOIL SAMPLE | Party Reference No.: | NIL |
| Sample Location: | Makanpur Khadar (S2) | Reporting Date: | 18/12/2021 |
| Sample Collected by: | Vardan EnviroLab Representative | Period of Analysis: | 14/12/2021- 18/12/2021 |
| Sampling and Analysis Protocol: | IS 2720, USEPA 3050B & SOP | Receipt Date: | 14/12/2021 |
| | | Sampling Date: | 13/12/2021 |
| | | Sample Quantity: | 2.0 Kg |
| | | Sampling Type: | Composite |
| | | Packing Status: | Temp Sealed |
| | | Parameter Required: | As Per ToR Letter |

| No. | Parameter | Method | Result | Unit |
|-----------|-------------------------|---------------------------------------|-----------------|----------|
| 1. | pH (at 25 °C) | IS : 2720 (P-26) by pH Meter | 7.83 | -- |
| 2. | Conductivity | IS:14767, 2000, RA | 0.349 | mS/cm |
| 3. | Soil Texture | SOP, SP-87, Issue No.-01 | Sand - 49 | -- |
| Silt - 34 | | | | |
| Clay - 17 | | | | |
| 4. | Color | SOP, SP-78, Issue No.-01 | Yellowish Brown | -- |
| 5. | Water holding capacity | SOP, SP-81, Issue No.-01 | 39.25 | % |
| 6. | Bulk density | SOP, SP-80, Issue No.-01 | 1.52 | gm/cc |
| 7. | Chloride as Cl | SOP, SP-83, Issue No.-01 | 35.43 | mg/100g |
| 8. | Calcium as Ca | SOP, SP-82, Issue No.-01 | 31.26 | mg/100g |
| 9. | Sodium as Na | SOP, SP-84, Issue No.-01 | 58.31 | mg/kg |
| 10. | Potassium as K | SOP, SP-84, Issue No.-01 | 126.00 | kg/hect. |
| 11. | Organic Matter | IS:2720 (P-22) Titrimetric Method, RA | 0.42 | % |
| 12. | Magnesium as Mg | SOP, SP-83, Issue No.-01 | 13.56 | mg/100g |
| 13. | Available Nitrogen as N | IS:14684 Distillation Method, RA | 113.47 | kg/hect. |
| 14. | Available Phosphorus | SOP, SP-86, Issue No.-01 | 10.53 | kg/hect. |
| 15. | Zinc (as Zn) | USEPA 3050B | 1.63 | mg/kg |
| 16. | Manganese (as Mn) | USEPA 3050B | 7.23 | mg/kg |
| 17. | Lead (as Pb) | USEPA 3050B | 0.74 | mg/kg |
| 18. | Cadmium (as Cd) | USEPA 3050B | 0.48 | mg/kg |
| 19. | Chromium (as Cr) | USEPA 3050B | 0.35 | mg/kg |
| 20. | Copper (as Cu) | USEPA 3050B | | mg/kg |

VARDAN
(Tested by)

VARDAN ENVIROLAB
GURUGRAM
Checked By

VARDAN ENVIROLAB
Dr. Shiv Prakash Singh
Haryana



VEL/E/17/R/PN14126

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Vardan EnviroLab

Annexure-IV

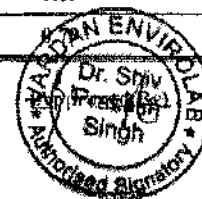
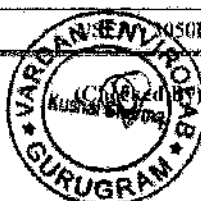
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| | | | |
|---------------------------------|--|----------------------|------------------------|
| Sample Number: | VEL/DDSPL/S/03 | Report No.: | VEL/S/2112/14/003 |
| Name & Address of the Party: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| | | Party Reference No.: | NIL |
| | | Reporting Date: | 18/12/2021 |
| | | Period of Analysis: | 14/12/2021- 18/12/2021 |
| | | Receipt Date: | 14/12/2021 |
| Sample Description: | SOIL SAMPLE | Sampling Date: | 13/12/2021 |
| Sample Location: | Panchayati Juggi (S3) | Sample Quantity: | 2.0 Kg |
| Sample Collected by: | Vardan EnviroLab Representative | Sampling Type: | Composite |
| Sampling and Analysis Protocol: | IS 2720, USEPA 3050B & SOP | Packing Status: | Temp Sealed |
| | | Parameter Required: | As Per ToR Letter |

| No. | Parameter | Test Method | Result | Unit |
|-----------|-------------------------|---------------------------------------|-----------------|----------|
| 1. | pH (at 25 °C) | IS : 2720 (P-26) by pH Meter | 7.67 | -- |
| 2. | Conductivity | IS:14767. 2000. RA | 0.264 | mS/cm |
| 3. | Soil Texture | SOP. SP-87.Issue No.-01 | Sand - 48 | -- |
| Silt - 36 | | | | |
| Clay - 16 | | | | |
| 4. | Color | SOP, SP-78,Issue No.-01 | Yellowish Brown | -- |
| 5. | Water holding capacity | SOP, SP-81,Issue No.-01 | 34.17 | % |
| 6. | Bulk density | SOP, SP-80,Issue No.-01 | 1.41 | gn/cc |
| 7. | Chloride as Cl | SOP, SP-85,Issue No.-01 | 34.27 | mg/100g |
| 8. | Calcium as Ca | SOP, SP-82,Issue No.-01 | 41.85 | mg/100g |
| 9. | Sodium as Na | SOP, SP-84,Issue No.-01 | 47.28 | mg/kg |
| 10. | Potassium as K | SOP, SP-84,Issue No.-01 | 167.00 | kg/hect. |
| 11. | Organic Matter | IS.2720 (P-22) Titrimetric Method, RA | 0.43 | % |
| 12. | Magnesium as Mg | SOP, SP-83,Issue No.-01 | 16.71 | mg/100g |
| 13. | Available Nitrogen as N | IS:14684 Distillation Method, RA | 107.15 | kg/hect. |
| 14. | Available Phosphorus | SOP, SP-86,Issue No.-01 | 12.14 | kg/hect. |
| 15. | Zinc (as Zn) | USEPA 3050B | 0.84 | mg/kg |
| 16. | Manganese (as Mn) | USEPA 3050B | 4.28 | mg/kg |
| 17. | Lead (as Pb) | USEPA 3050B | 0.60 | mg/kg |
| 18. | Cadmium (as Cd) | USEPA 3050B | 0.27 | mg/kg |
| 19. | Chromium (as Cr) | USEPA 3050B | 0.19 | mg/kg |
| 20. | Copper (as Cu) | USEPA 3050B | 0.19 | mg/kg |

Tested by: [Signature]
Analyst



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Annexure-IV

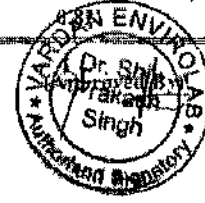
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| | | | |
|---------------------------------|---|----------------------|------------------------|
| Sample Number: | VEL/DDSPL/S/04 | Report No.: | VEL/S/2112/14/004 |
| Name & Address of the Party: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana . | Format No.: | 7.8 F-01 |
| Sample Description: | SOIL SAMPLE | Party Reference No.: | NIL |
| Sample Location: | Chhainsa (S4) | Reporting Date: | 18/12/2021 |
| Sample Collected by: | Vardan EnviroLab Representative | Period of Analysis: | 14/12/2021- 18/12/2021 |
| Sampling and Analysis Protocol: | IS 2720, USEPA 3050B & SOP | Receipt Date: | 14/12/2021 |
| | | Sampling Date: | 13/12/2021 |
| | | Sample Quantity: | 2.0 Kg |
| | | Sampling Type: | Composite |
| | | Packing Status: | Temp Sealed |
| | | Parameter Required: | As Per ToR Letter |

| S. No. | Parameter | Method | Result | Unit |
|-----------|-------------------------|---------------------------------------|-----------------|-----------|
| 1. | pH (at 25 °C) | IS : 2720 (P-26) by pH Meter | 7.80 | -- |
| 2. | Conductivity | IS:14767, 2000, RA | 0.332 | mS/cm |
| 3. | Soil Texture | SOP, SP-87, Issue No.-01 | Sand - 45 | -- |
| Silt - 40 | | | | |
| Clay - 15 | | | | |
| 4. | Color | SOP, SP-78, Issue No.-01 | Yellowish Brown | -- |
| 5. | Water holding capacity | SOP, SP-81, Issue No.-01 | 38.45 | % |
| 6. | Bulk density | SOP, SP-80, Issue No.-01 | 1.49 | gm/cc |
| 7. | Chloride as Cl | SOP, SP-85, Issue No.-01 | 39.74 | mg/100g |
| 8. | Calcium as Ca | SOP, SP-82, Issue No.-01 | 45.56 | mg/100g |
| 9. | Sodium as Na | SOP, SP-84, Issue No.-01 | 59.78 | mg/kg |
| 10. | Potassium as K | SOP, SP-84, Issue No.-01 | 183.49 | kg/hect. |
| 11. | Organic Matter | IS:2720 (P-22) Titrimetric Method, RA | 0.46 | % |
| 12. | Magnesium as Mg | SOP, SP-83, Issue No.-01 | 17.47 | mg/100g |
| 13. | Available Nitrogen as N | IS:14684 Distillation Method, RA | 121.56 | kg./hect. |
| 14. | Available Phosphorus | SOP, SP-86, Issue No.-01 | 12.31 | kg./hect. |
| 15. | Zinc (as Zn) | USEPA 3050B | 0.97 | mg/kg |
| 16. | Manganese (as Mn) | USEPA 3050B | 5.21 | mg/kg |
| 17. | Lead (as Pb) | USEPA 3050B | 0.70 | mg/kg |
| 18. | Cadmium (as Cd) | USEPA 3050B | 0.37 | mg/kg |
| 19. | Chromium (as Cr) | USEPA 3050B | 0.26 | mg/kg |
| 20. | Copper (as Cu) | USEPA 3050B | | mg/kg |

Vardan EnviroLab Analyst



www.vardan.co.in

Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardanenvirolab.com, bd@vardanenvirolab.com



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

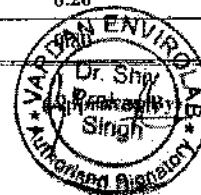
Annexure-IV

Test Report

| | | | |
|---|--|-----------------------------|------------------------|
| Sample Number: | VEL/DDSPL/S/05 | Report No.: | VEL/S/2112/14/005 |
| Name & Address of the Party: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| Sample Description: | SOIL SAMPLE | Party Reference No.: | NIL |
| Sample Location: | Qadirpur (SS) | Reporting Date: | 18/12/2021 |
| Sample Collected by: | Vardan EnviroLab Representative | Period of Analysis: | 14/12/2021- 18/12/2021 |
| Sampling and Analysis Protocol: | IS 2720, USEPA 3050B & SOP | Receipt Date: | 14/12/2021 |
| | | Sampling Date: | 13/12/2021 |
| | | Sample Quantity: | 2.0 Kg |
| | | Sampling Type: | Composite |
| | | Packing Status: | Temp Sealed |
| | | Parameter Required: | As Per ToR Letter |

| S. No. | Parameter | Method | Result | Unit |
|--------|-------------------------|---------------------------------------|-------------------------------------|----------|
| 1. | pH (at 25 °C) | IS : 2720 (P-26) by pH Meter | 7.71 | -- |
| 2. | Conductivity | IS:14767, 2000, RA | 0.274 | mS/cm |
| 3. | Soil Texture | SOP, SP-87, Issue No.-01 | Sand - 49 Silt - 35 Clay - 16 | -- |
| 4. | Color | SOP, SP-78, Issue No.-01 | Yellowish Brown | -- |
| 5. | Water holding capacity | SOP, SP-81, Issue No.-01 | 35.24 | % |
| 6. | Bulk density | SOP, SP-80, Issue No.-01 | 1.43 | gm/cc |
| 7. | Chloride as Cl | SOP, SP-85, Issue No.-01 | 37.54 | mg/100g |
| 8. | Calcium as Ca | SOP, SP-82, Issue No.-01 | 42.12 | mg/100g |
| 9. | Sodium as Na | SOP, SP-84, Issue No.-01 | 50.71 | mg/kg |
| 10. | Potassium as K | SOP, SP-84, Issue No.-01 | 172.00 | kg/hect. |
| 11. | Organic Matter | IS:2720 (P-22) Titrimetric Method, RA | 0.44 | % |
| 12. | Magnesium as Mg | SOP, SP-83, Issue No.-01 | 14.89 | mg/100g |
| 13. | Available Nitrogen as N | IS:14684 Distillation Method, RA | 110.23 | kg/hect. |
| 14. | Available Phosphorus | SOP, SP-86, Issue No.-01 | 10.47 | kg/hect. |
| 15. | Zinc (as Zn) | USEPA 3050B | 0.91 | mg/kg |
| 16. | Manganese (as Mn) | USEPA 3050B | 4.41 | mg/kg |
| 17. | Lead (as Pb) | USEPA 3050B | 0.63 | mg/kg |
| 18. | Cadmium (as Cd) | USEPA 3050B | 0.31 | mg/kg |
| 19. | Chromium (as Cr) | USEPA 3050B | 0.20 | mg/kg |
| 20. | Copper (as Cu) | USEPA 3050B | | mg/kg |

Checked By: VANDANA
Analyst



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Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardanenviro.net.com, bd@vardanenviro.net.com

Vardan EnviroLab

Annexure-IV

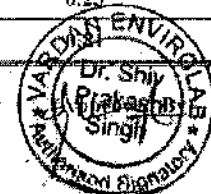
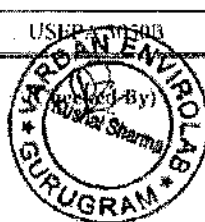
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| | | | |
|---|--|-----------------------------|------------------------|
| Sample Number: | VEL/DDSPL /S/06 | Report No.: | VEL/S/2112/14/006 |
| Name & Address of the Party: | M/sDev&Div Solutions Pvt. Ltd. Sand Mining Project "MakhanpurUnit" At At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| | | Party Reference No.: | NIL |
| | | Reporting Date: | 18/12/2021 |
| | | Period of Analysis: | 14/12/2021- 18/12/2021 |
| | | Receipt Date: | 14/12/2021 |
| Sample Description: | SOIL SAMPLE | Sampling Date: | 13/12/2021 |
| Sample Location: | Near Moujpur (S6) | Sample Quantity: | 2.0 Kg |
| Sample Collected by: | VardanEnviroLabRepresentative | Sampling Type: | Composite |
| Sampling and Analysis Protocol: | IS 2720, USEPA 3050B & SOP | Packing Status: | Temp Sealed |
| | | Parameter Required: | As Per ToR Letter |

| Sr. No. | Parameter | Method | Result | Unit |
|---------|-------------------------|---------------------------------------|-------------------------------------|----------|
| 1. | pH (at 25 °C) | IS : 2720 (P-26) by pH Meter | 7.76 | -- |
| 2. | Conductivity | IS:14767, 2000, RA | 0.305 | mS/cm |
| 3. | Soil Texture | SOP, SP-87, Issue No.-01 | Sand - 51 Silt - 34 Clay - 15 | -- |
| 4. | Color | SOP, SP-78, Issue No.-01 | Yellowish Brown | -- |
| 5. | Water holding capacity | SOP, SP-81, Issue No.-01 | 37.15 | % |
| 6. | Bulk density | SOP, SP-80, Issue No.-01 | 1.45 | gm/cc |
| 7. | Chloride as Cl | SOP, SP-85, Issue No.-01 | 38.87 | mg/100g |
| 8. | Calcium as Ca | SOP, SP-82, Issue No.-01 | 43.14 | mg/100g |
| 9. | Sodium as Na | SOP, SP-84, Issue No.-01 | 49.46 | mg/kg |
| 10. | Potassium as K | SOP, SP-84, Issue No.-01 | 179.00 | kg/hect. |
| 11. | Organic Matter | IS:2720 (P-22) Titrimetric Method, RA | 0.47 | % |
| 12. | Magnesium as Mg | SOP, SP-83, Issue No.-01 | 16.59 | mg/100g |
| 13. | Available Nitrogen as N | IS:14684 Distillation Method, RA | 112.35 | kg/hect. |
| 14. | Available Phosphorus | SOP, SP-86, Issue No.-01 | 11.58 | kg/hect. |
| 15. | Zinc (as Zn) | USEPA 3050B | 0.95 | mg/kg |
| 16. | Manganese (as Mn) | USEPA 3050B | 4.63 | mg/kg |
| 17. | Lead (as Pb) | USEPA 3050B | 0.66 | mg/kg |
| 18. | Cadmium (as Cd) | USEPA 3050B | 0.34 | mg/kg |
| 19. | Chromium (as Cr) | USEPA 3050B | 0.23 | mg/kg |
| 20. | Copper (as Cu) | USEPA 3050B | | mg/kg |

VARDANA
(Design) by
Analyst



VEL/E/1/TR/PNT/024

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Vardan EnviroLab

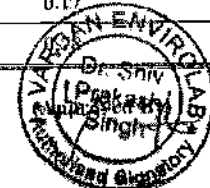
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| | | | |
|---------------------------------|---|----------------------|------------------------|
| Sample Number: | VEL/DDSPL/JS/07 | Report No.: | VEL/S/2112/14/007 |
| Name & Address of the Party: | M/sDev&Div Solutions Pvt. Ltd. Sand Mining Project "MakhanpurUnit" AtAt Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| Sample Description: | SOIL SAMPLE | Party Reference No.: | NIL |
| Sample Location: | Shopura (S7) | Reporting Date: | 18/12/2021 |
| Sample Collected by: | VardanEnviroLabRepresentative | Period of Analysis: | 14/12/2021- 18/12/2021 |
| Sampling and Analysis Protocol: | IS 2720, USEPA 3050B & SOP | Receipt Date: | 14/12/2021 |
| | | Sampling Date: | 13/12/2021 |
| | | Sample Quantity: | 2.0 Kg |
| | | Sampling Type: | Composite |
| | | Packing Status: | Temp Sealed |
| | | Parameter Required: | As Per ToR Letter |

| Sl. No. | Parameter | Method | Result | Unit |
|---------|-------------------------|---------------------------------------|-------------------------------------|----------|
| 1. | pH (at 25 °C) | IS : 2720 (P-26) by pH Meter | 7.64 | - |
| 2. | Conductivity | IS:14767, 2000, RA | 0.406 | mS/cm |
| 3. | Soil Texture | SOP, SP-87, Issue No.-01 | Sand - 47 Silt - 37 Clay - 16 | -- |
| 4. | Color | SOP, SP-78, Issue No.-01 | Yellowish Brown | -- |
| 5. | Water holding capacity | SOP, SP-81, Issue No.-01 | 37.81 | % |
| 6. | Bulk density | SOP, SP-80, Issue No.-01 | 1.35 | gm/cc |
| 7. | Chloride as Cl | SOP, SP-85, Issue No.-01 | 32.48 | mg/100g |
| 8. | Calcium as Ca | SOP, SP-82, Issue No.-01 | 39.96 | mg/100g |
| 9. | Sodium as Na | SOP, SP-84, Issue No.-01 | 46.57 | mg/kg |
| 10. | Potassium as K | SOP, SP-84, Issue No.-01 | 163.00 | kg/hect. |
| 11. | Organic Matter | IS:2720 (P-22) Titrimetric Method, RA | 0.48 | % |
| 12. | Magnesium as Mg | SOP, SP-83, Issue No.-01 | 18.56 | mg/100g |
| 13. | Available Nitrogen as N | IS:14684 Distillation Method, RA | 114.00 | kg/hect. |
| 14. | Available Phosphorus | SOP, SP-86, Issue No.-01 | 14.89 | kg/hect. |
| 15. | Zinc (as Zn) | USEPA 3050B | 0.80 | mg/kg |
| 16. | Manganese (as Mn) | USEPA 3050B | 4.23 | mg/kg |
| 17. | Lead (as Pb) | USEPA 3050B | 0.53 | mg/kg |
| 18. | Cadmium (as Cd) | USEPA 3050B | 0.24 | mg/kg |
| 19. | Chromium (as Cr) | USEPA 3050B | 0.17 | mg/kg |
| 20. | Copper (as Cu) | USEPA 3050B | | mg/kg |

(Fek) Analyst



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Annexure-IV

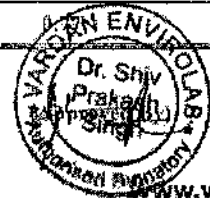
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| | | | |
|---------------------------------|---|----------------------|------------------------|
| Sample Number: | VEL/DDSPL/S/08 | Report No.: | VEL/S/2112/14/008 |
| Name & Address of the Party: | M/sDev&Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| | | Party Reference No.: | NIL |
| | | Reporting Date: | 18/12/2021 |
| | | Period of Analysis: | 14/12/2021- 18/12/2021 |
| | | Receipt Date: | 14/12/2021 |
| Sample Description: | SOIL SAMPLE | Sampling Date: | 13/12/2021 |
| Sample Location: | Mohna (S8) | Sample Quantity: | 2.0 Kg |
| Sample Collected by: | Vardan EnviroLab Representative | Sampling Type: | Composite |
| Sampling and Analysis Protocol: | IS 2720, USEPA 3050B & SOP | Packing Status: | Temp Sealed |
| | | Parameter Required: | As Per ToR Letter |

| No. | Parameter | Method | Result | Unit |
|-----|-------------------------|---------------------------------------|-------------------------------------|----------|
| 1. | pH (at 25 °C) | IS : 2720 (P-26) by pH Meter | 7.60 | - |
| 2. | Conductivity | IS:14767, 2000, RA | 0.386 | mS/cm |
| 3. | Soil Texture | SOP, SP-87, Issue No.-01 | Sand - 46 Silt - 37 Clay - 17 | -- |
| 4. | Color | SOP, SP-78, Issue No.-01 | Yellowish Brown | - |
| 5. | Water holding capacity | SOP, SP-81, Issue No.-01 | 35.49 | % |
| 6. | Bulk density | SOP, SP-80, Issue No.-01 | 1.43 | gm/cc |
| 7. | Chloride as Cl | SOP, SP-85, Issue No.-01 | 31.20 | mg/100g |
| 8. | Calcium as Ca | SOP, SP-82, Issue No.-01 | 37.69 | mg/100g |
| 9. | Sodium as Na | SOP, SP-84, Issue No.-01 | 45.33 | mg/kg |
| 10. | Potassium as K | SOP, SP-84, Issue No.-01 | 150.00 | kg/hect. |
| 11. | Organic Matter | IS:2720 (P-22) Titrimetric Method, RA | 0.45 | % |
| 12. | Magnesium as Mg | SOP, SP-83, Issue No.-01 | 19.56 | mg/100g |
| 13. | Available Nitrogen as N | IS:14684 Distillation Method, RA | 121.00 | kg/hect. |
| 14. | Available Phosphorus | SOP, SP-86, Issue No.-01 | 13.55 | kg/hect. |
| 15. | Zinc (as Zn) | USEPA 3050B | 0.76 | mg/kg |
| 16. | Manganese (as Mn) | USEPA 3050B | 4.17 | mg/kg |
| 17. | Lead (as Pb) | USEPA 3050B | 0.46 | mg/kg |
| 18. | Cadmium (as Cd) | USEPA 3050B | 0.21 | mg/kg |
| 19. | Chromium (as Cr) | USEPA 3050B | 0.16 | mg/kg |
| 20. | Copper (as Cu) | USEPA 3050B | 0.16 | mg/kg |

(Tested By) An



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Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardanenviro.net, bd@vardanenviro.net



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001


Test Report

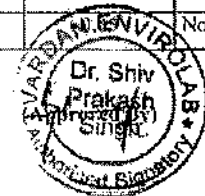
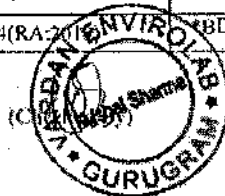
Sample Number: VEL/W/DDSPL/01
Name & Address of the Project: M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At At Village: Makhanpur, Tehsil & District: Faridabad, Haryana

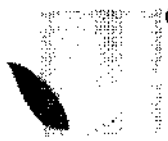
Sample Description: Ground Water Sample
Sample Location: Makhanpur Khadar (GW1)
Sample Collected by: Vardan EnviroLab Representative
Sampling and Analysis Protocol: IS 3025 & APHA, 23rd Edition 2017

Report No.: VEL/W/2112/14/001
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 18/12/2021
Period of Analysis: 14/12/2021~ 18/12/2021
Receipt Date: 14/12/2021
Sampling Date: 13/12/2021
Sampling Quantity: 5.0 Ltr + 250ml.
Sampling Type: Grab
Preservation: Refrigerator

| Sl. No. | Parameter | Method | Result | Unit | Limit (IS 3025) / Requirement (Acceptable Limit) | Permissible Limit in the Agricultural Category (mg/L) |
|---------|-------------------------------------|--|-----------------------|-------|--|---|
| 1. | pH (at 25 °C) | APHA ,4500-H' B Electrometric Method | 7.72 | -- | 6.5 to 8.5 | No Relaxation |
| 2. | Colour | APHA ,2120 B, Visual Comparison Method | *BDL (**DL 1.0 Hazen) | Hazen | 5 | 15 |
| 3. | Turbidity | APHA, 2130 B, Nephelometric Method | *BDL (**DL 1.0 NTU) | NTU | 1 | 5 |
| 4. | Odour | APHA, 2150 B, Threshold Odour Method | Agreeable | -- | Agreeable | Agreeable |
| 5. | Taste | APHA , 2160 B, Threshold Test Method | Agreeable | -- | Agreeable | Agreeable |
| 6. | Total Hardness as CaCO ₃ | APHA , 2340 C, EDTA Titrimetric Method | 272.00 | mg/l | 200 | 600 |
| 7. | Calcium as Ca | APHA, 3500 Ca B, EDTA Titrimetric Method | 68.42 | mg/l | 75 | 200 |
| 8. | Alkalinity as CaCO ₃ | APHA , 2320 B, Titrimetric Method | 238.00 | mg/l | 200 | 600 |
| 9. | Chloride as Cl | APHA, 4500-Cl B, Argentometric Method | 74.65 | mg/l | 250 | 1000 |
| 10. | Cyanide as CN | APHA , 4500 CN D | *BDL(**DL 0.02 mg/l) | mg/l | 0.05 | No Relaxation |
| 11. | Magnesium as Mg | APHA , 3500 Mg B, Calculation Method | 24.61 | mg/l | 30 | 100 |
| 12. | Total Dissolved Solids | APHA , 2540 C, Gravimetric Method | 430.00 | mg/l | 500 | 2000 |
| 13. | Sulphate as SO ₄ | APHA , 4500 E, Turbidimetric Method | 44.58 | mg/l | 200 | 400 |
| 14. | Fluoride as F | APHA , 4500-F' D, SPADNS Method | 0.49 | mg/l | 1.0 | 1.5 |
| 15. | Nitrate as NO ₃ | IS 3025 (P-34) ,Chromotropic Method | 15.47 | mg/l | 45 | No Relaxation |
| 16. | Iron as Fe | IS 3025 (P-65):2014(RA:2019) | 0.37 | mg/l | 1.0# | No relaxation |
| 17. | Aluminium as Al | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.03 | 0.2 |
| 18. | Boron | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l | 0.5 | 2.4# |
| 19. | Chromium as Cr | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | | No Relaxation |


ANSHU SHARMA
Jr. Lab Analyst





Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| Sample No.: VEL/W/DDSPL/01 | | | Report No.: VEL/W/2112/14/001 | | | |
|----------------------------|----------------------------|---|-------------------------------|-------|--|-----------------------------------|
| Sr.No. | Parameter | Reference | Result | Unit | IS:3025-2019 Standard Limit | IS:3025-2019 Standard Limit |
| 20. | Conductivity (at 25°C) | APHA, 2510 B, Conductivity Meter Method | 662 | µS/cm | -- | -- |
| 21. | Phenolic Compounds | APHA, 5530 C Chloroform Extraction Method | *BDL(**DL 0.0004 mg/l) | mg/l | 0.001 | 0.002 |
| 22. | Mineral Oil | Clause 6 of IS:3025(Part 39) | *BDL(**DL 0.05 mg/l) | mg/l | 1.0 | No Relaxation |
| 23. | Anionic Detergents as MBAS | Annex K of IS 13428, IS 3025 (P-68) | *BDL(**DL 0.05 mg/l) | mg/l | 0.2 | 1.0 |
| 24. | Zinc as Zn | IS 3025 (P-65):2014(RA:2019) | 1.35 | mg/l | 5 | 15 |
| 25. | Copper as Cu | IS 3025 (P-65):2014(RA:2019) | 0.08 | mg/l | 0.05 | 1.5 |
| 26. | Manganese as Mn | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l | 0.1 | 0.3 |
| 27. | Cadmium as Cd | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.003 | No Relaxation |
| 28. | Lead as Pb | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.01 | No Relaxation |
| 29. | Selenium as Se | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.001 mg/l) | mg/l | 0.01 | No Relaxation |
| 30. | Arsenic as As | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.01 | No Relaxation |
| 31. | Mercury as Hg | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.0005 mg/l) | mg/l | 0.001 | No Relaxation |
| 32. | Total Coliform | IS 1622, 1981, RA-2019 | <2 | 100ml | Shall not be detectable in any 100 ml sample | |
| 33. | E. Coli | IS 1622, 1981, RA-2019 | Absent | 100ml | Shall not be detectable in any 100 ml sample | |

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

KANCHAN SHARMA
Analyst



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Annexure-IV

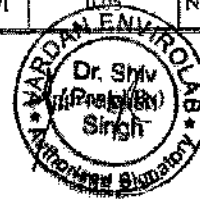
Test Report

| | | | |
|--------------------------------|---|----------------------|-------------------------|
| Sample Number: | VEL/W/DDSPL/02 | Report No.: | VEL/W/2112/14/002 |
| Name & Address of the Project: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| | | Party Reference No.: | NIL |
| | | Reporting Date: | 18/12/2021 |
| | | Period of Analysis: | 14/12/2021 - 18/12/2021 |
| | | Receipt Date: | 14/12/2021 |
| | | Sampling Date: | 13/12/2021 |
| | | Sampling Quantity: | 5.0 Ltr + 250ml. |
| | | Sampling Type: | Grab |
| | | Preservation: | Refrigerator |

Sample Description: Ground Water Sample
 Sample Location: Chhainsa (GW2)
 Sample Collected by: Vardan Enviro Lab Representative
 Sampling and Analysis Protocol: IS 3025 & APHA, 23rd Edition 2017

| Sl. No. | Parameter | Test Method | Result | Unit | Limit of Standard (mg/l) | |
|---------|-------------------------------------|--|------------------------|-------|--------------------------|---------------|
| | | | | | IS 3025 | IS 3025 |
| 1. | pH (at 25 °C) | APHA ,4500-H B Electrometric Method | 7.78 | -- | 6.5 to 8.5 | No Relaxation |
| 2. | Colour | APHA ,2120 B, Visual Comparison Method | *BDL (**DL 1.0 Hazen) | Hazen | 5 | 15 |
| 3. | Turbidity | APHA ,2130 B, Nephelometric Method | *BDL (**DL 1.0 NTU) | NTU | 1 | 5 |
| 4. | Odour | APHA ,2150 B , Threshold Odour Method | Agreeable | -- | Agreeable | Agreeable |
| 5. | Taste | APHA ,2160 B, Threshold Test Method | Agreeable | -- | Agreeable | Agreeable |
| 6. | Total Hardness as CaCO ₃ | APHA ,2340 C, EDTA Titrimetric Method | 283.00 | mg/l | 200 | 500 |
| 7. | Calcium as Ca | APHA ,3500 Ca B, EDTA Titrimetric Method | 53.00 | mg/l | 75 | 200 |
| 8. | Alkalinity as CaCO ₃ | APHA ,2320 B, Titrimetric Method | 243.00 | mg/l | 200 | 500 |
| 9. | Chloride as Cl | APHA ,4500-Cl B, Argentometric Method | 59.63 | mg/l | 250 | 1000 |
| 10. | Cyanide as CN | APHA ,4500 CN D | *BDL (**DL 0.02 mg/l) | mg/l | 0.05 | No Relaxation |
| 11. | Magnesium as Mg | APHA ,3500 Mg B, Calculation Method | 36.64 | mg/l | 30 | 100 |
| 12. | Total Dissolved Solids | APHA ,2540 C, Gravimetric Method | 391.00 | mg/l | 500 | 2000 |
| 13. | Sulphate as SO ₄ | APHA ,4500 B, Turbidimetric Method | 39.76 | mg/l | 200 | 400 |
| 14. | Fluoride as F | APHA ,4500-F D, SPADNS Method | 0.32 | mg/l | 1.0 | 1.5 |
| 15. | Nitrate as NO ₃ | IS 3025 (P-34) ,Chromotropic Method | 11.30 | mg/l | 45 | No Relaxation |
| 16. | Iron as Fe | IS 3025 (P-65):2014(RA:2019) | 0.27 | mg/l | 1.0# | No relaxation |
| 17. | Aluminium as Al | IS 3025 (P-65):2014(RA:2019) | *BDL (**DL 0.002 mg/l) | mg/l | 0.03 | 0.2 |
| 18. | Boron | IS 3025 (P-65):2014(RA:2019) | *BDL (**DL 0.01 mg/l) | mg/l | 0.5 | 2.4# |
| 19. | Chromium as Cr | IS 3025 (P-65):2014(RA:2019) | *BDL (**DL 0.002 mg/l) | mg/l | 0.05 | No Relaxation |

KANISHK SHARMA
Sr. Lab Analyst





Vardan EnviroLab

Annexure-IV

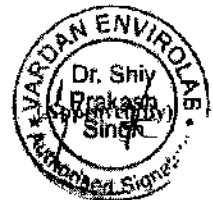
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| Sample No.: VEL/W/DDSPL/02 | | | Report No.: VEL/W/2112/14/002 | | | |
|----------------------------|----------------------------|---|-------------------------------|-------|--|---------------|
| S.No. | Parameter | Method | Result | Unit | SI | Relaxation |
| 20. | Conductivity (at 25°C) | APHA, 2510 B, Conductivity Meter Method | 602 | µS/cm | -- | -- |
| 21. | Phenolic Compounds | APHA, 5530 C Chloroform Extraction Method | *BDL(**DL 0.0004 mg/l) | mg/l | 0.001 | 0.002 |
| 22. | Mineral Oil | Clause 6 of IS:3025(Part 39) | *BDL(**DL 0.05 mg/l) | mg/l | 1.0 | No Relaxation |
| 23. | Anionic Detergents as MBAS | Annex K of IS 13428, IS 3025 (P-68) | *BDL(**DL 0.05 mg/l) | mg/l | 0.2 | 1.0 |
| 24. | Zinc as Zn | IS 3025 (P-65):2014(RA:2019) | 1.16 | mg/l | 5 | 15 |
| 25. | Copper as Cu | IS 3025 (P-65):2014(RA:2019) | 0.07 | mg/l | 0.05 | 1.5 |
| 26. | Manganese as Mn | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l | 0.1 | 0.3 |
| 27. | Cadmium as Cd | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.003 | No Relaxation |
| 28. | Lead as Pb | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.01 | No Relaxation |
| 29. | Selenium as Se | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.001 mg/l) | mg/l | 0.01 | No Relaxation |
| 30. | Arsenic as As | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.01 | No Relaxation |
| 31. | Mercury as Hg | IS 3025 (P-65):2014(RA:2019) | *BDL (**DL 0.0005 mg/l) | mg/l | 0.001 | No Relaxation |
| 32. | Total Coliform | IS 1622,1981, RA-2019 | <2 | 100ml | Shall not be detectable in any 100 ml sample | |
| 33. | E. Coli | IS 1622,1981, RA-2019 | Absent | 100ml | Shall not be detectable in any 100 ml sample | |

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

KANISHK KUMAR
Analyst
(Tested By)



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Vardan EnviroLab

Annexure-IV

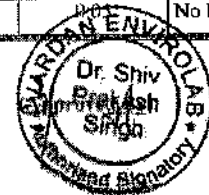
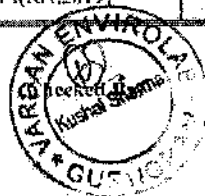
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VELAW/USPL/03
Name & Address of the Project: M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unif" At At Village: Makhanpur, Tehsil & District: Faridabad, Haryana
Report No.: VELAW/2112/14/003
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 18/12/2021
Period of Analysis: 14/12/2021 - 18/12/2021
Receipt Date: 14/12/2021
Sampling Date: 13/12/2021
Sampling Quantity: 5.0 Ltr + 250ml.
Sample Description: Ground Water Sample
Sample Location: Panchayati Juggi (GW3)
Sample Collected by: Vardan Enviro Lab Representative
Sampling and Analysis Protocol: IS 3025 & APHA, 23rd Edition 2017
Sampling Type: Grab
Preservation: Refrigerator

| Sl. No. | Parameter | Test Method | Result | Unit | IS 3025 (P-34) | APHA 2110 |
|---------|-------------------------------------|--|-----------------------|-------|----------------|---------------|
| 1. | pH (at 25 °C) | APHA ,4500-H' B Electrometric Method | 7.69 | -- | 6.5 to 8.5 | No Relaxation |
| 2. | Colour | APHA ,2120 B, Visual Comparison Method | *BDL (**DL 1.0 Hazen) | Hazen | 5 | 15 |
| 3. | Turbidity | APHA, 2130 B, Nephelometric Method | *BDL (**DL 1.0 NTU) | NTU | 1 | 5 |
| 4. | Odour | APHA, 2150 B . Threshold Odour Method | Agreeable | -- | Agreeable | Agreeable |
| 5. | Taste | APHA , 2160 B. Threshold Test Method | Agreeable | -- | Agreeable | Agreeable |
| 6. | Total Hardness as CaCO ₃ | APHA , 2340 C, EDTA Titrimetric Method | 286.00 | mg/l | 200 | 600 |
| 7. | Calcium as Ca | APHA, 3500 Ca B, EDTA Titrimetric Method | 57.58 | mg/l | 75 | 200 |
| 8. | Alkalinity as CaCO ₃ | APHA , 2320 B, Titrimetric Method | 314.00 | mg/l | 200 | 600 |
| 9. | Chloride as Cl | APHA, 4500-Cl' B, Argentometric Method | 66.18 | mg/l | 250 | 1000 |
| 10. | Cyanide as CN | APHA , 4500 CN' D | *BDL(**DL 0.02 mg/l) | mg/l | 0.05 | No Relaxation |
| 11. | Magnesium as Mg | APHA . 3500 Mg B. Calculation Method | 34.59 | mg/l | 30 | 100 |
| 12. | Total Dissolved Solids | APHA . 2540 C. Gravimetric Method | 493.00 | mg/l | 500 | 2000 |
| 13. | Sulphate as SO ₄ | APHA . 4500 E. Turbidimetric Method | 46.51 | mg/l | 200 | 400 |
| 14. | Fluoride as F | APHA , 4500-F' D. SPADNS Method | 0.51 | mg/l | 1.0 | 1.5 |
| 15. | Nitrate as NO ₃ | IS 3025 (P-34) ,Chromotropic Method | 15.24 | mg/l | 45 | No Relaxation |
| 16. | Iron as Fe | IS 3025 (P-65):2014(RA:2019) | 0.35 | mg/l | 1.0# | No relaxation |
| 17. | Aluminium as Al | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.03 | 0.2 |
| 18. | Boron | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l | 0.5 | 2.4# |
| 19. | Chromium as Cr | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.01 | No Relaxation |

KANCHAN SHARMA
Analyst
(Listed)



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Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| Sample No.: VEL/W/USPL/03 | | | Report No: VEL/W/2112/14/003 | | | |
|---------------------------|----------------------------|---|------------------------------|-------|--|---------------|
| Sl. No. | Parameter | Method | Result | Unit | Relaxation Limit | Remarks |
| 20. | Conductivity at (25°C) | APHA, 2510 B, Conductivity Meter Method | 758 | µS/cm | -- | -- |
| 21. | Phenolic Compounds | APHA, 5530 C Chloroform Extraction Method | *BDL(**DL 0.0004 mg/l) | mg/l | 0.001 | 0.002 |
| 22. | Mineral Oil | Clause 6 of IS:3025(Part 39) | *BDL(**DL 0.05 mg/l) | mg/l | 1.0 | No Relaxation |
| 23. | Anionic Detergents as MBAS | Annex K of IS 13428, IS 3025 (P-68) | *BDL(**DL 0.05 mg/l) | mg/l | 0.2 | 1.0 |
| 24. | Zinc as Zn | IS 3025 (P-65):2014(RA:2019) | 1.23 | mg/l | 5 | 15 |
| 25. | Copper as Cu | IS 3025 (P-65):2014(RA:2019) | 0.10 | mg/l | 0.05 | 1.5 |
| 26. | Manganese as Mn | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l | 0.1 | 0.3 |
| 27. | Cadmium as Cd | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.003 | No Relaxation |
| 28. | Lead as Pb | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.01 | No Relaxation |
| 29. | Selenium as Se | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.001 mg/l) | mg/l | 0.01 | No Relaxation |
| 30. | Arsenic as As | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.01 | No Relaxation |
| 31. | Mercury as Hg | IS 3025 (P-65):2014(RA:2019) | *BDL (**DL 0.0005 mg/l) | mg/l | 0.001 | No Relaxation |
| 32. | Total Coliform | IS 1622, 1981, RA-2019 | <2 | 100ml | Shall not be detectable in any 100 ml sample | |
| 33. | E. Coli | IS 1622, 1981, RA-2019 | Absent | 100ml | Shall not be detectable in any 100 ml sample | |

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

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Analyst
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Vardan EnviroLab

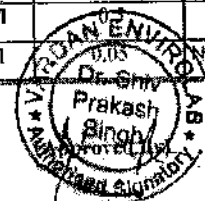
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| | | | |
|---|--|-----------------------------|------------------------|
| Sample Number: | VEL/W/USPL/04 | Report No.: | VEL/W/2112/14/004 |
| Name & Address of the Project: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| | | Party Reference No.: | NIL |
| | | Reporting Date: | 18/12/2021 |
| | | Period of Analysis: | 14/12/2021- 18/12/2021 |
| | | Receipt Date: | 14/12/2021 |
| Sample Description: | Ground Water Sample | Sampling Date: | 13/12/2021 |
| Sample Location: | Near Moujpur (GW4) | Sampling Quantity: | 5.0 Ltr + 250ml. |
| Sample Collected by: | Vardan Enviro Lab Representative | Sampling Type: | Grab |
| Sampling and Analysis Protocol: | IS 3025 & APHA, 23rd Edition 2017 | Preservation: | Refrigerator |

| Sl. No. | Parameter | Method | Result | Unit | IS 3025 (P-34) Limit | APHA 23rd Edition Limit |
|---------|-------------------------------------|--|------------------------|-------|----------------------|-------------------------|
| 1. | pH (at 25 °C) | APHA ,4500-H* B Electrometric Method | 7.70 | -- | 6.5 to 8.5 | No Relaxation |
| 2. | Colour | APHA ,2120 B, Visual Comparison Method | 1.0 | Hazen | 5 | 15 |
| 3. | Turbidity | APHA, 2130 B, Nephelometric Method | *BDL (**DL 1.0 NTU) | NTU | 1 | 5 |
| 4. | Odour | APHA, 2150 B, Threshold Odour Method | Agreeable | -- | Agreeable | Agreeable |
| 5. | Taste | APHA , 2160 B, Threshold Test Method | Agreeable | -- | Agreeable | Agreeable |
| 6. | Total Hardness as CaCO ₃ | APHA , 2340 C, EDTA Titrimetric Method | 245.00 | mg/l | 200 | 600 |
| 7. | Calcium as Ca | APHA, 3500 Ca B, EDTA Titrimetric Method | 52.19 | mg/l | 75 | 200 |
| 8. | Alkalinity as CaCO ₃ | APHA , 2320 B, Titrimetric Method | 301.00 | mg/l | 200 | 600 |
| 9. | Chloride as Cl | APHA, 4500-Cl* B, Argentometric Method | 60.23 | mg/l | 250 | 1000 |
| 10. | Cyanide as CN | APHA , 4500 CN* D | *BDL (**DL 0.02 mg/l) | mg/l | 0.05 | No Relaxation |
| 11. | Magnesium as Mg | APHA , 3500 Mg B, Calculation Method | 27.89 | mg/l | 30 | 100 |
| 12. | Total Dissolved Solids | APHA , 2540 C, Gravimetric Method | 476.00 | mg/l | 500 | 2000 |
| 13. | Sulphate as SO ₄ | APHA , 4500 E, Turbidimetric Method | 43.15 | mg/l | 200 | 400 |
| 14. | Fluoride as F | APHA , 4500-F* D, SPADNS Method | 0.37 | mg/l | 1.0 | 1.5 |
| 15. | Nitrate as NO ₃ | IS 3025 (P-34) , Chromotropic Method | 20.13 | mg/l | 45 | No Relaxation |
| 16. | Iron as Fe | IS 3025 (P-65):2014(RA:2019) | 0.26 | mg/l | 1.0# | No relaxation |
| 17. | Aluminium as Al | IS 3025 (P-65):2014(RA:2019) | *BDL (**DL 0.002 mg/l) | mg/l | 0.03 | 0.2 |
| 18. | Boron | IS 3025 (P-65):2014(RA:2019) | *BDL (**DL 0.01 mg/l) | mg/l | | 2.4# |
| 19. | Chromium as Cr | IS 3025 (P-65):2014(RA:2019) | *BDL (**DL 0.002 mg/l) | mg/l | | No Relaxation |

KAMAL SHARMA
Sr. Lab Analyst





Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

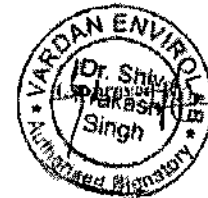
Test Report

| Sample No.: VEL/W/USPL/04 | | | Report No VEL/W/2112/14/004 | | | |
|---------------------------|----------------------------|---|-----------------------------|-------|--|---------------|
| Sr. No. | Parameter | Method | Result | Unit | Limit (mg/l) | Remarks |
| 20. | Conductivity (at 25°C) | APHA, 2510 B, Conductivity Meter Method | 733 | µS/cm | -- | -- |
| 21. | Phenolic Compounds | APHA, 5530 C Chloroform Extraction Method | *BDL(**DL 0.0004 mg/l) | mg/l | 0.001 | 0.002 |
| 22. | Mineral Oil | Clause 6 of IS:3025(Part 39) | *BDL(**DL 0.05 mg/l) | mg/l | 1.0 | No Relaxation |
| 23. | Anionic Detergents as MBAS | Annex K of IS 13428, IS 3025 (P-68) | *BDL(**DL 0.05 mg/l) | mg/l | 0.2 | 1.0 |
| 24. | Zinc as Zn | IS 3025 (P-65):2014(RA:2019) | 1.20 | mg/l | 5 | 15 |
| 25. | Copper as Cu | IS 3025 (P-65):2014(RA:2019) | 0.08 | mg/l | 0.05 | 1.5 |
| 26. | Manganese as Mn | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l | 0.1 | 0.3 |
| 27. | Cadmium as Cd | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.003 | No Relaxation |
| 28. | Lead as Pb | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.01 | No Relaxation |
| 29. | Selenium as Se | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.001 mg/l) | mg/l | 0.01 | No Relaxation |
| 30. | Arsenic as As | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.01 | No Relaxation |
| 31. | Mercury as Hg | IS 3025 (P-65):2014(RA:2019) | *BDL (**DL 0.0005 mg/l) | mg/l | 0.001 | No Relaxation |
| 32. | Total Coliform | IS 1622,1981, RA-2019 | <2 | 100ml | Shall not be detectable in any 100 ml sample | |
| 33. | E. Coli | IS 1622,1981, RA-2019 | Absent | 100ml | Shall not be detectable in any 100 ml sample | |

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

KANCHAN SHARMA

(Tested By)



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Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/W/USPL/03 **Report No.:** VEL/W/2112/14/005
Name & Address of the Project: M/s Dev & Div Solutions Pvt. Ltd. Sand Mining **Format No.:** 7.8 F-01
Project "Makhanpur Unit" At At Village: Makhanpur, **Party Reference No.:** NIL
Tehsil & District: Faridabad, Haryana. **Reporting Date:** 18/12/2021
Period of Analysis: 14/12/2021- 18/12/2021
Receipt Date: 14/12/2021
Sample Description: Ground Water Sample **Sampling Date:** 13/12/2021
Sample Location: Shopura (GW5) **Sampling Quantity:** 5.0 Ltr + 250 ml.
Sample Collected by: VardanEnviro Lab Representative **Sampling Type:** Grab
Sampling and Analysis Protocol: IS 3025 & APHA, 23rd Edition 2017 **Preservation:** Refrigerator

| Sl. No. | Parameter | Method | Result | Unit | Standard Limit (mg/l) | Relaxation |
|---------|-------------------------------------|--|-----------------------|-------|-----------------------|---------------|
| 1. | pH (at 25 °C) | APHA ,4500-H* B Electrometric Method | 7.72 | -- | 6.5 to 8.5 | No Relaxation |
| 2. | Colour | APHA ,2120 B, Visual Comparison Method | *BDL (**DL 1.0 Hazen) | Hazen | 5 | 15 |
| 3. | Turbidity | APHA, 2130 B, Nephelometric Method | *BDL (**DL 1.0 NTU) | NTU | 1 | 5 |
| 4. | Odour | APHA, 2150 B, Threshold Odour Method | Agreeable | -- | Agreeable | Agreeable |
| 5. | Taste | APHA, 2160 B, Threshold Test Method | Agreeable | -- | Agreeable | Agreeable |
| 6. | Total Hardness as CaCO ₃ | APHA , 2340 C, EDTA Titrimetric Method | 213.00 | mg/l | 200 | 600 |
| 7. | Calcium as Ca | APHA, 3500 Ca B, EDTA Titrimetric Method | 46.25 | mg/l | 75 | 200 |
| 8. | Alkalinity as CaCO ₃ | APHA , 2320 B, Titrimetric Method | 223.45 | mg/l | 200 | 600 |
| 9. | Chloride as Cl | APHA, 4500-Cl* B, Argentometric Method | 58.14 | mg/l | 250 | 1000 |
| 10. | Cyanide as CN | APHA , 4500 CN D | *BDL(**DL 0.02 mg/l) | mg/l | 0.05 | No Relaxation |
| 11. | Magnesium as Mg | APHA , 3500 Mg B, Calculation Method | 23.72 | mg/l | 30 | 100 |
| 12. | Total Dissolved Solids | APHA , 2540 C, Gravimetric Method | 386.00 | mg/l | 500 | 2000 |
| 13. | Sulphate as SO ₄ | APHA , 4500 E, Turbidimetric Method | 32.41 | mg/l | 200 | 400 |
| 14. | Fluoride as F | APHA , 4500-F D, SPADNS Method | 0.48 | mg/l | 1.0 | 1.5 |
| 15. | Nitrate as NO ₃ | IS 3025 (P-34) ,Chromotropic Method | 26.31 | mg/l | 45 | No Relaxation |
| 16. | Iron as Fe | IS 3025 (P-65):2014(RA:2019) | 0.37 | mg/l | 1.0# | No relaxation |
| 17. | Aluminium as Al | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.03 | 0.2 |
| 18. | Boron | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l | 0.5 | 2.4# |
| 19. | Chromium as Cr | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.05 | No Relaxation |

(Tested By)

KANCHAN SHARMA
 Jr. Lab Analyst

(Checked By)

KANCHAN SHARMA
 Jr. Lab Analyst

(Approved By)

Anil Singh
 Quality Control Officer



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Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| Sample No.: VEL/W/DDSPI/05 | | | Report No.: VEL/W/2112/14/005 | | | |
|----------------------------|----------------------------|---|-------------------------------|-------|--|---------------|
| Sl. No. | Parameter | Method | Result | Unit | Limit (IS:3025:2019) | Remarks |
| 20. | Conductivity (at 25 °C) | APHA, 2510 B, Conductivity Meter Method | 594 | µS/cm | -- | -- |
| 21. | Phenolic Compounds | APHA, 5530 C Chloroform Extraction Method | *BDL(**DL 0.0004 mg/l) | mg/l | 0.001 | 0.002 |
| 22. | Mineral Oil | Clause 6 of IS:3025(Part 39) | *BDL(**DL 0.05 mg/l) | mg/l | 1.0 | No Relaxation |
| 23. | Anionic Detergents as MBAS | Annex K of IS 13428, IS 3025 (P-68) | *BDL(**DL 0.05 mg/l) | mg/l | 0.2 | 1.0 |
| 24. | Zinc as Zn | IS 3025 (P-65):2014(RA:2019) | 1.09 | mg/l | 5 | 15 |
| 25. | Copper as Cu | IS 3025 (P-65):2014(RA:2019) | 0.05 | mg/l | 0.05 | 1.5 |
| 26. | Manganese as Mn | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l | 0.1 | 0.3 |
| 27. | Cadmium as Cd | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.003 | No Relaxation |
| 28. | Lead as Pb | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.01 | No Relaxation |
| 29. | Selenium as Se | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.001 mg/l) | mg/l | 0.01 | No Relaxation |
| 30. | Arsenic as As | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.01 | No Relaxation |
| 31. | Mercury as Hg | IS 3025 (P-65):2014(RA:2019) | *BDL (**DL 0.0005 mg/l) | mg/l | 0.001 | No Relaxation |
| 32. | Total Coliform | IS 1622, 1981, RA-2019 | <2 | 100ml | Shall not be detectable in any 100 ml sample | |
| 33. | E. Coli | IS 1622, 1981, RA-2019 | Absent | 100ml | Shall not be detectable in any 100 ml sample | |

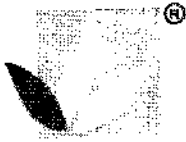
Note: - *BDL-Below Detection Limit, **DL- Detection Limit

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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Annexure-IV

Test Report

| | | | |
|---|---|-----------------------------|------------------------|
| Sample Number: | VEL/W/DDSPL/06 | Report No.: | VEL/W/2112/14/006 |
| Name & Address of the Project: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| | | Party Reference No.: | NIL |
| | | Reporting Date: | 18/12/2021 |
| | | Period of Analysis: | 14/12/2021- 18/12/2021 |
| | | Receipt Date: | 14/12/2021 |
| Sample Description: | Ground Water Sample | Sampling Date: | 13/12/2021 |
| Sample Location: | Qadirpur (GW6) | Sampling Quantity: | 5.0 Ltr + 250ml. |
| Sample Collected by: | Vardan Enviro Lab Representative | Sampling Type: | Grab |
| Sampling and Analysis Protocol: | IS 3025 & APHA, 23rd Edition 2017 | Preservation: | Refrigerator |

| Sl. No. | Parameter | Method | Result | Unit | Limit (mg/l) | Relaxation |
|---------|-------------------------------------|--|-----------------------|-------|--------------|---------------|
| 1. | pH (at 25 °C) | APHA ,4500-H* B Electrometric Method | 7.65 | -- | 6.5 to 8.5 | No Relaxation |
| 2. | Colour | APHA ,2120 B, Visual Comparison Method | *BDL (**DL 1.0 Hazen) | Hazen | 5 | 15 |
| 3. | Turbidity | APHA, 2130 B, Nephelometric Method | *BDL (**DL 1.0 NTU) | NTU | 1 | 5 |
| 4. | Odour | APHA, 2150 B , Threshold Odour Method | Agreeable | -- | Agreeable | Agreeable |
| 5. | Taste | APHA , 2160 B, Threshold Test Method | Agreeable | -- | Agreeable | Agreeable |
| 6. | Total Hardness as CaCO ₃ | APHA , 2340 C, EDTA Titrimetric Method | 222.00 | mg/l | 200 | 600 |
| 7. | Calcium as Ca | APHA, 3500 Ca B, EDTA Titrimetric Method | 45.21 | mg/l | 75 | 200 |
| 8. | Alkalinity as CaCO ₃ | APHA , 2320 B, Titrimetric Method | 247.00 | mg/l | 200 | 600 |
| 9. | Chloride as Cl | APHA, 4500-Cl* B, Argentometric Method | 64.15 | mg/l | 250 | 1000 |
| 10. | Cyanide as CN | APHA , 4500 CN* D | *BDL(**DL 0.02 mg/l) | mg/l | 0.05 | No Relaxation |
| 11. | Magnesium as Mg | APHA , 3500 Mg B, Calculation Method | 26.54 | mg/l | 30 | 100 |
| 12. | Total Dissolved Solids | APHA , 2540 C, Gravimetric Method | 421.00 | mg/l | 500 | 2000 |
| 13. | Sulphate as SO ₄ | APHA , 4500 E, Turbidimetric Method | 33.12 | mg/l | 200 | 400 |
| 14. | Fluoride as F | APHA , 4500-F D, SPADNS Method | 0.36 | mg/l | 1.0 | 1.5 |
| 15. | Nitrate as NO ₃ | IS 3025 (P-34) , Chromotropic Method | 27.46 | mg/l | 45 | No Relaxation |
| 16. | Iron as Fe | IS 3025 (P-65):2014(RA:2019) | 0.21 | mg/l | 1.0# | No relaxation |
| 17. | Aluminium as Al | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.03 | 0.2 |
| 18. | Boron | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l | 0.5 | 2.4# |
| 19. | Chromium as Cr | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.05 | No Relaxation |

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Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| Sample No.: VEL/W/DDSPL/06 | | | Report No.: VEL/W/2112/14/006 | | | |
|----------------------------|----------------------------|---|-------------------------------|-------|--|---------------|
| Sr. No. | Parameter | Method | Result | Unit | Relaxation | Remarks |
| 20. | Conductivity (at 25 °C) | APHA, 2510 B, Conductivity Meter Method | 647 | µS/cm | -- | -- |
| 21. | Phenolic Compounds | APHA, 5530 C Chloroform Extraction Method | *BDL(**DL 0.0004 mg/l) | mg/l | 0.001 | 0.002 |
| 22. | Mineral Oil | Clause 6 of IS:3025(Part 39) | *BDL(**DL 0.05 mg/l) | mg/l | 1.0 | No Relaxation |
| 23. | Anionic Detergents as MBAS | Annex K of IS 13428, IS 3025 (P-68) | *BDL(**DL 0.05 mg/l) | mg/l | 0.2 | 1.0 |
| 24. | Zinc as Zn | IS 3025 (P-65):2014(RA:2019) | 1.05 | mg/l | 5 | 15 |
| 25. | Copper as Cu | IS 3025 (P-65):2014(RA:2019) | 0.09 | mg/l | 0.05 | 1.5 |
| 26. | Manganese as Mn | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l | 0.1 | 0.3 |
| 27. | Cadmium as Cd | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.003 | No Relaxation |
| 28. | Lead as Pb | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.01 | No Relaxation |
| 29. | Selenium as Se | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.001 mg/l) | mg/l | 0.01 | No Relaxation |
| 30. | Arsenic as As | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.01 | No Relaxation |
| 31. | Mercury as Hg | IS 3025 (P-65):2014(RA:2019) | *BDL (**DL 0.0005 mg/l) | mg/l | 0.001 | No Relaxation |
| 32. | Total Coliform | IS 1622, 1981, RA-2019 | <2 | 100ml | Shall not be detectable in any 100 ml sample | |
| 33. | E. Coli | IS 1622, 1981, RA-2019 | Absent | 100ml | Shall not be detectable in any 100 ml sample | |

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

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Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

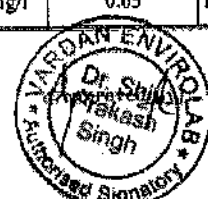
Sample Number: VEL/W/DDSPL/07
Name & Address of the Project: M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At At Village: Makhanpur, Tehsil & District: Faridabad, Haryana

Report No.: VEL/W/2112/14/007
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 18/12/2021
Period of Analysis: 14/12/2021- 18/12/2021
Receipt Date: 14/12/2021
Sampling Date: 13/12/2021
Sampling Quantity: 5.0 Ltr + 250ml.
Sampling Type: Grab
Preservation: Refrigerator

Sample Description: Ground Water Sample
Sample Location: Mohna (GW7)
Sample Collected by: Vardan Enviro Lab Representative
Sampling and Analysis Protocol: IS 3025 & APHA, 23rd Edition 2017

| Sl. No. | Parameter | Method | Result | Unit | Standard / Limit | Remarks |
|---------|-------------------------------------|--|------------------------|-------|------------------|---------------|
| 1. | pH (at 25 °C) | APHA, 4500-H ⁺ B Electrometric Method | 7.64 | -- | 6.5 to 8.5 | No Relaxation |
| 2. | Colour | APHA, 2120 B, Visual Comparison Method | *BDL (**DL 1.0 Hazen) | Hazen | 5 | 15 |
| 3. | Turbidity | APHA, 2130 B, Nephelometric Method | *BDL (**DL 1.0 NTU) | NTU | 1 | 5 |
| 4. | Odour | APHA, 2150 B, Threshold Odour Method | Agreeable | -- | Agreeable | Agreeable |
| 5. | Taste | APHA, 2160 B, Threshold Test Method | Agreeable | -- | Agreeable | Agreeable |
| 6. | Total Hardness as CaCO ₃ | APHA, 2340 C, EDTA Titrimetric Method | 273.00 | mg/l | 200 | 600 |
| 7. | Calcium as Ca | APHA, 3500 Ca B, EDTA Titrimetric Method | 55.61 | mg/l | 75 | 200 |
| 8. | Alkalinity as CaCO ₃ | APHA, 2320 B, Titrimetric Method | 234.00 | mg/l | 200 | 600 |
| 9. | Chloride as Cl | APHA, 4500-Cl ⁻ B, Argentometric Method | 75.23 | mg/l | 250 | 1000 |
| 10. | Cyanide as CN | APHA, 4500-CN ⁻ D | *BDL (**DL 0.02 mg/l) | mg/l | 0.05 | No Relaxation |
| 11. | Magnesium as Mg | APHA, 3500 Mg B, Calculation Method | 32.62 | mg/l | 30 | 100 |
| 12. | Total Dissolved Solids | APHA, 2540 C, Gravimetric Method | 409.00 | mg/l | 500 | 2000 |
| 13. | Sulphate as SO ₄ | APHA, 4500 E, Turbidimetric Method | 31.18 | mg/l | 200 | 400 |
| 14. | Fluoride as F | APHA, 4500-F ⁻ D, SPADNS Method | 0.47 | mg/l | 1.0 | 1.5 |
| 15. | Nitrate as NO ₃ | IS 3025 (P-34), Chromotropic Method | 21.58 | mg/l | 45 | No Relaxation |
| 16. | Iron as Fe | IS 3025 (P-65):2014(RA:2019) | 0.30 | mg/l | 1.0# | No relaxation |
| 17. | Aluminium as Al | IS 3025 (P-65):2014(RA:2019) | *BDL (**DL 0.002 mg/l) | mg/l | 0.03 | 0.2 |
| 18. | Boron | IS 3025 (P-65):2014(RA:2019) | *BDL (**DL 0.01 mg/l) | mg/l | 0.5 | 2.4# |
| 19. | Chromium as Cr | IS 3025 (P-65):2014(RA:2019) | *BDL (**DL 0.002 mg/l) | mg/l | 0.05 | No Relaxation |

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Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| Sample No.: VEL/W/DDSPL/07 | | | Report No.: VEL/W/2112/14/007 | | | |
|----------------------------|----------------------------|---|-------------------------------|-------|--|---------------|
| No. | Parameter | Method | Result | Unit | Standard Limit | Relaxation |
| 20. | Conductivity (at 25 °C) | APHA, 2510 B, Conductivity Meter Method | 629 | µS/cm | -- | -- |
| 21. | Phenolic Compounds | APHA, 5530 C Chloroform Extraction Method | *BDL(**DL 0.0004 mg/l) | mg/l | 0.001 | 0.002 |
| 22. | Mineral Oil | Clause 6 of IS:3025(Part 39) | *BDL(**DL 0.05 mg/l) | mg/l | 1.0 | No Relaxation |
| 23. | Anionic Detergents as MBAS | Annex K of IS 13428, IS 3025 (P-68) | *BDL(**DL 0.05 mg/l) | mg/l | 0.2 | 1.0 |
| 24. | Zinc as Zn | IS 3025 (P-65):2014(RA:2019) | 1.14 | mg/l | 5 | 15 |
| 25. | Copper as Cu | IS 3025 (P-65):2014(RA:2019) | 0.07 | mg/l | 0.05 | 1.5 |
| 26. | Manganese as Mn | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l | 0.1 | 0.3 |
| 27. | Cadmium as Cd | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.003 | No Relaxation |
| 28. | Lead as Pb | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.01 | No Relaxation |
| 29. | Selenium as Se | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.001 mg/l) | mg/l | 0.01 | No Relaxation |
| 30. | Arsenic as As | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.01 | No Relaxation |
| 31. | Mercury as Hg | IS 3025 (P-65):2014(RA:2019) | *BDL (**DL 0.0005 mg/l) | mg/l | 0.001 | No Relaxation |
| 32. | Total Coliform | IS 1622,1981, RA-2019 | <2 | 100ml | Shall not be detectable in any 100 ml sample | |
| 33. | E. Coli | IS 1622,1981, RA-2019 | Absent | 100ml | Shall not be detectable in any 100 ml sample | |

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Annexure-IV

Test Report

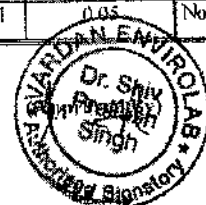
Sample Number: VELAV/DDSP/08
Name & Address of the Project: M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At At Village: Makhanpur, Tehsil & District: Faridabad, Haryana

Sample Description: Ground Water Sample
Sample Location: Shekhpur (GW8)
Sample Collected by: Vardan Enviro Lab Representative
Sampling and Analysis Protocol: IS 3025 & APHA, 23rd Edition 2017

Report No.: VEL/W/2112/14/008
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 18/12/2021
Period of Analysis: 14/12/2021 - 18/12/2021
Receipt Date: 14/12/2021
Sampling Date: 13/12/2021
Sampling Quantity: 5.0 Ltr + 250ml.
Sampling Type: Grab
Preservation: Refrigerator

| Sl. No. | Parameter | Method | Result | Unit | IS 3025 (P-65):2014(RA:2019) | APHA 23rd Edition 2017 |
|---------|-------------------------------------|--|-----------------------|-------|------------------------------|------------------------|
| 1. | pH (at 25 °C) | APHA .4500-H' B Electrometric Method | 7.60 | -- | 6.5 to 8.5 | No Relaxation |
| 2. | Colour | APHA .2120 B, Visual Comparison Method | *BDL (**DL 1.0 Hazen) | Hazen | 5 | 15 |
| 3. | Turbidity | APHA, 2130 B, Nephelometric Method | *BDL (**DL 1.0 NTU) | NTU | 1 | 5 |
| 4. | Odour | APHA, 2150 B, Threshold Odour Method | Agreeable | -- | Agreeable | Agreeable |
| 5. | Taste | APHA, 2160 B, Threshold Test Method | Agreeable | -- | Agreeable | Agreeable |
| 6. | Total Hardness as CaCO ₃ | APHA, 2340 C, EDTA Titrimetric Method | 217.00 | mg/l | 200 | 600 |
| 7. | Calcium as Ca | APHA, 3500 Ca B, EDTA Titrimetric Method | 43.79 | mg/l | 75 | 200 |
| 8. | Alkalinity as CaCO ₃ | APHA, 2320 B, Titrimetric Method | 220.00 | mg/l | 200 | 600 |
| 9. | Chloride as Cl | APHA, 4500-Cl' B, Argentometric Method | 64.19 | mg/l | 250 | 1000 |
| 10. | Cyanide as CN | APHA . 4500 CN' D | *BDL(**DL 0.02 mg/l) | mg/l | 0.05 | No Relaxation |
| 11. | Magnesium as Mg | APHA, 3500 Mg B, Calculation Method | 26.18 | mg/l | 30 | 100 |
| 12. | Total Dissolved Solids | APHA . 2540 C, Gravimetric Method | 377.00 | mg/l | 500 | 2000 |
| 13. | Sulphate as SO ₄ | APHA . 4500 E, Turbidimetric Method | 28.36 | mg/l | 200 | 400 |
| 14. | Fluoride as F | APHA . 4500-F D, SPADNS Method | 0.33 | mg/l | 1.0 | 1.5 |
| 15. | Nitrate as NO ₃ | IS 3025 (P-34) ,Chromotropic Method | 19.68 | mg/l | 45 | No Relaxation |
| 16. | Iron as Fe | IS 3025 (P-65):2014(RA:2019) | 0.25 | mg/l | 1.0# | No relaxation |
| 17. | Aluminium as Al | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.03 | 0.2 |
| 18. | Boron | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l | 0.5 | 2.4# |
| 19. | Chromium as Cr | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.05 | No Relaxation |

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Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| Sample No.: VEL/W/DDSPL/08 | | | Report No.: VEL/W/2112/14/008 | | | |
|----------------------------|----------------------------|---|-------------------------------|-------|--|---------------|
| Sr. No. | Parameter | Test Method | Result | Unit | Standard Limit | Remarks |
| 20. | Conductivity (at 25 °C) | APHA, 2510 B, Conductivity Meter Method | 580 | µS/cm | -- | -- |
| 21. | Phenolic Compounds | APHA, 5530 C Chloroform Extraction Method | *BDL(**DL 0.0004 mg/l) | mg/l | 0.001 | 0.002 |
| 22. | Mineral Oil | Clause 6 of IS:3025(Part 39) | *BDL(**DL 0.05 mg/l) | mg/l | 1.0 | No Relaxation |
| 23. | Anionic Detergents as MBAS | Annex K of IS 13428, IS 3025 (P-68) | *BDL(**DL 0.05 mg/l) | mg/l | 0.2 | 1.0 |
| 24. | Zinc as Zn | IS 3025 (P-65):2014(RA:2019) | 0.86 | mg/l | 5 | 15 |
| 25. | Copper as Cu | IS 3025 (P-65):2014(RA:2019) | 0.04 | mg/l | 0.05 | 1.5 |
| 26. | Manganese as Mn | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l | 0.1 | 0.3 |
| 27. | Cadmium as Cd | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.003 | No Relaxation |
| 28. | Lead as Pb | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.01 | No Relaxation |
| 29. | Selenium as Se | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.001 mg/l) | mg/l | 0.01 | No Relaxation |
| 30. | Arsenic as As | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l | 0.01 | No Relaxation |
| 31. | Mercury as Hg | IS 3025 (P-65):2014(RA:2019) | *BDL (**DL 0.0005 mg/l) | mg/l | 0.001 | No Relaxation |
| 32. | Total Coliform | IS 1622,1981, RA-2019 | <2 | 100ml | Shall not be detectable in any 100 ml sample | |
| 33. | E. Coli | IS 1622,1981, RA-2019 | Absent | 100ml | Shall not be detectable in any 100 ml sample | |

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

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Vardan EnviroLab

Annexure-IV

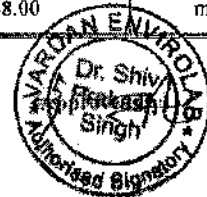
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| | | | |
|--|--|-----------------------------|------------------------|
| Sample Number: | VEL/DDSPL /W/09 | Report No.: | VEL/W/2112/14/009 |
| Name of the Project: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| | | Party Reference No.: | NIL |
| Sample Description: | Surface Water Sample | Reporting Date: | 18/12/2021 |
| Sampling Location: | Yamuna River Near Latifpur (Up-stream)(SW1) | Period of Analysis: | 14/12/2021- 18/12/2021 |
| Sample Collected by: | Vardan Enviro Lab Representative | Receipt Date: | 14/12/2021 |
| Preservation: | Refrigerator | Sampling Date: | 13/12/2021 |
| Sampling and Analysis Protocol: | IS:3025 & APHA 23 rd Edition 2017 | Sampling Quantity: | 5.0 Ltr + 250ml. |
| | | Sampling Type: | Grab |

| Sl. No. | Parameter | Method | Result | Unit |
|---------|-------------------------------------|--|----------------------|-------|
| 1. | pH (at 25 °C) | APHA .4500-H ⁺ B Electrometric Method | 7.84 | -- |
| 2. | Colour | APHA ,2120 B, Visual Comparison Method | 13.0 | Hazen |
| 3. | Turbidity | APHA, 2130 B, Nephelometric Method | 33.00 | NTU |
| 4. | Odour | APHA, 2150 B . Threshold Test Method | Agreeable | -- |
| 5. | Total Hardness as CaCO ₃ | APHA . 2340 C, EDTA Titrimetric Method | 713.00 | mg/l |
| 6. | Calcium as Ca | APHA, 3500 Ca B, EDTA Titrimetric Method | 209.33 | mg/l |
| 7. | Alkalinity as CaCO ₃ | APHA , 2320 B, Titrimetric Method | 440.00 | mg/l |
| 8. | Chloride as Cl | APHA, 4500-Cl ⁻ B, Argentometric Method | 214.36 | mg/l |
| 9. | Residual free Chlorine | APHA, 4500 ClB Iodometric Method | *BDL(**DL 0.15mg/l) | mg/l |
| 10. | #Cyanide as CN | APHA , 4500 CN ⁻ D | *BDL(**DL 0.02 mg/l) | mg/l |
| 11. | Magnesium as Mg | APHA , 3500 Mg B, Calculation Method | 46.34 | mg/l |
| 12. | Total Dissolved Solids | APHA , 2540 C, Gravimetric Method | 985.00 | mg/l |
| 13. | Total Suspended solids | APHA,2540 D Gravimetric Method | 56.00 | mg/l |
| 14. | Dissolved Oxygen | APHA.4500 O B Iodometric Method | 6.9 | mg/l |
| 15. | Sulphate as SO ₄ | APHA , 4500 E, Turbidimetric Method | 127.00 | mg/l |
| 16. | Fluoride as F | APHA , 4500-F D, SPADNS Method | 0.40 | mg/l |
| 17. | BOD (3 Days at 27°C) | APHA. 5210 C / IS 3025,P-44 | 12.00 | mg/l |
| 18. | COD | APHA. 5220 B, Open Reflux Method | 48.00 | mg/l |

K. Anshu
T. Anshu
AN SHARMA
Jr. Lab Analyst



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Test Report

| Sample No.: VEL/DDSPL/W/09 | | | Report No.: VEL/W/2112/14/009 | |
|----------------------------|-----------------------------|---|-------------------------------|-----------|
| Sr. No. | Parameter | Method | Result | Unit |
| 19. | Conductivity (at 25 °C) | APHA, 2510 B, Conductivity Meter Method | 1.51 | mS/cm |
| 20. | Nitrate as NO ₃ | IS 3025 (P-34), Chromotropic Method | 28.49 | mg/l |
| 21. | Sodium as Na | APHA, 3500 Na B, Flame Photometric Method | 79.00 | mg/l |
| 22. | Potassium as K | APHA 3500 KB, Flame Photometric Method | 20.63 | mg/l |
| 23. | Iron as Fe | IS 3025 (P-65):2014(RA:2019) | 0.75 | mg/l |
| 24. | Aluminium as Al | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 25. | Boron | IS 3025 (P-65):2014(RA:2019) | 0.46 | mg/l |
| 26. | Chromium as Cr | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 27. | Phenolic Compounds | APHA, 5530 C Chloroform Extraction Method | *BDL(**DL 0.0004mg/l) | mg/l |
| 28. | #Mineral Oil | Clause 6 of IS:3025(Part 39) | *BDL(**DL 0.05 mg/l) | mg/l |
| 29. | #Anionic Detergents as MBAS | APHA, 5540 C MBAS Method | *BDL(**DL 0.05 mg/l) | mg/l |
| 30. | Zinc as Zn | IS 3025 (P-65):2014(RA:2019) | 2.75 | mg/l |
| 31. | Copper as Cu | IS 3025 (P-65):2014(RA:2019) | 0.19 | mg/l |
| 32. | Manganese as Mn | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l |
| 33. | Cadmium as Cd | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 34. | Total Coliform | IS 1622, 1981, RA-2019 | 900 | MPN/100ml |
| 35. | Fecal Coliform | IS 1622, 1981, RA-2019 | 300 | MPN/100ml |

Note: -# These parameter are not covered in our NABL scope.

*BDL- Below Detection Limit. **DL- Detection Limit

KANAKA SHARMA
Jr. Lab Analyst





Vardan EnviroLab

Annexure-IV

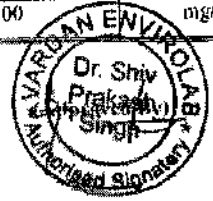
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| | | | |
|---------------------------------|--|----------------------|-------------------------|
| Sample Number: | VEL/DDSPL/W/10 | Report No.: | VEL/W/2112/14/010 |
| Name of the Project: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| Sample Description: | Surface Water Sample | Party Reference No.: | NIL |
| Sampling Location: | Yamuna River Near Mohna (Down-stream) (SW2) | Reporting Date: | 18/12/2021 |
| Sample Collected by: | Vardan Enviro Lab Representative | Period of Analysis: | 14/12/2021 - 18/12/2021 |
| Preservation: | Refrigerator | Receipt Date: | 14/12/2021 |
| Sampling and Analysis Protocol: | IS:3025 & APHA 23 rd Edition 2017 | Sampling Date: | 13/12/2021 |
| | | Sampling Quantity: | 5.0 Ltr + 250ml |
| | | Sampling Type: | Grab |

| No. | Parameter | Method | Result | Unit |
|-----|---|--|-----------------------|-------|
| 1. | pH (at 25 °C) | APHA 4500-H ⁺ B Electrometric Method | 7.82 | -- |
| 2. | Colour | APHA 2120 B. Visual Comparison Method | 11.0 | Hazen |
| 3. | Turbidity | APHA, 2130 B. Nephelometric Method | 39.00 | NTU |
| 4. | Odour | APHA, 2150 B. Threshold Test Method | Agreeable | -- |
| 5. | Total Hardness as CaCO ₃ | APHA, 2340 C. EDTA Titrimetric Method | 725.00 | mg/l |
| 6. | Calcium as Ca | APHA, 3500 Ca B. EDTA Titrimetric Method | 212.47 | mg/l |
| 7. | Alkalinity as CaCO ₃ | APHA, 2320 B. Titrimetric Method | 452.00 | mg/l |
| 8. | Chloride as Cl ⁻ | APHA, 4500-Cl ⁻ B. Argentometric Method | 224.13 | mg/l |
| 9. | Residual free Chlorine | APHA, 4500 CTB Iodometric Method | *BDL (**DL 0.15mg/l) | mg/l |
| 10. | #Cyanide as CN ⁻ | APHA, 4500 CN ⁻ D | *BDL (**DL 0.02 mg/l) | mg/l |
| 11. | Magnesium as Mg | APHA, 3500 Mg B. Calculation Method | 47.36 | mg/l |
| 12. | Total Dissolved Solids | APHA, 2540 C. Gravimetric Method | 1013.00 | mg/l |
| 13. | Total Suspended solids | APHA, 2540 D. Gravimetric Method | 54.00 | mg/l |
| 14. | Dissolved Oxygen | APHA, 4500 O B. Iodometric Method | 6.7 | mg/l |
| 15. | Sulphate as SO ₄ ²⁻ | APHA, 4500 E. Turbidimetric Method | 129.0 | mg/l |
| 16. | Fluoride as F ⁻ | APHA, 4500-F ⁻ D. SPADNS Method | 0.46 | mg/l |
| 17. | BOD (3 Days at 27°C) | IS 3025.P-44 | 14.00 | mg/l |
| 18. | COD | APHA, 5200 B. Reflux Method | 52.00 | mg/l |

KANISHA SHARMA
Analyst



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Annexure-IV

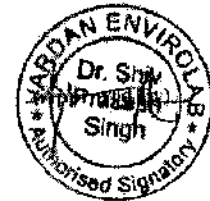
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| Sample No.: VEL/DDSPL/W/10 | | | Report No.: VEL/W/2112/14/010 | |
|----------------------------|-----------------------------|---|-------------------------------|-----------|
| Sr. No. | Parameter | Method | Result | Unit |
| 19. | Conductivity (at 25 °C) | APHA, 2510 B, Conductivity Meter Method | 1.55 | mS/cm |
| 20. | Nitrate as NO ₃ | IS 3025 (P-34), Chromotropic Method | 27.59 | mg/l |
| 21. | Sodium as Na | APHA, 3500 Na B, Flame Photometric Method | 81.00 | mg/l |
| 22. | Potassium as K | APHA 3500 K B, Flame Photometric Method | 23.15 | mg/l |
| 23. | Iron as Fe | IS 3025 (P-65):2014(RA:2019) | 0.94 | mg/l |
| 24. | Aluminium as Al | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 25. | Boron | IS 3025 (P-65):2014(RA:2019) | 0.54 | mg/l |
| 26. | Chromium as Cr | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 27. | Phenolic Compounds | APHA, 5530 C Chloroform Extraction Method | *BDL(**DL 0.0004mg/l) | mg/l |
| 28. | #Mineral Oil | Clause 6 of IS:3025(Part 39) | *BDL(**DL 0.05 mg/l) | mg/l |
| 29. | #Anionic Detergents as MBAS | APHA, 5540 C MBAS Method | *BDL(**DL 0.05 mg/l) | mg/l |
| 30. | Zinc as Zn | IS 3025 (P-65):2014(RA:2019) | 2.68 | mg/l |
| 31. | Copper as Cu | IS 3025 (P-65):2014(RA:2019) | 0.18 | mg/l |
| 32. | Manganese as Mn | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l |
| 33. | Cadmium as Cd | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 34. | Total Coliform | IS 1622,1981, RA-2019 | 1000 | MPN/100ml |
| 35. | Fecal Coliform | IS 1622,1981, RA-2019 | 600 | MPN/100ml |

Note: -#These parameter are not covered in our NABL scope.
*BDL-Below Detection Limit, **DL- Detection Limit

KANGHAN SHARMA
(Tested by) Lab Analyst



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/DDSPL/W/11
Name of the Project: M/s Dev & Div Solutions Pvt. Ltd. Sand Mining
Project "Makhanpur Unit" At At Village: Makhanpur, Tehsil & District: Faridabad, Haryana

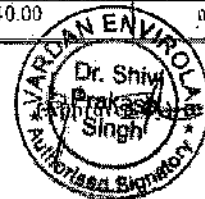
Report No.: VEL/W/2112/14/011
Format No.: 7.8 F-01
Party Reference No.: NIL

Sample Description: Surface Water Sample
Sampling Location: Pond Near Naryala (SW3)
Sample Collected by: Vardan Enviro Lab Representative
Preservation: Refrigerator
Sampling and Analysis Protocol: IS:3025 & APHA 23rd Edition 2017

Reporting Date: 18/12/2021
Period of Analysis: 14/12/2021- 18/12/2021
Receipt Date: 14/12/2021
Sampling Date: 13/12/2021
Sampling Quantity: 5.0 Ltr + 250ml.
Sampling Type: Grab

| S.No. | Parameter | Method | Result | Unit |
|-------|-------------------------------------|--|----------------------|-------|
| 1. | pH (at 25 °C) | APHA .4500-H* B Electrometric Method | 7.79 | -- |
| 2. | Colour | APHA ,2120 B. Visual Comparison Method | 10.0 | Hazen |
| 3. | Turbidity | APHA. 2130 B. Nephelometric Method | 32.00 | NTU |
| 4. | Odour | APHA, 2150 B , Threshold Test Method | Agreeable | -- |
| 5. | Total Hardness as CaCO ₃ | APHA . 2340 C. EDTA Titrimetric Method | 709.00 | mg/l |
| 6. | Calcium as Ca | APHA. 3500 Ca B. EDTA Titrimetric Method | 197.66 | mg/l |
| 7. | Alkalinity as CaCO ₃ | APHA , 2320 B, Titrimetric Method | 437.00 | mg/l |
| 8. | Chloride as Cl | APHA, 4500-Cl* B, Argentometric Method | 217.33 | mg/l |
| 9. | Residual free Chlorine | APHA, 4500 Cl* B Iodometric Method | *BDL(**DL 0.15mg/l) | mg/l |
| 10. | #Cyanide as CN | APHA , 4500 CN* D | *BDL(**DL 0.02 mg/l) | mg/l |
| 11. | Magnesium as Mg | APHA , 3500 Mg B, Calculation Method | 52.45 | mg/l |
| 12. | Total Dissolved Solids | APHA , 2540 C, Gravimetric Method | 966.00 | mg/l |
| 13. | Total Suspended solids | APHA.2540 D Gravimetric Method | 48.00 | mg/l |
| 14. | Dissolved Oxygen | APHA.4500 O B Iodometric Method | 6.2 | mg/l |
| 15. | Sulphate as SO ₄ | APHA , 4500 E, Turbidimetric Method | 121.00 | mg/l |
| 16. | Fluoride as F | APHA , 4500-F D. SPADNS Method | 0.38 | mg/l |
| 17. | BOD (3 Days at 27°C) | IS 3025,P-44 | 11.00 | mg/l |
| 18. | COD | APHA. 5220 B, Open Reflux Method | 40.00 | mg/l |

KAMAL SHARMA
 (Analyst)
 Lab Analyst





Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| Sample No.: VEL/DDSPL/W/11 | | | Report No.: VEL/W/2112/14/011 | |
|----------------------------|-----------------------------|---|-------------------------------|-----------|
| S.No. | Parameter | Test Method | Result | Unit |
| 19. | Conductivity (at 25 °C) | APHA, 2510 B, Conductivity Meter Method | 1.48 | mS/cm |
| 20. | Nitrate as NO ₃ | IS 3025 (P-34), Chromotropic Method | 25.41 | mg/l |
| 21. | Sodium as Na | APHA, 3500 Na B, Flame Photometric Method | 74.00 | mg/l |
| 22. | Potassium as K | APHA 3500 K B, Flame Photometric Method | 15.4 | mg/l |
| 23. | Iron as Fe | IS 3025 (P-65):2014(RA:2019) | 0.73 | mg/l |
| 24. | Aluminium as Al | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 25. | Boron | IS 3025 (P-65):2014(RA:2019) | 0.42 | mg/l |
| 26. | Chromium as Cr | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 27. | Phenolic Compounds | APHA, 5530 C Chloroform Extraction Method | *BDL(**DL 0.0004 mg/l) | mg/l |
| 28. | #Mineral Oil | Clause 6 of IS:3025(Part 39) | *BDL(**DL 0.05 mg/l) | mg/l |
| 29. | #Anionic Detergents as MBAS | APHA, 5540 C MBAS Method | *BDL(**DL 0.05 mg/l) | mg/l |
| 30. | Zinc as Zn | IS 3025 (P-65):2014(RA:2019) | 2.46 | mg/l |
| 31. | Copper as Cu | IS 3025 (P-65):2014(RA:2019) | 0.11 | mg/l |
| 32. | Manganese as Mn | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l |
| 33. | Cadmium as Cd | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 34. | Total Coliform | IS 1622,1981, RA-2019 | 1200 | MPN/100ml |
| 35. | Fecal Coliform | IS 1622,1981, RA-2019 | 900 | MPN/100ml |

Note: -#These parameter are not covered in our NABL scope.

*BDL- Below Detection Limit. **DL- Detection Limit

KANCHAN SHARMA
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Vardan EnviroLab

Annexure-IV

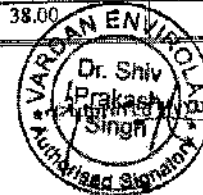
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

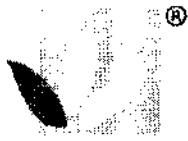
Test Report

| | | | |
|---------------------------------|--|----------------------|-------------------------|
| Sample Number: | VEL/DDSPI/W/12 | Report No.: | VEL/W/2112/14/012 |
| Name of the Project: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| Sample Description: | Surface Water Sample | Party Reference No.: | NIL |
| Sampling Location: | Pond Near Bhaipur (SW4) | Reporting Date: | 18/12/2021 |
| Sample Collected by: | Vardan Enviro Lab Representative | Period of Analysis: | 14/12/2021 - 18/12/2021 |
| Preservation: | Refrigerator | Receipt Date: | 14/12/2021 |
| Sampling and Analysis Protocol: | IS:3025 & APHA 23 rd Edition 2017 | Sampling Date: | 13/12/2021 |
| | | Sampling Quantity: | 5.0 Ltr + 250ml. |
| | | Sampling Type: | Grab |

| Sr. No. | Parameter | Test Method | Result | Unit |
|---------|---|--|-----------------------|-------|
| 1. | pH (at 25 °C) | APHA .4500-H ⁺ B Electrometric Method | 7.76 | -- |
| 2. | Colour | APHA .2120 B, Visual Comparison Method | 9.0 | Hazen |
| 3. | Turbidity | APHA. 2130 B, Nephelometric Method | 35.00 | NTU |
| 4. | Odour | APHA. 2150 B . Threshold Test Method | Agreeable | -- |
| 5. | Total Hardness as CaCO ₃ | APHA . 2340 C. EDTA Titrimetric Method | 720.00 | mg/l |
| 6. | Calcium as Ca | APHA. 3500 Ca B. EDTA Titrimetric Method | 211.44 | mg/l |
| 7. | Alkalinity as CaCO ₃ | APHA . 2320 B. Titrimetric Method | 451.00 | mg/l |
| 8. | Chloride as Cl ⁻ | APHA. 4500-Cl ⁻ B, Argentometric Method | 220.49 | mg/l |
| 9. | Residual free Chlorine | APHA. 4500 Cl ⁻ B Iodometric Method | *BDL (**DL 0.15mg/l) | mg/l |
| 10. | #Cyanide as CN ⁻ | APHA . 4500 CN ⁻ D | *BDL (**DL 0.02 mg/l) | mg/l |
| 11. | Magnesium as Mg | APHA . 3500 Mg B. Calculation Method | 46.77 | mg/l |
| 12. | Total Dissolved Solids | APHA . 2540 C. Gravimetric Method | 1009.00 | mg/l |
| 13. | Total Suspended solids | APHA.2540 D Gravimetric Method | 53.00 | mg/l |
| 14. | Dissolved Oxygen | APHA.4500 O B Iodometric Method | 6.5 | mg/l |
| 15. | Sulphate as SO ₄ ⁻² | APHA . 4500 E, Turbidimetric Method | 128.00 | mg/l |
| 16. | Fluoride as F ⁻ | APHA , 4500-F D, SPADNS Method | 0.42 | mg/l |
| 17. | BOD (3 Days at 27°C) | IS 3025,P-44 | 10.00 | mg/l |
| 18. | COD | APHA. 5220 B. Flux Method | 38.00 | mg/l |

KANISHK SHARMA
(Tel: 0124) Analyst





Vardan EnviroLab

Annexure-IV

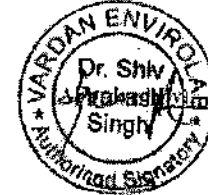
Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| Sample No.: VEL/DDSPL/W/L2 | | | Report No.: VEL/W/2112/14/012 | |
|----------------------------|-----------------------------|---|-------------------------------|-----------|
| Sr. No. | Parameter | Method | Result | Unit |
| 19. | Conductivity (at 25 °C) | APHA, 2510 B, Conductivity Meter Method | 1.56 | µS/cm |
| 20. | Nitrate as NO ₃ | IS 3025 (P-34), Chromotropic Method | 31.55 | mg/l |
| 21. | Sodium as Na | APHA, 3500 Na B, Flame Photometric Method | 84.00 | mg/l |
| 22. | Potassium as K | APHA 3500 K B, Flame Photometric Method | 11.22 | mg/l |
| 23. | Iron as Fe | IS 3025 (P-65):2014(RA:2019) | 0.84 | mg/l |
| 24. | Aluminium as Al | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 25. | Boron | IS 3025 (P-65):2014(RA:2019) | 0.49 | mg/l |
| 26. | Chromium as Cr | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 27. | Phenolic Compounds | APHA, 5530 C Chloroform Extraction Method | *BDL(**DL 0.0004mg/l) | mg/l |
| 28. | #Mineral Oil | Clause 6 of IS:3025(Part.39) | *BDL(**DL 0.05 mg/l) | mg/l |
| 29. | #Anionic Detergents as MBA5 | APHA, 5540 C MBAS Method | *BDL(**DL 0.05 mg/l) | mg/l |
| 30. | Zinc as Zn | IS 3025 (P-65):2014(RA:2019) | 2.76 | mg/l |
| 31. | Copper as Cu | IS 3025 (P-65):2014(RA:2019) | 0.14 | mg/l |
| 32. | Manganese as Mn | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l |
| 33. | Cadmium as Cd | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 34. | Total Coliform | IS 1622,1981, RA-2019 | 900 | MPN/100ml |
| 35. | Fecal Coliform | IS 1622,1981, RA-2019 | 500 | MPN/100ml |

Note: -#These parameter are not covered in our NABL scope.
*BDL-Below Detection Limit. **DL- Detection Limit

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Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

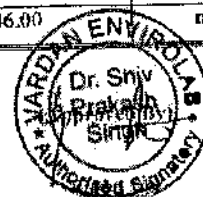
Sample Number: VEL/DDSPL/W/13
Name of the Project: M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At At Village: Makhanpur, Tehsil & District: Faridabad, Haryana

Report No.: VEL/W/2112/14/013
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 18/12/2021
Period of Analysis: 14/12/2021- 18/12/2021
Receipt Date: 14/12/2021
Sampling Date: 13/12/2021
Sampling Quantity: 5.0 Ltr + 250ml.
Sampling Type: Grab

Sample Description: Surface Water Sample
Sampling Location: Pond Near Jawan(SW5)
Sample Collected by: Vardan Enviro Lab Representative
Preservation: Refrigerator
Sampling and Analysis Protocol: IS:3025 & APHA 23rd Edition 2017

| S.No. | Parameter | Method | Result | Unit |
|-------|-------------------------------------|--|----------------------|-------|
| 1. | pH (at 25 °C) | APHA ,4500-H' B Electrometric Method | 7.73 | -- |
| 2. | Colour | APHA ,2120 B, Visual Comparison Method | 10.0 | Hazen |
| 3. | Turbidity | APHA, 2130 B. Nephelometric Method | 28.00 | NTU |
| 4. | Odour | APHA, 2150 B , Threshold Test Method | Agreeable | -- |
| 5. | Total Hardness as CaCO ₃ | APHA , 2340 C. EDTA Titrimetric Method | 671.00 | mg/l |
| 6. | Calcium as Ca | APHA. 3500 Ca B. EDTA Titrimetric Method | 191.45 | mg/l |
| 7. | Alkalinity as CaCO ₃ | APHA . 2320 B. Titrimetric Method | 422.00 | mg/l |
| 8. | Chloride as Cl | APHA, 4500-Cl' B. Argentometric Method | 207.49 | mg/l |
| 9. | Residual free Chlorine | APHA, 4500 Cl' B Iodometric Method | *BDL(**DL 0.15mg/l) | mg/l |
| 10. | #Cyanide as CN | APIIA , 4500 CN D | *BDL(**DL 0.02 mg/l) | mg/l |
| 11. | Magnesium as Mg | APHA , 3500 Mg B. Calculation Method | 46.98 | mg/l |
| 12. | Total Dissolved Solids | APHA , 2540 C, Gravimetric Method | 919.00 | mg/l |
| 13. | Total Suspended solids | APHA.2540 D Gravimetric Method | 37.00 | mg/l |
| 14. | Dissolved Oxygen | APHA,4500 O B Iodometric Method | 5.6 | mg/l |
| 15. | Sulphate as SO ₄ | APHA . 4500 E, Turbidimetric Method | 111.00 | mg/l |
| 16. | Fluoride as F | APHA , 4500-F D, SPADNS Method | 0.28 | mg/l |
| 17. | BOD (3 Days at 27°C) | APHA. 5210 C / IS 3025.P-44 | 11.00 | mg/l |
| 18. | COD | APHA, 5220 B, Open Reflux Method | 46.00 | mg/l |

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Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| Sample No.: VEL/INDSPL/W/13 | | | Report No.: VEL/W/2112/14/013 | |
|-----------------------------|-----------------------------|---|-------------------------------|-----------|
| 19. | Conductivity (at 25 °C) | APHA, 2510 B, Conductivity Meter Method | 1.41 | mS/cm |
| 20. | Nitrate as NO ₃ | IS 3025 (P-34), Chromotropic Method | 23.44 | mg/l |
| 21. | Sodium as Na | APHA, 3500 Na B, Flame Photometric Method | 75.00 | mg/l |
| 22. | Potassium as K | APHA 3500 K B, Flame Photometric Method | 10.5 | mg/l |
| 23. | Iron as Fe | IS 3025 (P-65):2014(RA:2019) | 0.41 | mg/l |
| 24. | Aluminium as Al | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 25. | Boron | IS 3025 (P-65):2014(RA:2019) | 0.19 | mg/l |
| 26. | Chromium as Cr | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 27. | Phenolic Compounds | APHA, 5530 C Chloroform Extraction Method | *BDL(**DL 0.0004mg/l) | mg/l |
| 28. | #Mineral Oil | Clause 6 of IS:3025(Part 39) | *BDL(**DL 0.05 mg/l) | mg/l |
| 29. | #Anionic Detergents as MBAS | APHA, 5540 C MBAS Method | *BDL(**DL 0.05 mg/l) | mg/l |
| 30. | Zinc as Zn | IS 3025 (P-65):2014(RA:2019) | 1.81 | mg/l |
| 31. | Copper as Cu | IS 3025 (P-65):2014(RA:2019) | 0.10 | mg/l |
| 32. | Manganese as Mn | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l |
| 33. | Cadmium as Cd | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 34. | Total Coliform | IS 1622, 1981, RA-2019 | 700 | MPN/100ml |
| 35. | Fecal Coliform | IS 1622, 1981, RA-2019 | 300 | MPN/100ml |

Note: -# These parameter are not covered in our NABL scope.
*BDL- Below Detection Limit, **DL- Detection Limit

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Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/DDSPL/W/14
 Name of the Project: M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At At Village: Makhanpur, Tehsil & Distric: Faridabad, Haryana

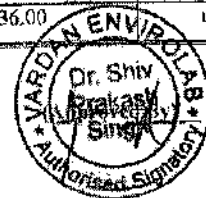
Sample Description: Surface Water Sample
 Sampling Location: Pond Near Qadirpur (SW6)
 Sample Collected by: Vardan Enviro Lab Representative
 Preservation: Refrigerator
 Sampling and Analysis Protocol: IS:3025 & APHA 23rd Edition 2017

Report No.: VEL/W/2112/14/014
 Format No.: 7.8 F-01
 Party Reference No.: NIL

Reporting Date: 18/12/2021
 Period of Analysis: 14/12/2021- 18/12/2021
 Receipt Date: 14/12/2021
 Sampling Date: 13/12/2021
 Sampling Quantity: 5.0 Ltr + 250ml.
 Sampling Type: Grab

| Sr. No. | Parameter | Method | Result | Unit |
|---------|-------------------------------------|--|----------------------|-------|
| 1. | pH (at 25 °C) | APHA ,4500-H ⁺ B Electrometric Method | 7.69 | -- |
| 2. | Colour | APHA ,2120 B, Visual Comparison Method | 8.0 | Hazen |
| 3. | Turbidity | APHA, 2130 B, Nephelometric Method | 21.00 | NTU |
| 4. | Odour | APHA, 2150 B , Threshold Test Method | Agreeable | -- |
| 5. | Total Hardness as CaCO ₃ | APHA , 2340 C, EDTA Titrimetric Method | 654.00 | mg/l |
| 6. | Calcium as Ca | APHA, 3500 Ca B, EDTA Titrimetric Method | 187.54 | mg/l |
| 7. | Alkalinity as CaCO ₃ | APHA , 2320 B, Titrimetric Method | 411.00 | mg/l |
| 8. | Chloride as Cl | APHA, 4500-Cl ⁻ B, Argentometric Method | 203.15 | mg/l |
| 9. | Residual free Chlorine | APHA, 4500 Cl ⁻ B Iodometric Method | *BDL(**DL 0.15mg/l) | mg/l |
| 10. | #Cyanide as CN | APHA , 4500 CN ⁻ D | *BDL(**DL 0.02 mg/l) | mg/l |
| 11. | Magnesium as Mg | APHA , 3500 Mg B, Calculation Method | 45.22 | mg/l |
| 12. | Total Dissolved Solids | APHA , 2540 C, Gravimetric Method | 895.00 | mg/l |
| 13. | Total Suspended solids | APHA,2540 D Gravimetric Method | 36.00 | mg/l |
| 14. | Dissolved Oxygen | APHA,4500 O B Iodometric Method | 5.5 | mg/l |
| 15. | Sulphate as SO ⁴ | APHA , 4500 E, Turbidimetric Method | 106.00 | mg/l |
| 16. | Fluoride as F | APHA , 4500-F D, SPADNS Method | 0.25 | mg/l |
| 17. | BOD (3 Days at 27°C) | APHA, 5210 C / IS 3025,P-44 | 10.00 | mg/l |
| 18. | COD | APHA, 5220 B, Open Reflux Method | 36.00 | mg/l |

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Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| Sample No.: VEL/DDSPL/W/14 | | | Report No.: VEL/W/2112/14/014 | |
|----------------------------|-----------------------------|---|-------------------------------|-----------|
| 19. | Conductivity (at 25 °C) | APHA, 2510 B, Conductivity Meter Method | 1.37 | µS/cm |
| 20. | Nitrate as NO ₃ | IS 3025 (P-34) ,Chromotropic Method | 22.74 | mg/l |
| 21. | Sodium as Na | APHA,3500 Na B, Flame Photometric Method | 73.00 | mg/l |
| 22. | Potassium as K | APHA 3500 K B, Flame Photometric Method | 8.6 | mg/l |
| 23. | Iron as Fe | IS 3025 (P-65):2014(RA:2019) | 0.34 | mg/l |
| 24. | Aluminium as Al | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 25. | Boron | IS 3025 (P-65):2014(RA:2019) | 0.16 | mg/l |
| 26. | Chromium as Cr | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 27. | Phenolic Compounds | APHA, 5530 C Chloroform Extraction Method | *BDL(**DL 0.0004mg/l) | mg/l |
| 28. | #Mineral Oil | Clause 6 of IS:3025 (Part 39) | *BDL(**DL 0.05 mg/l) | mg/l |
| 29. | #Anionic Detergents as MBAS | APHA, 5540 C MBAS Method | *BDL(**DL 0.05 mg/l) | mg/l |
| 30. | Zinc as Zn | IS 3025 (P-65):2014(RA:2019) | 1.46 | mg/l |
| 31. | Copper as Cu | IS 3025 (P-65):2014(RA:2019) | 0.07 | mg/l |
| 32. | Manganese as Mn | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l |
| 33. | Cadmium as Cd | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 34. | Total Coliform | IS 15185:2002(RA: 2016) | 1000 | MPN/100ml |
| 35. | Fecal Coliform | IS 15185:2002(RA: 2016) | 600 | MPN/100ml |

Note: #These parameter are not covered in our NABL scope.
*BDL-Below Detection Limit. **DL- Detection Limit

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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

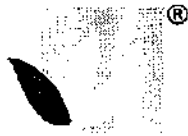
Test Report

| | | | |
|---------------------------------|---|----------------------|-------------------------|
| Sample Number: | VEL/DDSPL/W/15 | Report No.: | VEL/W/2112/14/015 |
| Name of the Project: | M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana | Format No.: | 7.8 F-01 |
| | | Party Reference No.: | NIL |
| Sample Description: | Surface Water Sample | Reporting Date: | 18/12/2021 |
| Sampling Location: | Pond Near Chandpur (SW7) | Period of Analysis: | 14/12/2021 - 18/12/2021 |
| Sample Collected by: | Vardan Enviro Lab Representative | Receipt Date: | 14/12/2021 |
| Preservation: | Refrigerator | Sampling Date: | 13/12/2021 |
| Sampling and Analysis Protocol: | IS:3025 & APHA 23 rd Edition 2017 | Sampling Quantity: | 5.0 Ltr + 250ml. |
| | | Sampling Type: | Grab |

| Sl. No. | Parameter | Test Method | Result | Unit |
|---------|-------------------------------------|--|----------------------|-------|
| 1. | pH (at 25 °C) | APHA .4500-H ⁺ B Electrometric Method | 7.66 | -- |
| 2. | Colour | APHA .2120 B, Visual Comparison Method | 11.0 | Hazen |
| 3. | Turbidity | APHA, 2130 B, Nephelometric Method | 22.00 | NTU |
| 4. | Odour | APHA. 2150 B . Threshold Test Method | Agroceable | -- |
| 5. | Total Hardness as CaCO ₃ | APHA . 2340 C, EDTA Titrimetric Method | 641.00 | mg/l |
| 6. | Calcium as Ca | APHA, 3500 Ca B, EDTA Titrimetric Method | 174.52 | mg/l |
| 7. | Alkalinity as CaCO ₃ | APHA . 2320 B, Titrimetric Method | 401.00 | mg/l |
| 8. | Chloride as Cl | APHA, 4500-Cl ⁻ B, Argentometric Method | 200.12 | mg/l |
| 9. | Residual free Chlorine | APHA, 4500 ClB Iodometric Method | *BDL(**DL 0.15mg/l) | mg/l |
| 10. | #Cyanide as CN | APHA . 4500 CN D | *BDL(**DL 0.02 mg/l) | mg/l |
| 11. | Magnesium as Mg | APHA . 3500 Mg B, Calculation Method | 49.95 | mg/l |
| 12. | Total Dissolved Solids | APHA . 2540 C, Gravimetric Method | 867.00 | mg/l |
| 13. | Total Suspended solids | APHA, 2540 D Gravimetric Method | 33.00 | mg/l |
| 14. | Dissolved Oxygen | APHA, 4500 O B Iodometric Method | 5.3 | mg/l |
| 15. | Sulphate as SO ₄ | APHA . 4500 E, Turbidimetric Method | 104.00 | mg/l |
| 16. | Fluoride as F | APHA . 4500-F D, SPADNS Method | 0.22 | mg/l |
| 17. | BOD (3 Days at 27°C) | APHA. 5210 C / IS 3025, P-44 | 9.76 | mg/l |
| 18. | COD | APHA, 5220 B, Dichromate Oxidation Method | 34.00 | mg/l |

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Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| Sample No: VEL/DDSPL/W/15 | | | Report No: VEL/W/2112/14/015 | |
|---------------------------|-----------------------------|---|------------------------------|-----------|
| No. | Parameter | Method | Result | Unit |
| 19. | Conductivity (at 25 °C) | APHA, 2510 B, Conductivity Meter Method | 1.33 | mS/cm |
| 20. | Nitrate as NO ₃ | IS 3025 (P-34), Chromotropic Method | 20.88 | mg/l |
| 21. | Sodium as Na | APHA, 3500 Na B, Flame Photometric Method | 70.00 | mg/l |
| 22. | Potassium as K | APHA 3500 K B, Flame Photometric Method | 7.3 | mg/l |
| 23. | Iron as Fe | IS 3025 (P-65):2014(RA:2019) | 0.15 | mg/l |
| 24. | Aluminium as Al | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 25. | Boron | IS 3025 (P-65):2014(RA:2019) | 0.12 | mg/l |
| 26. | Chromium as Cr | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 27. | Phenolic Compounds | APHA, 5530 C Chloroform Extraction Method | *BDL(**DL 0.0004mg/l) | mg/l |
| 28. | #Mineral Oil | Clause 6 of IS:3025(Part 39) | *BDL(**DL 0.05 mg/l) | mg/l |
| 29. | #Anionic Detergents as MBAS | APHA, 5540 C MBAS Method | *BDL(**DL 0.05 mg/l) | mg/l |
| 30. | Zinc as Zn | IS 3025 (P-65):2014(RA:2019) | 1.30 | mg/l |
| 31. | Copper as Cu | IS 3025 (P-65):2014(RA:2019) | 0.08 | mg/l |
| 32. | Manganese as Mn | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l |
| 33. | Cadmium as Cd | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 34. | Total Coliform | IS 15185:2002(RA: 2016) | 1200 | MPN/100ml |
| 35. | Fecal Coliform | IS 15185:2002(RA: 2016) | 700 | MPN/100ml |

Note: -#These parameter are not covered in our NABL scope.
*BDL-Below Detection Limit. **DL- Detection Limit

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Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/DDSPL/W/16
 Name of the Project: M/s Dev & Div Solutions Pvt. Ltd. Sand Mining Project "Makhanpur Unit" At Village: Makhanpur, Tehsil & District: Faridabad, Haryana

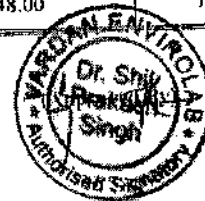
Sample Description: Surface Water Sample
 Sampling Location: Pond Near Amarpur (SW8)
 Sample Collected by: Vardan Enviro Lab Representative
 Preservation: Refrigerator
 Sampling and Analysis Protocol: IS:3025 & APHA 23rd Edition 2017

Report No.: VEL/W/2112/14/016
 Format No.: 7.8 F-01
 Party Reference No.: NIL

Reporting Date: 18/12/2021
 Period of Analysis: 14/12/2021- 18/12/2021
 Receipt Date: 14/12/2021
 Sampling Date: 13/12/2021
 Sampling Quantity: 5.0 Ltr + 250ml
 Sampling Type: Grab

| Sl. No. | Parameter | Method | Result | Unit |
|---------|-------------------------------------|--|----------------------|-------|
| 1. | pH (at 25 °C) | APHA ,4500-F B Electrometric Method | 7.54 | -- |
| 2. | Colour | APHA ,2120 B, Visual Comparison Method | 6.0 | Hazen |
| 3. | Turbidity | APHA, 2130 B. Nephelometric Method | 30.00 | NTU |
| 4. | Odour | APHA, 2150 B . Threshold Test Method | Agreeable | -- |
| 5. | Total Hardness as CaCO ₃ | APHA , 2340 C, EDTA Titrimetric Method | 700.00 | mg/l |
| 6. | Calcium as Ca | APHA, 3500 Ca B, EDTA Titrimetric Method | 194.53 | mg/l |
| 7. | Alkalinity as CaCO ₃ | APHA , 2320 B. Titrimetric Method | 424.00 | mg/l |
| 8. | Chloride as Cl | APHA, 4500-Cl B. Argentometric Method | 208.33 | mg/l |
| 9. | Residual free Chlorine | APHA, 4500 Cl B Iodometric Method | *BDL(**DL 0.15mg/l) | mg/l |
| 10. | #Cyanide as CN | APHA , 4500 CN D | *BDL(**DL 0.02 mg/l) | mg/l |
| 11. | Magnesium as Mg | APHA , 3500 Mg B, Calculation Method | 52.16 | mg/l |
| 12. | Total Dissolved Solids | APHA , 2540 C. Gravimetric Method | 929.00 | mg/l |
| 13. | Total Suspended solids | APHA.2540 D Gravimetric Method | 42.00 | mg/l |
| 14. | Dissolved Oxygen | APHA.4500 O B Iodometric Method | 5.9 | mg/l |
| 15. | Sulphate as SO ₄ | APHA , 4500 E. Turbidimetric Method | 119.00 | mg/l |
| 16. | Fluoride as F | APHA , 4500-F D. SPADNS Method | 0.31 | mg/l |
| 17. | BOD (3 Days at 27°C) | APHA. 5210 C / IS 3025.P-44 | 11.00 | mg/l |
| 18. | COD | APHA. 5220 C. Dichromate Reflux Method | 48.00 | mg/l |

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Vardan EnviroLab

Annexure-IV

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
ISO 9001 | ISO 14001 | ISO 45001

Test Report

| Sample No.: VEL/DDSP1/W/16 | | | Report No.: VEL/W/2112/14/016 | |
|----------------------------|-----------------------------|---|-------------------------------|-----------|
| 19. | Conductivity (at 25 °C) | APHA, 2510 B, Conductivity Meter Method | 1.43 | mS/cm |
| 20. | Nitrate as NO ₃ | IS 3025 (P-34) .Chromotropic Method | 27.44 | mg/l |
| 21. | Sodium as Na | APHA,3500 Na B, Flame Photometric Method | 67.00 | mg/l |
| 22. | Potassium as K | APHA 3500 K B, Flame Photometric Method | 6.2 | mg/l |
| 23. | Iron as Fe | IS 3025 (P-65):2014(RA:2019) | 0.54 | mg/l |
| 24. | Aluminium as Al | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 25. | Boron | IS 3025 (P-63):2014(RA:2019) | 0.21 | mg/l |
| 26. | Chromium as Cr | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 27. | Phenolic Compounds | APHA, 5530 C Chloroform Extraction Method | *BDL(**DL 0.0004mg/l) | mg/l |
| 28. | #Mineral Oil | Clause 6 of IS:3025(Part 39) | *BDL(**DL 0.05 mg/l) | mg/l |
| 29. | #Anionic Detergents as MBAS | APHA, 5540 C MBAS Method | *BDL(**DL 0.05 mg/l) | mg/l |
| 30. | Zinc as Zn | IS 3025 (P-65):2014(RA:2019) | 1.76 | mg/l |
| 31. | Copper as Cu | IS 3025 (P-65):2014(RA:2019) | 0.12 | mg/l |
| 32. | Manganese as Mn | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.01 mg/l) | mg/l |
| 33. | Cadmium as Cd | IS 3025 (P-65):2014(RA:2019) | *BDL(**DL 0.002 mg/l) | mg/l |
| 34. | Total Coliform | IS 15185:2002(RA: 2016) | 1600 | MPN/100ml |
| 35. | Fecal Coliform | IS 15185:2002(RA: 2016) | 900 | MPN/100ml |

Note: -#These parameter are not covered in our NABL scope.

*BDL-Below Detection Limit, **DL- Detection Limit

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ANNEXURE-5

1. INTRODUCTION:

The proposed Project is for the Mining of sand minor minerals from the riverbed Yamuna River with 24,00,000 MT over an area of 66.32 Hectare Located in Village- Makhanpur, Tehsil &, District- Faridabad, State- Haryana by M/s Dev & Div Solutions Pvt. Ltd. Govt. of Haryana, Department of Mines and Geology conducted auction of Sand minor mineral mine of "Makhanpur Unit and M/s Dev & Div Solutions Pvt. Ltd was considered as highest bidder by paying Rs.9,98,00,000 /- , for the Makhanpur Unit, accordingly LOI was issued for tentative area 66.32 Hectares for 7 years.

M/s Dev & Div Solutions Pvt. Ltd is one of the pioneer company in sand mining in the state of Haryana having vast experience in operating sand mines, Road - Building Construction and Marketing of building material in Faridabad and other parts of the state.

2. BIOLOGICAL ENVIRONMENT:

Study of biological environment is one of the important aspects for the Environmental Impact Assessment, in view of the need for conservation of Environmental quality and biodiversity of particular geographical area. Ecological systems show complex interrelationship between biotic and Abiotic components including dependence, competition and mutualism. Biotic components comprises of plant and animal communities which interact not only within and between themselves but also with the Abiotic components viz. Physical and Chemical; components of the environment.

Generally, biological communities are the good indicators of climatic and edaphic factors. Studies on biological aspects of ecosystems are important in Environmental Impact Assessment for safety of natural flora and fauna. Information on the impact of environmental stress on the community structure serves as an inexpensive and efficient early warning system to check the damage to a particular ecosystem. The biological environment includes mainly terrestrial and aquatic ecosystems.

The animal and plant communities exist in their natural habitats in well organized manner. Their natural settings can be disturbed by any externally induced anthropological activities or by naturally induced calamities or disaster. So, once this setting is disturbed, it becomes practically impossible or takes a longer time to come to its original state. Plants and animals are more susceptible to environmental stress. The sensitivity of animal and plant species to the changes

occurring in their existing ecosystem can therefore, be used for monitoring Environmental Impact Assessment studies of any project.

2.1 Objectives of Biological Study:

The main objectives of biological study were:

- To collect the baseline data for the study along with a description of the existing terrestrial, wetland and aquatic biodiversity.
- To assess the scheduled species in the proposed site (rare, endangered, critically endangered, endemic and vulnerable).
- To identify the locations and features of ecological significance.
- To identify the Impacts of proposed project before, after and during development phase.

Table: 1. Mode of data collection and parameters considered during the Survey

| Sr. No. | Aspect | Mode of Data collection | Parameters monitored | Remarks |
|---------|--------------------------|--|---|--|
| 1. | Terrestrial Biodiversity | By field survey | Floral and Faunal diversity | For Floral Diversity: Random survey, sapling survey/forest inventory, walking transect, collection and identification with the help of relevant literature. For Faunal Diversity: direct and indirect sampling, walking transect, point sampling and nest sampling etc. |
| 2. | | From authentic sources like Forests department of Haryana and available published literatures from ZSI, BSI etc. | Floral and Faunal diversity and study of vegetation, forest type, importance etc. | Data collected from the working plan of the region, forest types from the authentic literature of Champion & Seth. |
| 3. | Aquatic Biodiversity | By field survey | Floral and Faunal diversity | For Plankton Study- Lackey's drops method and light microscope For other aquatic- Random survey, opportunistic observations |
| 4. | | From authentic | Floral and Faunal | Desktop literature review to |

| | | | | |
|--|--|---|---|---|
| | | sources like Forests department of Haryana. | diversity and study of vegetation, forest type, importance etc. | indentify the representative spectrum of threatened species, population and ecological communities. |
|--|--|---|---|---|

3. STUDY AREA:

The proposed project for the **Mining of sand minor mineral** from the riverbed of Yamuna river with 24,00,000 MT production capacity over an area of 66.32 Hectare is located at Village-Makhanpur unit, Tehsil- & District- Faridabad, and State- Haryana proposed by **M/s Dev & Div Solutions Pvt. Ltd.**

The Makhanpur unit River sand mine is located in Village - Makhanpur, Tehsil & District- Faridabad, Haryana between latitudes N 28° 16' 18.96" to N 28° 15' 32.67" and longitude E 77° 29' 24.98" to E 77° 28' 15.78" is covered under the Survey of India toposheet no. H43X7.

The Makhanpur unit river sand mine area is connected through approach road which will connect to NH-19, Faridabad to Palwal road and Yamuna Expressway Roads. The quarry is well connected by metalled road. Faridabad is about 10 km and Palwal is about 32 km and New Delhi is about 24 Km from the lease area.

4. ECOLOGY:

Biological communities are the indicator environmental condition and resource of its distribution and survival. Biotic component comprises of both plants (Flora) and animals (Fauna) communities, which interact not only within and between them but also with the Abiotic components, viz. physical and chemical components of the environment. The changes in biotic community are studied in the pattern of distribution, abundance and diversity. The study area is divided into two parts i.e.:

- a) **Core Zone:** Project Site i.e. Makhanpur unit river sand mine, District- Faridabad, Haryana.
- b) **Buffer Zone:** Area within 10 Km radius from the project site.

4.1 Methodology:

The present study on the floral assessment for the project activity is based on the field survey of the area. By the following forest inventory methodology; the survey of biological parameters has been conducted within the core zone and buffer zone (10 km radial distance) from project site at village-Makhanpur, Tehsil & District- Faridabad, Haryana, in accordance with the guidelines

issued by the ministry of Environment, Forest and Climate Change, CPCB and SPCB during the study period.

A preliminary survey of the study area has been performed to get a general picture of the landscapes in vegetation. Traverses have been taken within different zone of the study area to note major vegetation patterns and plant communities including their growth form and dominant species. A forest inventory is “an attempt to describe the quantity and quality of forest trees and many of the characteristics of the land area upon which the trees are grown.” The objective for this floral inventory of the study area is to provide complete checklist of floristic structure within the core zone and buffer zone (10 km radial distance) from project site for formulating effective management and conservation measures.

Biological environment is a good bio-indicator of changing environmental quality. Reconnaissance survey was undertaken around the proposed project site. In the present survey 10 km radius area around the project site was considered as study area. Both terrestrial and aquatic ecological analysis was carried out in the field and in the laboratory. Assessment of flora and fauna was undertaken in the study area. The field study was undertaken during September-2020. In addition to the field study, literature review /desk research was carried out to determine the existing conditions within the study area and to identify habitats and species of potential importance that may be affected by the Project.

The following parameters were primarily considered in the study.

- Assessment of present state of vegetation, flora and fauna in the study area.
- Collection of data from literature about the flora and fauna accounts
- Identification of rare, endangered plants and animal species (if any).
- Identification of important plants/animals species having diverse economic values.

The study area falls under the category of **Tropical Desert Thorn** and comprise predominantly of xerophytes. The area is sparsely populated and is almost plain. The study area contains plantations around villages. There is no wildlife and bird sanctuary within the study area. The biotic environment can be described under following heads:

- 1 Core Zone/Project Site
- 2 Buffer Zone: (Area within 10 km radius): The Buffer Zone can further be described as per the types of the land use.
 - i. Terrestrial Ecology

ii. Aquatic Ecology

4.2 Terrestrial Ecology:

The natural flora and fauna of the land habitats constitute terrestrial ecosystem. The study of terrestrial ecosystem is important as a part of the monitoring environmental changes. Due to rapid industrialization, currently the ecological status of an area changed dramatically. Thus impact evaluation of any developmental activities is highly essential with a view to formulation of mitigatory plan layout.

4.2.1 Floral Survey:

Though natural vegetation of this area is very poor except some degraded patches of evergreen scrub or thorny forests, but overall floral diversity is fairly high. The major components of natural forest are Dhak of Palas (*Butea monosperma*), Jand (*Prosopis cineraria*), Kaur (*Capparis decidua*), Kikar (*Acacia nilotica*) and Datepalm (*Phoenix sylvestris*).

During present field survey, a large number of plant species were recorded in different habitats. They are listed in **Table-2**. There is no rare and endangered plant species in the present study area.

Table: 2 floral checklist of the Study Area

| Sr. No. | SCIENTIFIC NAME | LOCAL NAME | FAMILY |
|-------------------|--------------------------------|--------------|----------------|
| (A) Trees: | | | |
| 1 | <i>Acacia nilotica</i> | Kikar | Fabaceae |
| 2 | <i>Acacia Senegal</i> | Khair | Fabaceae |
| 3 | <i>Albizia lebbeck</i> | Kala siris | Fabaceae |
| 4 | <i>Albizia procera</i> | Safed siris | Fabaceae |
| 5 | <i>Alstonia scholaris</i> | Chatim | Apocyanaceae |
| 6 | <i>Ailanthus excelsa</i> | Arusa | Simaroubaceae |
| 7 | <i>Azadiracta indica</i> | Neem | Meliaceae |
| 8 | <i>Bauhinia purpurea</i> | Kachnar | Caesalpinaceae |
| 9 | <i>Bombax ceiba</i> | Semal | Malvaceae |
| 10 | <i>Butea monosperma</i> | Dhak | Fabaceae |
| 11 | <i>Cassia fistula</i> | Amaltas | Fabaceae |
| 12 | <i>Cassia siamea</i> | Kassod | Caesalpinaceae |
| 13 | <i>Casuarina equisetifolia</i> | Jungli Saru | Casuarinaceae |
| 14 | <i>Callistemon speciosus</i> | Bottle Brush | Myrtaceae |
| 15 | <i>Crataeva nurvala</i> | Baruna | Capparaceae |
| 16 | <i>Dalbergia sissoo</i> | Shisham | Fabaceae |
| 17 | <i>Delonix regia</i> | Gulmohar | Fabaceae |
| 18 | <i>Diospyros cordifolia</i> | Bistendu | Ebenaceae |
| 19 | <i>Erythrina arborescens</i> | Roringe | Fabaceae |

| Sr. No. | SCIENTIFIC NAME | LOCAL NAME | FAMILY |
|-----------------------------|--------------------------------|----------------|-----------------|
| 20 | <i>Eucalyptus globosus</i> | Nilgiri/Safeda | Myrtaceae |
| 21 | <i>Ficus benghalensis</i> | Bargad | Moraceae |
| 22 | <i>Ficus religiosa</i> | Pipal | Moraceae |
| 23 | <i>Ficus palmata</i> | Anjir | Moraceae |
| 24 | <i>Ficus glomerata</i> | Gullor | Moraceae |
| 25 | <i>Holoptelea integrifolia</i> | Papri | Ulmaceae |
| 26 | <i>Pithecellobium dulce</i> | Jungle Jalebi | Fabaceae |
| 27 | <i>Leucaena leucocephala</i> | Safed babul | Mimosaceae |
| 28 | <i>Magnolia champaka</i> | Champa | Magnoliaceae |
| 29 | <i>Mangifera indica</i> | Aam | Anacardiaceae |
| 30 | <i>Mimusops elengi</i> | Maulsari | Sapotaceae |
| 31 | <i>Melia azedarach</i> | Bakain | Meliaceae |
| 32 | <i>Moringa oleifera</i> | Sohanjana | Moringaceae |
| 33 | <i>Morus alba</i> | Toot | Moraceae |
| 34 | <i>Millingtonia hortensis</i> | Akas neem | Bignoniaceae |
| 35 | <i>Mitragyna parvifolia</i> | Phaldu | Rubiaceae |
| 36 | <i>Parkinsonia aculeata</i> | Ram Babul | Fabaceae |
| 37 | <i>Phoenix sylvestris</i> | Khazoor | Arecaceae |
| 38 | <i>Pongamia pinnata</i> | Karanj | Fabaceae |
| 39 | <i>Prosopis juliflora</i> | Khejri | Fabaceae |
| 40 | <i>Prosopis cineraria</i> | Jand | Fabaceae |
| 41 | <i>Populus deltoides</i> | Poplar | Salicaceae |
| 42 | <i>Polyalthia longifolia</i> | Debdaru | Anonnaceae |
| 43 | <i>Putranjiva roxburghii</i> | Jivanputra | Putranjivaceae |
| 44 | <i>Salix tetrastratica</i> | Willow | Salicaceae |
| 45 | <i>Syzygium cumini</i> | Jamun | Myrtaceae |
| 46 | <i>Tamarindus indica</i> | Imli | Caesalpiniaceae |
| 47 | <i>Tectona grandis</i> | Sagun | Verbenaceae |
| 48 | <i>Terminalia arjuna</i> | Arjun | Combretaceae |
| 49 | <i>Terminalia belerica</i> | Bahera | Combretaceae |
| 50 | <i>Thevetia peruviana</i> | Karabi | Apocyanaceae |
| 51 | <i>Ziziphus mauritiana</i> | Ber | Rhamnaceae |
| (B) Shrubs and Herbs | | | |
| 1 | <i>Abutilon indicum</i> | Kanghi | Malvaceae |
| 2 | <i>Achyranthes aspera</i> | Chirchita | Amoranthaceae |
| 3 | <i>Adhatoda vasica</i> | Bansak | Acanthaceae |
| 4 | <i>Aerva tomentosa</i> | Bui | Amoranthaceae |
| 5 | <i>Agave americana</i> | Gwarpatha | Amaryllidaceae |
| 6 | <i>Antigonon leptopus</i> | Coral Vine | Polygonaceae |
| 7 | <i>Boerhaavia diffusa</i> | Punaruara | Nyctaginaceae |
| 8 | <i>Bougainvillea glabra</i> | Bougainvillia | Nyctaginaceae |
| 9 | <i>Calotropis procem</i> | Aak | Asclepiadaceae |
| 10 | <i>Capparis decidua</i> | Karir | Capparidaceae |

| Sr. No. | SCIENTIFIC NAME | LOCAL NAME | FAMILY |
|--|---------------------------------|---------------|-----------------|
| 11 | <i>Cassia occidentalis</i> | Kasunda | Caesalpiniaceae |
| 12 | <i>Cassia tora</i> | Panwar | Caesalpiniaceae |
| 13 | <i>Cleome viscosa</i> | Bagra | Capparidaceae |
| 14 | <i>Datura metel</i> | Kala Dhatura | Solanaceae |
| 15 | <i>Datura stramonium</i> | Dhatura | Solanaceae |
| 16 | <i>Euphobia hirta</i> | Dudhi | Euphobiaceae |
| 17 | <i>Flacourtia indica</i> | Bilangada | Leguminosae |
| 18 | <i>Ipomoea fistulosa</i> | Besharam | Convolvulaceae |
| 19 | <i>Lantana camara</i> | Panchpuli | Verbenaceae |
| 20 | <i>Opuntia dillenii</i> | Nagphani | Cactaceae |
| 21 | <i>Polygonum orientale</i> | Knot Plant | Polygonaceae |
| 22 | <i>Parthenium hysterophorus</i> | Gajar Ghass | Asteraceae |
| 23 | <i>Ricinus communis</i> | Arand | Euphorbiaceae |
| 24 | <i>Nerium odorum</i> | Kaner | Apocyanaceae |
| 25 | <i>Sida acuta</i> | Kharenti | Malvaceae |
| 26 | <i>Solanum xanthocarpum</i> | Kateri | Solanaceae |
| 27 | <i>Solanum nigrum</i> | Makoi | Solanaceae |
| 28 | <i>Solanum surattense</i> | Kakri | Solaceae |
| 29 | <i>Tribulus terrestris</i> | Gokhru | Zygophyceae |
| 30 | <i>Vitex negundo</i> | Bana | Verbenaceae |
| 31 | <i>Urena lobata</i> | Bachita | Malvaceae |
| 32 | <i>Xanthium strumarium</i> | chota gokhru | Asteraceae |
| (C) Grasses, Hedges and Climbers: | | | |
| 1 | <i>Coccinia cordifolia</i> | Janglo | Cucurbitaceae |
| 2 | <i>Cuscuta reflexa</i> | Akash bel | Cosnopolaceae |
| 3 | <i>Capparis sepiaria</i> | Hins | Capparidaceae |
| 4 | <i>Cyperus bulbosus</i> | Kila | Cyperaceae |
| 5 | <i>Cyperus rotundus</i> | Dilla | Cyperaceae |
| 6 | <i>Cocculus pendulus</i> | Vallus | Merispermaceae |
| 7 | <i>Momordica charantia</i> | Jangli kasula | Cucurbitaceae |
| 8 | <i>Perguleria extensa</i> | Trotur | Asclepiadaceae |
| 9 | <i>Tinospora cordifolia</i> | Gilloh | Menispermaceae |
| 10 | <i>Andropogon annulatus</i> | Gandra | Poaceae |
| 11 | <i>Cenchrus biflorus</i> | Bhurat | Poaceae |
| 12 | <i>Chrysopogon fulvus</i> | Dhanlar | Poaceae |
| 13 | <i>Cymbopogon</i> | Anjan | Poaceae |
| 14 | <i>Cynodon dactylon</i> | Dubsha | Poaceae |
| 15 | <i>Dichanthium</i> | Talwan | Poaceae |
| 16 | <i>Desmostachys</i> | Dub | Poaceae |
| 17 | <i>Echinochloa colorium</i> | China | Poaceae |
| 18 | <i>Erianthus munja</i> | Kana | Poaceae |
| 19 | <i>Imperata cylindrica</i> | Siris | Poaceae |
| 20 | <i>Panicum colonum</i> | Sanuak | Poaceae |

| Sr. No. | SCIENTIFIC NAME | LOCAL NAME | FAMILY |
|---------|------------------------------|------------|---------|
| 21 | <i>Saccharum munja</i> | Kans | Poaceae |
| 22 | <i>Sporobolus marginalis</i> | Chiria | Poaceae |
| 23 | <i>Vetiveria zizanoides</i> | Khas | Poaceae |

4.2.2 Plantation Forestry:

As the natural forest area was currently very poor in this district, enormous attempt has been made for raising plantation forestry in government as well as private land either through social forestry programme or by organized strip plantation by the forest department. Over last two decades such attempts were undertaken. Many fast-growing trees, ornamental plants and also fruit trees were planted through these programmes. Usually through mass strip plantation programme along the railway line, road, canal bank, drain bank, and also even in degraded notified forest land, a considerable volume of wood biomass was expected in this area. Four major plant categories were used for this purpose viz. Shisam, Kikar, Eucalyptus, and other mixed types.

In addition various private land and also panchyat areas were taken up for social forestry programmes. A total of more than twenty five plant species were regularly utilized for planting in this programme during onset on monsoon period. The details of plant species used in the social forestry programmes are given in the **Table-3**. Among them once again the most prevalent species that are used for these purposes were Kikar, Eucalyptus, Khair, Shisham, Teak and Neem.

Table: 3 Major Plant Species Used For Social Forestry Plantation in Faridabad, Haryana

| Sr. No. | Common Name | Botanical Name |
|---------|-------------|---------------------------------|
| 1. | Babul | <i>Acacia nilotica</i> |
| 2. | Safeda | <i>Eucalyptus cameldulensis</i> |
| 3. | Khair | <i>Acacia Senegal</i> |
| 4. | Aam | <i>Mangifera indica</i> |
| 5. | Jungle Saru | <i>Casuarina equisetifolia</i> |
| 6. | Gulmohar | <i>Delonix regia</i> |
| 7. | Bahera | <i>Terminalia balerica</i> |
| 8. | Subabul | <i>Leucenea leucocephala</i> |
| 9. | Arjun | <i>Terminalia arjuna</i> |
| 10. | Neem | <i>Azadirachta indica</i> |
| 11. | Jamun | <i>Syzgium cuminii</i> |
| 12. | Shisham | <i>Dalbergia sissoo</i> |
| 13. | Papri | <i>Holoptelia integrifolia</i> |

| | | |
|-----|-------------|-----------------------------|
| 14. | Asan | <i>Terminalia tomentosa</i> |
| 15. | Kassod | <i>Cassia siamea</i> |
| 16. | Amrood | <i>Psidium guajava</i> |
| 17. | Teak/Sagwan | <i>Tectona grandis</i> |
| 18. | Kachnar | <i>Bauhinia variegata</i> |
| 19. | Bakain | <i>Melia azadirachta</i> |
| 20. | Poplar | <i>Populus deltoids</i> |
| 21. | Khejri | <i>Prosopis juliflora</i> |
| 22. | Imli | <i>Tamarindus indica</i> |
| 23. | Mull berry | <i>Morus alba</i> |

4.2.3 Plants of Economic Importance:

A good number of plants found in this area having enormous importance as medicine & other allied uses. There are listed in Table-4. However none of the plants can be considered as rare & endangered as suggested by IUCN. There is no wild germplasm stock in the area under survey.

Table: 4 Plants of Medicinal Importance & Other Allied Uses

| Sr. No. | Botanical Name | Local Name | Part Used |
|---------|------------------------------|------------|---------------------|
| 1. | <i>Alstonia scholaris</i> | Saptparni | Bark |
| 2. | <i>Azadirachta indica</i> | Neem | Seed, Leaf, Bark |
| 3. | <i>Bombax ceiba</i> | Semal | Fruits |
| 4. | <i>Butea monosperma</i> | Palash | Flower, Leaf |
| 5. | <i>Erythrina arborescens</i> | Roringe | Flower, Bark |
| 6. | <i>Moringa oliefera</i> | Sainjna | Flower, Fruit, Leaf |
| 7. | <i>Syzygium cumini</i> | Jamun | Fruit, Bark |
| 8. | <i>Tamarindus indica</i> | Imli | Fruit |
| 9. | <i>Terminalia arjuna</i> | Arjun | Bark |
| 10. | <i>Terminalia belerica</i> | Bahera | Fruit, Bark |
| 11. | <i>Zizyphus mauritiana</i> | Ber | Fruit |
| 12. | <i>Achranthus aspera</i> | Latjeera | Whole plant |
| 13. | <i>Adhatoda vasica</i> | Adusa | Leaf |
| 14. | <i>Datura metal</i> | Dhatura | Seeds |
| 15. | <i>Sida acuta</i> | Baraira | Whole Plant |
| 16. | <i>Solanum xanthocarpum</i> | Kateri | Fruits |
| 17. | <i>Tribulus terrestris</i> | Gokhru | Whole plant |
| 18. | <i>Vitex negundo</i> | Bana | Leaf |
| 19. | <i>Vetiveria zizanoides</i> | Khas | root |

4.2.4 Agriculture:

Quite a good number of crops were grown in this area. The major crops are paddy, jowar, bajra, makai and sugarcane in kharif seasons, while that of Rabi seasons crops are wheat, barley, sunflower, arahar, mung, chana, masoor, rapeseed, pea and barseem. The average yield rate of

paddy and wheat are 20-25 Q/ha and 36-37 Q/ha respectively. The cultivation in this area is highly mechanized and there are profound facilities for canal and deep tube well irrigation. The farmers also use both chemical and bio-fertilizer in adequate quantity.

4.2.5 Grasslands:

No prominent grass land ecosystem has been found in core and buffer zone of the project. However the grass lands were mixed with natural vegetation in low lands and cultivable waste lands are now being utilized as grazing grounds to the livestock species: Goat, Cow, Ox and Buffalo. The grass species and sedges of core and buffer zone are listed below with the natural vegetation of buffer zone.

4.2.6 Endemic/Endangered Flora:

No endangered and endemic flora was recorded from core and buffer zone of the project area.

4.2.7 Location of National Park/Sanctuaries:

There is no Bio-sphere Reserve, National Parks, Wildlife Sanctuary, Tiger Reserve and Elephant Reserve within 10 km radius of the project site.

4.2.8 Waste Land:

Wasteland has developed in the area where the soil conditions are poor and under high biotic pressure. Places where soil conditions are not appropriate to support plant growth are commonly seen in the area. All such areas are either without any vegetation or are covered with species like *Acacia nilotica*, *Prosopis juliflora*, *Lantana camara*, *Calotropis procera*, *Zyziphus mauritiana*, *Leonotis nepetifolia*, *Xanthium strumarium*, etc.

4.2.9 Faunal Diversity:

To prepare a detailed report on the status of wildlife biodiversity within 10 km radial area to assess the impacts due to the project activity and evolve suitable mitigation measures to protect and conserve wildlife biodiversity following components were studied:

- a) Wildlife Survey (Diversity)
- b) Habitat Study (Feeding, Breeding and Roosting areas)
- c) Distribution/Status of Birds
- d) Rare & Endangered species of Fauna
- e) Specific local characteristics of biodiversity in the study area.

4.2.10 Methodology for Faunal Diversity:

A linear transect of 1.0 km each was chosen for sampling at each site. Each transect was trekked for 1.5 hr for the sampling of faunal diversity through following methods for different categories. For the sampling of butterflies, the standard 'Pollard Walk' method was employed and all the species recorded daily. Voucher specimens of the species that could not be identified in the field were collected using a butterfly net besides photographing them.

For bird's sampling, 'Point Sampling' along the fixed transect (Foot trails) was carried out. All the species of birds were observed through a binocular and identified with the help of field guide book and photographs.

For the sampling of mammals, direct count on open width (20m) transect was used. In addition, information on recent sightings/records of mammals by the villagers/locals was also collected. For carnivores, indirect sampling was carried out and the mammals were identified by foot marks, faeces and other marks/sign created by them. In case of reptiles mainly lizards were sampled by direct count on open width transects.

The study of fauna takes substantial amount of time to understand the specific faunal characteristic of area. The assessment of fauna has been done by extensive field survey of the area. During survey, the presence of wildlife was also inhabitants depending on animal sightings and the frequency of their visits in the project area which was later confirmed from forest department, Wildlife department etc.

Table 5: Faunal Diversity from Study Area

| S. No. | English Name | Scientific Name | Status/Schedule |
|-------------------|----------------------------|------------------------------------|-----------------|
| Mammals | | | |
| 1. | Black Rat | <i>Rattus rattus</i> | Schedule-V |
| 2. | Common Mongoose | <i>Herpestes edwardsii</i> | Schedule-II |
| 3. | Five Striped Palm Squirrel | <i>Funambulus pennanii</i> | Schedule-IV |
| 4. | Little Indian field mouse | <i>Mus booduga</i> | Schedule-V |
| 5. | Indian Hare | <i>Lepus nigricollis</i> | Schedule-IV |
| 6. | Monkey | <i>Maccaca mulata</i> | Schedule-II |
| 7. | Jackal | <i>Canis aureus</i> | Schedule-II |
| 8. | Bat | <i>Rousettus leschenaultia</i> | Schedule-V |
| 9. | Common Langur | <i>Semnopithecus entellus</i> [LC] | Schedule-II |
| 10. | Common mongoose | <i>Herpestes edwardsii</i> | Schedule-II |
| Amphibians | | | |
| 11. | Indian pond frog | <i>Rana hexadactyla</i> | Schedule-IV |
| 12. | Common Indian Toad | <i>Duttaphrynus melanostictus</i> | Not Listed |
| 13. | Indian Bull Frog | <i>Hoplobatrachus tigerinus</i> | Schedule-IV |

| S. No. | English Name | Scientific Name | Status/Schedule |
|--------------------|---------------------------|----------------------------------|-----------------|
| 14. | Indian Skipper Frog | <i>Euphlyctis cyanophlyctis</i> | Schedule-IV |
| 15. | Toad | <i>Bufo bufo</i> | Not Listed |
| 16. | Indian Cricket Frog | <i>Rana limnocharis</i> | Schedule-IV |
| 17. | Common Frog | <i>Rana tigrina</i> | Schedule-IV |
| Reptiles | | | |
| 18. | House gecko | <i>Hemidactylus flaviviridis</i> | Common |
| 19. | Common garden lizard | <i>Calotes versicolor</i> | Common |
| 20. | Brahminy skink | <i>Mabuya carinata</i> | Common |
| 21. | Indian Cobra | <i>Naja naja</i> | Schedule-II |
| 22. | Rat Snake | <i>Ptyas mucosa</i> | Schedule-IV |
| 23. | Garden Lizard | <i>Calotes versicolor</i> | Not Listed |
| Butterflies | | | |
| 24. | White orange tip | <i>Ixias marianne</i> | Common |
| 25. | Lime butterfly | <i>Papilio demoleus</i> | Common |
| 26. | Common crow | <i>Euploea core</i> | Common |
| 27. | Common map | <i>Cyrestis thyodamas</i> | Common |
| 28. | Common mormon | <i>Papilio polytes</i> | Common |
| 29. | Common Grass Yellow | <i>Eurema hecabe</i> | Fairly Common |
| 30. | Stripped Tiger | <i>Danaus genutia</i> | Common |
| 31. | Danaid Egg Fly | <i>Hypolimanas misippus</i> | Common |
| 32. | Common Bush Brown | <i>Mycalesis perseus</i> | Common |
| Aves | | | |
| 33. | House Crow | <i>Corvus splendens</i> | Schedule-V |
| 34. | Rock Pigeon | <i>Columba livia</i> | Common |
| 35. | Jungle babbler | <i>Turoides striatus</i> | Schedule-IV |
| 36. | Common Myna | <i>Acridotheres tristis</i> | Schedule-IV |
| 37. | Green bee-eater | <i>Merops orientalis</i> | Least Concern |
| 38. | Indian roller | <i>Coracias benshalensis</i> | Schedule-IV |
| 39. | Black Drongo | <i>Dicirurus macrocercus</i> | Schedule-IV |
| 40. | Little cormorant | <i>Microcarbo niger</i> | Schedule-IV |
| 41. | Common swift | <i>Apus apus</i> | Schedule-IV |
| 42. | House swift | <i>Apus affinis</i> | Schedule-IV |
| 43. | Cattle Egret | <i>Bubulcus ibis</i> | Schedule-IV |
| 44. | Little Egret | <i>Egretta garzetta</i> | Schedule-IV |
| 45. | Pond heron | <i>Ardeola grayii</i> | Schedule-IV |
| 46. | Red wattled lapwing | <i>Vanellus indicus</i> | Schedule-IV |
| 47. | Ring dove | <i>Streptopelia decaocto</i> | Schedule-IV |
| 48. | Spotted Dove | <i>Streptopelia chinensis</i> | Schedule-IV |
| 49. | White Breasted Kingfisher | <i>Halcyon smyrnensis</i> | Schedule-IV |
| 50. | Blue Cheeked Bee Eater | <i>Merops persicus</i> | Schedule-IV |
| 51. | Asian Koel | <i>Eudynamis scolopacea</i> | Schedule-IV |
| 52. | Indian Robin | <i>Saxicoloides fulicata</i> | Schedule-IV |
| 53. | Pied Bush Chat | <i>Saxicola caprata</i> | Schedule-IV |
| 54. | Purple Sun Bird | <i>Nectarinia asiatica</i> | Schedule-IV |

| S. No. | English Name | Scientific Name | Status/Schedule |
|--------|----------------------|---------------------------------|-----------------|
| 55. | Small Sun Bird | <i>Nectarinia minima</i> | Schedule-IV |
| 56. | House Sparrow | <i>Passer domesticus</i> | Schedule-IV |
| 57. | Grey Tit | <i>Parus major</i> | Schedule-IV |
| 58. | Red Vented Bulbul | <i>Pycnonotus cafer</i> | Schedule-IV |
| 59. | Bank Myna | <i>Acridotheres ginginianus</i> | Schedule-IV |
| 60. | Common Babbler | <i>Turdoides caudatus</i> | Schedule-IV |
| 61. | Tailor Bird | <i>Orthotomus sutorius</i> | Schedule-IV |
| 62. | Rose Ringed Parakeet | <i>Psittacula krameri</i> | Schedule-IV |
| 63. | Baya | <i>Ploceus philippinus</i> | Schedule-IV |
| 64. | Owl | <i>Bubo bubo</i> | Schedule-IV |
| 65. | Black Ibis | <i>Pseudibis papillosa</i> | Schedule-IV |
| 66. | Whistling duck | <i>Dendrocygna javanica</i> | Schedule-IV |
| 67. | Pea fowl | <i>Pavo cristatus</i> | Schedule-I |

4.2.11 Endangered Species:

67 species of vertebrates could be seen in the vicinity of the proposed project. Only one Schedule I i.e. *Pavo cristatus*, under Wildlife Protection Act, 1972, have been reported from the study area. Although these are very common species and found in every locality, even in villages, certain steps should be taken to conserve the critical wild life:

- I. Programs for the conservation of wildlife will be formulated and implemented outside the protected areas by educating the local communities with help of local public agencies, and other stakeholders including the environment division officers of our company, in order to reduce the scope of man-animal conflict.
- II. It will be ensured that human activities on the fringe of the protected areas do not degrade the habitat.

Over all, the status of wildlife in a region is an accurate index of the state of ecological resources, and thus, of the natural resources base of human well-being. This indicates the interdependent nature of ecological entities (the web of life), in which wild life is a vital link and a base of eco-tourism. Thus, the importance of conserving and protecting wildlife will be spread among the local people.

4.3 Aquatic Ecology:

There are a number of canals and drains connected with river Yamuna. Aquatic biotic communities like Phytoplanktons and Zooplanktons, Macrophytes and Fishes were studied.

4.3.1 Methodology For Aquatic Diversity:

The samples for qualitative and quantitative analysis of planktons were collected from the sub surface layer at knee depth. Water samples were filtered through plankton net of 20 μ mesh size (APHA, 1971). The filtered samples were concentrated by using the centrifuge. By using Lackey's drops method and light microscope (Lackey, 1938), the qualitative analysis was carried out for phytoplankton and zooplankton. The standard flora and other literature were followed for the qualitative evaluation of Plankton.

4.3.2 Macrophytes:

For studies on macrophytes, marsh areas, canal and drains, water bodies of different size were surveyed within the radius of about 10 km from the proposed site. A check list of macrophytes is given in the **Table – 6**. Among them water hyacinth, duckweed and hogla plants were most common.

Table: 6 Checklists of Macrophytes in Aquatic Habitats

| Sr. No. | Common Name | Scientific Name | Growth Form |
|---------|-----------------|--------------------------------|-------------|
| 1. | Water hyacinth | <i>Eichornea crassipes</i> | Floating |
| 2. | Duck weed | <i>Lemna minor</i> | Floating |
| 3. | Patera | <i>Typha domingensis</i> | Emergent |
| 4. | Kalmi Saag | <i>Imomea aquatica</i> | Floating |
| 5. | Garundi | <i>A lternanthera sessilis</i> | Floating |
| 6. | Sedges | <i>Cyperus difformis</i> | Emergent |
| 7. | Oriental Pepper | <i>Polygonum orientale</i> | Amphibious |
| 8. | Barnyard Grass | <i>Echinochloa glabrescens</i> | Amphibious |
| 9. | Jal kumbhi | <i>Pistia stratiotes</i> | Floating |
| 10. | Lotus | <i>Nymphaea nancheli</i> | Emergent |

4.3.3 Planktons:

Four sites were selected for plankton analysis. These are (i) Agra Canal as upstream point, (ii) Agra Canal as downstream point, (iii) Sehatpur Drain and Bhuriya Nala. The detail of planktonic diversities is given in **Table-7**.

Table 7: List of Phytoplankton & Zooplanktons from Study Area

| PHYTOPLANKTON | ZOOPLANKTONS |
|--------------------------|----------------------|
| <i>Achnanthes sp.</i> | <i>Arcella sp.</i> |
| <i>Ankistrodesmus sp</i> | <i>Keratella sp.</i> |
| <i>Ceratium sp</i> | <i>Asplancha sp.</i> |

| PHYTOPLANKTON | ZOOPLANKTONS |
|-------------------------|------------------------------|
| <i>Euglena sp.</i> | <i>Brachonus sp.</i> |
| <i>Melosira sp.</i> | <i>Daphnia sp.</i> |
| <i>Microcystis sp.</i> | <i>Cyclops sp.</i> |
| <i>Navicula sp.</i> | <i>Cypris sp.</i> |
| <i>Nitzschia sp.</i> | ROTIFERA |
| <i>Oscilaltoria sp.</i> | <i>Asplanchna intermedia</i> |
| <i>Pediastrum sp.</i> | <i>Brachionus falcatus</i> |
| <i>Pinnularia sp.</i> | <i>Filinia longiseta</i> |
| <i>Pleurosigma sp.</i> | <i>Keratella tropica</i> |
| <i>Scenedesmus sp.</i> | |
| <i>Spirulina sp.</i> | |
| <i>Volvox sp.</i> | |

4.3.4 Fishes:

A total of species of fishes were recorded as exists in different types of water bodies in the study area. A checklist of fish species is given in the **Table-8**.

Among the fishes, four common carps are cultured in village ponds and canals, while both carps and other catfishes were found in the rivers and canal system.

4.3.5 Fisheries:

The pisciculture activities were restricted only in the Yamuna River, canals and village ponds. The culture fisheries were common practices in the confined water bodies over the years. Transported fish seeds core supplied by State Fisheries Department to the villagers and commercial entrepreneurs for pisciculture in confined water bodies. The yield rate is fairly high. The major carps like Rahu (*Labeo rohita*), Catla (*Catla catla*), Mrigal (*Cirrhina mrigala*) and Cyprinus carp (*Cyprinus carpio*) were primarily cultured.

With respect to capture fisheries, a good number of fishes were reported to be captured from rivers and canal system in particulars. The major fishes were species of *Mystus*, *Channa*, *Silonia*, *Rita* and *Puntius* etc.

Table 8: Fishes found in the Study Area

| SN | Common Name | Scientific Name |
|----|-------------|------------------------------|
| 1. | Pholus | <i>Notopterus notopterus</i> |
| 2. | Chital | <i>Notopterus chitala</i> |
| 3. | Chela | <i>Salmostoma bacaila</i> |
| 4. | Katla | <i>Catla catla</i> |

Annexure V

| | | |
|-----|----------|--------------------------|
| 5. | Mrigal | <i>Cirrhina mrigala</i> |
| 6. | Chunni | <i>Cirrhina reba</i> |
| 7. | Bata | <i>Labeo bata</i> |
| 8. | Siriha | <i>Labeo gonius</i> |
| 9. | Rohu | <i>Labeo rohita</i> |
| 10. | Magur | <i>Clarias batrachus</i> |
| 11. | Singhara | <i>Mystys seenghala</i> |
| 12. | Ghally | <i>Ompok bimaculatus</i> |
| 13. | Mallee | <i>Wallago attu</i> |
| 14. | Dolla | <i>Channa punctatus</i> |
| 15. | Curd | <i>Channa striatus</i> |

ANNEXURE-6

Annexure VI
M/S DEV & DIV SOLUTIONS PVT. LTD.

**WILDLIFE CONSERVATION PLAN FOR
SCHEDULE-I SPECIES**

SUBMITTED BY

**M/s Dev & Div Solution Pvt. Ltd.
River Sand Mining (Minor Mineral),
At-Village-Makhanpur,
Tehsil & District-Faridabad
Haryana**

Prepared by



Yashpal Environmental
Planning & Secretariat
Ministry of Environment, Government of Haryana
Plot No. 1, Sector 10, Faridkot Road, Chandigarh
Tel: 91-172-2723000

Table of Contents

| | |
|--|------------------------------|
| Table of Contents | 2 |
| CHAPTER-1: PROJECT DETAILS | 5 |
| 1.1 INTRODUCTION | 5 |
| 1.2 PROJECT DESCRIPTION & LOCATION | 5 |
| 1.3 NEED OF THE PROJECT | 7 |
| 1.4 PROJECT PROPONENT | 7 |
| 1.5 MANPOWER REQUIREMNET..... | 8 |
| 1.6 WATER REQUIREMENT | 8 |
| 1.7 EFFLUENT GENERATION..... | 8 |
| 1.8 SOLID WASTE MANAGEMENT | 8 |
| CHAPTER-2: BIOLOGICAL ENVIRONMENT | 9 |
| 2.1 INTRODUCTION | 9 |
| 2.2 OBJECTIVES OF THE STUDY | 10 |
| 2.3 FOREST TYPES | Error! Bookmark not defined. |
| 2.4 RIPARIAN ENVIRONMENT | 11 |
| 2.5 TERRESTRIAL FLORA & FAUNA | 11 |
| 2.5.1 TERRESTRIAL FLORA | 12 |
| 2.5.2 METHODOLOGY..... | 12 |
| 2.5.3 FLORISTIC COMPOSITION OF CORE ZONE..... | 14 |
| 2.5.4 FLORISTIC COMPOSITION OF BUFFER ZONE | Error! Bookmark not defined. |
| 2.5.4.1 Agriculture and Horticulture Crops | Error! Bookmark not defined. |
| 2.5.4.2 Social/Agro Forestry | Error! Bookmark not defined. |
| 2.5.4.3 Grasslands | Error! Bookmark not defined. |

| | | |
|---|--|------------------------------|
| 2.5.4.4. | Endemic/Endangered Flora:..... | Error! Bookmark not defined. |
| 2.5.4.5. | Location of National Park/Sanctuaries: | Error! Bookmark not defined. |
| 2.5.4.6. | Natural/Forest Vegetation:..... | Error! Bookmark not defined. |
| 2.5.5. | WETLAND/MARSH LAND DIVERSITY | 19 |
| 2.5.6. | FAUNAL DIVERSITY | 21 |
| 2.5.6.1 | Methodology for Faunal Diversity..... | 21 |
| 2.5.6.2 | Endangered Species | 23 |
| 2.5.7. | AQUATIC DIVERSITY..... | 24 |
| CHAPTER-3: CONSERVATION ACTION PLAN FOR WILDLIFE..... | | 27 |
| 3.1. | CONSERVATION PLAN FOR FAUNA REQUIRES KNOWLEDGE ON..... | 27 |
| 3.2. | REASONS FOR DECLINE OF WILDLIFE..... | 27 |
| 3.3. | CONSERVATION ACTION PLAN FOR SCHEDULE-I SPECIES | 27 |
| 3.3.1. | INDIAN PEAFOWL (Pavo cristatus):..... | 28 |
| 3.3.2. | INDIAN LEOPARD (Panthera pardus)..... | Error! Bookmark not defined. |
| 3.4. | CONSERVATION MEASURES | 29 |
| 3.4.1. | ELIMINATION OF MAN ANIMAL CONFLICT | 29 |
| 3.4.2. | DUST CONTROL | 30 |
| 3.4.3. | PROTECTION & IMPROVEMENT OF HABITAT..... | 30 |
| 3.4.4. | PREVENTION OF FOREST FIRE..... | 30 |
| 3.4.5. | REDUCING STAKE HOLDER'S DEPENDENCE ON FOREST PRODUCES..... | 30 |
| 3.4.6. | WATER AVAILABILITY | 30 |
| 3.4.7. | SALT LICKS | 31 |
| CHAPTER-4: ACTION PLAN AND FINANCIAL PROJECTION | | 32 |
| 4.1. | INTRODUCTION | 32 |
| 4.2. | ACTION PLAN..... | 32 |

| | | |
|---------|---|----|
| 4.2.1. | NON-FORMAL EDUCATION..... | 32 |
| 4.2.2. | INSTITUTIONAL INFRASTRUCTURE..... | 32 |
| 4.2.3. | RESCUE & REHABILITATION CENTRE..... | 33 |
| 4.2.4. | ECO DEVELOPMENT WORKS..... | 33 |
| 4.2.5. | CHECKS & CONTROL ON THE MOVEMENT OF VEHICLE..... | 33 |
| 4.2.6. | PRESSURE HORN & HEAD LIGHTS..... | 33 |
| 4.2.7. | ENCOURAGE LOCAL VILLAGERS TO GROW TREES ON THEIR ON THEIR FIELD BOUNDS/COURT YARDS..... | 34 |
| 4.2.8. | REDUCING ENVIRONMENTAL POLLUTION..... | 34 |
| 4.2.9. | PROVIDE EMPLOYMENT TO THE VILLAGERS..... | 34 |
| 4.2.10. | PLANTATION IN THE BUFFER ZONE..... | 34 |
| 4.3. | FINANCIAL PROJECTION..... | 35 |

CHAPTER-1: PROJECT DETAILS

1.1 INTRODUCTION

Biodiversity management is considered as a difficult task as it refers to diversity at all levels like genetic, species and community. The formulation of a biodiversity management and wildlife conservation plan for a developmental Project is one of the steps towards the environment conservation. Human activities like agricultural expansion, road construction, urbanization, and other mining/industrial activities are supposed to be major threats to biodiversity and wildlife, therefore, the most effective and efficient mechanisms for conserving biodiversity is to prevent further destruction of degradation of habitats. Four strategies required for the biodiversity management are in Situ strategy, ex Situ Strategy, reduction of anthropogenic pressure and rehabilitation of endangered species.

1.2 PROJECT DESCRIPTION & LOCATION

Project is proposed for the Mining of sand minor minerals from the riverbed Yamuna river with 24,00,000 MTPA over an area of 66.32 Hectare Located in Village- Makhanpur, Tehsil &, District- Faridabad, State- Haryana by M/s Dev & Div Solutions Pvt. Ltd. Govt. of Haryana, Department of Mines and Geology conducted auction of Sand minor mineral mine of "Makhanpur Unit and M/s Dev & Div Solutions Pvt. Ltd was considered as highest bidder by paying Rs. 9,98,00,000 /-, for the Makhanpur Unit, accordingly LOI was issued for tentative area 66.32 Hectares for 7 years.

Subsequent to auction process by Department of Mines & Geology, Govt. of Haryana issued the letter of intent for LOI vide letter no. DMG/HY/Makhanpur Unit/FBD/2021/3176 dated Panchkula 16.08.2021 in favor of M/s Dev & Div Solutions Pvt. Ltd was issued. The period of lease shall be 07 years & the same shall commence with effect from the date of grant of Environment Clearance by Competent Authority.

Lease Period: The period of lease shall be 07 years & the same shall commence with effect from the date of grant of Environment Clearance by Competent Authority.

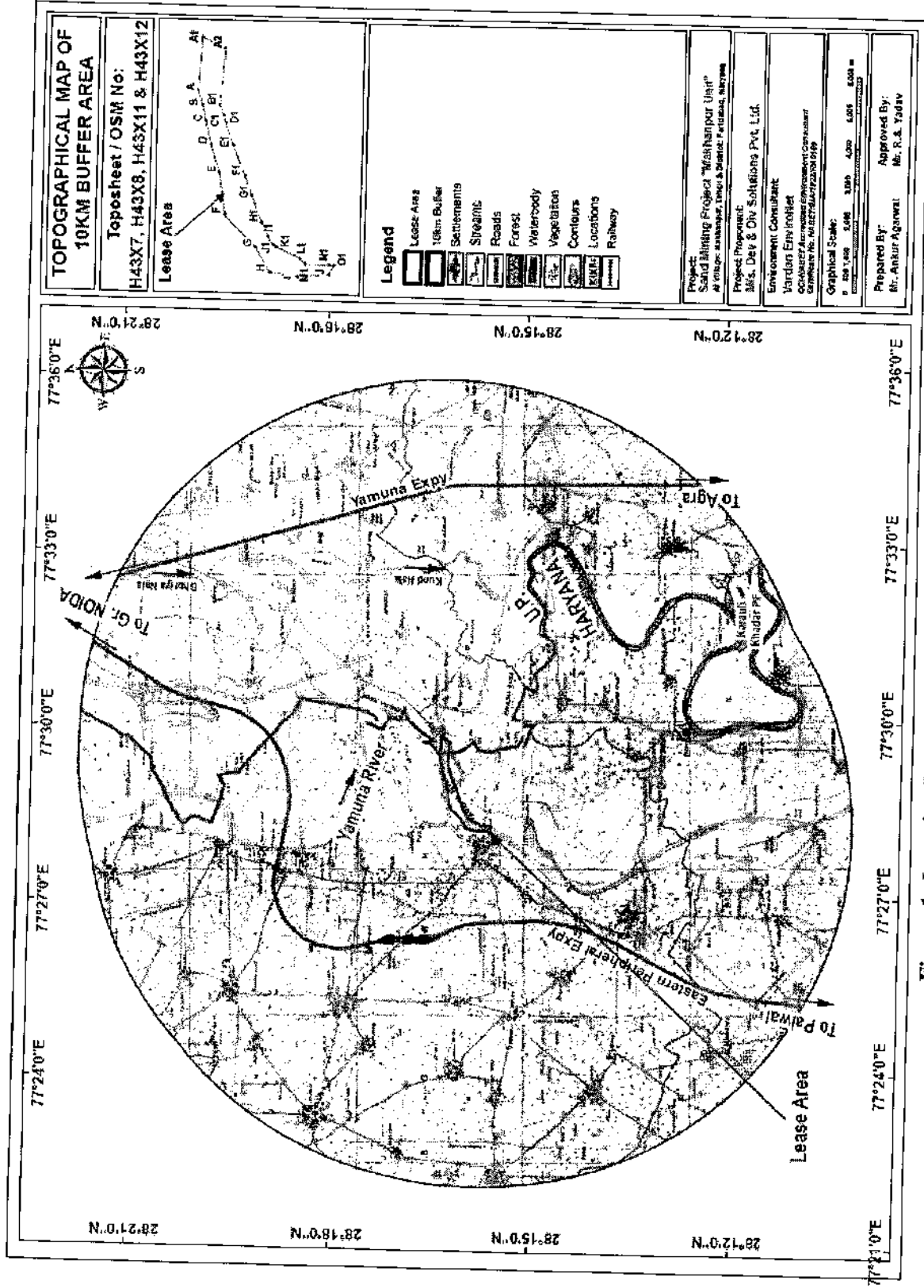


Figure 1: Location Map of proposed River Sand Mining Project

There is no forest land involved in the M.L. area. The entire mining contract lies in River bed of Yamuna River. There is Following RF/ PF present in the study area.

1.3 NEED OF THE PROJECT

Building huge infrastructure as envisaged by Government of India/Haryana Government particularly in road and housing sector requires basic building and construction raw materials. Sand is the primary building material required for the purpose. The mining activities as proposed are the backbone of all construction and infrastructure projects as the raw material for construction is made available only from such mining. The sand to be excavated is in high demand at the local market for real estate and infrastructure industry.

This project will also provide employment to local people helping them earn livelihood. In addition to this, it will further prevent widening of the Yamuna river bed due to the deposition of sediments which if not mined out will result in raising of the river bed causing flooding, damage to the adjoining areas, destruction of life and property..

1.4 PROJECT PROPONENT

| | |
|-----------------------|--|
| Name of the Applicant | Mr. Laxman Kumar Binani |
| Address of Applicant | M/s Dev & Div Solutions Pvt. Ltd. R/o- 31/1,3rd floor KCG Heritage Farm, Satberi, New Delhi-110074 laxmanbinani165@gmail.com +91-9818162912 |
| Name of Mine | Mining of sand minor mineral from the riverbed of Yamuna river |
| Mineral | Sand (Minor Mineral) |
| Area (Ha) | 66.32 |
| Status of Project | New |

1.5 MANPOWER REQUIREMENT

Around 98 workers will be employed directly and 100-150 indirectly in the proposed project. Transportation is required. Hence jobs and business opportunities in logistical activities will come up.

1.6 WATER REQUIREMENT

The total water requirement will be 87.0KLD which will be sourced from the nearby villages through tankers. Water balance is given below:

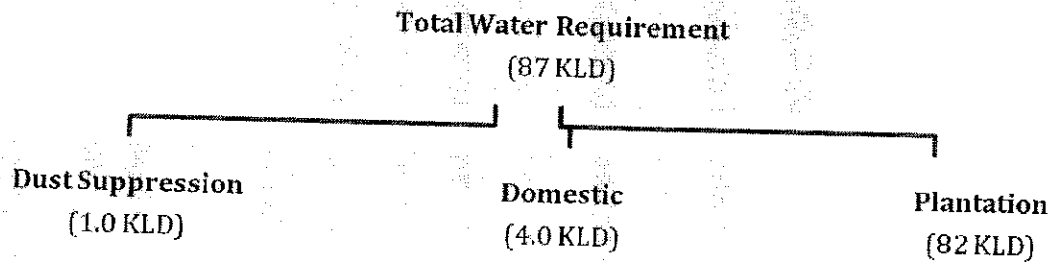


Figure 2: Water Balance Diagram

1.7 EFFLUENT GENERATION

No liquid effluent will be generated at the mine site. Only domestic waste water will be generated from mine office etc. which will be disposed off in septic tank.

1.8 SOLID WASTE MANAGEMENT

There will be no OB or waste generation as the sand is exposed in the river bed.

CHAPTER-2: BIOLOGICAL ENVIRONMENT

2.1. INTRODUCTION

Conservation of Biodiversity is essential for the survival of the biosphere. Biodiversity consists of two components: richness, or taxonomic diversity, and evenness, or the distribution of individuals among taxa. Anthropogenic factors are eroding both the richness as well as evenness components of the biodiversity, jeopardizing the survival of human race itself. This realization has initiated serious efforts towards conservation of both the components of biodiversity. One of the causes for the erosion of biodiversity has been recognized to be the mining/industrial/developmental activity. The present study was carried out to centralize at near Village – Makhanpur, Tehsil & District- Faridabad (Haryana).

Living forms cover a very wide spectrum of species and even a small area may have thousands of species including bacteria, protozoa, worms, insects, plants, animals and birds. In the present study, Flora (trees, small trees, shrubs, under shrubs, climbers and grasses) and Fauna (mammals, birds and reptiles) are considered. It is needless to emphasize that living system is extremely complicated. They are directly affected by changes in the physical environment but may often either adapt or avoid the adverse environmental conditions.

Generally, biological communities are the best indicators of climatic and edaphic factors. Studies on biological aspects of ecosystems are important in Environmental Impact Assessment for safety of natural flora and fauna. Information on the impact of environmental stress on the community structure serves as an inexpensive and efficient early warning system to check the damage to a particular ecosystem. The biological environment includes mainly terrestrial and aquatic ecosystems.

A change in the composition of biotic communities is reflected by a change in the distribution pattern of natural species of flora and fauna existing in the ecosystem. The sensitivity of animal and plant species to the changes occurring in their existing ecosystem can, therefore, be used for monitoring Environmental Impact Assessment studies of any project.

2.2. OBJECTIVES OF THE STUDY

- To collect the baseline data for the study along with a description of the existing terrestrial, wetland and aquatic biodiversity.
- To assess the scheduled species in the proposed site (rare, endangered, critically endangered, endemic and vulnerable).
- To identify the locations and features of ecological significance by reconnaissance survey.
- To identify the impacts of a proposed project during the mining activities.
- To identify the livelihood dependency on NTFPs.
- To assess the wildlife presence within the 10 km study area.

Table 1: Mode of Data Collection and Parameters considered during the survey

| Sr. No. | Aspect | Mode of Data collection | Parameters monitored | Remarks |
|---------|--------------------------|--|---|--|
| 1. | Terrestrial Biodiversity | By field survey | Floral and Faunal diversity | For Floral Diversity: Random survey, sapling survey/forest inventory, walking transect, collection and identification with the help of relevant literature. For Faunal Diversity: direct and indirect sampling, walking transect, point sampling and nest sampling etc. |
| 2. | | From authentic sources like Forests department of Haryana and available published literatures from ZSI, BSI etc. | Floral and Faunal diversity and study of vegetation, forest type, importance etc. | Data collected from the working plan of the region, forest types from the authentic literature of Champion & Seth. |
| 3. | Aquatic Biodiversity | By field survey | Floral and Faunal diversity | For Plankton Study- Lackey's drops method and light microscope For other aquatic- Random survey, opportunistic observations |
| 4. | | From authentic sources like Forests department of Haryana. | Floral and Faunal diversity and study of vegetation, forest | Desktop literature review to identify the representative spectrum of threatened species, |

| | | | | |
|--|--|--|-----------------------|--|
| | | | type, importance etc. | population and ecological communities. |
|--|--|--|-----------------------|--|

2.3. RIPARIAN ENVIRONMENT

Riparian habitats are the interface of terrestrial and aquatic ecosystems and they are essential in controlling flows of energy and nutrients between terrestrial and aquatic ecosystems. Despite the relatively small area that they occupy within the landscape, riparian zones provide a major contribution to the ecology and biodiversity in the areas where they occur.

The study of riparian vegetation of a river is an important as it strongly affects soil-water characteristics of the area and thus the aquatic life. Moreover, the vegetation provides the human population with vital life support and socio-economic security. Riparian zones often regulate aquatic-terrestrial linkages. Riparian vegetation is important for regulating nutrient cycle of the streams, preventing soil erosion and stabilizing river banks. Further, the riparian vegetation is modified or destroyed by grazing, logging, urbanization, road construction, water development, mining and recreation. Also, the riparian zone is thought to have a disproportionate influence (relative to its land area) on the running water because of its immediate effects on the transport of water, nutrients and sediments. The district is mainly drained by the river Yamuna River and its tributaries.

Table 2: Location sites for the study of Riparian Vegetation

| Sr. No. | Site Location | Direction |
|---------|---|------------|
| I. | Yamuna River (Up Stream) near Bhikuka | North |
| II. | Yamuna River (Down Stream) near Chainsa | South |
| III. | Bhuriya Nala Near Latifpur Bhangar | North East |
| IV. | Kund Nala near Chak Jalalabad | East |

2.4. TERRESTRIAL FLORA & FAUNA

Biological communities are the indicator environmental condition and resource of its distribution and survival. Biotic component comprises of both plants (Flora) and animal (Fauna) communities, which interact not only within and between them but also with the Abiotic components, viz. physical and chemical components of the environment. The changes in biotic community are studied in the pattern of distribution, abundance and diversity.

2.5.1. TERRESTRIAL FLORA

The Vegetation and plant species composition observed and documented during field visit in and around the proposed location of the project. Besides primary surveys in the project sites, published literature and various floras were consulted to prepare an inventory of plant species growing at project sites. The vegetation of the study area is highly degraded and some areas consisting water bodies. The plant diversity is classified into various plant groups such as tree, shrubs, herbs, climbers, sedges and grasses. The plant diversity survey in the project area was undertaken during the summer season with the objectives of preparing a checklist of flora in the study area which is divided into two parts i.e. Core Zone & Buffer Zone.

Core Zone: The Makhanpur unit River sand mine is located in Village - Makhanpur, Tehsil & District- Faridabad, Haryana between latitudes N 28° 16' 18.96"to N 28° 15' 32.67" and longitude E 77° 29' 24.98to E 77° 28' 15.78" is covered under the Survey of India toposheet no. H43X7. Total M.L. area is **66.32 ha**, which is a non-forest land.

Buffer Zone: The selection of terrestrial and aquatic ecological sampling location was based on land use pattern, topography and habitat patterns of the study area. The terrestrial ecological survey was carried out in forest and non-forest areas (agricultural fields, roadsides, urban & semi-urban wastelands etc) and the aquatic ecological survey was carried out at rivers & ponds/lakes within the study area.

2.5.2. METHODOLOGY

The Floral study survey was made to assess the existing plant species in all accessible areas within the 10 km radius by the crisscross method of field exploration. The local flora was identified by their morphological observation, such as its size and shape of the leaf, flowers, fruits and their bark features of stem and also documented their habitat viz. Trees, Shrubs, Herbs, Grasses and Climbers etc. The plants which were not identified in the field were collected, brought to the laboratory and identified using standard herbarium references. Photo documentation of some of the key species presents the study area was also done.

A preliminary survey of the study area has been performed to get a general picture of the landscapes in vegetation. Traverses have been taken within different zone of the study area to note major vegetation patterns and plant communities including their growth form

and dominant species. A forest inventory is “an attempt to describe the quantity and quality of forest trees and many of the characteristics of the land area upon which the trees are grown.” The objective this floral inventory of the study area, is to provide complete checklist of floristic structure within the core zone and buffer zone (10 km radial distance) from project site for formulating effective management and conservation measures.

Biological environment is a good bio-indicator of changing environmental quality. Reconnaissance survey was undertaken around the proposed project site. In the present survey 10 km radius area around the project site was considered as study area. Both terrestrial and aquatic ecological analysis was carried out in the field and in the laboratory. Assessment of flora and fauna was undertaken in the study area. The field study was undertaken during September-2020.

In addition to the field study, literature review /desk research was carried out to determine the existing conditions within the study area and to identify habitats and species of potential importance that may be affected by the Project.

The following parameters were primarily considered in the study.

- Assessment of present state of vegetation, flora and fauna in the study area.
- Collection of data from literature about the flora and fauna accounts
- Identification of rare, endangered plants and animal species (if any).
- Identification of important plants/animals species having diverse economic values.

The study area falls under the category of **Tropical Desert Thorn** and comprise predominantly of xerophytes. The area is sparsely populated and is almost plain. The study area contains plantations around villages. There is no wildlife and bird sanctuary within the study area. The biotic environment can be described under following heads:

- 1 Core Zone/Project Site
- 2 Buffer Zone: (Area within 10 km radius): The Buffer Zone can further be described as per the types of the land use.
 - i. Terrestrial Ecology
 - ii. Aquatic Ecology

2.5.3. FLORISTIC COMPOSITION OF CORE & BUFFER ZONE

Though natural vegetation of this area is very poor except some degraded patches of evergreen scrub or thorny forests, but overall floral diversity is fairly high. The major components of natural forest are Dhak of Palas (*Butea monosperma*), Jand (*Prosopis cineraria*), Kaur (*Capparis decidua*), Kikar (*Acacia nilotica*) and Datepalm (*Phoenix sylvestris*).

During present field survey, a large number of plant species were recorded in different habitats. They are listed in Table-3. There is no rare and endangered plant species in the present study area.

Table 3: List of floral diversity from the study area

| Sr. No. | SCIENTIFIC NAME | LOCAL NAME | FAMILY |
|------------|--------------------------------|----------------|-----------------|
| (A) Trees: | | | |
| 1 | <i>Acacia nilotica</i> | Kikar | Fabaceae |
| 2 | <i>Acacia Senegal</i> | Khair | Fabaceae |
| 3 | <i>Albizia lebeck</i> | Kala siris | Fabaceae |
| 4 | <i>Albizia procera</i> | Safed siris | Fabaceae |
| 5 | <i>Alstonia scholaris</i> | Chatim | Apocyanaceae |
| 6 | <i>Ailanthus excelsa</i> | Arusa | Simaroubaceae |
| 7 | <i>Azadiracta indica</i> | Neem | Meliaceae |
| 8 | <i>Bauhinia purpurea</i> | Kachnar | Caesalpiniaceae |
| 9 | <i>Bombax ceiba</i> | Semal | Malvaceae |
| 10 | <i>Butea monosperma</i> | Dhak | Fabaceae |
| 11 | <i>Cassia fistula</i> | Amaltas | Fabaceae |
| 12 | <i>Cassia siamea</i> | Kassod | Caesalpiniaceae |
| 13 | <i>Casuarina equisetifolia</i> | Jungli Saru | Casuarinaceae |
| 14 | <i>Callistemon speciosus</i> | Bottle Brush | Myrtaceae |
| 15 | <i>Crataeva nurvala</i> | Baruna | Capparaceae |
| 16 | <i>Dalbergia sissoo</i> | Shisham | Fabaceae |
| 17 | <i>Delonix regia</i> | Gulmohar | Fabaceae |
| 18 | <i>Diospyros cordifolia</i> | Bistendu | Ebenaceae |
| 19 | <i>Erythrina arborescens</i> | Roringe | Fabaceae |
| 20 | <i>Eucalyptus globosus</i> | Nilgiri/Safeda | Myrtaceae |
| 21 | <i>Ficus benghalensis</i> | Bargad | Moraceae |
| 22 | <i>Ficus religiosa</i> | Pipal | Moraceae |
| 23 | <i>Ficus palmata</i> | Anjir | Moraceae |
| 24 | <i>Ficus glomerata</i> | Gullor | Moraceae |
| 25 | <i>Holoptelea integrifolia</i> | Papri | Ulmaceae |
| 26 | <i>Pithecellobium dulce</i> | Jungle Jalebi | Fabaceae |
| 27 | <i>Leucaena leucocephala</i> | Safed babul | Mimosaceae |
| 28 | <i>Magnolia champaka</i> | Champa | Magnoliaceae |

Annexure VI

WILDLIFE CONSERVATION PLAN FOR SCHEDULE-I SPECIES (M/S Dev & Div Solutions PVT. LTD.)

| Sr. No. | SCIENTIFIC NAME | LOCAL NAME | FAMILY |
|-----------------------------|-------------------------------|--------------|-----------------|
| 29 | <i>Mangifera indica</i> | Aam | Anacardiaceae |
| 30 | <i>Mimusops elengi</i> | Maulsari | Sapotaceae |
| 31 | <i>Melia azedarach</i> | Bakain | Meliaceae |
| 32 | <i>Moringa oleifera</i> | Sohanjana | Moringaceae |
| 33 | <i>Morus alba</i> | Toot | Moraceae |
| 34 | <i>Millingtonia hortensis</i> | Akas neem | Bignoniaceae |
| 35 | <i>Mitragyna parvifolia</i> | Phaldu | Rubiaceae |
| 36 | <i>Parkinsonia aculeata</i> | Ram Babul | Fabaceae |
| 37 | <i>Phoenix sylvestris</i> | Khazoor | Arecaceae |
| 38 | <i>Pongamia pinnata</i> | Karanj | Fabaceae |
| 39 | <i>Prosopis juliflora</i> | Khejri | Fabaceae |
| 40 | <i>Prosopis cineraria</i> | Jand | Fabaceae |
| 41 | <i>Populus deltoides</i> | Poplar | Salicaceae |
| 42 | <i>Polyalthia longifolia</i> | Debdaru | Annonaceae |
| 43 | <i>Putranjiva roxburghii</i> | Jivanputra | Putranjivaceae |
| 44 | <i>Salix tetrastomatica</i> | Willow | Salicaceae |
| 45 | <i>Syzygium cumini</i> | Jamun | Myrtaceae |
| 46 | <i>Tamarindus indica</i> | Imli | Caesalpiniaceae |
| 47 | <i>Tectona grandis</i> | Sagun | Verbenaceae |
| 48 | <i>Terminalia arjuna</i> | Arjun | Combretaceae |
| 49 | <i>Terminalia belerica</i> | Bahera | Combretaceae |
| 50 | <i>Thevetia peruviana</i> | Karabi | Apocyanaceae |
| 51 | <i>Ziziphus mauritiana</i> | Ber | Rhamnaceae |
| (B) Shrubs and Herbs | | | |
| 1 | <i>Abutilon indicum</i> | Kanghi | Malvaceae |
| 2 | <i>Achyranthes aspera</i> | Chirchita | Amoranthaceae |
| 3 | <i>Adhatoda vasica</i> | Bansak | Acanthaceae |
| 4 | <i>Aerva tomentosa</i> | Bui | Amoranthaceae |
| 5 | <i>Agave americana</i> | Gwarpatha | Amaryllidaceae |
| 6 | <i>Antigonon leptopus</i> | Coral Vine | Polygonaceae |
| 7 | <i>Boerhaavia diffusa</i> | Punaruara | Nyctaginaceae |
| 8 | <i>Bougainvillea glabra</i> | Bougainvella | Nyctaginaceae |
| 9 | <i>Calotropis procem</i> | Aak | Asclepiadaceae |
| 10 | <i>Capparis decidua</i> | Karir | Capparidaceae |
| 11 | <i>Cassia occidentalis</i> | Kasunda | Caesalpiniaceae |
| 12 | <i>Cassia tora</i> | Panwar | Caesalpiniaceae |
| 13 | <i>Cleome viscosa</i> | Bagra | Capparidaceae |
| 14 | <i>Datura metel</i> | Kala Dhatura | Solanaceae |
| 15 | <i>Datura stramonium</i> | Dhatura | Solanaceae |
| 16 | <i>Euphobia hirta</i> | Dudhi | Euphobiaceae |
| 17 | <i>Flacourtia indica</i> | Bilangada | Leguminosae |
| 18 | <i>Ipomoea fistulosa</i> | Besharam | Convolvulaceae |
| 19 | <i>Lantana camara</i> | Panchpuli | Verbenaceae |

| Sr. No. | SCIENTIFIC NAME | LOCAL NAME | FAMILY |
|--|---------------------------------|---------------|----------------|
| 20 | <i>Opuntia dillenii</i> | Nagphani | Cactaceae |
| 21 | <i>Polygonum orientale</i> | Knot Plant | Polygonaceae |
| 22 | <i>Parthenium hysterophorus</i> | Gajar Ghass | Asteraceae |
| 23 | <i>Ricinus communis</i> | Arand | Euphorbiaceae |
| 24 | <i>Nerium odorum</i> | Kaner | Apocyanaceae |
| 25 | <i>Sida acuta</i> | Kharenti | Malvaceae |
| 26 | <i>Solanum xanthocarpum</i> | Kateri | Solanaceae |
| 27 | <i>Solanum nigrum</i> | Makoi | Solanaceae |
| 28 | <i>Solanum surattense</i> | Kakri | Solaceae |
| 29 | <i>Tribulus terrestris</i> | Gokhru | Zygophyceae |
| 30 | <i>Vitex negundo</i> | Bana | Verbenaceae |
| 31 | <i>Urena lobata</i> | Bachita | Malvaceae |
| 32 | <i>Xanthium strumarium</i> | chota gokhru | Asteraceae |
| (C) Grasses, Hedges and Climbers: | | | |
| 1 | <i>Coccinia cordifolia</i> | Janglo | Cucurbitaceae |
| 2 | <i>Cuscuta reflexa</i> | Akash bel | Cosnopolaceae |
| 3 | <i>Capparis sepiaria</i> | Hins | Capparidaceae |
| 4 | <i>Cyperus bulbosus</i> | Kila | Cyperaceae |
| 5 | <i>Cyperus rotundus</i> | Dilla | Cyperaceae |
| 6 | <i>Cocculus pendulus</i> | Vallus | Merispermaceae |
| 7 | <i>Momordica charantia</i> | Jangli kasula | Cucurbitaceae |
| 8 | <i>Perguleria extensa</i> | Trotur | Asclepiadaceae |
| 9 | <i>Tinospora cordifolia</i> | Gilloh | Menispermaceae |
| 10 | <i>Andropogon annulatus</i> | Gandra | Poaceae |
| 11 | <i>Cenchugus biflorus</i> | Bhurat | Poaceae |
| 12 | <i>Chrysopogon fulvus</i> | Dhanlar | Poaceae |
| 13 | <i>Cymbopogon</i> | Anjan | Poaceae |
| 14 | <i>Cynodon dactylon</i> | Dubsha | Poaceae |
| 15 | <i>Dichanthium</i> | Talwan | Poaceae |
| 16 | <i>Desmostachys</i> | Dub | Poaceae |
| 17 | <i>Echinochloa colorium</i> | China | Poaceae |
| 18 | <i>Erianthus munja</i> | Kana | Poaceae |
| 19 | <i>Imperata cylindrica</i> | Siris | Poaceae |
| 20 | <i>Panicum colonum</i> | Sanuak | Poaceae |
| 21 | <i>Saccharum munja</i> | Kans | Poaceae |
| 22 | <i>Sporobolus marginalis</i> | Chiria | Poaceae |
| 23 | <i>Vetiveria zizanioides</i> | Khas | Poaceae |

Source: Field survey by Vardan Team

2.5.4. PLANTATION FORESTRY

As the natural forest area was currently very poor in this district, enormous attempt has been made for raising plantation forestry in government as well as private land either

through social forestry programme or by organized strip plantation by the forest department. Over last two decades such attempts were undertaken. Many fast-growing trees, ornamental plants and also fruit trees were planted through these programmes. Usually through mass strip plantation programme along the railway line, road, canal bank, drain bank, and also even in degraded notified forest land, a considerable volume of wood biomass was expected in this area. Four major plant categories were used for this purpose viz. Shisam, Kikar, Eucalyptus, and other mixed types.

In addition various private land and also panchyat areas were taken up for social forestry programmes. A total of more than twenty five plant species were regularly utilized for planting in this programme during onset on monsoon period. The details of plant species used in the social forestry programmes are given in the **Table-4**. Among them once again the most prevalent species that are used for these purposes were Kikar, Eucalyptus, Khair, Shisham, Teak and Neem.

Table: 4 Major Plant Species Used For Social Forestry Plantation in Faridabad

| Sr. No. | Common Name | Botanical Name |
|---------|-------------|---------------------------------|
| 1. | Babul | <i>Acacia nilotica</i> |
| 2. | Safeda | <i>Eucalyptus cameldulensis</i> |
| 3. | Khair | <i>Acacia Senegal</i> |
| 4. | Aam | <i>Mangifera indica</i> |
| 5. | Jungle Saru | <i>Casuarina equisetifolia</i> |
| 6. | Gulmohar | <i>Delonix regia</i> |
| 7. | Bahera | <i>Terminalia balerica</i> |
| 8. | Subabul | <i>Leucenea leucocephala</i> |
| 9. | Arjun | <i>Terminalia arjuna</i> |
| 10. | Neem | <i>Azadirachta indica</i> |
| 11. | Jamun | <i>Syzygium cuminii</i> |
| 12. | Shisham | <i>Dalbergia sissoo</i> |
| 13. | Papri | <i>Holoptelia integrifolia</i> |
| 14. | Asan | <i>Terminalia tomentosa</i> |
| 15. | Kassod | <i>Cassia siamea</i> |
| 16. | Amrood | <i>Psidium guajava</i> |
| 17. | Teak/Sagwan | <i>Tectona grandis</i> |
| 18. | Kachnar | <i>Bauhinia variegata</i> |
| 19. | Bakain | <i>Melia azadirachta</i> |
| 20. | Poplar | <i>Populus deltoids</i> |
| 21. | Khejri | <i>Prosopis juliflora</i> |
| 22. | Imli | <i>Tamarindus indica</i> |
| 23. | Mull berry | <i>Morus alba</i> |

2.5.4.1.Plants of Economic Importance:

A good number of plants found in this area having enormous importance as medicine & other allied uses. There are listed in **Table-5**. However none of the plants can be considered as rare & endangered as suggested by IUCN. There is no wild germplasm stock in the area under survey.

Table: 5 Plants of Medicinal Importance & Other Allied Uses

| Sr. No. | Botanical Name | Local Name | Part Used |
|---------|------------------------------|------------|---------------------|
| 1. | <i>Alstonia scholaris</i> | Saptparni | Bark |
| 2. | <i>Azadirachta indica</i> | Neem | Seed, Leaf, Bark |
| 3. | <i>Bombax ceiba</i> | Semal | Fruits |
| 4. | <i>Butea monosperma</i> | Palash | Flower, Leaf |
| 5. | <i>Erythrina arborescens</i> | Roringe | Flower, Bark |
| 6. | <i>Moringa oliefera</i> | Sainjna | Flower, Fruit, Leaf |
| 7. | <i>Syzygium cumini</i> | Jamun | Fruit, Bark |
| 8. | <i>Tamarindus indica</i> | Imli | Fruit |
| 9. | <i>Terminalia arjuna</i> | Arjun | Bark |
| 10. | <i>Terminalia belerica</i> | Bahera | Fruit, Bark |
| 11. | <i>Zizyphus mauritiana</i> | Ber | Fruit |
| 12. | <i>Achranthus aspera</i> | Latjeera | Whole plant |
| 13. | <i>Adhatoda vasica</i> | Adusa | Leaf |
| 14. | <i>Datura metal</i> | Dhatura | Seeds |
| 15. | <i>Sida acuta</i> | Baraira | Whole Plant |
| 16. | <i>Solanum xanthocarpum</i> | Kateri | Fruits |
| 17. | <i>Tribulus terrestris</i> | Gokhru | Whole plant |
| 18. | <i>Vitex negundo</i> | Bana | Leaf |
| 19. | <i>Vetiveria zizanoides</i> | Khas | root |

2.5.4.2.Agriculture:

Quite a good number of crops were grown in this area. The major crops are paddy, jowar, bajra, makai and sugarcane in kharif seasons, while that of Rabi seasons crops are wheat, barley, sunflower, arahar, mung, chana, masoor, rapeseed, pea and barseem. The average yield rate of paddy and wheat are 20-25 Q/ha and 36-37 Q/ha respectively. The cultivation in this area is highly mechanized and there are profound facilities for canal and deep tube well irrigation. The farmers also use both chemical and bio-fertilizer in adequate quantity.

2.5.4.3. Grasslands:

No prominent grass land ecosystem has been found in core and buffer zone of the project. However the grass lands were mixed with natural vegetation in low lands and cultivable waste lands are now being utilized as grazing grounds to the livestock species: Goat, Cow, Ox and Buffalo. The grass species and sedges of core and buffer zone are listed below with the natural vegetation of buffer zone.

2.5.4.4. Endangered/Endemic Flora:

No endangered and endemic flora was recorded from core and buffer zone of the project area.

2.5.4.5. Location of National Park/Sanctuaries:

There is no Bio-sphere Reserve, National Parks, Wildlife Sanctuary, Tiger Reserve and Elephant Reserve within 10 km radius of the project site.

2.5.4.6. Waste Land:

Wasteland has developed in the area where the soil conditions are poor and under high biotic pressure. Places where soil conditions are not appropriate to support plant growth are commonly seen in the area. All such areas are either without any vegetation or are covered with species like *Acacia nilotica*, *Prosopis juliflora*, *Lantana camara*, *Calotropis procera*, *Zyziphus mauritiana*, *Leonotis nepetifolia*, *Xanthium strumarium*, etc.

2.5.5. WETLAND/MARSH LAND DIVERSITY

Wetlands are very useful to us. By producing resources, enabling recreational activities and controlling flood and pollution, they contribute to the national and local economies and environmental consequences. Wetlands provide important and incredible services to society, these services can neither be sold nor do they have the market value and tried to give wetlands an economic value.

Table 6: Wetland/Marshland Diversity of Study area

| Family | Botanical Name | Local Name |
|------------------|-------------------------------|---------------|
| Salviniaceae | <i>Azolla pinnata</i> | Mosquito Fern |
| Asteraceae | <i>Caesulia axillaris</i> | Maka |
| Ceratophyllaceae | <i>Ceratophyllum demersum</i> | Hornwort |

| Family | Botanical Name | Local Name |
|------------------|--------------------------------|------------------------|
| Poaceae | <i>Chrysopogon zizanioides</i> | Vetiver |
| Poaceae | <i>Coix lacryma-jobi</i> | Adlay Millet |
| Araceae | <i>Colocasia esculenta</i> | Taro |
| Commelinaceae | <i>Commelina benghalensis</i> | Kana |
| Cyperaceae | <i>Cyperus alternifolius</i> | Umbrella Sedge |
| Dryopteridaceae | <i>Dryopteris filix-mas</i> | Fern |
| Dryopteridaceae | <i>Dryopteris sieboldii</i> | Fern |
| Poaceae | <i>Echinochloa colona</i> | Shama |
| Pontederiaceae | <i>Eichhornia crassipes</i> | Jal Kumbhi |
| Asteraceae | <i>Grangea maderaspatana</i> | Madras Carpet, Mustaru |
| Acanthaceae | <i>Hygrophila salicifolia</i> | --- |
| Convolvulaceae | <i>Ipomea aquatic</i> | Kalmi Shak |
| Lemnaceae | <i>Lemna minor</i> | Duck Weed |
| Onagraceae | <i>Ludwigia adscendens</i> | Water Primrose |
| Marsileaceae | <i>Marsilea quadrifolia</i> | Four Leaf Clover |
| Sterculiaceae | <i>Melochia corchorifolia</i> | Bilpat |
| Nelumbonaceae | <i>Nelumbo nucifera</i> | Lotus, Kamal |
| Nymphaeaceae | <i>Nymphaea pubescens</i> | White Lotus |
| Oxalidaceae | <i>Oxalis corniculata</i> | Amrul |
| Pandanaceae | <i>Pandanus odoratissimus</i> | Keora |
| Urticaceae | <i>Pilea microphylla</i> | Gun Powder Plant |
| Polygonaceae | <i>Polygonum hydropiper</i> | Marsh Pepper Knot Weed |
| Portulacaceae | <i>Portulaca oleracea</i> | Little Hog-Weed |
| Potamogetonaceae | <i>Potamogeton natans</i> | Floating Pond Weed |
| Lythraceae | <i>Trapa natans</i> | Water Chest Nut |
| Ranunculaceae | <i>Ranunculus sceleratus</i> | Aglaon |
| Polygonaceae | <i>Rumex dentatus</i> | Ambavati |
| Typhaceae | <i>Typha angustata</i> | Patara |
| Lentibulariaceae | <i>Utricularia gibba</i> | Floating Bladderwort |

| Family | Botanical Name | Local Name |
|----------------|------------------------------------|-----------------|
| Plantaginaceae | <i>Veronica anagallis-aquatica</i> | Water Speedwell |

2.5.6. FAUNAL DIVERSITY

To prepare a detailed report on the status of wildlife biodiversity within 10 km radial area from the project site to assess the impacts due to the project activity and evolve suitable mitigation measures to protect and conserve wildlife biodiversity following components were studied:

- a) Wildlife Survey (Diversity)
- b) Habitat Study (Feeding, Breeding and Roosting areas)
- c) Distribution/Status of Birds
- d) Rare & Endangered species of Fauna
- e) Specific local characteristics of biodiversity in the study area.

2.5.6.1 Methodology for Faunal Diversity

A linear transect of 1.0 km each was chosen for sampling at each site. Each transect was trekked for 1.5 hr for the sampling of faunal diversity through following methods for different categories. For the sampling of butterflies, the standard 'Pollard Walk' method was employed and all the species recorded daily. Voucher specimens of the species that could not be identified in the field were collected using a butterfly net besides photographing them.

For bird's sampling, 'Point Sampling' along the fixed transect (Foot trails) was carried out. All the species of birds were observed through a binocular and identified with the help of field guide book and photographs.

For the sampling of mammals, direct count on open width (20m) transect was used. In addition, information on recent sightings/records of mammals by the villagers/locals was also collected. For carnivores, indirect sampling was carried out and the mammals were identified by foot marks, faeces and other marks/sign created by them. In case of reptiles mainly lizards were sampled by direct count on open width transects.

The study of fauna takes substantial amount of time to understand the specific faunal characteristic of area. The assessment of fauna has been done by extensive field survey of the area. During survey, the presence of wildlife was also inhabitants depending on

animal sightings and the frequency of their visits in the project area which was later confirmed from forest department, Wildlife Department etc.

Table 7: Faunal Diversity from Study Area

| S. No. | English Name | Scientific Name | Status/Schedule |
|--------------------|----------------------------|------------------------------------|-----------------|
| Mammals | | | |
| 1. | Black Rat | <i>Rattus rattus</i> | Schedule-V |
| 2. | Common Mongoose | <i>Herpestes edwardsii</i> | Schedule-II |
| 3. | Five Striped Palm Squirrel | <i>Funambulus pennaniii</i> | Schedule-IV |
| 4. | Little Indian field mouse | <i>Mus booduga</i> | Schedule-V |
| 5. | Indian Hare | <i>Lepus nigricollis</i> | Schedule-IV |
| 6. | Monkey | <i>Maccaca mulata</i> | Schedule-II |
| 7. | Jackal | <i>Canis aureus</i> | Schedule-II |
| 8. | Bat | <i>Rousettus leschenaultia</i> | Schedule-V |
| 9. | Common Langur | <i>Semnopithecus entellus</i> [LC] | Schedule-II |
| 10. | Common mongoose | <i>Herpestes edwardsii</i> | Schedule-II |
| Amphibians | | | |
| 11. | Indian pond frog | <i>Rana hexadactyla</i> | Schedule-IV |
| 12. | Common Indian Toad | <i>Duttaphrynus melanostictus</i> | Not Listed |
| 13. | Indian Bull Frog | <i>Hoplobatrachus tigerinus</i> | Schedule-IV |
| 14. | Indian Skipper Frog | <i>Euphlyctis cyanophlyctis</i> | Schedule-IV |
| 15. | Toad | <i>Bufo bufo</i> | Not Listed |
| 16. | Indian Cricket Frog | <i>Rana limnocharis</i> | Schedule-IV |
| 17. | Common Frog | <i>Rana tigrina</i> | Schedule-IV |
| Reptiles | | | |
| 18. | House gecko | <i>Hemidactylus flaviviridis</i> | Common |
| 19. | Common garden lizard | <i>Calotes versicolor</i> | Common |
| 20. | Brahminy skink | <i>Mabuya carinata</i> | Common |
| 21. | Indian Cobra | <i>Naja naja</i> | Schedule-II |
| 22. | Rat Snake | <i>Ptyas mucosa</i> | Schedule-IV |
| 23. | Garden Lizard | <i>Calotes versicolor</i> | Not Listed |
| Butterflies | | | |
| 24. | White orange tip | <i>Ixias marianne</i> | Common |
| 25. | Lime butterfly | <i>Papilio demoleus</i> | Common |
| 26. | Common crow | <i>Euploea core</i> | Common |
| 27. | Common map | <i>Cyrestis thyodamas</i> | Common |
| 28. | Common mormon | <i>Papilio polytes</i> | Common |
| 29. | Common Grass Yellow | <i>Eurema hecabe</i> | Fairly Common |
| 30. | Stripped Tiger | <i>Danaus genutia</i> | Common |
| 31. | Danaid Egg Fly | <i>Hypolimanas misippus</i> | Common |
| 32. | Common Bush Brown | <i>Mycalesis perseus</i> | Common |
| Aves | | | |
| 33. | House Crow | <i>Corvus splendens</i> | Schedule-V |
| 34. | Rock Pigeon | <i>Columba livia</i> | Common |

| S. No. | English Name | Scientific Name | Status/Schedule |
|--------|---------------------------|---------------------------------|-----------------|
| 35. | Jungle babbler | <i>Turoides striatus</i> | Schedule-IV |
| 36. | Common Myna | <i>Acridotheres tristis</i> | Schedule-IV |
| 37. | Green bee-eater | <i>Merops orientalis</i> | Least Concern |
| 38. | Indian roller | <i>Coracias benshalensis</i> | Schedule-IV |
| 39. | Black Drongo | <i>Dicirius macrocercus</i> | Schedule-IV |
| 40. | Little cormorant | <i>Microcarbo niger</i> | Schedule-IV |
| 41. | Common swift | <i>Apus apus</i> | Schedule-IV |
| 42. | House swift | <i>Apus affinis</i> | Schedule-IV |
| 43. | Cattle Egret | <i>Bubulcus ibis</i> | Schedule-IV |
| 44. | Little Egret | <i>Egretta garzetta</i> | Schedule-IV |
| 45. | Pond heron | <i>Ardeola grayii</i> | Schedule-IV |
| 46. | Red wattled lapwing | <i>Vanellus indicus</i> | Schedule-IV |
| 47. | Ring dove | <i>Streptopelia decaocto</i> | Schedule-IV |
| 48. | Spotted Dove | <i>Streptopelia chinensis</i> | Schedule-IV |
| 49. | White Breasted Kingfisher | <i>Halcyon smyrnensis</i> | Schedule-IV |
| 50. | Blue Cheeked Bee Eater | <i>Merops persicus</i> | Schedule-IV |
| 51. | Asian Koel | <i>Eudynamys scolopacea</i> | Schedule-IV |
| 52. | Indian Robin | <i>Saxicoloides fulicata</i> | Schedule-IV |
| 53. | Pied Bush Chat | <i>Saxicola caprata</i> | Schedule-IV |
| 54. | Purple Sun Bird | <i>Nectarinia asiatica</i> | Schedule-IV |
| 55. | Small Sun Bird | <i>Nectarinia minima</i> | Schedule-IV |
| 56. | House Sparrow | <i>Passer domesticus</i> | Schedule-IV |
| 57. | Grey Tit | <i>Parus major</i> | Schedule-IV |
| 58. | Red Vented Bulbul | <i>Pycnonotus cafer</i> | Schedule-IV |
| 59. | Bank Myna | <i>Acridotheres ginginianus</i> | Schedule-IV |
| 60. | Common Babbler | <i>Turdoides caudatus</i> | Schedule-IV |
| 61. | Tailor Bird | <i>Orthotomus sutorius</i> | Schedule-IV |
| 62. | Rose Ringed Parakeet | <i>Psittacula krameri</i> | Schedule-IV |
| 63. | Baya | <i>Ploceus philippinus</i> | Schedule-IV |
| 64. | Owl | <i>Bubo bubo</i> | Schedule-IV |
| 65. | Black Ibis | <i>Pseudibis papillosa</i> | Schedule-IV |
| 66. | Whistling duck | <i>Dendrocygna javanica</i> | Schedule-IV |
| 67. | Pea fowl | <i>Pavo cristatus</i> | Schedule-I |

Reference: For Avifauna: The book of Indian Birds by Salim Ali (1948)

For Amphibians: Atlas of amphibians, Published by Zoological Survey of India, Kolkata (September, 2013)

2.5.6.2 Endangered Species

67 species of vertebrates could be seen in the vicinity of the proposed project. Only one Schedule I i.e. *Pavo cristatus*, under Wildlife Protection Act, 1972, have been reported from the study area. Although these are very common species and found in every locality, even in villages, certain steps should be taken to conserve the critical wild life:

- I. Programs for the conservation of wildlife will be formulated and implemented outside the protected areas by educating the local communities with help of local public agencies, and other stakeholders including the environment division officers of our company, in order to reduce the scope of man-animal conflict.
- II. It will be ensured that human activities on the fringe of the protected areas do not degrade the habitat.

Over all, the status of wildlife in a region is an accurate index of the state of ecological resources, and thus, of the natural resources base of human well-being. This indicates the interdependent nature of ecological entities (the web of life), in which wild life is a vital link and a base of eco-tourism. Thus, the importance of conserving and protecting wildlife will be spread among the local people.

2.5.7. AQUATIC ECOLOGY:

There are a number of canals and drains connected with river Yamuna. Aquatic biotic communities like Phytoplanktons and Zooplanktons, Macrophytes and Fishes were studied.

2.5.7.1. Methodology for Aquatic Diversity:

The samples for qualitative and quantitative analysis of planktons were collected from the sub surface layer at knee depth. Water samples were filtered through plankton net of 20 μ mesh size (APHA, 1971). The filtered samples were concentrated by using the centrifuge. By using Lackey's drops method and light microscope (Lackey, 1938), the qualitative analysis was carried out for phytoplankton and zooplankton. The standard flora and other literature were followed for the qualitative evaluation of Plankton.

2.5.7.2. Planktons:

Four sites were selected for plankton analysis. These are (i) Yamuna River as upstream point, (ii) Yamuna River as downstream point, (iii) Bhuriya Nala Near Latifpur Bhangar and (iv) Kund Nala near Chak Jalalabad. The detail of planktonic diversities is given in **Table-8**.

Table 8: List of Phytoplankton & Zooplanktons from Study Area

| PHYTOPLANKTON | ZOOPLANKTONS |
|--------------------------|------------------------------|
| <i>Achnanthes sp.</i> | <i>Arcella sp.</i> |
| <i>Ankistrodesmus sp</i> | <i>Keratella sp.</i> |
| <i>Ceratium sp</i> | <i>Asplancha sp.</i> |
| <i>Euglena sp.</i> | <i>Brachonius sp.</i> |
| <i>Melosira sp.</i> | <i>Daphnia sp.</i> |
| <i>Microcystis sp.</i> | <i>Cyclops sp.</i> |
| <i>Navicula sp.</i> | <i>Cypris sp.</i> |
| <i>Nitzschia sp.</i> | ROTIFERA |
| <i>Oscilaltoria sp.</i> | <i>Asplanchna intermedia</i> |
| <i>Pediastrum sp.</i> | <i>Brachionus falcatus</i> |
| <i>Pinnularia sp.</i> | <i>Filinia longiseta</i> |
| <i>Pleurosigma sp.</i> | <i>Keratella tropica</i> |
| <i>Scenedesmus sp</i> | |
| <i>Spirulina sp.</i> | |
| <i>Volvox sp.</i> | |

2.5.7.3. Fisheries:

The pisciculture activities were restricted only in the Yamuna River, canals and village ponds. The culture fisheries were common practices in the confined water bodies over the years. Transported fish seeds core supplied by State Fisheries Department to the villagers and commercial entrepreneurs for pisciculture in confined water bodies. The yield rate is fairly high. The major carps like Rahu (*Labeo rohita*), Catla (*Catla catla*), Mrigal (*Cirrhina mrigala*) and Cyprinus carp (*Cyprinus carpio*) were primarily cultured. With respect to capture fisheries, a good number of fishes were reported to be captured from rivers and canal system in particulars. The major fishes were species of *Mystus*, *Channa*, *Silonia*, *Rita* and *Puntius* etc.

Table 9: Fishes found in the Study Area

| SN | Common Name | Scientific Name |
|----|-------------|------------------------------|
| 1. | Pholus | <i>Notopterus notopterus</i> |
| 2. | Chital | <i>Notopterus chitala</i> |
| 3. | Chela | <i>Salmostoma bacaila</i> |
| 4. | Katla | <i>Catla catla</i> |
| 5. | Mrigal | <i>Cirrhina mrigala</i> |

| | | |
|-----|----------|--------------------------|
| 6. | Chunni | <i>Cirrhina reba</i> |
| 7. | Bata | <i>Labeo bata</i> |
| 8. | Siriha | <i>Labeo gonius</i> |
| 9. | Rohu | <i>Labeo rohita</i> |
| 10. | Magur | <i>Clarias batrachus</i> |
| 11. | Singhara | <i>Mystys seenghala</i> |
| 12. | Ghally | <i>Ompok bimaculatus</i> |
| 13. | Mallee | <i>Wallago attu</i> |
| 14. | Dolla | <i>Channa punctatus</i> |
| 15. | Curd | <i>Channa striatus</i> |

CHAPTER-3: CONSERVATION ACTION PLAN FOR WILDLIFE

3.1. CONSERVATION PLAN FOR FAUNA REQUIRES KNOWLEDGE ON

- 1) Home range of the animal
- 2) Territorial requirement of the animal
- 3) Deciding the number of animals to be conserved and accordingly evaluating the carrying capacity of the habitat
- 4) Conservation is aimed at single species or multiple species
- 5) Conservation is proposed in a managed ecosystem or an un-managed, natural ecosystem
- 6) However, very little knowledge exists on the above parameters of most of the animals.

3.2. REASONS FOR DECLINE OF WILDLIFE

Several reasons for the decline of wild life and methods for their conservation are proposed. However the best method for the conservation of wild life is related directly to the maintenance of ecosystems in their natural condition, allowing their natural development and protection to the wildlife and their habitat. Both these phenomena (ecosystem development and habitat protection) are related to anthropogenic factors.

Some of the important anthropogenic factors are listed below:

- I. Habitat fragmentation and destruction
- II. Man animal conflict
- III. Forest fire
- IV. Poaching
- V. Stake holders dependence on forest resources
- VI. Creating awareness amongst forest stake holders
- VII. Water scarcity

3.3. CONSERVATION ACTION PLAN FOR SCHEDULE-I SPECIES

Biodiversity conservation plan is developed with the aim to reduce adverse impact on the natural habitat of various wild animals. Day by day issues related to threats to natural terrestrial and aquatic ecosystems arises due to high anthropogenic activities and loss of natural habitat due to climate change. A conservation plan is needed for the conservation of critical habitats of wildlife for endangered and schedule-I species along with their scientific management strategy. During the mining/industrial/developmental activities

and conservation activities, natural resources (Land, Biodiversity, Forest, Animals and Humans) are likely to exert tremendous pressure due to various activities in the respective region, while the present management plan will ensure mitigation of such impacts. A separate Wildlife conservation Plan is proposed for M/s Dev & Div Solutions Pvt Ltd. for sand mining project from the riverbed of Yamuna River of district – Faridabad, Haryana.

3.3.1. INDIAN PEAFOWL (*Pavo cristatus*):

The Indian Peafowl (*Pavo cristatus*), is also known as the Common Peafowl or the Blue Peafowl. The peacock is the **national bird** of India.

Habitat: It is found in forests, but can live also in cultivated regions and around human habitations and is usually found where water is available.

Food: It is an omnivorous bird. It's diet consists of small mammals like: mice, reptiles like lizards and snakes, amphibians, arthropods like: insects, ticks, termites, ants, locusts and scorpions, seeds, fruit, vegetables, flowers, leaves, and minnows in shallow streams and so on. With its strong bill it is able to kill a snake, even a cobra. Around cultivated areas, peafowl feed on a wide range of crops such as groundnut, tomato, paddy, chilly, and even bananas. Around human habitations, they feed on a variety of food scraps and even human excreta.

Threat: Poaching of peacocks for their meat, feathers and accidental poisoning by feeding on pesticide treated seeds are known threats to wild birds. Methods to identify if feathers have been plucked or have been shed naturally have been developed as Indian law allows the collection of feathers that have been shed. However, presently, there is no severe threat to this species, primarily for its status as a National bird and secondarily due to religious belief this species is protected. But its train feathers are in great demand for commercial purposes and are the main threat to its survival. Their loud calls make them easy to detect, and in forest areas, often indicate the presence of a predator such as a tiger.

Conservation: They are generally protected by religious sentiment and will forage around villages for scraps. The people living in the surrounding area should be rewarded for timely information about disturbing and/or poaching of the bird. The bird has a wide range of food items, hence, improvement of and protection of the bird in the buffer zone will provide sufficient food to the animal.

Conservation Status: IUCN Red List, Least Concern species, and Schedule-I species under Indian Wildlife (Conservation) Act, 1972.

3.4. CONSERVATION MEASURES

It is critical that urgent efforts are made to understand the habitat and population status of the species through field based research and *in situ* conservation projects. A meeting of the Indian Board for Wild Life (held on 19 June 2006) underlined the need for such efforts. The actions required are:

- 1) Mapping of habitat and distribution status of the species across the country, inside and outside protected areas;
- 2) Time series analysis of habitat change to quantify the rate of change and identify high-risk areas and potential sites for further affirmative action;
- 3) Estimation of population size by established count methods such as line transect, call counts and roost counts;
- 4) Intensive ecological investigations in representative sites in major biogeographic zones with focus on the effects of threats in relation to breeding success and survival probability;
- 5) Quantification of trade, with details on source and people involved; and
- 6) Undertaking outreach activities to sensitize local communities, this may be carried out by a network of 'student clubs' (e.g. National Green Corps) throughout the country. These people could be trained to collect population data and undertake monitoring within their localities, and the reliability of the results could be ensured by adopting rigorous protocols.

3.4.1. ELIMINATION OF MAN ANIMAL CONFLICT

Man-animal conflict is a difficult problem to be eliminated. The conflict is both deliberate as well as inadvertent. However, conflict can be minimized through employing local persons to form anti-depredation team. The conflict can be minimized also through protecting the area, preventing the entry of human beings or the cattle in the area. First aid facilities should be provided in the villages to meet exigencies in case of any conflict.

3.4.2. DUST CONTROL

All transport roads of the project passing through buffer zone shall be kept wet by sprinkling of water at required intervals. The frequency of watering will be based on season and weather conditions. This will reduce and minimize the impact of dust on flora/fauna.

3.4.3. PROTECTION & IMPROVEMENT OF HABITAT

The patches of forest that forms the habitat of wildlife is threatened due to anthropogenic pressure generated due to the construction/operation and other ancillary activities. Hence, concerted and vigorous efforts will be made to protect such forest patches. Besides, improvement of vegetation cover on Non-Forest land in the buffer zone will be tried.

3.4.4. PREVENTION OF FOREST FIRE

Forest fire is caused both naturally as well as by the human beings. Anthropogenic causes will be minimized through forming a fire line around the forest area. To add to the prevention of fire local persons will be employed as fire guards, during the fire prone season. The team will be instructed to fight the fire as soon as it is detected. Watch towers will also be constructed to detect forest fire. Awareness program against forest fire will also be run in adjoining villages.

3.4.5. REDUCING STAKE HOLDER'S DEPENDENCE ON FOREST PRODUCTS

People from adjoining villages have already exploited the forest to the extent that the forests have become a grazing land or a source of fuel wood. Timber and medicinal species have either disappeared or have become scarce. However, regenerating the forest will again attract the villagers towards the forest. To keep the people away from the forest their economic condition will be improved. This will be achieved through financial and technical help to develop Dairy, Poultry, Vegetable cultivation, Horticulture and Agroforestry. Promotion of agro-forestry, in particular, will reduce their dependence on forests for timber as well as for fuel wood.

3.4.6. WATER AVAILABILITY

However, due to lack of proper storage, severe water scarcity develops during the summer season. To make the water available throughout the year it is essential to create

water storage facility. Multiple water storage places will be created in the Buffer zone through improving the existing ponds, constructing check dams in the water channels and through creating water holes. Also, camouflage and hiding places should be created. Some wildlife species fulfill their salt requirement through licking the soil. Salt deposits will be arranged for such species adjacent to the water holes. These water holes will also be helpful in recharging the ground water and thus will be supporting good growth of the vegetation.

3.4.7. SALT LICKS

As natural salt is very scarce in the area and salt is a very essential requirement for the wild animals particularly the herbivores. Five such saltlicks may be created artificially and maintained for use of wild animals near the water hole and grass lands. Clay soil will be mixed with salt mixture in 3:1 ratio. Salt mixture will be prepared by mixing of 95 kg common salt, 3 kg rock salt and 2 kg trace mineral mixture.

CHAPTER-4: ACTION PLAN AND FINANCIAL PROJECTION

4.1. INTRODUCTION

Protected areas and threatened species could most effectively be safeguarded if local people considered it in their own interest to do so. Working with rather than against local people has become a major working principle for IUCN. For the protection of habitat sensitive wildlife and other living form need proper action plan and budgetary allocation which will be a roadmap for the success of conservation scheme.

4.2. ACTION PLAN

4.2.1. NON-FORMAL EDUCATION

Conservation education and awareness will be imparted both at the formal and non-formal levels. At the formal level, it will be given at school, colleges and university levels. Formal education, in spite of all the curriculum development and introduction of the study of ecology, wildlife and conservation at the school and college levels, however, largely remains text book and examination oriented. Because of the situation, non-formal education becomes all the more necessary for creating the right kind of awareness and attitude among people at all levels- children, teenagers, adults, family groups, teachers, administrators, politicians and policymakers. To achieve this some local tours of school and college students will be arranged to nearby National Parks.

4.2.2. INSTITUTIONAL INFRASTRUCTURE

The prime requisite for building up an understanding and awareness about wildlife and conservation is to develop an appreciation, respect and love for nature. Most people lack the curiosity to know even the names of animals and plants they come across in their day to day life. Development of an inquisitive mind, a keen sense of observation and curiosity about the fauna and flora are, therefore, very important. Concern for conservation can only emanate from a love for nature and awareness about the interdependence of all species of animals and plants, including the man. To arouse curiosity about the wildlife some quiz and essay competitions will be arranged in the schools and colleges of the buffer zone and some nearby areas.

4.2.3. RESCUE & REHABILITATION CENTRE

The Government of India has put a ban on performance of lion, tiger, panther, bear and monkeys by circuses. Consequent to the ban, these animals were to be rehabilitated by creating appropriate facilities. As Indian Zoos did not have adequate facilities to rehabilitate all these animals, the Central Government decided that rescue centers should be created by the Central Zoo Authority for the display areas of the various zoos.

The M/s Dev & Div Solutions Pvt. Ltd. will establish a suitably equipped Mobile Units (one member) as per the consultation with Forest Department in districts having high levels of Human-Wildlife Conflict (HWC) to attend to wildlife emergencies, rescue and rehabilitation, and to provide wildlife health support.

4.2.4. ECO DEVELOPMENT WORKS

People in and around the forest area generally are hostile against the forest department and its staff, because they are prevented from taking out timber and other forest products illegally. Such antagonistic behavior is mainly because little effort is made to meet their genuine demands either from outside the forest area or from the forest area but in a sustainable manner. Regular interaction with them with agreement for sustainable utilization of forest resources combined with some incentives can completely change their indifferent or even un-concerned attitude to conservative attitude.

4.2.5. CHECKS & CONTROL ON THE MOVEMENT OF VEHICLE

Due to movement of vehicles injury to animals and reptiles may take place. For this reason speed limit of vehicles will be fixed and operators will be educated and advised regularly to drive vehicle safely and slowly. All operators will also be advised to stop the vehicle on seeing such reptiles or animals and let it go away before moving the vehicle further.

4.2.6. PRESSURE HORN & HEAD LIGHTS

Noise generated by pressure horn disturbs the wildlife and forces them to leave the place. No pressure horn will be fixed on vehicle plying in the area. All the drivers will be advised to make minimum use of horn while working hours.

Efforts will be made to cover the lights suitably with paint so that strong beam of head light is not formed and light falls in front of the vehicle only.

4.2.7. ENCOURAGE LOCAL VILLAGERS TO GROW TREES ON THEIR ON THEIR FIELD BOUNDS/COURT YARDS

In consultation with Forest Department the company will provide some finance, to grow saplings of tree species, having importance for wood, small timber and fuel wood to distribute to the villagers. Bamboo will be another important species with a lot of environmental and economic value. This no doubt will help reduce dependence of people on RF/PF forest; as a result the ecological condition of the area will improve so the wild life will be attracted to this area.

4.2.8. REDUCING ENVIRONMENTAL POLLUTION

To keep the environment free from smoke, cooking gas cylinders will be provided to all the project workers particularly. To control pollution from project measure outlined in EMP will be followed.

4.2.9. PROVIDE EMPLOYMENT TO THE VILLAGERS

On the basis of their suitability, jobs in project will be provided to the nearby villagers. As a result their economic condition will improve. This will keep them busy also, so they will not be tempted/compelled to cause destruction to forest which will help improve the status of wildlife.

4.2.10. PLANTATION IN THE BUFFER ZONE

Trees will be planted in the buffer zone also. This plantation will be done at selected places only and only local species will be used in the plantation. Some of the tree species included will be Saja (*Terminalia tomentosa*), Baheda (*Terminalia bellerica*), Bija (*Pterocarpus masupium*), Bargad (*Ficus benghalensis*), Peepal (*Ficus religiosa*), Neem (*Azadirachta indica*), Sal (*Shorea robusta*), etc. Care will be taken to include some fruit bearing trees like Gular (*Ficus glomerata*), Aonla (*Emblica officinalis*), Aam (*Mangifera indica*) and such trees to provide food to the herbivores which in turn will be the food source of the carnivores. Water, particularly during drier seasons, becomes the most important factor to all types of wild animals including the mammals, birds and reptiles. If water is available safely, then all other factors become secondary for the presence and survival of the wild life in any forested area. Places suitable for mini watersheds will be identified in the core as well as in the buffer zone to store rainwater.

Further, to make water available at all the times, throughout the year, some of these water holes will be recharged through artificial means. Proper slope will be given to approach these water sources so that the wild animals will be able to drink water without any difficulty. Proper cover through vegetation or any other type of even artificial cover will be developed near to these water sources so that the prey species will be able to hide themselves from the predators, at the time of approaching the water sources. To attract the birds, plants yielding food to the birds will be planted on priority basis. If water and food are available to the birds without any anthropogenic disturbances the area can become an ideal place for bird watching.

4.3. FINANCIAL PROJECTION

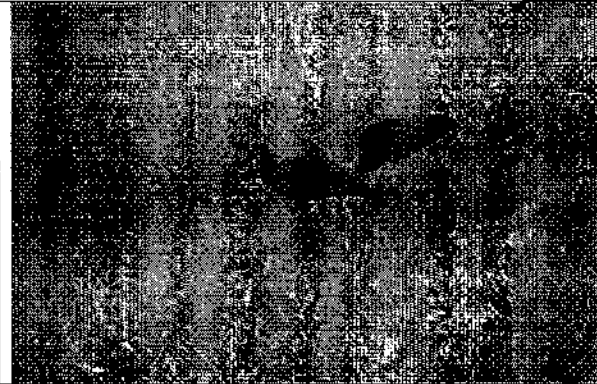


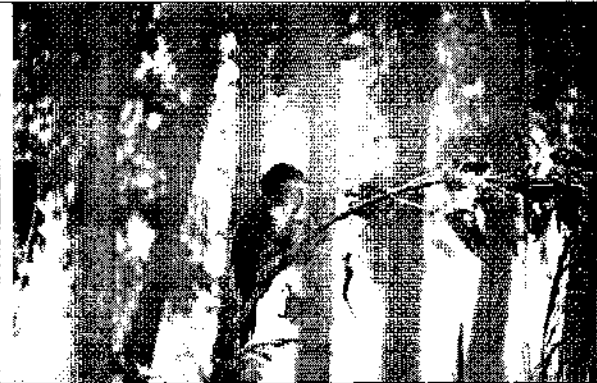


Rs. 20.00 Lakhs (excluding Plantation inside plant premises will be done as per ToR (33% of total land and commitment as per public hearing) has been allocated towards conservation of scheduled fauna in the area for the implementation of conservation proposal.

Table 11: Budget for Conservation/Management Plan

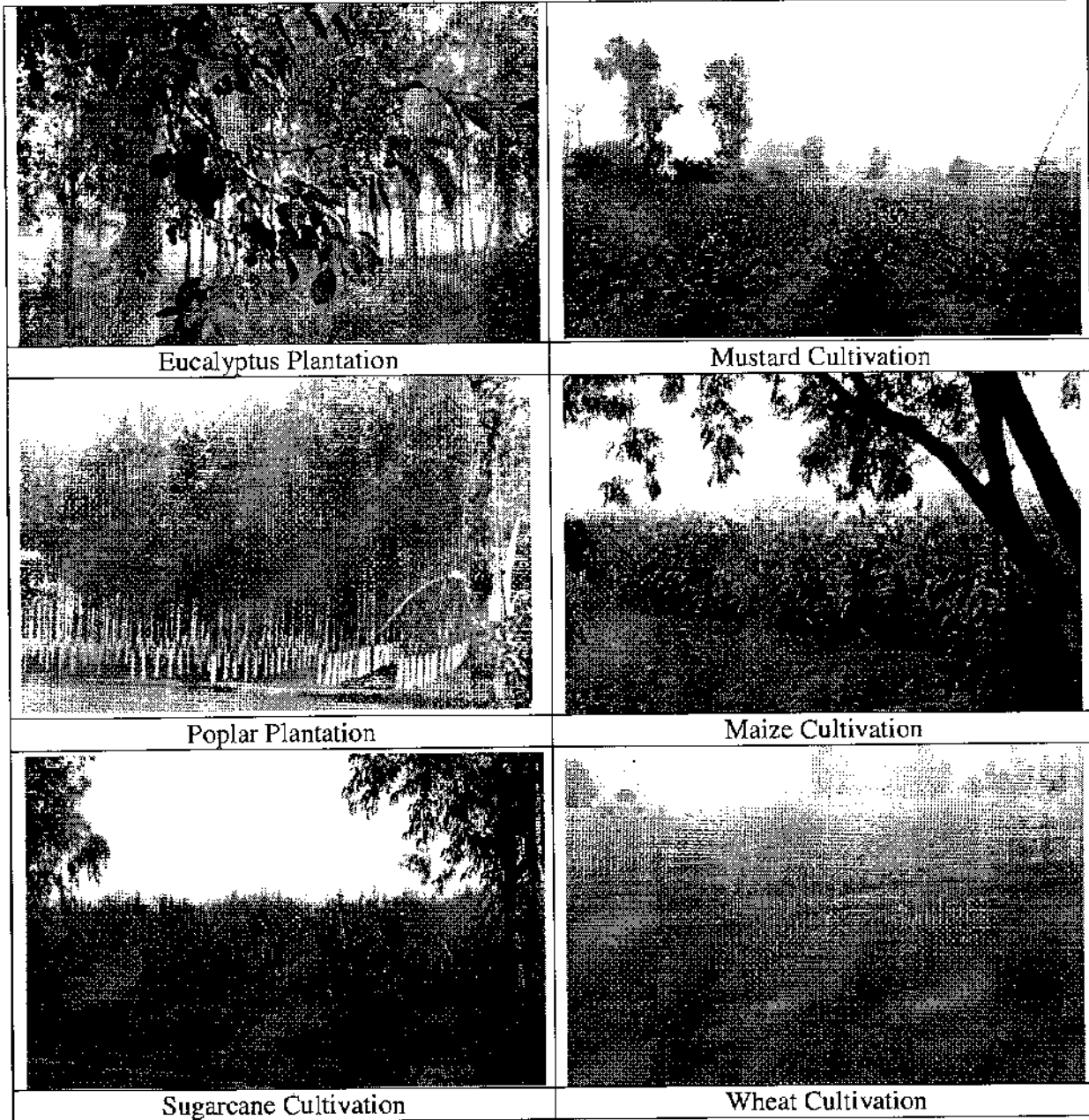
| S. No. | Component | Budget in Rs (Lakh) |
|--------------|---|---------------------|
| 1 | Planting of trees groves in surrounding area and Promotion of agro forest in villages planting fruits trees | 5.00 |
| 2 | Artificial nests, feeding and watering arrangement for animals | 1.00 |
| 3 | Workshops, Training and awareness programs | 1.00 |
| 4 | Water supply | 1.00 |
| 5 | Salt Licks | 1.00 |
| 6 | Contingency | 1.00 |
| Total | | 10.00 |

Annexure-1

PICS OF ANIMALS

| | |
|---|--|
|  |  |
| Black Ibis | Common Moorhen |
|  |  |
| Pond Heron | Water Cormorant |
|  |  |
| Five Striped Palm Squirrel | Common Langur |

BUFFER ZONE



ANNEXURE-7

ANNEXURE-8

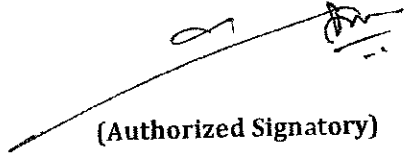
Annexure-VIII

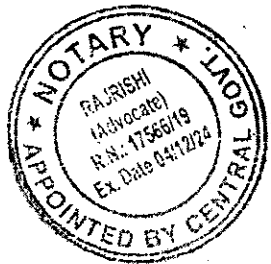
1. That I have applied the application for EC for proposed Makhanpur Unit the above said project whose total project area is 66.32 Ha.
2. That there is no litigation/ order passed by any Court of Law is pending against the project and/or land in which the project is proposed to be set up at and that any such litigation what so ever the sole responsibility will be borne by me. (Area- 66.32Ha at near village - Makhanpur, Tehsil-Faridabad, District- Haryana.
3. That, the mining will not mined to any person including minor minerals and sand.
4. That, No JCB will be used for mining and only semi-mechanized mining will be carried out.
5. That no illegal mining activity has been or is being carried out in the mining lease area. And no illegal mining will be allowed during operation of mine.
6. That, additional minerals mined during the mining will be stored as mining burden and same will be intimated to the State Mines & Geology Department.
7. That, I hereby give undertaking that the data and information given in the application, enclosures and other documents are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance given, if any to the Project will be revoked at our risk and cost.

Date: 10/01/2022

Place: Delhi

M/S Dev & Div Solutions Pvt. Ltd


(Authorized Signatory)



ATTESTED

NOTARY PUBLIC

1 07 JAN 2022

DEV & DIV SOLUTIONS PRIVATE LIMITED

CIN: U14100DL2020PTC365823

31/1, 3RD Floor KCG Heritage Farm, Satberi New Delhi DL 110074 IN

Email: devanddivsolutions@gmail.com, Mobile: +91 9818162912

UNDERTAKING (By Project Proponent)

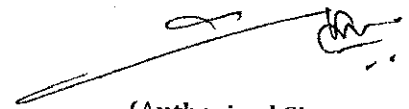
I (Mr. Laxman Kumar Binani), M/S Dev & Div Solutions pvt. Ltd the Authorized Signatory of Proposed Project "Sand Mining Project from River bed of Yamuna River" (Area- 66.32 Ha.) at Near village - Makhanpur, Tehsil-Faridabad, District- Haryana, do here solemnly, affirm and declare as under:

1. That, the each year after the replenishment study the plan & section will be submitted to concerned Department of Mining & Geology of the State for verification and official record
2. That the project /activity pertaining to the mining lease have not in violation as per Ministry's O.M No 3- 50/2017 -1A. IM) dated 30.05.2018 to comply with all the statutory requirements and judgment of Hon'ble Supreme Court dated the 2nd August 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India and Ors.
3. That, the protective and mitigative measures will be taken for the nearby habitation and religious structures in line with the Ministry's O.M. No. Z- 11013/57/2014- IA. II (M) dated 29.10.2014.
4. That, the safeguards which are suggested in sustainable sand mining guidelines as well as notification dated 15.01.2016 ought will be scrupulously followed and taken in EIA/EMP Report.
5. That, the mining will be carried out in accordance with all other provisions as applicable under the Mines Act, 1952, Mines and Minerals (Development and Regulation) Act, 1957, Forest (Conservation) Act, 1980 and Environment (Protection) Act, 1986 and the rules made there under, wild life (Protection) Act 1972, water (Prevention and control of pollution) Act 1974 and Air (Prevention and Control of Pollution) Act, 1981.
6. That, I hereby give undertaking that the data and information given in the application, enclosures and other documents are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance given, if any to the Project will be revoked at our risk and cost.

Date: 10/01/2022

Place: Delhi

M/S Dev & Div Solutions Pvt. Ltd



(Authorized Signatory)

DEV & DIV SOLUTIONS PRIVATE LIMITED

CIN: U14100DL2020PTC365823

31/1, 3RD Floor KCG Heritage Farm, Satberi New Delhi DL 110074 IN
Email: devanddivsolutions@gmail.com, Mobile: +91 9818162912

UNDERTAKING (By Project Proponent)

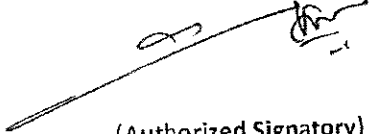
I (Mr. Laxman Kumar Binani), M/S Dev & Div Solutions Pvt. Ltd the Authorized Signatory of Proposed Project "Sand Mining Project from River bed of Yamuna River" (Area- 66.32 Ha.) at Near village – Makhanpur, Tehsil- Faridabad, District- Haryana, do here solemnly, affirm and declare as under:

1. That no illegal mining activity has been or is being carried out in the mining lease area. And no illegal mining will be allowed during operation of mine.
2. That the project /activity pertaining to the mining lease have not in violation as per Ministry's O.M No 3-50/2017 -1A. IM) dated 30.05.2018 to comply with all the statutory requirements and judgment of Hon'ble Supreme Court dated the 2nd August 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India and Ors.
3. That, I hereby give undertaking that the data and information given in the application, enclosures and other documents are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance given, if any to the Project will be revoked at our risk and cost.

Date: 10/01/2022

Place: Delhi

M/S Dev & Div Solutions Pvt. Ltd



(Authorized Signatory)

ANNEXURE-9

DISTRICT SURVEY REPORT

The main objective of the preparation of District Survey Report, as per "The Sustainable Sand Mining Guideline" is to identify the areas of aggradations or deposition where mining can be allowed; and identification of areas of erosion and proximity to infrastructural structures and installations where mining should be prohibited and calculation of annual rate of replenishment and allowing time for replenishment after mining in that area.

1. Introduction

Minor Mineral Deposits:

- 1.1 Faridabad district of Haryana is located in South-eastern part of Haryana State and lies between $28^{\circ}31'17.69''$ to $28^{\circ}8'19.3''$ North latitudes and $77^{\circ}07'34.29''$ to $77^{\circ}32'16.36''$ East longitudes. **The total area is 2151 square kilometers**, in which there are 62 villages, 2 towns, 2 tehsils and 1 sub-tehsils. . Large part of the district of Faridabad is situated between Aravalies in west and river Yamuna in east. Faridabad district is bounded by the state of Delhi in the north, by the state of Uttar Pradesh in the east, in west by Gurugram district and south by Palwal and Mewat Districts.
- 1.2 The district has a sub-tropical continental monsoon climate where we find seasonal rhythm, hot summer, cool winter, unreliable rainfall and great variation in temperature. In winters, frost sometimes occurs during December and January. The district also gets occasional winter rains from cyclones. The rain fall is mostly restricted to rainy season. The district has Aravali hills in the West and flood - plain along the Yamuna river in the east.
- 1.3 River Sand (Minor Minerals) finding use as construction material are found in the river bed areas and flood plain areas. The size and the concentration of material

gradually reduce towards down stream as the heavy material of larger size settles with reduction in flow of water stream. The material deposits are found in villages of the districts located along the river or their flood plains and abandoned water courses/drains.

Quartzite (Minor Minerals) is also found in hilly areas of Aravali within jurisdiction of district Faridabad extending from North-West of the district to South-West of the district sharing with District Gurgaon.

- 1.4 The water of river Yamuna is diverted partly towards Uttar Pradesh and Haryana for different Canal Systems for Irrigation purposes. In the main river bed area, the maximum water is only due to release of water from Kalindikunj Barrage during rainy seasons. The water released in the river during rainy season brings huge quantity of Sand which gets deposits in the river bed area.
- 1.5 Part area of river Yamuna in the State of Uttar Pradesh and part area falls in the State of Haryana. Though in general river Yamuna acts as natural boundary between the two state i.e eastern part in Haryana and western part in Uttar Pradesh. However at certain places, the entire area of river (both sides of river bank) falls in either of the State. In other words there are areas of river where entire riverbed area falls within the jurisdiction of Haryana or Uttar Pradesh.

Location Map of Mineral Bearing Areas:

- 1.6 The minor mineral deposits in the district Faridabad can be divided mainly in two locations / blocks marked on a map prepared by joining **Survey of India Top Sheets** of the area (**Annexure "D"**). The areas broadly can be divided in following Two categories for the purpose of location and type of areas :

- (i) Area in river Yamuna for excavation of Sand [**Location A**]

(ii) Area in Aravali hill range [**Location B**]

This report primarily relates to Location A as a litigation regarding location B is pending for adjudication in Hon'ble Apex court.

Apart from above, Ordinary Clay/Ordinary Earth/Brick earth is also extensively available through the district.

2 Overview of Mining Activity in the District

Grant of Mineral Concessions for Mining of Minor Minerals.

2.1 Mode of grant of mineral concession

Before giving details of actual sites / number of sites or mineral concessions it would be appropriate to explain that the Mineral Concession in respect of minor minerals are granted as per provisions of the State Rules, framed by the respective State Governments in exercise of power under section 15 of the Mines and Minerals (D&R) Act, 1957.

2.1.1 The State of Haryana at the time of bifurcation in 1966, opted prevailing Rules namely "Punjab Minor Mineral Concession Rules 1964". These Rules were amended from time to time as per policy of the State Government for Minor Minerals. The Hon'ble Supreme Court vide its order dated 27.02.2012 directed all State Governments to revise their State Rules making provisions in accordance with various recommendations contained in the report of the 'Group' of MoE&F, GoI, on mining of minor minerals and the Model draft guidelines issued by the Ministry of Mines, GoI.

2.1.2 Accordingly, the State of Haryana comprehensively revised its State Rules namely, the "Haryana Minor Mineral Concession, Stocking, Transportation of Minerals, and Prevention of Illegal Mining Rules, 2012", repealing the prevailing Rules namely

"Punjab Minor Mineral Concession Rules 1964".

- 2.1.3 The mineral concessions in the Haryana are being granted in the form of "**Mining Contract**" or "**Mining Lease**" through competitive bidding process. The Mining Contracts are granted for a minimum period of 07 years and maximum period of 10 years. Whereas the Mining Leases are granted for a minimum period of 10 years and maximum period of 20 years
- 2.1.4 In district Faridabad mineral concessions for Yamuna River bed are/were granted in the form of Mining contracts. The areas selected for mining in river bed are allowed to excavate mineral in the central 3/4th of river bed that too up to a maximum depth of 03 meters from existing level of river bed. Further following conditions are also being imposed for excavation of minor mineral(s) from river beds in order to ensure safety of river-beds, structures and the adjoining areas:
- (i) No mining would be permissible in a river-bed up to a distance of five times of the span of a bridge on up-stream side and ten times the span of such bridge on down-stream side, subject to a minimum of 250 meters on the up-stream side and 500 meters on the down-stream side;
 - (ii) There shall be maintained an un-mined block of 50 meters width after every block of 1000 meters over which mining is undertaken or at such distance as may be directed by the Director or any officer authorized by him;
 - (iii) The maximum depth of mining in the river-bed shall not exceed three meters measured from the un-mined bed level at any point in time with proper bench formation;
 - (iv) Mining shall be restricted within the central 3/4th width of the river/ rivulet;
- 2.1.5 The method of excavation for mineral as stated above takes place only up to a maximum depth of 03 meters in the Central 3/4th part of the river bed. The area left on both side of the river bank not only ensures the safety of banks(bank cutting due

to water stream) but also ensures that in the central part of river, water stream flows smoothly during rains and process of river meandering does not occur. The light weight excavator/JCBs are being deployed to remove mineral from river bed up to maximum depth of 03 meter layer from general level of the bed. The mineral excavated is directly loaded in the vehicles/dumpers and the vehicles owners and drivers take away the mineral directly to the stone crushers or screening plants or consumers. In certain cases mineral concession holders stacks mineral on the river bank in case are not able to sell the material on actual mining itself

2.1.6 Further **in case** of excavation of Ordinary Clay/Ordinary Earth/Brick Short Term Permits are being issued to either the owner of the land or to a person/owner of Brick Kiln, having consent from the owner of the land. The Short Term Permits are being issued under rule 6, 30 and 31 of the "Haryana Minor Mineral Concession, Stocking, Transportation of Minerals, and Prevention of Illegal Mining Rules, 2012".

2.A. Method of Mining in river bed areas (semi-mechanized/mechanized or manual)

2.A.1 The Hon'ble NGT with regards to river bed mining has specifically desired to examine the mode of mining – shall the same be **semi mechanized /mechanized or manual**.

2.A.2 There is no specific definition of **Semi - Mechanized Mining**. The term Semi - mechanized mining in general is used where method of working in general are undertaken mechanically, however, some operations are also undertaken manually. Therefore the semi mechanized mining or mechanized mining, is the same method of working. Sometime mechanized mining with light machines are also referred as semi- mechanized mining. The term semi mechanized mining is being used in general parlance where in the very same mining area in part area as per requirement manual mining is also under taken along with mechanized mining of manual sand/river bed mining.

2.A.3 Whereas **Manual** mining operations are undertaken using conventional hand tools only like chisel, hammer and crowbar etc. and operations are only labour intensive. As per requirement manual lifting of sand and directly loading the sand in tractor trolleys etc. through labours itself.

2.A.4 The **Mechanized** mining operations in respect of sand mining are undertaken with the help of excavator-cum-loaders. In this process sand is lifted/excavated from the river bed through excavator-cum-loaders and directly loaded in dumpers or other mode of transport. The vehicles carrying the mineral from mines to site of use/ site of construction or sale stocks outside lease hold areas (*an independent business than that of mining*).

2.A.5 In the current scenario it is impractical to undertake manual mining because :

- (i) The labours are not easily available;
- (ii) Manual mining cannot be undertaken in systematic and scientific manner as compared to mechanical mining which can be undertaken systematic/ scientific and controlled mining.
- (iii) In case of manual mining to achieve desired level of production more number of manpower would be required meaning thereby human interface within river bed area would increase and more ecological damage would be caused.

2.A.6 The method of mining even otherwise can not be uniform even for same area and all the methods have their own pros and cons, however, considering the current scenario wherever feasible mechanized (semi-mechanized or mechanized is same thing) mining should be preferred over manual method.

2.B Regulation relating to Mining

2.B.1 As per prevailing State Rules the Mineral Concession holders are required to get a Mining Plan for the area prepared from a "Registered Qualified Persons". The mining plan includes the area specific details along with the Mine Closure Plan (Progressive & Final) taking into consideration the details of the geology and lithology of the area including the estimated mineral reserves of the area. Proposed method of mining/ development of mines, use of explosives and blasting operations, if any, stacking and disposal of minerals,

mine-drainage pattern, handling of the overburden, location of weigh bridges, and mineral processing, if any. The extent of manual mining or mining with the use of machinery and mechanical devices along Level of Production (production from year-to-year for a period of five years), Mechanization, Type of Machinery to be used, nature and extent of the mineral body/ spot or spots where the mining operations are proposed to be undertaken; natural water courses, limits of mineral reserves and other forest areas and density of trees, if any, assessment of impact of mining activity on land surface and environment including air and water pollution i.e. the environment management plan. In addition to this Mining plan also suggests the details of scheme of restoration/ rehabilitation of the area through afforestation, land reclamation, use of pollution control devices and such other measures as may be directed by the State Government from time to time.

2.B.2 The Mining Plan are to be got approved from the authorized officer of the State Government. Based on mining plan prior environmental clearance from the competent authority as per provisions of EIA Notification dated 14.09.2006 of MoEF, CC, Gol.

2.B.3 After obtaining the Environmental Clearances as Further, to comply with requirement of Air Act, 1981 the consent to establish and “**consent to operate**” from State Pollution Control Board are also obtained before actual mining

2.B.4 The above said provisions mainly relates to mineral conservation and environmental protection. With regards to provisions related to safety in mines and welfare of labors provisions under the Mines Act, 1952 are ensured by the Directorate General Mines Safety a department under the Ministry of Labour, Government of India.

3 The List of Mining Leases in the District with location, area and period of validity

Areas selected for Mining in District Faridabad

3.1 As per rough estimate total area of rivers beds passing through district Faridabad is about **9 sq. km.** Further recommendation of CEC for approximately 600 Hectares out of entire Aravali range within Faridabad is pending approval before Hon,ble Supreme Court Of India which is also having mineral deposits. As regards selection of area for mining it may be pointed out that:

- (i) Earlier, (about 16-18 years back) mineral concession/mining contracts were being granted for extraction of sand from river Yamuna of district Faridabad on revenue estate basis, subject to various restrictions. The mineral concession holders used to undertake mining in areas after leaving restricted area.
- (ii) Initially about **28 villages (includes 12 villages of present district Palwal)** during joint Faridabad were being offered for mining, as area of some of the villages came under other restrictions either because of construction of some bridges on river bed or due to other development projects including habitation.
- (iii) The mode of grant of mining contracts of individual quarries/revenue estates in Faridabad district was changed in late nineties and instead granting individual quarries on contract, number of adjoining quarries were clubbed for the purpose of granting mineral concession. On 18.04.2000, three zones namely Agwanpur-Basantpur Zone, Chandpur Zone and Murtzabad Zone were auctioned for three years. This mode was further changed and all minor mineral quarries of the district were given "as one unit". In this way their used to be a single contractor for all minor mineral quarries of a "**district as one unit**" from 03.06.2003 for a period up to 28.02.2010.
- (iv) *Needless to state that such **mineral concession areas** use to have even the areas having no mineral deposits the areas otherwise not permissible for mining. The mineral concession holders were under obligation to undertake mining only in the areas free from all restriction and as per prevailing all Rules and Regulations. Mineral Concessions for minor Mineral prior to 14.09.2006 were not required to obtain environmental clearance.*
- (v) The EIA notification dated 14.09.2006 became applicable for fresh contacts/ leases and in the year 2008 for grant of mineral concessions in respect of other areas in the State fresh auction was notified subject to condition that mining will be allowed

- to be undertaken only after prior environmental clearance is obtained as per requirement of EIA notification dated 14.09.2006 of MoEF,CC, GoI. However, said condition was challenged by some prospective bidders on the plea that the notification dated 14.09.2006 was not applicable for mining of minor minerals.
- (vi) The operation of notification dated 14.09.2006 for mining of minor mineral was stayed by the Hon'ble Punjab and Haryana High Court vide its interim order dated 07.04.2008 in CWP No. 4578 of 2008- Chandi Mandir Stone Crusher Consumer Company Vs. Union of India and Others.
- (vii) The State could not have granted long term contracts during the pendency of said case because operation of the notification was under stay and in case long term contracts were granted the mineral concession holders would have claimed that at the time of grant the notification was not applicable for them or may have sought to cancel the contract.
- (viii) Subsequently, the Hon'ble High Court on 15.05.2009 while disposing of the above said writ petition (along with CWP no 20134 of 2004 Vijay Bansal V/s State) upheld that notification dated 14.09.2006 was applicable for mining of minor mineral also.
- (ix) However, as regards the process of obtaining the prior environmental clearance, the Hon'ble High Court directed the process to be followed in two parts. In the first stage, it was directed that the state of Haryana would submit the ToRs to the EAC and the EIA report will be prepared by Expert Appraisal Committee (EAC) in the MoEF, GoI before conducting the auctions. Subsequent to the holding of the auctions, the successful bidder shall obtain the prior environmental clearance from the competent authority.
- (x) The Hon'ble High Court, considering that some time would be required for completing the process as per above, and general public would face problems due to sudden closure of mining, permitted mining without environmental clearance for the period up to 28.02.2010.
- (xi) Accordingly, no long term contract in Faridabad area could be granted due to above litigation and after expiry of the last contract the mining operations was allowed in district Faridabad (as well as in other part of the state) for the period of up to 28.02.2010 without environmental clearance as per orders of Hon'ble High Court.
- (xii) However, the order dated 15.05.2009 of Hon'ble High Court relating to preparation of EIA report by the State Government was not acceptable to the MoEF, CC, GoI. The

MoEF was of the view that state being regulating agency can not prepare the said report at its own. Therefore, the applications submitted by State of Haryana for approval of ToR were not considered.

- (xiii) The MoEF initially filed a Review Application before the Hon'ble High Court and thereafter SLP before the Hon'ble Supreme Court. During the pendency of said matter the state of Haryana neither could take further action relating to preparation of EIA report nor could auctioned its minor mineral areas for grant of mineral concessions subject to condition that Environmental Clearance shall be obtained by the project proponent.
- (xiv) The mining in district Faridabad/other parts of the State came to grinding halt on 01.03.2010.
- (xv) It may be pointed out here itself that since than mining is lying closed in the district. The mining operations prior to 01.03.2010 was either undertaken by the contactors to whom contact was granted prior to 14.09.2006 or under special dispensation granted by the Hon'ble High Court.
- (xvi) Subsequently, Hon'ble Supreme Court on 28.10.2013 while disposing of the SLP No. 729 of 2011 of the MOEF CC, GoI held that prior environmental clearance was to be obtaining by the concerned mining lease holders and not by the State Government. In other words the process for obtaining prior environmental clearance was to be followed as prescribed by MoEF, CC, GoI under its notification dated 14.09.2006 as amended to time to time (uniformly applicable for country).
- (xvii) In view of above the State of Haryana in November, 2013 could issued notifications for grant of mineral concession in the various part of the State including for district Faridabad through open auctions which held in December, 2013.

3.2 Areas Selected for mining in November/ December, 2013 and thereafter, the areas at present on contracts or to be granted on mining contracts

It is stated that two contracts /concessions in district Faridabad had been granted to M/s D.Krish Builders Pvt. Ltd. 624,6th Floor, DLF Tower A, District Centre, Jasola, New Delhi-110025, was the highest bidder (62.50 Crores) for the Sand quarries of Faridabad Unit-1 which include Yamuna riverbed area of villages Basantpur, Agwanpur, Dadasiya, Kiravali, Lalpur, Mahawatpur, Mozmabad, Rajpur Kalan, Baskola, Shikargarh and M/s NCR Real Tech Pvt. Ltd., Plot No. A-101 Sharma Market PWL, Pahaladpur, New Delhi

being the highest bidder (50.00 Crores) for the Sand quarries of Faridabad Unit-2 which include Yamuna riverbed area of villages Shekkhpur, Manjihauli, Gharaura, Ghurasan, Nangla Majra, Chandpur, Shahjahanpur, Imammudinpur, Sahupur Khadar, Arwa, Latifpur, Jaffarpur, Chhainsan and Mohna for which auction was held on 27-12-13. Apart from above villages one more village has taken into consideration namely Amipur through which river Yamuna is passing.

“Letter of Intent” had been issued by the Director Mines & Geology Haryana vide letter dated 03-01-2014 for Mining of Sand (Minor Mineral) in 10 villages of Faridabad Unit-1, over an area of 273.50 hectares for a period of 08 years and in 14 villages of Faridabad Unit-2, over an area of 655.63 hectares for a period of 10 years in district Faridabad, Haryana.

4 Details of Royalty or Revenue received in last three years

Due to NGT orders dated 02.11.2015, both the mining units were restrained to undertake mining operations

5 Detail of Production of Sand or Bajari or minor mineral in last three years

Due to pending litigations in Hon'ble Punjab and Haryana High Court and Hon'ble Supreme Court of India sand mining in the district Faridabad remained vacant since 01.03.2010 hence production in last 3 years is/was nil.

6 Process of Deposition of Sediments in the rivers of the District

Description of formations

Description of formations found in the area is as under:

Soil/ alluvium: The finer sediments have been deposited in the flood plains of the River Yamuna.

6.1 Sand

Sediments of less than 1-3 mm size are predominantly deposited in the riverbed by flood waters during rainy season. There is no perfect classification between Sand and Silt. They have been deposited in a mixed state. As usual the larger size sediments are deposited at the bottom and the smaller sizes are deposited at the top, on the edges/flanks of the riverbed.

However, during the course of shifting of the river course towards East about five hundred years back, silt was deposited on top in thicker layers up to 3 meters in some cases underlain by about 6-15 meters of sand.

Sediments of various sizes and in mixed form are predominantly deposited in the river bed and there is no perfect classification between sediments. These may be called as coarse sand, medium sand and fine sand. The term sand is used to denote an aggregate of mineral or rock grains greater than 1/16mm and less than 2 mm in diameter.

Most sand is made of quartz or its microcrystalline cousin chalcedony, because that common mineral is resistant to weathering. The farther from its source rock sand is, the closer it is to impure quartz. But Yamuna sands contain quartz grains, tiny bits of rock (lithics), or dark minerals like limestone and ferruginous concretions.

The size of the sediments is variable. The grains whether small or large are rounded in shape. Sand is grey, brown in color, coarse to fine grained. The present deposits are of good quality and can be used for building industries. There is no other use of this material.

6.2 Origin and control of mineralization (annual replenishment of mineral in river bed area vis-a-vis sedimentation)

Yamuna basin is bordered by river Yamuna from Yamunanagar to Delhi and National Highway No. 1 from Nilokheri to Delhi. Between Nilokheri and Delhi the National Highway No.1 is aligned on the levee of River Yamuna and acts as water divide between the ancient River Saraswati and Yamuna. The Riverine action deposited several meter thick sand layers in the riverbed. Slow shifting of river Yamuna towards east left behind several meter deep sand deposits, which was subsequently covered by alluvium consisting sand, silt and clay to form topsoil. The Yamuna basin measuring around 1700 sq km is estimated to have 300 billion cu m of sand deposits in the basin.

River sediment is transported based on the strength of the flow that carries it and its own size, volume, density, and shape. Stronger flows will increase the lift and drag on the particle, causing it to rise, while larger or denser particles will be more likely to fall through the flow. Rivers and streams carry sediment in their flows. This sediment can be in a variety of locations within the flow, depending

on the balance between the upwards velocity on the particle (drag and lift forces), and the settling velocity of the particle

If the upwards velocity is approximately equal to the settling velocity, sediment will be transported downstream entirely as suspended load. If the upwards velocity is much less than the settling velocity, but still high enough for the sediment to move (see Initiation of motion), it will move along the bed as bed load by rolling, sliding, and saltating (jumping up into the flow, being transported a short distance then settling again). If the upwards velocity is higher than the settling velocity, the sediment will be transported high in the flow as wash load.

Sedimentation, in the geological sciences, is a process of deposition of a solid material from a state of suspension or solution in a fluid (usually air or water). Broadly defined it also includes deposits from glacial ice and those materials collected under the impetus of gravity alone, as in talus deposits,

or accumulations of rock debris at the base of cliffs. The term is commonly used as a synonym for sedimentary petrology and sedimentology. Sedimentation is generally considered by geologists in terms of the textures; structures, and fossil content of the deposits lay down in different geographic and geomorphic environments. The factors which affects the "Computation of Sediment":

a) Geomorphology & Drainage Pattern: The following geomorphic units plays important role:

- Structural Plain
- Structural Hill
- Structural Ridge
- Denudation Ridge & Valley
- Plain & Plateau of Gangetic plain
- Highly Dissected pediment
- Un dissected pediment

b) Distribution of Basin Area River wise (Area in Sq. Km or Sq. Miles)

c) Drainage System/Pattern of the area (Drainage Density = Km/Sq. Km of Yamuna River)

d) Rainfall & Climate: Year wise Rainfall data for previous 10 years of Yamuna Basin/River

e) As per **Dandy & Bolton study** "Sediment Yield" can be related to

i) Catchment Area and

ii) Mean Annual Run-off

Sand is an essential minor mineral used extensively across the country as a useful construction constituent and variety of other uses in sports, agriculture, glass making (a form of sand with high silica content) etc. It is common knowledge that minerals are non-renewable but this form of mineral naturally gets replenished from time to time in a given river system and is very much interrelated to the hydrological cycle in a river basin.

Sand mining has become a widely spread activity and does not require a huge set up or technology, the number of ventures has increased extensively and it has become a footloose industry in itself but the backward-forward linkages are becoming stronger as many are getting employed as well as the construction activity / industry requires this mineral at consistent rates. In the state of Punjab, sand has been declared as an essential commodity so as to control its extraction and sale price. Andhra Pradesh on the hand is heading towards a lottery system¹. Riverine environmental systems are unique in themselves and provide environmental services, natural resources to meet variety of needs of urban and rural communities. The Rivers originating from the Himalayas bring with them lots of aggregate materials whereas as they move downstream, only finer elements / minerals like sand are found in abundance. River Yamuna near Dak pathar barrage leaves Uttarakhand and enters Himachal Pradesh.

The YAMUNA RIVER is the biggest tributary of the river Ganga in North India. Its source in the Yamunotry glacier at an elevation of 6387 mtrs on South western sides of Banderpooch crests in the lower Himalayan ranges. The overall span of the Yamuna river is 1376 Kms (855 miles) with catchment area of 366223 square km (141,399 square mile). This encompasses 40.2 % of the whole Ganga valley, prior to joining Ganga at Triveni Sangam in Allahabad (UP)

Itinerary of Yamuna River:

The river passes through many states such as Uttrakhand, UP, Haryana, going across to HP and then Delhi. With yearly discharge of around 10,000 cubic billion meters (cbm) and consumption of 4400 cbm (of which irrigation comprises 96), the river represents above 70 of water provision of Delhi. Yamuna water are fairly good quality for its entire span from Yamunotri in Himalayan ranges to Wazirabad in Delhi, the length of which is around 375 Kms.

Itinerary of Drainage area of Yamuna:

The origin of Yamuna is situated in the Yamunotri glacier at an elevation of 6387 mtrs on SE sides of Banderpooch crests, which are located in the Mussoorie range of lower Himalayan range in Uttarakashi district of Uttrakhand, to the North of Haridwar. From this place Yamuna runs to South around 200 Kms across the Shivalik mountain ranges and lower Himalayan ranges. A significant portion of its beginning of Drainage basin (with total area of 2320 square km) is situated in HP and a major tributary sapping the upper drainage basin in the Tons, which is also biggest and most extensive tributary of the Yamuna. Other tributaries in the area are the Rishi Ganga, Giri, Hanuman Ganga, Kurta & Bata, which sap the upper drainage basin of the huge Yamuna river. Subsequently, the river moves down the terrains of Doon basin at Oak Pathar close to Dehradun, in this place water is redirected into a channel for the purpose of electricity generation. Once it goes across the sikh religious place of Ponta Sahib, the river arrives at Mamdubas village near Hathnikund in the YAMUNANAGAR district of Haryana where a Barrage is being constructed. This Barrage/dam is the origin of the two major channels or water courses - Eastern Yamuna Canal and Western Yamuna Canal and both drain in UP & Haryana. The Western Yamuna Canal (WYC) traverses Karnal, Yamunanagar and Panipat prior to arriving at the Haiderpur water treatment plant, which provides a portion of municipal water provisions of Delhi. The Yamuna also forms natural boundary between the states of Uttrakhand & HP and also amid the states of UP and Haryana. Together with the Ganga to which it flows almost parallel once it meets the Indo-Gangetic plateau, the biggest Alluvial productive area in the World, it forms the Ganges-Yamuna Doab are stretched across 69,000 square Km which is 33% of the whole area.

Table of Drainage Basin area of River Yamuna (square

| Sl. No. | State | Area (square Km/square mile) |
|---------|-----------------|------------------------------|
| 1 | HP | 5799/2240 (1.6) |
| 2 | UP & Uttrakhand | 74208/28662 (21.50) |
| 3 | Rajasthan | 102883/39739 (29.80) |
| 4 | Haryana | 21265/8214(6.5) |
| 5 | Delhi | 1485/574(0.4) |
| 6 | MP | 14023/5416 (40.6) |

The closest mountain system in all these places is the Shivaliks i.e. Outer Himalayan region where the sub-mountainous regions begin and eventually expand into plains. As the river flows further down, the reach or its active floodplains increase.

Dandy & Bolton formula for calculation of Sediment Yield:

Dandy bolton formula is often used to check whether the sedimentation yield exceeds the replenishment rate but the whole question is whether there is adequate monitoring of the river basin, the answer is no as hydrological stations are sparsely spread. The formula uses catchment area and mean annual runoff as key determinants to give a yield value. It does not differentiate in basin wide smaller streams and their characteristics. EWE distinguishes river basins as classified and non-classified, as per the latest hydrological data for unclassified River basins; there are 122 GDSW (Gauge, Discharge, Sediment & Water Quality) sites in 12 such basins, the number was 147 in 2005. This brings in context the whole issue of scientific mining, thereby indicating that the monitoring of sediment yield in rivers / streams within the river basin is essential to arrive at extraction rates and express and conduct environmental studies based on these basin wide characteristics which should become part of the Terms of Reference' Sediment Yield versus Drainage Area

Dandy and Bolton studied sedimentation data from about 1500 reservoirs, ponds, and sediment detention basins. In developing their formulas, they used data from about 800 of these reservoirs with drainage areas greater than or equal to 1 mi². The smaller watersheds- those of drainage area less than 1 mi²-were excluded because of their large variability of sediments yield, reflecting the diverse effects of soils, local terrain, vegetation, land use, and agricultural practices.

For drainage areas between 1 and 30,000 mi², Dandy and Bolton found that the annual sediment yield per unit area was inversely related to the 0.16 power of the drainage area: In which $S =$ sediment yield in tons per square mile per year; $SR =$ Reference sediment yield corresponding to a 1-mi² drainage area, equal to 1645 tons per year; $A =$ drainage area in square miles; and $AR =$ reference drainage area (1 mi²)

Sediments Yield versus Mean Annual Runoff

Dandy and Bolton studied sedimentation data from 505 reservoirs having mean annual runoff data. Annual sediment yield per unit area was shown to increase sharply as mean annual runoff O increased from 0 to 2 inches. Thereafter, for mean annual runoff from 2 to 50 inches, annual sediment yield per unit area decreased exponentially. This led to the following equations.

For $O < 2$ in.:

For $O > 2$ in.:

In which OR = reference mean annual runoff $OR = 2$ in.

Dandy and Bolton combined above equations into a set of equations to express sediment yield in terms of drainage area and mean annual runoff(Q).

For $Q < 2$ in.:

For $Q > 2$ in.:

Sediment Productions/yield.

For $S = 1645$ tons/mi²/y, $Q = 2$ in., and $A = 1$ mi², reduces to the followings:

For $Q < 2$ in.: $S = 1280 Q^{0.46}(1.43 - 0.26 \log A)$

For $Q > 2$ in.: $S = 1965e^{-0.055Q}(1.43 - 0.26 \log A)$

Above equations are based on average values of grouped data; therefore, they should be used with caution. In Certain cases, local factors such as soils, geology, topography, land use, and vegetation may have greater influence on sediment yield than either mean annual runoff or drainage area. Nevertheless, these equations provide a first approximation to be regional assessment of sediment yield for watershed planning purposes.

Calculation of Sediment Yield for Sand Mines of Faridabad-

- Area under riverbed: 9 square KM.
- Drainage basin area of river Yamuna in Haryana : 21265 square kilometers
- Average Annual Runoff from Yamuna Nagar to Palwal district: 140.50 mm
(the data used for runoff calculation is of the year 2004-2008 of district Yamunanagar, Karnal, Panipat, Sonipat, Faridabad and 25% is being taken as runoff)

With above inputs, the calculation of the sediment yield by the Dandy and Bolton formula is illustrated below:

Formulas

$$\text{For } Q < 2: \quad S = 1280 Q^{0.46} [1.43 - 0.26 \log(A)]$$

$$\text{For } Q \geq 2: \quad S = 1965 e^{-0.055Q} [1.43 - 0.26 \log(A)]$$

[Q (mm), A (km²), Y (tons/km²/yr)]

Reference

Ponce, V. M., 1989. Engineering Hydrology, Principles and Practices, Prentice Hall, pages 547-548.

With above formula the value of $S = 209.39 \text{ T/square KM/annum}$

Therefore the Total Sediment Yield per annum for drainage basin of 21265 square kilometers will be $= 21265 \times 209.39 = 44,52,678 \text{ T per annum}$.

Dandy & Boltan formula also says that actual sediments yield from individual drainage basins may vary 10-fold or even 100 fold from computed yields. Since itinerary of river Yamuna indicates that its basin comprises of sediment rocks with good average rainfall and high drainage density therefore there are fair chances of yield of sediments to be 50 fold of computed results hence Annual Sediment Yield will be : $44,52,678 \text{ T} \times 50 \text{ fold} = 22,26,33,900 \text{ T / Annum}$. Even if calculated on lower site of 10 foals then also the Annual Sediment Yield will be $44,52,678 \times 10 = 4,45,26,780 \text{ T / Annum}$.

The equations express the general relationships between sediment yield runoff and drainage area. They may provide a quick rough approximation of mean sediment yields on a regional basis for preliminary watershed planning. Because Dandy & Bolton have derived the equation from average values computed sediment yields normally would be low for highly erosive area and high for well stabilized drainage basins with high plant density. Factors which have direct bearing on sediments yield & limitations of Dandy & Bolton equation.

Sediment yield of a sediment basin has direct impact of local terrain, climate, vegetation, soils, agricultural practices & land use pattern of catchment area of the sediment basin aforesaid factors varies from basin to basin therefore, Dandy & Bolton has category stated that use of the equation to predict sediment yield for a specific location would be unwise because of the wide variability caused by local factors not considered in the equation development. Actual sediment yield from individual drainage basins may vary 10-fold or even 100-fold from computed yields.

The sediments are river borne and are the product of sedimentary process. The entire river bed is having ample quantity of sediments. The size of the sediments depends upon the velocity of flow of water in the river.

River sediment are transported based on the strength of the flow that carries it and its own size, volume, density, and shape. Stronger flows will increase the lift and drag on the particle, causing it to rise, while larger or denser particles will be more likely to fall through the flow. Rivers and streams carry sediment in their flows. This sediment can be in a variety of locations within the

flow, depending on the balance between the upwards velocity on the particle (drag and lift forces), and the settling velocity of the particle

If the upwards velocity is approximately equal to the settling velocity, sediment will be transported downstream entirely as suspended load. If the upwards velocity is much less than the settling velocity, but still high enough for the sediment to move (see Initiation of motion), it will move along the bed as bed load by rolling, sliding, and saltating (jumping up into the flow, being transported a short distance then settling again). If the upwards velocity is higher than the settling velocity, the sediment will be transported high in the flow as wash load.

7 General Profile of the District

As regards to the profile of the district is concerned on the western edge of the district there are varieties of formations of Oelhi Super Group ranging from 200 at bottom and 315 at top. On the eastern edge of the district is river Yamuna

8 Land Utilization Pattern in the district:

Forest, Agriculture, Horticulture, Mining etc. In district Faridabad, part area is under Agriculture and Horticulture, part area is for mining and few part of land is also forest.

9 Physiography of the District:

9.1 Physiography, Hydrogeology, Drainage and Climate

The area of is marked by flat topography of sedimentary formations, which are surrounded by fine-grained blown soil overlying the sand deposits. Highest elevation is 191.70 mRL & lowest 181.10 mRL in the proposed lease area.

The Yamuna river flows from N to S direction. The alluvial ground surface area over lying sand some distance away from the riverbed is under cultivation. It is believed that in the past, the River Yamuna used to flow closer to the present GT road which has now moved about 5-15 kms towards east.

9.2 Hydrogeology

Ground water occurs in alluvium and the underlying weathered/ fractured quartzite. Alluvium comprises sands silt, kankar and gravel which form the principal ground water bearing horizon. In Quartzite formation, occupying the north- western part of the district, ground water occurs in weathered and jointed fractured horizons.

Weathering and fracturing has resulted in formation of semi-consolidated sand beds (BADARPUR SANDS) which form potential aquifer zones. The Depth of water level lies between 3.35 to 18.00 m.bgl during pre-monsoon and 3.96 to 21.00 m.bgl during post-monsoon period in the district. In small areas in the west, in parts of Palwal and Hathin blocks, shallow water level 2 to 5m deep was observed. Deeper water level, in the depth range of 10m to 15 m occurs in the south-eastern parts of Ballabgarh and Faridabad blocks. Water level elevation range from 220 to 180 m amsl and the general groundwater flow is towards southeast and east. Isolated Groundwater mounds and troughs in different parts of the district have been created because of heavy pumping in city area. In general water table has declined all over the district over the past

10 Rainfall:

ENVIRONMENT STATISTICS (CLIMATE)

Monthly Normal Rainfall by Districts Average of 5 years (2004-2008)

No. 4.2

| District | (Millimetres) | | | | |
|--------------|---------------|----------|------------------|-------|-------|
| | January | February | Monthly March | April | May |
| 1 | 2 | 3 | 4 | 5 | 6 |
| Ambala | 28.60 | 51.50 | 46.50 | 12.30 | 47.70 |
| Panchkula | 39.06 | 40.40 | 56.40 | 3.80 | 34.80 |
| Yamunanagar | 28.36 | 41.56 | 32.96 | 18.56 | 33.70 |
| Kurukshetra | 17.40 | 24.90 | 21.10 | 4.80 | 24.90 |
| Kaithal | 7.48 | 19.48 | 23.12 | 5.64 | 29.26 |
| Karnal | 16.60 | 34.90 | 19.50 | 6.10 | 39.80 |
| Parbhani | 13.80 | 16.90 | 22.90 | 3.20 | 17.20 |
| Sonapat | 10.80 | 17.30 | 19.30 | 4.70 | 38.90 |
| Rohilk | 5.40 | 12.30 | 18.70 | 8.40 | 27.20 |
| Ajajjar | 3.44 | 17.46 | 21.24 | 0.80 | 30.82 |
| Faridabad | 4.84 | 15.94 | 18.90 | 0.00 | 30.64 |
| Gurgaon | 1.72 | 24.58 | 24.32 | 2.04 | 34.52 |
| Mewat | 0.0 | 16.32 | 7.20 | 1.00 | 21.24 |
| Rawan | 2.64 | 23.24 | 22.34 | 3.84 | 31.38 |
| Mahendragarh | 4.68 | 21.96 | 14.30 | 8.68 | 28.82 |
| Bhivani | 3.20 | 18.06 | 18.72 | 8.44 | 35.24 |
| Jind | 10.74 | 32.56 | 27.94 | 5.08 | 43.34 |
| Hisar | 6.76 | 15.90 | 16.66 | 6.16 | 22.22 |
| Rateshbad | 7.53 | 16.16 | 17.30 | 10.10 | 23.36 |
| Gisra | 2.80 | 14.30 | 16.50 | 3.30 | 11.10 |

ENVIRONMENT STATISTICS (CLIMATE)

Monthly Normal Rainfall by Districts Average of 5 years (2004-2008)

No. 4.2 (Concl.)

(Millimetres)

| District | Monthly | | | | | | | | Annual |
|--------------|---------|--------|--------|-----------|---------|----------|----------|---------|--------|
| | June | July | August | September | October | November | December | Total | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
| Ambala | 102.03 | 233.86 | 271.10 | 104.00 | 20.00 | 1.20 | 1.00 | 1034.00 | |
| Panchkula | 76.40 | 208.40 | 209.00 | 115.24 | 22.40 | 1.00 | 4.00 | 819.28 | |
| Yamunanagar | 158.20 | 234.96 | 171.00 | 45.10 | 6.00 | 0.00 | 1.10 | 395.60 | |
| Kurukshetra | 64.03 | 93.58 | 95.70 | 167.68 | 3.54 | 0.00 | 0.00 | 423.28 | |
| Kaithal | 60.14 | 86.10 | 104.00 | 60.40 | 12.60 | 1.00 | 0.00 | 442.59 | |
| Karnal | 58.15 | 69.13 | 106.50 | 122.40 | 6.20 | 1.40 | 0.00 | 493.30 | |
| Parbhani | 63.63 | 108.90 | 118.20 | 67.00 | 21.40 | 5.80 | 0.20 | 569.72 | |
| Sonbat | 71.52 | 128.70 | 140.50 | 61.40 | 10.80 | 2.60 | 3.40 | 460.70 | |
| Rohatak | 64.40 | 68.60 | 110.00 | 68.04 | 7.40 | 0.0 | 0.00 | 493.60 | |
| Jhajjar | 78.00 | 117.56 | 115.12 | 56.00 | 25.80 | 0.44 | 0.00 | 491.20 | |
| Faridabad | 45.52 | 127.10 | 156.72 | 62.68 | 50.60 | 6.46 | 0.64 | 451.08 | |
| Gurgaon | 51.80 | 94.26 | 133.72 | 14.32 | 0.0 | 0.00 | 0.00 | 199.78 | |
| Mewar | 47.06 | 61.80 | 33.60 | 63.20 | 3.00 | 0.00 | 0.00 | 304.80 | |
| Palwal | 72.23 | 132.24 | 100.02 | 66.10 | 9.60 | 2.04 | 1.50 | 503.62 | |
| Mehendragarh | 155.12 | 66.24 | 76.26 | 56.04 | 10.60 | 1.16 | 0.76 | 404.84 | |
| Rithwan | 66.23 | 60.96 | 113.56 | 108.54 | 12.48 | 2.80 | 1.08 | 530.68 | |
| And | 90.74 | 130.86 | 113.66 | 50.32 | 5.38 | 2.20 | 1.48 | 230.66 | |
| Mirat | 62.10 | 63.38 | 57.62 | 66.60 | 1.00 | 0.54 | 1.40 | 335.78 | |
| Fatehabad | 65.03 | 64.40 | 66.20 | 27.20 | 3.00 | 1.00 | 1.50 | 229.36 | |
| Sisra | 57.23 | 41.00 | 30.26 | 27.20 | 3.00 | 1.00 | 1.50 | 229.36 | |

Source: Director of Land Records, Haryana

11 Geology and Mineral Wealth

11.1 Regional Geology

The regional geology of Distt. Faridabd & Palwal (Haryana) is represented by varieties of formations belonging to Delhi Super Group. Stratigraphically the rock formations of Delhi super group are composed of arenaceous, argillaceous & calcareous sediments. These sediments have been placed by Heron (1923) in the Alwar & Ajabgarh series of Delhi system & intruded by basic granitic rocks.

The general succession of Delhi system can be represented as follows: (Das, Gupta S.P. 1968)

| Series | Rock Types |
|-------------------|--|
| Recent intrusives | Alluvium, dune sand, soil, ankerite, chert, quartz veins, younger basic dykes. Granites, Pegmatites, |

| | | |
|-----------------|----|---|
| | | Quartz veins Older basic rocks. |
| Ajabgarh series | 8. | Carbonaceous phyllites & schists etc. (Local). |
| | 7. | Massive Quartzites. |
| | 6. | Phyllites, Mica-shists (Local). |
| | 5. | Marble, calc-gneiss, amphibolite etc. |
| | 4. | Schist with or without garnet. Stauroite, Kyanite, Sillimenite, Andalusite, phyllites, sandy phyllites. |
| Alwar series | 3. | Amphibole quartzite, marble, Amphibolites. |
| | 2. | Arkosic quartzites, quartzites & Interealated phyllite & schists. Magnetite & Hametite quartzites etc. |
| | 1. | Phyllite & schists. |

11.2 LOCAL GEOLOGY

River sand found in Distt. Faridabad & Palwal are Alluvial sediments of fluvial deposits brought down from Himalayas from the upstream side by river Yamuna and its tributaries which have variable thickness depending upon the original land form on which deposition took place. The river sand is most recent deposit of clean sand deposited by river Yamuna and is being reworked every year.

The litho units encountered in the river bed are younger sedimentary formations in nature and are brought by river water from high reaches of Himalayan range of hills of Himachal Pradesh. The sediments are river borne and have been deposited in the riverbed and its flood plains.

i) Geology of the area

The sediments of the river bed are of recent nature. These sediments have been brought by river water and deposited in the bed of Yamuna river. The following sequence of formations has been observed in the area:

- Soil/Alluvium
- Sand

In district Faridabad there is only one source of river sand i.e. river Yamuna.

12. Drainage system with description of main rivers

| S. No. | Name of the river | Area drained (Sq. Km) | % Area drained |
|--------|------------------------|-----------------------|----------------|
| 1 | Yamuna River (1376 km) | 21265 | 6.5 |

13. Salient Feature of Important Rivers and Streams:

| S. No. | Name of the River or Stream | Total Length in the District (in Km) | Place of origin | Altitude at Origin |
|--------|-----------------------------|--------------------------------------|-----------------|---------------------------|
| 1 | River Yamuna | 38.50 | Yamnotri | 3291 mts Or 10797 feet |

14. Methodology adopted for calculation of Mineral Potential

| Portion of the River or Stream Recommended for Mineral Concession | Length of area recommended for mineral concession (in kilometer) | Average width of area recommended for mineral concession (in meters) | Area recommended for mineral concession (in square meter) | Mineable mineral potential (in metric tonne) (60% of total mineral potential) |
|---|--|--|---|---|
| 35 km | 35 | 290 meters | 1,01,50,000 Sqm | 2,74,05,000 MT |

15. Present Status of mining**16. Mineral Potential**

| Sand (MT) min. | Total Mineable Mineral Potential (MT) |
|-------------------|---------------------------------------|
| 2,74,05,000 | 2,74,05,000 |
| Annual Deposition | |
| 4,45,26,780 | 4,45,26,780 |

Recommendation:

From the above, it is clear that about 2,74,05,000 MT of mineral is available up to depth of three meters in the river bed of Yamuna River in Faridabad District. The annual deposition is 4,45,26,780 MT. Hence, 2,74,05,000/- MT of mineral can be safely removed and disposed off every year.

Further, if any new area with mineral deposit is available in future, inadvertently left out or received under any scheme of the Government from neighboring state then the same will also be part of the mineral concession.

District Faridabad

| Faridabad | Sr. No. | Name of village | Area earlier auction in 2013 (in hectare) | Re-verified area (in hectare) | Area for ancillary activity |
|----------------|---------|------------------------|---|-------------------------------|-----------------------------|
| Sand Unit (I) | 1 | Bsantpur | 117.80 | 00.00 | Nil |
| | 2 | Agawanpur | 11.20 | 00.00 | Nil |
| | 3 | Dadasia | 56.40 | 58.50 | 12.65 |
| | 4 | Kidawali | 13.10 | 13 | 00.00 |
| | 5 | Lalpur | 11.20 | 0.93 (Part) | 00.00 |
| | 6 | Mahawatpur | 13.80 | 27.60 (part) | 10.82 |
| | 7 | Mojmabad | 4.40 | 1.30 | 00.00 |
| | 8 | Baskola | 12.40 | 12.25 | 00.00 |
| | 9 | Dungarpur | 00.00 | 15.41 | 10.00 |
| | 10 | RajpurKalan | 18.00 | 4.80 | 00.00 |
| | 11 | Shikargah | 15.20 | 15.00 | 00.00 |
| | 12 | Amipur | 00.00 | 66.23 | 25.2 |
| Total | | | 273.50 | 215.02 | 58.42 |
| Sand Unit (II) | 1 | Shekhpura | 60.50 | 00 (due to bridge) | 00.00 |
| | 2 | Manjhawali | 163.00 | 00 (due to bridge) | 00.00 |
| | 3 | Gharora | 15.95 | 00 (due to bridge) | 00.00 |
| | 4 | Ghorasan | 23.10 | 15.90 (part area) | 10.00 |
| | 5 | Dalelgarh | 00.00 | 05.00 | 00.00 |
| | 6 | NanglaMajra | 7.80 | 6.52 | 00.00 |
| | 7 | Chandpur | 14.45 | 12.29 | 10.00 |
| | 8 | Imamudeenpur | 5.20 | 00 (due to bridge) | 00.00 |
| | 9 | Arwa | 38.90 | 00 (due to bridge) | 00.00 |
| | 10 | Sajhapur | 9.50 | 6.55 (2.85+3.7) | 05.00 |
| | 11 | SahupuraKhadar | 62.60 | 25.50 (part) | 10.00 |
| | 12 | Parasrampur (Dhulepur) | 00.00 | 19.26 | 00.00 |
| | 13 | Latifpur | 20.60 | 64 | 00.00 |
| | 14 | Makanpur | 00.00 | 56 | 10.00 |
| | 15 | Bhikuka | 00.00 | 4.66 | 00.00 |
| | 16 | Jaffarpur | 20.85 | 1.26 | 00.00 |
| | 17 | Chainsa | 112.00 | 34.29 | 15.00 |
| | 18 | Mohna | 101.20 | 00 (due to bridge) | 00.00 |
| Total | | | 655.63 | 243.80 | 60.00 |

ANNEXURE-10

REPLENISHMENT STUDY REPORT

FOR

SAND MINE LOCATED AT

MAKHANPUR UNIT

VILLAGE- MAKHANPUR

TEHSIL- FARIDABAD

DISTRICT- FARIDABAD, STATE-HARYANA

TOTAL LEASE AREA-66.32 Hect. (NON-FOREST)

PRODUCTION CAPACITY -24, 00,000 T/ANNUM

M/s DEV & DIV SOLUTIONS PVT. LTD.

R/o- 31/1,3rd floor KCG Heritage Farm, Satberi, New Delhi-110074 India.

e-mail: devanddivsolutions@gmail.com

Vardan Environet

(A NABET Accredited Consultant)

82A, Sector-5, IMT Manesar, Gurgaon

Phone /Fax.;0124-4291036,9929108691

email: info@vardanenvironet.com

Annexure X

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

INDEX

| Sr.No. | Description | Page No. |
|--------|-------------------------------|----------|
| 1 | The Project | 1-2 |
| 2 | Object of Replenishment Study | 3 |
| 3 | Replenishment Study | 4-14 |

Map

| Sr. No. | Details of Annexure | Page No. |
|---------|---------------------------------------|----------|
| 1. | Pre-Monsoon Contour Map | 15 |
| 2. | Post-Monsoon Contour Map | 16 |
| 3. | Composite Section of Pre and Post map | 17 |

Table

| Sr. No. | Description | Page No. |
|---------|---------------------------------|----------|
| 1 | Calculation of sand Replenished | 18-37 |

Figure

| Sr. No. | Description | Plate No |
|---------|-----------------|----------|
| Fig -1 | Mine Site Photo | 38 |
| Fig -1 | 3D View | 39 |

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

SUBJECT : REPORT ON REPLENISHMENT STUDY FOR RIVER BED MINING PROJECT OF MINOR MINERAL SAND OF MAKHANPUR UNIT , (SAND MINOR MINERAL),RIVER BED, DISTRICT: FARIDABAD, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

This is fresh LOI.

1) The Project :

M/s Dev & Div Solutions Pvt. Ltd., R/o 31/1,3rd floor KCG Heritage Farm, Satberi, New Delhi-110074 India owns the mines of Sand Minor Mineral of Makhanpur Unit in revenue village Makhanpur over an area of 66.32 hectares in District- Faridabad, Haryana for a period of 07 years and this is River Bed deposit lying in the Yamuna River Bed.

Details of the Mining Area

a) Details of the land covered in the 'Area' is as notified by Hr. Govt. on 15-12-2014 are as under:-

Mining Contract of Makhanpur Sand unit (Minor Mineral) over an area of 66.32 ha is located in District - Faridabad, containing one mining block namely Makhanpur River bed block.

Table -1: Block wise, village wise & Khasra wise details of proposed mining area

| Details of Khasra No/Kila Nos Name of Village & Area of block in ha |
|--|
| MAKHANPUR UNIT, AREA- 66.32 Hect. |
| 6/7Min,12Min,13,14,17,18,19,20min,21,22,23 |
| 7//16 Min,17Min,22Min,23Min,24Min,25 Min |
| 11//23 Min,24 Min,25 Min |
| 13//4Min,5Min,6,7Min,8Min,9Min,11Min,12Min,13,14,15,16,17,18,19,20,21,22,23,24,25Min |
| 14//1Min,2Min,3,4,5,6,7,8,9,10,11,12,13,14, Min,15Min,18Min,19Min,20,21Min |
| 15//1,2,3 Min,9Min,10Min |
| 18//1,2,3Min,4 Min,8Min,9Min,10Min,11Min |
| 19//1,2,3,4,5,6,7,8,9,10,11,12,13,14Min,17Min,18 Min,19Min,20Min |
| 20//3,4,5,6,7,8,9,12,13,14,15,16,17,18,19,20,21,22,23,24,25, |
| 22//5,6,7,8,12,13,14,15,16Min,17,18,19,20,21,22,23 |
| 23//1,2,3,4Min,5Min,8 Min,9Min,10,11Min |
| 33//1,2,3,4Min,8 Min,9,10,11,12,13 Min,18 Min,19 ,20,21,22,23Min |
| 36//1,2 Min,10Min,11Min,20Min,21Min |
| 47//1Min,10Min,11Min |

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

For Ancillary area

4//11,12,13,14,15,16,17,18,19,20,21,22,23,24,25

7//1,2,3,4,5,6,7,8,9,10,11,12,13,14,15

It forms a part of G. T. Sheet No's - H43X7

Co-ordinates of the lease area as under

The area is bounded by coordinates between latitude N 28° 16' 18.96" to N 28° 15' 32.67" and longitude E 077° 29' 24.98" to E 077° 28' 15.78" on Topo sheet No. H43X7 as approved by Department of Mines and Geology, Govt. of Haryana as under- (Plate No 1.)

Boundary Pillar of Makhanpur Unit

| | | |
|----|------------------|------------------|
| A | 28° 16' 18.96" N | 77° 29' 24.98" E |
| B | 28° 16' 17.60" N | 77° 29' 19.56" E |
| C | 28° 16' 16.47" N | 77° 29' 13.21" E |
| D | 28° 16' 14.66" N | 77° 29' 3.87" E |
| E | 28° 16' 11.64" N | 77° 28' 52.38" E |
| F | 28° 16' 9.75" N | 77° 28' 35.11" E |
| G | 28° 15' 59.29" N | 77° 28' 23.11" E |
| H | 28° 15' 54.60" N | 77° 28' 13.35" E |
| I | 28° 15' 45.20" N | 77° 28' 11.25" E |
| J | 28° 15' 34.27" N | 77° 28' 12.11" E |
| A1 | 28° 16' 17.49" N | 77° 29' 46.37" E |
| A2 | 28° 16' 9.65" N | 77° 29' 41.87" E |
| B1 | 28° 16' 11.56" N | 77° 29' 19.43" E |
| C1 | 28° 16' 10.33" N | 77° 29' 15.21" E |
| D1 | 28° 16' 9.65" N | 77° 29' 12.11" E |
| E1 | 28° 16' 7.08" N | 77° 29' 3.49" E |
| F1 | 28° 16' 3.00" N | 77° 28' 51.14" E |
| G1 | 28° 16' 0.52" N | 77° 28' 43.44" E |
| H1 | 28° 15' 57.26" N | 77° 28' 32.93" E |
| I1 | 28° 15' 55.01" N | 77° 28' 27.18" E |
| J1 | 28° 15' 52.99" N | 77° 28' 23.80" E |
| K1 | 28° 15' 52.16" N | 77° 28' 23.14" E |
| L1 | 28° 15' 44.06" N | 77° 28' 18.54" E |
| M1 | 28° 15' 42.16" N | 77° 28' 16.32" E |
| N1 | 28° 15' 34.23" N | 77° 28' 15.94" E |
| O1 | 28° 15' 32.67" N | 77° 28' 15.78" E |

2) Objective for Replenishment Study

The requirements of the "Replenishment Study" as per the terms of LOI letter are as below:

As per LOI condition no.4.19 the proponent will prepare a Mining Plan along with the Mine closure Plan (Progressive & Final) from the Recognized Qualified Person as per chapter10 of the State Rules, 2012 for the "Mining Unit" and shall not commence mining operations in any area except in accordance with such Mining Plan duly approved by an officer authorized by the Director, Mines & Geology, in this behalf.

Further, as per condition no. 4.20 the actual mining will be allowed to be commenced only after prior Environment clearance is obtained by you as the LOI holder/ Mining contractor for the Mining Unit from the Competent Authority as required under EIA notification dated 14 /09 /2006 issued by Ministry of Environment, Forests and climate change, Government of India or as amended from time to time and also other required approvals for mining including Consent to Establish and Consent to Operate from the Haryana State Pollution Control Board before commencement of actual mining operations.

In order to prepare a systematic mining plan of the area is required to estimate the reserves status of the area w.r.t to anticipated replenishment per year .The applicant approached to Vardan Enviornet, Gurgaon to carry out post monsoon replenishment study to ascertain the quantity of material replenished and production should not be more than the quantity replenished. The proponent will submit the replenishment study report to Regional Office, MoEF & CC every year.

Need for present Annual Replenishment Study

Project Proponent M/s Dev & Div Solutions Pvt. Ltd. appointed M/S Vardan Environet, Gurgaon, an Environmental Consulting Company for undertaking:

- a) Pre-monsoon survey and replenishment study, In the present case it is not feasible being a fresh LOI.
- b) Post-monsoon survey and replenishment study
- c) To prepare composite sections of pre and post monsoon survey findings.
- d) To calculate the volume of sand replenished during study period.
- e) Finally to prepare "Replenishment Study Report".

3. Replenishment Study

3.1 Period of Survey for sedimentation survey and replenishment study

Pre-monsoon: 15th to 20th June, 2021 – Not applicable (Google Time Series)

Post-monsoon: 18th to 21st September, 2021

3.2 General Introduction:

Sand is an essential minor mineral used extensively across the country as a useful construction constituent and variety of other uses in sports, agriculture, glass making (a form of sand with high silica content) etc. It is common knowledge that minerals are non-renewable but this form of mineral naturally gets replenished from time to time in a given river system and is very much interrelated to the hydrological cycle in a river basin. Sand mining has become a widely spread activity and does not require a huge set up or technology, the number of ventures has increased extensively and it has become a footloose industry in itself but the backward-forward linkages are becoming stronger as many are getting employed as well as the construction activity / industry requires this mineral at consistent rates. In the state of Punjab, sand has been declared as an essential commodity so as to control its extraction and sale price. Andhra Pradesh on the hand is heading towards a lottery system¹. Riverine environmental systems are unique in themselves and provide environmental services, natural resources to meet variety of needs of urban and rural communities. The Rivers originating from the Himalayas bring with them lots of aggregate materials whereas as they move downstream, only finer elements / minerals like sand are found in abundance. River Yamuna near Dak pathar barrage leaves Uttarakhand and enters Himachal Pradesh.

The YAMUNA RIVER is the biggest tributary of the river Ganga in North India. Its source in the Yamunotry glacier at an elevation of 6387 mtrs on South western sides of Banderpooch crests in the lower Himalayan ranges. The overall span of the Yamuna river is 1376 Kms (855 miles) with catchment area of 366223 square km (141,399 square mile). This encompasses 40.2 % of the whole Ganga valley, prior to joining Ganga at Triveni Sangam in Allahabad (UP)

Itinerary of Yamuna River:

The river passes through many states such as Uttrakhand, UP, Haryana, going across to HP and then Delhi. With yearly discharge of around 10,000 cubic billion meters (cbm) and consumption of 4400 cbm (of which irrigation comprises 96), the river represents above 70 of water provision of Delhi. Yamuna water are fairly good quality for its entire span from Yamunotri in Himalayan ranges to Wazirabad in Delhi, the length of which is around 375 Kms.

Itinerary of Drainage area of Yamuna:

The origin of Yamuna is situated in the Yamunotri glacier at an elevation of 6387 mtrs on SE sides of Banderpooch crests, which are located in the Mussoorie range of lower Himalayan range in Uttrakashi district of Uttrakhand, to the North of Haridwar. From this place Yamuna runs to South around 200 Kms across the Shivalik mountain ranges and lower Himalayan ranges. A significant portion of its beginning of Drainage basin (with total area of 2320 square km) is situated in HP and a major tributary sapping the upper drainage basin in the Tons, which is also biggest and most extensive tributary of the Yamuna. Other tributaries in the area are the Rishi Ganga, Giri, Hanuman Ganga, Kunta & Bata, which sap the upper drainage basin of the huge Yamuna River. Subsequently, the river moves down the terrains of Doon basin at Oak Pathar close to Dehradun, in this place water is redirected into a channel for the purpose of electricity generation. Once it goes across the sikh religious place of Ponta Sahib, the river arrives at Mamdubas village near Hathnikund in the YAMUNANAGAR district of Haryana where a Barrage is being constructed. This Barrage/dam is the origin of the two major channels or water courses - Eastern Yamuna Canal and Western Yamuna Canal and both drain in UP & Haryana. The Western Yamuna Canal (WYC) traverses Karnal, Yamunanagar and Panipat prior to arriving at the Haiderpur water treatment plant, which provides a portion of municipal water provisions of Delhi. The Yamuna also forms natural boundary between the states of Uttrakhand & HP and also amid the states of UP and Haryana. Together with the Ganga to which it flows almost parallel once it meets the Indo-Gan getic plateau, the biggest Alluvial productive area in the World, it forms the Ganges-Yamuna Doad are stretched across 69,000 square Km which is 33% of the whole area. Table of Drainage Basin area of River Yamuna (square KM/square mile) with of Drainage Basin.

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

| | |
|--------------------|----------------------|
| 1 . HP | 5799/2240 (1.6) |
| 2. UP & Uttrakhand | 74208/28662 (21.50) |
| 3. Rajasthan | 102883/39739 (29.80) |
| 4. Haryana | 21265/8214(6.5) |
| 5 . Delhi | 1485/574(0.4) |
| 6 . MP | 14023/5416 (40.6) |

The closest mountain system in all these places is the Shivaliks i.e. Outer Himalayan region where the sub-mountainous regions begin and eventually expand into plains. As the river flows further down, the reach or its active floodplains increase.

3.3 Physiography:

Faridabad district of Haryana is located in South-eastern part of Haryana State and lies between 28°31'17.69" to 28°8'19.3" North latitudes and 77° 07'34.29" to 77°32'16.36" East longitudes. The total area is 2151 square kilometers, in which there are 62 villages, 2 towns, 2 tehsils and 1 sub-tehsils. . Large part of the district of Faridabad is situated between Aravalies in west and river Yamuna in east. Faridabad district is bounded by the state of Delhi in the north, by the state of Uttar Pradesh in the east, in west by Gurugram district and south by Palwal and Mewat Districts.

The district has a sub-tropical continental monsoon climate where we find seasonal rhythm, hot summer, cool winter, unreliable rainfall and great variation in temperature. In winters, frost sometimes occurs during December and January. The district also gets occasional winter rains from cyclones. The rain fall is mostly restricted to rainy season. The district has Aravali hills in the West and flood - plain along the Yamuna river in the east.

River Sand (Minor Minerals) finding use as construction material are found in the river bed areas and flood plain areas. The size and the concentration of material gradually reduce towards downstream as the heavy material of larger size settles with reduction in flow of water stream. The material deposits are found in villages of the districts located along the river or their flood plains and abandoned water courses/drains. Quartzite (Minor Minerals) is also found in hilly areas of Aravali within jurisdiction of district Faridabad extending from North-West of the district to South-West of the district sharing with District Gurgaon.

The water of river Yamuna is diverted partly towards Uttar Pradesh and Haryana for different Canal Systems for Irrigation purposes. In the main river bed area, the maximum

water is only due to release of water from Kalindikunj Barrage during rainy seasons. The water released in the river during rainy season brings huge quantity of Sand which gets deposits in the river bed area.

Part area of river Yamuna in the State of Uttar Pradesh and part area falls in the State of Haryana. Though in general river Yamuna acts as natural boundary between the two state i.e eastern part in Haryana and western part in Uttar Pradesh. However at certain places, the entire area of river (both sides of river bank) falls in either of the State. In other words there are areas of river where entire riverbed area falls within the jurisdiction of Haryana or Uttar Pradesh.

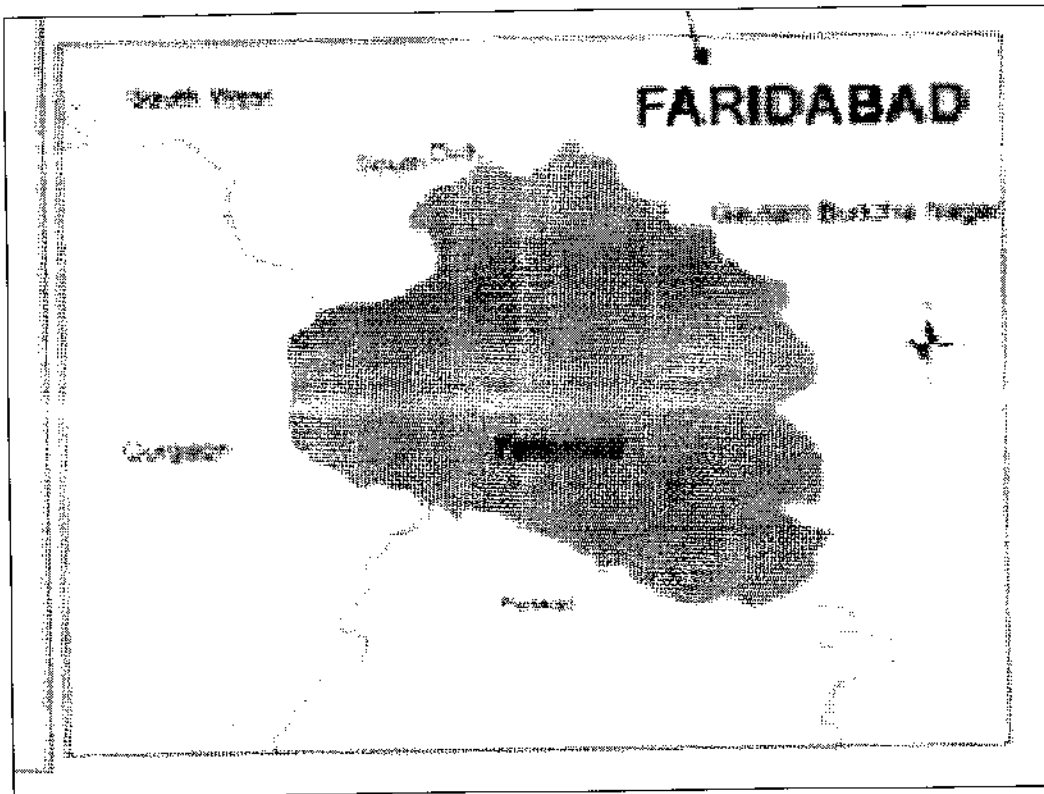
Hydrogeology Ground water occurs in alluvium and the underlying weathered/ fractured quartzite. Alluvium comprises sands silt, kankar and gravel which form the principal ground water bearing horizon. In Quartzite formation, occupying the north- western part of the district, ground water occurs in weathered and jointed fractured horizons. Weathering and fracturing has resulted in formation of semi-consolidated sand beds (Yamuna SANDS) which form potential aquifer zones. The Depth of water level lies between 3.35 to 18.00 m.bgl during pre-monsoon and 3.96 to 21.00 m.bgl during post-monsoon period in the district. In small areas in the west, in parts of Palwal and Hathin blocks, shallow water level 2 to 5m deep was observed. Deeper water level, in the depth range of 10m to 15 m occurs in the south-eastern parts of Ballabgarh and Faridabad blocks. Water level elevation range from 220 to 180 m amsl and the general groundwater flow is towards southeast and east. Isolated Groundwater mounds and troughs in different parts of the district have been created because of heavy pumping in city area. In general water table has declined all over the district over the past.

DEPTH TO WATER LEVEL

The Depth of water level lies between 3.35 to 18.00 m.bgl during pre-monsoon and 3.96 to 21.00 m.bgl during post-monsoon period in the district. In small areas in the west, in parts of Palwal and Hathin blocks, shallow water level 2 to 5m deep was observed. Deeper water level, in the depth range of 10m to 15 m occurs in the south-eastern parts of Ballabgarh and Faridabad blocks. Water level elevation range from 220 to 180 m amsl and the general groundwater flow is towards southeast and east. Isolated Groundwater mounds and troughs

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

in different parts of the district have been created because of heavy pumping in city area. In general water table has declined all over the district over the past.



last ten years, majority of observation points in the district have shown declining trends ranging from 0.00013 m/yr to 0.389m/yr, however, area as not recorded any significant rise during last ten years. The discharge of the shallow tubewells tapping unconfined aquifers is tube wells ranges from 100 lpm to 500 lpm with moderate Drawdown values. Near Manakpur, a phreatic aquifer extending down to 88.0m bgl has Transmissivity value of 2500m²/day, lateral hydraulic conductivity of 31m /day .

(Source: District Groundwater Brochure CGWB)

Sedimentation, in the geological sciences, is a process of deposition of a solid material from a state of suspension or solution in a fluid (usually air or water). Broadly defined it also includes deposits from glacial ice and those materials collected under the impetus of gravity alone, as in talus deposits, or accumulations of rock debris at the base of cliffs. The term is commonly used as a synonym for sedimentary petrology and sedimentology.

Sedimentation is generally considered by geologists in terms of the textures, structures, and fossil content of the deposits lay down in different geographic and geomorphic environments.

The factors which affects the "Computation of Sediment":

a) Geomorphology & Drainage Pattern : The following geomorphic units plays important role :

- Structural Plain
- Structural Hill
- Structural Ridge
- Denudation Ridge & Valley
- Plain & Plateau of Gangetic plain
- Highly Dissected pediment
- Un dissected pediment

b) Distribution of Basin Area River wise (Area in Sq. Km or Sq. Miles)

c) Drainage System/Pattern of the area (Drainage Density = Km/Sq. Km)

d) Rainfall & Climate: Year wise Rainfall data for previous 10 years

e) As per Dandy & Bolton study "Sediment Yield" can be related to

i) Catchment Area and

ii) Mean Annual Run-off

Sand is an essential minor mineral used extensively across the country as a useful construction constituent and variety of other uses in sports, agriculture, glass making (a form of sand with high silica content) etc. It is common knowledge that minerals are non-renewable but this form of mineral naturally gets replenished from time to time in a given river system and is very much interrelated to the hydrological cycle in a river basin.

The Rivers originating from the Himalayas bring with them lots of aggregate materials whereas as they move downstream, only finer elements / minerals like sand are found in

abundance. River Yamuna near Dakpathar barrage leaves Uttarakhand and enters Himachal Pradesh.

The Yamuna River is the biggest tributary of the river Ganga in North India. Its source in the Yamunotry glacier at an elevation of 6387 mtrs on South western sides of Banderpooch crests in the lower Himalayan ranges. The overall span of the Yamuna river is 1376 Kms (855 miles) with catchment area of 366223 square km (141,399 square mile). This encompasses 40.2 % of the whole Ganga valley, prior to joining Ganga at Triveni Sangam in Allahabad (UP)

Dandy & Boltan formula for calculation of Sediment Yield:

Dandy Bolton formula is often used to check whether the sedimentation yield exceeds the replenishment rate but the whole question is whether there is adequate monitoring of the river basin, the answer is no as hydrological stations are sparsely spread. The formula uses catchment area and mean annual runoff as key determinants to give a yield value. It does not differentiate in basin wide smaller streams and their characteristics. CWC distinguishes river basins as classified and non-classified, as per the latest hydrological data for unclassified River basins; there are 122 GDSW (Gauge, Discharge, Sediment & Water Quality) sites in 12 such basins, the number was 147 in 2005. This brings in context the whole issue of scientific mining, thereby indicating that the monitoring of sediment yield in rivers / streams within the river basins is essential to arrive at extraction rates and express and conduct environmental studies based on these basin wide characteristics which should become part of the 'Terms of Reference' for Environmental Clearance.

Sediment Yield versus Drainage Area

Dandy and Bolton studied sedimentation data from about 1500 reservoirs, ponds, and sediment detention basins. In developing their formulas, they used data from about 800 of these reservoirs with drainage areas greater than or equal to 1 mi². The smaller watersheds- those of drainage area less than 1 mi²-were excluded because of their large variability of sediments yield, reflecting the diverse effects of soils, local terrain, vegetation, land use, and agricultural practices.

For drainage areas between 1 and 30,000 mi², Dandy and Bolton found that the annual sediment yield per unit area was inversely related to the 0.16 power of the drainage area:

In which S= sediment yield in tons per square mile per year; SR = Reference sediment yield

Corresponding to a 1-mile square drainage area, equal to 1645 tons per year; A = drainage area in square miles; and AR = reference drainage area (1 mi²)

Sediments Yield versus Mean Annual Runoff

Dandy and Bolton studied sedimentation data from 505 reservoirs having mean annual runoff data. Annual sediment yield per unit area was shown to increase sharply as mean annual runoff Q increased from 0 to 2 in. Thereafter, for mean annual runoff from 2 to 50 in. annual sediment yield per unit area decreased exponentially.

This led to the following equations.

For $Q < 2$ in.:

For $Q > 2$ in.:

In which QR = reference mean annual runoff QR = 2 in.

Dandy and Bolton combined Eqs. 15-10 and 15-11 into a set of equations to express sediment

yield in terms of drainage area and mean annual runoff.

For $Q < 2$ in.:

For $Q > 2$ in.:

Sec: 15.2 Sediment Productions.

For SR = 1645 tons/mi²/y, QR = 2 in., and AR = 1 mi², Eq. 15-12 reduces to the followings:

For $Q < 2$ in.: $S = 1280 Q^{0.46} (1.43 - 0.26 \log A)$

For $Q > 2$ in.: $S = 1965e^{-0.055Q} (1.43 - 0.26 \log A)$

Equations 5-12 and 5-13 are based on average values of grouped data; therefore, they should be used with caution. In Certain cases, local factors such as soils, geology, topography, land use, and vegetation may have greater influence on sediment yield than either mean annual runoff or drainage area. Nevertheless, these equations provide a first approximation to be of sediment yield for watershed planning purposes.

Calculation of Sediment Yield for Sand Mine of Makhanpur Unit

- Area under riverbed : 66.32 Ha

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

- Normal Annual Rainfall of Faridabad district (1978 to 2005) :1057mm or 42.28 inch With above inputs, the calculation of the sediment yield by the Dandy and Bolton formula is illustrated below :

| Sample Set | S.No. | Q (in inches) | A (in square mile) | S |
|------------|-------|---------------|--------------------|----------|
| | 1 | 3.5 | 150 | 1400.823 |
| | 2 | 27.4 | 8214 | 179.4756 |

$$S = 1965 e^{-0.055Q} [1.43 - 0.26 \log(A)]$$

Dandy & Bolton formula also says that actual sediments yield from individual drainage basins may vary 10-fold or even 100 fold from computed yields. Since river Yamuna River indicates that its basis comprises of sediment rocks with good average rainfall therefore there are fair chances of yield of sediments to be 50 fold of computed results hence Actual Sediment Yield will be : 24,00,000 T per Annum.

The equations express the general relationships between sediment yield runoff and drainage area.

They may provide a quick rough approximation of mean sediment yields on a regional basis for preliminary watershed planning. Because Dandy & Bolton have derived the equation from average values computed sediment yields normally would be low for highly erosive area and high for well stabilized drainage basins with high plant density. Factors which have direct bearing on sediments yield & limitations of Dandy & Bolton equation.

Sediment yield of a sediment basin has direct impact of local terrain, climate, vegetation, soils, agricultural practices & land use pattern of catchment area of the sediment basin aforesaid factors varies from basin to basin therefore, Dandy & Bolton has category stated that use of the equation to predict sediment yield for a specific location would be unwise because of the wide variability caused by local factors not considered in the equation development. Actual sediment yield from individual drainage basins may vary 10-fold or even 100-fold from computed yields.

Assessment & Monitoring:

The mining of the mineral from the river bed area would be undertaken over maximum depth of 3 meter from the existing level of the bed, which at present is 192 mRL. It will be ensured that at no point of time the mining is undertaken below the 3 meter of the existing bed level. To ensure the compliance of the same Annual River

bed monitoring of would be ensured by taking the bed level at fixed GCP's at regular intervals. It is proposed that the MRL of the river bed area of the contracted area length wise would be taken after every 500 meter after regular intervals i.e at the time of commencement of mining, on 30th June, 15th September (immediately after end of monsoon season), 30th December, and 31st March.

Therefore it is recommended that Project Proponent is required to conduct sedimentation study of the project area every year through reputed agency so that accordingly production can be monitored regularly.

3.2.5 Grade & Use of sand

Sand is made of quartz or quartzite/its microcrystalline cousin chalcedony, because that common mineral is resistant to weathering. Sand mineral contain quartz, feldspar grains, tiny bits of rock (lithics), or dark minerals like ilmenite and magnetite.

The size of the sediments is variable. The grains whether small or large are rounded in shape. Sand is mainly grey, brown in color, coarse to fine grained. The present deposits are of good quality and can be used for building industries. There is no other use of this material.

Name of prospecting /exploration agency-

Department of Geology and Mines Haryana have identified potential segments in Yamuna River near Faridabad district found depositional sites for sand. Accordingly department carved sand blocks for auction. Finding it low costs mineral and useful for common man No detailed exploration was proposed in the area.

Methodology and approach followed for Replenishment studies

- a) Pre-monsoon survey and replenishment study At present not applicable since the LOI was granted on 16.8.2021
- b) Post-monsoon survey and Conducted with the provided coordinates given by Mines and Geology Department on Sep2021 by fixing GCP's and Geo-referencing.
- c) To prepare composite sections of pre and post monsoon survey findings(for Pre-monsoon season profile period sep 2021 has been considered on time series

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

- d) To calculate the volume of sand pre-monsoon data and post monsoon data as above are considered.
- e) Difference in volume and multiplying with Bulk density 2.0 , volume is converted to Reserves”
- f) Post monsoon survey of River bed conducted with the help of GPS and Drone
- g) Grid pattern 30 m x 20 m (30 m along the length of the river and 20 m along width of the river) or part thereof.
- h) To draw pre-monsoon contour using Google map image on time series is considered Post-monsoon survey of River bed with the help of GPS and Drone
- i) Same Grid pattern (30 m x 20 m) or part thereof was considered for survey.
- j) To draw post-monsoon contour map (Base map considered as per approved mining plan)
- k) To draw composite sections of Pre and post monsoon maps. This will determine the depth and volume of sand replenished.
- l) Finally to calculate the volume of sand with grid pattern of 30 m x 20 m multiplied by depth of replenishment.
- m) The tonnage of replenishment will be volume of sand multiplied by density of sand (which is 2 T per Cubic m)

Software & Equipment Deployed

Equipment:

- DGPS
- Drone

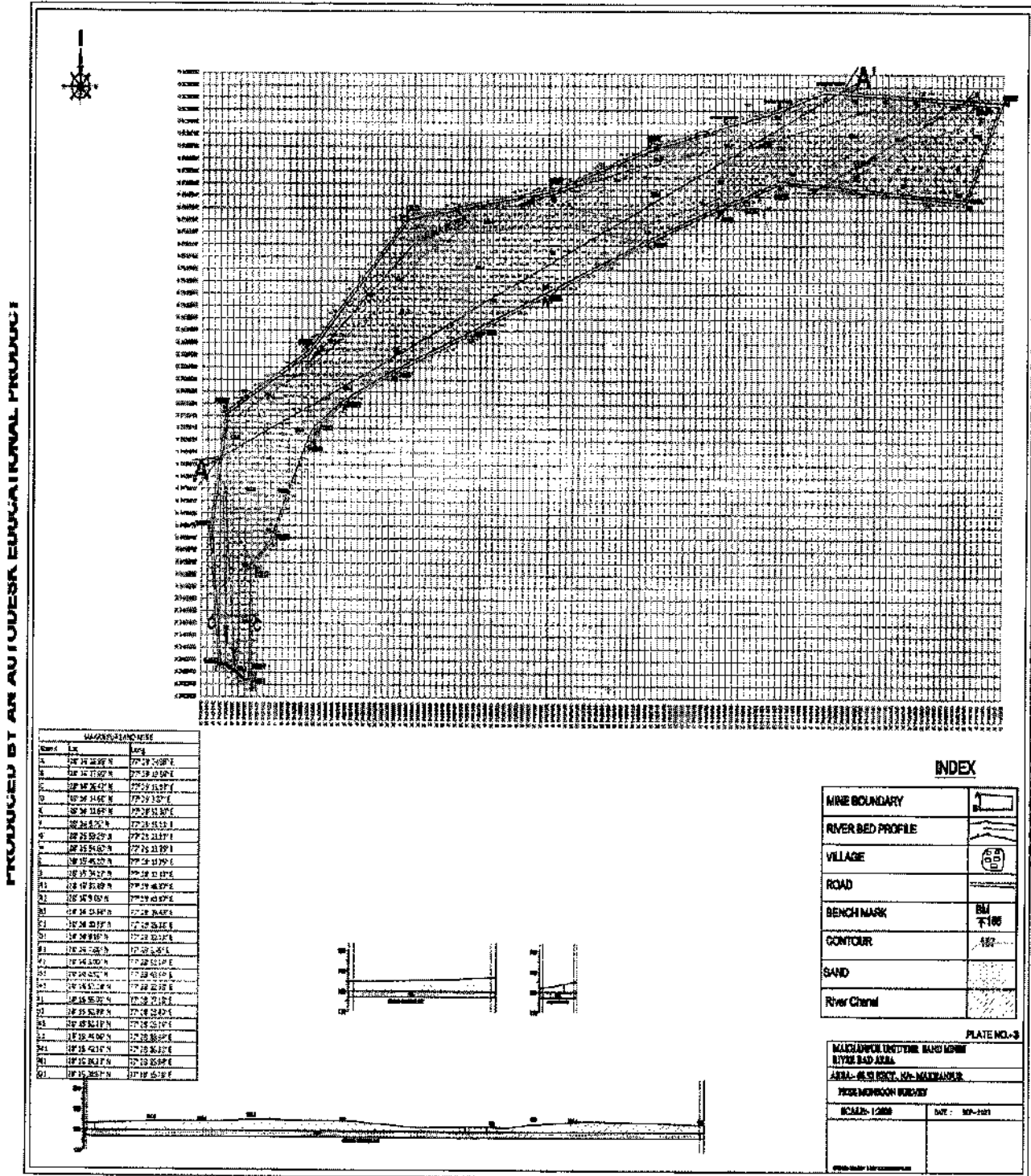
Software:

- Drone Mapper (Software)
- DJI Mavic GPS & Glonass Based Software
- Arc GIS 10.8 (Software)
- AutoCad 2007 (Software)
- Global Mapper 10.0
- Google earth Pro

Annexure X

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

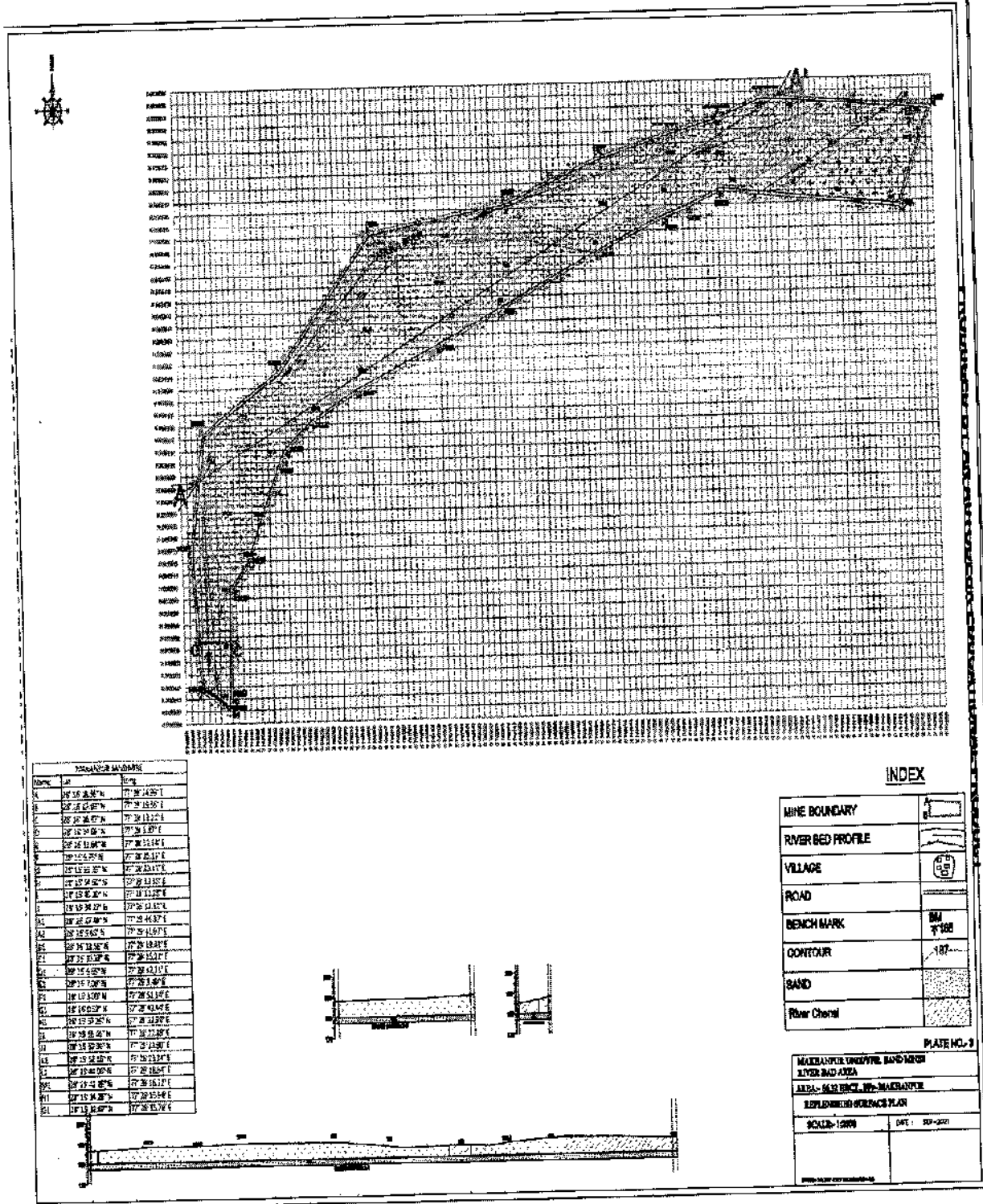
a) Pre-monsoon Contour Map (Grid Pattern 30m x 20m or part thereof)



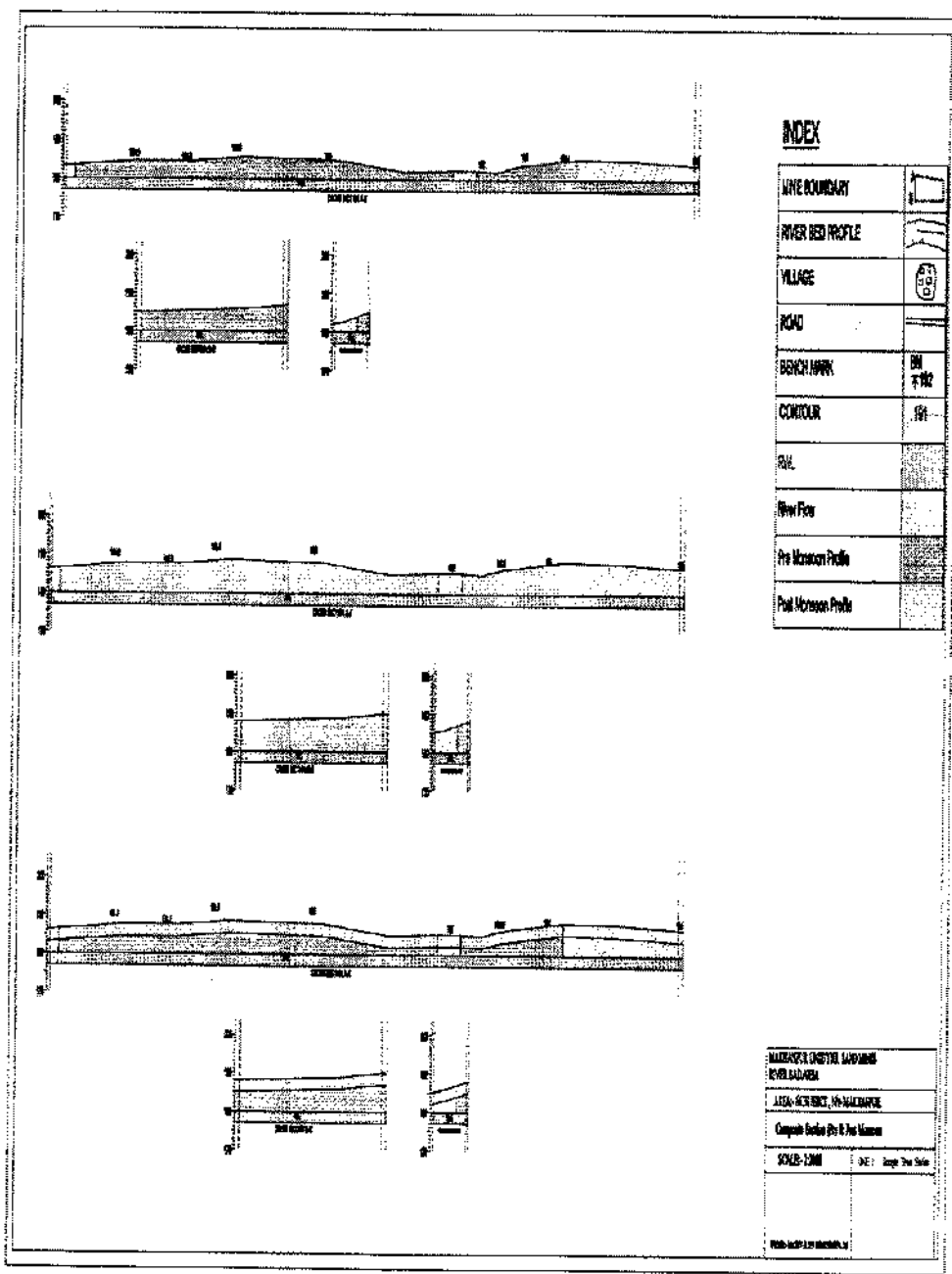
Annexure X

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

B) Post-monsoon Contour map (Grid Pattern : 30m x 20m or part thereof)



C. Composite section of Pre & Post Monsoon Contour Map



Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

a) Tonnage Calculation of Sand Replenished

| Grid | Post Monsoon Elevation | Grid Area | Pre Monsoon Elevation | Difference of Elevation (Pre And Post Monsoon) in m | Total reserve in T | Mineable Reserve for 3 mtr Depth of Sand | Replenished Reserve Tonnage |
|------|------------------------|-----------|-----------------------|---|--------------------|--|-----------------------------|
| 31 | 191.3 | 300 | 188.3 | 3 | 1800 | 3 | 1800 |
| 32 | 191.3 | 600 | 188.3 | 3 | 3600 | 3 | 3600 |
| 33 | 191.3 | 600 | 188.3 | 3 | 3600 | 3 | 3600 |
| 34 | 191.3 | 600 | 188.3 | 3 | 3600 | 3 | 3600 |
| 35 | 191.3 | 600 | 188.3 | 3 | 3600 | 3 | 3600 |
| 36 | 191.3 | 600 | 188.3 | 3 | 3600 | 3 | 3600 |
| 37 | 191.3 | 600 | 188.3 | 3 | 3600 | 3 | 3600 |
| 98 | 191.3 | 300 | 188.3 | 3 | 1800 | 3 | 1800 |
| 99 | 191.3 | 600 | 188.8 | 2.5 | 3600 | 3 | 3000 |
| 100 | 191.3 | 600 | 188.8 | 2.5 | 3600 | 3 | 3000 |
| 101 | 191.3 | 600 | 188.8 | 2.5 | 3600 | 3 | 3000 |
| 102 | 191.3 | 600 | 188.8 | 2.5 | 3600 | 3 | 3000 |
| 103 | 191.3 | 600 | 188.3 | 3 | 3600 | 3 | 3600 |
| 104 | 191.3 | 600 | 188.3 | 3 | 3600 | 3 | 3600 |
| 105 | 191.3 | 600 | 188.3 | 3 | 3600 | 3 | 3600 |
| 116 | 191.3 | 300 | 188.3 | 3 | 1800 | 3 | 1800 |
| 117 | 191.3 | 300 | 188.3 | 3 | 1800 | 3 | 1800 |
| 118 | 191.3 | 600 | 188.3 | 3 | 3600 | 3 | 3600 |
| 119 | 191.3 | 600 | 188.3 | 3 | 3600 | 3 | 3600 |
| 120 | 191.3 | 600 | 188.3 | 3 | 3600 | 3 | 3600 |
| 121 | 191.3 | 600 | 188.3 | 3 | 3600 | 3 | 3600 |
| 122 | 191.3 | 600 | 188.3 | 3 | 3600 | 3 | 3600 |
| 123 | 191.3 | 600 | 188.3 | 3 | 3600 | 3 | 3600 |
| 124 | 191.3 | 600 | 188.3 | 3 | 3600 | 3 | 3600 |
| 125 | 191.3 | 600 | 188.8 | 2.5 | 3600 | 3 | 3000 |
| 126 | 191.3 | 600 | 188.8 | 2.5 | 3600 | 3 | 3000 |
| 127 | 191.3 | 600 | 188.3 | 3 | 3600 | 3 | 3600 |
| 128 | 191.3 | 600 | 188.3 | 3 | 3600 | 3 | 3600 |
| 197 | 188.5 | 300 | 185.5 | 3 | 1800 | 3 | 1800 |
| 198 | 188.5 | 600 | 185.5 | 3 | 3600 | 3 | 3600 |
| 199 | 188.5 | 600 | 185.5 | 3 | 3600 | 3 | 3600 |
| 200 | 188.5 | 600 | 185.5 | 3 | 3600 | 3 | 3600 |
| 201 | 188.5 | 600 | 185.5 | 3 | 3600 | 3 | 3600 |
| 202 | 188.5 | 600 | 185.5 | 3 | 3600 | 3 | 3600 |

Annexure X

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

| | | | | | | | |
|-----|-------|-----|-------|-----|------|---|------|
| 203 | 188.5 | 600 | 186 | 2.5 | 3600 | 3 | 3000 |
| 204 | 188.5 | 600 | 186 | 2.5 | 3600 | 3 | 3000 |
| 205 | 188.5 | 600 | 186 | 2.5 | 3600 | 3 | 3000 |
| 206 | 188.5 | 600 | 186 | 2.5 | 3600 | 3 | 3000 |
| 207 | 188.5 | 600 | 186 | 2.5 | 3600 | 3 | 3000 |
| 208 | 188.5 | 600 | 186 | 2.5 | 3600 | 3 | 3000 |
| 233 | 188.5 | 300 | 186 | 2.5 | 1800 | 3 | 1500 |
| 234 | 188.5 | 600 | 186 | 2.5 | 3600 | 3 | 3000 |
| 235 | 188.5 | 600 | 186 | 2.5 | 3600 | 3 | 3000 |
| 236 | 188.5 | 600 | 186 | 2.5 | 3600 | 3 | 3000 |
| 237 | 188.5 | 600 | 185.5 | 3 | 3600 | 3 | 3600 |
| 238 | 188.5 | 600 | 185.5 | 3 | 3600 | 3 | 3600 |
| 239 | 188.5 | 600 | 185.5 | 3 | 3600 | 3 | 3600 |
| 240 | 188.5 | 600 | 185.5 | 3 | 3600 | 3 | 3600 |
| 241 | 188.5 | 600 | 185.5 | 3 | 3600 | 3 | 3600 |
| 242 | 188.5 | 600 | 185.5 | 3 | 3600 | 3 | 3600 |
| 243 | 188.5 | 600 | 185.5 | 3 | 3600 | 3 | 3600 |
| 318 | 188.5 | 300 | 185.5 | 3 | 1800 | 3 | 1800 |
| 319 | 188.5 | 300 | 186 | 2.5 | 1800 | 3 | 1500 |
| 320 | 188.5 | 600 | 186 | 2.5 | 3600 | 3 | 3000 |
| 321 | 188.5 | 600 | 186 | 2.5 | 3600 | 3 | 3000 |
| 322 | 188.5 | 600 | 185.5 | 3 | 3600 | 3 | 3600 |
| 323 | 188.5 | 600 | 185.5 | 3 | 3600 | 3 | 3600 |
| 324 | 188.5 | 600 | 185.5 | 3 | 3600 | 3 | 3600 |
| 325 | 188.5 | 600 | 185.5 | 3 | 3600 | 3 | 3600 |
| 326 | 188.5 | 300 | 185.5 | 3 | 1800 | 3 | 1800 |
| 363 | 191 | 300 | 188 | 3 | 1800 | 3 | 1800 |
| 364 | 191 | 600 | 188 | 3 | 3600 | 3 | 3600 |
| 365 | 191 | 600 | 188 | 3 | 3600 | 3 | 3600 |
| 366 | 191 | 600 | 188 | 3 | 3600 | 3 | 3600 |
| 367 | 191 | 600 | 188 | 3 | 3600 | 3 | 3600 |
| 368 | 191 | 600 | 188 | 3 | 3600 | 3 | 3600 |
| 369 | 191 | 600 | 188 | 3 | 3600 | 3 | 3600 |
| 370 | 191 | 600 | 188 | 3 | 3600 | 3 | 3600 |
| 371 | 191 | 600 | 188 | 3 | 3600 | 3 | 3600 |
| 372 | 191 | 600 | 188 | 3 | 3600 | 3 | 3600 |
| 373 | 191 | 600 | 188 | 3 | 3600 | 3 | 3600 |
| 374 | 191 | 600 | 188 | 3 | 3600 | 3 | 3600 |
| 375 | 191 | 600 | 188 | 3 | 3600 | 3 | 3600 |
| 376 | 191 | 600 | 188 | 3 | 3600 | 3 | 3600 |
| 262 | 187.5 | 300 | 184.5 | 3 | 1800 | 3 | 1800 |

Annexure X

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

| | | | | | | | |
|-----|-------|-----|-------|-----|------|---|------|
| 263 | 187.5 | 600 | 184.5 | 3 | 3600 | 3 | 3600 |
| 264 | 187.5 | 600 | 184.5 | 3 | 3600 | 3 | 3600 |
| 265 | 187.5 | 600 | 184.5 | 3 | 3600 | 3 | 3600 |
| 266 | 187.5 | 600 | 184.5 | 3 | 3600 | 3 | 3600 |
| 267 | 187.5 | 600 | 184.5 | 3 | 3600 | 3 | 3600 |
| 268 | 187.5 | 600 | 185 | 2.5 | 3600 | 3 | 3000 |
| 269 | 187.5 | 600 | 185 | 2.5 | 3600 | 3 | 3000 |
| 270 | 187.5 | 600 | 185 | 2.5 | 3600 | 3 | 3000 |
| 289 | 187.5 | 300 | 185 | 2.5 | 1800 | 3 | 1500 |
| 290 | 187.5 | 600 | 185 | 2.5 | 3600 | 3 | 3000 |
| 291 | 187.5 | 600 | 185 | 2.5 | 3600 | 3 | 3000 |
| 292 | 187.5 | 600 | 184.5 | 3 | 3600 | 3 | 3600 |
| 293 | 187.5 | 600 | 184.5 | 3 | 3600 | 3 | 3600 |
| 294 | 187.5 | 600 | 184.5 | 3 | 3600 | 3 | 3600 |
| 295 | 187.5 | 600 | 184.5 | 3 | 3600 | 3 | 3600 |
| 296 | 187.5 | 600 | 184.5 | 3 | 3600 | 3 | 3600 |
| 297 | 187.5 | 600 | 184.5 | 3 | 3600 | 3 | 3600 |
| 298 | 187.5 | 600 | 184.5 | 3 | 3600 | 3 | 3600 |
| 299 | 187.5 | 600 | 184.5 | 3 | 3600 | 3 | 3600 |
| 300 | 187.5 | 600 | 184.5 | 3 | 3600 | 3 | 3600 |
| 301 | 187.5 | 600 | 184.5 | 3 | 3600 | 3 | 3600 |
| 385 | 188 | 300 | 185 | 3 | 1800 | 3 | 1800 |
| 386 | 188 | 600 | 185.5 | 2.5 | 3600 | 3 | 3000 |
| 387 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 388 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 389 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 390 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 391 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 392 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 393 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 394 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 395 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 396 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 397 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 398 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 399 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 400 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 401 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 402 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 403 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 404 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND
MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per
Annum

| | | | | | | | |
|-----|-------|-----|-------|-----|------|---|------|
| 423 | 188 | 300 | 185 | 3 | 1800 | 3 | 1800 |
| 424 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 425 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 426 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 427 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 428 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 429 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 430 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 431 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 432 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 433 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 434 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 435 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 436 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 437 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 438 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 439 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 440 | 188 | 600 | 185.5 | 2.5 | 3600 | 3 | 3000 |
| 441 | 188 | 600 | 185.5 | 2.5 | 3600 | 3 | 3000 |
| 442 | 188 | 600 | 185.5 | 2.5 | 3600 | 3 | 3000 |
| 443 | 188 | 600 | 185.5 | 2.5 | 3600 | 3 | 3000 |
| 444 | 188 | 600 | 185.5 | 2.5 | 3600 | 3 | 3000 |
| 445 | 188 | 600 | 185.5 | 2.5 | 3600 | 3 | 3000 |
| 508 | 186.5 | 300 | 183.5 | 3 | 1800 | 3 | 1800 |
| 509 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 510 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 511 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 512 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 513 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 514 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 515 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 516 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 517 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 518 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 519 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 520 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 521 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 522 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 523 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 524 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 525 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |

Annexure X

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

| | | | | | | | |
|-----|-------|-----|-------|-----|------|---|------|
| 526 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 527 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 528 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 529 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 530 | 186.5 | 600 | 184 | 2.5 | 3600 | 3 | 3000 |
| 531 | 186.5 | 600 | 184 | 2.5 | 3600 | 3 | 3000 |
| 580 | 187 | 300 | 184.5 | 2.5 | 1800 | 3 | 1500 |
| 581 | 187 | 300 | 184 | 3 | 1800 | 3 | 1800 |
| 582 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 583 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 584 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 585 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 586 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 587 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 588 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 589 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 590 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 591 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 592 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 593 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 594 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 595 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 596 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 597 | 187 | 300 | 184 | 3 | 1800 | 3 | 1800 |
| 609 | 187 | 300 | 184 | 3 | 1800 | 3 | 1800 |
| 610 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 611 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 612 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 613 | 187 | 600 | 184 | 3 | 3600 | 3 | 3600 |
| 619 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 620 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 621 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 622 | 185 | 600 | 182.5 | 2.5 | 3600 | 3 | 3000 |
| 623 | 185 | 600 | 182.5 | 2.5 | 3600 | 3 | 3000 |
| 624 | 185 | 600 | 182.5 | 2.5 | 3600 | 3 | 3000 |
| 625 | 185 | 600 | 182.5 | 2.5 | 3600 | 3 | 3000 |
| 626 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 627 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 628 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 629 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 630 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |

Annexure X

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

| | | | | | | | |
|-----|-----|-----|-------|-----|------|---|------|
| 631 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 632 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 633 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 634 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 635 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 636 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 637 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 638 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 639 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 640 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 641 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 661 | 185 | 300 | 182 | 3 | 1800 | 3 | 1800 |
| 662 | 185 | 300 | 182 | 3 | 1800 | 3 | 1800 |
| 663 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 664 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 665 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 666 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 667 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 668 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 669 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 670 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 671 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 672 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 673 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 674 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 675 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 676 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 677 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 678 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 679 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 680 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 681 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 682 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 683 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 684 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 685 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 686 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 687 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 688 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 689 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 690 | 185 | 600 | 182.5 | 2.5 | 3600 | 3 | 3000 |

Annexure X

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

| | | | | | | | |
|-----|-------|-----|-------|-----|------|---|------|
| 691 | 185 | 600 | 182.5 | 2.5 | 3600 | 3 | 3000 |
| 692 | 185 | 600 | 182.5 | 2.5 | 3600 | 3 | 3000 |
| 693 | 185 | 600 | 182.5 | 2.5 | 3600 | 3 | 3000 |
| 694 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 700 | 185 | 300 | 182 | 3 | 1800 | 3 | 1800 |
| 701 | 185 | 300 | 182 | 3 | 1800 | 3 | 1800 |
| 702 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 703 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 704 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 705 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 706 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 707 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 708 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 709 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 710 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 711 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 712 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 713 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 714 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 715 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 716 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 717 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 718 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 719 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 720 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 721 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 722 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 723 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 724 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 725 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 726 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 727 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 728 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 729 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 730 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 731 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 732 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 733 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 734 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 735 | 185 | 600 | 182 | 3 | 3600 | 3 | 3600 |
| 750 | 186.5 | 300 | 183.5 | 3 | 1800 | 3 | 1800 |

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND
MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per
Annum

| | | | | | | | |
|-----|-------|-----|-------|-----|------|---|------|
| 751 | 186.5 | 300 | 183.5 | 3 | 1800 | 3 | 1800 |
| 752 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 753 | 186.5 | 600 | 184 | 2.5 | 3600 | 3 | 3000 |
| 754 | 186.5 | 600 | 184 | 2.5 | 3600 | 3 | 3000 |
| 755 | 186.5 | 600 | 184 | 2.5 | 3600 | 3 | 3000 |
| 756 | 186.5 | 600 | 184 | 2.5 | 3600 | 3 | 3000 |
| 757 | 186.5 | 600 | 184 | 2.5 | 3600 | 3 | 3000 |
| 758 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 759 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 760 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 761 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 762 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 763 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 764 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 765 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 766 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 767 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 768 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 769 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 770 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 771 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 772 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 773 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 774 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 775 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 776 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 777 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 778 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 779 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 780 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 781 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 782 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 783 | 186.5 | 300 | 183.5 | 3 | 1800 | 3 | 1800 |
| 786 | 186.5 | 300 | 183.5 | 3 | 1800 | 3 | 1800 |
| 787 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 788 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 789 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 790 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 791 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 792 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 793 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |

Annexure X

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

| | | | | | | | |
|-----|-------|-----|-------|---|------|---|------|
| 794 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 795 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 796 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 797 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 798 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 799 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 800 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 801 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 802 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 803 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 804 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 805 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 806 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 807 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 808 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 809 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 810 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 811 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 812 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 813 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 814 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 815 | 186.5 | 600 | 183.5 | 3 | 3600 | 3 | 3600 |
| 816 | 186.5 | 300 | 183.5 | 3 | 1800 | 3 | 1800 |
| 831 | 189 | 300 | 186 | 3 | 1800 | 3 | 1800 |
| 832 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 833 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 834 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 835 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 836 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 837 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 838 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 839 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 840 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 841 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 842 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 843 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 844 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 845 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 846 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 847 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 848 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

| | | | | | | | |
|-----|-----|-----|-----|---|------|---|------|
| 849 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 850 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 851 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 852 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 853 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 854 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 855 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 856 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 857 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 858 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 859 | 189 | 600 | 186 | 3 | 3600 | 3 | 3600 |
| 860 | 189 | 300 | 186 | 3 | 1800 | 3 | 1800 |
| 863 | 188 | 300 | 185 | 3 | 1800 | 3 | 1800 |
| 864 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 865 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 866 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 867 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 868 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 869 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 870 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 871 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 872 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 873 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 874 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 875 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 876 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 877 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 878 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 879 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 880 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 881 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 882 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 883 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 884 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 885 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 886 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 887 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 888 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 889 | 188 | 300 | 185 | 3 | 1800 | 3 | 1800 |
| 903 | 188 | 300 | 185 | 3 | 1800 | 3 | 1800 |
| 904 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |

Annexure X

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

| | | | | | | | |
|-----|-------|-----|-------|---|------|---|------|
| 905 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 906 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 907 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 908 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 909 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 910 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 911 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 912 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 913 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 914 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 915 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 916 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 917 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 918 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 919 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 920 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 921 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 922 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 923 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 924 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 925 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 926 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 927 | 188 | 600 | 185 | 3 | 3600 | 3 | 3600 |
| 928 | 188 | 300 | 185 | 3 | 1800 | 3 | 1800 |
| 931 | 188.2 | 300 | 185.2 | 3 | 1800 | 3 | 1800 |
| 932 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 933 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 934 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 935 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 936 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 937 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 938 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 939 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 940 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 941 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 942 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 943 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 944 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 945 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 946 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 947 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

| | | | | | | | |
|------|-------|-----|-------|---|------|---|------|
| 948 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 949 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 950 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 951 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 952 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 953 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 954 | 188.2 | 300 | 185.2 | 3 | 1800 | 3 | 1800 |
| 965 | 188.2 | 300 | 185.2 | 3 | 1800 | 3 | 1800 |
| 966 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 967 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 968 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 969 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 970 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 971 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 972 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 973 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 974 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 975 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 976 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 977 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 978 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 979 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 980 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 981 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 982 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 983 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 984 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 985 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 986 | 188.2 | 300 | 185.2 | 3 | 1800 | 3 | 1800 |
| 989 | 188.2 | 300 | 185.2 | 3 | 1800 | 3 | 1800 |
| 990 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 991 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 992 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 993 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 994 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 995 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 996 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 997 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 998 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 999 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 1000 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |

Annexure X

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

| | | | | | | | |
|------|-------|-----|-------|---|------|---|------|
| 1001 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 1002 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 1003 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 1004 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 1005 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 1006 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 1007 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 1008 | 188.2 | 600 | 185.2 | 3 | 3600 | 3 | 3600 |
| 1009 | 188.2 | 300 | 185.2 | 3 | 1800 | 3 | 1800 |
| 1017 | 188.8 | 300 | 185.8 | 3 | 1800 | 3 | 1800 |
| 1018 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1019 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1020 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1021 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1022 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1023 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1024 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1025 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1026 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1027 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1028 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1029 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1030 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1031 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1032 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1033 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1034 | 188.8 | 300 | 185.8 | 3 | 1800 | 3 | 1800 |
| 1039 | 188.8 | 300 | 185.8 | 3 | 1800 | 3 | 1800 |
| 1040 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1041 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1042 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1043 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1044 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1045 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1046 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1047 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1048 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1049 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1050 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1051 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1052 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

| | | | | | | | |
|------|-------|-----|-------|-----|------|---|------|
| 1053 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1054 | 188.8 | 300 | 185.8 | 3 | 1800 | 3 | 1800 |
| 1063 | 188.8 | 300 | 185.8 | 3 | 1800 | 3 | 1800 |
| 1064 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1065 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1066 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1067 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1068 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1069 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1070 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1071 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1072 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1073 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1074 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1075 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1076 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1077 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1078 | 188.8 | 600 | 185.8 | 3 | 3600 | 3 | 3600 |
| 1079 | 188.8 | 300 | 185.8 | 3 | 1800 | 3 | 1800 |
| 1082 | 187.8 | 300 | 184.8 | 3 | 1800 | 3 | 1800 |
| 1083 | 187.8 | 600 | 184.8 | 3 | 3600 | 3 | 3600 |
| 1084 | 187.8 | 600 | 184.8 | 3 | 3600 | 3 | 3600 |
| 1085 | 187.8 | 600 | 184.8 | 3 | 3600 | 3 | 3600 |
| 1086 | 187.8 | 600 | 184.8 | 3 | 3600 | 3 | 3600 |
| 1087 | 187.8 | 600 | 184.8 | 3 | 3600 | 3 | 3600 |
| 1088 | 187.8 | 600 | 184.8 | 3 | 3600 | 3 | 3600 |
| 1089 | 187.8 | 600 | 184.8 | 3 | 3600 | 3 | 3600 |
| 1090 | 187.8 | 600 | 184.8 | 3 | 3600 | 3 | 3600 |
| 1091 | 187.8 | 600 | 184.8 | 3 | 3600 | 3 | 3600 |
| 1092 | 187.8 | 600 | 184.8 | 3 | 3600 | 3 | 3600 |
| 1093 | 187.8 | 600 | 184.8 | 3 | 3600 | 3 | 3600 |
| 1094 | 187.8 | 600 | 184.8 | 3 | 3600 | 3 | 3600 |
| 1095 | 187.8 | 600 | 184.8 | 3 | 3600 | 3 | 3600 |
| 1096 | 187.8 | 600 | 184.8 | 3 | 3600 | 3 | 3600 |
| 1097 | 187.8 | 600 | 184.8 | 3 | 3600 | 3 | 3600 |
| 1098 | 187.8 | 300 | 184.8 | 3 | 1800 | 3 | 1800 |
| 1104 | 187.9 | 300 | 184.9 | 3 | 1800 | 3 | 1800 |
| 1105 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1106 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1107 | 187.9 | 600 | 185.4 | 2.5 | 3600 | 3 | 3000 |
| 1108 | 187.9 | 600 | 185.4 | 2.5 | 3600 | 3 | 3000 |

Annexure X

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

| | | | | | | | |
|------|-------|-----|-------|-----|------|---|------|
| 1109 | 187.9 | 600 | 185.4 | 2.5 | 3600 | 3 | 3000 |
| 1110 | 187.9 | 600 | 185.4 | 2.5 | 3600 | 3 | 3000 |
| 1111 | 187.9 | 600 | 185.4 | 2.5 | 3600 | 3 | 3000 |
| 1112 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1113 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1114 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1115 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1116 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1117 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1118 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1119 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1120 | 187.9 | 300 | 184.9 | 3 | 1800 | 3 | 1800 |
| 1123 | 187.9 | 300 | 184.9 | 3 | 1800 | 3 | 1800 |
| 1124 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1125 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1126 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1127 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1128 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1129 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1130 | 187.9 | 600 | 185.3 | 2.6 | 3600 | 3 | 3120 |
| 1131 | 187.9 | 600 | 185.3 | 2.6 | 3600 | 3 | 3120 |
| 1132 | 187.9 | 600 | 185.3 | 2.6 | 3600 | 3 | 3120 |
| 1133 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1134 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1135 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1136 | 187.9 | 600 | 184.9 | 3 | 3600 | 3 | 3600 |
| 1137 | 187.9 | 300 | 184.9 | 3 | 1800 | 3 | 1800 |
| 1142 | 186.3 | 300 | 183.3 | 3 | 1800 | 3 | 1800 |
| 1143 | 186.3 | 600 | 183.3 | 3 | 3600 | 3 | 3600 |
| 1144 | 186.3 | 600 | 183.3 | 3 | 3600 | 3 | 3600 |
| 1145 | 186.3 | 600 | 183.3 | 3 | 3600 | 3 | 3600 |
| 1146 | 186.3 | 600 | 183.3 | 3 | 3600 | 3 | 3600 |
| 1147 | 186.3 | 600 | 183.3 | 3 | 3600 | 3 | 3600 |
| 1148 | 186.3 | 600 | 183.3 | 3 | 3600 | 3 | 3600 |
| 1149 | 186.3 | 600 | 183.3 | 3 | 3600 | 3 | 3600 |
| 1150 | 186.3 | 600 | 183.3 | 3 | 3600 | 3 | 3600 |
| 1151 | 186.3 | 600 | 183.3 | 3 | 3600 | 3 | 3600 |
| 1152 | 186.3 | 600 | 183.8 | 2.5 | 3600 | 3 | 3000 |
| 1153 | 186.3 | 600 | 183.8 | 2.5 | 3600 | 3 | 3000 |
| 1154 | 186.3 | 300 | 183.8 | 2.5 | 1800 | 3 | 1500 |
| 1157 | 188.6 | 300 | 186.1 | 2.5 | 1800 | 3 | 1500 |

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

| | | | | | | | |
|------|-------|-----|-------|---|------|---|------|
| 1158 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1159 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1160 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1161 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1162 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1163 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1164 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1165 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1166 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1167 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1168 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1169 | 188.6 | 300 | 185.6 | 3 | 1800 | 3 | 1800 |
| 1173 | 188.6 | 300 | 185.6 | 3 | 1800 | 3 | 1800 |
| 1174 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1175 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1176 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1177 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1178 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1179 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1180 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1181 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1182 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1183 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1184 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1185 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1186 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1187 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1188 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1189 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1190 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1191 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1192 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1193 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1194 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1195 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1196 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1197 | 188.6 | 300 | 185.6 | 3 | 1800 | 3 | 1800 |
| 1202 | 188.6 | 300 | 185.6 | 3 | 1800 | 3 | 1800 |
| 1203 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1204 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1205 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |

Annexure X

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

| | | | | | | | |
|------|-------|-----|-------|-----|------|---|------|
| 1206 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1207 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1208 | 188.6 | 600 | 185.6 | 3 | 3600 | 3 | 3600 |
| 1209 | 188.6 | 600 | 186.1 | 2.5 | 3600 | 3 | 3000 |
| 1210 | 188.6 | 600 | 186.1 | 2.5 | 3600 | 3 | 3000 |
| 1211 | 188.6 | 600 | 186.1 | 2.5 | 3600 | 3 | 3000 |
| 1212 | 188.6 | 300 | 186.1 | 2.5 | 1800 | 3 | 1500 |
| 1214 | 188.7 | 300 | 186.2 | 2.5 | 1800 | 3 | 1500 |
| 1215 | 188.7 | 600 | 185.7 | 3 | 3600 | 3 | 3600 |
| 1216 | 188.7 | 600 | 185.7 | 3 | 3600 | 3 | 3600 |
| 1217 | 188.7 | 600 | 185.7 | 3 | 3600 | 3 | 3600 |
| 1218 | 188.7 | 600 | 185.7 | 3 | 3600 | 3 | 3600 |
| 1219 | 188.7 | 600 | 185.7 | 3 | 3600 | 3 | 3600 |
| 1220 | 188.7 | 600 | 185.7 | 3 | 3600 | 3 | 3600 |
| 1221 | 188.7 | 600 | 185.7 | 3 | 3600 | 3 | 3600 |
| 1222 | 188.7 | 600 | 185.7 | 3 | 3600 | 3 | 3600 |
| 1223 | 188.7 | 600 | 185.7 | 3 | 3600 | 3 | 3600 |
| 1224 | 188.7 | 300 | 185.7 | 3 | 1800 | 3 | 1800 |
| 1231 | 188.7 | 300 | 185.7 | 3 | 1800 | 3 | 1800 |
| 1232 | 188.7 | 600 | 185.7 | 3 | 3600 | 3 | 3600 |
| 1233 | 188.7 | 600 | 185.7 | 3 | 3600 | 3 | 3600 |
| 1234 | 188.7 | 600 | 185.7 | 3 | 3600 | 3 | 3600 |
| 1235 | 188.7 | 600 | 185.7 | 3 | 3600 | 3 | 3600 |
| 1236 | 188.7 | 600 | 185.7 | 3 | 3600 | 3 | 3600 |
| 1237 | 188.7 | 300 | 185.7 | 3 | 1800 | 3 | 1800 |
| 1238 | 188.7 | 600 | 185.7 | 3 | 3600 | 3 | 3600 |
| 1239 | 188.7 | 600 | 185.7 | 3 | 3600 | 3 | 3600 |
| 1240 | 188.7 | 600 | 185.7 | 3 | 3600 | 3 | 3600 |
| 1241 | 187.2 | 600 | 184.2 | 3 | 3600 | 3 | 3600 |
| 1242 | 187.2 | 600 | 184.2 | 3 | 3600 | 3 | 3600 |
| 1243 | 187.2 | 600 | 184.2 | 3 | 3600 | 3 | 3600 |
| 1244 | 187.2 | 600 | 184.2 | 3 | 3600 | 3 | 3600 |
| 1245 | 187.2 | 600 | 184.2 | 3 | 3600 | 3 | 3600 |
| 1246 | 187.2 | 600 | 184.7 | 2.5 | 3600 | 3 | 3000 |
| 1247 | 187.2 | 600 | 184.7 | 2.5 | 3600 | 3 | 3000 |
| 1248 | 187.2 | 600 | 184.7 | 2.5 | 3600 | 3 | 3000 |
| 1249 | 187.2 | 300 | 184.2 | 3 | 1800 | 3 | 1800 |
| 1257 | 187.2 | 600 | 184.2 | 3 | 3600 | 3 | 3600 |
| 1258 | 187.2 | 600 | 184.2 | 3 | 3600 | 3 | 3600 |
| 1259 | 187.2 | 600 | 184.2 | 3 | 3600 | 3 | 3600 |
| 1260 | 187.2 | 600 | 184.2 | 3 | 3600 | 3 | 3600 |

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

| | | | | | | | |
|------|-------|-----|-------|-----|---------|---|---------|
| 1261 | 187.2 | 600 | 184.2 | 3 | 3600 | 3 | 3600 |
| 1262 | 187.2 | 600 | 184.2 | 3 | 3600 | 3 | 3600 |
| 1263 | 187.2 | 300 | 184.2 | 3 | 1800 | 3 | 1800 |
| 1265 | 188.1 | 300 | 185.1 | 3 | 1800 | 3 | 1800 |
| 1266 | 188.1 | 600 | 185.1 | 3 | 3600 | 3 | 3600 |
| 1267 | 188.1 | 600 | 185.1 | 3 | 3600 | 3 | 3600 |
| 1268 | 188.1 | 600 | 185.1 | 3 | 3600 | 3 | 3600 |
| 1269 | 188.1 | 600 | 185.1 | 3 | 3600 | 3 | 3600 |
| 1270 | 188.1 | 300 | 185.1 | 3 | 1800 | 3 | 1800 |
| 1282 | 188.1 | 600 | 185.1 | 3 | 3600 | 3 | 3600 |
| 1283 | 188.1 | 600 | 185.1 | 3 | 3600 | 3 | 3600 |
| 1284 | 188.1 | 600 | 185.1 | 3 | 3600 | 3 | 3600 |
| 1286 | 188.1 | 600 | 185.1 | 3 | 3600 | 3 | 3600 |
| 1287 | 188.1 | 600 | 185.1 | 3 | 3600 | 3 | 3600 |
| 1299 | 187.3 | 300 | 184.3 | 3 | 1800 | 3 | 1800 |
| 1300 | 187.3 | 600 | 184.3 | 3 | 3600 | 3 | 3600 |
| 1301 | 187.3 | 600 | 184.3 | 3 | 3600 | 3 | 3600 |
| 1314 | 187.3 | 300 | 184.8 | 2.5 | 1800 | 3 | 1500 |
| 1315 | 187.3 | 600 | 184.8 | 2.5 | 3600 | 3 | 3000 |
| 1316 | 187.3 | 600 | 184.8 | 2.5 | 3600 | 3 | 3000 |
| 1317 | 187.3 | 600 | 184.8 | 2.5 | 3600 | 3 | 3000 |
| 1318 | 187.3 | 300 | 184.8 | 2.5 | 1800 | 3 | 1500 |
| 1319 | 187.3 | 600 | 184.3 | 3 | 3600 | 3 | 3600 |
| 1320 | 187.3 | 600 | 184.3 | 3 | 3600 | 3 | 3600 |
| 1327 | 187.3 | 300 | 184.3 | 3 | 1800 | 3 | 1800 |
| 1328 | 187.3 | 600 | 184.3 | 3 | 3600 | 3 | 3600 |
| 1329 | 187.3 | 600 | 184.3 | 3 | 3600 | 3 | 3600 |
| 1330 | 186.1 | 600 | 183.1 | 3 | 3600 | 3 | 3600 |
| 1331 | 186.1 | 600 | 183.1 | 3 | 3600 | 3 | 3600 |
| 1332 | 186.1 | 300 | 183.1 | 3 | 1800 | 3 | 1800 |
| 1333 | 186.1 | 600 | 183.1 | 3 | 3600 | 3 | 3600 |
| 1342 | 186.1 | 300 | 183.6 | 2.5 | 1800 | 3 | 1500 |
| 1343 | 186.1 | 600 | 183.1 | 3 | 3600 | 3 | 3600 |
| 1346 | 186.1 | 300 | 183.1 | 3 | 1800 | 3 | 1800 |
| 1347 | 186.1 | 600 | 183.1 | 3 | 3600 | 3 | 3600 |
| 1354 | 186.1 | 300 | 183.1 | 3 | 1800 | 3 | 1800 |
| 1355 | 186.1 | 600 | 183.1 | 3 | 3600 | 3 | 3600 |
| | | | | | 2480400 | | 2439660 |

Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

Conclusion

Replenishment Study for the year 2021 reveals that there is replenishment (Natural Reclamation Rainfed Water Containing Sand) of approximately 2439660 MT of sand.

Vardan Environet

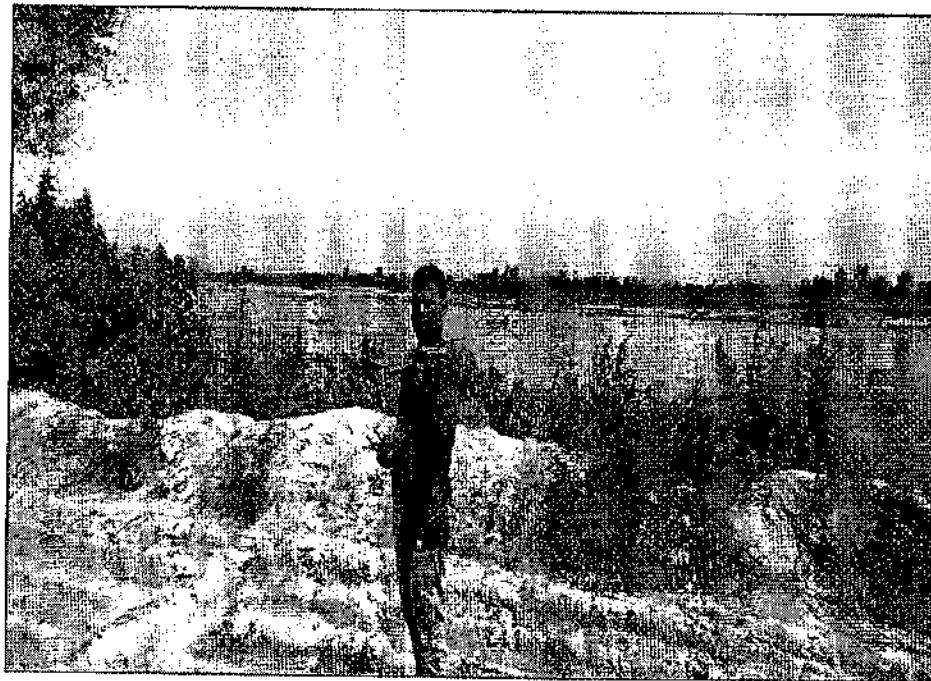
(A NABET Accredited Consultant)

82A, Sector-5, IMT Manesar, Gurgaon

Phone /Fax.; 0124-4291036, 9929108691

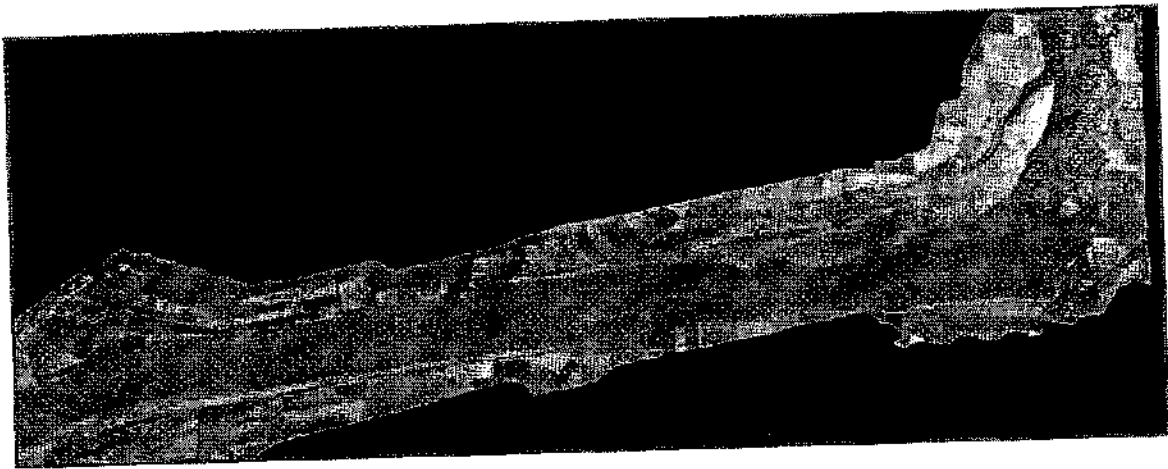
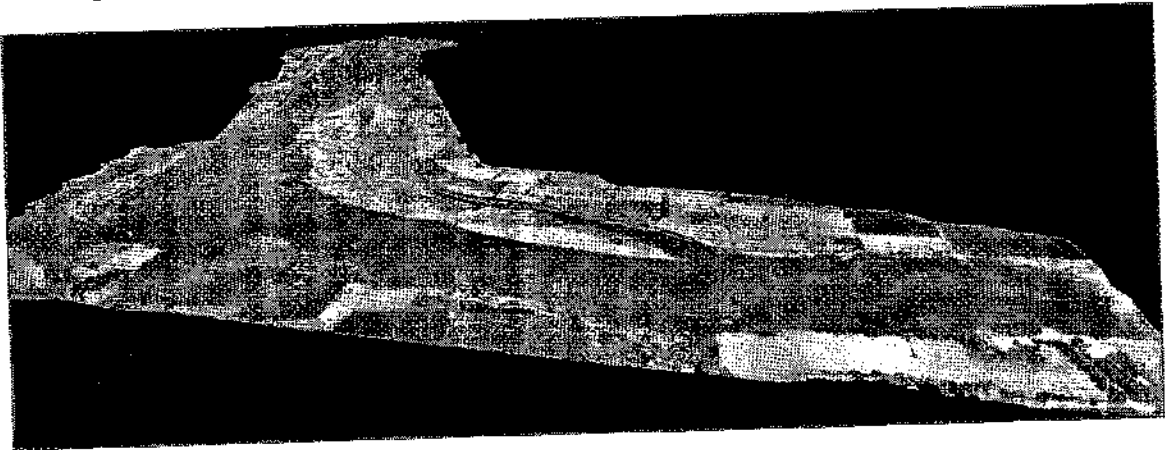
email: info@vardanenvironet.com

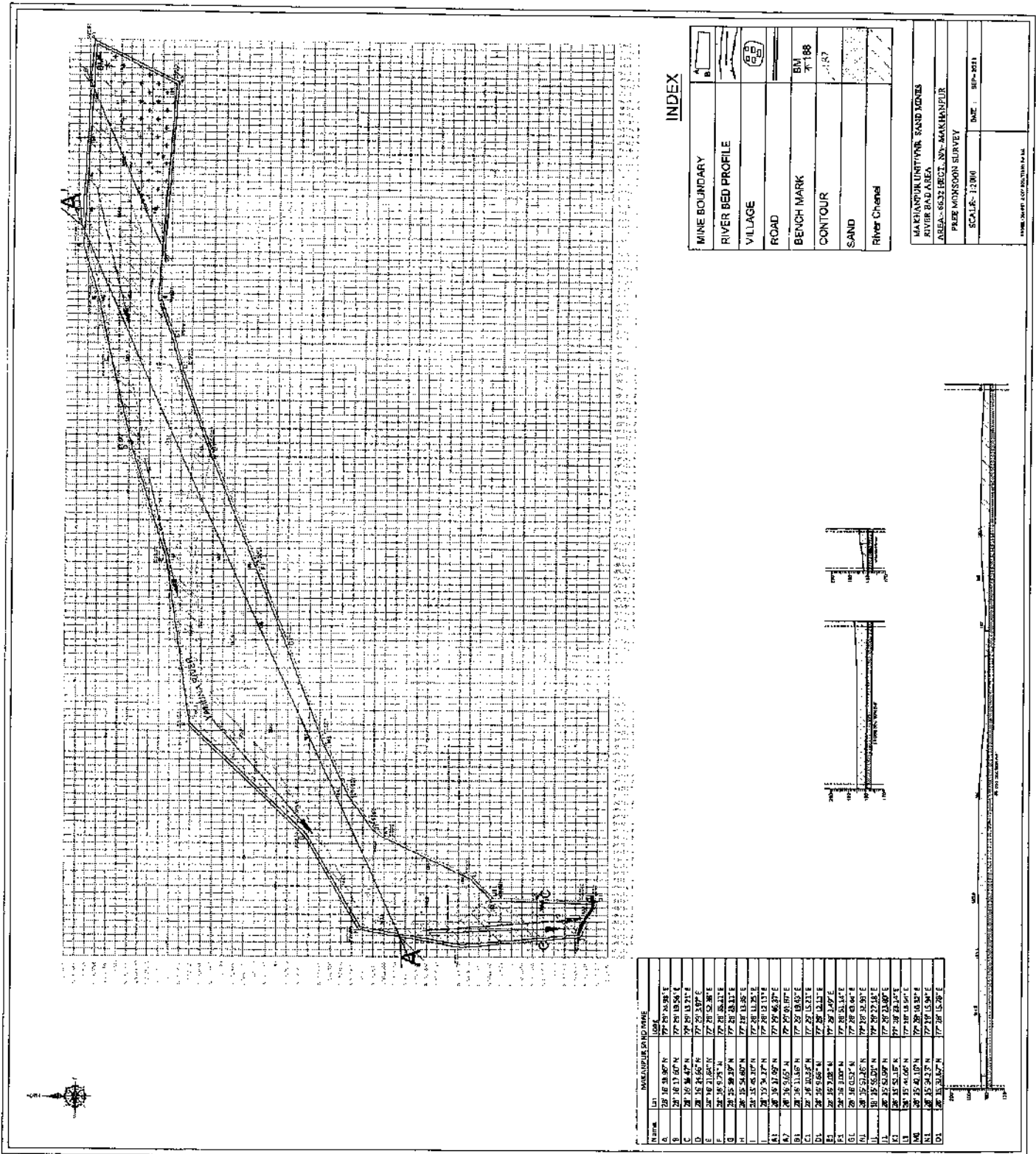
G) Site Photographs



Replenishment Study Report for Sand Mine located at Makhanpur Unit, RIVER BED-(SAND MINOR MINERAL), DISTRICT: Faridabad, Lease Area: 66.32 ha, Production: 24 Lac T Per Annum

Makhanpur Site 3D View





MAKHANPUR UNIT (W.R. SAND LINES RIVER BAD AREA)

| Point | N. Lat. | East. |
|-------|-----------------|-----------------|
| A | 77 29 58.987' N | 77 29 58.987' E |
| B | 77 29 58.987' N | 77 29 58.987' E |
| C | 77 29 58.987' N | 77 29 58.987' E |
| D | 77 29 58.987' N | 77 29 58.987' E |
| E | 77 29 58.987' N | 77 29 58.987' E |
| F | 77 29 58.987' N | 77 29 58.987' E |
| G | 77 29 58.987' N | 77 29 58.987' E |
| H | 77 29 58.987' N | 77 29 58.987' E |
| I | 77 29 58.987' N | 77 29 58.987' E |
| J | 77 29 58.987' N | 77 29 58.987' E |
| K | 77 29 58.987' N | 77 29 58.987' E |
| L | 77 29 58.987' N | 77 29 58.987' E |
| M | 77 29 58.987' N | 77 29 58.987' E |
| N | 77 29 58.987' N | 77 29 58.987' E |
| O | 77 29 58.987' N | 77 29 58.987' E |
| P | 77 29 58.987' N | 77 29 58.987' E |
| Q | 77 29 58.987' N | 77 29 58.987' E |
| R | 77 29 58.987' N | 77 29 58.987' E |
| S | 77 29 58.987' N | 77 29 58.987' E |
| T | 77 29 58.987' N | 77 29 58.987' E |
| U | 77 29 58.987' N | 77 29 58.987' E |
| V | 77 29 58.987' N | 77 29 58.987' E |
| W | 77 29 58.987' N | 77 29 58.987' E |
| X | 77 29 58.987' N | 77 29 58.987' E |
| Y | 77 29 58.987' N | 77 29 58.987' E |
| Z | 77 29 58.987' N | 77 29 58.987' E |

INDEX

| | |
|-------------------|--|
| MINE BOUNDARY | |
| RIVER BED PROFILE | |
| VILLAGE | |
| ROAD | |
| BENCH MARK | |
| CONTOUR | |
| SAND | |
| River Channel | |

MAKHANPUR UNIT (W.R. SAND LINES RIVER BAD AREA)
 AREA - 8632 HECT. 200 - MAKHANPUR
 FREE MORISON SURVEY
 SCALE - 1:2000
 DATE - SEP-2011

