HALLUX TALON™

OIL SERVICES

MuddAse Clean-Up Efficiency Procedure

A modified high temperature, high pressure long fluid loss cell and a 5 micron Aloxite or Ohio Sandstone discs are used in the testing to simulate well conditions as close as possible. The procedure used in the testing is as follows:

- Saturate a 5 micron Aloxite or Ohio Sandstone disc in RO Water and Choline Chloride overnight using vacuum. Mark one side of disc with “I” for the “INJECTION” and the other side with “P” for the “PRODUCTION” direction.
- Preheat the fluid loss cell to 150°F (65.55°C).
- Load your disc into a 10 inch fluid loss cell will the “P” face up. Add 500 ml of RO Water and Choline Chloride and heat up to 150°F (65.55°C).
- Flow RO Water and Choline Chloride flow through the disc in the production direction at a differential pressure of 20 psi, measuring the time for 300 cc of RO Water and Choline Chloride to pass through the disc.

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MuddAse Clean-Up Efficiency Procedure

- Flip the disc over in the fluid loss cell will the “I” face up. Add 500 ml of RO Water and Choline Chloride and heat to 150°F (65.55°C).
- Flow RO Water and Choline Chloride through the disc in the Injection direction at a differential pressure of 20 psi, measuring the time for 300 cc of RO Water and Choline Chloride to pass through the disc.
- Pour 350 ml of “Drilling Mud Sample” into the fluid loss cell. Once at BHT, place 200 psi across disc and allow the drilling fluid to leak-off for 180 minutes. Take readings at 1 minute intervals up to 5 minutes and 5 minute intervals up to 30 minutes then every 30 minutes up to 180 minutes. Remove excess drilling fluid without disturbing the filter cake.

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MuddAse Clean-Up Efficiency Drilling Fluid Preparation

- Place 350 ml of treatment fluid (MuddAse SX: 50 gpt MuddAse X and 10 gpt MuddAse S)
- Treatment fluid formulation add - 140 mls RO Water + 200 mls MuddAse + 0.42 grams Iron Control). Add MuddAse on top of the filter cake and stir at 300 rpm for five (5) minutes with a lab mixer. Heat to BHT of 150°F (65.55°C).
- Shut in cell with the MuddAse Concentrate fluid treatment at 100 psi and static conditions for the designated shut-in period of 24 hours (or overnight) at 150°F (65.55°C). Record shut-in time.
- Remove MuddAse Concentrate treatment fluid; flip over your disc in the fluid loss cell will the “P” face up. Pour 350 ml of RO Water and Choline Chloride into the fluid loss cell and heat to 150°F (65.55°C) and flow RO Water and Choline Chloride at 20 psi in the original production direction measuring the time for 300 cc to pass through the disc.

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MuddAse Clean-Up Efficiency Drilling Fluid Preparation

- Flip disc in the fluid loss cell will the “I” face up. Pour 500 ml of RO Water and Choline Chloride into the fluid loss cell and heat to 150°F (65.55°C) and flow RO Water and Choline Chloride at 20 psi in the original injection direction measuring the time for 300 cc to pass through the disc.
- Flip in the fluid loss cell will the “P” face up. Pour 500 ml of RO Water and Choline Chloride into the fluid loss cell and heat to 150°F (65.55°C) and flow RO Water and Choline Chloride at 20 psi in the original production direction measuring the time for 300 cc to pass through the disc.
- Record data in spread sheet and calculate clean-up efficiency in the initial production and injection directions and again in the stabilized production direction using the time in minutes and calculate a percentage (%). The result need to be greater than 75% clean-up efficiency in order to pass.

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MuddAse

RO Water			
Stabilized Flow Production	20 psi – 300 cc RO Water and Choline Chloride	Seconds	14.81
Stabilized Flow Injection	20 psi – 300 cc RO Water and Choline Chloride	Seconds	14.38
Texas Oil Company Mud Samples			
Leak Off	200 psi	1 Minutes	2.29
Leak Off	200 psi	2 Minutes	2.775
Leak Off	200 psi	3 Minutes	3.128
Leak Off	200 psi	4 Minutes	3.423
Leak Off	200 psi	5 Minutes	3.658

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Leak Off	200 psi	10 Minutes	4.592
Leak Off	200 psi	15 Minutes	5.398
Leak Off	200 psi	20 Minutes	6.034
Leak Off	200 psi	25 Minutes	6.601
Leak Off	200 psi	30 Minutes	7.049
Leak Off	200 psi	60 Minutes	9.522
Leak Off	200 psi	90 Minutes	11.350
Leak Off	200 psi	120 Minutes	12.877
Leak Off	200 psi	150 Minutes	14.236
Leak Off	200 psi	180 Minutes	15.582

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RO Water and Choline Chloride			
Stabilized Flow Production	20 psi – 300 cc RO Water and Choline Chloride	Seconds	15.5
Stabilized Flow Injection	20 psi – 300 cc RO Water and Choline Chloride	Seconds	14.28
Stabilized Flow Production	20 psi – 300 cc RO Water and Choline Chloride	Seconds	15.24
Percent Cleanup Efficiency Production Initial		>75%	95.55 %
Percent Cleanup Efficiency Injection		>75%	100.7 %
Percent Cleanup Efficiency Production Stabilized		>75%	97.18 %

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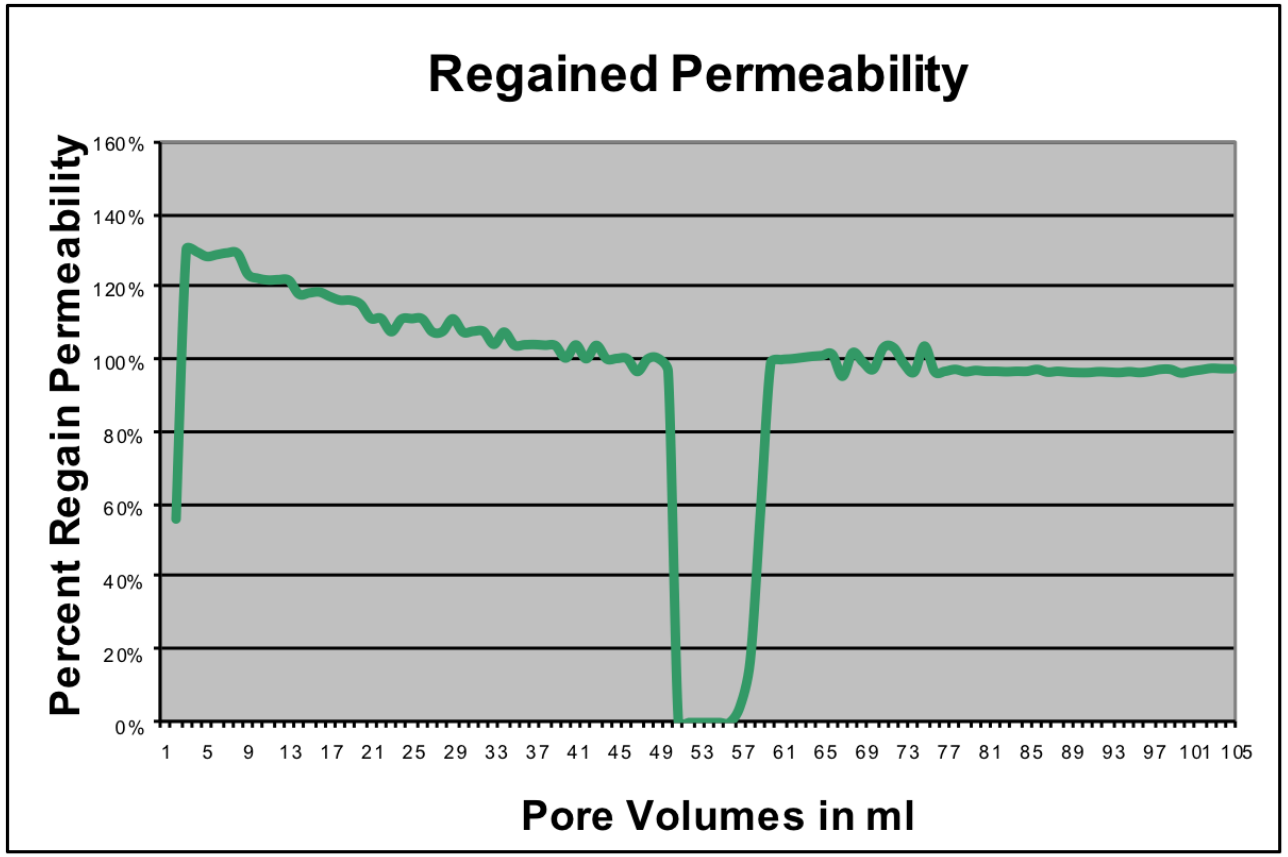
MuddAse



Clean-up Fluid:
MuddAse SX

Shut-in time:
20 hrs 15 min

Final Regain Permeability:
97.18%

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"Why let residual polymeric damage reduce the profit potential from every well?"