



Pre-feasibility Report

Environmental Clearance

for

Development Drilling of 27 Wells &
Conversion of 37 Exploration Wells &
laying of Associated Flowlines, involving
construction of Well Manifold at
Kunjaban & Sundalbari and Pipeline

**OIL AND NATURAL GAS CORPORATION Ltd.
TRIPURA ASSET**

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1.0 Introduction

The discovery of gas in Tripura region in 1970s raised the hope for development of this remotely located state, which received further fillip in 1986-87 when gas production commenced in Tripura. Over the years, 11 structures have been probed through exploratory drilling by ONGC, out of which commercial gas has been discovered in 8 structures viz Baramura, Rokhia, Agartala Dome, Gojalia, Tichna, Sonamura, Kunjaban & Sundalbari. Unfortunately, poor infrastructure and absence of adequate industrial development did not allow this natural resource to be fully utilized for strengthening the economy of the State. Thus, this vital source of energy remained under-utilized.

With a view to monetize the idle gas reserves and improve the power scenario of the North-East, ONGC conceptualized setting up Mega Power Plant of 726.6 MW capacity through a joint venture company viz. ONGC Tripura Power Company (OTPC) at Palatana in 2005. Palatana is located at a distance of about 60 km from Agartala City. The requirement of gas for this plant was estimated to be around 2.65 MMSCMD and the supply was to be ascertained at least for 15 years.

Subsequently, keeping in view the latest gas demand scenario in the state, ONGC Management has recently strategized to produce and supply 6.0 MMSCMD gas to different consumers as under:

- **Existing Consumers : 1.5 MMSCMD**
- **Incremental Demand : 4.5 MMSCMD**
 - ✓ OTPC Power Plant : 3.0 MMSCMD
 - ✓ OTPC Power Plant (Addl.) : 0.5 MMSCMD
 - ✓ TSECL Rokhia : 0.1 MMSCMD
 - ✓ TSECL Baramura : 0.2 MMSCMD
 - ✓ Allied Resins & Chemicals : 0.2 MMSCMD
 - ✓ NEEPCO Monarchak : 0.5 MMSCMD
- **Total Gas Demand Build-up: 6.0 MMSCMD**

1.1 Description of Contract Area:

PML Name	Area (Km ²)	Validity of PML/ Remarks
Agartala Dome (AD-4)	32.580	PML valid till December 2017
Agartala Dome	15.75	PML valid till April 2029
Agartala Dome Extension II	160.86	PML valid till January 2026
Manikyanagar Sonamura Ext I	138.55	PML valid till January 2026
Konaban	33.0046	PML valid till June 2034
Kunjaban	288	PML valid till July 2028
Sundalbari Agartala Dome	301	PML valid till December 2026
Tichna	195.410	PML valid till February 2026

1.2 Proposed Project:

This project includes the following activities:

- i. Drilling of 27 No. new development wells
- ii. Conversion of 37 No. Exploratory Wells for Development
- iii. Construction of 2 pipe manifold at Kunjaban 8' & 6' and Sundalbari 8' & 6'
- iv. Flow-lines and Gas Grid Network

2.0 Fields Description

2.1 Konaban Field

Konaban field is located to the north of Manikyanagar field in the northern culmination of NNWSSE trending Rokhia anticline which is the western most exposed structure of the Frontal Fold Belt of Tripura. It is tectonically less disturbed as compared to the structures lying to the east and south east. Konaban field is separated from Manikyanagar field (located to the south) by a broad saddle and structurally higher by about 180 m w.r.t. Manikyanagar field.

Konaban field was discovered in 1986 through drilling of well RO#4. The field has a total of 24 pay sands (KP- 7, KP- 8, KP-10, KP-15, KP-16, KP-21, KP-30, KP-40, KP-42, KP-44, and KP-50, KP-51, KP-55A, KP-55B, KP-56, KP-57, KP-59, KP-60, KP-60A, KP-65A, KP-65B, KP-66, KP-67 and KP-70) occurring in a depth range of -693 mMSL (KP-7) to -2725 mMSL (KP-70) are interpreted to be gas bearing out of which 13 pay sands are producing/produced. All the pay sands are of sandstone dominantly silty in nature. Of these 24 pays, the upper 3 pays from KP-7 to KP- 10 belong to the Bokabil Formation while 7 pays from KP-15 to KP-44 belong to the Upper Bhuban Formation and the remaining 14 pays KP- 50 to KP-70 fall within Middle Bhuban Formation of Surma Group of sediments of Miocene Age.

Thirteen pay sands viz. KP-7, KP-30, KP-40, KP-42, KP-50, KP-51, KP-55A, KP-55B, KP-56, KP-59, KP-65A, KP-65B & KP-66 are under exploitation from this field. Two development locations, RODO (KP-30) and RODI (KP-65B and 59) are available for drilling; and location RODM (KP-65B) recently put on production through Konaban GCS.

2.2 Manikyanagar Field

Manikyanagar field is located in the southern part of the northern culmination of NNW-SSE trending Rokhia anticline which is the western most exposed structure of the Frontal Folded Belt of Tripura. It is tectonically less disturbed as compared to the structures lying to the east and south east. Manikyanagar field is separated from Konaban field (located to the north) by a broad saddle and structurally lower by about 180 m w.r.t. Konaban field. Manikyanagar field discovered in 1983 is one of the main gas-producing fields of Tripura Asset. The field

has a total of eight pay sands viz. MP-20, MP-21, MP-30, MP-33, MP-34, MP-35, MP-50 and MP-51A. All the pay sands have been tested and proved to be gas bearing in commercial scale. 75.64% of the total proved reserves of the field are placed in the main pay sands MP-21 and MP-30. The reservoir sand facies are dominantly silty in nature with intercalations of shale at places. This gas bearing pay sands are within Surma Group of Middle and Upper Bhuban Formations belonging to Miocene age, occurring at a depth range of 1360 to 2400 m MSL.

2.3 Agartala Dome Field

Agartala Dome field is a concealed structure located at a distance of about 15 km SE of Agartala town lying on a broad syncline between Rokhia anticline in west and Baramura anticline in east. The structure is wide with a slight crestal shift towards south. The structure was initially identified as a geomorphic high through photogeological data. The areal extent as well as closure increases with depth. Its eastern and western margins are faulted.

Agartala Dome field was discovered in February 1987 through drilling of well AD#1. The field has a total of twelve pay sands, which are designated as AP-10B, AP-36, AP-38, AP-39, AP-40, AP-50, AP-51, AP-53, AP-54, AP-55, AP-58 and AP-60 from top to bottom. The depth of occurrences of these pay sands ranges from -1661 m to -3150 m. Out of 12 pay sands 9 pay sands namely AP-10B, AP-36, AP-38, AP-40, AP-50, AP-53, AP-55, AP-58 and AP-60 have been tested and proved to be gas bearing in commercial quantities. Out of the remaining three pay sands, pay sand AP-39 has a GIIP of 366.6 MMm³ in PB category whereas pay sands AP-51 and AP-54 have marginal GIIP of 65 MMm³ each in PS category. The pay sands are developed within Upper Bhuban (AP-10B, AP-36, AP-39, AP-38 and AP-40) and Middle Bhuban Formations (AP-50, AP-51, AP-53, AP-54, AP-55, AP-58 and AP-60). However as per study conducted by IRS pay sand AP-55 has been divided in to two parts. Eastern extension of this sand is denoted by AP-55B and western extension as AP-55A. The field holds the largest volume of gas reserves among the present five producing fields (viz. Agartala Dome, Baramura, Konaban, Kunjaban and Manikyanagar).

2.4 Kunjaban Field

Kunjaban structure is located to the north of Agartala Dome field in West Tripura district. It is a concealed structure that has been identified/ mapped based on satellite and photo-geological studies by Remote Sensing Division of KDMIPE, Dehradun. Commercial discovery of gas occurrence in Kunjaban Field was made during FY2007-08 through drilling of the exploratory well KU# 2 (KUAC). So far four exploratory wells viz. KU# 1 (KUA), KU# 2 (KUAC), KU# 3 (KUAD) and KU# 4 (KUAE) are drilled in Kunjaban structure/field out of

which two wells KU# 2 and KU# 3 are completed as gas wells. There are two pay sands in the field designated as KUP-35 and KUP-56, belonging to Upper Bhuban formation with depth of occurrence ranging from -2657 m (KUP-35 in well KU#2) to -3060 m (KUP-56 in well KU# 3). Drilling/ testing of wells KU# 2 and KU# 3 during 2007-08 have opened up new areas for further exploration and delineation in Kunjaban structure/ field.

2.5 Sonamura Field

Sonamura field mapped within a four way closure is located to the south of Manikyanagar field in Rokhia structure. The closure is mapped at all the three stratigraphic levels viz. near top of Middle Bhuban, within Middle Bhuban and base of Middle Bhuban. Commercial discovery of gas occurrence in Sonamura field was made during 2003-04 through drilling of exploratory well RO#41 (SNA). The field has 3 gas bearing pay sands with depth of occurrence ranging from -1742 m (SP-29) to -2011 m (SP-38). All the pay sands have been tested through well RO#41 and the well is presently completed in SP-29.

2.6 Sundulbari Field

Sundulbari structure has been mapped as a separate structure in the northern plunge of Tichna anticline. Sundulbari structure is characterized by presence of prominent seismic anomaly, likely to that of sediment fill in the sub-aerial unconformity and multi-layered sands. Commercial discovery of gas occurrence in Sundulbari structure/ field was made during FY2007-08 through drilling of the exploratory well SD# 2 (SDAA). Presence of commercial gas has been proved in two pay sands designated as SDP-35 and SDP-36, belonging to Upper Bhuban Formation with depth of occurrence ranging from -2724 m (SDP-35) to -2753 m (SDP-36).

3.0 Drilling of wells

27 number new development wells are to be drilled to probe & delineate the reservoirs and conversion of already drilled 37 exploratory wells to development wells. This will increase in production to meet the consumer requirement. The cost of drilling each well is approximately 30 crore. Well location coordinates are:

S. No	Proposed Wells	Coordinates	
Kunjaban			
1	KUNJD-1	23.927761 N	91.291231 E
2	KUNJD-2	23.905543 N	91.413591 E
3	KUNJD-3	23.941649 N	91.317389 E
4	KUNJD-4	23.880196 N	91.317390 E

Konaban			
5	KND-1	23.710971 N	91.170293 E
6	KND-2	23.697361 N	91.171960 E
7	KND-3	23.695417 N	91.183069 E
8	KND-4	23.703750 N	91.185014 E
9	KND-5	23.710693 N	91.179181 E
10	KND-6	23.694028 N	91.169738 E
11	KND-7	23.698472 N	91.167238 E
12	KND-8	23.712082 N	91.175292 E
13	KND-10	23.733191 N	91.168071 E
14	KND-11	23.733191 N	91.168626 E
15	KND-14	23.738746 N	91.163349 E
Manikyanagar			
16	MNKD-4	23.637575 N	91.192956 E
17	MNKD-5	23.639449 N	91.181910 E
18	MNKD-6	23.534326 N	91.253545 E
19	MNKD-7	23.550475 N	91.259194 E
20	MNKD-8	23.551558 N	91.251975 E
21	MNKD-9	23.545942 N	91.245668 E
22	MNKD-10	23.567656 N	91.246609 E
23	MNKD-11	23.564873 N	91.240334 E
24	MNKD-12	23.540276 N	91.258253 E
Sonamura			
25	SMD-1	23.50515667 N	91.27111833 E
26	SMD-2	23.50654556 N	91.27945083 E
27	SMD-3	23.49654639 N	91.28222833 E

3.1 Drilling Operations

ONGC owned electrical type rigs or chartered hired rig are proposed to be deployed for undertaking drilling in the block. The technical details of the proposed drilling activity are given below:

No.of wells to be drilled	27
Duration of Drilling	Approx 3-4 months for each well
Qty. of drilling fluid.	About 700 M³ for each well
Qty. of cuttings, cu.m.	250-300 M³for each well (approx.)
Qty. of drilling Waste water, cu.m.	1000 M³ for each well
Distance of Block boundary from the coast line	On land Locations
Test flaring, duration	2 to 3 days

Details of the drilling rig proposed to be deployed

Type of rig	Electrical Rig
Drilling mud composition	Water based Drilling Fluid
Power generator type & nos.	AC – SCR Type. (06 Nos.)
Diesel consumption	@ 6 M³/ Day per day for each well

Qty. of fresh water requirement & source	1000 M³ Transported from nearby source
Manpower on rig	25 per shift of 12 Hrs. Two shifts / day
Material requirement & Mobilization	From ONGC base in Agartala
Details of solids handling system on rig	Shale Shakers - 1200 GPM Capacity Desander – 1200 GPM Capacity Desilter – 1200 GPM Capacity
Details of Sewage treatment, if any	Not applicable
Waste Pit availability & Size	30' x 33' x 5' - 2 Nos. 38' x 33' x 5' – 1 No. 23' x 20' x 5' – 1 No.

Only water based drilling mud will be used. The quantity of drill cuttings generated will be around 250-300 m³. The quantity of wastewater produced will be about 15 m³/day. The rig will be provided with solids handling system comprising Shale shakers (1200 GPM), Desander (1200 GPM) and De silter (1200 GPM) and Degasser with vacuum pump.

Drilling operations will be carried out using an electrical type. Drilling unit for drilling of oil and gas wells consists of a derrick at the top of which is mounted a crown block and a hoisting block with a hook. From the swivel is suspended a Kelly stem passes through a square or hexagonal Kelly bush which fits into the rotary table. The rotary table receives the power to drive it from an electric motor. The electric motor rotates the rotary table which passes through the Kelly bush and the rotations are transmitted to the bit as the drilling progresses, the drill pipe in singles are added to continue the drilling process. At the end of the bit life, the drill pipes are pulled out in stands and stacked on the derrick platform. A stand normally has 3 single drill pipes. After changing the bit, the drill string is run back into the hole and further drilling is continued. This process continues till the target depth is reached.

3.2 Drilling Facilities

Drilling is a temporary activity which will continue for about 90-100 days for each well in the block. The rigs are self-contained for all routine jobs. Once the drilling operations are completed, and if sufficient indications of hydrocarbons are noticed while drilling, the well is tested by perforation in the production casing. This normally takes 2-3 days. If the well is found to be a successful hydrocarbon bearing structure, it is sealed off for future development, if any.

4.0 Conversion of Exploratory Wells for Development

In the old exploration project covered under different environment clearance, drilling operations were completed, and in some of the wells sufficient indications of hydrocarbons were noticed while drilling, the wells were tested by perforation in the production casing.

Thirty Seven (37 no.) such wells are found to be a successful hydrocarbon bearing structure, it was sealed off at that time for future development. List of the successful wells are:

S. No.	Release Name	PML Name	Environment Clearance	Location Coordinates	(Flow line length) (Km)
1	ADDE	Agartala Dome PML	F.No.J-11011 / 213 / 2008-1A II(I) Dated 11.06.2008	91° 20' 27.88"E 23° 43' 17.404"N	ADB GCS (6.5)
2	ADAK	Agartala Dome Ext-II	F.No.J-11011 / 635 / 2007-1A II(I) Dated 22.10.2007	91° 17' 31.502"E 23° 45' 30.589"N	ADB GCS (9.07)
3	ADDI	Agartala Dome PML	F.No.J-11011 / 213 / 2008-1A II(I) Dated 11.06.2008	91° 20' 19.342"E 23° 44' 31.967"N	ADB GCS (0.81)
4	ADDD	Agartala Dome (AD4)	-DO-	91° 21' 37.469"E, 23° 45' 1.796"N	ADB GCS (4.45)
5	ADAO	Agartala Dome Ext-II	-DO-	91° 19' 13.766"E 23° 44' 4.967"N	ADB GCS (4.07)
6	ADDO	Agartala Dome (AD4)	-DO-	91° 21' 50.026"E 23° 44' 35.339"N	ADB GCS (3.5)
7	ADDP_AGT	Agartala Dome PML	-DO-	91° 21' 0.9"E 23° 43' 44.1"N	ADB GCS (5.39)
8	ADDM	Agartala Dome PML	-DO-	91° 20' 37.421"E 23° 44' 11.366"N	ADB GCS (1.26)
9	KUAC	Kunjaban	-DO-	91° 18' 20.53"E 23° 50' 54.24"N	Kunjaban (0.1)
10	KUAD	Kunjaban	F.No.J-11011 / 636/2007-1A II(I) Dated 22.10.2007	91° 17' 20.1"E 23° 53' 33.29"N	Kunjaban (5.0)
11	ROAX	Manikya Nagar Sonamura	F.No.J-11011 / 213 / 2008-1A II(I) Dated 11.06.2008	91° 16' 3.17"E 23° 30' 40.92"N	Sonamura GCS
12	RO-9 (SUB)	Konaban	-DO-	91° 10' 44.562"E, 23° 42' 14.8"N	Konaban GCS (1.5)
13	RODG	Konaban	-DO-	91° 9' 46.368"E, 23° 44' 5.298"N	Konaban GCS (11.27)
14	RODH	Konaban	-DO-	91° 10' 3.266"E, 23° 43' 25.262"N	Konaban GCS (12.5)
15	RODL	Konaban	-DO-	91° 10' 23.365"E, 23° 43' 3.097"N	Konaban GCS (3.07)
16	RODJ	Konaban	-DO-	91° 10' 23.732"E, 23° 41' 37.54"N	Konaban GCS (1.88)
17	RODM_AGT	Konaban	-DO-	91° 10' 34.619"E, 23° 42' 41.094"N	Konaban GCS (2.48)
18	RODI_AGT	Konaban	-DO-	91° 9' 58.277"E, 23° 42' 2.423"N	Konaban GCS (4.36)
19	SDDB_AGT	Tichna	-DO-	91° 22' 21.86"E, 23° 31' 31.39"N	Sundulbari Manifold (0.2)
20	ADDQ		F.No.J-11011 / 213 / 2008-1A II(I) Dated 11.06.2008	91° 19' 42.47"E, 23° 44' 45.629"N	ADB GCS (2)
21	ADDK		-Do-	91° 20' 26.902"E, 23° 44' 12.8"N	ADB GCS (1.7)
22	ADAP		-Do-	91° 16' 10.182"E, 23° 45' 15.811"N	ADB GCS (6.5)
23	ROAW		F.No.J-11011/635/2007-1A II(I) Dated 22.10.2007	91° 10' 2.546"E, 23° 44' 23.068"N	Konaban GCS (12.5)

24	ROBD		F.No.J-11011 / 213 / 2008-1A II(I) Dated 11.06.2008	91° 9' 38.509"E, 23° 42' 4.982"N	Konaban GCS (4.6)
25	RODO		-Do-	91° 10' 40.577"E, 23° 42' 4.367"N	Konaban GCS (1.5)
26	ROBF		-Do-	91° 9' 36.389"E, 23° 42' 37.436"N	Konaban GCS (4.3)
27	RODP		-Do-	91° 10' 20.528"E, 23° 42' 11.588"N	Konaban GCS (18)
28	ROBB		-Do-	91° 15' 28.04"E, 23° 42' 28.62"N	Konaban GCS (10.9)
29	ROBC		-Do-	91° 17' 5.226"E, 23° 28' 32.347"N	Konaban GCS (6.5)
30	SDAA		-Do-	91° 22' 24.179"E, 23° 31' 33.37"N	Sundulbari Manifold (0.2)
31	SDAC		F.No.J-11011/633/2007-1A II(I) Dated 22.10.2007	91° 24' 33.602"E, 23° 29' 1.446"N	Sundulbari Manifold (18)
32	SDDA_Agt		F.No.J-11011 / 213 / 2008-1A II(I) Dated 11.06.2008	91° 24' 33.322"E, 23° 29' 2.18"N	Sundulbari Manifold (18)
33	SNDA_Sub		-Do-	91° 16' 34.349"E, 23° 29' 58.42"N	Sonamura GCS (0.2)
34	GOAF		F.No.J-11011 / 213 / 2008-1A II(I) Dated 11.06.2008	91° 31' 5.074"E, 23° 14' 47.062"N	Gojalia GCS (15)
35	GOAK		-Do-	91° 30' 42.037"E, 23° 15' 37.116"N	Gojalia GCS (12)
36	KHBE		F.No.J-11011/401/2006-1A II(I) Dated 22.09.2008	92° 9' 28.937"E, 24° 14' 27.985"N	Nearest GCS
37	KHBJ		F. No. J-11011/41/2010- 1A II (I) dated 04.01.2011	92° 8' 38.875"E, 24° 14' 26.444"N	Nearest GCS

Proposed for production from these wells by connecting to the GCS through flow lines

S. No.	MoEF Reference no. & Date	Name of Project
1	F.No.J-11011/633/2007-1A II(I) Dated 22.10.2007	Exploratory Drilling for Oil & Gas at Assam Arakan Fold Belt Block in Baramura-Gojalia-Tulamura Area, South Tripura District, Tripura by M/s ONGC
2	F.No.J-11011 / 635 / 2007-1A II(I) Dated 22.10.2007	Exploratory Drilling for Oil & Gas at Assam Arakan fold belt block in Konaban Manikyanagar area, West Tripura District, Tripura
3	F.No.J-11011 / 636 /2007-1A II(I) Dated 22.10.2007	Exploratory Drilling for Oil & Gas at Assam Arakan fold belt block in Kunjaban Bamutia area, West Tripura District, Tripura
4	F.No.J-11011 / 213 / 2008-1A II(I) Dated 11.06.2008	Onshore Exploratory Drilling of 67 wells for Oil & Gas in West Tripura & South Tripura District, Tripura
5	F.No.J-11011/401/2006-1A II(I) Dated 22.09.2008	Exploratory Drilling in NELP III Block AA-ONN-2001/1 in Tripura in Assam Arakan Basin
6	F. No. J-11011 / 41 / 2010- 1A II (I) dated 04.01.2011	Expansion of Exploratory Drilling in NELP- III, Block AA-ONN-2001/1, Tripura

5.0 Construction of Manifold at Kunjaban & Sundalbari

Pipe manifold is a system of headers and branched piping that is used to gather gas from different wells and supply it to the processing facility. Well Manifold is used to gather produced gas and direct selected wells to a test header line, as well as to the production header lines. Typically manifolds include valves for controlling the on/off flow of fluids, and may also include other flow control devices (e.g. chokes) if these are not mounted on the individual wells.

The following gas handling manifolds have been planned in such a way to meet the gas requirement of different consumers:

- Since Kunjaban wells have high pressure, a manifold with Feeder and Test/MP lines instead of GGS are proposed at Kunjaban and fluid will flow to ADB GGS.
- Similarly, Sundalbari wells having sufficiently high pressure and proximity to Sonamura, a manifold with Feeder and Test/MP lines are proposed at Sundalbari and fluid will flow to Sonamura GGS.

5.1 Kunjaban Manifold

Designed for connecting 10 well flow lines to the manifold header. Cost of the Project is estimated as 37.24 Crore. Cost includes associated pipelines and Kunjaban Well Manifold to ADB GCS.

Kunjaban Production manifold	Kunjaban Test Manifold
Diameter – 8 inch Operating Pressure : 60.85 – 60.92 kg/cm ² Operating Temperature: 20-35 °C	Diameter – 6 inch Operating Pressure : 41.63 – 56.14 kg/cm ² Operating Temperature: 20-35 °C
Pig Launcher	Pig Launcher
Major Barrel: 12 inch Minor Barrel: 8 inch	Major Barrel: 10 inch Minor Barrel: 6 inch

5.2 Sundalbari Manifold

Designed for connecting 12 well flow lines to the manifold header. Cost of the Project is estimated as 26.52 Crore. Cost includes associated pipelines and Sundalbari Well Manifold to Sonamura GCS.

Sundalbari Production manifold	Sundalbari Test Manifold
Diameter – 8 inch Operating Pressure : 74.19 – 74.21 kg/cm ² Operating Temperature: 20-35 °C	Diameter – 6 inch Operating Pressure : 36.1 – 73.6 kg/cm ² Operating Temperature: 20-35 °C
Pig Launcher	Pig Launcher
Major Barrel: 12 inch Minor Barrel: 8 inch	Major Barrel: 10 inch Minor Barrel: 6 inch

6.0 Flow-lines and Gas Grid Network

6.1 Flow-lines

Details of the flow lines for the conversion of the exploration wells for development is given in the para 4.0 above. The cost of laying 4 inch diameter flow lines is around Rs. 1200/- per meter including material and labour.

6.2 Gas Grid Network

Based on the production profiles furnished by study has done simulation study of the integrated pipeline grid considering the following assumptions:

- i. Steady state simulation model using compositional analysis.
- ii. Delivery pressure at Monarchak (NEEPCO): $\pm 20 \text{ Kg/cm}^2$
- iii. Manifold and Feeder, Test/MP lines for Sundalbari and Kunjaban areas.
- iv. Grid pipe lines are pigable.

Cost of the Gas Grid Network Project is Rs. 250 Crores

The proposed gas feeder pipeline network comprising of following sectors:

Sector	Description	Nominal Size (inches)	Estimated Length (kms)
Sector –I	ADB GGS to Palatana Terminal main pipeline. (04 nos. SVSs at approx. chainages 11.26 kms (Nimbutali JP) , 26.87 kms & 39.36 kms.	20	53
Sector –II	Konaban GGS to Nimbutali (Limbutali) Junction Point on ADB -Palatana main pipeline	16	12
Sector –III	Sonamura GGS to Palatana Terminal via Bagabasa junction	16	22
Sector –IV	Baramura GGS to ADB GGS	20	35
Sector –V	Kunjaban Well Manifold to ADB GGS	8	19.5
Sector –VI	Kunjaban Well Manifold to ADB GGS	6	19.5
Sector –VII	Sundalbari Well Manifold to Sonamura GGS	8	12
Sector –VIII	Sundalbari Well Manifold to Sonamura GGS	6	12

6.3 Sectionalizing Valve Stations (SVS)

Sectionalizing Valves Stations (SVS) shall be constructed in accordance with ASME B 31.8 (Latest Edition) at the following locations:

Sector	Description	SVS Nos.	Location (Approx. chainage)
I	ADB GGS to Palatana Terminal.	04	11.26 kms (Nimbutali Junction Point) 26.87 kms 39.36 kms 49.5 kms (Upstream of Gomti river) *
II	Konaban GGS to Nimbutali JP	Nil	
III	Sonamura Gas GGS to Palatana	02	11.58 kms (near Bagabasa)

	Terminal via Bagabasa		18.2 Km(Upstream of Gomti river)*
IV	Baramura GGS to ADB GGS	02	To be decided during Pre-Engineering survey

6.4 Terminal Stations (Scrapper Launcher / Receiver)

Facilities to carry out pigging shall be installed for each pipeline sector at the following locations with launching and receiving facilities as specified here under:

Pipeline Sector	Scrapper Launcher	Scrapper Receiver	Remarks
Sector –I: ADB GGS to Palatana Terminal main pipeline	ADB GCS	Palatana terminal	Suitable for Intelligent Pigging
Sector –II: Konaban GGS to Nimbutali Junction Point.	Konaban GCS	Nimbutali Junction Point	Suitable for Intelligent Pigging
Sector –III: Sonamura GGS to Palatana Terminal via Bagabasa.	Sonamura GCS	Palatana terminal	Suitable for Intelligent Pigging
Sector –IV : Baramura GGS to ADB GGS	Baramura GCS	ADB GCS	Suitable for Intelligent Pigging
Sector- V : 8" pipeline from Kunjaban Well Manifold to ADB GGS	Kunjaban	ADB GCS	Suitable normal scrapper / Maintenance pigging
Sector- VI : 6" pipeline from Kunjaban Well Manifold to ADB GGS	Kunjaban	ADB GCS	Suitable normal scrapper / Maintenance pigging
Sector- VII : 8" Pipeline from Sunderbari Well Manifold to Sonamura GGS	Sundelbari	Sonamura GCS	Suitable normal scrapper / Maintenance pigging
Sector- VIII : 6" Pipeline from Sunderbari Well Manifold to Sonamura GGS	Sundelbari	Sonamura GCS	Suitable normal scrapper / Maintenance pigging

7.0 Environment and Safety Management

The environmental impact and safety issues of the proposed locations are briefly discussed. At the outset it is brought out that all existing rigs and installations of Tripura Asset have been holding QHSE accreditation (Quality Health, Safety & Environment Management System i.e. QMS-ISO 9001, EMS-ISO 14001 & OHSAS 18001) by third party certification body since March, 2005 and process for fresh certification is underway.

7.1 Environment Protection Measures

Drill cuttings will be separated using shale shakers and other solids removal equipment like de sanders and de silters. The recovered mud will be reused while the rejected solids will be collected and discharged into the waste pit. The waste residual muds and drill cuttings which

contain clay, sand etc. will be disposed into the waste pit. The environment protection measures built into the design. The drilling fluid will not contain any diesel.

7.2 Emergency Preparedness

Major emergency situations during drilling/production operations are blow out, fire and gas leakage. Emergency control measures are defined for each situations. Remotely-controlled blow out preventor (BOP) are installed which can close a well in case of any threatened blow-out during drilling operations. Fire/smoke detectors, gas detectors are provided for early detection of fire in GGS. Water sprinkler and deluge system, automatic dry chemical powder and foam systems are provided to control fire. Hi-Lo Safety valves installed on wells automatically close the well in the event of pipeline failure, thus limiting the quantity of any gas leakage .Inspections of pipelines are regularly carried out to ensure their integrity and protect against corrosion. Gas corrosion inhibitor is dosed to pipeline gas to be transported over long distances.

Disaster Management Plan: To minimize the consequences of disaster due to the situations mentioned above, disaster management plans (DMP) have been prepared.

Drills and Exercise: Regular drills are carried out on drilling & production installations to ensure that persons are familiar with their emergency duties and can respond effectively.

8.0 Project Investment

The total approximate cost including cost of drilling of 27 new development wells (daily drilling rates, consumables, well accessories etc.), cost of construction of Well Manifold and laying of flow lines and gas grid network is Rs. 1123.76 Crores.