

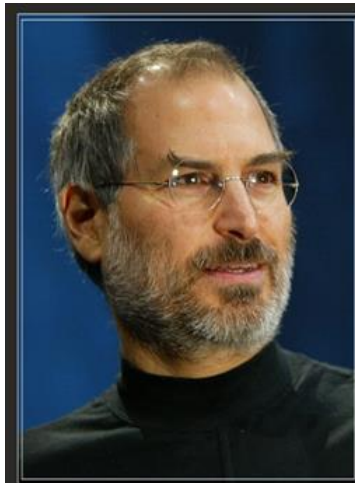


DIVERSIFIED GAS & OIL
CORPORATION

Plugging Modifications
Discussion
September 21, 2020



Who better than Steve Jobs to encourage innovation...?



MR

Innovation distinguishes between a leader and a follower.

”



MR

But innovation comes from people meeting up in the hallways or calling each other at 10:30 at night with a new idea, or because they realized something that shoots holes in how we've been thinking about a problem.

”

Innovation is the ability to see change as an opportunity - not a threat

Steve Jobs

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- **Agenda**

- Describe the opportunity
- Review the proposal
- Establish next steps
- Q & A

- **West Virginia DEP participants**

- Austin Caperton, WVDEP Cabinet Secretary
- James “Marty” Martin, Director of the Office of Oil and Gas

- **Diversified participants**

- Brad Gray, Chief Operating Officer
- Ben Sullivan, General Counsel
- Jeff Mast, Production & Plugging Director

- **Industry expert**

- Mike McCown

- **Government affairs consultant**

- Larry Puccio



- **Simply stated...effective process, less disruption, lower costs**
- Proven, safe and effective plugging procedures
- Less interference, disruption and impact to surface owners
- Less traffic and road usage by heavy trucks
 - Less road wear and tear
 - Lower emissions
- Less time on well pad lowers risk of safety incidents/accidents
- Lowers project cost by reducing number of project hours/days
- Lower project costs generates opportunity for other operators and state agencies to plug additional wells
- Lower project costs creates incentives for other operators to fulfill obligations

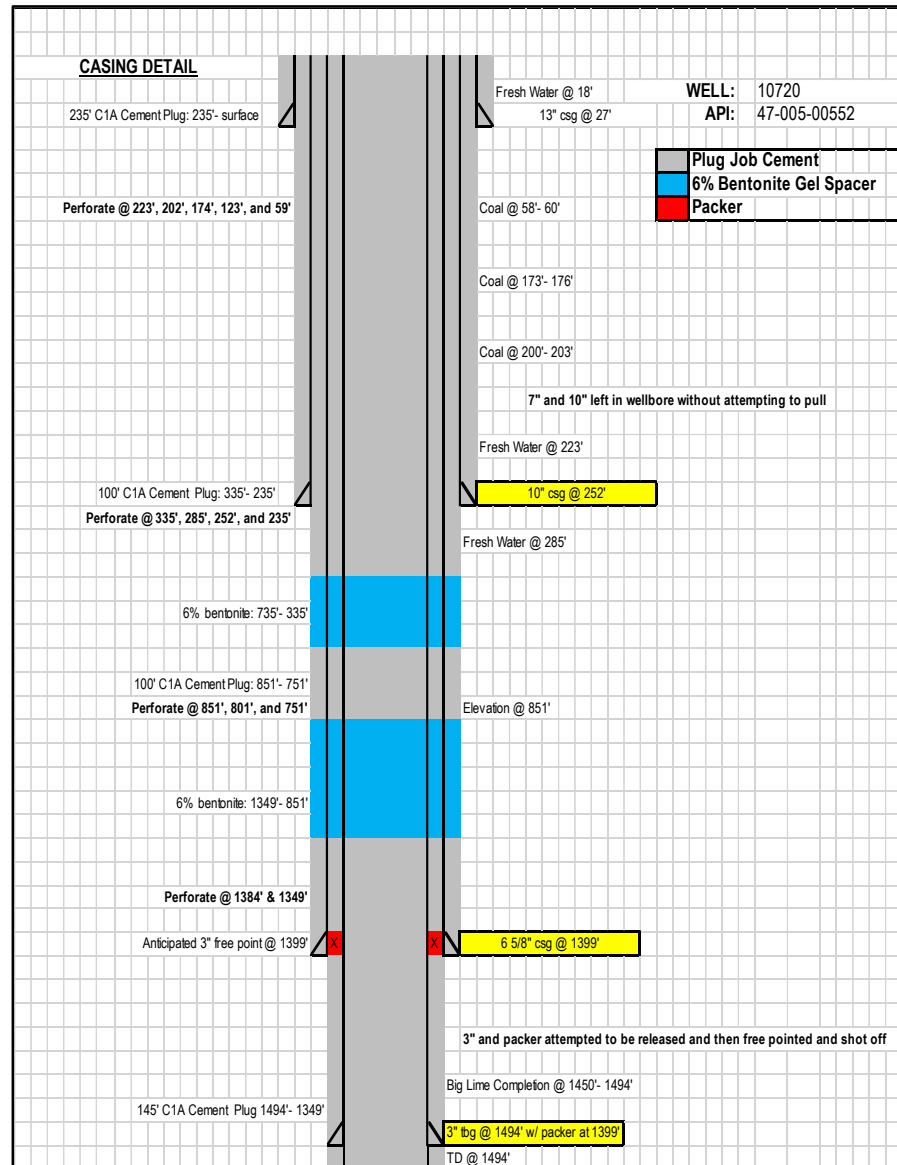


- **Two primary well types**
 - Non-modern construction - *Older wells that were drilled prior to modern regulations. Effectively, regulations in place at time of non-modern well construction did not require cement to surface in structural casing pipe in order to provide further protection to water and coal areas.*
 - Modern construction – *Newer wells drilled under modern regulations that require cement to surface in open areas around all structural casing pipe which is designed for the protection to water and coal areas.*
- **Non-modern well plugging proposal...simply stated**
 - ✓ Pull production casing, regardless of diameter (DGOC change from initial proposal)
 - ✓ Perforate (shoot holes) in multiple casing strings VS. current regulations requiring ATTEMPTS to pull casing pipe (see example – the 10” and 6 5/8” casing)
 - ✓ Fill well bore to total depth with combination of cement and bentonite gel
- **Modern well plugging proposal...simply stated**
 - ✓ Production casing string remains in well bore because all other casing pipe is cemented to surface due to modern construction requirements
 - ✓ Perforate (shoot holes) in multiple casing strings VS. current regulations requiring ATTEMPTS to pull casing pipe (see example – the 9 5/8”, 7” and 4 1/2” casing)
 - ✓ Fill well bore to total depth with combination of cement and bentonite gel

Non-modern well...A picture is worth thousand's of \$'s



- Non-modern well construction
- Note amount of cement used during plug project (light gray)
- 3" production tubing is removed (change from prior proposal)
- Perforate the 6 5/8" and 10" casing
- Cement required zones to surface, supplement with gel spacers
- Effective plugging project complete





§22-6-24. Methods of plugging well.

General Requirement

- Recover Casings and Tubulars.
- Cement Plugs - oil, gas, salts, workable coal, fresh water strata.
- 6% Gel between plugs.
- Tag plugs as necessary.
- Surface Cement Plug.
- Install Monument with API PERMIT ID (height 30 inch minimum).

Placement of Cement Plugs

- Bottom Wellbore Plug.
- 100 Feet Cement Plugs Minimum.
- Any Oil and Gas Bearing Strata.
- Across Casing Cuts.
- Above shallowest Salt Bearing Strata.
- Workable Coal Strata (twenty inches).
- Fresh Water Bearing Strata.
- Surface Plug.

Coal Protection Strings (Casing-Annulus Cemented)

- 100 Feet Expanding Cement below Coal Protection String.
- Coal Protection String remains (vent or 'coal degas' purpose).
- Well Left for Vent or De-Gas Purposes.

Coal Protection Strings (Casing-Annulus Open)

- Recover Coal Protection String.
- Cement across Coal Strata.
- Surface and Fresh Water Strata plugged.
- Install Monument.

§35-4-13 PLUGGING, ABANDONMENT, and RECLAMATION

§35-4-14 PLUGGING METHODS

Proposed Next Steps



- Establish a pilot program for DGOC to select 10 wells to plug using proposed procedures
- WVDEP to assign one dedicated inspector to work with DGOC on all phases of the pilot program
- Start pilot program to begin in 2021 with potential to complete 1-3 wells during Q4 2020 (weather dependent).
- In 2021, confirm pilot program assumptions for plugging effectiveness and cost reductions
- In 2H 2021, work with WVDEP to modify regulations based on successful pilot
- Modified regulations officially in place 1/1/2022

Questions?

THANK YOU for the opportunity to
INNOVATE for the benefit of West Virginia!



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