

SUMMARY

OF

COMBINED DRAFT EIA / EMP REPORT

FOR

ROUGHSTONE AND GRAVEL QUARRIES (3 PROJECTS)

Irukkandurai Part(II) village, Radhapuram Taluk, Tirunelveli District,
Tamil Nadu

Lease Details	P1	P2	P3
Lease area	3.981 Ha	4.714Ha	3.740 Ha
Survey nos	282/3B(P), 283/2(P), 278/2(P), 277/1B(P), 284/1A1(P) & 284/2(P)	290/1B(P), 290/2(P), 160/1A(P), 289/1A(P) & 289/2(P)	289/1A(P), 289/2(P), and 161/1A(P)
Landuse	Consent Registered Patta land		
5 years Production Capacity	Roughstone – 4,78,340m3 Weathered Rock- 2,95,390m3 Gravel-67,550m3	Roughstone – 6,25,475m3 Weathered Rock – 3,59,325m3 Gravel-81,618m3	Roughstone – 4,14,975m3 Weathered Rock- 2,74,250m3 Gravel-63,384m3
Tor Obtained Vide Letter No.	SEIAA- TN/F.No.9406/ToR- 1262/2022 dated 26.09.2022.	SEIAA- TN/F.No.9407/ToR- 1261/2022 dated: 26.09.2022.	SEIAA- TN/F.No.9405/ToR- 1260/2022 dated 26.09.2022.
Project Cost	Rs.1,04,68,600/-	Rs.1,19,28,400/-	Rs.1,03,24,000/-
EMP Cost	Rs 32,00,000/-	Rs 27,20,000/-	Rs 25,80,000/-

PROJECT PROPONENT

HI-TECH ROCK PRODUCTS & AGGREGATES

Mount Poonamalee Road, Manapakkam, P.B.No.979, Chennai-600089.

CONSULTANT

CREATIVE ENGINEERS & CONSULTANTS



(Creating Foundations)

NABET accredited vide Certificate no. NABET/EIA/2023/RA 0187,

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SUMMARY

1.1 INTRODUCTION:

Hi-Tech Rock Products & Aggregates Limited proposes to operate three Roughstone and Gravel Quarries in Irukkandurai Part (II) village, Radhapuram Taluk, Tirunelveli District, Tamil Nadu and has initiated action towards obtaining environmental clearance. The three proposals are:

- Roughstone and Gravel Quarry over an area of 3.981Ha herein referred to as P1
- Roughstone and Gravel Quarry over an area of 4.714Ha herein referred to as P2
- Roughstone and Gravel Quarry over an area of 3.740Ha herein referred to as P3

Although the individual lease area of each of these projects are less than 5 Ha, extent of existing quarries within the 500m radius cluster along with this subject projects works out to >5 Ha. Hence, all three proposals is considered under Category – B1 and as per MoEF & CC notification, this necessitates preparation of EIA/EMP report and public hearing. As such Common EIA for the above mentioned 3 proposals of Hi-Tech Rock Products & Aggregated Limited, falling in the cluster along with separate assessment of impacts and EMP for each proposed project is carried out. For cumulative impact assessment apart from these 3 proposals one other quarry of the same proponent over an area of 4.65Ha (for which EC has already been accorded, herein referred to as E1) is also considered. Composite map of the proposed projects namely P1, P2 and P3 & E1 is shown in Figure enclosed.

1.2 STATUTORY APPROVALS:

Table 1:Statutory Approvals

Particulars	P1	P2	P3
Precise Area Communication Letter	Rc.No.M2/38650-1/2019 dated 11.05.2022	Rc.No.M2/38650-2/2019 dated 11.05.2022	Rc.No.M2/38650-3/2019 dated 11.05.2022
Mining Plan Approval	Rc.No.M2/38650-1/2019, dt 14.05.2022	Rc.No.M2/38650-2/2019, dt 14.05.2022	Rc.No.M2/38650-3/2019, dt 14.05.2022
Terms of reference	SEIAA- TN/F.No.9406/ToR- 1262/2022 dated 26.09.2022.	SEIAA- TN/F.No.9407/ToR- 1261/2022 dated 26.09.2022.	SEIAA- TN/F.No.9405/ToR- 1260/2022 dated 26.09.2022.

ROUGHSTONE AND GRAVEL QUARRIES (P1- 3.981 HA, P2-4.714HA AND P3-3.740HA) OF HI-TECH ROCK PRODUCTS & AGGREGATES LIMITED IN IRUKKANDURAI PART (II) VILLAGE, RADHAPURAM TALUK, TIRUNELVELI DISTRICT, TAMIL NADU.

Based on the conditions of Precise Area Communication letter, safety distance has been left for the adjoining patta lands. Salient details of the report is given below.

2.1 SITE DESCRIPTION:

Table 2: Site Details

S.No	Particulars	P1	P2	P3
1	Name of the Project	Rough Stone and Gravel Quarry of Hi-Tech Rock Products & Aggregates Limited (Over an area of 3.981 Ha)	Rough Stone and Gravel Quarry of Hi-Tech Rock Products & Aggregates Limited (Over an area of 4.714Ha)	Rough Stone and Gravel Quarry of Hi-Tech Rock Products & Aggregates Limited (Over an area of 3.740 Ha)
2	Location of the project	Irukkandurai Part (II) village, Radhapuram Taluk, Tirunelveli District		
3	Survey No.	282/3B(P), 283/2(P), 278/2(P), 277/1B(P), 284/1A1(P) & 284/2(P)	290/1B(P), 290/2(P), 160/1A(P), 289/1A(P) & 289/2(P)	289/1A(P), 289/2(P), and 161/1A(P)
4	Proposed production for 5 years lease period	Roughstone – 4,78,340m ³ Weathered Rock- 2,95,390m ³ Gravel-67,550m ³	Roughstone – 6,25,475m ³ Weathered Rock – 3,59,325m ³ Gravel-81,618m ³	Roughstone – 4,14,975m ³ Weathered Rock- 2,74,250m ³ Gravel-63,384m ³
5	Latitude	08°11 '56.76"N to 08°11'48.80"N	08°12 02.74"N to 08°11'55.56"N	08°11 '48.79"N to 08°11'54.89"N
6	Longitude	77°40'01.59"E to 77°39'54.64"E	77°40'18.79"E to 77°39'10.39"E	77°40'10.63"E to 77°40'18.60"E
7	Extent	3.981 Ha	4.714 Ha	3.740 Ha
8	Type of land	Consent Registered Patta Land		
9	Topography	The area applied for mining lease is a gentle plain terrain.		
10	Accessibility	Site can be approached from Koodankulam Road, which joins the SH-176 (Anjugramam – Tiruchendur). Can also be approached from the Kanniyakumari – Radhapuram road which ultimately connects to Radhapuram in the northern side and SH-176 on the southern side.		
11	Nearest highway	(SH-176) Thiruchendur to Kanyakumari – 1.8Km (S)	(SH-176) Thiruchendur to Kanyakumari – 1.9Km (S)	(SH-176) Thiruchendur to Kanyakumari – 1.7Km (S)
12	Nearest Railway station	Kavalkinaru – 13.4 Km (NW)		
13	Nearest Airport	Tuticorin – 70.0Km (NE)		

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14	Nearest major water bodies	<ul style="list-style-type: none"> •Odai – 440m (S) •Tank – 600m (W) •Hanuman Nadi - 2.8km(SW) •Uppar R- 4.6km(SW) •Radhapuram Canal- 3.2km(NW) •The Bay of Bengal - 4.3km(S) 	<ul style="list-style-type: none"> •Odai – 550m (S) •Tank – 600m (SW) •Hanuman Nadi - 3.30km(SW) •Uppar R- 5.10km(SW) •Radhapuram Canal- 3.30km(NW) •The Bay of Bengal - 4.3km(S) 	<ul style="list-style-type: none"> •Odai – 470m (S) •Tank – 550m (SE) •Hanuman Nadi - 3.30km(SW) •Uppar R- 5.0km(SW) •Radhapuram Canal- 3.5km(NW) •The Bay of Bengal - 4.2km(S)
15	Environmental sensitive areas, Protected areas as per Wildlife Protection Act, 1972*	Kanniyakumari Wild life sanctuary -12.2Km (W).	Kanniyakumari Wild life sanctuary -12.7Km (W).	Kanniyakumari Wild life sanctuary - 12.7Km (W).
		As per MoEFCC's Final notification, SO.3236 (E) dated 22 Sep 2020, since all the leases are located outside the ESZ, NBWL clearance is not applicable.		
16	Local Places of Historical and Tourism Interest	Nil within 10 km radius		
17	Reserved / Protected Forests	Nil within 10 km radius		
18	Seismic Zone	Zone – II (Least Active)		

Table 3: Technical Description

PARTICULARS	DETAILS		
	P1	P2	P3
Geological Reserves	Roughstone - 17,86,950m ³ Weathered Rock - 3,97,100m ³ Gravel - 79,420m ³	Roughstone - 21,20,580 m ³ Weathered Rock - 4,71,240 m ³ Gravel - 94,248 m ³	Roughstone - 16,82,775m ³ Weathered Rock - 3,73,950m ³ Gravel - 74,790m ³
Mineable Reserves	Roughstone - 5,09,875m ³ Weathered Rock - 2,95,390m ³ Gravel - 67,550m ³	Roughstone - 6,78,900m ³ Weathered Rock - 3,59,325m ³ Gravel - 81,618m ³	Roughstone - 4,34,625m ³ Weathered Rock - 2,74,250m ³ Gravel - 63,384m ³
Method of Mining	Open cast mechanized mining method with drilling, blasting, excavation, loading and transportation of Roughstone to needy buyers.		

ROUGHSTONE AND GRAVEL QUARRIES (P1- 3.981 HA, P2-4.714HA AND P3-3.740HA) OF HI-TECH ROCK PRODUCTS & AGGREGATES LIMITED IN IRUKKANDURAI PART (II) VILLAGE, RADHAPURAM TALUK, TIRUNELVELI DISTRICT, TAMIL NADU.

Production	P1			
	YEAR	Rough Stone in m³	Weathered Rock in m³	Gravel in m³
	1	142840	295390	67550
	2	143375	-	-
	3	143250	-	-
	4	48875	-	-
	5	-	-	-
	Total	478340	295390	67550
	P2			
	YEAR	Rough Stone in m³	Weathered Rock in m³	Gravel in m³
	1	199405	3,59,325	81,618
	2	199320	--	--
	3	199740	--	--
	4	27010	--	--
	5	-	--	--
	Total	625475	3,59,325	81,618
	P3			
	YEAR	Rough Stone in m³	Weathered Rock in m³	Gravel in m³
	1	118060	2,742,50	63,384
	2	118170	--	--
	3	119965	--	--
	4	50500	--	--
	5	8280	--	--
	Total	414975	2,74,250	63,384
Lease Period	5 Years		5 Years	5 Years
Waste Generation and Management	There is no waste generation anticipated in this quarry operation since the entire excavated material will be utilized. The gravel and weathered rock will be used for backfilling purpose at KKNPP Unit-3,4,5 and 6 construction works and in case of any non-useable and excess gravel and weathered rock found, same will be disposed through suitable vendors after paying necessary seignior age fees to Government.			
Ultimate Depth	47m		47m	47m
Man power	38		44	38
Mode of Transport	By Road		By Road	By Road
Water Requirement	10.0 KLD		10.0 KLD	10.0 KLD
Source of Water	The required water will be procured initially from outside agencies. Later Rain water harvested in the mine sump can also be used.			
Power Requirement	No electricity needed for mining operation. The minimum power requirement for office, etc will be met from state grid.			
Project Cost	Rs.1,04,68,600/-		Rs.1,19,28,400/-	Rs.1,03,24,000/-
CER Cost	Rs.5.0 Lakhs		Rs.5.0 Lakhs	Rs.5.0 Lakhs



3.1 EXISTING ENVIRONMENTAL SCENARIO:

The studies and data collection have been carried out systematically and meticulously as per relevant IS codes, CPCB and MoEF&CC guidelines and as per approved ToR during **Winter Season (December 2021 to February 2022)**. For the purposes of this study, the area has been divided into two zones, namely, core and buffer zones. The leases in the cluster area (P1, P2, P3 and E1) is considered to be the core zone while the buffer zone encompasses a 10km radius from the periphery of the core zone. As such the data generated are commonly considered wherever applicable. Based on 2011 census data, in the 10km radius there are 13 Rural villages from Radhapuram Taluk, Tirunelveli District.

Table 4: Social, Economic & Demographic Profile of The Study Area

Details	Population	Percentage
A. Gender-wise distribution		
Male Population	50933	49.62
Female Population	51706	50.38
Total	102639	100
B. Caste-wise population distribution		
Scheduled Caste	738	16.34
Scheduled Tribes	16774	0.72
Other	85127	82.94
Total	102639	100
C. Literate and Illiterate population		
Literate Males	41553	40.48
Literate Females	38819	37.82
Total Literate Population	80372	78.31
Others Males	9380	9.14
Others Females	12887	12.56
Others Population	22267	21.69
Total	102639	100
D. Occupational structure		
Main workers	36290	35.40
Marginal workers	6512	6.30
Total Workers	42802	41.70
Total Non-workers	59837	58.30
Total	102639	100

3.2.1 EXISTING ENVIRONMENTAL QUALITY:

Baseline monitoring was carried out during Winter Season, December 2021 to February 2022). The details of the same are provided below:

Table 5: Baseline Data

A) AMBIENT AIR QUALITY		Monitoring Location – 6 locations	
PARAMETER	RESULT (µg/m3)		*LIMIT (µg/m3)
Location	Core Zone	Buffer Zone	
Particulate Matter (Size <10 µm)	49.6 – 68.5	45.4 – 68.1	100
Particulate Matter (Size <2.5 µm)	23.9 – 33.0	21.9 – 32.5	60
Sulphur Dioxide (as SO ₂)	5.1 – 8.2	4.2 – 8.1	80
Nitrogen Dioxide (as NO ₂)	7.9 – 11.1	6.4 – 10.6	80
Conclusion: The existing Ambient Air Quality levels for PM10, PM2.5, SO2 and NO2, are within the NAAQ standards prescribed CPCB limits of 100 µg/m3, 60 µg/m3, 80 µg/m3 & 80 µg/m3. The CO values in all the locations were found to be below detectable limit.			
B) WATER QUALITY		Monitoring Location – 5 locations	
PARAMETER	Result	*LIMIT (µg/m3)	
pH at 25 °C	7.7 – 8.28	6.5-8.5	
Total Dissolved Solids, mg/L	172 – 1204	2000	
Chloride as Cl-, mg/L	33.5 – 478	1000	
Total Hardness (as CaCO3), mg/L	89 – 476	600	
Total Alkalinity (as CaCO3), mg/L	86.5– 272	600	
Sulphates as SO42-, mg/L	21.2 – 323	400	
Iron as Fe, mg/L	0.04 – 0.08	0.3	
Nitrate as NO3, mg/L	2.55 – 4.34	45	
Fluoride as F, mg/L	0.12 – 0.58	1.5	
Conclusion: The water quality of ground water is found to be within the prescribed Permissible limits of IS: 10500 Norms in the absence of an alternative source as per Drinking Water Specifications.			
C) NOISE LEVELS		Monitoring Location – 6 locations	
PARAMETER	RESULT dB(A)		*LIMIT (µg/m3)
	Day Equivalent	Night Equivalent	
Core Zone	50.5	40.2	90
Buffer Zone	46.3 – 48.9	39.3 – 42.5	Day Equivalent - 55dB(A), Night Equivalent - 45dB(A)
*Permissible noise for industrial workers as laid down by CPCB (at 8 hrs Exposure Time). While comparing with the MoEF&CC Norms, the monitored ambient noise levels are generally within the limit values.			
D) SOIL QUALITY		Monitoring Location – 3 locations	
PARAMETER	Range of values		
pH	7.28 – 7.78		
Electrical Conductivity (µmho/cm)	38.57 – 80.59		
Organic matter (%)	0.65 – 1.32		
Total Nitrogen (mg/kg)	98.7 – 110		
Phosphorus (mg/kg)	1.65 – 2.32		
Sodium (mg/kg)	362 – 482		
Potassium (mg/kg)	661 – 810		
Soil is of clay loam type.			

3.2.2 LAND ENVIRONMENT:

Land use pattern study carried out through remote sensing satellite data around the 10km buffer zone shows that 28.60% of the buffer area is classified under the land use category of Sea. 28.36% of the buffer zone is fallow land, 10.13% constitutes agriculture, 17.54% constitutes land with scrub and the balance falls under other land use categories.

3.2.3 BIOLOGICAL ENVIRONMENT:

Flora: All the three lease areas (P1, P2 and P3) are non forest, private lands with patches of thorny bushes and is dominated with *Prosopis juliflora*. The buffer zone is dominated by species like *Prosopis juliflora*, *Sygygium cumuni*, *Acacia auriculiformis*, *Borassus flabellifer*, *Azadirachta indica*, *Albizia lebbeck*, etc. Patches of coconut and casurina farms are also observed.

Fauna: There is no Wild Life Sanctuary or National Park within the study area of 10 km. Domesticated animals are commonly found. There is no Schedule I animals in the land area. However, sea turtle classified under Schedule – 1 occur in Sea and nearby coast.

3.2.4 HYDROLOGICAL STUDY:

A Hydro Geological study for the Roughstone and Gravel Quarry was carried out by Dr.Antony Ravindran, V.O.Chidambaram College.

Study result is as follows:

Vertical Electrical Sounding (VES): VES was carried out from 100m depth and 10m interval of electrode spacing in the lease hold area. Overall 10 profiles were carried out. From this study, it was inferred that the overall water bearing zone is identified much below the proposed mining depth.

Magneto Telluric Method: Magneto Telluric Survey was carried out in the mine site and three profiles were studied. The MT profile study indicated availability of better water availability water in deeper range.

Well Inventory Data: The water levels studied show that shallow water levels are observed in the wells during post monsoon days and it becomes deeper or even dry during peak summer. Deeper bore wells in the area reflects that the yield is only better at deeper water levels.

In the study area, the shallow aquifer is developed through dug wells and deeper aquifer through tube wells. The groundwater has revealed that potential fractures are encountered at deeper levels. The occurrence of groundwater mainly in the porous soil are weathered layers,

very negligible amount of groundwater percolated through the poorly fractured layer, after that there is no existence of groundwater. Besides, the mining area consists of hard compact rock, no major water seepage within the mine is expected. From the nearby working mines no such seepage is observed.

4.1 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

All the three projects are proposed projects and Semi – Mechanized Open Cast mining will be carried out. The identified impacts during mining and associated activities have been studied in relation to various environmental components like Air, water, noise, vibration, land, transport etc.

4.1.1 AIR ENVIRONMENT:

The principal sources of air pollution in general due to mining and allied activities will be Excavation, Drilling, Movement of HEMM such as Excavators, tippers etc., Loading and unloading operation and transportation. The common measures to be adopted in all the three proposals (P1, P2 and P3) to control the impact on air quality due to mining operations is described below.

- Regular wetting of transport road using mobile water tanker.
- Wet drilling / Covering of drill holes with wet clothes
- Proper maintenance of roads.
- Avoiding overloading of tippers & Transportation of material by tarpaulin covered trucks
- Proper maintenance of HEMM to minimize gaseous emission
- Setting up of tyre washing facility in the lease area exit.
- Vehicular emission tests with digital smoke meter.
- Provision of tin sheet around the lease periphery on all sides.
- Development of green belt/ plantation in various areas within the mine lease area etc.

By adoption of all these measures, no adverse impact on air quality is envisaged due to this proposed opencast mining operation.

The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model.



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The results of the Peak GLC's for various environmental parameters with control measures are given below:

S.No	Parameters	Peak Incremental Concentration		
		Peak incremental concentration $\mu\text{g}/\text{m}^3$		
		P1	P2	P3
1	PM ₁₀	12.24	14.80	10.98
2	PM _{2.5}	4.61	5.76	4.12

The resultant added concentrations with baseline figures even at worst scenario, show that the values of ambient air quality are within the statutory limits in each case. For preservation of environment in this mine strict enforcement of management schemes and regular air quality monitoring will be undertaken for taking corrective actions, as needed. By adopting the effective implementation of all the mitigative measures, no adverse impact on Air quality due to the mining operation in these lease areas is expected.

4.1.2 WATER ENVIRONMENT:

The total water requirement for all the three projects will be 10.0 KLD each. The water will be sourced initially from outside agencies. Later the rainwater collected in the mine pit sump will be used for this purpose.

The domestic sewage to be generated from these projects will be collected in septic tank with soak pits. Since the entire material from the quarry faces will be directly dispatched to the consumers, there will not be any stockpiles. There are no waste dumps in the quarries. As such there will not be any wash out due to stock pile or waste dumps.

The rain water falling in the quarries will be harvested in the sump at the lowest level of the quarry. The sumps will act as a settling pond to prevent solids escaping along with discharge, before outlet. etc. Towards surface runoff management, garland drain will be constructed around the quarry and will be connected to a settling pond with silt traps. The supernatant clear water from the settling pond will be flow to the downstream users.

There are no major drainage courses in the core zone. There is an odai and tank in the vicinity of all the three projects. There is no proposal to discharge any effluent into these water bodies. No major impact is envisaged on the nearby water bodies due to project operations.

4.1.3 NOISE ENVIRONMENT:

During mining operation there will be noise generation due to working of excavators, movement of vehicles, etc. However, it will be felt near the active working area only and at away from its



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source it will get reduced. There will also be attenuation due to vegetation, tin sheet/ green netting to be erected by the proponent all around the lease and as such there will not be any adverse noise propagation outside the lease boundary. Due to natural attenuation effects, by proper green belt development, design / maintenance of machines, etc., the impact on noise levels will be negligible and are expected to be well within the prescribed limits.

4.1.4 VIBRATION:

During the project operations, various control measures as listed below will be carried out in all the three projects to mitigate adverse impact due to the ground vibration caused due to blasting activities:

- ❖ Controlled blasting techniques to maintain the peak particle velocity (PPV) below DGMS prescribed levels.
- ❖ Ideally formulating drilling and charging pattern.
- ❖ To contain fly rocks, stemming column will not be less than burden of the hole. Blasting area will also be muffled, if necessary, to stop fly rocks propagation.
- ❖ Proper care and supervision during blasting by a competent and experienced person.
- ❖ Besides, different blasting time for the projects in the vicinity is suggested and the timing is to be mentioned in the display board in the respective mines entrance.

4.1.5 IMPACT ON LAND ENVIRONMENT:

All the three lease areas are patta lands registered in the name of Tvl. KMS Project and Services and the applicant has obtained consent from pattadar and got registered.

The present land use pattern, and the post mining land use pattern is shown below:

Land Use Table

S. No	Land Use	P1		P2		P3	
		Present Area (Ha)	At end of 5 th year	Present Area (Ha)	At end of 5 th year	Present Area (Ha)	At end of 5 th year
1.	Quarrying Pit	--	3.411	--	4.08.00	--	3.140
2.	Infrastructure	--	0.010	--	0.01.00	--	0.010
3.	Roads	--	0.020	--	0.02.00	--	0.020
4.	Green Belt	--	0.300	--	0.40.00	--	0.300
5.	Unutilized	3.981	0.240	4.71.40	0.20.40	3.740	0.270
Total		3.981	3.981	4.71.40	4.71.40	3.740	3.740

Entire mined out area will be properly fenced to prevent inadvertent entry of men and animals. In the post mining stage entire mined out area will be left as water body and used for rainwater harvesting. Besides, plantation will be developed in the peripheral safety zone and in all possible places around the lease area.

4.1.6 BIOLOGICAL ENVIRONMENT:

Other than clearing the shrubs and bushes within the lease areas, no clearance of major vegetation is involved. Necessary mitigative measures like dust suppression, proper maintenance of equipment's, greenbelt and plantation etc., will be carried out to prevent dust generation & any further impact on the vegetation or agricultural activity nearby. Greenbelt / Plantation will be carried out to enhance the vegetative growth and aesthetic in the safety zone area

4.1.7 SOCIO ECONOMIC ENVIRONMENT:

All the three lease areas are patta lands in the proponent's possessions. Hence, there are no habitations or hutments in the core zone area and no rehabilitation or resettlement problems will arise here. The mining operations in the proposed mine will provide the following socio-economic benefits:

- Direct Employment
- Besides through allied opportunities in logistics, trading, repairing works etc. good employment potential will arise in this area, which will provide raising income levels and standards of living in the area through various service-related activities connected with the project operations.
- Benefit to State and central exchequer by way of royalty, taxes.

Towards the socio-economic development of the surrounding area, the proponent has earmarked an amount of Rs.5.0 Lakhs under Corporate Environmental Responsibility separately for all the three projects. The activities identified under CER will be implemented in a phased manner. In consultation with the locals based on the need & priority it will be implemented.

By carrying out systematic and scientific mining and implementing all the environmental mitigative measures it will be ensured that there will be no adverse impact on this front.

4.1.8 IMPACT ON LOCAL LOGISTICAL SYSTEM DUE TO PROJECT:

The material mined out from all the three proposals will be directly transported to the Koodankulam Nuclear Power Plant by road. There will about 26 trips per hour. It can be deduced that the road is sufficient to cater to the project traffic. Besides it can meet the initial transport requirement of weathered rock and gravel also. The following mitigative measures are suggested for mitigation of adverse impacts on the logistical aspect of the project:

- ❖ Water sprinkling on mineral in the transport vehicles before transporting, so that no dust nuisance during transport will arise.
- ❖ Plantation on either side of the transport road in consultation with the concerned department.
- ❖ Proper maintenance of transport road.
- ❖ Proper maintenance of transport vehicles.
- ❖ Avoiding overloading of material.
- ❖ Covering of loaded vehicles with tarpaulins sheet.
- ❖ Limiting of speed

All efforts will be made to make black topped mineral transport road from mine site to the Koodankulam Nuclear Power Plant through Government Agencies using the DMF fund. Besides, the road which will be used for mineral transportation to the Koodankulam Nuclear Power Plant will be properly maintained, avenue plantation will be carried out on either side of the road and solar street lights will be provided along this road.

4.1.9 WASTE MANAGEMENT:

There is no process effluent generation from this mine. Hence no liquid waste is generated. Single use plastics/ use and throwaway plastics will be banned in the site as directed by the Tamil Nadu Government vide GO(Ms)No.84 regarding ban on use of plastic products. The employees will be encouraged to use compostable material or reusable material.

5.1 ENVIRONMENTAL MONITORING PROGRAMME:

Regular, systematic and sustained programme schedules for implementation and monitoring of various control measures are devised with clear cut guidelines of various concerned plans for keeping a continuous surveillance on the various environmental quality parameters in the area.

ROUGHSTONE AND GRAVEL QUARRIES (P1- 3.981 HA, P2-4.714HA AND P3-3.740HA) OF HI-TECH ROCK PRODUCTS & AGGREGATES LIMITED IN IRUKKANDURAI PART (II) VILLAGE, RADHAPURAM TALUK, TIRUNELVELI DISTRICT, TAMIL NADU.

There is a separate environmental management cell for each of the projects. The respective Mines Managers will be directly responsible for various environmental activities in the mine and will undertake effective monitoring and implementation of various environmental control measures promptly and effectively and to oversee various environmental management schemes. Towards capital cost of EMP, Rs.32.0 Lakhs for P1, Rs.27.2 Lakhs for P2 and 25.8 Lakhs for P3 has been allocated. Towards recurring cost of EMP Rs.15.35 Lakhs per annum for P1, 16.25Lakhs per annum for P2 and Rs.13.75 Lakhs per annum for P3 has been allocated.

6.1 CUMULATIVE IMPACT STUDY:

As already mentioned, cumulative impact of these proposed quarry operations (i.e P1, P2, P3 & E1) on the environment is studied.

Combined cumulative computer Air Quality Model simulations carried out show that the resultant added concentrations with baseline figures with respect to PM_{10} is in the range of 58.5 $\mu g/m^3$ to 89.0 $\mu g/m^3$ and with respect to $PM_{2.5}$ are in the range of 28.6 $\mu g/m^3$ to 41.0 $\mu g/m^3$ which are within the statutory stipulations in respective case..

It is observed that the peak incremental concentration for PM_{10} , $PM_{2.5}$ is occurring very near the source. At away from the source the values are getting drastically reduced due to dispersion effects no effect is observed. By strict enforcement of various mitigative measures mentioned in the report, no adverse impact on Ambient air quality is envisaged. Cumulative Noise modeling has been carried out to determine the post project noise levels due to the mining operations of the proposed quarries and it is seen that that the post project concentration in the nearby areas are within the statutory limits of 55dB(A).

For other environmental attributes also, by implementing the mitigative measures as suggested in the report continuously and rigorously, no adverse impact on the surround environment is expected on the cumulative basis also.

7.1 CONCLUSION:

By systematic and scientific mining adhering to all the statutory norms and enforcing and strictly implementing the above said mitigation measures mentioned in this report, no adverse impact is envisaged. The proposed mining project will benefit this region in the fields of potential employment opportunities, improved income for local people, improved social welfare facilities in respect of education, medical healthcare systems, etc. in its own way and also revenue to

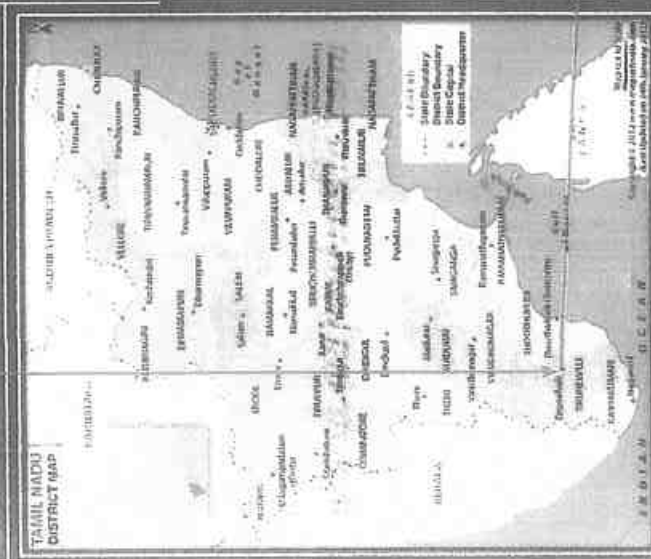
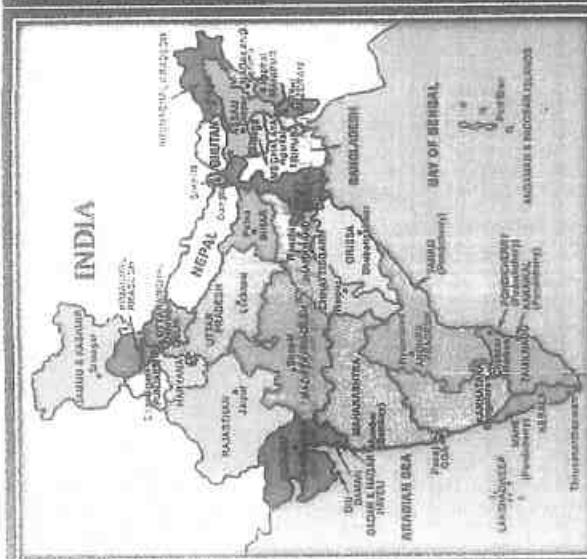


ROUGHSTONE AND GRAVEL QUARRIES (P1- 3.981 HA, P2-4.714HA AND P3-3.740HA) OF HI-TECH ROCK PRODUCTS & AGGREGATES LIMITED IN IRUKKANDURAI PART (II) VILLAGE, RADHAPURAM TALUK, TIRUNELVELI DISTRICT, TAMIL NADU.

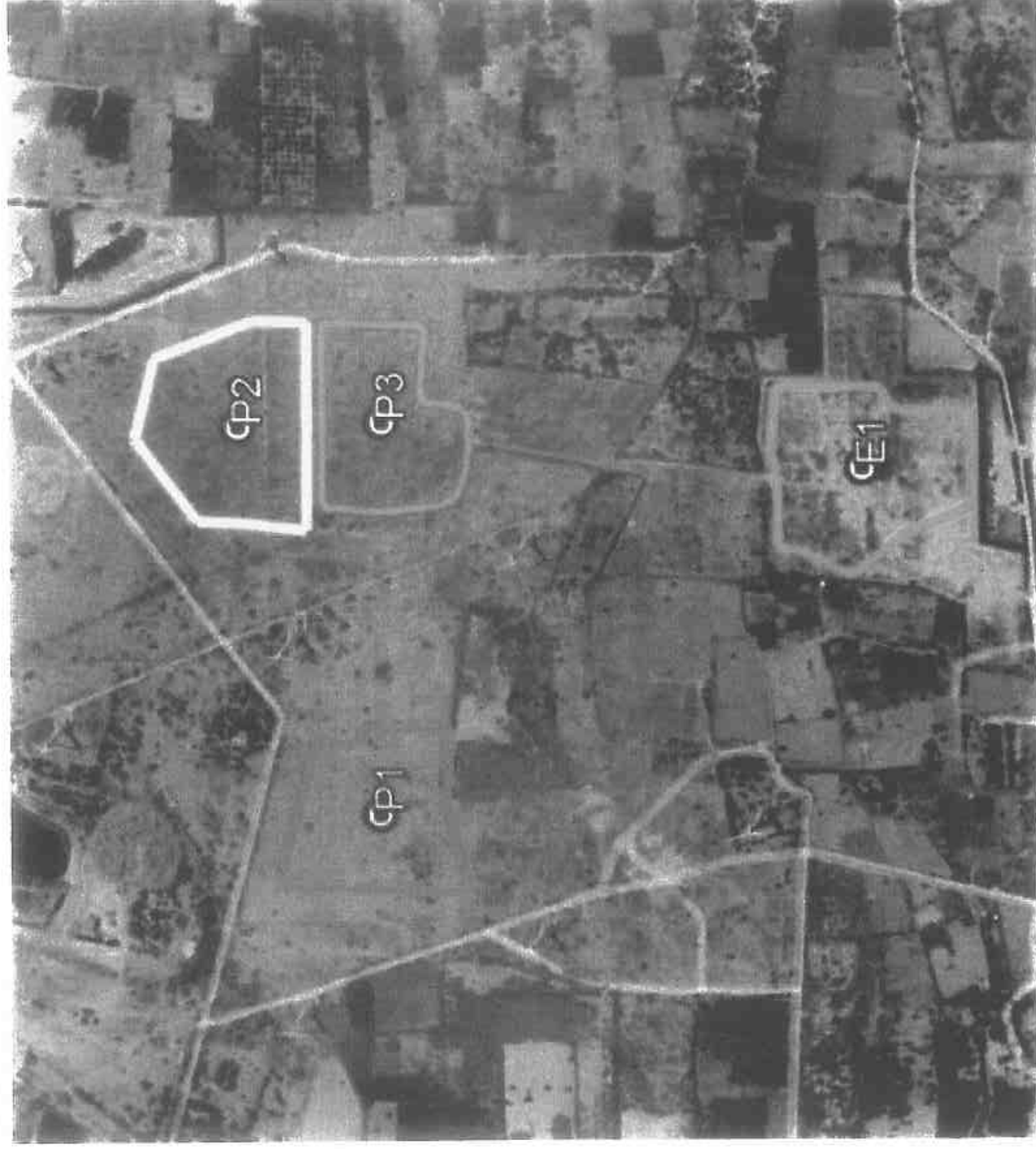
Government through royalty, taxes etc. Besides, the material from this project will meet the under construction KKNPP unit 3, 4, 5 & 6 plant and allied facilities which is of national and state importance. Hitech's parent company L & T who is the main contractor of KKNPP through their CER measures has carried out improvements in road, transport facilities, school infrastructural facility, water provision, etc. around the plant area. It has also brought about direct and indirect benefits to scores of people by way of employment opportunities in the plant (direct and indirect), vendors, shops, renting of houses, etc. These project will further augment these facilities.



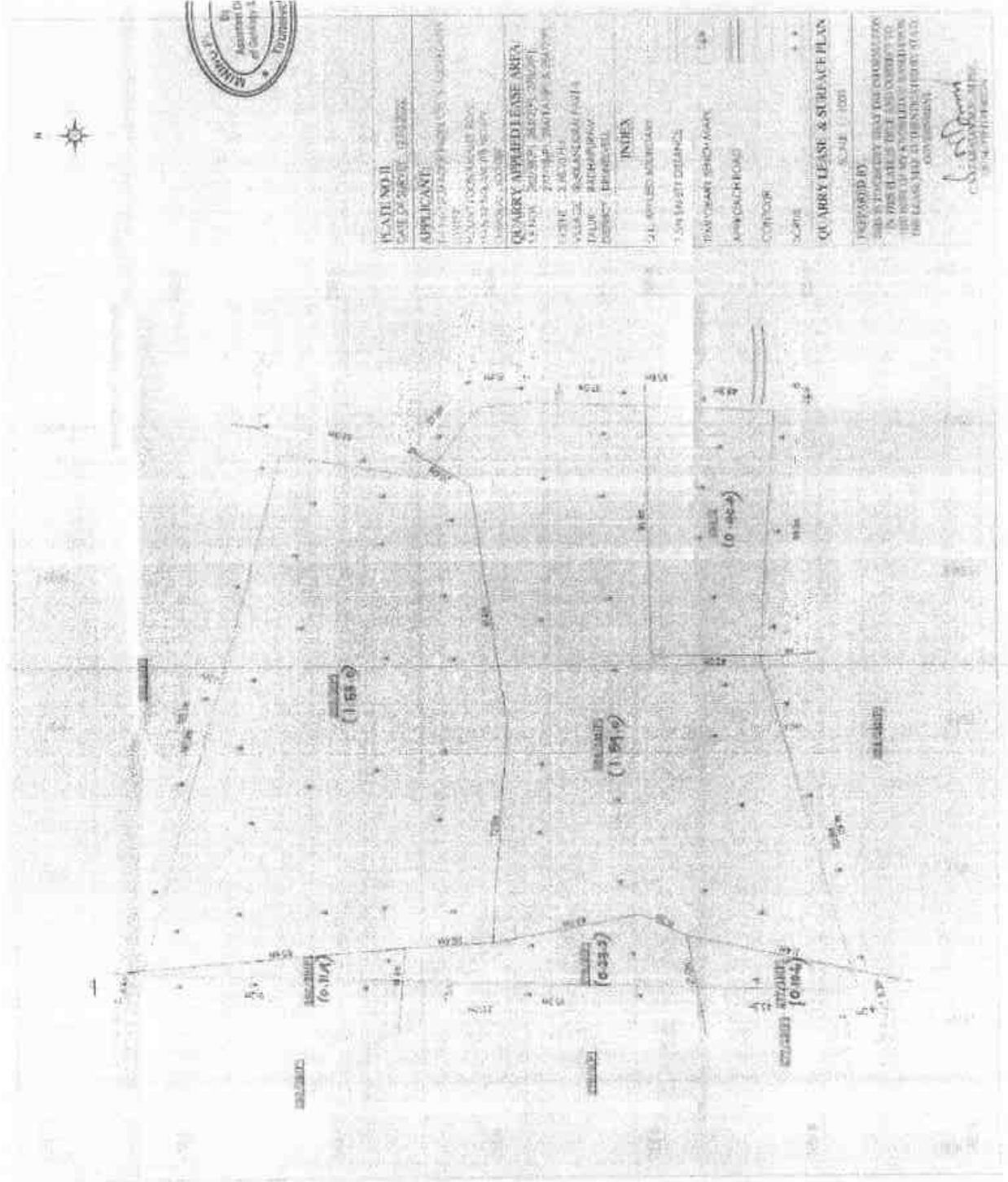
LOCATION PLAN



MAP SHOWING HITECH LEASES IN THE CLUSTER



Lease Plan (P1)



QUARRY LEASE & SURFACE PLAN

INDEX

QL APPLIED BOUNDARY
7.5m SAFETY DISTANCE
TEMPORARY BENCH MARK
APPROACH ROAD
CONTOUR
SCHEM

QUARRY LEASE & SURFACE PLAN

SC 41E 1:1500

PREPARED BY:
THIS IS TO BE USED ONLY FOR THE PURPOSE OF THE QUARRY LEASE & SURFACE PLAN. IT IS NOT TO BE USED FOR ANY OTHER PURPOSE. THE USER SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE DATA AND THE RESULTS OF THE ANALYSIS.

BOUNDARY CO-ORDINATES

Label	Easting	Northing
1	08 11 40 30.76	77 40 11.24
2	08 11 40 42.76	77 40 10.81
3	08 11 40 39.76	77 40 10.81
4	08 11 40 37.76	77 40 10.63
5	08 11 40 35.76	77 40 10.81
6	08 11 40 33.76	77 40 10.81
7	08 11 40 31.76	77 40 10.81
8	08 11 40 29.76	77 40 10.81
9	08 11 40 27.76	77 40 10.81
10	08 11 40 25.76	77 40 10.81
11	08 11 40 23.76	77 40 10.81
12	08 11 40 21.76	77 40 10.81
13	08 11 40 19.76	77 40 10.81
14	08 11 40 17.76	77 40 10.81

WGS 84 Datum

DATE OF SURVEY - 12.15.2022

[illegible]

S.F. NO. 20571A07, 20572P1 & 1011A07
 EXTENT 17.00 H2
 VILLAGE RIJANDRON PART
 TALUK RACHINPUSAM
 DISTRICT THIRUVARUR

Q.L. ABBONDANDOLO

CONCLUSIONS

CONVULSION

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PREPARED BY

[illegible]

WILLIAM H. HARRIS

Boundary Co-Ordinates	Label	Latitude	Longitude
1	01	11° 40' 25.74" N	77° 40' 11.24" E
2	01	11° 51.6424' N	77° 40' 12.851' E
3	01	11° 50.7974' N	77° 40' 10.063' E
4	01	11° 50.7974' N	77° 40' 10.063' E
5	01	11° 54.0574' N	77° 40' 10.063' E
6	01	11° 54.0574' N	77° 40' 10.063' E
7	01	11° 54.0574' N	77° 40' 10.063' E
8	01	11° 50.6574' N	77° 40' 18.945' E
9	01	11° 50.6574' N	77° 40' 18.945' E
10	01	11° 48.9374' N	77° 40' 10.063' E
11	01	11° 50.0694' N	77° 40' 14.915' E
12	06	11° 48.7974' N	77° 40' 14.915' E
13	01	11° 48.7974' N	77° 40' 14.915' E
14	06	11° 48.9274' N	77° 40' 12.307' E

STUDY AREA MAP

