Compiled by

S. Chadima

1-9-2015

***Presho Core Hole - Fall 2014***

**Location 103N, 77W, Sec10 BCBC**

**Elevation 1872 feet**

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| **Day** | **Date** | **Personnel**  **in addition**  **to SDGS staff normally present (Ann, Sarah, Ted, Jim, and Scott)** | **Logistics and tasks** | **Pass** | **Drill**  **footage**  **in feet** | **Fish for dropped core and/or re-drill to capture dropped core** | **Recovery**  **in**  **inches** | **Downtime**  **and**  **reason** |
| **WEEK 1** | | | | | | | | |
| Mon | 9-8-14 | Bill;  Jay | * Drove to Presho * (Rig was previously set up) * Rotary drilled to 67 feet * Changed to the coring setup |  |  |  |  |  |
| Tues | 9-9-14 | Bill;  Jay;  Derric | * Rain and lightening * Cleaned/reamed the hole * Derric drove out from Vermillion with casing * Set 4-inch, schedule 40, PVC casing from 0 to 60 feet * SDSMT decided to buy 500 feet of PVC casing |  |  |  |  | 8 hours Weather |
| Wed | 9-10-14 | Bill;  Jay | * Used diamond-impregnated bit for first coring pass * Pulled rods * Changed to carbide-tooth bit after Pass 1 * Cored * After Pass 6, adjusted the v-latch on the core barrel * Cored | 1  2  3  4  5  6  7  8  9  10  11  12 | 67-67.7  67.7-69  69-74  74-79  79-84  84-89  89-94  94-99  99-104  104-109  109-114  114-119 | ---  ---  ---  ---  ---  ---  ---  ---  ---  ---  ---  --- | 8  31.3  72  69  96  77  89  88  92  89  100  95 |  |
| Thurs | 9-11-14 |  | * Drove to Vermillion |  |  |  |  |  |
| **WEEK 2** | | | | | | | | |
| Mon | 9-15-14 | Bill;  Dan;  Rachelle;  Wes  replaced  Jim;  Jeff  replaced  Sarah | * Drove to Presho * Pulled rods * Changed to a diamond-impregnated bit before Pass 13 * Cored * Bit plugged * Pulled rods; cleaned bit | 13 | 119-120 | --- | 5.5 |  |

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| Tues | 9-16-14 | Bill;  Dan;  Rachelle;  Amy;  Wes;  Jeff | * Changed to carbide-tooth bit before Pass 14 * Cored | 14  15  16  17  18  19  20  21 | 120-124  124-129  129-134  134-139  139-144  144-149  149-154  154-157 | ---  ---  ---  ---  ---  ---  ---  --- | 12  115  74  60  87.5  65  92  30 |  |
| Wed | 9-17-14 | Bill;  Dan;  Rachelle;  Sarah  replaced  Wes;  Jeff | * Before Pass 22, pulled rods; SDSMT requested that we try their diamond-impregnated bit (from the Ft. Pierre core hole) * Changed to that bit (which has larger water ports) * Cored * Pulled rods; installed surface set bit before Pass 24 * Cored | 22  23  24  25 | 157-159  159-164  164-169  169-174 | ---  ---  ---  Fished once | 31  70  35  80 |  |
| Thurs | 9-18-14 | Jeff | * Drove to Vermillion * Learned that DOT wants a permit filed, for drilling in this ditch! |  |  |  |  |  |
| **WEEK 3** | | | | | | | | |
| Mon | 9-22-14 | Bill | * Drove to Presho * Repaired rig; replaced hydraulic seals |  |  |  |  | 5 hours Equipment |
| Tues | 2-23-14 | Bill | * Cored * SDSMT’s casing arrived (in Chamberlain) | 26  27  28 | 174-179  179-184  184-189 | ---  ---  --- | 45  77  47 |  |
| Wed | 9-24-14 | Bill;  Foster;  1 Student from Thailand | * Cored * NO SDGS photos for Pass 29 * Bit plugged at 200 feet * Pulled rods; cleaned bit * The 500 feet of casing that arrived in Chamberlain was transferred to Presho; placed on SDGS trailer * Took road measurements for DOT permit | 29  30  31  32  33 | 189-194  194-199  199-200  200-204  204-209 | ---  ---  ---  ---  --- | 69.5  53  23  50.5  59 |  |
| Thurs | 9-25-14 |  | * Drove to Vermillion |  |  |  |  |  |

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| **WEEK 4** | | | | | | | | |
| Mon | 9-29-14 | Bill;  Dan;  Rebecca | * Drove to Presho * Got a stopwatch for timing passes more easily * Cored | 34  35  36 | 209-214  214-219  219-224 | ---  ---  --- | 58.5  62.5  58 |  |
| Tues | 9-30-14 | Bill;  Dan;  Rebecca | * Rained * Cored | 37  38  39  40  41  42  43  44 | 224-229  229-234  234-239  239-244  244-249  249-254  254-259  259-262 | ---  ---  ---  ---  ---  ---  ---  --- | 59  62  60  43  55  67  34  79 |  |
| Wed | 10-1-14 | Bill;  Dan;  Rebecca;  Foster;  Derric;  Layne;  Tom;  Chris | * Cored * Pass 50 was in 3rd gear * Repaired broken strand on core retriever cable which jammed in the wireline crown block at the top of the mast pulley after Pass 50, but before the first fish | 45  46  47  48  49  50 | 262-264  264-269  269-274  274-279  279-284  284-289 | ---  ---  ---  ---  ---  Fished twice | 24  52  70  52  69  47.5 | 2 hours Equipment |
| Thurs | 10-2-14 | Bill | * Cored * Pass 51 was in 2nd gear * Pass 52 was in 2nd gear * Drove to Vermillion | 51  52 | 289-294  294-299 | ---  --- | 66  56 |  |
| **WEEK 5** | | | | | | | | |
| Mon | 10-6-14 | Bill;  Amy | * Drove to Presho * Pulled rod * As requested, put on diamond-impregnated series 6 flat bit before Pass 53 * Also asked to double rotation and pressure (4th gear) * Before Pass 53, noticed that the rod exteriors were green (rather than the usual rusty red) as they came out of the hole while changing bits from about 180 to 280 feet below the surface (possibly due to sulfuric/reducing water?) * Cored passes 53 and 54 in 4th gear | 53  54 | 299-304  304-309 | ---  Fished once | 51  58 |  |
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| Tues | 10-7-14 | Amy | * Windy; and very windy afternoon * Cored * Passes 55, 56, and 57 were drilled in 4th gear * Pulled rods after Pass 57 * Put on surface set bit * Note - the diamond-impregnated series 6 flat bit we removed had 2 chips of metal broken off the end * Cored | 55  56  57  58  59 | 309-314  314-319  319-324  324-329  329-334 | Fished once  Fished once  Fished once & re-drilled  ---  Fished once & re-drilled | 61  53  68  44  55 |  |
| Wed | 10-8-14 | Amy;  2 Students from Sinte  Gleska University | * Late afternoon was very windy * Cored * After Pass 60, replaced core lifters with new ones * Cored * After Pass 63, adjusted inner barrel v-latch length by one full rotation * Cored | 60  61  62  63  64 | 334-339  339-344  344-349  349-354  354-356 | ---  Fished twice & re-drilled  Fished twice  Fished once  Fished twice & re-drilled | 41.5  54  59  62  17.5 |  |
| Thurs | 10-9-14 | Foster;  Amy | * Cored * Drove to Vermillion | 65  66 | 356-359  359-364 | Fished twice & re-drilled  --- | 41  58.5 |  |
| **WEEK 6** | | | | | | | | |
| Mon | 10-13-14 |  | * Holiday |  |  |  |  |  |
| Tues | 10-14-14 |  | * SDGS staff had health screenings at USD in the morning * Drove to Presho * Unloaded rods from gooseneck trailer, unloaded water truck |  |  |  |  | 3 hours Health |
| Wed | 10-15-14 |  | * Took water truck to Pierre for replacement of water tank * Borrowed DOT portable, plastic water tank; secured it on the gooseneck trailer * Cored * Passes 67, 68, and 69 were drilled in 3rd gear | 67  68  69 | 364-369  369-374  374-379 | ---  Fished once  --- | 61  58  54 |  |

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| Thurs | 10-16-14 | Bill | * Very windy * Cored * Also, repackaged 3 core passes from yesterday, now that the argon and package sealer were available * Passes 70, 71, and 72 were drilled in 3rd gear * Drove to Vermillion | 70  71  72 | 379-384  384-389  389-394 | ---  ---  Fished once | 51.5  57  62 |  |
| **WEEK 7** | | | | | | | | |
| Mon | 10-20-14 | Bill | * Drove to Presho * Cored * Passes 73 and 74 were drilled in 3rd gear | 73  74 | 394-399  399-404 | Fished once  --- | 57  79.5 |  |
| Tues | 10-21-14 | Bill | * Cored * Passes 75, 76, and 77 were drilled in 3rd gear | 75  76  77  78A  78B  79  80 | 404-409 409-414  414-419  419-421  421-424  424-429  429-434 | Fished twice  Fished once  Fished three times  Fished twice  Fished once  ---  Fished three times | 54.5  65.5  47.5  8  65  58.5  66.5 |  |
| Wed | 10-22-14 | Bill;  Stevie  replaced  Sarah | * Rained * Cored | 81  82  83 | 434-439  439-444  444-449 | Fished twice  ---  --- | 53  59  56 | 1 hour Weather |
| Thurs | 10-23-14 | Stevie | * Ordered/picked up several replacement parts * Drove to Vermillion |  |  |  |  | 5 hours Equipment |
| **WEEK 8** | | | | | | | | |
| Mon | 10-27-14 |  | * Raining * Drove to Presho * New core lifters arrived, but they were the wrong size (diameter) * Installed new hook on rig * Coring began at 3:55pm | 84  85 | 449-454  454-459 | ---  --- | 45  67 |  |

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| Tues | 10-28-14 | Bill | * Wind 30 mph * Cored * Pulled rods after Pass 88 * Planned to e-log with both probes; first the sonic probe * Sonic probe hung up at 134-135 feet (going down and coming up); bottomed at 273 feet (approximate top of the faulted zone) * Sonic probe was not communicating with data computer; tried a second sonic e-log from 100 feet to surface (also unsuccessful) * Next, tried to e-log with the gamma/resistivity/SP (8144A) probe; from about 147 feet to the surface - successfully * Winterized equipment | 86  87  88 | 459-464  464-469  469-474 | ---  ---  Fished five times | 46  57  14 |  |
| Wed | 10-29-14 | Bill | * Rig froze up overnight (expected low of 28°, actual was 17°F) * Checked on new water truck tank (requested adjustments) * New core lifters arrived * Started putting rods down about 2 pm, started coring at 5:08 pm * Winterized equipment | 89 | 474-479 | --- | 63 | 7 hours Weather |
| Thurs | 10-30-14 |  | * Drove to Pierre * Picked up water truck; returned portable tank to DOT * Reloaded equipment onto the water truck * Drove to Vermillion |  |  |  |  |  |
| **WEEK 9** | | | | | | | | |
| Mon | 11-3-14 |  | * Daylight savings started * Meeting at 7am with Derric; overtime is now allowed * Rain and sleet * Drove to Presho * Installed heavier valves on new water truck * Replaced pressure gauge on rig * Cored * Winterized equipment | 90 | 479-484 | --- | 57.5 |  |
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| Tues | 11-4-14 | Bill | * Thawed/warmed up equipment * Cored * Repackaged Pass 90 * Water swivel starting to leak * Winterized equipment | 91  92  93  94  95  96 | 484-489  489-494  494-499  499-504  504-509  509-514 | ---  ---  ---  ---  ---  --- | 60  63  63.5  46  77  51 |  |
| Wed | 11-5-14 | Bill;  Derric;  Tom;  Darren | * Thawed/warmed up equipment * Cored * Wind gusts forecast to 55 mph; arranged trucks accordingly as a windbreak! * Winterized equipment | 97  98  99  100  101  102 | 514-519  519-524  524-529  529-534  534-539  539-544 | Fished once  ---  ---  ---  ---  Fished once | 54  62  59.5  61.5  57  67 |  |
| Thurs | 11-6-14 | Bill | * Overnight low was 26°F * Thawed/warmed up equipment * Cored * Winterized equipment * Drove to Vermillion | 103 | 544-548.7  Ran out of water & stopped coring | --- | 59 |  |
| **WEEK 10** | | | | | | | | |
| Mon | 11-10-14 |  | * In the office all week, due to 8-hour holiday, and winter storm/weather |  |  |  |  | 30 hours Weather |
| **WEEK 11** | | | | | | | | |
| Mon | 11-17-14 |  | * Drove to Presho * Bad weather; prepared, but delayed start until Tuesday |  |  |  |  | 5 hours Weather |
| Tues | 11-18-14 | Dan | * Met with Dan at Hutch’s Café * Before the meeting, Dan had already changed his flight plans; rescheduled to leave on 11-19 because of the weather * Could not drill due to weather-related conditions - unable to safely core |  |  |  |  | 5 hours Weather |
| Wed | 11-19-14 |  | * Bad weather, could not drill due to weather-related conditions * Drove to Vermillion |  |  |  |  | 5 hours Weather |
| Thurs | 11-20-14 |  | * Bad weather, could not drill because of weather-related conditions |  |  |  |  | 10 hours Weather |
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| **WEEK 12** | | | | | | | | |
| Mon | 11-24-14 |  | * Did not drill this week due to Thanksgiving holiday * Ann Ted Scott drove out and back to return the loggers to Vermillion (recheck sonic probe communication) |  |  |  |  |  |
| **WEEK 13** | | | | | | | | |
| Mon | 12-1-14 | Chris  replaced  Jim | * Drove to Presho * Chipped ice out of pit for 3 hours |  |  |  |  |  |
| Tues | 12-2-14 | Chris | * Temperature was 17°F; with wind-chill 10°F * Started rig, warmed hydraulic fluids, chipped remaining ice out of pit, thawed remaining ice in hoses/equipment * Used plopper to check depth to water table (67 feet) * Retrieved the inner barrel * E-logged through the inside of the drill stem from 500 feet up, twice; using both probes * Pulled the drill stem * Next, planned to e-log with both probes in the open hole * Tried the 8144A probe first, but it hung up at 119 feet going downhole * Logged with the 8144A probe from 119 feet to the surface * Decided not to lower the sonic probe * Pulled casing * Casing broke after we pulled the first 20 feet; leaving 40 feet downhole * Winterized equipment |  |  |  |  |  |
| Wed | 12-3-14 | Chris | * Drove to Vermillion * Pursued fishing tool ideas * Scott assembled/built tools |  |  |  |  | 5 hours Equipment |
| Thurs | 12-4-14 |  | * In office |  |  |  |  | 10 hours Equipment |

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| **WEEK 14** | | | | | | | | |
| Mon | 12-8-14 |  | * Drove to Presho * At Presho, at noon; temperature was 30°F; with wind-chill 22°F * Thawed/warmed up equipment * Fished for remaining 40 feet of PVC successfully * Estimated less than about one (vertical) foot of PVC pipe left downhole * Winterized equipment |  |  |  |  |  |
| Tues | 12-9-14 |  | * Temperature was 19°F (overnight low at Presho was 12°F) * With wind-chill, 11°F at Presho * Thawed/warmed up equipment * Primed pumps, warmed hydraulic fluids * During the first pipe connection, Ted slipped and his right foot was totally immersed in pit water to his mid-calf (over the top of his boot) * Plan was to rotary drill with 5.5-inch diameter bit so that we could e-log the open hole * Ended the day at 320 feet * Winterized equipment |  |  |  |  |  |

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| Wed | 12-10-14 |  | * Thawed/warmed up equipment * None of the gauges worked in the water truck (rpm, fuel indicator, brake pressure) * The water truck heater hasn’t worked all season! * Line next to the drill stem was frozen; plugs of ice shot out from the pop-off valve * Mud pump gaskets starting to leak * Water swivel still leaking * Rotary drilled with 5.5-inch diameter bit to 380 feet * Pulled rods – a piece of PVC plugged the bit * Tried to e-log but couldn’t get the 8144A probe lower than 69 feet (approximate contact between weathered and unweathered shale) * Rotary drilled with 8-inch diameter bit to 85 feet * Tried to e-log, but couldn’t get 8144A probe below 70 feet * Winterized equipment |  |  |  |  |  |
| Thurs | 12-11-14 |  | * Drove to Vermillion |  |  |  |  |  |
| **WEEK 15** | | | | | | | | |
| Mon | 12-15-14 |  | * Storm in Presho area with light freezing rain; postponed start until Tuesday * Forecast was for 2 to 5 inches of snow in Presho by late afternoon Monday |  |  |  |  | 10 hours Weather |
| Tues | 12-16-14 |  | * Drove to Presho (35 mph on Hwy 37) * Lowered 20 feet of PVC casing into the hole; suspended by a horizontal bar * Grouted upper 3 feet with bentonite granules; poured 1 gallon of water on grout at 2 foot depth * Moved vehicles to Chamberlain |  |  |  |  |  |
| Wed | 12-17-14 |  | * Drove vehicles to Vermillion |  |  |  |  |  |
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| **WEEK 16** | | | | | | | | |
| Mon | 12-22-14 |  | * Ann, Ted, Jim drove out and back, in order to return all remaining vehicles to the Vermillion office |  |  |  |  |  |