Technical Data Information Report

RID Number	Transmitter	Transmitter Organization	Receiver	Receiver Organization	Keyword 1
7827.01	Walker	Nye County NWRPO	QARC	Nye County NWRPO	GWE

Document Date	5/19/2011	General Document Type	QA Program Doc	Keyword 2	Drilling
Entry Date	6/3/2011	Detail Document Type	Cuttings Sample Log	Keyword 3	Completion

Document Title/Subject
Cuttings Sample Log Report for NC-GWE-8PA from ground surface to 448.2 ft, 5 pages, in Microsoft Word Format.

Data Originator/Preparer
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Data Description
Cuttings Sample Log Report for borehole NC-GWE-8PA from ground surface to 448.2 ft, 5 pages, in Microsoft Word format. Reports posted to the NWRPO website as rid7827_01.pdf.

Data Collection Method
Reports generated from existing field Sample Cuttings Logs from NC-GWE-8PA. (see RID 7827).

Data Collection Location
Not applicable, generated from existing data.

Data Collection Period
5/19/2010 to 6/1/2010

Data Sources
Sample Cuttings Logs from NC-GWE-8PA (see RID 7827).

Data Censoring
None

Data Processing
Data from Field Cuttings Sample Logs were entered into Microsoft Word forms for publishing.

Data Limitations
This borehole was drilled with bucket augering methods from ground surface to 20 ft and conventional air rotary (air/foam) methods from 20 ft to the bottom of the borehole at 448.2 ft. These drilling methods produce disturbed samples that are considered reasonably representative of in situ conditions. The samples collected with the bucked auger method (surface to 20 ft) are disturbed but considered reasonably representative of in situ sediments limited by the following factors: 1) Dry and unconsolidated sediment in auger holes have a tendency to cave and result in mixing of the sediments within the borehole, and 2) It is difficult to determine the precise depth of the sample excavated and returned by an Auger Bucket. Samples collected below 20 ft to the bottom of the borehole at 448.2 ft using conventional air rotary (air/foam) drilling methods are also disturbed but considered reasonably representative of in situ conditions. As recognized in EWDP investigations (See discussions in EWDP Phase III Report (RID 5579, Sections 2.1 and 4), Phase IV Report (RID 6801, Section 2.1.1.1)), rotary drilling pulverizes coarser components into finer particles and some of the in situ fines (silt and clay) are carried away in the drilling fluid (air discharge or returned injection water or formation water). These effects were minimized as much as possible during drilling operations. Consequently, the samples collected are biased towards the coarse fraction and are considered disturbed from in situ conditions. Losses to drilling fluid impact primarily the fines proportion of sediment sampled.
As a consequence of the sample bias introduced by conventional air rotary drilling methods, there are limitations inherent in certain parameters described on

the Cutting Sample log. The field estimates of particle size distribution are impacted because of the loss of fines to the drilling fluid as well as the increase of sand at the expense of gravel due to the pulverization of the coarser particles by the bit. Grading evaluations are considered reasonable because the recovered samples are considered representative, for the most part, of the in situ fractions of the sediments drilled preserved, thus allowing field personnel to make a determination. Unified Soils Classification System (USCS) classifications recorded on the Cuttings Sample Log Form are based on field estimates using ASTM D 2487-06 methods on cuttings that are returned and sampled, and the experience of the geologist logging the samples. Evidence of cementation is difficult to find in air rotary samples because of the grinding action of the bit; however, grain coatings of sand and fines were observed to be present on larger clasts in particular intervals indicating the presence of localized cementing agents present in the sediments. No limitations is assigned to sample reaction to 10% HCl as sample reaction is unaffected by air rotary drilling methods.

Sample lag time inherent in air rotary drilling methods introduces a small uncertainty in determining the proper time during the advancement of the borehole to collect each 5-foot sample interval specified on the Cutting Sample Log Form (even 5-foot intervals). Sample lag time is a function of drilling fluid type (in this case air or air/foam), borehole diameter, and the annular area between drill pipe and borehole walls. These factors determine the up-hole velocity of the drilling fluid (and sample). Conventional air rotary uses large volumes of compressed air (up to 1000 cubic feet minute), resulting in large up-hole velocities and relatively small sample lag times. The depth intervals assigned to the samples on the Cuttings Sample Log form are therefore considered reasonably accurate.

Sampling was conducted in the following manner: For the interval drilled using augering methods (surface to 20 feet), five-foot sample intervals correlating to the intervals specified on the Cuttings Sample Log Form were marked on the auger stem. Cuttings samples were collected from a cuttings pile after each auger bucket was brought to the surface and emptied on the ground. Care was taken to collect a reasonably representative sample of the interval. For samples collected by conventional air rotary methods (20 to 448.2 ft), five-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 5-gallon plastic bucked labeled with the depth interval was positioned on the ground under the cyclone cuttings separator and drill cuttings were collected until the end of the interval marked on the drill pipe would intersect the drilling table. At this time the sample bucket was removed and replaced by an empty bucked to collect the next 5-foot interval. The cuttings were homogenized within the sample bucket by mixing with a metal scoop and care was taken to collect a reasonably representative sample of the mixture for logging purposes. It is not, however, possible to ensure that a perfect representation of in situ conditions was collected using this sampling method. A smaller sample wsa stored for archival purposes in 40 dram clear-plastic vials which were labeled with the sample interval. These samples were stored in plastic core boxes for future reference.

As noted in the logs, specific samples were impacted by drilling conditions. The sample from 320 to 325 ft contains up-hole contamination from "hole cleanout". Up-hole contamination was noted for samples from 375 to 380 ft and 405 to 410 ft. Toward the bottom of the hole, intervals of "poor" recovery were noted from 425 to 430 ft and 435 to 440 ft. No samples were recovered from 445 to 448.2 ft (Total Depth).

Governing QA Docs:	TPN-5.6, Rev. 0
Frequency of Transmittal	Once per borehole/well.
Direct Questions About Data To:	NWRPO QA Records Center