



GMDC

GMDC/BHV/ENV/ 114 /11-12

Date : 13-April-12

To
The Director (s)
Ministry of Environment & Forest
Regional Office, Western Division
Kendriya Paryavaran Bhavan
Link Road No. 3, E-5
Ravishankar Nagar
Bhopal, Pin: 462016

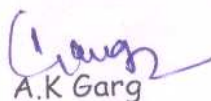
Subject: Six monthly compliance report of Environment Clearance.

Dear Sir,

With reference to the above mentioned subject, please find enclosed herewith the six monthly compliance report of Surkha (N) Lignite Mines, Gujarat Mineral Development Corporation Ltd., Bhavnagar for the duration (Oct' 2011- Mar' 2012).

This is for your kind perusal.

Thanking you.
For GMDC Ltd.


A.K Garg

General Manager (Project)

Encl: As mentioned.

Cc: To Chief General Manager, Corporate Office, GMDC Ltd. Ahmedabad.

GUJARAT MINERAL DEVELOPMENT CORPORATION
(A Govt. Of Gujarat Enterprise)
Lignite Project Bhavnagar, Dist. Bhavnagar 364 002
Village – Tagadi, Post- Malpar
Ph No. (0278) 2883100, Fax no. (0278) 2883802

Surka (N) Lignite Mines, GMDC Ltd -Bhavnagar
Environment Clearance by Ministry of Environment & Forest
Compliance Report October'2011–March'2012

Environmental Clearance Letter No.J-11015/234/2006-IA II (M), Dt.7/05/2007

(A) Specific Conditions

Sr.no.	Conditions	Present Status																
01	Nonmineralized /areas of uneconomical reserves of 1018 Ha. (Block-C) shall be surrendered before mining. Mining shall be carried out in the revised lease area of 3672 ha only.	<u>Complied</u> Land already Surrendered. Now final lease area is 3672 Ha. Instead of 4690 Ha.																
02	Mining shall be carried out as per statuette at a safe distance from the seasonal stream/nalla flowing within lease boundary.	<u>Complied.</u> The nearest distance of working mine is 65 m away from Thordi Nallah & Protective Bund is provided.																
03	Top Soil shall be stacked properly with proper slope and will be used for reclamation and development of greenbelt.	<u>Complied.</u> Top soil is stacked separately in 9 Ha. Area with proper slope. This will be used for reclamation of backfilled and OB dump area for plantation and for green belt development in mine lease area.																
04	OB shall be stacked at 4 external dumpsites within ML area. OB dumps shall be a maximum height of 30m only and consist of three benches of 10m each. The Ultimate slope of dump shall not exceed 28°. The OB dumps shall be vegetatively reclaimed. Monitoring and management of reclaimed dumpsite should continue until the vegetation becomes self sustaining. Compliance status should be submitted to the MOEF on yearly basis.	<u>Complied.</u> There are Three OB dumps within the lease area. Slopes are maintained at 27 ⁰ . The dump wise details for OB is as follows. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Sr</th> <th style="text-align: center;">Dump</th> <th style="text-align: center;">Volume (Lac m3)</th> <th style="text-align: center;">Height (m)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">W I</td> <td style="text-align: center;">4.31</td> <td style="text-align: center;">15</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">W II</td> <td style="text-align: center;">60.95</td> <td style="text-align: center;">30</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">W III</td> <td style="text-align: center;">175.00</td> <td style="text-align: center;">30</td> </tr> </tbody> </table> Plantation on dumps has been started from financial year 2011-12 in consultation with Local Forest department. Grass seeds of Karad have been sown along with the saplings of <i>Bougainvillea Sp.</i> , <i>Nerium indicum</i> , <i>Annona squamosa</i> , <i>Pongamia pinnata</i> , <i>Holoptelea integrifolia</i> etc on dumps.	Sr	Dump	Volume (Lac m3)	Height (m)	1	W I	4.31	15	2	W II	60.95	30	3	W III	175.00	30
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05	Catch drains and Siltation ponds of appropriate size should be constructed to arrest silt and sediments flows from soil &, OB dumps. Collected water should be utilized for watering	<u>Complied.</u> At the mine pit and at the toe of all the dumps catch/Garland drains are constructed.																

	<p>mine area, roads, green belt development etc. The drains should be regularly de-silted and maintained properly.</p> <p>Garland drains (size, gradient & length) and sump capacity should be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine pit. Sump capacity should also provide adequate retention period to allow proper settling of silt material.</p>	<p>Garland Drains size:</p> <table border="1" data-bbox="853 353 1460 504"> <thead> <tr> <th>Sr</th> <th>Location</th> <th>Length (km)</th> <th>Depth (m)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>NW drain</td> <td>1.3</td> <td>2.0</td> </tr> <tr> <td>2</td> <td>SW drain</td> <td>0.6</td> <td>2.0</td> </tr> </tbody> </table> <p>Siltation pond size:</p> <table border="1" data-bbox="853 571 1460 757"> <thead> <tr> <th>Sr</th> <th>Location</th> <th>Length (m)</th> <th>Breadth (m)</th> <th>Depth (m)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Near Dargah</td> <td>60</td> <td>30</td> <td>8</td> </tr> </tbody> </table> <p>De-silting of garland drains are done periodically. Accumulated water is kept in sump and used for dust suppression and greenbelt development in ML area. The accumulated water is monitored monthly for quality purpose.</p>	Sr	Location	Length (km)	Depth (m)	1	NW drain	1.3	2.0	2	SW drain	0.6	2.0	Sr	Location	Length (m)	Breadth (m)	Depth (m)	1	Near Dargah	60	30	8
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06	<p>Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run off and Siltation should be based on the rainfall data.</p>	<p><u>Under Progress</u></p> <p>Planning for the construction of retaining walls is in process so that run off from dumps can be checked. Details are here as under.</p> <table border="1" data-bbox="853 1182 1300 1397"> <thead> <tr> <th>Prop No.</th> <th>Proposed length(m)</th> <th>Estimated cost (Rs.)</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>1600</td> <td>3123300</td> </tr> <tr> <td>02</td> <td>800</td> <td>1562000</td> </tr> <tr> <td>03</td> <td>1200</td> <td>2342500</td> </tr> </tbody> </table>	Prop No.	Proposed length(m)	Estimated cost (Rs.)	01	1600	3123300	02	800	1562000	03	1200	2342500										
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07	<p>Mining operation shall not involve mineral processing.</p>	<p><u>Complied.</u></p> <p>At present no mineral processing is involved. Corporation is planning to install pyrite removal plant for mined out lignite in ML area based on dry beneficiation technology to reduce the Sulphur content from lignite. This will reduce the Sulphur dioxide emission at user end.</p> <p>For this, application has already been submitted to MoEF and presentation also has been made. Now we are waiting for amended EC from MoEF.</p>																						
08	<p>Mining shall not involve drilling & blasting operation.</p>	<p><u>Complied.</u></p> <p>No drilling & blasting is involved in the mining operations.</p> <p>At present, some of the hard strata is encountered</p>																						

		which will require blasting and the same is incorporated in revised mine plan for capacity expansion from 3.0 MTPA to 5.0 MTPA. TOR has been granted by MoEF for the same.
09	High efficiency water sprinkling system should be provided to check fugitive emission from haulage roads, transfer points	<u>Complied.</u> 20 KL capacity water tankers, equipped with pressurized sprinkling arrangement, are working round the clock to check fugitive emission from all potential fugitive emission source including haul road and transfer points. Water consumption Data for sprinkling is enclosed as Annexure I.
10	The total area brought under afforestation at the end of mine life shall include reclaimed external OB dumps , reclaimed quarry area, progressive green belt development (60Ha.) including plantation along ML boundary, roads etc. planting native species in consultation with local DFO. The density of trees should be around 2000 plants/Ha.	<u>Under Progress.</u> Plantation has been started from the year 2008 in consultation with local Forest department. Till date plantation drive is in full swing to achieve the target. 46 Ha area has been covered till March'12, which includes 41.5 Ha of land and 4.5 Ha of reclaimed Dumps, by planting native plant species like <i>Azadiracta indica</i> , <i>Delonix regia</i> , <i>Annona squamosa</i> , <i>Pongamia pinnata</i> , <i>Holoptelea integrifolia</i> , <i>Senna surattensis</i> , etc under Afforestation activity like greenbelt development, reclamation of external OB dumps in ML area. Plant density of 2000/ha is maintained thoroughly. Plantation Details are attached as Annexure II.
11	Backfilling shall begin from the 4 th year of mining operations. A Progressive Mine Closure Plan shall be implemented from the 4th year of mining operation and OB generated shall backfilled. Plantation shall be developed over the backfilled area.	<u>Under progress.</u> GMDC Ltd. has started overburden removal work from 5/4/2008 and lignite loading from 14/12/2008. Backfilling in the area about 45 Ha has been started. The backfilled area shall be reclaimed and planted after achieving sufficient level w.r.t ground partly with tree species and majority shall be developed as pasture in lieu of gauchar land acquired.
12	The project authorities shall provide land/areas for grazing, if required in the reclaimed land in consultation with local villagers.	The gauchar land shall be developed on backfilled area and the land shall be hand over to the district authorities as per existing regulation.
13	No groundwater shall be used for mining operations. Prior approval of the competent authority such as SGWB/CGWA shall be obtained for using groundwater for the project.	<u>Complied.</u> No ground water is being used for Mining activity. Gujarat Water Supply and Sewerage Board connection has been taken to meet Drinking water

		requirement of the project. About 714 KL of water is used in average per month for drinking and domestic purpose.
14	Regular monitoring of groundwater level and water quality should be carried out by establishing a network of existing wells. The monitoring of water level & quality of water should be done during May, August November and January months and data collected should be sent to MOEF/GPCB.	<u>Complied.</u> Regular third party monitoring of mine seepage and stored water is carried out by schedule II auditor recognized by Gujarat Pollution Control Board. Monthly groundwater levels of wells of surrounding villages are also monitored departmentally. GW monitoring data from OCT 11- MAR 12 is enclosed as Annexure III.
15	The company shall put up artificial groundwater recharge measures for augmentation of groundwater resource. The project authorities should meet Water requirement of nearby villages in case the villages well go dry due to dewatering of mine.	<u>Complied.</u> Presently no difficulty is observed in terms of ground water depletion due to increased rainfall in recent years. Further, to increase the recharge capacity of the area, deepening of ponds and check dams work has already completed in Thordi and Malpar villages. GMDC has planned more such works in and around villages to increase the water recharging capacity in this area. Details of artificial ground water recharge structures are enclosed as Annexure IV.
16	Digital processing of the entire lease area using remote sensing technique should be done regularly once in 3 years for monitoring land use pattern and report submitted to MOEF and Regional office Bhopal.	<u>Under progress.</u> Digital Processing has done by “Bhaskaracharya Institute for Space Applications & Geo-Informatics, Gandhinagar (Gujarat) and Draft report already has received.
17	Besides carrying out regular periodic health check up of the workers , 10 % of the workers identified from workforce engaged in active mining operation shall be subjected to health check up for occupational diseases and hearing impairment, if any, through an agency such as NIOH, Ahmedabad within a period of one year and results reported to this Ministry and to DGMS.	<u>Complied.</u> Regular Medical check-up of all employees in city hospital is being done as per DGMS norms. A total of 194 employees have been covered under the medical examination in the year 2010 and for the year 2011 the check up process is under progress. Till March 2012, all the employees of GMDC, Bhavnagar have undergone check up by NIMH Nagpur.
18	A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the MOEF 5 years in advance of Final Mine Closure for the approval.	The estimated cost of mine closure is revised from 2.65 Crores to 100.5 Crores which includes plantation, stabilization of dump and backfilling. However final mine closure plan shall be prepared well in advance with prevailing cost at that time and

		submitted to MoEF and other authorities for approval.
19	Consent to operate Mine shall be obtained before starting of mining.	Env. Consent already obtained on 30/9/08 from GPCB vide order no. AWH/31089/ dt 30/9/2008. This is valid up to 21/04/2013.

(B) General Conditions

S.no.	Conditions	Present status																																																								
01	No change in mining technology and scope of working should be made without prior approval of MOEF.	<p><u>Complied.</u></p> <p>No change has been made in the mining technology and scope of work. However, a proposal for the inclusion of pyrite removal plant has been submitted to MoEF for amendment in the existing Environmental Clearance, as some noticeable percent of pyrite nodules are found associated with the lignite which was not found during the excavation stage.</p>																																																								
02	No change in the calendar plan including excavation, quantum of mineral and waste should be made.	<p><u>Under progress.</u></p> <p>The year wise production quantity (in MT) is given below.</p> <table border="1" data-bbox="852 965 1552 1525"> <thead> <tr> <th>Yr/Month</th> <th>2009-10</th> <th>2010 - 11</th> <th>2011-12</th> </tr> </thead> <tbody> <tr><td>Apr</td><td>124561.77</td><td>61827.03</td><td>184196.43</td></tr> <tr><td>May</td><td>96728.90</td><td>51969.16</td><td>175962.66</td></tr> <tr><td>Jun</td><td>62899.55</td><td>50350.02</td><td>128651.98</td></tr> <tr><td>Jul</td><td>36494.88</td><td>39590.61</td><td>45334.14</td></tr> <tr><td>Aug</td><td>44190.63</td><td>38802.50</td><td>40913.09</td></tr> <tr><td>Sep</td><td>42443.26</td><td>54815.24</td><td>110347.145</td></tr> <tr><td>Oct</td><td>48530.33</td><td>64824.75</td><td>149030.090</td></tr> <tr><td>Nov</td><td>24551.24</td><td>65200.08</td><td>160503.115</td></tr> <tr><td>Dec</td><td>24324.31</td><td>72646.05</td><td>219447.13</td></tr> <tr><td>Jan</td><td>42214.16</td><td>93071.32</td><td>315983.790</td></tr> <tr><td>Feb</td><td>50368.08</td><td>130822.59</td><td>294920.27</td></tr> <tr><td>Mar</td><td>54091.37</td><td>144033.08</td><td>277783.170</td></tr> <tr> <td>Total</td> <td>651398.92</td> <td>867952.43</td> <td>2103073.01</td> </tr> </tbody> </table>	Yr/Month	2009-10	2010 - 11	2011-12	Apr	124561.77	61827.03	184196.43	May	96728.90	51969.16	175962.66	Jun	62899.55	50350.02	128651.98	Jul	36494.88	39590.61	45334.14	Aug	44190.63	38802.50	40913.09	Sep	42443.26	54815.24	110347.145	Oct	48530.33	64824.75	149030.090	Nov	24551.24	65200.08	160503.115	Dec	24324.31	72646.05	219447.13	Jan	42214.16	93071.32	315983.790	Feb	50368.08	130822.59	294920.27	Mar	54091.37	144033.08	277783.170	Total	651398.92	867952.43	2103073.01
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03	Four ambient air quality monitoring stations will be established in the core zone as well as in the buffer zone for SPM, RPM, SO2 AND NOX monitoring.	<p><u>Complied.</u></p> <p>Already established Five stations</p> <ol style="list-style-type: none"> 1. At Time office 2. At Gate no.2 3. At Dargah gate 4. At KCL Camp 5. At Substation-2 																																																								
04	Data on ambient air quality should be regularly submitted to Ministry and its regional office at	<p><u>Complied.</u></p> <p>The required data is submitted to State Pollution</p>																																																								

	Bhopal including Pollution Control Board once in six months.	Control Board on periodic basis. Data enclosed as Annexure V Latest been submitted in January 2012 to GPCB, Gandhinagar.
05	Fugitive dust emissions from all the sources should be controlled regularly, monitored and data recorded properly. Water spraying arrangement on haul roads, dumps etc. should be provided and maintained.	<u>Complied.</u> Emissions from dumps, etc., are controlled by continuous water sprinkling through movable sprinklers. Proper records for the same is shown in Annexure I. Avenue plantation and greenbelt development is also going on in phased manner as detailed out in compliance of specific condition no. 10.
06	Adequate measures should be taken to control noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operation, operation of HEMM, etc should be provided with ear plugs/muffs.	<u>Complied.</u> Preventive measures are taken to control the noise pollution through regular maintenance of the vehicles, machineries etc. The mining operations does not include drilling and blasting in Surkha mines, besides this, ear muffs and ear plugs are provided to employees engaged for mining activities. All HEMM has noise proof cabin for operator and regular maintenance of machineries are also being done. Apart from this regular health check up is conducted by NIMH Nagpur which includes audiometric test of the workers. No such occupational health hazard has been noticed till date.
07	Industrial waste water (workshop and wastewater from mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19/5/1993 and 31/12/1993. Oil and grease trap should be installed before discharging of workshop effluents.	<u>Complied.</u> The mine seepage water is collected in mine pit and utilized for dust suppression after sufficient treatment. Workshop waste water is re-circulated in workshop itself after oil and grease separation through oil trap. Arrangement for collecting used oil is made in isolated and protected place near the workshop.
08	Vehicular emissions should be kept under control and regularly monitored. Vehicles used for transporting the material should be covered with tarpaulins and optimally loaded.	<u>Complied.</u> All the vehicles used for transporting the mineral is covered with tarpaulins and optimally loaded as per RTO rules.
09	Environment laboratory should be established with adequate number and type of pollution monitoring and analysis equipment in consultation with State Pollution Control Board.	<u>Under progress.</u> Establishment of environmental laboratory is under progress.

		At present, services of outside agency are hired for monitoring. Apart from this annual environmental auditing is also carried out by GPCB recognized Schedule I auditor.												
10	Personnel working in dusty area should wear protective respiratory devices and they should be given training and information on safety and health aspects. Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.	<u>Complied.</u> At GMDC, we ensure that each and every person working in the active Mine area wears the PPE issued to them. Apart from this Workers are being trained regularly & adequate safety equipments are provided to them. Annually worker's health is examined under DGMS norms. No any occupational disease related complication is reported till date.												
11	A separate Environmental Management Cell with suitable qualified personnel should be set up under the control of a Sr. executive, who will report directly to the Head of the company.	<u>Complied.</u> Env. Management Cell is already established which directly reports to General Manager (Project). At Corporate level also, Environmental Cell is working under control of Chief General Manager who is directly reporting to Managing Director of the organization.												
12	The funds earmarked for environment protection measures 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 at Bhopal.	<u>Complied.</u> GMDC is concern with the environmental protection measures and allocate sufficient funds for implementing the measures. Till date, following expenses has occurred apart from laboratory services, monthly monitoring, auditing by external agency and water sprinkling. <table border="1" data-bbox="853 1328 1396 1615"> <thead> <tr> <th>Year</th> <th>Expenses.</th> </tr> </thead> <tbody> <tr> <td>2008-09</td> <td>1,14,679</td> </tr> <tr> <td>2009-10</td> <td>27,77,890</td> </tr> <tr> <td>2010-11</td> <td>13,21,683</td> </tr> <tr> <td>2011-12</td> <td>5,56,180.50</td> </tr> <tr> <td>Total</td> <td>4770432.50</td> </tr> </tbody> </table> Water recharging structures and various check dams has been constructed. Expenditure for the same is enclosed in Annexure VI along with the CSR activity expenses.	Year	Expenses.	2008-09	1,14,679	2009-10	27,77,890	2010-11	13,21,683	2011-12	5,56,180.50	Total	4770432.50
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Total	4770432.50													
13	A copy of E. C. will be marked to concern Panchayat/local NGO, if any, from whom any suggestion has been received while processing the proposal.	<u>Complied.</u>												

14	State Pollution Control Board should display a copy of clearance letter at Regional Office, District Industry Centre and Collectors office for 30 days	<u>Complied at GPCB end.</u>
15	Publish advertisement of Env. Clearance in local language within seven days of clearance letter.	<u>Complied</u> The environmental clearance is published in two news papers. In English, The Times of India on 26.05.2007 and in Local Gujarati language news paper, Saurashtra Samachar on 26.05.2007.

(Gang)
13/4/12
[Authorized Signatory]

Shande
13/4/12

ANNEXURE: I

Water Consumption Data For Sprinkling

WATER SPRINKLING DETAILS APR 2011-SEPT 2011				
S. NO	MONTH 2011-12	TRIPS	QTY (KL)	Remarks
1	October 2011	285	5700	-
2	November 2011	423	8460	-
3	December 2011	367	7340	-
4	January 2012	211	4220	-
5	February 2012	225	4500	-
6	March 2012	282	5640	-
TOTAL		1793	35860	-

Annexure II: Plantation Details

PLANTATION DETAILS OF BHAVNAGAR PROJECT							
S.NO.	YEAR	AGENCY	NO. OF PLANTS	SURVIVAL RATE %	LOCATION	SPECIES	AREA (H)
1	2008-09	CONTRACTOR	NIL	NA	KARAN	3.0
		DEPARTMENTAL/ GMDC	NIL	NA	GULMOHAR	
		FOREST DEPT.	2500	70	OPPOSITE TO ELECTRIC SUB-STATION	MEETHA BABOOL	
					EAST TO DIESEL PUMP	NEEM	
					IN BETWEEN TIME-OFFICE & DIESEL PUMP	JATROPHA	
						KARANJ	
						CHARAL	
				MEETHI IMLI			
TOTAL PALNTS: 2500, SMALL PLANTS: 124, BIG PLANTS: 2376							
2	2009-10	CONTRACTOR	NIL	NA	CHARAL	10.4
		DEPARTMENTAL/ GMDC	NIL	NA	NEEM	
		FOREST DEPT.	6500	77	ADM OFIICE	TIKOMA	
					GATE NO. 2, FENCING PLOT	GULMOHAR	
					PARKING PLOT/ BEHIND WEIGHT BRIDGE	KASID	
					PARALLEL TO CANAL	KARANJ	
					IN BETWEEN TIME-OFFICE & DARGAH-I	IMLI	
					IN BETWEEN TIME-OFFICE & DARGAH-II	PILU	
						SEESU	
						PEEPAL/VAD	
				DESI BABOOL			
				GOONDI			
				KARANJ			
TOTAL PLANTS: 6500, SMALL PLANTS: 240, BIG PLANTS: 6260							

3							
3	2010-11	CONTRACTOR	20543	72	SAT BEHNO MANDIR PLOT	NEEM	24.96
		DEPARTMENTAL/ GMDC	3948	80	ROAD SIDE- WB1-WB2 & RIVER	GULMOHAR	
		FOREST DEPT.	2500	88.28	ELECTRIC SUBSTATION	GLICERIA	
					NEW VIEW POINT	UMARA	
					GATE NO.2	AVAL	
					GATE NO.4	JAMBOO	
					GATE NO. 4 TO MINES ROAD	KASID	
					COLONY @ BHAVNAGAR	KARANJ	
					BETWEEN DARGAH & DUMP	CHAMPA	
					BHUMBALI SAMASAN	BOGAINVILLEA	
					CANAL- BUND OPPOSITE TO SAT- BEHNO MANDIR	DESI- GULAB	
					ADM- NR. IOC GATE	PIPAR STEM	
					BETWEEN HELMET GATE & W/B-1 ROAD SIDE	GULMOHAR	
					DARGAH DUMP	SARGAVO	
					BEHIND DUMP, THORDI TAGADI ROAD	ASHOK	
						DADAM	
						SITAFAL	
						JAMFAL	
						ALOEVERA	
						KARAN	
						TJKOMA	
TOTAL PLANTS: 26991, ALOEVERA: 19700, SMALL PLANTS: 962, BIG PLANTS: 6329							
4							
4	2011-12	CONTRACTOR	NIL	NA	THORDI OB DUMP	ALOEVERA	7.09
		DEPARTMENTAL/ GMDC	29116	98	CANAL BUND NEAR SAT BEHNO MANDIR	KASID	
		FOREST DEPT.	NIL	NA	TOP SOIL DUMP SLOPES	NEEM	
					DARGAH ROAD	GULMOHAR	
					PWD- THORDI ROAD	TIKOMA	
					DUMP SLOPES	KARANJ	
					THORDI ROAD SIDE	JAMBU	

				PARALLEL TO DARGAH ROAD	CHARAL	
				TOP SOIL DUMP BORDER	SITAFAL	
				TOP SOIL DUMP TOE	BOUGAINVILLEA	
				ADMISTRARTIVE OFFICE	KARAN	
				HANUMAN TEMPLE	BAROMASI	
				OB DUMP NERA THORDI ROAD SIDE	GALGOTTA	
				ARVIND SINGH PLOT		
				BEHIND DARGAH		
				BELOW TOP SOIL DUMP NEAR CANAL		

TOTAL PLANTS: 29116

ALOEVERA: 5000,

SMALL PLANTS: 7398

BIG PLANTS: 16718

Annexure III: Ground Water Data OCT – 2011

Sr.no.	Location/ Parameters	Tagdi Nr.GWSSB Tank	Malpar Near Temple	Thordi Nr.check Dam on Pithalpar Rd	Nr.bhumli In farm	Bhutesar Road in farm	Pir Dargah	Hanu.Temple
01	Dt of Survey	21/10/2011	21/10/2011	21/10/2011	21/10/2011	21/10/2011	21/10/2011	21/10/2011
02	Village	Tagadi	Malpar	Thordi	Bhumli	Bhutesar	Malpar	Malpar
03	Taluka	Ghohga	Ghohga	Bhavnagar	Bhavnagar	Bhavnagar	Ghohga	Ghohga
04	Survey no.	-	-	-	110 pvt	-	Govt.Land	Govt.Land
05	Owner	Govt	Govt	Govt	Harjibhai	Dayalbhai	Dargah	Temple
06	Type of Well	DugWell	Dug well	Dug Well	Dugwell	Dugwell	Dug Well	Dug Well
07	Total Depth(m)	16	25	30	7.5	30	30	30
08	Well Dia.(m)	5.0	5.0	8.20	4.5	3.5	3.25	2.9
09	Measuring .Pt(m)	0.80Agl	0.80Agl	0.60Agl	gl	gl	1.10Agl	0.84
10	R.L.						31.0	30.0
11	Luined/Unlined	Lined	Lined	Lined	Lined	Lined	Lined	Lined
12	Use	Drinking	Drinking	Drinking	Agri	Drin/Agri	Dom/ Pltn	Domestic
13	Mode of pumping	-	Sub.Pump	Sub.Pump	Machine	Machine	Pump	Hand Pump
14	H.P.	-	5HP	5HP	-	-	2HP	-
15	Discharge	-	-	-	-	-	NA	-
16	Elect/Deisel	-	Elect	Elect	Diesel	Diesel	Elect	-
17	Water Level(m) Agl	2.20	3.0	2.25	3.00	10.50	9.80	7.60
18	TDS	300	400	400	700	1600	800	900
19	pH	7.5	7.0	7.5	7.0	7.0	7.0	7.5

Ground water data: November 2011

Sr.no.	Location/ Parameters	Tagdi Nr.GWSSB Tank	Malpar Near Temple	Thordi Nr.check Dam on Pithalpar Rd	Nr.bhumli In farm	Bhutesar Road in farm	Pir Dargah	Hanu.Temple	Near Sat Behno Mandir
01	Dt of Survey	19-11-11	19-11-11	19-11-11	19-11-11	19-11-11	16-11-11	16-11-11	16-11-11
02	Village	Tagadi	Malpar	Thordi	Bhumli	Bhutesar	Malpar	Malpar	Malpar
03	Taluka	Ghogha	Ghogha	Bhavnagar	Bhavnagar	Bhavnagar	Ghogha	Ghogha	Gogha
04	Survey no.	-	-	-	110 pvt	-	Govt.Land	Govt.Land	-
05	Owner	Govt	Govt	Govt	Harjibhai	Dayalbhai	Dargah	Temple	Govt.
06	Type of Well	DugWell	Dug well	Dug Well	Dugwell	Dugwell	Dug Well	Dug Well	Dug well
07	Total Depth(m)	16	25	30	7.5	30	30	30	45.0
08	Well Dia.(m)	5.0	5.0	8.20	4.5	3.5	3.25	2.9	3.2
09	Measuring .Pt(m)	0.80Agl	0.80Agl	0.60Agl	gl	gl	1.10Agl	0.84	0.0 gl
10	R.L.	-	-	-	-	-	31.0	30.0	-
11	Lined/Unlined	Lined	Lined	Lined	Lined	Lined	Lined	Lined	Lined
12	Use	Drinking	Drinking	Drinking	Agri	Drin/Agri	Dom/ Pltn	Domestic	Drinking
13	Mode of pumping	-	Sub.Pump	Sub.Pump	Machine	Machine	Pump	Hand Pump	-
14	H.P.	-	5HP	5HP	-	-	2HP	-	-
15	Discharge	-	-	-	-	-	NA	-	-
16	Elect/Deisel	-	Elect	Elect	Diesel	Diesel	Elect	-	-
17	Water Level(m) Agl	5.40	3.1	6.4	5.33	8.40	14.12	6.36	4.15
18	TDS	300	400	400	2400	1600	1400	800	600
19	pH	7.0	7.0	7.0	7.0	7.0	7.5	7.5	7.5

Ground water data: DECEMBER 2011

Sr.no.	Location/ Parameters	Tagdi Nr.GWSSB Tank	Malpar Near Temple	Thordi Nr.check Dam on Pithalpar Rd	Nr.bhumli In farm	Bhutesar Road in farm	Pir Dargah	Hanu.Temple	Near Sat Behno Mandir
01	Dt of Survey	20-12-11	20-12-11	20-12-11	20-12-11	20-12-11	20-12-11	20-12-11	20-12-11
02	Village	Tagadi	Malpar	Thordi	Bhumli	Bhutesar	Malpar	Malpar	Malpar
03	Taluka	Ghogha	Ghogha	Bhavnagar	Bhavnagar	Bhavnagar	Ghogha	Ghogha	Gogha
04	Survey no.	-	-	-	110 pvt	-	Govt.Land	Govt.Land	-
05	Owner	Govt	Govt	Govt	Harjibhai	Dayalbhai	Dargah	Temple	Govt.
06	Type of Well	DugWell	Dug well	Dug Well	Dugwell	Dugwell	Dug Well	Dug Well	Dug well
07	Total Depth(m)	16	25	30	7.5	30	30	30	45.0
08	Well Dia.(m)	5.0	5.0	8.20	4.5	3.5	3.25	2.9	3.2
09	Measuring .Pt(m)	0.80Agl	0.80Agl	0.60Agl	gl	gl	1.10Agl	0.84	0.0 gl
10	R.L.	-	-	-	-	-	31.0	30.0	-
11	Lined/Unlined	Lined	Lined	Lined	Lined	Lined	Lined	Lined	Lined
12	Use	Drinking	Drinking	Drinking	Agri	Drin/Agri	Dom/ Pltn	Domestic	Drinking
13	Mode of pumping	-	Sub.Pump	Sub.Pump	Machine	Machine	Pump	Hand Pump	-
14	H.P.	-	5HP	5HP	-	-	2HP	-	-
15	Discharge	-	-	-	-	-	NA	-	-
16	Elect/Deisel	-	Elect	Elect	Diesel	Diesel	Elect	-	-
17	Water Level(m) Agl	7.06	3.2	7.0	4.22	8.44	18.2	4.22	4.10
18	TDS	300	400	400	2400	1600	1400	800	600
19	pH	7.0	7.0	7.0	7.0	7.0	7.5	7.5	7.5

Ground water data: JANUARY 2012

Sr.no.	Location/ Parameters	Tagdi Nr.GWSSB Tank	Malpar Near Temple	Thordi Nr.check Dam on Pithalpar Rd	Nr.bhumli In farm	Bhutesar Road in farm	Pir Dargah	Hanu.Temple	Near Sat Behno Mandir
01	Dt of Survey	20-1-12	20-1-12	20-1-12	20-1-12	20-1-12	20-1-12	20-1-12	20-1-12
02	Village	Tagadi	Malpar	Thordi	Bhumli	Bhutesar	Malpar	Malpar	Malpar
03	Taluka	Ghogha	Ghogha	Bhavnagar	Bhavnagar	Bhavnagar	Ghogha	Ghogha	Gogha
04	Survey no.	-	-	-	110 pvt	-	Govt.Land	Govt.Land	-
05	Owner	Govt	Govt	Govt	Harjibhai	Dayalbhai	Dargah	Temple	Govt.
06	Type of Well	DugWell	Dug well	Dug Well	Dugwell	Dugwell	Dug Well	Dug Well	Dug well
07	Total Depth(m)	16	25	30	7.5	30	30	30	45.0
08	Well Dia.(m)	5.0	5.0	8.20	4.5	3.5	3.25	2.9	3.2
09	Measuring .Pt(m)	0.80Agl	0.80Agl	0.60Agl	gl	gl	1.10Agl	0.84	0.0 gl
10	R.L.	-	-	-	-	-	31.0	30.0	-
11	Lined/Unlined	Lined	Lined	Lined	Lined	Lined	Lined	Lined	Lined
12	Use	Drinking	Drinking	Drinking	Agri	Drin/Agri	Dom/ Pltn	Domestic	Drinking
13	Mode of pumping	-	Sub.Pump	Sub.Pump	Machine	Machine	Pump	Hand Pump	-
14	H.P.	-	5HP	5HP	-	-	2HP	-	-
15	Discharge	-	-	-	-	-	NA	-	-
16	Elect/Deisel	-	Elect	Elect	Diesel	Diesel	Elect	-	-
17	Water Level(m) Agl	5.8	8.2	3.2	1.18	5.8	12.15	4.73	1.60
18	TDS	400	400	400	2300	1600	1500	800	800
19	pH	7.0	7.0	7.0	7.5	8.0	7.0	7.0	7.0

Ground water data: FEBRUARY 2012

Sr.no.	Location/ Parameters	Tagdi Nr.GWSSB Tank	Malpar Near Temple	Thordi Nr.check Dam on Pithalpar Rd	Nr.bhumli In farm	Bhutesar Road in farm	Pir Dargah	Hanu.Temple	Near Sat Behno Mandir
01	Dt of Survey	20-1-12	20-1-12	20-1-12	20-1-12	20-1-12	20-1-12	20-1-12	20-1-12
02	Village	Tagadi	Malpar	Thordi	Bhumli	Bhutesar	Malpar	Malpar	Malpar
03	Taluka	Ghogha	Ghogha	Bhavnagar	Bhavnagar	Bhavnagar	Ghogha	Ghogha	Gogha
04	Survey no.	-	-	-	110 pvt	-	Govt.Land	Govt.Land	-
05	Owner	Govt	Govt	Govt	Harjibhai	Dayalbhai	Dargah	Temple	Govt.
06	Type of Well	DugWell	Dug well	Dug Well	Dugwell	Dugwell	Dug Well	Dug Well	Dug well
07	Total Depth(m)	16	25	30	7.5	30	30	30	45.0
08	Well Dia.(m)	5.0	5.0	8.20	4.5	3.5	3.25	2.9	3.2
09	Measuring .Pt(m)	0.80Agl	0.80Agl	0.60Agl	gl	gl	1.10Agl	0.84	0.0 gl
10	R.L.	-	-	-	-	-	31.0	30.0	-
11	Lined/Unlined	Lined	Lined	Lined	Lined	Lined	Lined	Lined	Lined
12	Use	Drinking	Drinking	Drinking	Agri	Drin/Agri	Dom/ Pltn	Domestic	Drinking
13	Mode of pumping	-	Sub.Pump	Sub.Pump	Machine	Machine	Pump	Hand Pump	-
14	H.P.	-	5HP	5HP	-	-	2HP	-	-
15	Discharge	-	-	-	-	-	NA	-	-
16	Elect/Deisel	-	Elect	Elect	Diesel	Diesel	Elect	-	-
17	Water Level(m) Agl	10.10	15.40	13.40	6.74	10.40	15.90	7.12	5.23
18	TDS	400	400	400	2300	1600	1500	800	800
19	pH	7.0	7.0	7.0	7.5	8.0	7.0	7.0	7.0

Ground water data: MARCH 2012

Sr.no.	Location/ Parameters	Tagdi Nr.GWSSB Tank	Malpar Near Temple	Thordi Nr.check Dam on Pithalpar Rd	Nr.bhumli In farm	Bhutesar Road in farm	Pir Dargah	Hanu.Temple	Near Sat Behno Mandir
01	Dt of Survey	20-1-12	20-1-12	20-1-12	20-1-12	20-1-12	20-1-12	20-1-12	20-1-12
02	Village	Tagadi	Malpar	Thordi	Bhumli	Bhutesar	Malpar	Malpar	Malpar
03	Taluka	Ghogha	Ghogha	Bhavnagar	Bhavnagar	Bhavnagar	Ghogha	Ghogha	Gogha
04	Survey no.	-	-	-	110 pvt	-	Govt.Land	Govt.Land	-
05	Owner	Govt	Govt	Govt	Harjibhai	Dayalbhai	Dargah	Temple	Govt.
06	Type of Well	DugWell	Dug well	Dug Well	Dugwell	Dugwell	Dug Well	Dug Well	Dug well
07	Total Depth(m)	16	25	30	7.5	30	30	30	45.0
08	Well Dia.(m)	5.0	5.0	8.20	4.5	3.5	3.25	2.9	3.2
09	Measuring .Pt(m)	0.80Agl	0.80Agl	0.60Agl	gl	gl	1.10Agl	0.84	0.0 gl
10	R.L.	-	-	-	-	-	31.0	30.0	-
11	Lined/Unlined	Lined	Lined	Lined	Lined	Lined	Lined	Lined	Lined
12	Use	Drinking	Drinking	Drinking	Agri	Drin/Agri	Dom/ Pltn	Domestic	Drinking
13	Mode of pumping	-	Sub.Pump	Sub.Pump	Machine	Machine	Pump	Hand Pump	-
14	H.P.	-	5HP	5HP	-	-	2HP	-	-
15	Discharge	-	-	-	-	-	NA	-	-
16	Elect/Deisel	-	Elect	Elect	Diesel	Diesel	Elect	-	-
17	Water Level(m) Agl	11.27	12.580	10.05	6.5	11.25	16.10	7.5	5.45
18	TDS	400	600	400	2300	1800	1400	900	700
19	pH	7.0	7.0	7.0	7.0	7.5	7.5	7.5	7.5

Annexure IV
Ground Water Recharging Structures

Details for water recharging structures made so far at Bhavnagar Project:

S. No.	Type of structure	Location	Formation
01	Deepening of channel (1250 X 8 X 0.75) m ³	Thordi channel near OB dump road side	Altered hard rock
02	Mini check dam in channe(140 X 10 X 0.75) m ³	Near Sat Baheno temple	Altered hard rock
03	Mini check dam in channel (100 X 30 X 1) m ³	Near Hanuman temple	Altered hard rock
04	Pond in the River (150 X 15 X 1) m ³	Thordi – Malpar road	Altered hard rock
05	Siltation Pond (60 X 30 X 8) m ³	Toe of dump near Dargah gate	OB Clays

Planning for construction of few more check dams at Thordi-Tagadi Nallah is under process.

Annexure V

MONITORING REPORT

By

III Party

GMDC Ltd. Bhavnagar Project

AAQ STATUS

Ambient Air Quality Status September 2011

Location	PM 10 (100) ($\mu\text{g}/\text{M}^3$)	PM 2.5 (60) ($\mu\text{g}/\text{M}^3$)	SO _x (80) ($\mu\text{g}/\text{M}^3$)	NO _x (80) ($\mu\text{g}/\text{M}^3$)	Out of limit value
At Time Office	68.2	23.3	19.5	12.4	Nil
At KCL Camp	86.1	31.6	24.4	14.3	Nil
At SS-2	64.4	21.1	16.2	13.9	Nil
At Security Gate-2	59.1	18.8	15.5	12.2	Nil
Dargah gate	84.4	29.9	22.5	16.2	Nil

Ambient Air Quality Status October 2011

Location	PM 10 (100) ($\mu\text{g}/\text{M}^3$)	PM 2.5 (60) ($\mu\text{g}/\text{M}^3$)	SO _x (80) ($\mu\text{g}/\text{M}^3$)	NO _x (80) ($\mu\text{g}/\text{M}^3$)	Out of limit value
At Time Office	72.5	24.2	18.4	14.2	Nil
At KCL Camp	81.3	28.6	20.4	16.7	Nil
At Security Gate-2	65.8	21.5	14.6	11.8	Nil
At SS-2	71.8	24.3	15.5	12.2	Nil
Dargah gate	76.9	25.5	19.7	15.7	Nil

Ambient Air Quality Status November 2011

Location	SPM (200) ($\mu\text{g}/\text{M}^3$)	RSPM /PM10 (100) ($\mu\text{g}/\text{M}^3$)	Sox (80) ($\mu\text{g}/\text{M}^3$)	NO _x (80) ($\mu\text{g}/\text{M}^3$)	Out of limit value
At Time Office	138.5	58.4	12.4	8.8	Nil
At KCL Camp	146.1	61.6	9.3	7.4	Nil
At SS-2	127.3	52.7	10.6	7.1	Nil
Dargah gate	114.6	58.3	7.8	8.6	Nil
At Gate-2	148.3	64.4	11.9	13.5	Nil

Ambient Air Quality Status December 2011

Location	SPM (200) ($\mu\text{g}/\text{M}^3$)	RSPM /PM10 (100) ($\mu\text{g}/\text{M}^3$)	SO _x (80) ($\mu\text{g}/\text{M}^3$)	NO _x (80) ($\mu\text{g}/\text{M}^3$)	Out of limit value
At Time Office	147.6	61.4	10.8	12.6	Nil
At KCL Camp	152	58.7	14.6	8.4	Nil
At SS-2	120.7	56.4	16.8	7.7	Nil
Dargah gate	122.5	54.8	8.8	9.2	Nil
At Gate-2	154.4	58.6	11.2	16.3	Nil

Ambient Air Quality Status Jan 2012

Location	PM 10 (100) ($\mu\text{g}/\text{M}^3$)	PM 2.5 (60) ($\mu\text{g}/\text{M}^3$)	SO _x (80) ($\mu\text{g}/\text{M}^3$)	NO _x (80) ($\mu\text{g}/\text{M}^3$)	Out of limit value
At Time Office	70.1	19.6	23.4	14.5	Nil
At KCL Camp	88.3	27.4	26.5	17.3	Nil
At Security Gate-2	61.2	20.1	16.1	14.1	Nil
At SS-2	61.5	23.5	18.6	15.7	Nil
Dargah gate	86.1	31.1	24.7	18.1	Nil

Ambient Air Quality Status Feb 2012

Location	PM 10 (100) ($\mu\text{g}/\text{M}^3$)	PM 2.5 (60) ($\mu\text{g}/\text{M}^3$)	SO _x (80) ($\mu\text{g}/\text{M}^3$)	NO _x (80) ($\mu\text{g}/\text{M}^3$)	Out of limit value
At Time Office	76.4	23.5	24.3	15.8	Nil
At KCL Camp	83.9	25.7	27.9	19.0	Nil
At Security Gate-2	67.8	24.1	18.3	13.2	Nil
At SS-2	63.5	20.5	21.2	16.4	Nil
Dargah gate	79.4	28.2	23.0	17.8	Nil

Annexure VI

Expenditure on construction of Check Dams and on CSR activities

GMDC has targeted nearby villages for betterment in life of villagers. In this connection GMDC has worked for water conservation, primary education improvement and street lighting provision. A total of Rs. 63.98 lakhs have been contributed for the same. The village-wise breakup of the expenditure is shown in table.

Sr. No.	Description of the work	Total Expenses (in Rs.)
A.	THORDI Village	
1	Deepening and Widening of Check-dam	986101.00
2	T-5 street light fixtures installation upto 14.10.10 = 129 nos. Proposed = 9 nos.	255913.00
3	Financial Assistance to Miss Anjliba Gohil - Daughter of Shri Kishorsinh Gohil village - Thordi, survey no. 13 P and 27 P land acquired by GMDC	11000.00
4	Two nos - Computer allotted to primary school – Thordi dt. 30.10.10	50000
5	Construction - extension of school building Navdarpan Vidyalay - Shree Sitaram Education Trust, Bhavangar	2181600.00
6	One no. computer (HCL - allotted to primary school – Thordi	16500.00
B	MALPAR Village	
1	Deepening and widening of Check-dams.	
(i)	Check-dam no. 5	554553.00
(ii)	Check dam no. 6	506903.00
(iii)	Check dam no.4	346215.00
(iv)	Check dam no. 2	154155.00
(v)	Check dam no-1	114360.00
(vi)	Check-dam no. 3	60616.00
(vii)	2 No. of HCL computers allotted to primary School of Malpar	35 600.00
C.	TAGADI Village	
1	Supply of 60 nos. school benches to primary school	180000.00
2	1 No. of HCL computer allotted to primary School of Tagadi	17 800.00
3	Repairing of overhead water tank and pipeline with providing and lying new water pipeline	5 55 800.00
D.	RAMPAR Village	
1	Preparation of Volleyball playground	8000.00
2	2 No. of HCL computers allotted to primary School of Rampar	35 600.00
E	MISCELLANEOUS WORK	
1	Kanya Kelavani Fund	100000.00
2	Solar Lights for Khodiya Mataji Mandir	161391.00
3	‘Vanche Gujarat’ project by Smt. N.C & B.V. Gandhi, mahila Arts and Commerce College, Bhavnagar.	40 000.00
4	Supply of 5 No. powder coated SS type steel benches each having seating capacity for 3 persons at Lilashah Pir Dirgah.	26 250.00
	TOTAL	6398357.00