



Halliburton OIL WELL CEMENTING COMPANY

DUNCAN, OKLAHOMA

Farmington, New Mexico

July 10, 1959

Mr. Frank Gray
Caulkins Oil Company
Box 967
Farmington, New Mexico

Dear Sir:

I am sending you two copies of the data on Gel Plug. This is our material for formation protection during initial completion or remedial work on a well. I think this is exactly the material you would want to use to insure of a definite separation of the zones in the Breech B T-123 well should any remedial work ever be necessary.

This is an improved material over that which I spoke to you about. Previously we used the powdered ATB as an emulsifier where a fluid ATO is now used.

All material necessary to make Gel Plug are available in Farmington as well as in Cortez, Colorado. They are hauled separately to the location and any amount of the material can be mixed at the well site. I do not remember any occasion where more than 500 gallons was necessary to get the desired results.

Gel Plug currently is priced at thirty cents (30¢) per gallon.

If you desire any further information let us know.

Yours very truly,

Dick Northcutt
Dick Northcutt
Fieldman

DN:fab
cc: O. L. Elliott
H. C. Gray
Bill Taylor

BEFORE THE
OIL CONSERVATION COM.
SANTA FE, NEW MEX.
Caulkins EXHIBIT No. 4
CASE 1420

Case No. 1420
Exhibit No. 4

GEL PLUG

Gel Plug is a thick fluid designed to blanket an exposed formation so that undesired fluids in the well will not contact that formation.

Properties

It is prepared by emulsifying calcium chloride solution and Diesel oil or kerosene resulting in what is known as a water-in-oil emulsion. This means that the water is present as very fine thoroughly dispersed drops within a continuous oil matrix. This can be demonstrated by placing a small quantity of Gel Plug in water and in kerosene. Easy mixing with kerosene and difficult mixing with water will be observed.

This miscibility with oil allows dilution with formation crude oil and the complete removal from the formation will result.

Very little Gel Plug will normally enter the formation due to its high consistency and the low pressures involved. It is normally used as a blanket across the face of a formation to prevent the entrance of fluids present in the well into the formation which has been exposed while manipulating the packer during a remedial treatment of a well.

Much of the trouble normally experienced in cleaning up a well after the usual well-killing fluids have been employed will be avoided by use of this material. The possible harm to the formation such as a water block or the swelling of bentonitic materials present in the formation will also be avoided.

The viscosity of Gel Plug is not easily measured by conventional methods and will vary depending upon the amount of mixing employed during its preparation. A consistency that is almost too thick to pump can be obtained.

Calcium chloride serves to increase the weight of this material so that it will not be displaced by the fluid above it in the well bore. A density of about 10 pounds per gallon is obtained. In the event that bentonitic materials are contacted in the formation, no appreciable swelling should result due to the inhibiting action of calcium chloride.

Formation Protection

Gel Plug does not contain any type of chemical breaker which will destroy it. The finished emulsion is extremely stable and will remain in this condition for an indefinite period of time. Therefore, it may be necessary, in order to remove this fluid from the well, to swab it from the hole rather than expect it to flow out with ease. A small amount of dilution by well fluids will lower the viscosity considerably, making it much more easily removed.

Materials

<u>Code Name</u>	<u>Part Number</u>	<u>Description</u>
ATC	70-15533	Emulsifier
Calcium chloride	--	Weighting material

Uses

This material is normally used to prevent the entrance of an undesirable fluid into the formation which has been exposed due to manipulating a packer during remedial treatment of the well.

It has also been employed where a diverting action of a thin fluid being injected at a slow rate is desired. For example, in acidizing, this material has been used as a blanketing fluid.

A reverse application also has been found. Gel Plug pumped into formations has prevented formation fluids from entering a well. This is sometimes desirable while moving a packer between fracturing treatments.

Advantages

1. Less trouble experienced in cleaning up a well. A little swabbing is usually all that is necessary to initiate production.
2. Prevention of possible water blocking of the formation.
3. Prevention of possible swelling of bentonitic materials, if present in the formation.

Formation Protection

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ILLEGIBLE