USGS science for a changing world

BOREHOLE GEOPHYSICAL LOG

English/Metric units M

SiteID (C1) 420031091422601	**Station name (C12)** 2015USGS GPW4	**Other ID** GX-4
County Linn	**State** Iowa	**Log date** 06/19/17
Owner USGS		**Project** Cedar Rapids Alluvial Aquifer Study
Location description Forested area off of Edgewood Rd. NW; west of Manhattan/ Robbins Lake Park, south of Cedar River		
Latitude 42.00873610°	**Longitude** -91.70729°	**Lat/Long datum** NAD83
Altitude LMP 244	**Altitude datum** NGVD88	**Log measurement point (LMP)** Top of Casing (TOC)
Height LMP 0.8 m above (+) LS	**Description of LMP** Top of steel casing; 5 mm above inner 2" PVC casing	
Borehole depth 11.77 TOC	**Borehole diameter** Unknown	**Casing bottom** 11.77 TOC
Casing diameter 5.08	**Casing type** PVC	**Source of data** USGS Iowa WSC and OGW BG
Logging unit USGS OGW BG	**Log orientiation** MN	**Magnetic declination** 0.068° W
Recorded by KLCP/SNP	**Observed by** LG/ EB/JW	
Software non-ASCII logs WellCAD 5.1	**Type of log** ZZ-Composite	
Fluid type Water	**Fluid depth below LMP** 1.94	**at time** 08:59
Hydrologic conditions Flood Plain of the Cedar River, scattered thunderstorms during week of logging		

Tool manufacturer and model, tool serial number, log date and time, logging direction and speed, depth error after logging, log parameter(s) and date(s) of calibration check

Tool run 1 Mount Sopris Instruments (MSI), 2PIA-1000, SN 2377, 06/19/2017 at 09:46 logging down and up at ~4.6 m/min, round trip error of 0 ft, measuring bulk electrical conductivity, calibrated in field on date of log

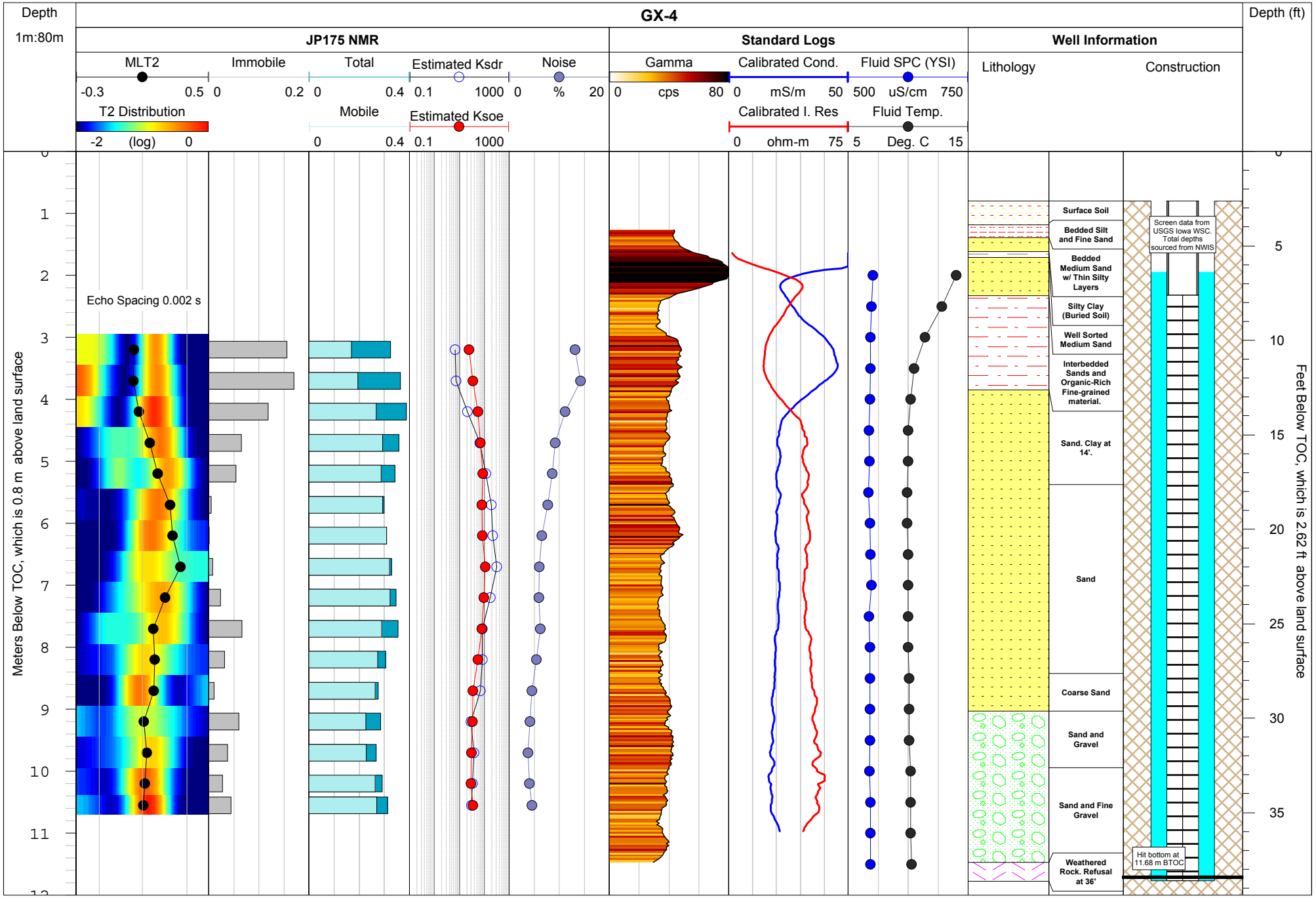
Tool run 2 MSI, 2PGA, SN2339, 06/19/2017 at 10:12, logging down and up at ~4.6 m/min, measuring natural gamma, calibrated at factory

Tool run 3 Vista Clara (VC) NMR JP175, SN001, 6/19/2017 at 10:30, logging down collecting stationary measurements in 0.5 m increments, round trip error of 0.00 m, measuring total, mobile and bound water content, calibrated May 2016 at OGW-BG

Remarks

For each depth, the decay data are shown as total-, mobile-, capillary-, clay-, and bound- fractions of water content (where bound = clay + capillary), Sum of Echoes (SOE), and Mean Log T2 (MLT2). The T2 "free water cut-off" was 33 ms. All water content (WC) greater than the free water cut off is mobile, and all WC less than the free water cut-off is immobile or bound. A T2 cut-off for clay was set at 3 ms. Using this clay cut off, the bound water can be subdivided into clay-bound and capillary bound. Noise indicates the fit of the multiexponential decay curve to the data.

Hydraulic conductivity(K) was estimated at each depth using two empirical relations, including the Schlumberger-Doll research (SDR) and the Sum of Echoes (SOE). The default parameters for these equations were used. These are derivative estimates that can be updated if better site specific parameters are determined.


Depth
1m:80m
GX-4
Depth (ft)
JP175 NMR
Standard Logs
Well Information
MLT2
-0.3
0.5
T2 Distribution
-2
(log)
0
Immobile
0
0.2
Total
0
0.4
Mobile
0
0.4
Estimated Ksdr
0.1
1000
Estimated Ksoe
0.1
1000
Noise
0
%
20
Gamma
0
cps
80
Calibrated Cond.
0
mS/m
50
Calibrated I. Res
0
ohm-m
75
Fluid SPC (YSI)
500
uS/cm
750
Fluid Temp.
5
Deg. C
15
Lithology
Construction
Echo Spacing 0.002 s
Meters Below TOC, which is 0.8 m above land surface
Feet Below TOC, which is 2.62 ft above land surface
Surface Soil
Bedded Silt and Fine Sand
Bedded Medium Sand w/ Thin Silty Layers
Silty Clay (Buried Soil)
Well Sorted Medium Sand
Interbedded Sands and Organic-Rich Fine-grained material.
Sand. Clay at 14'.
Sand
Coarse Sand
Sand and Gravel
Sand and Fine Gravel
Weathered Rock. Refusal at 36'
Screen data from USGS Iowa WSC. Total depths sourced from NWIS.
Hit bottom at 11.68 m BTOC