Shallow Gas Field Screening in the Mohall 100K Sheet, North Dakota

The investigation of shallow natural gas occurrences used a variety of correlation parameters and methods. The objective was to identify potential areas for future gas collection and analysis as well as to provide an overview of the occurrence of shallow gas in the area.

Materials and Methods

Data included the results of field surveys, water level measurements, water analysis, and gas detection using various methods. The study area includes a total of 133 wells, of which 25 were selected for field screening, including 10 nested wells.

A total of 83 water observation wells were selected to be sampled, and 10,000 ppm high and 8.3 mg/L low carbon dioxide (co2) were selected as the upper and lower limits of natural gas production. The criteria established for selecting wells for field screening were that they had to be water observation wells, and that the water level readings had to be taken continuously.

Results

The occurrence of FID responses are constrained by geological formations. Of the existing wells, 75% were found to be flowing at less than one gallon per minute, while 25% were found to be flowing at greater than one gallon per minute. Of these, 83% were found to have a gas concentration of greater than 20.6 ppm, with the remainder having concentrations of 0.0 ppm.

A total of 25 wells were surveyed and screened, including 10 nested wells. Of these, six responses were recorded, which included seven occurrences of natural gas at 8.3 mg/L.

The results suggest that natural gas production has developed in the area, with a possibility of future candidate observation well locations and or areas to conduct additional sampling and analysis and for field screening on all wells.

Geologic Symbols

- Existing observation wells
- Water level reading
- Water observation wells
- Natural gas
- Methane

Explanation

Additional information on the occurrence of shallow gas is included in Table 1. The data is separated into categories based on the depth of occurrence of gas and the type of occurrence. The data is presented in a tabular format, with columns for the depth of occurrence, the type of occurrence, and the associated information such as whether it is a natural occurrence or an occurrence due to human activity.

Other Features

- Existing observation wells
- Water level readings
- Water observation wells
- Natural gas

Other symbols include markers for roads, water bodies, and other features relevant to the study area. The map includes a legend with symbols for different features, and a scale bar for measurement.

References