GEOLOGICAL SURVEY OF CANADA
OPEN FILE 7335

Fluid and gas analyses of formation waters in the Mackenzie Corridor

S.E. Grasby, L. Yang, K. Hu

2013

Natural Resources Canada | Ressources naturelles Canada

Canada

GEOLOGICAL SURVEY OF CANADA
OPEN FILE 7335

Fluid and gas analyses of formation waters in the Mackenzie Corridor

S.E. Grasby, L. Yang, K. Hu

2013

doi:10.4095/292554

This publication is available for free download through GEOSCAN (http://geoscan.ess.nrcan.gc.ca/)

Recommended citation
Grasby, S.E, Yang, L., and Hu, K., 2013. Fluid and gas analyses of formation waters in the Mackenzie Corridor; Geological Survey of Canada, Open File 7335, doi:10.4095/292554.

Publications in this series have not been edited; they are released as submitted by the author.

Abstract
Petroleum fluid test results from wells drilled in the MacKenzie Corridor derived from well history reports are compiled into a digital data format. These include formation pressure tests, temperature, as well as formation water and gas geochemistry.

Introduction

Data derived from fluid and gas analyses in petroleum wells drilled in the Mackenzie Corridor were only available in paper copy from well history reports submitted to the National Energy Board. All available public reports have been examined and fluid test result data have been digitized and compiled into this single database. Additional data sources were used to constrain well location, well ID, and formation tops, principally the Geological Survey of Canada in-house database (SAMS). SAMs includes a compilation of data from a variety of sources and offers either additional data not found in the well history reports or some times contradictory data.

The resultant digital database includes a compilation of formation, pressure, temperature, and fluid analyses (gas chemistry, oil, water chemistry). A total of 2560 analyses data from 1061 wells in the Mackenzie Corridor are presented. There were no DST for 648 additional wells on record.

Database Structure

The *.xls file include the following data fields:

1. WELL ORDER (a number assigned to each well for sorting purposes – multiple test from the same well will have the same sorting number)
2. UWI: Unique Well Identification
3. SHORT NAME
4. TD: Total Measured Depth (three columns: first is reported data in feet, second is feet converted to metres, third is reported data in metres).
5. TEST TYPE: DST-Drill Stem Test
6. TEST NO. : Test Number
7. TEST INTERVAL: Including:
   - TOP_Depth (reported depth in feet/feet converted to metres/ reported depth in metres),
   - BOT_ Depth-Bottom Depth (reported depth in feet/feet converted to metres/ reported depth in metres),
   - RUN _Depth(metre/feet);
8. FORMATION (formation tested):
   Including TOP_FM –Top Formation and BOT_FM-Bottom Formation;
9. FLOW RATE AND RECOVERY:
   Including GAS FLOW, OIL FLOW and WATER FLOW
   (reported depth in feet/feet converted to metres/ reported depth in metres)
10. PRESSURE
    (1) Measured Pressure:
    Including Initial Shut In Pressure in psi and kpa, Final Shut In Pressure in psi and kpa; (I.F.B.H.P.) Initial Flowing Bottom Hole Pressure in psi and kpa, (F.F.B.H.P) Final Flowing Bottom Hole Pressure in psi and kpa; (I.H.P.) Initial Hydrostatic Pressure in psi and kpa, (F.H.P.) Final Hydrostatic Pressure in psi and kpa;
    (2) Extrapolation Pressure: Including Extrapolation of Initial Shut In Pressure in psi and kpa, Extrapolation of Final Shut In Pressure in psi and kpa;
    (3) Pressure from SAMs: Including Initial Shut In Pressure in kpa and Final Shut In Pressure in kpa; Initial Flowing Bottom Hole Pressure in kpa and Final Flowing Bottom Hole Pressure in kpa;
11. TEMPERATURE
    Including Measured Temperature in ^{0}F/ converted to ^{0}C/measured in ^{0}C;
12. WATER ANALYSES:
    Including Report Number, Sample Interval, Salinity, pH, H_2S, Na+K, Na, K, Ca, Mg, Ba, Sr, Fe, Cl, B, Br, I, HCO_3, SO_4, CO_3, CO_3/HCO_3, OH, By Evap (By Evaporation), At Ignition, Sp.Gravity (Specific Gravity),

RW. Reported depth in feet/feet converted to metres/ reported depth in metres). Concentrations reported in original units (mg/L, g/m^3/ppm).

13. GAS ANALYSES in mol %
    Including Report Number, H_2,He, N_2, CO_2, H_2S, O_2, AIR, C_1(methane),C_2(ethane), C_3(propane), IC_4(isobutane), C_4(butane), IC_5(isopentane), C_5(pentane), C_6(hexane), C_6+(hexane plus), C_7(heptane), C_7+(heptane plus), C_8(octane), C_9(nonane), C_{10}(decane), C_{10}+(decane plus)
14. Comment

Notes:
(1) Abbreviated words: PRES=present, N/D=Not Detected, ABS=Absent, N.A.=Not analyzed, Nil=0;
(2)All of original Imperial measurements have been converted to SI Units

Fluid Chemistry

Geochemical results from petroleum wells are subject to numerous potential errors and data have to be examined carefully to avoid potential spurious results from contamination. After culling suspect data there are 523 samples with reasonable water chemistry results. These data show a wide range of reported salinities ranging from 113 to >303,000 mg/l. Only low salinity waters occur at the shallowest levels, but deeper than ~500 m the full range of salinities are observed. The majority of waters are Na-Cl type, while Ca-Cl brines and Na-SO_4 waters are also observed.