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**Environmental Impact Assessment (EIA) study of  
exploratory oil well: A critical review**

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**Abstract**

Environmental Impact Assessment is a study of the effect of a proposed exploratory drilling project, plan or program on the environment. Exploratory drilling has a great impact on environmental component i.e. air, noise, land, water, biological and socio economic which will affect our ecosystem. But exploratory drilling wisely has greater impact on our country's economy and is helpful in socio-economic development of the region. India is heavily dependent on imports of crude petroleum to meet the rapidly growing demand for petroleum products. Current requirement and supply projections indicate that the level of self-sufficiency is likely to decline to about 30% over the next few years. Substantial efforts are therefore, necessary to increase the level of exploration activity in the country, so that latest finds can be made and the level of crude oil and gas production significantly increase in the years to come. It is also evident that vast amount of capital investments are necessary if exploration efforts are to be significantly augmented. Therefore, there is need to attract both the National as well as private sector oil companies to invest in this critical area. This paper briefly highlights on issues related with Environmental Impact Assessment (EIA) of exploratory drilling at national and international level.

Key-Words: Air, Biological, EIA, Exploratory drilling, Land, Water, Noise, Socioeconomic

**Introduction**

The major element involved in the process of environmental impact assessment is identification as it leads to other elements such as quantification and evaluation of impacts. Although, in general number of impacts can be identified while describing the project, all the impacts may not be considered significant. With this background, a New Exploration Licensing Policy (NELP) was formulated by the government in 1997-98 to provide a level playing field in which all parties could compete on equal terms for the award of exploration acreage.

Under the NELP VI one exploratory well is to be drilled as Ganga block under Block GV-ONN-2004/1, near Mahuar, tehsil Mau, District Mau in Uttar Pradesh for exploratory drilling. Depending upon the accomplishment of this well, the other wells in this block will be taken up.

ONGC being the operator of this block, has carried out the preliminary G & G studies undertaken. ONGC has decided to take up exploratory drilling to assess the hydrocarbon potential in the block. One exploratory site has been firmed based on G&G Studies and techno-economic evaluation of the project.

**Scope of EIA Study**

The scope of study includes detailed characterization of existing status of environment around the proposed exploration drilling site in Ganga block in Uttar Pradesh for various environmental components. It is envisaged the following :

- To evaluate significant impacts of proposed drilling operations on various environmental components.
- To evaluate present status of air, noise, water, land, biological and socio-economic components of environment.
- To evaluate pollution anticipation and control measures.

To mark out post-project environmental quality monitoring programme to be pursued by ONGC.

**Methodology of EIA**

Keeping in view of the nature of activities envisaged and environmental quality guidelines of Uttar Pradesh State and Government of India, the area around proposed exploration well site was studied for the

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purpose of environmental impact assessment studies. The Terms of Reference (TOR) for Exploratory Drilling In Block GV-ONN-2004/1 at Uttar Pradesh issued by the Ministry of Environment, New Delhi is given below:

The following are the Terms of References for preparation of On-shore EIA/EMP reports :

- Executive summary of a project.
- Project description and project benefits.
- Status and number of the wells which are completed and closed.
- Point-wise compliance report to the conditions specific in environmental clearance project.
- Point-wise compliance report to establish, operate and authorization for the existing units along with all the necessary annexure.
- Site details within 1 km of the each proposed well, any environment, any other installation/activity, flora and fauna, accessibility to site, other activities including agriculture/land, satellite imagery for 10 km area

#### **Environmental Impact Statement**

The impact statement focuses on the study area within block boundary of the proposed drilling sites. The 5 basic environmental components of concern are:

- Air Environment
- Noise Environment
- Water Environment
- Land Environment
- Socio-economic Environment

For each of the above components of environment, the impacts are identified through cause-condition network predicted through appropriate mathematical models and evaluated through environmental evaluation system.

#### **Air Environment**

The impacts on air emissions arising out of proposed activity are mainly due to construction activity, flaring and emissions from DG sets. These will have no adverse impact and it is anticipated that this will lead to marginal increase in SPM, NO<sub>x</sub>, etc. also the activity is temporary in nature. The prediction of impacts due to oxides of nitrogen and hydrocarbons which lead to secondary air pollutants is difficult, because of contributions from other existing industries and those coming up in that region. However, the impact of these parameters will be negligible from the proposed activity since the terrain is plain and sufficient amount of atmospheric mixing is available in that region.

#### **Noise Environment**

The impact of noise generated by the drilling on the general population is expected to be insignificant. On the basis of expected noise levels calculated through standard attenuation model, it is observed that the noise levels in the region would be within the standard limits (IS: 4954). The increase will only be marginal in comparison to the existing noise levels. The estimated background noise levels in the villages near the drilling site varied between 37.1 and 52.8 dB.

The impact of the noise on general population is therefore expected to be insignificant.

#### **Land Environment**

The proposed drilling activity will lead to temporary and minor soil erosion and loss of agricultural land.

#### **Water Environment**

No significant impacts on water quality are envisaged due to discharges of wastewater if properly treated as the baseline status show low dissolved solids, total hardness, chloride, sulphate, sodium, potassium and nutrients.

Groundwater quality around the drilling sites shows alkaline nature with a pH range of 7.5 to 8.2. The general quality of water is mineralized with phosphate and nitrate concentrations of groundwater are well within the prescribed limits.

#### **Biological Environment**

Vegetation in the vicinity of the drilling sites will not get affected by proposed drilling because of marginal change in ambient air quality. Re-establishment of crops by natural means is expected to adequately mitigate the impact due to emissions of pollutants.

#### **Socio-economic Environment**

The Proposed Exploratory Drilling Project activities in near Mahuar village would bring forth certain socio-economic impacts. Some of the impacts would be directly beneficial to the socio-economic environment due to employment potential, development in infrastructural facilities, whereas some of them would be of adverse nature.

The positive impacts due to proposed Exploratory Drilling project activities in the region would be:

#### **Positive Impacts**

- 70% respondents have favourable ranking about the proposed exploratory drilling project.
- Proposed project would help to fulfil the Oil and Gas demand in the industrial sector of the region which will ultimately improve the backwardness of the region
- Increase in job opportunities operational phase for the qualified and skilled as well as unqualified and unskilled people in the study

area will have distinctive impact on the socio-economic development of the region

- Enhanced infrastructure facilities, better employment opportunities the overall quality of life of the people will be upgraded
- Development in housing, medical facilities, market, education, power supply, transport and cultural in the study area
- The proposed project is expected to contribute to improvement of quality of life in the region.

#### Negative Impacts

- The project activity may disturb the Quality of air, land and water if not properly managed
- The project activity would create pollution in the area during the construction period if adequate care is not taken for pollution prevention
- Disturbance to human and wildlife, due to the vehicle and drilling equipment can create noise pollution in operation phase if proper abatement measures are not adopted
- Change in the socio-economic environment due to increased activities

#### Future scope

Environmental impact assessment is having a very useful practice in upcoming future because the developing countries are progressive towards a harmful and less health supportive future. The life sustaining measures are mostly required which can only be recovered by environmental impact assessment. As per the results of researchers the assessment is cumulating in the production of this report, the environmental statements (ES). It is the identification and evaluation of all significant, direct and indirect effects of the proposed development, during both construction and operation, on the environment. As it was introduced in 1994, where it was relied on institutional framework that has a strong supportive legislative, administrative and procedural setup. The new EIA notification 2006 and amendments to follow are projective steps that have been taken to launch only sustainable and carefully planned projects in the country. The new notification has certain drawbacks which are and will be addressed by bringing necessary amendment from time to time.

#### Conclusion

Environmental Impact Assessments study should lead to development decisions informed by knowledge of the range of potential environmental and social impacts—direct, indirect, interactive and cumulative. In order to save our ecosystem it is very necessary to a well planned drilling. Thus EIA plays a vital role in these situations. It tells how to exploit the natural

components for human with wisely, thus EIA has a great impact on a country development. It has been recognized that India is well in adapting legal provisions, which are very essential for further strengthening of the EIA process. Moreover, EIA process posses a basic structure including screening, scoping, comprehensive study, progress report, review, public participation, decision and follow up measures. Thus further recommend project level EIA needs and immediate attention but efforts should also be targeted to include environmental conservation concerns at policy and planning level. Such initiatives could help in filling up the gaps and coordination between various government authorities involved in planning and execution of the exploratory drilling of oil in our country.

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