

Executive Summary (English & Khasi Language)

for setting up of

1.0 Million TPA Integrated Cement Plant & 30 MW Coal Based Captive Power Plant

at

**Village: Umlong, Near Lumshnong, Rymbai Elaka,
Sub-division: Khliehriat,
District: Jaintia Hills, Meghalaya**

Project Proponent

Nilanchaal Cement Pvt. Ltd

**B-27A, Sector – 3, Noida – 201 301
Uttar Pradesh**

EIA Consultant

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English Language

Executive Summary

Introduction

M/s Nilanchaal Cement Pvt Ltd. (NCPL) is a new company promoted by Dharampal Satyapal Group (DS Group) and propose to setup a 1.0 Million TPA Cement production unit at Village Umlong, Elaka Rymbai, District Jaintia Hills, and Meghalaya State.

The Project would also include coal based 30 MW Captive Thermal Power Plant (CPP) (2X10MW in Phase-I & 1X10MW in Phase-II) at the proposed Cement manufacturing unit.

The Environmental Studies were carried out for the proposed power plant as per Terms of Reference (ToR) No. J-11011/25/2010-IA.II (I) dated June 22nd, 2010, EIA Notification 2006, Ministry of Environment and Forests (MoEF) & J-11011/25/2010-IA-II (I) dated July 21st 2010.

1.0 Project Description

The land of 250 Acres has been identified in the region of village – Umlong (near Lumshnong), Sub-division: Khliehriat, District – Jaintia Hills, State - Meghalaya for the proposed 1.0 million TPA Integrated Cement Plant with Captive Thermal Power Plant. The criteria for land selection is based on the availability of suitable land close to good quality limestone reserves, minimum R & R issues, proximity to rail and road connectivity, as well as power evacuation facility, distance with respect to coal transport and availability of water. The salient features of the proposed project and site attributes are presented in the following table.

Table - Salient Features of Project

Nature of the Project	Integrated Cement Plant (1.0 million TPA) along with Captive Power Plant (FBC, 30 MW)
Size of Project	Set up of Cement Plant with production capacity 1.0 MioTPA and Captive Power Plant of capacity 30 MW (2x10 MW Pahse-I & 1x10 MW Phase-II)
Location of Project	
District & State	Jaintia Hills, Meghalaya
Taluk / Subdivision	Khliehriat
Village	Umlong P.O. (Lumshnong)
Land Requirement	250 Acres
Nature Of The Area	Barren Land
Latitude	N 25°10' 53.18"
Longitude	E 92°20' 4.59"
General Climatic Conditions	
Maximum Temperature	30°C
Minimum Temperature	3°C
Annual Rainfall (average)	2232 mm

Wind Pattern During Study Period	East
Elevation Above Mean Sea Level	615 m
Accessibility	
Road Connectivity	The proposed plant site is about 7-8 kms from NH-44 Shilong – Silchar Road and is connected to highway by 3.5 m wide PWD road.
Rail Connectivity	Badarpur is the nearest meter gauge (MG) railway station of N-E Frontier railway at about 70 Km distance from the proposed plant site. Guwahati is the nearest broad gauge railway station from the proposed plant site at a distance of about 240 Km.
Airport	Umroi (Shilong) and Silchar, which are at 150km each from the proposed plant.
Historical / Important Places	
Archaeological/ Historically Important Site	None within 10 kms radius of the proposed site
Sensitive Places	None within 10 Kms radius of the proposed site
Sanctuaries / National Parks	No Sanctuaries/National Parks are within 10 Kms radius of the proposed site
Forests	Narpuh Reserve Forest (3.9 km)
Water Bodies	Umsu River (7.3 kms) Lukha River (8.0 kms) Lyber (Seshympa) Nallah (1.5 Kms) A seasonal Nallah (through plant site)

List of Other Existing Industries				
S.No.	Name of the Industry	Location	Distance in kms	Direction
A Industries in Operation				
1	Cement Manufacturing Co. Ltd. 0.92 mtpa cement plant	Lumshnong	8	South East
2	Meghalaya Cement Ltd. 0.97mtpa cement plant	Thangskai	4	NE
3	JUD Cement Pvt. Ltd. 0.30 mtpa cement	Wah-iazer	8.5	East
4	Adhunik Cement Ltd. 1.3 mtpa clinkerisation & Cement unit	Thangskai	2.0	East
5	Green Valley Industries Ltd. 0.43 mtpa cement	Nongsning	8.5	North
6	Hill Cement Ltd. 0.3 mtpa	Mynkre	7.0	North
B Industries in Project Stage				
1	Amrit cement 1.5 mtpa	Umlaper	4	North
2	Goldstone Cement Ltd, 1.80 MTPA	Old Musiang	2.0	North

		Lamare		
3	Cosmos Cement	Sutnga	40	NE

Basic Requirement for the Proposed Project

The general characteristic of the 250 Acres area selected for the 1.0 Million TPA Integrated Cement Plant and 30 MW Coal Based Captive Power Plant is that the entire southern part of Meghalaya in fact displays a classic section of Cretaceous-tertiary sedimentary rocks. The land use break-up for various units and facilities in the proposed plant is based on the MoEF Guidelines. The layout of the proposed plant has been optimized considering the space requirements of all major equipment, plant buildings and structures, raw material/ fuel storage area, product silos, start-up fuel oil tanks, pump house, water treatment plant, cooling tower, cooling water pump house, switchyards, etc.

Raw Material Requirement

The raw materials required for production of cement and power are summarized below:

S.No.	Material	Source category	Source locality	Distance from plant (km)	Quantity required/ Annum
1	Limestone	Proposed captive mine	Umrasiang in Jaintia Hills District	8	1.26 Mio T
2	Shale/Clay	Purchased	Tomshnong in Jaintia Hills District	25	0.2173 Mio T
3	Sandstone	Proposed captive mine	Umrasiang in Jaintia Hills District	10	0.01638 MioT
4	Gypsum	Purchase	Kothakpa (Bhutan) Rangia (Assam)	650	0.0525 Mio T
5	Mill scale	Purchase	Byrnihat, Guwahati (Assam)	230	0.00945 Mio T
6	Flyash	Purchase	Farakka (West Bengal) Kahalgaon (Bihar) Barh stations (Bihar)	790	0.08 Mio T
7	Coal	Purchase	Wapung, Sutnga, Myndihati	50	0.2313 Mio T

Fuel

Use of Meghalaya coal as a fuel has been considered for the plant. Coal is being exploited locally by private parties in the areas around Wapung and Sutanga, which are located at a distance of about 40-50 Km from the proposed plant site. Coal with maximum of 20-28% ash with 2.4-5.0% sulphur content, which will be fired in cement plant kiln and power plant boilers directly.

2.0 Description Of the Environment

The study area covers 10 Km radius of the proposed site for cement plant along with captive power plant at village Umlong, in Jaintia hills district of Meghalaya.

The baseline environmental quality was assessed for the Post Monsoon Season-2010.

The regional climate of Jaintia hills District is moderate. Warm and humid conditions are prevalent in the foot hills region in the south and sub-mountain region in the North and central uplands. The maximum temperature reaches to 30°C in the month of April. While minimum is recorded as 3°C in the month of January. Rainfall occurs during the monsoon period which extends from May to October. June & July months receive the maximum rainfall. The average annual rainfall of the district is 4000 mm.

Air Environment

During the study period, the predominant wind direction, was mostly observed to be towards West. The wind speed ranged from 0 to 5.2 m/sec.

The ambient air quality monitored at 10 locations selected based on predominant wind direction, sensitive areas, and human settlements indicated the following ranges for specified parameters:

PM ₁₀ -	20.0 - 32.3 µg/m ³
PM _{2.5} -	4.1 - 7.3 µg/m ³
SO ₂ -	3.1 - 1.3 µg/m ³
NO _x -	4.7 - 15.8 µg/m ³
CO -	0.7 – 1.0 µg/m ³

The concentrations of PM₁₀, PM_{2.5}, SO₂, NO_x, and CO values were within the National Ambient Air Quality Standards .

Noise Environment

The noise levels were measured at 10 locations within 10 km radius study area of the proposed project site.

The noise levels are primarily due to vehicular traffic and other anthropogenic activities. During the study period, during day time, the noise equivalents observed (L_d) were found to be in the range of 49.2—50.7 dB (A) while during night time the noise equivalents (L_n) were found to be in the range of 42.1—43.4 dB(A).The Overall maximum noise equivalent was observed at Umlong with maximum values of 50.7 dB(A) during the day. The lowest noise equivalents were observed at Lokadong during the night time with value 42.1 dB(A). The noise levels were observed within standard limits laid down for residential areas by CPCB. The relative high values of noise recorded in some rural areas were primarily due to vehicular traffic and other activities.

Water Environment

Ground and surface water samples were collected from 8 different locations within study area. The water quality parameters investigated from the study area were found to be fit for human consumption in accordance with IS:10500. Most of the heavy metals in all samples were found to be below detectable limits.

Land Environment

The soil samples were collected from 6 locations within study area and analyzed for all the important parameters like pH, electrical conductance, calcium, magnesium, nitrogen, phosphorus, potassium, etc. The NPK represents the nutrients available in the soil, which directly indicates the soil fertility. The range of variation of different parameters found in the study area explained briefly.

The study area of 10 km radial distance from the plant which is about 31416 ha is dominated by Open forest 18248.71 ha (58.09%), Crop land 4488.50 ha (14.29%), Dense forest 3728.11 ha (11.87 %), Fallow land 2058.81 ha (6.55 %), Land with/without shrub 1594.65 ha (5.08%), Mining Area 418.29 ha (1.33 %), Barren Land 608.00 ha (1.94%) and water body 270.85 ha (0.86 %).

Flora & Fauna

Assessment of floral and faunal species carried out by collating the field studies with the available information and the data authenticated by the Forest Department. The proposed project may have marginal impact on flora and fauna of the region.

Socio-economic Environment

The study area consists of 69 villages. Total population of the study area is 4466 with males comprising of 2318 and females 2148. The male and female ratio of the study area is 927 females per every 1000 males. The average literacy rate in the study area was found about 36.27%. The basic Infrastructural facilities such as educational, health, drinking water, post office and electricity are available in most of the villages.

People prefer to work as labour in nearby industrial area and also in construction projects. Livestock and related activities help in the improvement of economy of the area.

3.0 Anticipated Environmental Impacts And Mitigation Measures

During the Operation Phase the major sources of air emissions are from mills, kiln, crushers, stock piles and boiler from CPP. Noise levels at Cement plant and CPP. Wastewater and Solid waste generation from CPP.

Air Environment

Operations of the proposed cement plant and captive power plant will have various sources of emissions i.e., Particulate matter (PM), Sulphur dioxide (SO_2) and NO_x . The Major sources of air emissions at cement production plant are:

- Lime stone crushing
- Raw material handling/ transport & storage
- Raw material, fuel and finish material grinding operations
- Clinkerisation
- Packing and loading

The Major sources of air pollution in a coal-based power plant are:

- Boilers,
- Coal crushers, transport and storage

With the provision of ESP of high efficiency (99.89%) particulate matter emissions will be limited to 50 mg/Nm³. The emissions of NO_x will be controlled by using low NO_x burners.

The predictions using Industrial Source Complex AERMOD view Model indicated that the maximum incremental 24 hourly Ground Level Concentrations of PM, SO_2 and NO_x will be 2.54 $\mu\text{g}/\text{m}^3$, 10.15 $\mu\text{g}/\text{m}^3$ and 9.17 $\mu\text{g}/\text{m}^3$ respectively at a distance of 2.5 km from the emission source towards West direction.

The predicted GLCs when superimposed on the baseline concentrations indicated that the air quality will be within the prescribed NAAQ Standards for residential areas in the post-project scenario.

The cement and power plant main machinery and auxiliaries will be designed to meet the emission norms within the prescribed standards. The stacks for the proposed cement and captive power plant will be designed to meet an emission limit of 50 mg/Nm³.

Following air pollution Control measures will be adopted:

- Sprinkling of water at regular intervals on main haul roads and service roads.
- Dust suppression system to be adopted while unloading/ dumping of raw materials.
- Bag filters to be provided at all material storage, transfer points and for dedusting of exhaust gases at main process department.
- Electrostatic precipitators will be used at cement plant Clinker Cooler, Power plant boiler for controlling stack emissions within 50 $\mu\text{g}/\text{Nm}^3$.
- Dust suppression will be carried out to reduce fugitive emissions at coal handling area, cement mill area and transfer points by water sprinklers.
- Adequate thickness of insulation will be provided at required points to control thermal heat loss.
- Plantation of wide leaf trees, creepers, tall grass around the working areas, along the roads and in buffer zones will help in suppression of dust and minimizing of dust

pollution.

Noise Environment

Noise will be generated due to operations at cement and power plant. The noise generating sources in the plant includes rotating equipments like mills, fans, compressors, feed pumps, boiler, super heater safety valves, steam turbine, movement of vehicles and other machinery in plant and mines etc. Noise control will be an integral part of the plant design. The equipments will have inbuilt noise control devices and the measured noise produced by any equipment will not exceed 85 dB(A) at a distance of 1 m from source in any direction.

Following noise pollution Control measures will be adopted:

- Proper and regular maintenance of vehicles, plant machinery and other equipment
- Provision of ear plugs to the workers/ staff at sites of high noise generation
- Limit the time exposure of workers in the excessive noise zone, noise proof cabins will be provided to operators wherever feasible.
- Reduction of noise generation by proper lubrication of plant machinery and equipment from time to time.
- Limiting the speed of trucks to moderate speeds to prevent undue noise due to empty truck movement.
- The noise produced in valves and piping will be attenuated to 75 dB(A) at a distance of 1 m from the source by using low noise trims, baffle plate silencers/line silencers, acoustic lagging (insulation), thick-walled pipe work etc.

The ambient noise levels in the region are between 39.8 and 53.5 dB (A) and are predicted to be within the permissible limits with the proposed mitigation measures even after commissioning of the cement and power plant.

Water Environment

The water requirement for cement plant, captive power plant and colony has been estimated 4000 m³/day. Water demand can be met from the perennial water stream which is flowing close to plant site.

Water is required for equipment cooling, drinking, sanitation, horticulture, etc apart from Process water. A suitably designed water treatment and chlorination plant will be installed. Water will be stored in an underground tank for plant and overhead (OH) tank for drinking purpose. For plant equipment, water will be recirculated after cooling to avoid any wastage and only losses will be made up from fresh water.

The liquid effluents mainly come from water treatment plant, cooling tower blow down and boiler blow down. Some waste water will be coming out from domestic usage at plant and colony which will be used for horticulture. The treated effluents will not be discharged from the power plant as this water will be utilised for dust suppression in coal yard and ash yard and for gardening purpose. No condenser cooling water is proposed to be drawn from or discharged to any inland water bodies for the proposed plant.

Solid waste

Burning of coal in the boiler results in generation of both coarse ash and fly ash. The coarse ash collected from bed ash coolers, economizer and air heater hoppers will be conveyed to ash silo by pneumatic system. The main solid waste from the proposed operations of cement and power plant will be Total ash (fly ash and bottom ash), which will be generated at the rate of 88.2 TPD and used / burnt refractory.

The fly ash will be collected in electrostatic precipitator (ESP) hoppers. The fly ash collected in ESP hoppers will be transported through pneumatic conveyors and will be stored in the fly ash silos. The fly ash thus collected will be sent to cement plant and will be used in the cement manufacturing process. The used burnt refractory generated is used for land filling/ pavement work along roads.

Ecology

There are no national parks/ wild life sanctuaries/ places of historical importance located with in 10 km radius of study area. If the mitigation measures for solid waste management are strictly followed then there will not be any significant impact on biodiversity. Narpuh Reserve Forest is located 3.9 kms away from the proposed plant site, within 10 km study area.

Socio-Economic Environment

The proposed project site is coming on barren land and does not cover any habitation thus will not require any relocation or resettlement. The proposed project is expected to have several positive impacts on demography and socio-economic conditions by way of increase in employment opportunities leading to reduction in migration of locals for employment; growth in service sectors; improvement in prices of indigenous produced material and services benefiting local people; improvement in transport, communication, health and educational services etc.

Health & Safety Measures

Pollution due to dust, noise and water mainly impose health hazards for workers and hence NCPL will strictly implement all the prescribed safety measures to ensure safe working atmosphere within the prescribed limits.

Well equipped health centre with experienced Doctors and other staff will be established by NCPL near the project site. Periodic health check up will be carried out for staff and their families. Health camps will be organized in surrounding villages from time to time. Demonstrations and Lectures on First aid, personal hygiene, Safety, Environmental Hygiene will be provided to concerned staff on regular basis.

3.0 Environmental Monitoring Programme

Environment Management Cell will monitor the environmental related parameters and manage them in the proposed plant site as per CPCB and MoEF guidelines.

Monitoring Program

The Environment Management Cell is the nodal agency to co-ordinate and to provide necessary services on environmental issues during operation of the project. This environmental cell is responsible for implementation of environmental management plan, interaction with the environmental regulatory agencies, reviewing draft policy and planning. This cell will interact with Meghalaya State pollution Control Board and other environment regulatory agencies. The cell also interacts with local people to understand their problems and to formulate appropriate community development plan.

Environmental Laboratory Equipment

The plant will have an in-house environmental laboratory for the routine monitoring of air, water, noise, and soil quality. For all non-routine analysis, the plant management may utilize the services of external laboratories.

4.0 Additional Studies

Risk Assessment & Environment Management Plan

Possible emergencies that can arise in the plant due to operations, storages and handling of the fuels and gases are:

- Explosion in boilers, turbo generators, transformers
- Heavy leakage and subsequent fire in the fuel oil handling area and storage tanks
- Large fires involving the coal stockyard and coal handling areas including fine coal bins
- Chlorine leakage in the water treatment plant etc.
- Short circuit in Electrical wiring

Out of these, the major fire and explosion hazards are due to storages of LDO/HSD and cylinders of chlorine.

The high intensity thermal radiation contours due to Preheating of raw meal, hot air ductings LDO/HSD storage tanks on fire would be confined to the plant premises. Hence, the effect of thermal radiation levels on general public outside the plant premises would be insignificant. To minimize the risk, adequate insulation systems, firewater cooling system and foam facilities will be provided as per OISD standard measures of safety requirements.

The threat zones due to the storage of gas cylinders would be within the plant premises.

- All standard measures of safety such as regular inspections of piping for damage and corrosion;
- Storages in a cool, dry, and well-ventilated area away from incompatible materials in tightly sealed containers;
- Labelling in accordance with OSHA's Hazard Communication Standard;
- Special training in safety to workers handling and operating chlorine containers, cylinders,

- Approved storage cabinets, tanks, rooms and buildings to store cylinders will be taken.

All the instruments like pressure, temperature transmitters/gauges and alarms switches and safety interlocks will be tested for their intended application as per the preventive maintenance schedule. Similarly, the emergency shutdown system will be tested as per the preventive maintenance schedule.

Hydrocarbon, smoke and fire detectors will be suitably located and linked to fire fighting system in the vulnerable zones to reduce the response time and ensure safe dispersal of vapours before ignition can occur. Combustible materials will not be kept in storage and process areas as well as road tankers loading/unloading sites where there is maximum possibility of presence of flammable hydrocarbons.

Disaster Management Plan

The DMP will be designed to intercept full range of hazards specific 'to cement and captive power plant such as fire, explosion, major spill etc. Emergency medical aids to those who might be affected by incident heat radiation flux, shock wave overpressures and toxic exposure will be inherent in the basic capabilities. The most important capability of this DMP will be the required speed of response to intercept a developing emergency in good time so that man made disasters are never allowed to happen.

Since the fire and explosion hazards in these plants mainly occur in the event of loss of containment, one of the key objectives of technology selection, project engineering, construction, commissioning and operation is "Total and Consistent Quality Assurance". The DMP will consist of "On-site Emergency Plan" and "Off-site Emergency Plan" and will be prepared in consonance with the guidelines laid by the MoEF.

6.0 Environmental Budget

Nilanchaal Cements Private Ltd (NCPL) has proposed to take adequate measures to mitigate all possible adverse impacts at the plant premises. NCPL has earmarked an amount of `32 Crores for the Environmental Protection cost for the proposed plant and annual recurring cost is about `1.60 Crores.

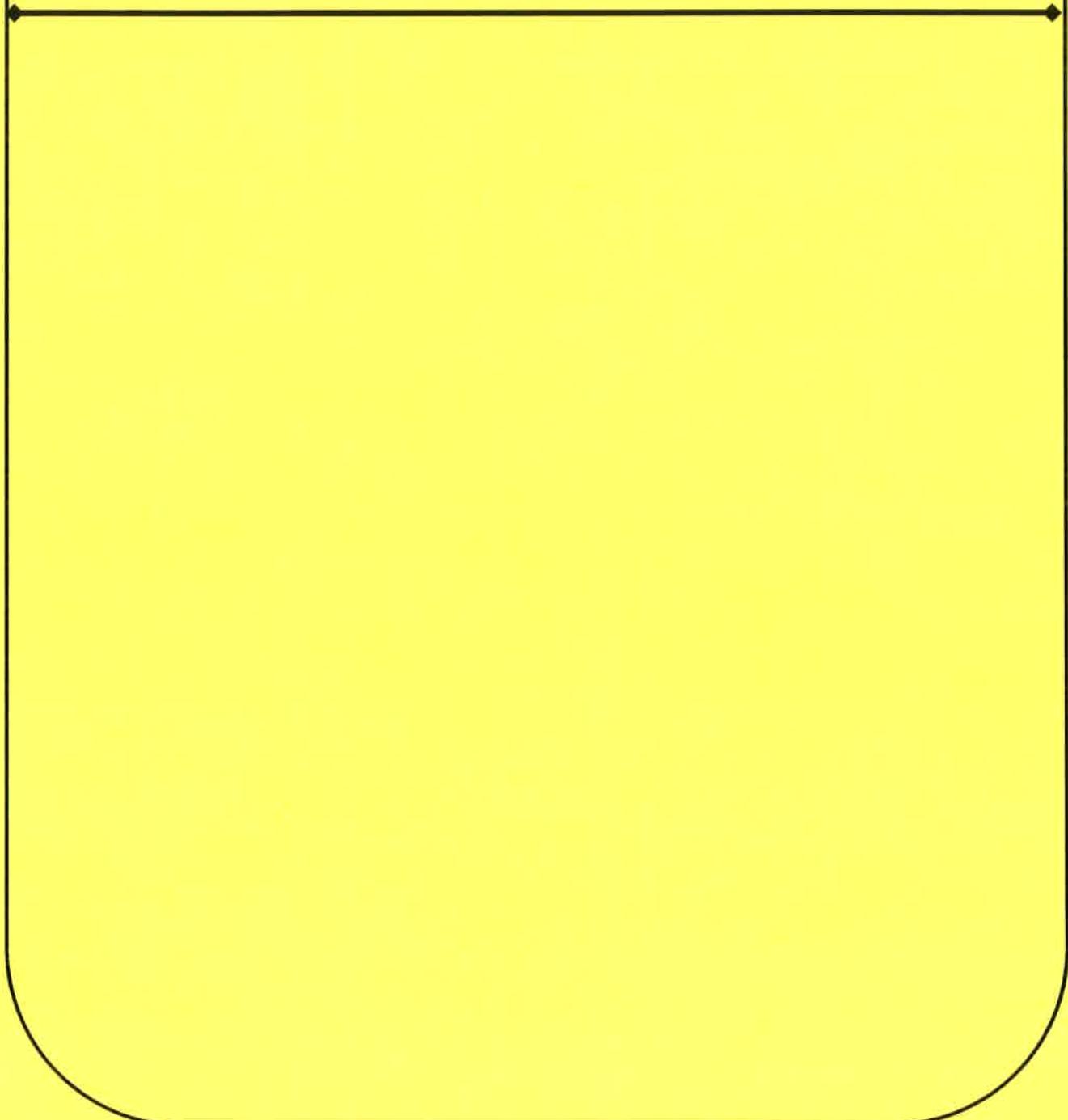
7.0 Project Benefits

- Increase in employment opportunities and reduction in migrants to outside for employment.
- The project would provide direct and indirect employment opportunities.
- Increase in literacy rate.
- Growth in service sectors
- Improvement in socio cultural environment of the study area.
- Improvement in transport, communication, health and educational services.
- Increase in employment due to increased business, trade commerce and service sector.

8.0 Conclusion

The potential environmental, social and economic impacts have been assessed. The proposed plant has certain level of marginal impacts on the local environment. With effective implementation of proposed environment management plan, these effects will get marginalized. Implementation of the project has beneficial impact in terms of providing direct and indirect employment opportunities. This will be a positive socio-economic development in the region.

Khasi language



Executive summary

[Ka jingpyni kyllum jong ki nongpyniaid]

Ka jinglamphrang

M/s Nilanchaal Cement Pvt Ltd. (NCPL) ka kompani thymmai bala pynkyntiew da ka ds group ka don ka jingthmu haka ban buh iaka kharkhana shna dewbilat,kaba lah ban pynmih shi milian(1.0million) ton u dewbilat haka shisnem.ia kane ka kharkhana,ladon ka jingthmu haka ban tei iaka,haka shnong umlong,elaka rymbai,jaintia hills district,Meghalaya state.

Kane ka projekt kan kynthup ruh haka ban pynmih bording na u dewiong hapoh ka kharkhana dewbilat hi,kumba 30mw(2X10MW hakaba sdang & 1X10MW hadien pat).

Ia ka jingpule hakaba iadei bad ka mei mariang nakabynta kane ka kharkhana bala thmu ka long katkum ki kyndon (terms of reference no.j-11011/25/2010 – IA.II (I) dated june 22nd, 2010,EIA notification 2006,ministry of environment and forests (MoEF) bad j – 11011/25/2010 – IA.II (I) dated july 21st 2010.

1.0 ka jingbatai iaka project

ka jaka kumba 250 acres haka shnong umlong (hajan lumshnong),sub-division khliehriat,district – jaintia hills,Meghalaya state,la shim ba kan long kum ka jaka ban tei ia kane ka kharkhana shna dewbilat,kaba lah ban pynmih shi milian(1.0million) ton u dewbilat haka shisnem bad ruh ka jaka pynmih bording hapoh ka kharkhana dewbilat hi. Ka jingshim iakane ka jaka ka long halor ka jingdon jong ka jaka ba biang hajan u mawshun ba bha, kajingduna ha ki issue ba iadei bad ki jaka pynjah thait, ka jingjan jong ka jingdon jong ka lynti rel bad u surok bah, kumjuh ka bor jong ka jinglah ban pynriah,ka jingjingai hakaba iadei bad ka kit ka bah ia u dewion bad ruh ka jingdon jong ka um. Ki jonglong jong ka projek bad ki jingling ka jaka la ai kumne harum.

Table – ki jingling ba kongsan jong ka projek

Kyrteng ka projek	ka kharkhana shna dewbilat,kaba lah ban pynmih shi milian(1.0million) ton u dewbilat haka shisnem kynthup ruh haka ban pynmih bording na u dewiong hapoh ka kharkhana dewbilat hi,kumba 30MW
Jingheh ka projek	Ban tei iaka projek kharkhana shna dewbilat,kaba lah ban pynmih shi milian(1.0million) ton u dewbilat haka shisnem kynthup ruh haka ban pynmih bording na u dewiong hapoh ka kharkhana dewbilat hi,kumba 30mw(2X10MW hakaba sdang & 1X10MW hadien pat).

Location of Project / ka Jaka jong ka projek	
District & State	Jaintia Hills, Meghalaya
Taluk / Subdivision	Khliehriat
shnong	Umlong P.O. (Lumshnong)
Jingdonkam jaka	250 Acres
Jingling jong ka jaka	Barren Land
Latitude	N 25°10' 53.18"
Longitude	E 92°20' 4.59"
Jingling ka suinbneng	
Shit eh	30°C
Khriat eh	3°C
U slap haka shisnem (average)	2232 mm
Ka liang jong ka lyer haka por ba pule.	East
Ka jingkynjang na sla duriaw	615 m
Accessibility/ka jinglait lynti syngkein	
Road Connectivity/u surok	Kane ka jaka bala thmu ka don kumba 7-8 kms from NH-44 Shilong – Silchar Road and bad la pyniasoh ia kane ka jaka sha u NH da u surok PWD ba 3.5 m haka jingheh.
Rail Connectivity/ka lynti rel	Ka Badarpur ka dei ka jaka kaba ia jan eh ha ka jingdon ka lynti rel na kane ka kharkhana kaba don kumba 70 Km ka jingjngai na kane ka kharkhana dewbilat ba la thmu ban tei. Ka Guwahati ka dei ka station rel kaba heh tam, bad kaba ka jingjngai jong ka na kane ka kharkhana ka long kumba 240 Km.
Airport/ka jaka sangeh airplein.	Ka Umroi (Shillong) bad Silchar, ki don kumba 150km na kane ka kharkhana ba la thmu ban tei..
Jaka don nam	
Ki jingtei bad ki jaka ba bna nam naduh mynbarim .Important Site	Ym don hapoh 10 kms
Ki jaka ba sheptieng ban duh noh.	Ym don hapoh 10 Kms sawdong kane ka kharkhana ba la thmu ban tei.
Jaka ri mrad khlaw / National Parks (ka park jong ka sorkar kmie).	Ym don hapoh 10 Kms sawdong kane ka kharkhana ba la thmu ban tei.
Ki khlaw	Khlaw narpuh (3.9 km)
Ki wah um	Wah umso (7.3 kms) Wah lukha (8.0 kms) Wahduid Lyber (Seshympa) (1.5 Kms) Wahduid haki por lyiur (ha jaka ban buh iaka projek.)

Ka kyrteng ki kharkhana bala don lypa				
S.No.	Kyrteng ki kharkhana	jaka	Jingjngai'kms'	Ka liang
A	Kharkhana bala trei kam			
1	Cement Manufacturing Co. Ltd. 0.92 MTPA Cement plant	Lumshnong	8	Shathie lam mihngi
2	Meghalaya Cement Ltd. 0.97 MTPA Cement plant	Thangskai	4	Shatei lam mihngi
3	JUD Cement Pvt. Ltd. 0.30 MTPA Cement plant	Wah-iazer	8.5	mihngi
4	Adhunik Cement Ltd. 1.3 MTPA clinkerisation & Cement plant	Thangskai	2.0	mihngi
5	Green Valley Industries Ltd. 0.43 MTPA Cement plant	Nongsning	8.5	shatei
6	Hill Cement Ltd. 0.3 MTPA	Mynkre	7.0	shatei
B	Jingtrei Kharkhana ha ka Kyrdan jong ka projek			
1	Amrit Cement Ltd 1.5 MTPA	Umlaper	4	shatei
2	Goldstone Cement Ltd, 1.80 MTPA	Old Musiang Lamare	2.0	shatei
3	Cosmos Cement Ltd, 2.5 MTPA	Sutnga	40	Shatei lam mihngi

Ki jingdonkam kiba hakhmat duh naka bynta ka projek bala thmu

ka jingling kyllum jong kane ka jaka kaba 250 acres ka jingheh naka bynta kane ka kharkhana shna dewbilat, kaba lah ban pynmih shi milian(1.0million) ton u dewbilat haka shisnem bad ruh ban pynmih bording na u dewiong hapoh ka kharkhana dewbilat hi,kumba 30mw,kalong ba baroh kane ka bynta ba shathie jong ka Meghalaya haka jingshisha ka pyni ia ka jingdon jong ki maw barim naduh kulong kunah,ia kiba latip kum ki cretaceous – tertiary sedimentary rocks. La pyn bynta ia ka jaka ha ki ba bun bynta kat kum ki kyndon bala buh da ka MoEF naka bynta baroh ki tiar ki tar ba kongsan, ki ing sah,ka jaka buh ia u mawshun bad ruh ia u dewiong, ki jaka shongkai iaidkai, jaka buh umphniang,ka jaka pump,ka jaka pynkhuid iaka um,jaka pyndait thah, jaka pyndaithah iaka um, bad ka jaka ban control ia baroh ki jingpyntrei kam ia ki tiar mashin baroh,bad kumta ter ter.

Kie Ki mar ba donkam

Ki mar ba pyndonkam haka ban pynmih dewbilat bad bording elektrik ki long:-

S.No.	U mar	Ioh na ei	Jaka ba ki don	Ka jingjngai na ka kharkhana (km)	Quantity required/ Annum
1	Limestone	Lum mawshun lajong	Umrasiang in Jaintia Hills District	8	1.26 Mio T

2	Shale/Clay	thied	Tomshnong in Jaintia Hills District	25	0.2173 Mio T
3	Sandstone	Lum mawshyiap lajong	Umrasiang in Jaintia Hills District	10	0.01638 Mio T
4	Gypsum	thied	Kothakpa (Bhutan) Rangia (Assam)	650	0.0525 Mio T
5	Mill scale	thied	Byrnihat, Guwahati (Assam)	230	0.00945 Mio T
6	Flyash	thied	Farakka (West Bengal), Kahalgaon (Bihar), Barh (Bihar) stations	790	0.08 Mio T
7	Coal	thied	Wapung, Sutnga, Myndihati (Jaintia Hills)	50	0.2313 Mio T

U mar ban pynmeh ding

ia u dewiong ba mih na Meghalaya hi,la shim ban pyndonkam kum u mar ban pynmeh dingla u dewiong lah ban ioh na ki jaka ba marjan jong ka kharkhana kum ka wapung bad sutnga kaba jngai kumba 40 - 50 Km na ka kharkhana. la u dewiong u ba don bun eh u dpei kumba 20 – 28% ryngkat 2.4 – 5.0 % u sulphur, yn sa pyndonkam ban thang haka tyndur bad ruh haka boilers jong ka jaka pynmih bording.

2.0 ka jingbatai iaka mei mariang

ka jaka bala pule bniah naka bynta kane ka project ka kynthup ruh ia ki 10 kms sawdong jong kane ka projek. kane ka jaka ban ieng kane ka projek kan long haka shnong umlong, ha jaintia hills jong ka jylla Meghalaya.

la ka jinglong tynrai jong ka mariang la pule hadien ka aiom lyiur jong u snem 2010.

Ka jinglong jong ka pyrthei mariang (suinbneng) hakane ka jaka ka long shit ruh em, khriat ruh em. Ka jingshit ryngkat bad ka haw haw ba don jynhaw um ki don haka trail um haka bynta ba shathie bad ha ki bynta shiteng jong ki lum ha ki bynta ba shatei, ruh haki bynta ba ha pdeng jong kane ka thain. Ka jingshit kaba heh duh ka long kumba 30°C ha u bnai april. Bad ka jingriat eh ka poi haduh 3°C ha u bnai January. U slap u wan barabor haki por lyiur, kata naduh u bnai may haduh u October. U slap u jur than ha u bnai june bad july. Ka jingkhein pdeng ia ka jingioh slap ka thain haka shisnem ka long 4000 mm.

Ka lyer

Haka npor ka jingwad bniah, la lap baka jingbeh jong ka lyer, ka ba bun eh ka dei sha ka liang mihsngi. ka jingsted jong ka lyer kalong 0 haduh 5.2 m/sec.

Ka jingpule iaka jinglong ka lyer ha ki 10 jaka bala jied bad katkum ka liang ba beh ka lyer,ki jaka ba donka jingma ban duh noh,bad ka jaka shong jong ki briew,ka pyni iakine ki jingthew harum.

PM_{10} -	20.0 - 32.3 $\mu\text{g}/\text{m}^3$
$PM_{2.5}$ -	4.1 - 7.3 $\mu\text{g}/\text{m}^3$
SO_2 -	3.1 - 1.3 $\mu\text{g}/\text{m}^3$
NO_x -	4.7 - 15.8 $\mu\text{g}/\text{m}^3$
CO -	0.7 – 1.0 $\mu\text{g}/\text{m}^3$

Ka jinglang jong kiei kiei haka lyer kaba PM_{10} , $PM_{2.5}$, SO_2 , NO_x , and CO,ka long katkum ka standard jong ka National Ambient Air Quality Standards naka bynta ki jaka ba don ka jingma naka jingsniew jong ka lyer.

Ka jinghalla

Ia ka jinghalla ruh la thew haki 10 jaka bala jied,kata hapoh ki 10 kms sawdong naka projek.Bun eh ki jinghalla ki wan na ki kali bad katto katne naki jingtrei kam ki briew hakato ka jaka naka bynta ka ioh ka kot jong ki.haka por ba pule,haka por mynsngi,ka jinghalla bala ioh(Ld) ka don hapdeng ka 49.2 – 50.7 dB (A) bad mynmiet pat ka jinghalla (Ln) ka don kumba 42.1—43.4 dB(A).iaka jinghalla kaba heh duh la lap haka shnong UMLONG haka jingthew kaba 50.7 dB(A) haka por mynsngi. Ka jinghalla kaba duna eh la lap haka shnong LAKADONG haka por mynmiet ryngkat bad ka jingthew kaba 42.1 dB(A). la lap ba ka jinghalla ka dang don katkum ka standard bala ai daka CPCB. Ka jingioh iaka jingthew kaba heh haki katto katne ki jaka ka dei namar ka jingiaid ki kali bad ruh kiwei ki kam.

Ka um

La shim samples haki 8 ki jaka bapher bapher kiba hap hapoh ka jingpule,naka bynta ka um ba tuid na sla khyndew bad ruh iaka um ba napoh ramew.iaka um bala pule la lap baka long kaba bit ba ki briew kin bam kin dih naka bad kane ka long katkum ka IS:10500. Ki don tang khyndiat eh ki kynja nar haka um,kiba bym da don jingktah ei ei.

Ka khyndew ka shyiap

Iaka khyndew la shim naki 6 tylli ki jaka bad la pule ruh iaki jingthew kum iaka pH, electrical conductance, calcium, magnesium, nitrogen, phosphorus, potassium, etc. ka NPK ka pyni iaka jingdon jong ki kynja jingbam ba don haka khyndew,kaba pyni ruh baka khyndew ka long kaba seisoh bha.ia ki jingthew baroh la batai lyngkot kumne:-

Ka jaka ba pule ba 10 km naka kharkhana kaba ka jingheh ka long kumba 31416 hecters la tap da ki khlaw sanium kumba 18248.71 ha (58.09%), jaka rep 4488.50 ha (14.29%), law bah 3728.11 ha (11.87 %), jaka bympat pyndonkam ban rep = 2058.81 ha (6.55 %), jaka ba khlem

da don wat tang ki diengrit/tang katto katne 1594.65 ha (5.08%), par maw 418.29 ha (1.33 %), jaka shrah 608.00 ha (1.94%) bad ki jaka um 270.85 ha (0.86 %).

Ki dieng ki siej bad ki mrad ki mreng

Ka jingwad bniah iaka jingdon ki dieng ki siej bad ki mrad ki mreng ka long katkum ka jingwad bniah bala don lypa bad ia kiba la pynshisha daka department jong ka tnat sorkar ba dei peit ia ki khlaw.kane ka projek kan don tang khyndiat eh ka jingktah ha kaba iadei bad ki dieng ki siej bad ki mrad ki mreng jong kane ka thain.

Ka ioh ka kot haka imlang sahlang

Ka jaka bala pule ka kynthup iaki 69 tylli ki shnong.ka jingdon bries ka long 4466 ngut,kynthup ia ki shynrang 2318 bad ki kynthei 2148.ka ratio jong ka jingdon kynthei ia u shynrang ka long 927 ngut ki kynthei ia 1000 ngut ki shynrang.ka jingnang jingstad ha kane ka jaka ka long 36.27%.kiba bun ki shnong ki don iaki jaka pule,jaka ai dawai,ki umbam umdih,ki ing dak bad ruh ka ding elektrik.

Ki bries ha kine ki jaka ki jied barabor ban trei kum ki libar haki kharkhana ba marjan bad ruh haki jingtei iaki kam kharkhana,haka rep ka riang bad kiwei de ki kam kiba iarap iaka ioh ka kot jong ka jaka.

3.0 ka jingktah ia ka mei mariang bad ki lad ban iada na ka jingshahktah

Haka por ka jingpyntreikam ia ki jingtei,ka jingkmih ka lyer sniew ka long na ka mills(mashin), kiln(tyndur), crushers(jaka tylliat), stock piles(jaka stok) bad ka boiler fna CPP. Ka lebel jong ka jinghalla haka kharkhana bad ka CPP. Ka um jakhlia bad kiwei ki jakhlia balong eh ba mihi naka CPP.

Ka lyer

Ka jingpyntrei iaka ne ka kharkhana dewbilat bad ka jingpynmih bording bala thmu ka sa don shibun ki jingpynmih sha ka lyer kum ki Particulate matter (PM)(phngit), Sulhpur dioxide (SO_2) and NO_x . Ki jaka ba don ka jingpynmih jakhlia ba hakhmat duh ki long:-

- Lime stone crushing(jaka tylliat maw)
- Raw material handling/ transport & storage(ka kit ka bah)
- Raw material, fuel and finish material grinding operations (ka jaka pynlwet)
- Clinkerisation
- Packing and loading (jaka pynsong bad jaka thep)

Ki bynta ba ha khmat duh ba don ki jingpynmih shaka lyer ha ka jaka pynmih bording ka long: -

- Boilers, (jaka tiew)
- Coal crushers, transport and storage (jaka pynlwet ia u dewiong,jaka buh bad ka kit ka bah)

Da ka jingdon ki ESP kiba khlain bor (99.89%) ia ki phngit la pynduna ka jingmih jong ki;kata tang 50 mg/Nm³. Ia ka jingmih ki NO_x yn control da ka jingpyndonkam da ki jaka thang ba duna NO_x .

Ka jingpyni lypa dakaba pyndonkam iaki Industrial Source Complex AERMOD view Model,la pyni ba ka jingkiew kine ki jakhlia ba mih haka lyerkum ka PM, SO₂ and NO_x kan long 2.54 µg/m³, 10.15 µg/m³ and 9.17 µg/m³ ha ka jingjingai kaba 2.5 km naka jaka ba don kane ka jingmih bad sha ka liang ba sep ka sngi.

Ka jingpyni lypa GLCs haba la khein iaka jinglang jong ki ka pyni baka jinglong jong ka lyer ka dang long katkum ka standard bala ai da ka NAAQ naka bynta ki jaka sah brieuw hadien ka jingpyntreikam iaka projek.

Iaki tiar mashin ba pyndonkam ha ka kharkhana dewbilat bad haka jaka pynmih bording,yn sa bishar bha bad ruh ban buh da kiba duna ka jingdon ka jingpynmih iaka lyer ba sniew,khnang ba ka jinglong jong ka lyer kan long kat kum ka ka bor bala ailad daka National Ambient Quality standards. Iaki tiar mashin ba pyndonkam ha ka kharkhana dewbilat bad haka jaka pynmih bording,yn sa bishar bha khnang ban lah ban pynioh iaka jingpymih tdem kaba 50 mg/Nm³.

Kine harum kin long ki lad ban iada ia ka jingsniew jong ka lyer:-

- Yn synreit um haki surok man ka por.
- Yn pyndonkam da ki tiar katkum ka juk naka bynta ban pynduna ia u pump um haka por ba pynhiar/buh ia u mar.
- Yn aid a kit kynja pla philter ha baroh ki jaka stok,jaka transphar bad ruh naka bynta ban pynduna ia u pum pum bad ka lyer sniew haki jaka treikam ki tiar mashin.
- Yn sa buh da ki Electrostatic precipitators ha ki bynta u Clinker Cooler, Power plant boiler naka bynta ban ioh ia ka jingmih ka lyer sniew kaba tang 50 µg/Nm³.
- Yn pyndonkam da ki tiar synreid um katkum ka juk naka bynta ban pynduna ia u pum pum haki jaka ba ba kit ba pynhiar ia dewiong,jaka kit dewbilat,bad ka jaka tranphar mar.
- Yn sa pyntap rben bha hakino kino ki jaka ba donkam khnang ban lait naka jingduh noh jong ka jingkhuit.
- Ka jingdon jong ki dieng ki siej ha ki katto katne ki jaka hapoh kharkhana kan iarap haka ban pynduna iaka jingpynmih ka lyer ba sniew..

Ka jinghalla

Ka jinghalla kan sa don daka jingpyntreikam iaka kharkhana bad ka jaka pynmih bording.ka jinghalla ha ka kharkhana ka wan bha na ka jingiaid bad tyllun ki mashin,ki pangkha,ki turbine,na ki kali motors,na boiler bad ruh naki wei ki mashin haki jaka tylliat bad jika tih ia u mar. Ban pynduna ia kane ka jinghalla ka long ka kam baha khmat duh ia ka jingpyndonkam iaki tiar kiba katkum ka juk mynta. Ki tiar ba pyndonkam ha ka kharkhana kin don ki tiar ban pynduna ia ka jinghalla bad kane kam dei ban tam iaka 85 dB(A) haka jingjingai kaba 1 m naka jika ba mih ka jinhalla ka nakano kano ka liang ruh.

Kine harum kin long ki lad ban pynduna iaka jinghalla:-

- Ka jingphikir bad peit bniah iaka jingtrei kam jong baroh ki tiar mashin ba pyndonkam.kumjuh ruh iaki kali motor.
- Yn sa aid a ki jingset shkor ia ki nongtrei kiba trei haki jaka bah eh bha ka jinghalla.
- Ban pynduna ia ka por trei ki nongtrei ha kine ki jaka ba don ka jinghalla kaba kham heh.
- Yn sa pynduna ruh iaka jingmih ka jinghalla naki tiar mashin,da kaba pyntah ia ka grease,ka umpiang hakine ki tiar mashin na kawei ka por sha kawei pat.
- Ban pynduna ia ka jingiaid stet ki kali,khamtam iaki trok.
- Ia ka jinghalla ba mih na ka valves and piping yn sa pynbiang kumba 75 dB(A) haka jingjngai 1 m naka jaka ba mih dakaba pyndonkam da ki low noise trims, baffle plate silencers/line silencers, acoustic lagging (insulation), thick-walled pipe work etc.

Ka jinghalla haki bynta ba shapoh(sla khyndew) jong ka haw hawT ka long hapdeng 39.8 bad 53.5 dB (A) bad la pyni lypa ba kan sa don katcum ki kyndon bal ah ban shah bad ryngkaty bad ki lad ban iada hadien bala pyntreikam iaka kharkhana dewbilat bad ruh ka jaka pynmih bording.

Ka um

Ka jingdonkam um baroh haka shisngi ka long 4000 m³/shisngi.kane ka kynthup iaka kharkhana dewbilat,ka jaka pynmih bording bad ki ingsah.ia kane ka jingdonkam um,yn sa pyndap daki wah ba tuid baroh shisnem najan jong ka kharkhana.

Iaka um yn sa pyndonkam iaka haka ban pynpjah iaki tiar mashin,ban bam ban dih,ka khuid ka suba,ka rep jhur bad ki syntiew ki skud, bad ruh haki ba bun ki jaka ha ka kharkhana. Ia ka um yn sa pynkhuid shwa ban sam sha ki ing sah khamtam.iaka um ban pyndonkam haka ban bam ban dih ynsa buh ia ki tanky halor bad ia ka um ban pyndonkam ha kharkhana yn sa buh ia ka tanky jong hapoh khyndew. Iaka um ba mih naka jingpyndonkam iaki mashin,yn sa pyniaid biang sha ki tiar mashin hadien baka la pjah bad namarkata ka um kaban sa suh noh khyndiat ka long ka um dih.

Kiba bun ki kynja um ba mih na kiba bun ki bynta jong ka kharkhana.katto katne ka um jakhlia kan wan na ki ingsah bad ia kane yn sa pyndonkam hakaban thung jingthung. Ia ka kynja um ba mih naka jaka pynmih bording yn ym pynmih shabar namar yn pyndonkam da kane hi ka um ban pynduna ia u pump um haki jaka buh ne pyntreikam ia u dewiong bad ruh u dpei.yn ym don condenser cooling water ba la thmu ban shim bad ruh ban pynlait ia ka kynja um sha kino ki um ba tuid na sla khyndew.

Kio jakhlia ba low eh

Ka jingthang ia u dewiong haka boiler ka wanrah iaka jingmih jong u dpei ba ni bad ruh u ba kham heh.ia u dpei ba kham heh yn sa pynlang na trai ka coolers,na ka tiar pynduna dpei bad naka air heater The coarse ash collected from bed ash coolers, economizer and air heater hoppers bad yn sap hah sha jaka buh lyngba ka jingpyndonkam da ki kynja tiar. Ka jingjakhlia ba kynja maw ban mih na ka kharkhana dewbilat bad na ka jaka pynmih bording kan long ka Total ash (fly ash and bottom ash), ia kaba la mih haka jinglah kaba 88.2 TPD bad pyndonkam/thang khlem da don ba complaint.

Ia u dpei u ba her (fly ash) yn sa pynlang ha ka electrostatic precipitator (ESP) hoppers. Ia u dpei ba Executive Summary 8 Bhagavathi Ana Labs Ltd., Hyderabad.

her bad bala pynlang yn sa pynkit lyngba ki pneumatic conveyers bad sa stoor iaki haki jaka ba don bad ki jingbu. Bad ia une u dpei yn saphah sha ka kharkhana dewbilat bad ia une yn sa pyndonkam haka ban shna dewbilat. ia ki dpei kiba mih naka jingpyndonkam ban thang pat yn sa pyndonkam kum ka khyndew ban pyndap iaki jaka ba thliew bad ruh kum ka jingiaid lynti baroh shilynter ka surok.

Ka mei mariang

Ym don national parks/ wild life sanctuaries(jaka ri mrad khlaw)/ jaka bna nam hapoh 10 km sawdong ka kharkhana. Lada ia ki lad iada la bud bha naka bynta ki jakhlia ba long kynjaw maw,yn ym don ei ei ka jingktah ia ka mei mariang baroh kawei.ka Narpuh Reserve Forest ka don kumba 3.9 kms naka jaka ban pynieng iaka kharkhana , kaba mut ka don hapoh kitei ki 10 kms sawdong bala pule..

Ka ioh ka kot

Ia Ka projek bala thmu kan sa wan haki jaka balong shrah bad ruh haki jaka bym don ei ei kiba don jingim.kane ka projek kan wan rah ia shibun ka jingmyntoi ha baroh ki liang khamtam haka ba iadei bad ka jingkiew haka lad iohkam ioh jam,ka jingpynduna iaka jingmih nala ki shnong ban leit trei shawei,ka jingkiew hakiwei ki liang ki kamai kajih,ka jingiohdor ia ki mar ki mata ba mih nakito ki jaka,ka jingbha ki lynti syngkein,ki lad phah khubor,ka jingkoit jingkhiah bad ruh ka jingwanpoi ka jingtip jingstad hala shnong bad bun kiwei ruh ki jingmyntoi

Ka jingkoit jingkhiah bad ki lad jingiada

Ka jingjaboh/jakhlia ba wan na u pump um,na ka jinghalla bad ka um,ka long hakhmat eh ka jingwanrah iaka jingma iaki nongtrei bad dei namarkata ka NCPL kan sa bud thik pa thik ia baroh ki lad jingiada khnang ban pynioh ka lyer bad ka sawdong kaba khlem ka jingma iaki nongtrei.

Yn sap plie ia ka hospital kiba biang ki tiar ki tar kiba katkum ka juk mynta bad ruh ka ban biang lut ki nongtrei naduh ki doctor bala experience haduh ki nurse,daka NCPL hajan naka kharkhana. Yn sa ai checkup man ka por iaki nongtrei bad ka ing ka sem jong ki baroh. Yn sa organised iaki health camp haki shnong ba marjan hamanla kipor.yn sa iai pynbna bad hikai naka por sha ka por hakaba iadei bad ka first aid,ka jingle khuid lade,bad ka lad jingiada.

4.0 Ki rukom- ka program ban peit bniah iaka mei mariang

Ka Environment Management Cell ka sa kit khlieh naka bynta ban pule bniah iaka jinglong jong kiba bun ki bynta jong ka mei mariang hakane ka kharkhana bala thmu,katkum ki kyndon jong ka CPCB bad MoEF.

ka program ban peit bniah

Ka bynta jong ka jingtreikam jong ka kharkhana kaba dei peit beit tang iaka jingpyndonkam iaka mariang(Environment Management Cell),kan long maka ban pyniajan ialade bad kiwei ki deparment bad ruh ban ai ia kino kino ki jingiarap haka por ban tei iaka projek bad kumjuh ruh por ba pyntreikam iaka projek. Kane ka bynta ka don ka jingkit khlieh ban pyntreikam ia kino kino ki plan haka iadei bad ka mei mariang,ban ia kren bad kino ki kiba dei peit ia ki ain ki kanun

hakaba iadei bad ka mariang, bad ruh ban iai peit bniyah ia ka policy hakaba iadei bad ka mei mariang. kane ka department kan iakren bad ka meghalaya state pollution control board (MSPCB) haka ba iadei bad ki kyndon ha kaba iadei bad ka jingpyndonkam iaka mei mariang. kane ka department ruh kan sa shim ka jingkitkhlieh ban iakren bad ki trai shnong ha kato ka jika bad ban sngewthuh ia ki jingeh jong ki bad ban thaw ka plan naka bynta ban iarap iaki.

Environmental Laboratory Equipment /ki tiar ban pyndonkam ha ka lab kaba iadei bad ka mei mariang.

Ka NCPL ka sa buh ia ka lab naka bynta ka jingtest ia ka jinglong ka mei mariang bad ia ki bynta jong ka hi naduh ka lyer, ka um, ka jinghalla bad ruh ka jinglong jong ka khydew. Naka bynta kiwei ki jingtest ki ba bymdei man ka por, ka kharkhana kan sa shim iaka jingiarap naki lab ba nabar

5.0 ki jingpule bniah shuh shuh -Additional Studies

Ka jingpule iaka jingma & ka plan ban pyndonkam ia ka mariang

Ki jingjia ba kyrkieh ki lah ban wan haka kharkhana haka por ka jingpyntrei kam ia ki tiar mashin, haki jaka stok, bad haki jaka ba dang trei kam hakaba iadei bad ki mar pynmehding bad ruh ia ka kynja lyer ba pyndonkam. ba kine kin long lehse kum kine ki jingjia bah arum:-

- Ka jingbthei haki boilers, turbo generators, transformers
- Heavy leakage and subsequent fire in the fuel oil handling area and storage tanks
(ka jingpei haki jaka ba pyntreikam iaka umphniang bad ruh ka jaka stok iaki bda bala bud daka jingkem ding kynsan)
- Large fires involving the coal stockyard and coal handling areas including fine coal bins
(ka jingkem ding baklang haki jaka ba pyndonkam bad stok ia u dewiong)
- Chlorine leakage in the water treatment plant etc.
[ka jingpei/liat ka khlorin haka jaka pynkhuid ia ka um]
- Short circuit in Electrical wiring [shot ka light].

Na kine, ka ding baklang bad ka jingbthei kadei da ka jingbuh ia u LDO/HSD bad u kum cylinders chlorine.

Ka bor bah eh jong ka radiation kaba wan naka jingpynkhuid shwa ia u, ka jingdon jong ka lyer khuid ha LDO/HSD tanky naka ding, kan sa long tang hapoh karma jong ka hi. Namar ka, ka jingktah jong ka radiation ba mih na ka jingshit jong ka ding, kan ymdon ka jingktah shaki briew ki don shabar na ka jingbuh. Ban pynduna ia ka jingma, ka jingpyndonkam da ki tiar bym kem ding, ka um pynlip ding, bad ka lyer pynlip ding, yn sa ai ha baroh ki bynta ba kongsan jong ka kharkhana; kata katkum ka standard OISD, ka jingthew ia ka jingdonkam iaki lad jingiada.

Ki phang ba don ka jingma na ki jaka buh ia ka lyer kum gas kan sa long tang hapoh ka kharkhana hi.

- Baroh ki lad jingiada kynthup iaka jingleit ban chek iaki pipe barabor na ki jingsniew baki lah ban don.

- Ba buh haki jaka ba kham pjah,ba rkhiang,bad haki jaka ba biang ki jingkhang iit bad ruh ha ki kum ba la pyndait bha sbak.
- Jingthoh katcum ka OSHA's Hazard Communication Standard;
- Ka Spesial training haka ba iadei bad ki lad jingiada iaki nongtrei kiba trei hakaba iadei bad ki kum gas bad ki jingbuuh khlorin.
- Ki jaka buh(cabinet),tanky,ki karma bad ruh ka ing naka bynta ban buh iaki cylinders,ki dei ban long lypa baroh kiba la approve bad ruh ka ba la deibeit tang naka bynta kane kawei ka kam.

Baroh ki tiar kum ka pressure, temperature (ka jingshit) transmitters/gauges bad ki alarms switches bad iaki lad ban lait naki jingma ba la shim,yn sa test naka bynta ka ka jinglah jong ki ban treikam katcum ki lad jingiada haka por baleh maintenance. Kumjuh, iaka emergency shutdown system ruh yn sa test katcum ki lad jingiada haka por baleh maintenance.

Hydrocarbonka tdem bad ki detectors naka bynta ka jingdon jong ka ding,yn sa pynbuuh haki jaka ba ki dei ban don bad ruh ban pyniasoh iaka bad ka jaka naka bynta ba don ki nongpynlipding haki jaka ba kloiu ban kem ding khnang ban pynduna iaka por iaka jingioh iaka jingtip hakaba iadei bad ka jjingsdang jong ka ding bad ruh khnang ban ioh kloiu ban pynher ia ki jynhaw um hakine ki jaka shwa ba ka ding kan kem. Yn ym buh ia ki mar balah ban kem ding kloiu haka jaka stok bad ka jaka pynmih dewbilat,kumjuh ruh iaki tankers haka por ba thep/pyllait phniang ha ki jaka badon ki hydrocarbon ba kem ding kloiu kloiu.

Ka plan ban iada na ki jingshah pynjot

Ia Ka plan ban iada na ki jingshah pynjot (DMP) yn sa designed ban pynduna ia kano kano ka jingjur jong ka jingpynjot ha ka kharkhana dewbilat bad ruh jaka pynmih bording,kata naki jingpynjot jong ka ding,ka jingbthei,ka jingpei/phlei jong ka umphniang,bad kiwei ruh ki ba wanrah iaka jingma. Kan sa don ka Emergency medical aids(ka jingiarap naka liang ki nongtrei haka ba iadei bad ka koit ka khiah) naka bynta kito lehse kiba lah ban shah ktah na kino kino ki jingma kiba mih haka por ba dang pyntreikam iaka kharkhana;kata naki radiation,na ka jingheh ka pressure,bad ka jingdon jong ki phngit balong bih haki jaka trei bad ruh nakiwei kiwei ruh ki ba wanrah iaka jingma. Ka jingtrei kam kaba kongsan jong kane ka plan,kan sa donkam iaka jingsted ban shim iaki lad jingiada bad ruh ban ioh pynduna ne ban ioh tem kloiu kloiu kino jingpynjotne ki jingma bad ruh khnang ba kum kine ki jingma kin ym jia shuh.

Namar ba ka jingpynjot naka ding bad ka jingbthei ha kane ka kharkhana ki jia barabor namar ka jingduna ha kano re kano ka bynta,ka jingduna ha kawei naki bynta haka por ka jingjied iaki tiar ban pyndonkam,ka jingbakla haka engineering,ka jingbakla haka jingtei,ka jingbakla haka jingpyntreikam,namarkata donkam iaka "Total and Consistent Quality Assurance". Ka plan ban iada na ki jingshah pynjot (DMP) kan kynthup "On-site Emergency Plan[ka plan jingiada ha ka jaka ba don emergency]" bad ruh ka "Off-site Emergency Plan[ka plan jingiada shawei naki jaka ba don emergency]" bad yn sa pynkhreh bad pynkynthuplang kawei katcum ki kyndon bala buh daka MoEF.

6.0 Budget For Implementation Of Environmental Management Plan/Ka Budget Naka Bynta Ban Pyntreikam Ia Ka Emp

Ka NCPL ka don ka jingthmu ban shim ia baroh ki lad ki lynti ban lait naka jingshah pynjot laka dei iaka kharkhana pynmih dewbilat ne iaka jaka pynmih bording.ka NCPL haka juh ka por ka la mang kumba `32 klur naka bynta ka jinglut haka ban iada iaka mei mariang naka jingsniew balah ban mih nakane ka pojek bad ka jingpynlut kan long kumba `1.60 klur haka shisnem.

7.0 ki jingmyntoi kiba lah ban ioh nakane ka project.

- Ka jingkiew haki lad iohkam ioh jam bad ban pynduna iaka jingmih ki trai muluk ban leit trei sha kiwei ki jaka.
- Ka projek kan plie iaka lad iohkam laha kaba iadei ban trei hakane ka projek bad bad ruh leh iakiwei ki jingtrei ba nabar hynrei kiba iadei pat bad kane ka projek hi.
- Ka jingkiew haka jingnang jingstad.
- Ka jingkiew haka liang ki kam ba iadei bad ka jingtrei pynbha pat ia kino kino ki tiar machine bad kiwei kiwei.
- Ka jingpynbha shuh shuh iaka jinglong jingim jong kiba sah ka kato ka jaka bala pule.
- Ka jingpynbha shuh shuh haka liang ka kit ka bah,ki lad phah khubor,ka jingkoit jingkhiah bad ka jingnang jingstad.
- Ka jingkiew ka jingiohkam namar ka jingkiew jong ka lain khaii pateng.

8.0 ki kyntien khatduh

Ia kino kino ki jinglah ban shah ktah ka mei mariang,ka imlang sahlang bad ka ioh ka kot lah dep ban pule bniah.kane ka kharkhana kan don khyndiat eh ka jingktah iaka iaka mei mariang hakato ka jaka. Da ka jingdon bad ruh daka jingpyntreikam bha ia ka plan ban iada,kine ki jingktah yn sa lah ban pynduna iaka bor ka jingktah jong ki. Ka jingwan jong kane ka projek kan wanrah ia ka jingmyntoi shibun eh haka dur jong ki lad iohkam iohjam laha kaba iadei ban trei hakane ka projek bad lane ia kiwei ki jingtrei ba nabar hynrei kiba iadei pat bad kane ka projek hi. Kane hi baroh kin wanrah ia ka jingkiew jong ka ioh ka kot jong ki bries hakane ka thain.