Technical Data Information Report

RID Number	Transmitter	Transmitter Organization	Receiver	Receiver Organization	Keyword 1
7638.01	Kryder	Nye County NWRPO	QARC	Nye County NWRPO	4PD

Document Date	7/14/2008	General Document Type	QA Program Doc	Keyword 2	Reports
Entry Date	3/18/2010	Detail Document Type	Alluvium/ Non-Alluvium Loggin	Keyword 3	NALF

Document Title/Subject
NC-EWDP-4PD Non-Alluvium Logging Report.

Data Originator/Preparer
Levi Kryder

Data Description
Drill cuttings logging reports exported from drilling database (NC Drilling v.3.6_4_24_09) in .pdf format. (Non-Alluvium Logging Forms from 8/7/2008 to 10/7/2008).

Data Collection Method
Borehole drilling and sampling and borehole depth control procedures (see governing QA procedures/plans).

Data Collection Location
NC-EWDP-4PD

Data Collection Period
7/14/2008 to 11/25/2008

Data Sources
Geologic logging of drill cuttings.
Scientific Notebook # 182 and 183 RID 7603) describes general drilling conditions for 4PD.
Supporting Data: RID 7638, 7630, 7722

Data Censoring
This cuttings sample log data was collected under Field Change approval dated 7/12/08. Due to the fact that this borehole was drilled with Conventional Mud Rotary methods, the alluvial drill cuttings collected are not representative of in situ sediments (TP-8.0). The cuttings were collected from "Shale Shaker" screens that separate sand and gravel from the mud-based drilling fluid. The finest screen has a #175 mesh and all the particle sizes finer that #175 (find sand, silt, and clay) pass through the screen and are retained within the drilling mud and re-circulated through the borehole. Consequently, the samples collected are biased toward the coarse fraction and considered disturbed from in situ conditions. For this reason the alluvium from this borehole, including the Alluvium Drill Cuttings Logging Form and the laboratory parameter measurements, are censored.

Data Processing
Data from field logging forms were entered into the drilling database, reviewed, and transmitted to QARC.

Data Limitations
Samples collected from mud rotary drilling are the least representative of in situ conditions; however, samples were collected for use for determining well casing and filter pack specifications. The samples were collected from fine (#175) and coarse (#10) "shale shaker" screens mounted over mud containment tanks. The shaker screens collect drill cuttings from the drilled formations but a component of particles finer than #175 mesh screen is lost to the drilling mud. It is believed that only about 90% of the total amount of drill cuttings for each10 foot sample interval were retained with the remainder lost to drilling mud. Losses to drilling fluid are relative to the fine proportion of sediment encountered. Conventional mud rotary method lag time for this borehole was computed and shaker lag time was tested in the field for the purpose of determining the proper time to collect each 10-foot sample specified on the Alluvium and Non-Alluvium Drill Cuttings Logging Form. Borehole lag time was computed with the aid of an Up-hole Water Velocity Calculator which is a chart that computes the travel time in units of gpm that water, and by extension drilling fluid charged with drill cuttings, will require to get from the bit to the ground surface. The chart computes up-hole velocity in units of fpm as a function of hole diameter, annular area between drill pipe and borehole walls, and drilling

fluid volume in gpm. Hole diameter and drill pipe are known quantities as both the diameter of the bit and the diameter of the drill pipe are measured on surface. Drilling fluid volume was measured at the annulus discharge trench by using the timed-bucket method in which a 5-gallon bucket was positioned at the annulus discharge and the amount of time in minutes to fill the bucket was measured. Shaker lag time was determined by the following two empirical tests: 1) the first test was to determine the amount of time for drill cuttings to travel from the borehole annulus at the surface, through the cuttings pit, and finally to the first shaker screen, a distance of 35 feet measured across ground surface to the mud containment tank. This test was conducted by introducing 10 gallons of gravel-sized particles at the discharge trench that transports cuttings that are suspended in the drilling mud from the borehole to the cuttings pit. A lifting pump pumps the cuttings from the cuttings pit to the shaker screens. A stop watch was used to measure the total transport time from the annulus to the first (#10) shaker screen; and 2) in the same manner, transport time was measured for sand to travel from the annulus trench to the second (#175) screen. The transport times for the gravel and sand were 2 minutes and 7 minutes respectively. By taking borehole lag time and shaker lag time into consideration it was possible for the sampling crew to assign a depth interval to the drill cuttings collected from the shaker screens. It was discovered during sampling that certain sample intervals brought drill cuttings to the surface slightly faster than the computed borehole lag time would have predicted. This was believed to be a result of mud cake building up on the borehole walls and thereby reducing the effective borehole diameter which would in turn increase the up-hole velocity of drilling fluid. Another problem was presented any time borehole advancement outpaced the computed borehole lag time. To compensate for this the sampling crew would collect the cuttings from the shakers at approximately 1 foot earlier than usual. This situation only occurred a few times and the driller was asked to decrease the drill rate when it did occur. More specifically, sampling was conducted in the following manner: A chute was attached to the coarse screen and one to the fine screen. The chutes served as mechanisms to funnel the cuttings from the shaker screens into 20-gallon galvanized tubs positioned on the ground to accept the cuttings coming down either chute. Ten-foot sample intervals correlating to the intervals specified on the Drill Cuttings Logging Forms were marked on the drill pipe. As the drill string advanced downward and the beginning of each marked sample interval came into alignment with a measured reference feature, in this case the drilling table with known height above original ground surface, a stopwatch was started and the known lag time for cuttings to travel from the bit to the surface and subsequently from the discharge trench to the coarse screen, as described above, were considered before placing a tub in position below the coarse screen chute. Five minutes later, the difference between the time when gravel first appeared at the coarse screen and sand first appeared at the fine screen, a tub was placed in position below the fine screen chute. When the end of each marked sample interval on the drill pipe intersected the plane of the drilling table the stopwatch was again employed to clock the lag time required for the last of the cuttings from the end of the sampled interval to appear on the coarse and fine screens respectively. At the designated times the tubs were pulled out from below each chute and new tubs were placed into position to collect the next sample interval. After each interval was collected and tubs were removed from under their respective chutes they were combined on a plastic tarp lying on the ground and homogenized and split using the cone-and-quarter method. At 690 feet the cone-and-quarter method was discontinued and a portable cement mixer-style rotating drum was used to homogenize the samples from that point forward. Three splits were collected from each depth interval: two for the NWRPO and one for DOE.

Governing QA Docs:	TP-7.0 Rev. 4, TP-8.0 Rev. 6
Frequency of Transmittal	Once per borehole
Direct Questions About Data To:	NWRPO QA Records Center