



Undeniable Diverison:

Completing Wells More Efficiently with SlicFrac™

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Thru Tubing Solutions

Diversion Technology - Background

- Diversion Outside Casing (far field, etc)
 - Rock Salt, Naphthane, ...etc.
 - PLA (Poly Lactic Acid) flakes, granules, beads, etc.
 - Other
- Diversion Inside Casing (near field, etc)
 - Frac Balls
 - Ball-Sealers
 - Coated Frac Balls
 - **SlicFrac™ Perf PODs**

What is SlicFrac™?

SlicFrac is a new patented technology that selectively diverts the frac to untreated formation, efficiently increasing the stimulated reservoir volume.

Benefits:

- Intra-wellbore diversion
- Maintain near-wellbore frac
- Reduce or eliminate plugs and all associated time and costs
- Improve frac efficiency
- Minimize risk of frac hits on neighboring wells



What are Perf Pods™?

Perf PODs are perforation plugging devices that can be deployed in a wellbore to efficiently attach to and block perforations; sealing irregularly shaped holes. Perf PODs selectively plug perforations that are taking the most fluid.



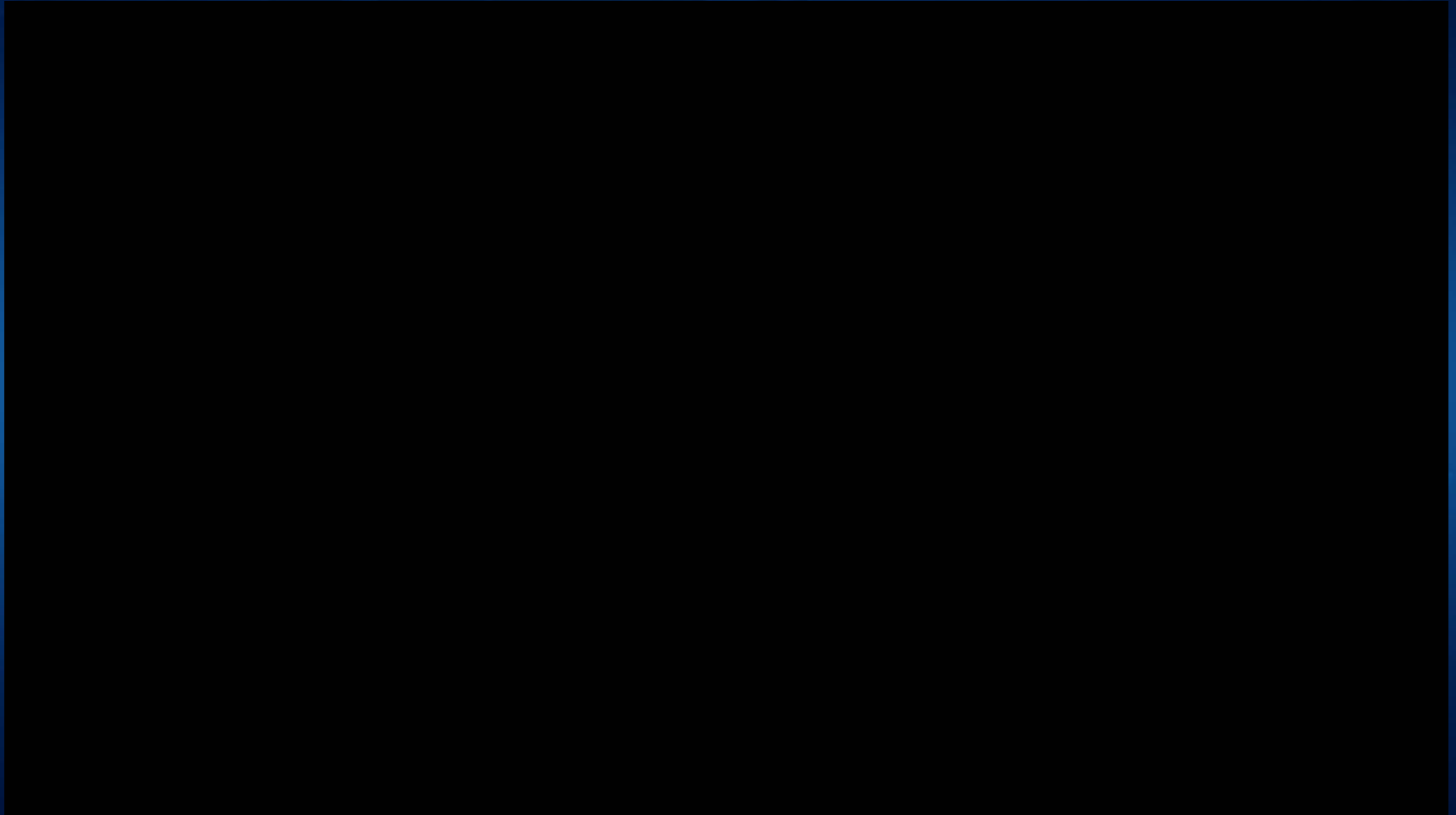
Specifications:

- Pressure Rating – up to 10,000 psi
- Millable or Self Degrading versions available
- Acid Resistant PODs available for chemical diversion
- “Packaged” in frangible shell for precise surface deployment or launched downhole via Wireline Deployment Tool.

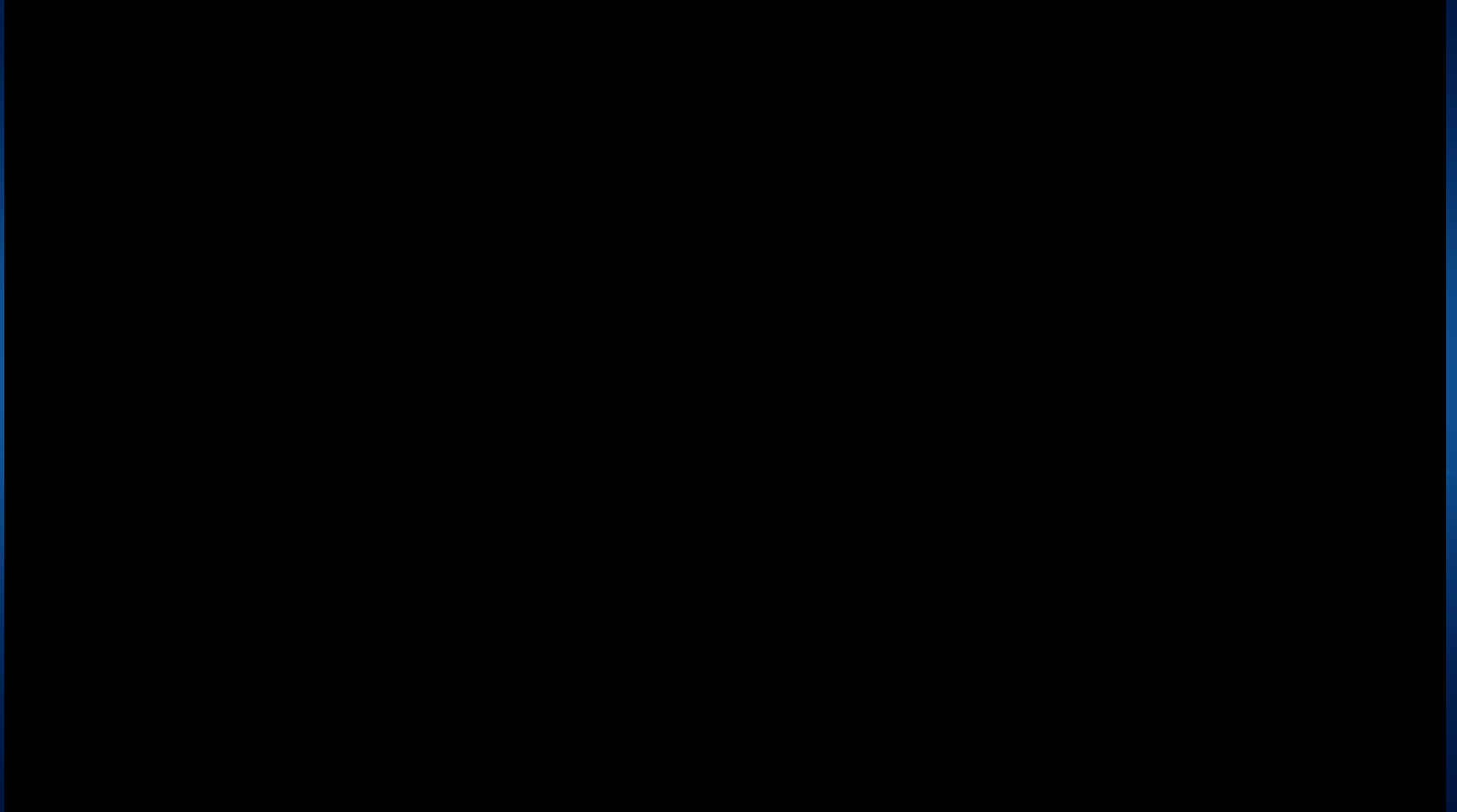


SlicFrac Diversion Test (0.42" perf holes)

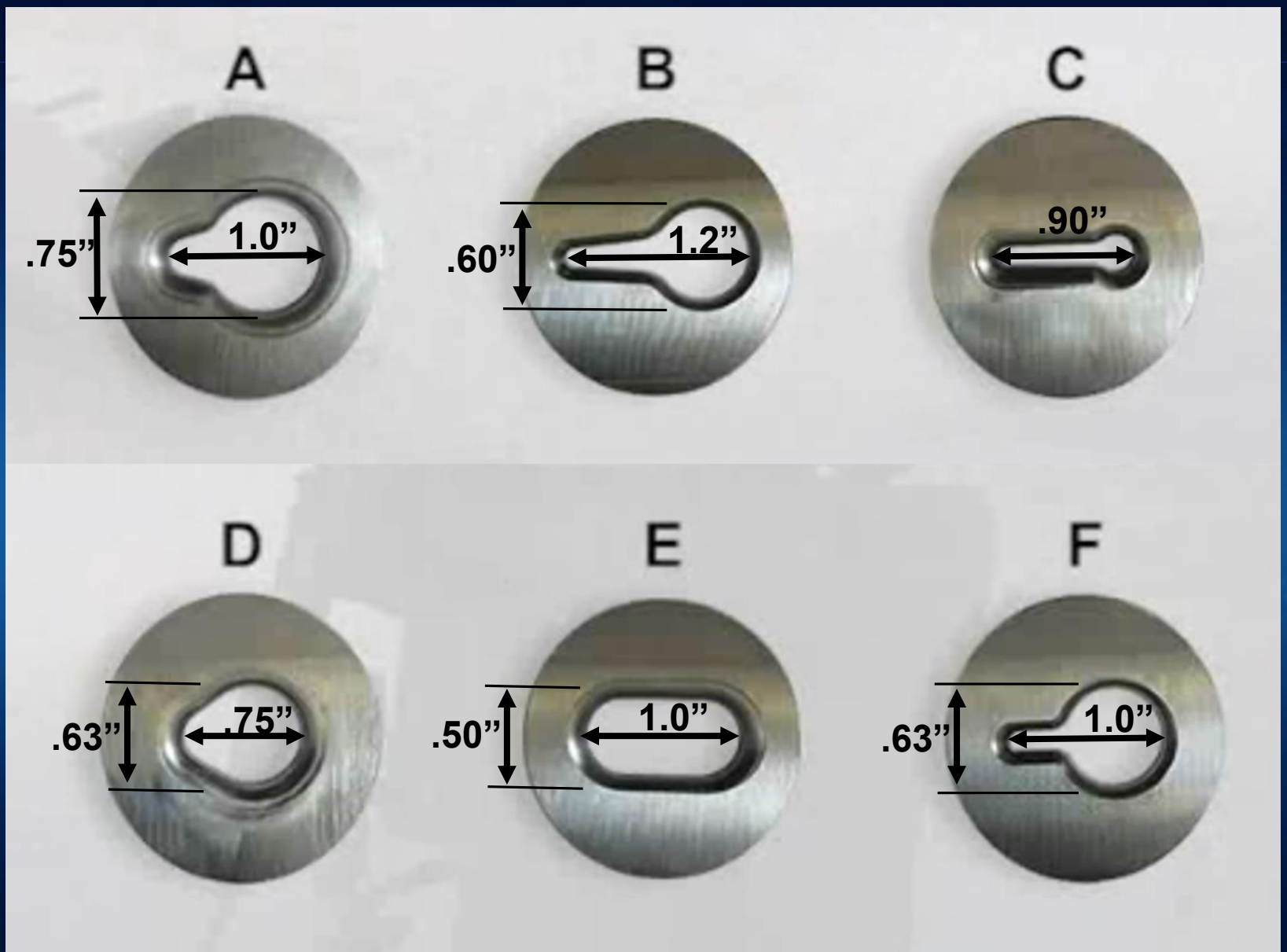
Utilizing 3,000 psi burst discs to simulate diversion



SlicFrac Diversion Test (varied hole sizes)



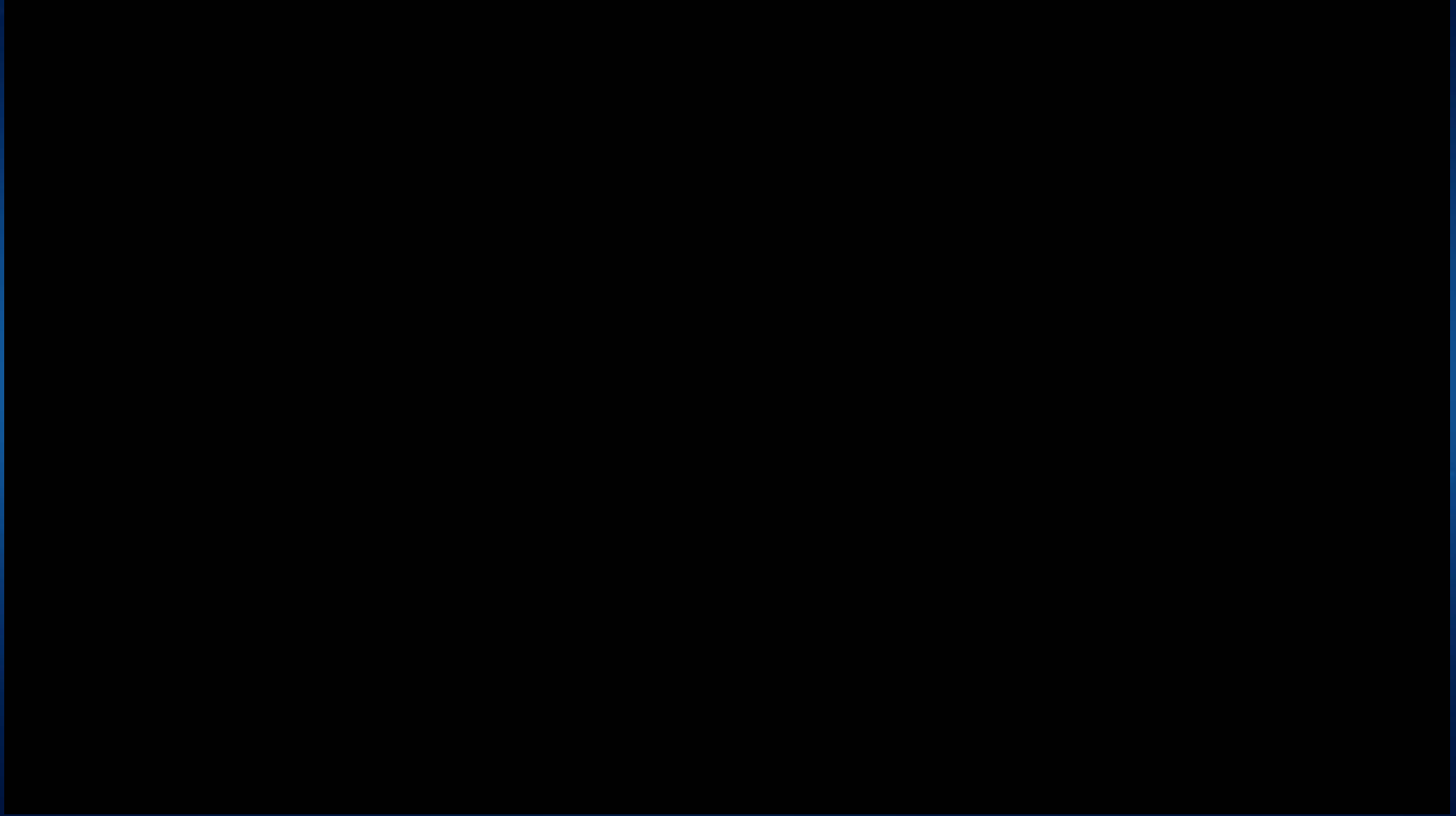
SlicFrac Irregular Perforations



SlicFrac Irregular Perforations



Self Degrading POD



Degradation charts available for specific operating parameters



SlicFrac™ Field History



- 1150+ Total SlicFrac™ jobs completed
 - 150+ Refracs
 - 60 Vertical wells w/ new perforations added after initial frac
 - 9 Horizontal wells containing open sleeves
 - 1 Horizontal well containing swell packers
 - 900+ New Completions
 - Mid-stage diversion
 - Plug elimination
 - WL deployed Perf PODs
 - 25+ Chemical Diversion
 - Stimulate down production tubing or annulus
 - Degradable Perf PODs maintain integrity with chemicals

Case Study No. 6202

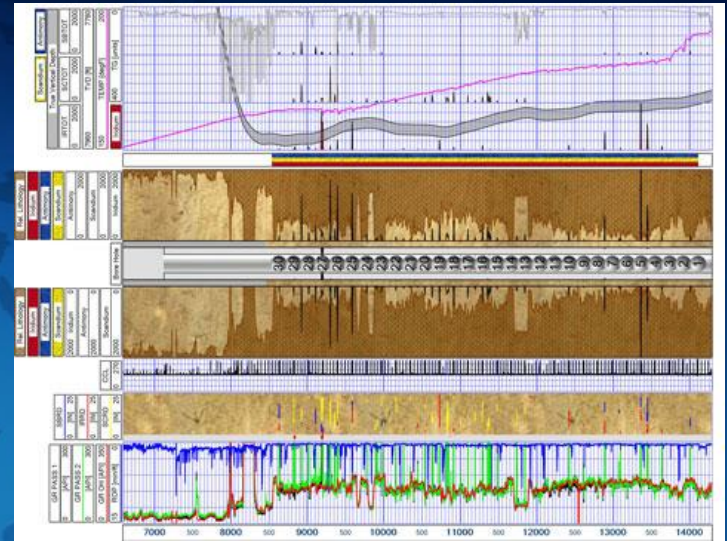
SlicFrac Diverts Multistage Sleeve System for Successful Re-Frac

DETAILS:

- Formation: Bakken
- Operation Depth: 13,710' – 14,400'
- POD Type: PCL-Large Millable PODs
- Type of Operation: Horizontal Re-Frac

RESULTS:

- Added new perforations between existing sleeves
- Same Perf PODs were used to plug sleeves and new perforations
- Radioactive tracer showed diversion throughout entire lateral with stimulation to sleeves and new perfs



Click to enlarge...



Case Study No. 6202

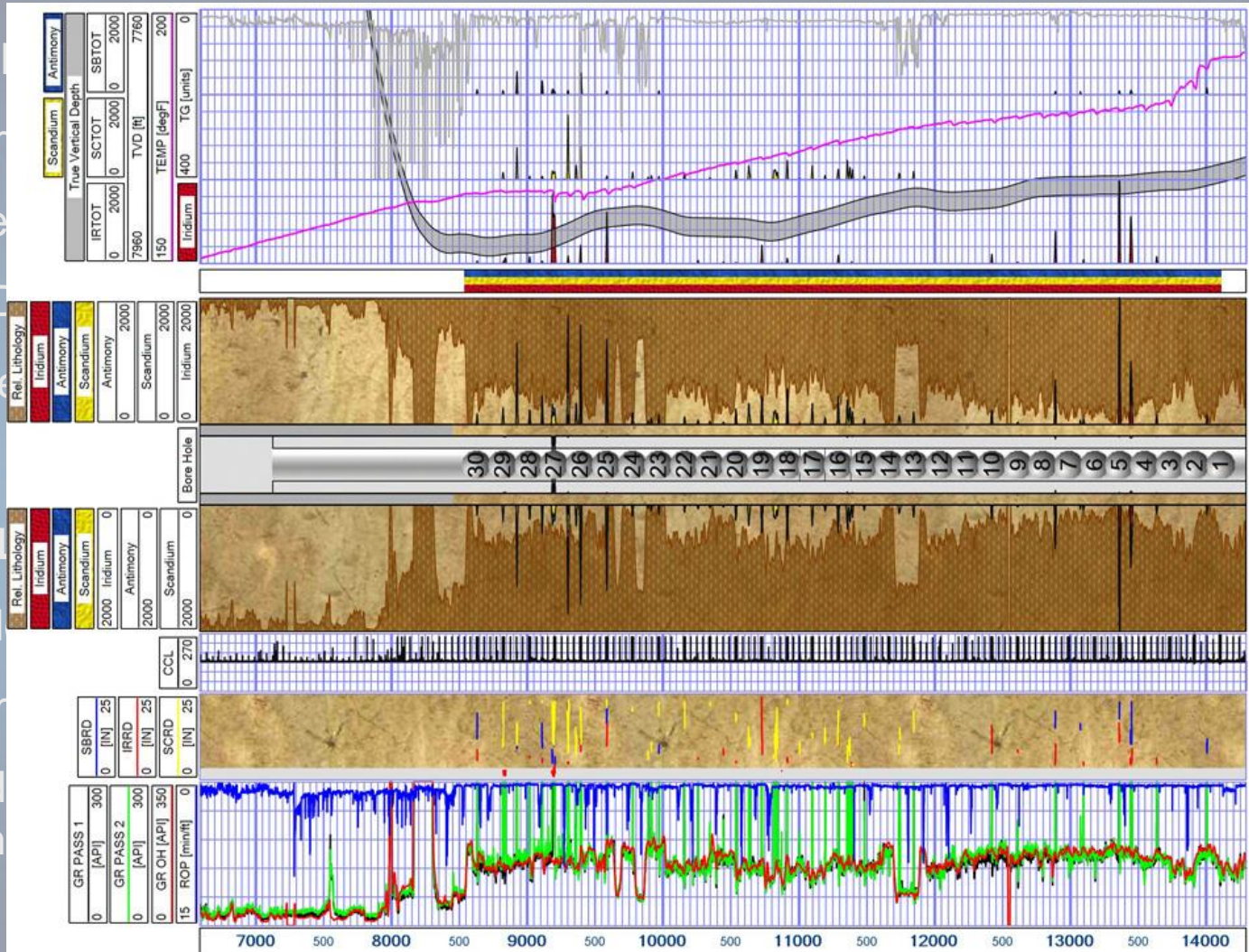
SlicFrac Diverts Multistage Sleeve System for Successful Re-Frac

DETAILS

- Form
- Oper
- POD
- Type

RESULTS

- Add
- Sam
- Rad
- stim



Case Study – Cottage Grove Formation, Custer County, OK

■ New Well – Plug n' Perf Style Diversion Frac

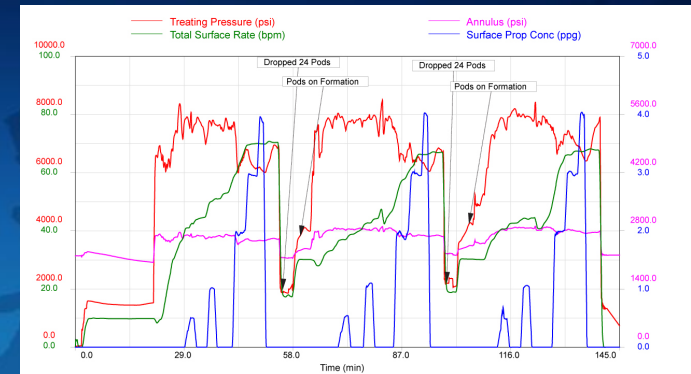
- E-Line to set plugs and perforate
 - 72 perforations per stage
 - 12 stages
 - 50% bridge plugs eliminated
 - PODs used to optimize frac

■ PODs used for diversion frac on every stage

- Millable PODs
 - 10,000 psi differential rating
- Multiple smaller POD drops each stage to maximize diversion

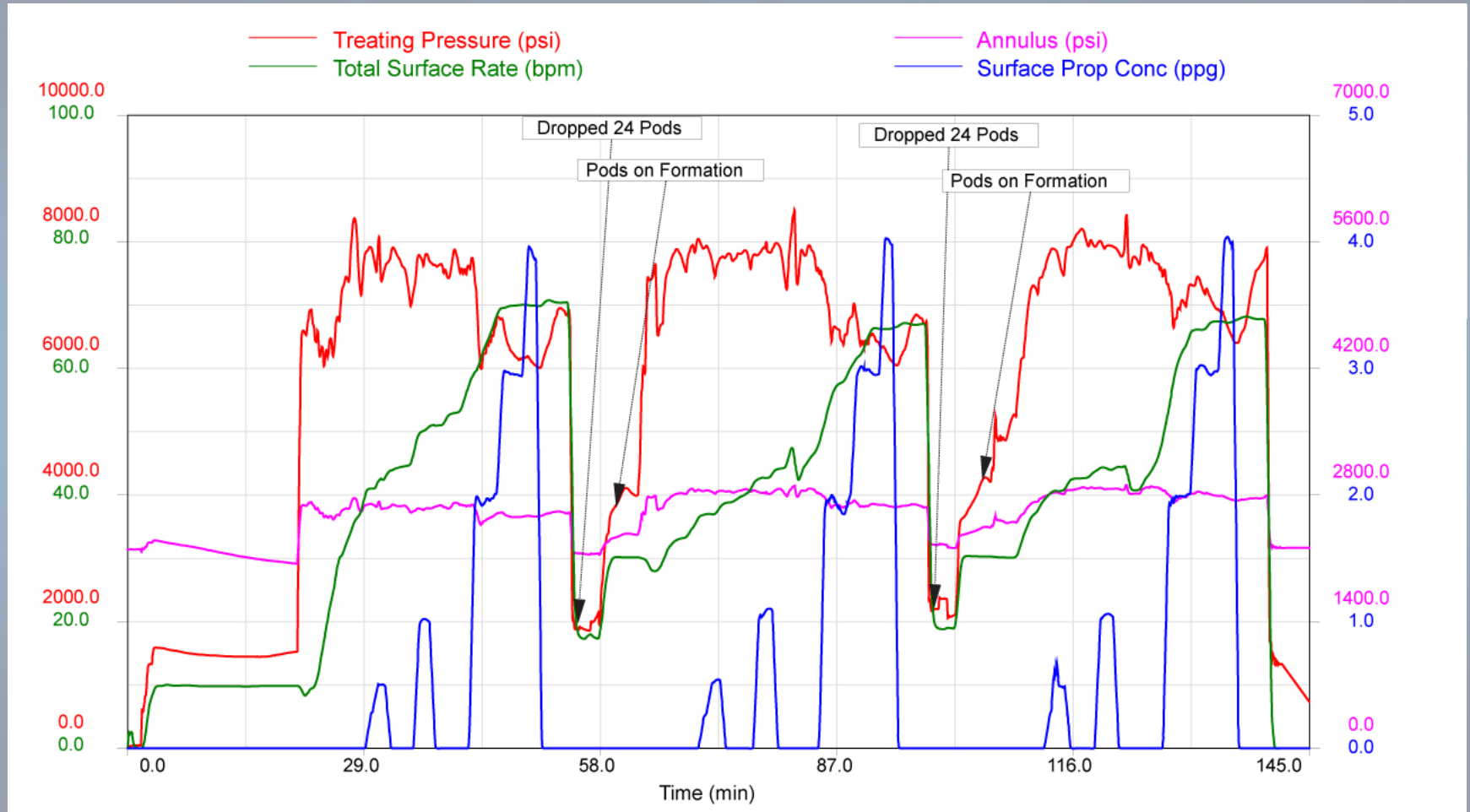
■ Removal of PODs

- Milling assembly used to drill bridge plugs and clean to TD



Click to enlarge...

Case Study – Cottage Grove Formation, Custer County, OK



Case Study No. 6205

Eliminate Plugs with Wireline Deployed PODs and Mid-Stage Diversion

DETAILS:

- Formation: Woodford
- Operation Depth: 14,800'
- POD Type: Bio-Rez Lo Degradable PODs
- Type of Operation: Pod 'n' Perf™

Eliminated
89%
of Plugs

RESULTS:

- Minimized number of bridge plugs deployed
- Maintained customer's planned stage spacing and cluster volume
- PODs deployed via wireline tool and from surface for mid-stage diversion
- The post frac cleanout consisted of milling out 2 bridge plugs



Case Study No. 6206

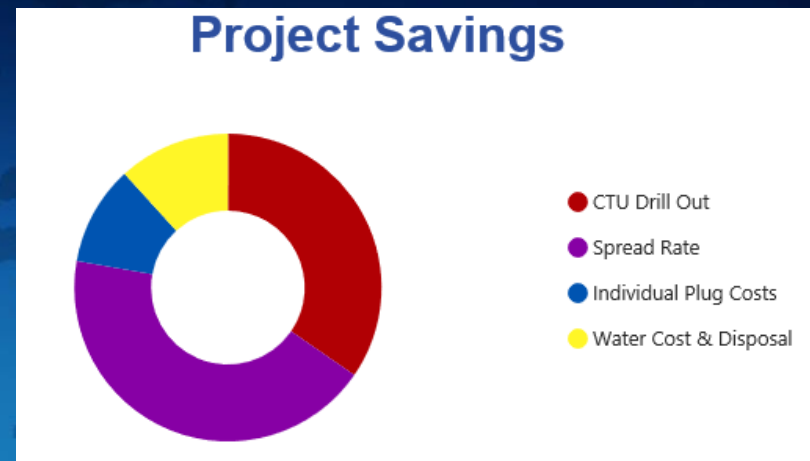
Eliminate Bridge Plugs using Mid-Stage Diversion

DETAILS:

- Location: Anadarko Basin
- Formation: SCOOP/STACK
- Operation Depth: +/- 21,600 ft
- Well Orientation: Horizontal
- POD Type: Bio-Rez Lo (150F)
- Type of Operation: Mid-Stage Diversion | Plug Elimination

RESULTS:

- Combined 3 stages between frac plugs
24 Perfs -> 72 Perfs
- Perf Pods used for mid-stage diversion
- Reduce overall costs for all associated services



\$400,000+

Case Study No. 6207

Eliminate 54 Frac Plugs for Full Well Diversion

DETAILS:

- Location: Northern DJ Basin
- Formation: Codell
- Operation Depth: 10,000 ft lateral
- Well Orientation: Horizontal
- POD Type: Bio-Rez Hi (175F)
- Type of Operation: Full Well Diversion | Plug Elimination

Results:

- Completed stage by stage, as per design
- Zonal Isolation replaced with Perf Pods
- Degradable Perf Pods maintained integrity for entire 10 day stimulation

- Eliminated
ALL 54
Frac Plugs -

SlicFrac Operational Summary

1125+

Total Jobs
Completed

26,400+

Stages Stimulated

150+

Operators



A faint, light blue world map is centered in the background of the slide, showing the outlines of continents and oceans.

Questions?

