a different kind of oil & natural gas company

LINN Energy

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Dynamic MudCap Drilling in the Granite Wash Formation

Kurt A. Shipley

Presentation Outline

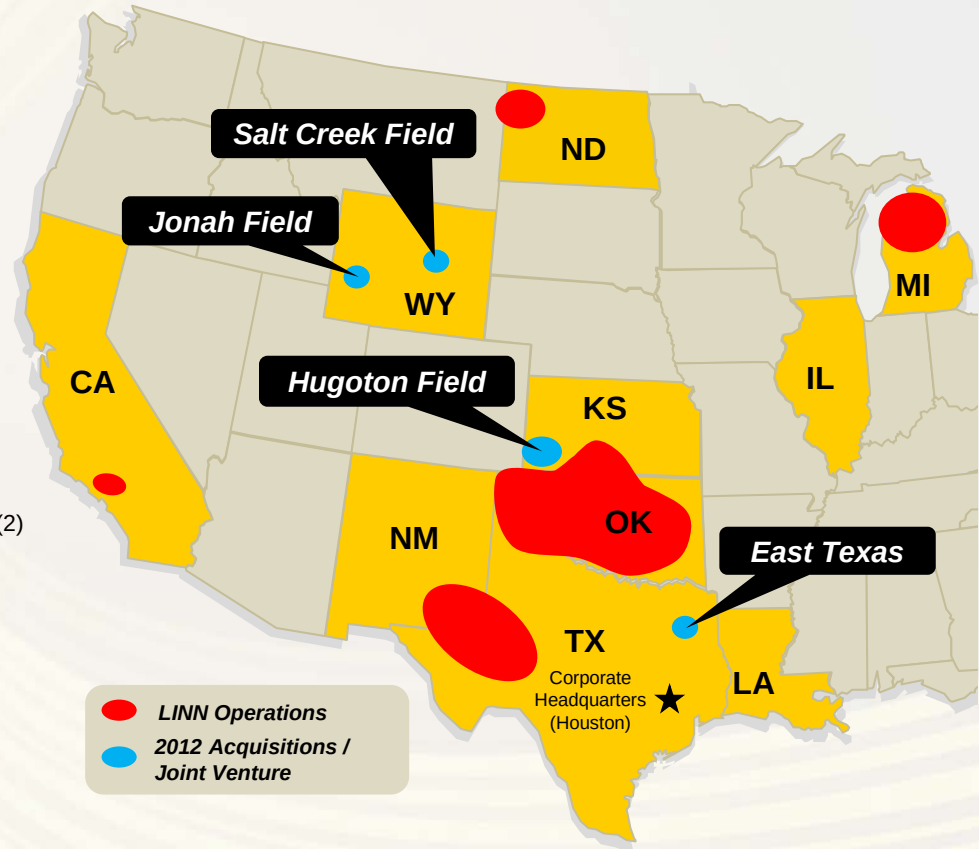
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- LINN Energy Overview
- Mid-Continent Drilling Program
- Extreme Lost Circulation Challenges
- MudCap and Dynamic MudCap Drilling
- LINN Energy Water Recycling Program
- Summary

LINN Energy Overview

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- **9th largest public MLP/LLC and 12th largest domestic independent oil & natural gas company**
  - LINE IPO in 2006 with enterprise value of ~$713 million
  - Equity market cap $9.1 billion
    Total net debt $5.6 billion
    Enterprise value $14.7 billion(1)
- **Large, long-life diversified reserve base**
  - ~5.1 Tcfe total proved reserves
  - 64% proved developed
  - 45% oil and NGLs / 55% natural gas
  - ~17 year reserve-life index
  - >15,000 gross productive oil and natural gas wells(2)
- **Large inventory of low risk and liquids-rich development opportunities**
  - Jonah Field – ~650 locations
  - Granite Wash – ~600 horizontal locations
  - Wolfberry – ~400 locations
  - Bakken – ~800 horizontal locations(3)
  - Cleveland – ~165 horizontal locations
  - Kansas Hugoton – ~800 locations
  - Salt Creek Field – CO_2 flood



Note: Market data as of January 25, 2013 (LINE and LNCO closing price of $38.65 and $39.59, respectively). All operational and reserve data as of December 31, 2011, pro forma for closed 2012 acquisitions and joint venture ("JV"). Estimates of proved reserves for closed 2012 acquisitions and JV were calculated as of the effective date of the acquisitions using forward strip oil and natural gas prices, which differ from estimates calculated in accordance with SEC rules and regulations. Estimates of proved reserves for closed 2012 acquisitions and JV based solely on data provided by seller. Source: Bloomberg.

(1) Pro forma for LNCO IPO (assumes net proceeds used to repay debt outstanding).
(2) Well count does not include ~2,500 royalty interest wells.
(3) Average working interest of ~7%.

Mid-Continent Drilling Program

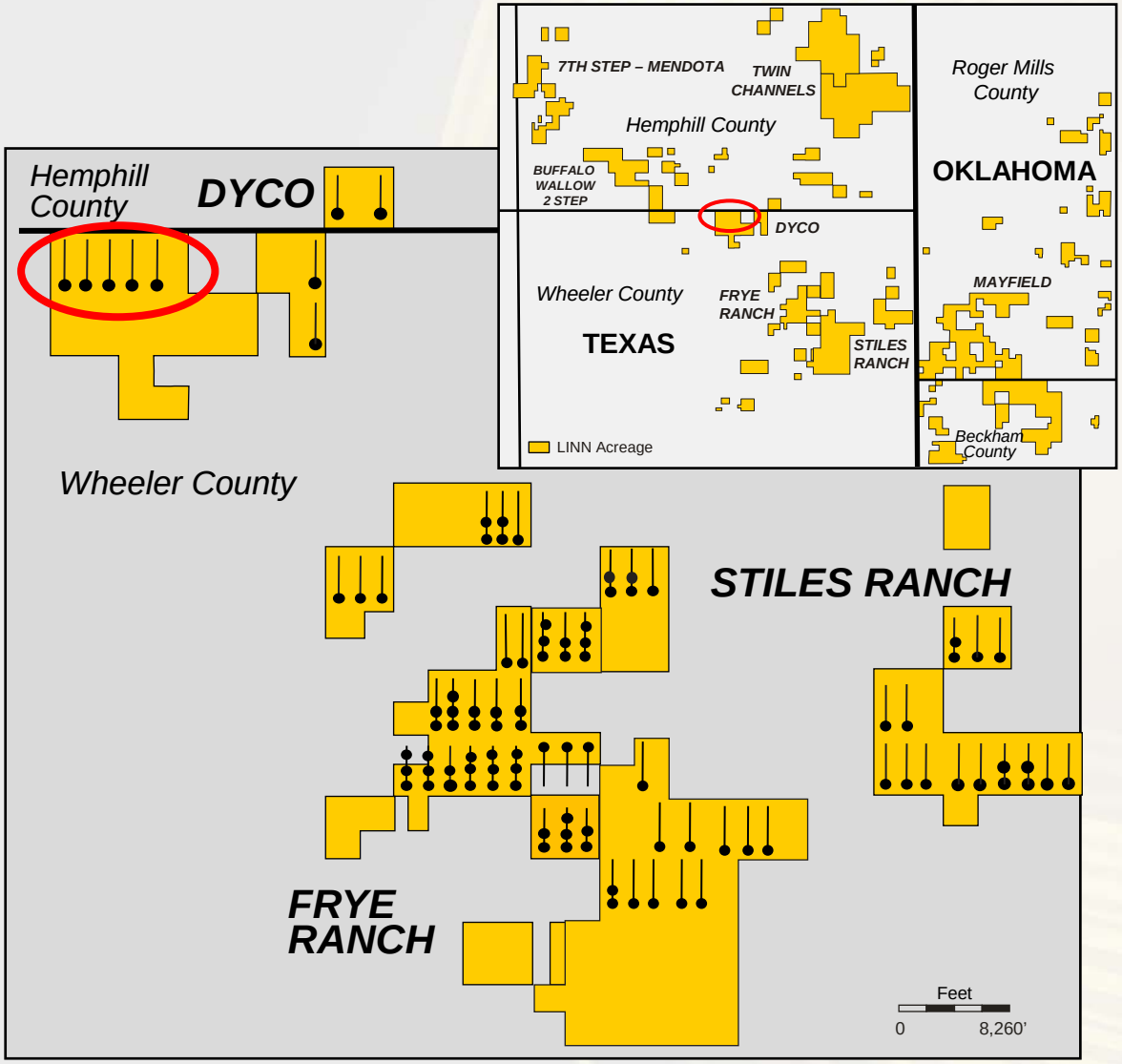
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LINN Energy
Mid-Continent Division
Core Drilling Area



Core Area Drilling Program

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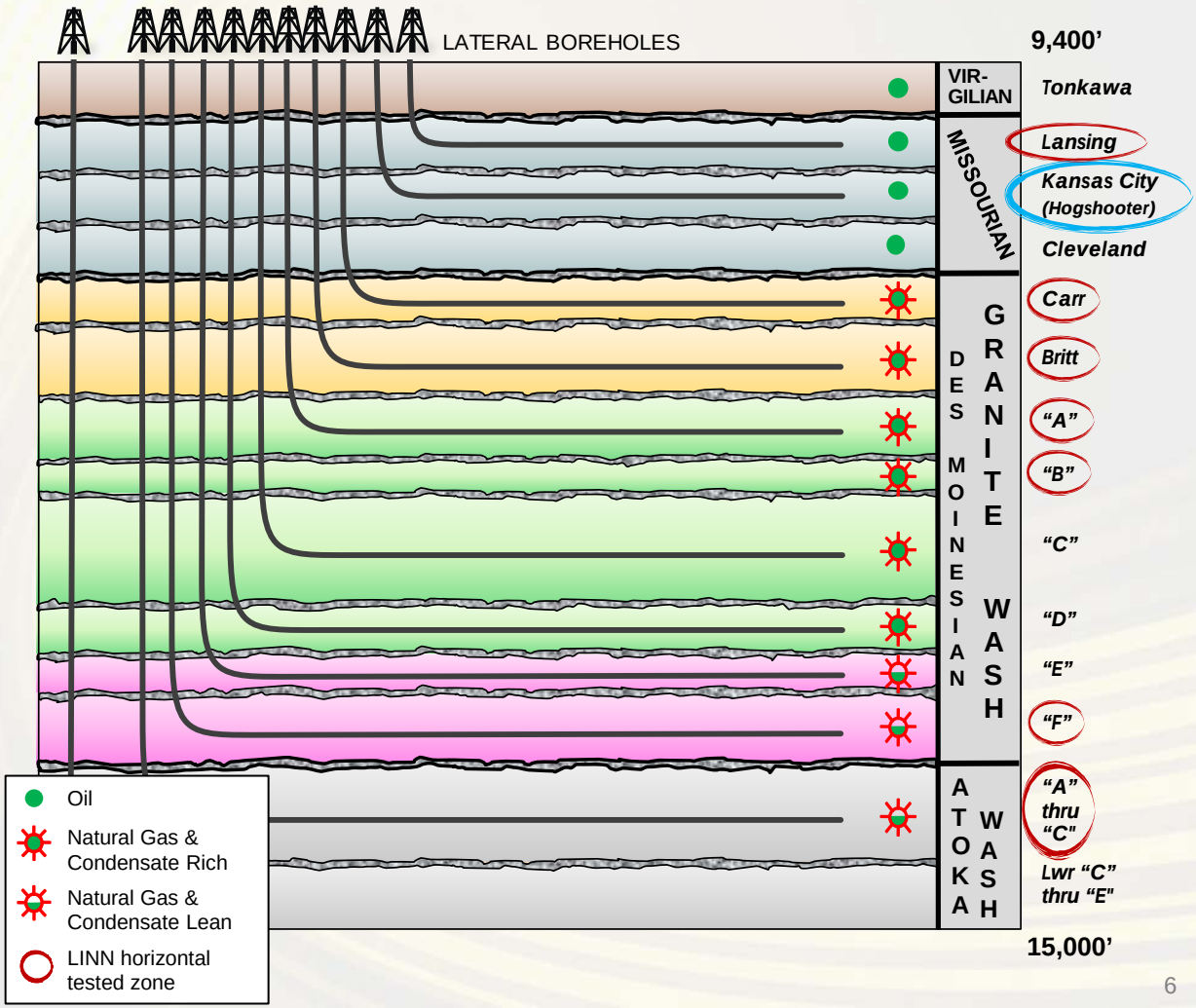
- Over 600 horizontal locations
  - Granite Wash
  - Hogshooter
  - Atoka
- Dynamic MudCap Drilling is utilized in DYCO Area
- Dynamic MudCap Drilling represents a very small part of LINN Energy's drilling program

LINN's Unique Position In The Granite Wash

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- **Produce from eight separate zones**
- **Each zone bears a unique production profile**
  - Oil
  - Liquids-rich gas
  - Dry gas
- **Enables LINN to adapt its drilling program**
  - Focus on highest returns
- **Recently shifted entire drilling program to focus on oil**

Granite Wash / Atoka Wash Stratigraphy



Core Area Prospects

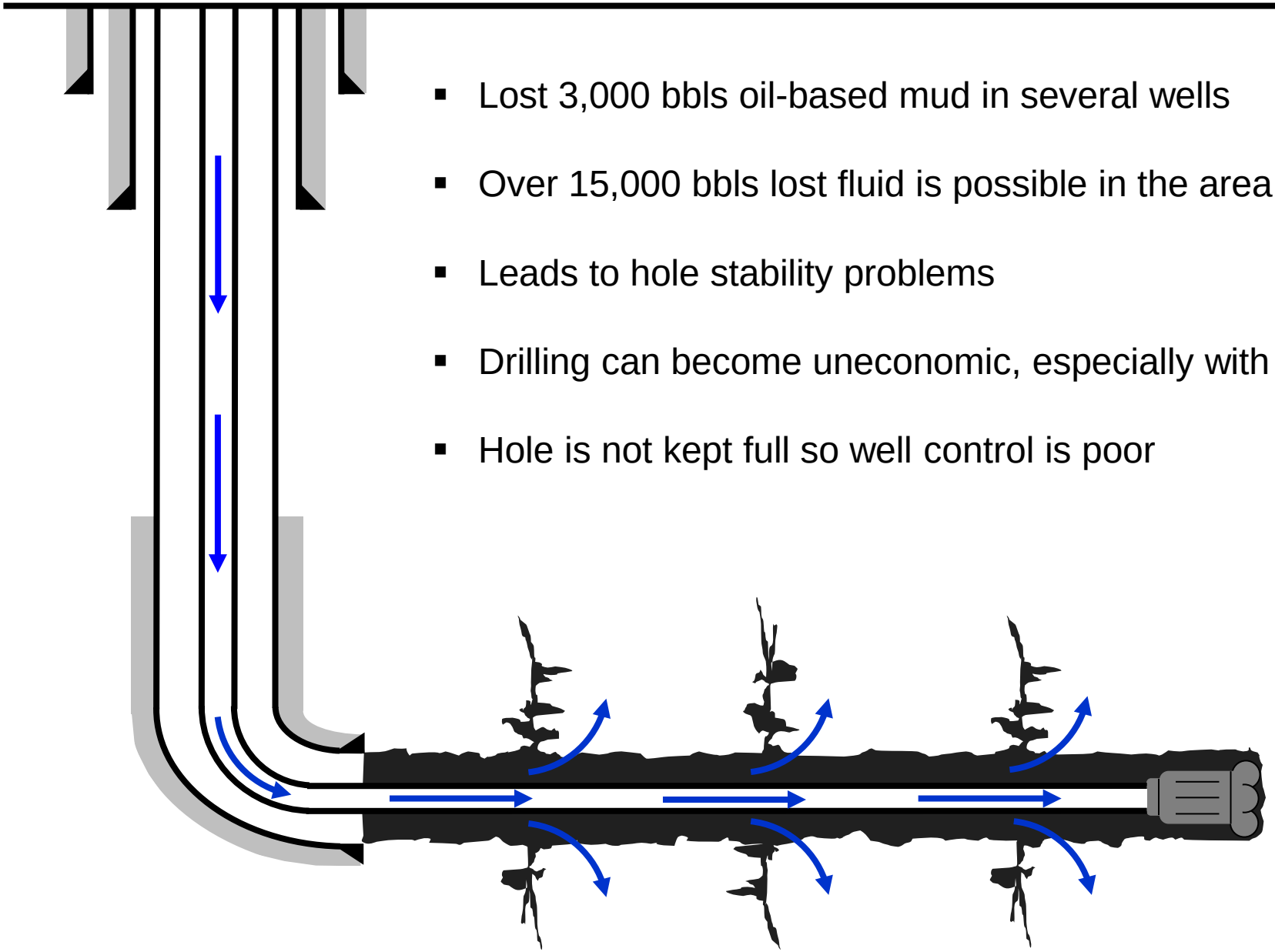
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Horizontal Well Initial Production Rates

Formation	Oil	Gas
Hogshooter	500 - 5,000 BPD	1 - 10 MMCF/D
Granite Wash	10 - 2,500 BPD	2 - 30 MMCF/D
Atoka	2 - 75 BPD	8 - 50 MMCF/D

Extreme Lost Circulation

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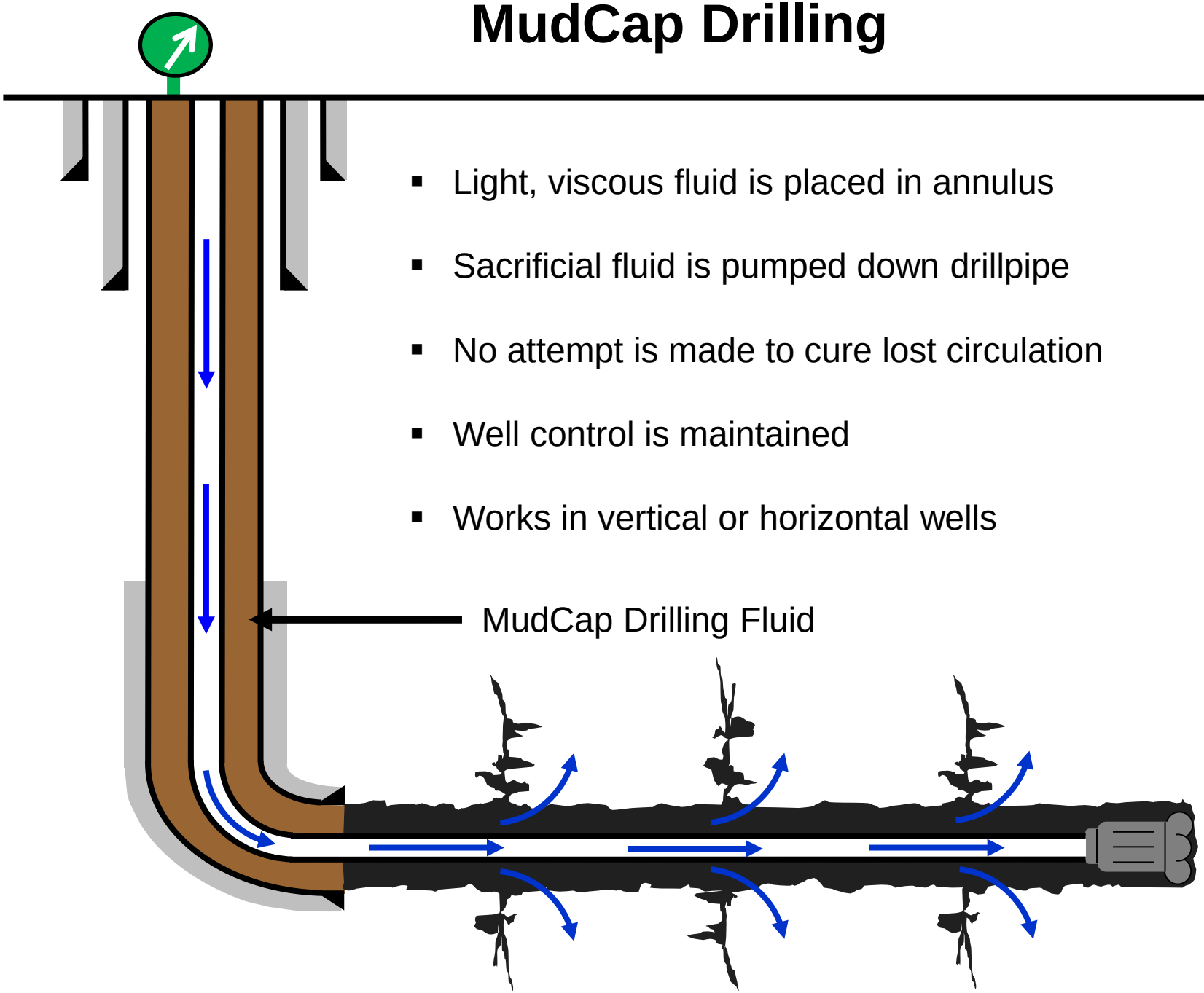


- Lost 3,000 bbls oil-based mud in several wells
- Over 15,000 bbls lost fluid is possible in the area
- Leads to hole stability problems
- Drilling can become uneconomic, especially with OBM
- Hole is not kept full so well control is poor

MudCap Drilling

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- Light, viscous fluid is placed in annulus
- Sacrificial fluid is pumped down drillpipe
- No attempt is made to cure lost circulation
- Well control is maintained
- Works in vertical or horizontal wells

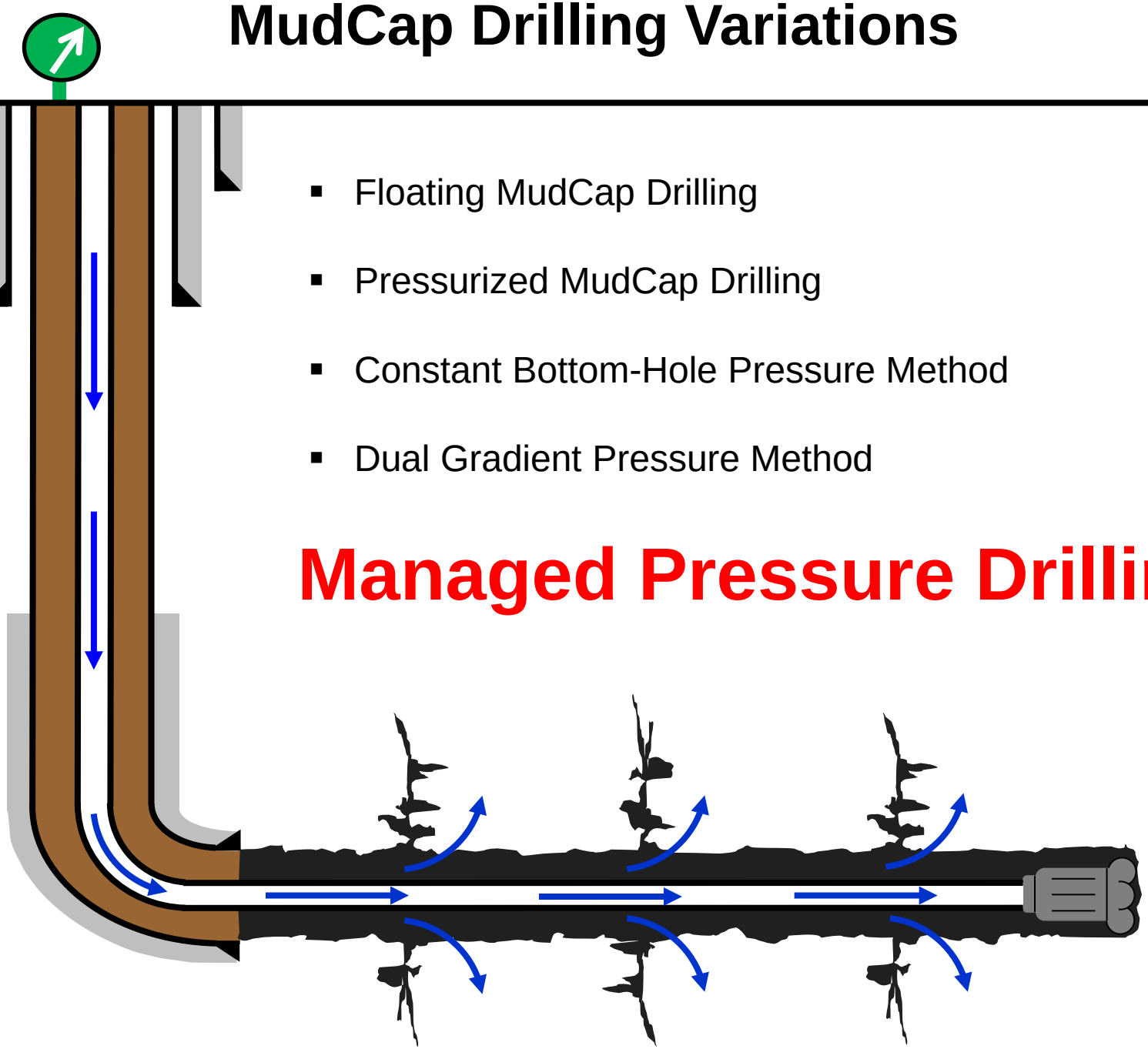


MudCap Drilling Variations

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- Floating MudCap Drilling
- Pressurized MudCap Drilling
- Constant Bottom-Hole Pressure Method
- Dual Gradient Pressure Method

Managed Pressure Drilling



Project Team Members

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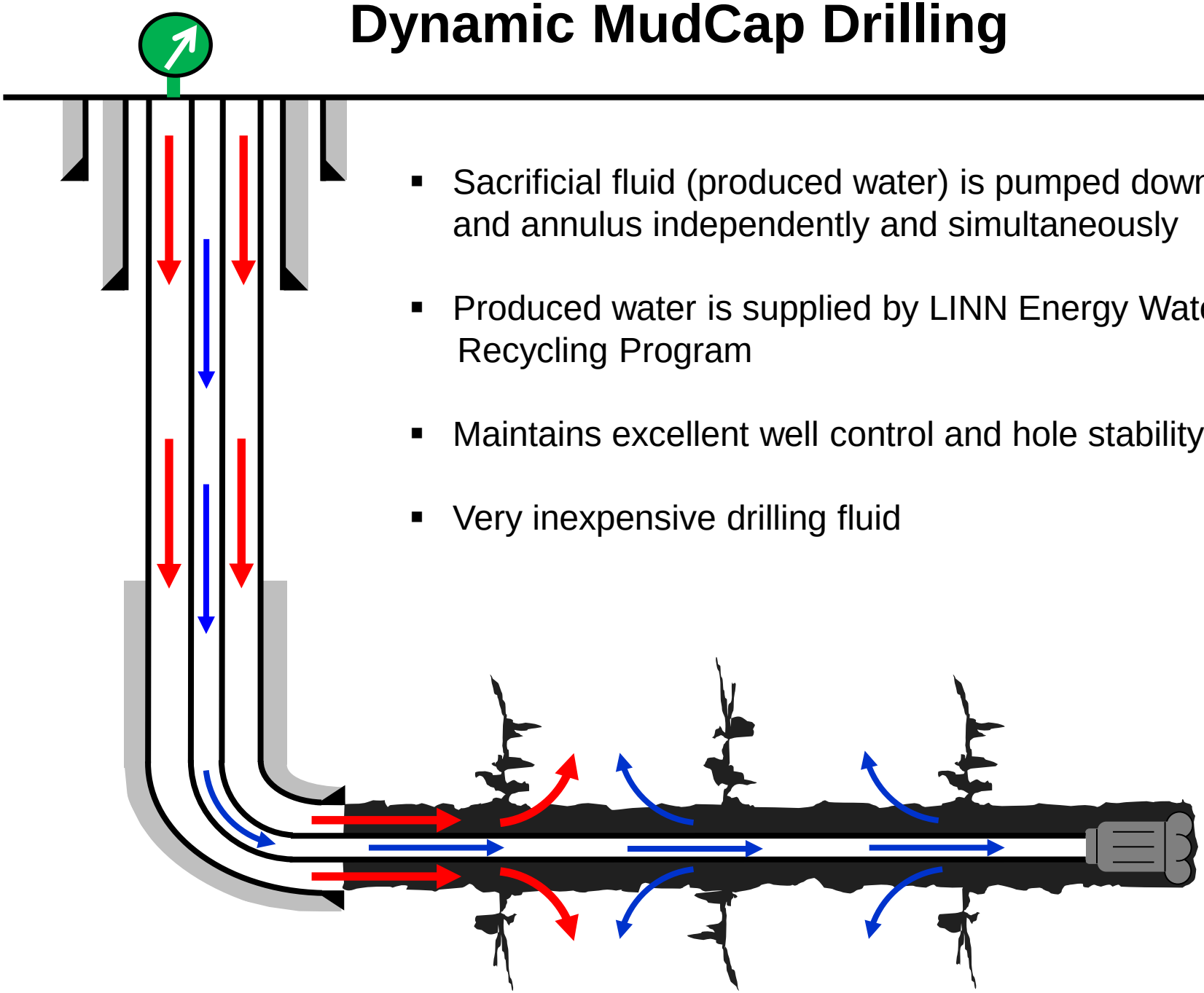
- LINN Energy and Signa Engineering designed DMCD system
- Signa Engineering provided training and onsite engineering support
- Baker Hughes, Anchor, and Ensign provided additional support with Directional Drilling, Cement and Liner Equipment, Drilling Fluids, and Rig Equipment





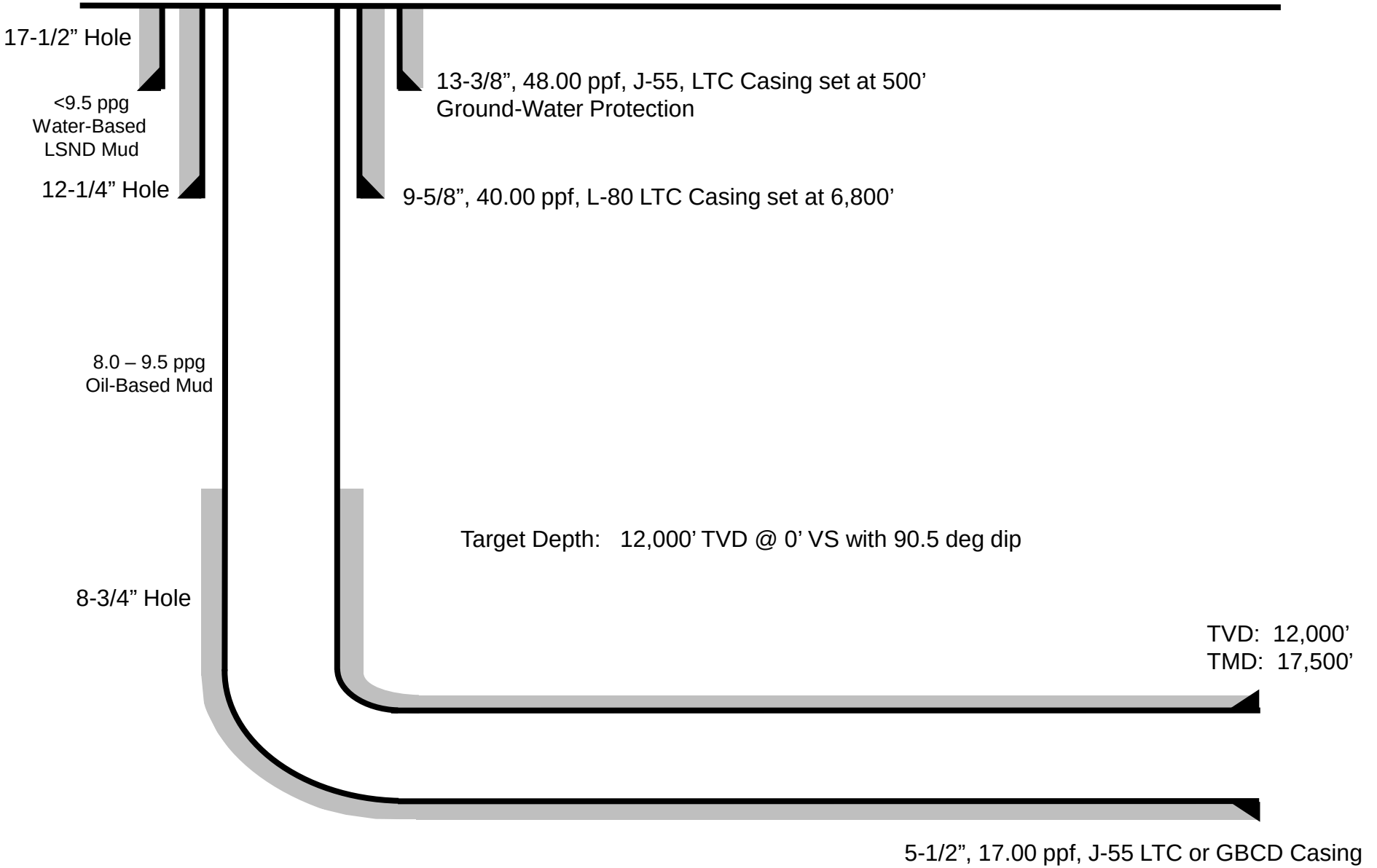


Dynamic MudCap Drilling

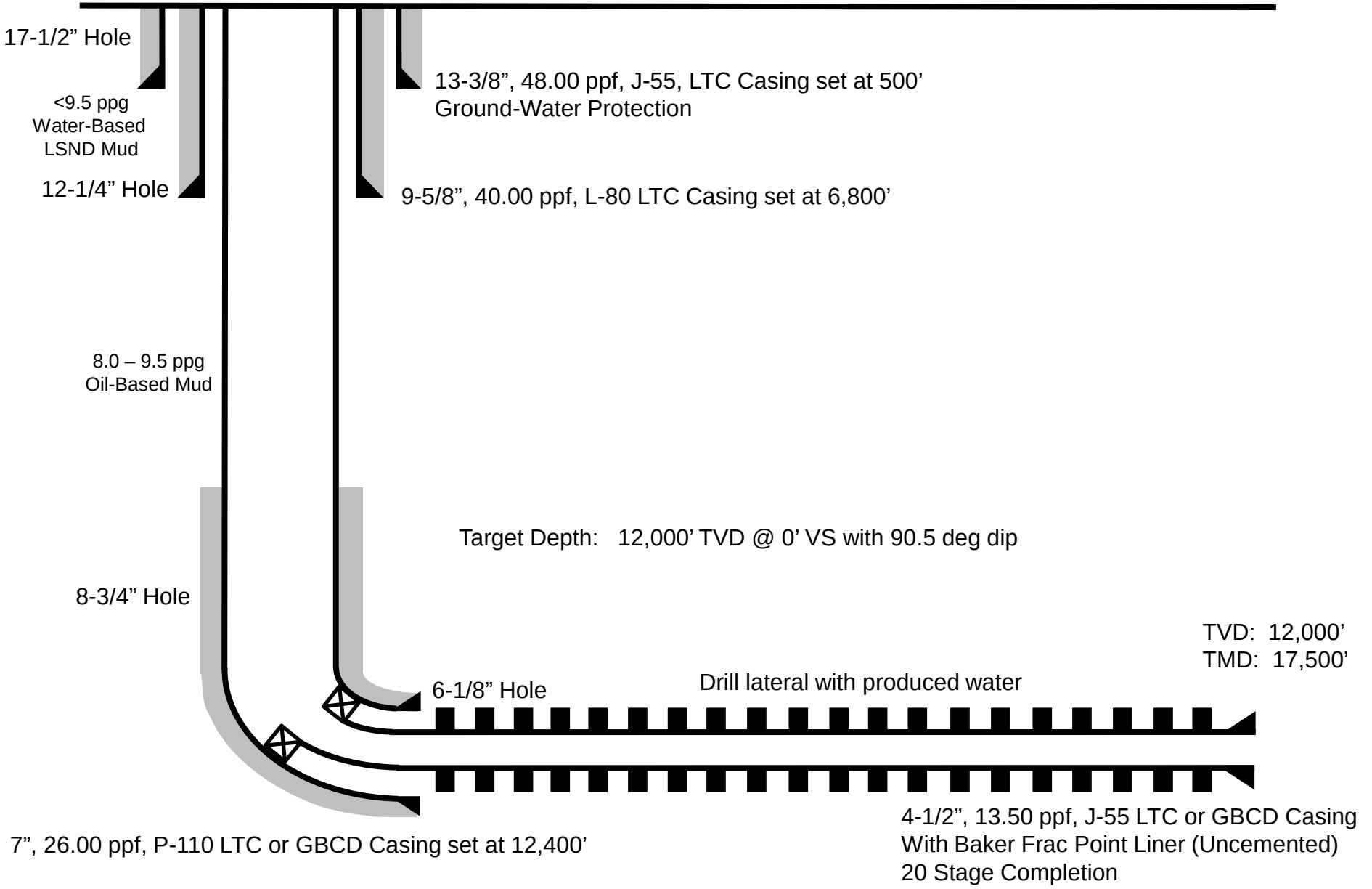


- Sacrificial fluid (produced water) is pumped down drillpipe and annulus independently and simultaneously
- Produced water is supplied by LINN Energy Water Recycling Program
- Maintains excellent well control and hole stability
- Very inexpensive drilling fluid

Typical Granite Wash Well Design



DMCD Granite Wash Well Design

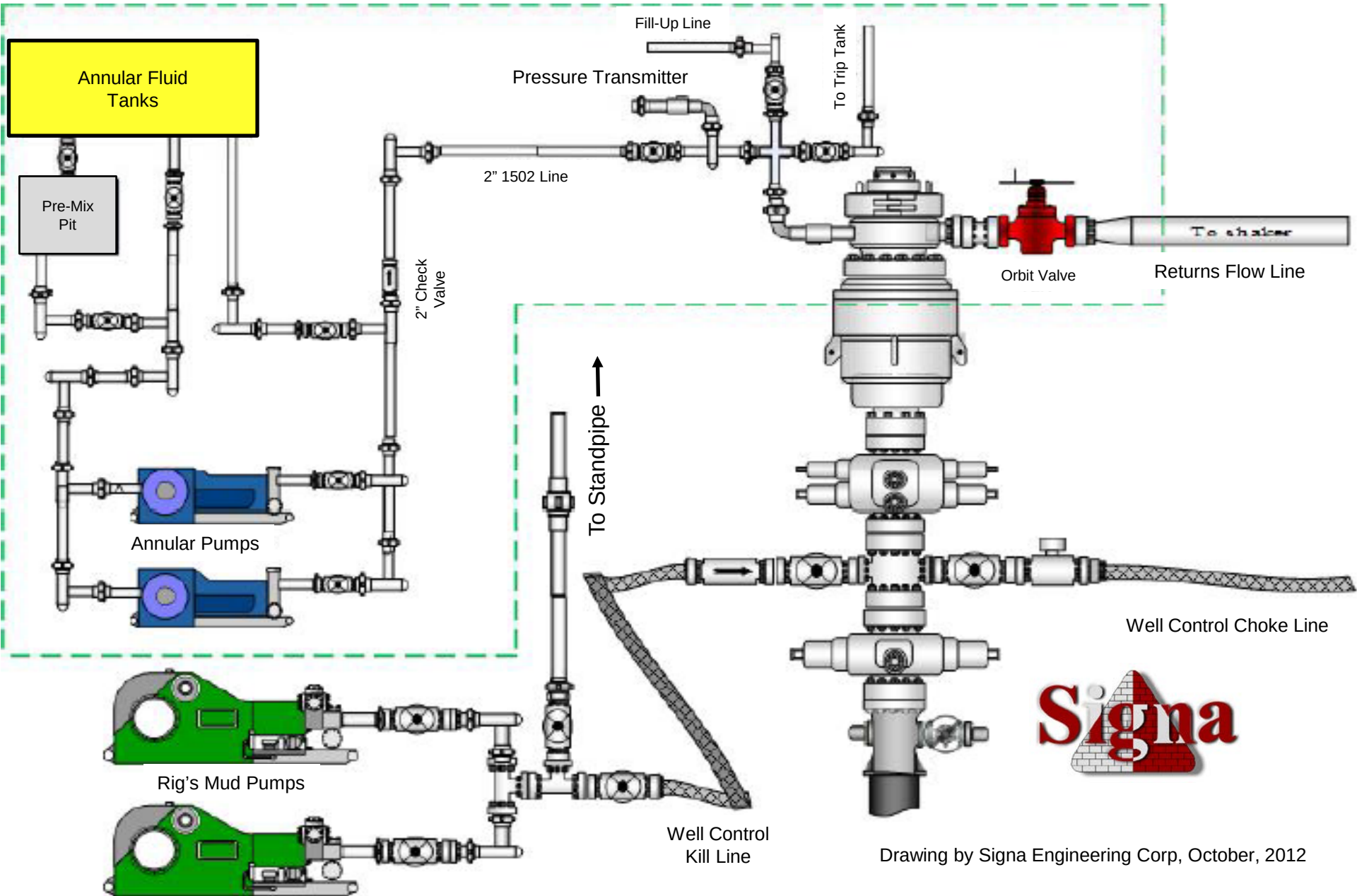


DMCD Equipment Requirements

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- Rotating Control Device (to apply pressure to annulus)
- Independent Annular Pump(s)
- Fluid Storage Tanks
- Annular Pressure Gauge (Electronic: 2000 psi with 1 psi increments)
- Conventional MWD with Bottom-Hole Pressure Sub
- LOTS of fluid

DMCD Surface Equipment Schematic



Drawing by Signa Engineering Corp, October, 2012

Rotating Control Device

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Weatherford®

Controlled Pressure Drilling®

Model IP 1000 Rotating Control Device



Annular Pumps



- Union TX-200 Triplex Pump (200 HP)
- Powered by 225 HP C7 Caterpillar I-6 Diesel

Additional DMCD Equipment

16” Riser for Water Supply



Centrifugal Pump with Valve Manifold



Fluid Storage Tanks



LINN Energy Water Recycling Program

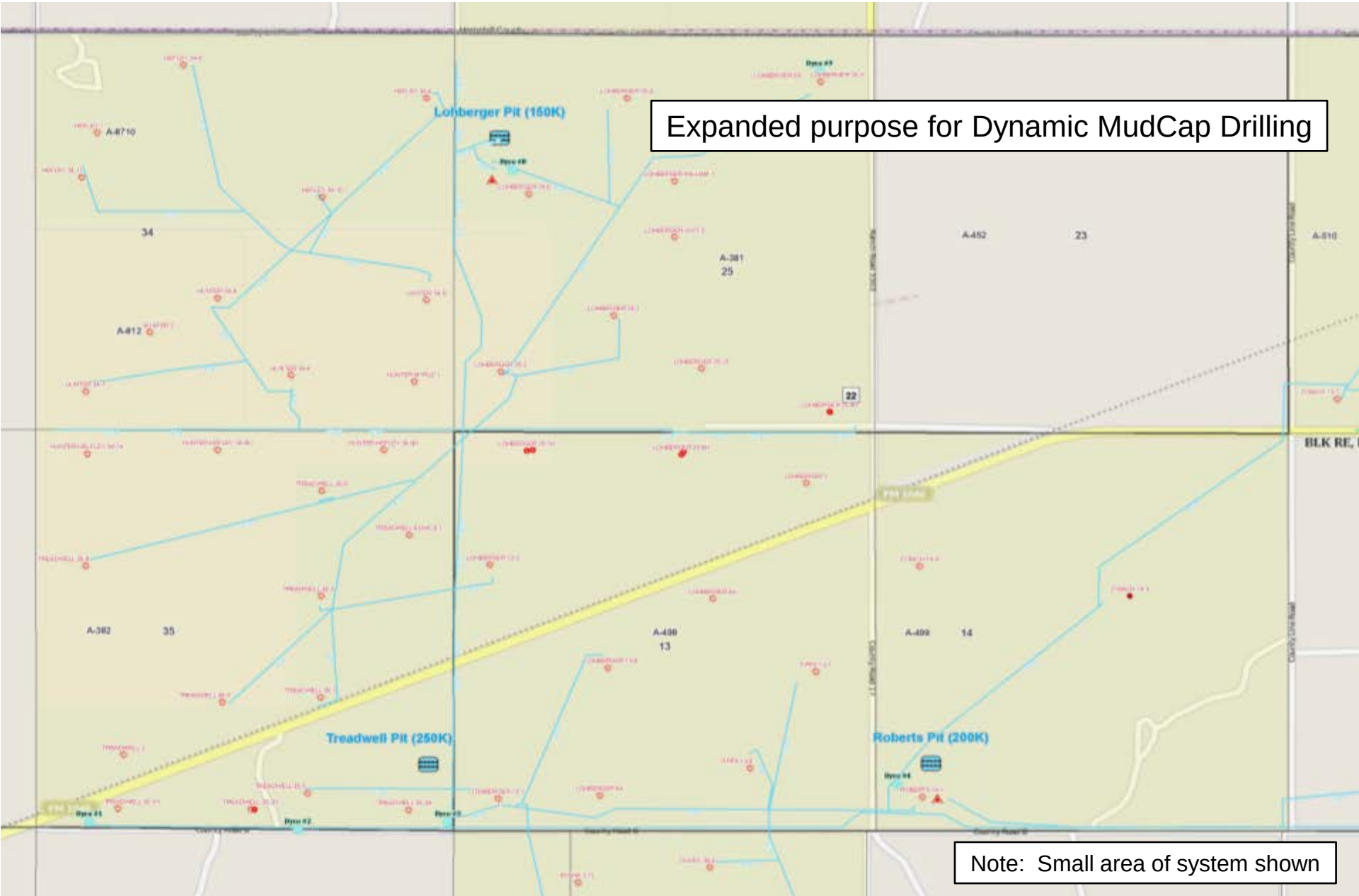
- Water used for fracture stimulation purposes
- Construction initiated in 2010
- Reduces demand on aquifer
- Minimizes produced water disposal
- Eliminates trucking

- 17 water containment ponds
- 87 miles of pipeline
- 4 million bbl water storage



Water Recycling System Pipeline Map

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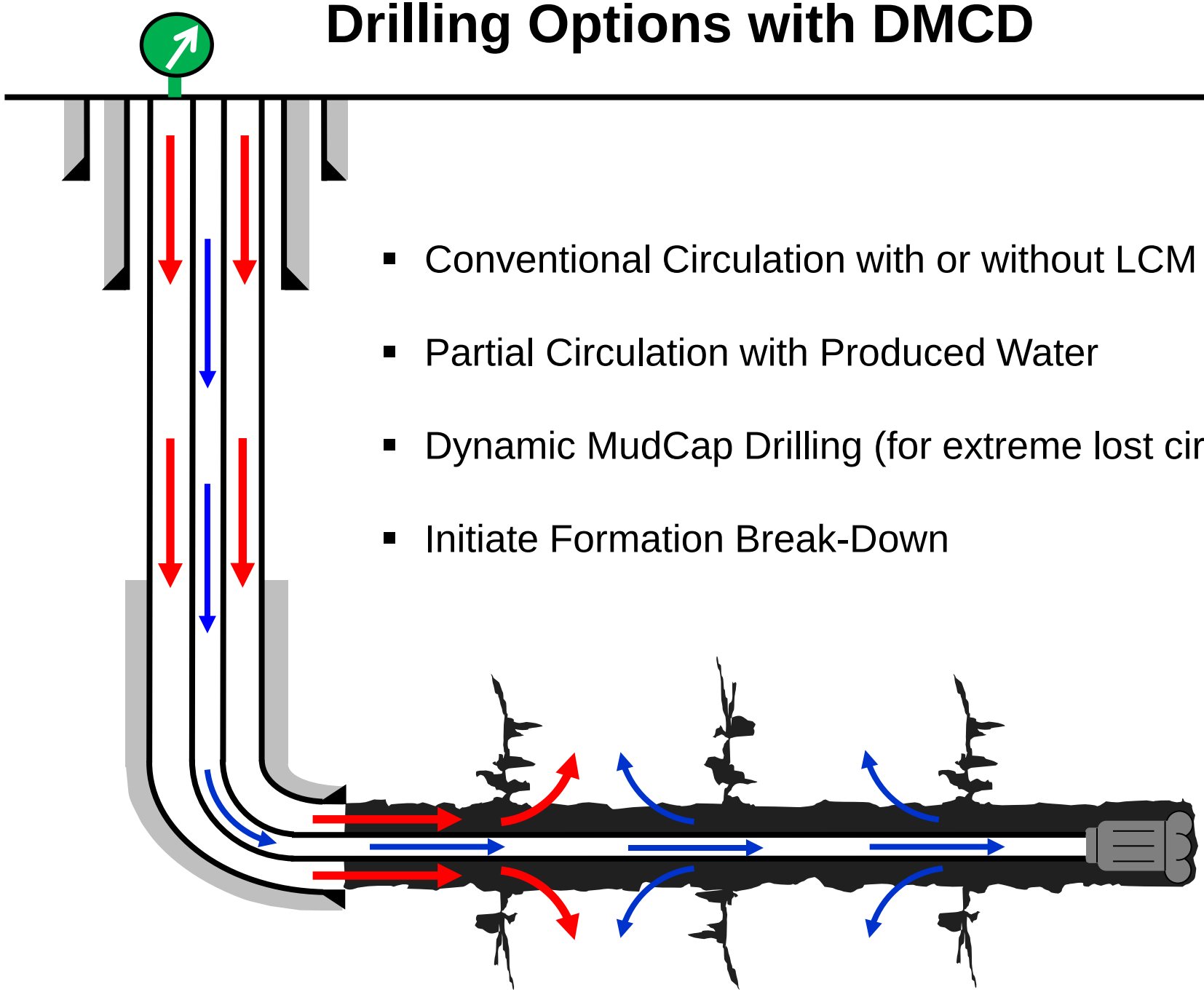
Stiles Ranch Operations

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Drilling Options with DMCD

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- Conventional Circulation with or without LCM
- Partial Circulation with Produced Water
- Dynamic MudCap Drilling (for extreme lost circulation)
- Initiate Formation Break-Down

Dynamic MudCap Drilling Summary

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- 5 Wells Drilled (3 drilled, 2 currently drilling)
- Successful - Very little trouble time with DMCD
- Water has been compatible with formation
- Incremental equipment costs less than $3,000 per day

Well Name	Total Depth	Lateral Length	Water Volume
Hunter Hefley 34-8H	16,927’	4565’	169,645 bbls
Hunter Hefley 34-9H	16,965’	4488’	55,263 bbls
Lohberger 25-7H	15,975’	3550’	31,606 bbls



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Summary

- Important asset for LINN Energy in multiple formations
- Challenging wells with extreme lost circulation
- Dynamic MudCap Drilling is a specialized drilling technique
- Integrated with LINN Energy Water Recycling Program
- Proven success in horizontal drilling


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