Field Screening for Shallow Gas in Grant County, North Dakota

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The investigation of shallow natural gas occurrences within existing ground-water wells in Grant County, North Dakota was conducted over a three day period from August 3 to 5, 2009. A total of 86 well sites were visited prior to the field component of this investigation. Of these, 79 wells sites, consisting of historic and existing observation and stock wells, were selected to be visited in the field in order to (1) determine the actual existence of the well, (2) to verify its location, and (3) perform flame-ionization detector (FID) field screening for possible shallow natural gas occurrences. 18 well sites (16 observation and two stock wells) were verified to have a ground-water observation well at their prescreened location and were subsequently field screened. 29 wells were not found at their prescreened location in the field and were presumed abandoned or destroyed. A few wells were not visited due to access or time constraints. Each of the wells selected for field screening were abandoned or destroyed. The investigation of shallow natural gas occurrences within existing ground-water wells in Grant County. FID results for each well are presented in order of field screening occurrence from top to bottom. Values shown are those reported from the ground-water/air interface (GWI) (as CH4 in ppm). The concentration of methane typical in commercial natural gas is highlighted by the vertical green line at 75%.

Figure 1. Graph depicting the relative relationship and absolute maximum values of flame-ionization detector (FID) instrument responses from shallow wells in Grant County. FID results for each well are presented in order of field screening occurrence from top to bottom. Values shown are those reported from the ground-water/air interface (GWI) (as CH4 in ppm). The concentration of methane typical in commercial natural gas is highlighted by the vertical green line at 75%.

Explanation

Geologic Symbols

- Existing observation well with a positive numerical FID instrument response in parts per million (ppm) as methane, at the top of casing (TOC) and/or the ground-water/air interface (GWI). (S) indicates stock well.
- Existing observation well, no FID response at TOC and/or the GWI.
- Historical observation well described. No existing well at well site location visited. Well presumed abandoned or destroyed.
- Wells sites not visited during this investigation.
- Newly added/fitted at some locations.
- Indicates number of wells drilled at same coordinates.