MAX KATCHEN 1

1 Locate and dig up plate welded on top of surface casing. Expected to be approximately 5' below ground level.
2 Weld bell nipple on top of 4-1/2" casing and have top of 4-1/2" casing about level with ground. Install 4-1/2" tubing head on top of casing stub.
3 Level location for base beam rig.
4 Notify COGCC at least 48 hrs before moving rig on location.
5 Move In Rig Up Work Over Rig. Nipple Up 7-1/16" Blow Out Preventer .
6 Pick Up (PU) 3-7/8" mill tooth bit, (4) 3-1/8" drill collars and 2-3/8" N-80 workstring and drill through existing cement plugs in 4-1/2" production casing using fresh water with biocide. Plugs from original P&A (2002) records are as follows:

   a. 0-496' (40 sks Class G neat cement)

   b. 548' – 744' (40 sks Class G neat cement)

   c. 1,188' - 1,616' (40 sks Class G neat cement)

   There is most likely a cement across the Sussex from 4,200' – 4,600'

7 Continue going in hole down to top of 2 sks cement 7,244', above Cast Iron Bridge Plug at 7,270'. Trip Out Of Hole and stand 2-3/8 workstring in derrick. Lay Down drill collars and bit.
8 MIRU gyro services. Run gyro survey from CIBP at 7,244' to surface. TOOH with gyro tools. RDMO gyro services.
9 MIRU wireline contractor. PU & Run In Holewith Casing Collar Locator (CCL) & Cement Bond Log tools (CBL) to 7244' and run bond log from 7,244' to surface. Standby wireline.
10 PU & RIH open ended with 2-3/8" workstring to top of cement at 7,244'.
11 Circulate hole with drilling mud weighting at least 9 ppg and treated with biocide from cement above CIBP at 7,244' to surface. TOOH and stand back 2-3/8" workstring.
12 NOTE: WE WILL ASSUME 7,035' AS TOP OF CEMENT IN ANNULUS OUTSIDE OF 4-1/2" PRODUCTION CASING. CBL MAY INDICATE OTHERWISE AND IF SO, ADJUSTMENTS TO VOLUMES AND DEPTHS WILL NEED TO BE MADE.
13 PU & RIH with CCL & 3-1/8" perf guns to 6,935' (or 100' above Top Of Cement as verified by the CBL) and perforate using 3 spf, 0.38" EHD, 120 deg phasing, 1' net, 3 shots total. PUH to 6,400' and perforate using 3 spf, 0.38" EHD, 120 deg phasing, 1' net, 3 shots total. POOH with wireline. Note: top of Niobrara is at 6,830'.
14 PU & RIH with 2-3/8" workstring and cast iron cement retainer on setting tool and set CICR at 6,450' (50' below upper squeeze holes). MIRU cement contractor. Establish pumping rate through squeeze holes at 6,935' and 6,400' with mud. Pump tubing volume plus 20 bbls. Shift retainer setting tool and test tubing with 1,000psi for 5 mins. Note returns in Open Wells report. Pump 10 bbls water ahead. Mix and pump 140 sks cement down 2-3/8" TBG and through retainer consisting of 15.9 ppg, 1.49 cf/sk, Class G, Neat with 35% silica flour cement slurry (includes 25% excess). Displace cement with mud to within 1 bbl of cement retainer at 6,450'. Sting out of retainer and dump remaining cement on top of CICR. Note returns during cement job in Open Wells report. ***NOTE: If less than full circulation is coming to surface while performing suicide squeeze, displace cement to top of cement retainer (do not dump any cement on top of the retainer). Sting out of the retainer, pull two joints and reverse circulate to clear any cement from the tubing. Mix and pump an additional 50 sks of the same cement blend as used below the retainer and circulate cement slurry to the end of the tubing and close in backside. Pump cement into squeeze holes above the cement retainer and displace cement to clear the tubing in an effort to get a "walking" squeeze. Hesitation squeeze if necessary to get 1000 psi standing pressure. Hold for 15 mins and slowly bleed off pressure. Slowly pull one stand or two joints and reverse circulate until returns are free of cement. Close backside again and pressure to 1,000 psi and shut in for minimum of 4 hours or overnight. After the shut in time, bleed off pressure and continue with the procedure.***
15 Pull up hole 150' to 6,300' with workstring and reverse circulate until no cement returns to surface plus 20 bbls.
16 TOOH while standing back 2-3/8" workstring. Lay down CICR setting tool.
17 PU & RIH with CCL & 3-1/8" perf guns to 5,000' and perforate using 3 spf, 0.38" EHD, 120 deg phasing, 1' net, 3 shots total. PUH to 4,185' (150' above top of Sussex) and perforate using 3 spf, 0.38" EHD, 120 deg phasing, 1' net, 3 shots total. POOH with wireline and release wireline. Note: top of Sussex is 4,335'.

18 PU & RIH with 2-3/8" workstring and cast iron cement retainer on setting tool and set CICR at 4,235' (50' below upper squeeze holes). Establish pumping rate through squeeze holes at 5,000' and 4,185' with mud. Pump tubing volume plus 20 bbls. Shift retainer setting tool and test tubing with 1,000psi for 5 mins. Note returns in Open Wells report. Pump 10 bbls of water ahead, then pump 20 bbls Sodium Metasilicate water ahead of cement. Mix and pump 300 sks cement down 2-3/8" workstring and through retainer consisting of 15.8 ppg, 1.15 cf/sk, Class G, Neat, with ¼#/sk cello-flake (volumes include 25% excess for annular fill). Displace to within 1 bbl of CICR at 4,235'. Sting out of retainer and dump remaining cement on top of CICR. Note returns during cement job in Open Wells report. ***NOTE: If less than full circulation is coming to surface while performing suicide squeeze, displace cement to top of cement retainer (do not dump any cement on top of the retainer). Sting out of the retainer, pull two joints and reverse circulate to clear any cement from the tubing. Mix and pump an additional 50 sks of the same cement blend as used below the retainer and circulate cement slurry to the end of the tubing and close in backside. Pump cement into squeeze holes above the cement retainer and displace cement to clear the tubing in an effort to get cement into and across the upper squeeze holes. Slowly pull one stand or two joints and reverse circulate until returns are free of cement. Pull an additional stand of pipe and shut in for minimum of 4 hrs or overnight. Go back down hole and tag top of plug and record in Open Wells report and continue the procedure.***

19 Pull up hole 100' to 4,125' and reverse circulate with mud until no cement returns to surface plus 20 bbls.

20 TOOH while standing back 800' of 2-3/8" workstring in derrick. Lay down remaining workstring and CICR setting tool.

21 TIH open ended with 800' of 2-3/8" workstring standing in derrick. Mix and spot 35 sks cement consisting of Class G, Neat, 15.8 ppg, 1.15 cf/sk, 2% $CaCl_2$ cement slurry. Note: base of Fox Hills is at 700'.

22 PUH to 400' laying down 2-3/8" workstring. Mix and spot 35 sks cement consisting of Class G, Neat, 15.8 ppg, 1.15 cf/sk, 2% $CaCl_2$ cement slurry up to surface. TOOH while laying down remaining workstring. RDMO cementing company.

23 ND BOPE and RDMO WO Rig.

24 <u>Post Rig Activities (Document in Open Wells)</u>

25 Have excavation contractor notify One-Call to clear for digging around wellhead.

26 Check top of cement inside 4-1/2" production casing. If cement is not of sufficient height (less than 25' below ground level), place redi-mix cementer on will call.

27 Excavate hole around production casing of sufficient size and depth to allow welder to cut off 4-1/2" production casing at least 5' below ground level.

28 Have welder cut off 4-1/2" production casing at least 5' below ground level.

29 If needed, MIRU ready cement mixer. Use 4,500 psi compressive strength redi-mix cement (cement with sand, no gravel)to finish filling surface casing to top of cut off.

30 Have welder weld on cap.

31 Have excavation contractor back fill hole with native material. Clean up location and have leveled to plant any vegetation required.

32 Submit Form 6 to COGCC. Provide "As Plugged" wellbore diagram identifying the specific plugging completed.