## **NYE County NWRPO -Technical Data Report**

RID No	o. Transmitter	Org.	Receiver	Org.	Key word1	Title/Description
7265.0	Mryder	NWRPO	QARC	Nye	32P	NC-EWDP-32P Alluvium and Non-Alluvium Drill Cuttings Logging Forms
Doc. Date	12/19/2008 General Doc. Type			Keyword2 geologic		Logging i omis
Entry Date	12/30/2008 Detailed Doc. Type	Alluvium/Non-Allu	ıvium Logging	Keyword3	og	
Data Originator Preparer	Contract Geologic Staff					
Title of Data	NC-EWDP-32P Alluvium and Non-Alluvium Drill Cuttings Logging Forms					
Description of Data	Drill cuttings logging reports exported from drilling database (NC Drilling v3.6.mdb) in .pdf format (Alluvium Drill Cuttings Logging Form and Non-Alluvium Drill Cuttings Logging Form from 3/28/06 to 4/10/06).					
Data Collection Method	Drill cuttings samples described on the geologic field logging forms during drilling of borehole.					
Data Location(s)	NC-EWDP-32P					
Data Collection Period(s)	3/28/06 to 4/10/06					
Data Source(s)	Geologic logging of drill cuttings.					

Data Censoring

Density data recorded on the Alluvium Drill Cuttings Logging Forms.

7265); and archived drilling database (RID 7561).

Data Processing

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

Data Limitations

Data Censoring and Data Limitations have changed from the original field forms contained in RID 7265.

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 260 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. The sample from 90 to 92.5 ft was impacted by the presence of a small amount of foam that was used to condition the borehole. The sample from 125 to 127.5 ft was impacted by foam to the degree that certain logging parameters could not be determined. Installation of a 55 ft surface casing eliminated the near surface hole erosion problems. When the borehole was advanced after installation of surface casing the first sample collected at 57.5 to 60.0 ft was moist because of water used during the casing operation. From ground surface to a depth of 240 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. From 860 to 870 ft sample size increased to 7.5 gallons as a result of a stratigraphic horizon at 750 ft that was producing flowing sand. The sand fell down the annular space and mixed with samples as the borehole was advanced. The impact diminished after 870 ft.

Supporting Data: Field Scientific Notebook # 168, Pages 5 to 33 (RID 7202) describes general drilling conditions; original field logging forms (RID

Evidence from other boreholes in alluvial sediments indicate that the mechanical action of the rotary bit results in sample degradation and particle size distribution bias (see discussion in the 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 840 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.

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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) 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.

In the upper section of the saturated zone from 256 to 400 ft, the water production data was estimated. 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 400 ft, timed volume water tests were conducted generally at 40 to 60 foot intervals to measure the production of water. From 760 to 800 ft water production could only be estimated due to the fact that the drill string was "booting off" as a result of loose sediments coming down from above in the borehole and blocking-off drilling return 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. Cementation estimates were not logged in the interval from 260 to 400 ft due to field error.

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-32P are considered approximately representative of in situ conditions. The geologic data recorded in these geologic logs are used to produce a Summary Lithologic Log.

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

Frequency of Transmittal

Once per borehole/well

Direct Questions About Data To-

NWRPO QA Records Center