Stim-Lab Inc.

Fluid Sensitivity and Shale Stability Report for Heartland Energy Group Ltd., Eagle Ford Shale

Prepared by:
Michael Conway, Ph. D.
David Whaley
Stim-Lab, Inc.

SL10156

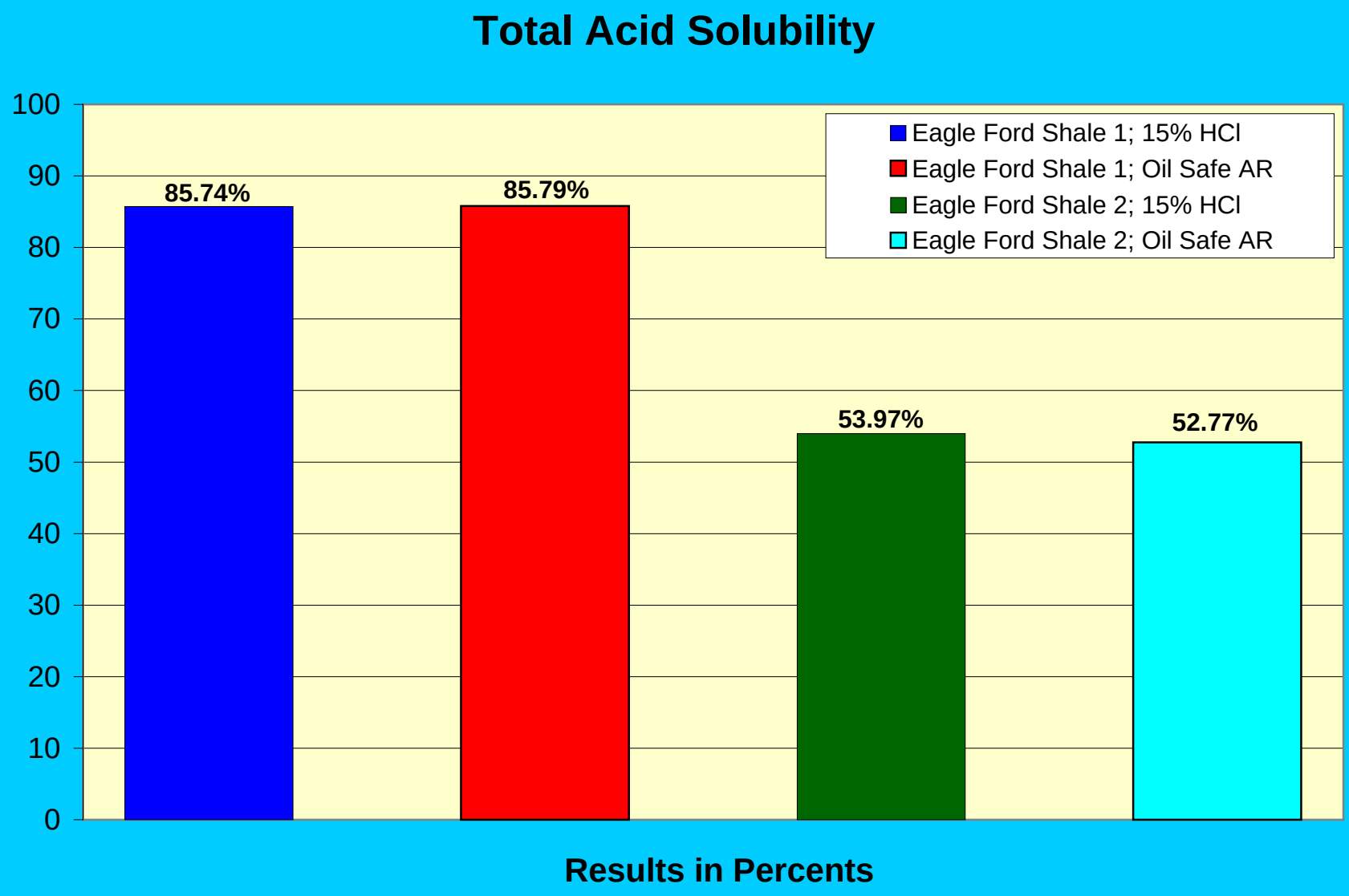
June 2012

Acid Recipe for Solubility Testing

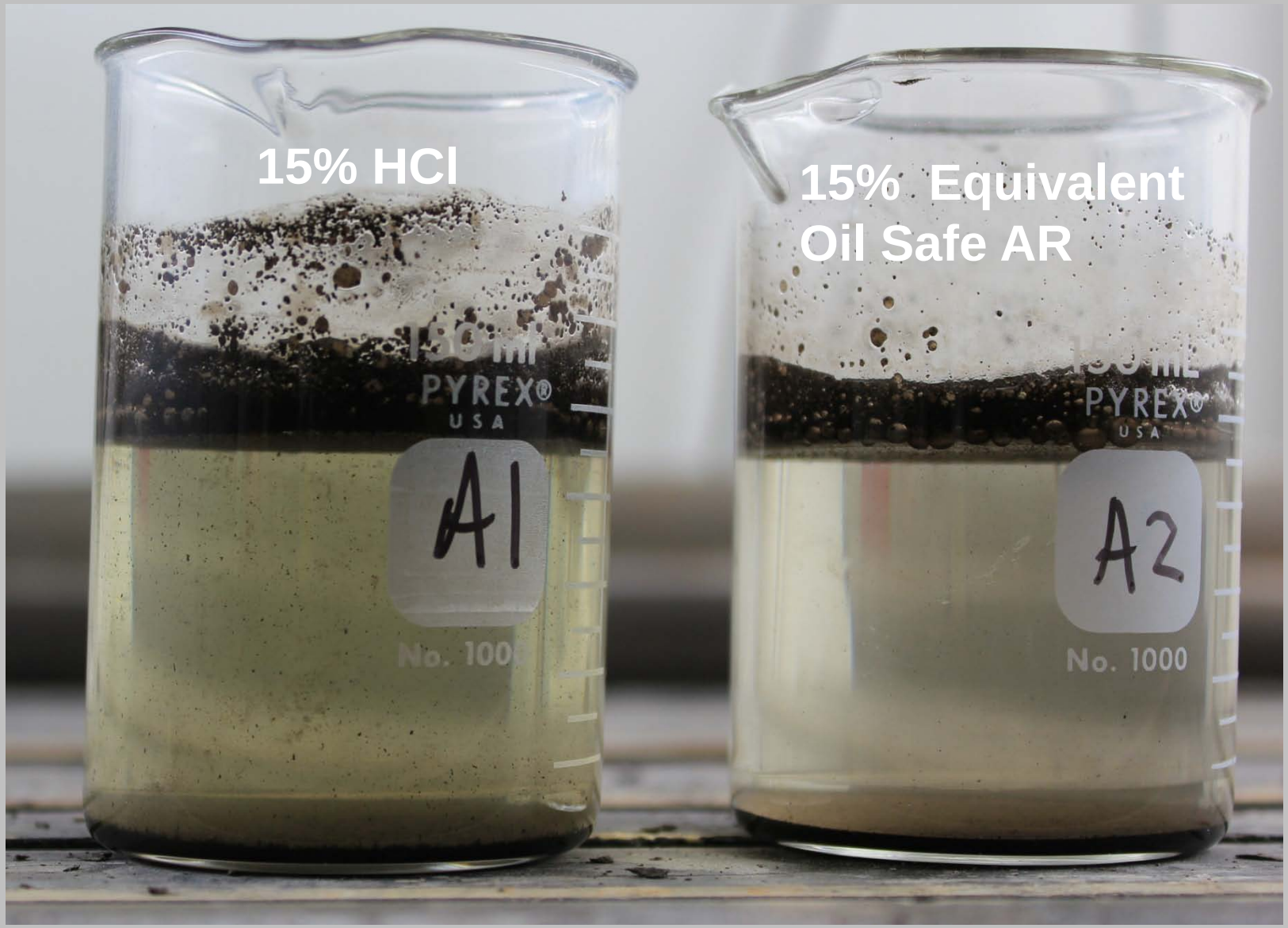
- **The samples were tested in the following:**
  - **15% HCl**
  - **Oil Safe AR**
    - **Acid substitute**
    - **Mixed at a 1:1 ratio with DI water**
    - **Provided by the client**
- **Mineralogy**
  - **On Sample juxtaposition to the this to sample**

Volume % Mineralogy (Includes TOC as Kerogen)	Shale Sample 1	Shale Sample 2
Quartz	5.0	4.6
Plagioclase	1.5	0.0
Feldspars	1.5	0.0
Calcite	87.2	89.7
Pyrite	0.3	0.4
Pyrite/Marcasite	0.3	0.4
Illite/Smectite *	2.2	1.9
Illite & Mica	1.1	1.1
Kaolinite	0.0	0.1
Chlorite	0.0	0.5
Kerogen	2.6	1.6
Total	99.9	99.9
Vclay	3.3	3.6
Calc. G.D. (g/cc)	2.675	2.691

Total Acid Solubility in the Eagle Ford Shale



Example of Post Test Samples for Shale 1



Conclusions

- **Total Acid Solubility**
  - **In both Eagle Ford the results were very similar between the HCl and the Oil Safe AR solutions**
    - **Sample 1 demonstrated a mass loss of ~ 85%**
    - **Sample 2 indicated ~53%**