

CIN No. : L26943RJ1979PLC001935
Phone : 01462 228101-6
Toll Free : 1800 180 6003 / 6004
Fax : 01462 228117 / 228119
E-Mail : shreebwr@shreecement.com
Website : www.shreecement.com



SHREE CEMENT LTD.

An ISO 9001, 14001, 45001 & 50001 Certified Company

Regd. Office:

BANGUR NAGAR, POST BOX NO.33, BEAWAR 305901, RAJASTHAN, INDIA

SCL/RAS/MoEF&CC/2021-2022/3098

25/05/2021

To,
Deputy Director General of Forests (C),
Ministry of Environment, Forest and Climate Change,
Integrated Regional Office, Jaipur ,
A-209&218, Aranya Bhawan, Mahatma Gandhi Road,
Jhalana Institutional Area, Jaipur – 304002, Rajasthan

Sub: - Compliance of environmental clearance along with land use land cover report of Nimbeti Limestone Mine of M/s Shree Cement Limited situated near Village – Nimbeti & Jawangarh, Tehsil - Jaitaran, District Pali, Rajasthan.

Ref: - (1) EC. Letter no. J-11015/226/2015-IA.II (M) dated: 11th May 2017, amendment EC letter no. J-11015/226/2015-IA.II (M) dated: November 27th. 2017 & amendment EC letter no. J-11015/226/2015-IA.II (M) dated: February 21th. 2018

Dear Sir,

Kindly refer to the above subjected matter and referred EC letter. We are submitting herewith the six monthly compliance report for the period from **October-2020 to March-2021**, along with report of remote sensing of land use land cover pattern of the entire lease area (core zone) through digital processing which is carried out regularly once in three years (As per general condition no. VIII of referred EC).

This is for your kind information please.

Thanking you,

Yours faithfully,
For Shree Cement Ltd.


(Dr. Anil Kumar Trivedi)
Sr. G.M (Environment)

Copy to:

- 1) The Director (Non Coal Mines), Ministry of Environment, Forest & Climate Change, Indira Paryavaran Bhavan Jorbagh Road New Delhi - 110 003
- 2) The In-Charge (Zonal Office), Central Pollution Control Board (CPCB), Vithal Market, Paryavaran Parisar, E-5, Arera Colony, Bhopal, Madhya Pradesh 462016
- 3) The Member Secretary, Rajasthan Pollution Control Board, 4, Institutional Area, Jhalana Doongri, JAIPUR-302004 (Rajasthan)

o/c Environment Department, Ras

JAIPUR OFFICE : SB-187, Bapu Nagar, Opp. Rajasthan University, JLN Marg, Jaipur 302015
Phone : 0141 4241200, 4241204

NEW DELHI OFFICE : 122-123, Hans Bhawan, 1, Bahadurshah Zafar Marg, New Delhi 110002
Phone : 011 23370828, 23379218, 23370776

CORP. OFFICE : 21, Strand Road, Kolkata 700001 Phone : 033 22309601-4 Fax : 033 22434226

SHREE CEMENT LIMITED; VIII-NIMBETI & JAWANGARH, Tehsil- JAITARAN, Dist- PALI (RAJASTHAN)

COMPLIANCE STATUS OF ENVIRONMENT CLEARANCE :

**EC Letter NO.:J-11015/226/2015-IA.II (M) dated: May 11th, 2017, amendment EC letter no. J-11015/226/2015-IA.II (M) dated: November 27th, 2017 & amendment EC letter no. J-11015/226/2015-IA.II (M) dated: February 21th, 2018
October-2020 to March-2021**

(A) Additional Specific Conditions		
S. No.	Conditions	Compliances
(i)	No mining activities will take place until the permission of the State Government as per Law for diversion of land use change as applicable is obtained.	Mine lease (M. L. No. 91/93) was obtained vide order no. P-3(65/Khan/Group - 1/91) dated 06.08.1996 from the State Government before starting mining activity.
(ii)	The proponent shall install online Ambient Air Quality Monitoring System and there should be system for display of digital AAQ data within 03 months at least at three locations as per wind direction. Online provisions of Ph and turbidity meter at discharge point of STP and ETP and also at water storage ponds in the mining area may be made. Project proponent should display the result digitally in front of the main gate of the mine site.	Continuous Ambient Air Quality Monitoring System (CAAQMS) have been installed at three location of mines as per wind direction. Digital data are being displayed at main gate and SPCB server.
(iii)	Project proponent shall obtain the necessary prior permission from the Central Ground Water Authority (CGWA) for intersecting the ground water table. The intersecting ground water table can only be commence after conducting detailed hydrological study and necessary permission from the CWGA/MoEFCC. The report on six monthly basis on changes in ground water level and quality shall be submitted to the Regional Office of the Ministry, CGWA and State Pollution Control Board.	Presently, mining is not intersecting ground water table in the mine lease areas. However, NOC will be obtain prior permission from Central Ground Water Authority (CGWA) whenever mining will intersect ground water table.
(iv)	Project proponent shall plant the following species for green belt & plantation which are as: Neem (Azadirachta indica), Gulmohar (Delonix Regia), Yellow Gulmohar (Peltophorum Ferriginum), Sesum (Delbergia Sissoo), Karanj (Pongamia pinnata) Parkinsonia (Parkinsonia aculeate), Ardoo (Alianthus exelsa), Kasood (Cassia siamea), Siris (Albizia lebbeck), Alma (Phyllanthus emblica), Imli (Tamarindus indica), Ber (Ziziphus mauritiana), Jamun (Syzygium cumini), Raintree (Samanea saman). Shrubs plantation in Mine area: Tecoma (Tecoma gaudi chaudii), Krishanchura (Caesalpinia pulcherrima), Jetropha (Jetropha curcas), cassia biflora and Mehndi (Lawsonia inermis).	Native and local species of plant sapling is being planted for plantation and greenbelt development within mine lease and outside areas. Native species of trees planted are Neem, Karanj, Gulmogar, Yello gulmohar, Nili gulmohar, Ardoo, sesum, parkinsonian, Siris, saptakarni, amaltash, kanakchampa, etc. Native species of shrubs planted are Tecoma, Krishanchura, Jetropha, kachhnaar, Harsingar, Chandani etc

(v)	The project should also implement community development and welfare programme in the area of health, education and environmental protection.	Company is working on extensive community development and welfare programmes in the area of health, education and environmental protection. under CSR activities. Total expenses on social welfare activities for the 2019-2020 was INR 432.16 lacs for all units of cement, power and mining.
(vi)	Proponent shall appoint Occupational health specialist for regular and periodical medical examination of the workers engaged in the project and maintained records accordingly. Also, occupational health check-ups for workers having some ailments like BP, diabetes, habitual smoking, etc. shall be undertaken once in six months and necessary remedial/ preventive measures taken accordingly. The recommendation of National Institute for ensuring good occupational environment for mine workers shall be implemented. The prevention measure for burns, malaria and provision of anti-snake venom including all other paramedical safeguards may be endured initiating the mining activities.	1. Well-equipped occupation health care center has been established at the site and being operated by occupational health specialist. 2. Well-equipped ambulances are available with adequate medical staff for immediate medical help and refer to the hospital at Beawar. 3. Occupational Health Surveillance programme being carried out on regular basis of workers. 4. Six monthly check up of staff and workers is being carried out for ailments like BP, diabetes etc. No occupational diseases have been reported so far. 5. Mobile van equipped with latest medical facilities, 6. Health camps in nearby villages are organized regularly.
(B) Specific Conditions		
S. No.	Conditions	Compliances
(i)	Environmental clearance is granted subject to final outcome of Hon'ble Supreme Court of India, Hon'ble High Court of Rajasthan and any other Court of Law, if any, as may be applicable to this project.	Will be Complied with as per the order.
(ii)	This Environmental clearance is granted subject to necessary permissions for land use to be obtained from the State Govt. of Rajasthan before commencing the activities.	Mine operation started after lease execution. Mine lease (M. L. No. 91/93) was obtained vide order no. P-3(65/Khan/Group – 1/91) dated 06.08.1996 from the State Government.
(iii)	The Proponent shall ensure that the canal should not be diverted. The 50m buffer zone on either side of stream/canal in lease area and adjoining to the mine lease area shall be maintained.	There is no stream/canal passes from the lease area.
(iv)	No mining activities will be allowed in forest area, if any, for which the Forest Clearance is not available.	There is no forest area within the mining lease.
(v)	The Environment clearance is subject to obtaining requisite NBWL Clearance, if any, from the Standing committee of National Board for Wildlife for Mining project.	NBWL clearance is not applicable in this case, however, for the purpose of Schedule-I animals Peafowl conservation plan has been executed as per approved plan. Details are given as below: 1) Cage for protection of sick birds / injured birds has been given to DFO Pali on dated.15/10/2015. Photographs are enclosed as annexure 1.

		<p>2) Awareness programmes have been organized for conservation and protection of peafowl in nearby schools and villages. Photographs are enclosed as annexure 1.</p> <p>3) Plant saplings have been distributed to the villagers for enhancement of biodiversity. Photographs are enclosed as annexure 1.</p>
(vi)	The project Proponent shall obtain Consent to Operate from the State Pollution Control Board, Rajasthan and effectively implement all the conditions stipulated therein.	Consent to Operate have been obtained from Rajasthan State Pollution Control Board and complying all the conditions stipulated within.
(vii)	The proponent shall install online Ambient Air Quality Monitoring System and there should be system for display of digital AAQ data within 09 months at least at three locations as per wind direction. Online provisions of pH and turbidity meters at discharge points of STP and ETP and also at water storage ponds in the mining area may be made. Project proponent should display the result digitally in front of the main Gate of the mine site.	<ul style="list-style-type: none"> • Agreed, 03 nos AAQMS has been installed within mine lease area. Real time data are also displaying digitally in front of main gate. • There is no waste water discharge.
(viii)	The report on six monthly basis on changes in Ground water level and quality shall be submitted to the Regional Office of the ministry, CGWA and State Pollution Control Board.	<p>Complying with.</p> <p>Ground water level and quality monitoring is being carried out on regular basis. Ground water level for last 3 years is given in Annexure-2 and ground water quality reports are enclosed as Annexure-3.</p>
(IX)	Project Proponent should plant only native species for green belt development. Plantation of local species should be carried out during Monsoon Season. The project should also implement community Development and Welfare programme in the area of Health, Education and Environment Protection.	<p>Native species such as <i>Neem, Karanj, dhak, pili gulmohar</i> etc. are planted .Plantation has been carried out within and outside the mine lease area Besides following community development work are carried out:-</p> <ol style="list-style-type: none"> 1. Shree ki Pathshala for education development in nearby villages. 2. Mamta Project for better health of community, mobile van equipment with latest medical facilities health camps in nearby villages. 3. Plantation in nearby schools, roadside, community area, hospital, govt. buildings etc.

(x)	<p>Proponent shall appoint an Occupational Health Specialist for Regular and Periodical medical examination of the workers engaged in the Project and maintain records accordingly; also, Occupational health check-ups for workers having some ailments like BP, diabetes, habitual smoking, etc. shall be undertaken once in six months and necessary remedial/preventive measures taken accordingly. The Recommendations of National Institute for ensuring good occupational environment for mine workers shall be implemented; The prevention measure for burns, malaria and provision of anti-snake venom including all other paramedical safeguards may be ensured before initiating the mining activities.</p>	<ol style="list-style-type: none"> 1. Well-equipped occupation health care center has been established at the site. 2. Well-equipped ambulances are available with adequate medical staff for immediate medical help and refer to the hospital at Beawar. 3. Occupational Health Surveillance programme being carried out on regular basis. 4. Six monthly check up of staff and workers is being carried out for ailments like BP, diabetes etc. No occupational diseases have been reported so far. 5. Mobile van equipped with latest medical facilities, 6. Health camps in nearby villages are organized regularly. 															
(B) General Conditions																	
(i)	<p>A final Mine Closure plan along with details of Corpus Fund shall be submitted to the Ministry of Environment, Forest & Climate Change 5 years in advance of final mine closure for approval.</p>	<p>Mine closure plan will be submitted to the ministry 5 years before closure of the mine.</p>															
(ii)	<p>No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment, Forest & Climate Change</p>	<p>Prior approval for change in mining technology and scope of working will be obtained.</p>															
(iii)	<p>No change in the calendar plan including excavation, quantum of limestone and waste should be made.</p>	<p>Mining is being done as per the approved mining plan.</p>															
(iv)	<p>The Project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of surface water and ground water for the project.</p>	<ol style="list-style-type: none"> 1.Total water requirement for entire project including Cement, Power, Mine and Residential colony is <4380 KLD. 2. CGWA granted permission to withdraw 4000 KLD ground water. 3. Balance 380 KLD water is source from rain water collected in pits. 4. Rain water collection pits have been developed at the following locations to use for plant & mining activities and to recharge the ground water. <table border="1" data-bbox="906 1566 1468 1892"> <thead> <tr> <th>Sr. No.</th> <th>Structure</th> <th>Water storage Capacity in KL</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Harvesting Pit-1 at Mines</td> <td>900000</td> </tr> <tr> <td>2.</td> <td>Harvesting Pit-2 at Mines</td> <td>40000</td> </tr> <tr> <td>3.</td> <td>Harvesting Pit-3 near plant gate</td> <td>147000</td> </tr> <tr> <td>4.</td> <td>Harvesting Pit-4 in Colony near</td> <td>40000</td> </tr> </tbody> </table>	Sr. No.	Structure	Water storage Capacity in KL	1.	Harvesting Pit-1 at Mines	900000	2.	Harvesting Pit-2 at Mines	40000	3.	Harvesting Pit-3 near plant gate	147000	4.	Harvesting Pit-4 in Colony near	40000
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		Vill. Bhagatpura
(v)	Mining shall be carried out as per the provisions outlined in mining plan approved by Indian Bureau of Mines (IBM) as well as by abiding to the guidelines of Directorate General Mines Safety(DGMS)	Mining is done as per the approved mining plan and mining rule and regulations.
(vi)	The project proponent shall carry out scientific investigation in respect of "Blast induced ground vibration, fly rock & air blast". Based on the study, Project Proponent should design an effective blast design to curb blast induced menace and public annoyance. The report shall be submitted to the Regional Office of the Ministry.	Investigation of vibration is being carried out. Following measures adopted to avoid public annoyance: 1. Controlled blasting is done in most scientific manner by using shock tube detonators during day time to control noise level, vibration, & fly rock etc. 2. Only day time blasting is in practice. 3. Supervision of blasting operation by competent persons as per MMR, 1961 and Explosive Act.
(vii)	The lands which are not owned by Proponent, mining will be carried out only after obtaining the consents from all the concerned land owners as per the provisions of the Mineral Concession Rules, 1960 and MMDR Act, 1957.	Agreed.
(viii)	Digital processing of the entire lease area using remote sensing technique shall be carried out regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment, Forest & Climate Change its Regional Office.	Digitally processed land use land cover report is attached as Annexure-10 .
(ix)	The critical parameters such as PM ₁₀ (size less than 10 micro meter), PM _{2.5} (size less than 2.5 micro meter), NO _x in the ambient air within the impact zone, peak particle velocity at 300m distance or within the nearest habitation, whichever is closer shall be monitored[(TDS, DO, PH, and TSS)]. The monitored data shall be uploaded on the project site at a suitable location near the main gate of the company in public domain. The circular No. J-20012/1/2006-IA.II (M) dated 27.05.2009 issued by Ministry of Environment, Forest & Climate Change, shall also be referred. In this regard for its compliance	1. Status of compliance of the stipulated environment clearance conditions, including results of monitored data are available on company's web site and displayed at the main gate. 2. AAQ monitoring data are submitted on regular basis to the ministry, CPCB and SPCB. 3. Complying with the National Ambient Air Quality Emission Standards issued by the Ministry. 4. Monitoring result of ambient air quality (all values are in µg/m ³) are enclosed herewith as Annexure-4 . 5. Depending on the type of structures and the dominant excitation frequency, the peak particle velocity (PPV) on the ground adjacent to the structures is not exceeding.
(x)	Effective safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of PM ₁₀ and PM _{2.5} such as haul road, loading and unloading point and transfer points. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard. Monitoring of Ambient Air	1. Water spraying arrangement have been provided and working at the unloading points & inside the crushers. 2. Water spraying is being done on haul roads during HEMM movement. 3. Bag filters have been installed at all material transfer points. 4. Conveyor belts are covered to reduce the air born dust.

	Quality to be carried out by the Central Pollution Control Board.	5. Wet drilling / dry drilling with dust extraction system is being practiced.
(xi)	Regular monitoring of ground water level and quality shall be carried out in and around the mine lease by establishing a network of existing wells and constructing new piezometers during the mining operation. The project proponent shall ensure that no natural water course and/or water resources shall be obstructed due to any mining operations. The monitoring shall be carried out four times in a year- pre-monsoon(April-May), Monsoon (August), post monsoon (November) and winter (January) and the data thus collected may be sent regularly to Ministry of Environment, Forest & Climate Change and its Regional office, Lucknow, Central Ground Water Authority and Regional Director, Central Ground Water Board.	<ol style="list-style-type: none"> 1. Network of existing well and bore well have been established for ground water monitoring. 2. Monitoring of ground water quality and level are being carried out regularly as per guidelines of CGWA. <p>Monitoring data for ground water level and quality for the period of three years are attached herewith as <u>Annexure-2 & 3.</u></p>
(xii)	Regular monitoring of the flow rate of the springs and perennial nallah flowing in and around the mine lease shall be carried out and record maintain. The natural water bodies and or streams which are flowing in an around the village, should not be disturbed. The water Table should be nurtured so as not to go down below the pre-mining period. In case of any water scarcity in the area, the project Proponent has to provide water to the villagers for their use. A provision for regular monitoring of water table in open dug well located in village should be incorporated to ascertain the impact of mining over ground water table.	<ol style="list-style-type: none"> 1. There is no perennial nallaha/ river / surface water body in the lease area. 2. Monitoring of ground water quality and level are being carried out regularly as per guidelines of CGWA 3. Monitoring report is being submitted to MoEF & CC, CGWA, SPCB and CPCB on regular basis.
(xiii)	Regular monitoring of water quality upstream & downstream of water bodies shall be carried out and record of monitoring data should be maintained and submitted to the Ministry of Environment , Forest and Climate Change and its Regional Office, Central Ground water Authority, Regional Director, Central Ground Water Board, State Pollution Control Board & Central Pollution Control Board.	<ol style="list-style-type: none"> 1. There is no perennial nallaha/ river / surface water body in the lease area. 2. Monitoring of ground water quality and level are being carried out regularly as per guidelines of CGWA 3. Monitoring report being submitted to MoEF & CC, CGWA, SPCB & CPCB on continuous basis.
(xiv)	Transportation of the minerals by road passing through the village shall not be allowed. A 'bypass' road should be constructed (say, leaving a gap of at least 200 meters) for the purpose of transportation of the minerals so that the impact of sound, dust and accidents could be mitigated. The Project proponent shall bear the cost towards the widening and	<ol style="list-style-type: none"> 1. Nimbeti Limestone mine is well connected to NH-158. At present no village road network is used for limestone transportation. 2. Company also maintains the existing road for strengthening of transport. 3. Safety precaution such as installation of safety signal, speed breakers, Traffic control, movement control, use of safety precaution

	strengthening of existing public road network in case the same is provided to be used for the Project. No road movement should be allowed on existing village road network without appropriately increasing the carrying capacity of such roads.	such as safety belts for truck drivers etc. is being done by company. 4. Road safety trainings and consultation to truck drivers are provided.									
(xv)	The illumination and sound at night at project site disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Habitations have a right for darkness and minimal noise level at night. Project Proponent must ensure that the biological clock of the villages is not disturbed; by orienting the floodlights/masks away from the villagers and keeping the noise levels well within the prescribed limits for day light/night hours.	<ol style="list-style-type: none"> 1. Controlled blasting is being done in most scientific manner by using shock tube detonators during day time to control noise level, vibration, & fly rock etc. 2. Only day time blasting is in practice. 3. Noise level monitoring is being carried out on regular basis & submitted to the MoEF&CC, RSPCB. Monitoring results of ambient noise quality is attached herewith as Annexure-5 4. Lux level monitoring is being carried out at mine lease boundary. 5. Flood lights installed in such a way that they do not disturb the villagers. 									
(xvi)	Main haulage road in the mine should be provided with permanent water sprinklers and other roads should be regularly wetted with water tankers fitted with sprinklers. The material transfer points should invariably be provided with Bag filters and or dry fogging system. In case of Belt-conveyors facilities the system should be fully covered to avoid air borne dust; Use of effective sprinkler system to suppress fugitive dust on haul roads and other transport roads shall be ensured.	<ol style="list-style-type: none"> 1. Regular water spray and compaction is being done for all haul roads to control the fugitive emissions. 2. Water spray arrangements have been provided at all crushers. 3. All material transfer point equipped with Bag filters 4. Conveyor belts are covered to reduce the air born dust. 5. Permanent water sprinkler system systems is installed at haul roads to control the fugitive emissions. <p>Measures taken form control of Fugitive emission and monitoring results for fugitive emission from mining activities are attached herewith are Annexure-6.</p>									
(xvii)	Sufficient number of Gullies to be provided for better management of water. Regular Monitoring of PH shall be included in the monitoring plan and report shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office on six monthly basis.	Rain water is collected through development of proper canalization towards the mine pit.									
(xviii)	There shall be planning, developing and implementing facility of rainwater harvesting measures on long term basis in consultation with Regional Director, Central Groundwater Board and implementation of conservation measures to augment ground water resources in the area in consultation with Central Ground Water Board.	<p>Presently mining is being done at the top of the hill. Rain water collection pits have been developed at the following locations to use for plant & mining activities to recharge the ground water.</p> <table border="1"> <thead> <tr> <th>Sr. No.</th> <th>Structure</th> <th>Water storage Capacity in KL</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Harvesting Pit-1 at Mines</td> <td>1375000</td> </tr> <tr> <td>2.</td> <td>Harvesting Pit-2 at</td> <td>40000</td> </tr> </tbody> </table>	Sr. No.	Structure	Water storage Capacity in KL	1.	Harvesting Pit-1 at Mines	1375000	2.	Harvesting Pit-2 at	40000
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Following rain water harvesting measures have been developed outside the plant premises.				
		S. No.	Watershed development & Construction of Anicuts	
Year 2015-2016				
		1	Construction of anicut in Roopnagar(Ras) village	
Year 2010-2011				
		1	Construction of anicut in Bagatpura village	
		2	Construction of anicut in Bhimgarh village	
		3	Construction of anicut in Kanyakhedi village	
		4	Rooftop water harvesting in 12 schools	
		5	Construction of Rapat (Nimbeti to Jawangarh village)	
Year 2009-2010				
		6	Watershed development project for all villages	
		7	Small check dam/Anicut, Village Nimbeti	
		8	Construction of anicut in Nimbeti river	
		9	Construction of anicut in Kheda Village	
		10	Construction of anicut in Bhimgarh Village	
		11	Pal construction at Anicut Nimbeti river	
Year 2008-2009				
		12	Construction/Repairing of anicut in Nimbeti village	
		13	Jawangarh Anicut	
		14	Bhairav Ji Dhani Anicut Jawangarh Anicut	
Artificial recharge structures (de-silting & filter pits) have been provided with dug wells and bore wells inside the plant premises & Mine lease to recharge the ground water.				
After year 2016, artificial rain water recharge structures were made outside plant premises i.e. 04 nos of Nadi were constructed in Bhimgarh, Butiwas, Kundal and Bagatpura villages. 04 nos. of west wears were constructed near Roopnagar village. 03 nos. CCT (Continuous Contour Trenched) were constructed near Mohangarh, Kotadiya and Bakhtawarpura. 10 nos. MPT (Multi				

		Percolating Tanks) were constructed near Kurki village. Photographs of Mine pits are attached as <u>Annexure-8</u>
(xix)	The project Proponent has to take care of gullies formed on slopes. Dump mass should be consolidated with proper filling/leveling with the help of dozer/compactors.	Regular compaction is being done at slopes of haul road & OB dump area with help of grader, dozer & compactors.
(xx)	The reclamation at waste dump shall be ecologically sustainable. Scientific reclamation shall be followed. The local species may be encouraged and species are so chosen that the slope, bottom of the dumps and top of the dumps are able to sustain these species. The aspect of the dump is also a factor which regulates some climatic parameters and allows only species adopted to that micro climate.	Presently dumps are active. After maturity native plant species will be planted.
(xxi)	The top soil, if any, shall temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long. The topsoil shall be used for land reclamation and plantation. The over burden (OB) generated during the mining operations shall be stacked at earmarked dump site(s) only and it should not be kept active for a long period of time. The maximum height of dumps shall not exceed 8m and width 20m and overall slope of the dumps shall be maintained to 45°. The OB dumps should be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geotextiles shall be undertaken for stabilization of the dump. The issue related to backfilling of area, plantation, development of water reservoir, undisturbed area, waste dump area etc. in the mine lease shall be governed as per the approved mine plan/ mining scheme as submitted to the Ministry while seeking EC. Monitoring and management of rehabilitated area should continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office on six monthly basis.	<ol style="list-style-type: none"> 1. There is no top soil. Limestone is exposed on surface. 2. Interstitial clay sorted through grizzly is being stacked separately and used for road making within the lease area. 3. OB is being stacked on earmarked sites only. At present waste dump yards are active. Plantation along the slope of the dump shall be done on maturity. 4. Mining is being done as per approved mining plan. 5. As per amendment in environment clearance amendment EC letter no. J-11015/226/2015-IA.II (M) dated: February 21th. 2018 & approved mining plan overall dump height will be 60 m (5 terrace of 12m) and overall slope will be 45°. 6. Sedimentation pits have been made for waste dump yards at the corners of the garland drains. Check dams have been made across the surface run-off through and drains before final disposal. 7. Compliance status is being submitted to the Ministry and its Regional Office, Lucknow on six monthly basis.
(xxii)	Catchment drains and siltation ponds of appropriate size shall be constructed around the mine working, mineral and OB dumps to prevent run off of water and flow of sediments directly into the river and other water bodies. The water so collected should be utilized for	<ol style="list-style-type: none"> 1. Check dams & siltation pond have been made across the surface run-off through and drains from mining area to arrest silt & sediments. 2. Garland drains with siltation pond have been made to check the surface run-off & silt. 3. Sedimentation pits have been made for waste

	watering the mine area, roads, green belt development etc. The drains shall be regularly desilted particularly after monsoon and maintained properly. The drains, settling tanks and check dams of appropriate size, gradient and length shall be constructed both around the mine pit and over burden dumps to prevent run off of water and flow of sediments directly into the river and other water bodies and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of slit material. Sedimentation pits shall be constructed at the corners of the garlands drains and desilted at regular intervals.	<p>dump yards at the corners of the garland drains. Photographs attached as Annexure-8.</p> <p>4. Rain water collected in mine pits is used for water spray on haul roads and green belt development. Photographs of Mine pits are attached as Annexure-9.</p> <p>5. De-silting of siltation pond, garland drains and check dam is being done mainly after monsoon season.</p>
(xxiii)	Plantation shall be raised in a 7.5 m wide green belt in safety zone around the mining lease, backfilled and reclaimed area, around water body, along the road etc. by planting the native species in consultation with the local DFO/Agriculture Department and as per CPCB guidelines. The density of the trees should be around 2500 plants per ha. Green belt shall be developed all along the mine lease area in a phased manner and shall be completed within first five years.	<p>1. Presently 76.15 ha land has been developed with 97110 saplings for plantation around the lease boundary, near crusher and near road in mine lease area. Photographs are attached as Annexure-7.</p> <p>2. Plantation around the water body, backfilled and reclaimed area would be started after such situation arises.</p> <p>3. Native species are used for plantation. Such as Neem, Karanj, Gulmohar etc</p>
(xxiv)	Project proponent shall follow the mitigation measures provided in Office Memorandum No. Z-11013/57/2014-IA.II (M), dated 29 th October, 2014, titled "Impact of mining activity on Habitation and villages are the part of mine lease areas or habitations and villages are surrounded by the mine lease area", if any, applicable to the project.	Not applicable
(xxv)	The Project Proponent shall make necessary alternative arrangements, where required, in consultation with the State Government to provide alternate areas for livestock grazing, if any. In this context, Project proponent should implement the directions of the Hon'ble Supreme Court with regard to acquiring grazing land. The sparse trees on such grazing ground, which provide mid-day shelter from the scorching sun, should be scrupulously guarded against felling and plantation of such trees should be promoted.	No grazing land is being used for mining purpose.
(xxvi)	The project proponent shall take all precautionary measures during mining	Peafowl conservation plan has been executed as per approved plan. The same has been submitted

	operation for conservation and protection of endangered fauna, if any, spotted in the study area. Action plan for conservation of flora & fauna shall be prepared and implemented in consultation with the State Forest and Wildlife Department. A copy of action plan shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office.	to the ministry and its regional office.
(xxvii)	At least 2.5% of the total cost of the project shall be earmarked towards the Enterprise Social Commitment (ESC) based on local needs and action plan with financial and physical breakup/details shall be prepared and submitted to the Ministry's Regional office located at Lucknow. Implementation of such program shall be ensured accordingly in a time bound manner.	Company is working on extensive social welfare works under CSR activities. Total expenses on social welfare activities for the 2019-2020 was INR 432.16 lac for all units of cement, power and mining.
(xxviii)	Provision shall be made for the housing of construction labor 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.	All necessary facilities such as toilets, drinking water, medical health etc. have been provided to construction labors.
(xxix)	Measures should be taken for control of noise levels below 85 dBA In the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs/muffs.	<ol style="list-style-type: none"> 1. Regular maintenance of HEMM is in practice. 2. Controlled blasting is being done in most scientific manner by using shock tube detonators to control noise level, vibration, & fly rock etc. 3. Only day time blasting is in practice. 4. Overall noise level in and around the mine area are well within the prescribed standards (85 dB (A)). 5. PPE's have been providing to all HEMM operators.
(xxx)	Industrial waste water(workshop) and waste water from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19 th May, 1993 and 31 st December, 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.	Waste water generated from workshop is being treated for oil and grease trap to meet the desired standards and is being used in crusher for dust suppression.
(xxxi)	Personnel working in dusty areas should wear protective respiratory device and they should also be provided with adequate training and information on safety and health aspects.	Nimbeti limestone mine is open cast and fully mechanized mine. PPE'S have been provided to all workers/employee and regular Health & safety training being organized.
(xxxii)	A separate environmental cell with suitable qualified personnel should be set up under	Separate environment management cell with full-fledged laboratory has been established to carry

	the control of a Senior Executive, who will report directly to the Head of the Organization.	out various environment monitoring functions under the control of Senior executive.																
(xxxiii)	The funds earmarked for environmental protection should be kept in separate Account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office Located at Lucknow.	<p>All the pollution control measures have been implemented.</p> <p>Following is the last three years recurring cost for the environment pollution control:</p> <table border="1"> <thead> <tr> <th>Description</th> <th>2018-2019</th> <th>2019-2020</th> <th>2020-2021</th> </tr> </thead> <tbody> <tr> <td>Plant</td> <td>1370.29 Lacs</td> <td>1196.85 Lacs</td> <td>1193.20 Lacs</td> </tr> <tr> <td>Mines</td> <td>297.99 Lacs</td> <td>305.58 Lacs</td> <td>304.47 Lacs</td> </tr> <tr> <td>Total</td> <td>1668.28 Lacs</td> <td>1502.41 Lacs</td> <td>1497.67 Lacs</td> </tr> </tbody> </table>	Description	2018-2019	2019-2020	2020-2021	Plant	1370.29 Lacs	1196.85 Lacs	1193.20 Lacs	Mines	297.99 Lacs	305.58 Lacs	304.47 Lacs	Total	1668.28 Lacs	1502.41 Lacs	1497.67 Lacs
Description	2018-2019	2019-2020	2020-2021															
Plant	1370.29 Lacs	1196.85 Lacs	1193.20 Lacs															
Mines	297.99 Lacs	305.58 Lacs	304.47 Lacs															
Total	1668.28 Lacs	1502.41 Lacs	1497.67 Lacs															
(xxxiv)	The project authorities should inform to the Regional office regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.	Nimbeti limestone mine is in operation since 1997.																
(xxxv)	The Project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment, Forest & Climate Change, its Regional Office, Lucknow, Central Pollution Control Board and State Pollution Control Board.	Compliance of the stipulated environment clearance conditions, including results of monitored data are being submitted on six monthly basis to the Ministry, its Regional Office, Lucknow, Central Pollution Control Board and State Pollution Control Board.																
(xxxvi)	The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The (project authorities should extend full cooperation to the officer(s) of the Regional Office by furnishing the requisite data/information /monitoring reports.	Full cooperation is being extended to the officer(s) of the Regional Office by furnishing the requisite data/information /monitoring reports.																
(xxxvii)	A copy of clearance letter will be marked to concerned Panchayat / local NGO, if any, from whom suggestion/representation has been received while processing the proposal.	<ol style="list-style-type: none"> Copy of environment clearance letter has been sent on 16.05.2017 to the following:- <ol style="list-style-type: none"> Gram Panchayat, Ras Gram Panchayat, Butiwas EC letter has been placed on our website:- www.shreecement.in 																
(xxxviii)	State pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and Collector's office/Tehsildar's office for 30 days.	It's board's jurisdiction.																
(xxxix)	The project authorities should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has	Advertisement has been given in two local newspapers widely circulated in the region namely, Rajasthan Patrika and Dainik Navjyoti on 18/05/2017. Copy of the newspapers has been sent on 13/06/2017.																

	<p>been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment, Forest & Climate Change at http://envfor.nic.in and a copy of the same should be forwarded to the Regional office of this Ministry located Lucknow.</p>	
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Peacock Conservation Plan implementation detail

CIN No. : L26943RJ1979PLC001935
Phone : 01462 228101-6
Toll Free : 1800 180 6003 / 6004
Fax : 01462 228117 / 228119
E-Mail : shreebwr@shreecementltd.com
Website : www.shreecement.in

OIC

 **SHREE CEMENT LTD.**
Regd. Office:
BANGUR NAGAR, POST BOX NO.33, BEAWAR 305 901, RAJASTHAN, INDIA

To,
The District Forest Officer,
Dept. of Forest (Govt. of Rajasthan),
Opp. Railway station,
Pali (Raj.)

Date: 14/10/2015

Sub-Compliance of approved Peafowl conservation plan & Environment clearance of Nimbelli Limestone mines dated 21/07/2015 (Specific Condition no. V)

Ref:- 1) F. /Dev/ CWLW/ 2014/1042 dated 12/12/2014
2) EC letter no J-11015/327/2012-IA.II(M) dated 21/07/2015.

Dear Sir,

Kindly refer to above subject matter and referred letters dated 12/12/2014 & 21/07/2015; we are hereby providing 2 Nos. of cages for veterinary care of injured or sick deformed birds as per approved Peafowl conservation plan by your good office.

Thanking you,
Yours faithfully,
For Shree Cement Limited,

[Rakesh Bhargava]
Vice President (Environment)

two cages (bird) received.
असि अच. फे
15/10/15
जसोबत प्रशासक
सो. व. अ.
बिहार, बि. प्रशासक
सो.

Enc. As above

JAIPUR OFFICE : 5B-187, Bapu Nagar, Opp. Rajasthan University, JLN Marg, Jaipur-302 015
Phone : 0141 4241200, 4241204, Fax : 0141 4241219
NEW DELHI OFFICE : 122-123, Hans Bhawan, 1, Bhadurshah Zafar Marg, New Delhi 110 002
Phone : 011 23370828, 23379218, 23370776, Fax : 011 23370499
CORP. OFFICE : 21, Strand Road, Kolkata 700 001 Phone : 033-22309601-4 Fax : 033 22434226

Mass Awareness Programme on Peacock Conservation 2020-2021

Peacock conservation Awareness Programme at, SCL RAS



Mass Awareness Programme at, SCL, RAS



Mass Awareness Programme at, SCL, RAS.



Mass Awareness Programme at, SCL, RAS.



Mass Awareness Programme at Butiwas Govt. School



Mass Awareness Programme at Butiwas Govt. School



Awareness Creating on Peacock Conservation



Awareness Creating on Peacock Conservation



Plant sapling distribution programme



Plant sapling distribution programme



Cage Providing to DFO, Pali



Cage Providing to DFO, Pali



Annexure-2

Ground Water Level Monitoring

Ground water level in meter below ground level - Year - 2018						
S. No	Location of well ↓	Season ⇒	Winter (January-2018)	Pre-Monsoon (May-2018)	Monsoon (August-2018)	Post-Monsoon (Nov-2018)
1	B/W Near Old Mines Office (Within Plant Area) North Side		19.26	23.4	20.60	21.89
2	O/W Jassanath Ji ki Mandi (Outside plant Area) East Side		13.99	16.95	15.23	16.21
3	Open Well # 9 Stacker & reclaimer area West side		15.98	20.33	20.33	19.02
4	Open Well # 2 Near mess area South side		16.44	18.62	18.89	17.23

Ground water level in meter below ground level - Year - 2019						
S. No	Location of well ↓	Season ⇒	Winter (January-2019)	Pre-Monsoon (May-2019)	Monsoon (August-2019)	Post-Monsoon (Nov-2019)
1	B/W Near Old Mines Office (Within Plant Area) North Side		23.02	24.89	18.60	18.16
2	O/W Jassanath Ji ki Mandi (Outside plant Area) East Side		18.26	21.66	18.30	16.22
3	Open Well # 9 Stacker & reclaimer area West side		20.01	22.01	10.11	3.25
4	Open Well # 2 Near mess area South side		19.24	22.29	21.20	13.25

Ground water level in meter below ground level - Year - 2020						
S. No	Location of well ↓	Season ⇒	Winter (January-2020)	Pre-Monsoon (May-2020)	Monsoon (August-2020)	Post-Monsoon (Nov-2020)
1	B/W Near Old Mines Office (Within Plant Area) North Side		18.20	20.42	21.58	18.26
2	O/W Jassanath Ji ki Mandi (Outside plant Area) East Side		17.99	20.69	14.85	12.98
3	Open Well # 9 Stacker & reclaimer area West side		4.02	6.44	5.54	4.89
4	Open Well # 2 Near mess area South side		15.25	18.79	13.58	14.07



EKO PRO ENGINEERS PVT. LTD.

Environmental Consultants and Analytical Laboratory
(An ISO 9001:2015 Certified Company)

Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009 (Delhi-NCR) INDIA.
Contact No.: 9818405427, 9810240678, 8826344487 E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

TEST REPORT

Ambient Air Quality Monitoring

Test Report No. : EKO/123/101220

Issue Date : 15/12/2020

Issued To : Shree Cement Limited
Village - Ras
Tehsil - Jaitaran
Distt. - Pali
Rajasthan - 306107

Sample Description : Ambient Air
Sample Drawn on : 08/12/2020 To 09/12/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 10/12/2020
Sampling Location : Near Mine Office
Sampling Time : 24.0 Hrs.
Sampling Plan & Procedure : SOP-AAQ/15
Analysis Duration : 10/12/2020 To 15/12/2020
Ambient Temperature (°C) : 20.0
Average Flow Rate of SPM (m³/min.) : 1.1
Average Flow Rate of Gases (lpm) : 1.0
Weather Conditions : Clear
Remark (if any) : Monitoring Photograph Showing Coordinate an enclosure Annexure-1

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per CPCB Notification, 18th Nov 2009
1	Particulate Matter (PM10)	IS: 5182 (P-23)	55.3	µg/m ³	100.0
2	Particulate Matter (PM2.5)	EKO/CHEM/SOP/AAQ-01	30.8	µg/m ³	60.0
3	Sulphur Dioxide (as SO ₂)	IS: 5182 (P-2)	9.60	µg/m ³	80.0
4	Nitrogen Dioxide (as NO ₂)	IS: 5182 (P-6)	17.5	µg/m ³	80.0
5	Carbon Monoxide (as CO)	IS: 5182 (P-10)	0.85	mg/m ³	4.0

Remark- Monitoring hours for PM10, PM2.5, SO2, NO2- 24Hrs. & CO-1 Hrs.

Notes :

1. The results given above are related to the tested sample, for various parameters, as observed at the time of Sampling. The customer asked for the above tests only.
2. This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
3. The test report will not be used for any publicity/legal purpose.
4. The test samples will be disposed off after 15 days from the date of issue of test report, unless until specified by the customer.
5. Responsibility of the Laboratory is limited to the invoiced amount only.

**** End of Report ****

For EKO PRO ENGINEERS PVT. LTD.

PURNIMA CHAUHAN
TECHNICAL MANAGER
(Authorised Signatory)

Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009 (Delhi-NCR) INDIA.
Contact No.: 9818405427, 9810240678, 8826344487 E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

TEST REPORT

Ambient Air Quality Monitoring

Test Report No. : EKO/124/101220

Issue Date : 15/12/2020

Issued To : Shree Cement Limited
Village - Ras
Tehsil - Jaitaran
Distt. - Pali
Rajasthan - 306107

Sample Description : Ambient Air
Sample Drawn on : 08/12/2020 To 09/12/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 10/12/2020
Sampling Location : Near Nimbeti Village
Sampling Time : 24.0 Hrs.
Sampling Plan & Procedure : SOP-AAQ/15
Analysis Duration : 10/12/2020 To 15/12/2020
Ambient Temperature (°C) : 20.0
Average Flow Rate of SPM (m³/min.) : 1.1
Average Flow Rate of Gases (lpm) : 1.0
Weather Conditions : Clear
Remark (if any) : Monitoring Photograph Showing Coordinate an enclosure Annexure-1

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per CPCB Notification, 18th Nov 2009
1	Particulate Matter (PM10)	IS: 5182 (P-23)	59.6	µg/m ³	100.0
2	Particulate Matter (PM2.5)	EKO/CHEM/SOP/AAQ/01	25.8	µg/m ³	60.0
3	Sulphur Dioxide (as SO ₂)	IS: 5182 (P-2)	10.20	µg/m ³	80.0
4	Nitrogen Dioxide (as NO ₂)	IS: 5182 (P-6)	18.5	µg/m ³	80.0
5	Carbon Monoxide (as CO)	IS: 5182 (P-10)	0.73	mg/m ³	4.0

Remark- Monitoring hours for PM10, PM2.5, SO2, NO2- 24Hrs. & CO-1 Hrs.

Notes :

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For EKO PRO ENGINEERS PVT. LTD.

PURNIMA CHAUHAN
TECHNICAL MANAGER
(Authorised Signatory)



Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009 (Delhi-NCR) INDIA.
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TEST REPORT**Ambient Air Quality Monitoring**

Test Report No. : EKO/177/040321

Issue Date : 12/03/2021

Issued To

: Shree Cement Limited
 Village - Ras
 Tehsil - Jaitaran
 Distt. - Pali
 Rajasthan - 306107

Sample Description	: Ambient Air
Sample Drawn on	: 02/03/2021 To 03/03/2021
Sample Drawn by	: EPEPL (Mr. Rohitash Rajput)
Sample Received on	: 04/03/2021
Sampling Location	: Near Mine Office
Sampling Time	: 24.0 Hrs.
Sampling Plan & Procedure	: SOP-AAQ/15
Analysis Duration	: 04/03/2021 To 08/03/2021
Ambient Temperature (°C)	: 28.0
Average Flow Rate of SPM (m ³ /min.)	: 1.1
Average Flow Rate of Gases (lpm)	: 1.0
Weather Conditions	: Clear
Remark (if any)	: Monitoring Photograph Showing Coordinate an enclosure Annexure-1

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per CPCB Notification, 18th Nov 2009
1	Particulate Matter (PM10)	IS: 5182 (P-23)	58.2	µg/m ³	100.0
2	Particulate Matter (PM2.5)	EKO/CHEM/SOP/AAQ-01	32.4	µg/m ³	60.0
3	Sulphur Dioxide (as SO ₂)	IS: 5182 (P-2)	10.9	µg/m ³	80.0
4	Nitrogen Dioxide (as NO ₂)	IS: 5182 (P-6)	19.2	µg/m ³	80.0
5	Carbon Monoxide (as CO)	IS: 5182 (P-10)	0.87	mg/m ³	4.0

Remark- Monitoring hours for PM10, PM2.5, SO₂, NO₂- 24Hrs. & CO-1 Hrs.

Notes :

1. The results given above are related to the tested sample, for various parameters, as observed at the time of Sampling. The customer asked for the above tests only.
2. This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
3. The test report will not be used for any publicity/legal purpose.
4. The test samples will be disposed off after 15 days from the date of issue of test report, unless until specified by the customer.
5. Responsibility of the Laboratory is limited to the invoiced amount only.

**** End of Report ****

For EKO PRO ENGINEERS PVT. LTD.

FURNIMA CHAUHAN
 TECHNICAL MANAGER
 (Authorised Signatory)



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 Contact No.: 9818405427, 9810240678, 8826344487 E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

TEST REPORT**Ambient Air Quality Monitoring**

Test Report No. : EKO/178/040321

Issue Date : 12/03/2021

Issued To : Shree Cement Limited
 Village - Ras
 Tehsil - Jaitaran
 Distt. - Pali
 Rajasthan - 306107

Sample Description : Ambient Air
 Sample Drawn on : 02/03/2021 To 03/03/2021
 Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
 Sample Received on : 04/03/2021
 Sampling Location : Near Nimbeti Village
 Sampling Time : 24.0 Hrs.
 Sampling Plan & Procedure : SOP-AAQ/15
 Analysis Duration : 04/03/2021 To 08/03/2021
 Ambient Temperature (°C) : 28.0
 Average Flow Rate of SPM (m³/min.) : 1.1
 Average Flow Rate of Gases (lpm) : 1.0
 Weather Conditions : Clear
 Remark (if any) : Monitoring Photograph Showing Coordinate an enclosure Annexure-1

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per CPCB Notification, 18th Nov 2009
1	Particulate Matter (PM10)	IS: 5182 (P-23)	61.4	µg/m ³	100.0
2	Particulate Matter (PM2.5)	EKO/CHEM/SOP/AAQ/01	26.5	µg/m ³	60.0
3	Sulphur Dioxide (as SO ₂)	IS: 5182 (P-2)	10.35	µg/m ³	80.0
4	Nitrogen Dioxide (as NO ₂)	IS: 5182 (P-6)	19.7	µg/m ³	80.0
5	Carbon Monoxide (as CO)	IS: 5182 (P-10)	0.88	mg/m ³	4.0

Remark- Monitoring hours for PM10, PM2.5, SO2, NO2- 24Hrs. & CO-1 Hrs.

Notes :

- The results given above are related to the tested sample, for various parameters, as observed at the time of Sampling. The customer asked for the above tests only.
- This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
- The test report will not be used for any publicity/legal purpose.
- The test samples will be disposed off after 15 days from the date of issue of test report, unless until specified by the customer.
- Responsibility of the Laboratory is limited to the invoiced amount only.

**** End of Report ****

For EKO PRO ENGINEERS PVT. LTD.

PURNIMA CHAUHAN
 TECHNICAL MANAGER
 (Authorised Signatory)



Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009 (Delhi-NCR) INDIA.
Contact No.: 9818405427, 9810240678, 8826344487 E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

TEST REPORT**Workzone Air Quality Monitoring**

Test Report No. : EKO/233/141220

Issue Date : 18/12/2020

Issued To

: Shree Cement Limited
Village - Ras
Tehsil - Jaitaran
Distt. - Pali
Rajasthan - 306107

Sample Description : Fugitive Emission (Mining Activity)
Sample Drawn on : 10/12/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 14/12/2020
Sampling Location : Mine Crusher
Sampling Plan & Procedure : SOP-AAQ/15
Analysis Duration : 14/12/2020 To 17/12/2020
Sampling Time : 08 Hrs.
Ambient Temperature (°C) : 19.0
Average Flow Rate of SPM (m³/min) : 1.1
Average Flow Rate of Gases (lpm) : NA
Weather Condition : Clear
Remark (if any) : Monitoring Photograph Showing Coordinate an enclosure Annexure-1

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Permissible Limits
1	SPM	IS: 5182 (P-4)	426.5	μ/m ³	600

Notes :

- The results given above are related to the tested sample, as received & mentioned parameters.
The customer asked for the above tests only.
- This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
- The test report will not be used for any publicity/legal purpose.
- The test samples will be disposed off after 15 days from the date of reporting of result, unless until specified by the customer. Sample received for biological tests will be destroyed after 7 days from the date of issue of test report.
- Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.

PRNITA BHAUHAN
TECHNICAL MANAGER
(Authorised Signatory)



Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009 (Delhi-NCR) INDIA.
 Contact No.: 9818405427, 9810240678, 8826344487 E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

TEST REPORT**Workzone Air Quality Monitoring**

Test Report No. : EKO/234/141220

Issue Date : 18/12/2020

Issued To

: Shree Cement Limited
 Village - Ras
 Tehsil - Jaitaran
 Distt. - Pali
 Rajasthan - 306107

Sample Description : Fugitive Emission (Mining Activity)
 Sample Drawn on : 10/12/2020
 Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
 Sample Received on : 14/12/2020
 Sampling Location : Mine Phase
 Sampling Plan & Procedure : SOP-AAQ/15
 Analysis Duration : 14/12/2020 To 17/12/2020
 Sampling Time : 08 Hrs.
 Ambient Temperature (°C) : 19.0
 Average Flow Rate of SPM (m³/min) : 1.1
 Average Flow Rate of Gases (lpm) : NA
 Weather Condition : Clear
 Remark (if any) : Monitoring Photograph Showing Coordinate an enclosure Annexure-1

RESULTS

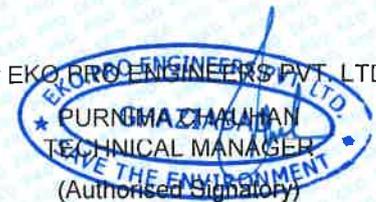
S. No.	Parameters	Test Methods	Results	Units	Permissible Limits
1	SPM	IS: 5182 (P-4)	335.6	µg/m ³	600

Notes :

- The results given above are related to the tested sample, as received & mentioned parameters.
The customer asked for the above tests only.
- This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
- The test report will not be used for any publicity/legal purpose.
- The test samples will be disposed off after 15 days from the date of reporting of result, unless until specified by the customer. Sample received for biological tests will be destroyed after 7 days from the date of issue of test report.
- Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.



TEST REPORT
Water Sample Analysis

Test Report No : EKO/147/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
Village - Ras, Tehsil - Jaitaran
Distt - Pali, Rajasthan

Sample Description : Ground Water
Sample Drawn on : 02/11/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 03/11/2020
Sampling Location : Open well No.1 Near Unit IV Raw Mill
Sampling Plan & Procedure : SOP-W/66
Sample Quantity : 1.0 Litre
Environmental Conditions : Normal
Analysis Duration : 03/11/2020 To 06/11/2020
Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.36	-	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	420.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	170.5	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	980.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	100.6	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	110.5	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	7.28	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	41.1	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	290.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

Notes:

- The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
- This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
- The test report will not be used for any publicity/legal purpose.
- The test samples will be disposed off after 15 days from the date of issue of test report, unless until specified by the customer. Sample received for biological tests will be destroyed after 7 days from the date of issue of test report.
- Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.

PURNIMA CHAUHAN
TECHNICAL MANAGER
(Authorised Signatory)

TEST REPORT

Water Sample Analysis

Test Report No : EKO/148/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
Village - Ras, Tehsil - Jaitaran
Distt - Pali, Rajasthan

Sample Description : Ground Water
Sample Drawn on : 02/11/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 03/11/2020
Sampling Location : Open well No.2 Near Guest House, Store Boundary
Sampling Plan & Procedure : SOP-W/66
Sample Quantity : 1.0 Litre
Environmental Conditions : Normal
Analysis Duration : 03/11/2020 To 06/11/2020
Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.48	-	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	392.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	192.8	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	1080.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	94.2	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	148.2	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	4.16	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	37.7	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	260.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

Notes:

- The results given above are related to the tested sample, as received & mentioned parameters.
The customer asked for the above tests only.
- This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
- The test report will not be used for any publicity/legal purpose.
- The test samples will be disposed off after 15 days from the date of issue of test report, unless until specified by the customer. Sample received for biological tests will be destroyed after 7 days from the date of issue of test report.
- Responsibility of the Laboratory is limited to the invoiced amount only.

End of Report

For EKO PRO ENGINEERS PVT. LTD.

PUJNIMA CHAUHAN
TECHNICAL MANAGER
(Authorised Signatory)

Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009 (Delhi-NCR) INDIA.
Contact No.: 9818405427, 9810240678, 8826344487 E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in**TEST REPORT**
Water Sample Analysis

Test Report No : EKO/149/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
Village - Ras, Tehsil - Jaitaran
Distt - Pali, RajasthanSample Description : Ground Water
Sample Drawn on : 02/11/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 03/11/2020
Sampling Location : Open well No.3 Near RNCU near GPP-4
Sampling Plan & Procedure : SOP-W/66
Sample Quantity : 1.0 Litre
Environmental Conditions : Normal
Analysis Duration : 03/11/2020 To 06/11/2020
Remark (if any) : NA**RESULTS**

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.56	-	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	320.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	150.5	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	830.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	77.0	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	190.1	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	3.82	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	31.1	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	240.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.**Notes:**

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The customer asked for the above tests only.
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- The test report will not be used for any publicity/legal purpose.
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- Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****For EKO PRO ENGINEERS PVT. LTD.
PUERNIMA CHADHAN
TECHNICAL MANAGER
(Authorised Signatory)

TEST REPORT

Water Sample Analysis

Test Report No : EKO/150/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
Village - Ras, Tehsil - Jaitaran
Distt - Pali, Rajasthan

Sample Description : Ground Water
Sample Drawn on : 02/11/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 03/11/2020
Sampling Location : Open well No.5 Near Logistic Office, Behind ATM
Sampling Plan & Procedure : SOP-W/66
Sample Quantity : 1.0 Litre
Environmental Conditions : Normal
Analysis Duration : 03/11/2020 To 06/11/2020
Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.24	-	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	380.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	209.8	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	950.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	91.4	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	120.5	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	11.70	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	36.9	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	320.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

Notes:

- The results given above are related to the tested sample, as received & mentioned parameters.
The customer asked for the above tests only.
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- The test report will not be used for any publicity/legal purpose.
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- Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.

PURNIMA CHAUDHAN
TECHNICAL MANAGER
(Authorised Signatory)

TEST REPORT

Water Sample Analysis

Test Report No : EKO/151/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
Village - Ras, Tehsil - Jaitaran
Distt - Pali, Rajasthan

Sample Description : Ground Water
Sample Drawn on : 02/11/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 03/11/2020
Sampling Location : Open well No.9 Near Coal Yard Power Plant
Sampling Plan & Procedure : SOP-W/66
Sample Quantity : 1.0 Litre
Environmental Conditions : Normal
Analysis Duration : 03/11/2020 To 06/11/2020
Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.69	—	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	420.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	170.2	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	1040.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	100.6	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	138.9	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	12.50	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	41.1	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	340.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

Notes:

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****End of Report****

For EKO PRO ENGINEERS PVT. LTD.
GHAZIABAD
PUJNIMA CHAUDHAN
TECHNICAL MANAGER
(Authorised Signatory)

TEST REPORT
Water Sample Analysis

Test Report No : EKO/152/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
 Village - Ras, Tehsil - Jaitaran
 Distt - Pali, Rajasthan

Sample Description : Ground Water
 Sample Drawn on : 02/11/2020
 Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
 Sample Received on : 03/11/2020
 Sampling Location : Open well No.13 Near RNCU Near Main Gate
 Sampling Plan & Procedure : SOP-W/66
 Sample Quantity : 1.0 Litre
 Environmental Conditions : Normal
 Analysis Duration : 03/11/2020 To 06/11/2020
 Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.58	--	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	510.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	240.5	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	1280.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	122.2	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	142.8	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	9.26	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	49.8	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	294.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

Notes:

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The customer asked for the above tests only.
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- Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.
 PURNIMA CHAUHAN
 TECHNICAL MANAGER
 (Authorised Signatory)

Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009 (Delhi-NCR) INDIA.
Contact No.: 9818405427, 9810240678, 8826344487 E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

TEST REPORT
Water Sample Analysis

Test Report No : EKO/153/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
Village - Ras, Tehsil - Jaitaran
Distt - Pali, Rajasthan

Sample Description : Ground Water
Sample Drawn on : 02/11/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 03/11/2020
Sampling Location : Open well No.14 Near Truck Packing Area
Sampling Plan & Procedure : SOP-W/66
Sample Quantity : 1.0 Litre
Environmental Conditions : Normal
Analysis Duration : 03/11/2020 To 06/11/2020
Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.15	--	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	430.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	190.5	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	1048.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	103.0	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	190.4	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	8.16	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	42.0	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	274.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

Notes:

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The customer asked for the above tests only.
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- Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.
PURNIMA CHAUHAN
TECHNICAL MANAGER
(Authorised Signatory)

TEST REPORT
Water Sample Analysis

Test Report No : EKO/154/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
Village - Ras, Tehsil - Jaitaran
Distt - Pali, Rajasthan

Sample Description : Ground Water
Sample Drawn on : 02/11/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 03/11/2020
Sampling Location : Open well No.18 Near New Truck Packing near plant boundary
Sampling Plan & Procedure : SOP-W/66
Sample Quantity : 1.0 Litre
Environmental Conditions : Normal
Analysis Duration : 03/11/2020 To 06/11/2020
Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.36	-	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	290.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	172.6	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	840.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	69.7	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	152.6	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	7.28	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	28.2	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	342.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

Notes:

- The results given above are related to the tested sample, as received & mentioned parameters.
The customer asked for the above tests only.
- This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
- The test report will not be used for any publicity/legal purpose.
- The test samples will be disposed off after 15 days from the date of issue of test report, unless until specified by the customer. Sample received for biological tests will be destroyed after 7 days from the date of issue of test report.
- Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.
*PURNIMA CHAUDHAN
TECHNICAL MANAGER
(Authorised Signatory)

TEST REPORT
Water Sample Analysis

Test Report No : EKO/155/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
Village - Ras, Tehsil - Jaitaran
Distt - Pali, Rajasthan

Sample Description : Ground Water
Sample Drawn on : 02/11/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 03/11/2020
Sampling Location : Open well No.19 Near New Truck Packing near plant boundary
Sampling Plan & Procedure : SOP-W/66
Sample Quantity : 1.0 Litre
Environmental Conditions : Normal
Analysis Duration : 03/11/2020 To 06/11/2020
Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.32	-	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	340.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	168.4	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	910.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	81.8	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	102.5	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	9.28	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	33.1	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	305.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

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Notes:

- The results given above are related to the tested sample, as received & mentioned parameters.
The customer asked for the above tests only.
- This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
- The test report will not be used for any publicity/legal purpose.
- The test samples will be disposed off after 15 days from the date of issue of test report, unless until specified by the customer. Sample received for biological tests will be destroyed after 7 days from the date of issue of test report.
- Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.
PURNIMA CHAWHAN
TECHNICAL MANAGER
(Authorised Signatory)

TEST REPORT

Water Sample Analysis

Test Report No : EKO/156/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
Village - Ras, Tehsil - Jaitaran
Distt - Pali, Rajasthan

Sample Description : Ground Water
Sample Drawn on : 02/11/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 03/11/2020
Sampling Location : Open well No.20 Near New Truck Packing near plant boundary
Sampling Plan & Procedure : SOP-W/66
Sample Quantity : 1.0 Litre
Environmental Conditions : Normal
Analysis Duration : 03/11/2020 To 06/11/2020
Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.58	-	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	260.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	170.2	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	995.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	62.5	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	120.8	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	11.80	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	25.3	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	264.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

Notes:

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- Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.
PURNIMA CHAUDHAN
TECHNICAL MANAGER
(Authorised Signatory)



Contact : +91 - 9810243870

EKO PRO ENGINEERS PVT. LTD.Environmental Consultants and Analytical Laboratory
(An ISO 9001:2015 Certified Company)Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009 (Delhi-NCR) INDIA.
Contact No. : 9818405427, 9810240678, 8826344487 E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in**TEST REPORT****Water Sample Analysis**

Test Report No : EKO/143/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
Village - Ras, Tehsil - Jaitaran
Distt - Pali, RajasthanSample Description : Ground Water
Sample Drawn on : 02/11/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 03/11/2020
Sampling Location : Borewell No.1 Near Old Crusher Area
Sampling Plan & Procedure : SOP-W/66
Sample Quantity : 1.0 Litre
Environmental Conditions : Normal
Analysis Duration : 03/11/2020 To 06/11/2020
Remark (if any) : NA**RESULTS**

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.16	--	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	490.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	221.5	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	986.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	121.4	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	132.6	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	9.25	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	49.3	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	260.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

Notes:

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****End of Report****

For EKO PRO ENGINEERS PVT. LTD.


PURSHABABHAN
TECHNICAL MANAGER
(Authorized Signatory)

Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009 (Delhi-NCR) INDIA.
Contact No.: 9818405427, 9810240678, 8826344487 E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

TEST REPORT

Water Sample Analysis

Test Report No : EKO/144/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
Village - Ras, Tehsil - Jaitaran
Distt - Pali, Rajasthan

Sample Description : Ground Water
Sample Drawn on : 02/11/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 03/11/2020
Sampling Location : Borewell No.2 Near Old Crusher Area
Sampling Plan & Procedure : SOP-W/66
Sample Quantity : 1.0 Litre
Environmental Conditions : Normal
Analysis Duration : 03/11/2020 To 06/11/2020
Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.52	—	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	455.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	201.6	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	1022.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	115.0	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	168.9	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	15.30	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	46.9	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	360.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

Notes:

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****End of Report****

For EKO PRO ENGINEERS PVT. LTD.


PURNIMA GHOSHAN
 TECHNICAL MANAGER
 (Authorised Signatory)

Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009 (Delhi-NCR) INDIA.
Contact No.: 9818405427, 9810240678, 8826344487 E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

TEST REPORT

Water Sample Analysis

Test Report No : EKO/145/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
Village - Ras, Tehsil - Jaitaran
Distt - Pali, Rajasthan

Sample Description : Ground Water
Sample Drawn on : 02/11/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 03/11/2020
Sampling Location : Borewell No.3 Near Old Crusher Area
Sampling Plan & Procedure : SOP-W/66
Sample Quantity : 1.0 Litre
Environmental Conditions : Normal
Analysis Duration : 03/11/2020 To 06/11/2020
Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.86	—	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	502.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	284.6	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	1280.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	117.8	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	190.3	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	7.25	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	48.1	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	340.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

Notes:

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****End of Report****

For EKO PRO ENGINEERS PVT. LTD.

PURNIMA CHAUHAN
TECHNICAL MANAGER
(Authorised Signatory)

TEST REPORT

Water Sample Analysis

Test Report No : EKO/146/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
Village - Ras, Tehsil - Jaitaran
Distt - Pali, Rajasthan

Sample Description : Ground Water
Sample Drawn on : 02/11/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 03/11/2020
Sampling Location : Borewell No.3B Near Old Crusher Area
Sampling Plan & Procedure : SOP-W/66
Sample Quantity : 1.0 Litre
Environmental Conditions : Normal
Analysis Duration : 03/11/2020 To 06/11/2020
Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	6.98	-	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	395.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	310.5	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	890.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	113.8	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	205.6	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	5.98	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	46.7	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	280.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

Notes:

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The customer asked for the above tests only.
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****End of Report****

For EKO PRO ENGINEERS PVT. LTD.

PURNIMA CHAUHAN
 TECHNICAL MANAGER
 (Authorised Signatory)

Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009 (Delhi-NCR) INDIA.
 Contact No.: 9818405427, 9810240678, 8826344487 E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

TEST REPORT
Water Sample Analysis

Test Report No : EKO/164/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
 Village - Ras, Tehsil - Jaitaran
 Distt - Pali, Rajasthan

Sample Description : Ground Water
 Sample Drawn on : 02/11/2020
 Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
 Sample Received on : 03/11/2020
 Sampling Location : Bore well No. 24 Near Ballupura
 Sampling Plan & Procedure : SOP-W/66
 Sample Quantity : 1.0 Litre
 Environmental Conditions : Normal
 Analysis Duration : 03/11/2020 To 06/11/2020
 Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.35	-	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	530.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	305.2	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	1328.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	127.1	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	110.7	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	3.86	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	51.8	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	294.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

Notes:

- The results given above are related to the tested sample, as received & mentioned parameters.
The customer asked for the above tests only.
- This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
- The test report will not be used for any publicity/legal purpose.
- The test samples will be disposed off after 15 days from the date of issue of test report, unless until specified by the customer. Sample received for biological tests will be destroyed after 7 days from the date of issue of test report.
- Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.
 PURNIMA CHAUDHAN
 TECHNICAL MANAGER
 (Authorised Signatory)

TEST REPORT

Water Sample Analysis

Test Report No : EKO/160/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
 Village - Ras, Tehsil - Jaitaran
 Distt - Pali, Rajasthan

Sample Description : Ground Water
 Sample Drawn on : 02/11/2020
 Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
 Sample Received on : 03/11/2020
 Sampling Location : Bore well No. 24 A Near Ballupura
 Sampling Plan & Procedure : SOP-W/66
 Sample Quantity : 1.0 Litre
 Environmental Conditions : Normal
 Analysis Duration : 03/11/2020 To 06/11/2020
 Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.45	-	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	590.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	320.5	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	1308.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	141.5	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	190.5	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	12.70	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	57.6	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	310.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

Notes:

- The results given above are related to the tested sample, as received & mentioned parameters.
The customer asked for the above tests only.
- This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
- The test report will not be used for any publicity/legal purpose.
- The test samples will be disposed off after 15 days from the date of issue of test report, unless until specified by the customer. Sample received for biological tests will be destroyed after 7 days from the date of issue of test report.
- Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.

PURNIMA CHAUDHARI
 TECHNICAL MANAGER
 (Authorised Signatory)

TEST REPORT
Water Sample Analysis

Test Report No : EKO/161/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
Village - Ras, Tehsil - Jaitaran
Distt - Pali, Rajasthan

Sample Description : Ground Water
Sample Drawn on : 02/11/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 03/11/2020
Sampling Location : Bore well No. 24 B Near Ballupura
Sampling Plan & Procedure : SOP-W/66
Sample Quantity : 1.0 Litre
Environmental Conditions : Normal
Analysis Duration : 03/11/2020 To 06/11/2020
Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.25	-	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	510.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	390.7	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	1290.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	122.2	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	210.7	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	9.14	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	41.1	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	270.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

Notes:

- The results given above are related to the tested sample, as received & mentioned parameters.
The customer asked for the above tests only.
- This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
- The test report will not be used for any publicity/legal purpose.
- The test samples will be disposed off after 15 days from the date of issue of test report, unless until specified by the customer. Sample received for biological tests will be destroyed after 7 days from the date of issue of test report.
- Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.

PUJAN CHAUHAN
TECHNICAL MANAGER
(Authorised Signatory)

TEST REPORT

Water Sample Analysis

Test Report No : EKO/157/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
 Village - Ras, Tehsil - Jaitaran
 Distt - Pali, Rajasthan

Sample Description : Ground Water
 Sample Drawn on : 02/11/2020
 Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
 Sample Received on : 03/11/2020
 Sampling Location : Bore well No. C 1 Near Bagatpura Colony Near School
 Sampling Plan & Procedure : SOP-W/66
 Sample Quantity : 1.0 Litre
 Environmental Conditions : Normal
 Analysis Duration : 03/11/2020 To 06/11/2020
 Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.48	-	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	282.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	152.6	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	830.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	67.7	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	128.4	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	12.70	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	27.0	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	255.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

Notes:

- The results given above are related to the tested sample, as received & mentioned parameters.
The customer asked for the above tests only.
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- The test samples will be disposed off after 15 days from the date of issue of test report, unless until specified by the customer. Sample received for biological tests will be destroyed after 7 days from the date of issue of test report.
- Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.
 PURNIMA CHAUDHARI
 TECHNICAL MANAGER
 (Authorised Signatory)

TEST REPORT
Water Sample Analysis

Test Report No : EKO/158/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
 Village - Ras, Tehsil - Jaitaran
 Distt - Pali, Rajasthan

Sample Description : Ground Water
 Sample Drawn on : 02/11/2020
 Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
 Sample Received on : 03/11/2020
 Sampling Location : Bore well No. C 2 Near Bagatpura Colony Near A Type
 Sampling Plan & Procedure : SOP-W/66
 Sample Quantity : 1.0 Litre
 Environmental Conditions : Normal
 Analysis Duration : 03/11/2020 To 06/11/2020
 Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.69	-	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	420.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	284.5	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	840.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	100.6	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	142.9	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	6.28	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	41.1	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	292.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

Notes:

- The results given above are related to the tested sample, as received & mentioned parameters.
The customer asked for the above tests only.
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- The test samples will be disposed off after 15 days from the date of issue of test report, unless until specified by the customer. Sample received for biological tests will be destroyed after 7 days from the date of issue of test report.
- Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.

 PURNIMA CHAUHAN
 TECHNICAL MANAGER
 (Authorised Signatory)

TEST REPORT
Water Sample Analysis

Test Report No : EKO/159/031120

Issue Date : 06/11/2020

Issued To : SHREE CEMENT LIMITED
Village - Ras, Tehsil - Jaitaran
Distt - Pali, Rajasthan

Sample Description : Ground Water
Sample Drawn on : 02/11/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 03/11/2020
Sampling Location : Bore well No. C 3 Near Bagatpura Colony Near Railway Line
Sampling Plan & Procedure : SOP-W/66
Sample Quantity : 1.0 Litre
Environmental Conditions : Normal
Analysis Duration : 03/11/2020 To 06/11/2020
Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per IS:10500-2012 (Amd.No.2 Sep-2018)	
					Acceptable	Permissible
1	pH	IS: 3025 (P-11)	7.58	-	6.5-8.5	No relaxation
2	Total Hardness (as CaCO ₃)	IS: 3025 (P-21)	380.0	mg/L	200.0	600.0
3	Iron (as Fe)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	1.0	No relaxation
4	Chloride (as Cl)	IS: 3025 (P-32)	210.7	mg/L	250.0	1000.0
5	Fluoride (as F)	IS: 3025 (P-60)	<1.0	mg/L	1.0	1.5
6	Total Dissolved Solids	IS: 3025 (P-16)	930.0	mg/L	500.0	2000.0
7	Total Suspended Solids	IS: 3025 (P-17)	<5.0	mg/L	-	-
8	Calcium (as Ca)	IS: 3025 (P-40)	91.4	mg/L	75.0	200.0
9	Manganese (as Mn)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.1	0.3
10	Sulphate (as SO ₄)	IS: 3025 (P-24)	192.6	mg/L	200.0	400.0
11	Nitrate (as NO ₃)	IS: 3025 (P-34)	11.90	mg/L	45.0	No relaxation
12	Magnesium (as Mg)	IS: 3025 (P-46)	36.9	mg/L	30.0	100.0
13	Mercury (as Hg)	EKO/CHEM/SOP-ICPMS/W-01	<0.001	mg/L	0.001	No relaxation
14	Arsenic (as As)	EKO/CHEM/SOP-ICPMS/W-01	<0.005	mg/L	0.01	No relaxation
15	Total Alkalinity (as CaCO ₃)	IS: 3025 (P-23)	320.0	mg/L	200	600.0

Remark:- Standard Applicable only for Drinking Water.

Notes:

- The results given above are related to the tested sample, as received & mentioned parameters.
The customer asked for the above tests only.
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- The test report will not be used for any publicity/legal purpose.
- The test samples will be disposed off after 15 days from the date of issue of test report, unless until specified by the customer. Sample received for biological tests will be destroyed after 7 days from the date of issue of test report.
- Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.
PURNIMA CHAUDHAN
TECHNICAL MANAGER
(Authorised Signatory)



Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009 (Delhi-NCR) INDIA.
Contact No.: 9818405427, 9810240678, 8826344487 E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

TEST REPORT**Noise Monitoring**

Test Report No. : EKO/129/101220

Issue Date : 15/12/2020

Issued To : Shree Cement Limited
Village - Ras
Tehsil - Jaitaran
Distt. - Pali
Rajasthan - 306107

Sample Description : Ambient Noise
Sample Drawn on : 08/12/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 10/12/2020
Sampling Location : Near Mine Office
Sampling Plan & Procedure : SOP-N/01
Weather Condition : Normal
Analysis Duration : 10/12/2020 To 11/12/2020
Remark (if any) : NA

RESULTS

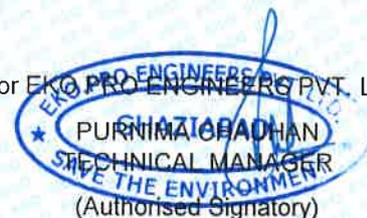
S. No.	Parameters	Test Methods	Results	Units	Limits as per "The Noise Pollution (Regulation & Control) Rules, 2000"
1	Leq (Day Time)	EKO/CHEM/SOP/S/N-01	62.3	dB (A)	75.0
2	Leq (Night Time)	EKO/CHEM/SOP/S/N-01	47.5	dB (A)	70.0

Notes :

1. The results given above are related to the tested sample, as received & mentioned parameters.
The customer asked for the above tests only.
2. This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
3. The test report will not be used for any publicity/legal purpose.
4. Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.



(Authorised Signatory)

Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009 (Delhi-NCR) INDIA.
Contact No.: 9818405427, 9810240678, 8826344487 E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

TEST REPORT

Noise Monitoring

Test Report No. : EKO/130/101220

Issue Date : 15/12/2020

Issued To : Shree Cement Limited
Village - Ras
Tehsil - Jaitaran
Distt. - Pali
Rajasthan - 306107

Sample Description : Ambient Noise
Sample Drawn on : 08/12/2020
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 10/12/2020
Sampling Location : Near Nimbeti Village
Sampling Plan & Procedure : SOP-N/01
Weather Condition : Normal
Analysis Duration : 10/12/2020 To 11/12/2020
Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per "The Noise Pollution (Regulation & Control) Rules, 2000"
1	Leq (Day Time)	EKO/CHEM/SOP/S/N-01	61.5	dB (A)	75.0
2	Leq (Night Time)	EKO/CHEM/SOP/S/N-01	45.9	dB (A)	70.0

Notes :

- The results given above are related to the tested sample, as received & mentioned parameters.
The customer asked for the above tests only.
- This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
- The test report will not be used for any publicity/legal purpose.
- Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.

PURNIMA CHABRA
TECHNICAL MANAGER
(Authorised Signatory)



Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009 (Delhi-NCR) INDIA.

Contact No.: 9818405427, 9810240678, 8826344487 E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in

TEST REPORT**Noise Monitoring**

Test Report No. : EKO/205/080321

Issue Date : 12/03/2021

Issued To

: Shree Cement Limited
Village - Ras
Tehsil - Jaitaran
Distt. - Pali
Rajasthan - 306107

Sample Description : Ambient Noise
Sample Drawn on : 02/03/2021
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 08/03/2021
Sampling Location : Near Mine Office
Sampling Plan & Procedure : SOP-N/01
Weather Condition : Normal
Analysis Duration : 08/03/2021 To 09/03/2021
Remark (if any) : NA

RESULTS

S. No.	Parameters	Test Methods	Results	Units	Limits as per "The Noise Pollution (Regulation & Control) Rules, 2000"
1	Leq (Day Time)	EKO/CHEM/SOP/S/N-01	64.2	dB (A)	75.0
2	Leq (Night Time)	EKO/CHEM/SOP/S/N-01	52.7	dB (A)	70.0

Notes :

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
3. The test report will not be used for any publicity/legal purpose.
4. Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.

PURNIMA CHAUHAN
TECHNICAL MANAGER
(Authorised Signatory)

Office & Laboratory : 32/41, South Side of G. T. Road, UPSIDC Industrial Area, Ghaziabad - 201 009 (Delhi-NCR) INDIA.
Contact No.: 9818405427, 9810240678, 8826344487 E-mail : email@ekopro.in, ekoproengineers@gmail.com, website : www.ekopro.in**TEST REPORT**
Noise Monitoring

Test Report No. : EKO/206/080321

Issue Date : 12/03/2021

Issued To

: Shree Cement Limited
Village - Ras
Tehsil - Jaitaran
Distt. - Pali
Rajasthan - 306107

Sample Description : Ambient Noise
Sample Drawn on : 02/03/2021
Sample Drawn by : EPEPL (Mr. Rohitash Rajput)
Sample Received on : 08/03/2021
Sampling Location : Near Nimbeti Village
Sampling Plan & Procedure : SOP-N/01
Weather Condition : Normal
Analysis Duration : 08/03/2021 To 09/03/2021
Remark (if any) : NA

RESULTS

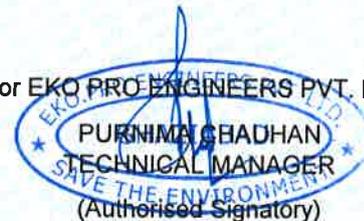
S. No.	Parameters	Test Methods	Results	Units	Limits as per "The Noise Pollution (Regulation & Control) Rules, 2000"
1	Leq (Day Time)	EKO/CHEM/SOP/S/N-01	67.8	dB (A)	75.0
2	Leq (Night Time)	EKO/CHEM/SOP/S/N-01	53.4	dB (A)	70.0

Notes :

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The customer asked for the above tests only.
2. This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
3. The test report will not be used for any publicity/legal purpose.
4. Responsibility of the Laboratory is limited to the invoiced amount only.

****End of Report****

For EKO PRO ENGINEERS PVT. LTD.



(Authorised Signatory)

Annexure-4

Ambient Air quality results (All values in $\mu\text{g}/\text{m}^3$)

Location	Mines office				Near Nimbeti village			
Month	PM 2.5	PM 10	SO ₂	NO _x	PM 2.5	PM 10	SO ₂	NO _x
Oct-2020	24.5	38.0	11.1	10.9	27.0	42.5	11.0	13.3
Nov-2020	21.5	33.5	10.6	10.9	25.5	36.0	11.5	13.0
Dec-2020	25.0	30.5	11.7	12.4	18.5	27.0	11.1	11.0
Jan-2021	34.5	49.5	8.7	9.1	34.0	45.0	9.7	8.9
Feb-2021	37.5	49.5	9.5	11.7	35.5	47.5	8.2	11.6
Mar-2021	40.5	45.5	9.4	8.7	36.5	51.0	10.4	10.2

Annexure-5

Ambient noise level at Mine): all values in dB (A):-

Location	Mines office		Near Nimbeti village		Near Mines crusher		Near Mines phase	
Month	Day	Night	Day	Night	Day	Night	Day	Night
Oct-2020	70.5	63.9	65.9	58.4	70.1	62.2	64.7	58.0
Nov-2020	69.0	62.8	63.4	56.0	69.1	60.8	61.0	55.9
Dec-2020	71.0	65.8	63.5	57.9	71.1	62.3	62.1	55.8
Jan-2021	68.3	59.3	62.6	58.0	71.7	59.4	67.4	56.5
Feb-2021	70.8	61.1	64.7	57.1	72.3	58.4	67.1	56.6
Mar-2021	71.6	62.8	65.6	52.6	70.6	59.8	64.1	57.5

Fugitive Emission for Mining Activities (All values in $\mu\text{g}/\text{m}^3$)

Location	Near Mines crusher			Near Mines phase		
	SPM	SO ₂	NOx	SPM	SO ₂	NOx
Oct-2020	323.5	11.2	9.8	239.5	10.1	10.2
Nov-2020	322.0	11.1	11.8	293.0	12.7	14.8
Dec-2020	346.0	11.3	12.7	322.0	11.4	12.8
Jan-2021	424.0	9.1	10.1	428.5	9.4	10.8
Feb-2021	411.5	8.4	10.7	469.0	9.5	11.5
Mar-2021	483.0	9.8	9.5	548.5	10.3	10.4

Photographs showing control measure taken for control of Fugitive emission

Water spray on haul road



Water spray on unloading point



Haul Road with water spray compaction, grading

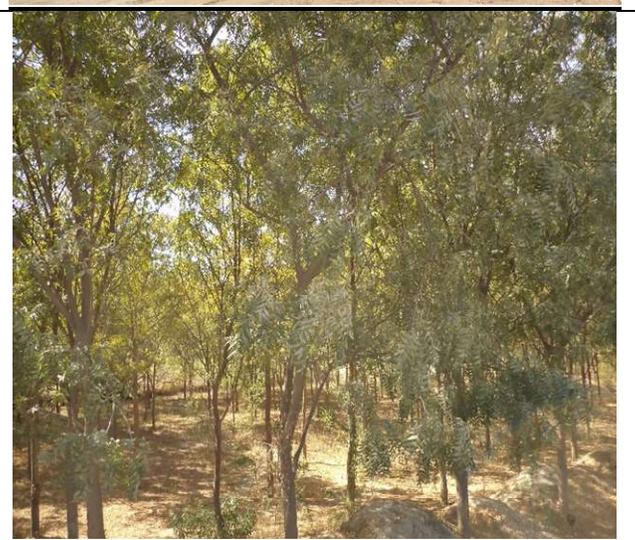


Crusher covered with curtain



Photographs of Nimbeti Limestone Mine: Plantation & Greenbelt Development





Photographs showing garland drains & desilting

Garland drain around mining activity



Garland drains



OB dump yard along with garland drain



Desilting pit at garland drain



Photographs of Nimbeti Limestone Mine: Mine Pits for Rain Water Collection

Mine Pit



Mine pit toward Village Butiwas



Project: Land Use Land Cover analysis of Core Zone (Mining Lease Area) and Buffer Zone (10 Kms. Radius study area from the mining lease boundary) of Nimbeti Limestone Mine (M.L. No. 09/93, M.L. Area 750 Ha.)

Promoter: Shree Cement Ltd.

REPORT ON LAND USE & LAND COVER ANALYSIS

OF

Core Zone (Mining Lease Area) & Buffer Zone (10 kms. radius study area from the mining lease boundary) of

“NIMBETI LIMESTONE MINES”

(M.L. NO. 09/93, M.L. AREA 750 Ha.)

**Location: - Near Village- Nimbeti & Jawangarh, Tehsil - Jaitaran,
District – Pali (Rajasthan)**

Submitted to:



SHREE CEMENT LTD.

Bangur Nagar, Post Box No. 33, Beawar, Dist Ajmer-- 305 901 (Raj)

PREPARED BY:



GAURANG ENVIRONMENTAL SOLUTIONS PVT. LTD.

102, SNG Shree Ratna Apartment, Peetal Factory, Jhotwara Road, Bani Park, Jaipur-302016

E-mail: gaurangenviro@gmail.com

(NABET accredited & ISO 9001: 2015 certified Environmental Consultancy Organization)

	Gaurang Environmental Solutions Pvt. Ltd.	
	Report Ref: GESPL_380/LULC/2021-22/02	Rev. No. 02

Project: Land Use Land Cover analysis of Core Zone (Mining Lease Area) and Buffer Zone (10 Kms. Radius study area from the mining lease boundary) of Nimbeti Limestone Mine (M.L. No. 09/93, M.L. Area 750 Ha.)

Promoter: Shree Cement Ltd.

INDEMNIFICATION

The report on land use/ land cover analysis of the **Core Zone (Mining Lease Area) and Buffer Zone (10 kms. Radius study area from the mining lease boundary)** of Nimbeti Limestone Mines of Shree Cement Limited (SCL) located at Near Village- Nimbeti & Jawangarh, Tehsil - Jaitaran, District- Pali (Rajasthan) has been prepared as per the client WO no. SCL/ENV/2020-2021/001 dated 19.10.2020

Utmost care has been taken in preparation of this Report. The data incorporated in the report is generated through information received from clients in form of their project report received through e-mail, land use map has been prepared on the basis of high resolution satellite imagery purchased from National Remote Sensing Centre (NRSC) and google imagery and information received from client. Due care has been taken to represent facts and figures and sources acknowledged. The purpose of this document is to facilitate environmental appraisal of the proposal and as such the exercise has been scientifically carried out. The Consultant stand indemnified against any consequences arising out of any inadvertent omissions.

REVISION HISTORY

Report No.	GESPL_380/LULC/2021-22/02
Type of report	Final report on Land use land cover analysis of the Core Zone (Mining Lease Area) and Buffer Zone (10 Kms. Radius study area from the mining lease boundary) of Nimbeti Limestone Mines of Shree Cement Ltd.
Revision No.	02
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Issue Date	29.05.2021
Prepared by	Mr. Vinod Kr. Verma Mrs. Neha Bhargava
Checked by	Dr. Yati Kachhawa

	Gaurang Environmental Solutions Pvt. Ltd.	Page i
	Report No: GESPL_380/LULC/2021-22/02	Rev. No. 02

Project: Land Use Land Cover analysis of Core Zone (Mining Lease Area) and Buffer Zone (10 Kms. Radius study area from the mining lease boundary) of Nimbeti Limestone Mine (M.L. No. 09/93, M.L. Area 750 Ha.)

Promoter: Shree Cement Ltd.

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Promoter: Shree Cement Ltd.

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Chapter 1: Introduction

1.0 PROJECT INTRODUCTION

The project “Nimbeti Limestone Mine” of Shree Cement Ltd. having ML Area of 750 ha, ML No. 9/93 is located near Villages Nimbeti & Jawangarh, Tehsil Jaitaran, Dist. Pali, Rajasthan. The mining lease over an area of 750 ha was granted in favour of M/s Shree Cement Limited vide the Government order no. P-3 (65/Khan/Group-1/91) dated 06.08.1996 effective for a period of 20 years from 14.11.1996 to 13.11.2016. Mining lease period has been extended till date 13.11.2046 as per Section 8A (5) of M.M.D.R. Amendment Act, 2015. Now, the Supplementary lease has been executed for 50 years till date 13.11.2046 by Department of Mines & Geology, Government of Rajasthan, Jodhpur vide letter no. ME/ Sojat/ Major/ML/9/1993 dated 27.11.2015.

1.1 PROJECT BRIEF

Project brief is tabulated as under:

Table 1: Salient Features of the Project

S. No.	PARTICULARS	DETAILS		
1.	Project	Captive Nimbeti limestone mine of Shree Cement Limited (ML Area of 750 ha, ML No. 09/93)		
2.	Mining Lease Area			
	Total Lease Area	750.0 ha		
	Green Area	Existing: 76.18 Ha. At the conceptual stage: - 250 ha.		
3.	Location			
	Village	Near Villages Nimbeti & Jawangarh		
	Tehsil	Jaitaran		
	District	Pali		
	State	Rajasthan		
4.	Latitude and Longitude	Pillar No.	Latitude (N)	Longitude (E)
		A	26° 16' 57.13"	74° 10' 05.96"
		B	26° 16' 57.49"	74° 11' 09.06"
		C	26° 15' 36.23"	74° 11' 09.62"

Project: Land Use Land Cover analysis of Core Zone (Mining Lease Area) and Buffer Zone (10 Kms. Radius study area from the mining lease boundary) of Nimbeti Limestone Mine (M.L. No. 09/93, M.L. Area 750 Ha.)

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S. No.	PARTICULARS	DETAILS			
		D	26°15'36.13"	74°10'51.6"	
		E	26°14'14.87"	74°10'52.17"	
		F	26°14'14.61"	74°10'07.12"	
	Toposheet No.	ML Area - G43I3 & G43I4			
5.	Climatology				
	A. Temperature	5 °C to 49 °C			
	B. Relative Humidity	4 to 99 %			
	C. Wind Speed	0.1 to 25 m/sec			
	D. Dominant Wind Direction	Towards NNW			
	E. Rain Fall	500-600 mm per annum rainfall from July to Sep.			
6.	Project Site Vicinity Details				
	Nearest Railway Station	Beawar Railway Station (~ 21.0 km in SE direction)			
	Nearest National Highway/State Highway	State Highway- 39 (~2.0 km in NE direction) NH-14 (~19.4 km in SE direction)			
	Nearest Town / City	<ul style="list-style-type: none"> • Nearest Town- Ras (~ 3.0 km in North direction) • Nearest City- Beawar (~ 21.0 km in SE direction) • District Head Quarter- Pali (~ 102.0 km in SW direction) 			
	Nearest Airport	Kishangarh Airport (~ 90 km in West direction)			
	Nearest River	<ul style="list-style-type: none"> • Lilri River (Seasonal) – (~ 0.5 km in NW direction) • Sukri River (~ 5.5 km in SSW direction) 			
	Reserved/ Protected Forest within 10 km radius	List of Reserved and Protected Forests (Open mixed jungle & Scrub type)			
		S. No.	Name	Distance and Direction from Boundary of Project Site	
				Distance (in km.)	Direction
		1.	Gopalpura Block PF	~3.5 km	ESE
		2.	BabraGiri Block RF	~3.5 km	SSE
		3.	Salarmal Block RF	~5.5 km	SSE
		4.	AsarlaiJor Block RF	~8.5 km	West
	Ecological Sensitive Areas	No National Park, Biosphere Reserve, Wild Life Sanctuary falls within 10 km radius study area from the mining lease area..			
	Seismic Zone	Zone – II [as per IS 1893 (Part-I): 2002]			



Project: Land Use Land Cover analysis of Core Zone (Mining Lease Area) and Buffer Zone (10 Kms. Radius study area from the mining lease boundary) of Nimbeti Limestone Mine (M.L. No. 09/93, M.L. Area 750 Ha.)

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1.1.1 PAST PRODUCTION DATA

Limestone production data of last 4 years is tabulated as under:

Table 2: Limestone production data of last 4 years*

S. No.	Year	Production in MT
1	2017-2018	19275645.580
2	2018-2019	17463560.43
3	2019-2020	15852774.15
4	2020-2021	15472489.56

**Source: Data provided by SCL*

1.2 INTRODUCTION OF THE PROJECT PROPONENT

Shree Cement Limited (SCL) is a Limited Company and environment friendly business organization incorporated under the Companies Act, 1956 (no. 1 of 1956) on 25th October, 1979. The Company is engaged in the business of cement manufacturing, mining of mineral for Cement manufacturing facilities in India & United Arab Emirates (UAE) and generation of electrical power for captive use & sell.

Presently, SCL cement production capacity stands at 47.4 Million TPA. The Company's Cement and Clinker manufacturing facilities are located at Beawar & Ras in Rajasthan, Balodabazar- Bhatapara in Chhattisgarh, Sedam in Karnataka and Ras Al Khaimah (RAK) in United Arab Emirates (UAE). It has split grinding units at eight locations viz. Khushkhera, Suratgarh, Jobner in Rajasthan, Roorkee in Uttarakhand, Aurangabad in Bihar, Bulandshahr in Uttar Pradesh, Panipat in Haryana, Saraikela- Kharsawan in Jharkhand and Cuttack in Odisha.

Total thermal power plants capacity is 742 MW (including 211 MW WHRS, which is the largest capacity of Green Power in the entire world cement industry excluding China, 1.999 MW Solar Plant, 21 MW Wind Plant). The power generated from these plants is primarily utilized for the consumption in its own integrated cement plants as well as to sell to the outside parties.



Project: Land Use Land Cover analysis of Core Zone (Mining Lease Area) and Buffer Zone (10 Kms. Radius study area from the mining lease boundary) of Nimbeti Limestone Mine (M.L. No. 09/93, M.L. Area 750 Ha.)

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The Company pursues with multi-brand portfolio strategy consisting of four brands viz.; Shree Jang Rodhak Cement, Bangur Cement, Rock Strong Cement and Roof On. The Company currently enjoys the highest market share in Rajasthan, Delhi and Haryana, Punjab, West Uttar Pradesh and Uttarakhand.

1.3 PROJECT LOCATION

The project is located near Villages Nimbeti & Jawangarh, Tehsil Jaitaran, Dist. Pali, Rajasthan. Map showing project site on Google map, SoI Toposheet/OSM & satellite imagery showing Core Zone (Mining Lease Area) and Buffer Zone (10 Kms. Radius study area from the mining lease boundary) are given in Fig. below

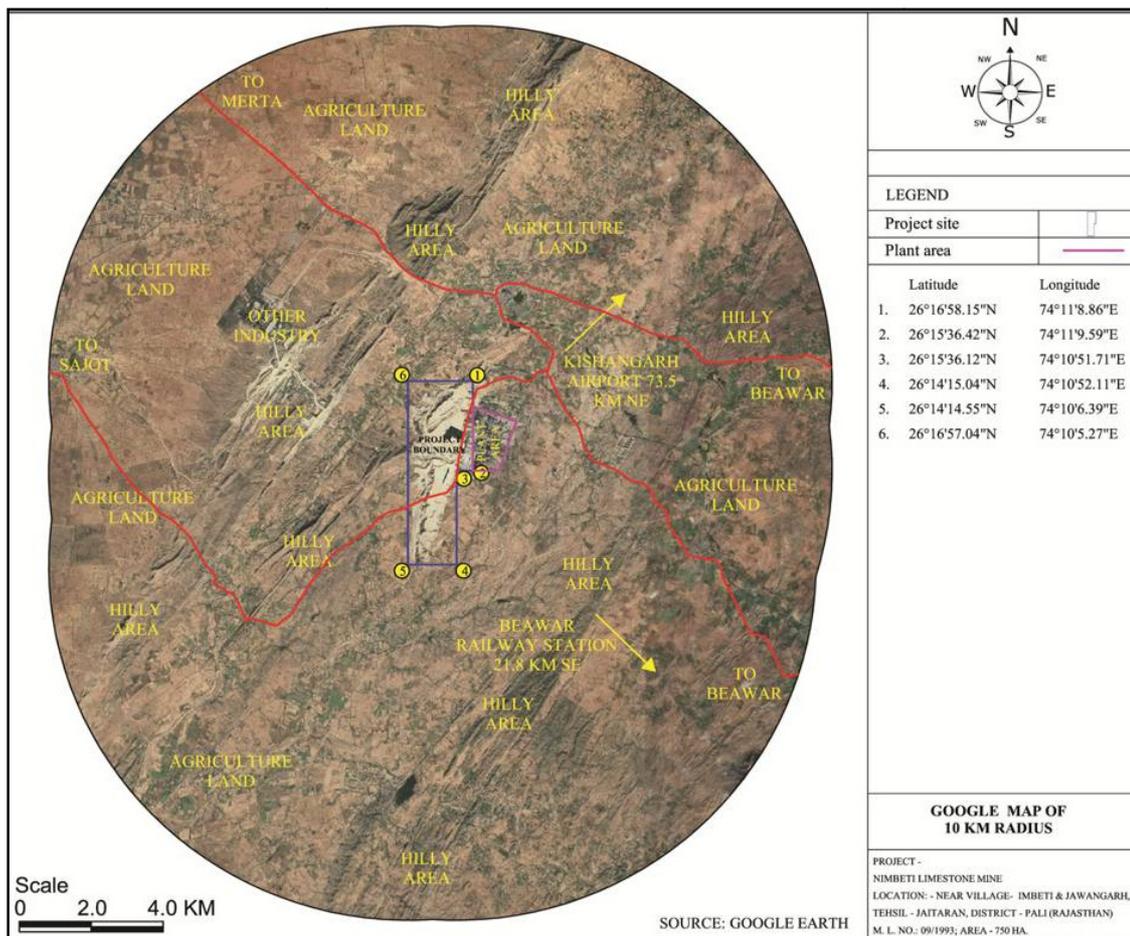


Fig. 1.1: Google Map showing Core Zone (Mining Lease Area) and Buffer Zone (10 Kms. Radius study area from the mining lease boundary)

Project: Land Use Land Cover analysis of Core Zone (Mining Lease Area) and Buffer Zone (10 Kms. Radius study area from the mining lease boundary) of Nimbeti Limestone Mine (M.L. No. 09/93, M.L. Area 750 Ha.)

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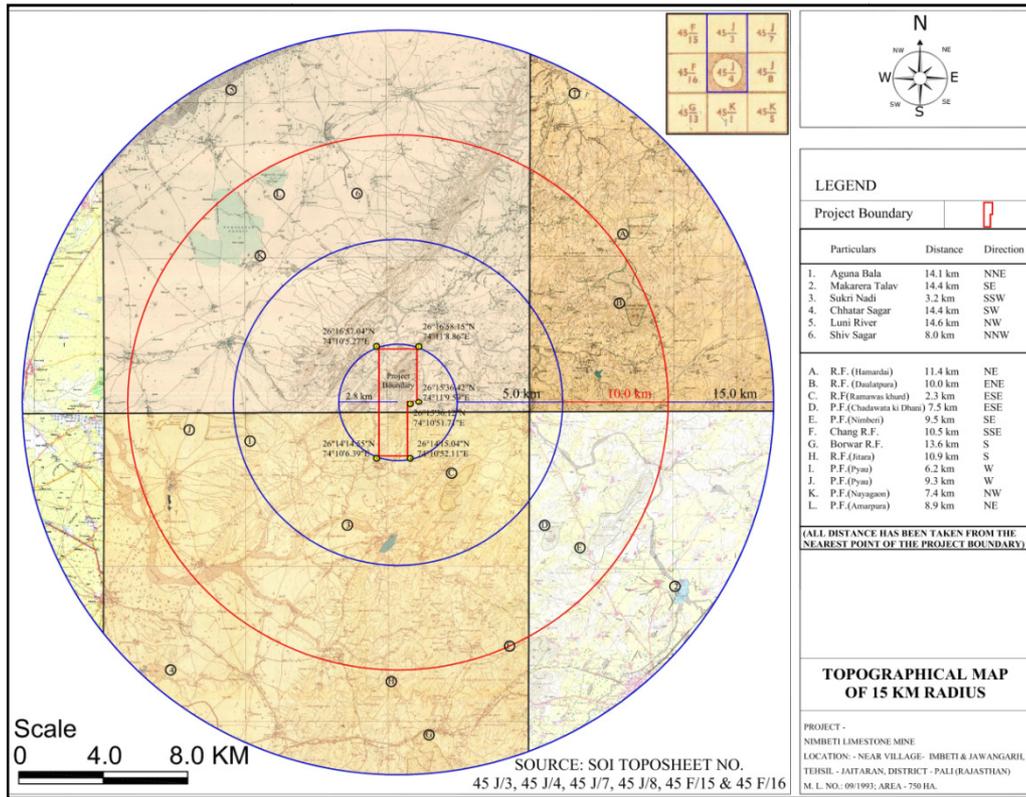


Fig 1.2: Map showing mining lease and study area (15 kms) on SOI Toposheet/OSM

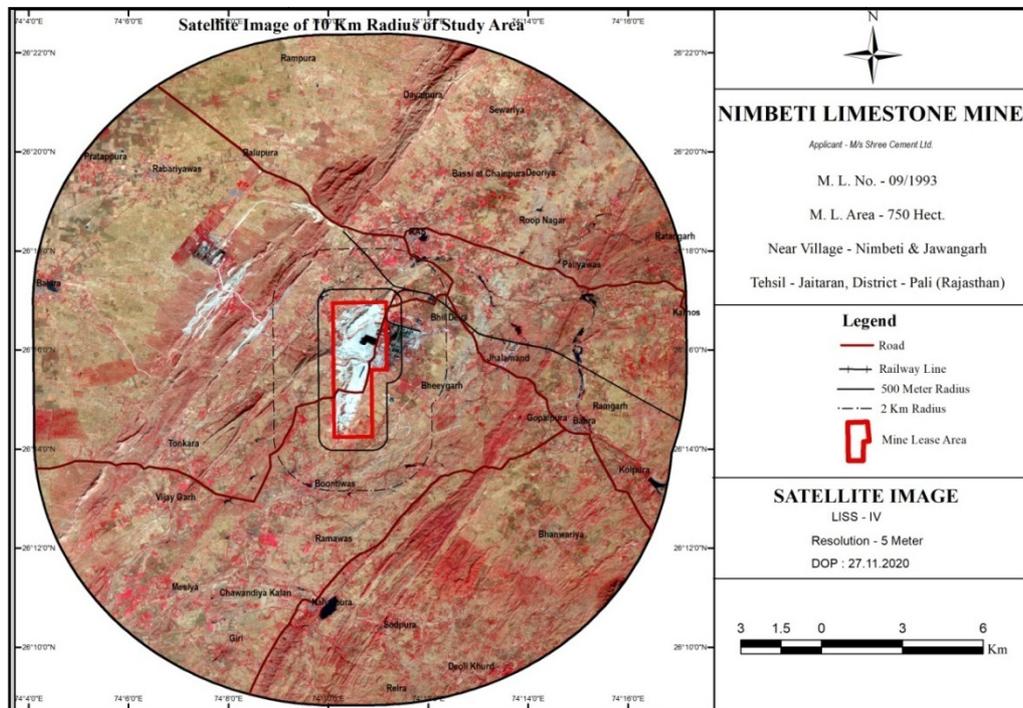


Fig.1.3: Satellite imagery of Core Zone (Mining Lease Area) and Buffer Zone (10 Kms. Radius study area from the mining lease boundary) LISS-IV Data (FCC map)



Project: Land Use Land Cover analysis of Core Zone (Mining Lease Area) and Buffer Zone (10 Kms. Radius study area from the mining lease boundary) of Nimbeti Limestone Mine (M.L. No. 09/93, M.L. Area 750 Ha.)

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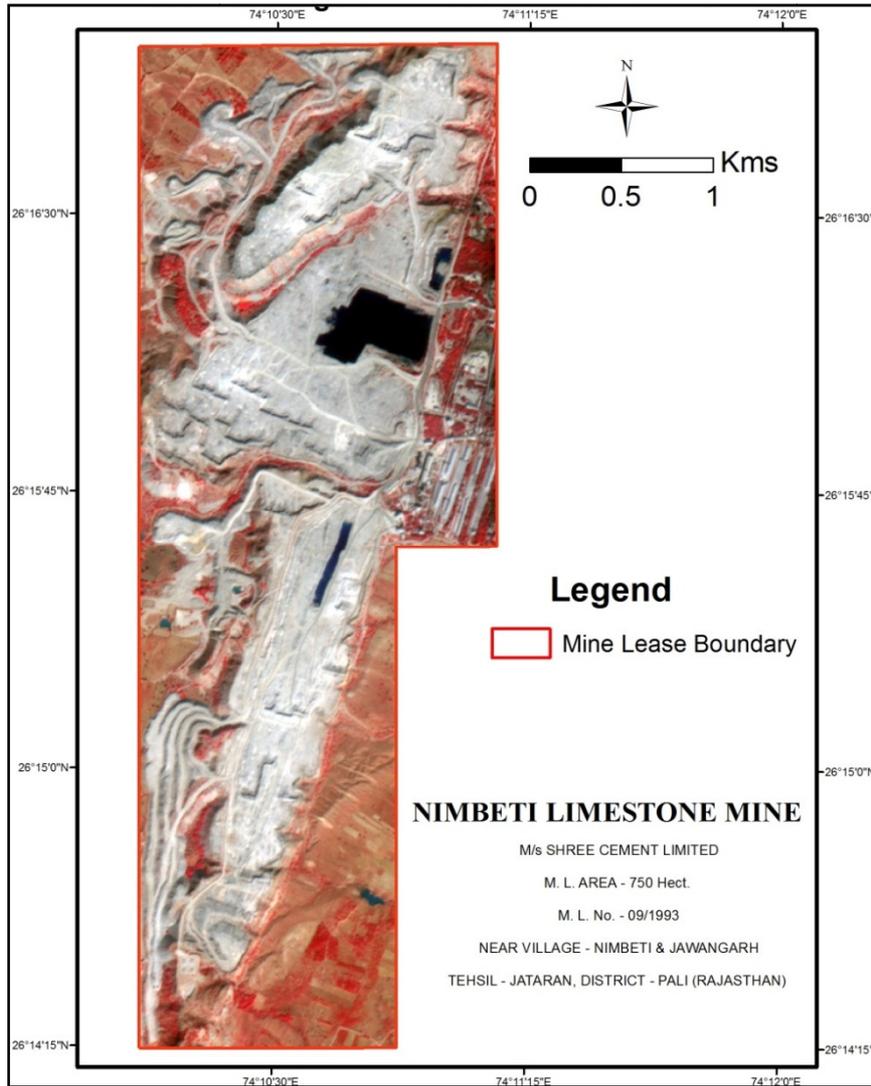


Fig.1.4: Satellite imagery of Core Zone i.e. Mining Lease area LISS-IV Data (FCC map)

1.4 GENERAL INTRODUCTION TO THE STUDY

Satellite design development & operations includes data reception, processing, interpretation and utilization of satellite image. All these advancements have widened the applicability of remotely sensed data in various areas, like forest cover, vegetation type mapping, and their changes on a regional scale. If satellite data is judiciously used along with the sufficient ground data, it is possible to carry out detailed forest inventories, monitoring of land use, and vegetation cover at various scales. Digital image processing



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and classification of the satellite imageries and analysis of interpreted maps were carried out using Geospatial software like ERADAS imagine, ArcGIS & QGIS.

1.5 OBJECTIVE

The objective of the present work is to prepare land use and land cover map using hybrid digital classification technique. The land cover/ land use map will depict the state of land features and land use of the Core Zone (Mining Lease Area) and Buffer Zone (10 Kms. Radius study area from the mining lease boundary). In addition land cover/land use thematic map will also be used in studying the spatial distribution of impact due to the project.

As per the conditions stipulated in the Environmental Clearance issued by the MoEF&CC vide letter no. J-11015/226/2015-IA.II (M) dated: 11th May, 2017, digital processing of the entire lease area using remote sensing technique has to be carried out once in 3 years for monitoring land use pattern and report shall be submitted to MoEF&CC & its Regional Office (previously at Lucknow, now at Jaipur (Raj))

Project: Land Use Land Cover analysis of Core Zone (Mining Lease Area) and Buffer Zone (10 Kms. Radius study area from the mining lease boundary) of Nimbeti Limestone Mine (M.L. No. 09/93, M.L. Area 750 Ha.)

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Chapter 2: Classification Scheme & Brief description of classes

2.0 CLASSIFICATION SCHEME

Keeping in mind the objectives of preparation of environmental management plan (EMP), action plan for LULC (Land use Land Cover), DEM (Digital Elevation Model), Drainage plan, and classification scheme adopted for the preparation of land use/land cover maps on 1:25,000 scales. Land use/ Land cover classification standardized by NRSC/ISRO is followed.

Table 3: LULC Classification Scheme by NRSC of 2nd CLASS

S. No.	Description – I	Description – II
1.	Built-up	Urban
		Rural
		Mining
2.	Agriculture	Crop land
		Plantation
		Fallow
		Current Shifting Cultivation
3.	Forest	Evergreen/ Semi evergreen
		Deciduous
		Forest Plantation
		Scrub Forest
		Swamp/ Mangroves
4.	Grass/ Grazing	Grass / Grazing
5.	Barren/ Unculturable/ Waste Land	Salt affected Land
		Gullied / Ravenous Land
		Scrub Land
		Sandy Area
		Barren Rocky
		Rann
6.	Wetlands/ Water Bodies	Inland Wetland
		Coastal Wetland
		River / Stream / Canal
		Water Bodies
7.	Snow and Glacier	Seasonal and Permanent Snow

Source: Natural Resource Manual, NRSC, Hyderabad.



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2.1 LAND USE/ LAND COVER AREA

Brief description/ general definitions of classes are as given here under:

2.1.1 Land Cover

Land cover is defined as observed physical features on the Earth's Surface. When an economic function is added to it, it becomes Land Use. (FAO, 2005).

2.1.2 BUILT-UP LAND

It is an area of human habitation developed due to non-agricultural use and that has a cover of buildings, transport and communication, utilities in association with water, vegetation and vacant lands.

2.1.2.1 Urban:

Urban areas are non-linear built up areas covered by impervious structures adjacent to or connected by streets. This cover is related to centres of population. This class usually occurs in combination with, vegetated areas that are connected to buildings that show a regular pattern, such as vegetated areas, gardens etc. and industrial and/or other areas. (FAO, 2005). It includes residential areas, mixed built-up, recreational places, public / semi-public utilities, communications, public utilizes/facility, commercial areas, reclaimed areas, vegetated areas, transportation, industrial areas and their dumps, and ash/cooling ponds.

2.1.2.2 Rural

These are the lands used for human settlement of size comparatively less than the urban settlements of which the majority of population is involved in the primary activity of agriculture. These are the built-up areas, smaller in size, mainly associated with agriculture and allied sectors and non-commercial activities. They can be seen in clusters non-contiguous or scattered.



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2.1.2.3 Mining

Mining areas encompass area under surface mining operations. The recognizable impacts of these activities on the landscape are unmistakable giant pit mines covering vast areas. It includes surface rocks and stone quarries, sand and gravel pits, brick kilns, etc. These are areas of stockpile of storage dump of industrial raw material or slag/effluents or waste material or quarried/mixed debris from earth's surface.

2.1.3 AGRICULTURAL LAND

These are the lands primarily used for farming and for production of food, fibre, and other commercial and horticultural crops. It consists of:

2.1.3.1 Cropland

These are the areas with standing crop as on the date of Satellite overpass. Cropped areas appear in bright red to red in color with varying shape and size in a contiguous to non-contiguous pattern. They are widely distributed indifferent terrains; prominently appear in the irrigated areas irrespective of the source of irrigation.

2.1.3.2 Plantation

These are the areas under agricultural tree crops planted adopting agricultural management techniques. Depending on the location, they are exhibit a dispersed or contiguous pattern. Use of multi-season data will enable their separation in a better way. It includes agricultural plantation (like tea, coffee, rubber etc.) horticultural plantation (like coconut, citrus fruits, orchards, fruits, ornamental shrubs and trees, vegetable gardens etc.) and agro-horticultural plantation.



Project: Land Use Land Cover analysis of Core Zone (Mining Lease Area) and Buffer Zone (10 Kms. Radius study area from the mining lease boundary) of Nimbeti Limestone Mine (M.L. No. 09/93, M.L. Area 750 Ha.)

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2.1.3.3 Fallow

An agricultural system with an alternation between a cropping period of several years and a fallow period (Ruthenberg, 1980). In another terms these are the lands, which are taken up for cultivation but are temporarily allowed to rest, un-cropped for one or more season, but not less than one year.

2.1.4 FOREST

The term forest is used to refer to land with a tree canopy cover of more than 10 percent and area of more than 0.5 ha. Forests are determined both by the presence of trees and the absence of other predominant land uses. The trees should be able to reach a minimum height of 5 m (MoE&F, 2011). It consists of:

2.1.4.1 Evergreen/Semi-Evergreen

This term describes the phenology of perennial plants that are never entirely without green foliage (*Ford-Robertson, 1971*). This category comprises of tall trees, which predominantly remain green throughout the year. It includes both coniferous and tropical broadleaved evergreen species. Semi-evergreen is a forest type that includes combination of evergreen & deciduous species with the former dominating the canopy cover

2.1.4.2 Deciduous

This applies to the phenology of perennial plants that are leafless for a certain period of the year (*Ford-Robertson, 1971*). The leaf shedding usually takes place simultaneously in connection with the unfavourable season (*UNESCO, 1973*).

These are the forest types that are predominantly composed of species, which shed their leaves once a year, especially during summer. It also includes tree clad area with tree cover lying outside the notified forest boundary areas that are herbaceous with a woody appearance (e.g.bamboos, palms, tree ferns, etc.).



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2.1.4.3 Forest Plantation

These are the areas of tree species of forestry importance, raised and managed especially in notified forest areas. The species mainly constitute teak, Sal, eucalyptus, casuarina, bamboo etc.

2.1.5 GRASS/ GRAZING LAND

These are the areas of natural grass along with other vegetation, predominantly grass-like plants (Monocots) and non-grass-like herbs (except Lantana species which are to be classified as scrub). It includes natural/semi-natural grass/ grazing lands of Alpine/ Sub-Alpine or temperate or sub-tropical or tropical zones, desertic areas and manmade grasslands.

2.1.6 WASTELANDS

Described as degraded lands which can be brought under vegetative cover with reasonable effort and which is currently underutilized and land which is deteriorating for lack of appropriate water and soil management or on account of natural causes. It consists of:

2.1.6.1 Salt-Affected Land

Generally characterized as land that has excess salt in the soils with patchy growth of grasses

2.1.6.2 Gullied / Ravenous Land

They are the resultant of terrain deformation due to water erosion which occurs widely in all agro-climatic zones. Gullies are formed as a result of localized surface run-off affecting the unconsolidated material resulting in the formation of perceptible channels causing undulating terrain. They are mostly associated with stream courses, sloping grounds with good rainfall regions and foothill regions. These are the first stage of

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excessive land dissection followed by their networking which leads to the development of ravenous land.

2.1.6.3 Scrub Land

These areas possess shallow and skeletal soils, at times chemically degraded extremes of slopes, severely eroded or subjected to excessive aridity with scrubs dominating the landscape.

2.1.6.4 Sandy Area

These can occur in coastal, Riverine or inland areas. Desertic sands are characterized by accumulation of sand developed in situ or transported by Aeolian processes.

Coastal sands are the sands that are accumulated as a strip along the sea-coast. Riverine sands are those that are seen as accumulations in the flood plain as sheets which are the resultant phenomena of river flooding.

2.1.6.5 Barren Rocky/Stony Waste

These are rock exposures of varying lithology often barren and devoid of soil and vegetation cover

2.1.6.6 Rann

An extensive salt marsh of western India between the Gulf of Kutch and the Indus River delta

2.1.7 WETLAND / WATER BODIES

All submerged or water-saturated lands, natural or man-made, inland or coastal, permanent or temporary, static or dynamic, vegetated or non-vegetated, which necessarily have a land-water interface, are defined as wetlands. It consists of:

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2.1.7.1 Inland Wetlands

These are the areas that include ox-bow lakes, cut-off meanders, playas, marsh, etc. which are seasonal as well as permanent in nature. It also includes manmade wetlands like waterlogged areas (seasonal and perennial).

2.1.7.2 Coastal Wetland

These include estuaries, lagoons, creek, backwater, bay, tidal flat/mudflat, sand/beach, rocky coast, mangrove, salt marsh/marsh vegetation and other hydrophytic vegetation and salt pans.

2.1.7.3 River /Stream / Canals

Rivers/streams are natural course of water flowing on the land surface along a definite channel/slope regularly or intermittently towards a sea in most cases or into a lake or an inland basin in desert areas or a marsh or another river. Canals are artificial water course constructed for irrigation, navigation or to drain out excess water from agricultural lands.

2.1.7.4 Water Bodies

This category comprises areas with surface water in the form of ponds, lakes, tanks and reservoirs.



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Chapter 3: Methodology

3.0 METHODOLOGY:

For preparation of land use map, NRSC's Land-use & landcover mapping scheme has been followed. The general process flow chart is given as Fig. 3.1

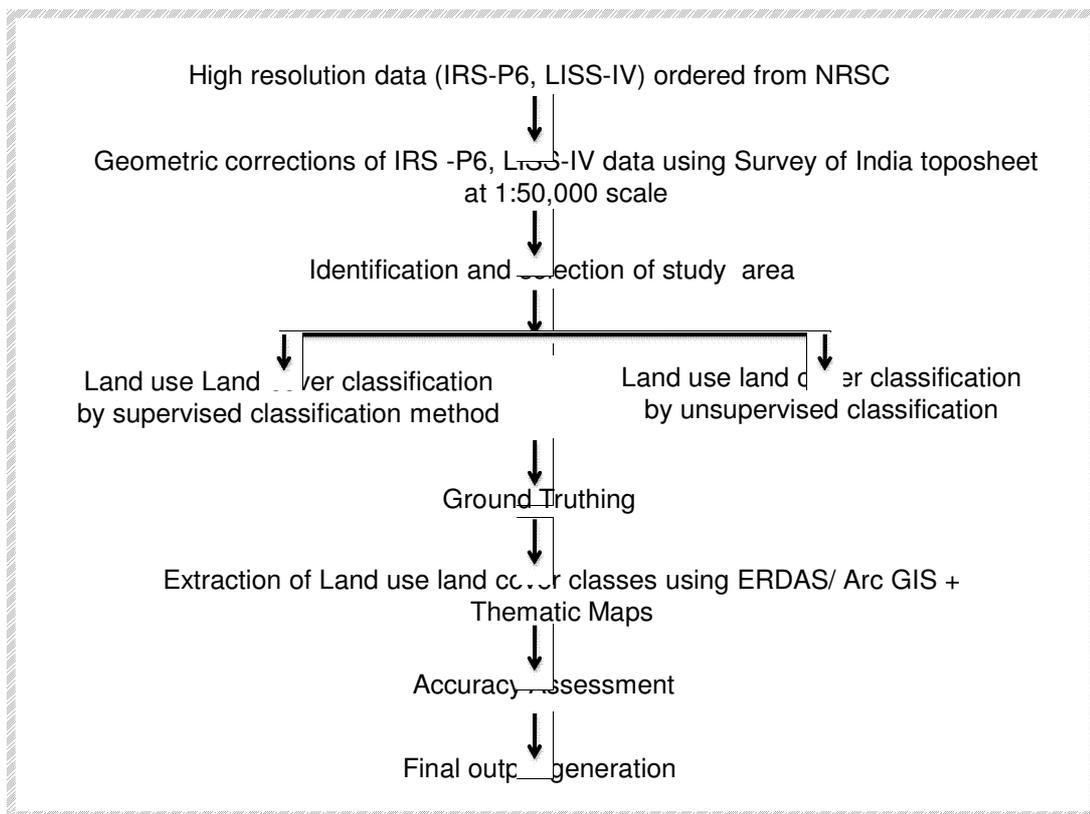


Fig. 3.1: Process flow chart for preparation of land use maps

3.1 SOURCE OF INFORMATION & DATA BASE

The data in this work is collected from the following sources:

1. **Topographic data:** From Survey of India Toposheet
2. **Remotely Sensed Data:** IRS P6, LISS IV Data of Resource Sat 2, SRTM



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The entire study area of 10 kms has been covered in the satellite scene (Path no. 93 & Row no. 53). All the data used in this work have been supplied by National Remote Sensing Centre, Hyderabad, India through ftp mode (online).

The mask of the entire buffer of mining lease including the influence zone was generated from the IRS-P6, LISS-IV. For the secondary data, SRTM were referred to for the preparation of drainage map.

Table 4: Database used for Land Use and Land Cover Mapping

S. No.	Satellite	Sensor	Date type & Bands
1.	IRS-P6	LISS-IV	Digital (1,2,3)
2.	Cartosat	Pan	Digital (1)
3.	Google Image	Visible	Digital (1)

3.2 SPATIAL REFERENCE PROPERTIES

Following spatial data references has been used:

Spatial Reference : WCS 1984 UTM Zone 43 N

Linear Unit : Meter (1.000000)

False Easting : 500000

Central Meridian : 75

Datum : WGS 1984

3.3 SATELLITE DATA SPECIFICATIONS & DETAILS:

The satellite scene pass date is 27th November 2020. Other basic details are as given below:-

Product ID=211740011; Sat ID = IRS-R2; Sensor = L4FX; Sub Scene =B; Path = 093; Row=053; Session Number = 1; Date of Pass = 27-NOV-2020; No of Bands=3; Band Numbers = 234; Pass Type = PLD; Date of Dump= 27-NOV-2020; Dumping Orbit No=049858; Imaging Orbit No= 049858; Bytes Per Pixel=2; Bits Per Pixel=10; Generation Date Time=15-Apr-21 10:17:32; Prod Code= STUC00OTD; Prod Type=ORTHO; Input Resolution Along= 5.80; Input Resolution Across= 5.80; Output Resolution Along= 5.00; Output Resolution Across=5.00; Season= NOV; Image Format= GEOTIFF; Processing



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Level = ORTHORECTIFIED; Resamp Code = CC; No Scans= 16409; No Pixels= 18383; Map Projection =UTM; Ellipsoid= WGS_84; Datum=WGS84; Map Origin Lat= 26.463050; Map Origin Lon= 73.997494; Prod ULL at=26.829277; Prod ULL on = 73.531917; Prod URL at=26.835852; Prod URL on=74.456822; Prod LRL at =26.095078; Prod LRL on=74.460289; Prod LLL at=26.088712; Prod LLL on= 73.541282; Image ULL at= 26.831158; Image ULL on= 73.736109; Image URL at= 26.835535; Image URL on= 74.456773; Image LRL at=26.094310; Image LRL on=74.257095; Image LLL at= 26.089073; Image LLL on= 73.541278; Prod UL Map X=354115.000000; Prod UL Map Y=2968370.000000; Prod UR Map X=446030.000000; Prod UR Map Y= 2968370.000000; Prod LR Map X=446030.000000; Prod LR Map Y=2886325.000000; Prod LL Map X=354115.000000; Prod LL Map Y=2886325.000000; Scene Center Lat= 26.463050; Scene Center Lon=73.997494; False Easting= 500000.000000; False Northing= 0.000000; Zone No=43; Scene Center Time=27-NOV-2020 05:53:33.597932; Scene Center Roll= - 0.178252; Scene Center Pitch=0.033045; Scene Center Yaw= 2.828594; Sun Azimuth At Center= 162.109074; Sun Elevation At Center=40.284989; Image Heading Angle= 194.619298; Incidence Angle= 0.000000; Satellite Altitude= 824.005662; Tilt angle= 2.535675; Shift%=0; Satellite Heading Angle=194.619298; Scene Start Time=27-NOV-2020 05:53:27.118085839; Scene End Time=27-NOV-2020 05:53:37.657399009; Product Scene Start Time= 27-NOV-2020 05:53:26.392199 & Product Scene End Time=27-NOV-2020 05:53:40.803665.

3.4 DATA PREPARATION

Preparing the data is a primary requirement before undertaking interpretation and subsequent analysis. Preparation of datasets for use in the current mining project is described below:

3.5 GEO-RECTIFICATION

Satellite data, which is available in a raster form, need to be geo-referenced to a map coordinate system so as to generate spatial information and subsequent use in a GIS

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environment. The processes of ortho-rectification involve assigning a coordinate system and transform the raster to the input coordinate system that enable viewing, querying and analyzing the geographic data. However, images of different points of time are often acquired from slightly different angles, from different positions and may be of different resolutions. Hence, they need to be referenced to a common projection system before they are transformed to the original images.

3.6 REGISTRATION

Image to image registration option has been used for selection of ground control points. Registration involves selection of ground control points between reference image and input L3 image. The following are the steps involved during the process.

3.7 IMAGE PREPARATION

Consistency in the image handling requires a thorough pre-processing of satellite data for inter and intra image alignments in terms of geometry and radiometry. Image covering the study areas, as available in specific scene-id is to be identified. While changing the raster image format care should be taken to maintain the geo referencing scheme and an informal check on projection parameters may be done after the conversion. It is suggested that interpretation may be initiated using *rabi* season data to delineate maximum possible land use categories. The interpreted vector can be overlaid on to *kharif* and *zaid* data to include the seasonal aspect of the land degradation information. Seasonality of a particular degradation type should be taken care while preparing the interpretation key. If seasonal changes are quite distinct and present a clear case for separability issue, respective samples need to be incorporated.

3.8 IMAGE ENHANCEMENTS

Image enhancement is essential for improving the image contrast for better delineation of land degradation types. Image radiometry characteristically varies from one scene to another. Hence standardization of enhancement has to be achieved depending upon the

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major earth surface elements and the degraded land types being delineated. The type of enhancement varies depending upon the scene coverage, feature type to be extracted etc. For instance major part of a scene may be covered with sea surface or snow which will have bearing on the overall contrast of the scene, which needs to be balanced.

Masks for LUT: A mask for Sea, Snow etc. can be prepared to counter the bimodal distribution of image histogram before any satisfactory enhancement.

3.9 IMAGE INTERPRETATION

Image interpretation is defined as the ‘the art of examining images for the purpose of identifying objects or surface features and judging their significance. Interpreter studies the remotely sensed data and attempts through logical processes in detecting and identifying, classifying, measuring and evaluating the significance of physical and cultural significance of spatial relationship’ (Manual of Remote Sensing, Vol. 1p. 369).

3.10 IMAGE INTERPRETATION KEY

The image interpretation key provides a critical reference base for advanced interpretation. It helps the interpreter in evaluating the information in an organized and consistent manner. Ideally an interpretation key consists of two components viz:

- Collection of annotated / captioned images illustrating features,
- A graphic or textual description of the systematically recognizes image features.

An image interpretation key for the study area has to be designed prior to interpretation, which can be further refined in course of interpretation.

- a. Collection of annotated / captioned images:** Complete scene is studied thoroughly for distinction of features in different possible band combinations across different seasons to understand the spectral response patterns. Image subsets for each land cover prepared and annotations/captions for each are provided.
- b. Description of each land cover feature** is provided in the key in specific reference to all interpretation elements viz., Tone, Texture, Size, Shape, Association, Pattern, etc.



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While delineating land cover classes like sandy & saline, ash pond & pond, waterlogged & black cotton soil area, use of extra knowledge while carrying out on screen visual interpretation is useful.

3.11 INTERPRETATION OF LAND DEGRADATION TYPES

Satellite remote sensing techniques are used to map the structure and dynamics of land use/land cover on an operational basis earlier on 1:25,000 scale. In order to establish the methodology, operational applications under the NR Census program is adopted and followed. The same shall be adhered to in the present effort and are given below:

- i. Using the interpretation key prepared, land use land cover classes have to be delineated by using onscreen interpretation procedure.
- ii. Relevant satellite image(s) has to be displayed on the computer screen at 1:25,000 scale. In order to enhance the image appearance proper LUT has to be applied and care to be taken so that LUT is not burnt on to the image. As often operator may tend to save the LUT inadvertently it may be worthwhile to spare attention while removing the image from the interface.
- iii. Onscreen interpretation is carried out in a separate layer (in vector layer format) after opening the grid tiles onto the image. Conventional method of interpretation in vector format (line format) requires rigorous and time taking editing to eliminate dangles, label errors etc. Further this can be used with most GIS / image processing suites available.
- iv. Land use classification codes used for labeling using the specific codes (As in Table) only. Textual errors while manually entering in label in the Arc\Info would require additional but avoidable effort to rectify them.
- v. Integration of layers such as base, road and other network carried out.

3.12 COMPONENTS OF LAND USE/ LAND COVER CLASSIFICATION

Following are the broad components in land use land cover classification;

- Built up: Settlement Urban/Rural, Civil Structures



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- Agriculture: Crop land, Plantation, Fallow land, shifting cultivation.
- Forest: Forest plantation, all kind of forest.
- Grazing land
- Barren/ Uncultivable/Wasteland: Salt affected land, Sandy land, Scrub land, Barren rocky.
- Wetland/ Water bodies: River, Stream, Canal, Lake, Pond, Reservoir, Coastal Zone.

3.13 GROUND DATA COLLECTION AND VERIFICATION

Ground truth/ field verification is an important component in mapping and its validation exercise. Utmost care and planning is required for collecting ground data and verification. To facilitate a good ground truthing exercise the following steps need to be followed:

- Identify & list all the doubtful areas for ground verification and refer all such areas with respect to the toposheet to know their geographical location & accessibility on ground
- Prepare field traverse plan to cover maximum doubtful areas in the field. Ensure that each traverse covers, as many land classes as possible, apart from the doubtful areas, and
- These observations are required both for quality checking as well as accuracy estimation, in addition to use in interpretation.

3.14 ACCURACY ESTIMATION

Overall accuracy of map is comprised of geometric and thematic accuracy. To check the geometric accuracy of the data, the projection information has to be checked first. To check the interpretation quality, the individual vector layers are superimposed on the corresponding satellite data and check should be made for overall interpretation quality of major land cover types. Subsequently, map should be focused and interpretation should be checked for polygon complexity, interpretation quality of feature and proper labeling of features. Using a random number generator, random polygons are to be generated using stratified random sampling technique. However, a minimum of one polygon needs to be checked even for the classes those have very fewer number of polygons.

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The polygons should be distributed well of map. It needs to be checked for interpretation quality, consistency of interpretation, polygon complexity, appropriate labeling, and continuity with other polygons. The accuracy will be estimated using Kappa statistics.

$$\text{Individual class Accuracy} = \frac{\text{No of polygons correctly interpreted as that class}}{\text{No of polygons checked in the field for the same class}} \times 100$$

The report output consists of:-

- Matrix of confusion or error matrix (Optional)
- Accuracy totals, consisting of class-wise accuracies.
- Overall as well as Kappa accuracy.
- Conditional Kappa for each of the class.

Accuracy achieved is greater than 90% for the current land use mapping.

3.15 FINAL MAP GENERATION

Base map features are overlaid and then map has been generated on the layout consisting of theme map, legend, sources of data, index map, project title and year of publication, scale bar, north arrow. The output maps are generated in the ArcMap/QGIS software.

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Chapter 4: Presentation of results

4.1 LAND USE/LAND COVER

The core zone (mining lease area) and the study area 10 kms radius from the mining lease has been covered in the satellite scene (Path no. 93 & Row no. 53). All the data used in this work have been supplied by National Remote Sensing Centre, Hyderabad. The mask of the entire Buffer of mining lease area including the influence zone was generated from the IRS-P6 LISS-IV. The satellite scene pass date is 27th November 2020.

4.2 LAND USE PATTERN OF THE CORE ZONE & STUDY AREA

The land use classification of the mining lease area (750 ha) & study area 10 kms radius from the mining lease boundary (45343.51 ha) along with the geographic area under each class is tabulated in Table 4.1 & 4.2 respectively as under:

Table 5: Land Use/ Land Cover classes for core zone (mining lease area)

S. No.	Class	Sub Class	Area (Ha.)	Area (%)
1	Fallow Cultivable /Open Land		106.55	14.21
2	Mine Quarry	A) Mine pit area	244.96	32.66
		B) Internal roads	7.54	1.01
		C) Water Bodies / reservoirs	19.53	2.60
3	Other Built-up/ Industrial Area		26.50	3.53
4	Fallow Land /Open-Scrub Land		111.63	14.88
5	Barren/ Stony/ Land		69.94	9.33
6	Dump Area		87.17	11.62
7	Plantation on Dump		4.35	0.58
8	Plantation		71.83	9.58
Total			750.00	100.00



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Land use map of the core zone (mining lease area) is presented as under:

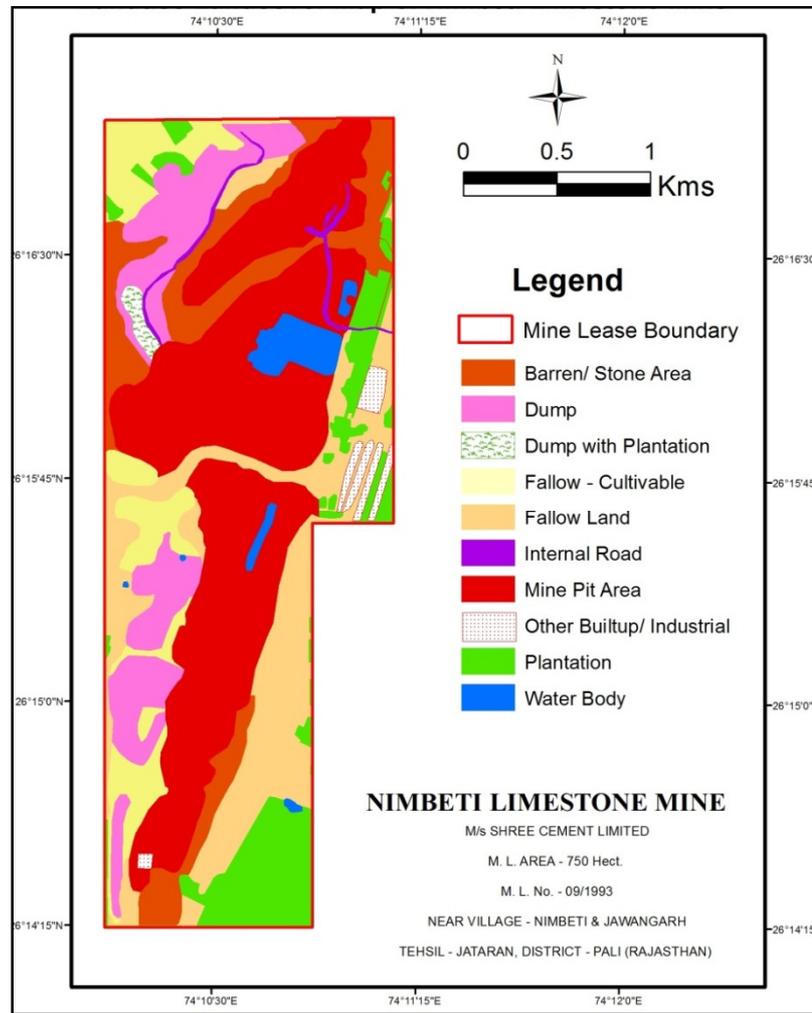


Fig. 4.1: Land-use/ Land cover map of core zone (mining lease area)

Land use analysis of the study area (10 kms radius from the mining lease boundary) is presented as under:

Table 6: Land Use/ Land Cover classes for study area (10 kms)

S. No.	Land use classes as per NRSC Classification		Area (Ha.)	Area (%)
	Level - I	Level - 2		
1.	Built up	Urban	1024.50	2.26
		Rural		
		Mining (Including Nimbeti)	792.67	1.75
2.	Agriculture	Crop Land	11139.46	24.57
		Fallow Land	18596.89	41.01
3.	Forest	Deciduous (Dry/Thorn)	3059.20	6.75
		Plantation		



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4.	Barren/ Uncultivable/ Waste Land	Scrub Land	10400.10	22.93
5.	Wetlands/ Water Bodies	Drainage/ Stream/ Ponds/ Reservoir	330.70	0.73
Total			45343.51	100

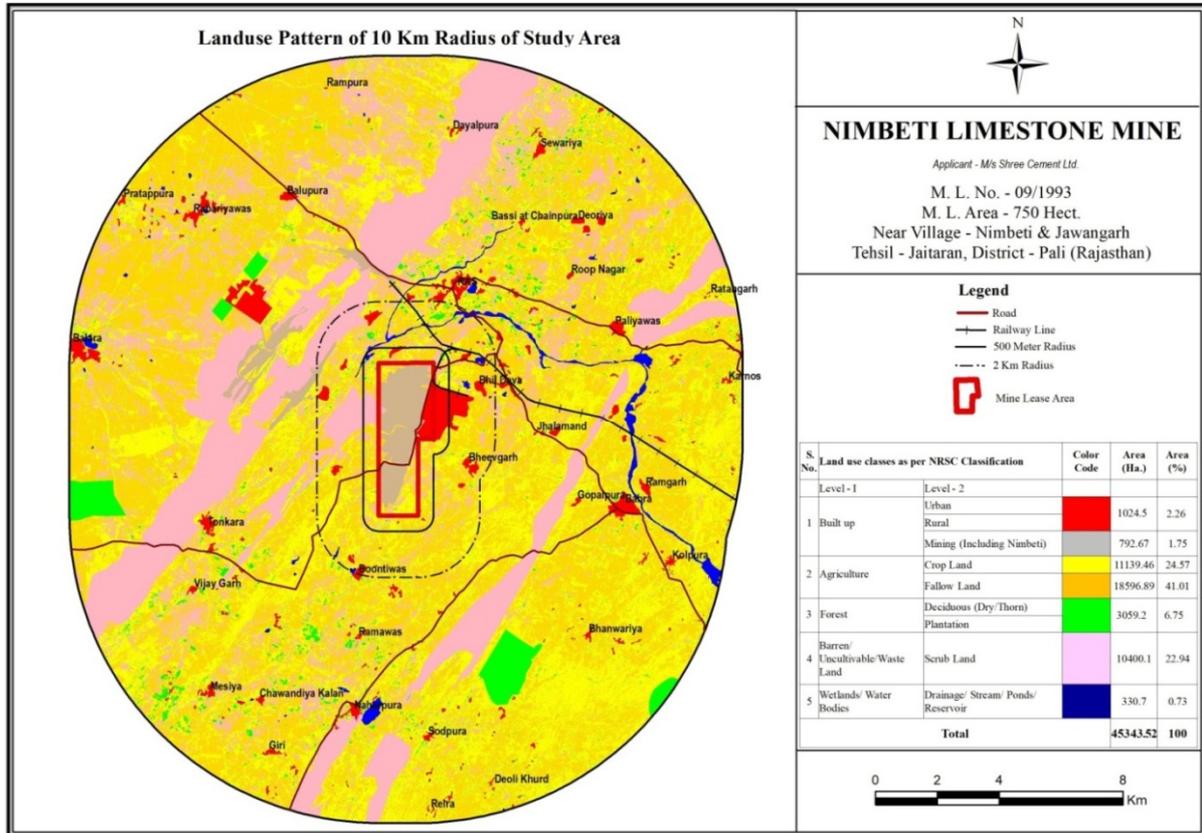


Fig. 4.2: Land-use/ Land cover map of study area 10 Kms radius from the mining lease boundary

4.3 DIGITAL ELEVATION MODEL (DEM) & DRAINAGE MAP

DEM map (Fig. 4.3) was prepared for analysis of topography of the study area. It is observed from the map that the topography of the area is hilly consisting of series of hummocks running in the NE-SW direction. The highest and lowest elevation is 490 MSL and 375 MSL. The slope of the surrounding area is gradually decreases towards SW as indicated by the flow of river Lilri. Two major seasonal streamlets have been observed in the area -one is SW flowing towards the west and another in SE flowing towards east.

The drainage in surrounding area is dendritic in nature. Drainage map of the study area is depicted in Fig. 4.4. Nimbeti Limestone deposit forms the part of catchment area of Lilri

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River, a tributary of Luni River. Lilri River originates from Ramgarh – Narpura hills, north of Beawar. After flowing west up to Ras, it takes southern turn, flowing between two limestone hills, is joined by Sukri river near village Mohari and further downstream meets Luni river near Nimbol.

Lilri river is an ephemeral stream and flows only in direct response to rainfall in its catchment area. There is well-developed drainage, which is dendrite in nature. The drainage on the north-easterly trending hills of limestone, takes westerly and easterly course, ultimately joining Lilri River.

Nimbeti limestone deposit is the most easterly limestone hill, among the four prominent limestone hills, all sticking NE-SW and all hills are being mined and proposed to be mined as source of limestone by other cement plants. Four minor irrigation projects have been constructed upstream of Ras limestone deposits on Lilri river and its tributary Sukri.

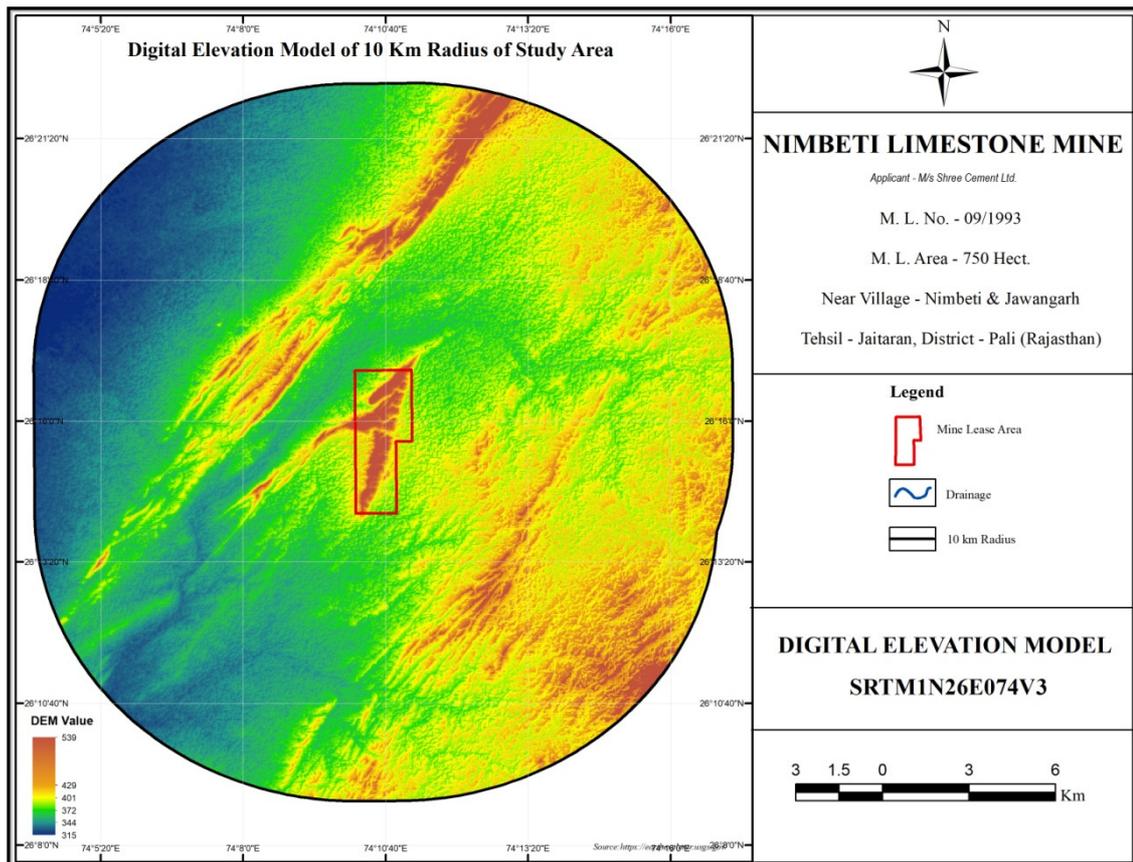


Fig.4.3: Digital Elevation Model Map of the Study Area 10 kms. Radius from mining lease boundary

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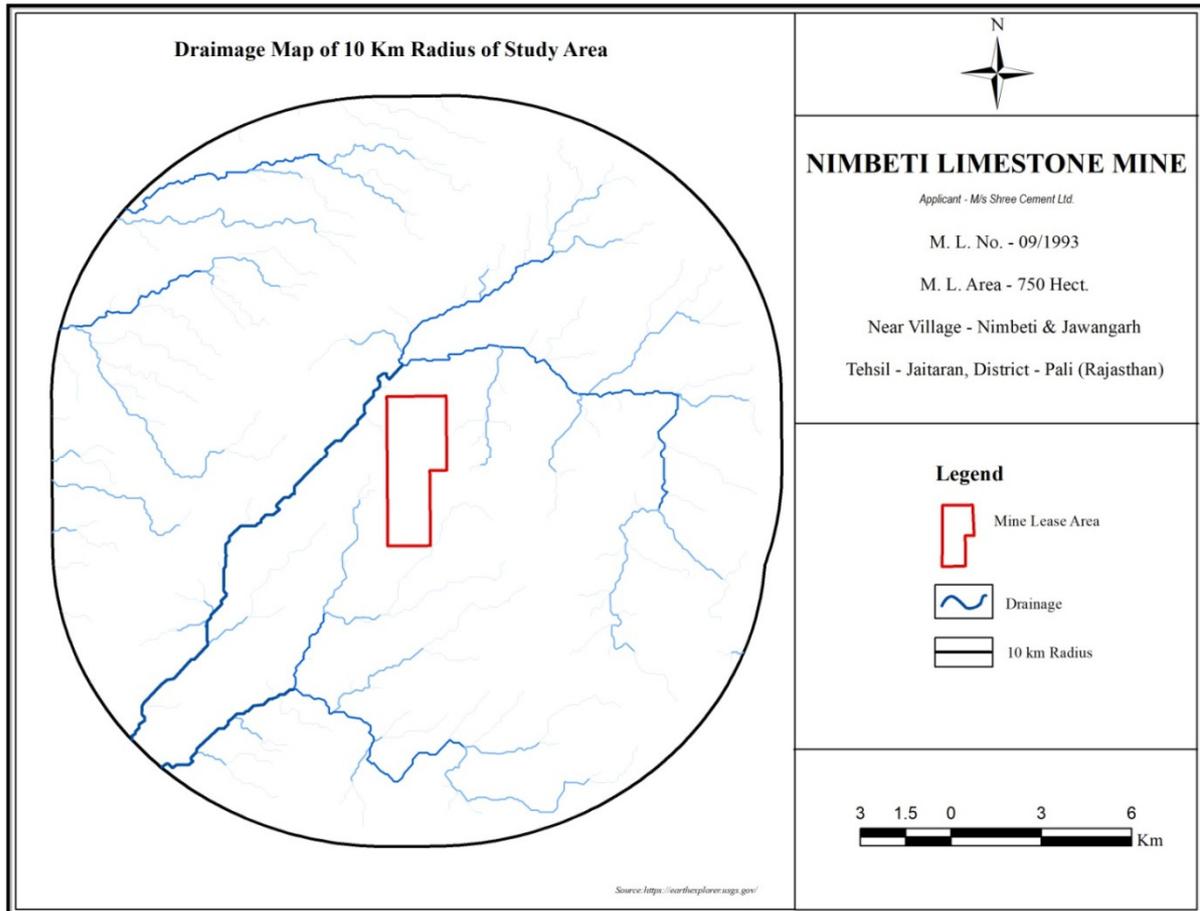


Figure 4.4: Drainage Map of the Study Area (10 Kms. Radius from the mining lease boundary)

4.4 RESULTS

This study underlines the performance of three widely used classification techniques for classification of study area. From the land use analysis it is observed that the study area comprises mainly of agricultural land (65.58%) which may be further sub-categorized as fallow land (41.01%) and crop land (24.57%), followed by barren/ uncultivable land (22.94%). There are no National Park/ Wildlife Sanctuaries within 10 kms radius of the mining lease. However, there are patches of forest land (6.75%- plantation), which is also depicted and verified from the SoI toposheets.

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REFERENCES

- Encyclopedic District Gazetters of India.
- Gong P and P Howarth, Frequency base classification and grey level vector reduction for land use identification. PE&RS, Vol.58, No.4, April 1992, PP.423-437 12.
- Kai-Yi-Huang and P.M.Mausel(1994), Comparing a Piecewise Linear Classifier with Gaussian Maximum Likelihood and Parallelepiped Classifiers In terms Of Accuracy and Speed PE&RS, Vol.LX,No.11,Nov.1994 pp.1333.
- Mallat,S(1989) A theory of multiresolution signal decomposition: the wavelet representation.IEEE train. PAMI, Vol.II, No.7.PP.572-693.
- Paola J.D.and Schowengrdt R.A.(1995). A Detailed Comparison of Black Propagation Neural Network and Maximum Likelihood Classifier for Urban Landuse Classification .IEEE Trans. On Geosciences And Remote Sensing, Vol.33,pp.981-986.
- Peng Gong and Philip J.Howarth(1992). Frequency Based Contextual Classification and Grey Level Vector reduction For Land use Identification. PE &RS, Vol.58, No.4, Apr.1992 pp.423-437.
- S.Sudhakaret,al.(1999). Techniques of Classification for Landuse/Landcover with special reference for Forest type mapping in Jaldapara Wild life Sanctuary. Journal of the Indian society of Remote Sensing, Vol. 27.No.4, 1999.

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TRAINING SETS



Built-up (Industrial)



Built-up (Mining Area)



Built-up (Settlement)



Agriculture (Fallow)



Forest/ Plantation



Agriculture (Crop Land)



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PLATES



Scrublands - Water erosion - Moderate



Scrublands - Salinization - Moderate



(1)



(2)



(3)

- (1) Forest – Vegetation degradation – Severe**
- (2) Un-irrigated agriculture – Salinization - Moderate**
- (3) Un-irrigated agriculture – Water erosion - Slight**



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(NABET APPROVED, ISO 9001: 2015 CERTIFIED CONSULTANT ORGANIZATION)

#102, SNG Shree Ratna Apartment, Peetal Factory, Bani Park,

Jhotwara Road, Jaipur-302016

E-mail: gaurangenviro@gmail.com

Website: www.gauranggroup.com