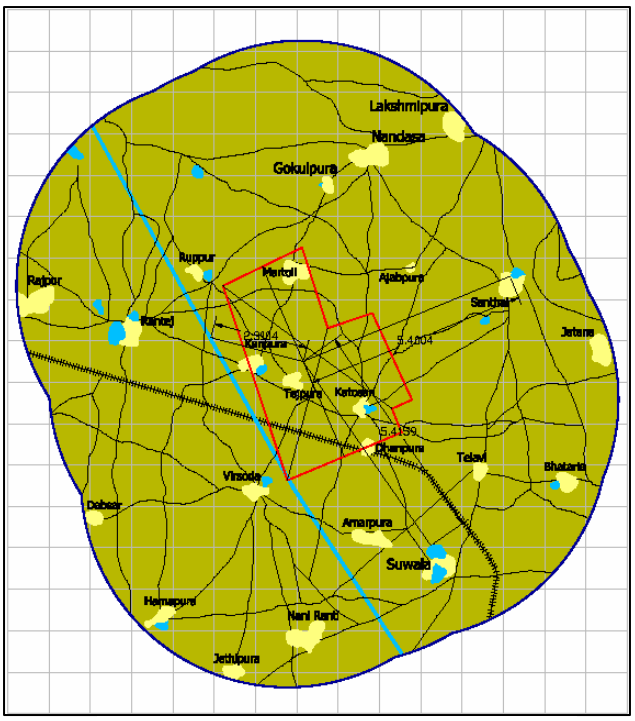
Environmental Studies for Drilling and Hook up of Infill Development Wells in Mehsana District of Gujarat State

Kadam Environmental Consultants (KEC) was appointed as Environmental Consultant by Hindustan Oil Exploration Company (HOEC) for carrying out environmental studies and procure Environmental Clearance (EC) for proposed drilling and hook-up of infill development wells in Asjol Block of Mehsana District, Gujarat.

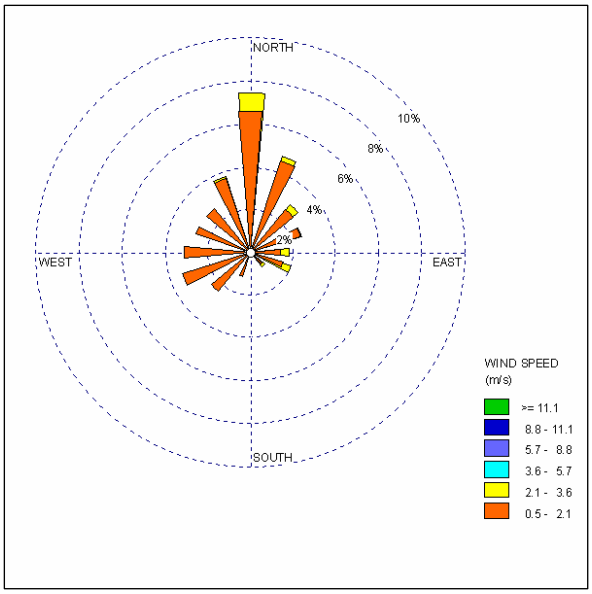
The project operations envisage expansion of the existing Asjol oil field by drilling and hooking up of 4 infill development wells in the vicinity of the well drilled earlier. Connecting pipelines from the well head (Approximately 4" pipeline of 0.3 to 0.8 km) to the existing EPS shall be laid. There is also possibility of drilling a number of wells from a single site, which increases the time during which the site is occupied and is termed as directional drilling or cluster well drilling. Some of the wells may be drilled horizontal also to improve sweep efficiency and in turn enhance production. This mode of drilling would also reduce the land used or 'foot print'.

Primary baseline environmental studies were carried out in winter season of year 2007/08 with respect to Meteorology, Ambient Air Quality, Noise Levels, Groundwater Quality, Surface Water Quality, Soil Quality, Terrestrial Flora and Fauna. Secondary data was collected and processed for landuse, hydrogeology, geology and terrain, soil type and socio-economic profile.

Plantations in the Study Area



Landuse Map of Study Area



Windrose

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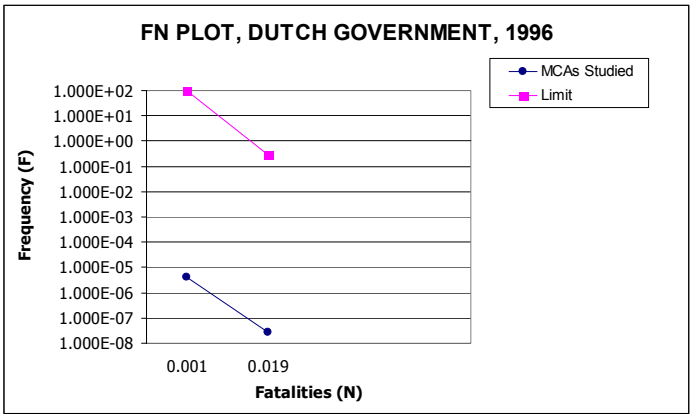
Risk assessment was considered using certain internationally recognized yardsticks for measuring risk.

- **ALARP**: ALARP, short for 'As Low As Reasonably Practicable' refers to acceptability of fatality risk per year, for employees. The region between the tolerable & acceptable region is known as the 'ALARP REGION' wherein efforts should be made to minimize risk. Risks are not acceptable above tolerating limits.
- Frequency (F) Vs Fatality Number (N) - The Dutch Government has developed risk curves, called the FN-Relationship curves that delineate the acceptability (or otherwise) of a series of consequences based on frequency and fatalities, on a graph.

IMPACTS DUE TO DRILLING OPERATIONS:

- Emissions from the Diesel Engines were analyzed for their impacts on the GLC using the Industrial Source Complex Short Term Model (ISCST3) of the USEPA. It was observed that the ambient air quality due to operation of diesel engines is not expected to cause an effect on human settlements in the vicinity of the drilling sites.
- The noise sources in a drilling well are scattered within an area of about 110 m x 110 m and drilling operations shall be carried out 0.5 - 1.0 km away from the human habitation. The noise level only during the drilling is of concern for occupational consideration. This noise is transient and will occur only for the duration of drilling operations.
- Drilling operations require the use of water for domestic requirements as well as for operations, but the use will be of temporary nature. Consequently the proposed drilling and hooking up activities will not cause water or ground water over-withdrawal, pollution or degradation. Characteristics of wastewater discharged from the HOEC's drilling/other operations shall meet the prescribed norms specified and no adverse impact is anticipated on the receiving water body.
- The possible major impacts on the land environment could be due to disposal of drilling mud reject in pits. Drilling mud is impermeable suspension of clay, which form an even more impermeable surface between the mud and native soils. As a result of these characteristics, the potential for leaching of constituents from mud pits is likely to be negligible. The vegetation loss during access cutting and site preparation can be mitigated by adequate afforestation in near-by wastelands.
- All the plants and animal species are commonly observed in the study area and do not include any rare or endangered species.
- The proposed drilling activities shall generate indirect employment in the region due to the requirement of workers in trail making, supply of raw material, auxiliary and ancillary works, which would marginally improve the economic status of the people.
- The existing loose/soft surface roads shall be upgraded to facilitate the movement of the heavy equipment required for drilling. This would lead to improvement in transport facilities in the project area.
- In the event that commercial quantities of hydrocarbon reserves are discovered, more long-term employment opportunities would be created. Besides, the hydrocarbons brought to the surface shall help in contributing the ongoing efforts of the government to meet the national demand of petroleum resources.



F-N curve for the proposed project lies below standard curve showing acceptable limit.

The proposal was scrutinized by the Ministry of Environment and Forest (MoEF) and MoEF has accorded environmental clearance for the proposed activities.