

"Chloride" citations from pre-acid swabbing upper St Louis Perfs
5018-5024 ft squeezed off: 24000 ppm, 16200 ppm, 13800 ppm,
16000 ppm, 12500 ppm, 11220 ppm. Average about 15500 ppm.

Doc # 2618700

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COLO. OIL & GAS CONS. COMM.



00501085

PLAINS EXPLORATION COMPANY
1135 Petroleum Club Building
Denver, Colorado 80202

May 15, 1968 Completion Report - - - - - Owens #1

Location: C SW SW Sec. 2 - T17S - R48W, Kiowa County, Colorado

Elevation: 4203 K.B.
4193 Gr.

Casing: 252' of 8-5/8" with 250 sacks

5225' of 4 1/2" 9.6# set at 5233 with 125 sacks of cement with
2% Gel, 10% salt, 12.5% Gilsonite, 1% CFR2.

Commenced: 3/13/68 (w/r)
4/15/68 (w/pu)

Completed: 4/3/68 (w/r)
5/24/68 (w/pu)

PEC & UPRR 5/15/68 (W/pu)

May 15, 1968 Baney Well Service on location at 1:10 P.M., Mountain Time, with completion unit. Running swab tools less cups at 2:00 P.M. to check fluid level and get a marker on line for pick up at plug. Got fluid level with swab, but same too light to get pick up on plug. Put sand pump on then put two silver spots on line at frame above reel for pick up which showed plug that records show set at 5070'. Strung sand line out that showed 2213' of fluid in hole or 2171' above top of perforations at 5018'. First pull with swab showed about 1700' of gas that burned. Very slight sum of mucky, broken oily-type muck, but no live oil showed. While swabbing fluid on to bottom, had some kick back of fluid and 500 to 600' of gas showing ahead of each pull. Pulled swab in 20 minutes. Put fluid in drum - about 46 gal. fluid with scum of muck - no live oil. Another 30-min. pull had about 700' of gas that burned with chlorides of water showing 24,000 ppm. Total fluid out today approximately 40 bbls. Now about 100 bbls. over treating fluid out of top perforation. Shut down at 6:00 P.M.

May 16, 1968 On lease at 7:15 A.M. No pressure, as well was left open to get maximum fill up. No gas to surface. Ran swab at 7:30. Estimated 1268' of fluid above top of perforation - about 800' of gas ahead of first pull. Put first of fluid in dru. Same had good scum of brownish mucky with live oily-look forming in streaks. Did not have good oil odor. Four pulls getting fluid to perf. Now about 23 bbls. out of formation or 123 over treating fluid. 30-min. pull at 8:30 with chlorides of water showing 16,000 ppm. Got 60 gallons fluid with the scum of brownish muck with streaks of live oily look, breaking out of foamy muck, estimated 800' of gas ahead of swab. 30-min. pull fluid went into pit, but gas estimated at 1000'. Oil on pit caught fire and burned good for 8 to 10 minutes. Pulled in

30 min. at 9:30, burned gas which showed 700' ahead of swab. Put first of fluid in drum, rest to pit. Had 90' fluid with an oil scum, first definite live oil scum on drum, but no noticeable increase in scum. Pulled once every half-hour with the following results:

Time	Ft. Gas	Gal. Fluid	Remarks
10:00	600	48	Scum live green oil, no increase <u>16,000 ppm chlorides of water showing.</u>
10:30	600	42	Scum live green oil-covers $\frac{1}{2}$ top barrel.
11:00	600	48	" " " " " " " "
11:30*			
11:45	600	20	Scum live oil - covers $\frac{1}{2}$ barrel.
12:15	450	55	" " " covers all barrel.
			Very def. incr. Prob. $\frac{1}{2}$ " of oil-mud.
12:45	600	45	Good thick oil scum. $\frac{1}{2}$ " \neq
1:15	550	40	" " " Milked
1:45	550	40	" " " "
2:15	550	45	Good thick Oil show. Est. 4-5%?
2:45	?	30	" " " "
			<u>13,800 ppm chlorides of water showing.</u>
3:15	500	33	Possibly oil increase.
3:45	500	33	No noticeable change.
4:15	500	33	No noticeable change.

Now 139 bbls. over treatment back.

- * Ran Halliburton measuring line - zeroed braden head and found plug at 5065 or 5075 K. B.
- Shut down at 5:00 P.M.

May 17, 1968

Running swab at 6:30 A.M. Well had been left open. No gas to surface. 600' of gas ahead of first pull. 870' of fluid in hole or 818' above top of perf. First of fluid through drum showed scum of muck. Second pull 600' gas fluid same as above. Third pull 1200' of gas. Fluid showed scum of live oil. Fourth pull lost fluid in hole and some out of formation showed 1500' gas - possibly 3 gal. badly cut, but good live oil. Grind out from the 3 gal. showed 70% oil, quite a bit of oil scattered throughout water. After swabbing hole down, now have 152 bbls. over treat. fluid. Started 30-min. run from perforation.

Time	Ft. Gas	Gal. Fluid	Remarks
7:45	1100	44	Good scum w/live oil. Possibly 4% oil. <u>16,000 ppm chlorides of water showing.</u>
8:15	600	38	Good scum.
8:45	500	38	Broken scum.
9:15	500	36	Broken scum.
9:45	400	30	Broken scum, that increased while setting. <u>12,500 ppm chlor. water showing.</u>
10:15	400	30	Broken scum, that incr. while setting.
10:45	400	30	Possible increase in live oil.
11:15	350	33	No noticeable change.
11:45	400	35	" " " "
12:15	400	36	" " " "
12:45	350	35	" " " "
1:15	500	29	Possible increase in oil.
1:45	500	43	No noticeable change.

<u>Time</u>	<u>Ft. Gas</u>	<u>Gal. Fluid</u>	<u>Remarks</u>
2:15	500	20	No noticeable change.
2:45	500	34	" " "
3:15	350	34	" " "
3:45	400	31	" " " 11,220 ppm chlorides of water showing.

Total fluid swabbed by hourly test this day 14 bbls., making a total of 166 bbls. over seed from acid job. Possibly oil increased, but very little, if any. 1/4" to 3/8" scum of brownish badly cut with broken scum of live thin oil on top. Some oil still in water, but would guess less than 2%. Orders from Mr. Volk at 6:15 P.M., 5-17-68 to treat well with 500 bbls. fresh water. The water had been put in Halliburton's tank that was on location 5-16-68. Halliburton was on location at 8:00 P.M. with 1 - HT 400. Laid two 2" lines to well head. Started to load hole at 8:35 P.M., 5-17-68. Hole loaded at 8:40, showing 80 bbls. had been pumped. Pressure started up, second pump was added. In 1/2 min., pressure had reached 1175#. Gradual increase for 4 minutes, then leveled at 1300#, then no change for 21 minutes. Meter on truck showed that 380 bbls. had gone into formation. Min. pump pressure 1175# - Max. 1300#. Average rate while pumping in formation 15.1 bbls. per minute. Instant shut down pressure 250# on vacuum in 4 minutes. Total used in treatment by meter 460 bbls. (fluid to recover) from Halliburton 500 tank.

May 18, 1968 6:00 A.M. made connection to swab tank. At 7:00 A.M., 2500' of fluid in hole. Swabbed to perf. at 8:30. Had taken out 76 bbls. Show of oil at 8:10, or approx. 60 bbls. back. Fluid was leveling off at 10:00 with 115 bbls. back. Sample from stream showed scum of brownish muck with streaks of greenish free oil breaking out. About 400' of gas ahead of swab. Then started 7-hour swab test that averaged 11.60 bbls. fluid per hour with very little change in oil show. Slight decrease in gas at end of test. Now 203 bbls. of the 460 of treating fluid back - or 257 bbls. seed left in hole. Could be as much as 1 to 2% oil? Shut down at 6:00.

May 19, 1968 At 6:30 A.M., 2118' fluid above top perforation. 1st pull with swab showed 400 to 500' of gas. First of fluid put through drum - same showing slight broken scum of brownish muck - no live oil show. Put 40.25/1 bbl. to pit in tank swabbing down. No live oil show until pull of fluid from formation. 2nd run from fresh formation fluid put through drum. Same showed possibly a 2" scum of cut and live oil. About 4 gal. of the muck and oil were taken from the top of 2 drums of fluid. Same settled by heating to possibly 2 gal. of good, clean oil. From one pull at this time, about 3800' of gas ahead of swab, with about 10 bbls. out of formation. This morning started test in tanks, swabbing from top of perforation. For that hour, made 13.57 bbls. Same showed 800 to 900' of gas showing scum of live oil on sample taken from stream. Last pull put through drum. Same showed scum of live oil with some brownish muck. Now have 264.53 bbls. out after treatment. 196 bbls. seed left in hole. Started tubing in hole, Halliburton RTTS tool & tubing tester tool at 10:50 A.M. for squeeze job on top perf. (5018-5024) with bridge plug at 5070'. Halliburton steel line showed same at 5075' K. B. In hole. After

May 19, 1968
(Cont'd.)

169 jts. of 2" EUE 8rd thrd. tubing and 1 - 10' and 1 - 8' sub were tested to ample pressure to handle job, bottom of packer was set at 4983' by Halliburton steel line measurements showing tubing 5' deeper than tally. Injection rate showed 4.50 bpm at 1000# psi at surface. Mixed 150 sacks Posmix - first 75 with 1½% calcium chloride - other 75 sacks with fresh water. Radioactive material throughout. With 100 sacks in formation, same was taking cement on vacuum. By several stages 10 to 3 minutes, was able to squeeze to 3100#. Held for 1 minute. Released. Repressured to 3000# for 2 minutes with 140 sacks out. Released tool. Backed the 10 sacks up the tubing, then added 3 jts. of tubing to string, lowering 2½ jts. while washing out cement from casing, returning same to surface. For the record, there was slight radioactivity from same for the material returned to pit about 50' north of the well. Laid down 3 jts. of tubing. Reset packer and pressured to 1650# at surface, hole loaded with water for 2 minutes. Released pressure very slowly. Pulled 10 jts. tubing. Shut down at 7:00 P.M.

May 20, 1968

6:00 A.M. Pulled tubing. Swabbed fluid. Fluid to (1,000' in hole.) Putting same into tank for re-use. Sand pumped clean as possible to top of plug. Spudded with tools on sand line 40 to 50 minutes, then sand pumping to 8:00 P.M. Ran Halliburton steel line about 2:00 P.M. Plug showed at 5072' K.B. or same as the day before when plug was checked for this purpose. Sand pump picked up several pieces thought to be part of plug. The first 4 hours was thought to be part of the plug, then mostly finer metal-material. The foregoing all on 5-20-68. Shut down at 8:00 P.M.

May 21, 1968

6:00 A.M. Sand pumped 3 times, getting from a small handful to less fine metal cuttings. Swabbed fluid to bottom. Spudded on plug 15 to 20 minutes. Lost tools. Got fishing tool from Sterling, Colorado. Fished tools first run. Rigged tools again for spudding. Spudded 4½ minutes. Lost tools. Fished same. Ran the 2" EUE 8rd tubing with 3-7/8" rock bit. Got Halliburton pump truck back on location. Used same for circulating while drilling plug. Plug drilled in one hour. Then ran remainder of plug to 5183 tubing tally or 5183 steel line. Very good check with plug and original reported T.D. Pulled 48 jts. tubing. Shut down at 8:00 P.M.

May 22, 1968

Started 6:00 A.M. Pulled tubing. Halliburton tool man on location at 7:30 A.M. Started in hole with RTTS tool at 8:15 A.M. Set bottom of RTTS tool at 5049 and were ready to squeeze perforations 5084 to 99 with 150 sacks Posmix with first 75 sacks having 1½% calcium chloride. Radioactive material was distributed throughout cement. Approximately first one-hundred sacks went in with a vacuum. Staged several times, waiting two to seven minutes between pumping, to 3000 psi. Bled off twice and held 3000 psi for four minutes. Washed through cement and down to 5174. Reset tool approx. one hour after 3100 psi test, and tested to 1500 psi squeeze on perf. 5084 to 89. Pressure bled 100 psi in four minutes. Released pressure and let set one hour plus. Repressured to 1500# - pressure held for 2 mins., bled off and repressured

to 1500#, held for seven minutes. Started tubing out of hole at 3:00 and decided to let cement set 36 hours plus before perforating.

May 23, 1968 Shut down waiting on cement.

May 24, 1968 Crew on location at 8:00. Swabbed down hole. Arrived on location at 10:05, loggers were going in hole to log. Started logging at 10:30 for a radioactive tracer and a collar log. Found fluid at 4735 while going in hole with logging tool and gun. Ran gun with top shot 2'9" below collar locator and bottom shot 5'6" below collar. Bottom of gun 9'4" below collar locator. Pickup showed T.D. at 5183 corrected to 5174; i. e. 9' of gun below collar locator. Checked collars up through 4898, with all checking out. Dropped back and picked up collar at 5123, then stopped with collar locator at 5090. Picked up 9', so collar locator at 5081 and top shot at 5084. Perforated 10 deep penetrating dyna jets 5084 to 87 at 12:20. Gun showed second jet from top and second jet from bottom. did not fire, so original plans of 4' or 12 shots was reduced to 10. It was decided that 10 holes would be sufficient, so a second run was not attempted. The collar locator log was rerun to check perforations. Only one perforation at 5084 was seen.

The hole was swabbed to bottom at 2:00 with some gas seen on first pull. The gas was lit on second pull which showed 60' of gas ahead of fluid that was on bottom. Waited 15 minutes and pulled, 55' of gas lit ahead of approximately 3 gallons of fluid. Pulled at 3:30, had 150' of gas and 7 gal. of fluid with a broken mucky scum with a live oil show. Pulled at 4:30, had 140' of gas, 3 gal. of fluid with mucky scum and some free live oil. Shut down at 5:00.

May 25, 1968 Running swab at 6:30 A.M., 700' gas 75 gal. fluid, or an average of 5 gal. per hour. Same settled out to show about 15% or 12 gal. oil emulsion. The clean oil grind out showed less than 1/2% water. The 1-hour pull had 35 gal. fluid with muck on top of oil. Only caught 15 gal., same had scum showing streaks of live oil. 150' gas ahead of fluid. Milked two times, then pulled on hour. 12 gal. fluid, scum of muck with live oil. Now 122 gal. fluid from formation after perforation. Possibly 12 gal. oil and emulsion. Ran swab to bottom to clean up hole for correct fluid measurement below perforation. Halliburton chemist ran water- showed as follows:

Specific Gravity	1.015
pH	8.5
Sulfates	Heavy
Total Solids	23,000
Chlorides	13,800
Iron	None

The chemist said this was filtrate water because of the pH and sulfate. At 8:50 pumped 1 bbl. of water to fill below perforations. Waited until 9:00 and followed with 250 gal. MCA and 1,000 gal. treated water (2½ gal. 3N & 2½ gal. 5N) Filled hole. Meter showed a total of 84.2 bbls, initial water, acid, treated water and water. Well was not on vacuum, so pressured to 200 psi, bled off to 100 in

1st Use of Acid?
TDS contaminated
after this.

four minutes. Filled tank and pressured to 200 psi - 2 more tries, allowing to bleed to 100 which took about four minutes each time. Had approximately 10 gal. of acid in formation. Pressured to 300 psi 5 times. Bled back to 200 in from 4 to 3 minutes. Pressured to 400 psi two times. Bled to 200 in 4 minutes and 2 minutes respectively. Pressured to 500. Bled to 300 in 1 minute. Repressured, bled to 300 in 3/4 minute, then 1/2 minute. Started taking fluid at .7 bbl. per minute at 500 psi. Took remaining six barrels at .6 bbls. per minute with pressure dropping from 500 to 350 psi in the interim. Shut down and on a slight vacuum in five minutes. Job complete at 10:00 A.M. Total fluid to recover, 92 bbls.

At 11:00 A.M., 5-25-68, started swabbing back fluid. Found fluid 60' down hole. At 12:40, pulled from bottom. Had put 84.52 bbls. in tank or hole capacity. Started swabbing fluid through drum. In 4.5 hours, took 103 gal. fluid from formation - or an average of 23 gal. per hr. Now 90.42 bbls. of the 93 bbls. used in treatment recovered - or 2.5 bbls. seed left in hole with 1.5 bbls. of the 8 bbls. that entered formation back, 250' of gas showed ahead of fluid and spots of black, dead oil-type muck formed on top of fluid. No live oil show. With 4.75 bbls. back, about 1/4" of muck formed on top of fluid in drum from 17 gals. Approximately 130' of gas showing now. With 5.5 bbls. back, approximately 100' of gas. No noticeable change in muck. No live oil showing, but good oily show on hand from muck. It was decided that hole should have a chance to clean muck from formation before another treatment. All present agreed that overnight should be allowed. Shut down at 6:00 P.M.

May 26, 1968

Running swab at 6:30, 330' fluid in hole in 13 hrs. 900' gas. Put first of fluid through drum. After settling, drew water - same showed about 15 gal. fairly clean oil.

Pulled in 1 hour - got 150' gas, 32 gal. fluid with good scum oily muck. 30 mins. to clean up hole. Dry run.

More Acid

Made connections for acid job. Put 1/2 bbl. water in hole at 8:30. Then started acid. Capacity of hole to perforation, 84 bbls. Hole loaded with 86 bbls. in. Remainder of 16 bbls. was pumped in 2 1/2 minutes from 450# to 500# psi at surface with increase in injection. Ran last minute with slight increase in pressure - approximately 104 bbls. total. Shut down pressure 150#-on vacuum in 2 1/2 minutes. Swabbing in 15 minutes after job was completed. Fluid down hole, 150'. Put 80.48 bbls. in tank then turned fluid to pit. Estimated amount by ft. of fluid on swab. Pulled from 5050' at 10:12 A.M., making 92 bbls. back - or approximately 8 bbls. back of the 20 bbls. which had entered formation. Had 3100' of burnable gas ahead of fluid with good show of free oil. When the 104 bbls. of treating fluid were back, estimated a possible 10% oil. With 8 bbls. over seed out, a sample from treater indicated 15% and oil and emulsion, showing about 1,000' gas each pull. Now swabbing about 12 bbls. per hour. Pulling from bottom 6 times per hour, 800' gas each pull. At 12:45, switched to tank for 5-hour test. Averaged 8.8 bbls. per hr. Pulling 5 times per hour, samples from stream indicating 4 to 18% oil and emulsion. Hourly gauge following 9.65 - 8.95 - 8.50 - 9.75 bbls. Possibly 6 pulls last hour. By Kolor Kut, fluid showed 8% oil, but spots indicated that the oil was carrying some water. 5'6" in tank starting fluid back after 750-gal. job 5-26-68.

May 27, 1968 Drew water from tank, oil being jelled - stuck to sides of tank and did not level in tank when water was drawn off. When oil levels, same could show 8%. Indicated by Kolor Kut.

At 6:30, 2200' fluid in hole - 1300' gas ahead of first pull. First of fluid put through drum had 30 gal. good clean oil; other water showed badly cut muck ____%? Swabbed fluid to bottom. Took two pulls of fresh fluid from formation - oil badly cut throughout fluid-% of oil Indicated to 10% from top to bottom of pull.

Running tubing and rods to put on pump.

/S/ E. E. Duncan -- 5/27/68