GMDC

GMDC/BHV/ENV/ 139 /13-14 Date : 10-Apr-13

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 (October 2012-March 2013).

This is for your kind perusal.

Thanking you.
For GMDC Ltd.

10/04/13

P.K. Samantray
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'2012–March'2013

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

(A) Specific Conditions

<table>
<tr><th>S. No.</th><th>Conditions</th><th>Present Status</th></tr>
<tr><td>01</td><td>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.</td><td><u>Complied</u>

Land already Surrendered. Now final lease area is 3672 Ha instead of 4690 Ha.</td></tr>
<tr><td>02</td><td>Mining shall be carried out as per statuette at a safe distance from the seasonal stream/nalla flowing within lease boundary.</td><td><u>Complied.</u>

The nearest distance of working mine is 65 m away from Thordi Nallah & Protective Bund is provided.</td></tr>
<tr><td>03</td><td>Top Soil shall be stacked properly with proper slope and will be used for reclamation and development of greenbelt.</td><td><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.</td></tr>
<tr><td>04</td><td>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 28º. 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.</td><td><u>Complied.</u>

Presently there exists three OB dumps within the lease area. Slopes are maintained at 27^0.
The dump wise details for OB is as follows.
<table>
<tr><th>Sr</th><th>Dump</th><th>Volume (Lac m3)</th><th>Height (m)</th></tr>
<tr><td>1</td><td>W I</td><td>7.5</td><td>15</td></tr>
<tr><td>2</td><td>W II</td><td>130.5</td><td>30</td></tr>
<tr><td>3</td><td>W III</td><td>170.0</td><td>30</td></tr>
</table>
Plantation on dumps has been started from financial year 2011-12.
In the year 2012-13 the reclamation of W III OB dump is in progress. Till March 2013, approx 17.205 Ha of area has been reclaimed.
Grass seeds of Karad (Dichanthium annulatum) have been sown along with the saplings of Bougainvillea Sp., Nerium indicum, Annona squamosa, Pongamia pinnata, Holoptelea integrifolia, Azadirachta indica, Ficus religiosa etc on dumps.</td></tr>
</table>

<table>
<tr><td></td><td></td><td>4900 Sq. m of slope area of W III OB Dump has been covered under the Geotextile Coir mats in 2012 as on experimental basis for Reclamation.</td></tr>
<tr><td>05</td><td>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 mine area, roads, green belt development etc. The drains should be regularly de-silted and maintained properly.
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.</td><td><u>Complied.</u>

At the mine pit and at the toe of all the dumps catch/Garland drains are constructed.

<u>Garland Drains size:</u>
<table>
<tr><th>S. No</th><th>Location</th><th>Length (km)</th><th>Depth (m)</th></tr>
<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>
</table>
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.</td></tr>
<tr><td>06</td><td>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.</td><td><u>Under Progress</u>

Planning for the construction of retaining walls is in process so that run off from dumps can be checked. Details are here as under.
<table>
<tr><th>Prop No.</th><th>Proposed length(m)</th><th>Estimated cost (Rs.)</th></tr>
<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>
</table></td></tr>
<tr><td>07</td><td>Mining operation shall not involve mineral processing.</td><td><u>Complied</u>

At present no mineral processing is involved.
However, 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.
EC has been modified from MoEF, for the same vide Ref: No.J-11015/234/2006-IA.II(M); Dtd: 18.May.2012</td></tr>
<tr><td>08</td><td>Mining shall not involve drilling & blasting operation.</td><td><u>Complied.</u>

No drilling & blasting is involved in the mining operations.
At present, some of the hard strata is encountered</td></tr>
</table>

		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. Preparation of EIA Report is in progress.
09	High efficiency water sprinkling system should be provided to check fugitive emission from haulage roads, transfer points.	**Complied.** 20 KL capacity water tankers, equipped with pressurized sprinkling arrangement, are working round the clock to check fugitive emissions from all potential fugitive emission source including haul road and transfer points.
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.	**Under Progress**. 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. 58 Ha area has been covered till Sept'12, which includes 42 Ha of land and 16 Ha of reclaimed Dumps, by planting native plant species like *Azadirecta indica, Delonix regia, Annona squamosa, Pongamia pinnata, Holoptelea integrifolia, Senna surattensis*, 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 I.**
11	Backfilling shall begin from the 4th 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.	**Under progress**. GMDC Ltd. has started overburden removal work from 5/4/2008 and lignite loading from 14/12/2008. Backfilling in the area about **90 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.	**Complied.** 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 710 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.	**Complied.** 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 12- Mar 13 is enclosed as **Annexure II.**
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.	**Complied.** 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 III.**
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.	**Complied** Digital Processing has been done by "Bhaskaracharya Institute for Space Applications & Geo-Informatics, Gandhinagar (Gujarat). Land use pattern Report enclosed in **Annexure VI.**
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 heath 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.	**Complied.** Regular Medical check-up of all employees in city hospital is being done as per DGMS norms. Till March 2013, 111 employees of GMDC, Bhavnagar have undergone check up by NIMH Nagpur for all the occupational diseases. Regular reports for the same being submitted to DGMS yearly.
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.	**Complied.** No change has been made in the mining technology and scope of work. However, 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. **EC has been modified from MoEF for the same vide Ref: No.J-11015/234/2006-IA.II(M); Dtd: 18.May.2012**
02	No change in the calendar plan including excavation, quantum of mineral and waste should be made.	**Point Noted with esteem** The yearly production quantity (in Metric Ton) is given below.

MONTH	2012-13
	Production
APR	312235.30
MAY	242536.93
JUN	163226.45
JUL	100797.28
AUG	117717.09
SEP	62536.83
OCT	85039.69
NOV	102668.46
DEC	196755.84
JAN	205151.04
FEB	139794.64
MAR	194566.67
TOTAL	1923026.19

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.	**Complied.** Already established Five stations 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 Bhopal including Pollution Control Board once in six months.	**Complied.** The required data is submitted to State Pollution Control Board on periodic basis. The Monthly Patrak online data for AAQ is submitted every month in GPCB website. Additionally Yearly CCA compliance is furnished for the same. Last Six month data enclosed as **Annexure IV**
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.	**Complied.** Emissions from dumps, etc., are controlled by continuous water sprinkling through movable sprinklers and grading of Haul Roads. 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.	**Complied.** 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.
07	Industrial waste water (workshop and wastewater from mine) should be properly collected, treated so as to confirm 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.	**Complied.** 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.	**Complied.** 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.	**Under progress**. Establishment of environmental laboratory is under progress. At present, services of GPCB certified 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.	**Complied.** 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.	**Complied.** 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.	**Complied.** 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>
<tr><td></td><td></td><td>
<table>
<tr><th>Year</th><th>Expenses.</th></tr>
<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>2012-13</td><td>2894981.00</td></tr>
<tr><td>Total</td><td>7665413.50</td></tr>
</table>
Water recharging structures and various check dams has been constructed. Expenditure for the same is enclosed in Annexure V along with the CSR activity expenses.</td></tr>
<tr><td>13</td><td>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.</td><td><u>Complied.</u></td></tr>
<tr><td>14</td><td>State Pollution Control Board should display a copy of clearance letter at Regional Office, District Industry Centre and Collectors office for 30 days</td><td>Point Noted with esteem</td></tr>
<tr><td>15</td><td>Publish advertisement of Env. Clearance in local language within seven days of clearance letter.</td><td><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.</td></tr>
</table>

[redacted]

Prepared by:

Tr/Eng (Env) 10.4.13

Authorized Signatory:

General Manager (P) 10/04/13

8 |

Annexure I: Plantation Details

			PLANTATION DETAILS OF BHAVNAGAR PROJECT				
S.NO.	**YEAR**	**AGENCY**	**NO. OF PLANTS**	**SURVIVAL RATE %**	**LOCATION**	**SPECIES**	**AREA (Ha)**
1	2008-09	CONTRACTOR	NIL	NA	……..	KARAN	3.0
		DEPARTMENTAL / GMDC	NIL	NA	……..	GULMOHAR	**Dump Area 0**
		FOREST DEPT.	2500	70	OPPOSITE TO ELECTRIC SUB-STATION	MEETHA BABOOL	**Green Belt 3.0**
					EAST TO DIESEL PUMP	NEEM	
					IN BETWEEN TIME-OFFICE & DIESEL PUMP	JATROPHA	
						KARANJ	
						CHARAL	
						MEETHI IMLI	
						PILU	
TOTAL PALNTS: 2500, SMALL PLANTS: 124, BIG PLANTS: 2376							
2	2009-10	CONTRACTOR	NIL	NA	…….	CHARAL	10.4
		DEPARTMENTAL / GMDC	NIL	NA	…….	NEEM	**Dump Area 0**
		FOREST DEPT.	6500	77	ADM OFIICE	TIKOMA	**Green Belt 10.4**
					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 &	PILU	

					DARGAH-II		
						SEESU	
						PEEPAL/VAD	
						DESI BABOOL	
						GOONDI	
						KARANJ	
TOTAL PLANTS: 6500, SMALL PLANTS: 240, BIG PLANTS: 6260							
3	2010-11	CONTRACTOR	20543	72	SAT BEHNO MANDIR PLOT	NEEM	24.96
		DEPARTMENTAL / GMDC	3948	80	ROAD SIDE- WB1-WB2 & RIVER	GULMOHAR	**Dump Area 0**
		FOREST DEPT.	2500	88.28	ELECTRIC SUBSTATION	GLICERIA	**Green Belt 24.96**
					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 ROAD	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	2011-Mar'12	CONTRACTOR	NIL	NA	THORDI OB DUMP	ALOEVERA	7.09
		DEPARTMENTAL / GMDC	29116	98	CANAL BUND NEAR SAT BEHNO MANDIR	KASID	**Dump Area 4.5**
		FOREST DEPT.	NIL	NA	TOP SOIL DUMP SLOPES	NEEM	**Green Belt 2.59**
					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**
5	2012-13	CONTRACTOR	NIL	NA	THORDI OB DUMP	ALOEVERA	13.78
		DEPARTMENTAL / GMDC	34361	95	TOP SOIL DUMP SLOPES	KASID	**Dump Area 12.705**

		FOREST DEPT.	NIL	NA	DARGAH ROAD	NEEM	**Green Belt 1.075**
					THORDI ROAD SIDE PARALLEL TO NALLAH	GULMOHAR	
					TOP SOIL DUMP BORDER	TIKOMA	
					DUMP SLOPES	KARANJ	
					TOP SOIL DUMP TOE	JAMBU	
					ADMISTRARTIVE OFFICE	CHARAL	
						PEEPAL	
						BOUGAINVILLEA	
						KARAN	
						BAMBOO	
						SEERAS	
TOTAL PLANTS: 34361			**ALOEVERA: 17495,**		**SMALL PLANTS: 8575**		**BIG PLANTS: 8291**

Annexure II: Ground Water Data; October 2012-March 2013

Oct 2012

Sr.no.	Location/ Parameters	Tagdi Nr.Jhangam wadi	Bhutesar well	Bhumli Dug well in farm	Bhumli Bore well	Thordi (Farm)	Pir Dargah	Hanu.Temple	Behind Sat Behno Mandir	Near Sat Behno Mandir
01	Dt of Survey	29.10.12	31.10.12	31.10.12	31.10.12	29.10.12	29.10.12	29.10.12	29.10.12	29.10.12
02	Village	Tagadi	Bhutesar	Bhumli	Bhumli	Thordi	Malpar	Malpar	Malpar	Malpar
03	Taluka	Ghohga	Bhavnagar	Bhavnagar	Bhavnagar	Bhavnagar	Ghogha	Ghogha	Gogha	Gogha
04	Survey no.	-	-	110 pvt	122	-	Govt.Land	Govt.Land	-	-
05	Owner	Govt	Pvt. Dayalbhai	Pvt.Jethabhai/ Harjibhai	jivrajbhai	Poonabhai	Dargah	Temple	Govt.	Govt.
06	Type of Well	DugWell	Dugwell	Dugwell	Borewell	Dug Well	Dug Well	Dug Well	Dug well	Dug well
07	Total Depth(m)	22.50	30	7.5	60	22.5	30.00	30	25.00	45.0
08	Well Dia.(m)	3.0	3.5	4.5	0.25	3.0	3.25	2.9	3.00	3.2
09	Measuring .Pt(m)	0.30Agl	0gl	0gl	0	0.70Agl	1.10Agl	0.84	0.80	0.0 gl
10	R.L.	-	-	-	-	-	31.0	30.0	-	-
11	Lined/Unlined	Lined	Lined	Lined	-	-	Lined	Lined	Lined	Lined
12	Use	Drinking	Drin/Agri	Agri	Irrigation	Irrigation	Dom/ Pltn	Domestic	Plantation	Drinking
13	Mode of pumping	Sub Pump	Machine	Machine	Sub pump	Pump	Pump	Hand Pump	Sub pump	-
14	H.P.	-	-	-	7.5	-	2	-	5	-
15	Discharge	-	-	-	-	-	NA	-	-	-
16	Elect/Deisel	-	Diesel	Diesel	Elec	Diesel	Elect	-	Elec.	-
17	Water Level(m) Agl	21.80	13.0	5.9	16.0	8.6	17.0	9.0	5.0	7.2
18	pH	8.5	8.5	8.5	7.7	8.8	8.4	8.7	8.6	8.6

Nov 2012

Sr.no.	Location/ Parameters	Tagdi Nr.Jhangam wadi	Bhutesar well	Bhumli Dug well in farm	Bhumli Bore well	Thordi (Farm)	Pir Dargah	Hanu.Temple	Behind Sat Behno Mandir	Near Sat Behno Mandir
01	Dt of Survey	30.11.12	30.11.12	30.11.12	30.11.12	30.11.12	30.11.12	30.11.12	30.11.12	30.11.12
02	Village	Tagadi	Bhutesar	Bhumli	Bhumli	Thordi	Malpar	Malpar	Malpar	Malpar
03	Taluka	Ghohga	Bhavnagar	Bhavnagar	Bhavnagar	Bhavnagar	Ghogha	Ghogha	Gogha	Gogha
04	Survey no.	-	-	110 pvt	122	-	Govt.Land	Govt.Land	-	-
05	Owner	Govt	Pvt. Dayalbhai	Pvt.Jethabhai/ Harjibhai	jivrajbhai	Poonabhai	Dargah	Temple	Govt.	Govt.
06	Type of Well	DugWell	Dugwell	Dugwell	Borewell	Dug Well	Dug Well	Dug Well	Dug well	Dug well
07	Total Depth(m)	22.50	30	7.5	60	22.5	30.00	30	25.00	45.0
08	Well Dia.(m)	3.0	3.5	4.5	0.25	3.0	3.25	2.9	3.00	3.2
09	Measuring .Pt(m)	0.30Agl	0gl	0gl	0	0.70Agl	1.10Agl	0.84	0.80	0.0 gl
10	R.L.	-	-	-	-	-	31.0	30.0	-	-
11	Lined/Unlined	Lined	Lined	Lined	-	-	Lined	Lined	Lined	Lined
12	Use	Drinking	Drin/Agri	Agri	Irrigation	Irrigation	Dom/ Pltn	Domestic	Plantation	Drinking
13	Mode of pumping	Sub Pump	Machine	Machine	Sub pump	Pump	Pump	Hand Pump	Sub pump	-
14	H.P.	-	-	-	7.5	-	2	-	5	-
15	Discharge	-	-	-	-	-	NA	-	-	-
16	Elect/Deisel	-	Diesel	Diesel	Elec	Diesel	Elect	-	Elec.	-
17	Water Level(m) Agl	21.50	13.20	5.70	15.0	8.7	16.60	9.0	6.3	7.6
18	pH	8.5	8.5	8.5	7.7	8.8	8.4	8.7	8.6	8.6

Dec 2012

Sr.no.	Location/ Parameters	Tagdi Nr.Jhangam wadi	Bhutesar well	Bhumli Dug well in farm	Bhumli Bore well	Thordi (Farm)	Pir Dargah	Hanu.Temple	Behind Sat Behno Mandir	Near Sat Behno Mandir
01	Dt of Survey									
02	Village	Tagadi	Bhutesar	Bhumli	Bhumli	Thordi	Malpar	Malpar	Malpar	Malpar
03	Taluka	Ghohga	Bhavnagar	Bhavnagar	Bhavnagar	Bhavnagar	Ghogha	Ghogha	Gogha	Gogha
04	Survey no.	-	-	110 pvt	122	-	Govt.Land	Govt.Land	-	-
05	Owner	Govt	Pvt. Dayalbhai	Pvt.Jethabhai/ Harjibhai	jivrajbhai	Poonabhai	Dargah	Temple	Govt.	Govt.
06	Type of Well	DugWell	Dugwell	Dugwell	Borewell	Dug Well	Dug Well	Dug Well	Dug well	Dug well
07	Total Depth(m)	22.50	30	7.5	60	22.5	30.00	30	25.00	45.0
08	Well Dia.(m)	3.0	3.5	4.5	0.25	3.0	3.25	2.9	3.00	3.2
09	Measuring .Pt(m)	0.30Agl	0gl	0gl	0	0.70Agl	1.10Agl	0.84	0.80	0.0 gl
10	R.L.	-	-	-	-	-	31.0	30.0	-	-
11	Lined/Unlined	Lined	Lined	Lined	-	-	Lined	Lined	Lined	Lined
12	Use	Drinking	Drin/Agri	Agri	Irrigation	Irrigation	Dom/ Pltn	Domestic	Plantation	Drinking
13	Mode of pumping	Sub Pump	Machine	Machine	Sub pump	Pump	Pump	Hand Pump	Sub pump	-
14	H.P.	-	-	-	7.5	-	2	-	5	-
15	Discharge	-	-	-	-	-	NA	-	-	-
16	Elect/Deisel	-	Diesel	Diesel	Elec	Diesel	Elect	-	Elec.	-
17	Water Level(m) Agl	22.00	11.50	6.00	16.25	11.70	17.00	9.00	5.5	7.3
18	pH	8.5	8.5	8.5	7.5	7.0	8.0	8.5	8.0	8.5

Jan 2013

Sr.no.	Location/ Parameters	Tagdi Nr.Jhangam wadi	Bhutesar well	Bhumli Dug well in farm	Bhumli Bore well	Thordi (Farm)	Pir Dargah	Hanu.Temple	Behind Sat Behno Mandir	Near Sat Behno Mandir
01	Dt of Survey	17.01.2013	17.01.2013	17.01.2013	17.01.2013	17.01.2013	12.01.13	12.01.13	12.01.13	12.01.13
02	Village	Tagadi	Bhutesar	Bhumli	Bhumli	Thordi	Malpar	Malpar	Malpar	Malpar
03	Taluka	Ghohga	Bhavnagar	Bhavnagar	Bhavnagar	Bhavnagar	Ghogha	Ghogha	Gogha	Gogha
04	Survey no.	-	-	110 pvt	122	-	Govt.Land	Govt.Land	-	-
05	Owner	Govt	Pvt. Dayalbhai	Pvt.Jethabhai/ Harjibhai	jivrajbhai	Poonabhai	Dargah	Temple	Govt.	Govt.
06	Type of Well	DugWell	Dugwell	Dugwell	Borewell	Dug Well	Dug Well	Dug Well	Dug well	Dug well
07	Total Depth(m)	22.50	30	7.5	60	22.5	30.00	30	25.00	45.0
08	Well Dia.(m)	3.0	3.5	4.5	0.25	3.0	3.25	2.9	3.00	3.2
09	Measuring .Pt(m)	0.30Agl	0gl	0gl	0	0.70Agl	1.10Agl	0.84	0.80	0.0 gl
10	R.L.	-	-	-	-	-	31.0	30.0	-	-
11	Lined/Unlined	Lined	Lined	Lined	-	-	Lined	Lined	Lined	Lined
12	Use	Drinking	Drin/Agri	Agri	Irrigation	Irrigation	Dom/ Pltn	Domestic	Plantation	Drinking
13	Mode of pumping	Sub Pump	Machine	Machine	Sub pump	Pump	Pump	Hand Pump	Sub pump	-
14	H.P.	-	-	-	7.5	-	2	-	5	-
15	Discharge	-	-	-	-	-	NA	-	-	-
16	Elect/Deisel	-	Diesel	Diesel	Elec	Diesel	Elect	-	Elec.	-
17	Water Level(m) Agl	21.90	11.70	7.00	16.60	13.0	17.80	8.50	7.5	8.0
18	TDS	900	2000	2700	4000	800	900	900	900	900
19	pH	7.5	7.5	7.0	7.0	7.5	7.5	7.0	8.0	7.0

Feb 2013

Sr.no.	Location/ Parameters	Tagdi Nr.Jhangam wadi	Bhutesar well	Bhumli Dug well in farm	Bhumli Bore well	Thordi (Farm)	Pir Dargah	Hanu.Temple	Behind Sat Behno Mandir	Near Sat Behno Mandir
01	Dt of Survey	22.02.13	22.02.13	22.02.13	22.02.13	22.02.13	18.02.13	18.02.13	18.02.13	18.02.13
02	Village	Tagadi	Bhutesar	Bhumli	Bhumli	Thordi	Malpar	Malpar	Malpar	Malpar
03	Taluka	Ghohga	Bhavnagar	Bhavnagar	Bhavnagar	Bhavnagar	Ghogha	Ghogha	Gogha	Gogha
04	Survey no.	-	-	110 pvt	122	-	Govt.Land	Govt.Land	-	-
05	Owner	Govt	Pvt. Dayalbhai	Pvt.Jethabhai/ Harjibhai	jivrajbhai	Poonabhai	Dargah	Temple	Govt.	Govt.
06	Type of Well	DugWell	Dugwell	Dugwell	Borewell	Dug Well	Dug Well	Dug Well	Dug well	Dug well
07	Total Depth(m)	22.50	30	7.5	60	22.5	30.00	30	25.00	45.0
08	Well Dia.(m)	3.0	3.5	4.5	0.25	3.0	3.25	2.9	3.00	3.2
09	Measuring .Pt(m)	0.30Agl	0gl	0gl	0	0.70Agl	1.10Agl	0.84	0.80	0.0 gl
10	R.L.	-	-	-	-	-	31.0	30.0	-	-
11	Lined/Unlined	Lined	Lined	Lined	-	-	Lined	Lined	Lined	Lined
12	Use	Drinking	Drin/Agri	Agri	Irrigation	Irrigation	Dom/ Pltn	Domestic	Plantation	Drinking
13	Mode of pumping	Sub Pump	Machine	Machine	Sub pump	Pump	Pump	Hand Pump	Sub pump	-
14	H.P.	-	-	-	7.5	-	2	-	5	-
15	Discharge	-	-	-	-	-	NA	-	-	-
16	Elect/Deisel	-	Diesel	Diesel	Elec	Diesel	Elect	-	Elec.	-
17	Water Level(m) Agl	21.50	12.60	6.30	24.00	14.90	19.00	10.50	8.50	9.00
18	TDS	800	1900	2300	3600	700	1800	900	900	1000
19	pH	8.10	8.0	7.7	7.1	8.10	7.8	8.0	8.0	7.9

March 2013

Sr.no.	Location/ Parameters	Tagdi Nr.Jhangam wadi	Bhutesar well	Bhumli Dug well in farm	Bhumli Bore well	Thordi (Farm)	Pir Dargah	Hanu.Temple	Behind Sat Behno Mandir	Near Sat Behno Mandir
01	Dt of Survey	23.03.13	23.03.13	23.03.13	23.03.13	23.03.13	16.03.13	16.03.13	16.03.13	16.03.13
02	Village	Tagadi	Bhutesar	Bhumli	Bhumli	Thordi	Malpar	Malpar	Malpar	Malpar
03	Taluka	Ghohga	Bhavnagar	Bhavnagar	Bhavnagar	Bhavnagar	Ghogha	Ghogha	Gogha	Gogha
04	Survey no.	-	-	110 pvt	122	-	Govt.Land	Govt.Land	-	-
05	Owner	Govt	Pvt. Dayalbhai	Pvt.Jethabhai/ Harjibhai	jivrajbhai	Poonabhai	Dargah	Temple	Govt.	Govt.
06	Type of Well	DugWell	Dugwell	Dugwell	Borewell	Dug Well	Dug Well	Dug Well	Dug well	Dug well
07	Total Depth(m)	22.50	30	7.5	60	22.5	30.00	30	25.00	45.0
08	Well Dia.(m)	3.0	3.5	4.5	0.25	3.0	3.25	2.9	3.00	3.2
09	Measuring .Pt(m)	0.30Agl	0gl	0gl	0	0.70Agl	1.10Agl	0.84	0.80	0.0 gl
10	R.L.	-	-	-	-	-	31.0	30.0	-	-
11	Lined/Unlined	Lined	Lined	Lined	-	-	Lined	Lined	Lined	Lined
12	Use	Drinking	Drin/Agri	Agri	Irrigation	Irrigation	Dom/ Pltn	Domestic	Plantation	Drinking
13	Mode of pumping	Sub Pump	Machine	Machine	Sub pump	Pump	Pump	Hand Pump	Sub pump	-
14	H.P.	-	-	-	7.5	-	2	-	5	-
15	Discharge	-	-	-	-	-	NA	-	-	-
16	Elect/Deisel	-	Diesel	Diesel	Elec	Diesel	Elect	-	Elec.	-
17	Water Level(m) Agl	22.00	10.80	7.00	16.70	15.00	18.00	15.60	8.10	9.00
18	TDS	900	2000	2300	3800	700	1100	1100	900	1000
19	pH	7.6	7.90	7.7	7.2	8.1	7.9	8.00	8.10	8.10

Annexure III
Ground Water Recharging Structures

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

S. No.	Type of structure	Location
01	Deepening of channel (1250 X 8 X 0.75) m3	Thordi channel near OB dump road side
02	Mini check dam in channel (140 X 10 X 0.75) m3	Near Sat Baheno temple
03	Mini check dam in channel (100 X 30 X 1) m3	Near Hanuman temple
04	Pond in the River (150 X 15 X 1) m3	Thordi – Malpar road
05	Rain water harvesting Pond (Under Excavation work) Proposed capacity (2 Lack m3)	Near IOC nallah

Annexure IV: AAQ Data

Location	Parameter	Consent Limit	Oct.	Nov.	Dec.	Jan	Feb	March
At Time Office	**PM 10**	**100**	68.5	65.2	–	70.1	82.0	
	PM 2.5	**60**	19.6	–	–	19.6	40.0	
	SO_2	**80**	24.8	–	–	23.4	12.4	
	NO_2	**80**	17.1	–	–	14.5	18.8	
At K.C.L. Camp	**PM 10**	**100**	74.3	71.1	–	88.3	84.0	
	PM 2.5	**60**	22.5	–	–	27.4	48.0	
	SO_2	**80**	23.7	–	–	26.5	17.4	
	NO_2	**80**	15.3	–	–	17.3	23.8	
At Sub station No. 2	**PM 10**	**100**	69.7	79.5	–	61.5	88.0	
	PM 2.5	**60**	21.9	–	–	23.5	59.0	
	SO_2	**80**	21.5	–	–	18.6	25.0	
	NO_2	**80**	18.1	–	–	15.7	21.5	**Reports Awaited**
At Dargah Gate	**PM 10**	**100**	67.3	83.1	–	86.1	93.0	
	PM 2.5	**60**	23.6	–	–	31.1	54.0	
	SO_2	**80**	23.7	–	–	24.7	15.8	
	NO_2	**80**	17.4	–	–	18.1	17.5	
At Sec Gate No. 2	**PM 10**	**100**	67.1	72.8	–	61.2	95.0	
	PM 2.5	**60**	24.5	–	–	20.1	52.0	
	SO_2	**80**	20.3	–	–	16.1	13.4	
	NO_2	**80**	17.8	–	–	14.1	19.4	

$PM_{(10)}$, $PM_{(2.5)}$, So_x , NO_X are in µg/m^3

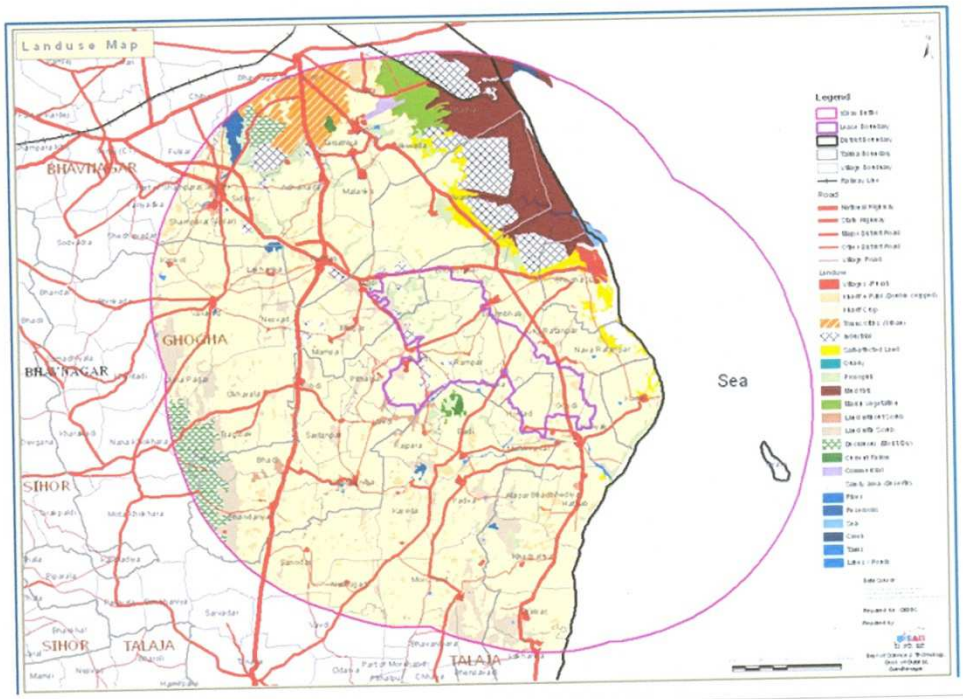
Annexure V: CSR Details									
Sr.No	**Type of Activity**	**Type of Work**	**Project / Village**	**Number of beneficiaries**	**Fund Under GVT/Special Fund/Project**	**Date of Starting**	**Date of Completion**	**Cost of Works (Amount in Rs,)**	**Remarks**
1	Water Conservation & Water Harwesting	Deepening and Widening of a Check dam	Thordi	Village Community	GVT	29-10-09	18-12-09	986101	
		Deepening and widening of 6 nos. Check dams.(46560.71 M^3)	Malpar	Village Community	GVT		18-08-2010	1736802	
		Check Dam & Talav Deepning work through DWDU 2012 (Thordi and Tagdi village) – Total Cost 47.55 Lac	Malpar/ Thordi	Village Community	GVT			2853362	Ongoing Work
2	Eduction	Financial Assistance to Miss Anjliba Gohil - Daughter of Shri Kishorsinh gohil village - Thordi, survey no. 13 P and 27 P land acquired by GMDC for higher studies. (She stood first in Bhavnagar District in 12^{th} Science Gujarat Board Examination)	Thordi	1	GVT			11000	
		Two nos - Computer allotted to primary school - Thordi	Thordi	Primary Schools Students	GVT		30-10-2010		
		Construction - extension of school building Navdarpan Vidyalay - Shree Sitaram Education Trust, Bhavnagar	Thordi	Schools' Students	GVT		17-03-2011	2181600	
		One no. computer (HCL - New allotted to primary school - Thordi	Thordi	Schools' Students	GVT	7/12/2010	7/12/2010	16500	
2	Eduction	Two nos. computer (HCL – New allotted to primary school – Malpar	Malpar	Schools' Students	GVT	7/12/2010	7/12/2010	35600	

		Supply of 60 nos. school benches to primary school	Tagdi	Schools' Students	GVT			180000	
		One no. computer (HCL - New allotted to primary school	Tagdi	Schools' Students	GVT	7/12/2010	7/12/2010	17800	
		Two nos. computer (HCL – New allotted to primary school	Rampar	Schools' Students	GVT	7/12/2010	7/12/2010	35600	
		Two nos. computer (HCL – New allotted to primary school	Bhuteshvar	Schools' Students	GVT	7/12/2010	7/12/2010	35600	
		Two nos. computer (HCL – New allotted to primary school	Bhumbhli	Schools' Students	GVT	7/12/2010	7/12/2010	35600	
		Kanya Kelavani Fund to Malpar and Ghogha Taluka	Ghogha	Girls student of Distirct	GVT		30-08-2012	100000	
		Funding to 'Vanche Gujarat' project run by Smt. N C & B V Gandhi Mahila Arts and Commerce college	Bhavnagar	Students of College	GVT		Feb-11	40000	
		Kanya Kelevani Fud to Bhavnagar Block	Bhavnagar	Girls student of Distirct	GVT		5/9/2012	50000	
		Financial Assistance to Girsl students	Thordi	Girls Students - 24	GVT	24-08-12	5/9/2012	55000	First Installmen t-2012
		Financial Assistance to Girsl students	Thordi	Girls Students - 25	GVT			57500	Second Installmen t-2013
2	Eduction	Financial Assistance to Girsl students	Malpar	Girls Students - 34	GVT	24-08-12	5/9/2012	95500	First Installmen t-2012
		Financial Assistance to Girsl students	Malpar	Girls Students - 34	GVT			95500	Second Installmen t-2013

		Financial Assistance to Girsl students	Tagdi	Girls Students - 51	GVT	24-08-12	5/9/2012	132000	First Installment-2012
		Financial Assistance to Girsl students	Tagdi	Girls Students - 52	GVT			136000	Second Installment-2013
		Financial Assistance to Girsl students	Bhumbhli	Girls Students - 244	GVT	24-08-12	5/9/2012	623000	First Installment-2012
		Financial Assistance to Girsl students	Bhumbhli	Girls Students - 243	GVT			620000	Second Installment-2013
		Financial Assistance to Girsl students	Bhuteshvar	Girls Students - 39	GVT	24-08-12	5/9/2012	82500	First Installment-2012
		Financial Assistance to Girsl students	Bhuteshvar	Girls Students - 40	GVT			87500	Second Installment-2013
		Financial Assistance to Girsl students	Rampar	Girls Students - 10	GVT	24-08-12	5/9/2012	20000	First Installment
		Financial Assistance to Girsl students	Rampar	Girls Students - 10	GVT			20000	Second Installment-2013
3	Infrastructure Development	Providing streetlight	Thordi	Village Community	GVT	11/3/2010	20-3-10	305913	
3	Infrastructure Development	Lok falo for Pavar Block, Protoction wall (50 % of 6 Lac)	Malpar	Village Community	GVT		14-08-2012	300000	
		Street Light	Malpar	Village Communit	GVT	5/5/2012	5/6/2012	107000	

				y					
		Repairing of overhead water tank and lying of new water pipeline	Tagdi	Village Community	GVT			555800	
		Lok falo for Pavar Block and Under Ground Sewage (50 % of 4 Lac)	Tagdi	Village Community	GVT		14-08-2012	200000	
		Preparation of Volley ball playground	Rampar	Village Community	GVT			8000	
		Solar Lights for Khodiyar Mataji Mandir Bhavnagar	BLP	Village Community	GVT		Nov-12	161391	
		Street Light	Thordi	Village Community	GVT		Jan-13	139883	
		Supply of 5 nos powder coated ss type steel benches for seating at Lilasa Pir Dargah	BLP	Community of Near by Project	GVT			26250	
4	Mobile Dispensary	Mobile Dispensary Service in Core Zone Villages (July to December 2012)	Core Zone Villages	Community of Near by Project	GVT	Jul-12	March-13	810213	
5	Miscellaneous Work	Expense for food packets for Garib kalian mela at Chitra Bhavnagar	Bhavnagar	Village Community of Ghogha & Bhavnagar Blocks	GVT		Nov-11	20000	
Total								**12974515**	

Annexure VI:
Land Use Pattern Report: BISAG,Gandhinagar



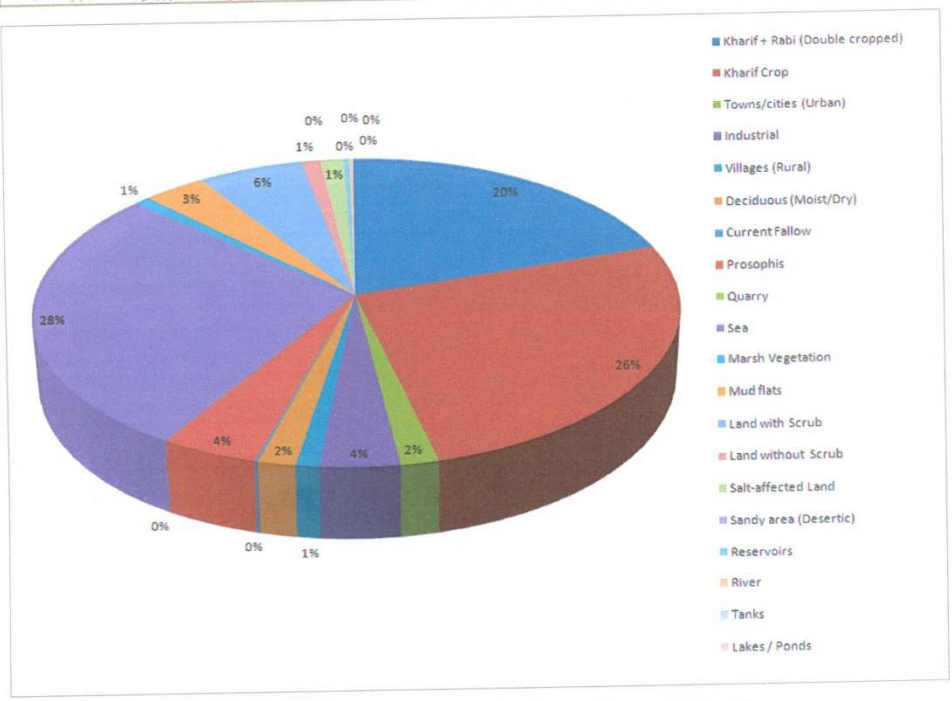


Figure-12: Land use map of 2005 and its statistics

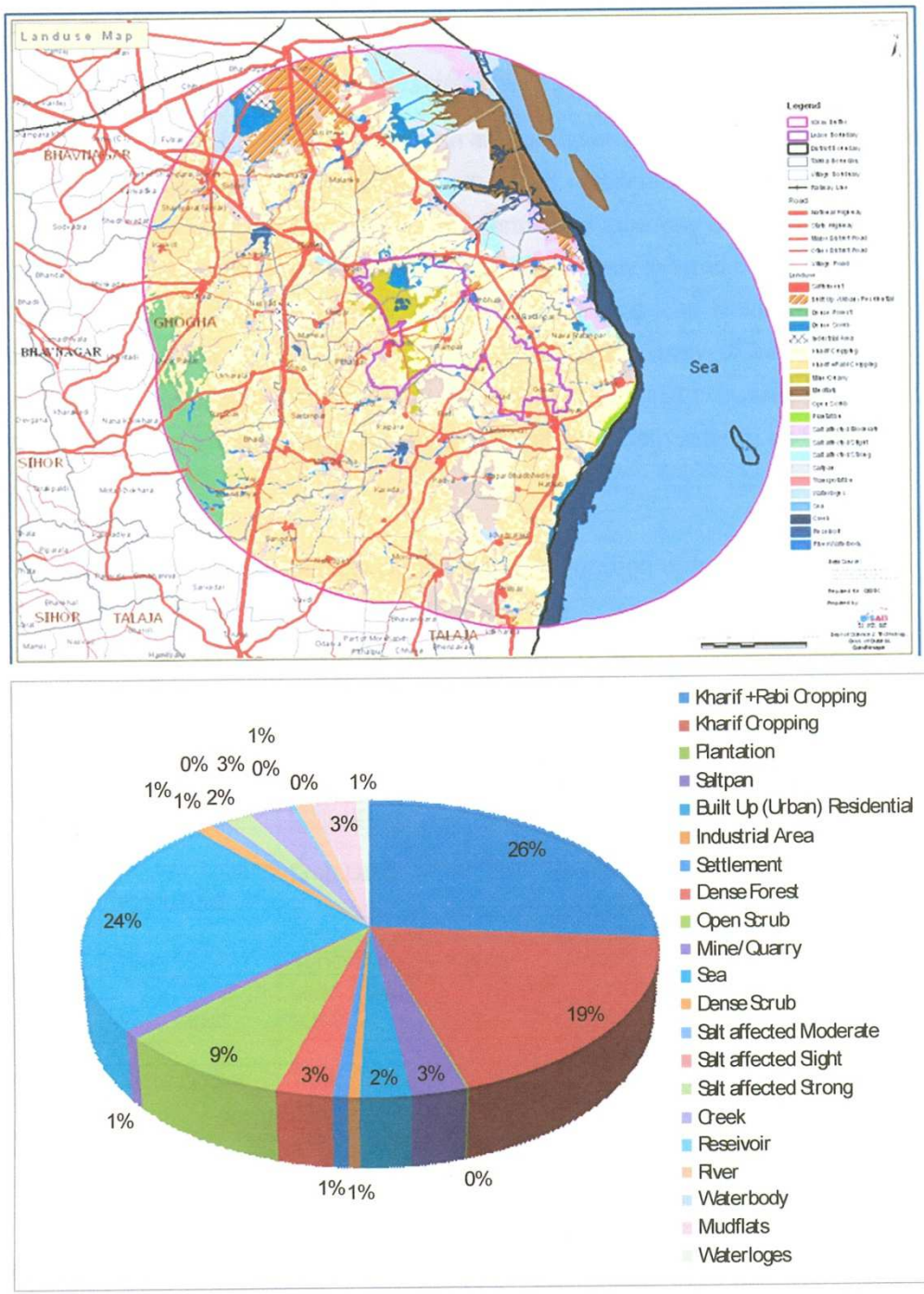


Figure-13: Land use map of 2011 and its statistics