
CHAPTER 3

PROJECT DESCRIPTION**3.1 INTRODUCTION**

Oil India Ltd. (OIL) is proposing to increase its hydrocarbon production capacity from its oil fields in North Chandmari and Baghjan areas in Tinsukia-Dhola (TD) Area located in Tinsukia and Dibrugarh district of Assam. Hence to handle additional production of crude oil and natural gas, OIL is proposing to establish 3 new pipeline projects in TD Area as given below:

1. Baghjan-Secondary Tank Farm Crude Oil Pipeline (length 45 km)
2. Baghjan-CGGS & OTP near W/50 Gas Pipeline (length 37 km)
3. Baghjan-Makum OCS Crude Oil Pipeline (length 23 km)

3.2 PROPOSED NEW PIPELINE PROJECTS

The salient features of the 3 Pipeline projects are briefly given below:

- 1. Baghjan-Secondary Tank Farm (STF) Crude Oil Pipeline:** Presently, crude oil from Baghjan EPS in Tinsukia district of Assam, is being evacuated by bowsers (tankers). As transportation of crude oil by bowsers from remote inside location on bad roads is difficult and problematic job and in consideration of future increase in production from the above area, it is proposed to lay 200 mm NB pipeline from Baghjan (near Loc TP), which is about 20 km from Doomduma Railway Station in Tinsukia District of Assam, to Secondary Tank Farm (STF) at Naoholia in Dibrugarh District, Assam through a distance of 45 km at a total cost of Rs. 35.04 crores. Likely date of commissioning of Baghjan-STF crude oil pipeline is March 2012.
- 2. Baghjan-CGGS & OTP near W/50 Gas Pipeline:** Presently major portion of associated gas produced at Baghjan EPS is being flared and non-associated gas is not produced at Baghjan due to inadequate transportation facility. Production of associated gas will increase with the increase in crude oil production in Baghjan area. Furthermore, production of non-associated gas will have to be started in Baghjan area to meet the gas supply commitments to BCPL (Brahmaputra Cracker and Polymer Ltd.) from March 2012. It is, therefore, proposed to construct a 400 mm NB diameter pipeline to transport associated and non-associated gas from Baghjan (near Location TP) to CGGS (Central Gas Gathering Station) and OTP (Off Take Point) near W/50. The total length of gas transmission pipeline will be 37 km and will be laid adjacent to Baghjan-STF crude oil pipeline for most of its length at a total cost nearly Rs. 78.51 crores. Likely commissioning date will be March 2012.
- 3. Baghjan-Makum OCS Crude Oil Pipeline:** Presently, crude oil from Baghjan EPS in Tinsukia district of Assam, is being evacuated by bowsers (tankers). As transportation of crude oil by bowsers from remote inside

location on bad roads is difficult and problematic job and in consideration of future increase in production from the above area, it is proposed to lay 100 mm NB pipeline from Baghjan (near Loc TP), which is about 20 km from Doomduma Railway Station in Tinsukia District of Assam, to Makum OCS which is located in Makum township in Tinsukia district through a distance of 23 km and will be laid adjacent to Baghjan-STF crude oil pipeline for most of its length at a total cost of Rs. 20 crores. Likely commissioning date will be end 2011.

Details of 3 pipeline projects including site location, facilities, plant and equipment are given in **Section 3.4 to 3.6**.

3.3 JUSTIFICATION AND BENEFITS OF NEW DEVELOPMENT PROJECTS

3.3.1 Justification

The present production profile and the future production strategy indicate an upward trend in production from Baghjan Field located in TD Area. In order to handle the additional production of crude oil natural gas, 3 pipeline projects as summarized in **Section 3.2** are proposed to be constructed by OIL in Tinsukia and Dibrugarh Districts of Assam. Construction and operation of the proposed 3 pipeline projects at a total cost of nearly Rs. 133.55 crores will enable OIL to handle increased crude oil and natural gas production, for downstream use by creating additional facilities for, transportation of crude oil and natural gas by pipeline.

3.3.2 Benefits

Pipeline transport of increased production of crude oil and natural gas for downstream users on commissioning of proposed 3 pipeline projects will generate additional revenue for the Assam State as well as Government of India in terms of royalty, taxation and profit petroleum. Furthermore, any increase in crude oil and natural gas production will be import substitute, would save foreign currency reserves of the Government of India and enhance energy security of the country.

Assam's economy is presently characterized by high rate of poverty, low per-capita income, low capital formation, inadequate infrastructure facilities, geographical isolation and communication bottleneck, inadequate exploitation and use of forest and mineral resources, low progress in industrial field and high unemployment problem. Industrial sector is not able to open sufficient employment opportunities despite government's effort for developing a comprehensive base for industrialization. On the other hand, agriculture sector has become stagnant and not ready to absorb growing demand for employment.

Increase in crude oil and natural gas production from the TD Area and their transport by pipeline to downstream users will, therefore, assist in the economic development of this less developed area of Assam due to increase in crude oil and natural gas revenue as well as generating some direct and indirect employment for unskilled and semi-skilled persons. Increase in crude

oil processing at the nearest oil refinery and natural gas processing at Brahmaputra Cracker and Polymer Ltd. will help in industrial development which in turn will result in improving the quality of roads, and growth of telecommunication and hospitality sectors in the area. Development of ancillary industries for supply of material and consumables requirements is a distinct possibility in the area as a result of increase in crude oil and natural gas production and downstream processing in TD Area. Furthermore, OIL's CSR schemes will also result in direct social benefits in the area, such as, improvement in educational and medical facilities as well per capita income in the TD Area and surrounding area.

These projects will play a very important role in the commissioning of Brahmaputra Cracker and Polymer Limited (BCPL) being set up at Lapetkata near Dibrugarh town because a portion of the required feedstock in the form of supply of 1.5 MMSCMD of natural gas will be transported through the proposed 400mm NB pipeline.

3.4 200 MM DIAMETER BAGHJAN-SECONDARY TANK FARM (STF) CRUDE OIL PIPELINE (LENGTH 45 KM)

3.4.1 Preamble

OIL's entire crude oil production comes from its Fields in Assam and Arunachal Pradesh. One of its newly discovered Fields, namely, Baghjan Field located in Tinsukia District of Assam is presently producing around 930 KLPD from its Early Production Set-up (EPS) having five producing wells. Baghjan field is a prospective field and a number of drilling wells are lined up. As per the internal estimate crude oil production of Baghjan area will increase to the level of more than 1500 KLPD in the near future.

Presently, crude oil is being evacuated by bowsers (tankers) by deploying 80-84 bowser trips per day. It will go on increasing with the increase in oil production. However, transporting oil by bowsers from remote inside location on bad road is difficult and problematic job and is considered not viable. Hence, alternately pipeline transportation of the crude oil from the above remote location, is felt necessary.

3.4.2 Project Justification

Presently, bowsers (tankers) loaded with crude oil from Baghjan EPS is brought to Duliajan in Dibrugarh District of Assam through a distance of 75 km and unloaded in the Bowser Unloading Station of Duliajan for onward dispatch to Central Tank Farm (CTF). About 20 km of above route passes through interior of Baghjan area where road condition is very bad. Also, the area is considered to be a very difficult area because of frequent social problems like bandhs, road blockade, forcefully demand of money by local people etc. In view of above problems, bowser transportation of crude oil very often gets disrupted affecting crude oil production from the above area. Hence, to mitigate the above problem and to ensure uninterrupted transportation of crude oil from Baghjan Field, it is proposed to lay 200 mm NB pipeline from Baghjan (Near Loc TP) to Secondary Tank Farm (STF) through a distance of 45 km.

3.4.3 Site Location

The starting point of the proposed pipeline will be near Location TP (in Baghjan area) which is about 20 km from Doomduma Railway Station in Tinsukia District of Assam. The end point of the pipeline will be at Secondary Tank Farm (STF) about 12 km from Duliajan township.

3.4.4 Description of Facilities and Plant & Equipment

Fig. 3.1 shows the route map of 45 km long Baghjan Secondary Tank Farm (STF) crude oil pipeline (BSP). The pipeline will be constructed with 200 mm NB bevel ended ERW pipes with their ends welded. The pipeline will be pre-coated (with three layers of polyethylene) and buried under ground with its top 1.2 m below the ground level. The pipeline will have the following equipment:

- **Engine Driven Reciprocating Pumps:** Two nos. Gas Engine Driven Reciprocating pumps for crude oil dispatch duties will be installed at Baghjan end.
- **Indirect Heaters:** Three nos. of Indirect Heaters will be installed at suitable intermittent places along the ROW of the pipeline to heat the crude oil of the pipeline to save it from congealing.
- **Pig Launcher:** One no. Pig Launcher will be installed at Baghjan end (near Loc TP) for launching Pigs for cleaning inside of the pipeline.
- **Pig Receiver:** One no. Pig Receiver will be installed at STF end to receive the pig launched at Baghjan end.

3.4.5 Project Cost Estimation

The estimated Project cost comes to Rs. 35.04 crores.

3.5 400 MM DIAMETER BAGHJAN-CENTRAL GAS GATHERING STATION AND OFFTAKE POINT (CGGS & OTP) NEAR W/50 GAS TRANSMISSION PIPELINE (LENGTH 37 KM)

3.5.1 Preamble

OIL has committed to supply 6 MMSCMD natural gas containing at least 7% C2+ components to Brahmaputra Cracker and Polymer Limited (BCPL) being set up at Lapetka near Dibrugarh town from March, 2012. This, together with existing and future demand and commitments for natural gas has necessitated action to ensure a jump in natural gas production from the existing level of around 6.5 MMSCMD to 10 MMSCMD by the end of 2011-12 fiscal.

3.5.2 Justification

Baghjan area is identified as a potential major source of gas production and it is expected that this area will contribute around 1.5 MMSCMD of natural gas which will mostly be NA gas. At present non associated gas is not produced in Baghjan. Only 104,000 SCMD associated gas is produced in Baghjan EPS at present with 930 KLPD of crude oil production and major portion of this

associated gas is being flared (around 60,000 SCMD) due to inadequate transportation facility. The crude oil production is expected to go up to a level of 1500 KLPD with consequent increase in associated gas production.

For production of non associated gas, one Field Gathering Station (FGS) will be constructed near the existing EPS (near location 'TP') which is likely to come up by end, 2011.

To transport the associated and non associated gas produced in Baghjan area it is now proposed to construct a 400 mm NB x 37 km pipeline from Baghjan (from near location TP) to CGGS & OTP near W/50.

3.5.3 Site Location

The starting point of the proposed pipeline will be near location 'TP' (in Baghjan area) which is about 20 km from Doomduma railway station in Tinsukia district of Assam. The pipeline will end at CGGS & OTP which is being constructed near W#NHK-50, about 5 km from Duliajan town.

As per OIL's classification 'Originating Area of the pipeline' falls in 'Tinsukia-Dhola Area'. The route of the pipeline will be adjacent to that of 200 mm diameter Baghjan-STF Crude Oil Pipeline in the same ROW for most of its length.

3.5.4 Description of Facilities and Plant & Equipment

Dimension of the 400 mm NB pipeline 406.4 mm (16") OD x 37 km long. **Fig. 3.2** also shows the route map of 37 km long Baghjan-CGGS & OTP gas transmission pipeline. The pipeline will be constructed with 400 mm NB bevel ended, ERW pipes with their ends welded. The pipeline will be pre-coated (with three layers of polyethylene) and buried under ground with its top 1.2 m below the ground level. Water bodies near Motapung will be crossed by HDD.

The pipeline will have a normal operating pressure of 17.5 kg/cm². The pipeline will have the following equipment:

- **Engine Driven Compressor and Booster:** Centrifugal compressors will be installed at Baghjan end. Intermediate booster compressor may also be installed in pipeline route, if considered necessary.
- **Pig Launcher:** One no. Pig Launcher will be installed at Baghjan end (near Loc TP) for launching Pigs for cleaning inside of the pipeline.
- **Pig Receiver:** One no. Pig Receiver will be installed at near W/50 end to receive the pig launched at Baghjan end.

3.5.5 Project Cost Estimation

The estimated project cost is Rs. 78.51 crores.

3.6 100 MM NB BAGHJAN-MAKUM OCS CRUDE OIL PIPELINE (LENGTH 23 KM)

3.6.1 Preamble

One of OIL's newly discovered fields, namely, Baghjan Fields located in Tinsukia district of Assam is presently producing around 930 KLPD from its Early Production Set-up (EPS) having five producing wells. Baghjan field is a prospective field and a number of drilling wells are lined up. As per the internal estimate crude oil production of Baghjan area will increase to the level of more than 1500 KLPD in the near future.

Presently, crude oil is being evacuated by bowzers by deploying 80-84 bowser trips per day. It will go on increasing with the increase in oil production. However, transporting oil by bowzers from remote inside location on bad road is difficult and problematic job and is considered not viable. Hence, alternately pipeline transportation of the crude oil from the above remote location, is felt necessary.

3.6.2 Justification

Presently, bowzers (tankers) loaded with crude oil from Baghjan EPS is brought to Duliajan in Dibrugarh district of Assam through a distance of 75 km and unloaded in the Bowser Unloading Station of Duliajan for onward dispatch to Central Tank Farm (CTF). About 20 km of above route passes through interior of Baghjan area where road condition is very bad. Also, the area is considered to be a very difficult area because of frequent social problems like bandhs, road blockade, forcefully demand of money by local people etc. In view of above problems, bowser transportation of crude oil very often gets disrupted affecting crude oil production from the above area. Hence, to mitigate the above problem and to ensure uninterrupted transportation of crude oil from Baghjan Field, it is proposed to lay 100 mm NB pipeline from Baghjan (Near Loc TP) to Makum OCS through a distance of 23 km.

3.6.3 Site Location

The starting point of the proposed pipeline will be near Location TP (in Baghjan area) which is about 20 km from Doomduma Railway Station in Tinsukia district of Assam. The end point of the pipeline will be at Makum OCS which is in Makum township in Tinsukia district.

3.6.4 Description of Facilities and Plant & Equipment

The pipeline will be constructed with 100 mm NB bevel ended seamless pipes with their ends welded. The pipeline will be coated and wrapped and buried under ground with its top 1.2 m below the ground level. The pipeline will have the following equipment:

- **Engine Driven Reciprocating Pumps:** Two nos. Gas Engine Driven Reciprocating pumps for crude oil dispatch duties will be installed at

Baghjan end. (The pumps will be common for both the two crude oil dispatch pipelines).

- **Indirect Heaters:** Three nos. of Indirect Heaters will be installed at suitable intermittent places along the ROW of the pipeline to heat the crude oil of the pipeline to save it from congealing. (The heaters will be common for both the two crude oil dispatch pipelines).
- **Pig Launcher:** One no. Pig Launcher will be installed at Baghjan end (near Loc TP) for launching Pigs for cleaning inside of the pipeline.
- **Pig Receiver:** One no. Pig Receiver will be installed at Makum OCS end to receive the pig launched at Baghjan end.

3.6.5 Project Cost Estimation

The estimated project cost comes to Rs. 20 crores.

3.7 REQUIREMENTS OF LAND, MANPOWER, WATER, POWER, FUEL, STEAM AND TRANSPORT FOR NEW DEVELOPMENT PROJECTS

3.7.1 Land Requirement

Area-wise sites which will have to be cleared for construction of the projects are as under:

•	Baghjan-STF 200 mm NB x 45 km long COD Pipeline, Baghjan-CGGS & OTP 400 mm NB x 37 km long Gas Transmission Pipeline and Baghjan-Makum OCS 100 mm NB x 23 km long COD Pipeline	:	69.61 ha
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3.7.2 Manpower Requirement

Under normal operation, the project work force will consist of only 5 persons for Baghjan-STF crude oil pipeline, Baghjan-CGGS & OTP gas transmission and Baghjan-Makum OCS crude oil pipeline.

3.7.3 Water Requirement, Use Pattern, Waste Water Generation and Discharge

Water requirement for Baghjan-STF, Baghjan-CGGS & OTP and Baghjan-Makum OCS Pipeline will be negligible.

3.7.4 Fuel and Power Requirements

The power required for crude oil despatch pumps and natural gas compressor will be met by captive power generation facilities at Baghjan OCS. Baghjan – STF Pipeline (length 45 km), Baghjan-CGGS & OTP Pipeline (length 37 km) and Baghjan-Makum OCS Pipeline (length 23 km) will not require any power or fuel.

3.8 NORMAL OPERATIONAL POLLUTION SOURCES AND TREATMENT AND DISPOSAL OF POLLUTANTS

Construction and operation of new 45 km long 200 mm diameter Baghjan–STF crude oil pipeline, 37 km long 400 mm diameter Baghjan-CGGS & OTP gas pipeline and 23 km long 100 mm diameter Baghjan-Makum OCS crude oil pipeline will be buried underground with its top 1.2 m below the ground level using same right-of-way (ROW), hence, there will be no emissions or effluents during normal operation.

Periodic cleaning of pipeline by pigging operation may result in small amount of sludge generation. This sludge will be kept in a secured, covered impermeable concrete sludge pit located outside the proposed installations at a central place before safe disposal through MoEF/ PCBA approved registered recycler.

3.9 POTENTIAL ACCIDENTAL EVENTS

Due to strict observation of necessary safety requirements, chances of accident occurring at an installation are negligible. However, in all aspects of hydrocarbon transportation, there is always a risk of non-routine or accidental events occurring which may lead to an unwanted emission or impact. A brief account of these hazards, risk assessment, general safety measures and disaster management plan likely to be adopted is presented in **Chapter 6** of this report.

3.10 ANALYSIS OF ALTERNATIVES

3.10.1 Site Alternative

All the three pipeline will be constructed close to each other in the same right of way. OIL will take all necessary measures including safe distances from Borajan WLS, Bharjan WLS, Padumoni WLS and Dibru-Saikhowa National Park in consultation with District Forest Officer, Tinsukia Wildlife Division, to ensure that construction and operation of 3 pipelines do not cause and adverse impact on flora and fauna of Wildlife Sanctuaries and National Park.

The sites of new development projects in TD area are selected on the basis of appropriate techno-economic considerations as presented in **Sections 3.4 to 3.6** for the proposed installations.

3.10.2 Technical Alternatives

The approach to be adopted in executing the new development projects in TD area will be cost effective and environment friendly having suitable abatement and control measures.