Draft Environmental Impact Assessment

Draft for Public Hearing

# Environmental Impact Assessment

*for*

**Expansion of MS Ingots/MS Billets Manufacturing Unit**
**(100 TPD to 500 TPD)**

*at*

**Plot No: B-07, Five Star MIDC, Kagal,**
**Tehsil: Karveer, District: Kolhapur, Maharashtra**

***Project Proponent:***

## M/s. Nilanjan Iron Pvt. Ltd.

***Plot No: B-07, Five Star MIDC, Kagal,***
***Tehsil: Karveer, District: Kolhapur, Maharashtra.***

***Environment Consultant:***


**M/s. Sri Sai Manasa Nature Tech Pvt. Ltd.**
(QCI/NABET Accredited Vide S. No. 140,Dated 15.06.2018 displayed on NABET website )
Plot No. 74/A, Flat No 102, Central Bank Building
Kalyan Nagar, Hyderabad 500038
E-mail: ssmntpl@gmail.com , web: www.ssmntech.com
Contact no. 040-2316333, Fax No.: 040-23816222



Jan, 2019

**Declaration by experts contributing to the EIA for M/s.Nilanjan Iron Pvt. Ltd.**

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

**EIA Coordinator**:

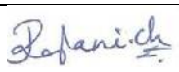
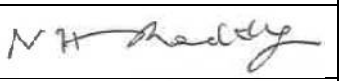
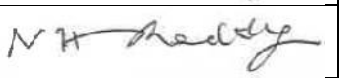
**Name** : Mr. Vipin Kumar

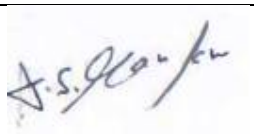
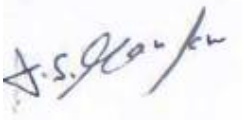
**Signature & Date** :

**Period of Involvement** : Sep. 2018 onwards

**Contact information** : Sri SaiManasa Nature Tech Pvt. Ltd.
Plot No. 74/A, Flat No. 102, Central Bank Building
Kalyan Nagar, Hyderabad - 500038

**Functional Area Experts:**

| Sr. No. | Functional Area | Name of the Expert/s | Signature and Dates |
|---|---|---|---|
| 1 | **AP*** | VipinKumar |  |
| 2 | **WP*** | Dr. Ch. RajaniKumari |  |
| 3 | **MSW*** | Smt. Reshma Thakur |  |
| 4 | **SE*** | A.Mohan Reddy |  |
| 5 | **EB*** | Dr. Ch. RajaniKumari |  |
| 6 | **HG*** | NH.Reddy |  |
| 7 | **GEO*** | NH Reddy |  |
| 8 | **SC*** | Sunder RaoDaggaraju |  |
| 9 | **AQ*** | Vipin Kumar |  |

| | | | |
|---|---|---|---|
| 10 | **N*** | Mr.SubramanyamAdapa |  |
| 11 | **LU*** | Mr.SubramanyamAdapa |  |
| 12 | **RH*** | K.Raji Reddy |  |

** Please attach additional sheet if required

**Declaration by the head of the accredited consultant organization/authorized person**

I, Dr. CH. RajaniKumari,hereby, confirm that the above mentioned experts prepared the EIA for **M/s.Nilanjan Iron Pvt. Ltd.**also confirm that the consultant organization shall be fullyaccountable for any mis-leading information mentioned in this statement.

**Signature** : 

**Name** : Dr. CH. RajaniKumari

**Designation** : Chairman & Managing Director

**Name of the EIA ConsultantOrganization** : Sri SaiManasa Nature Tech Pvt. Ltd.

**NABET Certificate No.&Issue Date** : NABET/EIA/1720/RA0111
Valid upto05th Aug. 2020

# CONTENTS

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# कार्यकारी सारांश

## १.० परिचय

एखादा प्रकल्प उभारण्याचा निर्णय घेण्यापूर्वी प्रस्तावित प्रकल्पामुळे निर्माण होणाऱ्या पर्यावरणविषयक, सामाजिक व आर्थिक प्रभाव ओळखण्यासाठी पर्यावरण प्रभाव मूल्यमापन (ईआयए) हि प्रक्रिया वापरली जाते. ईआयए हे निर्णय घेण्याकरिता वापरले जाणारे एक साधन आहे. जे प्रस्तावित प्रकल्पासाठी योग्य निर्णय घेण्याकरिता मार्गदर्शक म्हणून काम करते. ईआयए पद्धतशीरपणे प्रस्तावित प्रकल्पाच्या फायदेशीर किंवा प्रतिकूल परिणामांचा अभ्यास करते. त्याचबरोबर हे सुनिश्चित केले जाते कि, निर्माण होणाऱ्या सर्व परिणामांवर प्रकल्प आखणी व उभारणीवेळी योग्य उपाययोजना केल्या जातील.

## १.१ पर्यावरण मंजुरी

पर्यावरण, वन व हवामान बदल मंत्रालय, भारत सरकार द्वारा प्रसिद्ध करण्यात आलेल्या पर्यावरण प्रभाव मूल्यमापन (ईआयए) अधिसूचना एस.ओ. १५३३, १४.०९.२००६ नुसार, प्रस्तावित एम.एस. इन्गोट /एम.एस. बिलेट्सची निर्मिती करणारे प्रकल्प उभारणे किंवा त्यांचा विस्तार करणे असे प्रकल्प श्रेणी 'ब' मध्ये वर्गीकृत करण्यात आलेले आहेत. ज्या करिता राज्य पर्यावरण आघात मुल्यांकन प्राधिकरण (एस.ई.आय.ए.), महाराष्ट्र राज्य यांच्या कडून मंजुरी मिळविणे आवश्यक आहे.

## १.२ संदर्भ अटी

एम.एस. नीलांजन आयर्न प्रा. लि. यांनी नवीन अधिसूचनेनुसार फॉर्म १, ईआयए अभ्यासासाठी प्रस्तावित संदर्भ अटी आणि पूर्व-व्यवहार्यता आणि पूर्व-संभाव्यता अहवाल पर्यावरण मंजुरीसाठी सादर केलेला आहे. राज्यस्तरीय तज्ञ मुल्यांकन समितीने सदरील प्रस्तावावर ०२ नोव्हेंबर २०१८ रोजी घेण्यात आलेल्या १५७ सभेमध्ये विचार केलेला असून व संदर्भित अटी प्रस्तावित केल्या आहेत. प्रस्तावित सर्व संदर्भ अटींचा ईआयए अहवालात समावेश करण्यात आला आहे.

## १.३ प्रकल्पाचे संक्षिप्त वर्णन

प्रस्तावित प्रकल्प एम.एस. इन्गोट / एम.एस. बिलेट्सच्या उत्पादन (१०० टन प्रतिदिन ते ५०० टन प्रतिदिन) विस्तार संदर्भातील आहे. सदरील प्रकल्प प्लॉट क्र. ब - ०७, फाइव स्टार एम.आय.डी.सी., कागल, ता. करवीर, जि. कोल्हापूर, महाराष्ट्र येथे आहे. एन.आय.पी.एल. कडे एकूण १०१७४.०० चौरस

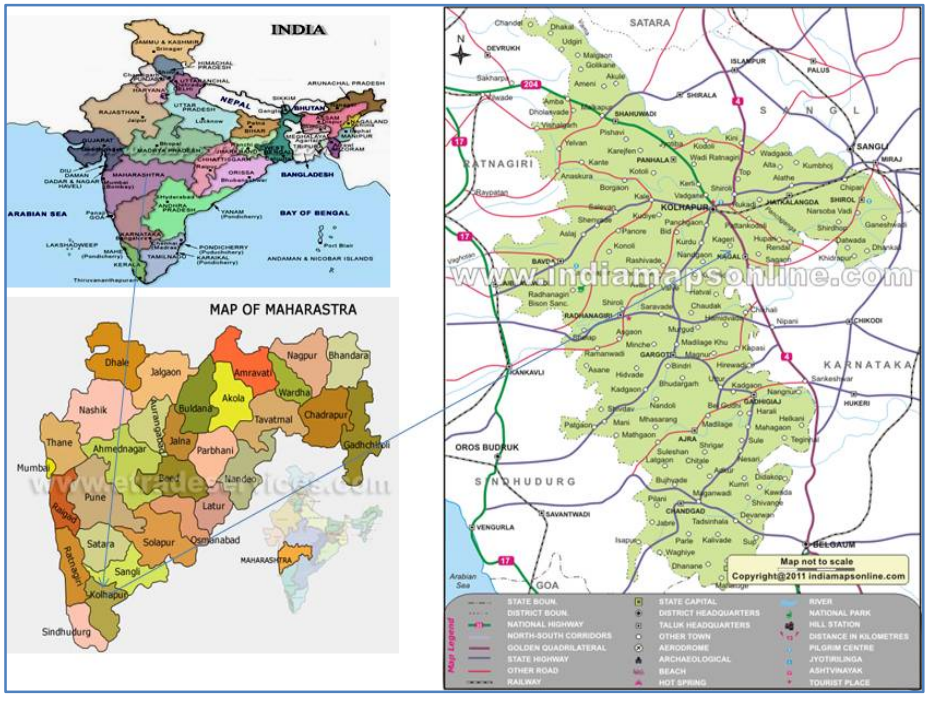
मीटर जमीन उपलब्ध आहे. प्रकल्प विस्ताराकरिता अधिकच्या जागेची गरज भासणार नाही. प्रकल्प स्थान दर्शविणारा नकाशा आकृती १ मध्ये व १० किमी त्रिज्या असलेले अभ्यास क्षेत्र आकृती २ मध्ये दर्शविण्यात आले आहे.

**उत्पादन तपशील**

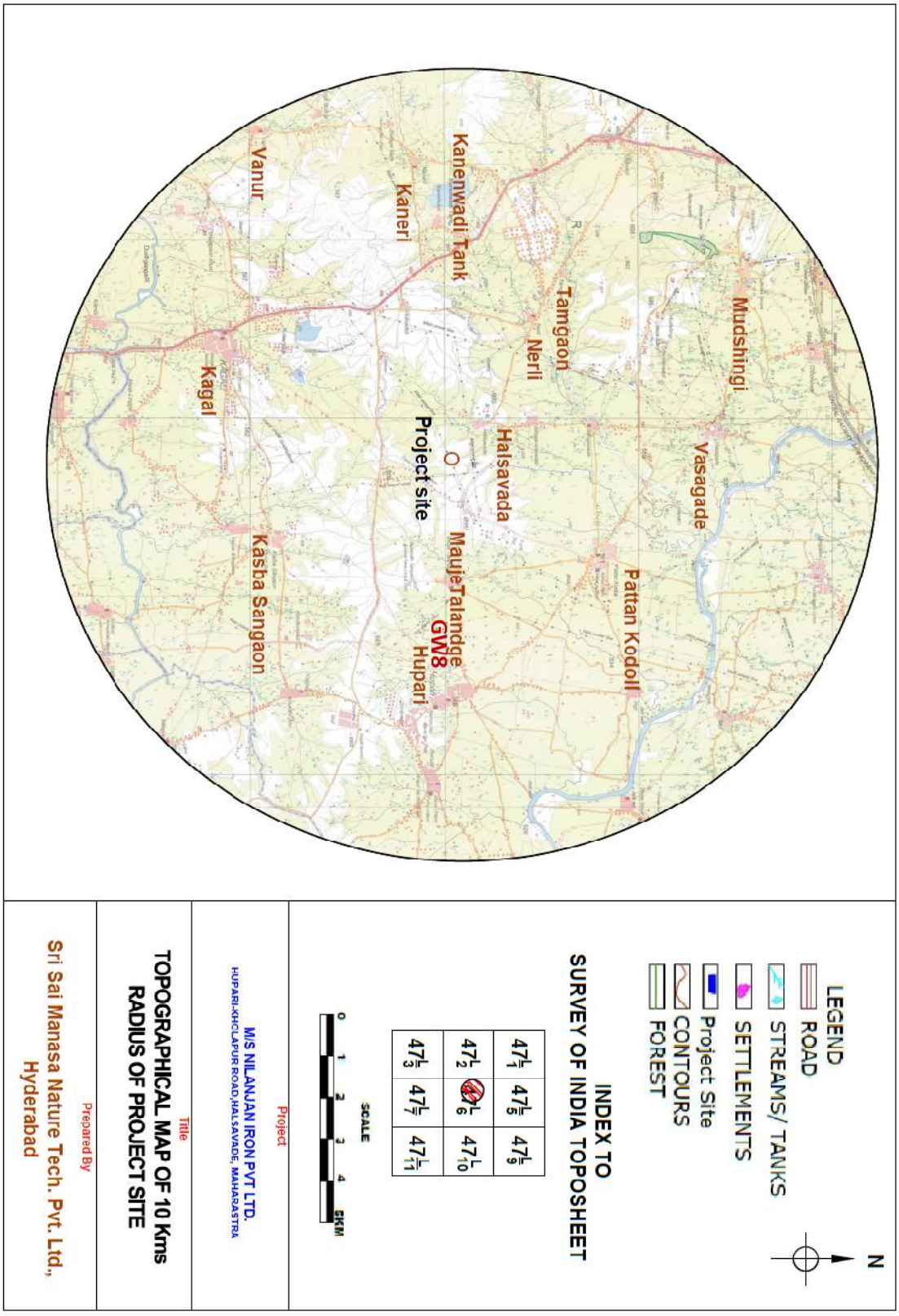
| **विद्यमान फर्नेस (काढला जाईल)** | |
|---|---|
| इंडक्शन फर्नेस (एम.एस. इन्गोट/ एम.एस. बिलेट्स) | १२ मेट्रिक टन x९ पट उष्णता = १०० टन प्रतिदिन |
| **प्रस्तावित फर्नेस (नव्याने बसविला जाईल)** | |
| इंडक्शन फर्नेस (एम.एस. इन्गोट/ एम.एस. बिलेट्स) | २० मेट्रिक टन x१३ पट उष्णता = २६० टन प्रतिदिन<br>२० मेट्रिक टन x१४ पट उष्णता = २८० टन प्रतिदिन<br>एकूण = ५०० टन प्रतिदिन |

**प्रकल्प प्रस्तावकर्ते**

नीलांजन आयर्न प्रा. लि. १४ जुलै २००५ रोजी सुरु करण्यात आलेला एक खाजगी प्रकल्प आहे. सदरील प्रकल्पाची नोंदणी कंपनी रजिस्ट्रार, गोवा यांचे कडे करण्यात आली आहे. एन.आय.पी.एल. प्रकल्पाची अधिकृत शेअर्स ६०,०००,००० रुपये आहे आणि त्यापैकी ५०,५००,००० रुपये भांडवली रक्कम भरलेली आहे. एन.आय.पी.एल. हे मुलभूत लोह आणि स्टील उत्पादन करणारी कंपनी आहे.




**आकृती क्र १ प्रकल्प स्थान दर्शक नकाशा**




**आकृती क्र. २: १० किमी त्रिज्या असलेले प्रकल्प सभोवतालचे अभ्यास क्षेत्र**

## २.० प्रकल्प वर्णन

### २.१ आवश्यक कच्चा माल

प्रस्तावित प्रकल्प विस्तारासाठी मुख्यत्वे करून स्पोंज आयर्न, स्क्रॅप आणि इतर खनिजे यांची गरज भासते. बिलेट्सच्या उत्पादनासाठी कच्चा मालाची आवश्यकता प्रकल्पातील एकूण कामकाजाच्या दिवसांवर आधारित असते. प्रकल्पामध्ये एकूण ३६० दिवस कामकाज व उत्पादन प्रक्रिया चालते. दररोज लागणाऱ्या कच्चा मालाचा तपशील खालील तक्ता क्र. १ मध्ये देण्यात आला आहे.

**तक्ता क्र. १: विस्तारा नंतर आवश्यक असलेला कच्चा माल**

| अ.न. | कच्चा माल | प्रमाण (मेट्रिक टन प्रतिवर्ष) | स्त्रोत |
|---|---|---|---|
| १ | स्पोंज आयर्न | २०० | खुली बाजारपेठ |
| २ | धातूयुक्त स्क्रॅप | ३०० | खुली बाजारपेठ |
| ३ | इतर खनिजे | १५ | खुली बाजारपेठ |

### २.१.१ मालातील समतोल:

कच्च्या मालाचा उपयोग व उत्पादन यामधील समतोल तक्ता क्र. २ मध्ये दर्शविण्यात आहे.

**तक्ता क्र २: बिलेट्स उत्पादनातील मालाचा समतोल.**

| गुंतवणूक | टन प्रतिवर्ष | उत्पादन | टन प्रतिदिन |
|---|---|---|---|
| स्पोंज आयर्न | २०० | बिलेट्स | ५०० |
| धातूयुक्त स्क्रॅप | ३०० | स्लॅग | १५ |
| इतर खनिजे | १५ | **एकूण** | **५१५** |
| **एकूण** | **५१५** | | |

### २.२ आवश्यक पाणी

प्रस्तावित प्रकल्पामध्ये उत्पादन निर्मिती प्रक्रियेच्या कोणत्याही टप्प्यावर पाण्याची अवश्यकता नसते. प्रकल्पामध्ये प्रामुख्याने शितीकरण, इतर वापर व हरित पट्टयांची निर्मिती या ठळक गोष्टींकरिता पाण्याची अवश्यकता भासते. प्रकल्पाकरिता एकूण १६३ के.एल.डी. पाण्याची गरज भासते. सदरील पाण्याची गरज स्वनिर्मित जलाशयातून भागवली जाते. प्रकल्पामध्ये विविध टप्यावर वापरण्यात येणाऱ्या पाण्याचा तपशील खालील तक्ता क्र. ३ मध्ये देण्यात आला आहे.

**तक्ता क्र. ३: आवश्यक पाणी**

सर्व आकडे के.एल.डी. मध्ये आहेत.

| प्रक्रिया | आवश्यक पाणी | तुट | पुनर्वापर / पुनर्प्रक्रिया | निर्माण होणाऱ्या दुषित पाण्याचे प्रमाण |
|---|---|---|---|---|
| शीतकरण प्रक्रिया | १५० | ६० | ९० | ० |
| इतर वापर | ८ | ३ | ० | ५* |
| हरित पट्टा निर्मिती व बागकाम | ५* | ५ | ० | ० |
| **एकूण** | **१६३** | **६८** | **९०** | ५* |

**पाणी वापरातील समतोल**

- शीतकरण प्रक्रीयेकरिता लागणारे पाणी = ९० के.एल.डी.
- इतर वापरासाठी लागणारे पाणी =८.० के.एल.डी
- निर्माण होणाऱ्या दुषित पाण्यावर सांडपाणी प्रक्रिया केंद्राद्वारे प्रक्रिया केली जाईल.
- दुषित पाण्यावर प्रक्रिया केल्यानंतर सदरील पाण्याचा वापर बागकाम करण्याकरिता केला जाईल.
- नियमानुसार एक थेंब पाण्याचाही विसर्ग प्रकल्पाबाहेर केला जाणार नाही याची संपूर्ण काळजी घेतली जाईल.

## २.३ जमिनीची आवश्यकता

एन.आय.पी.एल. कडे एकूण १०१७४.०० चौरस मीटर जमीन उपलब्ध आहे. उपलब्ध जमिनीमध्येच प्रस्तावित प्रकल्प विस्तार केला जाईल. तक्ता क्र. ४ मध्ये जमीन वापरासंदर्भातील माहिती देण्यात आली आहे.

**तक्ता क्र. ४: जमीन वापरासंदर्भातील माहिती**

| अ.न. | जमीन वापर तपशील | क्षेत्र (चौ.मी.) | क्षेत्र (%) |
|---|---|---|---|
| १ | बांधकाम क्षेत्र | ३३६७.७० | ३३.११ |
| २ | रस्ते | ८६४.० | ८.५ |
| ३ | खुले क्षेत्र | ११२१.५३ | ११.०२ |
| ४ | वाहनतळ | १३६३.९७ | १३.४ |
| ५. | हरित पट्टा | ३४५६.७९ | ३३.९७ |
| **एकूण** | | **१०१७४.००** | **१००** |

## २.४ विजेची अवश्यकता

सध्यस्थितीमध्ये प्रक्रीये करिता ५.० मेगावॉट विजेची आवश्यकता आहे. प्रस्तावित विस्ताराकरिता आणखीन ५.० मेगावॉट विजेची गरज भासणार आहे. लागणाऱ्या विजेचा पुरवठा महाराष्ट्र राज्य वीज महामंडळ मार्फत केला जाईल. वीज पुरवठा खंडित झाल्यास तरतूद म्हणून ५०० के.व्ही.ए. क्षमतेचे २ डी.जी. सेट बसविले जातील. सध्या उपलब्ध आणि आवश्यक वीज संदर्भातील माहिती तक्ता क्र. ५ मध्ये देण्यात आली आहे.

**तक्ता क्र ५: विजेची आवश्यकता**

| अ.न. | **तपशील** | **प्रमाण** | **स्त्रोत** |
|---|---|---|---|
| १ | सध्यस्थिती | ५.० मेगावॉट | महाराष्ट्र राज्य वीज महामंडळ |
| २ | प्रस्तावित | ५.० मेगावॉट | |
| | **एकूण** | १०.० मेगावॉट | |

## २.५ आवश्यक मनुष्यबळ

प्रस्तावित प्रकल्प विस्ताराकरिता कुशल / अकुशल / अर्धकुशल अशा कामगारांची आवश्यकता असते. आवश्यक कामगारांची पूर्तता आसपासच्या ग्रामीण भागातून पूर्ण होते. प्रस्तावित प्रकल्पामुळे आसपासच्या ग्रामीण भागाचा सामाजिक-आर्थिक विकास होण्यास मदत होईल. प्रकल्पामुळे निर्माण होणाऱ्या रोजगार संदर्भातील माहिती खालील तक्ता क्र ६ मध्ये देण्यात आली आहे.

**तक्ता क्र. ६: आवश्यक मनुष्यबळ**

| **अ.न.** | **तपशील** | **संख्या** |
|---|---|---|
| १ | उपलब्ध कामगार (कार्यालाईन + कामगार) | १० + ६० = ७० |
| २ | वाढीव कामगार (कार्यालाईन + कामगार) | १० + १०० = ११० |
| | **एकूण** | **१८०** |

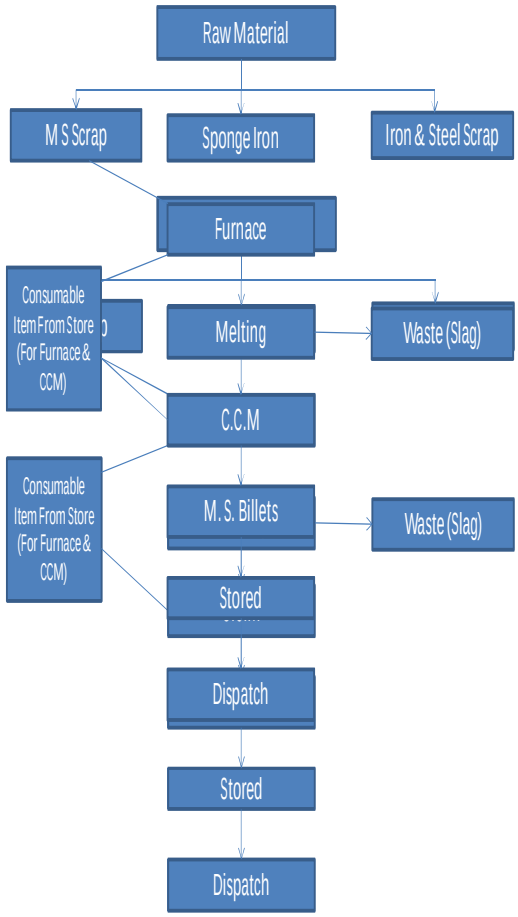
## २.६ तंत्रज्ञान व प्रक्रिया वर्णन

इंडक्शन फर्नेस मध्ये कच्चा माल वितळविण्याची प्रक्रिया केली जाते. छोट्या संच्यामध्ये कच्चा माल वितळवुन त्याचे विद्राव्य लोहामध्ये रूपांतरण केले जाते. विद्राव्य लोहास 'हेट्स' असे म्हणतात. फर्नेस मध्ये अशा प्रक्रिया सतत सुरु असतात. फर्नेस वापरतील याच चक्राला टॅप-टू-टॅप चक्राकार प्रक्रिया असे

म्हणतात. सदरील प्रक्रियेमध्ये खालील प्रमाणे कार्य होते.

- फर्नेस चार्जिंग
- वितळवने
- शुद्धीकरण
- डी-स्लॅगिंग (अनावश्यक पदार्थ बाजूला काढणे)
- आकार देणे
- फर्नेसचा वापर

.




**आकृती क्र ३: उत्पादन प्रक्रिया**

## ३.० पायाभूत पर्यावरणीय अभ्यास

प्रस्तावित प्रकल्प विस्तारापासून १० किमी त्रिज्या असेलेल्या क्षेत्रात विविध पायाभूत पर्यावरणीय घटकांच्या सध्यस्थितीचा अभ्यास करण्यात आला आहे. महत्वपूर्ण पर्यावरणीय घटक जसे की हवा, पाणी, ध्वनी, मृदा इत्यादींची आधारभूत पर्यावरणीय गुणवत्ता ऑक्टोबर २०१८ ते डिसेंबर २०१८ दरम्यान तपासण्यात आली आहे. सदरीय पर्यावरणीय घटकांची गुणवत्तापूर्ण माहिती प्रकल्प प्रस्तावामध्ये सादर करण्यात आली आहे.

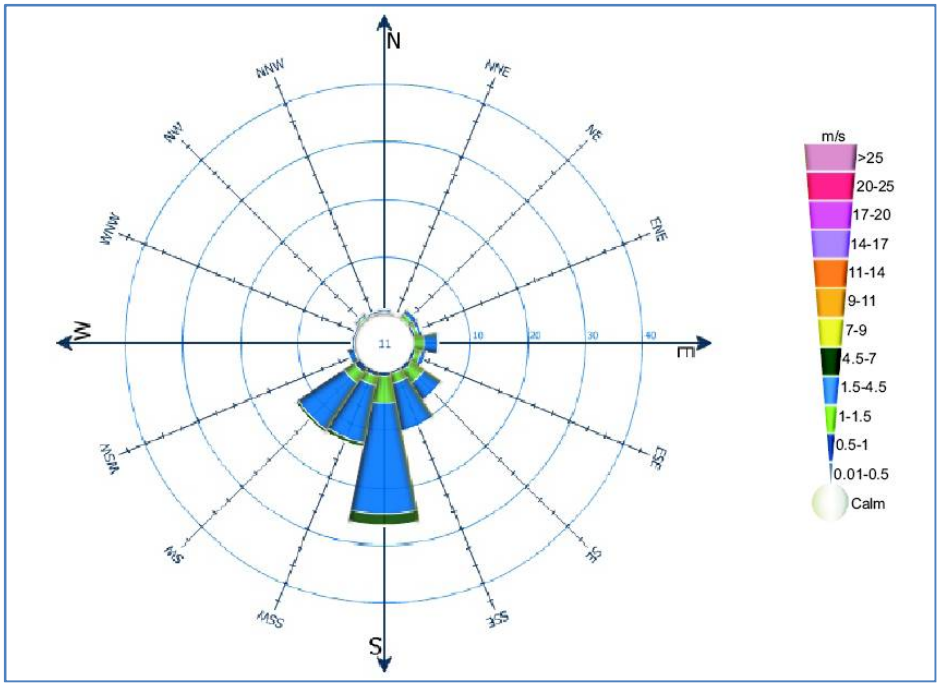
## ३.१ हवामान

### ३.१.१ हवामान दर्शक माहितीचा सारांश

प्रकल्प ठिकाणानुसार विशिष्ट हवामान दर्शक माहिती तक्ता क्र. ७ मध्ये दर्शविण्यात आली आहे. त्याच बरोबर हवेची गती व दिशा दर्शविणारी विंडरोज आकृती क्र. ४ मध्ये दर्शविण्यात आली आहे.

**तक्ता क्र. ७ विशिष्ट हवामान दर्शक माहिती (ऑक्टोबर २०१८ पासून डिसेंबर २०१८ पर्यंत)**

| महिना | तापमान (°C) | | सापेक्ष आर्द्रता (%) | | पर्जन्य (mm) |
|---|---|---|---|---|---|
| | किमान | कमाल | किमान | कमाल | |
| ऑक्टोबर २०१८ | १९.८ | ३१.७ | ४८ | ५३ | ४४.६ |
| नोव्हेंबर २०१८ | १७.९ | २९.८ | ४४ | ४८ | २९.७ |
| डिसेंबर २०१८ | १५.० | २९.१ | ३० | ३७ | १३.२ |
| **एकूण** | | | | | **८७.५** |




**आकृती क्र. ४ विंडरोज**

### ३.२ सभोवतालच्या हवेची गुणवत्ता

अभ्यास क्षेत्रातील हवा गुणवत्ता व सद्यस्थितीची माहिती प्रकल्प सभोवतालच्या ८ वेगवेगळ्या ठिकाणी तपासण्यात आली. सदरील सर्व नमुने ऑक्टोबर २०१८ ते डिसेंबर २०१८ या कालावधीमध्ये घेण्यात आले. वाऱ्याची दिशा व वेग आणि सद्यस्थितीतील हवामानविषयक परिस्थितीनुसार एकूण ८ ठिकाणे नमुना गोळा करण्याकरिता निवडण्यात आली. श्वसनयुक्त सूक्ष्मधुलीकण (पीएम १०), अतिसूक्ष्म धूळ (पीएम २.५), सल्फर डायऑक्साइड (**SO2**) आणि नायट्रोजन ऑक्साईड्स (**NOx**) इत्यादी गुणधर्मांची पातळी तपासण्यात आली. परीक्षणानंतर आढळून आलेल्या गुणधर्मांची कमाल आणि किमान पातळी तक्ता क्रमांक ८ मध्ये दर्शविण्यात आली आहे.

**तक्ता क्र. ८: सभोवतालच्या हवेची गुणवत्ता तपासणी सारांश**

**शुक्ष्म धुलीकण – पी.एम.$_{१०}$**

सर्व आकडे **µg/m$^3$**मध्ये आहेत

| ठिकाण | किमान | कमाल | सरासरी | ९८ टक्याहून |
|---|---|---|---|---|
| प्रकल्प ठिकाण | ७३.४ | ८१.५ | ७७.४ | ८१.१ |
| हळसवडे | ५२.२ | ५९.६ | ५५.५ | ५९.३ |
| तमगाव | ५१.३ | ६४.० | ५८.३ | ६३.३ |
| वासगडे | ४६.१ | ५३.७ | ५०.३ | ५३.७ |
| पट्टणकोडोली | ४३.८ | ५३.१ | ४९.४ | ५३.१ |
| कान्हेरी | ४०.५ | ४७.७ | ४४.२ | ४७.५ |
| कागल | ५९.५ | ६७.३ | ६४.५ | ६७.३ |
| तललंगडे | ६४.७ | ७४.७ | ६९.९ | ७४.६ |

**शुक्ष्म धुलीकण – पी.एम.$_{२.५}$**

सर्व आकडे **µg/m$^3$**मध्ये आहेत

| ठिकाण | किमान | कमाल | सरासरी | ९८ टक्याहून |
|---|---|---|---|---|
| प्रकल्प ठिकाण | ३०.७ | ३३.८ | ३२.२ | ३३.६ |
| हळसवडे | २०.३ | २२.७ | २१.६ | २२.७ |
| तमगाव | २०.३ | २५.० | २२.७ | २४.८ |
| वासगडे | १७.५ | २१.५ | २०.१ | २१.४ |
| पट्टणकोडोली | १७.४ | २१.३ | १९.४ | २१.१ |
| कान्हेरी | १५.५ | १७.८ | १६.८ | १७.८ |
| कागल | २३.९ | २७.५ | २६.० | २७.४ |
| तललंगडे | २६.० | ३०.५ | २८.१ | ३०.४ |

## सल्फर डायऑक्साइड (SO2)

सर्व आकडे **µg/m³**मध्ये आहेत

| ठिकाण | किमान | कमाल | सरासरी | ९८ टक्याहून |
|---|---|---|---|---|
| प्रकल्प ठिकाण | १२.६ | १४.० | १३.२ | १३.९ |
| हळसवडे | १३.३ | १५.२ | १४.२ | १५.२ |
| तमगाव | १४.१ | १७.४ | १५.४ | १७.२ |
| वासगडे | १०.२ | १२.८ | ११.९ | १२.८ |
| पट्टणकोडोली | १०.८ | १३.२ | १२.० | १३.१ |
| कान्हेरी | १०.१ | ११.८ | ११.० | ११.७ |
| कागल | १२.३ | १४.३ | १३.३ | १४.२ |
| तललंगडे | १२.६ | १४.८ | १३.७ | १४.७ |

## नायट्रोजन ऑक्साईड्स (NOx)

सर्व आकडे **µg/m³**मध्ये आहेत

| ठिकाण | किमान | कमाल | सरासरी | ९८ टक्याहून |
|---|---|---|---|---|
| प्रकल्प ठिकाण | १५.३ | १६.९ | १६.१ | १६.८ |
| हळसवडे | १६.२ | १८.४ | १७.४ | १८.३ |
| तमगाव | १६.९ | २०.८ | १८.५ | २०.६ |
| वासगडे | १३.० | १६.० | १४.९ | १५.९ |
| पट्टणकोडोली | १३.६ | १६.४ | १४.९ | १६.४ |
| कान्हेरी | १३.२ | १४.४ | १३.८ | १४.३ |
| कागल | १४.९ | १७.४ | १६.० | १७.३ |
| तललंगडे | १५.८ | १८.७ | १७.१ | १८.४ |

## कार्बन मोनॉक्साईड (CO)

सर्व आकडे **µg/m³**मध्ये आहेत

| ठिकाण | किमान | कमाल | सरासरी | ९८ टक्याहून |
|---|---|---|---|---|
| प्रकल्प ठिकाण | ०.५३ | ०.७२ | ०.६५ | ०.७२ |
| हळसवडे | <०.१ | <०.१ | <०.१ | <०.१ |
| तमगाव | <०.१ | <०.१ | <०.१ | <०.१ |
| वासगडे | <०.१ | <०.१ | <०.१ | <०.१ |
| पट्टणकोडोली | <०.१ | <०.१ | <०.१ | <०.१ |
| कान्हेरी | <०.१ | <०.१ | <०.१ | <०.१ |
| कागल | <०.१ | <०.१ | <०.१ | <०.१ |
| तललंगडे | ०.२२ | ०.२३ | ०.१८ | ०.२२ |

वरील अहवालानुसार असे दिसून येते कि, परीक्षण केलेल्या सर्वच ठिकाणी श्वसनयुक्त सूक्ष्मधुलीकण (पीएम १०), अतिसूक्ष्म धूळ (पीएम २.५), सल्फर डायऑक्साइड (**SO2**) आणि नायट्रोजन ऑक्साईड्स (**NOx**) या गुणधर्मांचे प्रमाण केंद्रीय प्रदूषण नियंत्रण मंडळाने निर्धारित केलेल्या पातळीपेक्षा कमी आहे.

### ३.३ सभोवतालची ध्वनी पातळी

हवेची गुणवत्ता तपासण्याकरिता निवडलेल्या ८ ठिकाणीच ध्वनी पातळीची तपासणी करण्यात आली. तपासणी अंती प्राप्त अहवाल खालील तक्ता क्र. ९ मध्ये दर्शविण्यात आला आहे.

**तक्ता क्र ९: ध्वनी पातळी अहवालाचा सारांश** [Leq **देसीबल मध्ये**]

| ध्वनी पातळी | | प्रकल्प ठिकाण | हळसवडे | तामगाव | वासगडे | पट्टणकोडोली | कान्हेरी | कागल | तललंगडे |
|---|---|---|---|---|---|---|---|---|---|
| $L_d$ | | ६९.४ | ५४.१ | ५३.२ | ५४.७ | ५१.३ | ५०.६ | ५४.८ | ५३.९ |
| $L_n$ | | ६५.७ | ४४.६ | ४३.१ | ४२.८ | ४४.२ | ४२.३ | ४४.५ | ४४.१ |
| **CPCB** | **Ld** | **७५** | **५५** | **५५** | **५५** | **५५** | **५५** | **५५** | **५५** |
| | **Ln** | **७०** | **४५** | **४५** | **४५** | **४५** | **४५** | **४५** | **४५** |

$L_d$ : दिवसाची ध्वनी पातळी

$L_n$ : रात्रीची ध्वनी पातळी

**निष्कर्ष**

दिवसा कमाल ध्वनी पातळी हि ६९.४ डेसीबल आणि किमान ध्वनी पातळी ५०.६ डेसीबल इतकी नोंदविण्यात आली. त्याच प्रमाणे रात्रीच्या वेळी कमाल ६५.७ आणि किमान ४३.१ डेसीबल ध्वनी पातळीची नोंद करण्यात आली.

### ३.४ पृष्ठभाग आणि भूजल स्त्रोत व गुणवत्ता

**पृष्ठभागावरील पाणी**

- पृष्ठभागावरील पाण्याच्या नमुन्यांचा pH हा ७.०७ ते ८.० मध्ये आढळून आला.
- एकूण विद्राव्य घटकांचे प्रमाण ४१८ ते ८५१ मिलिग्रॅम प्रतिलिटर इतके आढळले आहे..
- पाण्याच्या नमुन्यातील एकूण जडत्व ११७ ते ४४१ मिलिग्रॅम प्रतिलिटर इतके आढळले.

विविध नमुन्यातील जड धातूंचे प्रमाण अत्यल्प आढळले. पाण्याची गुणवत्ता उत्तम असून, कोलीफॉर्म जीवाणू आढळून आल्यामुळे पाण्याचा वापर पिण्यासाठी करता येणार नाही. वैयक्तिक किंवा सामुदायिक पातळीवर निर्जंतुकीकरण करणाऱ्या यंत्राद्वारे प्रक्रिया करूनच पाणी पिण्याकरिता वापरले जाऊ शकते.

**भूजल**

प्रकल्पा सभोवतालच्या एकूण ८ ठिकाणांवर भूजलाचे नमुने गोळा करण्यात आले. प्रत्येक ठिकाणांवर तीन वेळा नमुने गोळा करण्यात आले. सदरील नमुन्यांचे पृथःकारण मानक पद्धतीनुसार केले गेले. पृथःकारण अहवाल सारांश स्वरुपात खाली नमूद केला आहे. भूजलातील pH हा ८.११ ते ८.३२ या प्रमाणात आढळून आला आहे. त्याच प्रमाणे पाण्यातील विद्युत वाहकता ३२६ ते ४४८ µS/cm इतके आढळून आली. भूजलाचे जडत्व १०१.७ ते १८०.३ मिलिग्रॅम प्रतिलिटर आणि १२४ ते २३२ मिलिग्रॅम प्रतिलिटर या प्रमाणात आढळून आले. भूजलातील जड धातूंचे प्रमाण मानक प्रमाणापेक्षा कमी आढळून आले आहे.

## ३.५ जमिनीचा वापर व जमिनीवरील नैसार्गिक अच्छादन यांचे वर्गीकरण

तक्ता क्र १० मध्ये जमिनीच्या अच्छादन व वापरासंदर्भातील वर्गवारी आणि विस्तार दर्शविण्यात आला आहे.

**तक्ता क्र १० : १० किमी त्रिज्या असलेल्या अभ्यास क्षेत्रातील एल.यु./एल.सी. वर्गवारी आणि चौ.किमी. मधील विस्तार**

| अ.न. | तपशील | क्षेत्र (हेक्टर) | पी.जी.ए. *** (%) |
|---|---|---|---|
| १ | जलस्त्रोत | ५६८.७१ | १.८ |
| २ | रहिवासी क्षेत्र | ३२३५.६८ | १०.२८ |
| ३ | खुरटी झाडी असलेली खुली जागा | २१७१.३४ | ६.९ |
| ४ | मोकळी जमीन | २८७२.०८ | ९.१२ |
| ५ | कृषीक्षेत्र | २२६१०.७४ | ७१.९ |
| | **एकूण** | **३१४५८.५५** | **१००** |

## ३.६ मातीची गुणवत्ता

एकूण ८ वेगवेगळ्या ठिकाणी मातीचे नमुने गोळा करण्यात आले. माती नमुन्यांचा पृथःकरण अहवाल खाली दर्शविण्यात आला आहे.

- मातीचा pH हा ७.१४ ते ८.२२ या प्रमाणात आढळून आला.
- मातीतील घनता १.१६ ते १.६ ग्रॅम प्रति क्यू.से. इतकी आढळून आले.

## ३.७ जैविक पर्यावरण

**अभ्यास क्षेत्रातील दुर्मिळ आणि लुप्तप्राय वनस्पती**

आय.यु.सी.एन. रेड लिस्ट हि वनस्पती आणि प्राणी प्रजातींचे जागतिक संरक्षण स्थिती दर्शविणारी जगातील सर्वात व्यापक यादी मानली जाते. यामध्ये विविध प्रजाती आणि उप प्रजाती विलुप्त होण्यामागच्या जोखमांचे मूल्यमापन करण्या करिता या निकषांचा वापर केला जातो. हे निकष जगातील सर्व भूभाग आणि त्यावर उपलब्ध प्रजातींशी संबंधित आहेत. भक्कम वैज्ञानिक पायामुळे, जैव विविधतेची स्थिती दर्शविण्यासाठी आय.यु.सी.एन. रेड लिस्ट हि आधारभूत मार्गदर्शक म्हणून ओळखली जाते. **प्रकल्प क्षेत्रात सापडलेल्या वनस्पतींपैकी कोणतीही वनस्पती भारतीय वनस्पतींच्या रेड डेटा बुक नुसार दुर्मिळ किंवा जोखीमयुक्त श्रेणीमधील नाही.**

### ३.८ सामाजिक - आर्थिक पर्यावरण

१० किमी अभ्यासक्षेत्रातील सामाजिक-जनसांखीकीय स्थिती, समुदायांचा कल इत्यादी संदर्भातील महिती प्राथमिक सामाजिक सर्वेक्षण, २०११ सालची जनगणना आणि ग्रामीण निर्देशिका मध्ये उपलब्ध माहितीवरून गोळा करण्यात आली आहे. अभ्यास क्षेत्रातील सामाजिक - आर्थिक स्थितीचा सारांश तक्ता क्र ११ मध्ये दर्शविण्यात आला आहे.

**तक्ता क्र ११ लोकसंख्येची माहिती**

| अ.न. | तपशील | ० - २ किमी | २ - ५ किमी | ५ - १० किमी | ० - १० किमी |
|---|---|---|---|---|---|
| १ | कुटुंब संख्या | १८०४ | ५७७७ | २३५७६ | ३११५७ |
| २ | एकूण पुरुष | ३८६१ | १४१२३ | ४७६३१ | ६५६१५ |
| ३ | एकूण स्त्रिया | ३७१७ | १३४११ | ४७६०६ | ६४७३४ |
| ४ | एकूण लोकसंख्या | ७५७३ | २७५३३ | ९५२३२ | १३०३३८ |
| ५ | एस.सी. | १५८४ | ४६२७ | १९२४१ | २५४५२ |
| ६ | एस.टी. | ११६० | २५८४ | ९८८३ | १३६२७ |
| ७ | एकूण लोकसंख्या (० - ६ वयोगट) | ६७७ | ३४४१ | ८८०२ | १२९२० |
| ८ | सरासरी कुटुंबातील संख्या | ४.२ | ४.२ | ४.० | ४.१ |
| ९ | एकूण लोकसंख्येच्या तुलनेत पुरुषांचे प्रमाण | ५१.० | ५१.३ | ५०.० | ५०.३ |
| १० | एकूण लोकसंख्येच्या तुलनेत स्त्रियांचे प्रमाण | ४९.० | ४८.७ | ५०.० | ४९.७ |

## ४.० परिणाम कमी करण्यासाठी केलेल्या उपाययोजना

### ४.१ हवा प्रदूषण

हवा गुणवत्ता प्रतिमान तयार करण्यात आले आहे. त्या संदर्भातील तपशील खाली दर्शविण्यात आला आहे.

| २४ तासातील प्रमाण | सुक्ष धुलीकण **(PM) (µg/m$^3$)** | नायट्रोजन ऑक्साईड्स **(NOx) (µg/m$^3$)** |
|---|---|---|
| पायाभूत परिस्थिती (कमाल) | ८१.५ | २०.८ |
| अनुमानित भूजलातील प्रमाण (कमाल) | १.०२ | २.०५ |
| एकूण परिस्थिती | ८२.४२ | २२.८५ |
| एन.ए.ए.क्यू. मानक | १०० | ८० |

**उपाययोजना**

प्रत्यक्ष किंवा अप्रत्यक्ष क्रियेमधून निर्माण होणारे हवा प्रदूषण कमी करण्याकरिता खालील उपाययोजना करण्यात येणार आहेत.

- सी.पी.सी.बी. च्या निकषानुसार वायू उत्सर्जनासाठी वापरण्यात येणाऱ्या धुराड्याची उंची ४० मीटर (एकूण २ धुराडे) ठेवली जाईल. त्याच बरोबर डी.जी. सेट च्या धुराड्याची उंची छतापेक्षा ३ मीटर उंच ठेवण्यात येईल.
- धुराड्याची उत्सर्जन पातळी वेंचूरी स्क्रबर आणि फ्यूम एक्स्ट्रक्शन सिस्टम द्वारे मानक उत्सर्जन पातळी इतकी मर्यादित ठेवली जाईल. ऑनलाइन निरीक्षणाद्वारे धुराड्यातील उत्सर्जनावर नियंत्रण केले जाईल.
- सभोवतालची हवा गुणवत्ता व धुराड्यातील उत्सर्जनाचे प्रमाण यावर नियमितपणे देखरेख ठेवली जाईल. त्याच बरोबर प्रभावी नियंत्रण प्रणालीद्वारे धुराड्यातील उत्सर्जनावर प्रामाणिकपणे नियंत्रण मिळविले जाईल.
- विविध प्रक्रियांमधून नकळत उडणारी धूळ कमी करण्याकरिता पाणी शिंपडले जाईल. त्याच बरोबर प्रकल्प क्षेत्रातील धूळ कमी करणे करिता, प्रकल्प परिसरातील रस्त्यांचे कॉंक्रीटकारण केले जाईल.
- हवेतील दुषित घटकांचे प्रमाण मर्यादेत आहे किंवा नाही हे तपासण्याकरिता प्रकल्प परिसर व आसपासच्या क्षेत्रामध्ये नियमितपणे हवा गुणवत्ता तपासणी केली जाईल.

- प्रकल्प परिसर व सभोवतालच्या परिसरामध्ये मोठ्या प्रमाणावर वृक्षांची लागवड केली जाईल. जेणेकरून लागवड केलेल्या झाडांमुळे उत्सर्जित प्रदुषकांचे प्रमाण कमी होण्यास मदत होईल.

### ४.२ पाणी गुणवत्ता व्यवस्थापन

प्रकल्पातील विविध प्रक्रीयांकरिता एकूण १६३ के.एल.डी. पाण्याची आवश्यकता आहे. शीतकरण प्रक्रीयेसाठी ९० के.एल.डी. आणि इतर वापरासाठी ८ के.एल.डी. पाण्याची आवश्यकता भासते. पाणी मुख्यत्वे फर्नेस थंड ठेवणे, हरित पट्टा निर्मिती, धूळ नियंत्रण आणि इतर वापर इत्यादी साठी आवश्यक आहे. फर्नेस थंड ठेवण्याच्या प्रक्रियेमध्ये वारंवार पाण्याचा पुनर्वापर केला जातो. निर्माण होणारे सांडपाणी सेप्टिक टँक व नंतर शोष खड्डयामध्ये सोडले जाते. शीतकरण साठी फर्नेस कडे पाणी थंड करून सोडले जाते. इतर कामासाठी जसे कि, हरित पट्टा निर्मिती, धूळ नियंत्रण आणि इतर वापरासाठी पाणी थेट पुरविले जाते. तथापि, प्रकल्प प्रक्रीयेची 'झिरो डिस्चार्ज' प्रणालीनुसार उभारणी केली गेली आहे.

### ४.३ ध्वनी प्रदूषण नियंत्रण

ध्वनी पातळी योग्य गणितीय सूत्रांचा वापर करून मोजण्यात आली आहे. प्रकल्प सीमेवर ध्वनी पातळी कोणत्याही नियंत्रण प्रणालीशिवाय ६० डेसीबल पेक्षा कमी असणे अपेक्षित आहे. प्रकल्पातील विविध प्रक्रीयेमधून आवाज निर्माण होतो. या ध्वनीवर योग्य देखभाल व योग्य तंत्रज्ञानाचा वापर करून नियंत्रण मिळविले जाईल.

4 वेळोवेळी विविध यंत्रांणांची देखभाल व तेलपाणी केले जाईल.

5 टर्बाइन व डी.जी. सेट ला ध्वनी रोधक आवरण बसविले जाईल.

6 प्रकल्पसभोवताली हरित पट्टयांचा विकास केला जाईल जेणेकरून प्रकल्पामधील विविध प्रक्रिया व वाहतूक या मुळे निर्माण होणाऱ्या आवाजाला रोधक म्हणून हे वृक्ष कार्य करतील.

### ४.४ हरित पट्टा निर्मिती आणि वृक्षारोपण

प्रकल्प परिसरातील एकूण ३३% भूभागावर हरित पट्टयांची निर्मिती केली जाईल.

**४.५ घनकचरा आणि घातक कचरा निर्मिती व व्यवस्थापन**

घनकचरा निर्मिती संदर्भातील माहिती खाली देण्यात आली आहे.

| अ.न. | तपशील | सद्यस्थिती (टन प्रतिदिन) | विस्तारा नंतर (टन प्रतिदिन) | व्यवस्थापन |
|---|---|---|---|---|
| १ | स्लॅग | ३.० | १५.० | वीट कारखान्यास विकणे |
| २. | वापरलेले तेल | १.० | २.० | मंडळा मार्फत मान्यताप्राप्त वेंडर ला विकणे |

**४.६ इ.एम.पी. आणि सी.ई.आर. माहिती**

पर्यावरण व्यवस्थापन योजना संदर्भातील माहिती तक्ता क्र. ११ आणि सी.ई.आर संदर्भातील माहिती १२ मध्ये दर्शविण्यात आली आहे.

**तक्ता क्र. ११ ई.एम.पी. बजेट**

| अ.न | तपशील | भांडवली खर्च (लाख) | आवर्ती खर्च प्रति वर्ष (लाख) |
|---|---|---|---|
| १ | हवा प्रदूषण नियंत्रण | ८०.०० | १५.०० |
| २ | सांडपाणी व्यवस्थापन | ०३.५० | ०.८० |
| ३ | हरित पट्टा निर्मिती | ०३.०० | ०१.०० |
| ४ | पर्यावरणीय परीक्षण | ०६.०० | ०३.५० |
| ५ | व्यवसाईक आरोग्य आणि सुरक्षा व्यवस्थापण | ०३.०० | ०१.०० |
| ६ | घनकचरा व्यवस्थापन | १५.०० | ०४.०० |
| | **एकूण** | **११०.५०** | **२५.३०** |

**तक्ता क्र. १२ सी.ई.आर. बजेट**

| ठळक क्रिया | सी.ई.आर. बजेट (लाख) |
|---|---|
| आसपासच्या गावांमध्ये लागवड | ५.० |
| पर्यावरण जागरूकता कार्यक्रम | २.५ |
| घनकचरा व्यवस्थापन | २.५ |
| **एकूण** | १०.० |

**५.० निष्कर्ष**

वर नमूद केल्या प्रमाणे, प्रकल्प विस्तारामुळे पर्यावरणावर आणि सभोवतालच्या प्राणीमात्रांवर कोणताही दुष्परिणाम उद्भवणार नाही. कारण प्रदूषण नियंत्रण करण्याकरिता आधुनिक उपकरणांचा वापर करून प्रदूषकांचे प्रमाण परवानगी असलेल्या मर्यादेत ठेवले जाईल. विविध आधुनिक यंत्रांबरोबरच परिसरात विकसित केल्या जाणाऱ्या हरित पट्यामुळे प्रदूषणावर नियंत्रण ठेवण्यास मदत होईल.

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# EXECUTIVE SUMMARY

## 1.0 INTRODUCTION

Environmental Impact Assessment (EIA) is a process, used to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision making tool, which guides the decision makers in taking appropriate decisions for proposed projects. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are taken into account during the project designing.

## 1.1 Environmental Clearance

As per the Environmental Impact Assessment (EIA); Notification S.O. 1533, 14-09-2006 issued by MoEFCC, Government of India, the MS Ingots/MS Billets Manufacturing Unit expansion project is categorized as Category – B project, which mandates obtaining prior Environmental Clearance from State Environment Impact Assessment Authority, Maharashtra.

## 1.2 Terms of Reference

M/s. Nilanjan Iron Pvt. Ltd. submitted the application for Environmental Clearance as per the new notification along with prescribed Form1, proposed Terms of Reference for EIA study and pre-Feasibility report. The Expert Appraisal Committee considered the project in 157$^{th}$ Meeting on 02$^{nd}$ November 2018and issue the Terms of Reference and prescribed Terms of References is incorporated in the EIA report.

## 1.3 Brief Description of Project

The proposed project is an expansion project of MS Ingots/ MS billets production (100 TPD to 500 TPD) at Plot No: B-07, Five Star MIDC, Kagal, Tehsil: Karveer, District: Kolhapur, Maharashtra. Total land is available with NIPL is 10174.0 sq.m. No additional land is required for the proposed expansion. The project location map is given in **Figure 1**, and 10 km study area map is given in **Figure 2**.

**Product Details**

| **Existing Furnace (will be removed)** | |
|---|---|
| Induction Furnace (MS Ingots/MS Billets) | 12 MT x 9 Heats = 100 TPD |
| **Proposed Furnace (New Installation)** | |
| Induction Furnace (MS Ingots/MS Billets) | 20 MT x 13 Heats = 260 TPD<br>20 MT x 14 Heats = 280 TPD<br>**Total = 500 TPD** |

**Project Proponents**

Nilanjan Iron Private Limited is a Private incorporated on 14$^{th}$July 2005. It is classified as Non-Govt. Company and is registered at Registrar of Companies, Goa. Its authorized share capital is INR 60,000,000 and its paid up capital is INR 50,500,000.It is involved in Manufacture of Basic Iron & Steel.

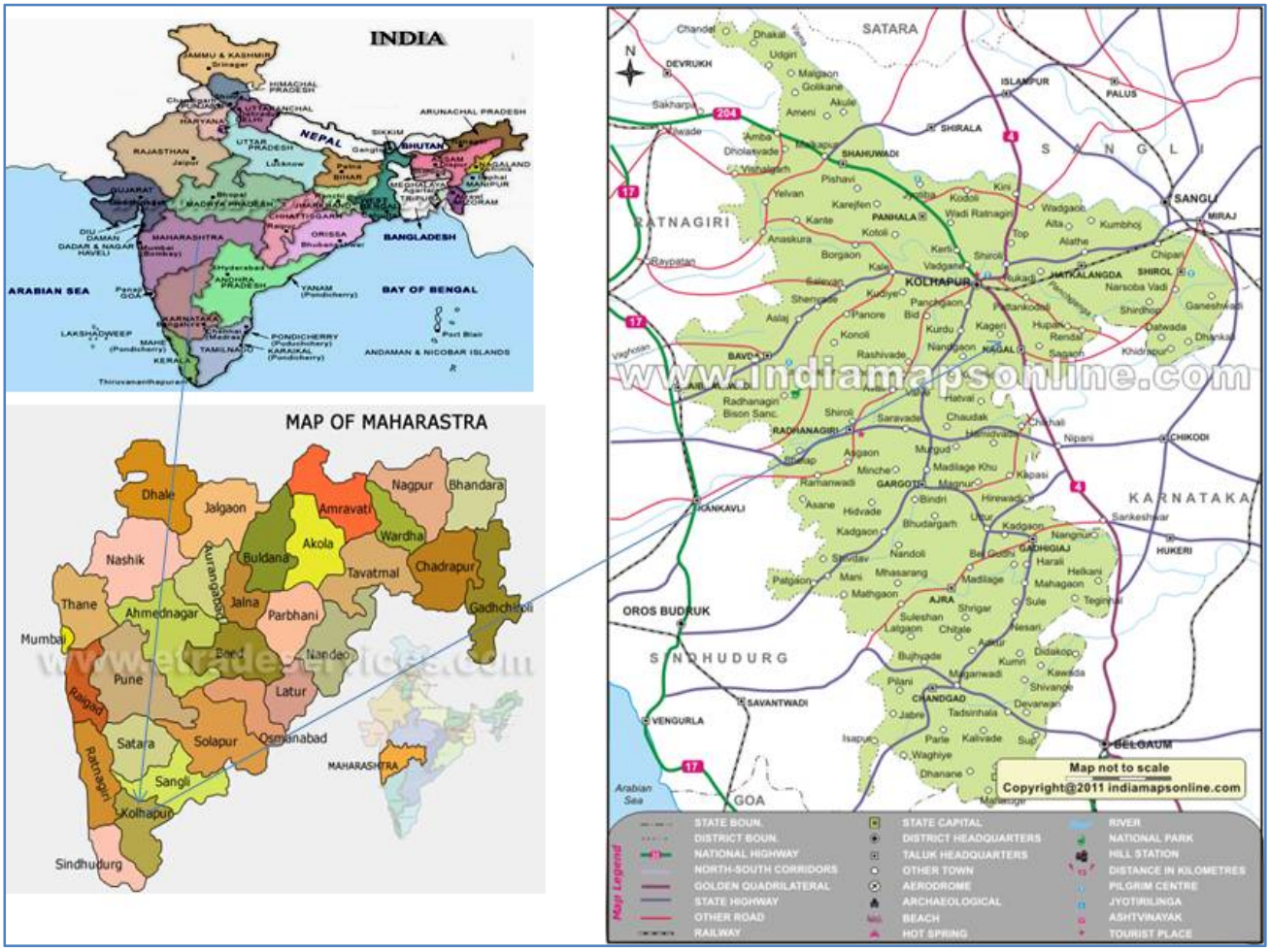


**Figure 1: Project Location Map**

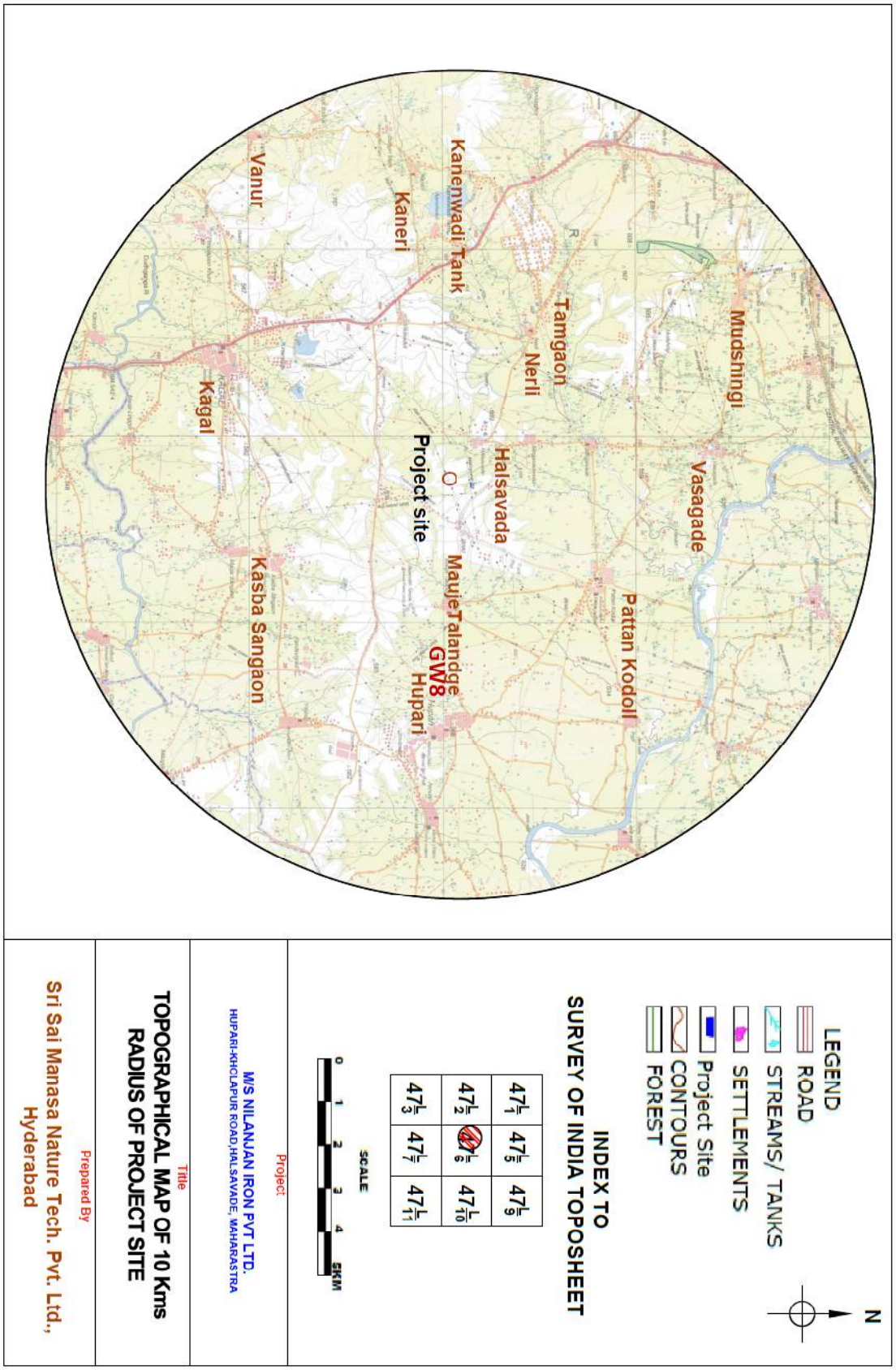


**Figure 2: 10 KM Study Area Map of the Project Site**

## 2.0 PROJECT DESCRIPTION

### 2.1 Raw MaterialRequirement

The major raw materials for the proposed expansion are Sponge Iron, Scrap and Other minerals.The raw material requirement for the production of billets is formulated based on the working days of the plant. The working days of the plant are 360 days per year. The raw material requirement per day is given in **Table 1**

**Table 1: Total Raw Material Requirement after Expansion**

| S. No. | Raw Materials | Quantity (MTPA) | Source |
|---|---|---|---|
| 1 | Sponge Iron | 200 | Open Market |
| 2 | Metal Scrap | 300 | Open Market |
| 3 | Other Minerals | 15 | Open Market |

### 2.1.1 Material Balance

The material balance is given in **Table 2.**

**Table 2:Material Balance for Billets**

| Input | TPD | Out Put | TPD |
|---|---|---|---|
| Sponge Iron | 200 | Billets | 500 |
| Metal Scrap | 300 | Slag | 15 |
| Other Minerals | 15 | **Total** | **515** |
| **Total** | **515** | | |

### 2.2 Water Requirement

The manufacturing process of proposed project does not require water at any stage. The water requirement in the project will be for cooling purpose, domestic consumption and green belt development. Total initial water requirement for the project will be 163 KLD. This requirement will be met from Local Supplier. The details of water requirement for different purposes are presented in **Table 3.**

**Table 3 : Water Requirement**

***All values in KLD***

| Item | Water Requirement | Losses | Recirculation/ Recycle | Effluent Generation |
|---|---|---|---|---|
| Industrial Cooling | 150 | 60 | 90 | 0 |
| Domestic Purpose | 8 | 3 | 0 | 5* |
| Gardening | 5* | 5 | 0 | 0 |
| **Total** | **163** | **68** | **90** | 5* |

**Water Balance**

Fresh water requirement for cooling = 90 KLD

Domestic water requirement = 8.0 KLD

Domestic waste will be treated in STP.

Treated water will be used for Gardening Purposes.

Zero Discharge norms will be followed.

## 2.3 Land Requirement

NIPL has acquired 10174.0 sq.m of land under notified industrial area. The proposed expansion activity will be established within the existing plant area only. The land breakup details are presented in **Table 4.**

**Table 4: Land Break-up Details**

| Sr. No. | Particular | Area (Sq.m) | Area in % |
|---|---|---|---|
| 1 | Built-up Area | 3367.71 | 33.11 |
| 2 | Road Area | 864.0 | 8.5 |
| 3 | Open Space Area | 1121.53 | 11.02 |
| 4 | Parking Area | 1363.97 | 13.4 |
| 5 | Greenbelt | 3456.79 | 33.97 |
| **Total** | | **10174.0** | **100** |

## 2.4 Power Requirement

The existing power requirement is 5.0 MW and additional 5.0 MW will be required for proposed expansion. The power will be sourced from the Maharashtra State Electricity Board. 2.0 nos. DG sets with a capacity of 500 kVA each will also be provided for emergency purposes. The details of Existing and proposed power requirement is given in **Table 5.**

**Table 5: Power Requirement**

| S No | Particular | Quantity | Source |
|---|---|---|---|
| 1 | Existing | 5.0MW | Maharashtra State Electricity Board |
| 2 | Proposed | 5.0 MW | |
| | **Total** | **10.0 MW** | |

## 2.5 Man Power Requirement

The skilled/semiskilled /unskilled manpower required for the proposed expansion project. The man power requirement will be fulfilled from the surrounding villages, to help for the improvement of the socio economic status in the surrounding rural areas. The details of employment is given in **Table 6**

**Table 6: Man Power Requirement**

| S No | Particular | Numbers |
|---|---|---|
| 1 | Existing Manpower (Staff + Worker) | 10 + 60 = 70 |
| 2 | Proposed Manpower(Staff + Worker) | 10 + 100 = 110 |
| | **Total** | **180 Nos.** |

## 2.6 Technology and Process Description

The induction furnace operates as a batch melting process producing batches of moltensteel known "heats". The furnace operating cycle is called the tap-to-tap cycle and is made up of the following operations:

- Furnace charging
- Melting
- Refining
- De-slagging
- Tapping
- Furnace turn-around

The process flow diagram is **Figure 3.**

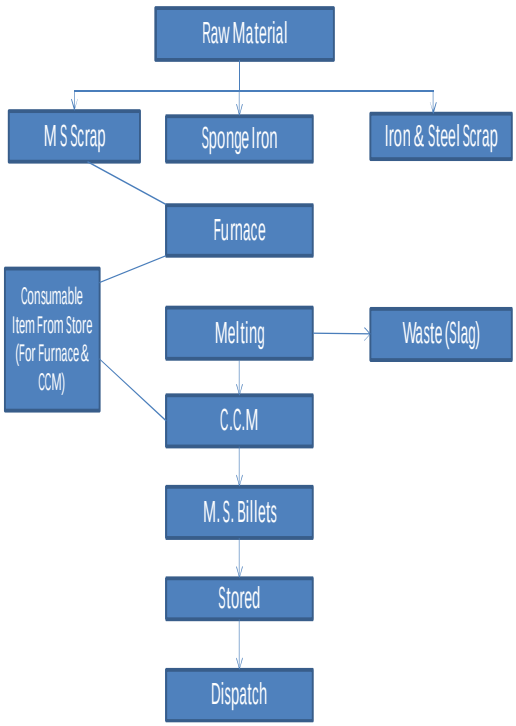


**Figure: 3 -Manufacturing Process**

## 3.0 BASELINE ENVIRONMENTAL STUDIES

Baseline environmental studies were conducted in the proposed project area and in the area within 10 km radius from the proposed expansion project area to assess the existing environmental scenario in the area. The baseline environmental quality data for various components of environment, viz. Air, Noise, Water, Land were monitored during October 2018 to December 2018 in the study area covering 10 km around the Plant area.

## 3.1 Meteorology

### 3.1.1 Summary of the Meteorological Data Generated at Site

The site Specific meteorological data is given in **Table -7 and** wind rose diagram is given in **Figure 4.**

**Table 7:Site SpecificClimatological Data (from October 2018 to December 2018)**

| Month | Temperature (°C) | | Relative Humidity (%) | | Rainfall (mm) |
|---|---|---|---|---|---|
| | Min | Max | Min | Max | |
| October 2018 | 19.8 | 31.7 | 48 | 53 | 44.6 |
| November 2018 | 17.9 | 29.8 | 44 | 48 | 29.7 |
| December 2018 | 15.0 | 29.1 | 30 | 37 | 13.2 |
| **Total** | | | | | **87.5** |

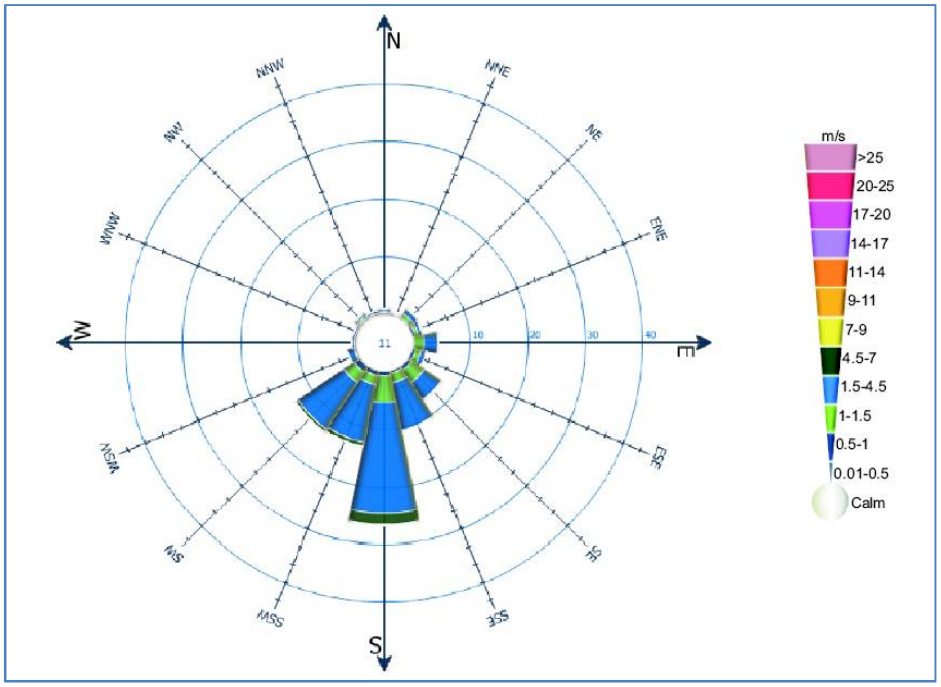


**Figure 4: Windrose Diagram (Site Specific)**

## 3.2 Ambient Air Quality Status

The status of ambient air quality within the study area was monitored for the period of during October 2018 to December 2018 at 8 locations including the Plant area and in nearby villages. Total 8 sampling locations were selected based on the meteorological conditions considering upwind and downwind directions. The levels of Respirable Particulate Matter ($PM_{10}$), Fine Particulates ($PM_{2.5}$), Sulphur Dioxide ($SO_2$,) and Oxides of Nitrogen ($NO_X$) were monitored. The minimum and maximum values of monitoring results are summarized in **Table 8.**

**Table 8: Summary of Ambient Air Quality Results**

**Particulate Matter – $PM_{10}$**

**All Values in µg/m$^3$**

| Location Name | Minimum | Maximum | Average | 98$^{th}$ Percentile |
|---|---|---|---|---|
| Project Site | 73.4 | 81.5 | 77.4 | 81.1 |
| Halsavade | 52.2 | 59.6 | 55.5 | 59.3 |
| Tamgaon | 51.3 | 64.0 | 58.3 | 63.3 |
| Vasagade | 46.1 | 53.7 | 50.3 | 53.7 |
| Pattankodli | 43.8 | 53.1 | 49.4 | 53.1 |
| Kanheri | 40.5 | 47.7 | 44.2 | 47.5 |
| Kagal | 59.5 | 67.3 | 64.5 | 67.3 |
| Talgande | 64.7 | 74.7 | 69.9 | 74.6 |

**Particulate Matter – $PM_{2.5}$**

[10]

**All Values in µg/m$^3$**

| Location Name | Minimum | Maximum | Average | 98$^{th}$ Percentile |
|---|---|---|---|---|
| Project Site | 30.7 | 33.8 | 32.2 | 33.6 |
| Halsavade | 20.3 | 22.7 | 21.6 | 22.7 |
| Tamgaon | 20.3 | 25.0 | 22.7 | 24.8 |
| Vasagade | 17.5 | 21.5 | 20.1 | 21.4 |
| Pattankodli | 17.4 | 21.3 | 19.4 | 21.1 |
| Kanheri | 15.5 | 17.8 | 16.8 | 17.8 |
| Kagal | 23.9 | 27.5 | 26.0 | 27.4 |
| Talgande | 26.0 | 30.5 | 28.1 | 30.4 |

**Sulphurdioxide - $SO_2$**

**All Values in µg/m$^3$**

| Location Name | Minimum | Maximum | Average | 98$^{th}$ Percentile |
|---|---|---|---|---|
| Project Site | 12.6 | 14.0 | 13.2 | 13.9 |
| Halsavade | 13.3 | 15.2 | 14.2 | 15.2 |
| Tamgaon | 14.1 | 17.4 | 15.4 | 17.2 |
| Vasagade | 10.2 | 12.8 | 11.9 | 12.8 |
| Pattankodli | 10.8 | 13.2 | 12.0 | 13.1 |
| Kanheri | 10.1 | 11.8 | 11.0 | 11.7 |
| Kagal | 12.3 | 14.3 | 13.3 | 14.2 |
| Talgande | 12.6 | 14.8 | 13.7 | 14.7 |

**Oxides of Nitrogen – NOx**

**All Values in µg/m$^3$**

| Location Name | Minimum | Maximum | Average | 98$^{th}$ Percentile |
|---|---|---|---|---|
| Project Site | 15.3 | 16.9 | 16.1 | 16.8 |
| Halsavade | 16.2 | 18.4 | 17.4 | 18.3 |
| Tamgaon | 16.9 | 20.8 | 18.5 | 20.6 |
| Vasagade | 13.0 | 16.0 | 14.9 | 15.9 |
| Pattankodli | 13.6 | 16.4 | 14.9 | 16.4 |
| Kanheri | 13.2 | 14.4 | 13.8 | 14.3 |
| Kagal | 14.9 | 17.4 | 16.0 | 17.3 |
| Talgande | 15.8 | 18.7 | 17.1 | 18.4 |

**Carbon Monoxide – CO**

**All Values in mg/m$^3$**

| Location Name | Minimum | Maximum | Average | 98$^{th}$ Percentile |
|---|---|---|---|---|
| Project Site | 0.53 | 0.72 | 0.65 | 0.72 |
| Halsavade | <0.1 | <0.1 | <0.1 | <0.1 |
| Tamgaon | <0.1 | <0.1 | <0.1 | <0.1 |
| Vasagade | <0.1 | <0.1 | <0.1 | <0.1 |
| Pattankodli | <0.1 | <0.1 | <0.1 | <0.1 |
| Kanheri | <0.1 | <0.1 | <0.1 | <0.1 |
| Kagal | <0.1 | <0.1 | <0.1 | <0.1 |
| Talgande | 0.22 | 0.23 | 0.18 | 0.22 |

From the above results, it is observed that the ambient air quality with respect to $PM_{10}$, $PM_{2.5}$, $SO_2$ and NOx at all the monitoring locations was within the permissible limits specified by CPCB.

### 3.3 Ambient Noise Levels

Ambient noise level monitoring was carried out at the 8 monitoring locations; those were selected for ambient air quality monitoring. The monitoring results are summarized in **Table 9.**

**Table 9: Summary of Ambient Noise Level Monitoring Results [Leq in dB(A)]**

| Equivalent Noise levels | Project Site | Halsavade | Tamgaon | Vasagade | Pattankodli | Kanheri | Kagal | Talgande |
|---|---|---|---|---|---|---|---|---|
| $L_d$ | 69.4 | 54.1 | 53.2 | 54.7 | 51.3 | 50.6 | 54.8 | 53.9 |
| $L_n$ | 65.7 | 44.6 | 43.1 | 55.3 | 44.2 | 42.3 | 44.5 | 44.1 |
| **CPCB** | **75** | **55** | **55** | **55** | **55** | **55** | **55** | **55** |
| **L** | **70** | **45** | **45** | **45** | **45** | **45** | **45** | **45** |

$L_d$ : DayEquivalent

$L_n$ : NightEquivalents

**Conclusion**

The Maximum Noise (day) value was observed 69.4 dB(A) and the minimum noise (day) valve was observed 50.6 dB(A). The Maximum Noise (night) value was observed 65.7 dB(A) and the minimum noise (night) valve was observed 43.1 dB(A).

## 3.4 Surface and Ground Water Resources & Quality

***Surface Water***

- pH of the ground water samples collected was in the range of 7.07 – 8.0.
- Total Dissolved Solids in the samples was in the range of 418 – 851mg/l.
- Total Hardness was found to vary between 117 – 441mg/l.

The heavy metal contents are found to be negligible. Water quality is excellent but it is not potable due to presence of coliform. It can be used for drinking purpose after installing bacteriological treatment devices at individual or at community level.

***Ground Water***

Sampling was carried out at 8 locations during the study period. Sampling and analysis was carried out, as per standard methods and frequency of the sampling was thrice/stations. The summary of the results are presented below: pH in ground water sample was observed to be in the range 8.11 to 8.32 while conductivity was observed in the range of 326- 448μS/cm. The value of alkalinity and hardness were observed in the range of 101.7 – 180.3 mg/l and 124to 232 mg/l respectively. Whereas the heavy metals were found to be within the limits.

## 3.5 Land use Land Cover classification

The Land Cover classes and their coverage are summarized in **Table 10**.

**Table 10: LU/LC Classes and their Coverage in SQ. km of 10 km Radius)**

| S. No. | Particular | Area (ha.) | PGA *** (%) |
|---|---|---|---|
| 1 | Water body | 568.71 | 1.8 |
| 2 | Settlement | 3235.68 | 10.28 |
| 3 | Open Scrub | 2171.34 | 6.9 |
| 4 | Fallow Land | 2872.08 | 9.12 |
| 5 | Agriculture Land | 22610.74 | 71.9 |
| | **Total** | **31458.55** | **100** |

## 3.6 Soil Quality

Sampling was carried out at 8 locations during the study period. The summary of the results are presented below:

- pH in soil sample was observed in the range 7.14 to 8.22.
- Bulk density was observed in the range of 1.16 -1.36 g/cc.

## 3.7 Biological Environment

### Rare and Endangered Flora in the Study Area

The IUCN Red List is the world's most comprehensive inventory of the global conservation status of plant and animal species. It uses a set of criteria to evaluate the extinction risk of thousands of species and subspecies. These criteria are relevant to all species and all regions of the world. With its strong scientific base, the IUCN Red List is recognized as the most authoritative guide to the status of biological diversity. **Among the enumerated flora in the study area, none of them were assigned any threat category, by RED data book of Indian Plants.**

## 3.8 Socio-economic Environment

Information on socio-demographic status and the trends of the communities in the 10 km radius was collected through primary social survey and secondary data from census 2011 & village directory 2011. Summary of the socio-economic status of the study area is given in **Table 7.**

**Table 7: Population Details**

| S.No. | Particulars | 0-2km | 2-5km | 5-10km | 0-10km |
|---|---|---|---|---|---|
| 1 | Number of households | 1804 | 5777 | 23576 | 31157 |
| 2 | Male population | 3861 | 14123 | 47631 | 65615 |
| 3 | Female population | 3717 | 13411 | 47606 | 64734 |
| 4 | Total population | 7573 | 27533 | 95232 | 130338 |
| 5 | SC population | 1584 | 4627 | 19241 | 25452 |
| 6 | ST population | 1160 | 2584 | 9883 | 13627 |
| 7 | Total population(0-6 years) | 677 | 3441 | 8802 | 12920 |
| 8 | Average household size | 4.2 | 4.2 | 4.0 | 4.1 |
| 9 | % of males to the total Population | 51.0 | 51.3 | 50.0 | 50.3 |
| 10 | % of females to the total population | 49.0 | 48.7 | 50.0 | 49.7 |

## 4.0 IMPACT ASSESSMENT AND MITIGATION MEASURES

### 4.1 AIR Pollution

The air quality modeling has been done and the details are given below:

| 24 Hourly Concentrations | Particulate Matter (PM) ($\mu g/m^3$) | Oxides of Nitrogen (NOx) ($\mu g/m^3$) |
|---|---|---|
| Baseline Scenario (Max) | 81.5 | 20.8 |
| Predicted Ground Level Concentration (Max) | 1.02 | 2.05 |
| Overall Scenario | **82.42** | **22.85** |
| NAAQ Standards | **100** | **80** |

**Mitigation Measures**

Following measures will be taken to control air/fugitive pollution during operation:

- Stack height would be approx..40 m (2 nos.) for gaseous emission confirming to the CPCB norms. D. G. Sets, stack height of 3.0 m above the roof level will be maintained.
- Stack emission level will be kept within permissible limit by installation of Fume extraction system with ventury scrubber and online stack emission monitoring will be done.
- Ambient air quality and stack emission would be regularly monitored and effective control exercised, so as to keep limits on stack emission loads would be met honestly at all the time.
- In order to avoid fugitive emissions from different sources, water will be sprayed. Also the roads within the premises will be concreted to prevent dust emission.
- The ambient air monitoring will be carried out regularly in the work zone and surrounding areas, to check that ambient air levels of the contaminants, are well below the stipulated norms.
- Green belt around the periphery and within premises will be developed which will help in attenuating the pollutants emitted by the plant.

### 4.2 Water Quality Management

The total water requirement of the plant is 163 KLD and fresh water requirement will be 90.0 KLD for cooling and 8.0 KLD for domestic purposes. The water will be mainly used for furnace cooling purpose, greenbelt, dust suppression and domestic purpose only. Cooling water will be continuously recalculated in the cooling circuit and domestic effluent is sent to septic tank followed by soak pit. The water is supplied for cooling water in Induction Furnace. The water

for other areas i.e. for greenbelt, dust suppression and domestic use is supplied directly. However, the Plant will be designed for Zero Discharge from the operations.

### 4.3 Noise Pollution Control

Noise level at the plant boundary, calculated from the above equation, is expected to be less than 60 dB (A) without considering any attenuation factors.

Various components of industrial operations will cause some amount of noise, which will be controlled by proper maintenance and compact technology.

i. Time to time oiling and servicing of machineries will be done.
ii. Acoustic enclosure for Turbine and D.G. sets will be provided.
iii. Green belt development (plantation of dense trees across the boundary) will help in reducing noise levels in the plant as a result of attenuation of noise generated due to plant operations, and transportation.

### 4.4 Greenbelt Development and Plantation

About 33% of the total Plant area will be developed as green belt.

### 4.5 Solid and Hazardous WasteGeneration and Management

The details of solid waste generation are given below:

| Sr. No. | Particular | Existing (TPD) | After Expansion (TPD) | Management |
|---|---|---|---|---|
| 1 | Slag | 3.0 | 15.0 | Sold to Brick Manufactures |
| 2 | Used Oil | 1.0 | 2.0 | Sold to Board Authorized Vendor |

### 4.6 EMP and CER Details

Details of environment management plan are given in **Table 11**and **CER in Table 12.**

**Table 11: EMP Budget**

| S. No | Environmental Aspect | Capital Expenditure (Rs. Lacs) | Recurring Expenditure (Rs. Lacs) |
|---|---|---|---|
| 1 | Air Pollution Control | 80.00 | 15.00 |
| 2 | Wastewater Management | 03.50 | 0.80 |
| 3 | Green Belt development | 03.00 | 01.00 |
| 4 | Monitoring | 06.00 | 03.50 |
| 5 | Occupational Health safety Management | 03.00 | 01.00 |
| 6 | Solid Waste Management | 15.00 | 04.00 |
| | **Total** | **110.50** | **25.30** |

**Table 12: CER Budget**

| **Activity Identified** | **CER Budget INR (Lakhs)** |
|---|---|
| Plantation in surrounding Villages | 5.0 |
| Environmental Awareness Program | 2.5 |
| Solid waste management | 2.5 |
| **Total** | **10.0** |

## 5.0 CONCLUSION

As discussed, it is safe to say that the project is not likely to cause any significant impact on the ecology of the area, as adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Green belt development around the area will also be taken up as an effective pollution mitigative technique, as well as to control the pollutants released from the premises of the project.

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# CHAPTER 1
# INTRODUCTION

## 1.1 PURPOSE OF THE REPORT

**M/s.Nilanjan Iron Pvt. Ltd.(NIPL)** is steelmanufacturing facility at Kagal Five Star MIDC. NIPLis proposing expansion of existing MS Ingots/MS Billets production from 100 TPD to 500 TPD.

The existing project was accorded Environmental Clearance vide letter EC-2009/CR134/TC 2 dated 09th October,2009. The Consent to Operate was accorded by Maharashtra State Pollution Control Board vide letter no.RO-Kolhapur/Consent/1803000346/079/18 dated 07/03/2018. The validity of CTO is up to 31/12/2023.The existing plant, proposed expansion and total capacity after proposed expansion aregivenin **Table 1.1.**

**Table 1.1: Production Details**

| **Existing Furnace (will be removed)** | |
|---|---|
| Induction Furnace (MS Ingots/MS Billets) | 12 MT x 9 Heats = 100TPD |
| **Proposed Furnace (New Installation)** | |
| Induction Furnace(MS Ingots/MS Billets) | 20 MT x 13 Heats = 260 TPD<br>20 MT x 14 Heats = 280 TPD<br>**Total = 500 TPD** |

In view of the above, NIPL had made online application for TOR was submitted at State Environment Impact Assessment Authority (SEIAA) for expansion of the plant along with the application in prescribed format (Form-I), copy of pre-feasibility report and proposed ToRs for undertaking detailed EIA study as per the EIA Notification, 2006.The proposed project activity is listed at Sl. No. 3(a) Metallurgical industries (ferrous & non-ferrous) under Category "B" EIA Notification, 2006.

The State Expert Appraisal Committee considered the project in 157th Meeting on 02nd November 2018and issue the Terms of Reference (**Annexure 1).**

The Environmental Impact Assessment (EIA) report preparation and the corresponding work are entrusted to our Environmental consultant M/s. Sri SaiManasa Nature Tech Pvt. Ltd.(SSMNT). The EIA prepared using the baseline data collected during summer season i.e. from October 2018 to December 2018.

## 1.2 IDENTIFICATION OF PROJECT & PROJEC PROPONENT PROJECT

The proposed project is an expansion project of MS Ingots/ MS billets production (100TPD to500 TPD) at Plot No: B-07, Five Star MIDC, Kagal, Tehsil: Karveer, District: Kolhapur, Maharashtra.

**Project Proponents**

Nilanjan Iron Private Limited is a Private incorporated on 14$^{th}$July 2005. It is classified as Non-Govt.Company and is registered at Registrar of Companies, Goa. Its authorized share capital is INR 60,000,000 and its paid up capital is INR 50,500,000.It is involved in Manufacture of Basic Iron & Steel.

**PROJECT COST**

The Existing project cost is INR14.0croresand INR 5.0crores is earmarked for proposed expansion. After expansion total project cost will be INR 19.0 crores.

## 1.3 NATURE, SIZE AND LOCATION OF PROJECT SITE

The proposed project is an expansion project of MS ingot/MS billets project. The production quantity of the additional expansion project is given in **Table 1.1.** The proposed expansion will be done with in the existing project site Premises.Details of the projectare given in **Table 1.2.**The project location map is given in **Figure 1.1**, Google image of the project is given in **Figure 1.2** and 10 km study area map is given in **Figure 1.3**.

**Table 1.2: Project Details**

| Particulars | Details |
|---|---|
| Nature of the Project | Expansion Project |
| Project Location | Plot No: B-07, Five Star MIDC, Kagal, Tehsil: Karveer, District: Kolhapur, Maharashtra |
| Coordinates | Latitude –16°37'44.42"N<br>Longitude –74°20'41.29"E |
| Size of the Project | Expansion in MS Ingots/MS Billets Production – 100TPD to 500TPD |
| Total Project Cost (Existing and Proposed) | INR 19.0crores |
| Environment Management Plan Cost | INR 110.50 Lakhs |
| Corporate Environment Responsibility Cost | INR 10.0 Lakhs |

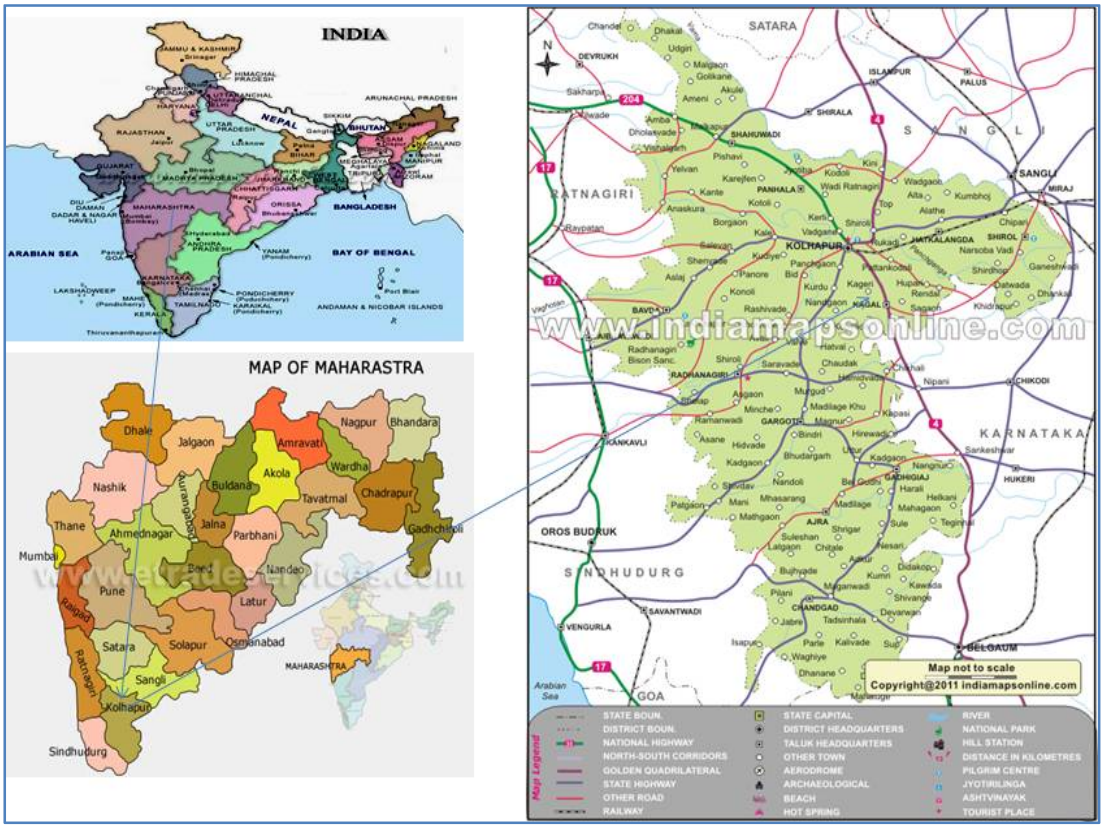


**Figure 1.1: Location Map of the Project Site**


**Figure 1.2: Google Image of the Project Site**

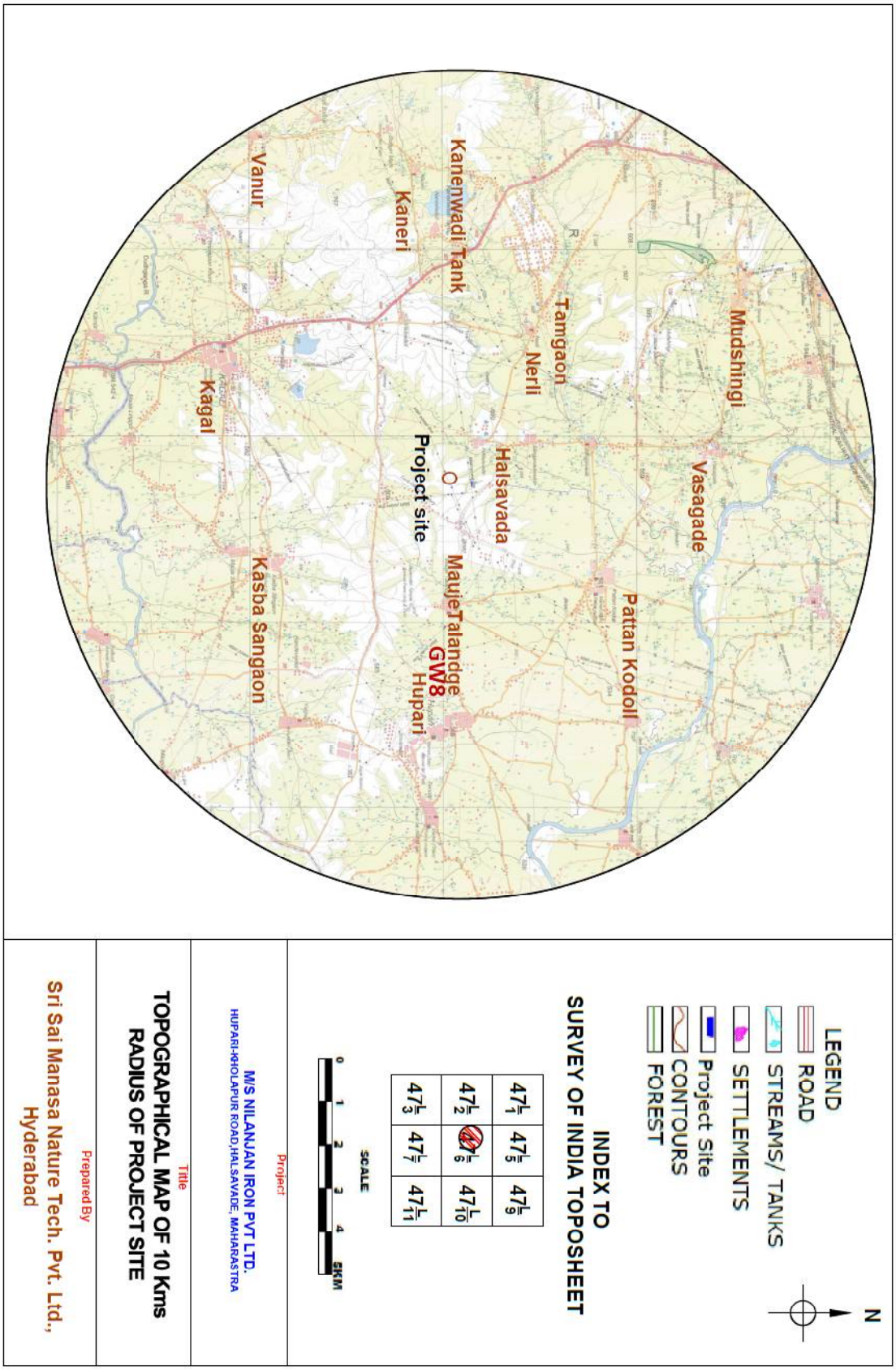


**Figure 1.3: 10 KM Study Area Map of the Project Site**

## 1.4 PROJECT IMPORTANCE TO THE COUNTRY

India was the world's third-largest steel producer in 2017. The growth in the Indian steel sector has been driven by domestic availability of raw materials such as iron ore and cost-effective labour. Consequently, the steel sector has been a major contributor to India's manufacturing output.

The Indian steel industry is very modern with state-of-the-art steel mills. It has always strived for continuous modernisation and up-gradation of older plants and higher energy efficiency levels. Indian steel industries are classified into three categories such as major producers, main producers and secondary producers.

*Market Size*

India's finished steel consumption grew at a CAGR of 5.69 per cent during FY08-FY18 to reach 90.68 MT. India's crude steel and finished steel production increased to 102.34 MT and 104.98 MT in 2017-18, respectively.

In 2017-18, the country's finished steel exports increased 17 per cent year-on-year to 9.62 million tonnes (MT), as compared to 8.24 MT in 2016-17. Exports and imports of finished steel stood at 1.35 MT and 1.89 MT, during Apr-Jun 2018.

*Investments*

Steel industry and its associated mining and metallurgy sectors have seen a number of major investments and developments in the recent past.

According to the data released by Department of Industrial Policy and Promotion (DIPP), the Indian metallurgical industries attracted Foreign Direct Investments (FDI) to the tune of US$ 10.84 billion in the period April 2000–June 2018.

*Government Initiatives*

Some of the other recent government initiatives in this sector are as follows:

An export duty of 30 per cent has been levied on iron ore^ (lumps and fines) to ensure supply to domestic steel industry.

Government of India's focus on infrastructure and restarting road projects is aiding the boost in demand for steel. Also, further likely acceleration in rural economy and infrastructure is expected to lead to growth in demand for steel.

The Union Cabinet, Government of India has approved the National Steel Policy (NSP) 2017, as it seeks to create a globally competitive steel industry in India. NSP 2017 targets 300 million tonnes (MT) steel-making capacity and 160 kgs per capita steel consumption by 2030.

The Ministry of Steel is facilitating setting up of an industry driven Steel Research and Technology Mission of India (SRTMI) in association with the public and private sector steel companies to spearhead research and development activities in the iron and steel industry at an initial corpus of Rs 200 crore (US$ 30 million).

India is expected to overtake Japan to become the world's second largest steel producer soon. The National Steel Policy, 2017, has envisaged 300 million tonnes of production capacity by 2030.

In 2018, steel consumption of the country is expected to grow 5.7 per cent year-on-year to 92.1 MT*.

Huge scope for growth is offered by India's comparatively low per capita steel consumption and the expected rise in consumption due to increased infrastructure construction and the thriving automobile and railways sectors.

Considering the said scenario, M/s. Nilanjan Iron Pvt. Ltd. is proposing to increase in existing steel plant capacity.

## 1.5 SCOPE OF STUDY

The scope of the study includes preparation of Environmental Impact Assessmentstudywith detailedcharacterizationofvarious environmental components such as air, noise, water, land, biological and socio economic within an area of 10 km radius around the project site.As per the latest guidelines of MoEFCC and the EIA study was conducted during the period of October 2018 –December 2018.

The main objectives of characterization are as follows:

- To assess the existing baseline status of air, water, noise, land, biological and socio-economic environments within the project site and around 10 km radius of the study area
- To identify and quantify significant impacts due to the proposed activity on various environmental components through prediction of impacts.
- To evaluate the beneficial and adverse impacts of the proposed activity.
- To prepare an Environmental Management Plan (EMP) detailing control technologies and measures to be adopted for mitigation of adverse impacts if any, as a consequence of the proposed activity.
- To prepare a Post Project Monitoring Program for checking and regulating the environmental quality of the project and help in sustainable development of the area.

### 1.5.1 Methodology of EIA

Any developmental activity is expected to cause impacts on surrounding environment during the construction and operation phases. The impacts may be adverse or beneficial. In order to assess the impacts due to the proposed activity, an Environmental Impact Assessment study has been conducted within an area of 10 km radius around the project site as per Terms of Reference prescribed by the State Expert Appraisal Committee.

The various steps involved in Environmental Impact Assessment study are divided into the following phases.

- Identification of significant environmental parameters and assessing the existing status within the impact zone with respect of air, water, noise, soil, biological and socioeconomic components of environment.
- Prediction of impact on air quality taking into consideration the proposed emissions to project the overall scenario.
- Prediction of impact on Water, Land, Biological and Socio Economic Environment
- Evaluation of total impacts after superimposing the predicted scenario over the baseline scenario to prepare an Environmental Management Plan.

The methodology adopted for studying the various individual components of environment is described below.

### 1.5.2 Micro Meteorology

An auto weather monitoring station to record meteorological parameters was installed at proposed project site. Wind speed, Wind direction, maximum, and minimum temperatures, relative humidity, cloud cover was recorded on hourly basis continuously covering the entire three months from October 2018 –December 2018.

Wind speed & Wind direction data recorded during the study period were used for computation of relative percentage frequencies of different wind directions. Themeteorological data thus collected has been used for interpretation of the existing Ambient Air Quality status, and the same data has been used for prediction of impacts of future scenario due to the activities of the proposed scheme.

### 1.5.3 Ambient Air Quality

The scenario of the existing ambient air quality in the study region has been assessed through a network of 8 ambient air quality stations during the study period within an area of 10 km radius around the project area. Themonitoring network was so designed such that

representative samples are obtained from the upwind direction, down wind and cross wind directions of the proposed project site. These monitoring sites have been established keeping in view the available climatologically norms of predominant wind direction and wind speed of this particular region.

The following points were also taken into consideration in designing the network of sampling stations:

1. Topography/ Terrain of the study area
2. Populated areas within the study area
3. Residential and sensitive areas within the study area.
4. Magnitude of the surrounding industries
5. Representation of regional background levels
6. Representations of cross sectional distribution in downward direction.

Ambient Air Quality monitored 24 hours per day for $PM_{2.5}$, $PM_{10}$, $SO_2$, NOxand CO at 8 stations within 10km radius of the project site once in twice per a week for the study period.

Pre-calibrated respirable dust samplers have been used for monitoring of the existing AAQ status. Methodologies adopted for sampling and analysis were, as per the approved methods of Central Pollution Control Board (CPCB). Maximum, minimum, average and percentile values have been computed from the raw data collected at all individual sampling stations to represent the ambient air quality status of the study area.

### 1.5.4 Noise Environment

Noise monitoring has been carried out at eight locations to identify the impact due to the existing sources on the surroundings in the study area. Noise levels were recorded at an interval of 1hrs during the day and night times to compute the day equivalent, night equivalent and day-night equivalent level.

### 1.5.5 Water Environment

8 groundwater samples and eight surface water samples from various locations around the project site within 10 km radius were collected for assessment of the existing physico-chemical and bacteriological quality. Methodologies adopted for sampling and analysis were according to the IS methods. Field parameters such as pH, Temperature were monitored on site. The parameters thus analyzed were compared with IS 10500:2012. The activities surrounding the source during sampling were taken into consideration in interpretation of the water quality of that particularsource.

### 1.5.6 Land Environment

Ground truth studies were conducted to identify the land use in and around 10 km radius of the site. Representative soil samples were collected from- 8 sampling locations within an area of 10 km radius around the proposed project site for analysis of the physico chemical characteristics to assess the cropping pattern, microbial growth etc. standard procedures were followed for sampling and analysis. The samples collected were also analyzed to check the suitability for growth of native plant species in and around the projectsite.

### 1.5.7 Biological Environment

Intensive survey of flora and fauna of the project site and its surroundings extending up to a radius of 10 Km has been collected during the study period.

As for as the fauna is concerned, both primary and secondary data have been collected from various government departments such as forest, agriculture, fisheries and animal husbandry to clearly understand the status of fauna. Quadrant method has been used for sampling offlora.

### 1.5.8 Socio- Economic Environment

Details on economic status of various villages within an area of 10 km around the project site have collected. Information on existing amenities has been collected to determine the developmental activities. Such developmental activities would result in upliftment of the economic status in thearea.

All the above environmental parameters have been used for identification, evaluation and prediction of significant impacts.

### 1.5.9 Prediction of Impacts, Environmental Management Plan & Disaster Management Plan

Various technical aspects of the proposed project have been studied to identify the significant impacts, which would arise from the proposed activity. The identified impacts have been quantified through prediction of impacts to estimate the post project scenario.

Identified impacts due to proposed project have been studied in detail to predict the impacts on various environmental components. Predicted scenario has been superimposed over the baseline (pre-project) status of environmental quality to derive the ultimate (post-project) scenario of environmental conditions.

Environmental Management Plan (EMP) for this proposed project details the control measures, which will be suitable for proposed expansion to maintain environmental quality within the stipulated limits specified by State Pollution ControlBoard/CPCB/MoEFCC.

**Table 1.2 Environmental Attributes and Frequency of Monitoring**

| Attribute | Parameters | Frequency of Monitoring |
|---|---|---|
| Ambient Air Quality | PM10, PM 2.5 | 24 hourly samples twice a week for four weeks at eight locations. |
| Ambient Air Quality | $SO_2$, NOx | 8 hourly samples average to 24 hrs for four weeks at eight locations. |
| Meteorology | Wind Speed, direction, Temperature, relative humidity andrainfall | Continuous monitoring station for entire study period on hourly basis and also data collection from Secondary sources. |
| Water Quality | Physical, Chemical and Bacteriological parameters | Once during the study period at eight locations |
| Biology | Existing Flora and Fauna | Through field visit during the study period and substantiated through Secondary sources. |
| Noise Levels | Noise levels in dB(A) | Hourly observations for 24 hours perlocation |
| Soil Characteristics | Parameters related to agricultural and afforestation potential | Once during the study period at eight locations |
| Land Use | Trend of land use change for Different categories | Data from various Government agencies. |
| Socio-economic Aspects | Socio-economic characteristics, labour force characteristics, population statistics and existing amenities in the studyarea. | Field Survey and Census Handbook, 2011 |

## 1.6 COMPLIANCE TO THE TERMS OFREFERENCE

Compliance to the additional terms of reference issued by SEAC/SEIAA is given below:

**A. Specific TOR:**

| S. No. | TOR Point | Compliance of TOR Points |
|---|---|---|
| 1 | PP to submit certificate of incorporation of the company, list of directors and memorandum of articles. | Details will be submitted along with Final EIA Report. |
| 2 | PP to explore possibility to recover waste heat by way of process re-engineering and include the same in EIA report. | We are in process to find out the sustainable way to recover the waste heat. After getting the suitable solution we will submit the details. |
| 3 | PP to carry out risk assessment and submit disaster management plan. | Details are given in Chapter 7. |

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| 4 | PP to submit structural stability certificate of existing structures with respect to the accommodation of proposed<br>expansion activities | We have applied for the structural stability certificate. The details will be submitted in Final EIA report. |
| 5 | PP to provide new and renewable energy for illumination of office buildings, street lights, parking areas and maintainthe same regularly. | Nilanjan Iron Pvt. Ltd. will install solar energy system for office buildings, street lights, parking areas. |
| 6 | PP to include slag management and disposal plan in the EIA report. | Slag will be sold to brick Manufacturing unit. Detail of slag management is given in **Chapter 4, Subheading 4.2.9.** |
| 7 | PP to include water and carbon foot print monitoring in the Environment Management Plan | Details of water foot Print and Carbon foot print is given in **Chapter 10, Subheading 10.1.6 and 10.1.7.** |

**B. General TOR**

| S. No. | TOR POINT | Compliance of TOR Points |
|---|---|---|
| 1 | **Executive Summary** | Attached with EIA Report |
| 2 | **Introduction** | |
| i) | Details of the EIA Consultant including NABET accreditation | Details are Given in **Chapter 12.** |
| ii) | Information about the project proponent | Details are given in **Chapter 1, Subheading 1.2** |
| iii) | Importance and benefits of the project | Details are given in **Chapter 8.** |
| 3 | **Project Description** | |
| 1 | Cost of project and time of completion. | The estimated project cost of the proposed expansion is Rs. 5.0crores. Proposed expansion will be completed with 10 months from the zero date. |
| 2 | Products with capacities for the proposed project. | The proposed project is an expansion of |
| 3 | If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any. | The project is expansion in MS billets manufacturing unit (100 TPD to 500 TPD)<br>The Existing land the sufficient for the proposed Expansion. |
| 4 | List of raw materials required and their source along with mode of transportation. | Details are given in **Chapter 2, Sub heading 2.5.** |
| 5 | Other chemicals and materials required with quantities and storage capacities | Details are given in **Chapter 2, Subheading 2.5.** |

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| 6 | Details of Emission, effluents, hazardous waste generation and their management. | Emission details are given in **Chapter 4, Subheading 4.2.4**<br>Effluent details are given in **Chapter 4, Subheading 4.2.10**<br>Solid waste generation details are given in **Chapter 4, Subheading 4.2.11** |
| 7 | Requirement of water, power, with source of supply, status of approval, water Balance diagram, man-power requirement (regular and contract) | After expansion about 164 KLD water will be required. The water details are given in **Chapter 2, Subheading 2.6.1.**<br>The Power requirement details are given in **Chapter 2, Subheading 2.6.3**<br>Manpower details are given in **Chapter 2, Subheading 2.6.4** |
| 8 | The project proponent shall furnish the requisite documents from the competent authority in support of drawl of ground water and surface water and supply of electricity. | Water will be sourced from MIDC.<br>Power will be sourced from state electricity board. |
| 9 | Process description along with major equipments and machineries, process flow sheet (Quantative) from raw material to products to be provided | Details are given in **Chapter 2, Subheading 2.7** |
| 10 | Hazard identification and details of proposed safety systems | Details are given in **Chapter 7.** |
| 11 | Copy of all the Environmental Clearance(s) including Amendments thereto obtained for the project from MOEF/SEIAA shall be attached as an Annexure. A certified copy of the latest Monitoring Report of the Regional Office of the Ministry of Environment and Forests as per circular dated 30th May, 2012 on the status of compliance of conditions stipulated in all the existing environmental clearances including Amendments shall be provided. In addition, status of compliance of Consent to Operate for the ongoing /existing operation of the project from SPCB shall be attached with the EIA-EMP report. | Existing Environment: **Annexure 2**<br>Copy of the Consent to Operate is attached as **Annexure 3.** |
| 12 | In case the existing project has not obtained environmental clearance, reasons for not taking EC under the provisions of the EIA Notification | - |

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| | 1994 and/or EIA Notification 2006 shall be provided. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of consents from the SPCB shall be submitted. | |
| **4** | **Site Details** | |
| 1 | Location of the project site covering village, Taluka/Tehsil, District and State, Justification for selecting the site, whether other sites were considered. | Details are given in **Chapter 1, Subheading 1.4** |
| 2 | A toposheet of the study area of radius of 10km and site location on 1:50,000/1:25,000 scale on an A3/A2 sheet. (including all eco-sensitive areas and environmentally sensitive places) | Topo Map is given in **Chapter 1, Figure 1.3**. |
| 3 | Co-ordinates (lat-long) of all four corners of the site. | Coordinates of the project site is given in **Chapter 1,Table 1.2.** |
| 4 | Google map-Earth downloaded of the project site.<br>Layout maps indicating existing unit as well as proposed unit indicating storage area, plant area, greenbelt area, utilities etc. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate. | Google Image of the project site is given in **Chapter 1, Figure 1.2.**<br><br>Layout map of the project site is given in **Chapter 2, Figure 2.1.** |
| 5 | Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular. | Photographs of the Plant site are given in **Chapter 2, Figure 2.2.** |
| 6 | Landuse break-up of total land of the project site (identified and acquired), government/private - agricultural, forest, wasteland, water bodies, settlements, etc shall be included. (not required for industrial area) | Not Applicable. |
| 7 | A list of major industries with name and type within study area (10km | The list of major industries is given in **Annexure 4** |

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| | radius) shall be incorporated. Land use details of the study area | |
| 8 | Geological features and Geo-hydrological status of the study area shall be included. | Geological and Hydro geological details are given in **Chapter 3, Subheading 3.7.** |
| 9 | Details of Drainage of the project upto 5km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of the project site and maximum Flood Level of the river shall also be provided. (mega green field projects) | Not Applicable. |
| 10 | Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land. | Not applicable |
| 11 | R&R details in respect of land in line with state Government policy. | Not applicable |
| **5** | **Forest and wildlife related issues (if applicable):** | |
| 1 | Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department. (if applicable). | Not applicable |
| 2 | Land use map based on High resolution satellite imagery (GPS) of the proposed site delineating the forestland (*in case of projects involving forest land more than40 ha).* | Not applicable |
| 3 | Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted. | Not applicable |
| 4 | The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the map duly authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location | None |

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| | and the recommendations or comments of the Chief Wildlife Warden-thereon. | |
| 5 | Wildlife Conservation Plan duly authenticated by the Chief Wildlife Warden of the State Government for conservation of Schedule I fauna, if any exists in the study area. | Not Applicable |
| 6 | Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife | Not Applicable |
| **6.** | **Environmental Status** | |
| 1 | Determination of atmospheric inversion level at the project site and site-specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall. | Details are given in **Chapter 3, Subheading 3.2** |
| 2 | AAQ data (except monsoon) at 8 locations for PM10, PM2.5, SO2, NOX, CO and other parameters relevant to the project shall be collected. The monitoring stations shall be based CPCB guidelines and take into account the pre-dominant wind direction, population zone and sensitive receptors including reserved forests. | Details are given in **Chapter 3, Subheading 3.3** |
| 3 | Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAQQM Notification of Nov. 2009 along with – min., max., average and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report. | Details are given in **Chapter 3, Subheading 3.3** |
| 4 | Surface water quality of nearby River (60m upstream and downstream) and other surface drains at eight locations as per CPCB/MoEF&CC guidelines. | Details are given in **Chapter 3, Subheading 3.5** |
| 5 | Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC. | Not Applicable |

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| 6 | Ground water monitoring at minimum at 8 locations shall be included. | Details are given in **Chapter 3, Subheading 3.5** |
| 7 | Noise levels monitoring at 8 locations within the study area. | Details are given in **Chapter 3, Subheading 3.4** |
| 8 | Soil Characteristic as per CPCB guidelines. | Details are given in **Chapter 3, Subheading 3.6** |
| 9 | Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking arrangement etc. | Details are given in **Chapter 4, Subheading 4.2.12** |
| 10 | Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. If Schedule-I fauna are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished. | Details are given in **Chapter 3, Subheading 3.9.** |
| 11 | Socio-economic status of the study area. | Details are given in **Chapter 3, Subheading 3.10** |
| **7** | **Impact Assessment and Environment Management Plan** | |
| 1 | Assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features. In case the project is located on a hilly terrain, the AQIP Modelling shall be done using inputs of the specific terrain characteristics for determining the potential impacts of the project on the AAQ. Cumulative impact of all sources of emissions (including transportation) on the AAQ of the area shall be well assessed. Details of the model used and the input data used for modelling shall also be provided. The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any. | Details are given in **Chapter 4 Subheading 4.2.4** |
| 2 | Water Quality modelling – in case, if the effluent is proposed to be discharged in to the local drain, then | Not Applicable<br>Zero discharge norms will be adopted |

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| | Water Quality Modelling study should be conducted for the drain water taking into consideration the upstream and downstream quality of water of the drain. | |
| 3 | Impact of the transport of the raw materials and end products on the surrounding environment shall be assessed and provided. In this regard, options for transport of raw materials and finished products and wastes (large quantities) by rail or rail-cum road transport or conveyor-cum-rail transport shall be examined. | Details are given in **Chapter 4, Subheading 4.2.12** |
| 4 | A note on treatment of wastewater from different plant operations, extent recycled and reused for different purposes shall be included. Complete scheme of effluent treatment. Characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E(P) Rules. | Water will be required for Cooling and Domestic purposes. Cooling waste water will be re circulated in system. Domestic effluent will be treated in Septic tank and disposed in Soak Pit. Zero discharge norms will be adopted. |
| 5 | Details of stack emission and action plan for control of emissions to meet standards. | Details are given in **Chapter 4, Subheading 4.2.4** |
| 6 | Measures for fugitive emission control | Water sprinkling will be done to control the fugitive emission. |
| 7 | Details of hazardous waste generation and their storage, utilization and disposal. Copies of MOU regarding utilization of solid and hazardous waste shall also be included. EMP shall include the concept of waste-minimization, recycle/reuse/recover techniques, Energy conservation, and natural resource conservation. | Details of waste generation are Given in **Chapter 4, Subheading 4.2.11.**<br><br>EMP Details are given in **Chapter 10.** |
| 8 | Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided. | Not Applicable |
| 9 | Action plan for the green belt development plan in 33 % area i.e. land with not less than 1,500 trees per ha. Giving details of species, width of plantation, planning | Green belt Details are given in **Chapter 10, Subheading 10.1.6.** |

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| | schedule etc. shall be included. The green belt shall be around the project boundary and a scheme for greening of the roads used for the project shall also be incorporated. | |
| 10 | Action plan for rainwater harvesting measures at plant site shall be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water requirement from other sources. | Rain Water harvesting Details are given in **Chapter 4, Sub heading 4.2.13.** |
| 11 | Total capital cost and recurring cost/annum for environmental pollution control measures shall be included. | Details are given in **Chapter 10, Table 10.4.** |
| 12 | Action plan for post-project environmental monitoring shall be submitted. | Details are given in **Chapter 6, Subheading6.2.** |
| 13 | Onsite and Offsite Disaster (natural and Man-made) Preparedness and Emergency Management Plan including Risk Assessment and damage control. Disaster management plan should be linked with District Disaster Management Plan. | Details are given in **Chapter 7.** |
| **8** | **Occupational health** | |
| 1 | Details of existing Occupational & Safety Hazards. What are the exposure levels of above mentioned hazards and whether they are within Permissible Exposure level (PEL). If these are not within PEL, what measures the company has adopted to keep them within PEL so that health of the workers can be preserved, | Details are given in **Chapter 10, Subheading 10.1.7.** |
| 2 | Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated by pre designed format, chest x rays, Audiometry, Spirometry, Vision testing (Far & Near vision, colour vision and any other ocular defect) | Details are given in **Chapter 7, Subheading 7.8.** |

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| | ECG, during pre-placement and periodical examinations give the details of the same. Details regarding last month analyzed data of abovementioned parameters as per age, sex, duration of exposure and department wise. | |
| 3 | Annual report of health status of workers with special reference to Occupational Health and Safety. | Details are given in **Chapter 10, Subheading 10.1.7.** |
| 4 | Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers. | Details are given in **Chapter 7, Subheading 7.8.** |
| **9** | **Corporate Environment Policy** | |
| 1 | Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report. | Yes,attached as **Annexure 5.** |
| 2 | Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA. | Yes |
| 3 | What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given. | Yes, Details are given in **Chapter 10, Figure 10.2** |
| 4 | Does the company have system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report | Yes |
| 5 | Details regarding infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase. | Details are given in **Chapter 4, subheading 4.1.8** |

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| 6 | Enterprise Social Commitment (ESC) | Detailed CER Plan is given in **Chapter 10, Subheading 10.2.4** |
| 7 | Adequate funds (Atleast 2.5 % of the project cost) shall be earmarked towards the Enterprise Social Commitment based on Public Hearing issues and item-wise details along with time bound action plan shall be included. Socio-economic development activities need to be elaborated upon. | Detailed CER Plan is given in **Chapter 10, Subheading 10.2.4** |
| 8 | Any litigation pending against the project and/or any direction/order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details thereof and compliance/ATR to the notice(s) and present status of the case. | Not Applicable |
| 9 | A tabular chart with index for point wise compliance of above TORs. | Complied |
| 10 | The TORs prescribed shall be valid for a period of three years for submission of the EIA-EMP reports along with Public Hearing Proceedings (wherever stipulated). | Noted |
| The following general points shall be noted: | | |
| i | All documents shall be properly indexed, page numbered. | All documents has been properly indexed, page numbered. |
| ii | Period/date of data collection shall be clearly indicated. | Noted |
| iii | Authenticated English translation of all material in Regional languages shall be provided. | Noted |
| iv | The letter/application for environmental clearance shall quote the MOEF file No. and also attach a copy of the letter. | Attached |
| v | The copy of the letter received from the Ministry shall be also attached as an annexure to the final EIA-EMP Report. | Noted |
| vi | The index of the final EIA-EMP report | Noted |

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| | must indicate the specific chapter and page no. of the EIA-EMP Report | |
| vii | 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 website of this Ministry shall also be followed. | Noted |
| viii | The consultants involved in the preparation of EIA-EMP report after accreditation with Quality Council of India (QCI) /National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA-EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. Name of the Consultant and the Accreditation details shall be posted on the EIA-EMP Report as well as on the cover of the Hard Copy of the Presentation material for EC presentation. | Details are given in **Chapter 12.** |
| ix | TORs' prescribed by the Expert Appraisal Committee (Industry) shall be considered for preparation of EIA-EMP report for the project in addition to all the relevant information as per the 'Generic Structure of EIA' given in Appendix III and IIIA in the EIA Notification, 2006. Where the documents provided are in a language other than English, an English translation shall be provided. The draft EIA-EMP report shall be submitted to the State Pollution Control Board of the concerned State for conduct of Public Hearing. The SPCBshall conduct the Public Hearing/public consultation, district-wise, as per the provisions of EIA notification, 2006. The Public Hearing shall be chaired by an Officer not | Noted |

| | | |
|---|---|---|
| | below the rank of Additional District Magistrate. The issues raised in the Public Hearing and during the consultation process and the commitments made by the project proponent on the same shall be included separately in EIA-EMP Report in a separate chapter and summarised in a tabular chart with financial budget (capital and revenue) along with time-schedule of implementation for complying with the commitments made. The final EIA report shall be submitted to the Ministry for obtaining environmental clearance. | |

**METALLURGICAL INDUSTRY (FERROUS AND NON FERROUS)**

| S. No. | ToR Points | Compliance of TOR Points |
|---|---|---|
| 1 | Complete process Flow Diagarme each unit, its Process and Operations, along with material and energy inputs and out pots (Material and energy balance) | Detailed flow chart is given in **Chapter 2, Figure 2.3.** |
| 2 | Emission from Sulphuric acid plant and sulphur musk management | Not Applicable |
| 3 | Details on installation of continuous emission monitoring system with recording with proper display | Continuous emission monitoring system with recording with proper display will be installed. |
| 4 | Details on Toxic material including fluoride emissions | Not Applicable. |
| 5 | Details on Stack Height | Details are given in **Chapter 4, Table 4.3.** |
| 6 | Details on ash disposal and management | Not Applicable |
| 7 | Complete process flow diagram describing process of lead/zinc/Aluminum etc. | Not Applicable |
| 8 | Details on smelting, thermal refining, melting, slag fuming, and Waelz kiln operation. | Not Applicable |
| 9 | Details on holding and de gassing of molten metal from primary and secondary aluminum, material pre treatment and from melting and smelting of secondary aluminum | Not Applicable |

| | | |
|---|---|---|
| 10 | Details on toxic material content in the waste material and its composition and end use (particularly slag) | Slag will be sold to brick manufactures. |
| 11 | Trace metals in waste material especially in slag | Not Applicable |
| 12 | Plan for trace metal recovery | Not Applicable |
| 13 | Trace metal in Water | Not Applicable. No water will be used in process. |

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# CHAPTER 2
# PROJECT DESCRIPTION

## 2.1 TYPE OFPROJECT

M/s. Nilanjan Iron Pvt. Ltd. is having steel manufacturing facility for manufacturing MS Billets/MS ingotsat Plot No: B-07, Five Star MIDC, Kagal, Tehsil: Karveer, District: Kolhapur, Maharashtra.NIPLis now proposing for the expansion of production MS Ingots/MS Billets.

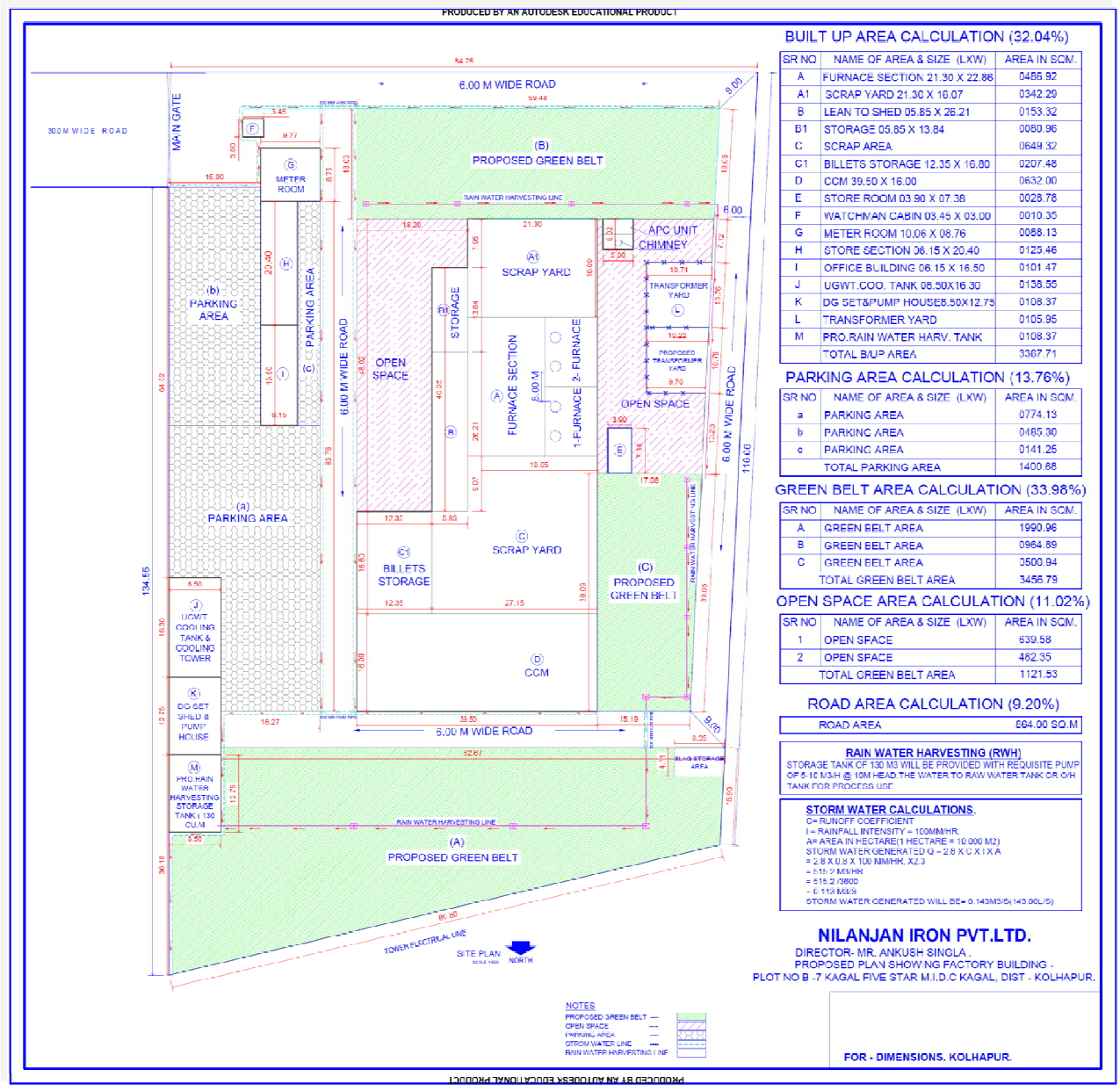
**NEED FOR THE PROJECT**

India is the third-largest crude steel producer in the world. In FY18, India produced 104.98 million tonnes (MT) of finished steel. Crude Steel production during 2017-18 stood at 102.34 MT Steel consumption is expected to grow 5.7 per cent year-on-year to 92.1 MT in 2018. India's steel production is expected to increase from 102.34 MT in FY18 to 128.6 MT by 2021. The Government of India has allowed 100 per cent foreign direct investment (FDI) in the steel sector under the automatic route. Nearly 301 MoUs have been signed with various states for planned capacity of about 486.7 MT.

India's per capita consumption of steel grew at a CAGR of 4.75 per cent from 45 kgs in FY09 to 65.25 kgs in FY17. The figure stood at 68 kgs during April-February 2017-18. National Steel Policy 2017 seeks to increase per capita steel consumption to the level of 160 kgs.

## 2.2 LOCATION OF THE PROJECT & SITE LAYOUT

NIPL is located at Plot No: B-07, Five Star MIDC, Kagal, Tehsil: Karveer, District: Kolhapur, Maharashtra.The location of the proposed project site is shown in **Chapter 1, Figure - 1.1.**TopoMapshowingthe10kmradiusofthestudyareaisgivenin **Chapter 1, Figure - 1.3**. Salient features of the study area are presented in below **Table - 2.1.** The Project Site Layout is shown in **Figure - 2.1**. Photographs of the project site are shown in **Figure - 2.2.**




BUILT UP AREA CALCULATION (32.04%)

| SR NO | NAME OF AREA & SIZE (LXW) | AREA IN SQM. |
|---|---|---|
| A | FURNACE SECTION 21.30 X 22.86 | 0486.92 |
| A1 | SCRAP YARD 21.30 X 16.07 | 0342.29 |
| B | LEAN TO SHED 05.85 X 26.21 | 0153.32 |
| B1 | STORAGE 05.85 X 13.84 | 0080.96 |
| C | SCRAP AREA | 0649.32 |
| C1 | BILLETS STORAGE 12.35 X 16.80 | 0207.48 |
| D | CCM 39.50 X 16.00 | 0632.00 |
| E | STORE ROOM 03.90 X 07.36 | 0028.78 |
| F | WATCHMAN CABIN 03.45 X 03.00 | 0010.35 |
| G | METER ROOM 10.06 X 08.76 | 0088.13 |
| H | STORE SECTION 06.15 X 20.40 | 0125.46 |
| I | OFFICE BUILDING 06.15 X 16.50 | 0101.47 |
| J | UGWT.COO. TANK 05.50X16.30 | 0138.55 |
| K | DG SET&PUMP HOUSE8.50X12.75 | 0108.37 |
| L | TRANSFORMER YARD | 0105.95 |
| M | PRO.RAIN WATER HARV. TANK | 0108.37 |
| | TOTAL B/UP AREA | 3367.71 |

PARKING AREA CALCULATION (13.76%)

| SR NO | NAME OF AREA & SIZE (LXW) | AREA IN SQM. |
|---|---|---|
| a | PARKING AREA | 0774.13 |
| b | PARKING AREA | 0485.30 |
| c | PARKING AREA | 0141.25 |
| | TOTAL PARKING AREA | 1400.68 |

GREEN BELT AREA CALCULATION (33.98%)

| SR NO | NAME OF AREA & SIZE (LXW) | AREA IN SQM. |
|---|---|---|
| A | GREEN BELT AREA | 1990.96 |
| B | GREEN BELT AREA | 0964.89 |
| C | GREEN BELT AREA | 0500.94 |
| | TOTAL GREEN BELT AREA | 3456.79 |

OPEN SPACE AREA CALCULATION (11.02%)

| SR NO | NAME OF AREA & SIZE (LXW) | AREA IN SQM. |
|---|---|---|
| 1 | OPEN SPACE | 639.58 |
| 2 | OPEN SPACE | 482.35 |
| | TOTAL GREEN BELT AREA | 1121.53 |

ROAD AREA CALCULATION (9.20%)

| | |
|---|---|
| ROAD AREA | 664.00 SQ.M |

**RAIN WATER HARVESTING (RWH)**
STORAGE TANK OF 130 M3 WILL BE PROVIDED WITH REQUISITE PUMP OF 5-10 M3/H @ 10M HEAD.THE WATER TO RAW WATER TANK OR O/H TANK FOR PROCESS USE.

**STORM WATER CALCULATIONS.**
C= RUNOFF COEFFICIENT
I = RAINFALL INTENSITY = 100MM/HR.
A= AREA IN HECTARE(1 HECTARE = 10 000 M2)
STORM WATER GENERATED Q = 2.8 X C X I X A
= 2.8 X 0.8 X 100 MM/HR. X2.3
= 515.2 MM/HR
= 515.2 /3600
= 0.143 M3/S
STORM WATER GENERATED WILL BE= 0.143M3/S(143.00L/S)

**NILANJAN IRON PVT.LTD.**
DIRECTOR- MR. ANKUSH SINGLA .
PROPOSED PLAN SHOWING FACTORY BUILDING -
PLOT NO B -7 KAGAL FIVE STAR M.I.D.C KAGAL, DIST - KOLHAPUR.

FOR - DIMENSIONS. KOLHAPUR.

**Figure 2.1: Plant Layout**

**Figure 2.2: Site Photographs**

**Table – 2.1: Salient Features of the Project**

| Particulars | Details |
|---|---|
| Project Location | Plot No: B-07, Five Star MIDC, Kagal, Tehsil: Karveer, District: Kolhapur, Maharashtra. |
| Total Area of Land | 10174.0 sq.m |
| Green belt/Green Cover Area | 3456.79Sq.m |
| Latitude and longitude | Latitude –16°37'44.42"Nand Longitude –74°20'41.29"E |
| Land Use | Industrial |
| Nearest Road | Pune-Banglore Highway : 5.0 Km- SW |
| Nearest Railway Station | Kolhapur : 14.0 Km – NW |
| Nearest Airport | Kolhapur : 8.0 Km – NW |
| Nearest Village | Halsavade : 1.1 Km- W |
| Place of Religious Importance | Nil |
| National Parks/ Wild Life Sanctuaries/Biosphere within 10 Km radius | There is no National Parks/ Wild Life Sanctuaries/ Biosphere Reserves |
| Water bodies | Panchganga River (7.8 Km- East);<br>Kaneri Lake (6.8 Km- West) |

## 2.3 SIZE OR MAGNITUDE OF OPERATION

NIPL is proposing to expend theproduction capacity of plant by replacing 12 TPHinduction furnaces with new 2 x 20 TPH furnaces. After expansion total induction furnace production capacity will be 500 TPD.

The existing production quantities and proposed production quantities are given below:

**Table 2.2: Existing and Proposed Products Quantities**

| | |
|---|---|
| Production Capacity | **Existing Production Capacity**<br>12 MT x 9 Heats = 100TPD<br>**Total Capacity after Expansion**<br>20 MT x 13 Heats = 260 TPD<br>20 MT x 12 Heats = 240 TPD<br>**Total = 500 TPD** |

## 2.4 RAW MATERIALREQUIREMENT

The major raw materials for the proposed expansion are Sponge Iron, Scrap and Other minerals.The raw material requirement for the production of billets is formulated based on the working days of the plant. The working days of the plant are 360 days per year. The raw material requirement per day is given in **Table 2.3**

**Table 2.3: Total Raw Material Requirement after Expansion**

| S. No. | Raw Materials | Quantity (MTPA) | Source |
|---|---|---|---|
| 1 | Sponge Iron | 200 | Open Market |
| 2 | Metal Scrap | 300 | Open Market |
| 3 | Other Minerals | 15 | Open Market |

### 2.4.1 Material Balance

The material balance is given in **Table 2.4**

**Table 2.4:Material Balance for Billets**

| Input | TPD | Out Put | TPD |
|---|---|---|---|
| Sponge Iron | 200 | Billets | 500 |
| Metal Scrap | 300 | Slag | 15 |
| Other Minerals | 15 | **Total** | **515** |
| **Total** | **515** | | |

### 2.4.2 Source of Raw Materials

Raw Material will be sourced from the Open Market.

## 2.5 UTILITIES

### 2.5.1 Water Requirement

The manufacturing process of proposed project does not require water at any stage. The water requirement in the project will be for cooling purpose, domestic consumption and green belt development. Total initial water requirement for the project will be 163 KLD. This requirement will be met from Local Supplier. The details of water requirement for different purposes are presented in **Table 2.5**

**Table 2.5: Water Requirement**

***All values in KLD***

| Item | Water Requirement | Losses | Recirculation/ Recycle | Effluent Generation |
|---|---|---|---|---|
| Industrial Cooling | 150 | 60 | 90 | 0 |
| Domestic Purpose | 8 | 3 | 0 | 5* |
| Gardening | 5* | 5 | 0 | 0 |
| **Total** | **163** | **68** | **90** | 5* |

**Water Balance**

Fresh water requirement for cooling = 90 KLD

Domestic water requirement = 8.0 KLD

Domestic waste will be treated in STP.

Treated water will be used for Gardening Purposes.

Zero Discharge norms will be followed.

### 2.5.2 Land Requirement

NIPL has acquired 10174.0sq.m of land under notified industrial area. The proposed expansion activity will be established within the existing plant area only. The land breakup details are presented in **Table 2.6.**

**Table 2.6: Land Break-up Details**

| Sr. No. | Particular | Area (Sq.m) | Area in % |
|---|---|---|---|
| 1 | Built-up Area | 3367.71 | 33.11 |
| 2 | Road Area | 864.0 | 8.5 |
| 3 | Open Space Area | 1121.53 | 11.02 |
| 4 | Parking Area | 1363.97 | 13.4 |
| 5 | Greenbelt | 3456.79 | 33.97 |
| **Total** | | **10174.0** | **100** |

### 2.5.3 Power Requirement

The existing power requirement is 5.0MW and additional 5.0MW will be required for proposed expansion. The power will be sourced from the Maharashtra State Electricity Board. 2.0 nos. DG sets with a capacity of 500 kVA each will also be provided for emergency purposes. The details of Existing and proposed power requirement is given in **Table 2.7.**

**Table 2.7: Power Requirement**

| S No | Particular | Quantity | Source |
|---|---|---|---|
| 1 | Existing | 5.0MW | Maharashtra State Electricity Board |
| 2 | Proposed | 5.0 MW | |
| | **Total** | **10.0 MW** | |

### 2.5.4 Man Power Requirement

The skilled/semiskilled /unskilled manpower required for the proposed expansion project.The man power requirement will be fulfilled from the surrounding villages, to help for the improvement of the socio economic status in the surrounding rural areas. The details of employment is given in **Table 2.8.**

**Table 2.8: Man Power Requirement**

| S No | Particular | Numbers |
|---|---|---|
| 1 | Existing Manpower (Staff + Worker) | 10 + 60 = 70 |
| 2 | Proposed Manpower(Staff + Worker) | 10 + 100 = 110 |
| | **Total** | **180 Nos.** |

## 2.6 TECHNOLOGY AND PROCESS DESCRIPTION

### 2.6.1 Induction furnace

The induction furnace operates as a batch melting process producing batches of moltensteel known “heats”. The furnace operating cycle is called the tap-to-tap cycle and is made up of the following operations:

- Furnace charging
- Melting
- Refining
- De-slagging
- Tapping
- Furnace turn-around

The process flow diagram is **Figure 2.3.**

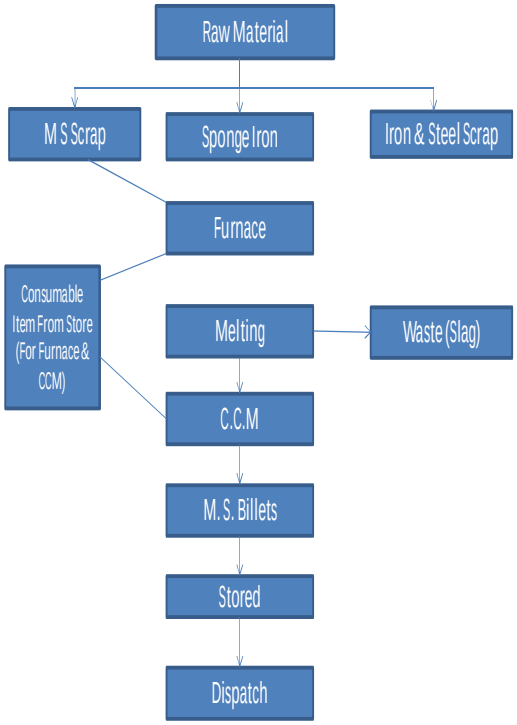



**Figure: 2.3 Process Flow Chart of Induction Furnace**

## 2.7 PLANT FACILITIES & OTHERREQUIREMENTS

### 2.7.1 Raw Material Receipt and StorageYard

The raw material viz., Sponge Iron, Scrap, and pig iron etc., will be received by trucks and stacked separately in stockyard. The materials will be procured in required size range and quality and no further processing is required. These raw materials will be stored in yards with

concreted flooring.

### 2.7.2 Induction Furnace forProposed Expansion

For smelting the raw material the 2 x 20 TPH capacities induction furnaceswillbeinstalled.The furnace shell will be externally water cooled by spraynozzles. In addition to the furnace shell, water-cooling system shall be provided for:

- Cooling of current conducting bus tubes and copperclamps,
- Electrode holding pressurering
- Furnacehood

A suitable Cooling Tower with necessary pipeline shall be installed to bring down the temperature of circulation water and re-circulate the same.

### 2.7.3 Control & Instrumentation (C & I)

The Instrumentation and control system will be provided with microprocessor based Distributed Control System (DCS) and controldevices, analogue instruments for local control. It will perform the functions of monitoring, control, alarm, protection and interlock, diagnosing, performance monitoring, trendingetc. The plant will have a Central Control Room (CCR) and Local Control Rooms (LCR) as required.

### 2.7.4 Utilities & Services

The following utilities and services shall be required.

**Compressed Air System**

A compressed air system shall be provided to cater the needs of service requirements such as slide gates pollution control equipment etc.

**Electrical Power Supply and Distribution**

The other major input in the proposed manufacturing process is the electricity. The electricity will be drawn from the grid to the switching station in the in-house substation wherein required HT switchgear, Capacitors, MCCs will be installed.

**Fire Protection Facilities**

The Fire protection system for the plant shall be consisting of:

- Hydrant System for all the areas of theplant
- High velocity water spray system forTransformers
- Automatic fire detection and alarmsystem
- Manual fire alarmsystem
- Portable fireextinguishers

The components of the fire protection system will confine to BIS mark /TAC approved type. The system shall be designed based on safety requirements and generally conforming to Traffic Advisory Committee (TAC) regulations and National Fire Protection Association of America.

The fire detection and alarm system shall be designed according to IS 2189 standards. The system shall consist of addressable type one loop fire alarm panel located at the control room, addressable smoke detectors, addressable type heat detectors, manual call points and electronic hooters.

Portable type fire extinguishers of DCP type shall be production building, Control room, MCC rooms etc.

## 2.8 POLLUTION CONTROL EQUIPMENT AND ITS DESCRIPTION

### Air Pollution and Management

The pollution control equipment proposed in the plant will be Fume extraction system with ventury scrubber.

### Wastewater Generation and Treatment

No process wastewater will be generated from the manufacturing process. The water for cooling of the equipment shall be circulated in a closed circuit. It will be pumped from the cold sump and sent to the equipment through necessary pipelines. After cooling different parts of the equipment, the hot water returns to the top of cooling tower. The required degree of cooling of hot water is done through the cooling tower and it is stored in the cold sump for recirculation. Some make up water will always necessary to be added to the cold sump to compensate for evaporation loss, drift loss, process loss and leakage loss. The water in the cooling system for the furnace and for compressors will be treated to the levels as specified by the equipment. Domestic waste water generated will be treated in Sewage Treatment Plant.

### Noise Generation and Control

In the proposed development, the major noise generating equipments will be from the compressors, transformers etc. Noise will be continuously generated from such sources. The noise levels of the individual equipment will not be more than 85 dB (A) at one meter distance. Provision of Personal Protective Equipment (PPE) to the workers in high noise generating areas would eliminate/ minimize such impacts to a great extent. Important noise generating sources have been identified in the proposed plant and the noise levels expected to be in the following range as given in **Table2.9**.

**Table 2.9: Noise Generating Sources**

| Sr. no. | Sources |
|---|---|
| 1 | Air compressors |
| 2 | Transformer |
| 3 | Raw Material and Finished Good Handling |
| 4 | Vehicular Moment |

It can be seen from the above table that all the noise levels at 1m distance from the equipment will be in the range of about 75-90dB(A).

**Noise Control**

Acoustic enclosures will be provided wherever required to control the noise levels below 90 dB (A). Wherever, it is not possible technically to meet the required noise levels, PPE will be provided to the workers. The wide green belt around the plant will attenuate the noise levels outside the plant boundary.

**Solid Waste Generation and Disposal**

The Major Solid waste is slag. About 15 TPD slag will be generated during operation of plant.

## 2.9 PROJECT IMPLEMENTATIONSCHEDULE

The proposed expansion will be completed within 10 months from the zero date.

The zero date for the project shall be from the date of financial tie-up and getting required clearances from various departments.

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# CHAPTER 3
# DESCRIPTION OF ENVIRONMENT

## 3.1 STUDY AREA, PERIOD, COMPONENTS ANDMETHODOLOGY

Description of the baseline environmental status in and around the proposed expansion project depicts the existing environmental conditions regarding the meteorology, air, water, noise, soil, biological and socio- economicenvironment.

### 3.1.1 StudyArea

Study area comprising of the area within a 10 km radius of the proposed expansion project as the center for environmental monitoring and data collection.

### 3.1.2 StudyPeriod

The baseline data generation for the EIA-EMP has been carried out during October 2018 to December 2018 for three months.

### 3.1.3 EnvironmentalComponents

The key environmental components of the expansion project are Meteorology, Ambient Air Quality, Water Quality, Noise Levels, Soil Quality, Geology & Hydrology, Traffic study and Socio-economic conditions which are most likely to be influenced by the setting up an industry were carried out during the study period.Secondary data like meteorological data from Indian Meteorological Department (IMD), Geology, Hydrogeology, Census data were collected from various government and non-government agencies.

### 3.1.4 Methodology

The methodology adopted for conducting the studies are:

- Selection of sampling locations based on the predominant wind directions recorded by the nearest India Meteorological Station(IMS);
- Existing topography of the studyarea;
- Location of existing surface water bodies like rivers, lakes/ponds and streams;and
- Location of villages/towns/sensitive areas, and areas, which represent baselineconditions;

The establishments of baseline for valued environmental components are described in the following sections.

## 3.2 BASELINEENVIRONMENT

The baseline environmental quality represents the background environmental scenario of various environmental components such as air, noise, water, and land and socio economic status of the study area. The general study area covers 10 km radius of the plant site.

### 3.2.1 Micro Meteorology of StudyArea

Meteorology of the study area plays an important role in the air pollution studies. The prevailing micro meteorological conditions at the proposed project site will regulate the dispersion and dilution of air pollutants in the atmosphere. The predominant wind directions and the wind speed will decide the direction and distance of the most affected zone from the proposed activity. The meteorological data collected during the monitoring period is very useful in interpretation of baseline as input for dispersion models for predicting the Ground Level Concentrations(GLC).

An auto weather monitoring station was installed during the months of from October 2018 to December 2018 to record various meteorological parameters on hourly basis to understand the wind pattern, Temperature variation, solar insulation and relative humidity variation etc. Percentage frequencies of wind in 16 directions have been computed from the recorded data of the study period to plot wind rose diagram. **Figure 3.2** represents the wind pattern of the studyperiod.

### 3.2.2 Wind Pattern during Study Period (from October2018 to December 2018)

Predominant Wind directions during this period were Sfollowed by SW and calm conditions are 11.0% of the study period time.

**Climatology**

The IMD based climate data is given in **Table 3.1** and Site specific data is given in **Table 3.2.**

**Table 3.1:Climatological Data (IMD Based)**

| Month | Temperature ($^{o}$C) | | Relative Humidity (%) | Rainfall (mm) |
|---|---|---|---|---|
| | Min | Max | | |
| January | 14.8 | 30.7 | 30 | 0.9 |
| February | 16.2 | 33.2 | 24 | 2.3 |
| March | 19.3 | 36.0 | 27 | 7.3 |
| April | 31.6 | 37.5 | 39 | 30.4 |
| May | 22.3 | 35.9 | 50 | 58.0 |
| June | 22.0 | 30.1 | 71 | 151.2 |
| July | 21.4 | 26.9 | 83 | 321.4 |
| August | 21.4 | 27.1 | 82 | 209.3 |
| September | 20.8 | 28.9 | 74 | 133.0 |
| October | 20.1 | 31.5 | 57 | 87.4 |
| November | 17.4 | 30.7 | 43 | 36.1 |
| December | 15.4 | 29.8 | 35 | 11.5 |
| **Total** | | | | **1048.8** |

*(Source: IMD, Kolhapur)*

**Table 3.2:Site SpecificClimatological Data (from October 2018 to December 2018)**

| Month | Temperature (°C) | | Relative Humidity (%) | | Rainfall (mm) |
|---|---|---|---|---|---|
| | Min | Max | Min | Max | |
| October 2018 | 19.8 | 31.7 | 48 | 53 | 44.6 |
| November 2018 | 17.9 | 29.8 | 44 | 48 | 29.7 |
| December 2018 | 15.0 | 29.1 | 30 | 37 | 13.2 |
| **Total** | | | | | **87.5** |

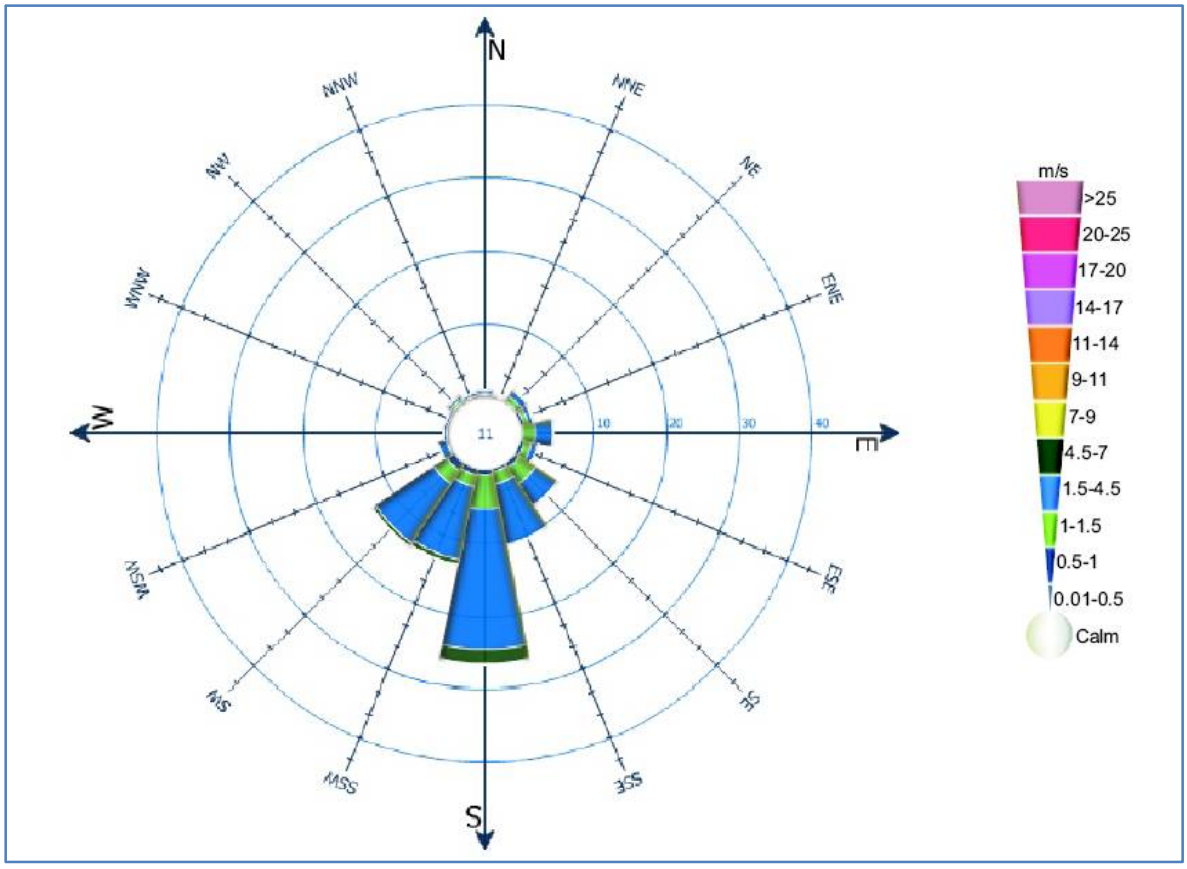



**Figure 3.1: Windrose Diagram (Site Specific)**

## 3.3 AMBIENT AIRQUALITY

In order to identify the background air quality data and also to represent the interference from various industrial and local activities, screening techniques have been used for identification of air quality stations in the study areas. The following points have been considered for the selection of air quality monitoringstations.

- Predominant winddirections
- Topography of the studyarea
- Terrain and sensitiveareas
- Populated areas near to the projectarea
- Magnitude of the surroundingindustries

### 3.3.1 Identifications of Various Industrial Operations in the Study Area

The area experiences dry climate and most of the roads in the area are good in condition. The proposed expansion project is located in the notified Industrial estate and various industrial operations in the study area are considered in the present study.

### 3.3.2 Topography / Terrain and Sensitive Areas of the StudyArea

The site is located at an elevation of 634m above mean sea level (MSL). There are no sensitive areas with the study area. Based on the above, the AAQ stations have been identified and locations of ambient air quality stations are presented in **Table 3.3**.

### 3.3.3 Identification of Ambient air Quality MonitoringStations

Ambient air quality of the study area has been assessed through a network of 8 ambient air quality locations. These stations are designed keeping in view of the climatological conditions of the study region.

**Table 3.3:Ambient Air Quality Monitoring Stations**

| Code | Sampling Location | Coordinates | | Distance (km) w.r.t Project | Direction w.r.t Project |
|---|---|---|---|---|---|
| | | Latitude | Longitude | | |
| A-1 | Project Site | $16^0$37’44.92” | $74^0$20’40.48” | -- | -- |
| A-2 | Halsavade | $16^0$38’ 0.66” | $74^0$20’0.51” | 1.5 | N |
| A-3 | Tamgaon | 16°38'51.41" | 74°18'9.19" | 5.0 | NW |
| A-4 | Vasagade | 16°40'50.75" | 74°20'15.08" | 6.5 | N |
| A-5 | Pattankodli | 16°39'9.09" | 74°21'49.21" | 5.5 | NE |
| A-6 | Kanheri | 16°37'21.40" | 74°17'25.63" | 8.0 | SW |
| A-7 | Kagal | 16°35'22.17” | 74°18'52.34" | 7.0 | S |
| A-8 | Talgande | 16°37'23.37" | 74°22'19.14" | 5.5 | E |

The above monitoring stations are located such that a representative background ambient air quality levels are obtained. **Figure 3.3** shows the location of ambient air quality monitoring stations in the study area.

Pre-calibrated R.D. Samplers and PM2.5 Sampler have been used for monitoring the existing AAQ status. Maximum, Minimum, Average and Percentile values have been computed from the raw data collected at all individual sampling stations to represent the Ambient Air Quality Status.

The Ambient Air Quality studies were carried out during from **October 2018 to December 2018.**Thedata thus obtained is considered for preparing thisreport.

### 3.3.4 Sampling & TestingMethodology

**Table 3.4** gives the standard procedures adapted for sampling and testing. The procedures are in compliance with CPCB &MoEFCC.

**Table 3.4: Sampling and Testing Methodology**

| Parameter | Duration of Sampling | Recommended Analytical Procedure |
|---|---|---|
| $PM_{10}$ and $PM_{2.5}$ | 24 hours - continuous | Gravimetric Method as per IS:5182 |
| $SO_2$ | 8 hours – continuous | Pararosaniline – Colorimetric method |
| NOx | 8 hours - continuous | Modified Jacob & Hochheiser method |
| CO | Grab Sample | As per IS 5182 |

### 3.3.5 Analysis of Baseline Concentrations

Statistical parameters like Arithmetic mean and 98$^{th}$ percentiles have been computed from the observed raw data for all sampling stations. Minimum and maximum noise levels recorded are also calculated from the data. The summary of baseline data values minimum, maximum along with 98$^{th}$percentile value for $PM_{10}$, $PM_{2.5}$, $SO_2$ and $NO_X$ are presented in **Table 3.5.** These are compared with the Revised National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R.no.826 (E) dated November 16,2009. The detailed AAQ monitoring results are given in **Annexure 6.**

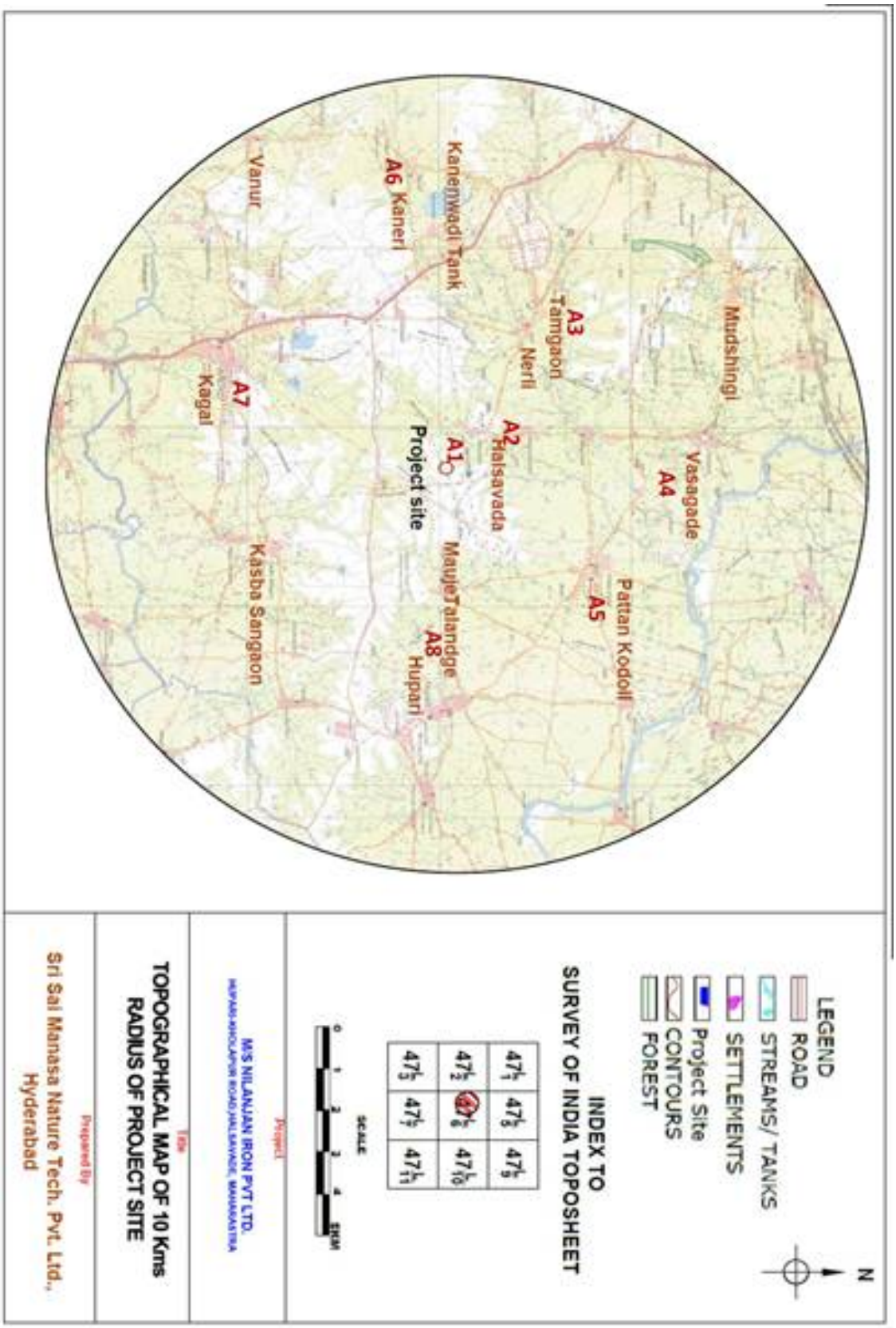



**Figure 3.2: Ambient Air Quality Monitoring Location**

**Table 3.5 (A): Particulate Matter – $PM_{10}$**

All Values in $\mu g/m^3$

| Location Name | Minimum | Maximum | Average | 98th Percentile |
|---|---|---|---|---|
| Project Site | 73.4 | 81.5 | 77.4 | 81.1 |
| Halsavade | 52.2 | 59.6 | 55.5 | 59.3 |
| Tamgaon | 51.3 | 64.0 | 58.3 | 63.3 |
| Vasagade | 46.1 | 53.7 | 50.3 | 53.7 |
| Pattankodli | 43.8 | 53.1 | 49.4 | 53.1 |
| Kanheri | 40.5 | 47.7 | 44.2 | 47.5 |
| Kagal | 59.5 | 67.3 | 64.5 | 67.3 |
| Talgande | 64.7 | 74.7 | 69.9 | 74.6 |

**Table 3.5 (B): Particulate Matter – $PM_{2.5}$**

[10]

All Values in $\mu g/m^3$

| Location Name | Minimum | Maximum | Average | 98th Percentile |
|---|---|---|---|---|
| Project Site | 30.7 | 33.8 | 32.2 | 33.6 |
| Halsavade | 20.3 | 22.7 | 21.6 | 22.7 |
| Tamgaon | 20.3 | 25.0 | 22.7 | 24.8 |
| Vasagade | 17.5 | 21.5 | 20.1 | 21.4 |
| Pattankodli | 17.4 | 21.3 | 19.4 | 21.1 |
| Kanheri | 15.5 | 17.8 | 16.8 | 17.8 |
| Kagal | 23.9 | 27.5 | 26.0 | 27.4 |
| Talgande | 26.0 | 30.5 | 28.1 | 30.4 |

**Table 3.5 (C): Sulphurdioxide - $SO_2$**

All Values in $\mu g/m^3$

| Location Name | Minimum | Maximum | Average | 98th Percentile |
|---|---|---|---|---|
| Project Site | 12.6 | 14.0 | 13.2 | 13.9 |
| Halsavade | 13.3 | 15.2 | 14.2 | 15.2 |
| Tamgaon | 14.1 | 17.4 | 15.4 | 17.2 |
| Vasagade | 10.2 | 12.8 | 11.9 | 12.8 |
| Pattankodli | 10.8 | 13.2 | 12.0 | 13.1 |
| Kanheri | 10.1 | 11.8 | 11.0 | 11.7 |
| Kagal | 12.3 | 14.3 | 13.3 | 14.2 |
| Talgande | 12.6 | 14.8 | 13.7 | 14.7 |

**Table 3.5 (D): Oxides of Nitrogen – NOx**

All Values in $\mu g/m^3$

| Location Name | Minimum | Maximum | Average | 98th Percentile |
|---|---|---|---|---|
| Project Site | 15.3 | 16.9 | 16.1 | 16.8 |
| Halsavade | 16.2 | 18.4 | 17.4 | 18.3 |
| Tamgaon | 16.9 | 20.8 | 18.5 | 20.6 |
| Vasagade | 13.0 | 16.0 | 14.9 | 15.9 |
| Pattankodli | 13.6 | 16.4 | 14.9 | 16.4 |
| Kanheri | 13.2 | 14.4 | 13.8 | 14.3 |
| Kagal | 14.9 | 17.4 | 16.0 | 17.3 |
| Talgande | 15.8 | 18.7 | 17.1 | 18.4 |

**Table 3.5 (E): Carbon Monoxide – CO**

**All Values in mg/m$^3$**

| Location Name | Minimum | Maximum | Average | 98$^{th}$ Percentile |
|---|---|---|---|---|
| Project Site | 0.53 | 0.72 | 0.65 | 0.72 |
| Halsavade | <0.1 | <0.1 | <0.1 | <0.1 |
| Tamgaon | <0.1 | <0.1 | <0.1 | <0.1 |
| Vasagade | <0.1 | <0.1 | <0.1 | <0.1 |
| Pattankodli | <0.1 | <0.1 | <0.1 | <0.1 |
| Kanheri | <0.1 | <0.1 | <0.1 | <0.1 |
| Kagal | <0.1 | <0.1 | <0.1 | <0.1 |
| Talgande | 0.22 | 0.23 | 0.18 | 0.22 |

### 3.3.6 Conclusion

The Minimum and Maximum concentration of PM10 was found in the range of 40.5 to 81.5 µg/m$^3$. The Minimum and Maximum concentration of PM2.5 was found in the range of 15.5 to 33.8µg/m$^3$. The Minimum and Maximum concentration of $SO_2$ and NOx were found in the ranges of10.1 to17.4µg/m$^3$ and 13.0 to20.8µg/m$^3$.

## 3.4 NOISEENVIRONMENT

The acoustical environment varies dynamically in magnitude and character throughout most communities. The noise level variation can be temporal, spectral and spatial. The residential noise level is that level below which the ambient noise does not seem to dropdown during the given interval of time and is generally characterized by unidentified sources. Ambient noise level is characterized by significant variations above a base or a residential noise level. The maximum impact of noise is felt on urban areas, which is mostly due to the commercial activities and vehicular movement during peak hours of theday.

Measured noise levels displayed as a function of time provides a useful scheme for describing the acoustical climate of a community. Noise levels records at each station with a time interval of about 30 minutes are computed for equivalent noise levels. Equivalent noise level is a single number descriptor for describing time varying noise levels. The equivalent noise level is defined asmathematically.

$$10\text{Log}1/\ T\Sigma\ (10^{\text{Ln}/10})$$

Where L = sound pressure level a function of time dB (A) & T = Time interval ofobservations

Noise levels during the night time generally drop, therefore to compute Equivalent noise levels for the night time, noise levels are increased by 10 dB(A) as the night time high noise levels are judged more annoying compared to the day time. The noise recording stations are shown in

**Figure 3.3and Table 3.6** and the summary of the minimum, maximum, day - equivalent, night - equivalent and day-night equivalent values computed for various locations in the study area is presented in **Table 3.7**.

**Table 3.6: Ambient Noise Quality Monitoring Stations**

| Code | Location | Distance (km) w.r.t Project | Direction w.r.t Project |
|---|---|---|---|
| N-1 | Project Site | 1.5 | N |
| N-2 | Halsavade | 5.0 | NW |
| N-3 | Tamgaon | 6.5 | N |
| N-4 | Vasagade | 5.5 | NE |
| N-5 | Pattankodli | 8.0 | SW |
| N-6 | Kanheri | 7.0 | S |
| N-7 | Kagal | 5.5 | E |
| N-8 | Talgande | 1.5 | N |

**Table 3.7: Noise Levels during Study Period**

**All values in dB(A)**

| Equivalent Noise levels | | N1 | N2 | N3 | N4 | N5 | N6 | N7 | N8 |
|---|---|---|---|---|---|---|---|---|---|
| $L_d$ | | 69.4 | 54.1 | 53.2 | 54.7 | 51.3 | 50.6 | 54.8 | 53.9 |
| $L_n$ | | 65.7 | 44.6 | 43.1 | 42.8 | 44.2 | 42.3 | 44.5 | 44.1 |
| **CPCB** | **Ld** | **75** | **55** | **55** | **55** | **55** | **55** | **55** | **55** |
| | **Ln** | **70** | **45** | **45** | **45** | **45** | **45** | **45** | **45** |

$L_d$ : DayEquivalent

$L_n$ : NightEquivalents

**Conclusion**

The Maximum Noise (day) value was observed 69.4dB(A) and the minimum noise (day) valve was observed 50.6 dB(A). The Maximum Noise (night) value was observed 65.7 dB(A) and the minimum noise (night) valve was observed 43.1 dB(A).

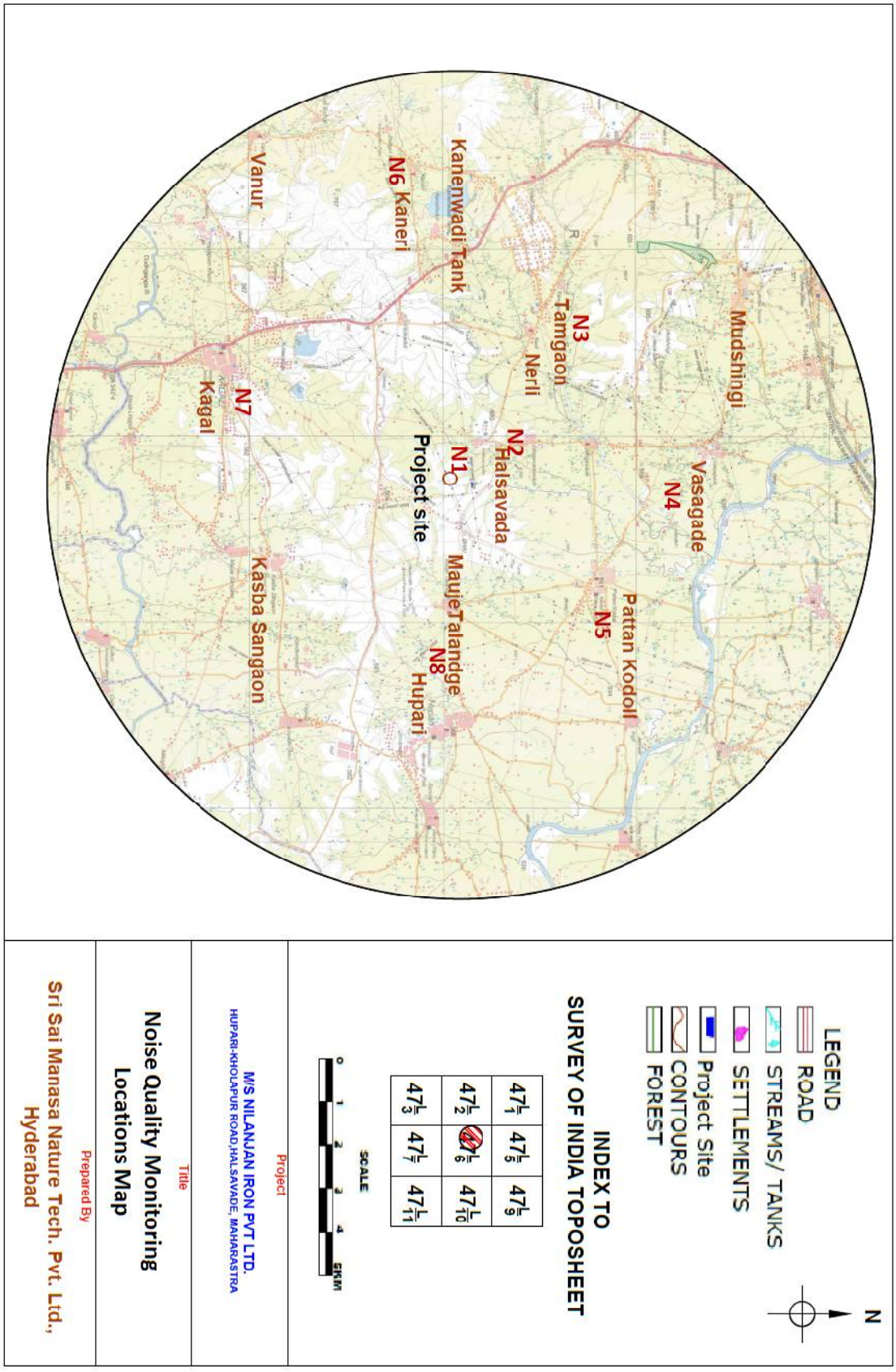



**Figure 3.3: Noise Monitoring Locations**

## 3.5 WATERENVIRONMENT

Assessment of baseline data on Water environment includes

a) Identification of surface watersources;

b) Identification of ground watersources;

c) Collection of watersamples; and

d) Analyzing water samples collected for physico-chemical and biological parameters

Assessment of water quality in the study area has been carried out as per the Indian standard IS 10500:2012 (drinking water standard). The locations of water sampling are shown in **Figure 3.4 and Table 3.8**.

**Table 3.8 Water SamplingLocations**

| Code | Location | Distance (km) w.r.t Project | Direction w.r.t Project |
|---|---|---|---|
| GW-1 | Project Site | -- | -- |
| GW-2 | Halsavade | 1.5 | N |
| GW-3 | Tamgaon | 5.0 | NW |
| GW-4 | Vasagade | 6.5 | N |
| GW-5 | Pattankodli | 5.5 | NE |
| GW-6 | Kaneri | 8.0 | SW |
| GW-7 | Kagal | 7.0 | S |
| GW-8 | Talgande | 5.5 | E |
| SW-1 | River Near Vasagade | 6.5 | SW |
| SW-2 | River Near Pattankodli | 7.2 | NE |

The analytical data of surface water quality and ground water quality is given in **Table 3.9** and **Table 3.10.**

**Table 3.9: Ground Water Quality**

| S. No. | Parameters | Unit | Limits as Per IS:10500:2012 | GW 1 | GW 2 | GW 3 | GW 4 | GW 5 | GW 6 | GW 7 | GW 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | pH @ 27.2$^{o}$C | - | 6.5-8.5 | 7.81 | 7.55 | 7.20 | 7.07 | 7.45 | 8.0 | 7.16 | 7.1 |
| 2 | Temperature | $^{o}$C | Not Specified | 26.3 | 26 | 25.2 | 27 | 25.8 | 26.1 | 26.2 | 25 |
| 3 | Electrical Conductivity | µMho/cm | Not Specified | 625 | 1240 | 1270 | 1115 | 1137 | 1230 | 1077 | 644 |
| 4 | Color | CU | 5 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 1 |
| 5 | Turbidity | NTU | 1 | 2.6 | 0.4 | 0.7 | 1.4 | 1.3 | 3.6 | 3 | 3 |
| 6 | Total Dissolved Solids | mg/L | 500 | 418 | 830 | 851 | 750 | 761 | 824 | 721 | 431 |
| 7 | Total Suspended Solids | mg/L | Not Specified | 6 | 1 | 1 | 2 | 1 | 3 | 19 | 20 |
| 8 | Alkalinity as $CaCO_3$ | mg/L | 200 | 154.3 | 417.6 | 236.9 | 280.4 | 369.5 | 132.6 | 204.3 | 132 |

| S. No. | Parameters | Unit | Limits as Per IS:10500:2012 | GW 1 | GW 2 | GW 3 | GW 4 | GW 5 | GW 6 | GW 7 | GW 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | Hardness as $CaCO_3$ | mg/L | 311 | 117 | 441 | 328 | 318 | 150 | 148 | 203 | 134 |
| 10 | Calcium as Ca | mg/L | 75 | 22 | 55 | 82 | 85.6 | 32 | 18.7 | 50.6 | 16.8 |
| 11 | Magnesium as Mg | mg/L | 30 | 15 | 74 | 30 | 25.3 | 17 | 24.6 | 18.5 | 22.4 |
| 12 | Chlorides as $Cl^-$ | mg/L | 250 | 89.9 | 189.9 | 149.9 | 199.9 | 139.9 | 69.98 | 138.9 | 138 |
| 13 | Nitrate as $NO_3$ | mg/L | 45 | | | | | | | | |
| 14 | Sodium as Na | mg/L | Not Specified | 23.58 | 69.74 | 69.06 | 40.5 | 64.94 | 13.37 | 59.7 | 38 |
| 15 | Potassium as K | mg/L | Not Specified | 1.2 | 35.4 | 2.2 | 0.2 | 98.3 | 0.8 | 1.7 | 1.8 |
| 16 | Fluoride as F | mg/L | 1 | 0.2 | 0.35 | 0.25 | 0.1 | 0.1 | 0.3 | 0.1 | 0.35 |
| 17 | Iron as Fe | mg/L | 0.3 | <0.1 | <0.2 | <0.3 | <0.4 | <0.5 | <0.6 | <0.7 | <0.8 |
| 18 | Sulphates as $SO_4$ | mg/L | 200 | | | | | | | | |
| 19 | Zinc as Zn | mg/L | 5 | <0.5 | <0.5 | 1.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| 20 | Nickel | mg/L | 0.02 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 21 | Phenolic Compounds as Phenols | mg/L | 0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 22 | Lead as Pb | mg/L | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 23 | Cadmium as Cd | mg/L | 0.003 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 24 | Total Chromium as Cr | mg/L | 0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 25 | Copper as Cu | mg/L | 0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |

Note: *Agree - Agreeable

**Conclusion**

- pH of the ground water samples collected was in the range of 7.07 – 8.0.
- Total Dissolved Solids in the samples was in the range of 418 – 851mg/l.
- Total Hardness was found to vary between 117 – 441mg/l.

Heavy metal concentrations in all the samples were found to be well within thelimits.

**Table 3.10: Surface Water Quality**

| S. No. | Parameter | Acceptable Limits as per IS: 10500:2012 | Permissible Limits as per IS: 10500: 2012 | Units | SW1 | SW2 |
|---|---|---|---|---|---|---|
| 1 | pH | 6.5 – 8.5 | No relaxation | - | 8.32 | 8.11 |
| 2 | Color | 5 | 15 | Hazen | <5 | <5 |
| 3 | Conductivity ($25^0$C) | NS | NS | µS/cm | 326 | 448 |
| 4 | Dissolved Oxygen | NS | NS | mg/l | 4.7 | 4.5 |
| 5 | BOD ( 5 days at 20oC) | NS | NS | mg/l | 6.2 | 6.4 |
| 6 | Total Dissolved Solids | 500 | 2000 | mg/l | 293.2 | 298.8 |
| 7 | Total Hardness | 200 | 600 | mg/l | 124 | 232.0 |
| 8 | Chloride as $Cl^-$ | 250 | 2000 | mg/l | 64.6 | 96.2 |
| 9 | Fluorides as $F^{2+}$ | 1.0 | 1.5 | mg/l | 0.26 | 0.31 |
| 10 | Sulphate as $SO_4^{2-}$ | 200 | 400 | mg/l | 27.8 | 37.61 |
| 11 | Alkalinity | 200 | 600 | mg/l | 101.7 | 180.3 |
| 12 | Nitrates as $NO_3^-$ | 45 | No relaxation | mg/l | 0.26 | 0.51 |
| 13 | Cyanides as CN | 0.05 | No relaxation | mg/l | <0.01 | <0.01 |
| 14 | Calcium as $Ca^{2+}$ | 75 | 200 | mg/l | 21.2 | 64.7 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 15 | Magnesium as $Mg^{2+}$ | 30 | 100 | mg/l | 17.8 | 18.62 |
| 16 | Sodium as $Na^{+}$ | NS | NS | mg/l | 42.1 | 54.92 |
| 17 | Potassium as $K^{+}$ | NS | NS | mg/l | 3.12 | 6.8 |
| 18 | Iron as $Fe2^{+}$ | 0.3 | No relaxation | mg/l | 0.12 | 0.26 |
| 19 | Chromium as $Cr^{6+}$ | 0.05 | No relaxation | mg/l | <0.01 | <0.01 |
| 20 | Cadmium as $Cd^{+2}$ | 0.003 | No relaxation | mg/l | <0.001 | <0.001 |
| 21 | Lead as $Pb^{2+}$ | 0.01 | No relaxation | mg/l | <0.01 | <0.01 |
| 22 | Copper as $Cu^{+}$ | 0.05 | 1.5 | mg/l | <0.01 | <0.01 |
| 23 | Arsenic as $As^{3+}$ | 0.01 | No relaxation | mg/l | <0.001 | <0.001 |
| 24 | Selenium as $Se^{2-}$ | 0.01 | No relaxation | mg/l | <0.01 | <0.01 |
| 25 | Phenolics as $C_6H_5OH$ | 0.001 | 0.002 | mg/l | <0.001 | <0.001 |
| 26 | Zinc as $Zn^{2+}$ | 5 | 15 | mg/l | <0.5 | <0.5 |
| 27 | Mercury as $Hg^{2+}$ | 0.001 | No relaxation | mg/l | <0.001 | <0.001 |
| 28 | Aluminum as $Al^{3+}$ | 0.03 | 0.2 | mg/l | <0.03 | <0.03 |
| 29 | Oil and grease | 0.5 | No relaxation | mg/l | <1.0 | <1.0 |
| 30 | Total Coliform | Shall not be detectable in any 100 ml Sample | Shall not be detectable in any 100 ml Sample | MPN/ 100 ml | 1200 | 22.0 |
| 31 | Fecal Coliform | Shall not be detectable in any 100 ml Sample | Shall not be detectable in any 100 ml Sample | MPN/ 100 ml | 220 | 80.0 |

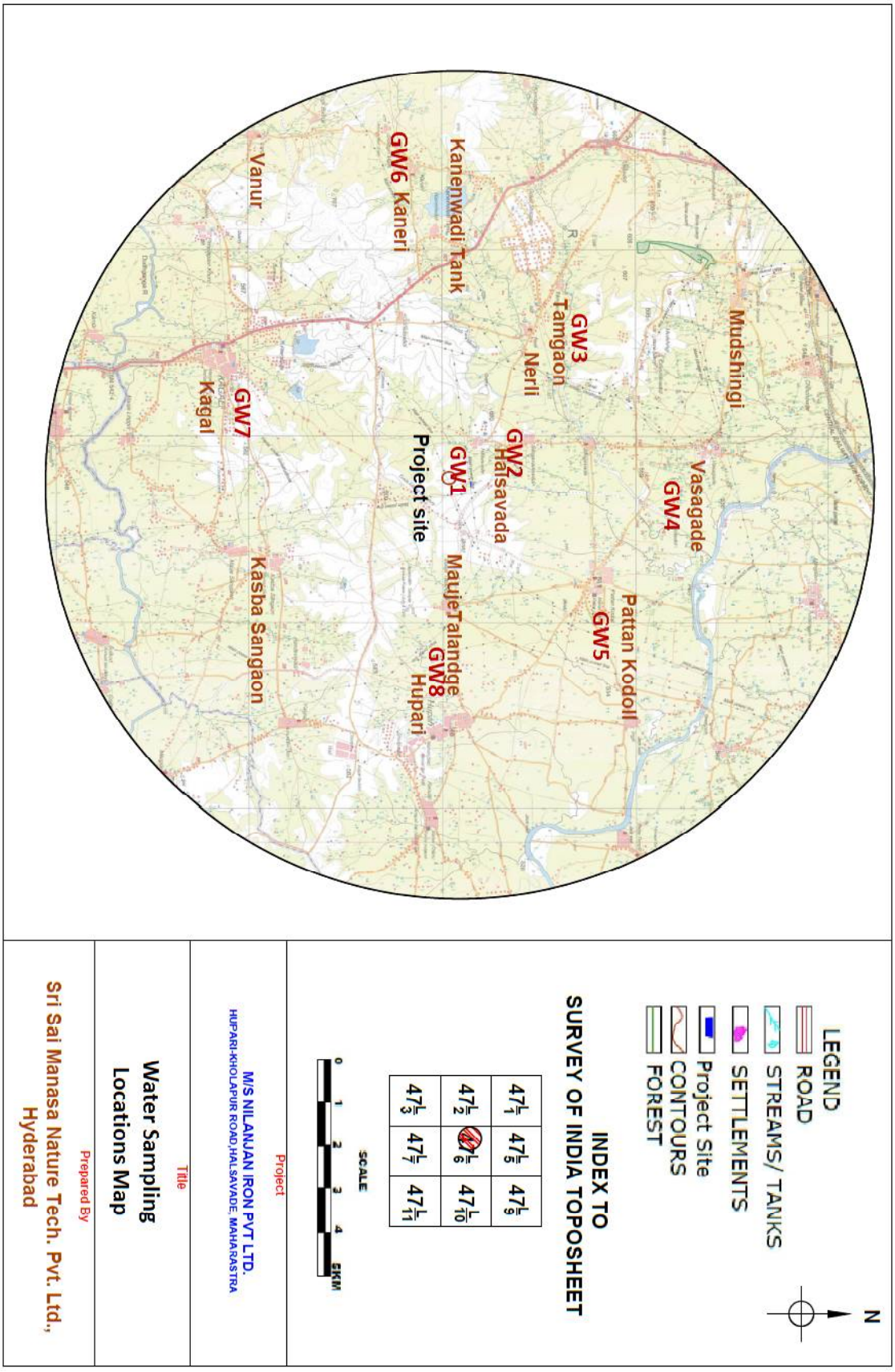



**Figure 3.4 Water Sampling Locations**

## 3.6 LANDENVIRONMENT

### 3.6.1 SoilQuality

The soil samples were collected from 8 sampling locations within an area of 10 km radius around the proposed project for analysis of the physico-chemical characteristics of the soil quality. The locations of soil sampling stations are given in**Table 3.11** and **Figure 3.5**.

**Table 3.11 Soil SamplingLocations**

| Code | Location | Distance (km) w.r.t Project | Direction w.r.t Project |
|---|---|---|---|
| S-1 | Project Site | -- | -- |
| S-2 | Halsavade | 1.5 | N |
| S-3 | Tamgaon | 5.0 | NW |
| S-4 | Vasagade | 6.5 | N |
| S-5 | Pattankodli | 5.5 | NE |
| S-6 | Kanheri | 8.0 | SW |
| S-7 | Kagal | 7.0 | S |
| S-8 | Talgande | 5.5 | E |

The Soil Analysis Results are given in **Table 3.12.**

**Table 3.12: Soil Analysis Report**

| Sr. No. | Parameter | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Texture | | | | | | | | |
| A | Sand (%) | 34 | 38 | 43 | 39 | 40 | 32 | 37 | 32 |
| B | Silt (%) | 44 | 49 | 42 | 50 | 47 | 54 | 50 | 44 |
| C | Clay (%) | 22 | 13 | 15 | 11 | 13 | 14 | 13 | 24 |
| 2 | pH | 7.14 | 8.22 | 8.01 | 8.15 | 7.35 | 7.40 | 7.96 | 8.05 |
| 3 | EC (µs/cm) | 180.3 | 164.7 | 49.4 | 162.6 | 123.4 | 97.7 | 68.1 | 141.1 |
| 4 | Bulk Density (g/cc) | 1.23 | 1.36 | 1.29 | 1.32 | 1.16 | 1.19 | 1.21 | 1.24 |
| 5 | SAR | 0.43 | 0.52 | 0.87 | 1.05 | 0.98 | 1.29 | 1.04 | 0.96 |
| 6 | Available Nitrogen (kg/ha) | 61.4 | 54.4 | 48.2 | 51.8 | 58.7 | 61.3 | 65.7 | 57.7 |
| 7 | Available P as $PO_4$ (kg/ha) | 8.0 | 6.3 | 5.1 | 7.8 | 18.2 | 8.5 | 13.6 | 18.0 |
| 8 | Available K (kg/ha) | 169.0 | 124 | 103 | 130 | 164 | 178 | 135 | 166 |
| 9 | Exchangeable Ca (meq/100gr) | 2.6 | 2.4 | 2.7 | 2.5 | 1.9 | 2.3 | 2.2 | 1.9 |
| 10 | Exchangeable Mg (meq/100gr) | 3.2 | 3.2 | 3.3 | 3.4 | 3.17 | 2.99 | 2.69 | 3.09 |
| 11 | Exchangeable Na (meq/100gr) | 0.06 | 0.05 | 0.08 | 0.1 | 0.08 | 0.11 | 0.09 | 0.08 |
| 12 | Organic Carbon (%) | 0.83 | 0.96 | 0.91 | 1.11 | 0.97 | 1.22 | 1.12 | 0.91 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 13 | Manganese (meq/100gr) | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| 14 | Zinc (meq/100gr) | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| 15 | Boron (meq/100gr) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |

**Conclusion**

Sampling was carried out at 8 locations during the study period. The result of the analysis of soil is presented in **Table 3.12**and the summary of the results are presented below:

- pH in soil sample was observed in the range 7.14 to 8.22.
- Bulk density was observed in the range of 1.16 -1.36 g/cc.

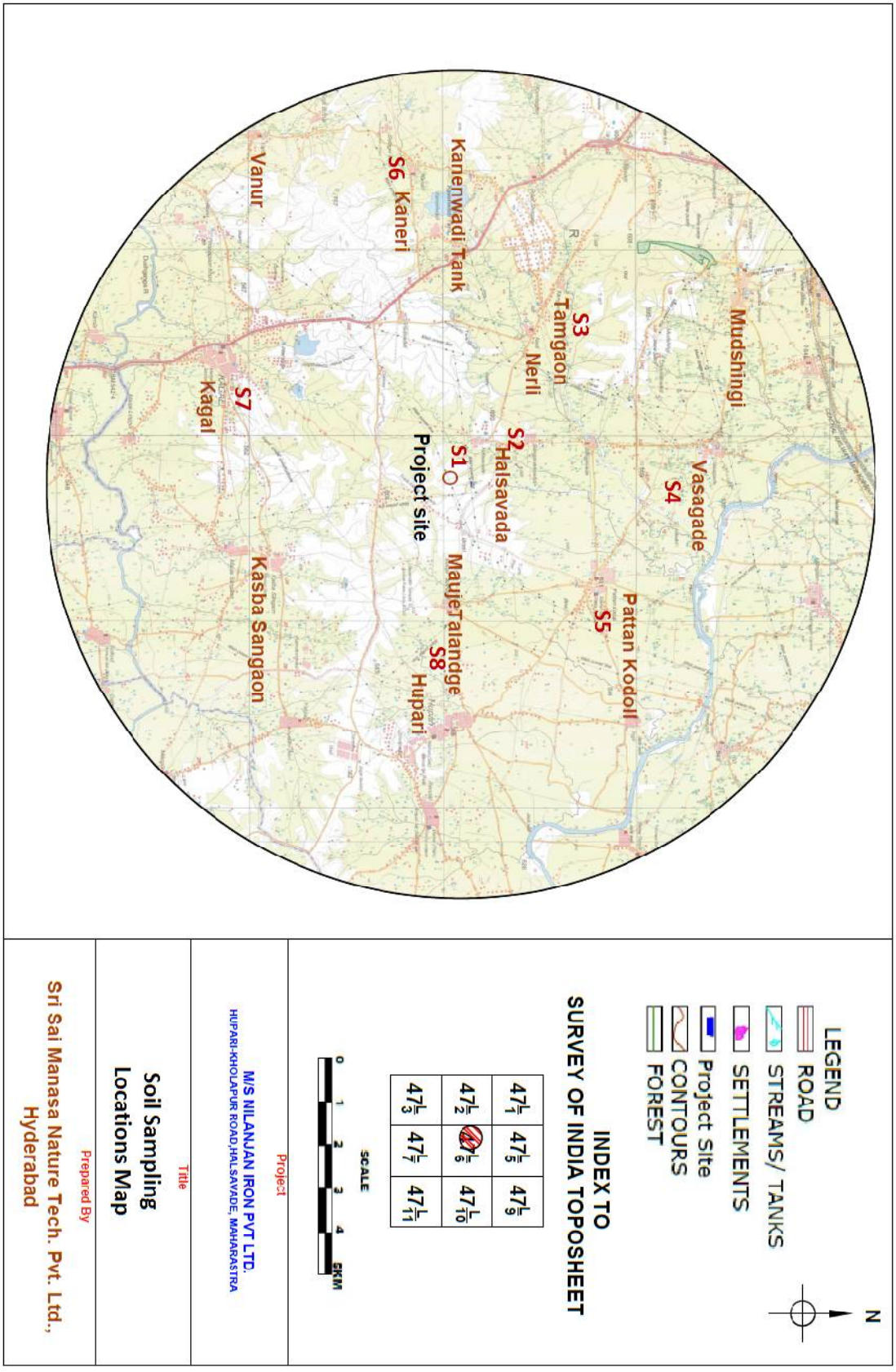



**Figure 3.5: Soil Sampling Locations**

## 3.7 GEOLOGY AND HYDROGEOLOGY

### 3.7.1 GEOLOGY

Two distinct trends are seen in the hill ranges of Kolhapur district. One runs roughly North-South, along the main range of the Western Ghats presenting wild and picturesque hill slopes and valleys. The other one comprises the narrow broken-crested ridges and flat topped masses stretching eastwards and merging gradually into the plains in the East. The rivers Hiranyakeshi, Vedganga, Dudhganga, Bhogvati and Panchganga drain the area towards East.

The geological formations met with, in the descending order of their antiquity, are as follows:

| | |
|---|---|
| Soil and Laterite | Recent and Sub-Recent. |
| Deccan trap | Lower Eocene. |
| Lower Kaladgi Series | Cuddapah. |
| Granite-gneiss Dharwars | Archaean. |

The Dharwar phyllites and amphibolities intruded by granite-gneiss are the oldest rocks found as small inlairs in this district. Phyllites and amphibolities are noticed near Ajra. The phyllites are completely weathered and have formed variegated clays. The amphibolities are dark, markedly schistose and break into thin slabs. Granite-gneiss crops out as four small in lairs along the junction of the Kaladgis and the Deccan trap near Hadalge, Nesri, Tarewadi and Chandewadi. It shows diversity of texture from a fine grained to a rather course porphyritic type. A number of basic inclusions are noticed in the granite-gneiss.

The Lower Kaladgi series, next in the chronological order, rest unconformable over the Dharwars and the granite-gneiss. It consists of conglomerates, compact to gritty quartzites with minor ferruginous bands and stains, variegated and sandy-shale's and re-crystallized sandstones. The Kaladgi rocks are well bedded, the thickness of the individual beds varying from a few inches to 20 feet or more. Conglomerates occur at various levels.

The outcrops are seen along the V-shaped Western margin of the main Kaladgi basin near Hadalge, Nesri and Watangi in the Ghatprabha river valley. They form small in lairs in the valleys of Vedganga, Dudhganga and Hiranyakeshi rivers. ***(Source: Groundwater Survey of India)***

### 3.7.2HYDROGEOLOGY

**Deccan Traps**

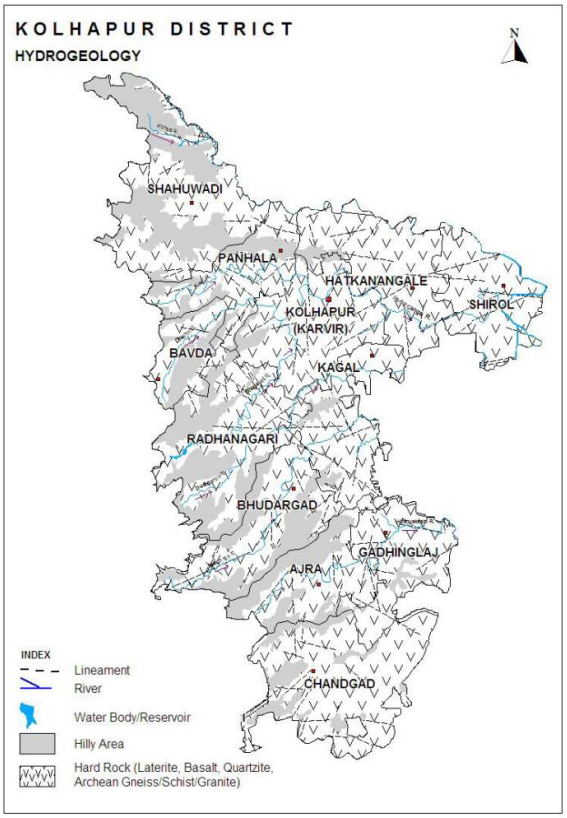
The major portion of district is covered by Basaltic lava flows of upper Cretaceous to lower Eocene age. These flows are part of the plateau Basalt of the Peninsular India, and believed to have been extruded by fissure type of Volcanoes. The Basaltic flows of the area are of 'aa'

type. These show a basal section having chilled basalt of greyish clincker with fragments of highly vesicular or dense purple trap cemented by zeolites, secondary silica, glass and powdered rock. The main middle section of the flow comprises dark or dark grey dense basalt. Over this is found a section of flow breccia, which also consists of sub-rounded angular blocks of vesicular traps cemented by zeolites, glass or pulverized rock. The thickness of the Breccia varies from a few centimeters to more than half the thickness of the flow. The top most layer of the flow is pinkish or purplish glass, which at places gives rise to clay like material after weathering and is referred to as "Red bole". The Breccia portion is generally altered and is pinkish or purplish in colour. The Breccia is easily weathered, the product of weathering comprises fine fragments and it gives rise to smooth slopes. The dense rock sections of the flows show spheroidal weathering and yield large fragments. They stand out as cliffs. Owing to this difference of the weathering characters, cliffs, benches, and terraces are formed. Brand bottomed valleys are derived whenever the erosion is arrested by the dense sections of the flows, Amphitheater like geomorphological features are also conspicuous in these area. While the fragmental tops of flows yield reddish soil with admixture of zeolitic and chert, the dense rock sections yield dark coloured soil. In the Basaltic Terrain, in parts of Kolhapur district, the ground water occurs under unconfined conditions in the phreatic zone up to the depth of 15.00 m in the weathered zone, joints and fractures in the massive units, and weathered vesicular units. The water bearing strata below the red bole and massive units exhibits mild confined conditions as observed in the borewells tapping deeper aquifers. In the laterites plateaus, the ground water occurs down to a depth of 15.00 to 20.00 m. bgl under un-confined conditions. The wells of these areas show rapid decline in water level during post monsoon period and practically go dry in peak summer, due to lateral movement at lithomargic/lateritic contact and spring discharge is noticed.

**Laterites**: Laterites forms plateaus in the area and cap the Basalts at different elevations. Mostly these are confined to flat and top hill ranges. Due to Laterite capping holding adequate moisture it is generally good for forests grown on such plateaus. The top of the many plateaus in the Western ghats and south and southeast of Kolhapur show development of Laterites. The thickness of Laterites varies from few meters to 30.00. The section of laterites shows, Bauxite, Laterites and Lithomargic clays. At places the Bauxite occurs as patches within the Laterite. All the above are derived from the leaching processes acting on weathered trap. The Laterites with numerous vesicles, irregular channel ways are moistly filled with yellowish to reddish

yellow and greyish white clayey material. The laterites and bauxite in the area show massive vermicular concretionary and brecciated structure. Secondary laterites derived from the denudation of plateaus laterites are found along slopes of the hills, and valleys. Laterites in the study area have better porosity due to network of sinuous conduits making it porous formations. The Ground Water circulates through a net work of voids and conduits, joints and fractures. The lithomargic clays occurring at the base act as aquiclude for percolating ground water, and springs emerge at this contact due to lateral movement of ground water.

**Alluvium:** Due to hilly terrain, conspicuous spreads of Alluvium are rarely noticed, except in some lower reaches of rivers. Few isolated patches of recent Alluvium varying in thickness from 3.00m to 5.00 m are seen at places along the banks of the River Krishna and Vairna. The Alluvium rests directly over the weathered basalt and comprises of pebbles, boulders and fragments of clayey and siliceous material. A map depicting hydrogeology of the district is shown in figure. The Alluvium deposits in the area have primary porosity due to inter granular pore spaces making sands and gravels a good water bearing formations. But their irregular lithological nature results in variable water yielding capacity, depending on the sand/clay ratio.



**Water Level Scenario**

Depth to water level varies with in the district depending upon hydrogeological framework, level of ground water development and topography of the area. It also varies with time. The general rise during monsoon and decline after monsoon till the next monsoon is witnessed in the region. The water level data of 36 National Hydrograph Network monitoring Stations (NHNS) established by CGWB have been analyzed to depict the ground water level during pre monsoon and post monsoon

**Pre monsoon Depth to Water Level**

The premonsoon depth to water level ranges from 0.00 to 16.28 m. bgl. The depth to water level ranges between 5 to 10 m. bgl. in major part of the district. The water levels of 2.0 to 5.0 m. bgl is observed as elongated patch in the central part of the district. The deeper water levels of more than 10.00 m bgl are observed in the northern and southern part of the district.

**Post monsoon Depth to Water Level**

Post monsoon depth to water level map has been prepared based on Nov 2011 water level data. The post monsoon water level ranges from 0.3 to 9.6 m bgl. The water levels of 2 to 5m bgl is observed in major part of the district. The shallow water level of less than 2.0m.bgl occur as scattered patches in northern and south eastern parts of the district. The deeper water levels of 5 to 10 m bgl are observed in eastern parts of the district.

**Water Level Fluctuation**

The difference between pre monsoon and post monsoon water level is taken as fluctuation, which assumes significance for ground water recharge, estimates. The difference between pre monsoon and post monsoon water level is the seasonal fluctuation, which may vary due to excess or deficit rainfall during that particular year. The fluctuation is less than 2.0m bgl. in almost entire district except in a few isolated patches where the fluctuation is more than 2.0m.

***(Source: Groundwater Survey of India)***

## 3.8 LAND USE STUDIES

Studies on land use aspects of eco-system play important roles for identifying sensitive issues, if any, and taking appropriate actions for maintaining the ecological balance in the development of the region.

### 3.8.1 Objectives

The objectives of land use studies are:

- To determine the present land use pattern;
- To analyze the impacts on land use due plant activities in the study area; and
- To give recommendations for optimizing the future land use pattern vis-a-vis growth of plant activities in the study area and its associated impacts.

### 3.8.2 Methodology

For the study of land use, literature review of various secondary sources such as District Census Handbooks, regional maps regarding topography, zoning settlement, industry, forest etc., were taken. The data was collected from various sources like District Census Handbook, Revenue records, state and central government offices and Survey of India (SOI) toposheets and also through primary field surveys.

### 3.8.3 Land use Based on Secondary Data

Based on the census report, 10-km radial distance around this Plant Centre has been considered in the study. These areas were studied in detail to get the idea of land use pattern in the study area. The land use pattern of the study area is given in **Table-3.13.** The FCC map and Land use map are given in **Figure 3.9.**

**Table 3.13: Land Use Pattern of the Study Area**

| S. No. | Particular | Area (ha.) | PGA *** (%) |
|---|---|---|---|
| 1 | Water body | 568.71 | 1.8 |
| 2 | Settlement | 3235.68 | 10.28 |
| 3 | Open Scrub | 2171.34 | 6.9 |
| 4 | Fallow Land | 2872.08 | 9.12 |
| 5 | Agriculture Land | 22610.74 | 71.9 |
| | **Total** | **31458.55** | **100** |

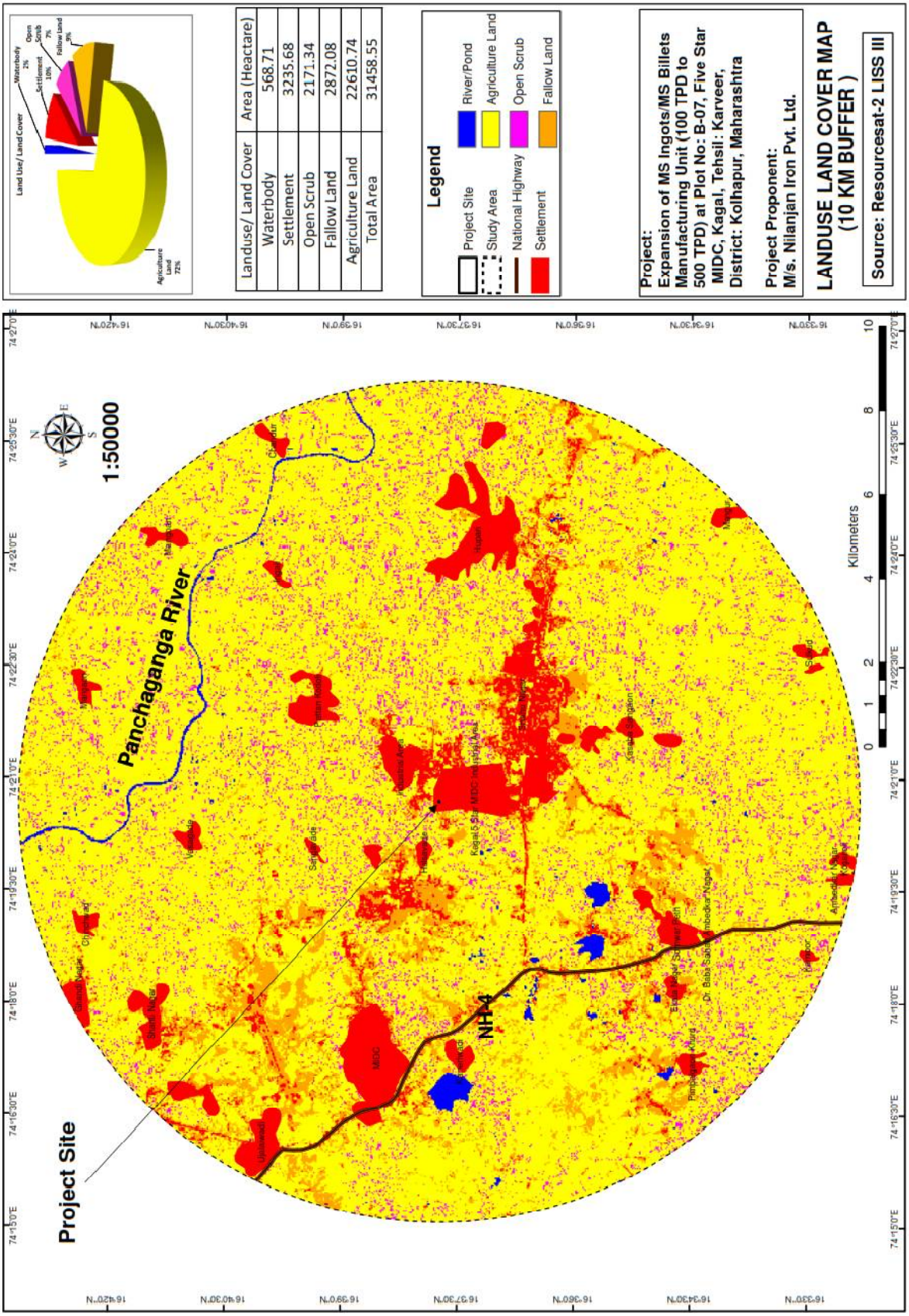



**Figure 3.6: Land use Map of the Study Area**

## 3.9 ECOLOGY

### 3.9.1 Introduction

A natural ecosystem is a structural and functional unit of nature. It has components, which exist in harmony and survive by interdependence. Ecosystem has self-sustaining ability and control the number of organisms at any level by cybernetic rules. The effect of this is that an ecosystem does not become imbalanced. Development is must for any nation, however, the development needs a price. The price is paid by one kind of people and natural biota and other people reap fruits of prosperity. The disparity between the sufferers and enjoyers increases. The only plausable answer to this is eco-friendly development. The ecological study was undertaken with the objective of the following:

- to assess the nature and distribution of vegetation in and around the project site;
- to assess the distribution of animal life spectra; and
- to assess the biodiversity and to understand the resource potential.
- To assess the impacts of the project on the immediate ecology and biodiversity

### 3.9.2 Methodology

Adopted for the Survey to achieve above objectives a detailed study of the area was undertaken in 10-km radius area with the project site as its center. The different methods adopted were as follows: Compilation of secondary data with respect to the study area from published literature and Government agencies; Generation of first hand data by undertaking systematic ecological studies in the area; Interrogating local people so as to elicit information for local plants, animals and their uses; and Gathering data for ethnobiology. The present report gives the review of published secondary data and the results and general ecological survey conducted in the month of Nov -2018.

To accomplish the above objectives, a general ecological survey covering an area of 10 km radius from the proposed project boundary was done as follows:

1. Reconnaissance survey for selection of sampling sites in and around the site on the basis of meteorologicalconditions
2. Compilation of secondary data from published literature of forestdivision
3. Primary data generation through systematic studies which was donethrough
   - Generation of primary data to understand baseline ecological status, fauna structure and important floristicelements
   - Preparing a checklist of plants observed at thesite.

- Determining the bird population by taking random readings at everylocation.
- Observing mammals, reptiles, amphibians, insects through their calls, droppings, burrows, pugmarks and othersigns.
- Interaction with localresidents

4. Collection of secondary data from forest working plan and gazetteers. The compilation of primary and secondary data for flora and fauna isappended.
5. Primary data collected from project site and also surrounding villages namely Halsavadeand Tamgaon.

### 3.9.3 Flora

**Flora within the Core Zone**

The area identified for the M/s Nilanjan Iron Pvt. Ltd., at Plot No: B-07, Five Star MIDC, Kagal, Tehsil: Karveer, District: Kolhapur is referred to hereafter as the core zone while its surroundings extending up to 10 km radius is referred to as the buffer zone. The core zone is a non-forest wasteland sparsely covered by a few shrubs and some trees. Major part of the land was under dry rain-fed cultivation.*Karanj (Pongamia pinnata), lantana camara, ber (Ziziphus nummularia), mesquite (Prosopis juliflora), custard apple (Annona squamosa), Anisomeles indica, Calotropis procera, Calotropis gigantea, Cassia auriculata. Waltheria indica, Aristida setacea, Scilla indica, Stylosanthes hamata, Solanum xanthocarpum were common wild plants found in the core zone. There were some trees of mango (Mangifera indica), neem (Azadirachta indica), tamarind (Tamarindus indica), karanj (Pongamia pinnata), copper pod (Peltophorum pterocarpum), siamese cassia (Cassia siamea)*around the Industry. The existing industry will grow avenue and greenbelt species in 33% of the total area within their site. A list of plants found in the study area is given in **Table 3.14.** The list includes the trees grown in the existing industrial unit.

**Table 3.14: List of Flora in the Core Zone**

| Scientific name | Common or Local name | Family |
|---|---|---|
| *Acacia nilotica* | Nalla tumma | Mimosaceae |
| *Acacia farnesiana* | Muriki thumma | Mimosaceae |
| *Acacia leucophloea* | Tella tumma | Mimosaceae |
| *Acacia auriculiformis* | Australian wattle | Mimosaceae |
| *Albizia lebbek* | Dirisanam | Mimosaceae |
| *Acaia holosericea* | Holosericea | Mimosaceae |
| *Achrus sapota* | Sapota | Sapotaceae |
| *Aegle marmelos* | Maredu | Rutaceae |
| *Ailanthus excels* | Peddamaanu | Simaroubaceae |

| | | |
|---|---|---|
| *Alangium salvifolium* | Ooduga | Alangiaceae |
| *Annona squamosa* | Custard apple | Annonaceae |
| *Aristida setacea* | Broom grass | Poaceae |
| *Artocarpus heterophyllus* | Jack fruit | Moraceae |
| *Azadirachta indica* | Vepa | Meliaceae |
| *Azima tetracantha* | Tella Uppili | Salvadoraceae |
| *Bauhinia racemosa* | Aare chettu | Caesalpiniaceae |
| *Bauhinia variegate* | Mandari | Caesalpiniaceae |
| *Bothriochloa pertusa* | Grass | Poaceae |
| *Brachiaria cruciformis* | Grass | Poaceae |
| *Brachiaria distachya* | Grass | Poaceae |
| *Brachiaria mutica* | Grass | Poaceae |
| *Breynia retusa* | Chinna purugudu | Euphorbiaceae |
| *Breynia vitis-ideae* | Nalla purugudu | Euphorbiaceae |
| *Callistemon citrinus* | Indian bottle brush tree | Myrtaceae |
| *Calotropis gigantean* | Tella Jilledu | Asclepiadaceae |
| *Calotropis procera* | Jilledu | Asclepiadaceae |
| *Canthium parviflorum* | Balusu | Rubiaceae |
| *Carissa spinarum* | Kalivi / Vaaka | Apocynaceae |
| *Cassia auriculata* | Tangedu | Caesalpiniaceae |
| *Casuarina equisetifolia* | Sarvi | Casuarinaceae |
| *Cenchrus ciliaris* | Grass | Poaceae |
| *Chrysopogon fulvus* | Grass | Poaceae |
| *Cymbopogon coloratus* | Grass | Poaceae |
| *Cymbopogon caesius* | Grass | Poaceae |
| *Cynodon dactylon* | Grass | Poaceae |
| *Cyperus rotundus* | Grass | Cyperaceae |
| *Dalbergia sisso* | Sisso or Seesum | Caesalpiniaceae |
| *Eremopogon faveolatus* | Grass | Poaceae |
| *Eucalyptus teretocronis* | Eucalyptus | Myrtaceae |
| *Eucalyptus hybrid* | Eucalyptus | Myrtaceae |
| *Ficus benghalensis* | Marri | Moraceae |
| *Ficus racemosa* | Medi | Moraceae |
| *Ficus religiosa* | Raavi | Moraceae |
| *Grevellia robusta* | Silver oak | Proteaceae |
| *Heterophragma roxburghii* | Kala Goru | Bignoniaceae |
| *Holoptelia integrifolia* | Nemali naara | Ulmaceae |
| *Ipomoea carnea* | Rubber mokka | Convolvulaceae |
| *Jacaranda mimosifolia* | Jacaranda | Bignoniaceae |
| *Kigelia africana* | Yenugu Paadam | Bignoniaceae |
| *Lagerstroemia parviflora* | Chennangi | Lythraceae |
| *Lantana camara* | Lantana | Verbenaceae |
| *Leptadenia reticulate* | Mukkupala Teega | Asclepiadaceae |
| *Leucaena leucocephala* | Subabul | Mimosaceae |
| *Limonia acidissima* | Velaga | Rutaceae |
| *Mangifera indica* | Mamidi | Anacardiaceae |
| *Maytenus emerginata* | Danti | Celastraceae |

| | | |
|---|---|---|
| *Millingtonia hortensis* | Aakaasa malle | Bignoniaceae |
| *Mimosa polyancistra* | Thumma | Mimosaceae |
| *Mimosa rubicaulis* | Pariki kampa | Mimosaceae |
| *Mimosops elengi* | Pogada | Sapotaceae |
| *Morinda pubescens* | Togaru | Rubiaceae |
| *Moringa oleifera* | Munaga | Moringaceae |
| *Muntingia calabura* | Wild cherry | Elaeocarpaceae |
| *Opuntia dillenii* | Naaga Jemudu | Cactaceae |
| *Oroxylum indicum* | Dundilam | Bignoniaceae |
| *Parkinsonia aculeate* | Jeeluga | Widespread |
| *Peltophorum pterocarpum* | Konda chinta | Caesalpiniaceae |
| *Pergularia daemia* | Dustapa teega | Asclepiadaceae |
| *Phoenix sylvestris* | Eetha | Arecaceae |
| *Phyllanthus emblica* | Usiri | Euphorbiaceae |
| *Phyllanthus reticulatus* | Pulasari / Puliseru | Euphorbiaceae |
| *Pithecellobium dulce* | Seema chinta | Mimosaceae |
| *Plumeria alba* | Tella devaganneru | Apocynaceae |
| *Plumeria pudica* | Frangipani | Apocynaceae |
| *Plumeria rubra* | Erra devaganneru | Apocynaceae |
| *Polyalthia longifolia* | Ashoka | Annonaceae |
| *Polyalthia pendula* | Asoka | Annonaceae |
| *Pongamia pinnata* | Gaanuga | Fabaceae |
| *Prosopis juliflora* | English tumma | Mimosaceae |
| *Prosopis spicigera* | Jammi chettu | Mimosaceae |
| *Quisqualis indica* | Rangoon creeper | Combretaceae |
| *Samanea saman* | Nidrabhangi | Mimosaceae |
| *Sapindus emarginatus* | Kunkundu | Sapindaceae |
| *Scilla hyacinthina* | Adavi Tellagadda | Liliaceae |
| *Spathodea companulata* | Flame of the forest | Bignoniaceae |
| *Sterculia foetida* | Adavi badam | Sterculiaceae |
| *Stylosanthes hamate* | Hamata grass | Fabaceae |
| *Syzigium cumini* | Neradu | Myrtaceae |
| *Tabernaemontana coronaria* | Nandivardhanam | Apocynaceae |
| *Tamarindus indica* | Chinta | Caesalpiniaceae |
| *Tarenna asiatica* | Kommi | Rubiaceae |
| *Tecoma capensis* | Cape Honey suckle | Bignoniaceae |
| *Tecoma stans* | Patcha turai | Bignoniaceae |
| *Tectona grandis* | Teak / Teku | Verbenaceae |
| *Terminalia arjuna* | Tella maddi | Combretaceae |
| *Terminalia catappa* | Baadam | Combretaceae |
| *Thespecia populnea* | Ganga Raavi | Malvaceae |
| *Thevetia nerifolia* | Yellow oleander | Apocynaceae |
| *Tylophora indica* | Kukkapala teega | Asclepiadaceae |
| *Vitex negundo* | Vaavili / Nirgundi | Verbenaceae |
| *Wattakaka volubilis* | Tummudu teega | Asclepiadaceae |
| *Withania somnifera* | Aswagandha | Solanaceae |
| *Wrightia tinctoria* | Pala –kordusha | Apocynaceae |

| | | |
|---|---|---|
| *Ziziphus nummularia* | Nela Regu | Rhamnaceae |
| *Ziziphus mauritiana* | Regu | Rhamnaceae |
| *Pithecellobium dulce* | Seema chinta | Mimosaceae |
| *Plumeria alba* | Tella devaganneru | Apocynaceae |
| *Plumeria pudica* | Frangipani | Apocynaceae |
| *Plumeria rubra* | Erra devaganneru | Apocynaceae |
| *Polyalthia longifolia* | Ashoka | Annonaceae |
| *Polyalthia pendula* | Asoka | Annonaceae |
| *Pongamia pinnata* | Gaanuga | Fabaceae |
| *Prosopis juliflora* | English tumma | Mimosaceae |
| *Prosopis spicigera* | Jammi chettu | Mimosaceae |
| *Quisqualis indica* | Rangoon creeper | Combretaceae |
| *Samanea saman* | Nidrabhangi | Mimosaceae |
| *Sapindus emarginatus* | Kunkundu | Sapindaceae |
| *Scilla hyacinthina* | Adavi Tellagadda | Liliaceae |
| *Spathodea companulata* | Flame of the forest | Bignoniaceae |
| *Sterculia foetida* | Adavi badam | Sterculiaceae |
| *Stylosanthes hamate* | Hamata grass | Fabaceae |
| *Syzigium cumini* | Neradu | Myrtaceae |
| *Tabernaemontana coronaria* | Nandivardhanam | Apocynaceae |
| *Tamarindus indica* | Chinta | Caesalpiniaceae |
| *Tarenna asiatica* | Kommi | Rubiaceae |
| *Tecoma capensis* | Cape Honey suckle | Bignoniaceae |
| *Tecoma stans* | Patcha turai | Bignoniaceae |
| *Tectona grandis* | Teak / Teku | Verbenaceae |
| *Terminalia arjuna* | Tella maddi | Combretaceae |
| *Terminalia catappa* | Baadam | Combretaceae |
| *Thespecia populnea* | Ganga Raavi | Malvaceae |
| *Thevetia nerifolia* | Yellow oleander | Apocynaceae |
| *Tylophora indica* | Kukkapala teega | Asclepiadaceae |
| *Vitex negundo* | Vaavili / Nirgundi | Verbenaceae |
| *Wattakaka volubilis* | Tummudu teega | Asclepiadaceae |
| *Withania somnifera* | Aswagandha | Solanaceae |
| *Wrightia tinctoria* | Pala –kordusha | Apocynaceae |
| *Ziziphus nummularia* | Nela Regu | Rhamnaceae |
| *Ziziphus mauritiana* | Regu | Rhamnaceae |

*(Data as per observations during study period and from secondary source)*

### 3.9.4 Vegetation and Flora of the Study area

Land use and land cover of the study area reveals the absence of any National Parks or Wildlife Sanctuaries or Reserve Forests or Biosphere Reserves or Important Bird Areas (IBAs) or Protected Wetlands and perennial water bodies within 10 km radius of the project. The core zone is surrounded mainly by Industries, croplands and wastelands. Several village tanks are present in the buffer zone but all of them were dry during the summer season.

Unusually, cashew nut (Anacardium occidentale) was grown in many private commercial plantation crops. But there are many non-cultivable wastelands sparsely covered with thorny bushes of Maytenus emarginata, Prosopis juliflra, Acacia nilotica as well as Lantana camara, Calotropis gigantea, Calotropis procera, Cassia auriculata and others. Sapota, mango, orange, guava and pomegranate are the major fruit trees. Eucalyptus and teak are the main pulpwood and timber plantations. Mulberry is widely cultivated for silk production. All common avenue and agro forest species are grown along the roadsides and in the greenbelt of local industrial units. A few rare, endangered and threatened (RET) trees such as sandal wood (Santalum album) and red sander (Pterocarus santalinus) are cultivated in very small numbers. There are no rare, endangered and threatened (RET) species existing under wild conditions. A list of trees, shrubs and perennial climbers found in the buffer zone is given in **Table 3.15.**

**Table 3.15: List of Flora in the Buffer Zone**

| **Scientific name** | **Family** |
|---|---|
| *Albizia lebbek* | Mimosaceae |
| *Acacia auriculiformis* | Mimosaceae |
| *Aegle marmelos* | Rutaceae |
| *Acacia farnesiana* | Mimosaceae |
| *Acacia leucophloea* | Mimosaceae |
| *Acacia nilotica* | Mimosaceae |
| *Acaia holosericea* | Mimosaceae |
| *Achrus sapota* | Sapotaceae |
| *Abrus precatorius* | Fabaceae |
| *Ailanthus excelsa* | Simaroubaceae |
| *Alangium salvifolium* | Alangiaceae |
| *Alhagi camelorum* | Fabaceae |
| *Allamanda cathartica* | Apocynaceae |
| *Ancardium occidentale* | Anacardiaceae |
| *Annona squamosa* | Annonaceae |
| *Artocarpus heterophyllus* | Moraceae |
| *Azadirachta indica* | Meliaceae |
| *Bauhinia racemosa* | Caesalpiniaceae |
| *Bauhinia variegata* | Caesalpiniaceae |
| *Borassus flabellifer* | Arecaace |
| *Breynia retusa* | Euphorbiaceae |
| *Breynia vitis-ideae* | Euphorbiaceae |
| *Butea monosperma* | Fabaceae |
| *Callistemon citrinus* | Myrtaceae |
| *Calotropis gigantea* | Asclepiadaceae |
| *Calotropis procera* | Asclepiadaceae |
| *Calycoperis floribunda* | Combretaceae |

| | |
|---|---|
| *Canthium dicoccum* | Rubiaceae |
| *Canthium parviflorum* | Rubiaceae |
| *Capparis zeylanica* | Capparidaceae |
| *Caralluma umbellata* | Apocynaceae |
| *Carissa spinarum* | Apocynaceae |
| *Cascabela thevetia* | Apocynaceae |
| *Cassia auriculata* | Caesalpiniaceae |
| *Cassia fistula* | Caesalpiniaceae |
| *Casuarina equisetifolia* | Casuarinaceae |
| *Catunaregam spinosa* | Rubiaceae |
| *Cissus vitiginea* | Vitaceae |
| *Cissus quadrangularis* | Vitaceae |
| *Cocos nucifera* | Arecaceace |
| *Codiaeum varieigatum* | Euphorbiaceae |
| *Cordia dichotoma* | Cordiaceae |
| *Cosmostigma racemosum* | Apocynaceae |
| *Crataeva religiosa* | Capparidaceae |
| *Dalbergia sisso* | Caesalpiniaceae |
| *Decalepis hahiltonii* | Periplocaceae |
| *Dendrocalamus strictus* | Poaceae |
| *Diospyros chloroxylon* | Ebenaceae |
| *Diospyros melanoxylon* | Fabaceae |
| *Dodonaea viscosa* | Sapindaceae |
| *Erythroxylon monogynum* | Erythroxylaceae |
| *Eucalyptus teretocronis* | Myrtaceae |
| *Eucalyptus hybrid* | Myrtaceae |
| *Euphorbia antiquorum* | Euphorbiaceae |
| *Ficus benghalensis* | Moraceae |
| *Ficus racemosa* | Moraceae |
| *Ficus religiosa* | Moraceae |
| *Grevellia robusta* | Proteaceae |
| *Hardwickia binata* | Caesalpiniaceae |
| *Hemidemus indicus* | Periplocaceae |
| *Heterophragma roxburghii* | Bignoniaceae |
| *Holoptelia integrifolia* | Ulmaceae |
| *Ipomoea carnea* | Convolvulaceae |
| *Jacaranda mimosifolia* | Bignoniaceae |
| *Jatropha glandulifera* | Euphorbiaceae |
| *Kigelia africana* | Bignoniaceae |
| *Lagerstroemia parviflora* | Lythraceae |
| *Lantana camara* | Verbenaceae |
| *Leptadenia reticulata* | Asclepiadaceae |
| *Leucaena leucocephala* | Mimosaceae |
| *Limonia acidissima* | Rutaceae |
| *Citrus aurantifolia* | Rutaceae |
| *Citrus limonum* | Rutaceae |

| | |
|---|---|
| *Maytenus emerginata* | Celastraceae |
| *Millingtonia hortensis* | Bignoniaceae |
| *Mimosa polyancistra* | Mimosaceae |
| *Mimosa rubicaulis* | Mimosaceae |
| *Mimosops elengi* | Sapotaceae |
| *Morinda pubescens* | Rubiaceae |
| *Moringa olivaefera* | Moringaceae |
| *Muntingia calabura* | Elaeocarpaceae |
| *Opuntia dillenii* | Cactaceae |
| *Oroxylum indicum* | Bignoniaceae |
| *Parkinsonia aculeata* | Widespread |
| *Peltophorum pterocarpum* | Caesalpiniaceae |
| *Pergularia daemia* | Asclepiadaceae |
| *Phoenix sylvestris* | Arecaceae |
| *Phyllanthus emblica* | Euphorbiaceae |
| *Phyllanthus reticulatus* | Euphorbiaceae |
| *Pithecellobium dulce* | Mimosaceae |
| *Plumeria alba* | Apocynaceae |
| *Plumeria rubra* | Apocynaceae |
| *Polyalthia longifolia* | Annonaceae |
| *Polyalthia pendula* | Annonaceae |
| *Pongamia pinnata* | Fabaceae |
| *Prosopis juliflora* | Mimosaceae |
| *Prosopis spicigera* | Mimosaceae |
| *Quisqualis indica* | Combretaceae |
| *Samanea saman* | Mimosaceae |
| *Sapindus emarginatus* | Sapindaceae |
| *Spathodea companulata* | Bignoniaceae |
| *Sterculia foetida* | Sterculiaceae |
| *Streblus asper* | Moraceae |
| *Syzigium cumini* | Myrtaceae |
| *Tabernaemontana coronaria* | Apocynaceae |
| *Tamarindus indica* | Caesalpiniaceae |
| *Tecoma stans* | Bignoniaceae |
| *Tectona grandis* | Verbenaceae |
| *Tarenna asiatica* | Rubiaceae |
| *Terminalia arjuna* | Combretaceae |
| *Terminalia bellerica* | Combretaceae |
| *Terminalia catappa* | Combretaceae |
| *Terminalia tomentosa* | Combretaceae |
| *Thespecia populnea* | Malvaceae |

*(Data as per observations during study period and from secondary source)*

### 3.9.5 Fauna

As the animals, especially vertebrates and the winged invertebrates move from place to place in search of food, shelter, mate or other biological needs, separate lists for core and buffer

zone is not feasible. There are no forests or wildlife habitats, wetlands or IBAs. As such there are no chances of occurrence of any Rare or Endangered or Endemic or Threatened (REET) species within the core or buffer zone. There are no Sanctuaries, National Parks, Tiger Reserve or Biosphere Reserve or Elephant Corridor or other protected areas within 10 km of radius from core zone. It is evident from the available records, reports and circumstantial evidence that the entire study area including the core and buffer zones were free from any endangered animals. Among the mammals, only squirrels, mongoose, rats, bandicoots and rabbits were seen but rarely during the survey. Monkeys were also rare. Among the reptiles, lizards, garden lizards were very common. No snakes or monitor lizard was seen during the survey. The amphibians were also rare. A list of mammals, reptiles and amphibians either found or reported from the area is given in **Table 3.16**. A list of birds is given in **Table 3.17**. There were no resident birds other than crows, parrots, doves, and weaver birds, swifts, quails and mynas. It is apparent from the list that none of the species either spotted or reported is included in Schedule I of the Wildlife ProtectionAct.

**Table 3.16: List of Fauna in the Buffer Zone**

| Scientific Name | Common Name | WPA |
|---|---|---|
| **Mammals** | | |
| *Bandicota indica* | Large bandicoot rat | IV |
| *Cynopterus sphinx* | Short-nosed fruit bat | IV |
| *Funambulus palmarum* | Three striped squirrel | IV |
| *Golunda ellioti* | Indian bush rat | IV |
| *Herpestes edwardsii* | Indian grey mongoose | IV |
| *Hystrix indica* | Indian crested porcupine | IV |
| Macaca mulatta | Rhesus Macaque | II |
| *Mus booduga* | Common Indian field mouse | IV |
| *Mus musculus* | Home mouse | IV |
| *Nosokia indica* | Bandicoot rat | IV |
| *Pipistrellus mimus* | Indian pygmy pipistrelle | IV |
| *Plecotus auritus* | Long-eared bat | IV |
| *Rattus rattus* | Common Indian rat | IV |
| *Scotophillus heathi* | Greater yellow bat | IV |
| *Suncus etruscus* | Savvy pygmy shrew | IV |
| *Suncus murinus* | House shrew | IV |
| *Sus scrofa* | Wild boar | III |
| **Reptiles** | | |
| *Bungarus caeruleus* | Common Indian Krait | II |
| *Calotes versicolor* | Garden lizard | IV |
| *Chameleon zeylanicus* | Chameleon | IV |
| *Chrysopelea* | Tree Snake | II |

| | | |
|---|---|---|
| *taprobanica* | | |
| *Dryphis nasutus* | Whip Snake | II |
| *Echis carinatus* | Saw scaled viper | II |
| *Geochelone elegans* | Indian star tortoise | II |
| *Hemidactylus flaviviridis* | Indian wall lizard | IV |
| *Naja naja* | Cobra | II |
| *Ptyas mucosa* | Rat snake | II |
| *Typhlops diardii* | Blind Snake | II |
| *Typhlops porrectus* | Slender Blind Snake | II |
| *Varanus bengalensis* | Common Indian Monitor | II |
| *Vipera russseli* | Russell's viper | II |
| **Amphibians** | | |
| *Bufo melonosticatus* | Common Indian Toad | IV |
| *Hoplobatrachus tigerinus* | Tiger Frog | IV |
| *Hyla arboria* | Tree Frog | IV |
| *Rana hexadactyla.* | Green Pond Frog | IV |
| *Sphaerotheca breviceps* | Indian Burrowing frog | IV |

*(Data as per observations during study period and from secondary source)*

**Table 3.17: List of Avian Fauna in the Buffer Zone**

| Scientific Name | Common Name | Family | WPA |
|---|---|---|---|
| *Accipiter badius* | Shikra | Accipitridae | IV |
| *Acridotheres tristis* | Common myna | Sturnidae | IV |
| *Aegithinia tiphia* | Common Iora | Irenidae | IV |
| *Alcedo atthis* | Smallblue kingfisher | Alcedinidae | IV |
| *Athene brama* | Spotted owlet | Noctuidae | IV |
| *Bubulcus ibis* | Cattle Egret | Ardeidae | IV |
| *Centropus sinasis* | Greater coucal | Phasianidae | IV |
| *Ceryle rudis* | Lesser pied Kingfisher | Alcedinidae | IV |
| *Columba livia* | Blue rock pigeon | Columbidae | IV |
| *Coracias benghalensis* | Indian roller | Coraciidae | IV |
| *Corvus splendens* | House crow | Corvidae | V |
| *Dendrocitta vagabunda* | Indian tree pie | Corvidae | IV |
| *Dendrocygna javanica* | Lesser whistling-duck | Anatidae | IV |
| *Dicaeum erythrorhynchos* | Tickell's flower pecker | Dicaeidae | IV |
| *Dicrurus macrocercus* | Black drongo | Dicruridae | IV |
| *Egretta garzetta* | Little egret | Ardeidae | IV |
| *Elanus caeruleus* | Black-shouldered kite | Accipitridae | IV |
| *Eudynamys scolopace* | Asian koel | Cuculidae | IV |
| *Halcyon smyrnensis* | White-Breasted King fisher | Alcedinidae | IV |
| *Hierococcyx varius* | Brain fever bird | Ardeidae | IV |
| *Himantopus* | Black-winged stilt | Recurvirostridae | IV |

| Scientific Name | Common Name | Family | WPA |
|---|---|---|---|
| *himantopus* | | | |
| *Hydrophasianus chrugus* | Pheasant tailed Jacana | Jacanidae | IV |
| *Lanius excubitor* | Great grey shrike | Daniidae | IV |
| *Ixobrychus cinnamomeus* | Chestnut bittern | Ardeidae | IV |
| *Megalaima haemacephala* | Copper smith Barbet | Capitonidae | IV |
| *Merops orientalis* | Small Bee eater | Meropidae | IV |
| *Milvus migrans* | Black kite | Accipitridae | IV |
| *Motacilla alba* | White wagtail | Motacillidae | IV |
| *Motacilla flava* | Yellow wagtail | Motacillidae | IV |
| *Motacilla maderaspatensis* | Large pied wagtail | Motacillidae | IV |
| *Nectarinia asiatica* | Purple sunbird | Nectariniidae | IV |
| *Nectarinia zeylonica* | Purple-rumped sunbird | Nectariniidae | IV |
| *Oriolus oriolus* | Eurasian golden oriole | Oriolidae | IV |
| *Passer domesticus* | House sparrow | Passeridae | IV |
| *Perirocotus cinnomomeus* | Small Minivet | Phasianidae | IV |
| *Phalacrocorax carbo* | Large Cormorant | Phalacrocoracidae | IV |
| *Phalacrocorax niger* | Little cormorant | Phalacrocoracidae | IV |
| *Porphyrio porphyrio* | Purple moorhen | Rallidae | IV |
| *Prinia inornata* | Plain prinia | Cisticolidae | IV |
| *Prinia socialis* | Ashy prinia | Cisticolidae | IV |
| *Psittacula cyanocephala* | Blossom headed Parakeet | Psittacidae | IV |
| *Psittacula krameri* | Rose-Ringed Parakeet | Psittacidae | IV |
| *Pycnonotus cafer* | Red-vented bulbul | Pycnonotidae | IV |
| *Saxicolodies fulicata* | Indian robin | Turdinae | IV |
| *Streptopelia chinensis* | Spotted dove | Columbidae | IV |
| *Streptopelia decaocto* | Eurasian Collared-Dove | Columbidae | IV |
| *Streptopelia Senegalensis* | Little brown dove | Columbidae | IV |
| *Streptopelia tranquebarica* | Red Collared-Dove | Columbidae | IV |
| *Sturnus pagodarum* | Brahminy starling | Sturnidae | IV |
| *Turdoides caudatus* | Common babbler | Timalinae | IV |
| *Upupa epops* | Common hoopoe | Upupidae | IV |
| *Vanellus indicus* | Red-wattled lapwing | Charadriidae | IV |

*(Data as per observations during study period and from secondary source)*

### 3.9.6 Aquatic Flora &Fauna

There are several small village / irrigation tanks no perennial water bodies in the study area.

**Wildlife Sanctuaries/ National Parks/ Reserve Forest Areas**

There are no ecologically sensitive areas such as the Wildlife Sanctuaries, National Parks,

Biosphere Reserves, Important Bird Areas (IBAs), Wetlands or any other protected area either in the project site or in the study area. There are no reserve forests also. But there are many small irrigation tanks in the buffer zone.

### 3.9.7 Endangered Animals

There are no endangered species found during the study period.

## 3.10 SOCIO-ECONOMIC SURVEY

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.

M/s.Nilanjan Iron Pvt. Ltd. is proposing Expansion of existing plant. As per EIA Notification dated 14$^{th}$Sept2006, as amended the project falls in Category "B" Project activity; hence it requires Environmental Clearance from SEIAA. Steel industry plays a vital role in socio-economic development.

The project site is located at Plot No: B-07, Five Star MIDC, Kagal, Tehsil: Karveer, District: Kolhapur, Maharashtra. Total Exiting plant land is 10174.0 sq.m, there is no additional land is required for proposed expansion the current land sufficient for Expansion. No Rehabilitation &Resettlement envisaged.

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

Brief Profile of the Kolhapur district is largest district of Maharashtra.According to the census of 2001, the geographical area of the district is 7718 sq. km. It is 2.15 per cent of Maharashtra's area. The urban area occupies 1.32 per cent of the total area i.e. 102.0 sq. km. and the rural area occupies 98.68 per cent of the total area i.e. 7625 sq. km.

**Baseline Status**

The latest available data has been complied 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 including the population details of the region.

The Socio-Economic Status of the study areas is mentioned below and the villages surveyed are enlisted.

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.

**Demography and Socio-Economics (Secondary Data Description)**

This section illustrates the prevailing socio-economic aspects of people inhabiting villages in the core and buffer zone of the proposed industrial park boundary. It also attempts to understand these realities so as to plan impactful developmental interventions for inhabitants of project area villages.

### 3.10.1 Methodology Adopted for the Study

The study area (both core and buffer zone) covers a 10 km radial distance from the periphery of the proposed project. The methodology adopted for data collection includes review of published secondary data such as district census statistics of 2011, which includes: demography, occupational structure, literacy profile and social structure etc.

Similarly, the primary data was collected through administering structured questionnaire, focused group discussions, observation and key stakeholder interactions in the core zone of project area villages. The salient features of the demographic and socio-economic aspects in the core and buffer zone (hereafter referred as study area) has been described in the following sections.

### 3.10.2 Demographic Aspects

**Distribution of Population**

As per 2011 census the study area consists of 1,30,338 populations in 10 km radial distance from the periphery of the project. The distribution of population in the study area is given in **Table 3.18.**

**Table – 3.18: Distribution of Population in Core and Buffer Zone**

| S.No. | Particulars | 0-2km | 2-5km | 5-10km | 0-10km |
|---|---|---|---|---|---|
| 1 | Number of households | 1804 | 5777 | 23576 | 31157 |
| 2 | Male population | 3861 | 14123 | 47631 | 65615 |
| 3 | Female population | 3717 | 13411 | 47606 | 64734 |
| 4 | Total population | 7573 | 27533 | 95232 | 130338 |
| 5 | SC population | 1584 | 4627 | 19241 | 25452 |
| 6 | ST population | 1160 | 2584 | 9883 | 13627 |
| 7 | Total population(0-6 years) | 677 | 3441 | 8802 | 12920 |
| 8 | Average household size | 4.2 | 4.2 | 4.0 | 4.1 |
| 9 | % of males to the total Population | 51.0 | 51.3 | 50.0 | 50.3 |
| 10 | % of females to the total population | 49.0 | 48.7 | 50.0 | 49.7 |

***Source:** District Primary Census Statistics of Maharashtra -2011.*

**Average Household Size**

The study area had an average family size of 4.2 persons per household in 2011. This is moderate family size and is in comparison with the other parts of the district.

**Population Density**

The density of population of the study area works out to about 400 persons per $km^2$.

**Sex Ratio**

The configuration of male and female indicates that the males constitute to about 50.3% and 49.7% females of the total population. The sex ratio i.e. the number of females per 1000 males indirectly reveals certain sociological aspects in relation with female births, infant mortality among female children and single person family structure, a resultant of migration of industrial workers. The study area on an average has 986 females per 1000 males.

**Social Structure**

In the study area about 12.0% population belong to Scheduled Tribes (ST) and 22.2% Scheduled Castes (SC) indicating that about 34.2% of the population in the study area belongs to Scheduled sections. The distribution of population in the study area by social structure is given in **Table 3.19**

**Table 3.19: Distribution of Population by Social Structure in Study Area**

| S.No. | Particulars | 0-2 km | 2-5 km | 5-10 km | 0-10 km |
|---|---|---|---|---|---|
| 1 | SC population | 1584 | 5083 | 22241 | 28908 |
| 2 | ST population | 1160 | 3651 | 10883 | 15694 |
| 3 | % of SC to the total population | 20.9 | 18.5 | 23.4 | 22.2 |
| 4 | % of ST to the total population | 15.3 | 13.3 | 11.4 | 12.0 |

| | | | | | |
|---|---|---|---|---|---|
| 5 | Total SC & ST Population | 2744 | 8734 | 33124 | 44602 |
| 6 | percentage to the total population | 36.2 | 31.7 | 34.8 | 34.2 |
| 7 | Total population | 7573 | 27533 | 95232 | 130338 |

**Source: District Primary Census statistics of Maharashtra -2011*

**Literacy Levels**

The analysis of the literacy levels in the study area reveals an average literacy rate of 59 % as per 2011 census data. The distribution of literates and literacy rates in the study area is given in **Table 3.20**

**Table 3.20: Distribution of Literate and Literacy Rates in Study Area**

| S.No. | Particulars | 0-2 km | 2-5 km | 5-10 km | 0-10km |
|---|---|---|---|---|---|
| 1 | Male population | 3861 | 14123 | 47631 | 65615 |
| 2 | Female population | 3717 | 13411 | 47606 | 64734 |
| 3 | Total population | 7573 | 27533 | 95232 | 130338 |
| 4 | Male literates | 2602 | 9679 | 31729 | 44010 |
| 5 | Female literates | 1862 | 6701 | 24290 | 32853 |
| 6 | Total literates | 4464 | 16380 | 56019 | 76863 |
| 7 | Male literacy rate (%) | 58.3 | 59.1 | 56.6 | 57.3 |
| 8 | Female literacy rate (%) | 41.7 | 40.9 | 43.4 | 42.7 |
| 9 | % of Male literates to the male Population | 67.4 | 68.5 | 66.6 | 67.1 |
| 10 | % of Female literates to the female population | 50.1 | 50.0 | 51.0 | 50.8 |
| 11 | Total literacy rate (%) | 58.9 | 59.5 | 58.8 | 59.0 |

***Source:*** *District Primary Census Statistics of Maharashtra-2011.*

The male literacy i.e. the percentage of literate males to the total literates of the study area works out to be 57.3%. The female literacy rate, which is an important indicator for social change, is observed to be 42.7% in the study area.

**Occupational Structure**

The occupational structure of residents in the study area is studied with reference to main workers, marginal workers and non-workers. The main workers include 4 categories of workers defined by the census department consisting of cultivators, agricultural laborers, those engaged in manufacturing, processing and repairs in household industry; and others including those engaged in household industry, construction, trade and commerce, transport and communication and all other services.

The marginal workers are those workers engaged in some work for a period of less than six months during the reference year prior to the census survey. The non-workers include those engaged in unpaid household duties, students, retired persons, dependents, beggars, vagrant's etc. institutional inmates or all other non-workers who do not fall under the above categories.

As per 2011 census records, there is a total of 42.3% main workers in the study area. The marginal workers and non-workers constitute to 11.00% and 46.7% of the total population respectively. Therefore, non-workers are predominant in the total distribution of workers by occupation. The occupational structure of the study area is given in **Table -3.21**

**Table 3.21 Occupational Structure in Core and Buffer Zone**

| S.No. | Particulars | 0-2km | 2-5km | 5-10 Km | 0-10km |
|---|---|---|---|---|---|
| 1 | Total population | 7573 | 27533 | 95232 | 130338 |
| 2 | Total workers | 4068 | 14806 | 50604 | 69478 |
| 3 | Work participation rate (%) (Total workers/Total population)*100 | 53.7 | 53.8 | 53.1 | 53.3 |
| 4 | Main workers | 3184 | 12740 | 39207 | 55131 |
| 5 | Percentage of main workers to total population | 42.0 | 46.3 | 41.2 | 42.3 |
| 6 | Marginal workers | 884 | 2066 | 11397 | 14347 |
| 7 | Percentage of marginal workers to total population | 11.7 | 7.5 | 12.0 | 11.0 |
| 8 | Non-workers | 3510 | 13149 | 44212 | 60871 |
| 9 | Percentage of non-workers to total Population | 46.3 | 47.8 | 46.4 | 46.7 |
| 10 | Dependency ratio | 0.86 | 0.87 | 0.88 | 0.87 |

***Source:** District Primary Census Statistics of Maharashtra -2011.*

**Dependency Ratio**

Based on the occupational structure of the study area the dependency rate of non-workers on the workers category has been estimated at 0.87. Hence some economic generating activities should be developed so that most of the pupils can engage in employment opportunities.

**Inferences/Insinuations**

**Demographic**

As it is illustrated in the above graph, the sex ratio in the core zone observed as decent as 986 women for 1000 men, and the total socially weaker sections amounts to 34.2% in the study area.

**Occupational Structure**

It is also observed that 42.3% main worker in the total population, whereas marginal workers and non-workers constitute to 11.00% and 46.7% of the total population respectively. The distribution of workers by occupation in the core zone indicates that the non-workers are the predominant population.

It is also observed that here are many existing factories like chemicals, steel production factories; stone crushers etc. were placed fetching income to the rural poor. A lot of un-

employee youth is engaged in private sector and some of the other traditional workers like carpenters, tailors, washer men, earth workers, hair dressers and others had also observed.

**Literacy Profile:**

The male literacy rate is observed as 57.3% and female literacy rate is observed as 42.7% and hence the total literacy rate is 59% has been recorded.

**Health Care Facilities and Accessibility:**

It 80% of the population are accessed to govt. hospitals and else 20% are accessed to Private hospitals in the core zone.

**Accessibility to Educational Institutions:**

It was observed, that 80% of villages are accessed with primary schools, 15% to secondary schools and another 5% to higher studies institutions only in the core zone. In short, the educational infrastructure is limited and available only up to primary level. Many students travel to Aurangabad for higher studies.

**Water Resources:**

Major water sources in our surveyed villages are from other sources only like borrowed tanks due to famine atmosphere the scarcity of water has been observed in the core zone.

**Housing Typology:**

The 70 -75% of typology of housing is observed as pucca and other 25-30% is kutcha in the core zone.

**Communication Facilities:**

The transport and communication facilities are private owned. People travel by sharing autos and personal vehicles. No bus facility for majority villages in the core zone.

**Post offices:**

Only 20% of villages surveyed are accessed with postal services, while other 80% of villages have to access nearby town to get postal benefits in the core zone.

**Electricity:**

All villages are accessed with electricity supply for both phases in the core zone.

**Bank facilities:**

Some of the villagesare accessed with bank facilities within the villages.

**Heritage/pilgrim interests:**

Some of the villagers have accessed with temples.

**Awareness about Government Schemes and Programs:**

Most of the villages surveyed in the core zone are benefitted by government schemes such as old age pension schemes, widow pensions, housing schemes, mobile health service etc. The villagers are also aware of the developments so far as the welfare schemes and measures of the government is concerned.

During the FGD, it is also observed that many are educated youth in the village of core zone. Some of them have studied till ITI. As the job scenario is not promising, many of them are migrating to nearby towns and cities. These youth can be a potential source of workers with minimum handholding and vocational education skills. The youth have expressed their willingness to setting up of industries in the area as it provides them gainful employment opportunities. Similarly, this would also trigger many direct and indirect benefits for economic advancement and social up liftment of project area.

The study also noted an active presence of self-help-groups in the villages. Many of these groups are acting as micro-finance entities, rotating small amount of loans among the group members.

**CER Works would Carry Out in Future**

Currently, few CER activities were undertaken by the Industry; these activities nevertheless are limited to organizing Medical camps and health awareness camps.

**M/s. Nilanjan Iron Ispat Pvt. Ltd.**would involve in doing social service in and around the villages of Industry. It can be involve in developing health, education, skill development, environmental management of the society.

**Suggestions for Improvement of Socio-Economic Status**

The socio-economics status of the population in the project area shall be improved through CER and focused community development interventions. Some of the salient activities are illustrated below:

- Local Peoples should be given Priority in employment.
- The social investment on providing capacity building trainings and strengthening of SHG activities**.**
- Distribution of vitamin and de worming tablets to anganwadi and school going children, distribution of iron tablets to women will bring a tremendous change in the health of women and children.

- Fruit distribution to anganwadi children on certain days in a week, construction of baby friendly toilet with water facility in the anganwadi etc. will have positive impact.
- Providing skill trainings for rural women in tailoring, manufacturing household items like detergents, soap, toilet cleaners and room fresheners etc. would enhance their income, thereby create better livelihood opportunities for the rural women. These products can be purchased by company will provide additional employment opportunity of the rural women & adolescent girls.
- Veterinary camps and para-vet services to enhance the milk production of existing milk producing households.

## 3.11 TRAFFIC SURVEY

Traffic study measurements were performed at road near plant site to assess impact on local transport infrastructure due to this proposed project. Road and highway studies are given in **Table-3.18**

**Table 3.22: Highways in the Study Area**

| Name of National/State Highway/Road | Direction | |
|---|---|---|
| | Up | Down |
| Pune-Banglore Highway | Pune | Banglore |

Total numbers of vehicles per hour under the three categories were determined and given in **Table 3.19.**

**Table 3.23: No. of Vehicles per Day**

| S. No. | Vehicles Distribution | Number of Vehicles Distribution/Day |
|---|---|---|
| 1 | Cars | 1248 |
| 2 | Buses | 468 |
| 3 | Two wheelers | 1980 |
| 4 | Three wheelers | 578 |
| 5 | Trucks | 1986 |

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# CHAPTER 4
# ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

## 4.0 INTRODUCTION

Prediction of impacts is the most important component in the Environmental Impact Assessment studies. Several scientific techniques and methodologies are available to predict impacts of developmental activities on physical, ecological and socio-economic environments. Such predictions are superimposed over the baseline (pre-project) status of environmental quality to derive the ultimate (post-project) scenario of environmental conditions. The prediction of impacts helps in minimizing the impacts on environmental quality during the proposedproject.

An attempt has been made to predict the incremental rise of various ground level concentrations above the baseline status in respect to air pollution. The mathematical models used for predictions in the present study is an EPA approved ISCST3 model which is used on steady state Gaussian Plume Dispersion Model designed for point sources and area sources for air quality. The predicted ground level concentrations computed using EPA approved ISCST3 model and plotted as isoplethsconcentrations.

In case of water, land, biological and socio-economic environment, the predictions have been made based on available scientific literature and secondary sources of information.

In the earlier chapters, various process and pollution sources were identified. In this chapter, an attempt has been made to predict the incremental rise of various ground level concentrations above the baseline status due to the emissions from the proposedproject.

NIPLis proposing to install the 2no's of 20 TPHInduction furnaces for manufacturing of MS billets. To improve the supportive capacity of the study area, mitigation measures including the measures to be undertaken at the source level and an overall action plan at the study area level are detailed.

The impact of the proposed project is studied in two distinct phases:

- ConstructionPhase
- OperationalPhase

The impacts are regarded as temporary or short-term in construction phase whereas long-term in operational phase.

## 4.1 IMPACTS DURING CONSTRUCTIONPHASE

During the construction activities, activities like leveling of site, construction of plant, and

erection of equipment would be taken-up for which the possible impacts could be as explained below. These impacts are localized, short lived for majority of the parameters and permanent positive impact for land useonly.

### 4.1.1 Impact on AirQuality

Site development activities and vehicular movement may cause the release of fugitive dust into the air. Also due to construction, vehicular traffic playing along the road, there may be marginal increase in the concentration of $SO_2$, NOx and CO. Regular sprinkling of water is maintained during construction activities for the dust suppression. The approach roads and vehicles are properly maintained in good condition to minimize impact due to vehiculartraffic.

The impact of activities are temporary and effects during the construction phase are restricted and confined within the project premises and are expected to be negligible outside the plant premises. Proper upkeep and maintenance of vehicles, sprinkling of water during this phase, providing sufficient vegetation, etc., are some of the measures are maintained to reduce the impacts during the constructionphase.

### 4.1.2 Impact onWater

Water requirement for construction phase will be met from Local Supplier. So there will not be any impact on groundwater source in the region. Only foundation and superstructure development along with curing of the structure are water intensive.

Mostly local labors are employed in the construction phase. In future, if labors are allowed to stay at site, the number would not be more than 115 workers. At peak demand, the water requirement for labor camp would be approximately 6.0 $m^3$/day @ 45 liters per capita per day (lpcd). These workers shall be accommodated inside the project premises. Temporary sanitation facility will be provided for the construction labor in terms of septic tank followed by soak pits. There will be water requirement during construction phase, which will be of temporary in nature. Thus, a minor impact is envisaged on water, during the construction phase.

### 4.1.3 Impact onNoise

The sources of noise during the construction phase are vehicular traffic, construction equipment like dozers, scrapers, concrete mixers, cranes, hoists, pumps, compressors, pneumatic tools, saws, vibrators, etc. The noise levels due to operation of the above equipment will range between 70- 85 dB (A). The noise produced during construction has a significant impact on the existing ambient noise levels. The major work will be carried out

during the daytime. Staggered operations are carried out to minimize the impact on the ambient noise levels. The information is given in **Table 4.1.**

**Table 4.1: Noise Limits for Appliances and Equipments**

| Equipment | Noise Limit dB (A) |
|---|---|
| Window Air Conditioner | 68 |
| Air Cooler | 60 |
| Diesel Generators | 85-90 |
| Compactors (rollers), Front Loaders, Concrete Mixers, Cranes, Vibrators, and Saws | 75 |

***Source:*** *CPCB, Domestic Appliances and Construction Equipments at the Manufacturing Stage*

### 4.1.4 Impact on LandUse

The Steel Manufacturingexpansion project is in notified industrial area. There will not be any adverse impact on land use. Land for the proposed activity is in Industrial development area, thus, there will be minor changes in the present land usepattern.

The present construction activity employed local people. The proposed construction activities would attract labor of about 100 to 150 of skilled and unskilled from the nearby villages. Some skilled workers from outside areas will be housed in the nearby areas. However, local labor force is preferred to be employed.

### 4.1.5 Impact on SoilQuality

No blasting is envisaged for either leveling or during the foundation work. The site is plain and needs very little grading, filling and leveling. The soil at the project site predominantly consists of clay-sand. The sub-strata of this area are not rocky and uniformly plain. Hence, no impacts are anticipated.

### 4.1.6 Impact on Ecosystem

#### TerrestrialEcology

The proposed plant is in notified industrial areaand the land available for construction is open land and does not have any flora of importance. Project site is devoid of forest cover and does not harbor any fauna ofimportance.

Thus, the impact on terrestrial ecosystem during construction phase will not be there.

#### Aquatic Ecology

Sanitation facility will be provided to the laborers during construction, there will not be any discharge of wastewater outside the premises of the plant or any nearby water bodies. Hence, there will not be any impact on aquatic ecosystem of the study area.

### 4.1.7 Mitigation Measures During Construction Phase

The impacts during the construction phase on the environment would be of transientnatureandexpectedtoreducegraduallyoncompletionofthe construction activities. In order to mitigate them, the following measures are proposed.

**Recommendations**

During excavation and transportation over un-metaled roads at the plant site, there is scope for localized fugitive dust emissions. Frequent water sprinkling in the vicinity of the construction activity should be done and it should be continued even after the completion of the construction, as there is scope for heavy truck mobility. The industry shall make provision for watersprinklers.

Since, there is possibility of fugitive dust from the construction activity, material handling and from the truck movement in the premises of the proposed project site, the industry is going for extensive tree plantation.

NIPL has provided suitable toilet facilities to allow proper standards of hygiene. Sanitation in terms of septic tanks followed by soak pits is provided for the construction workers.

The noise effect on the nearest inhabitants due to construction activity will be negligible. On-site workers are given PPE. Noise prone activities were restricted to the extent possible for daytime hours only. The construction activities are staggered to minimize the noise impact.

An area earmarked for vehicle equipment maintenance is located in such a manner to prevent contamination of surface and groundwater sources. Unauthorized dumping of waste oil is prohibited for the same.

A proper garage area is earmarked for servicing of construction vehicles. Hazardous materials like paints drums, etc., are stored in areas earmarked for the waste storage.

Hazardous wastes generated during construction phase may include lubricants, oil filters and batteries. Pollution risks may arise from leakage and spillage of oil or fuel through poor protection, vehicle damage or the accidental opening of valves.Potentialpollution problems may arise from storage, treatment and transportation of contaminated soils; and residual paints and solvents. The hazardous waste material stored is and shall be disposed to authorized vendors on periodic basis.

On completion of construction activity, the rubble/ rubbish will be cleared and all un-built surfaces reinstated and suitably landscaped with plantation. This will also enhance the esthetic beauty of the plant and will help to boost the working environment during the

operationalphase. As far as possible, local labor is employed, so that need for construction camp is minimized. Moreover, local labor is also available from the nearby villages. This will benefit the nearby areas as well.

### 4.1.8 Facilities for Construction Workforce

The contractor shall be asked to provide following facilities to construction work force:

***First Aid:*** At work place, first aid facilities shall be maintained at a readily accessible place where necessary appliances including sterilized cotton wool etc. shall be available. Ambulance facilities shall be kept readily available at workplace to take injured person to the nearest hospital.

***Potable Water*****:** Sufficient supply of water fit for drinking shall be provided at suitable places.

***Sanitary Facility*****:** Within the precinct of work place, latrines and urinals shall be provided at accessible place. These shall be cleaned at least twice during working hours and kept in a good sanitary condition. The contractor shall conform to sanitary requirement of local medical and health authorities at all times.

***Canteen*****:** A canteen on a moderate scale shall be provided for the benefit of workers.

***Security*****:** Proponent shall provide necessary security to work force in co-ordination with state authorities.

## 4.2 IMPACT DURING OPERATIONALPHASE

The possible beneficial and adverse impacts on each component of environment due to operation of plant are assessed and predicted below:

### 4.2.1 Impact on LandUse

As mentioned earlier, the plant site falls in a notified Industrial area for industrial development; there will not be any negative impact on the land. Only the existing land use pattern on site will be changed. An industrial structure will be developed. In addition, the site will be beautifully landscaped and the greenbelt will be developed to increase the aesthetic view of the land. Thus, impact on land use will be beneficial andpermanent.

### 4.2.2 Impact on SoilQuality

During operation activity, the major solid waste as slag will be generated from the Plant. The slag generated during production will be sold to brick manufactures.

During the operation phase, carefully designed landscaped areas and plantation will be maintained. No significant impact is expected on the soils in and around the site, due to the following management measures:

- Sewage water will be treated and recycled forgardening
- The entire site area will be well-paved and thus, there will be no leaching of any substances in case ofspills.
- Sludge from septic tank will be composted and used as manure for the development of greenbelt. The manure will be organic in nature and will act as soilenricher.

Thus, the quality of the soil will improve and therefore, the impact on soil will bepositive.

### 4.2.3 Impact on Topography

General topography of area is plain terrain and the entire project site is reasonably leveled. However, development of land for civil works requires requisite filling, grading, leveling. Thus, the impact on topography will be minimum and positive.

### 4.2.4Impact on Air Environment

The present baseline concentrations were monitored in the EIA study. The additional emissions are mainly from 2 x 20 TPHInduction furnaces which are proposed.

The proposed project activity will result in air emissions from the following areas.

a) Raw material Handling and storagearea
b) Main Induction furnaces

The proposed Induction furnaces being electrically operated, no fuel will be used. Hence no major emissions are envisaged. The nature of emissions from the above units is detailed below in **Table 4.2.**

**Table 4.2: Nature of Emission and Pollutant**

| Particular | Nature of Emission | Pollutant |
|---|---|---|
| Raw material handling & storage area | Fugitive | Particulate Matter |
| Main furnace | Fugitive and Flue gas | |
| Final Product Storage area | Fugitive | |

Fugitive dust emissions confine to area of emission source and its spread to further areas is limited. Hence the impact of the fugitive dust is confined to the maximum of 50 m around the source at a lower height of 5 – 10 m. NIPL will incorporate the various pollution control systems in the fugitive dust prone areas while designing of the plant.

The major air emissions from the proposed project, which will have the impact on the surrounding is mainly from the Induction Furnace section where the dust is release through flue gases to the atmosphere.

NIPLwill provide 2 tall stacks for each of the proposed furnaces to exhaust the flue gas emissions. The major pollutants emitted from the unit will be particulate matter, and oxides of nitrogen. The hot gases released from the furnace will be of high temperature. NIPLproposes to install Gas Cleaning Plant for controlling dust emission.The flue gases with a temperature of about 130 $^{o}$C will be deducted in the Bag filter designed for an outlet concentration of less than 50 mg/Nm$^{3}$. The details of emission considered for estimation of impacts are given below in **Table 4.3**.

**Table 4.3 Emission Details of Proposed Furnace**

| Particular | Details |
|---|---|
| No. of Stacks | 2 |
| Height of Stack (m) | 35 |
| Diameter of Stack (m) | 1.5 |
| Temperature of Flue Gas ($^{o}$C) | 130 |
| Velocity of Flue Gas (m/s) | 18 |
| Volumetric Flow Rate (Nm$^{3}$/sec) | 23.5 |
| Particulate matter at outlet of Venturyscrubber (gm/sec/stack)(@50mg/Nm$^{3}$ at outlet) | 1.18 |
| Oxides of Nitrogen (gm/sec/stack) | 2.35 |

### 4.2.5 Stack Height Estimation

NIPLis proposing additional 2.0 Nos. of stacks for 2 x 20 TPH Induction Furnace units.

**Stack Emissions Input Data to the Model**

Industrial Source Complex Short Term (ISCST3) regulatory model recommended by United States Environmental Protection Agency (USEPA) has been used for predicting the incremental concentrations of PMand NOx form the proposed plant activities. ISCST3 is capable of modeling multiple sources in simple and complex terrain.

ISCST3 calculates ground level and elevated ambient concentrations or deposition from stack, volume and/ or area sources. The steady-state Gaussian plume equation for a continuous source is used to calculate ground level concentrations for stack.

**Input parameters required for ISCST3 are given below:**

- X and Y co-ordinates for thesource
- Source strength in terms of g/sec for NOxandPM
- Height of the stack inmeters

- Temperature of the exit gas in degreeKelvin
- Exit velocity of the gas inm/sec
- Diameter of the stack inmeters
- Meteorological parameters such as hourly data for wind direction, wind speed, mixing height and atmospheric stabilityclass

The air pollution modeling carried out represents the worst case operating scenarios. The pollutants considered for modeling include NOx and Particulate Matter.

### 4.2.6 MeteorologicalData

The meteorological data recorded continuously during the months of October 2018 to December2018on hourly basis on wind speed, wind directionandtemperaturehasbeenprocessedtoextractthe24–hourlymean meteorological data as per the guidelines of IMD and MoEFCC for application of ISCST3 model. Stability classes computed for the mean hours are based on guidelines issued by CPCB on modeling. Mixing heights representative of the region have been taken from the available published literature. The hourly meteorological data recorded at site is converted to the mean hourly meteorological data as specified by CPCB and the same has been used in the mode. In absence of site-specific mixing depths, mixing depths published in "Spatial Distribution of hourly Mixing Depths over Indian Region" by Mr. R.N. Gupta and recommended by CPCB have been used.

**ModelEmployed**

Prediction of cumulative ground level concentration due to emissions from the proposed project has been computed using EPA approved ISCST3 model.

### 4.2.7 Application of ISCST3 for Prediction of Ground Level Concentration

ISCST3 Model with the following options has been employed to predict the ground level concentration due to emissions from the proposed project in theSteel Plant.

- Areas being rural, rural dispersion parameters areconsidered.
- Predictions have been carried out to estimate concentration values over radial distance of 10 km around thesources
- Emission rates from the point sources and area sources were considered as constant and during the entireperiod.
- Consideration of settling velocity of theparticles
- The ground level concentrations computed were as is basis without any consideration of decaycoefficient.

- Calm winds recorded during the study period were also taken into consideration
- 24 hourly (for 24 – hour mean meteorological data as per guidelines of IMD and MoEFCC) mean ground level concentrations were estimated for the winter season using the mean meteorological data of October 2018 to December 2018.

**Emission Sources Considered for Simulations**

Emissions from the 2 x 20 TPHInduction furnaces have been considered for prediction ofimpacts.

**Maximum Ground LevelConcentrations:**

Ground level concentrations of PMand NOx were estimated using the mean meteorological data to project the incremental increase of concentration above baseline concentrations due to emission from the project.

The resultants values are compared with National Ambient Air Quality Emission (NAAQE) Standards issued by Ministry vide G.S.R no. 826(E) dated November 16, 2009. **Figure 4.1 and Figure 4.2** represents the spatial distribution of the predicted ground level concentrations of PM, and NOx due to emissions from the proposed project expansion.

**Post ProjectScenario**

Maximum ground level concentrations are predicted considering 24-hourly mean meteorological data of during October 2018 to December 2018, superimposed on the maximum baseline concentrations obtained during the study period to estimate the post project scenario which would prevail at the post operations phase.

The Overall Scenario with predicted concentrations over the maximum baseline concentrations is shown below.

**Table 4.4 Overall Scenarios within Study Area**

| **24 Hourly Concentrations** | **Particulate Matter (PM) ($\mu g/m^3$)** | **Oxides of Nitrogen (NOx) ($\mu g/m^3$)** |
|---|---|---|
| Baseline Scenario (Max) | 81.5 | 20.8 |
| Predicted Ground Level Concentration (Max) | 1.02 | 2.05 |
| Overall Scenario | **82.42** | **22.85** |
| NAAQ Standards | **100** | **80** |

**Impact on Villages**

It is observed that based on the predicted concentrations it can be inferred that area is unlikely to be significantly affected due to the proposed project. The details of incremental

and resultant data are given in **Table 4.5.**

**Table 4.5Impact on AAQ Locations ($PM_{10}$)**

| Location | Baseline Concentration (µg/$m^3$) | Incremental (µg/$m^3$) | Resultant (µg/$m^3$) |
|---|---|---|---|
| Project Site | 81.5 | 0.0 | 81.50 |
| Halsavade | 59.6 | 1.02 | 60.62 |
| Tamgaon | 64.0 | 0.0 | 64.0 |
| Vasagade | 53.7 | 0.8 | 54.5 |
| Pattankodli | 53.1 | 0.2 | 53.3 |
| Kanheri | 47.7 | 0.0 | 47.7 |
| Kagal | 67.3 | 0.1 | 67.4 |
| Talgande | 74.7 | 0.0 | 74.7 |

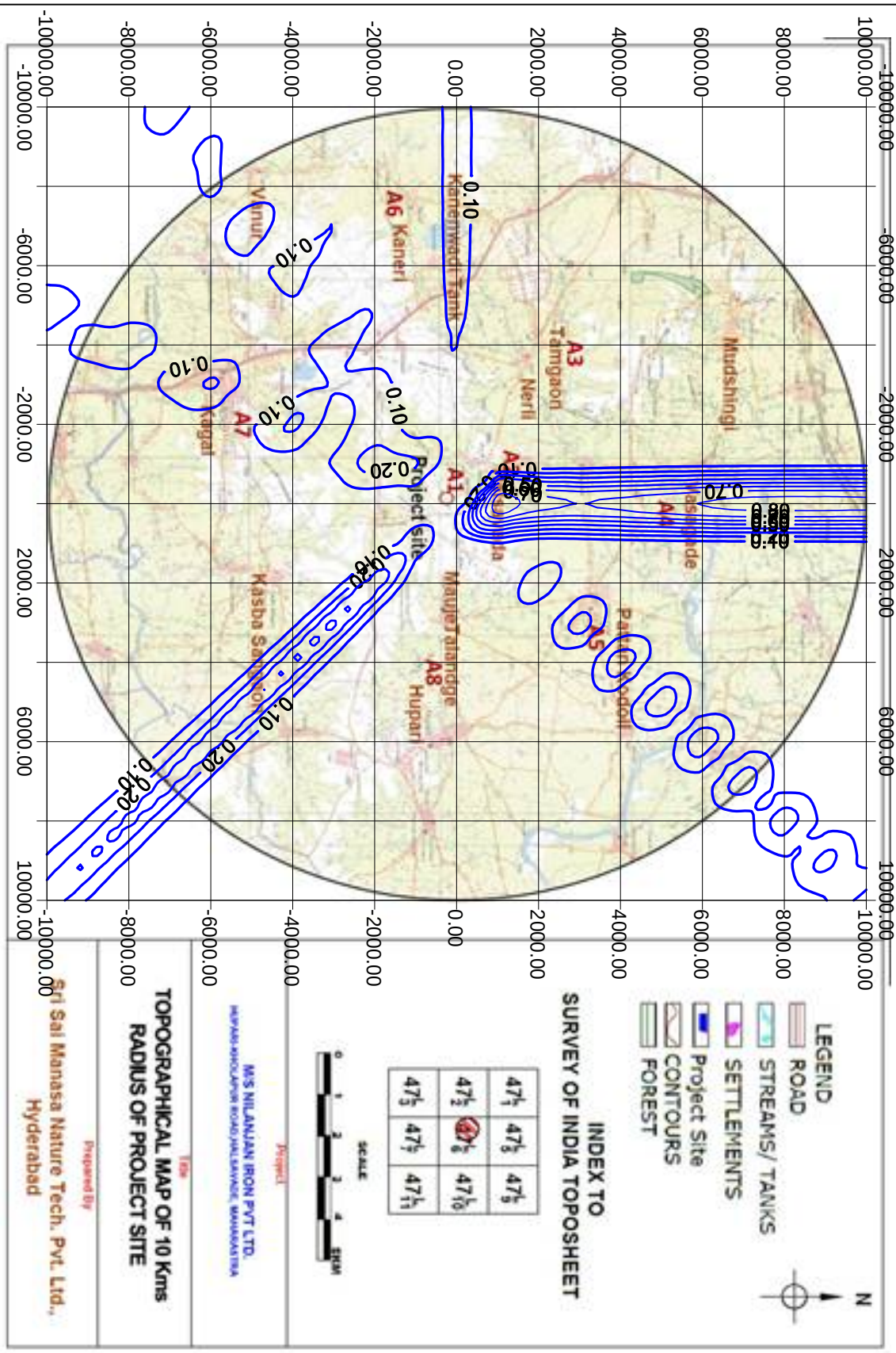


**Figure 4.1: Ground Level Concentrations of Particulate Matter**

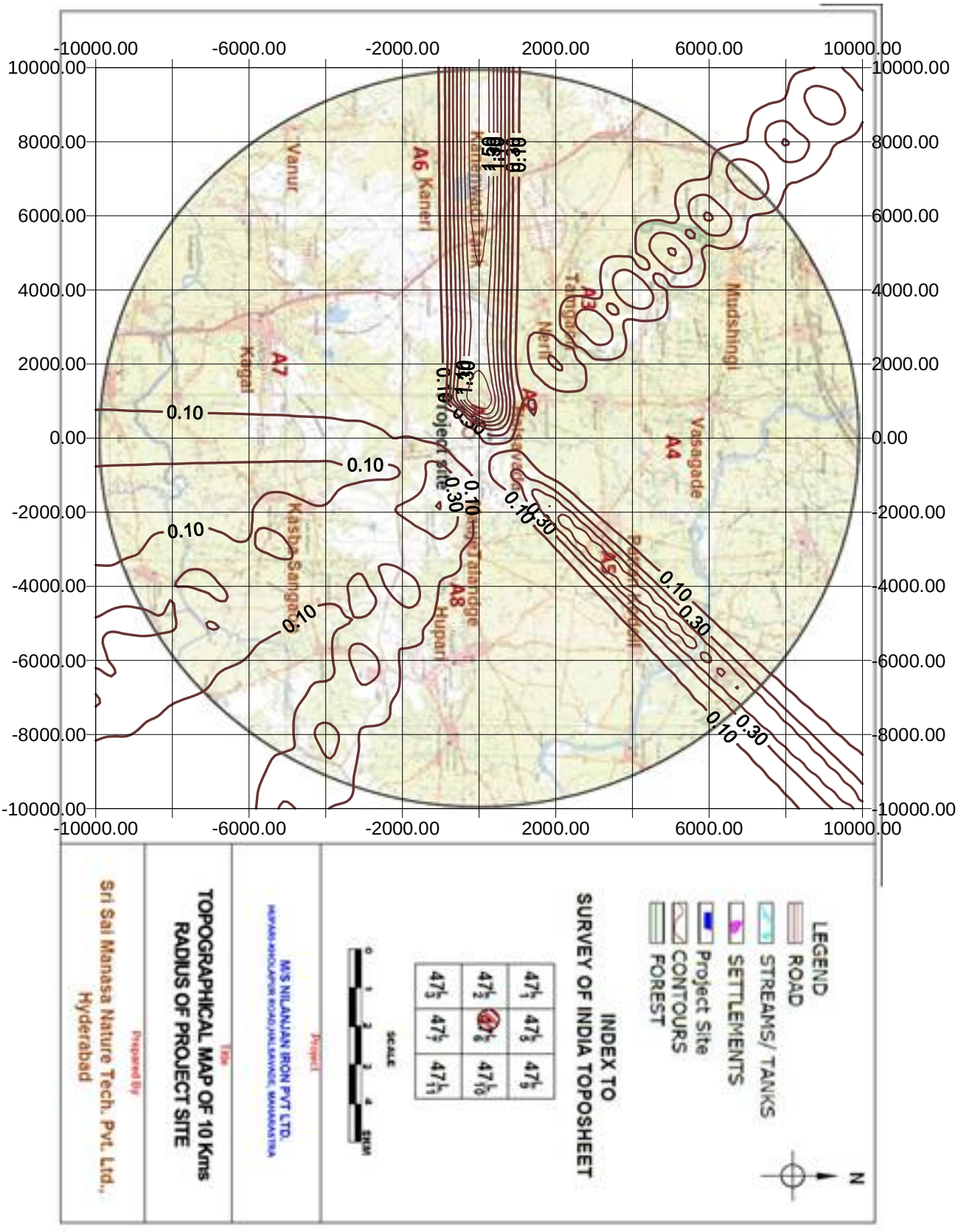


**Figure 4.2: Ground Level Concentrations of NOx**

**Observations**

It is observed from the model output that the incremental concentrations for $PM_{10}$, andNOxlevels, maximum GLCs were observed to be 1 km in Northdirection. It is noted that after adding the incremental concentrations to maximum baseline values also, the ambient levels will be within the specifiedlimits.

Hence it can be concluded that, though there will be an increase in GLC levels, no major significant impact on the air quality due to the proposed project is envisaged.

### 4.2.8 NoiseEnvironment

During construction, no significant impact is envisaged as most of the construction equipment produces noise level below 80 dB (A). The noise generated is expected to be intermittent and of short duration.

During operational phase after the proposed project the major noise generating sources are plant machinery and generator. These sources will be located far off from each other. Under any circumstances the noise level from each of these sources will not exceed 75 dB(A). The present noiselevels monitored at proposed plant are in the range of 75.0– 85.0 dB (A) (Lp total) during the day time as there is construction of the first phase in thesite.

Prediction of anticipated noise levels have been computed using point source model. A basic phenomenon of the model is the geometric attenuation of sound. Noise at a point generates spherical waves which are propagated outward from the source though the air at a speed of 1,100 ft/sec, with the first wave making an ever increasing sphere with time. As the wave spreads the intensity of noise diminishes as the fixed amount of energy is spread over an increasing surface area of thesphere.

The assumption of the model is based on point source relationship i.e. for every doubling of the distance the noise levels are decreased by 6 dB (A). Point source propagation is defined by the following equation:

$$Lp2 = Lp1 - 20 \log r2/r1$$

Where Lp1 and Lp2 are sound pressure levels at points located at distances r1 and r2, respectively, from the source.

Noise level at the plant boundary, calculated from the above equation, is expected to be less than 60 db (A). Predictions carried out are on as is basis without taking into consideration any attenuation factors. Additional attenuation is expected, due to atmospheric effect or its interaction with objects in the transmission path.

Based on the above principle a noise model "Dhawani" has been developed by National Environmental Engineering Research Institute (NEERI). The details of the model are as follows:

- Maximum number of sources is limited to20
- Noise levels can be predicted at any distance depending upon the grid scale
- Model is designed to take topographical conditions (flat, undulated, etc.)terrain
- Coordinates of the sources with respect to the center co-ordinates of 0,0
- Maximum and minimum levels are calculated by themodel
- Output of the model in the form ofisopleths
- Environmental attenuation factors have not been incorporated in the model

**Operational Noise Assessment**

Noise generating equipments /machinery in the proposed project is given in table. Predictions have been made taking into account all operations and utilities reflecting the worst-case scenario. The predicted Noise Levels along the proposed plant boundary are shown in the following **Table 4.6,** which are below the ambient noise standards. It is predicted that the high noise levels will be limited to work zone only and the noise levels gradually decreases further away from the source. Therefore, the impact of noise due to plant will be negligibly adverse innature.

**Table 4.6: Expected Noise Levels from Different Units**

| S. No. | Source |
|---|---|
| 1 | Air compressors |
| 2 | Transformer |
| 3 | Raw Material Handling |
| 4 | Conveyer System |
| 5 | Vehicular Moment |

Permissible working noise levels recommended by OSHA with respect to noise and the duration of exposure in hours are provided in the **Table 4.7.**

**Table 4.7: Permissible Noise Levels**

| Sound Pressure Level dB (A) | Maximum Permissible Exposure Time per Day (Hours) |
|---|---|
| 90 | 8 |
| 92 | 6 |
| 95 | 4 |
| 97 | 3 |
| 100 | 2 |
| 102 | 1 ½ |
| 105 | 1 |
| 107 | ¾ |
| 110 | ½ |
| 115 | ¼ |
| >115 | 0 |

***Distance in meter***

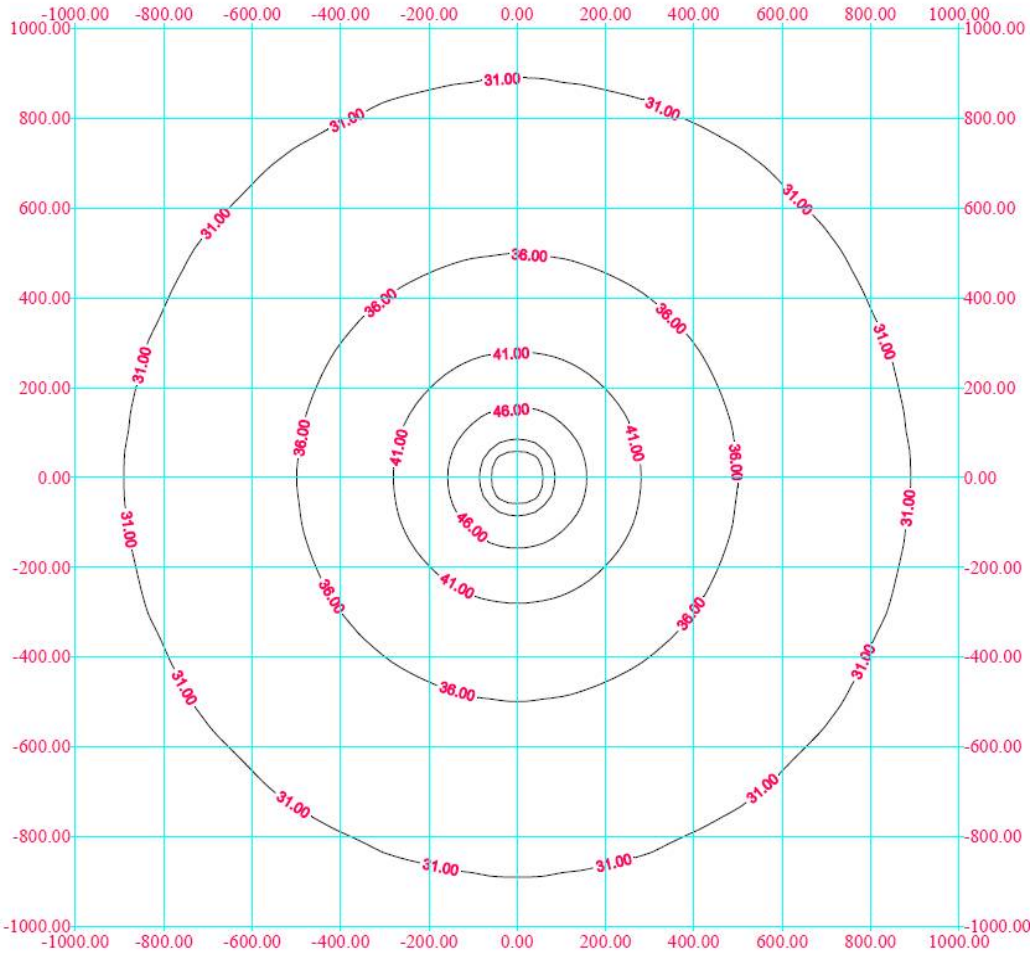


**Figure 4.3: Noise Dispersion Contour**

The noise levels expected due to operation of these equipment will range between 85 -100 dB (A). The noise produced during operation phase will have a significant impact on the existing ambient noise levels. The major work will be carried out during thedaytime.

**Mitigation measure proposed**

Noise levels generated during this proposed project is confined within the plant and is further reduced due to attenuation of greenbelt. Noise level at the plant boundary, calculated from the above equation, is expected to be less than 60 dB (A) without considering any attenuation factors. NIPL is having an area of 3456.79sq.m for develop of greenbelt within the premises. Boundary plantation developed will be act as a barrier and further reduce the noiselevels.

### 4.2.9Water Environment

The total water requirement of the plant is 163 KLD and fresh water requirement will be 90.0 KLD for cooling and 8.0 KLD for domestic purposes. The water will be mainly used **for furnace cooling purpose, greenbelt, dust suppression and domestic purpose only**. Cooling water will be continuously recalculated in the cooling circuit and domestic effluent is sentto septic tank followed by soakpit.The water is supplied for cooling water in Induction Furnace. The water for other areas i.e. for greenbelt, dust suppression and domestic use is supplied directly. However, the Plant will be designed for Zero Discharge from the operations. Wastewater/ sewage (5.0 KLD) generated from domestic activities will be treated in the MBBR Technology based STP (Capacity: 8.0 KLD). Treated water will be used for green belt development. Zero discharge norms will be followed.

### 4.2.9 Solid and Hazardous WasteGeneration and Management

The details of solid waste generation are given below:

| Sr. No. | Particular | Existing (TPD) | After Expansion (TPD) | Management |
|---|---|---|---|---|
| 1 | Slag | 3.0 | 15.0 | Sold to Brick Manufactures |
| 2 | Used Oil | 1.0 | 2.0 | Sold to Board Authorized Vendor |

Process slags will be used for filling of low laying areas, Brick manufactures and cement industry and some quantity will be given to foundries.

### 4.2.11 Traffic Details

**Traffic due to Project**

The proposed additional traffic mainly includes trucks, which are used to transport Raw and finished material. Hence, only heavy traffic is considered in assessing the impact of traffic. The proposed truck traffic due to proposed activity is considered in assessing the impact on surrounding area. The total proposed traffic details are given below:

| Material | Quantity (TPD) | Capacity of Trucks (Tonnes) | Number Trucks/Day | PCU |
|---|---|---|---|---|
| Raw | 515 | 20 | 26 | 78 |
| Finished | 500 | 20 | 25 | 75 |
| **Total** | | | **51** | **153** |

**Existing Traffic**

Road and highway studies are given below:

| Name of National/State Highway/Road | Direction | |
|---|---|---|
| | Up | Down |
| Puna Bangalore Highway | Puna | Bangalore |

Total numbers of vehicles per hour were determined and given below:

**No. of Vehicles per Day**

| S. No. | Vehicles Distribution | Number of Vehicles Distribution/Day | PUC |
|---|---|---|---|
| 1 | Cars | 1248 | 1248 |
| 2 | Buses | 468 | 1404 |
| 3 | Two wheelers | 1980 | 990 |
| 4 | Three wheelers | 578 | 578 |
| 5 | Trucks | 1986 | 5958 |
| | | **Total** | **10178** |

### 4.2.12 Rain Water Harvesting /Recharge Plan

The storm water disposal system for the premises shall be self-sufficient to avoid any collection/stagnation and flooding of water. Roof top runoff water will be collected in storage tank. As we know it is a purest form of water. After proper treatment we can use it for various purposes. Details are given below:

**Table 4.8: Rain Water Harvesting/Recharge Details**

| S. No. | Particulars | Catchment Area in $m^2$ (A) | Runoff Coefficient (C) | Rainfall Intensity in m/Annum (I) | Discharge ($m^3$) |
|---|---|---|---|---|---|
| 1 | Roof Top Area | 3367.71 | 0.9 | 0.85 | 2576.30 |

| | | | | | |
|---|---|---|---|---|---|
| 2 | Road Area | 864.0 | 0.8 | 0.85 | 587.52 |
| 3 | Green Cover Area | 3456.79 | 0.5 | 0.85 | 1469.14 |
| **Total** | | | | | **4632.96** |

Annually about 4632.96$m^3$ water will be conserved by rain water harvesting system and will be discharge in storage tank. About 51.0 days fresh water requirement will be meet through Rainwater harvesting.

### 4.2.13Socio-economic Impacts

The Socio economic Impacts details are given below:

| Positive Impacts | Negitive Impacts |
|---|---|
| i) There is no loss of land and consequential livelihoods, as no land acquistion is contemplated.<br>ii) Creation of employment opportinities for about 100 to 150 local skilled and semi-killed workers during project construction and operational phases.<br>iii) Multiplier effect due to induced growth during contruction and operational phaes in downstream and upstream project activites for about 150 persons majority of them local youth.<br>iv) Development/upgradation of vocational and soft skills of about 100 local youth over next five years thus enhancing their empliyability.<br>Emergence of local enterpreneur in complementary activites such as small business transporation,equipment repairs and maintence etc. | i) Air pollution and Noise pollution may happen if adequate mitigation measures not taken.<br>ii) Increased influx of people, and tranportion of vehicles putting pressure on existing road network in the visinity. |

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# CHAPTER 5
# ANALYSIS OF ALTERNATIVES

## 5.1 ANALYSIS OF ALTERNATIVETECHNOLOGY

Induction Furnace technology to produce Billets is a well proven technology all over the world. Hence alternative technologies were not considered.

## 5.2 ANALYSIS OF ALTERNATIVESITES

No alternative site is considered, as this is an expansion project and will be housed in the existing plant premises of 10174.0sq.mlocated at Plot No: B-07, Five Star MIDC, Kagal, Tehsil: Karveer, District: Kolhapur, Maharashtra..

The proposed plant site is in accordance with MoEFCC guidelines.

- There are no National Parks/Sanctuaries within 10 kmradius.
- The nearest village distance is above 0.5 km from the plantsite.

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# CHAPTER 6
# ENVIRONMENTAL MONITORING PROGRAME

## 6.0 INTRODUCTION

This chapter presents details of post-project environmental monitoring.

## 6.1 ENVIRONMENTAL MONITORING

The environmental monitoring will be done to assess performance of pollution control equipment recommended for proposed project. The sampling and analysis of environmental attributes including monitoring locations point sites will be as per the guidelines of the Central Pollution Control Board.

Environmental monitoring will be conducted on regular basis by NIPL to assess the pollution level in and around the project area.

The attributes, which require regular monitoring, are specified underneath:

1] Air quality;

2] Water and wastewater quality;

3] Noise levels;

4] Soil quality;

5] A forestation; and

6] Socio Economic aspects and community development.

## 6.2 MONITORING POINTS / LOCATIONS AND COMPONENTS

Theenvironmentalmonitoringpointsshallbedecidedconsideringtheenvironmentalimpacts likelytooccurduetotheoperationofproposedprojectasthemainscopeofmonitoring programistotrack,timelyandregularly,thechangeinenvironmentalconditionsandtotake timelyactionforprotectionofenvironment.Themonitoringpoints/locationandcomponentsof significance shall be as per **Table 6.1.**

**Table 6.1: Post Project Environmental Monitoring Locations**

| S. No. | Environmental Components | Monitoring Points/ Location |
|---|---|---|
| 1. | Ambient Air | • Select two point in downwind direction<br>• Take one point within project site<br>• Take one points in up wind direction<br>• Take one point in cross wind direction |
| 2. | Water (Ground Water and Surface Water) | • Take one upstream and downstream sample of surface water. Minimum distance 500 m.<br>• Take 4 nos. ground water samples from nearby villages. |

| S. No. | Environmental Components | Monitoring Points/ Location |
|---|---|---|
| | Waste water | • One sample from wastewater tank. |
| 3. | Emission | • Stack monitoring of 2 times a year if operated. |
| 4. | Noise | • 4 locations nearby work place.<br>• 4 location in surrounding area |
| 5. | Greenbelt/Vegetation Cover | • Check plant growth and survival of plants |
| 6. | Soil | • 4 locations in nearby villages. |

## 6.3 MONITORING PARAMETERS AND FREQUENCY

The monitoring parameters and frequency of monitoring shall be as per **Table-6.2.**

**Table 6.2: Parameters and Frequency for Post Project Environmental Monitoring**

| Sr.No | Item | Parameters | Frequency |
|---|---|---|---|
| 1. | Ambient Air quality | $PM_{10}$,$PM_{2.5}$, $SO_2$, $NO_x$, CO, etc. | Continuous online |
| 2. | Noise | Equivalent noise level- dB (A) | Monthly as per CPCB/MOEFCC guidelines |
| 3. | Soil, Solid wastes and Manure / Compost | pH , Humidity, Texture, Organic matter, N, P, K, Sulphate, Calcium, Magnesium, C:N ratio. | Quarterlyas per CPCB/MOEFCC guidelines |
| 4. | Greenbelt | Number of plantation (Units), Number of Survived plants/ trees, Number of poor plants/ Trees | Ongoing- round the year |
| 5. | Environmental Audit | As per Direction of ISO 14001 | Once in a Year as per CPCB/MOEFCC guidelines |

## 6.4 MONITORING METHODOLOGIES

Monitoringofenvironmentalsamplesshallbedoneasperthe guidelinesprovidedbyMoEF&CC/ CPCB/ SPCB.Themethodfollowedshallberecommended/standardmethodapproved/ recommended by MoEF& CC / CPCB.

## 6.5 REPORTING AND DOCUMENTATION

Therecordsofthemonitoringprogramshallbekeptonregularbasisforallaspectsofthe monitoring.Separaterecordsforwater,wastewater,solidwastes,airemission,soilandmanure / compost shall be prepared and preserved regularly.

Immediatelyuponthecompletionofmonitoringaspertheplannedschedule,reportshallbe prepared and necessary documents shall be forwarded to the concerned person.

Methodologyof monitoring (sampling andanalysis)shallbepreparedasseparatedocumentsas SOP (Standard Operating Procedure) wherever required.

Therecordsshowingresults/outcomeofthemonitoringprogramsshallbepreparedasper the requirement of the schedule mentioned above.

Regularly,thesedocumentsandrecordsshallbereviewedfornecessaryimprovementofthe monitoringplan/mitigationmeasures/environmentaltechnologiesaswellasfornecessary actions of Environmental Management Cell.

## 6.6 Budget and Procurement Schedule

Onregularbasis,EnvironmentManagementCellshallinspectthenecessityand availabilityofthe spares suitability of technologymaterials,servicesandmaintenancestatus.TheCellshallmakeappropriate budgetforthepurpose.Regularrecordreviewforanychangeinfinancialrequirementof environmentmanagementshallbedoneandappropriatebudgetaryprovisionsshallbemade.

Alongwithotherbudgets,Budgetforenvironmentalmanagementshallbepreparedand revised regularly as per requirement.The budget shall include provisions for:

- Environmental Monitoring Program
- Operation and Maintenance of Environmental Technologies / Equipments
- Laboratory works for Environmental management activities
- Emergency Purchase of necessary material, equipments, tools, services
- Annual Environmental Audit.
- Preparing environment statement.

**Budget for Environmental Monitoring**

The total capital investment onenvironmental control measuresisenvisagedtobeabout Rs.3.5 Lakh.Details are given in **Table-6.3**

**Table 6.3: Environment Monitoring Budget**

| S.No | Activity | Cost in Rslacs |
|---|---|---|
| 1. | Air Environment Monitoring | 1.00 |
| 2. | Stack Monitoring | 0.75 |
| 3. | Soil Quality Monitoring | 0.50 |
| 4. | Water Quality Monitoring | 0.75 |
| 5. | Noise Monitoring | 0.50 |
| | **Total** | **3.50** |

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# CHAPTER 7
# ADDITIONAL STUDIES

## 7.0 INTRODUCTION

The steel plant is associated with potential hazards that effect to the employee and environment. It would normally require the assistance of emergency services to handle it effectively. The operation shall be taken out under the well management and control by the qualified safety manager.

Disaster management plan has to be formulated 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.

## 7.1 RISK ASSESSMENT

Risk assessment study for the Proposed Modernization Cum Expansion of Induction Furnace Production will be conducted for Construction and operational Phase.

### 7.1.1 Risk during Construction Phase

Construction phase of the proposed expansion of the project is divided into following activities:

a. Site Leveling;
b. Construction of Roads;
c. Excavation;
d. Construction of building;
e. Construction of high-rise structure (i.e. Stack);
f. Material Handling (Loading and Un loading);
g. Cutting and Welding; and
h. Installation of Machineries.

Risk and mitigation measures during the construction phase is given in **Table 7.1**

**Table 7.1: Risk and Mitigation Measures during the Construction Phase**

| Activity | Hazards | Risk | Mitigation Measures |
|---|---|---|---|
| Site Leveling | Due to heavy vehicle movement accident may happen.<br>Snakes may bites to workers. | Physical injury, Life loss and organ damage | • Providing PPEs to workers<br>• Appointing the qualified persons for the particular job.<br>• Speed limit control<br>• Providing Training |

| Activity | Hazards | Risk | Mitigation Measures |
|---|---|---|---|
| Construction of Road | Loading and Unloading of material may cause accident.<br>Heavy Vehicle movement may cause accident.<br>Hot material cause burn injury. | Physical Injury<br>Life loss<br>Burn | • Providing PPEs to workers<br>• Appointing the qualified persons for the particular job.<br>• Valid license for Heavy vehicle operator will be mandatory.<br>• Speed limit control<br>• Providing Training |
| Excavation | • Excavation collapses<br>• Excavated material<br>• Falling objects or objects near an excavation<br>• Powered mobile equipment<br>• Slips, trips, and falls<br>• Hazardous atmospheres<br>• Flooding/water hazards<br>• Underground facilities | Property Loss<br>Physical injury<br>Life loss | • Work Permit System will be followed.<br>• Only experienced person will asset to team.<br>• Excavated material will be stacked safely.<br>• Area will be barricaded.<br>• Training will be Provided to all workers<br>• PPEs will be provided.<br>• Unauthorized person entry will be banned. |
| Construction of building | Heavy Material may fall down during loading and unloading<br>Structure may fall down if poor practice done<br>Waste stored in open may cause cut in feet<br>Storage of fuel may cause fire<br>Workers may fall down from the height. | Physical Injury<br>Life loss<br>Physically handicapped<br>Property Loss | • Work permit system will be adopted.<br>• PPEs will be provided to all workers.<br>• IS code will be followed for Building construction.<br>• Fuel will be stored separately area will be isolated from ingenious material.<br>• Fire extinguisher will be provided<br>• Height work permit will be issued to the person.<br>• Safety belt will be provided to workers working on above 1.8 M height.<br>• Adequate trainings will be provided for specific job works. |

| Activity | Hazards | Risk | Mitigation Measures |
|---|---|---|---|
| Commissioning of high-rise structure (i.e. 35-m height Stack); | Material may fall down<br>Fall Hazards | Physical injury<br>Life loss | • High rise structure will be constructed as per detailed engineering drawing.<br>• Safety belt will be provided to workers working on above 1.8 M height.<br>• Height work permit will be implemented<br>• Proper training will be provided for scaffolding.<br>• PPEs will be provided. |
| Material Handling (Loading and Un loading) | Extra weight lifting can cause strain in body mussels | Physical Injury | • Material will lift as per safety norms.<br>• PPEs will be provided. |
| Cutting and Welding | Welding, cutting, and allied processes produce molten metal, sparks, slag, and hot work surfaces can cause fire or explosion if precautionary measures are not followed.<br>Electric shock from electrical welding and cutting equipment can result in death or severe burns.<br>Gas cylinder can cause fire accident. | Physical Injury<br>Burn Injury<br>Property loss<br>Life loss | • Hot work permit will follow.<br>• Standards Work Procedure will be developed.<br>• Training will be provided<br>• Job will be assigned to only authorized person<br>• Proper PPEs will be provided.<br>• Loose connection will be avoided.<br>• Area will be barricaded<br>• Gas cylinder will be stored as per guidelines |
| Installation of Machineries. | Due to over load lifting belt break out<br>Un authorized operator of Lifting and Crain can create an emergency<br>During placement of machinery structure may collapse | Property loss<br>Physical Injury<br>Life loss | • Only authorized person will operate the machine<br>• Appropriate Belt will be used for lifting of material<br>• During lifting and placing of material area will be man free.<br>• Appropriate platform will be designed as per the load bearing calculation. |

**Additional Risk control Measures**

- Detailed Construction Hazard Identification Risk Assessment study will be done and accordingly safety manual will be prepared.
- First aid facility will be provided.
- 24 hrs Ambulance facilities will be provided.
- Safety Gate meeting will be conducted.
- Authorized contractor will be selected.
- Safety officer will be appointed.
- Training to the workers will be provided.
- Top to bottom safety culture will be developed.
- Safety slogan and instruction will be pasted at appropriate location.
- Emergency control Numbers will be provided inside the project site at various locations.
- All safety instruction will also be provided to all contractors.

### 7.1.2 Risk during Operational Phase

Activities requiring assessment of risk due to occurrence of most probable instances of hazard and accident are both onsite and off-site.

**On-site**

- Exposure to fugitive dust, noise, and other emissions.
- Housekeeping practices requiring contact with solid and liquid wastes.
- Emission/spillage etc. from storage and handling.
- Unsafe condition and unsafe act.

**Off-site**

- Exposure to pollutants released from offsite/ storage/related activities
- Contamination due to accidental releases or normal release in combination with natural hazard
- Deposition of toxic pollutants in vegetation / other sinks and possible sudden releases due to accidental occurrences

### 7.1.3 Risk Analysis Methodologies

Risk assessment often requires the synthesis of risk profiles, which represent the probability distribution of total annual loss due to a certain set of events or activities. These assessments usually involve estimation of losses for several sub-classifications of the overall process and synthesis of the results into an aggregate risk profile.

Main risk assessment technologies are:

- Hazard and operability study (HAZOP), and
- Fault Tree Analysis (FTA)

**HAZOP Study**

The HAZOP study is a systematic technique of identifying hazards of operability problems of a process and lists all possible deviations from normal operating condition and how they might occur. The consequences of the process are assessed and the means available to detect and correct the deviations are examined. Thus, within the entire process all "credible" deviations that could lead to hazardous events or operability problems are identified.

**Fault Tree Analysis (FTA)**

FTA is primarily a means of analyzing non-identifiable hazards. Hazards of top events (the ultimate happening that is to be avoided) are first identified by other techniques such as HAZOP. Then all combinations of individual failures that can lead to that hazardous event show the logical format of the fault tree. Estimating the individual probabilities and then using the appropriate arithmetical expressions can calculate the top event frequency.

**Hazard Identification and Risk Assessment (HIRA)**

There are three steps used to manage health and safety at work:

1. Spot the Hazard (Hazard Identification)
2. Assess the Risk (Risk Assessment)
3. Make the Changes (Risk Control)

***Spot the Hazard***

A hazard is anything that could hurt you or someone else.

Examples of workplace hazards include:

- Frayed electrical cords (could result in electrical shock);
- Boxes stacked precariously (they could fall on someone);
- Noisy machinery (could result in damage to your hearing).

***Assess the Risk***

Assessing the risk means working out how likely it is that a hazard will harm someone and how serious the harm could be.

For example:

- Ask your supervisor for instructions and training before using equipment;
- Ask for help moving or lifting heavy objects;

- Tell your supervisor if you think a work practice could be dangerous.

***Make the Changes***

The best way to fix a hazard is to get rid of it altogether. This is not always possible, but your employer should try to make hazards less dangerous by looking at the following options (in order from most effective to least effective):

- **Elimination** - Sometimes hazards - equipment, substances or work practices - can be avoided entirely. (e.g. Clean high windows from the ground with an extendable pole cleaner, rather than by climbing a ladder and risking a fall.)
- **Substitution** - Sometimes a less hazardous thing, substance or work practice can be used. (e.g. Use a non-toxic glue instead of a toxic glue.)
- **Isolation** - Separate the hazard from people, by marking the hazardous area, fitting screens or putting up safety barriers. (e.g. Welding screens can be used to isolate welding operations from other workers. Barriers and/or boundary lines can be used to separate areas where forklifts operate near pedestrians in the workplace.)
- **Safeguards** - Safeguards can be added by modifying tools or equipment, or fitting guards to machinery. These must never be removed or disabled by workers using the equipment.
- **Instructing workers in the safest way to do something** - This means developing and enforcing safe work procedures. Students on work experience must be given information and instruction and must follow agreed procedures to ensure their safety.
- **Using personal protective equipment and clothing (PPE)** - If risks remain after the options have been tried, it may be necessary to use equipment such as safety glasses, gloves, helmets and ear muffs. PPE can protect you from hazards associated with jobs such as handling chemicals or working in a noisy environment.

Sometimes, it will require more than one of the risk control measures above to effectively reduce exposure to hazards.

**Risk Classification Table: Based on Likelihood/Controls Rating x Severity Rating**

| | | | | | | |
|---|---|---|---|---|---|---|
| Almost certain | **5** | 5 | 10 | 15 | 20 | 25 |
| Likely | **4** | 4 | 8 | 12 | 16 | 20 |
| Possible | **3** | 3 | 6 | 9 | 12 | 15 |
| Unlikely | **2** | 2 | 4 | 6 | 8 | 10 |
| Rare | **1** | 1 | 2 | 3 | 4 | 5 |
| **Likelihood / Control Rating** | | **1** | **2** | **3** | **4** | **5** |
| | | **Severity Rating** | | | | |

The definition of risk level and acceptance criteria is given below:

| | Risk level | Category | Acceptability on necessry action and timescale |
|---|---|---|---|
| LOW RISK | 1 – 3 | Low | No additional controls are required unless they can be inplemented at very low cost (in terms of time, money and efforts), actions to further reduce these risks are assigned low priority. Arrangements should be made to ensure that the controls are maintained. |
| Moderate RISK | 4 – 8 | Medium | Consideration should be given as to whether the risks can be lowered, but the costs of additional risk reduction measures should be taken into account. The risk reduction measures should be implemented within a defined time period. Arrangement should be made to ensure that the controls are maintained, particulary if the risk levels are associated with extremely harmful consequences and very harmful consequences. |
| **HIGH RISK** | 09 – 14 | High | Substantial efforts should be made to reduce the risk. Risk reductino measures should be implemented urgently within a defined time period and it might be necessary to consider suspending or restricting the activity, or to apply interim risk contrls ar maintained, controls. Arrangements should be made to ensure that the controls are maintained, particulatly if the riks levels are associated with extremely harmful consequences and very harmful consequences. |
| | 15 – 25 | Very high | These risks are unacceptable. Substantial improvements in risk controls are necessary, so that the risk is reduced to an acceptable level. The work activity should be halted until risk controls are implemented that reduce the risk so that it is no longer very hign. If it is not possible to reduce risk the work should remain prohibited. |

***Review of HIRA Study***

- At least once in a year;
- Amendments / addition in legal requirements;
- Change in process or products handled;

- Internal and external audit results, including Specialized / Third Party Audits;
- Occurrence of accident, emergency;
- While initiating any corrective and preventive action;
- While purchasing and erecting any new equipment / machinery / building.

## 7.2 POTENTIAL RISK AREA ASSESSMENT IN STEELPLANT

The potential risk area inside the plant is given in **Table 7.2.**

**Table 7.2: Potential Risk Area inside the Plant**

| Block/Area | Hazards Identification | Control |
|---|---|---|
| Storage of LDO/HFO | Fire | Adequate capacity fire extinguisher will be provided |
| Production area | Heat, and current | Only authorized persons with adequate PPEs will permit to the area.<br><br>Adequate fire protection system will be developed<br><br>Good Housekeeping practices will be done |
| Raw Material Storage Area) | Material may Fall down if proper stacking and height not maintained | Proper height not more than 6-m will be maintained for stacking of the Raw Material<br><br>Safety fencing will be provided<br><br>Authorizes and trained persons will perform the job in particular area<br><br>Use of PPEs will be strictly followed |
| Finished Goods | Material may Fall down if proper stacking and height not maintained | Proper height not more than 6-m will be maintained for stacking of the Raw Material<br><br>Safety fencing will be provided<br><br>Authorizes and trained persons will perform the |

| | | |
|---|---|---|
| | | job in particular area<br><br>Use of PPEs will be strictly followed |
| Transformers/Switch Yard | Electric Current and Fire | Safety Fencing will be provided to control the direct contact of workers<br>Only authorized persons with adequate PPEs will permit to the area.<br><br>Adequate fire protection system will be developed<br><br>Good Housekeeping practices will be done |
| Road Area | Accident may happen | Vehicle Speed will maintained inside the plant<br><br>Speed breakers will be provided<br><br>Drinking will be strictly prohibited<br><br>Sufficient parking area will be provided<br><br>Proper Maintenance of the Road will be done |

## 7.3 DISASTER MANAGEMENT PLAN

### 7.3.1 Definition

A major emergency in an activity/project is one which has the potential to cause serious injury or loss of life. It may cause extensive damage to property and serious disruption both inside and outside the activity/project. It would normally require the assistance of emergency services to handle it effectively.

### 7.3.2 Scope

An important element of mitigation is emergency planning, i.e. identifying accident possibility, assessing the consequences of such accidents and deciding on the emergency procedures, both on site and off site that would need to be implemented in the event of an emergency.

Emergency planning is just one aspect of safety and cannot be considered in isolation from the proposed expansion and hence before starting to prepare the plan, works management will ensure that the necessary standards, appropriate to safety legislation, are in place.

### 7.3.3 Objective

The overall objectives of the emergency plan will be:

- To localize the emergency and, eliminate it; and
- To minimize the effects of the accident on people and property.

Elimination will require prompt action by operations and works emergency staff using, for example, fire–fighting equipment, water sprays etc.

Minimizing the effects may include rescue, first aid, evacuation, rehabilitation and giving information promptly to people living nearby.

### 7.3.4 Identification of Hazards

The following types of hazards may be identified at plant.

- Fire in Electric Panels, Oil room.
- Waste treatment processes.
- Cleaning of barrels, which have held chemical substances.

To deal the above emergencies, the Emergency Plan is prepared.

### 7.3.5 Safety Measures for Storage and Handling of Chemicals

The chemicals will be directly fed to the bottling unit mechanically and no manual handling will be involved which will reduce the risk of spillage in the storage area. Following precautionary measures would be taken for safety

- **Handling and Storage;** Keeping away from heat, sparks and open flame, care will be taken for avoidance of spillage, skin and eye contact, well ventilation, Use of approved respirator if air contamination is above acceptable level will be promoted. For Storage and handling following precautions will be taken:

- Keeping away from oxidizers, heat and flames.
- Avoidance of plastics, rubber and coatings in the storage area.
- Cool, dry, and ventilated storage and closed containers.
- Grounding of the container and transferring of equipment to eliminate static electric sparks.

In case of any emergency following measures would be taken:

- **First Aid Measures**: For Skin contact, Eye contact, and Inhalation.

- **Fire Fighting Measures:**

- Use of extinguishing media surrounding the fire as water, dry chemicals (BC or ABC powder), $CO_2$, Sand, dolomite, etc
- Foam System for firefighting will be provided to control fire from the fuel storage tank. The foam thus produced will suppress fire by separating the fuel from the air (oxygen), and hence avoiding the fire and explosion to occur in the tank. Foam would blanket the fuel surface smothering the fire. The fuel will also be cooled by the water content of the foam.
- The foam blanket suppresses the release of flammable vapors that can mix with the air.
- Special Fire Fighting Procedures; Keeping the fire upwind. Shutting down of all possible sources of ignition, keeping of run-off water out of sewers and water sources. Avoidance of water in straight hose stream which will scatter and spread fire. Use of spray or fog nozzles will be promoted, cool containers will be exposed to flames with water from the side until well after the fire is out.
- Hazardous Decomposition Products: gases of Carbon Monoxide (CO) and Carbon Dioxide ($CO_2$).

- **Accidental Release Measures;** ForSpill Cleanup well Ventilation, Shutting off or removal of all possible sources of ignition, absorbance of small quantities with paper towels and evaporate in safe place like fume hood and burning of these towels in a safe manner), Use of respiratory and/or liquid-contact protection by the Clean-up personnel will be promoted.

## 7.4 EMERGENCY PLANNING

### 7.4.1 General

Disaster Management Plan for an industrial unit is necessarily a combination of various actions which are to be taken in a very short time but in a present sequence to deal effectively and efficiently with any disaster, emergency or major accident with an aim to keep the loss of men, material, plant/machinery etc. to the minimum.

The main functions of the Disaster Management Cell are to prepare a detailed Disaster Management Plan, which includes:

- Identification of various types of expected disaster depending upon the type of the industrial unit.
- Identification of various groups, agencies, departments etc. necessary for dealing with a

specific disaster effectively.

- Preparation – by intensive training of relevant teams/groups within the organization to deal with a specific disaster and keep them in readiness.
- Establishment of an early detection system for the disaster.
- Development of a reliable instant information/communication system.
- Organization and mobilization of all the concerned departments/ organizations / groups and agencies instantly when needed.
- A major disaster that can be expected due to fire in this proposed plant expansion.

### 7.4.2 Emergency Planning for Disaster due to Fire

Cable rooms, transformer, unit, auxiliary transformers, oil tanks, etc. within the plant are the likely areas for which disaster management plan is to be made to deal with any eventuality of fire. Stores, workshop, canteen and administrative building will be included.

#### 7.4.2.1Classification of Fire

**Class (A)**

Fire involving combustible materials like wood, paper, cloth etc.

**Class (B)**

Fire due to liquid materials like oil, diesel, petroleum products and all inflammables.

**Class (C)**

Fires involving domestic and industrial gases like butane and propane etc.

**Class (D)**

Metal fires etc.

**Class (E)**

Electrical fires due to short circuiting etc.

### 7.4.3 Need of Establishing a Fire Fighting Group

A small spark of fire may result into loss of machines and the damage by fire may high economic losses. This type of losses can be avoided by preventing and controlling the fire instantly for which fire–fighting group will be established.

Establish which would house and keep in readiness, the following types of equipment and arrangements.

- $CO_2$ extinguishers
- Dry powder chemical extinguishers
- Foam extinguishers

- 80 mm. spray hoses
- Fire brigade
- Fire hydrant
- Protocol (chemical to combat oil fires).

In order to avoid fire in cable galleries, all the power and control cables of FRLS type (Fire Resistant Low Smoke) will be used.

### 7.4.4 Inspection

Fire alarm panel (electrical) will cover the entire plant. The inspection group will periodically inspect fire extinguishers in fire stations and machines and other places.

The groups will display emergency telephone number boards at vital points.

The group will regularly carry out general inspection for fire.

### 7.4.5 Procedure for Extinguishing Fire

The following steps will be taken during a fire accident in the system:

As soon as the message is received about fire, one of the systems will be diverted to the place of the fire accident along with a staff member.

Simultaneously plant fire station will be informed by phone walkie for fire brigades and fire stations of nearby area.

In the meanwhile, the pipe system will be operated to obtain maximum pressure on output. In case cables are within the reach of fire, power supply will be tripped and the cables shifted.

### 7.4.6 Fire Fighting with Water

Adequate and reliable arrangement is required for fighting the fire with water such as:

1. Provision for Fire brigade and Fire hydrant.
2. Arrangement of pipelines along and around all vulnerable areas.
3. Provision of valves at appropriate points to enable supply of water at the required place/area or divert the same to another direction/pipe line.
4. Provision of overhead tanks which will be providing with the water during power failure and it would work by the gravitational force.

### 7.4.7 Sources of Water for Fire Fighting

The following two sources of water have been considered for firefighting:

- Overhead Tank
- Raw Water Reservoir

### 7.4.8 Fire Fighting with Fire Extinguishers

To deal with fire – other than carbonaceous fires, which can be deal with by water – suitable fire extinguishers are required to do the job effectively. It is therefore, necessary to keep adequate number of extinguishers in readiness at easily approachable places. Adequate number of fire stations would be:

- Further, other spray groups from the system will be diverted to the spot.
- In case of fire in the belt, belt will be cut near the burning portion to save the remaining parts.
- After extinguishing the fire, the area will be well prepared for reuse.
- Foam System for firefighting will be provided to control fire from the fuel storage tank. The foam thus produced will suppress fire by separating the fuel from the air (oxygen), and hence avoiding the fire and explosion to occur in the tank. Foam would blanket the fuel surface smothering the fire. The fuel will also be cooled by the water content of the foam.
- The foam blanket suppresses the release of flammable vapors that can mix with the air.

## 7.5 ON–SITE EMERGENCY PLAN

### 7.5.1 Introduction

The views of the possible hazards that can arise out of the daily operations in the plant, various measures are adopted to prevent the occurrence of a major accident. This comprises of:

- Built in safety measures, alarms, trips and interlocks etc.
- Standard safe operating and maintenance procedures permit system etc.
- Training of all the involved staff in normal and emergency operating procedures.
- Training of all employees in safety, fire fighting and first aid.

However, in spite of these precautions, it is required to foresee situation of major accident and plan for taking timely action to minimize the effects of such incident on the safety and health of persons working in the plant as well as those living around the premises.

## 7.6 PREPARATION OF PLAN

### 7.6.1 Alarm System

A siren shall be provided under the control of Security office in the plant premises to give warning. In case of emergencies this will be used on the instructions to shift in charge that is positioned round the clock. The warning signal for emergency shall be as follows:

– Emergency Siren: Waxing and waning sound for 3 minutes.

– All clear signal: Continuous siren for one minute.

### 7.6.2 Communication

Walkies and Talkies are located at strategic locations; internal telephone system EPBX with external P&T telephones would be provided.

### 7.6.3 Fire Protection System

The fire protection system for the unit is to provide for early detection, alarm, containment and suppression of fires. The fire detection and protection system has been planned to meet the above objective an all–statutory and insurance requirement of Tariff Advisory Committee (TAC) of India. The complete fire protection system will comprise of the following.

**(a)Fire brigade**

Automatic / manual fire detection and alarm system

**(b)Fire Hydrant**

Fire hydrant will be provided at all around in the plant as per TAC Norms.

**(c)Portable fire extinguishers**

Various areas of the plant will have one or more of the above system depending upon the particular nature of risk involved in that area.

**(d)Portable Chemical Fire Extinguishers**

These are intended as a first line of defense, and hence will be stationed at strategic locations in different buildings and also for outdoor facilities. Portable fire extinguishers will be foam type; carbon dioxide type and multipurpose dry chemical (MPDC) type.

**(e)Fire Detection and Alarm System**

Fire detection and alarm system an effective means of detection, visual indication of fire location and audible alarm of any fire at its incipient stage. This system will comprise fire alarm panels, automatic fire detectors, manual call points and fire siren (hooter).

The main fire alarm panel will provide both visual and audible alarm of fire in any protected areas of the plant.

Manual break glass type fire alarms will be provided at strategic locations where high hazards exits.

Automatic fire detectors will be provided for coal handling areas and in plant areas such as control rooms, switchgear rooms, cable galleries etc.

### 7.6.4 First Aid

A first aid centre with adequate facilities shall be provided. It shall be maintained round the clock by a compounder cum dresser and a doctor. An Ambulance shall also be provided at site to carry affected people to hospital.

### 7.6.5 Security

The security requirements of the company premises shall be taken care of by CSO assisted by a Fire In charge. The team, apart from the normal security functions will manage the role required during a disaster management operation as a part of the crisis control team.

### 7.6.6 Safety

The safety wing led by a Safety Manager will meet the requirement of emergencies round the clock. The required safety appliances shall be distributed at different locations of the plant to meet any eventualities. Poster/placards reflecting safety awareness will be placed at different locations in the plant area.

### 7.6.7 Evacuation Procedure

As the major hazard is only due to fire, which has more or less localized impact no mass evacuation, procedures are required. Evacuation would involve only the people working very close to the fire area.

### 7.6.8 Emergency Control Center

Provision is made to establish an Emergency Control Centre (ECC) from which emergency operations are directed and coordinated. This centre is activated as soon as on–site emergency is declared.

The ECC consists of one room, located in an area that offers minimal risk being directly exposed to possible accidents.

During an emergency, the Emergency Management Staff, including the site controller will gather in the ECC. Therefore, the ECC is equipped with adequate communication systems in the form of telephones and other equipments to allow unhampered organisations and other nearby facility personnel.

The ECC provides shelter to its occupants against the most common accidents; in addition, the ECC's communication systems are protected from possible shutdown. The ECC has its own emergency lighting arrangement and electric communication systems operation.

Only a limited and prearranged number of people are admitted to the ECC, when in use. This eliminates unnecessary interference and reduces confusion.

The ECC is always ready for operation and provided with the equipment and supplies necessary during the emergency such as:

- Updated copies of the On–site Disaster Management Plan.
- Emergency telephone numbers.
- The names, phone number, and address of external agencies, response organizations and neighbouring facilities.
- The adequate number of telephone (more than two).
- Emergency lights, Clocks, Personal protective equipment.
- List of fire extinguishers with their type no. and location, capacity, etc.
- Safety helmets – List of quantity and location.
- Status boards/message board.
- Material safety data sheets for chemicals handled at the facility.
- Several maps of the facility including drainage system for surrounding area showing:

❖ Areas where hazardous materials are stored.
❖ Plot plans of storage tanks, routes of pipelines, all water permanent lines etc.
❖ The locations where personal protective equipment are stored.
❖ The position of pumping stations and other water sources.
❖ Roads and plant entrances.
❖ Assembly areas and layout of Hydrant lines.

### 7.6.9 Communication Equipments and Alarm Systems

This kind of equipment is absolutely vital for notifying accident; make the emergency known both inside and outside of the facility, and coordinating, the response actions among the various groups involved in response operations.

In particular, this equipment is used to communicate within the facility; communicate between the facility and outside organizations; and inform the public.

Different communications systems can vary in effectiveness, depending on the task. The most common types installed in the plant are given below.

#### 7.6.9.1Sirens

These are audible alarm systems commonly used in facilities. In case of any emergency siren will be operated short intermittently for 1.5 minutes.

An alarm does more than just emergency warning. It also instructs people to carry out specific assignments, such as reach to assembly point for further instructions and actions, or carry out

protective measures; this can be achieved only if the people are familiar with the alarm systems and are trained to respond to it.

### 7.6.10 Personal Protective Equipments

This equipment is used mainly for three reasons; to protect personnel from a hazard while performing rescue/accident control operations, to do maintenance and repair work under hazardous conditions, and for escape purposes. The list of Personal Protective Equipment provided at the facility and their locations are available in ECC.

Effective command and control accomplish these functions necessitates personal trained in this On–site Disaster Management Plan with adequate facilities and equipments and equipment to carry out their duties and functions. These organizations and the facilities required to support their response are summarized in the following subsections.Emergency Control Plan is given in **Figure 7.1**and list of contact person during emergency is given in **Table 7.3.**

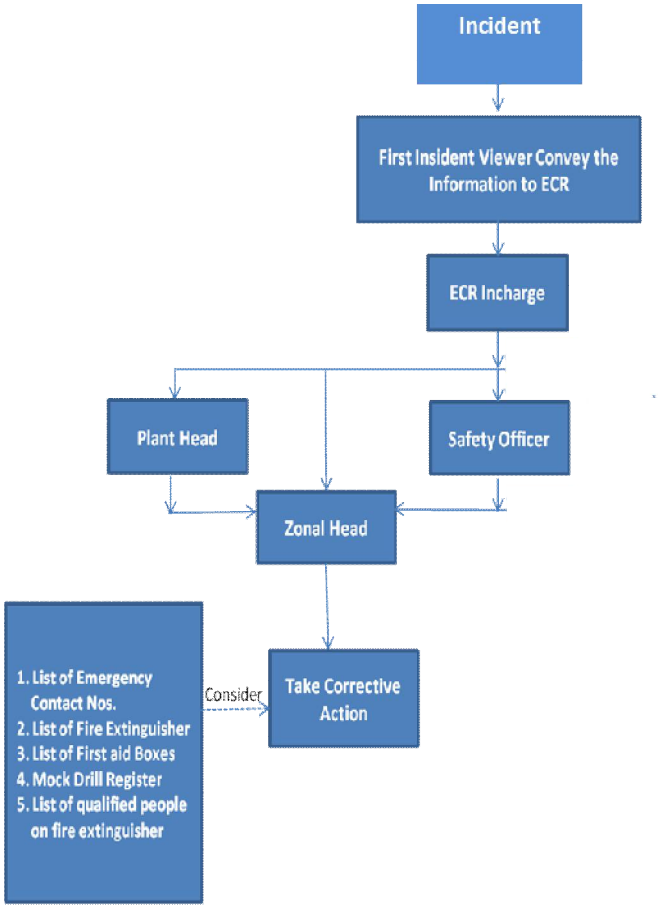


**Figure 7.1: Emergency Control Plan**

**Table 7.3: Contact Details for Emergency Purposes**

| **Telephone Numbers of Police, Fire Brigade, Hospitals and Other outside Emergency Services** | | |
|---|---|---|
| **SR. No.** | **Emergency Contacts** | **Phone Numbers** |
| 1 | Nearest Police Station | 0231 2671933 |
| 2 | Near Brigade | 0231 2305198 |
| 3 | Nearest Hospital | 0231 2644337 |
| 4 | Collector Office No. | 0231 2654811 |

| **Telephone Numbers and Addresses of Fire Key Personnel** | | | |
|---|---|---|---|
| **SR. No.** | **Name** | **Designation** | **Mobile No.** |
| 1 | MukeshGurjar | GM-Plant | 7720048130 |
| 2 | Surendra Ray | Mechanical Head | 8668291840 |
| 3 | SantoshVerma | Electrical Head | 8412866578 |
| 4 | YogeshSiddhanurle | Admin. Head | 9970788278 |
| 5 | PawanDhiman | Safety Officer | 7720048133 |
| 6 | AnnasoYadav | Security Dept. | 0231 6615914 |

### 7.6.11Procedure for Testing and Updating the Plan

Simulated emergency preparedness exercises and mock fire fighting exercises including mutual aid scheme resources and in conservation with district emergency authority to be carried out time to time.

### 7.6.12Disclosure of Information to Worker and Public Awareness System in Existence and Anticipated

- Safety awareness among workers by conserving various training programmes and Seminars, competition, slogans etc.
- Practical exercise.
- Distribution and practices of safety Instructions.
- Safety Quiz contests.
- Display of Safety Posters and Safety Slogans.
- Developing Safety Instructions for every Job and ensuring these instructions/booklets or manuals by the workers.

## 7.7 OFF-SITE EMERGENCY PREPAREDNESS PLAN

The task of preparing the Off-Site Emergency Plan lies with the district collector; however the off-site plan will be prepared with the help of the local district authorities. The proposed plan will be based on the following guidelines.

**Introduction**

Off-site emergency plan follows the on-site emergency plan. When the consequences of an emergency situation go beyond the plant boundaries, it becomes an off-site emergency. Off-site emergency is essentially the responsibility of the public administration. However, the factory management will provide the public administration with the technical information relating to the nature, quantum and probable consequences on the neighboring population.

The off-site plan in detail will be based on those events which are most likely to occur, but other less likely events which have severe consequence will also be considered. Incidents which have very severe consequences yet have a small probability of occurrence will also be considered during the preparation of the plan. However, the key feature of a good off-site emergency plan is flexibility in its application to emergencies other than those specifically included in the formation of the plan.

The roles of the various parties who will be involved in the implementation of an off-site plan are described below. Depending on local arrangements, the responsibility for the off-site plan will be either rest with the works management or, with the local authority. Either way, the plan will identify an emergency co-coordinating officer, who would take the overall command of the off-site activities. As with the on-site plan, an emergency control center will be setup within which the emergency co-coordinating office can operate.

An early decision will be required in many cases on the advice to be given to people living “within range” of the accident - in particular whether they should be evacuated or told to go indoors. In the latter case, the decision can regularly be reviewed in the event of an escalation of the incident. Consideration of evacuation may include the following factors.

- In the case of a major fire but without explosion risk (e.g an oil storage tank), only houses close to the fire are likely to need evacuation, although a severe smoke hazard may require this to be reviewed periodically;

- If a fire is escalating and in turn threatening a store of hazardous material, it might be necessary to evacuate people nearby, but only if there is time; if insufficient time exists, people should be advised to stay indoors and shield themselves from the fire.

**Aspects to be considered in the Off-Site Emergency Plan**

The main aspects, which will be included in the emergency plan, are:

**Organization**

Details of command structure, warning systems, implementation procedures, emergency control centers.

Names and appointments of incident controller, site main controller, their deputies and other key personnel.

**Communications**

Identification of personnel involved, communication center, call signs, network, lists of telephone numbers.

**Specialized Knowledge**

Details of specialist bodies, firms and people upon whom it may be necessary to call i.e. those with specialized chemical knowledge, laboratories.

**Voluntary Organizations**

Details of organizers, telephone numbers, resources etc

**Chemical Information**

Details of the hazardous substances stored or procedure on each site and a summary of the risk associated with them.

**Meteorological Information**

Arrangements for obtaining details of weather conditions prevailing at the time and weather forecasts.

**Humanitarian Arrangements**

Transport, evacuation centers, emergency feeding, treatment of injured, first aid, ambulances, temporary mortuaries.

**Public Information**

Arrangements for dealing with the media press office; informing relatives, etc.

**Assessment**

Arrangements for: (a) collecting information on the causes of the emergency; (b) reviewing the efficiency and effectiveness of all aspects of the emergency plan.

**Role of the Emergency Co-coordinating Officer**

The various emergency services will be co-ordinate by an emergency coordinating officer (ECO), who will be designated by the District Collector. The ECO will liase closely with the site main controller. Again depending on local arrangements, for very severe incidents with major or prolonged off-site consequences, the external control will be passed to a senior local authority administrator or even an administrator appointed by the central or state government.

**Role of the Local Authority**

The duty to prepare the off-site plan lies with the local authorities. The emergency planning officer (EPO) appointed will carry out his duty in preparing for a whole range of different emergencies within the local authority area. The EPO will liase with the works, to obtain the information to provide the basis for the plan. This liaison will ensure that the plan is continually kept up-to-date.

It will be the responsibility of the EPO to ensure that all those organizations which will be involved off site in handling the emergency, know of their role and are able to accept it by having for example, sufficient staff and appropriate equipment to cover their particular responsibilities. Rehearsals for off-site plans will be organized by the EPO.

**Role of Police**

Formal duties of the police during an emergency include protecting life and property and controlling traffic movements.

Their functions will include controlling bystanders evacuating the public, identifying the dead and dealing with casualties, and informing relatives of death or injury.

**Role of Fire Authorities**

The control of a fire will be normally the responsibility of the senior fire brigade officer who would take over the handling of the fire from the site incident controller on arrival at the site. The senior fire brigade officer will also have a similar responsibility for other events, such as explosions. Fire authorities in the region will be apprised about the location of all stores of flammable materials, water and foam supply points, and fire-fighting equipment. They will be involved in on-site emergency rehearsals both as participants and on occasions, as observes of exercises involving only site personnel.

**Role of Health Authorities**

Health authorities, including doctors, surgeons, hospitals, ambulances, and so on, will have a vital part to play following a major accident, and they will form an integral part of the emergency plan.

For major fires, injuries will be the result of the effects of thermal radiation to a varying degree, and the knowledge and experience to handle this in all but extreme cases may be generally available in most hospitals.

Major off-site incidents are likely to require medical equipment and facilities additional to those available locally, and a medical "mutual aid "scheme should exist to enable the assistance of neighboring authorities to be obtained in the event of an emergency.

**Role of Government Safety Authority**

Factory Inspectors of the region may like to satisfy themselves that the organization responsible for producing the off-site plan has made adequate arrangements for handling emergencies of all types including major emergencies. They may wish to see well documented producers and evidence of exercise undertaken to test the plan.

In the event of an accident, local arrangements regarding the role of the factory inspector will apply. These may vary from keeping a watching brief to a close involvement in advising on operations.

## 7.8 OCCUPATIONAL HEALTH AND SAFETY

Large industries, in general, and chemical plants in particular where multifarious activities are involved during construction, erection, testing, commissioning, operation & maintenance, the men, materials and machines are the basic inputs. Along with the boons, the industrialization generally brings several problems like occupational health and safety.

**Occupational Health**

Occupational health needs attention both during construction & erection and operation & maintenance phases. However, the problem varies both in magnitude and variety in the above phases.

**Construction & Erection**

The occupational health problems envisaged at this stage can mainly be due to constructional accident and noise.

To overcome these hazards, in addition to arrangements to reduce it within TLV's personal protective devices should also be supplied to workers.

**Operation and Maintenance**

The problem of occupational health, in the operation and maintenance phase is due to Respirable dust and noise. With suitable engineering controls the exposures can be reduced to less than TLV limits and proper personnel protective devices should be given to employees.

The working personnel should be given the following appropriate personnel protective devices.

- Industrial Safety Helmet
- Crash Helmets
- Zero power plain goggles with cut type filters on both ends.
- Zero power goggles with cut type filters on both sides and blue colour glasses
- Chemical goggles
- Welders equipment for eye & face protection
- Cylindrical type earplug
- Ear muffs
- Dust masks
- Canister Gas mask
- Self-contained breathing apparatus
- Leather apron
- Aluminized fiber glass fix proximity suit with hood and gloves
- Boiler suit
- Safety belt/lime man's safety belt
- Leather hand gloves
- Asbestos hand gloves
- Acid/Alkali proof rubberized hand gloves
- Canvas cum leather hand gloves with leather palm
- Lead hand glove
- Electrically tested electrical resistance hand gloves
- Industrial safety shoes with steel toe
- Rubber boots (alkali resistant)
- Electrical safety shoes without steel toe and gum boots

Full-fledged hospital facilities should be made available round the clock for attending emergency arising out of accidents, if any. All working personnel should be medically examined

at least once in every year and at the end of his term of employment. This is in addition to the pre-employment medical examination.

**Safety Plan**

Safety of both men and materials during construction and operation phases is of concern. The preparedness of an industry for the occurrence of possible disasters is known as emergency plan. The disaster in the plant is possible due to leakage of hazardous chemicals, collapse of structures and fire/explosion etc.

Keeping in view the safety requirement during construction, operation and maintenance phases, plant has formulated safety policy with the following regulations:

- To allocate sufficient resources to maintain safe and healthy conditions at work;
- To take steps to ensure that all known safety factors are taken into account in the design, construction, operation and maintenance of plants, machinery and equipment;
- To ensure that adequate safety instruction are given to all employees;
- To provide wherever necessary protective equipment, safety appliances and clothing, and to ensure their proper use;
- To inform employees about materials equipment or processes used in their work which are known to be potentially hazardous to health or safety;
- To keep all operations and methods of work under regular review for making necessary changes from the point of view of safety in the light of experience and upto date knowledge;
- To provide appropriate facilities for first aid and prompt treatment of injuries and illness at work;
- To provide appropriate instruction, training, retraining and supervision to employees in health and safety, first aid and to ensure that adequate publicity is given to these matters;
- To ensure proper implementation of fire prevention methods and an appropriate firefighting service together with training facilities for personnel involved in this service;
- To organize collection, analysis and presentation of data on accident, sickness and incident involving personnel injury or injury to health with a view to taking corrective, remedial and preventive action;
- To promote through the established machinery, joint consultation in health and safety matters to ensure effective participation by all employees;

- To publish/notify regulations, instruction and notices in the common language of employees;
- To prepare separate safety rules for each types of occupation/processes involved in a project; and
- To ensure regular safety inspection by a competent person at suitable intervals of all buildings, equipment, work places and operations.

**Safety Organization**

**Construction & Erection Phase**

A qualified and experienced safety officer will be appointed. The responsibilities of the safety officers include identification of the hazardous conditions and unsafe acts of workers and advice on corrective actions, conduct safety audit, organize training programs and provide professional expert advice on various issues related to occupational safety and health. He is also responsible to ensure compliance of works Safety Rules/Statutory Provisions.

In addition to employment of safety officer by plant every contractor, who employs more than 70 workers, should also employ one safety officer to ensure safety of the workers, in accordance with the conditions of contract.

**Operation & Maintenance Phase**

When the construction is completed the posting of safety officers should be in accordance with the requirement of Factories Act and their duties and responsibilities should be as defined thereof.

**Safety Circle**

In order to fully develop the capabilities of the employees in identification of hazardous processes and improving safety and health, safety circles would be constituted in each area of work. The circle would consist of 5-6 employees from that area. The circle normally should meet for about an hour every week.

**Safety Training**

A full-fledged training center will be set up. Safety training will be provided by the Safety Officer with the assistance of faculty members called from Corporate Center, Professional Safety Institutions and Universities. In addition to regular employees, limited contractor labors are also provided safety training.

To create safety awareness safety films will be shown to workers and leaflets etc. will be distributed.

Some precautions and remedial measures proposed to be adopted to prevent fires are:

- Compartmentation of cable galleries, use of proper sealing techniques of cable passages and crevices in all directions would help in localizing and identifying the area of occurrence of fire as well as ensure effective automatic and manual fire fighting operations;
- Spread of fire in horizontal direction would be checked by providing fire stops for cable shafts;
- Reliable and dependable type of fire detection system with proper zoning and interlocks for alarms are effective protection methods for conveyor galleries;
- Housekeeping of high standard helps in eliminating the causes of fire and regular fire watching system strengthens fire prevention and firefighting; and
- Proper fire watching by all concerned would be ensured.

**Details of Workers Health Check up**

**Pre Employment Test**

At the time of joining process every new employee under goes Pre Employment medical Test by the qualified doctors. Medical fitness is compulsory to submit the HR department.

**Frequency of Medical Test of Employees**

Medical test for all employees will be carried out bi-annually.

| Sr. No. | Existing | | Proposed |
|---|---|---|---|
| | **Pre-Employment Test** | **Post-Employment bi annual medical test** | **Post-Employment bi annual medical test** |
| 1 | Physical Examination<br>• Weight<br>• Height<br>• Blood Pressure<br>• Chest | Physical Examination<br>• Weight<br>• Height<br>• Blood Pressure<br>• Chest | Physical Examination<br>• Weight<br>• Height<br>• Blood Pressure<br>• Chest |
| 2 | Blood Group and RBC test | RBC test | RBC test |
| 3 | Urine Examination | Urine Examination | Urine Examination |
| 4 | Chest X ray | Chest X ray | Chest X ray |
| 5 | Vision test | Vision test | Vision test |
| 6 | Blood Sugar | Blood Sugar | Blood Sugar |
| 7 | ECG | ECG | ECG |
| 8 | Spirometry test | Spirometry test | Spirometry test |
| 9 | Color and Vision Test | Color and Vision Test | Color and Vision Test |
| 10 | Audiometry test | Audiometry test | Audiometry test |

Adequate fund **INR 5.0 Lakhs** per year will be allocated under occupational health and safety plan.Workers' health will be evaluated by pre designed format, chest x rays, Audiometry, Spirometry, Vision testing (Far & Near vision, colour vision and any other ocular defect) ECG, during pre placement and periodical examinations.

## 7.9 PUBLIC CONSULTATION

Public Hearing details will be incorporated after completion of pubic hearing.

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# CHAPTER 8
# PROJECT BENEFITS

## 8.0 INTRODUCTION

The proposed expansion project would bring forth many positive socio-economic improvements due to its varied production line comprising of:

## 8.1 IMPROVEMENT IN PHYSICAL INFRASTRUCTURE

- This project will improve the overall physical infrastructure in this area Rain water harvesting will be done for groundwater recharging that will improve the ground water table in the area.
- The availability of groundwater will be a boon to the surrounding vegetable and other product farmers.
- MFIPL shall maintain the roads in good conditions so that the road connectivity will improve for surface transport, villagers will be benefitted.
- Greening drive in the area will remove the barren land configuration and give a pleasant look and improve biodiversity

## 8.2 IMPROVEMENT IN SOCIAL INFRASTRUCTURE

- Proposed project will not disturb the existing pattern of demographic structure
- No R & R Plan is required as the industry will be located in barren land already procured.
- By the presence of this industry, local transporters will have business.
- The villagers will have employment opportunity and livelihood and basic amenity support for better future.
- Overall business environment will grow which will ensure improvement in banking insurance, investment and courier services.
- Fire fighting facilities will be now more easily available at doorstep of villagers.
- Education level of local community is expected to rise due to flow of funds and avenues of livelihood being available.
- Improvement in primary health centers (PHC) will help in health status of residents in this area. Augmentation in the areas of medical facilities will occur.
- Health awareness may also help in family planning decision making. Living in harmony is an impotent aspect of the society, this will become possible by this venture

- The corporate environmental responsibilities (CER) initiatives are focused on employees, the communities around its facilities and the environment running these activities. Providing vocational training to make them self-sufficient
- Unit will actively support the efforts of primary education to the children's of economically weaker sections of the society. More opportunity in the field of education
- On the environment front active drive of tree plantations across villages and training lectures in-house undertaken

## 8.3 EMPLOYMENT POTENTIAL

- Proposed industry expansion and its supporting activities need many types of people right from manual to managerial strength in a pyramid.
- The raw material growing and caring may need unskilled and skilled workers. Project activities will require skilled, semi skilled and unskilled workers.
- The overall potential including garage, loading unloading and small shop owners is substantial. The local people can get a good share out of these opportunities.
- It is expected that additional people will get employment. Increase Job opportunities for the local people as well as immigrants.
- Employment in tertiary sector is expected to be improved in the region.
- There would be increase in the commercial, business and shopping centers due to influx of population in the region to cater the needs of existing population.
- There may be a development of infrastructural facilities due to proposed activity in the region.
- It would also result in the appreciation of land values around these areas.
- Indirect benefit to the local people by providing opportunities for starting small / medium scale business in trade and commerce.
- Overall improvement of the peripheral human habitat in the project area.

## 8.4 OTHER TANGIBLE BENEFITS

- Both tangible and non-tangible benefits will result from this activity and many of those are described as above.
- Flood control by rain water arresting and harvesting.
- Groundwater levels increase by recharging by rainwater harvesting.
- Time saving by quicker transport available in the area.

- Aesthetics improvement by general greenery with emphasis on biodiversity.
- Developed economy strengthens demographic set up that will bring weightage to secure better school-subsidy and health institute.
- Improved safety security in surrounding with better law and order.
- Symbiosis and sustainable development will be the ultimate objectives of the proposed project.

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# CHAPTER 9
# ENVIRONMENTAL COST BENEFIT ANALYSIS

## 9.1 INTRODUCTION

Not required as this doesn't comes under scope.

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# CHAPTER 10
# ENVIRONMENTAL MANAGEMENT PLAN

## 10.0 INTRODUCTION

The environmental management plan consists of the set of mitigation, management, monitoring and institutional measures to be taken during implementation and operation to eliminate adverse environmental impacts or reduce them to acceptable levels. The present environmental management plan addresses the components of environmental affected during construction of the plant and by the different activities forming part of the manufacturing processes.

***Environmental Policy***

i. Overall conservation of environment.
ii. Minimization of waste generation and pollution.
iii. Judicious use of natural resources and water.
iv. Safety, welfare and good health of the work force and populace.
v. Ensure effective operation of all control measures.
vi. Vigilance against probable disasters and accidents.
vii. Monitoring of cumulative and long time impacts.
viii. Ensure effective operation of all control measures.

Annual review of the entire system and various environment management as well as process control and monitoring systems shall be done. Environment monitoring shall be done to collect the data on air, water, soil, noise etc. and duly recorded. Environmental Management Plan which shall be implemented is detailed under the following heads:

i. Pollution Control Systems
ii. Waste Minimization and Resource Conservation
iii. Occupational Health and Safety
iv. Socio-Economic Development
v. Greenbelt Development Plan

Standards operating procedures, formats will be developed and records will be maintained. Provision of internal audit will be made. Any NCs/Observation will be directly conveyed to Management and accordingly corrective and preventive action will be taken.

## 10.1 POLLUTION CONTROL SYSTEM

Detailed study of the pre-project commissioning environment and also the likely (and predicted) implications after the plant commissioning suggests that the following preventive/control measures are considered necessary to reduce the adverse impact to the utmost practicable limit.

### 10.1.1 Air Environment

i. Stack height would be approx..40 m (2 nos.) for gaseous emission confirming to the CPCB norms. D. G. Sets, stack height of 3.0 m above the roof level will be maintained.

ii. Stack emission level will be kept within permissible limit by installation of Fume extraction system with ventury scrubber and online stack emission monitoring will be done.

iii. Ambient air quality and stack emission would be regularly monitored and effective control exercised, so as to keep limits on stack emission loads would be met honestly at all the time.

iv. In order to avoid fugitive emissions from different sources, water will be sprayed. Also the roads within the premises will be concreted to prevent dust emission.

v. The ambient air monitoring will be carried out regularly in the work zone and surrounding areas, to check that ambient air levels of the contaminants, are well below the stipulated norms.

vi. Green belt around the periphery and within premises will be developed which will help in attenuating the pollutants emitted by the plant.

### 10.1.2 Action Plan to Control Fugitive Emission

Main source of fugitive emissions is transportation of men and material during operational phase of project. To control fugitive emissions following measures shall be adopted:

i. In order to avoid fugitive emissions from different sources spraying of water shall be used,

ii. The roads within the premises will be concreted / paved to avoid vehicular emissions,

iii. All transportation vehicles shall carry a valid PUC (Pollution under Control) Certificate,

iv. Proper servicing and maintenance of vehicles will be carried out,

v. Regular sweeping of all the roads and floors will be done,

vi. 33% of the total plant area will be developed as green area. Green belt act as surface for settling of dust particle and thus will reduce the particulate matter in air, and

vii. Ambient air quality will be regularly monitored and effective control exercised, so as to keep emission within the limits. **(Table 10.1).**

**Table 10.1: Action Plan to Control Fugitive Emissions**

| S. No. | Emissions Sources | Management measures |
|---|---|---|
| 1. | Vehicular emissions | ➢ Paved roads<br>➢ Regular sweeping<br>➢ Water sprinkling through mobile tankers |
| **CPCB Guidelines will be followed** | | |

### 10.1.3 Waste Water Environment

The proposed project would be based on "Zero Liquid Discharge" (ZLD).

### 10.1.4 Solid Waste Environment

**Process Waste**

Process slags will be used for filling of low laying areas, Brick manufactures and cement industry and some quantity will be given to foundries.

**Kitchen Waste:**

NIPLwill provide the bio digester for Kitchen waste. The generated gas will be used in kitchen as a fuel and bio compost will be used as manure for plantation.

### 10.1.5 Noise Environment

Various components of industrial operations will cause some amount of noise, which will be controlled by proper maintenance and compact technology.

i. Time to time oiling and servicing of machineries will be done.
ii. Acoustic enclosure for Turbine and D.G. sets will be provided.
iii. Green belt development (plantation of dense trees across the boundary) will help in reducing noise levels in the plant as a result of attenuation of noise generated due to plant operations, and transportation.

### 10.1.6 Water Conservation

Air cooled cooling technology will be adopted to conserve the fresh water requirement of the project. About 55% of the water requirement will be reduced by using the air cooled cooling towers instead off water cooled cooling tower. It will help the conserve the natural resources.

### 10.1.7 Energy Conservation

Solar lighting system will be provided for Admin Block, Street Lighting area, Parking area and common areas.

### 10.1.8 Green Belt Development

Green belt planning will be done with ecological perspectives for plant of NIPL plant taking into consideration the nature of pollutants, availability of space and dominant wind directions. Recommendations given by expert committee on plantation requirements in the premises of the plant would be fully implemented. This will help in reducing the concentration of pollutants and will also be effective in attenuating noise levels.

NIPLhas social obligation to recreate the environmental status by providing thick green cover to suppress fugitive emission and provide aesthetic beauty. Trees form the important part of the biosphere in the Eco-system.

It will be exercised as follows:

i. Green belt development in and around the project site will help in to attenuate the pollution level.
ii. Out of the total plant area 33% land will be utilized for green belt development and plantation will be done as per Central Pollution Control Board (CPCB) Norms.
iii. Native species will be given priority for Avenue plantation.
iv. The periphery will be devoted to generation of green belt area.

**Plantation Techniques**

Green belt will be developed within the Plant premises covering a total area of about 3456.79sq.m of total Plant area. The plantation work for green belt development will be carried out as per CPCB guidelines, local species would be preferred.

**Aftercare and Monitoring**

Investment on reclamation would be futile without adequate and timely aftercare. Aftercare includes weeding, soil working, mulching and fertilizing, and if possible, irrigation to promote better growth of the planted seedlings. The vegetated area would be protected from grazing of animals until the plants are above the level of damage. Wherever necessary, fencing would be erected on the boundaries of reclaimed areas.

Monitoring of the programme is the only way to improve both the long-term and short-term planning. It involves two important aspects, namely site investigation and record keeping.

**Baseline data and Potential Impacts of the Study Area**

The flora and fauna of an area shows a certain affinity to the existing environmental setting. Due to the proposed facility, there could probably be a change in the environmental surroundings for a short duration due to the construction phase and for a long term due to the operation of the project activities. Thus, in order to predict the ecological impacts from the proposed project, it is necessary to detail the baseline data.

The potential impacts on the ecology of the study area are discussed below:

i. As no wastewater from the proposed project will be discharged outside the premises, there will be no impact on the ecology of the study area due to wastewater arisen from the proposed project.
ii. The flora and fauna of the area could be disturbed if the various air pollutants discharged from the proposed facility would not be maintained within specified permissible limits. But project authority has already mentioned the adequate stack height, etc. Thus, the potential impact of air emission can be rated as no impact.
iii. Moreover, the proposed green belt would help in reducing the adverse impacts further if any.
iv. On the periphery of the plant a series of trees will also be planted.

**Recommendation on Greenbelt Development**

A green belt or tree plantation around the proposed plant shall help to arrest the effects of particulate matter and gaseous pollutants in the area besides playing a major role in environmental conservation efforts. Green belt development and plantation programme for the proposed project shall also be a part of the proposed plan.

For effective control of air pollutants in and around the proposed industry, a suitable green belt will be developed by taking into consideration the following criteria. The green belt would;

a. Mitigate gaseous emissions
b. Have sufficient capability to arrest accidental release.
c. Effective in wastewater reuse.
d. Maintain the ecological balance.

Total Green belt Area: 3456.79sq.m (0.345 ha)

Total plant should be planted as per MoEFCC recommendation

= 0.345 x 2500 = 864 **nos.**

As on date Plant =427 nos.

Plants will be planted = 437nos. within one year

a. Control noise pollution to a considerable extent.

b. Prevent soil erosion.

c. Improve the aesthetics.

NIPL will maintain the 33% of the total plot area as Green Belt.

Local and fast growing species will be planted (Neem, Aam, Mango, Banyan tree etc.). Two tier plantations will be done all along the plant boundary. Local and fast growing species will be planted (Neem, Aam, Mango, Banyan and Ashoka trees etc.). Regularly check the plantation growth and survival rate of the plants. Depending upon survival rate re-plantation will be done to maintain the 85% survival rate of the greenbelt. Plant layout alongwith revised Green belt is given in **Figure 10.1.**

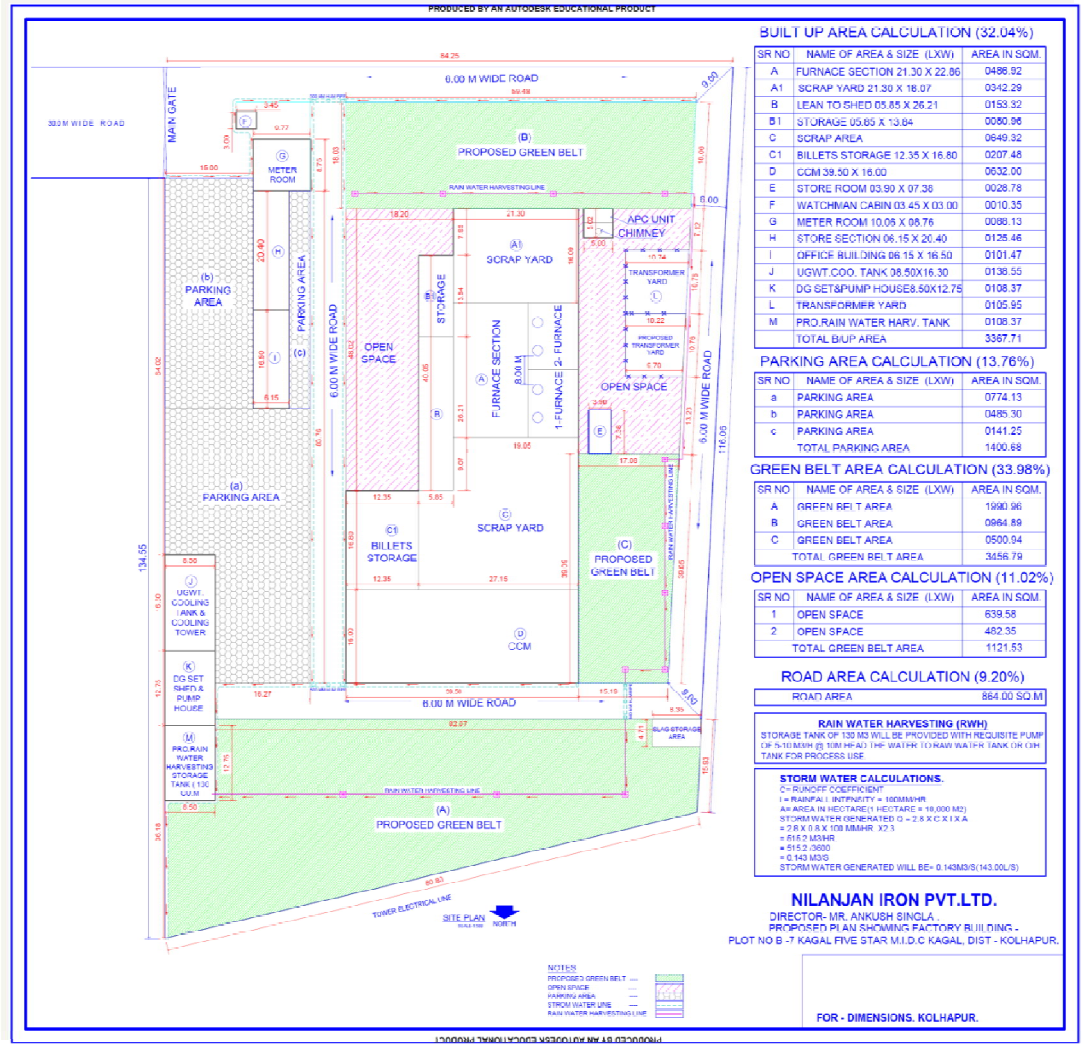


**Figure 10.1: Greenbelt/Green Cover Plan**

### 10.1.9 Occupational Health and Safety

Production of Material involves storage handling and use of several chemicals. Some of these chemicals are toxic and hazardous in nature. Information about these chemicals is therefore important for the safety of the employees and the plant. Besides, the health status of the employees is also important which may be affected due to exposure to these chemicals. The exposures may be sudden and accidental or for a long period. In both of the cases there will be different health effects. Therefore safety measures dealing with these chemicals are of vital importance and will be followed judiciously.

1. In order to ensure good health of workers, regular health check-up of the plant workers will be carried out.
2. Occupational health surveillance programme will be taken as a regular exercise for all the employees and their records maintained.
3. Proper storage and handling precautions will be taken. The storage area will be cool, dry and well ventilated away from any source of heat, flame or oxidizers.
4. Use of Personal Protective Equipment (PPEs) will be encouraged. Proper training on use of PPEs, characteristics of the material handled and safety precautions to be adopted will be given to the workers.
5. Fire safety measures will be incorporated within the factory premises. All the fire extinguishing media such as water, dry chemicals, $CO_2$, sand, dolomite, etc. will be kept in vital locations.
6. Mock drills will be arranged for the worker to test the effectiveness of the training program from time to time and the way to react in case of emergency.
7. Safety precautions will be displayed in the premises on the banners, boards etc.
8. Both On-site and Off-site emergency preparedness plan will be drawn.

### 10.1.10 Personnel Protective Equipments

**Goggles:**

The workers will be asked to use goggles who work on washing of bottles, filling, sealing of bottles cap for protection of their eyes in case bottles are broken.

**Rubber Gumboots:**

These will be provided to person who handles sulphuric acid. Full suit having hand-gloves, goggles, helmet and aprons will be provided.

**Face Shield Helmet:**

The person deputed for welding work will be provided with face shield helmet.

**Medical Facilities**

The Factory will be provided with the following medical facilities to handle any emergency:

1. Well equipped First Aid Boxes will be provided in each Section of the factory.
2. The First Aid Boxes will be distinctively marked with a Red Cross on green background and contain the following equipment/accessories:

a) Small sterilized dressings.
b) Medium size sterilized dressings
c) Large size sterilized dressings
d) Large size sterilized burn dressings
e) Packets sterilized cotton
f) Snake bite Lancet
g) Pair of scissors
h) Bottle of Potassium Permanganate
i) Bottle containing 2% of alcoholic solution of iodine.
j) Bottle of Sol. Volatile having the dose and mode of administration indicated on the label
k) One copy of first aid leaf-let
l) Bandages
n) Adhesive plaster
o) Triangular bandage
p) Packets of safety pins
q) Supply of suitable splints
r) One tournequet

In case of need factory will be having dispensary to give effective medical facility to workers. In dispensary, sufficient stock of medicines will be available to provide to workers in case of any major emergent situation. We will keep one Registered Medical Practitioner (Qualified Medical Officer) as Incharge of the Dispensary with a Qualified Compounder. A vehicle will be always available to shift the sick/injured person to District Hospital.

## 10.2 OVERALL RECOMMENDATION AND IMPLEMENTATION SCHEDULE

### 10.2.1 Introduction

The mitigation measures suggested in earlier Chapters 4 are to be implemented so as to reduce the impact on the environment due to proposed project. The implementation of these recommendations could be done in phases so that, the most important mitigation measures would be implemented first and the mitigation measures, which are less important, could be implemented later. Along with the implementation of these mitigation measures, monitoring schedule and infrastructural requirements for environmental protection detailed in previous chapter are important for environmental control measures.

### 10.2.2 Implementation Schedule and Environmental Management Cell.

Proposed plant will be completed within 10 months from zero date. Environment monitoring and implementation measures shall be supervised by environment management cell. Environmental Management cell structure is given in **Figure 10.2.**

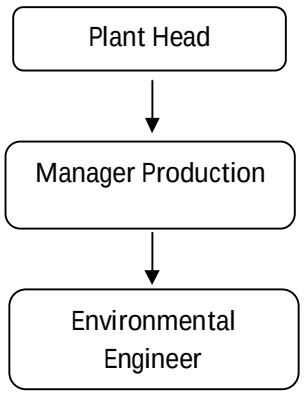


**Figure10.2: Environmental ManagementCell**

### 10.2.3 Budget for Implementation Environment Management Plan

Details of environment management plan are given in **Table 10.2**

**Table 10.2: EMP Budget**

| S. No | Environmental Aspect | Capital Expenditure (Rs. Lacs) | Recurring Expenditure (Rs. Lacs) |
|---|---|---|---|
| 1 | Air pollution control device, Chimney, water cooling, insulation etc | 80.00 | 15.00 |
| 2 | Wastewater Management | 03.50 | 0.80 |
| 3 | Green Belt development | 03.00 | 01.00 |
| 4 | Monitoring | 06.00 | 03.50 |
| 5 | Occupational Health safety Management | 03.00 | 01.00 |

| | | | |
|---|---|---|---|
| 6 | Solid Waste Management | 15.00 | 04.00 |
| | **Total** | **110.50** | **25.30** |

### 10.2.4 Justification of Corporate Environment Responsibility (CER)

NPILearmarked INR 10lakhs towards CER. The following needs have been requested by surrounding villagers during the public hearing and the same will be fulfilled by the project Proponent. These activities will be completed within 10 months from the zero date.

| **Activity Identified** | **CER Budget INR (Lakhs)** |
|---|---|
| Plantation in surrounding Villages | 5.0 |
| Environmental Awareness Programe | 2.5 |
| Solid waste management | 2.5 |
| **Total** | **10.0** |

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# CHAPTER 11
# SUMMARY AND CONCLUSION

## 11.0 INTRODUCTION

Environmental Impact Assessment (EIA) is a process, used to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision making tool, which guides the decision makers in taking appropriate decisions for proposed projects. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are taken into account during the project designing.

## 11.1 ENVIRONMENTAL CLEARANCE

As per the Environmental Impact Assessment (EIA); Notification S.O. 1533, 14-09-2006 issued by MoEFCC, Government of India, the proposed expansion project is categorized as Category – B project, which mandates obtaining prior Environmental Clearance from State Authority.

## 11.2 TERMS OF REFERENCE

NIPL submitted the application for Environmental Clearance as per the new notification along with prescribed Form-1, proposed Terms of Reference for EIA study and pre-Feasibility report on the project. The Expert Appraisal Committee considered the project and prescribed Terms of References is incorporated in the EIA report.

## 11.3 BRIEF DESCRIPTION OF PROJECT

The proposed project is expansion in production of ferroalloys unit. The production details are given below:

| **Existing Furnace (will be removed)** | |
|---|---|
| Induction Furnace (MS Ingots/MS Billets) | 12 MT x 9 Heats = 100TPD |
| **Proposed Furnace (New Installation)** | |
| Induction Furnace(MS Ingots/MS Billets) | 20 MT x 13 Heats = 260 TPD<br>20 MT x 12 Heats = 240TPD<br>**Total = 500 TPD** |

**Project Proponents**

Nilanjan Iron Private Limited is a Private incorporated on 14$^{th}$July 2005. It is classified as Non-Govt. Company and is registered at Registrar of Companies, Goa. Its authorized share capital is INR 60,000,000 and its paid up capital is INR 50,500,000.It is involved in Manufacture of Basic Iron & Steel.

## 11.4 MITIGATION MEASURES

### 11.4.1AIR Pollution Control Measures

Following measures will be taken to control air/fugitive pollution during mining operation:

i. Stack height would be approx.35 m (2 nos.) for gaseous emission confirming to the CPCB norms. D. G. Sets, stack height of 3.0 m above the roof level will be maintained.

ii. Stack emission level Swill be kept within permissible limit by installation of bag filter and online stack emission monitoring will be done.

iii. Ambient air quality and stack emission would be regularly monitored and effective control exercised, so as to keep limits on stack emission loads would be met honestly at all the time.

iv. In order to avoid fugitive emissions from different sources, water will be sprayed. Also the roads within the premises will be concreted to prevent dust emission.

v. The ambient air monitoring will be carried out regularly in the work zone and surrounding areas, to check that ambient air levels of the contaminants, are well below the stipulated norms.

vi. Green belt around the periphery and within premises will be developed which will help in attenuating the pollutants emitted by the plant.

### 11.4.2 Water Quality Management

The proposed project would be based on “Zero Liquid Discharge” (ZLD)

### 11.4.3 Noise Pollution Control

Various components of industrial operations will cause some amount of noise, which will be controlled by proper maintenance and compact technology.

i. Time to time oiling and servicing of machineries will be done.

ii. Acoustic enclosure for Turbine and D.G. sets will be provided.

iii. Green belt development (plantation of dense trees across the boundary) will help in reducing noise levels in the plant as a result of attenuation of noise generated due to plant operations, and transportation.

### 11.4.4 Greenbelt Development and Plantation

Details of the Greenbelt development plan have been incorporated in Chapter 10 (EMP) of section 10.1.6.

## 11.5CONCLUSION

As discussed, it is safe to say that the project is not likely to cause any significant impact on the ecology of the area, as adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Green belt development around the area will also be taken up as an effective pollution mitigative technique, as well as to control the pollutants released from the premises of the project.

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# CHAPTER 12
# DISCLOSURE OF CONSULTANT

## 12.0 INTRODUCTION

The consultant engaged for the preparation of the EIA/EMP of the project is M**/s Sri SaiManasa Nature Tech Pvt. Ltd**. Realizing the need for multi-disciplinary and pragmatic approach To environment management, a few dedicated experience started **M/s Sri SaiManasa Nature Tech Pvt. Ltd**. company as a consultancy organization in 2006 registered as company and ISO 9001:2008 Certified Company and accreditation by **NABET.** Our team consists of specialists in environmental consulting, regulatory compliance and review, site investigation, emergency response, environmental laboratory, site assessment, and data usability-related experience. These individuals have worked together on similar projects, and the leaders have been commended by their clients for accomplishment on other successful projects.

**M/s Sri SaiManasa Nature Tech Pvt. Ltd**. has its own Environmental laboratory with a name of KIWIS Eco Laboratory at Pragathi Nagar Hyderabad under EPA (Environmental Protection Act) from the MoEFCC, Govt. of India, New Delhi and by National Accreditation Board for testing and Calibration Laboratories (NABL).

Thelistoftheprojectteamhasbeensummarizedbelow:

| S.No. | Name & Designation | Qualification | Experience |
|---|---|---|---|
| 1 | Dr. Ch. RajaniKumari (Managing Director) EIA Coordinator and FAE (EB, AQ, WP & ISW) | M. Sc. Ph.D. (Environment Science) | 18 years of experience in the field of EIA Studies and Environmental Management |
| 2 | Mr. SubramanyamAdapa (Executive Director) EIA Coordinator & FAE (AP, AQ, LU and N) | M.Tech. (Env. Engg.), | 17 years of experience in the field of EIA Studies and Environmental Management. |
| 3 | Mr. Vipin Kumar (General Manager) EIA Coordinator & FAE (AP, AQ & SHW) | M.Tech. (Env. Engg.) | 12 years of experience in the field of EIA Studies and Environmental Management. |
| 4 | Mr. Vishnu Sharma EIA Coordinator & FAE (WP & RH) | B. Tech. (Chemical) | 10 Years of Experience in the field of EIA studies and Environmental Management. |
| 5 | Ms. Reshma Thakur EIA Coordinator & FAE (MSW) | M.Tech. (Env. Engg.) | 14 years of experience in the field of EIA Studies and Environmental Management. |

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| S.No. | Name & Designation | Qualification | Experience |
|---|---|---|---|
| 6 | Mr. I Durga Prasad | M. Sc. | Approved FAE in Socio Economy<br>More than 40 Years of Experience |
| 7 | Mr. A. Mohan Reddy | MSW | Approved FAE in Socio Economy<br>More than 4 Years of Experience |
| 8 | Mr. SundaraRao | M. Sc. | Approved FAE in Soil Conservation |
| 9 | Mr. N. H. Reddy | M.Tech. | Approved FAE in Hydrogeology and Geology<br>More than 20Years of Experience |
| 10 | Mr. K. Rajesham | M.Sc. (Env. Sc. & Tech.) | FAA for WP in SW<br>More than 2 years of experience |
| 11 | Dr. DesiSreekanth | M.Sc., Ph. D | Approved FAE for WP<br>Team Member& having 6 years of Experience |
| 12 | Dr. Siva Ramakrishana D | M.Sc., Ph.D | Team Member<br>(Proposed for WP, AP)<br>More than 6 years experience |
| 13 | Dr. NaliniVijayalaxmi | M.Sc., Ph.D | Team Member<br>(Proposed for WP, AP)<br>More than 2 years experience |
| 14 | Mr. Ahamad Alisha Md. | M.Sc. (Env. Sc.) | Team Member<br>(Proposed for WP, AP)<br>More than 2 years experience |
| 15 | Mr.M. ChaitanyaBabu | M.Sc. (Env Sc.) | Team Member<br>(Proposed for MSW &AP)<br>More than 4 years of experience |
| 16 | Mr. Rajesh Mankar | B. E., PGDEM | Team Member<br>(Proposed for NV, AP& AQ)<br>More than 15 years of experience |

# Quality Council of India

## National Accreditation Board for Education & Training

## Certificate Of Accreditation

**SRI SAI MANASA NATURE TECH (P) LIMITED**

**Plot no. 74/A, Flat No. 102, Central Bank Building, Kalyan Nagar, Hyderabad – 500038, Telangana**

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 – Open cast only | 1 | 1 (a) (i) | A |
| 2 | Thermal power plants | 4 | 1 (d) | B |
| 3 | Coal washeries | 6 | 2 (a) | B |
| 4 | Metallurgical industries (ferrous & non ferrous) | 8 | 3 (a) | B |
| 5 | Cement plants | 9 | 3 (b) | A |
| 6 | Distilleries | 22 | 5 (g) | B |
| 7 | Industrial estates/ parks/ complexes/Areas, export processing Zones(EPZs), Special economic zones(SEZs), Biotech Parks, Leather Complexes | 31 | 7 (c) | A |
| 8 | Common municipal solid waste management facility (CMSWMF) | 37 | 7 (i) | B |
| 9 | Building and construction projects | 38 | 8 (a) | B |
| 10 | Townships and Area development projects | 39 | 8 (b) | A |

***Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated October 06 and December 01, 2017 and posted on QCI-NABET website.***

*The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/18/0808 dated December 07, 2018. The accreditation needs to be renewed before the expiry date by SRI SAI MANASA NATURE TECH (P) LIMITED, Hyderabad, following due process of assessment.*

**Sr. Director, NABET**
**Dated: December 07, 2018**

**Certificate No.**
**NABET/ EIA/1720/ RA 0111**

**Valid till**
**05.08.2020**

**For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.**

**ANNEXURE –I**

## GENERIC TERMS OF REFERENCE (ToR) IN RESPECT OF INDUSTRY SECTOR

1. Executive Summary
2. Introduction
   - i. Details of the EIA Consultant including NABET accreditation
   - ii. Information about the project proponent
   - iii. Importance and benefits of the project

3. Project Description
   - i. Cost of project and time of completion.
   - ii. Products with capacities for the proposed project.
   - iii. If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.
   - iv. List of raw materials required and their source along with mode of transportation.
   - v. Other chemicals and materials required with quantities and storage capacities
   - vi. Details of Emission, effluents, hazardous waste generation and their management.
   - vii. Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract)
   - viii. The project proponent shall furnish the requisite documents from the competent authority in support of drawl of ground water and surface water and supply of electricity.
   - ix. Process description along with major equipment and machineries, process flow sheet (Quantative) from raw material to products to be provided
   - x. Hazard identification and details of proposed safety systems.
   - xi. Expansion/modernization proposals:
     - a. Copy of all the Environmental Clearance(s) including Amendments thereto obtained for the project from MoEF&CC/SEIAA shall be attached as an Annexure. A certified copy of the latest Monitoring Report of the Regional Office of the Ministry of Environment, Forest and Climate Change as per circular dated 30th May, 2012 on the status of compliance of conditions stipulated in all the existing environmental clearances including Amendments shall be provided. In addition, status of compliance of Consent to Operate for the ongoing /existing operation of the project from SPCB/PCC shall be attached with the EIA-EMP report.
     - b. In case the existing project has not obtained environmental clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification 2006 shall be provided. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of consents from the SPCB shall be submitted.

4. Site Details

   - i. Location of the project site covering village, Taluka/Tehsil, District and State, Justification for selecting the site, whether other sites were considered.
   - ii. A toposheet of the study area of radius of 10km and site location on 1:50,000/1:25,000 scale on an A3/A2 sheet. (including all eco-sensitive areas and environmentally sensitive places)

iii. Co-ordinates (lat-long) of all four corners of the site.
iv. Google map-Earth downloaded of the project site.
v. Layout maps indicating existing unit as well as proposed unit indicating storage area, plant area, greenbelt area, utilities etc. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate.
vi. Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular.
vii. Landuse break-up of total land of the project site (identified and acquired), government/private - agricultural, forest, wasteland, water bodies, settlements, etc shall be included. (not required for industrial area)
viii. A list of major industries with name and type within study area (10km radius) shall be incorporated. Land use details of the study area
ix. Geological features and Geo-hydrological status of the study area shall be included.
x. Details of Drainage of the project upto 5km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of the project site and maximum Flood Level of the river shall also be provided. (mega green field projects)
xi. Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land.
xii. R&R details in respect of land in line with state Government policy

## 5. Forest and wildlife related issues (if applicable):

i. Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department. (if applicable).
ii. Land use map based on High resolution satellite imagery (GPS) of the proposed site delineating the forestland (*in case of projects involving forest land more than 40 ha).*
iii. Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted.
iv. The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the map duly authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden-thereon.
v. Wildlife Conservation Plan duly authenticated by the Chief Wildlife Warden of the State Government for conservation of Schedule I fauna, if any exists in the study area.
vi. Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife

## 6. Environmental Status

i. Determination of atmospheric inversion level at the project site and site-specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall.
ii. AAQ data (except monsoon) at 8 locations for $PM_{10}$, $PM_{2.5}$, $SO_2$, $NO_X$, CO and other parameters relevant to the project shall be collected. The monitoring stations

shall be based CPCB guidelines and take into account the pre-dominant wind direction, population zone and sensitive receptors including reserved forests.

iii. Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAQQM Notification of Nov. 2009 along with – min., max., average and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report.

iv. Surface water quality of nearby River (60m upstream and downstream) and other surface drains at eight locations as per CPCB/MoEF&CC guidelines.

v. Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC.

vi. Ground water monitoring at minimum at 8 locations shall be included.

vii. Noise levels monitoring at 8 locations within the study area.

viii. Soil Characteristic as per CPCB guidelines.

ix. Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking arrangement etc.

x. Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. If Schedule-I fauna are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished.

xi. Socio-economic status of the study area.

**7.** Impact Assessment and Environment Management Plan

i. Assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features. In case the project is located on a hilly terrain, the AQIP Modelling shall be done using inputs of the specific terrain characteristics for determining the potential impacts of the project on the AAQ. Cumulative impact of all sources of emissions (including transportation) on the AAQ of the area shall be well assessed. Details of the model used and the input data used for modelling shall also be provided. The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any.

ii. Water Quality modelling – in case, if the effluent is proposed to be discharged in to the local drain, then Water Quality Modelling study should be conducted for the drain water taking into consideration the upstream and downstream quality of water of the drain.

iii. Impact of the transport of the raw materials and end products on the surrounding environment shall be assessed and provided. In this regard, options for transport of raw materials and finished products and wastes (large quantities) by rail or rail-cum road transport or conveyor-cum-rail transport shall be examined.

iv. A note on treatment of wastewater from different plant operations, extent recycled and reused for different purposes shall be included. Complete scheme of effluent treatment. Characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E(P) Rules.

v. Details of stack emission and action plan for control of emissions to meet standards.

vi. Measures for fugitive emission control

vii. Details of hazardous waste generation and their storage, utilization and disposal. Copies of MOU regarding utilization of solid and hazardous waste shall also be included. EMP shall include the concept of waste-minimization,

recycle/reuse/recover techniques, Energy conservation, and natural resource conservation.

viii. Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.

ix. Action plan for the green belt development plan in 33 % area i.e. land with not less than 1,500 trees per ha. Giving details of species, width of plantation, planning schedule etc. shall be included. The green belt shall be around the project boundary and a scheme for greening of the roads used for the project shall also be incorporated.

x. Action plan for rainwater harvesting measures at plant site shall be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water requirement from other sources.

xi. Total capital cost and recurring cost/annum for environmental pollution control measures shall be included.

xii. Action plan for post-project environmental monitoring shall be submitted.

xiii. Onsite and Offsite Disaster (natural and Man-made) Preparedness and Emergency Management Plan including Risk Assessment and damage control. Disaster management plan should be linked with District Disaster Management Plan.

**8.** Occupational health

i. Details of existing Occupational & Safety Hazards. What are the exposure levels of above mentioned hazards and whether they are within Permissible Exposure level (PEL). If these are not within PEL, what measures the company has adopted to keep them within PEL so that health of the workers can be preserved,

ii. Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated by pre-designed format, chest x rays, Audiometry, Spirometry, Vision testing (Far & Near vision, colour vision and any other ocular defect) ECG, during pre-placement and periodical examinations give the details of the same. Details regarding last month analysed data of abovementioned parameters as per age, sex, duration of exposure and department wise.

iii. Annual report of health status of workers with special reference to Occupational Health and Safety.

iv. Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers.

**9.** Corporate Environment Policy

i. Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.

ii. Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.

iii. What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given.

iv. Does the company have system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the company and / or

shareholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report

**10.** Details regarding infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase.

**11.** Enterprise Social Commitment (ESC)

i. To address the Public Hearing issues, 2.5% of the total project cost of (Rs. .....crores), amounting to Rs. .....crores, shall be earmarked by the project proponent, towards Enterprise Social Commitment (ESC). Distinct ESC projects shall be carved out based on the local public hearing issues. Project estimate shall be prepared based on PWD schedule of rates for each distinct Item and schedule for time bound action plan shall be prepared. These ESC projects as indicated by the project proponent shall be implemented along with the main project. Implementation of such program shall be ensured by constituting a Committee comprising of the project proponent, representatives of village Panchayat & District Administration. Action taken report in this regard shall be submitted to the Ministry's Regional Office. No free distribution/donations and or free camps shall be included in the above ESC budget

**12.** Any litigation pending against the project and/or any direction/order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details thereof and compliance/ATR to the notice(s) and present status of the case.

**13.** A tabular chart with index for point wise compliance of above ToRs.

**14.** The ToRs prescribed shall be valid for a period of three years for submission of the EIA-EMP reports along with Public Hearing Proceedings (wherever stipulated).

The following general points shall be noted:

i. All documents shall be properly indexed, page numbered.
ii. Period/date of data collection shall be clearly indicated.
iii. Authenticated English translation of all material in Regional languages shall be provided.
iv. The letter/application for environmental clearance shall quote the MOEF&CC file No. and also attach a copy of the letter.
v. The copy of the letter received from the Ministry shall be also attached as an annexure to the final EIA-EMP Report.
vi. The index of the final EIA-EMP report must indicate the specific chapter and page no. of the EIA-EMP Report
vii. 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 (I) dated 4th August, 2009, which are available on the website of this Ministry shall also be followed.
viii. The consultants involved in the preparation of EIA-EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA-EMP reports

prepared by them and data provided by other organization/Laboratories including the status of approvals etc. Name of the Consultant and the Accreditation details shall be posted on the EIA-EMP Report as well as on the cover of the Hard Copy of the Presentation material for EC presentation.

ix. ToRs' prescribed by the Expert Appraisal Committee (Industry) shall be considered for preparation of EIA-EMP report for the project in addition to all the relevant information as per the 'Generic Structure of EIA' given in Appendix III and IIIA in the EIA Notification, 2006. Where the documents provided are in a language other than English, an English translation shall be provided. The draft EIA-EMP report shall be submitted to the State Pollution Control Board of the concerned State for conduct of Public Hearing. The SPCBshall conduct the Public Hearing/public consultation, district-wise, as per the provisions of EIA notification, 2006. The Public Hearing shall be chaired by an Officer not below the rank of Additional District Magistrate. The issues raised in the Public Hearing and during the consultation process and the commitments made by the project proponent on the same shall be included separately in EIA-EMP Report in a separate chapter and summarised in a tabular chart with financial budget (capital and revenue) along with time-schedule of implementation for complying with the commitments made. The final EIA report shall be submitted to the Ministry for obtaining environmental clearance.

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**ANNEXURE-2**

## METALLURGICAL INDUSTRY (FERROUS AND NON-FERROUS)

1. Complete process flow diagram describing each unit, its processes and operations, along with material and energy inputs & outputs (material and energy balance).
2. Emission from sulphuric acid plant and sulphur muck management.
3. Details on installation of Continuous Emission Monitoring System with recording with proper calibration system.
4. Details on toxic metals including fluoride emissions.
5. Details on stack height.
6. Details on ash disposal and management.
7. Complete process flow diagram describing process of lead/zinc/copper/ aluminium, *etc.*
8. Details on smelting, thermal refining, melting, slag fuming, and Waelz kiln operation.
9. Details on Holding and de-gassing of molten metal from primary and secondary aluminum, materials pre-treatment, and from melting and smelting of secondary aluminum.
10. Details on toxic metal content in the waste material and its composition and end use (particularly of slag).
11. Trace metals in waste material especially slag.
12. Plan for trace metal recovery.
13. Trace metals in water.

## Executive Summary

Executive summary of the report in about 8-10 pages incorporating the following:

i. Project name and location (Village, Dist, State, Industrial Estate (if applicable)

ii. Products and capacities. If expansion proposal, then existing products with capacities and reference to earlier EC.

iii. Requirement of land, raw material, water, power, fuel, with source of supply (Quantitative)

iv. Process description in brief, specifically indicating the gaseousemission, liquid effluent and solid and hazardous wastes. Materials balance shall be presented.

v. Measures for mitigating the impact on the environment and mode of discharge or disposal.

vi. Capitalcost of the project, estimated time of completion

vii. Site selected for the project – Nature of land – Agricultural (single/double crop), barren, Govt/private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest, eco-sensitive zones, accessibility, (note – in case of industrial estate this information may not be necessary)

viii. Baseline environmental data – air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population

ix. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.

x. Likely impact of the project on air, water, land, flora-fauna and nearby population

xi. Emergency preparedness plan in case of natural or in plant emergencies

xii. Issues raised during public hearing (if applicable) and response given

xiii. CSR plan with proposed expenditure.

xiv. Occupational Health Measures

xv. Post project monitoring plan

*******

Annexure 1 Terms of Reference

## 157th Meeting of State Level Expert Appraisal Committee (SEAC-1)

**SEAC Meeting number:** 157th Day -1 **Meeting Date** November 2, 2018

**Subject:** Environment Clearance for EXPANSION OF M.S BILLETS MANUFACTURING (EXISTING CAPACITY 100 MTD TO 500 MTD) EXPANSION BY 400 MTD

**Is a Violation Case:** No

| | |
|---|---|
| **1.Name of Project** | NILANJAN IRON PVT. LTD. |
| **2.Type of institution** | Private |
| **3.Name of Project Proponent** | MR. ANKUSH SINGLA |
| **4.Name of Consultant** | -- |
| **5.Type of project** | FIVE STAR MIDC KAGAL, DIST :KOLHAPUR |
| **6.New project/expansion in existing project/modernization/diversification in existing project** | EXPANSION OF EXISTING M.S BILLETS MANUFACTURING PLANT 100 MTD TO 500 MTD (EXPANSION BY 400 MTD) |
| **7.If expansion/diversification, whether environmental clearance has been obtained for existing project** | YES, EC -2009/CR134/TC2. dated- 09/10/2009 from Environment department GoM. |
| **8.Location of the project** | PLOT NO:B-07, FIVE STAR MIDC KAGAL |
| **9.Taluka** | KARVEER |
| **10.Village** | HALSAWADE |
| **Correspondence Name:** | MR. ANKUSH SINGLA |
| **Room Number:** | N.A. |
| **Floor:** | N.A. |
| **Building Name:** | N.A. |
| **Road/Street Name:** | N.A. |
| **Locality:** | PLOT NO:B-07, FIVE STAR MIDC KAGAL |
| **City:** | KOLHAPUR |
| **11.Area of the project** | FIVE STAR MIDC AREA-KAGAL |
| **12.IOD/IOA/Concession/Plan Approval Number** | NA |
| | **IOD/IOA/Concession/Plan Approval Number:** NA |
| | **Approved Built-up Area:** 00 |
| **13.Note on the initiated work (If applicable)** | PROPOSED EXPANSION ACTIVITY WILL BE START AFTER ENVIRONMENTAL CLEARANCE AND MPCB CONSENT. |
| **14.LOI / NOC / IOD from MHADA/ Other approvals (If applicable)** | APPROVED MIDC AREA |
| **15.Total Plot Area (sq. m.)** | 10174.00 SQM |
| **16.Deductions** | Not applicable |
| **17.Net Plot area** | Not applicable |
| **18 (a).Proposed Built-up Area (FSI & Non-FSI)** | **FSI area (sq. m.):** Not applicable |
| | **Non FSI area (sq. m.):** Not applicable |
| | **Total BUA area (sq. m.):** 00 |
| **18 (b).Approved Built up area as per DCR** | **Approved FSI area (sq. m.):** Not applicable |
| | **Approved Non FSI area (sq. m.):** Not applicable |
| | **Date of Approval:** 21-06-2018 |
| **19.Total ground coverage (m2)** | Not applicable |
| **20.Ground-coverage Percentage (%) (Note: Percentage of plot not open to sky)** | Not applicable. |
| **21.Estimated cost of the project** | 190000000 |

## 22.Number of buildings & its configuration

| Serial number | Building Name & number | Number of floors | Height of the building (Mtrs) |
|---|---|---|---|
| 1 | Not applicable | Not applicable | Not applicable |

| | |
|---|---|
| **23.Number of tenants and shops** | NA |
| **24.Number of expected residents / users** | Not applicable |
| **25.Tenant density per hectare** | Not applicable |
| **26.Height of the building(s)** | |
| **27.Right of way (Width of the road from the nearest fire station to the proposed building(s)** | NA |
| **28.Turning radius for easy access of fire tender movement from all around the building excluding the width for the plantation** | TURNING RADIUS 09 METERS. |
| **29.Existing structure (s) if any** | Existing induction furnace shed is available with industry. The induction furnace capacity is 12 MT X 9 heat = 108 MTD. Expansion will be carried out in existing premises of the industry by installing two new induction furnaces will be installed. For expansion project two nos furnaces will be installed. 1) New 20 MT X 13 Heats= 260 MTD (Existing furnace 12 MT replaced with 20 MT) 2) New 20 MT X 12 Heats(1Heat+)=240 MTD, Total: 500 MTD (3-4% will be slag generation in total melting process) |
| **30.Details of the demolition with disposal (If applicable)** | Not applicable |

## 31.Production Details

| Serial Number | Product | Existing (MT/M) | Proposed (MT/M) | Total (MT/M) |
|---|---|---|---|---|
| 1 | MS BILLETS | 3000 | 12000 | 15000 |

## 32.Total Water Requirement

| | | |
|---|---|---|
| **Dry season:** | **Source of water** | MIDC KAGAL |
| | **Fresh water (CMD):** | 60 CMD FOR EXISTING PROJECT. 90 WATER FOR PROPOSED PROJECT , THE TOTAL REQUIREMENT OF WATER WILL BE AFTER EXPANSION IS 150 CMD. THE WATER IS MAINLY REQUIRED FOR COOLING PURPOSE IN THE PROCESS, THE EVAPORATION LOSSES WILL BE 60 CMD. THE 60 CMD WATER IS REQUIRED FOR DAILY TOP-UP, THE 90 CMD WATER IS REUSE AFTER COOLING PROCESS. |
| | **Recycled water - Flushing (CMD):** | Not applicable |
| | **Recycled water - Gardening (CMD):** | 05 CMD |
| | **Swimming pool make up (Cum):** | Not applicable |
| | **Total Water Requirement (CMD) :** | 60 CMD |
| | **Fire fighting - Underground water tank(CMD):** | 50 CMD UG TANK WILL BE CONSTRUCTED |
| | **Fire fighting - Overhead water tank(CMD):** | Not applicable |
| | **Excess treated water** | Not applicable |
| **Wet season:** | **Source of water** | MIDC KAGAL |
| | **Fresh water (CMD):** | 60 CMD WATER FOR EXISTING PROJECT. 90 CMD WATER FOR PROPOSED PROJECT , THE TOTAL REQUIREMENT OF WATER WILL BE AFTER EXPANSION IS 150 CMD. THE WATER IS MAINLY REQUIRED FOR COOLING PURPOSE IN THE PROCESS, THE EVAPORATION LOSSES WILL BE 60 CMD. THE 60 CMD WATER IS REQUIRED FOR DAILY TOP-UP, THE 90 CMD WATER IS REUSE AFTER COOLING PROCESS. |
| | **Recycled water - Flushing (CMD):** | Not applicable |
| | **Recycled water - Gardening (CMD):** | 05 CMD |
| | **Swimming pool make up (Cum):** | Not applicable |
| | **Total Water Requirement (CMD) :** | 60 CMD |
| | **Fire fighting - Underground water tank(CMD):** | 50 CMD UG TANK WILL BE CONSTRUCTED |
| | **Fire fighting - Overhead water tank(CMD):** | Not applicable |
| | **Excess treated water** | Not applicable |
| **Details of Swimming pool (If any)** | Not applicable | |

## 33.Details of Total water consumed

| Particulars | Consumption (CMD) | | | Loss (CMD) | | | Effluent (CMD) | | |
|---|---|---|---|---|---|---|---|---|---|
| Water Requirement | Existing | Proposed | Total | Existing | Proposed | Total | Existing | Proposed | Total |
| Domestic | 05 | 03 | 08 | 02 | 01 | 03 | 03 | 02 | 05 |
| Industrial Process | 60 | 90 | 150 | 24 | 36 | 60 | 00 | 00 | 00 |
| Fresh water requirement | 24 | 36 | 60 | 00 | 00 | 00 | 00 | 00 | 00 |
| Gardening | 03 | 02 | 05 | 03 | 02 | 05 | 00 | 00 | 00 |

| | | |
|---|---|---|
| **34.Rain Water Harvesting (RWH)** | **Level of the Ground water table:** | 10-15 M BELOW GROUND LEVEL. POST MONSOON 5-10 M BELOW GROUND LEVEL. |
| | **Size and no of RWH tank(s) and Quantity:** | TWO NOS OF RAINWATER HARVESTING TANK, NUMBERS OF TANK WILL BE INCREASED IF REQUIRED. |
| | **Location of the RWH tank(s):** | WITHIN INDUSTRIAL PREMISES. |
| | **Quantity of recharge pits:** | 05 NOS RAIN WATER HARVESTING PITS , NUMBERS OF PITS WILL BE INCREASED IF REQUIRED. |
| | **Size of recharge pits :** | DETAILS RAIN WATER HARVESTING PLAN WILL BE INCORPORATE IN FINAL EIA REPORT. |
| | **Budgetary allocation (Capital cost) :** | RS.600000/- |
| | **Budgetary allocation (O & M cost) :** | RS.350000/- |
| | **Details of UGT tanks if any :** | 1 no : 10 m X 8 M X 3 m |
| **35.Storm water drainage** | **Natural water drainage pattern:** | STORM WATER DRAIN SYSTEM WILL BE CONSTRUCTED AROUND THE PLANT |
| | **Quantity of storm water:** | 1017 m3 based on 100 mm rainfall in an hour |
| | **Size of SWD:** | 300 mm X 400 mm X 3000 mm |
| **36.Sewage and Waste water** | **Sewage generation in KLD:** | 05 KLD |
| | **STP technology:** | MBBR TECHNOLOGY |
| | **Capacity of STP (CMD):** | 10 CMD |
| | **Location & area of the STP:** | IN THE PREMISES OF INDUSTRY. |
| | **Budgetary allocation (Capital cost):** | Rs.450000/- |
| | **Budgetary allocation (O & M cost):** | Rs.150000/- |

## 37.Solid waste Management

| | | |
|---|---|---|
| **Waste generation in the Pre Construction and Construction phase:** | **Waste generation:** | NA |
| | **Disposal of the construction waste debris:** | NA |
| **Waste generation in the operation Phase:** | **Dry waste:** | EXISTING SLAG: 3.00 MTD, PROPOSED SLAG GENERATION:12.00 MTD, PROCESS DUST Existing 100 KG/DAY, Proposed 400 KG/DAY. |
| | **Wet waste:** | NA |
| | **Hazardous waste:** | NA |
| | **Biomedical waste (If applicable):** | NA |
| | **STP Sludge (Dry sludge):** | 0.1MTA |
| | **Others if any:** | NA |
| **Mode of Disposal of waste:** | **Dry waste:** | SLAG WILL BE CRUSHED IN SLAG CRUSHER AND IRON WILL BE RECOVERED BY MAGNETIC SEPARATOR. REMAINING CRUSHED SLAG USED FOR BRICK MAKING AND OTHER CONSTRUCTION USES. |
| | **Wet waste:** | NA |
| | **Hazardous waste:** | NA |
| | **Biomedical waste (If applicable):** | NA |
| | **STP Sludge (Dry sludge):** | IT WILL USED AS MANURE FOR GARDENING. |
| | **Others if any:** | NA |
| **Area requirement:** | **Location(s):** | WITHIN INDUSTRIAL PREMISES. |
| | **Area for the storage of waste & other material:** | 70 SQ. MTR |
| | **Area for machinery:** | 50 SQ. MTR |
| **Budgetary allocation (Capital cost and O&M cost):** | **Capital cost:** | Rs.1500000/- |
| | **O & M cost:** | Rs.400000/- |

## 38.Effluent Charecterestics

| Serial Number | Parameters | Unit | Inlet Effluent Charecterestics | Outlet Effluent Charecterestics | Effluent discharge standards (MPCB) |
|---|---|---|---|---|---|
| 1 | NA | NA | NA | NA | NA |

| | |
|---|---|
| Amount of effluent generation (CMD): | NA |
| Capacity of the ETP: | NA |
| Amount of treated effluent recycled : | NA |
| Amount of water send to the CETP: | NA |
| Membership of CETP (if require): | NA |
| Note on ETP technology to be used | WATER WILL BE SETTLED AND COOLED AND WILL BE REUSED FOR COOLING PURPOSE. |
| Disposal of the ETP sludge | NA |

## 39.Hazardous Waste Details

| Serial Number | Description | Cat | UOM | Existing | Proposed | Total | Method of Disposal |
|---|---|---|---|---|---|---|---|
| 1 | NA | NA | NA | NA | NA | NA | NA |

## 40.Stacks emission Details

| Serial Number | Section & units | Fuel Used with Quantity | Stack No. | Height from ground level (m) | Internal diameter (m) | Temp. of Exhaust Gases |
|---|---|---|---|---|---|---|
| 1 | EXISTING FUME EXTRACTION | ELECTRICITY | 1 | 30 | 1.6 | 50-60 |
| 2 | PROPOSED FUMES EXTRACTION | ELECTRICITY | 1 | 35 | 1.6 | 50-60 |

## 41.Details of Fuel to be used

| Serial Number | Type of Fuel | Existing | Proposed | Total |
|---|---|---|---|---|
| 1 | ELECTRICITY | 5.00 MW | 5.00 MW | 10.00 MW |
| 42.Source of Fuel | | MSEDCL | | |
| 43.Mode of Transportation of fuel to site | | TRANSMISSION LINE OF MSEDCL | | |

| | | |
|---|---|---|
| **44.Green Belt Development** | **Total RG area :** | NA |
| | **No of trees to be cut :** | 00 |
| | **Number of trees to be planted :** | 700 |
| | **List of proposed native trees :** | NEEM, BABUL, BAKUL, MANGO, AAPTA, BER |
| | **Timeline for completion of plantation :** | FOUR YEARS |

## 45.Number and list of trees species to be planted in the ground

| Serial Number | Name of the plant | Common Name | Quantity | Characteristics & ecological importance |
|---|---|---|---|---|
| 1 | AZATIRECTA INDICA | NEEM | 170 | SHADY TREE, MEDICINAL USE |
| 2 | ACACIA NILOTICA | BABUL | 120 | SHADY TREE WITH YELLOW FLOWERS |
| 3 | MIMUSO PSELENGI | BAKUL | 40 | SHADY TREE WITH SMALL WHITE FRAGRANT FLOWERS |
| 4 | MANGIFERA INDICA | MANGO | 150 | SHADY TREE |
| 5 | BAUHINIA RACEMOSA | AAPTA | 70 | SMALL TREE WITH SMALL WHITE FLOWERS, BUTTERFLY HOST PLANT |
| 6 | ZIZIPHUS MAURITIANA | BER | 150 | FAST GROWING & HARDY PLANT |
| **46.Total quantity of plants on ground** | | | | |

## 47.Number and list of shrubs and bushes species to be planted in the podium RG:

| Serial Number | Name | C/C Distance | Area m2 |
|---|---|---|---|
| 1 | AMERICAN ALEO | 2*2 | 4 |

| | | | |
|---|---|---|---|
| 2 | BLACK PHYSICNUT | 3*3 | 9 |
| 3 | GARDEN CROTON | 1*1 | 1 |
| 4 | CHINA ROSE | 2*2 | 4 |

## 48.Energy

| | | |
|---|---|---|
| **Power requirement:** | **Source of power supply :** | MSEDCL |
| | **During Construction Phase: (Demand Load)** | MSEB 1MW |
| | **DG set as Power back-up during construction phase** | 500 KVA |
| | **During Operation phase (Connected load):** | 10.00 MW |
| | **During Operation phase (Demand load):** | 10.00 MW |
| | **Transformer:** | YES |
| | **DG set as Power back-up during operation phase:** | 500 KVA 2 NOS. |
| | **Fuel used:** | HSD/LDO |
| | **Details of high tension line passing through the plot if any:** | NA |

## 49.Energy saving by non-conventional method:

Nil

## 50.Detail calculations & % of saving:

| Serial Number | Energy Conservation Measures | Saving % |
|---|---|---|
| 1 | LED LIGHT USED FOR STREET LIGHT AND IN OFFICE. | AS PER REQUIREMENT. |

## 51.Details of pollution control Systems

| Source | Existing pollution control system | Proposed to be installed |
|---|---|---|
| FURNACE (AIR POLLUTION) | FUMES EXTRACTION SYSTEM HOOD FOLLOWED BY VENTURY SCRUBBER TO STACK | FUMES EXTRACTION SYSTEM HOOD FOLLOWED BY VENTURY SCRUBBER TO STACK. |
| DG SETS(NOISE POLLUTION), | ACOUSTIC ENCLOSURE PROVIDED. | ACOUSTIC ENCLOSURE WILL BE PROVIDED. |
| DOMESTIC WASTE WATER | SEPTIC TANK WITH SOAK PIT | STP PROPOSED FOR DOMESTIC WASTE WATER TREATMENT. |
| SOLID WASTE (SLAG) ` | COLLECTION ,SEGREGATION | COLLECTION ,SEGREGATION & CRUSHING |

| | | |
|---|---|---|
| **Budgetary allocation (Capital cost and O&M cost):** | **Capital cost:** | Rs. 2.00 LACS IS ALOCATED FOR LED LIGHTS |
| | **O & M cost:** | APP. Rs. 0.25 IS REQUIRED FOR O & M. |

## 52.Environmental Management plan Budgetary Allocation

### a) Construction phase (with Break-up):

| Serial Number | Attributes | Parameter | Total Cost per annum (Rs. In Lacs) |
|---|---|---|---|
| 1 | NA | NA | 00 |

## b) Operation Phase (with Break-up):

| Serial Number | Component | Description | Capital cost Rs. In Lacs | Operational and Maintenance cost (Rs. in Lacs/yr) |
|---|---|---|---|---|
| 1 | AIR POLLUTION CONTROL EQUIPMENT | POLLUTION CONTROL EQUIPMENT FOR AIR POLLUTION CONTROL MEASURES | 80.00 | 15.00 |
| 2 | WATER POLLUTION CONTROL TREATMENT | WATER TREATMENT PLANTS STP WILL BE PROVIDED | 03.50 | 00.80 |
| 3 | SOLID WASTE MANAGEMENT | SOLID WASTE DISPOSAL & MANAGEMENT IN THE FORM OF MANURE & BRICK MANUFACTURING | 15.00 | 04.00 |
| 4 | OCCUPATIONAL HEALTH SAFETY MANAGEMENT | SAFETY MEASURES IN RESPECT TO HEALTH FACILITIESWILL BEPROVIDED TO WORKERS | 03.00 | 01.00 |
| 5 | ENVIRONMENTAL CELL& MONITORING | MANAGEMENT OF ENVIRONMENT BY ENVIRONMENTAL CELL | 06.00 | 03.50 |
| 6 | GREEN BELT DEVELOPMENT | PLANTATION OF VARIOUS NATIVE & OTHER SPECIES DEVELOPING THE GREEN BELT | 03.00 | 01.00 |
| 7 | NA | TOTAL | 110.50 | 25.30 |

## 52. Storage of chemicals (inflamable/explosive/hazardous/toxic substances)

| Description | Status | Location | Storage Capacity in MT | Maximum Quantity of Storage at any point of time in MT | Consumption / Month in MT | Source of Supply | Means of transportation |
|---|---|---|---|---|---|---|---|
| NA | NA | NA | 00 | NA | NA | NA | NA |

## 53. Any Other Information

No Information Available

## 54. Traffic Management

| | | |
|---|---|---|
| | **Nos. of the junction to the main road & design of confluence:** | NA |

| | | |
|---|---|---|
| **Parking details:** | **Number and area of basement:** | NA |
| | **Number and area of podia:** | NA |
| | **Total Parking area:** | THE AREA EARMARKED FOR THE PARKING IS 1220.00 SQM (ITS 12%OF THE TOTAL PLOT AREA) |
| | **Area per car:** | NA |
| | **Area per car:** | NA |
| | **Number of 2-Wheelers as approved by competent authority:** | NA |
| | **Number of 4-Wheelers as approved by competent authority:** | NA |
| | **Public Transport:** | 50-60 TRUCKS |
| | **Width of all Internal roads (m):** | THE INTERNAL ROADS WIDTH IS 06.00 METERS. |

| | | |
|---|---|---|
| | **CRZ/ RRZ clearance obtain, if any:** | NA |
| | **Distance from Protected Areas / Critically Polluted areas / Eco-sensitive areas/ inter-State boundaries** | NA |
| | **Category as per schedule of EIA Notification sheet** | 3(a)B1 |
| | **Court cases pending if any** | NA |
| | **Other Relevant Informations** | NA |
| | **Have you previously submitted Application online on MOEF Website** | No |
| | **Date of online submission** | - |

## Brief information of the project by SEAC

PP submitted their application for the grant of TOR under category 3(a)B1 as per EIA Notification, 2006. PP presented draft TOR based on standard TOR issued by MoEF & CC published in April, 2015.

The proposal was earlier considerd in the 154th meeting of SEAC-1 where in the proposal was deferred for following reason,

" During deliberations it was observed that, the lay out shown by PP was not having areas marked for the adequate storgae of raw materials and finished products. PP to submit lay out plan showing internal roads with six meter width and nine meter turning radius, location of pollution control equipment, parking areas, Raw Material and Finished product storage areas, 33% green belt with its dimensions, rain water harvesting pit/tank locations with dimensions, storm water drain lines, along with area statement showing calculations of each area and cross sections of storm water drain and rain water harvesting pits etc. "

Now PP submitted revised layout plan.

## DECISION OF SEAC

PP to collect base line data as per Office Memorandum issued by MoEF&CC dated 27.08.2017.

The validity of the TOR will be for three years as per OM issued by MoEF and CC on 29.08.2017.

PP to submit Form - 2 along with EIA/EMP report as per OM issued by MoEF&CC on 20.04.2018.

PP to carry out Public Consultation as per procedure stipulated in the EIA Notification, 2006 along with implementation plan of the issues raised during Public Consultation.

PP to submit their plan to utilize CER (Corporate Environment Responsibility) along with timelines as per OM issued by MoEF&CC dated 01.05.2018.

PP has obtained earlier EC vide No. EC-2009/CR-134/TC-2 dated 09.10.2009; PP to submit certified copy of compliance of earlier EC from Regional Office of MoEF&CC, Nagpur as per OM issued by MoEF&CC on 07/09/2017

Based on the presentation made by PP; committee decided to approve the TOR for the preparation of EIA/EMP report as per standard TOR and additional TOR points mentioned below.

**Specific Conditions by SEAC:**

**1)** PP to submit certificate of incorporation of the company, list of directors and memorandum of articles.
**2)** PP to explore possibility to recover waste heat by way of process re-engineering and include the same in EIA report.
**3)** PP to carry out risk assessment and submit disaster management plan.
**4)** PP to submit structural stability certificate of existing structures with respect to the accommodation of proposed expansion activities.
**5)** PP to provide new and renewable energy for illumination of office buildings , street lights, parking areas and maintain the same regularly.
**6)** PP to include slag management and disposal plan in the EIA report.
**7)** PP to include water and carbon foot print monitoring in the Environment Management Plan.

## FINAL RECOMMENDATION

The Committee decided to Grant ToR subject to the above observations,PP requested to prepare and submit EIA report as per EIA Notification, 2006 and amendments thereof.

Annexure 2 Exesting
Environmental Clearance

**Government of Maharashtra**

**No.: EC-2009/CR134/TC2**
Environment department
Room No. 217, 2nd floor,
Mantralaya Annexe,
Mumbai 400 032
Dated: 9 October, 2009

To,
M/s. Nilanjan Iron Pvt. Ltd
B-7 Five star MIDC Kagal, Kolhapur.

**Sub: Proposed steel unit for manufacturing of 3000 MT/Month M.S. Ingot and steel billets at B-7 Five star MIDC Kagal, Kolhapur - Environmental clearance regarding.**

Sir,

This has reference to the above mentioned subject. The proposal was considered as per the EIA Notification - 2006, by the State Level Expert Appraisal Committee in its 8th meeting & recommended for prior Environment Clearance to State Level Environment Impact Assessment Authority (SEIAA) subject to submission of additional information on the points raised by SEAC. Subsequent information submitted by you, dated 30th September, 2009 has also been considered by State Level Environment Impact Assessment Authority in its 14th meeting held on 30th September, 2009.

2. It is noted that the proposal is for grant of environmental clearance for proposed steel unit for manufacturing of 3000 MT/Month M.S. Ingot and steel billets at B-7 Five star MIDC Kagal, Kolhapur

**Project information from documents submitted by you & considered by SEAC & SEIAA is summarized as below:**

**Name of the Project**: Environmental clearance for proposed steel unit for manufacturing of 3000 MT/Month M.S. Ingot and steel billets at B-7 Five star MIDC Kagal, Kolhapur

**Project Proponent:** M/s. Nilanjan Iron Pvt. Ltd

**Location of the project**: B-7 Five star MIDC Kagal, Kolhapur.

**Estimated cost of the project:** Rs.15.78 crores

**Total plot area:** 10,174 sq. m.
**Built up Area:** 6000 sq. m.

**Raw material:**

- Sponge iron : 1950 Mt/M
- Pig Iron : 405 Mt/M
- Steel scrap : 900 Mt/M
- Silicon manganese : 75 Mt/M

**Product:**

- M.S. ingots/steel Billets: 3000 Mt/m

**Water Requirement:** 85 KLD. Source: MIDC
**Sewage & Wastewater generated**: Domestic Effluent: 3.0 KLD Septic tanks & soak pits shall be provided. Cooling water is continuously re-circulated and make up water will be added

**Solid Waste Generation:**

- **Dust / Slag:** 4.5 Mt/Month
- **Scrap :** 300 Mt/m **Disposal :**recycled
- **Domestic waste:** 20 kg/day will be disposed as per MSW guidelines.

**Energy:** power requirement: 4000 KW power would be require for induction furnace.
**Green Belt Development:** Area 3360 sq. m. shall be provided. Overall 500 trees shall be planted.

**Air pollution control:**

- Dust collector along with Fume extraction System & 30 m height chimney will be provided to bring down the particulate emission to less than 100 mg/nm3 to comply with CPCB norms.
- Better sorting /segregation of non metallic (plastic, rubber, PVC) materials if any will done from the scrap in order to avoid it from entering in the process.

**Noise pollution control:**

- Equipments will be designed to confirm to noise levels prescribed.
- Acoustic barriers or shelters will be provided in noisy workplace.
- Hoods will be provided to noise generating pumps.
- Personnel protective equipments such as earplugs, earmuffs to the workers.

**Environmental Management Plan:** EMP capital cost Rs. 35 lakhs and O& M Rs. 3.20 Lakhs.

3. The proposal has been considered by SEIAA in its 14th meeting dated on 30th September, 2009 & decided to accord environmental clearance to the said project under the provisions of Environment Impact Assessment Notification, 2006 subject to implementation of the following terms and conditions :-

(i) "Consent for Establishment" shall be obtained from Maharashtra Pollution Control Board under Air and Water Act and a copy shall be submitted to the Environment department before start of any construction work at the site.

(ii) No land development / construction work preliminary or otherwise relating to the project shall be taken up without obtaining due clearance from respective authorities.

(iii) No additional land shall be used /acquired for any activity of the project without obtaining proper permission.

(iv) Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. the housing may be in the form of temporary structures to be removed after the completion of the project.

(v) For controlling fugitive natural dust, regular sprinkling of water & wind shields at appropriate distances in vulnerable areas of the plant shall be ensured.

(vi) Regular monitoring of the air quality, including SPM & SO2 levels both in work zone and ambient air shall be carried out in and around the project and records shall be

maintained. The location of monitoring stations and frequency of monitoring shall be decided in consultation with Maharashtra Pollution Control Board (MPCB) & submit report accordingly to MPCB.

(vii) The process emissions and particulate matter from various units shall confirm to the standards prescribed by the concerned authorities from time to time. At no time, the emission levels shall go beyond the stipulated standards. In the event of failure of pollution control system(s) adopted by the unit, the unit shall be immediately put out of operation and shall not be restarted until the desired efficiency has been achieved.

(viii) Fugitive emissions in the work zone environment, product and raw materials storage area shall be regularly monitored. The emissions shall confirm to the limits imposed by MPCB.

(ix) During transfer of materials, spillages shall be avoided and garland drains be constructed to avoid mixing of accidental spillages with domestic waste and storm drains.

(x) For control of process emissions, stacks of appropriate height as per the CPCB guidelines shall be provided. The scrubbed water shall be sent to the ETP for further treatment.

(xi) A detailed scheme for rainwater harvesting shall be prepared and implemented to recharge ground water.

(xii) Periodic monitoring of ground water shall be undertaken and results analyzed to ascertain any change in the quality of water. Results shall be regularly submitted to the Maharashtra Pollution Control Board.

(xiii) The project proponent shall treat the wastewater up the industry specific standards as notified in EPA or as laid down by the MPCB whichever are stringent.

(xiv) Leq of Noise level shall be maintained as per standards. For people working in the high noise area, requisite personal protective equipment like earplugs etc. shall be provided.

(xv) The overall noise levels in and around the plant are shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures, etc. On all sources of noise generation. The ambient noise levels shall confirm to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989.

(xvi) Green belt shall be developed & maintained around the plant periphery. Green Belt Development shall be carried out considering CPCB guidelines including selection of plant species and in consultation with the local DFO/ Agriculture Dept.

(xvii) Adequate safety measures shall be provided to limit the risk zone within the plant boundary, in case of an accident. Leak detection devices shall also be installed at strategic places for early detection and warning.

(xviii) Occupational health surveillance of the workers shall be done on a regular basis and record maintained as per Factories Act.

(xix) The solid waste shall be properly collected, segregated and disposed as per the provision of solid waste (Management and Handling) Rules, 2000.

(xx) The company shall make the arrangement for protection of possible fine hazards during manufacturing process in material handling.

(xxi) The project authorities must strictly comply with the rules and regulations with regard to handling and disposal of hazardous wastes in accordance with the Hazardous Waste (Management and Handling) Rules, 2003. Authorization from the MPCB shall be obtained for collections/treatment/storage/disposal of hazardous wastes.

(xxii) The company shall undertake following Waste Minimization Measures :

- Metering of quantities of active ingredients to minimize waste.
- Reuse of by- products from the process as raw materials or as raw material substitutes in other process.
- Maximizing Recoveries.

- Use of automated material transfer system to minimize spillage.
- Use of "Closed Feed" system into batch reactors.

(xxiii) Regular mock drills for the on-site emergency management plan shall be carried out. Implementation of changes / improvements required, if any, in the on-site management plan shall be ensured.

(xxiv) A separate environment management cell with qualified staff shall be set up for implementation of the stipulated environmental safeguards.

(xxv) Separate funds shall be allocated for implementation of environmental protection measures/EMP along with item-wise breaks-up. These cost shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year-wise expenditure should reported to the MPCB & this department

(xxvi) The project management shall advertise at least in two local newspapers widely circulated in the region around the project, one of which shall be in the marathi language of the local concerned within seven days of issue of this letter, informing that the project has been accorded environmental clearance and copies of clearance letter are available with the Maharashtra Pollution Control Board and may also be seen at Website at http://envis.maharashtra.gov.in

(xxvii) Project management should submit half yearly compliance reports in respect of the stipulated prior environment clearance terms and conditions in hard & soft copies to the MPCB & this department, on 1st June & 1st December of each calendar year.

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

(xxix) The proponent shall upload the status of compliance of the stipulated EC conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MoEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; SPM, RSPM. $SO_2$, NOx (ambient levels as well as stack emissions) or critical sectorai parameters, indicated for the project shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.

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

(xxxi) The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of EC conditions and shall also be sent to the respective Regional Offices of MoEF by e-mail.

(xxxii) The environmental clearance is being issued without prejudice to the court case pending in the court of law and it does not mean that project proponent has not violated any environmental laws in the past and whatever decision of the Hon'ble court will be binding on the project proponent. Hence this clearance does not give immunity to the project proponent in the case filed against him.

4. The Environment department reserves the right to revoke the clearance if conditions stipulated are not implemented to the satisfaction of the department or for that matter, for any other administrative reason.

5. **Validity of Environment Clearance**: The environmental clearance accorded shall be valid for a period of 5 years.

6. No further expansion or modifications in the plant shall be carried out without prior approval of SEIAA. In case of any deviation or alteration in the project proposed from those submitted to this department for clearance, a fresh reference should be made to the department to assess the adequacy of the condition(s) imposed and to incorporate additional environmental protection measures required, if any.

7. The above stipulations would be enforced among others under the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution ) Act, 1981, the Environment (Protection) Act, 1986 and rules there under, Hazardous Wastes (Management and Handling ) Rules, 1989 and its amendments, the public Liability Insurance Act, 1991 and its amendments.

(Valsa R Nair Singh)
Secretary, Environment
department & MS, SEIAA

Copy to:

1. Shri. Ashok Basak, IAS ( Retd.),Chairman, SEIAA,502,Charleville, 'A' Road, Churchgate, Mumbai- 400 020, Maharashtra.
2. Shri. P.M.A Hakeem, IAS (Retd.), Chairman, SEAC, 'Jugnu' Kottaram Road, Calicut- 673 006 Kerla.
3. The Secretary, Energy department, Govt. of Maharashtra, Mantralaya, Mumbai - 400032., Maharashtra
4. Member Secretary, Maharashtra Pollution Control Board, with request to display a copy of the clearance.
5. The CCF, Regional Office, Ministry of Environment and Forest (Regional Office, Western Region, Kendriya Paryavaran Bhavan, Link Road No- 3, E-5, Ravi-Shankar Nagar, Bhopal- 462 016). (MP).
6. Regional Office, MPCB, Kolhapur.
7. Collector, Kolhapur.
8. IA- Division, Monitoring Cell, MoEF, Paryavaran Bhavan, CGO Complex, Lodhi Road, New Delhi-110003.
9. Director(TC-1), Dy. Secretary(TC-2),Scientist-1,Environment department
10. Select file (TC-3).

Annexure 3 Consent to Operate

# MAHARASHTRA POLLUTION CONTROL BOARD

## REGIONAL OFFICE KOLHAPUR


Phone : 0231-2652952 /2660448

Fax : 0231-2652952

Email : rokolhapur@mpcb.gov.in

Udyog Bhawan Near Collector Office,

Kolhapur - 416003

Visit At : http://mpcb.gov.in


*Orange/L.S.I/*

***Date: 07 / 03/2018***

***Consent No: RO-KOLHAPUR/CONSENT/ 1803000346/079/18***

**Renewal of Consent under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization / Renewal of Authorization under Rule 5 of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.**

**[To be referred as Water Act, Air Act and HW (M&H) Rules respectively].**

.....

**CONSENT is hereby granted to**

**M/s. Nilanjan Iron Pvt Ltd,**
**Pot. No. B-07, KAGAL 5 STAR MIDC,**
**Tal-Kagal, Dist-Kolhapur.**

Located in the area declared under the provisions of the Water Act, Air act and Authorization under the provisions of HW (M&H) Rules and amendments thereto subject to the provisions of the Act and the Rules and the Orders that may be made further and subject to the following terms and conditions:

1. **The Consent to Operate is granted for a period up to: 31.12.2023.**

2. **The Consent is valid for the manufacture of –**

| Sr. No. | Product Name | Maximum Quantity | UOM |
|---|---|---|---|
| 1 | M.S Ingots /Steel Billets | 3000 | MT/M |

3. **CONDITIONS UNDER WATER ACT:**

(i) The daily quantity of trade effluent from the factory shall be **NIL.**
(ii) The daily quantity of sewage effluent from the factory shall not exceed **3.0M³.**

(iii) **Trade Effluent Treatment:** NA
**(iv) Trade Effluent Disposal:** NA

**(v) Sewage Effluent Treatment:** The applicant shall provide comprehensive treatment system as is warranted with reference to influent quality and operate and maintain the same continuously so as to achieve the quality of treated effluent to the following standards.

(1) Suspended Solids Not to exceed 100 mg/l.
(2) BOD 3 days 27o C. Not to exceed 100 mg/l.

Regional Officer M.P.C.Board, Kolhapur

(vi) **Sewage Effluent Disposal:** The treated domestic effluent shall be soaked in a soak pit, which shall be got cleaned periodically. Overflow, if any, shall be used on land for gardening / plantation only.

(vii) **Non-Hazardous Solid Wastes:**

| Sr. No. | Type Of Waste | Quantity | UOM | Disposal |
|---|---|---|---|---|
| 1 | Steel Scrap | 300 | MT/M | Sale |

(viii)**Other Conditions:** Industry shall monitor effluent quality regularly.

4. **The applicant shall comply with the provisions of the Water (Prevention & Control of Pollution) Cess Act, 1977 (to be referred as Cess Act) and amendment Rules, 2003 there under**

The daily water consumption for the following categories is as under:

| | | |
|---|---|---|
| (i) Domestic | ... | 5.00 CMD |
| (ii) Industrial Processing | ... | 0.00 CMD |
| (iii) Industrial Cooling | ... | 60.00 CMD |
| (iv) Agriculture / Gardening | ... | 0.00 CMD |

The applicant shall regularly submit to the Board the returns of water consumption in the prescribed form and pay the Cess as specified under Section 3 of the said Act.

5. **CONDITIONS UNDER AIR ACT :**

(i) The applicant shall install a comprehensive control system consisting of control equipments as is warranted with reference to generation of emission and operate and maintain the same continuously so as to achieve the level of pollutants to the following standards:

**A) Control Equipment:**

1. **The industry shall provide adequate mechanical dust collector, Scrubber to furnace.**
2. **Dust collector of sufficient capacity shall be provided to shot blasting.**
3. **There shall not be any secondary (fugitive) emission.**

**B) Standards for Emissions of Air Pollutants:**

(i) TPM Not to exceed **150 mg/Nm$^3$.**

(ii) So2 Not to exceed **... Kg/Day.**

6. **Conditions for D.G. Set : NA**
7. **Standards for Stack Emissions:**

(i) **The applicant shall observe the following fuel pattern:-**

| Sr. No. | Type Of Fuel | Quantity | UOM |
|---|---|---|---|
| | Electricity | .. | ... |

(ii) **The applicant shall erect the chimney(s) of the following specifications:-**

| Sr. No. | Chimney Attached To | Height in Mtrs. |
|---|---|---|
| 1 | Induction Furnace | 30 |

(iii) The applicant shall provide ports in the chimney/(s) and facilities such as ladder, platform etc. for monitoring the air emissions and the same shall be open for inspection to/and for use of the Board's Staff. The chimney(s) vents

attached to various sources of emission shall be designated by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.

(iv) The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standard in respect of noise to less than 75 dB(A) during day time and 70 dB(A) during night time. Day time is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.

(vi) **Other Conditions:**

1) **The industry shall not cause any nuisance in surrounding area.**
2) **The industry shall monitor stack emissions and ambient air Quality Regularly.**

**8. Conditions Under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 :**

(i) The Industry shall handle hazardous wastes as specified below.

**The Industry shall not generate any type of hazardous waste**

9. Whenever due to any accident or gas leakage other unforeseen act or even, such emissions occur or is apprehended to occur in excess of standards laid down, such information shall be forthwith Reported to Board, concerned Police Station, office of Directorate of Health Services, Department of Explosives, Inspectorate of Factories and Local Body the production process shall be stopped by taking all necessary safety measures. Industry shall also monitor the emission and ensure that the emission do not cause any harm or nuisance in the surrounding. The industry shall not restart the process without permission of the Board and other statutory organization as require under the law.

**10. Industry comply with following additional conditions:**

i. The applicant maintain good housekeeping and take adequate measures for control of pollution from all sources so as not to cause nuisance to surrounding area / inhabitants.

ii. The applicant bring minimum 33% of the available open land under green coverage/ tree plantation.

iii. Solid waste – The non-hazardous solid waste arising in the factory premises, sweepings, etc., be disposed of scientifically so as not to cause any nuisance / pollution. The applicant take necessary permissions from civic authorities for disposal to dumping ground.

iv. The applicant provide for an alternate electric power source sufficient to operate all pollution control facilities installed by the applicant to maintain compliance with the terms and conditions of the consent. In the absence, the applicant stop, reduce or otherwise, control production to abide by terms & conditions of this consent regarding pollution levels.

(vi) **Sewage Effluent Disposal:** The treated domestic effluent shall be soaked in a soak pit, which shall be got cleaned periodically. Overflow, if any, shall be used on land for gardening / plantation only.

(vii) **Non-Hazardous Solid Wastes:**

| Sr. No. | Type Of Waste | Quantity | UOM | Disposal |
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| | | |
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| (iii) Industrial Cooling | ... | 60.00 CMD |
| (iv) Agriculture / Gardening | ... | 0.00 CMD |

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|---|---|---|---|
| | Electricity | .. | ... |

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|---|---|---|
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(iii) The applicant shall provide ports in the chimney/(s) and facilities such as ladder, platform etc. for monitoring the air emissions and the same shall be open for inspection to/and for use of the Board's Staff. The chimney(s) vents

attached to various sources of emission shall be designated by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.

(iv) The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standard in respect of noise to less than 75 dB(A) during day time and 70 dB(A) during night time. Day time is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.

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**10. Industry comply with following additional conditions:**

i. The applicant maintain good housekeeping and take adequate measures for control of pollution from all sources so as not to cause nuisance to surrounding area / inhabitants.

ii. The applicant bring minimum 33% of the available open land under green coverage/ tree plantation.

iii. Solid waste – The non-hazardous solid waste arising in the factory premises, sweepings, etc., be disposed of scientifically so as not to cause any nuisance / pollution. The applicant take necessary permissions from civic authorities for disposal to dumping ground.

iv. The applicant provide for an alternate electric power source sufficient to operate all pollution control facilities installed by the applicant to maintain compliance with the terms and conditions of the consent. In the absence, the applicant stop, reduce or otherwise, control production to abide by terms & conditions of this consent regarding pollution levels.

v. The applicant not change or alter quantity, quality, the rate of discharge, temperature or the mode of the effluent / emissions or hazardous wastes or control equipment's provided for without previous written permission of the Board.

vi. The applicant provide facility for collection of environmental samples and samples of trade and sewage effluents, air emissions and hazardous wastes to the Board staff at the terminal or designated points and pay to the Board for the services rendered in this behalf.

vii. The applicant make an application for renewal of the consent at least 60 days before the date of the expiry of the consent.

viii. The firm submit to this office, the 30th day of September every year, the Environmental Statement Report for the financial year ending 31st March in the prescribed Form-V as pre the provisions of rule 14 of the Environment (Protection) (Second Amendment) Rules, 1992.

ix. As inspection book be opened and made available to the Board's officers during their visit to the applicant.

x. The applicant install a separate electric meter showing the consumption of energy for operation of domestic and industrial effluent treatment plants and air pollution control system. A register showing consumption of chemicals used for treatment be maintained.

Xi. Separate drainage system be provided for collectiou of trade and sewage effluents. Terminal manholes be provided at the end of collection system with arrangement for measuring the flow. No effluent be admitted in the pipes / sewers down- stream of the terminal manholes. No effluent find its way other than in designed and provided collection System.

xii. Neither storm water nor discharge from other premises be allowed to mix with the effluents from the factory.

**11. Board reserves the right to review, amend, suspend, revoke Etc. this consent and the same be binding on the industry.**

**12. This consent shall not be construed as exemption from obtaining necessary NOC/permission from any other Government agencies.**

**13. Industry shall obtain permission of CGWA for use of ground water.**

**14. The industry shall submit B.G. of Rs. 1.0 lacs against O & M of pollution control system to Regional Office, Kolhapur having validity 31.03.2024.**

**15. The Capital investment of the industry is Rs. 1408.51 Lacs.**

Regional Officer M.P.C.B. Kolhapur

**(Dilip K. Khedkar)**
**Regional Officer, Kolhapur**

To,
M/s. Nilanjan Iron Pvt Ltd,
Plot. No. B-07, KAGAL 5 STAR MIDC,
Tal-Kagal, Dist-Kolhapur.

Copy submitted to:
1. The Member Secretary, MPC Board, Mumbai.
2. The Chief Accounts Officer, MPC Board, Mumbai.
1. Cess wing/Statistical wing/Air wing/Hazardous Management wing, MPC Board, Mumbai.

Received Consent fee of -

| Sr. No. | Amount(Rs.) | Transaction No. | Date | Drawn On |
|---|---|---|---|---|
| 1 | 50,000/- | TXN1711000923 | 10.11.2017 | ... |
| 2 | 115000/- | TXN1712001804 | 21.12.2017 | ... |

Copy to :-
1. The Sub Regional Officer, MPC Board, Kolhapur.

C.Board,Kolhapur

Regional Officer M.P.C.Board,Kolhapur

## Annexure 4
## List of Major Industries

- **GhatgePatil Industries Ltd Plant 2**
- **Menon and Menon, Kagal Plant**
- **V P Industries**
- **Elcom International Pvt. Ltd.**
- **Nikam Iron Sintered Products Pvt.Ltd.**
- **Mahalaxmi Textiles**
- **Microtech Machines**
- **Nooriya Engineers**

## Annexure 5
## Environmental, Health and Safety (EHS) Policy
## M/s. Nilanjan Iron Pvt. Ltd.

- Our organization commits to comply with all applicable local, state, federal, and other legal requirements and regulations related to our aspects;
- We are firmly committed to continual improvement, the efficient use of energy and natural resources, and the prevention of pollution from our activities;
- We adhere to globally responsible recycling practices;
- Our organization is committed to the principles of Social Accountability;
- Procedures, objectives, and targets have been established to reduce improve its performance in preventing injury and ill health;
- We work closely with our downstream vendors throughout the recycling chain to final disposition;
- Our procedures and requirements are communicated to our suppliers and contractors;
- We protect customer information and adhere to the most up-to-date security standards and practices; and
- This policy is made available to all parties inside and outside of the organization, and is communicated to employees through routine awareness and training sessions.

Dated:

Place: **Director**

## Annexure 6

| Location : AAQ 1 | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Project Site | | | | | | | | | | | | | |
| Date | Week | $PM_{10}$ | $PM_{2.5}$ | $SO_2$ | $NO_X$ | CO | NH3 | O3 | Ni | Pb | As | Benzene | Benzo(a)Pyrene |
| 03.10.2018 | 1 | 75.9 | 31.3 | 12.6 | 15.3 | 0.6 | 17.1 | 22.8 | BDL | BDL | BDL | BDL | BDL |
| 04.10.2018 | 1 | 76.4 | 32.0 | 12.9 | 15.6 | 0.6 | 17.3 | 23.1 | BDL | BDL | BDL | BDL | BDL |
| 10.10.2018 | 2 | 76.1 | 31.9 | 12.8 | 15.5 | 0.6 | 17.3 | 22.7 | BDL | BDL | BDL | BDL | BDL |
| 11.10.2018 | 2 | 78.8 | 33.0 | 13.3 | 16.0 | 0.6 | 17.7 | 23.5 | BDL | BDL | BDL | BDL | BDL |
| 17.10.2018 | 3 | 78.0 | 32.7 | 13.1 | 15.9 | 0.6 | 17.6 | 23.4 | BDL | BDL | BDL | BDL | BDL |
| 18.10.2018 | 3 | 80.6 | 33.8 | 13.6 | 16.3 | 0.7 | 18.0 | 24.0 | BDL | BDL | BDL | BDL | BDL |
| 24.10.2018 | 4 | 79.2 | 32.8 | 13.5 | 16.5 | 0.6 | 17.8 | 23.6 | BDL | BDL | BDL | BDL | BDL |
| 25.10.2018 | 4 | 76.7 | 31.8 | 13.1 | 16.1 | 0.7 | 17.4 | 23.1 | BDL | BDL | BDL | BDL | BDL |
| 31.10.2018 | 5 | 77.6 | 32.1 | 13.3 | 16.2 | 0.7 | 17.5 | 23.0 | BDL | BDL | BDL | BDL | BDL |
| 01.11.2018 | 5 | 76.1 | 31.5 | 13.0 | 16.0 | 0.7 | 17.3 | 21.6 | BDL | BDL | BDL | BDL | BDL |
| 07.11.2018 | 6 | 76.5 | 31.7 | 13.1 | 16.0 | 0.7 | 17.3 | 21.1 | BDL | BDL | BDL | BDL | BDL |
| 08.11.2018 | 6 | 74.2 | 30.7 | 12.7 | 15.6 | 0.7 | 16.9 | 22.5 | BDL | BDL | BDL | BDL | BDL |
| 14.11.2018 | 7 | 75.9 | 32.1 | 13.1 | 16.5 | 0.7 | 17.6 | 23.7 | BDL | BDL | BDL | BDL | BDL |
| 15.11.2018 | 7 | 73.4 | 31.0 | 12.7 | 16.0 | 0.7 | 17.1 | 21.4 | BDL | BDL | BDL | BDL | BDL |
| 21.11.2018 | 8 | 74.8 | 31.6 | 12.9 | 16.3 | 0.7 | 17.4 | 22.0 | BDL | BDL | BDL | BDL | BDL |
| 22.11.2018 | 8 | 77.2 | 32.6 | 13.3 | 16.7 | 0.7 | 17.8 | 23.9 | BDL | BDL | BDL | BDL | BDL |
| 5.12.2018 | 9 | 75.9 | 32.1 | 13.1 | 16.5 | 0.7 | 17.6 | 24.1 | BDL | BDL | BDL | BDL | BDL |
| 06.12.2018 | 9 | 78.5 | 33.2 | 13.5 | 16.9 | 0.6 | 18.9 | 25.4 | BDL | BDL | BDL | BDL | BDL |
| 12.12.2018 | 10 | 77.6 | 31.7 | 13.3 | 15.9 | 0.5 | 18.6 | 25.2 | BDL | BDL | BDL | BDL | BDL |
| 13.12.2018 | 10 | 80.6 | 32.9 | 13.8 | 16.4 | 0.5 | 19.1 | 24.8 | BDL | BDL | BDL | BDL | BDL |
| 19.12.2018 | 11 | 79.2 | 32.4 | 13.6 | 16.2 | 0.7 | 18.9 | 24.6 | BDL | BDL | BDL | BDL | BDL |
| 20.12.2018 | 11 | 81.5 | 33.3 | 14.0 | 16.6 | 0.7 | 19.3 | 25.0 | BDL | BDL | BDL | BDL | BDL |
| 26.12.2018 | 12 | 79.7 | 32.6 | 13.7 | 16.3 | 0.7 | 19.0 | 24.7 | BDL | BDL | BDL | BDL | BDL |
| 27.12.2018 | 12 | 77.9 | 31.9 | 13.4 | 16.0 | 0.7 | 18.7 | 24.4 | BDL | BDL | BDL | BDL | BDL |
| Minimum | | 73.4 | 30.7 | 12.6 | 15.3 | 0.53 | 16.9 | 21.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Maximum | | 81.5 | 33.8 | 14.0 | 16.9 | 0.72 | 19.3 | 25.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Average | | 77.4 | 32.2 | 13.2 | 16.1 | 0.65 | 17.9 | 23.5 | #DIV/0! | #DIV/0! | #DIV/0! | #DIV/0! | #DIV/0! |
| 98 Percentile | | 81.1 | 33.6 | 13.9 | 16.8 | 0.72 | 19.2 | 25.3 | #NUM! | #NUM! | #NUM! | #NUM! | #NUM! |

| | | |
|---|---|---|
| Pb | BDL | <0.5 µg/m3 |
| As | BDL | <2 ng/m3 |
| Ni | BDL | <5 ng/m3 |
| Benzene | BDL | <1.0 µg/m3 |
| Benzo(a)Pyr | BDL | <0.5 ng/m3 |