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FracFactorySM Service

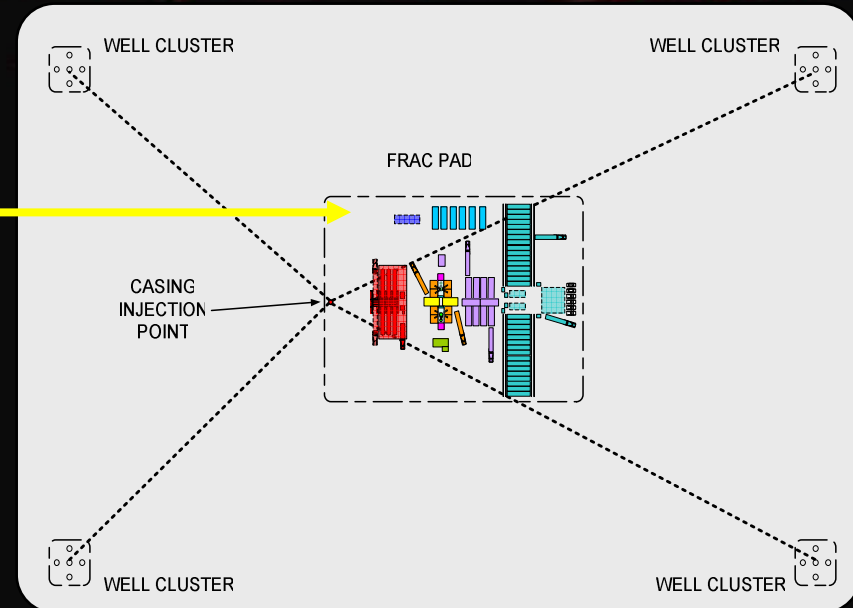
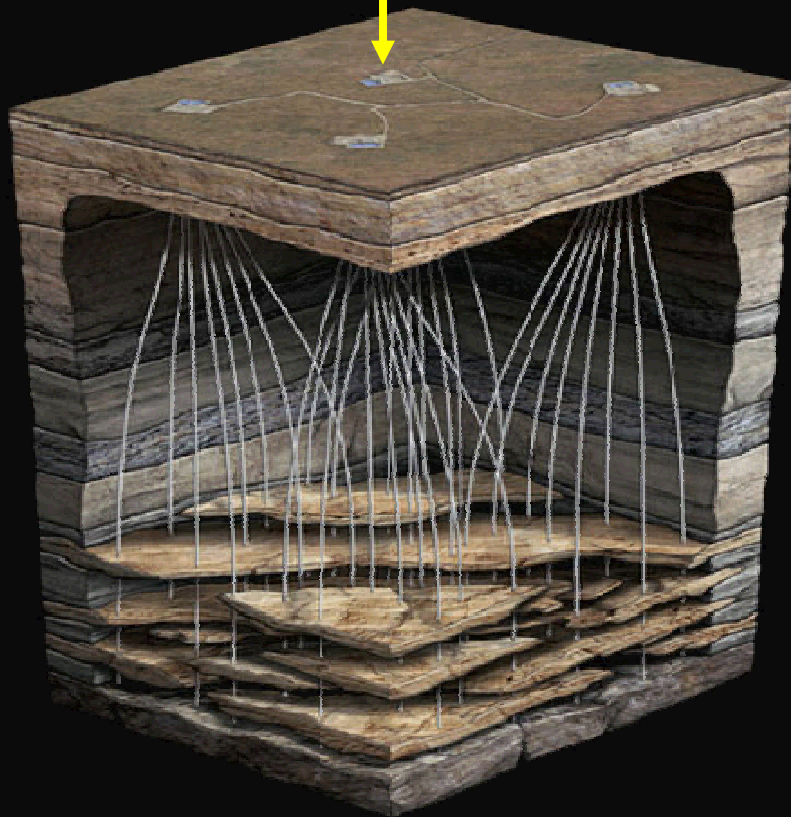
Presented by: Leonard Case

Halliburton

May 22, 2008

FracFactorySM Service

FracFactory Service Location



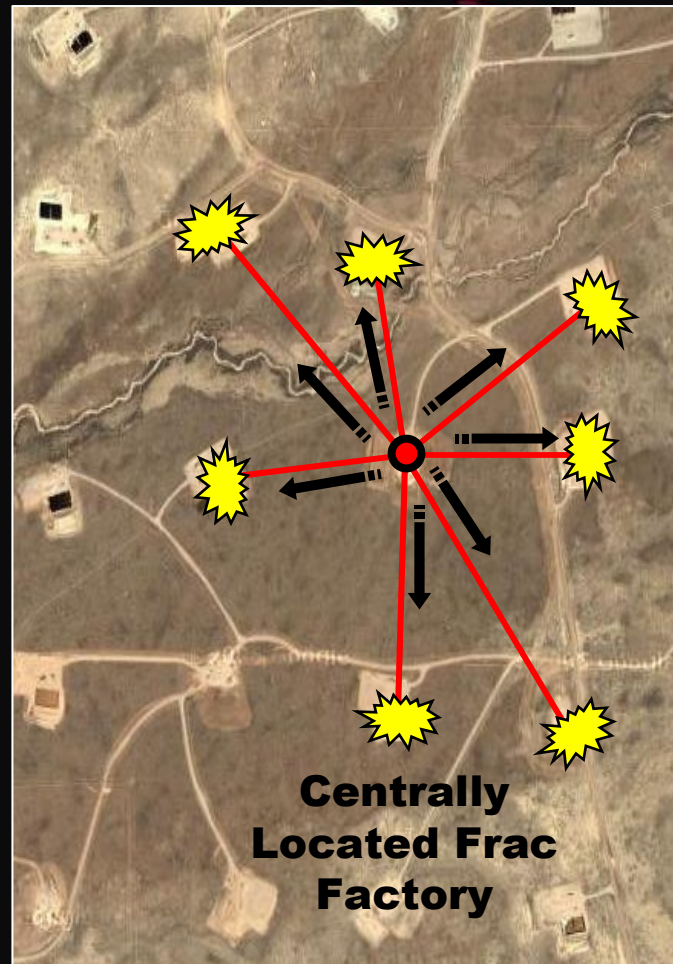
FracFactory (Frac Pad) Concept

- Matched set of equipment
- Configured for semi-permanent installation
- Performs fracturing service work from a central location on a series of wells without moving
- Plunges cycle time due to simultaneous fracturing capabilities on dual wells
- Reduction in mechanical complexity to help increase reliability and ease of operation

FracFactorySM Service

Focuses on

- Environmental improvements
- Increased reliability of service
- Improvements in operational efficiency
- Not cookie-cutter approach
- Custom-tuned to the targeted zone



Where the focus is on the treatment

Not on logistics

Not on rigging-down, relocating or rigging-up

Where Could This Concept Work?

Unconventional Reserves

- Multi-zoned
- Low perm $> .01$ md
- Tight well spacing 5- to 40-acre spacing
- Many/multiple small lenses

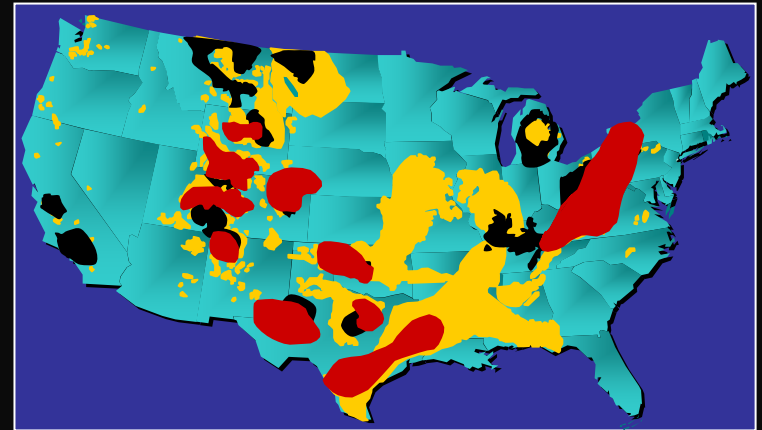
Large Drilling and Completions Campaign

- For every 100,000 acres
- With a conservative 20-acre drainage plan
- 10 to 20 treatments per well
- That's over 5,000 wells
- 50,000 to 100,000 individual treatments

How to Accomplish and ...

- Increase well production
- Shorten development time
- Improve service quality
- Ensure resources are available
- **Improve safety**
- **Improve environmental aspects**

Operational Efficiency



Important note: Halliburton is not the original source of the information and it has not been independently verified. Thus, this information is being provided without warranty of any kind.

Operator/Producer Advantages

- Increased personnel safety
- Less road time
- Fewer equipment moves
- Improved work environment
- Improved weather protection for crew
- Storage volumes
- Increased reliability of service
- Simpler equipment systems
- Dedicated resources



- Personnel, material and equipment on location
- Operate with a small “footprint”
- One frac pad for several wells
- Large coverage area
- Provide efficient stimulation operations
- Minimal nonproductive time between stages on numerous wells
- Two treatments concurrently
- Service-center type of operation

Environmental Improvements

- Reduction in the number of diesel engines and potential for leaks
- Reduced trips to location
- Dry-gel blending systems
- Use of produced water for treatments
- Small footprint
- More jobs from a central location to reduce moves
- Fewer locations



Environmental Improvements

- Incorporate latest equipment designs (T2 Compliant)
- Utilization of “over the road” diesel
- Limit idling of equipment where possible
- Servicing multiple wells from a single location
- Stationary Frac Spread with crew changes
- Equipment fitted with Diesel Oxidation Catalyst mufflers and crankcase filters)
- Onsite material control
- Bulk Transport material hauling...full truck loads only when permissible
- Frac fluid created from dry polymer

FracFactorySM Service Concept

Primary features

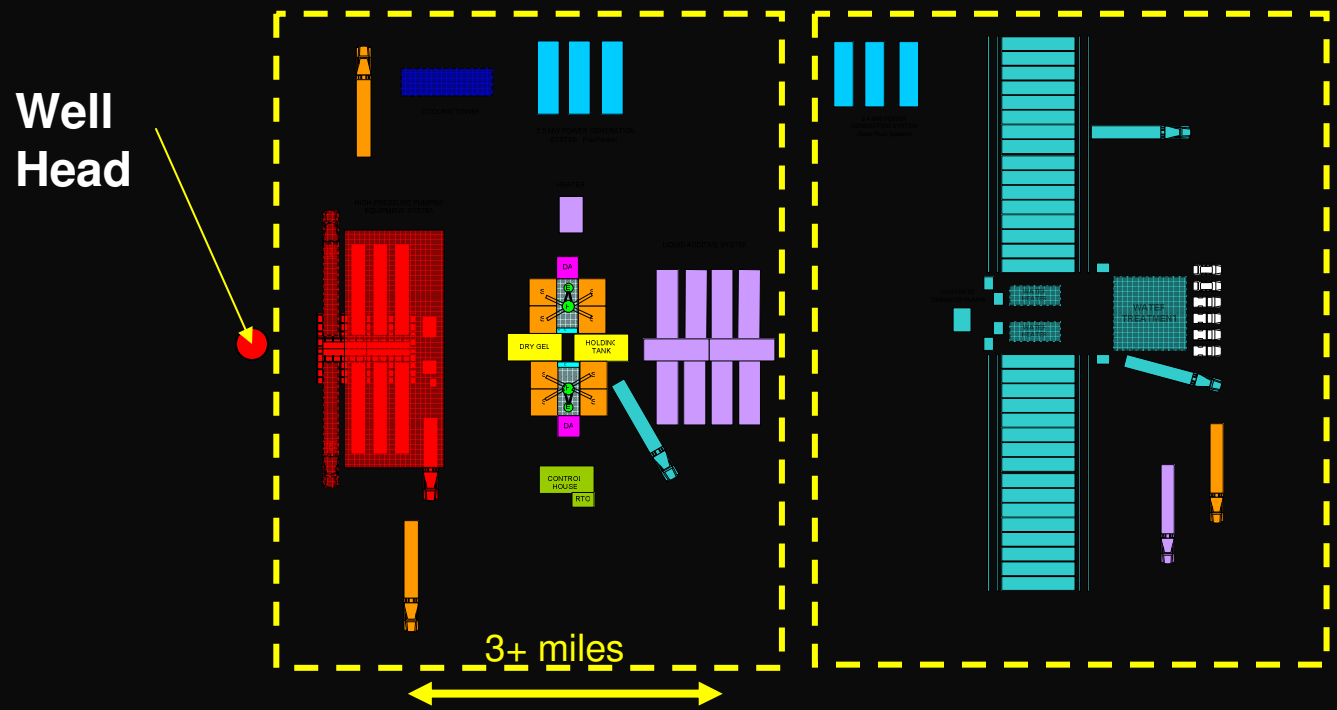
- Multiple jobs performed from a central location
- Dual job setup
- Bulk inventory system for proppant, frac fluid, LAs
- Real-time operation capabilities
- Mobile system – can be relocated as required
- 24-hour continual operation

Additional features

- Streamlined/efficient piping system design
- Electrically powered auxiliary systems
- Pad layout configured to streamline logistics/resupply
- Automated remote control for service operations
- Sheltered from the environment

FracFactorySM Service Center Layout

Split Location



Frac Factory

Fluids Factory

Reach \ Expandability

1 Square Mile

10-Acre Spacing

20-Acre Spacing

40 Acre Spacing

Frac Factory
Delivery Radius

Fluids Factory
Delivery Radius

Fluids Processing
Group
+
FracFactorySM
Equipment Group

Frac Factory
Delivery Radius

Frac Factory/Fluids Factory Service Center Concept

Not one size fits all ...

Must be custom-tuned to the reservoir and to the customer's:

- Drilling program
- Drainage plan
- Type of completions
- Production infrastructure
- Material supply chain
- Power sources available
- Environmental restrictions

FracFactorySM Service Concept

Pinedale Mesa:

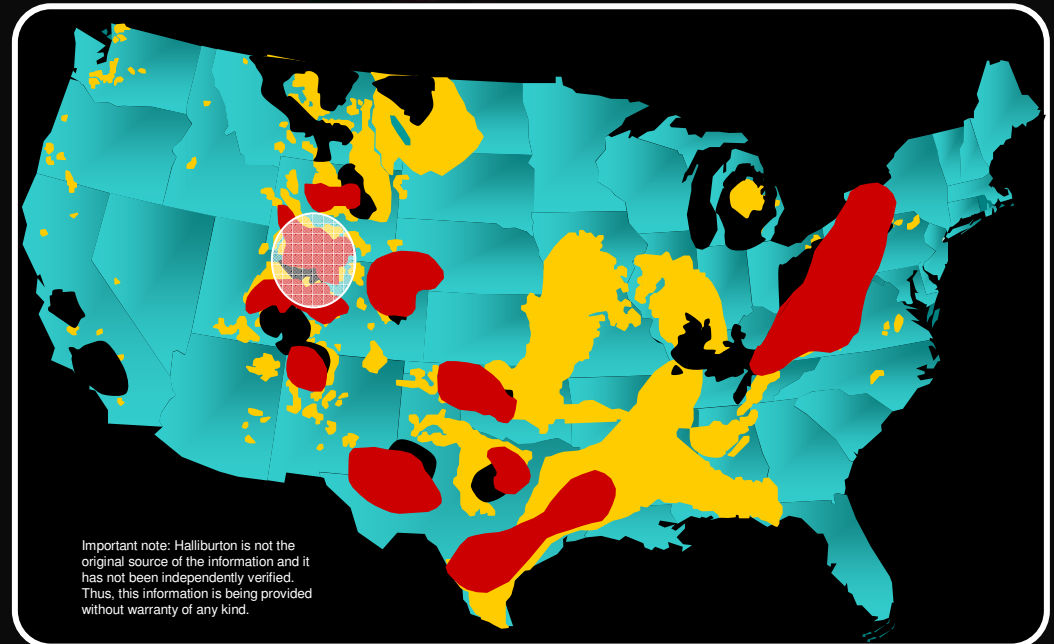
- Central pads.....6 well
- 17 stages per well
- Drill all year
- Service-restricted

Jonah:

- Central frac site
- 10 remote well sites
- 40 wells, 400 fracs
- 12 stages per well
- Work on 2 central pads

Piceance:

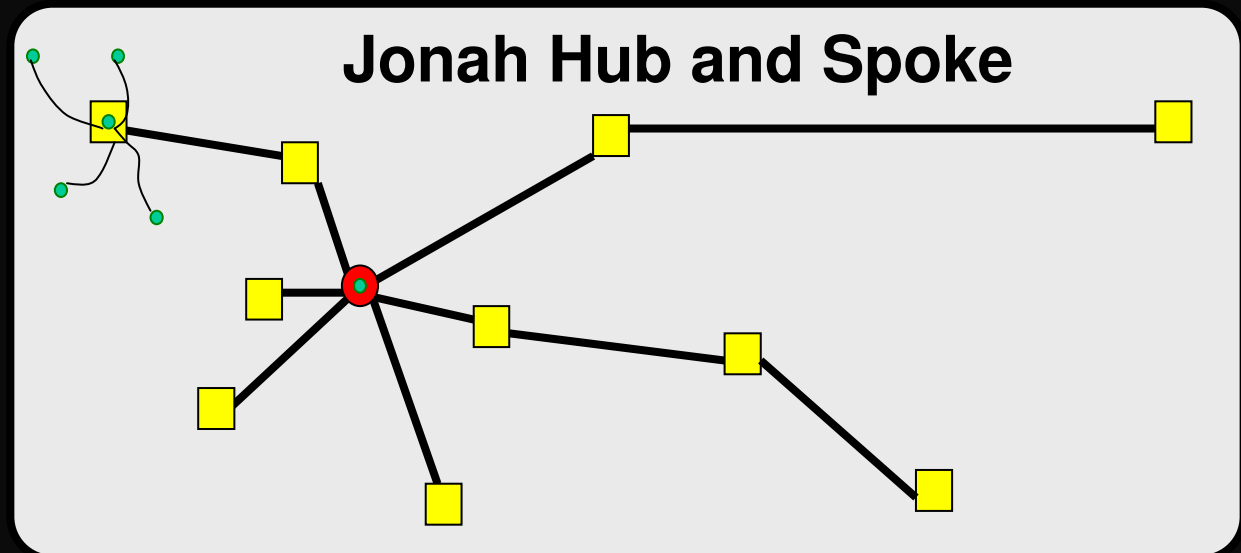
- Super pads.....20 wells
- Central pads.....6 wells
- 6 stages per well
- 4 pads within reach



FracFactory Service Concept

Jonah

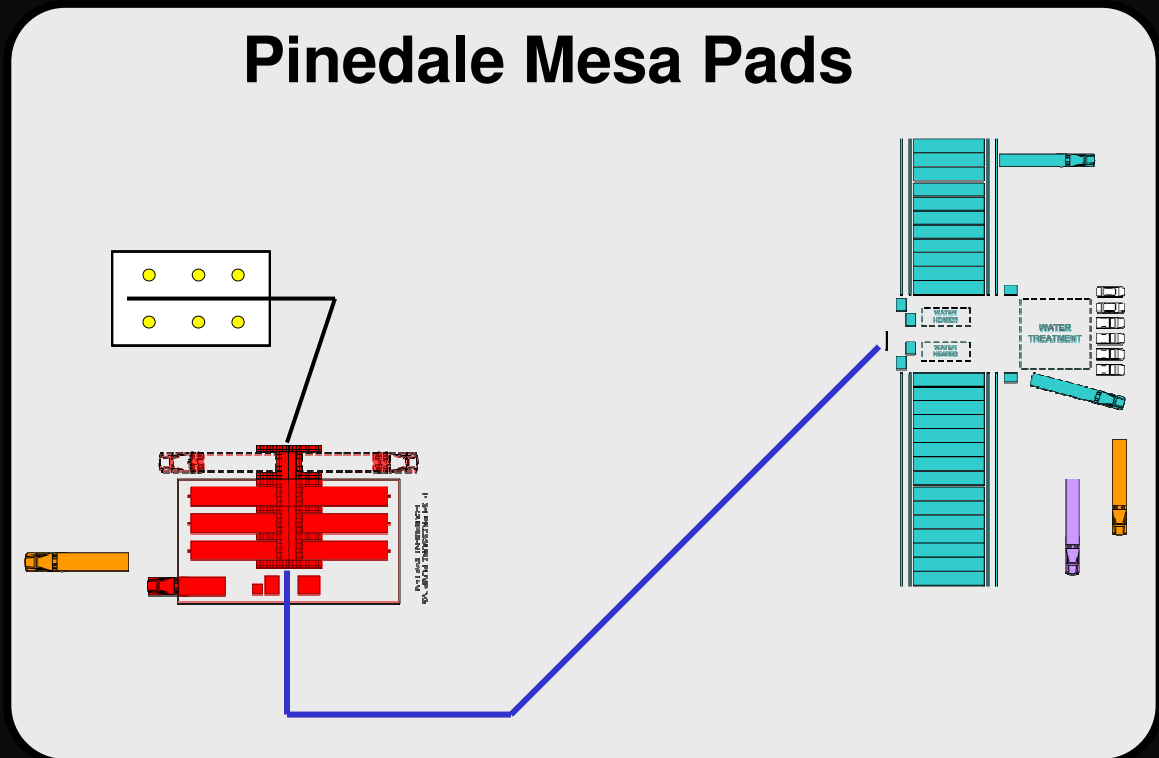
- Central frac site
- 10-acre spacing
- 10 remote well sites
- 40 wells, 400 fracs
- 12 stages per well
- Work on 2 central pads
- Frac line up to 6,800 ft
- 60/40 split of produced and potable water



FracFactory Service Concept

Pinedale Mesa

- Central pads.....6 wells
- 5- and 10-acre spacing
- 17 stages per well
- Drill all year
- Service-restricted
- Lightly treated produced water
- 21 days to complete 6 wells

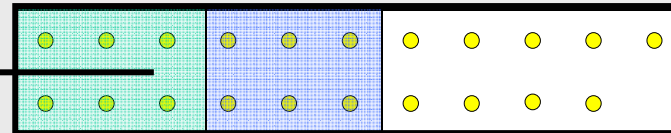


FracFactorySM Service Concept

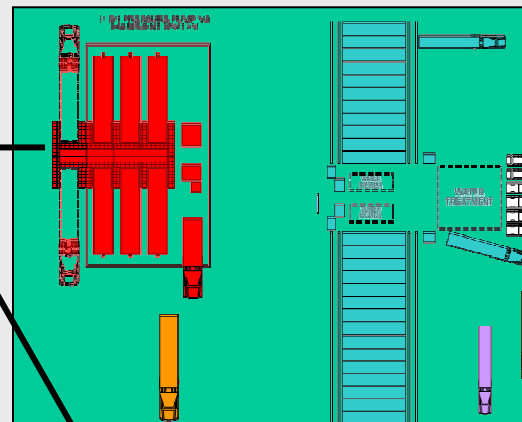
Piceance

- Super pads.....21 wells
- Central pads.....6 wells
- Remote frac pad
- 6 stages per well
- 5 to 10 pads within reach
- Frac line up to 13,200 ft
- Six days to complete 6 wells
- 600 ft altitude change
- Lightly treated produced water

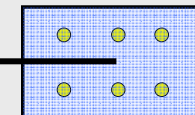
Piceance Super Pad – 21 wells



Remote Frac Pad



Std Pad – 4 to 6 wells



Results and Conclusions

- **Smaller drill pads and fewer of them**
 - Drill pads 50% smaller than central pad
 - Multiple wells per pad
 - One frac pad for several wells
- **Less diesel used in transporting equipment**
 - Camp is 45 miles to 75 miles from work site
 - Equipment only returns for extensive maintenance
 - Crew transported by bus
 - Less time idling, more time pumping
- **Increased safety**
 - Fewer moves
 - Less fatigue
 - Improved layout



- **Personnel, material and equipment on location**
 - Material transported in full loads
 - Increased use of produced water
 - Fewer spills
 - Lower logistical impact
- **Provide efficient stimulation operations**
 - Increased equipment utilization
 - Shortened time to completion
 - Two treatments concurrently