CHAPTER -1.0
INTRODUCTION

1.0 INTRODUCTION

M/s MAA SHAKTI BRICKS intends to venture into brick earth mining for its brick kiln. The land for the proposed mining is located at Village: Kabaraut, Tehsil: Shamli & District: Shamli. The brick kiln is also located adjacent to the brick earth mining site. The brick earth mining lease is having an area of 4.481ha with capacity of 10888.83m^3 per annum.

1.1 THE LOCATION AND DESCRIPTION OF THE SITE

The brick clay mining lease is located at about 25 km from the district Head Quarter, Shamli. The location of the mine site and brick kiln site is shown in Exhibit 1.1. The Exhibit 1.2 illustrates the 500 m radius buffer zone of the mine lease and the route map for transportation of brick earth. The geo-coordinates of the lease area is presented in Table 1.1.

The site is approachable by Meerut – Karnal Rd-0.25 km in E.

Table 1.1:
Geo-coordinates of the Mining Lease

Chimney	29°23'18.90"N	77°22'4.76"E
Composite Mine Area	29°23'22.55"N	77°21'45.14"E

Exhibit 1.1:
Location of the Mine Lease and Brick Kiln Site in the Concerned District

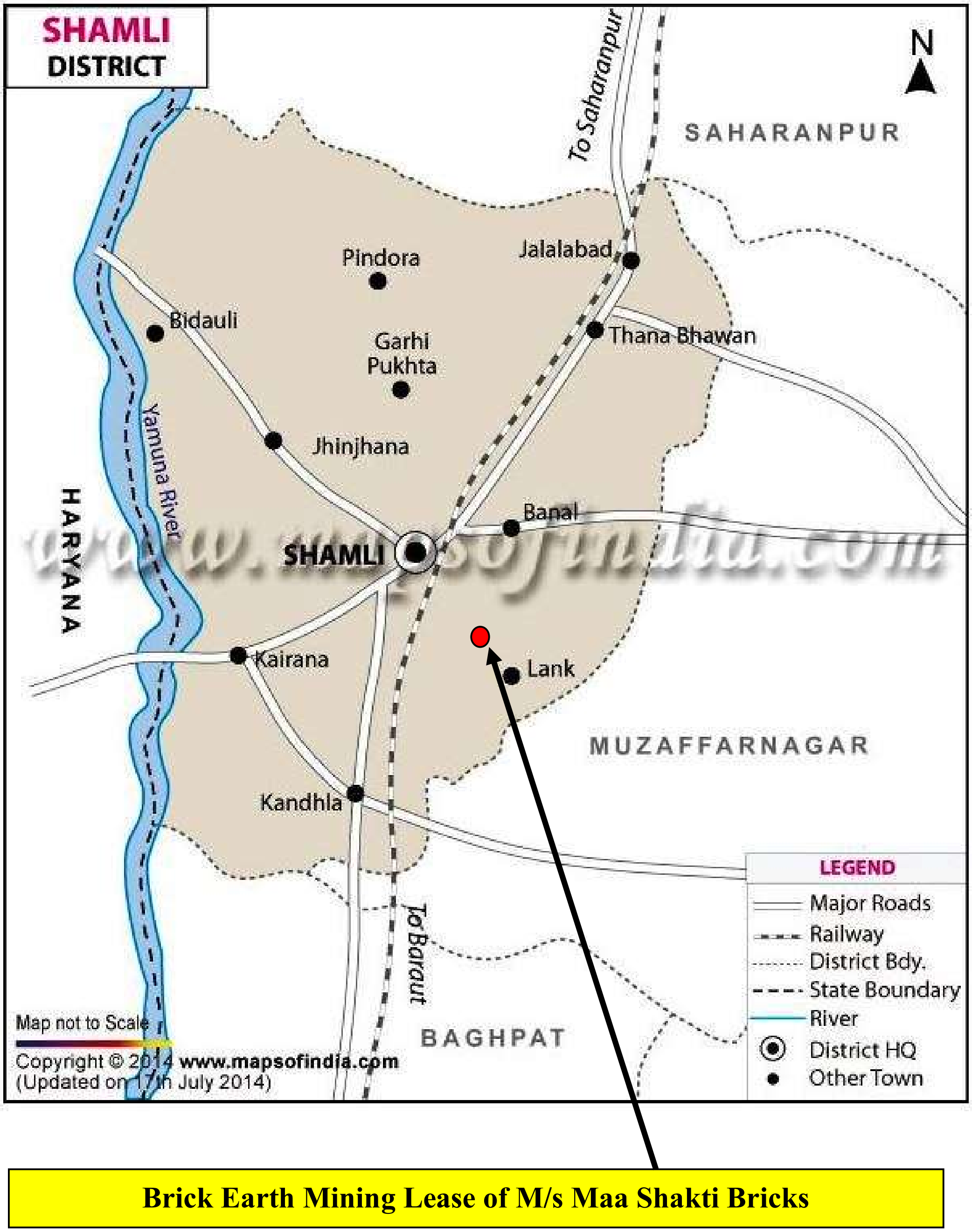
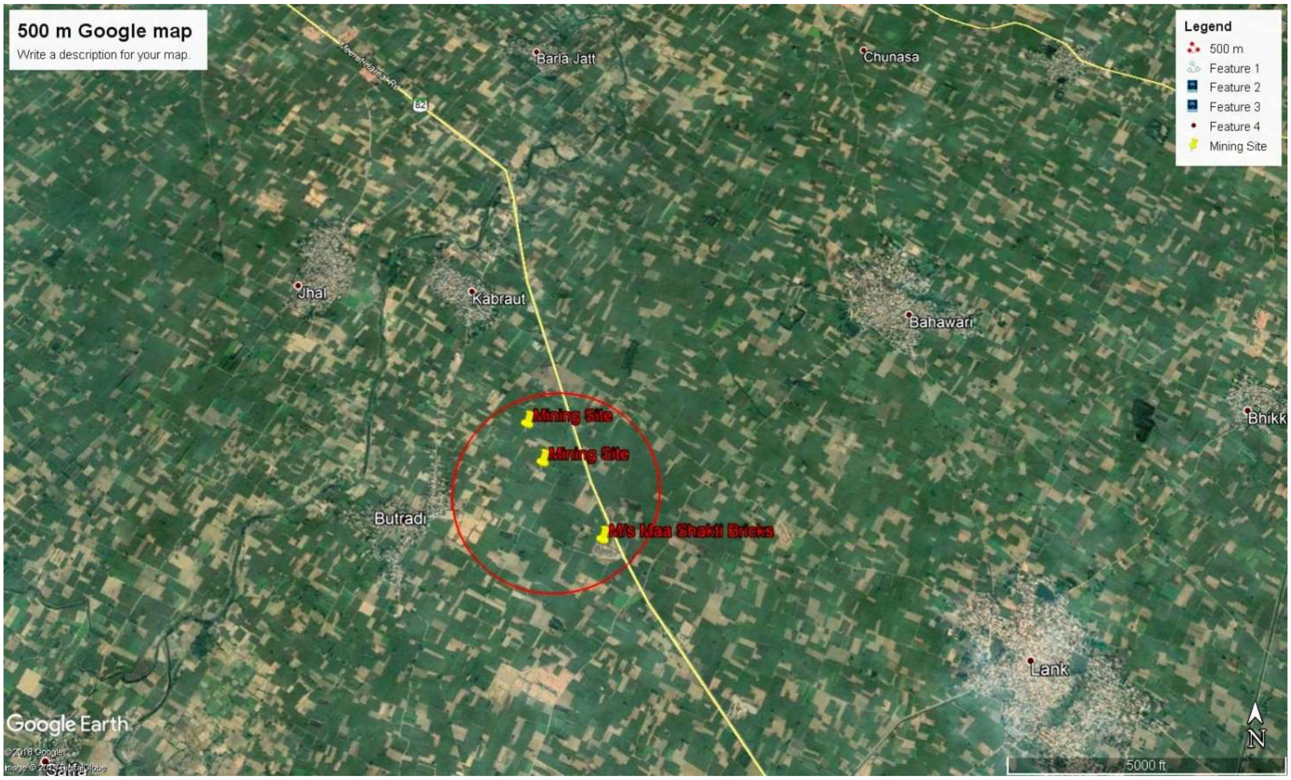
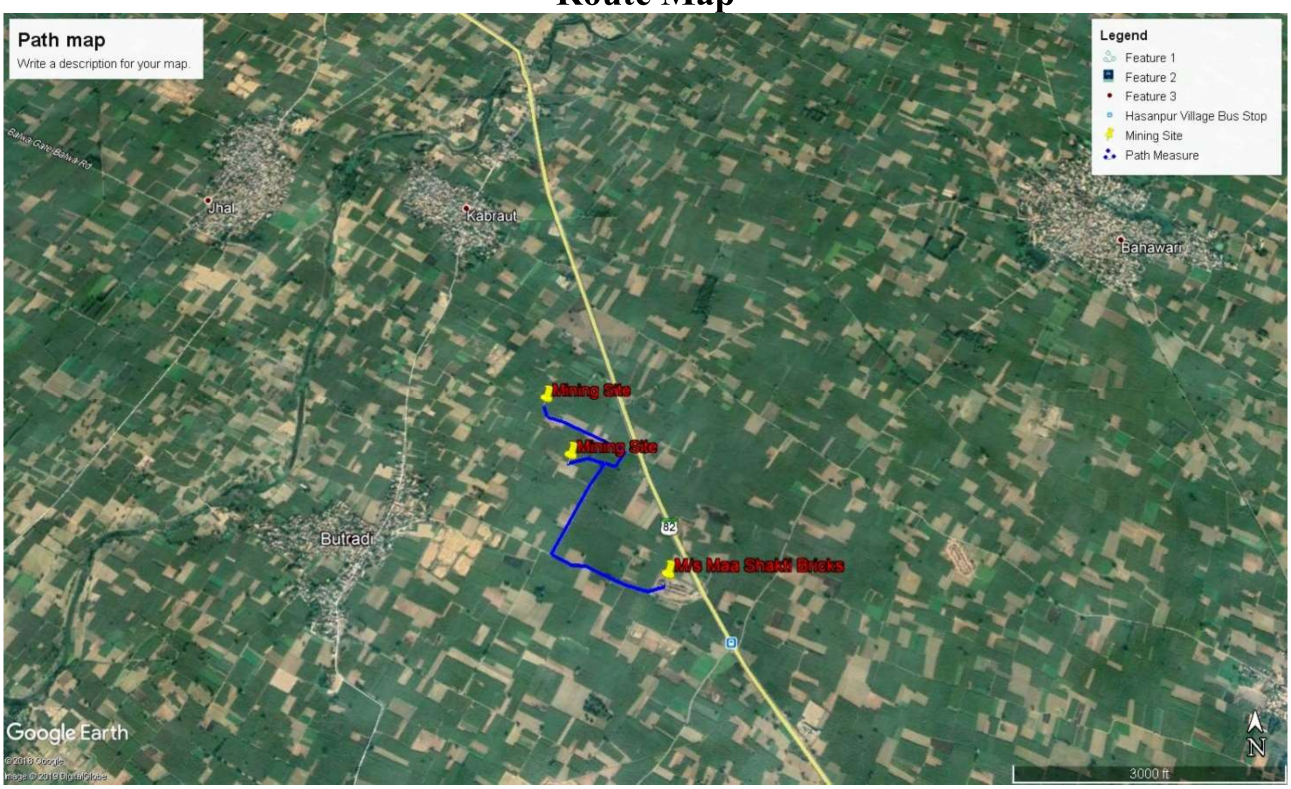


Exhibit 1.2:
The Buffer Zone of 500 m Radius Area



Route Map



1.2 THE DETAILS OF LEASE AREA

M/s Shri Balaji Brick Field is in possession of mining lease located in Village: Kabaraut , Tehsil: Shamli & District: Shamli. The details of the lease area is presented in Table 1.2. Duly authenticated (by Patwari) Khasra map of the mining lease area is attached as Annexure-3.

Table 1.2:
Details of Land falling in Mining Lease Area

District / State	Tehsil	Village	Ownership	Gata No.	Area (in hect.)
Shamli/ Uttar Pradesh	Shamli	Kabaraut	Private	665, 618	4.481
TOTAL					**4.481**

Total Govt. Land – Nil, Forest Land-Nil,
Total Private Land – 4.481Ha.

1.3 THE PROJECT COST

The estimated cost of the project is approximately Rs.17.50 lakh and the cost of Environmental Protection Measures is about Rs. 1.75 lakh. The provision for the Corporate Social Responsibility has been kept to the tune of Rs. 1.00 lakh.

1.4 REGULATORY COMPLIANCE

The original Notification S.O. 763 (E), published in the Gazette of India, as required by Sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986, states that “No person shall within a radius of fifty kilometers from coal or lignite based thermal power plants, manufacture clay bricks or tiles or blocks for use in construction activities without mixing at least 25 per cent of ash (fly ash, bottom ash or pond ash) with soil on weight to weight basis.”
Amendment was issued vide Notification S.O.979 (E) published in Gazette of India on 27th August, 2005, where in the word “fifty kilometers” was replaced by the words “One hundred kilometers”.

As per Gazette Notification of MoEFCC, GOI, No. S.O. 2731 (E) dated 9th September, 2013 in exercise of the power conferred by the sub-section (I) and clause (v) of the sub-section (2) of Section 3 of the Environment (Protection) Act 1986 (29 of 1986) read with sub-rule (4) of rule 5 of the Environment (Protection) Act 1986. The Government of India, hereby makes the further amendment to the earlier Notification of the MoEFCC, GOI, that general conditions shall apply except for the project or activity of less than 5 hectare of the mining lease area for the minor minerals.

1.5 STATUS OF STATUTORY CLEARANCES

As per EIA Notification of 14th September, 2006 and O.M. No. L-11011/47/2011-IA.II (M) dated 24th June 2013 the project falls under Schedule 1(a) and Category "B-2" project which require Environmental Clearance. Further, as per Gazette Notification of the MoEFCC vide S.O.141(E) dated 15/01/2016, the Category-B2 mining projects shall be appraised at the district level by the District Level Expert Appraisal Committee (DEAC).

The present application is for the same in compliance to the stated Gazette Notification of the MoEFCC. In view of the above, the following conditions shall be adhered to during the brick clay mining:

- The proposed brick clay mining project is an open cast, manual process;
- No drilling and blasting shall be undertaken;
- The borrowing/excavation activity shall be restricted up to maximum depth of 2 m below general ground level;
- No mining activity shall be carried out within 15 metre periphery of any civil structure.

CHAPTER -2.0
PROJECT DESCRIPTION

2.0 PROJECT PROFILE

M/s MAA SHAKTI BRICKS intends to commence brick earth mining at its mining lease located at Village: Kabaraut , Tehsil: Shamli & District: Shamli of Uttar Pradesh to feed its brick kiln located in the vicinity of the mining lease. The brick earth mining lease is having lease area of 4.481 ha. The details of the lease area is already discussed and presented in preceding Chapter-1.0 (Table 1.2). The estimation of the mineable reserve and the mine life is presented and discussed in the subsequent sections.

2.1 MINEABLE RESERVE

The brick clay mining activity will be carried out at the vacant agricultural and barren land which is in possession of the project proponent. The gata wise mineable reserve and excavation programme is presented in Table 2.1.

Table 2.1:
Excavation details of the Mining Area

Sl. No.	Gata No.	Lease Area (in Ha)	Area left for Berm (Safety Zone) and Plantation (inHa.)	Net Available Mineable area (in Ha.)	Ultimate depth for Excavation (in m)	Excavation Period	Mineable Reserve Without Blockade (in cum)
1.	665	3.55	0.355	3.195	1.5	5	47925
2.	618	0.931	0.0931	0.8379	1.5	5	12568.5
Total		**4.481**	**0.4481**	**4.0329**			**60493.5**
On an average 10888.83 m^3 Say 10889 m^3 per annum.							

2.2 THE MINE LIFE

Based on the total mineable area and the rate of excavation the mine life has been estimated to be 5-years, as evident from the Table 2.1 presented above.

2.3 INPUT

LAND

The mining lease area for the brick earth mining project is 4.481ha and is in possession of the project proponent. The status of the mining land is already given in Table 1.2 in the previous Chapter 1.0.

WATER

Total water requirement for the proposed project will be 2.75 KLD. The break-up of the water consumption for various activities is presented in Table 2.3.

Table 2.3:
Water Requirement and Uses

Activities	Requirement in KLD	Discharge
Dust Suppression during the excavation	2.00	Nil
Drinking and sanitation (estimated for 25 workmen @30 lpcd)	0.75	Nil
Total	**2.75**	**Nil**

The demand of domestic water requirement shall be met from the tube well, whereas, the demand of water for the dust suppression shall be met from the tankers.

EMPLOYMENT POTENTIAL

The brick earth mining activity is labour intensive venture and a number of un-skilled workmen are required for this. Hence it is the source of employment generation for the local populace. As per the requirement for the proposed brick earth mining project following categories manpower shall be required:-

Skilled- Supervisor-	1 No.
Clerk-	1 No.
Un-skilled labour-	23 nos.
Total	25 Nos. Max on any working day

2.4 DETAILS OF QUARRY

2.4.1 ESTIMATION OF GEOLOGICAL RESERVE

The quarrying area of this brick earth mining is 4.481ha. The proved minerals reserve (Mineable) is **54445** m^3 for five year plan period.

2.4.2 ESTIMATION OF YEAR WISE EXCAVATION

Based on the total mineable area, the production of brick clay for the plan period is presented in Table 2.4.

Table 2.4:
Year wise Production of Brick Clay

Year	Production (in m^3)
1^{st}	10889
2^{nd}	10889
3^{rd}	10889
4^{th}	10889

5th	10889
TOTAL	**54445**

2.4.3 USE OF MINERAL

The ordinary clay/brick earth excavated from this quarry will be used for brick manufacturing at brick kiln of ***M/s MAA SHAKTI BRICKS.***

2.5 METHODOLOGY OF MINING

- The excavation shall be carried out by manual open cast mining method. As per MoEFCC Notification, quarrying of ordinary clay/brick earth is permissible upto the depth of 2.0 m.
- The working pit in the quarry shall be developed by making proper bench formation.
- The mining activity shall be carried out in single shift in day time only.
- Regular sprinkling of water shall be done on haul roads as well as at possible working faces for dust suppression particularly in the peak summer season and also on the windy day.
- It is pertinent to mention here that for the quarrying of ordinary clay/brick earth no blasting shall be required.

2.5.1 LOADING AND TRANSPORTATION

Loading operation is carried out manually. Transportation of brick earth is carried out by tractor trolleys and dumpers.

2.5.2 WASTE GENERATION AND DISPOSAL

In the mining operation of brick earth (ordinary clay) no overburden or less quantity top soil as overburden is required to be removed either manually or through tractor trolleys. The removed top soil is stacked separately for its use in plantation and reclamations purpose. No liquid effluent is discharged to outside the lease area.

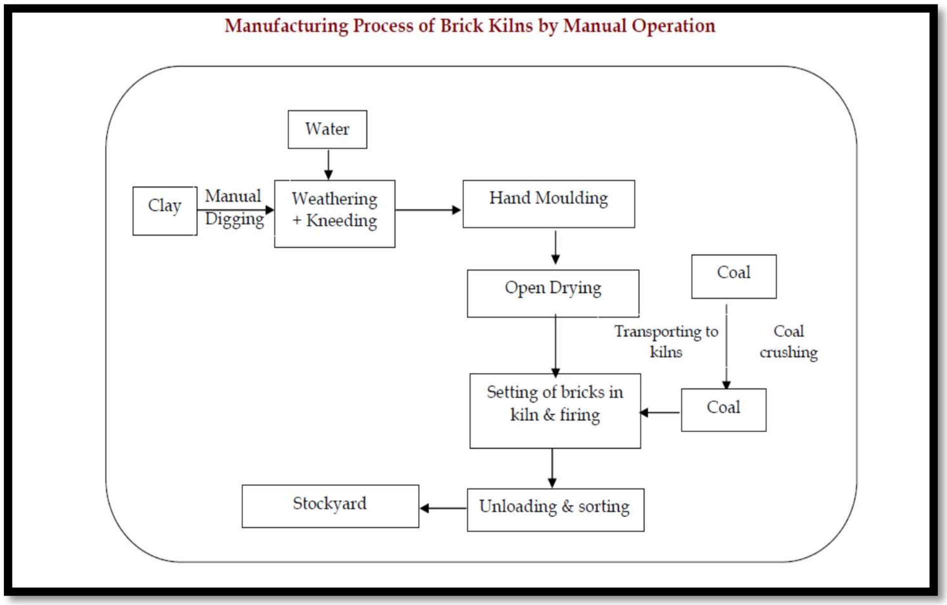
2.6 BRICK MANUFACTURING PROCESS

Fired bricks are burned in a kiln which makes them durable. Modern, fired, clay bricks are formed in one of three processes -soft mud, dry press, or extruded.
Normally, brick contains the following ingredient:

1. Silica (sand) – 50% to 60% by weight
2. Alumina (clay) – 20% to 30% by weight
3. Lime – 2 to 5% by weight
4. Iron oxide – ≤ 7% by weight
5. Magnesia – less than 1% by weight

The soft mud method is the most common, as it is the most economical. It starts with the raw clay, preferably in a mix with 25–30% sand to reduce shrinkage. The clay is first ground and mixed with water to the desired consistency. The clay is then pressed into steel moulds with a hydraulic press. The shaped clay is then fired ("burned") at 900–1000 °C to achieve strength. The process chart for brick manufacturing is illustrated in Exhibit 2.1.

Exhibit 2.1:
Process Flow Chart for Brick Manufacturing



2.7 PROJECT's IMPORTANCE TO THE COUNTRY AND REGION

The construction sector is an important part of the Indian economy with the contribution of 10% in the GDP and is registering an annual growth of 9%. Clay fired bricks are the backbone of this sector. The Indian brick industry is the second largest producer of bricks in the world after China. India is estimated to produce more than 14000 crores of bricks annually, mainly by adopting age-old manual traditional processes. The brick sector consumes more than 24 million tonnes of coals annual along with huge quantity of biomass fuels. Due to large scale construction activities in major towns and cities, a number of brick plants have been set up on the outskirts of these cities. These clusters are the source of local air pollution affecting local population, agriculture and vegetation.

The growth of India's economy and population, coupled with urbanization, has resulted in an increasing demand for residential, commercial, industrial, and public buildings as well as other physical infrastructure. Building construction in India is estimated to grow at a rate of 6.6% per year between 2005 and 2030.

2.8 SITE SERVICES

As per Mines Rules & Regulations following statutory site services shall be made available which are discussed in the subsequent section.

2.8.1 MINES OFFICE

A full-fledged quarry office shall be developed at suitable location near the brick kiln. The office will be well equipped with telephones, *etc*. Brick kiln office building will consist of facilities like First Aid Room, latrine and urinals, a small canteen *etc*.

2.8.2 MEDICAL FACILITY

The brick kiln and the mining lease area is close to the city Shamli, where adequate medical facilities are there. Provision has been made for the First Aid Facility for the workmen at the site itself, in case of any injury or activity which requires medical attention.

2.8.3 CANTEEN FACILITY

Provision has been made to establish a canteen at the mining site to cater to the need of snacks, tea, meals *etc.* for the workmen working at quarrying site.

2.8.4 REST SHELTER

Rest shelters shall be provided at the brick kiln which is located by the side of the brick earth mining site which shall have the provision of sitting arrangements, *etc.* surrounded by plantation. Employees can take their meals, tea, snacks and take rest during their rest hours.

CHAPTER-3.0
ENVIRONMENTAL MANAGEMENT PLAN

3.0 DESCRION OF ENVIRONMENT
3.1 PHYSIOGRAPHY

The Shamli district was carved out from Muzaffarnagar District on 28 September, 2011 as Prabudh Nagar and renamed Shamli in July 2012. Shamli is the headquarter of the district. Shamli is located approximately 92 kilometres from Delhi along the Delhi– Saharanpur and Meerut-Karnal highway. The district, covering an area of 1341 sq km lies in the north-west of Uttar Pradesh. It is bounded on the north by the Saharanpur district, Bagpat district in the south and west in Haryana state. It lies to the east of the Yamuna River, which marks the borders of two Indian states, Haryana and Uttar Pradesh. The district falls in Survey of India Toposheet No. 53G, covering north latitudes 29045'49.33" and 29042'33.33" and east longitude 77023' 10.06'' and 78008' 13.18''. For administrative purposes, the district has been sub-divided into 03 tehsils and 5 developmental blocks.

DRAINAGE PATTERN

Shamli district is demarcated by river Ganga in the east and by river Yamuna in the west. In fact, the drainage pattern of the district is strictly governed by these two major rivers. Both the rivers in their respective course flow more or less north to south. Major tributary of Ganga is Solani river. Yamuna has the tributaries named Hindon, Krisni and Hari rivers and the Katna nala.

FLORAL DIVERSITY

The forest of Shamli falls into two main divisions, the one comprising the Govt. reserve and the other those which are owned by rivate zamindars. There is abundance of bamboo and grass in the Chandi range, and salpoles in Rehar. The trees are *sal, semal, dhak, sain, asna or asaina, tendu, haldu* and many other species are found throughout the plains. Of the last the most valuable perhaps is the *shisham*, which occurs in fair quantities and is always demanded.

3.2 GEOMORPHOLOGY

The entire Shamli district underlains by the quaternary alluvium deposited by Ganga and Yamuna river system. Lithologically the alluvial sediments comprise of sand, silt, clay and kankars in varying proportions. The entire Shamli district is a flat terrain falling in middle Ganga plain. The highest point in the district is 201.00 mamsl in the north and lowest in the south is 222.00 mamsl giving rise an average slope of about 0.40 m/km. north to south. The district can be sub divided into 5 geographic units.

a. Sand Bars:

Along the courses of Ganga and Yamuna rivers, the sand bars are characteristic which dynamically change during floods.

b. Flood Plain:
The flat, low lying poorly drained area adjacent to Ganga and Yamuna rivers forms the flood plains frequented by floods during monsoons.

c. Ravines:
In the western part of the district, this unit is characterised by the gullies along the rivers Kari, Hindon and Krishni. This is probably due to the erosion of unconsolidated material by localised surface run off forming channels and ultimately giving rise to undulating topography and hence the formation of ravines.

d. Younger Alluvial Plains:
The gently sloping (southward) and slightly undulating terrain having ox-bow lakes, back swamp and paleo-channels forms this geomorphologic unit along the western bank of Ganga and eastern bank of Yamuna river in the district. This unit is also called Khadar. In the western part of the district, the Yamuna Khadar in the east of Yamuna river spreads about 12 kms. in the north and narrows down towards the south. In the eastern part of the district the Ganga Khadar (west of river Ganga) is widest (about 20 Kms.) in the north and gradually narrows down to 2 km width around the place called Bhokerhedi.

e. Older Alluvial Plain:
Older alluvial plain may be divided into three parts-

(i) Tract between Ganga canal and Kali river: This is upland with general east to west slopes more considerable than the regional slope of the area *i.e*. north to south. It is marked by natural levees as sand belt stretching north south with heights ranging 3-18 m.

(ii) Tract between Kali and Hindon rivers: Between these two rivers, the upland slopes down to both rivers side and marked by broken grounds which is more in southern part of the district than that in the northern part.

(iii) Tract between Hindon and Yamuna: Between the Yamuna Khadar and Hindon river there is an elevated plateau, where topography along the rivers is uneven due to poor soil character. The area is drained by Yamuna canal and Katna Nala.

3.3 SOIL

The soils in this area are originated from Siwalik Belt of Himalaya. Generally sandy, clay-loam and light loam soils are found. These soils are low-medium in P_2O_5, medium-high in K_2O and higher in organic matter and available sulphur is marginal. Zinc deficiency also found. The soils are naturally fertile and owing to its inherent capabilities, the accumulated deposit of the centuries of grass and foliage has contributed to the enrichment of the humus contents of the soils.

3.4 HYDROGEOLOGY

The entire Shamli district underlains by the quaternary alluvium deposited by Ganga and Yamuna river system. Lithologically the alluvial sediments comprise of sand, silt, clay and kankars in varying proportions. The perusal of all available lithological logs of the tubewells in the area reveal the complex configuration of alluvial sediments showing quick alteration from finer to coarser lithology. By and large the four distinct groups of permeable layers occurs in the area down to 450.00 mbgl.

3.5 DEPTH TO WATER LEVEL

Ground water occurs in pore spaces and interstices of unconsolidated alluvial sediments under phreatic to semi confined to confined conditions. The near surface aquifer is under unconfined / water table condition. The shallow phreatic aquifer is tapped by dugwells. The depth to water ranges from 5.20 to 12.95 mbgl in pre monsoon period whereas it ranges from 3.50 to 10.95 mbgl in post monsoon period.

3.6 CLIMATE AND RAINFALL

The average annual rainfall is 753.2 mm. The climate is sub humid and it is characterised by general dryness except in the brief monsoon season, a hot summer and pleasant cold season. About 80% of rainfall takes places from June to September. During monsoon surplus water is available for deep percolation to ground water. There is a meteorological observatory at Meerut, which may be taken as representative of meteorological condition. May is the hottest month. The mean daily maximum temperature is about 40^0C, mean daily minimum temperature is about 24^0C and maximum temperature some time rises to 44^0C. With the onset of southern monsoon by the end of June, there is appreciable drop in temperature. January is the coldest month with mean daily temperature at about 20^0C and mean daily minimum at 7^0C. The air is dry during the year. In south-west monsoon season, the air is very humid and April and May are usually driest months. The mean monthly relative humidity is 67%. The mean wind velocity is 6.70 km.p.h. The potential evapotranspiration is 1545.90 mm. The climatological data of Shamli district is given in Table 3.1.

Table 3.1:
Climate Data of Shamli District

month	1	2	3	4	5	6	7	8	9	10	11	12
mm	37	18	23	5	11	62	317	264	197	56	6	12
°C	14.0	16.5	21.8	27.4	31.8	32.4	29.6	28.6	28.2	24.7	19.1	15.3
°C (min)	7.6	9.4	14.2	19.3	24.1	26.3	25.7	25.1	23.8	18.1	11.1	7.9
°C (max)	20.5	23.7	29.4	35.6	39.5	38.6	33.5	32.2	32.6	31.3	27.1	22.7
°F	57.2	61.7	71.2	81.3	89.2	90.3	85.3	83.5	82.8	76.5	66.4	59.5
°F (min)	45.7	48.9	57.6	66.7	75.4	79.3	78.3	77.2	74.8	64.6	52.0	46.2
°F (max)	68.9	74.7	84.9	96.1	103.1	101.5	92.3	90.0	90.7	88.3	80.8	72.9

3.7 IMPACTS AND MITIGATION MEASURES

The pollution potential of the project, its probable impacts on surrounding environment and the proposed mitigation measures for control and abatement of pollution are described in the following sections.

3.7.1 AIR ENVIRONMENT

IMPACTS

Although the clay mining does not impose any direct impact on the existing air quality. However, transportation and processing of raw clays into the products could cause atmospheric pollution. In clay/soil mining, the source of air pollution is the fugitive dust arising during the excavation and transportation. Loading and unloading of brick clay would be associated with the fugitive dust emission in the active area/villages situated adjacent to road. Another source of air pollution would be rShamliing of vehicles.

MITIGATION MEASURES

- All trucks/tractor trolleys will be covered by tarpaulin sheet to prevent dust emission.
- Regular water sprinkling shall be done on the haul road
- Overloading of trucks/tractor trolleys shall be avoided
- Vehicular emission can pose serious health hazard. Tractor trolleys/truck are diesel operated vehicles and apart from gaseous emission, it also emits PM_{10} and $PM_{2.5}$. It is well known fact that the combustion of diesel generates small particulate matter and gaseous emission like nitrogen oxides and sulphur dioxide.
- Ultra low sulphur diesel shall be used in the vehicles.
- Regular maintenance of the vehicles will be carried out and fitness certificate from the concerned authority shall be ensured before deployment of the vehicles.
- CPCB prescribed emission Standard for the vehicle would be adhered to.
- Green belt shall be developed all along the periphery with native species having high tolerance index.

3.7.2 WATER ENVIRONMENT

IMPACTS

As far as impact on surface water is concerned, during mining, transportation and processing, there are chances of contamination of surface water bodies (pond, well *etc.*) with dust or other means. The labourers working in the clay mining and those moulding clay into bricks come from neighbouring villages in large numbers. Due to inadequate facility of waste disposal may lead to surface water contamination. Further, air pollutants would also be generated from firing and baking of the clay bricks, settling of the same on the surface water bodies.

MITIGATION MEASURES

- Safeguard will be taken against health risk on account of breeding vectors in the water bodies created due to burrowing/excavation of soil by sprinkling of pesticides.

- Labourers would not be allowed to throw trashes in the water bodies.
- Utmost care will be taken to minimize or control oil spills or leakage from the vehicles.
- The washing of tractor/trucks nearby the mine lease area shall be avoided.
- Water (ground water) quality monitoring shall be carried out on seasonal basis to ensure that the ground water quality is not affected by the project activities.
- The excavation shall be limited to 1.5 m from the bgl to avoid the intersection of the aquifer.
- The proponent will adhere to the guidelines and rules for proper and scientific method of mining during the brick clay (soil) extraction. Thus, the project activities shall not have any adverse impact on the physical components of the environment and therefore, may not have impact on the recharge of ground water.

3.7.3 LAND ENVIRONMENT

IMPACTS

Clay mining is the process of scooping of brick clay that actively supports the agricultural activities of an area. The removal of naturally formed soil from clay particles is really a loss forever of this fertile natural medium. The entire process is a kind of man made erosion of materials otherwise segregated by the Mother Earth through its geological process. The top soil is usually fertile in nature. The surface (top) layer is several folds richer in N, P, K and other mico-nutrient elements than subsurface layers. But according to some farmers of the area, the top soils of certain areas of the agricultural land are unsuitable for agricultural activity. But the subsurface layers seem to be more fertile and good for cultivation. In such cases, removal of top layer from the surface would be beneficial for the farmers.

Some of the pits may later be restored to the original level and some of the pits may be converted into water pond. The artificial ponds created in random locations due to indiscriminate clay mining may lead to land stability problems in the adjoining areas. The problem of subsidence will be aggravated in areas where the subsurface geology is with sand and clay alterations. Disposal of packing material, carried by workers may pose impact on the land. This packing material would include used sachet/gutka/pan mashala pouches. Polythene bags used by the workers to bring their meal *etc*.also is cause of concern.

MITIGATION MEASURES

- Top soil (0-6 inches) will be scooped first and stored for further reclamation of the mined out areas. Clay/soil mining will be limited to 1.5 m only from the general ground level.
- No foreign material like polythene bags, jute bags, sachets, pouches and useless articles should be allowed to remain/spill on the land or no pits/pockets will be allowed to be filled with such materials.
- Mining will not exceed beyond the extraction depth.

3.7.4 NOISE ENVIRONMENT

IMPACTS

As far as noise is concerned, clay mining does not contribute much, except the noise generated from the vehicles that transport raw clays scooped from lands and the products from the clay-based industrial units. Noise level in the working environment is compared with the standard prescribed by Central Pollution Control Board which has been adopted and enforced by the Govt. of India through The Noise Pollution (Regulation and Control) Rules, 2000 for Ambient Air *w.r.t.* Noise.

MITIGATION MEASURES

- Regular maintenance of vehicles shall be ensured.
- Only the vehicles having valid fitness certificate shall be deployed.
- There shall be restriction on vehicular movement during the night time.
- Plantation shall be done all along the periphery of the mining lease area which acts as noise barrier.

3.7.5 ECOLOGICAL ENVIRONMENT

IMPACTS

The area where brick clay mining is carried out is usually agricultural and barren land devoid of any natural vegetation. The process of mining and reclamation in the fringe areas of the mines, in fact, foreclose the option of natural regeneration of land. As regards agriculture, any type of quarrying or reclamation would pose some impacts on the area. The magnitude of such impacts is proportional to the area under quarry or to the extent of area brought under reclamation. There will not be any adverse impacts on the biological environment in the surrounding areas. Further, there is no natural habitat, Wildlife Sanctuaries within 15 km radius of the quarry.

MITIGATION MEASURES

As there is no any adverse impacts envisaged, mitigation measures has not been delineated.

3.8 GREENBELT DEVELOPMENT PLAN

Raising vegetation cover as "Green Belt" on the main roads, connecting road and briddle paths will play a significance role in mitigating atmospheric and noise pollution by filtering, absorbing, metabolizing and detoxifying or accumulating the pollutants. Suitable plant species for green belt development, air pollution abatement in villages and noise pollution abatement through green belt (Bhattacharya 1994; and Rao 1983; Varshney 1996) are listed in Tables 3.2.

Tables 3.2:
The Trees Proposed for Avenue Plantation

Scientific Name	Common Name	Pollution Control Features
Acacia nilotica	Babul	Air Pollutant Abatement
Azadirachta indica	Neem	Air Pollutant Abatement
Dalbergia sissoo	Shisham	Air Pollutant Abatement
Ficus benghalensis	Bargad	Air Pollutant Abatement
F. religiosa	Peepal	Air Pollutant Abatement
Zizyphus mauritiana	Indian plum, Ber	Air Pollutant Abatement
Mangifera indica	Aam	Air Pollutant Abatement
Populus ciliate	Popular	Fast growing with adequate canopy
Terminalia arjuna	Arjun	To stop soil erosion

3.9 SOCIO-ECONOMIC ENVIRONMENT

In the trade-off between the socio-economic needs and environmental conservation, generally, the former takes the upper hand. In a situation where competing demands do occur, choice of the most environmentally viable activity is extremely difficult. The mining of brick clay (soil) from agricultural land is not an exception. On one hand, the demand for construction material is to be met as there are some of the basic needs inherent in variable scale of development. In the process, the resource demand for such activities is bound to shoot up. However, the environmental viability of these activities cannot be ignored. As regards socio-economic condition of the project area, the clay mining activity provides employment opportunities to various people. The economic base of the region will also be enhanced, if the mining is allowed. In the case of land use, it is clear that any type of mining would drastically change the existing land use and /or settlements. The brick clay mining is a good potential for providing employment to the local villagers. There are about 20-35 labourers at each of the brick clay mines and at brick kiln in the remote villages.

EMPLOYMENT

The socio-economic conditions of the surrounding villages indicate that employment generation is seasonal. The occupational activities are agriculture, cattle rearing and employment in mines but on daily wages. The mining activity will provide employment to local people which will increase socio-economic status of the area. There is possibility of creation of direct and indirect employment opportunities.

IMPROVEMENT IN INFRASTRUCTURE

The commencement of mining activity will enhance the socio-economic and physical infrastructure in the adjoining areas.

- Improvement in physical infrastructure like development of road network;
- Improvement in Social Infrastructure;
- Potential of Employment Opportunities;
- Contribution to the Exchequer;

- Prevention of illegal mining;
- Improvement in the aesthetic value

3.10 ENVIRONMENTAL MANAGEMENT PLAN

Environmental Management Plan (EMP) reviews the adequacy of various pollution control measures envisaged for the brick clay mining for mitigating various environmental impacts identified and assessed in the earlier sections. Additional mitigatory measures, if required to ensure sustainable development are also suggested. It describes administrative aspects of ensuring that mitigatory measures are implemented and their effectiveness is monitored. It also includes green belt development plan. Environmental monitoring programme has been presented in **Section 3.11**.

Each of the mitigatory measure has been assessed with respect to

- Identification of human resources for its effective implementation;
- Allocation of financial resources for its effective implementation and
- Effectiveness of mitigatory measure in mitigation of impacts.

EMP specifies various technological measures for pollution prevention, waste minimization, end-of-pipe treatment, attenuation *etc.* proposed to be undertaken to mitigate the environmental impacts on each sector of environment during each phase of the project. The responsibility for implementation for all mitigatory measures rests with the brick kiln owner. However, at this stage, it is not possible to give a detailed physical and financial plan for individual measures.

- A berm will be left from the adjoining field having a width of 0.95 m. Further plantation will be done on the berm.
- No labour camp will be established at the mining site.
- No cooking, or burning of woods will be allowed at the mine site.
- Cutting of trees shall be avoided.
- Prior to commencement of mining, a short awareness program will be conducted for labours to make them aware of way of working and various precautionary measures to be taken while at work.
- Collection and analysis of air and water samples at strategic locations shall be undertaken at suitable interval and frequency.
- Measurement of depth to water level in the vicinity of the mining lease area shall be taken twice a year.
- Plantation/afforestation will be undertaken along the mining lease
- The project proponent of the brick clay mine shall be in regular touch with the local villagers for implementation of various Community Development Programmes.

3.11 ENVIRONMENTAL MONITORING PROGRAMME

To evaluate the effectiveness of Environmental Management Plan (EMP) regular monitoring of the important environmental attributes shall be taken up as per the details depicted in the Table 3.3.

Table 3.3:
Proposed Environmental Monitoring Programme

Environmental Attributes	Locations	Frequency
Ambient Air Quality PM_{10}, $PM_{2.5}$, SO_2 and NOx	Nearest Habitation	Once in a Year
Water Quality As per IS:10500 and IS:2286	Nearest Surface Water Body and hand Pump	Once in a Year
Noise Level Day and Night Time (Leq)	Nearest Habitation	Once in a Year
Soil Quality Availability of Nutrients	Nearest Agricultural field	Once in a Year

3.12 CORPORATE SOCIAL RESPONSIBILITY

Various Community Development Programme (CDP) shall be under taken by the project proponent in close coordination with the local villagers, local authority of the State Government. An amount of Rs 1.00 lakh has been earmarked for the CDP. Following activities shall be undertaken under the CDP:

- Regular medical camps will be organized in the surrounding villages.
- Various supporting items like Hearing Aids, Tri-Cycle and Wheelchair *etc.* will be provided to the physically challenged persons
- At least 5 toilets shall be constructed in the villages every year to provide the hygiene environment to the underprivileged.

3.13 MINE CLOSURE PLAN

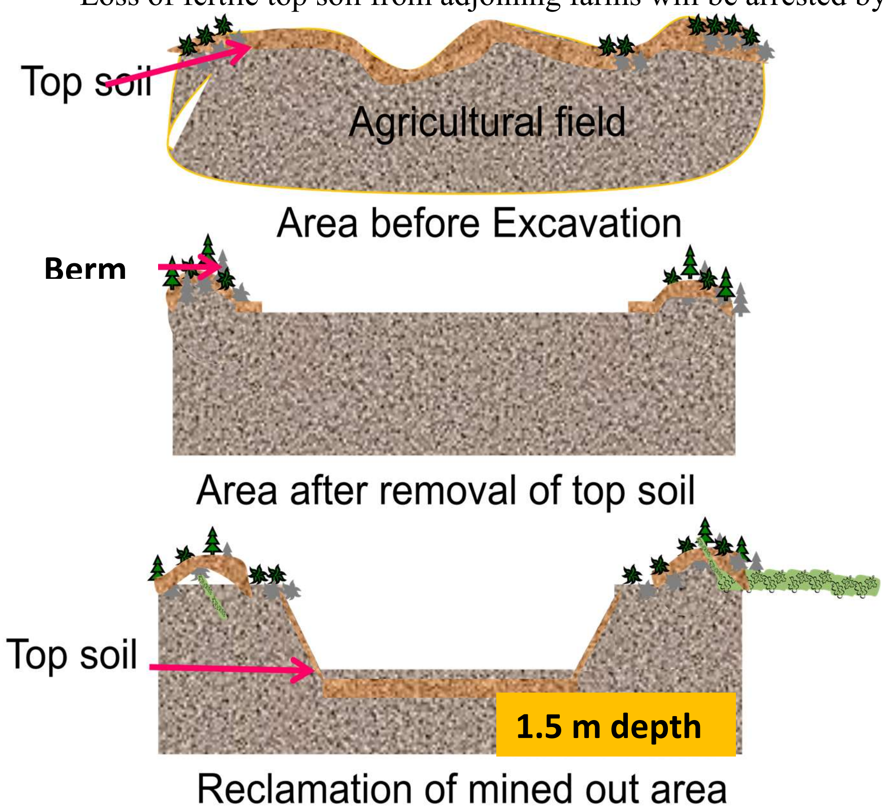
Project:	M/s MAA SHAKTI BRICKS Brick Earth Mining Project
Project Proponent (Lease Holder):	Mr. Harsh Chaudhary Add: Village: Malaindi, Tehsil ; Shamli , Dist: Shamli , Pin Code : 247776
Proposed Project Location:	Village: Kabaraut Tehsil: Shamli , Distt.: Shamli, PIN Code-247775
Gata No.:	665, 618
Quarry Area:	4.481 Ha.
Type of Land:	Private Agricultural Land taken on lease

Closure Plan

- The rehabilitation of the land shall be done by refilling of the upper layer of soil which was separately stored by removing the top layer of soil in the project site after the mine closure.
- Wire fencing will be done around the excavation site with the help of bamboo poles for safety precautions.

Stabilization of Slope:

- Planting of fast growing local species *e.g.* Sabai grass *etc.* Having extensive root system, so as to bind the soil.
- Plantation of bio vegetative species along the bund wall to act as a fence.
- Plantation across the slope so as to arrest the soil movement due to wind and water erosion.
- Loss of fertile top soil from adjoining farms will be arrested by making bund walls.



FINANCIAL ASSURANCE

An amount of Rs. 1.00 Lakh has been earmarked for the mine closure plan as detailed in Table 3.4.

Table 3.4:
Details of Financial Budget for the Mine Closure

Sl. No.	Activity	Amount (INR)
1	Maintaining bund wall, plantation on benches	0.70 Lakh
2	Leveling & landscaping of flat pit area and making it fit for cultivation. Formation of Bund walls around excavation plot	0.30 Lakh
Total		**1.00 Lakh**