



**THE SINGARENI COLLIERIES COMPANY LIMITED**

(A GOVERNMENT COMPANY)  
SRIRAMPUR AREA

Phone No: 08736-236681  
Fax No : 08736-238222.

Ref.No: SRP/ENV/E-417/2014/100

Date: 16.05.2014.

"By Regd. Post with ACK due"

To  
**The Additional Principal Chief Conservator of Forests (C),**  
MoEF, GOI, Regional Office,  
Southern Region, Kendriya Sadan,  
4<sup>th</sup> floor, E&F wing, 17th main,  
Koramangala,  
BANGALORE - 560 034.

Sir,

Sub: Half yearly Environmental monitoring Report in respect of **RK-5**  
Incline mine of SCCL for the period ending 31.03.2014 - Reg.  
Ref: **MoEF Lr.No. J-11015/306/2007-1A.II(M), dated. 24.10. 2008.**

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Reference to the MoEF Environmental clearance(E.C) letters cited above,  
please find enclosed herewith the Half yearly Environmental Monitoring report for the  
period ending 31.03.2014 in respect of **RK-5** Incline Mine of SCCL along with a Soft  
Copy.

The report consists of Part - I which indicates the status of implementation of  
environmental clearance conditions and Part-II indicates the various pollution control  
measures taken during the last six months period.

Thanking you,

Yours faithfully,



*Chandrasekar*  
Agent,  
RK-5&6 Group of Mines,  
**Agent**  
RK-5 & 6 Gr.

Encl: As above.

C.C. : The Environmental Engineer,  
A.P. Pollution Control Board,  
Regional Office,  
H.No: 6-2-166/A, Subhash Nagar,  
Nizamabad - 503 002.



# THE SINGARENI COLLIERIES COMPANY LIMITED

(A Government Company)  
SRIRAMPUR AREA

## PART-1

### HALF YEARLY COMPLIANCE REPORT OF ENVIRONMENTAL CLEARANCE CONDITIONS UPTO 31<sup>ST</sup> MARCH, 2014

#### A. SALIENT FEATURES OF THE PROJECT:

1	<b>Name of the Project</b>	:	<b>Ravindra Khani – 5 (RK-5) Incline Expansion Project.</b>
2	Organization	:	Singareni Collieries Company Limited
3	Coalfield	:	Godavari Valley Coal Field
4	Type of Mine	:	<b>Underground Coal Mine</b>
5	Technology	:	Bord and pillar method with hand section and Semi-mechanized with SDLs.
6	<b>Environmental Clearance</b>	:	
	A Letter No & date	:	EC. No: J-11015/306/2007-1A.II(M), dtd. 24 <sup>th</sup> October, 2008.
	B Sanction capacity	:	0.5 MT PA
	C Mining Lease Area	:	376.20 Ha.
	D Date of Public Hearing	:	12.03.2008
7	<b>Location of the Project</b>	:	
	A Village	:	Nasipur
	B Tehasil	:	Mancherial
	C District	:	Adilabad
	D State	:	Andhrapradesh
	E Latitude	:	N 18 <sup>0</sup> 52' 48" to 18 <sup>0</sup> 53' 56"
	F Longitude	:	E 79 <sup>0</sup> 30' 08" to 79 <sup>0</sup> 30' 50"
	G Topo Sheet	:	Survey of India Topo sheet No:56M/8 of Adilabad district .
	H Nearest railway station	:	Mancherial Railway Station of South Central Railway
	I Nearest Airport	:	Hyderabad
	J Nearest town	:	Mancherial
8	<b>Address for Correspondence</b>	:	
	A Name	:	K. Venkateswarlu
	B Designation	:	Agent
	C Address	:	O/o Agent, RK-5 & 6 group of Mines, Coal Chemical Complex (Post) Mancherial (Mandal), Adilabad (District) A.P.
	D Pin Code	:	504 302.
	F E-mail ID	:	agt_rk5n6_srp
	G Telephone No.	:	Ph: 08736-200617: Mobile No:9491144408
	H Fax No.	:	08736-238222
9	<b>Life of the Project</b>	:	
	A Date of Opening	:	06.04.1975.
	B Total Life of the project as per EMP	:	20 Years (from the expansion year )
	C Balance Life	:	12 Years.

10	<b>Seams</b>	:	
	A Total Seams Present	:	(no.s) 08
	B Seams being worked	:	4 (2A,2S,4S &5Seams)
11	<b>Depth</b>	:	
	A Minimum Depth (m)	:	175 m
	B Maximum Depth (m)	:	247 m.
	C Present working depth (m)	:	172 m.
12	<b>Reserves</b>	:	
	A Total Geological Reserves	:	30.05 MT
	B Total Extractable Reserves	:	17.03 MT
	C Reserves already Extracted	:	14.417MT
	D Balance Reserves	:	2.613 MT
	E Coal production during last six months	:	0.336 MT
13	<b>Land Requirement</b>	:	
	A Total Requirement (Mine Take Area)	:	376.20 Ha.
	B Forestland Involved	:	337.15 Ha.
	C Non-forestland	:	39.05 Ha. (SCCL acquired Forest land before enactment of FC Act, 1980)
	D Land acquired so far (Surface rights)	:	39.05 Ha.
14	<b>Statutory Clearances</b>	:	
	A Ground Water Clearance	:	Order No. 3324/Hg.III(2)/2005, Dtd.25.08.2005.
	B Consent for Establishment	:	Order No: 47/PCB/CFE/RO-NZB/HO/2009-1073, dtd.20.07.2009.
	C Consent for Operation	:	Consent Order No: APPCB/RCP/ADB/47/HO/CFO/ 2011- 2421, dtd.04.11.2011.
	D Forest Clearance	:	Vide Ir: GOI(MoEF) Lr.No: 8-72/93-FC, Dtd.23.02.1996
	E Mining Lease	:	North Godavari ML vide letter No. 8-5/88-FC, dated 15.09.1999.
	F Others (Specify)	:	--
15	<b>R &amp; R Involved</b>	:	Nil.

#### B. COMPLIANCE STATUS OF EC CONDITIONS AS ON 31.03.2014.

E. C. Cond. No.	Condition	Status as on 31.03.2014.
<b>2. (A)</b>	<b>SPECIFIC CONDITIONS:</b>	
(i)	Mining shall not be carried in forest land for which forestry clearance has not been obtained under the provisions of FC Act, 1980.	Forestland involved in the project is 337.15 Ha. This FL is already diverted as a part of North Godavari ML vide letter No. 8-5/88-FC, dated 15.09.1999.
(ii)	Sufficient coal pillars shall be left un-extracted around the airshaft (within the subsidence influence area) to protect from any damage from subsidence, if any.	One air shaft is present in the mine connecting to 5 Seam. Sufficient barrier (60m) is left un-extracted against the airshaft.
(iii)	Solid barriers shall be left below	A length of around 300m public road is

E. C. Cond. No.	Condition	Status as on 31.03.2014.
	the roads falling within the blocks to avoid any damage to the roads.	falling on the seams of RN <sub>24</sub> and YN <sub>24</sub> of sector B and 310m on YN <sub>2</sub> of sector-A. Sufficient barrier (45 m) is being left on either sides of the road to avoid any damage.
(iv)	Depression due to subsidence resulting in water accumulating within the low lying areas shall be filled up or drained out by cutting drains.	Depression due to subsidence if any on low lying areas is being filled with suitable material like earth or OB and proper drainage is being provided and maintained to avoid the accumulation of water.
(v)	While extracting panels in the lower seam, all water bodies in the subsidence area shall be drained. Dewatering of the old goaves of the upper seam shall be continued as long as the lower seam is worked to prevent accumulation of large water bodies over working area.	There is no water accumulated within 60m of the workings on all sides. All precautions under the provisions of Regulation 126 and 127 of Coal Mines Regulation, 1957 are being taken. Prior permission is also obtained from DGMS before extracting panels.
(vi)	Regular monitoring of subsidence movement on the surface over and around the working area and impact on natural drainage pattern, water bodies, vegetation, structure, roads, and surroundings should be continued till movement ceases completely. In case of observation of any high rate of subsidence movement, appropriate effective corrective measures should be taken to avoid loss of life and material. Cracks should be effectively plugged with ballast and clayey soil/suitable material.	Subsidence survey is being carried out during extraction of the caving panel once in every month and after completion of the extraction once in 6 months till the movement ceases completely. The system, frequency and recording of observations will be carried out as per the provisions DGMS Technical circular No.2 of 1988. The depressions / Cracks are being plugged, if any.  So far, 2.785 m maximum subsidence occurred and 40 cm. maximum crack width is observed. Subsidence management details are furnished in <b>point no. 13 of Part-II.</b>
(vii)	Garland/surface drains (size, gradient and length) around the safety areas such as mine shaft and low lying areas and sump capacity should be designed keeping 50% safety margin over an above the peak sudden rainfall and maximum discharge in the area adjoining the mine sites. Sump capacity should also provide adequate retention	The mine openings were designed 5.0 m to 9.71 m above the HFL of the nearby water bodies (HFL : 868.63). HFL of MID is 873.63, MWD is 874.36, 5B MID is 878.34, 5B MWD is 877.49 and Air Shaft is 877.50. All the precautions such as garland drains, diversion channels are being taken as per the requirement.  The sumps are designed keeping the highest seepage calculations and retention time to settle the silt material.

E. C. Cond. No.	Condition	Status as on 31.03.2014.
	period to allow proper settling of silt material. Sufficient number of pumps of adequate capacity shall be deployed to pump out mine water during peak rainfall.	Sufficient capacities of pumps were installed keeping the maximum seepage during rainy season in view. At present 05 nos. of sumps are provided.
(viii)	Crusher at the CHP should be operated with high efficiency bag filters, water sprinkling system should be provided to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points, etc.	The coal produced from this mine is being transported to SRP CHP from pit head coal handling arrangement.  Effective water spraying arrangements with mist spray were made at unloading, transfer, conveyor and crushing points in the SRP CHP. Coal transport roads and permanent internal roads were black topped.
(ix)	Drills should be wet operated	The DGMS approved portable hand held electrical drills are in use for drilling.  The water spraying on the working face as per the provisions of Regulations 123 of Coal Mines Regulation, 1957 is being implemented to avoid dust generation in the working places.  Dust masks are being provided to the persons working in dusty environment periodically. 100 nos. of dust masks were provided to the workmen during last six months period.
(xi)	A progressive afforestation plan shall be prepared and implanted for the undisturbed area and shall include area brought under green belt development, areas along roads, infra- structure, over surface where mining is being done below, along ML boundary an township outside the lease areas, etc, by planting native species in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per ha.	A progressive afforestation plan has been prepared and envisaged in the EIA/EMP. The Company has separate Forestry department under the control of an IFS officer deputed from AP Forest Department to implement afforestation plan into action. As on date, plantation in 31.65 Ha within the mine take area was carried apart from the vacant areas within the office complex. Plantation has completed in the vacant area of the mine. Existing plantation details furnished in <b>point no. 2 of Part-II</b> . A plan showing year wise plantation details is furnished as <b>Annexure – VIII</b> .
(xii)	Conservation Plan for endangered species found in and around the project area shall be formulated in consultation with the State Forest and Wildlife Departments.	No endangered species were found in and around the project, However, habitat amelioration measures were proposed to take up in the adjoining areas as a part of environmental safeguards beyond mandate and is being maintained. Amelioration scheme is enclosed as <b>Annexure – VI</b> .
(xiii)	Regular monitoring of	Phreatic surface in the area around the

E. C. Cond. No.	Condition	Status as on 31.03.2014.
	groundwater level and quality should be carried out by establishing a network of existing wells and construction of new piezometers. The monitoring for quantity should be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and Winter (January) seasons and for quality in May. Data thus collected should be submitted to the Ministry of Environment & Forests and to the Central Pollution Control Board quarterly within one month of monitoring.	project is being monitored four times in the year using a network of 25 existing observation wells and 5 piezometric wells in Srirampur area. The reports are being submitted to the Ministry regularly.  The monitoring data of the phreatic surface around the mine is furnished in the <b>Point No. 7 of Part-II.</b>
(xiv)	The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource. The project authorities should meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.	54 nos. of rain water harvesting pits have been constructed at various locations of Srirampur area to recharge ground water. Seven check dams were constructed in the nearby nallah for augmentation of ground water.  The list of the locations of the rain water harvesting structures is furnished in <b>point No.7 of Part-II.</b>
(xv)	The Company shall obtain approval of CGWA/CGWB Regional Office for use of groundwater if any, for mining operations.	Ground water clearance was obtained from A.P. State Ground water department Vide Lr. No. 3324/Hg.III(2)/2005, Dtd.25.08.2005.  The compliance status of the Ground water clearance is furnished in the <b>Point No. 7 of Part-II.</b>
(xvi)	Sewage treatment plant should be installed in the existing colony. ETP should also be provided for workshop and CHP wastewater.	Sewage generated in the existing colony is being treated in STP of 3.0 MLD capacity located in Naspur Colony and is functioning from 09.07.04, and other colonies are being treated with Septic tanks followed by soak pits.  ETP is provided in the Area Workshop and CHP of Srirampur Area.  The monitoring of ETP and STP outlet is furnished in <b>Point No. 6 of Part-II.</b>
(xvii)	For monitoring land use pattern and for post mining land use, a time series of land use maps, based on satellite imagery (on a scale of 1:5000) of the core zone	Digital image processing of entire lease area using remote sensing techniques is being done through an external agency, for monitoring land use pattern.  The report was submitted to Regional

E. C. Cond. No.	Condition	Status as on 31.03.2014.											
	and buffer zone, from the start of the project until end of mine life shall be prepared once in 3 years (for any one particular season which is consistent in the time series), and the report submitted to MoEF and its Regional Office at Bangalore.	office, MoEF, Bangalore vide Lr.No: SRP/ENV/E-417/2011/109, dtd.18.07.2011. The inference of land use monitoring carried during 2011 is furnished in <b>Point No. 12 of Part-II.</b>											
(xviii)	A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	The balance life is 12 years. A final mine closure plan along with details of corpus fund will be submitted 5 years in advance of final closure of the mine to the MoEF for approval.											
<b>2) B</b>	<b>General Conditions</b>												
(i)	No change in Mining technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.	No change in the technology and scope from the technology & Scope envisaged in the approved EMP. Any change in the scope or technology, prior approval of the Ministry of Environment and Forests will be obtained.											
(ii)	No change in the calendar plan including excavation, quantum of mineral coal and waste shall be made.	The current production schedule is being followed as per the approved calendar programme. <table border="1" data-bbox="846 1087 1398 1234"> <thead> <tr> <th rowspan="2">Year</th> <th colspan="2">Production in MT</th> </tr> <tr> <th>As per EC</th> <th>Actual</th> </tr> </thead> <tbody> <tr> <td>2012-13</td> <td>0.5</td> <td>0.6887</td> </tr> <tr> <td>2013-14</td> <td>0.5</td> <td>0.6482</td> </tr> </tbody> </table> The production details from 2006-07(Expansion year) is furnished in the <b>Point No.1 of Part-II.</b>	Year	Production in MT		As per EC	Actual	2012-13	0.5	0.6887	2013-14	0.5	0.6482
Year	Production in MT												
	As per EC	Actual											
2012-13	0.5	0.6887											
2013-14	0.5	0.6482											
(iii)	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for monitoring SPM, RPM, SO <sub>2</sub> , NO <sub>x</sub> , Hg and other heavy metals such as Pb, Cr, As, etc. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board.	Four (4) No.s of Ambient Air Quality Monitoring stations had been identified for post project monitoring work keeping in view of meteorological data in consultation with Regional Office, APPCB, Nizamabad. The results of monitoring of Ambient Air Quality including locations, frequency and parameters are furnished in <b>Point No. 5 of Part-II.</b>											
(iv)	Fugitive dust emissions (SPM and RSPM, Hg and other heavy	Water spraying arrangements have been provided on haul roads, dump trucks											

E. C. Cond. No.	Condition	Status as on 31.03.2014.
	metals) from all the sources shall be controlled regularly monitored and data recorded properly. Water spraying arrangement on haul roads, wagon loading, and dump trucks (loading and unloading) points shall be provided and properly maintained.	(loading and unloading) points and it is being constantly maintained for effective control. At present water spraying is done at 40 points in under ground and 30 points on surface of the mine premises.  The details of control measures being taken at the project is furnished in <b>Point No. 5 of Part-II.</b>  The fugitive dust is being monitored at the mine and the monitored data is furnished in Annexure of the report.
(v)	Data on ambient air quality (SPM, RSPM, SO <sub>2</sub> and NO <sub>x</sub> , Hg and other heavy metals) shall be regularly submitted to the Ministry including its Regional Office at Bangalore and to the State Pollution Control Board and the Central Pollution Control Board once in six months.	The Ambient Air Quality is being periodically (Quarterly basis) submitted to APPCB and on Six monthly basis to Regional Office, MoEF, Bangalore.
(vi)	Adequate measures shall be taken for control of noise levels below 85 dB(A) in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM etc shall be provided with ear plugs/muffs.	Noise control measures such as plantation around the fan house & mine take area were done, Provision of evasee to main mechanical ventilator, reduction of height of fall in the bunkers, maintenance of machinery, etc., are regularly taken up.  All the active work force engaged on drilling, blasting, operation of machinery and noise prone areas are being provided with earplugs. The Noise levels monitoring data is furnished in <b>Point No.8 of Part-II.</b>
(vii)	Industrial wastewater (Workshop and wastewater from the mine) shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19 <sup>th</sup> May 1993 and 31 <sup>st</sup> December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.	Mine seepage water is being collected in the under ground sumps of adequate capacity to settle the suspended solids and pumped out to the surface slow sand filters for further treatment to conform to the prescribed standards. The Sand was replaced once in a month in the chambers of filter bed.  Oil and Grease trap has been established in the area workshop for treatment of washing effluents.  The efficacy of the system is being monitored through fortnight sampling and analysis by external agency having MoEF

E. C. Cond. No.	Condition	Status as on 31.03.2014.
		recognized laboratory. Water monitoring results are furnished in <b>Point No. 6 of Part-II.</b>
(viii)	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded.	Vehicles are being tuned regularly for control of emissions and coal is being loaded optimally and trucks are covered with tarpaulin.
(ix)	Environmental laboratory shall be established with adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board.	Monitoring and analysis is being carried out by external agency i.e., Environment Protection Training and Research Institute (EPTRI), Hyderabad which is a CPCB recognized and NABL accredited Laboratory.  Regional Laboratory at Mandamarri is also established by EPTRI.
(x)	Personnel working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspects.  Occupational health surveillance programme of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed.	Personnel working in dusty areas are being provided dust respirators/masks and adopting job rotation practice. Training and information on safety and health aspects are being given through Internal Safety Organization and Mine Vocational Training Centers. 100 nos. of dust masks were provided to workmen during last six months.  Occupational health surveillance is being carried out periodically through Periodical Medical Examinations (PME) once in every 5 years through well established PME centers of SCCL. 242 persons have undergone PME during this six months.
(xi)	A separate environmental management cell with suitable qualified personnel shall be set up under the control of a Senior Executive, who will report directly to the Head of the company.	Unit level Environmental Management Committee has been constituted with suitable qualified personals under the control of Project Officer/Agent and Area Level Environmental and Forest Officer is also employed who are reportable to the head of the Area.  Apart from the above, a corporate environmental cell is established to monitor and guide in implementation of the environmental safeguards. Details are given in <b>Point No.11 of Part-II.</b>
(xii)	The funds earmarked for environmental protection	The funds earmarked for the environmental safeguards are being kept

E. C. Cond. No.	Condition	Status as on 31.03.2014.
	measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall be reported to this Ministry and its regional Office at Bangalore.	in separate account and will not be diverted for other purpose. Year wise expenditure is being reported to the Ministry and its Regional Office of MoEF. The environmental protection expenditure incurred in the Project is furnished in <b>Point No.9 of Part-II.</b>
(xiii)	The Regional Office of this Ministry located at Bangalore shall monitor compliance of the stipulated conditions. The Project authorities shall extend full co-operation to the Office(s) of the Regional Office by furnishing the requisite data / information/monitoring reports.	Project Authority will extend full cooperation to the office (s) of the regional office by furnishing the requisite data / information / monitoring reports.
(xiv)	A copy of the clearance letter will be marked to concerned Panchayat / local NGO, If any, from whom any suggestion/ representation has been received while processing the proposal.	The copy of the Clearance letter was send to following Panchayats vide Lr.No.SRP/ ENV/ E-417/2008/241, dtd.29.11.2008 i) Naspur Grampanchayat, ii) Theegalpahad Grampanchayat iii) Kankur Grampanchayat
(xv)	State Pollution Control Board shall display a copy of the clearance letter at the Regional Office, District Industry Centre and Collector's Office/ Tehsildar's Office for 30 days.	This Condition has been already complied.
(xvi)	The Project authorities shall advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within seven days of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and may also be seen at the website of the ministry of Environment & forests at <a href="http://envfor.nic.in">http://envfor.nic.in</a> .	Advertisement was given in the following Daily News papers as informing that the RK-5 Incline of SCCL has been accorded the Environmental Clearance from Ministry of Environment and Forests, GOI, New Delhi. i) Deccan Chronicle (English), dtd.18.11.2008 and ii) Vartha (Telugu), dtd. 18.11.2008.

A periodic progress report regarding environmental protection measures till 31.03.2014 is enclosed as **Part - II.**

**PART – II**

**1. Production Details**

Sl. No	Year	Coal (in MT)	
		As per EC	Actual
1.	2006-07	0.5	0.471
2.	2007-08	0.5	0.469
3.	2008-09	0.5	0.514
4.	2009-10	0.5	0.518
5.	2010-11	0.5	0.524
6.	2011-12	0.5	0.534
7.	2012-13	0.5	0.689
8.	2013-14	0.5	0.648

**2. Plantation:**

1	No of plants planted during last six months/ last year	--
2	Area covered in Ha	--
3	Expenditure incurred in Rs.lakhs	--
4	Total area brought under plantation so far in Ha	31.65 Ha
5	Total no of plants planted so far since inception	23,170
6	Species of plants planted	Eucalyptus, Gulmohar, Acascia, Jamun, Durshanam, Kanuga, Sisu, Pheltoform, Neem, Amla, Subabul, Iffa, Seethaful, Kunkudu and Guavva.
7	Seeds sown so far	--
8	Small plants planted so far	--
9	Total expenditure in Rs. lakhs -	19.28

Note: Plan along with details of year wise plantation furnished as **Annexure -VIII.**

**3. Water Balance Statement:**

Sl. No	Description	Quantity in KLD
1	Average quantity of water pumped out of the mine	<b>1940.00</b>
2.	<b>Water consumption :</b>	
A.	<b>Domestic:</b>	
	a) Water used for drinking/bathing and other industrial requirement	40.00
	b) Water supplied for nearest township/village for domestic purpose/CHP	1000 .00
	<b>Sub – Total</b>	<b>1040.00</b>
B.	<b>Industrial :</b>	
	a) Water used for plantation	20.00
	b) Water used for dust suppression	20.00
	c) Water used for stowing	NIL
	<b>Sub - Total</b>	<b>40.00</b>
3	Excess water let out	NIL

4	Point of disposal (as per CFO)	i) Excess mine water: After treatment for agricultural use/ gardening. ii) Domestic: STP followed by onland use / gardening
5	Discharge Consent from APPCB	1520.00

#### 4. Micro-meteorological Monitoring:

Micro-meteorological station was installed at General Manager's Office: The summary of the monitoring from December, 2013 to February, 2014 is as follows:

S.No	Parameter(s)	Min	Max	Mean
1.	Temperature (°C)	12.4	41.4	26.1
2.	Wind Speed (m/s)	Calm (28.56)	10.2	2.1
3.	Relative Humidity (%)	18.0	96.1	57.4
4.	Predominant Wind direction for the entire study period	South East (SE)		
5.	Total Rainfall (mm)	Nil		

#### 5. Ambient Air Quality Monitoring:

##### Parameters:

In accordance with MoEF Notification, GSR-742 (E), dt. 25.09.2000 and National Ambient Air Quality Standards, the concentration of Suspended Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>), Sulphur Dioxide (SO<sub>2</sub>) and Oxides of Nitrogen (NO<sub>x</sub>) is being monitored at work zone locations and also in nearby villages to assess the impact of mining operations on surrounding habitation.

Respirable Dust Sampler is used for monitoring of PM<sub>10</sub>, SO<sub>2</sub> and NO<sub>x</sub> and Ambient Fine Dust Sampler is being used for monitoring of PM<sub>2.5</sub>. SCCL is carrying out post-project environmental monitoring through EPTRI, Hyderabad, a CPCB recognized and NABL accredited laboratory. EPTRI has also established laboratories in SCCL mining areas for analyzing critical parameters in the field.

##### Frequency of Monitoring:

Air quality monitoring is being carried out at a frequency of once in a fortnight (24 hourly sampling) at the identified locations near the dust generating sources.

##### Monitoring Locations:

S.No.	Station Code	Name of the Stations	Latitude	Longitude
<b>CORE ZONE</b>				
1	CA1	RK-5 Incline	N 18°53' 18.6"	E 79° 30' 04.7"
<b>BUFFER ZONE</b>				
2	BA1	Doragari palli	N 18°53' 26.3"	E 79° 28' 29.3"

3	BA4	Srirampur Village	N 18°51' 44.9"	E 79° 30' 14.0"
4	BA2	Mudikunta village	N 18°51' 24.7"	E 79° 34' 31.8"

### Monitoring Data:

The summary of the monitoring from October, 2013 to March, 2014 is as follows:

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

Location	Direction & Distance	PM <sub>10</sub>			
		Min.	Max.	98%tile	STD
RK-5 Inc.	Core zone – 0.12 Km	131	237	235.9	250
Doragari palli	NW -2.76 km	66	94	93.56	100
Srirampur Village	SW -3.40 km	69	104	102.68	100
Mudikunta village	SE -5.81km	67	90	89.56	100
Location	Direction & Distance	PM <sub>2.5</sub>			
		Min.	Max.	98%tile	STD
Top of the RK-5 Inc. Store room	Core zone – 0.12 Km	51.2	68.4	67.72	--
Doragari palli	NW -2.76 km	30.2	45.8	45.2	60
Srirampur Village	SW -3.40 km	27.1	48.9	48.52	60
Mudikunta village	SE -5.81km	28.5	41.3	41.14	60
Location	Direction & Distance	SO <sub>2</sub>			
		Min.	Max.	98%tile	STD
Top of the RK-5 Inc. Store room	Core zone – 0.12 Km	12.6	17.5	17.45	120
Doragari palli	NW -2.76 km	12	20.1	19.88	80
Srirampur Village	SW -3.40 km	10.2	22.4	22.15	80
Mudikunta village	SE -5.81km	12.1	18.0	17.86	80
Location	Direction & Distance	NO <sub>2</sub>			
		Min.	Max.	98%tile	STD
Top of the RK-5 Inc. Store room	Core zone – 0.12 Km	18.7	30.8	30.75	120
Doragari palli	NW -2.76 km	20.2	32.0	31.51	80
Srirampur Village	SW -3.40 km	21.9	32.4	31.8	80
Mudikunta village	SE -5.81km	19.3	30.5	30.12	80

The air quality data monitored at the work zone locations and surrounding residential areas indicate that PM<sub>10</sub> concentration is within the stipulated limits at all locations except at Srirampur village, where the maximum value recorded was 104 $\mu\text{g}/\text{m}^3$ . The PM<sub>2.5</sub>, SO<sub>2</sub> and NO<sub>2</sub> levels are well within the limits at all the locations. The fortnightly air quality data monitored during six months period ending 31<sup>st</sup> March, 2014 is enclosed as **Annexure-I**.

SCCL is taking following control measures in the RK-5 Incline for air pollution control including reduction of particulate emissions:

### **Air Pollution Control Measures:**

- i) Water spraying arrangements have been made in underground at all working places, loading points and transfer points.
- ii) Arrangements have been made for water spraying on the surface coal handling arrangement.
- iii) The coal produced from the mine is transported to Area CHP, where effective mist spray arrangement is provided and maintained at transfer points and at loading points and the conveyor belts have been provided with covered structure.
- iv) Cleaning of coal dust is being taken up regularly.
- v) Coal transport route has been black topped from the mine to CHP. Internal roads have also been black topped.
- vi) Avenue plantation has been developed along the Coal Transportation Road.
- vii) All the transport Lorries are optimally loaded to prevent spillage of coal and covered with Tarpaulin.

### **CONTROL OF EMISSION OF NOXIOUS GASES:**

The measures taken for mitigating the noxious gases are as follows:

- i) Coal transportation trucks and other vehicles are periodically maintained.
- ii) Notice boards have been displayed on the surface; advising persons to avoid burning of coal/wood/oil grease impregnated waste cotton/garbage etc., in the mine premises as a method of disposal.
- iii) Blasting operations at underground is carried out with delay action detonators and ultra safe P5 explosives, which helps in mitigating the emission of gases from explosives.
- iv) Stocks of coal are not allowed to be kept on surface of the mine. If any coal heap has to be kept for sometime, water spraying is done over it to control oxidation of coal.
- v) Burning of firewood and coal for domestic purpose in colonies has been stopped due to usage of L.P Gas being distributed free of cost by the company to all the employees.
  - Total manpower of the mine as on 31.03.2014 : 2263
  - Total L.P Gas connections to the workers as on 31.03.2014: 2126
- vi) Post-project air quality monitoring is being carried out by outside agency (M/s Environment Protection Training and Research Institute (EPTRI) Hyderabad) as per the frequency stipulated by MoEF vide GSR 742 (E) for coal mining industry and all the necessary precautions are being taken to maintain the concentration of critical parameters well within the stipulated standards.

## 6. Water Quality Monitoring:

The impact of the mining activities on the water environment was assessed by studying the quality of groundwater and surface water bodies in the study area. The sampling locations were selected considering their proximity to the project sites. A total of 6 water samples i.e., 2 samples from surface and 4 samples from groundwater were collected and analyzed for various physico-chemical and bacteriological parameters.

### Post project water quality monitoring stations:

#### (i) Surface Water Quality Monitoring Locations:

Sl. No	Location	Zone	Latitude	Longitude	Station Code
1.	Thallapalli Tank	Buffer	N 18° 50' 22.2"	E 79° 29' 8.5"	SW1
2.	Indaram Tank	Buffer	N 18° 49' 3.6"	E 79° 52' 2.4"	SW2

#### (ii) Ground Water Quality Monitoring Locations:

Sl. No	Location	Zone	Latitude	Longitude	Station Code
1.	Borewell at Kankur	Buffer	N 18° 53' 11.4"	E 79° 32' 44.4"	GW1
2.	Borewell at Mudikunta	Buffer	N 18° 53' 08.3"	E 79° 32' 46.3"	GW2
3.	Borewell at Krishna Colony	Buffer	N 18° 52' 22.3"	E 79° 29' 59.7"	GW3
4.	Bore well at Srirampur village	Buffer	N 18° 51' 18.4"	E 79° 29' 28.7"	GW4

#### (iii) Effluents sampling locations

Sl.No.	Sample code	Name of the Location	Latitude	Longitude
1.	EW-1	RK-5 Inc. Mine discharge	N 18° 53' 18.6"	E 79° 30' 4.7"
2.	EW-2	Krishna Colony Sewage effluent	N 18° 51' 44.6"	E 79° 30' 24.4"
3.	EW-3	STP outlet	N 18° 51' 44.7"	E 79° 30' 25.7"
4.	EW-4	Area Workshop ETP outlet	N 18° 51' 44.7"	E 79° 30' 13.5"

### Parameters:

The ground water quality results are compared with IS: 10500 standards of groundwater quality and surface water quality with IS 2296, 1982 and CPCB Water Quality Criteria, Class- A (Drinking Water Source without conventional treatment but after Disinfection), Class – B (outdoor bathing (organized) and Class – C (Drinking Water Source with conventional treatment and after Disinfection, Class – C (Drinking Water Source with conventional treatment and after Disinfection, Class –D propagation of wild life fisheries and Class-E (Irrigation, Industrial cooling, controlled waste disposal).

Effluent water quality monitoring involves periodical assessment of quality of mine discharge water, treated workshop effluents, CHP effluent, treated colony effluents, ground water and surface water. pH, Total Suspended Solids (TSS), Chemical Oxygen demand (COD) and Oil

& Grease are being periodically monitored in effluents as per the Environmental Standards for coalmines, GSR - 742 (E) dated 25.09.2000.

All the parameters as given in Part-A of General Standards for Discharge of Environmental Pollutants, GSR 801 (E) EPA 1986 prescribed by CPCB is being analyzed for all the effluents, in addition to the above parameters, once in a year for assessing the overall quality of effluents.

**Frequency of monitoring:**

Monitoring of effluent water samples for four critical parameters is being done at a frequency of once in a fortnight. Effluents are also analyzed in every fortnight, whereas ground water (all parameters), surface water (all parameters) are being analyzed once in every quarter.

**Monitoring Data:**

The surface water, ground water quality and effluent quality data monitored during October, 2013 to March, 2014 is enclosed as **Annexure-II**. The summarized data on effluent water quality in respect of four critical parameters stipulated for coal mines is furnished hereunder.

**Effluent Quality Monitoring:**

The summary of the monitoring from October, 2013 to March, 2014 as follows:  
(All values in mg/l except pH)

Location	Zone	pH			
		Min.	Max.	98%tile	STD
RK-5 Inc. Mine discharge	Core	6.8	7.7	7.63	5.50 – 9.0
Krishna Colony Sewage effluent	Buffer	7.0	8.2	8.15	5.50- 9.0
Naspur Colony	Buffer	6.8	8.0	7.93	5.50-9.0
Area Workshop ETP outlet	Buffer	7.0	8.2	8.09	5.50-9.0
Location	Zone	TSS (mg/l)			
		Min.	Max.	98%tile	STD
RK-5 Inc. Mine discharge	Core	8.0	20.0	18.68	100
Krishna Colony Sewage effluent	Buffer	15.0	24.0	24.0	100
Naspur Colony	Buffer	19.0	30.0	29.78	100
Area Workshop ETP outlet	Buffer	14.0	28.0	27.78	100
Location	Zone	COD (mg/l)			
		Min.	Max.	98%tile	STD
RK-5 Inc. Mine discharge	Core	8.0	20.0	19.12	250
Krishna Colony Sewage effluent	Buffer	20.0	72.0	69.8	250
Naspur Colony	Buffer	20.0	64.0	63.12	250
Area Workshop ETP outlet	Buffer	16.0	76.0	73.36	250
Location	Zone	Oil & Grease (mg/l)			
		Min.	Max.	98%tile	STD
RK-5 Inc. Mine discharge	Core	<1	<1	--	10.0
Krishna Colony Sewage effluent	Buffer	1.0	3.0	3.0	10.0
Naspur Colony	Buffer	1.0	3.0	3.0	10.0
Area Workshop ETP outlet	Buffer	1.0	2.0	2.0	10.0

## Water Pollution Control Measures:

There is no chemical process involved, the mine discharge water may contain coal fines as such the water is being utilized for drinking and domestic purpose after treatment in slow sand filters followed by disinfections. The following control measures are being taken up at the mine to control the water pollution.

- i) The mine discharge water is being utilized for dust suppression, plantation, domestic use etc. after necessary treatment.
- ii) The excess mine discharge water is being treated in settling tanks before discharge into natural drains.
- iii) The domestic sewage from the mine is being treated in septic tank followed by soak pit.
- iv) An effective sewerage system is being maintained to treat the colony effluents by Sewage Treatment Plant at Naspur Colony of 3 MLD Capacity, and other colonies effluents treatment is being done with Septic tanks followed by soak pits.
- v) Post-project water quality monitoring is being carried through an outside agency (M/s Environment Protection Training and Research Institute (EPTRI) Hyderabad) as per the frequency stipulated by MoEF for coal mining industry.

## 7. Phreatic surface monitoring: (Range of Water Table)

### ATTITUDE OF PHREATIC SURFACE IN SRIRAMPUR AREA

Sl. No	Name of village	Owner's Name	Type of Well	Dimensions (M)	Total Depth (M)	Geology	Measuring point (MAGL)	Period	Depth to Water (M)				
									2010	2011	2012	2013	2014
1	S.R.Puram Naspur X Road	Middi Rajaiah/Ip palapalli Kanakaiah	Domestic	1.00/1.2	13.50	Talchir	0.90/0.6	Winter	10.0	6.63	7.28	7.38	6.05
								Pre-Monsoon	13.45	8.60	9.96	9.22	
								Monsoon	3.30	3.85	6.20	6.11	
								Post- Monsoon	5.18	5.62	7.11	5.78	
2	Sitharampalli / on the way to intake well	Surimilla Lachanna	Domestic	2.5x3.5	6.90	Sullavai	0.60	Winter	4.68	2.28	3.83	3.54	3.52
								Pre-Monsoon	Dry	4.42	5.12	4.77	
								Monsoon	2.20	1.96	2.08	3.88	
								Post- Monsoon	2.28	3.25	2.60	3.38	
3	Sitharampalli/on the way to Thallapalli	M.Gopaiah	Domestic	1.20	11.50	Sullavai	GL	Winter	10.20	7.02	8.85	8.00	7.78
								Pre-Monsoon	14.25	9.45	10.48	10.22	
								Monsoon	2.10	5.35	1.03	1.52	
								Post- Monsoon	4.40	7.07	6.01	6.47	
4	Tallapalli/end of the village towards OC	B.Rajaiah	Domestic	1.20	10.50	Sullavai	1.10	Winter	10.15	5.58	7.15	7.30	5.61
								Pre-Monsoon	Dry	7.24	7.19	6.98	
								Monsoon	2.80	4.78	4.05	3.96	
								Post- Monsoon	5.00	6.68	5.65	5.53	
5	Tallapalli/On the way to Intake well	Rukum. Ramaiah	Domestic	2.40	9.10	Sullavai	0.70	Winter	5.15	3.83	2.35	3.39	1.58
								Pre-Monsoon	6.88	5.08	3.81	3.90	
								Monsoon	1.80	3.16	3.23	1.10	
								Post- Monsoon	1.45	1.96	1.65	1.32	
6	Singapuram /near teak plantation	Aggu Sailu	Agriculture	4.00	10.50	Sullavai	GL	Winter	Dry	3.70	2.63	2.75	4.82
								Pre-Monsoon	Dry	5.06	3.86	3.43	
								Monsoon	2.00	1.80	3.22	1.43	
								Post- Monsoon	3.50	4.50	3.55	4.72	
7	Singapuram	Nammala	Domestic	2.40	7.40	Sullavai	0.30	Winter	Dry	5.18	5.28	5.32	4.08

Sl. No	Name of village	Owner's Name	Type of Well	Dimensions (M)	Total Depth (M)	Geology	Measuring point (MAGL)	Period	Depth to Water (M)				
									2010	2011	2012	2013	2014
	/opp.panchayat office	Srinivasu						Pre-Monsoon	Dry	4.90	3.58	4.34	
								Monsoon	2.20	3.42	0.42	1.88	
								Post- Monsoon	1.20	1.23	1.35	0.95	
8	Ramaraopet /Near bridge	Gunta. Chandraiah	Domestic	1.30	5.20	Talchir FM	0.60	Winter	Dry	3.60	Dry	3.70	4.98
								Pre-Monsoon	Dry	Dry	Dry	3.92	
								Monsoon	1.00	3.85	1.66	1.92	
								Post- Monsoon	1.90	4.75	2.49	4.91	
9	Indaram/side of HP Petrol bunk	Muppalaiah	Domestic	1.20	7.00	Barren Measur es Fm	0.60	Winter	Dry	3.67	6.05	4.58	4.64
								Pre-Monsoon	Dry	5.87	7.32	6.72	
								Monsoon	2.58	4.95	4.70	4.42	
								Post- Monsoon	2.52	4.76	3.43	4.58	
10	Indaram	A.Rajamalu/opp.BP bunk	Domestic	3x4	11.50	Barren Measur es Fm	0.40	Winter	Dry	4.87	6.04	5.15	4.68
								Pre-Monsoon	Dry	7.15	8.40	8.45	
								Monsoon	3.15	5.78	4.00	5.14	
								Post- Monsoon	3.70	5.68	3.90	3.46	
11	Indaram	Govt. Well	Domestic	2.00	9.00	Barren Measur es Fm	0.50	Winter	9.20	3.14	6.00	5.50	5.38
								Pre-Monsoon	Dry	5.82	Dry		
								Monsoon	2.32	4.60	5.10	1.72	
								Post- Monsoon	2.35	5.18	4.03	5.32	
12	Indram/ opp. Garden	M.Sankar/ Podusani Bhaskar reddy	Domestic	1.00	13.00	Barren Measur es Fm	0.90	Winter	Dry	9.10	10.67	4.54	9.52
								Pre-Monsoon	Dry	10.80	AB		
								Monsoon	9.40	10.80	AB	8.42	
								Post- Monsoon	9.37	10.4	AB	10.48	
13	Indaram/IK-1&1A X-roads	Rajanna	Agricultur e	6.50	8.50	Barren Measur es Fm	0.70	Winter	Dry	NA	Dry	NR	NA
								Pre-Monsoon	Dry	Dry	Dry		
								Monsoon	5.67	Dry	4.52	NA	
								Post- Monsoon	6.20	Dry	NR	NA	
14	Tekumatla	Rice mill	Domestic	1.60	10.50	Barren Measur es Fm	0.60	Winter	NR	6.55	10.43	7.22	6.70
								Pre-Monsoon	11.06	--	Dry		
								Monsoon	6.10	8.96	5.50	4.82	
								Post- Monsoon	5.40	9.35	4.05	9.24	
15	Tekumatla /behind Panchayat office	V.Ramireddy	Domestic	1.00	11.00	Barren Measur es Fm	GL	Winter	6.00	3.56	3.07	3.90	6.12
								Pre-Monsoon	6.27	3.36	9.89	8.13	
								Monsoon	1.57	3.16	1.23	2.88	
								Post- Monsoon	2.15	3.47	3.55	3.62	
16	Jaipur	Behind AE Off. Near bus stop	Domestic	1.50	12.00	Kamthi FM	0.80	Winter	Dry	3.05	5.85	3.86	4.88
								Pre-Monsoon	Dry	3.36	7.89	6.02	
								Monsoon	1.20	4.85	0.66	1.21	
								Post- Monsoon	1.87	4.34	2.43	4.43	
17	Rasulpalli	Madhukar	Domestic	1.00	8.00	Barren Measur es Fm	0.70	Winter	5.60	2.39	4.21	3.15	3.42
								Pre-Monsoon	7.73	4.17	5.82	5.05	
								Monsoon	1.05	2.16	0.66	0.78	
								Post- Monsoon	1.35	3.12	1.82	3.28	
18	Mudikunta	Ellamma temple	Domestic	1.00	4.50	Barren Measur es Fm	0.40	Winter	1.85	1.45	1.63	1.82	1.40
								Pre-Monsoon	2.80	6.45	2.64	2.05	
								Monsoon	1.20	1.20	1.03	1.03	
								Post- Monsoon	1.34	1.45	1.24	1.28	
19	Mudikunta	G.Rajaiah	Domestic	1.00	11.40	Barren Measur es Fm	0.40	Winter	5.35	3.56	4.45	4.40	4.17
								Pre-Monsoon	9.50	6.45	9.14	9.43	
								Monsoon	1.32	2.17	1.00	8.22	
								Post- Monsoon	2.70	4.00	4.12	4.02	
20	Kankur/near school	Govt. Well	Domestic	4.00	9.00	Barren Measur es Fm	0.40	Winter	6.92	3.87	5.96	5.50	5.12
								Pre-Monsoon	8.00	5.35	7.78	7.10	
								Monsoon	1.53	4.57	3.12	1.34	
								Post- Monsoon	2.80	4.40	3.72	3.89	
21	Guttedarpall	R.Venkati	Domestic	2.50	8.50	Barkar	0.50	Winter	9.62	7.80	8.10	7.85	7.98

Sl. No	Name of village	Owner's Name	Type of Well	Dimensions (M)	Total Depth (M)	Geology Fm	Measuring point (MAGL)	Period	Depth to Water (M)					
									2010	2011	2012	2013	2014	
	i/Near RWS tank							Pre-Monsoon	Dry	8.20	9.35	8.03		
								Monsoon	6.80	8.03	6.55	5.10		
								Post- Monsoon	6.70	7.54	7.92	7.72		
22	Arunakkana gar near GM office	N.Lingaiah	Domestic	1.00	9.40	Barren Measures Fm	0.30	Winter	4.97	2.33	3.43	3.11	2.58	
								Pre-Monsoon	5.93	3.96	4.38	3.98		
								Monsoon	0.70	1.76	1.66	1.12		
								Post- Monsoon	1.12	2.32	2.99	2.47		
23	RK-6 Colony/Kur mawada	Karre Posham	Domestic	1.00	6.50	Barkar Fm	GL	Winter	1.74	1.60	1.59	NA	1.79	
								Pre-Monsoon	2.78	1.67	1.63	1.44		
								Monsoon	1.30	1.20	1.15	1.22		
								Post- Monsoon	1.55	1.58	NA	1.67		
24	RK-6 Colony/Kur mawada	Eshwaraiah	Domestic	1.00	6.50	Barkar Fm	GL	Winter	2.40	2.54	2.27	1.80	2.73	
								Pre-Monsoon	4.15	2.88	2.84	2.80		
								Monsoon	1.72	1.80	2.52	1.14		
								Post- Monsoon	2.40	2.58	2.30	2.66		
25	RK-6 Colony	Q.No.SA-13	Domestic	1.20	10.00	Barkar Fm	0.30	Winter	2.28	1.13	1.30	1.42	1.48	
								Pre-Monsoon	4.10	1.22	2.73	1.00		
								Monsoon	0.80	0.95	0.82	0.84		
								Post- Monsoon	1.06	1.12	1.13	1.18		

Note: The Phreatic surface monitoring from 2010 (Winter) to 2014 (Winter) is enclosed as **Annexure-IV**

#### Compliance status of Ground water Clearance:

Ground Water Clearance Lr. No: 3324/Hg.III(2) /2005, dtd.25.8.2005.

GW Clearance Condition No.	GW Clearance Condition.	Status.
1.	Periodical Monitoring of ground water levels and quality (quarterly) should be under taken by constructing purpose built piezometers and by collecting water samples for chemical analysis and report submitted to the Deputy Director, Ground water Department, Nirmal, regularly.	5 Nos. of piezometric levels were monitored four times(Season wise i.e winter, Pre-monsoon, monsoon and post-monsoon) in a year and submit the report to the Dy. Director, A.P Ground water Department, Nirmal in a half yearly basis( i.e completion of Two seasons). Monitoring data is enclosed as <b>Annexure-IV</b>
2.	Rain water Harvesting Structures should be taken up in all the villages within a radius of 10 kms. of the project area.	54 Nos of Rain water Harvesting structures are existing in the Area. Location details are furnished under water conservation measures.
3.	As the Area falls in villages with groundwater exploration reaching Semi-Critical stage, the ground water pumping has to be regulated. (Condition except CHNR-1 &1A and CHNR-2, Chennur Village mines)	It is being complied
4.	Provision should be made to maintain present use/ supply of ground water in and around the project area to avoid any adverse effects as a result of	It is being followed

	mining in future.	
5.	Afforestation in surrounding areas should be taken up.	The plantations are being done.

#### **Water Conservation Measures:**

- i) Mine water is collected in sumps in side mine and pumped out after settling.
- ii) Mine water is filtered and used for domestic, washing the machinery, Plantation and Water Spraying etc,
- iii) Ground Water levels are recorded seasonally in near by villages
- iv) One ETP is provided area level at Area workshop to trap 210 liters of oil and grease in a year before letting out on surface water body.
- v) Ground Water levels recorded in the near by villages is furnished in **Annexure - IV**.
- vi) All the hazardous wastes like used oil, used batteries, waste oil, empty oil barrels are being disposed off to authorized recyclers.
- vii) Details of Rain water Harvesting structures in Srirampur Area is as below:

<b>Sl. No</b>	<b>Location of the Rain water Harvesting Pits</b>	<b>No.of Rain water Harvesting pits</b>
1.	G.M's Office	02
2.	Area Stores	02
3.	Area Workshop	02
4.	Auto garage	02
5.	RK-8 Dispensary	01
6.	SRP Dispensary	01
7.	SC High School, SRP	02
8.	CER Club, Srirampur (Pragathi Stadium)	03
9.	M&R Office, Srirampur	01
10.	MVTC, SRP	01
11.	Sub-Station, SRP	02
12.	C-2 Type Quarters, RK-8 Colony	01
13.	'C' Type Quarters, RK-8 Colony	02
14.	Dispensary, Naspur Colony	02
15.	G.T Hostel, Naspur Colony	03
16.	Community Hall, Naspur Colony	02
17.	Saraswathi Shishumandhir School, Naspur Colony	03
18.	M& R Office, Naspur Colony	02
19.	Venkateswara Temple, Naspur Colony	03
20.	Pump House, Naspur Colony	01
21.	Sub-station premises, Naspur Colony	03
22.	SCOA Club, CCC	01
23.	S.C. Primary School, CCC	01
24.	S.C. High School, CCC	02
25.	Dispensary, CCC	01
26.	Yelland Club, CCC	01
27.	Guest House, CCC	02

28.	Geetha Mandhir, CCC	01
29.	M & r Office, CCC	01
30.	RK-5 GLSR	01
31.	'C' Zone Dispensary	01
32.	Pump House, CCC	01
	<b>Total</b>	<b>54.</b>

## 8. Noise Level Monitoring :

The summary of the monitoring from October, 2013 to March, 2014 is as follows:

Location	Zone	Day Time in dB(A)			
		Min.	Max.	Avg.	STD
RK-5 Incline	Core	64.8	74.7	69.89	75
SRP CHP	Buffer	68.6	75.5	73.1	75
CCC Colony	Buffer	45.7	52.0	49.17	55
Mudikunta village	Buffer	39.8	53.0	46.20	55
Srirampur Colony	Buffer	43.5	53.9	48.22	55
Location	Zone	Night Time in dB(A)			
		Min.	Max.	Avg.	STD
RK-5 Incline	Core	52.7	69.9	62.51	70
SRP CHP	Buffer	61.7	69.5	65.0	70
CCC Colony	Buffer	35.2	42.2	39.55	45
Mudikunta village	Buffer	35.3	41.0	38.1	45
Srirampur Colony	Buffer	34.6	43.1	38.45	45

Note: The Noise level monitoring from October, 2013 to March, 2014 is enclosed as **Annexure-III**

### Noise Pollution Control Measures:

- i) The main mechanical ventilators are provided with evasee which dampens the noise.
- ii) To dampen the noise levels at CHP, impact rollers are provided at transfer points.
- iii) Height of fall is minimized at all coal transfer points and internal lining of bins and chutes are done.
- iv) In the high noise intensity working areas / zones earmuffs or earplugs or any other suitable personal protective equipment is being provided to the workmen.
- v) Regular noise level monitoring is being done periodically for taking corrective action, wherever required.
- vi) Extensive plantation of green belt and vegetation along the roads and around the offices to create a barrier or screen between the source and the receiver so that the noise is absorbed and the exposure level is minimized.
- vii) Cushioning belt liners under the tipplers are being provided under tippler resting pads to reduce the noise while tripling the tubs.
- viii) Post-project noise quality monitoring is being carried out by outside agency [M/s Environment Protection Training and Research Institute (EPTRI) Hyderabad] at a frequency of once in a fortnight as stipulated by MoEF for coal mining industry.

**9. Capital and Revenue Expenditure incurred on Environment Management and Pollution Control Measures:**

Sl. No	Expenditure Head	Capital Expenditure (in Rs.)			Revenue Expenditure (in Rs.)		
		upto 2012-13	2013-14	Total	upto 2012-13	2013-14	Total
I	Air pollution (Prevention & control)	377600	0	<b>377600</b>	2193515	304460	<b>2497975</b>
II	Water pollution (Prevention & Control)	0	0	<b>0</b>	1033298	319710	<b>1353008</b>
III	Land development	0	0	<b>0</b>	0	0	<b>0</b>
IV	Plantation	1074873	93862	<b>1168735</b>	311709	447716	<b>759425</b>
V	Equipment for maintenance of environment protection	0	0	<b>0</b>	0	0	<b>0</b>
VI	Consultancy payments	714200	0	<b>714200</b>	0	0	<b>0</b>
VII	OB Reclamation / Subsidence management	0	0	<b>0</b>	2399500	388936	<b>2788436</b>
VIII	Environment awareness/Environment education	0	0	<b>0</b>	12500	1500	<b>14000</b>
IX	Noise & Blasting vibration	0	0	<b>0</b>	16223	14560	<b>30783</b>
X	Others	0	0	<b>0</b>	0	0	<b>0</b>
	<b>Total</b>	<b>2166673</b>	<b>93862</b>	<b>2260535</b>	<b>5966745</b>	<b>1476882</b>	<b>7443627</b>

**10. Socio-economic Measures:**

- i) Common Central Township is provided on non-coal bearing area and it is maintained with facilities such as dispensary, schools, drinking water supply, super-bazaar, recreation clubs, parks, well lighted approach roads, dust bins at various places in the colony, etc., and it is away from the mining activity.
- ii) Workmen are encouraged to undergo family planning operations by extending cash incentives and leave etc.,
- iii) Weekly vaccination for Polio, DPT, BCG, Measles, DT and Hepatitis 'B' are being given at Area Hospital and dispensaries. 2259 persons were vaccinated during the above period at area level.
- iv) Daily Street cleaning and sanitation works are looked after by Health & Civil departments in Srirampur Area. 13,650 Cu.m of Garbage is removed from the colonies during the above period at area level.
- v) Workmen are encouraged to participate in sports and games which are conducted in Company's Pragati Stadium at Srirampur.
- vi) Existing number of quarters for this project : 1201
- vii) Infrastructure development is being taken up in the surrounding areas through specially designed programme called as "Surrounding Habitat Assistance Programme" (SHAPE). Rs.1309.860 lakhs has been spent in the area.
- viii) Public hearing minutes compliance status enclosed as **Annexure-VII**

## 11. Environment Management Committee:

Unit level Environmental Management committee has been constituted with following members.

- 1) Agent - Chairman.
- 2) Area Env. Officer - Secretary.
- 3) Mine Manager - Member
- 4) Area Civil Engineer, - Member
- 6) Area Survey officer - Member.
- 7) Area Estates Manager - Member.
- 8) Area Forest Officer - Member.
- 9) Regional Hydro geologist - Member.

The minutes of EMC held on 04.03.2014 is enclosed as **Annexure-V**

## 12. Land use based on satellite Imagery:

This land use study presents existing land use patterns for the core (376.20 hectares) as on 06<sup>th</sup> December 2008 and buffer zones of RK-5 Incline as on 20<sup>th</sup> December 2010. Core zone is the area where the actual mining activity takes place and the buffer zone is the surrounding area of 10 Km radius from core zone periphery. Hybrid digital classification technique is leveraged for the project. This technique gives unambiguous visual interpretation and supervised classification mixed with recoding practice. Core zone mapping has done with state of the art satellite data of Cartosat-II (pan) and IRS-P6 LISS-IV (multi-spectral) with 1m and 6 m of resolution respectively.

On screen digitization has carried out using Cartosat-II data with the help of drawing files prepared by mine surveyors and collected field data. Supervised digital classification is performed on LISS-IV data and recoded each class separately with the output of on screen digitized shape files prepared with Cartosat-II data. The identified potential classes of land use patterns in the core zone are:

Sl. No	Class	Area	% of usage
1	Forest-Scrub Forest	54.41	14.46%
2	Forest-Dense Scrub Forest	77.30	20.55%
3	Forest-Deciduous -Dry-Moist-Thorn-Open	207.06	55.04%
4	Forest-Blank	28.59	7.60%
5	Built Up-Mining	8.85	2.35%
	<b>Total</b>	<b>376.20</b>	<b>100.00%</b>

For buffer zone mapping, data of IRS-P6 LISS-IV and LISS-III of two consecutive seasons are chosen. Due to unavailability of two consecutive seasonal LISS-IV data (06th December 2008), LISS-III data (20th December 2010) is taken as complementary. Base map prepared with the help of 1:50000 Survey of India (Sol) digital toposheet (56 M/8, 56M/12, 56N/5,56N/9). To extract vegetation, normalized difference vegetation index (NDVI) method is employed here. Water bodies are extracted through infrared gradient

method. Remaining classification (level III) has done using hybrid classification technique. The identified potential classes of land use patterns in the buffer zone are:

Land Use Land Cover Class		Area of Sub Class		Area of Class	
		Area in	% of	Area in	% of
<b>Agriculture</b>	Crop Land-Kharif	4222.69	10.45%	16829.92	41.66
	Crop Land-Rabi	671.79	1.66%		
	Crop Land-Double	4595.50	11.38%		
	Current Fallow	7015.59	17.37%		
	Plantations	324.35	0.80%		
<b>Forest Cover</b>	Deciduous Dry/Moist/Thorn)-Dense	5304.69	13.13%	12195.61	30.19
	Deciduous (Dry/Moist/Thorn)-Open	1914.91	4.74%		
	Scrub Forest	2798.72	6.93%		
	Tree Clad Area-Dense	41.01	0.10%		
	Tree Clad Area-Open	176.08	0.44%		
	Forest blank	367.85	0.91%		
	Forest Plantation	1592.35	3.94%		
<b>Waste Land</b>	Wastelands-Scrub land-Dense scrub	640.00	1.58%	2469.27	6.11
	Wastelands-Scrub land-Open scrub	1433.78	3.55%		
	Barren Rocky-Stony waste	395.49	0.98%		
<b>Built up</b>	Urban	2397.30	5.93%	4846.42	12.00
	Rural	1070.21	2.65%		
	Mixed	0.00	0.00%		
	Industrial area	697.08	1.73%		
	Mining	681.83	1.69%		
<b>Water bodies</b>	Tanks	816.90	2.02%	2704.58	6.70
	River stream dry	1572.83	3.89%		
	River stream perennial	289.27	0.72%		
	Canal drain lined	20.91	0.05%		
	Reservoir tanks dry	4.67	0.01%		
<b>Others</b>	Ash pond	0.00	0.00%	1347.70	3.34
	urban-vegetation	645.31	1.60%		
	Barren OB dump	309.06	0.77%		
	Coal bench	22.84	0.06%		
	Coal dump	9.28	0.02%		
	Flood protection bund	22.08	0.05%		
	Quarry area	221.12	0.55%		
	Top soil dump	86.64	0.21%		

Land Use Land Cover Class		Area of Sub Class		Area of Class	
		Area in	% of	Area in	% of
	Unbroken quarry area	10.88	0.03%		
	Surface Infrastructure	20.49	0.05%		
	Others	0.00	0.00%		
<b>Total Area</b>		40393.50	100.00%	40393.50	100.00%

### 13. Subsidence management details:

(a) Total seam wise area developed (including Depillaring area ) so far:

Sl. No:	Seam	Area in Ha.	Depth (m)		Total Thickness (m)	Working height (m)
			Min.	Max.		
1.	2A	177.70	56	120	1.5 to 2.00	1.5 to 2.00
2.	2	162	48	187	3.5 to 4.50	3.5 to 4.00
3.	4	187.18	157	242	1.5 to 1.80	1.5 to 1.80
4.	5S	105.49	38	255	1.5 to 1.80	1.5 to 1.80

b) Total Seam wise area depillared so far since inception:

Sl. No:	Seam	Area in Ha.	Depth (m)		Total Thickness	Working thickness(m)	Caving/ stowing.
			Min.	Max.			
1.	2A	110.25	42	193	1.5 to 2.0	1.5 to 2.0	Caving
2.	2S	84.73	40	225	3.5 to 4.5	3.5 to 4.0	Caving
3.	4S	52.46	35	244	1.5 to 1.8	1.5 to 1.8	Caving
4.	5S	31.34	38	257	1.5 to 1.8	1.5 to 1.8	Caving

c) Total surface area effected due to subsidence so far : 59.12 Ha

- Max. Crack width observed so far : 0.40 Mtrs
- Max. Subsidence occurred so far : 2.785 Mtrs
- Whether the vegetation effected if any : Not Affected
- if affected, give details. : Nil

d) Mode of treatment given to substantiate subsidence effect:

- Total man-shifts worked in subsidence area for crack filling : 747
- Total dozer-shifts worked for subsidence reclamation : Nil
- Area filled up with OB/ subsoil material : Nil
- Quantity of OB / Subsoil dumped : Nil
- Maximum height of dump : Nil

e) Expenditure incurred for subsidence treatment so far : Rs. 27,88,436.

**AGENT,  
RK-5&6 Gr. Of Mines.**