

NYE County NWRPO -Technical Data Report

RID No.	Transmitter	Org.	Receiver	Org.	Key word1	Title/Description
7266.01	Kryder	NWRPO	QARC	Nye	13P	NC-EWDP-13P Alluvium and Non-Alluvium Drill Cuttings Logging Forms
Doc. Date	12/19/2008	General Doc. Type	QA Program Doc	Keyword2	geologic	
Entry Date	12/29/2008	Detailed Doc. Type	Alluvium/Non-Alluvium Logging	Keyword3	log	
Data Originator Preparer	Contract Geologic Staff					
Title of Data	NC-EWDP-13P Alluvium and Non-Alluvium Drill Cuttings Logging Forms					
Description of Data	Drill cuttings logging reports exported from drilling database (NC Drilling v.3.mdb) in .pdf format (Alluvium Drill Cuttings Logging Form and the Non-Alluvium Drill Cuttings Logging Form from 6/16/05 to 7/23/05).					
Data Collection Method	Drill cuttings samples described on the geologic field logging forms during drilling of borehole.					
Data Location(s)	NC-EWDP-13P					
Data Collection Period(s)	6/16/05 to 7/23/05					
Data Source(s)	Geologic logging of drill cuttings. Supporting Data: Scientific Notebook # 169, Pages 6 to 106 (RID 6950) describing general drilling conditions; field logging forms (RID 7266); and archived drilling database (RID 7561).					
Data Censoring	Density data recorded on the Alluvium Drill Cuttings Logging Forms.					
Data Processing	Data from field logging forms were entered into the drilling database, reviewed, and transmitted to the QARC.					
Data Limitations	Data Censoring and Data Limitations (as described) have been changed from that contained in the original field forms for NC-EWDP-13P (RID 7266), and clerical errors have been corrected.					
	Samples collected from alluvium by reverse circulation air drilling methods are not entirely representative of in situ conditions due to several drilling related factors. The alluvial drill cuttings samples from 0 to 87 ft are impacted as a result of hole erosion and related sample contamination resulting from the drilling of loose unconsolidated sediments. Small amounts of injection water were necessary to stabilize these unconsolidated sediments and repeated clean-out was required to advance the borehole. Installation of a 57.8 ft surface casing eliminated the near surface hole erosion problems. When the borehole was advanced after installation of surface casing the first two samples (62.5 to 65 ft and 65 to 67.5 ft) were wet because of water used during the casing operation. From ground surface to a depth of 87 ft, winnowing of fines at the air cyclone separator occurred during dry drilling of the unsaturated alluvium and could account for as much as a 50% loss of fines. The ideal sample volume for a 6 1/2 - inch borehole is 4.3 gallons and sample yield was as low as 1 gallon in the unsaturated sediments.					
	Lost circulation problems occurred in the interval from 132.5 to 182.5 ft. and no samples could be collected from 132.5 to 162.5 ft. At 182.5 ft drilling was stopped and the borehole was conditioned by pumping a mixture of a medium viscosity polymer and bentonite down the annular space between the drill string and the formation. Before any further advancement of the borehole was attempted, the conditioned borehole was air-dried in an effort to prevent contamination of subsequent samples. Some contamination was observed, however, in samples from 182.5 to 185 ft and 185 to 187.5 ft. The sample at 187.5 to 190 ft was unrecovered due to plugging of the drill string. From this point forward returns and sample quality were good although the sample from 190 to 192.5 ft was slightly moist from residual conditioning water. There were many other instances of plugging during the subsequent advancement of the borehole and it was necessary to condition the annular space frequently but samples were not affected other than occasional occurrences of induced moisture and one unrecovered sample (1040 to 1045 ft) due to bit plugging. The sample from 1240 to 1245 ft was impacted by the presence of foam that was used to condition the borehole and the integrity of the sample is questionable due to probable					

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contamination from sediments uphole.

Evidence from other boreholes in alluvial sediments indicates that the mechanical action of the rotary bit results in sample degradation and particle size distribution bias (see discussion in the Nye County Drilling, Geologic Sampling and Testing, Logging, and Well Completion Report for the Early Warning Drilling Program Phase III Boreholes, Section 2.1.2, RID 5579). In general, the mechanical action of the bit reduces large-size particles to smaller-size particles effectively decreasing the gravel-size component and effectively increasing the sand and "fines"-size component. This is a relatively minor problem in unsaturated alluvium and in the upper part of saturated alluvium where water production is low. In underlying saturated alluvium this drilling impact renders particle size distribution data useless.

The Alluvium Logging Form includes preliminary field estimates of grain size distribution for the 260 ft of alluvium penetrated. The estimates are made on every 2.5 foot sample interval and used for preliminary layering information and general planning of wells prior to receipt of laboratory data. These field estimates of grain size distribution as well as USCS group symbol data should be considered reasonably representative of geologic samples and have not been censored. Grain size distribution data determined by laboratory analysis on every second 2.5 foot sample interval are considered representative of the geologic samples.

In addition, some sample handling disturbance may have been introduced into samples by: 1) material accumulating on wet drill pipe and rotating splitter during wet drilling; 2) unsaturated zone sample homogenization process and sample splitting.

Sample weights in sample density data do not include material that is lost to winnowing of unsaturated fines (dust), partial returns of drill cuttings due to lost circulation problems, or material that was "cleaned out" of the borehole after each 20 ft drill run. Therefore unsaturated zone sample weight data is not representative of the volume of the borehole drilled, should not be used in density calculations, and has been censored. The intervals from 320 to 340 ft and 485 to 495 ft do not have density and sample weight data recorded due to field error.

In the upper section of the saturated zone from 430 to 745 ft, the water production data is limited and recorded as "0". Injection water was required to lift the sample and maintain a clean drill string as the drilling air was suppressing water flow from the formation. Beginning at 765 ft, timed volume water tests were conducted generally at 40 to 60 foot intervals to measure the production of water.

Evaluations of cementation and structure as recorded on the logging forms are difficult to accurately determine because intact pieces of in-situ material are not available in cuttings.

In summary, laboratory measurements of grain size distribution of alluvium drill cuttings in this borehole are considered to be modified to some extent from in situ conditions due to a number of drilling related factors. However, for the most part these factors were unavoidable. Disturbance from sample handling related factors is considered minimal. Except for censored data mentioned above, geologic drill cutting samples from NC-EWDP-13P are considered approximately representative of in situ conditions. The geologic data recorded in these geologic logs are used to produce a Summary Lithologic Log.

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Governing
QA Docs. TP-8.0 Rev. 5, TP-7.0 Rev. 3

Frequency
of
Transmittal Once per borehole/well

Direct Questions
About Data NWRPO QA Records Center
To-