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FACSIMILE

TO:	JOHN EDDY AND MIKE KLAHN - Mark Everett
COMPANY:	DYNATEC AND SCHLUMBERGER LANL
FROM:	GARY SIMPSON
DATE:	05-31-01
FAX NUMBER:	505 667-7977
PAGES (INCLUSIVE):	4
RE:	DRILLING FLUIDS TABLE AND RECOMMENDATIONS
CC:	

COMMENTS:

John and Mike,

Please feel free to call me to discuss these recommendations.

Gary Simpson

14600

Baroid Industrial Drilling Products

LANL RECOMMENDATIONS
05-31-01
BARBER DRILLING SYSTEM

These recommendations are made in response to concerns about the contamination or alteration of samples in environmental monitoring wells at Los Alamos by the use of EZ-Mud Plus in Westbay sampling wells. The nature and duration of EZ-Mud Plus leads to questions regarding the reliability of measurements taken with the low flow sampling that occurs in Westbay completed wells. Alternatives to the current practices of well development as well as to the use of EZ-Mud Plus during drilling are needed to eliminate these concerns and restore reliability to the data collection.

These recommendations address lubricity and clay stabilization. They will not provide the high levels of hole stabilization that would be necessary to control caving and flowing sands or silts. Drilling fluid systems that provide this level of stabilization are certainly available but require the use of large amounts of fluids. The decision to use such systems has been discussed at length previously by LANL and was rejected. Should LANL and its agents wish to revisit this discussion we would be happy to provide input, but until then we have limited these recommendations to batch additions of lubricants and clay stabilizers.

The use of EZ-Mud Plus currently is for the lubrication of the outside casing being advanced as well as the stabilization of the borehole. Lubricity can be accomplished in a number of manners, most commonly by the addition of polymers that act as lubricants. Lubrication can also be accomplished by a very simple method of providing spherical surfaces for the casing to rotate upon. This method has been used successfully, though not commonly, for decades. The recent upsurge in deviated oil and gas wells has revived interest in this method of lubrication and is now used worldwide. Two products are available, glass and plastic beads. We recommend the STICKLESS glass beads because of the higher compressive strengths. These inert beads could be added to the annular space between casing and formation without affecting sampling or water tests.

It would be advantageous if the beads could be suspended during their addition to the annulus. This would allow the use of a pump for the addition process. An inert carrying agent is available in the form of BAROLIFT which are tiny polypropylene fibers that form a "net" to carry materials, alternatively, Magma-Fiber provides the same function, though not as efficiently, with the use of spun basalt.

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EZ-Mud Plus has also provided borehole stabilization by its ability to encapsulate native clays. An alternative would be the use of the non-ionic surfactant, PENETROL, which although not as effective as a PHPA, has been commonly used successfully for clay control. It is a surfactant, which have been tacitly approved by LANL as acceptable for the sampling process. Although biodegradable, PENETROL can be easily flushed from the well during development prior to any biodegradation. This product can be added in discrete batches when needed for stabilization.

Should the use of a PHPA (partially hydrolyzed polyacrylamide) still be desired, we recommend the use of EZ-MUD Reg as opposed to EZ-MUD Plus. EZ-MUD Reg is a lower molecular weight and lower activity PHPA than the EZ-MUD Plus. These attributes are more satisfactory from a sampling standpoint than the larger chain PHPA, EZ-MUD Plus.

To summarize, the recommendation is as follows:

A). These treatments can be added in batches of small size. Since a 700-gallon tank is available, we will use this as the treatment size.

B). To 700 gals add: 2lbs of BAROLIFT

60 lbs of STICKLESS 20

C). Pump into the annular space between casing and formation as needed to control torque.

D). Add 7 gallons of PENETROL to the above mix, or without the STICKLESS and BAROLIFT products, to control the occurrence of sticky and swelling clays. Repeat as often as necessary.

Please feel free to contact me with any questions regarding these recommendations. My phone is 303 464-9663 (o) or 303 884-8185 (cell).

Gary Simpson
Baroid Industrial Drilling Products

PRODUCT	COMPOSITION	LUBRICITY	HOLE STABILITY	DEGRADATION	TEST	DEVELOP. STRATEGY
Stickless	Glass Beads 20/40 mesh	Yes	No	> 10,000 psi compressive strength	Inert	Flushing
Lubra-Beads®	Divinyl benzene styrene copolymer beads	Yes	No	None		Flushing
Penetrol™	Non-ionic surfactant blend	Yes	Yes, moderate clay stabilization	Biodegradable		Flushing
Loloss®	Guar Gum	Yes	Yes	Fermentable within days		Enzyme assisted degradation
EZ-MUD®	4-6 mil mol wgt PHPA	Yes	Yes	Slow natural degradation of 2-3 yrs		Breaks down easily with oxidizer
EZ-MUD ®Plus	15 mil mol wgt PHPA	Yes	Yes	2-3 yrs for natural degradation		Breaks down easily with oxidizer
Aquagel Gold Seal®	Sodium montmorillonite (bentonite)	Yes	Yes	None	Methylene blue test	Strong dispersants combined with flushing
Quik-Foam®	Sulfated, ethoxylated alcohol	Yes	Slight	Biodegradable		Flushing
SS-105	Non-ionic 15 mil mol wgt PHPA	Yes	Slight	2-3 yrs for natural degradation		Breaks down easily with oxidizers
Barolift™	Shredded polypropylene fibers	No	Carrying agent	None		Flushing
Magma Fiber®	Spun mineral fiber	No	Carrying agent	Acid-soluble		Flushing, acid soluble
No-Sag™	Xanthan biopolymer	Yes	Yes and a carrying agent	Fermenting		Breaks down with oxidizers or acid

Simpson_Gary

From: "Gary Matula" <Gary.Matula@Halliburton.com>
To: "'Simpson_Gary'" <Simpson_Gary@email.msn.com>
Sent: Thursday, May 31, 2001 5:54 AM
Subject: RE: LANL Recommendations

As a quick follow-up, I would like to see more comments on the use of EZ MUD over Plus. Secondly, Quik-Foam probably should be identified as a sulfated, ethoxylated alcohol. Lastly, in your overview document, perhaps it would be a good idea to indicate there are two separate problems here. Each has its own solution but each solution has its own drawbacks. For example, there are a number of ways and alternatives to provide borehole lubricity, but each will not provide high levels of borehole stability in caving sands and gravel zones. Alternatively, there are systems available that will provide excellent borehole stability even with some lubricity but they will be more difficult to "clean up". The road to a solution will depend on which road LANL wishes to take.

Gary Matula
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> -----Original Message-----
> From: Simpson_Gary [SMTP:Simpson_Gary@email.msn.com]
> Sent: Wednesday, May 30,2001 4:41 PM
> To: Gary Matula
> Subject: Fw: LANL Recommendations
>
>
> ----- Original Message -----
> From: Simpson_Gary <mailto:Simpson_Gary@email.msn.com>
> To: Gary Matula <mailto:gary.matula@halliburton.com>
> Sent: Thursday, May 24, 2001 5:27 PM
> Subject: LANL Recommendations
>
> Gary could you comment on the table and the recommendations when you get a
> chance. I especially need your technical input on the test for the
> products as well as the degradtion of each product.
>
> Thanks.
>
> Gary S. << File: LANL RECOMMENDATIONS5-24-01.doc >> << File:
> LANLtablePRODUCT.doc >>