# NYE County NWRPO -Technical Data Report

| RID No. | Transmitter | Org. | Receiver | Org. | Key word1 | Title/Description |
|---|---|---|---|---|---|---|
| 7404 | Gilmore | NWRPO | QARC | Nye | 19IM1 | NC-EWDP-19IM1A Alluvium and Non-Alluvium Logging Forms |

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**Doc. Date** 10/29/2007 **General Doc. Type** QA Program Doc **Keyword2** cuttings

**Entry Date** 1/29/2008 **Detailed Doc. Type** Alluvium/Non-Alluvium Logging **Keyword3** geology

**Data Originator Preparer** Kathy Gilmore

**Title of Data** NC-EWDP-19IM1A Alluvium and Non-Alluvium Logging Forms

**Description of Data** Drill cuttings logging reports exported from drilling database (NC Drilling v3.6.mdb) in .pdf format (Alluvium Logging Form and Non-Alluvium Drill Cuttings Logging Form from 7/10/01 to 7/13/01).

**Data Collection Method** Samples collected during reverse circulation drilling of 19IM1A. Borehole drilling and sampling, and borehole depth control procedures. Logs were reviewed for accuracy of field data.

**Data Location(s)** NC-EWDP-19IM1

**Data Collection Period(s)** 7/10/01 to 7/13/01

**Data Source(s)** Visual field description per TP-8.0, Field Logging and Handling of Borehole Samples, Revision 2, 06/01/01, Section 5.5. Drill cuttings samples and Nye County NWRPO laboratory data that includes grain size distribution (sieve data) and hydrometer data (silt/clay measurement).

Supporting Data: RIDs 4646, 5129, 6756.

**Data Censoring** Samples collected from 0-22.5 ft. interval are considered biased toward the coarse fraction due to the drilling and sampling method. This short section of the borehole was drilled with conventional or normal air circulation with an air hammer to install a pilot hole for a surface casing. The sample was blown to surface through the annulus and was winnowed of fines and likely contaminated with uphole material. Beyond 22.5', a casing was installed to maintain annular pressure and the borehole was advanced using reverse circulation dual-wall technique.

Particle Size Distribution data and USCS Group Name on the Alluvium Logging Form. In addition, data are censored for the interval 420 to 900 feet due to sample bias introduced by sample homogenization problems and bentonite contamination of samples. Water production data for interval 0 to 900 ft.

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

**Data Limitations** There were two boreholes drilled to complete well EWDP-19IM1. The first borehole, EWDP-19IM1A, was a pilot hole as well as a sampling hole, and was drilled from 07/09/01 through 07/13/01. This borehole is a 5-3/8" diameter hole and was drilled and sampled from ground surface to a total depth of 900 feet by Eklund Drilling Company, Inc. Drilling was conducted using dual-wall drill pipe with reverse air circulation methods. The second borehole, NC-EWDP-19IM1, is the stabilized borehole in which the well was completed and was drilled during the period of 08/13/01 through 09/16/01 by Beylik Drilling, Inc. It was collared at the same location as NC-EWDP-19IM1A but with a different drill rig employing mud rotary, flooded reverse methods. The borehole is 14-3/4" in diameter and the total depth is 1012.5 feet and the well was completed with 7" O.D. casing to 948.8'.
The near surface (0 to 22.5 ft) alluvial drill cuttings samples are not representative of in situ sediments due to hole erosion and related sample contamination resulting from the use of conventional air circulation drilling methods to start the borehole. Some sample disturbance from in situ conditions in the remaining alluvium is due to several drilling related factors including: 1) sample degradation by the mechanical action of the rotary

bit; 2) contamination due to some hole erosion and related sample mixing typical of reverse circulation drilling; 3) winnowing of fines at the cyclone collector during dry drilling; 4) loss of some of the fine fraction (and relative increase of the coarse fraction) when attempting to homogenize saturated zone samples containing too much water; and 5) bentonite contamination of saturated zone samples due to difficult drilling conditions encountered in the transition from unsaturated zone to saturated zone drilling. In addition, minor disturbance may have been introduced into samples by: 1) gravel accumulating on the rotating splitter during wet drilling; 2) unsaturated zone sample homogenization process and sample splitting; 3) loss of fines during pumping and siphoning of clear water from wet bucket samples; and 4) a very minor introduction of wind-blown fines during sample drying.
The Alluvium Logging Form includes preliminary field estimates of grain size distribution for the approximately 825 ft of alluvium penetrated. The estimates are made on every 2.5 and 5 ft sample interval and used for preliminary layering information and general planning of wells and screen intervals prior to receipt of laboratory data. These field estimates of grain size distribution should not be considered representative geologic samples. However, grain size distribution data determined by laboratory analysis on every second 2.5 ft sample and every 5 ft sample interval are considered representative of the geologic samples. A comparison of preliminary field estimates with laboratory measurements of grain size distributions of alluvium geologic samples indicates significant error in field estimates. Therefore, Particle Size Distribution data and USCS Group Name are censored.
In summary, grain size distribution of unsaturated alluvium drill and the upper part of the saturated zone (interval 0 to 420 ft.) cuttings in this borehole are considered disturbed to some extent from in situ conditions due to a number of drilling related factors. However, for the most part, these factors were not avoidable. Disturbance from sample handling related factors is considered minimal. Moreover, other drilling methods create significantly disturbance in drill cuttings than the small diameter reverse circulation methods used in this borehole. Therefore, to the extent reasonably possible, geologic drill cutting samples from NC-EWDP-19IM1A in the depth interval of 0 to 420 ft. are considered representative of in situ conditions. For this reason, the alluvium laboratory hydraulic parameter data including particle size distribution for the depth interval of 0 to 420 ft. are not censored.
The following data omissions from log columns are listed with the following commentary or reasons:
SAMPLE WEIGHTS: 40-80' due to destruction of subsample and wash out during drilling; 205-482.5' due to failure of digital scale; 512.5-517.5' due to muddy sample; 522.5-547.5' due to excessive water-only total fines recorded.
SAMPLE RECOVERY: 40-60', 62.5-67.5', 70-72.5' and 75-95' due to sample collection by splitter; 205-207.5' due to omission; 395-397.5', 400-402.5', 420-422.5', 430-432.5', 440-445', 450-452.5' and 455-457.5' due to excessive water; 820-900' per NWRPO direction in non-alluvium.
PARTICLE SIZE: 60-62.5', 67.5-70' and 72.5-75' due to destruction of subsample and wash out during drilling; 557.5-585' due to extensive bentonite contamination.
SAMPLE DESCRIPTION: 532.5-535' due to omission; 555-605' due to extensive bentonite contamination by drilling fluid.
FINES: 470-475', 480-482.5' and 525-555' due to excessive water; only total fines recorded.

**Governing QA Docs.** TP-8.0, Field Logging and Handling of Borehole Samples, Revision 2, 06/01/01, Section 5.5

**Frequency of Transmittal** once per borehole

**Direct Questions About Data To-** NWRPO QA Records Center