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U.S. Department of Energy
Los Alamos Area Office, MS A316
Environmental Restoration Program
Los Alamos, New Mexico 87544
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Date: August 24, 2000
Refer to: ER2000-0438

RECEIVED 2000

LANL HSWA 3/1082/16-021(c)

Mr. John Kieling
NMED-HWB
P.O. Box 26110
Santa Fe, NM 87502

SUBJECT: CdV-R15-3 UPDATE REGARDING INCORRECT SCREEN PLACEMENT

Dear Mr. Kieling:

The purpose of this letter is to document discussions between LANL and NMED personnel regarding the incorrect placement of screens at CdV-R15-3 and to update NMED concerning: 1) how the error occurred, 2) activities that have taken place to better document locations of backfill materials relative to screen locations, and 3) what will be done to avoid future occurrences of this type.

BACKGROUND

Six screens were installed in CdV-R15-3; three screens (#1-3) were placed opposite possible perched groundwater in the vadose zone and three screens (#4-6) are in the regional aquifer. Screens are 10 ft in length except for screen #3 (20 ft), which is opposite a basaltic-hosted perched zone, and screen #4 (50 ft), which straddles the regional water table. Screen locations were determined based on review of all available data (lithologic log constructed during well drilling, a full suite of open hole geophysical logs, water levels, and knowledge of other installed wells). A well construction diagram was drafted showing all planned screen locations with their respective backfill materials. The location of the screens was verbally communicated to NMED on May 1, prior to construction. This diagram was then used in the field as a guide for constructing the well. The well was assembled and was backfilled up to a depth of 1045 feet before the project was temporarily halted due to the Cerro Grande fire. The backfilling resumed as soon as site access could be gained and the site evaluated for potential fire damage. The backfill was completed on June 9. There were no indications at this time that there were any deviations from the planned well construction.

On July 27, a downhole video camera survey was run from ground surface to total depth(TD). This is normally planned on all wells after construction to check well integrity, screen condition and placement, general water turbidity, and as documentation prior to well development and testing. Based on the depths recorded during the video survey, all screens appeared approximately 10 feet off (lower) from where they were planned on the well construction diagram. A comparison was made between the Contractor's pipe tally sheets and the recorded depths of pipe joints from the camera survey, and a discrepancy of 9.08 feet was identified. Upon further analysis the

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Contractor determined that an error existed in the Excel spreadsheet they had used to keep track of casing joint lengths, casing string length, and projected screen landing depths. The reliance on the spreadsheet without an independent check on pipe tally with the driller led to construction of the well with all screens displaced approximately 10 feet lower in the hole.

DOCUMENTATION OF SCREEN/BACKFILL MATERIALS

The Contractor was instructed to revise the as-built diagram to reflect the new screen locations relative to the location of backfill materials and to determine the present usability of the screens. Based on the revised well construction diagram (Attachment 1), well development and testing proceeded. Development started on July 28 and continued through August 4, and was conducted in accordance with LANL procedures. A total of 33,260 gallons were produced from the well. Final turbidity values from all saturated screen intervals were less than 2 NTUs. Hydrologic testing was conducted from August 7 to August 9. Preliminary results appear positive with regards to screen #5, which was thought to be severely impacted by placement of bentonite next to the screen. Due to limited drilling resources, testing at CdV-R15-3 was suspended so R-19 could be prepared for Westbay installation. Further hydrologic tests will be conducted at CdV-R15-3 on screens #5 and 6 at a later date.

A downhole camera survey was run on August 10 to document the post-development condition of CdV-R15-3. Additionally, a natural gamma ray survey (Attachment 2) was run on August 11 to determine if placement of backfill materials relative to screen locations could be determined. The log was able to distinguish the different backfill materials and determine the degree of impact to the well screens. Based on preliminary review of the gamma ray log it appears there will be no impact to screens # 1, 2, 4 and 6. The lower 5 feet of screen #3 and the lower 2 to 3 ½ feet of screen #5 appears to have bentonite opposite the screens. As a result, the Westbay sampling ports will be placed such that sampling takes place where the screens are opposite sand filter packs.

Discussions with Dave Larssen, the Westbay representative, indicate there will be no problems from a mechanical perspective with installing the Westbay system in CdV-R15-3. There also should be no problems with regards to collecting fluid pressure measurements from any of the screened zones. From a geochemical perspective, there is a possibility that fluid-bentonite interactions may modify the major- and trace-element chemistry at screens #3 and 5. Screening geochemical data (major cations and anions) for screen #5 shows low potassium, sodium, and sulfate, elevated levels of which have been associated with bentonite contamination in previous wells. The turbidity within screen #5 is less than 2 NTUs. These data suggest minimal impacts on geochemistry at screen #5. Additional sampling will be performed in the future at CdV-R15-3; samples collected from the potentially impacted zones (screen #3 and 5) will be continually evaluated for bentonite effects on geochemistry.

CORRECTIVE ACTIONS

In addition LANL Contracting will instruct the Contractor to provide a root-cause analysis of the incident and to provide a formal corrective action plan, as well as a lessons learned analysis following QP 3.2. Internally LANL is reviewing current SOPs and will revise procedures to make sure this and other potential mistakes can be avoided. At a minimum we will ensure that the field support contractor verifies pipe tallies with

separate tallies kept by the drillers. All discrepancies must be resolved at the point at which they are discovered. In addition, we will add a quality assurance step during well installation in which a caliper and/or borehole video is run to verify the pipe tallies and screen placements recorded by the field support contractor. These logs will be run after the well components are installed and before annular fill materials are placed in the well bore. The ongoing reviews described above may identify additional steps that can be taken to avoid such incidents in the future.

Sincerely,

Julie A. Canepa, Program Manager
Los Alamos National Laboratory
Environmental Restoration

Sincerely,

FOR Theodore J. Taylor, Program Manager
Department of Energy
Los Alamos Area Office

JC/TT/NR/eim

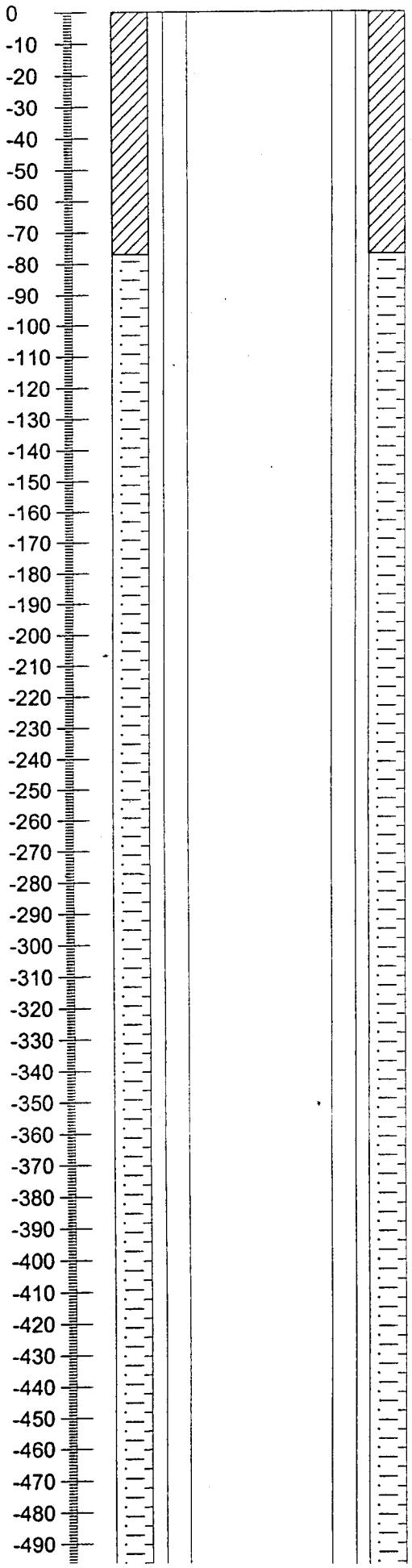
Enclosure: Revised well construction diagram
Natural gamma ray survey

Cy (w/enc.):
M. Buksa, E/ET, MS M992
A. Dorries, E/ER, MS M992
T. Grieggs, ESH-19, MS M992
D. Hickmott, EES-1, MS M992
J. Mose, LAAO, MS A316
D. Neleigh, US EPA (2 copies)
N. Riebe, E/ET, MS M992
C. Rodriguez, E/ER, MS M992
P. Schumann, ESH-19, MS M992
L. Soholt, E/ER, MS M992
T. Taylor, LAAO, MS A316
J. Parker, NMED-DOEOB
S. Yanicak, NMED-AIP, MS J993
E/ER File, MS M992
RPF, MS M707

Cy (w/o enc.):
J. Canepa, E/ER, MS M992
D. McInroy, E/ER, MS M992
J. Bearzi, NMED-HWB
S. Dinwiddie, NMED-HWB

Attachment 1

CDV-R1 Lithology R1 (7/28/00)



UNIT 3 TSHIREGE MEMBER, BANDELIER TUFF: (0-152') The Unit 4/Unit 3 contact was not evident in cuttings.

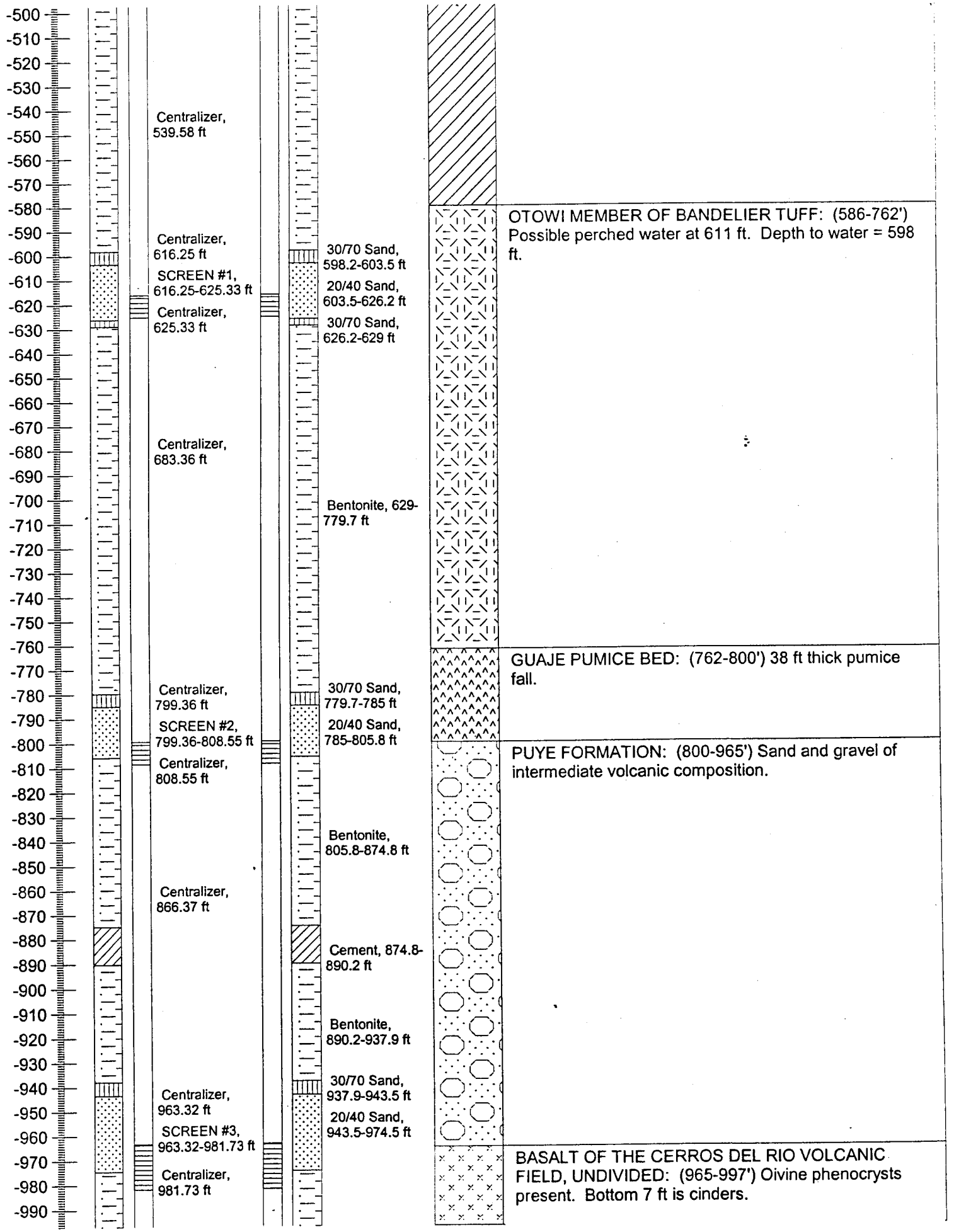
UNIT 2 TSHIREGE MEMBER, BANDELIER TUFF: (152-290') The Unit 2/Unit 1v contact was not evident in cuttings.

UNIT 1G TSHIREGE MEMBER, BANDELIER TUFF: (290-342') First vitric pumice at 290 ft.

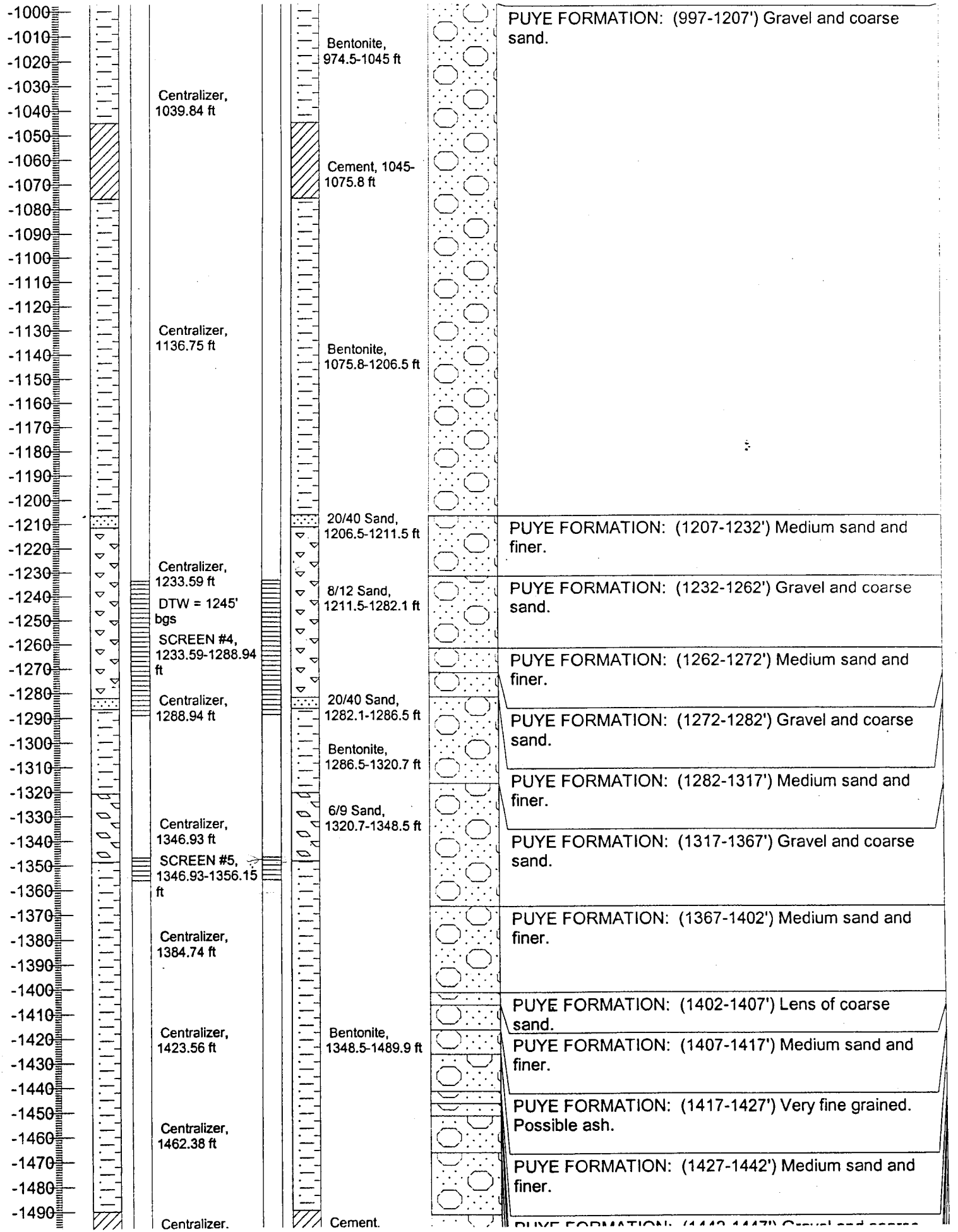
TSANKAWI PUMICE BED: (342-362') 20 ft thick pumice fall.

~~CERRO TOLEDO INTERVAL: (362-580')~~
Predominantly intermediate composition volcanic sand and gravel. 572-580 ft appear to be reworked Otowi basesd on cuttings and natural gamma geophysical log.

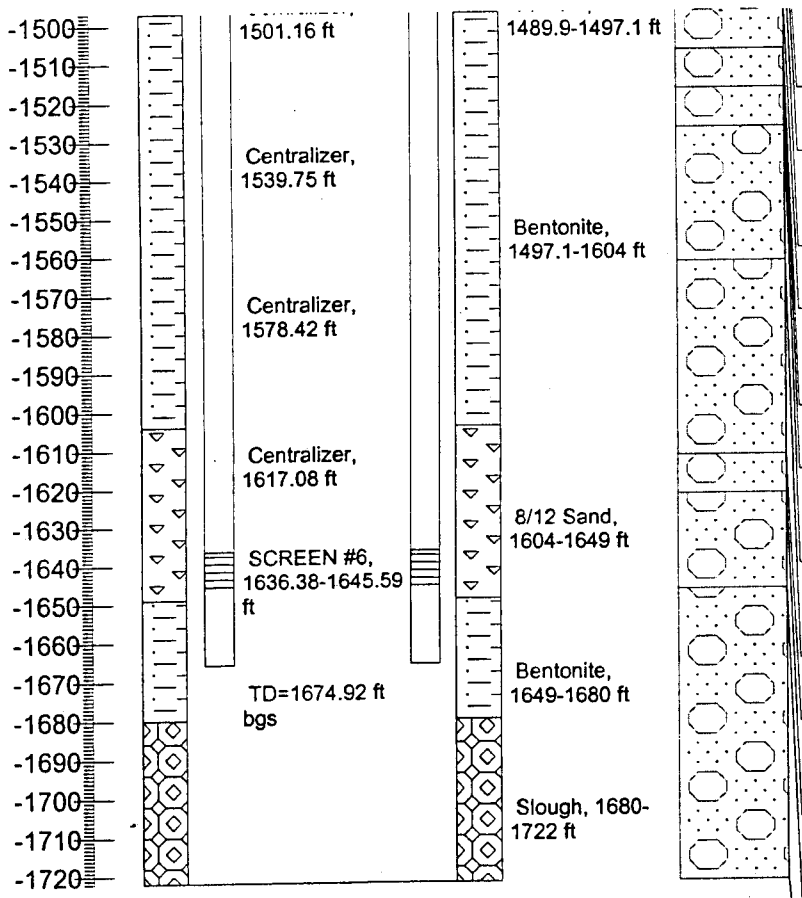
CDV-R15-3 Lithology R1 (7/28/00)



CDV-R15 Lithology R1 (7/28/00)



CDV-R15-3 Lithology R1 (7/28/00)



PUYE FORMATION: (1442-1447') Gravel and coarse sand.

PUYE FORMATION: (1447-1452') Fine grained.

PUYE FORMATION: (1452-1467') Gravel and coarse sand.

PUYE FORMATION: (1467-1492') Fine grained.

PUYE FORMATION: (1492-1507') Gravel and coarse sand.

PUYE FORMATION: (1507-1517') Fine grained.

PUYE FORMATION: (1517-1527') Minor gravel in coarse sand.

PUYE FORMATION: (1527-1562') Gravel with pumice and possible ash in medium sand/silt matrix.

PUYE FORMATION: (1562-1612') Gravel.

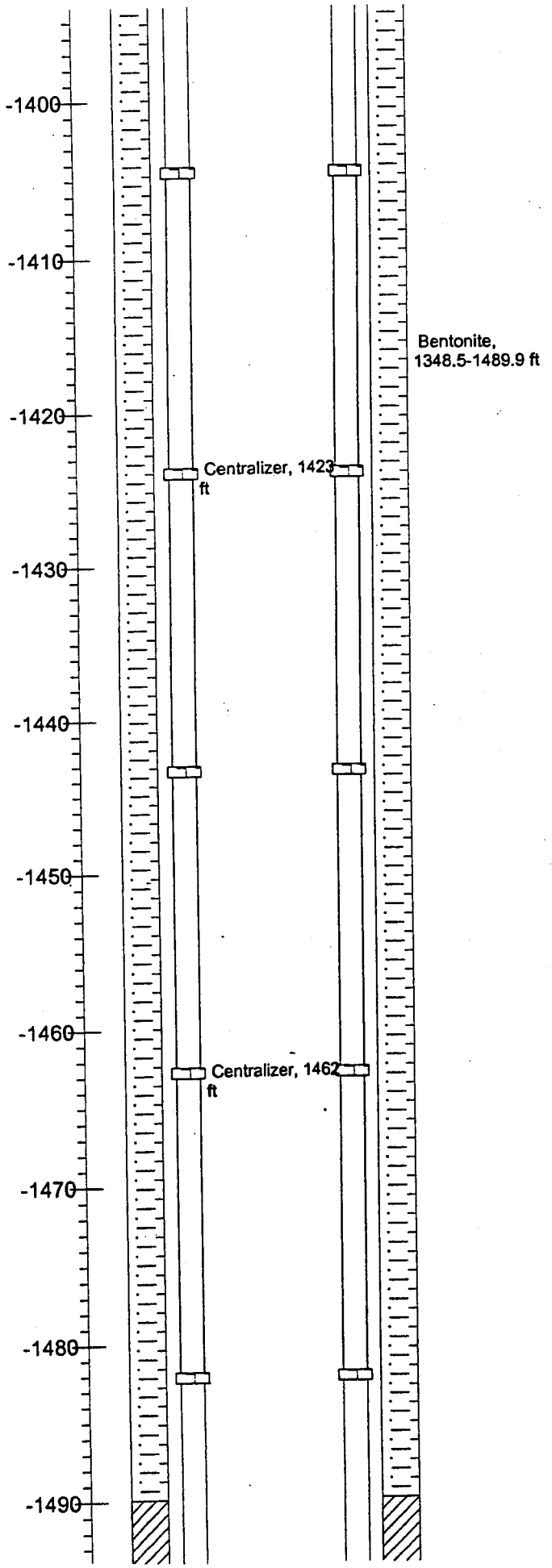
PUYE FORMATION: (1612-1622') Gravel and coarse sand with pumice.

PUYE FORMATION: (1622-1647') Gravel and coarse sand.

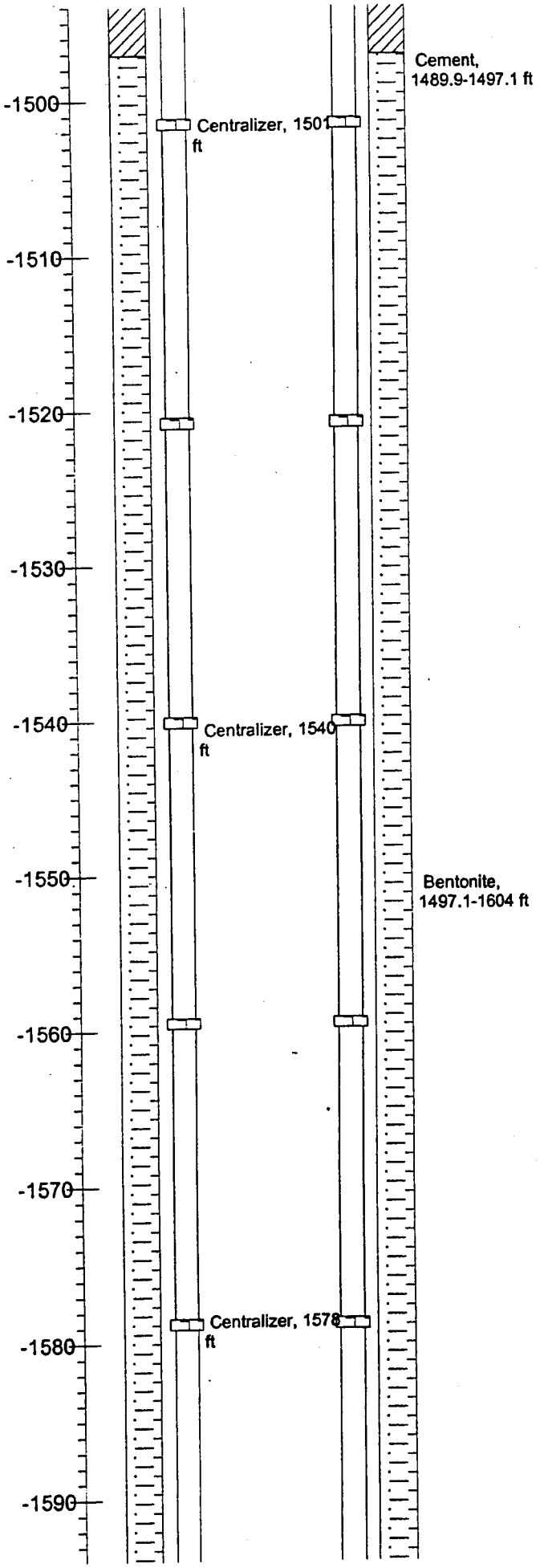
PUYE FORMATION: (1647-1722') Gravel and coarse sand with pumice present 1647-1652'.

Attachment 2

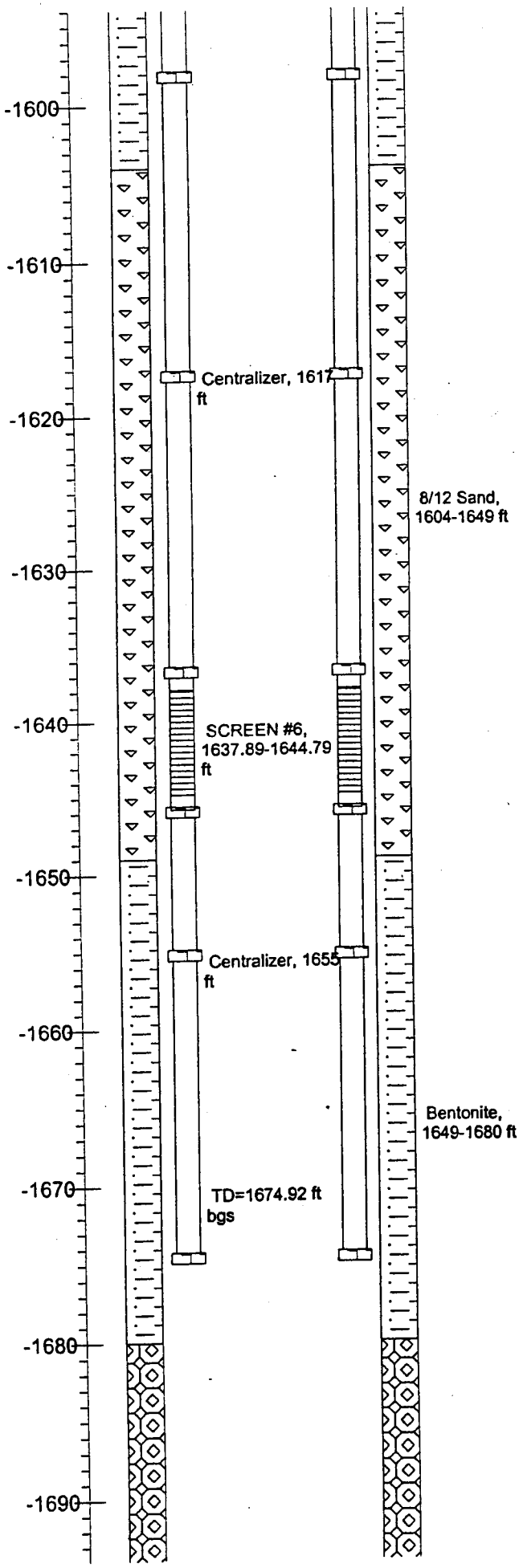
CDV-R1[illegible]3 Construction (8/10/00[illegible])

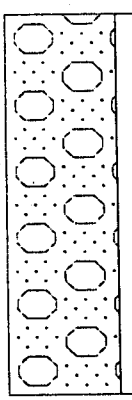


CDV-R15-[illegible] Construction (8/10/00)



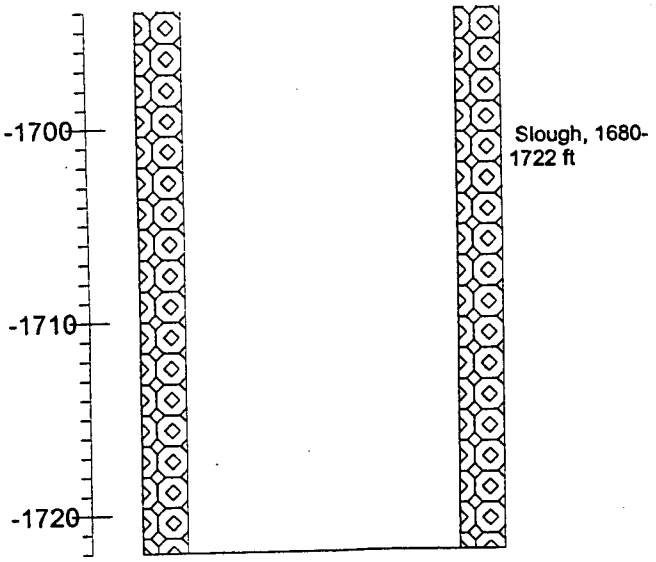
CDV-R15-3 Construction (8/10/00)





PUYE FORMATION: (1630-1650 ft) Bottom of the monitoring well.

CDV-R15- Construction (8/10/00)



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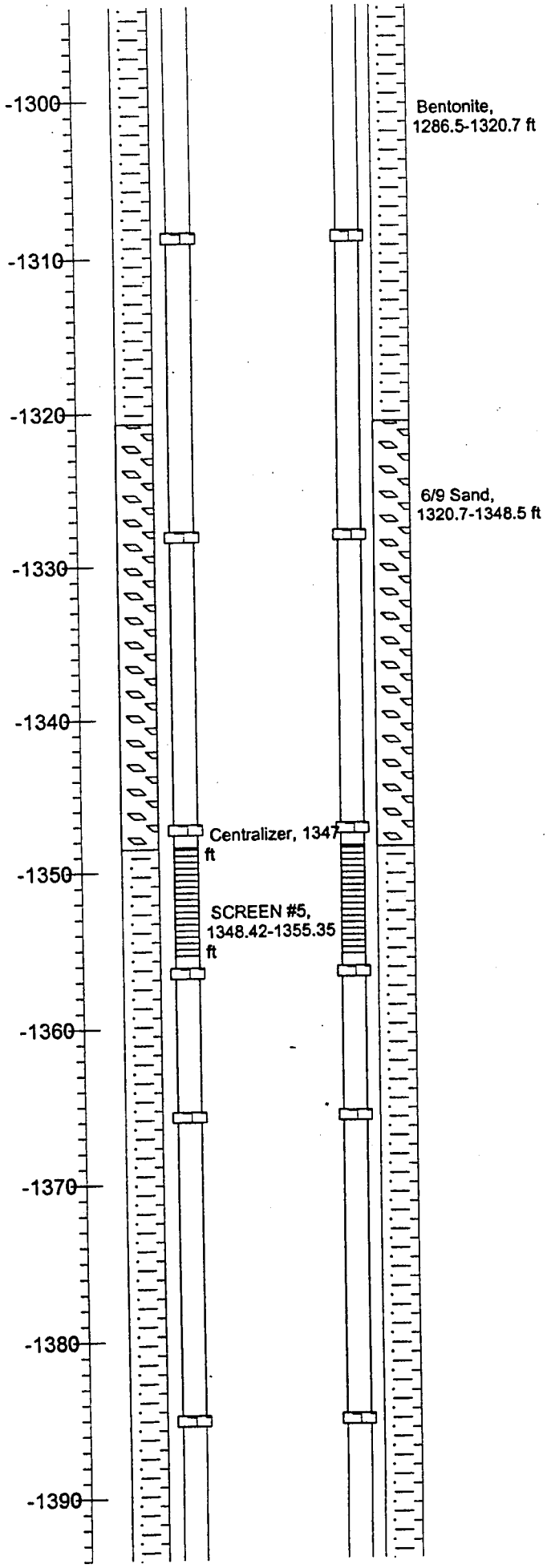
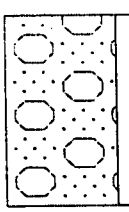
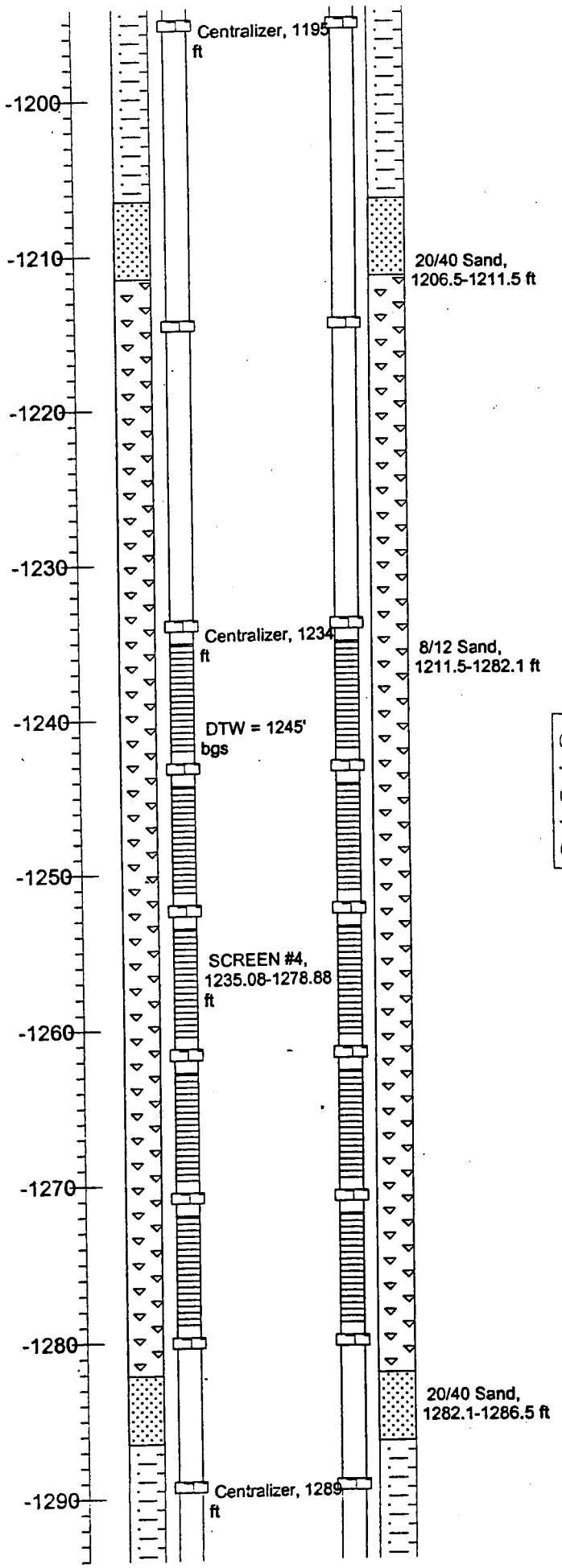
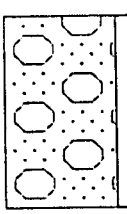




PUYE FORMATION: (1340-1350 ft) Temperature anomoly, possible high permeability. Not washed out.

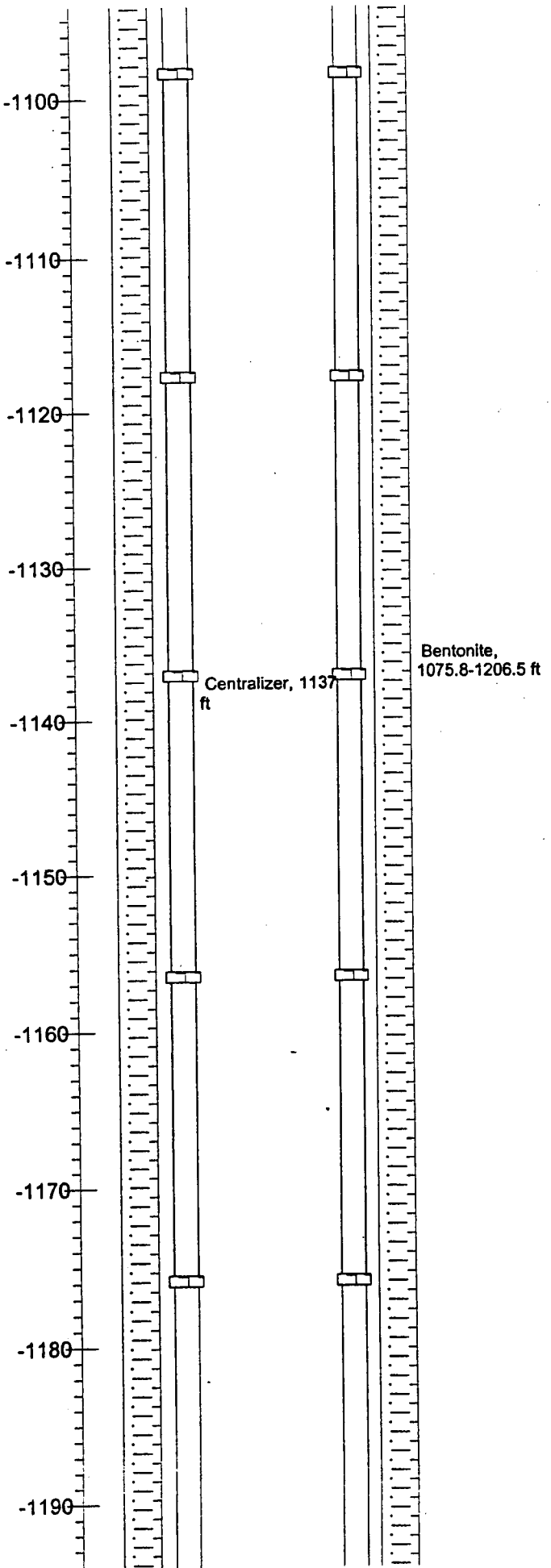
CDV-R15 Construction (8/10/00)





PUYE FORMATION: (1240-1250 ft) Top of the regional aquifer.

CDV-R15 Construction (8/10/00)



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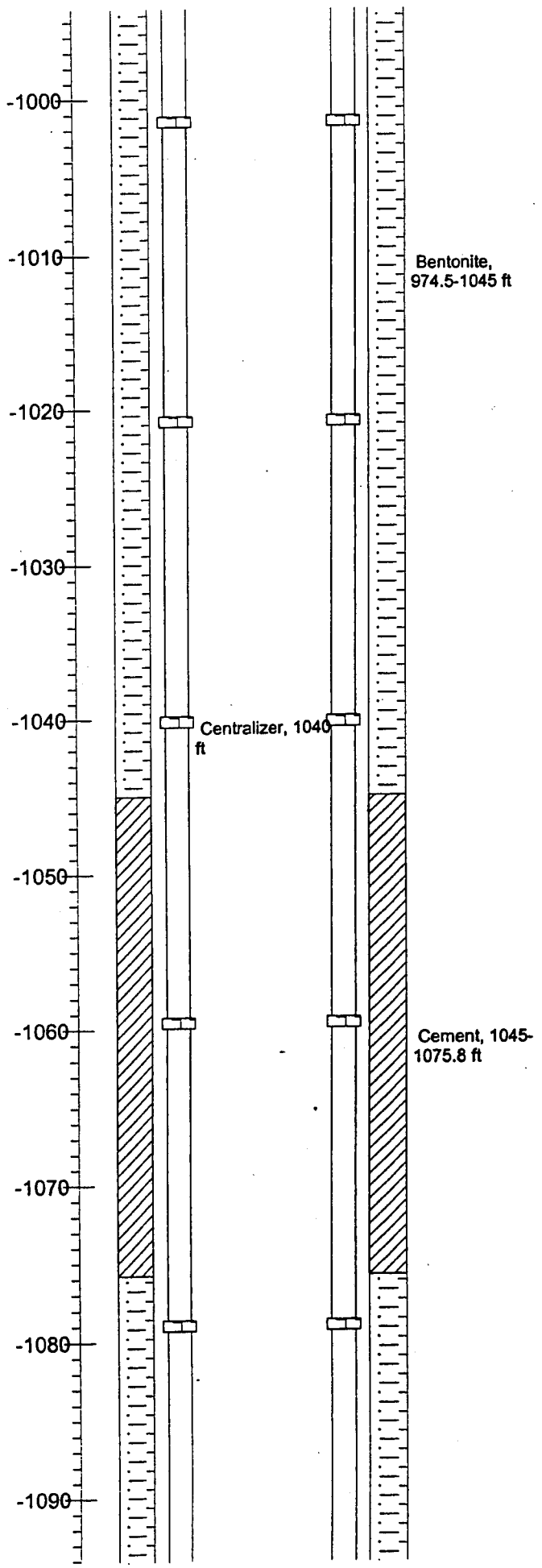
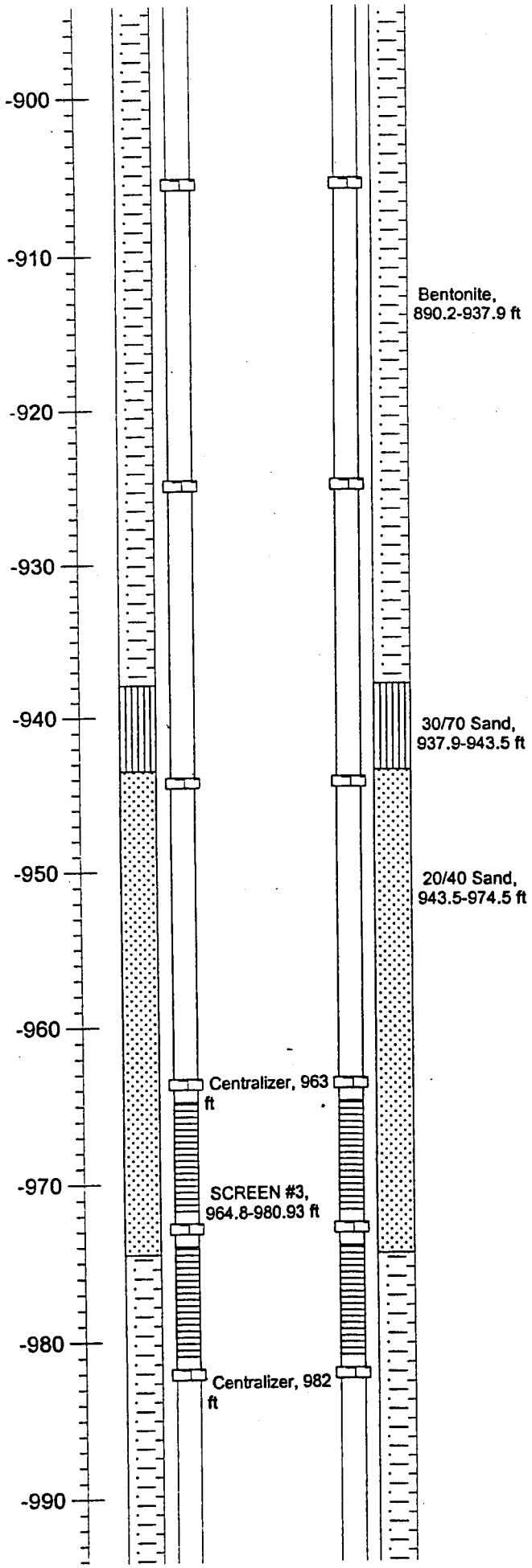
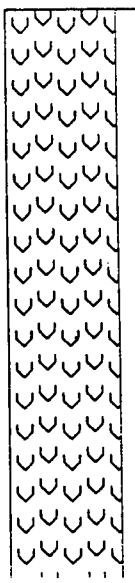


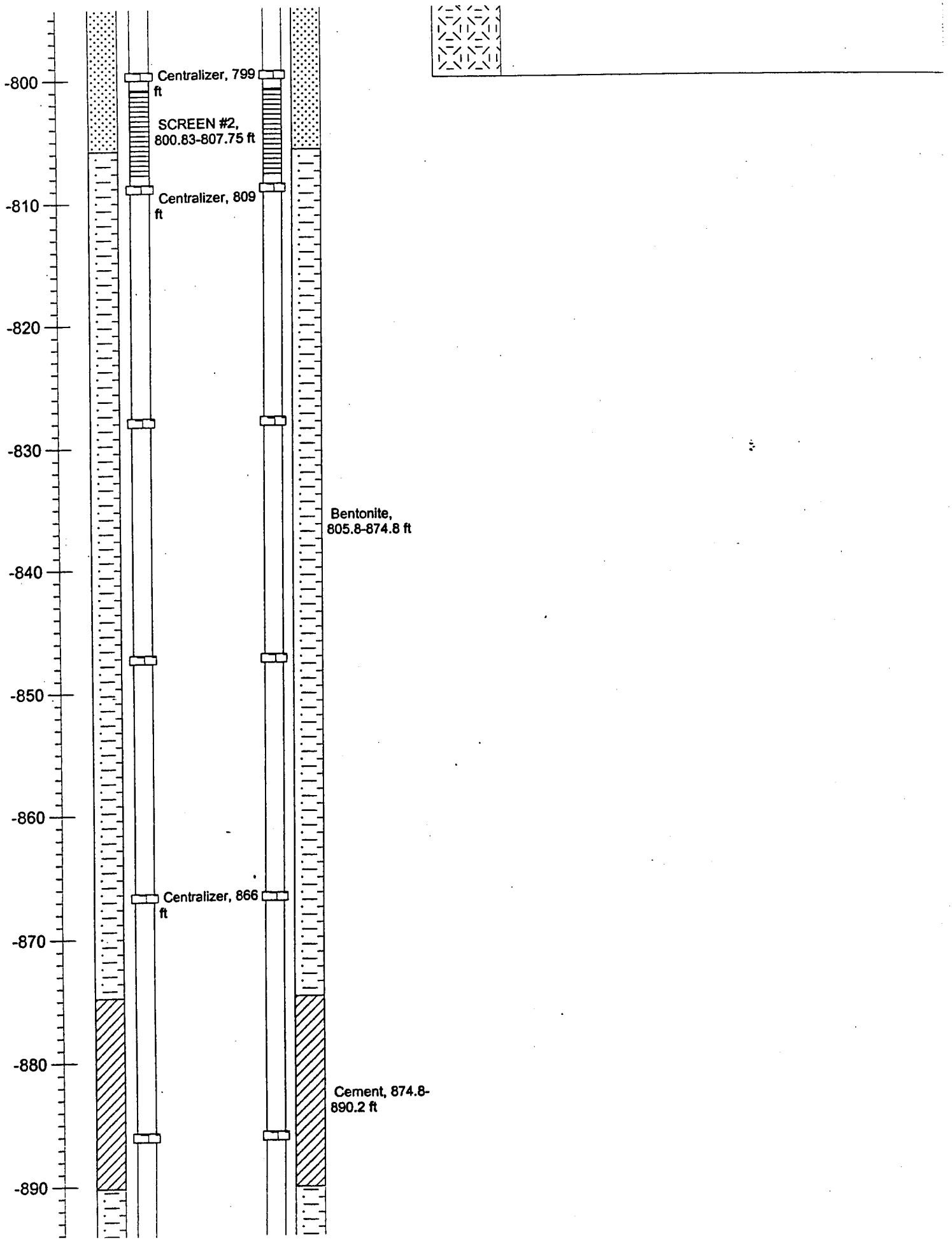
CDV-R15[illegible] Construction (8/10/00)





CERROS DEL RIO BASALT: (965-997 ft) Possible perched water target zone.

CDV-R15 Construction (8/10/00)



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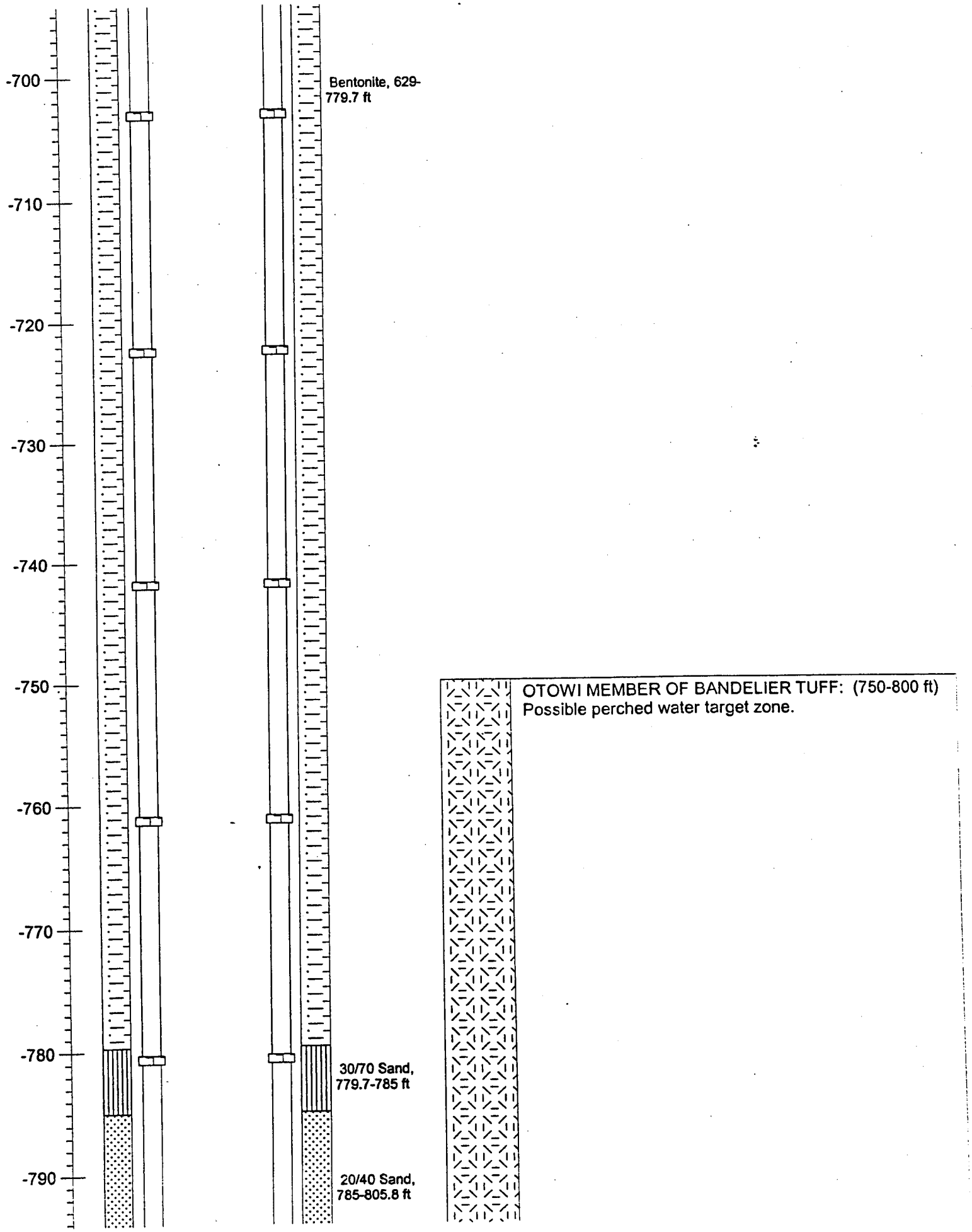

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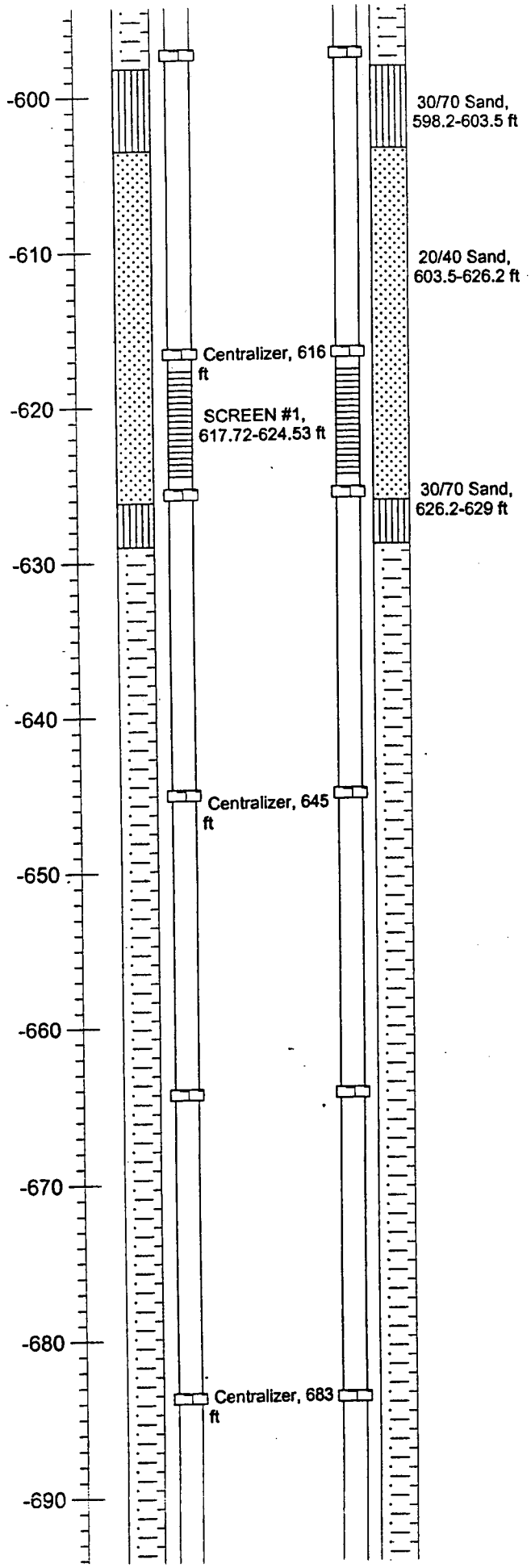
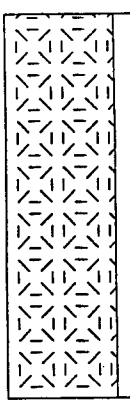
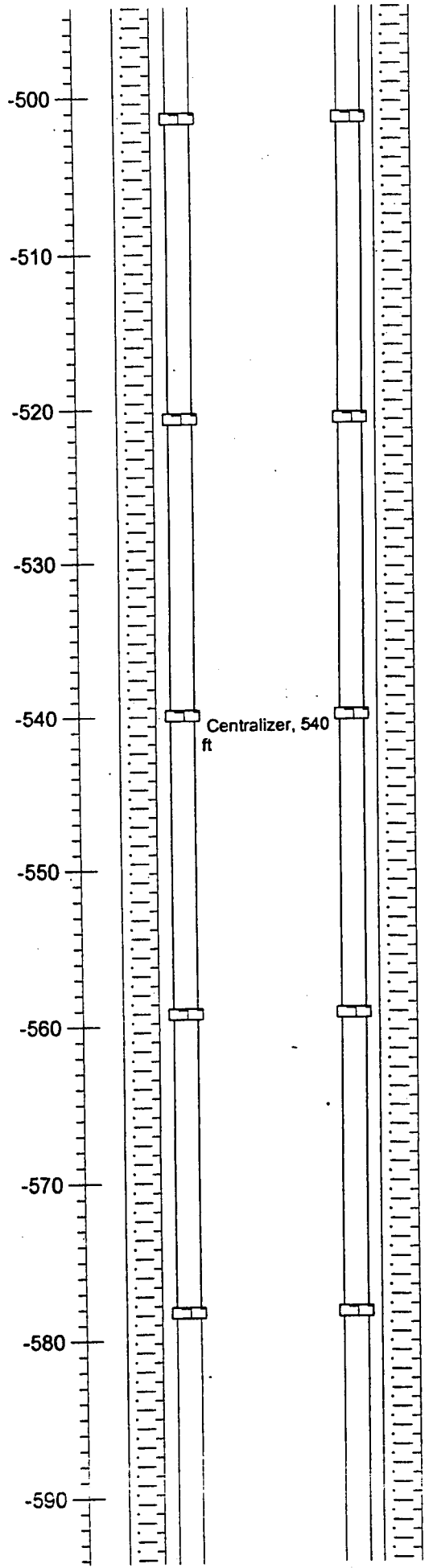




OTOWI MEMBER OF BANDELIER TUFF: (600-620 ft)
Possible perched water target zone.

CDV-R15 Construction (8/10/00)



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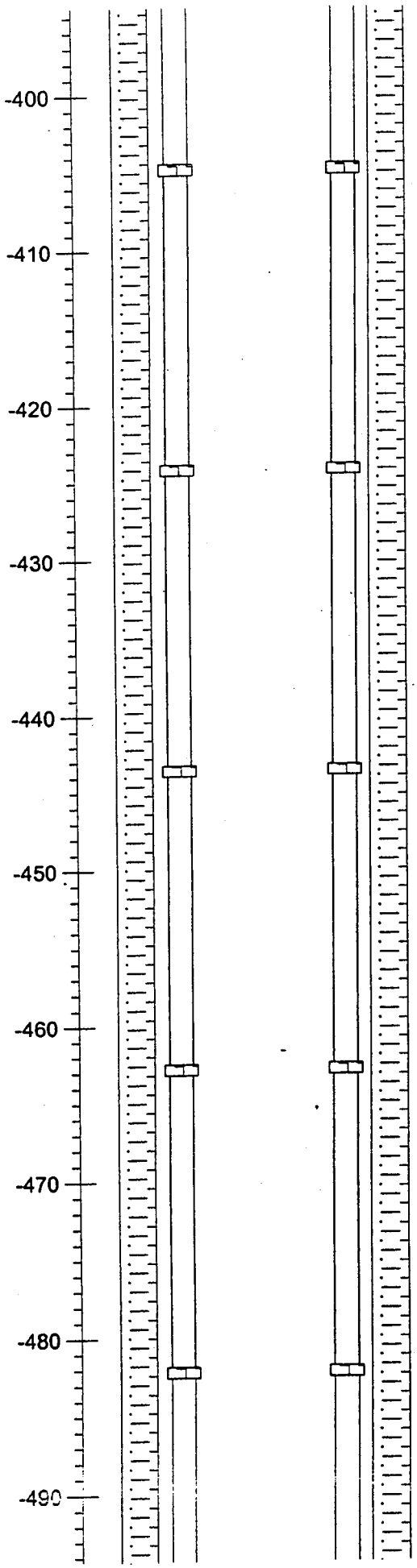
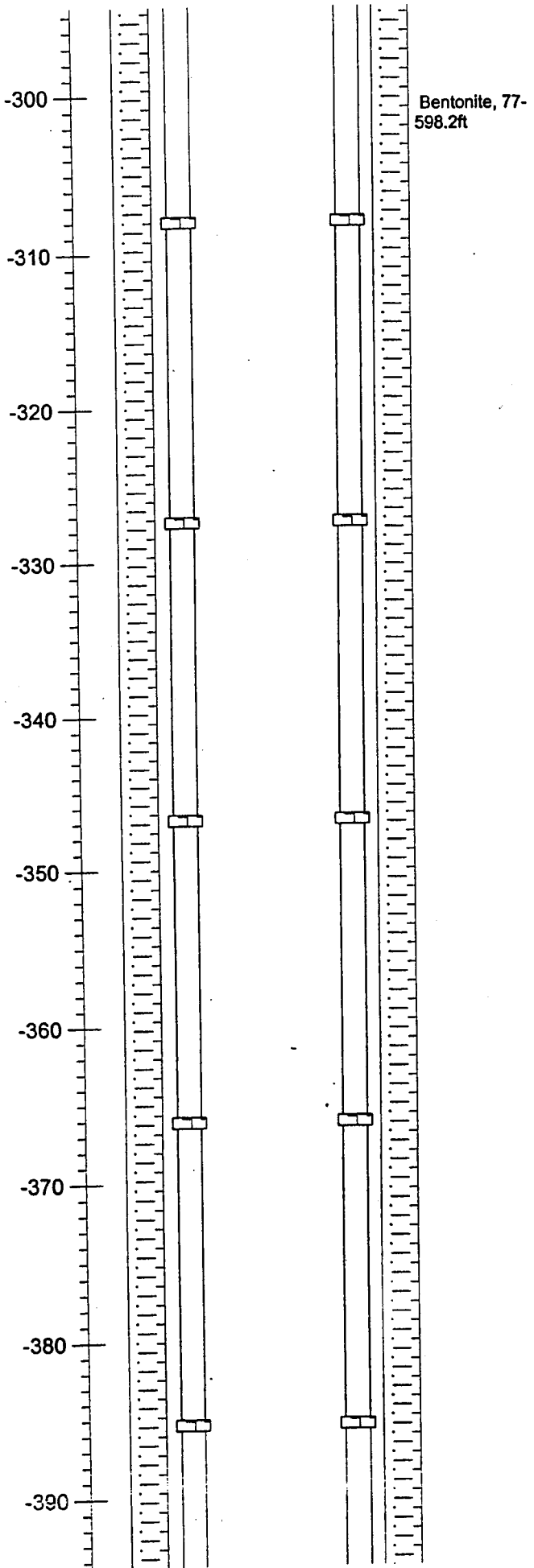


CDV-R15 Construction (8/10/00)



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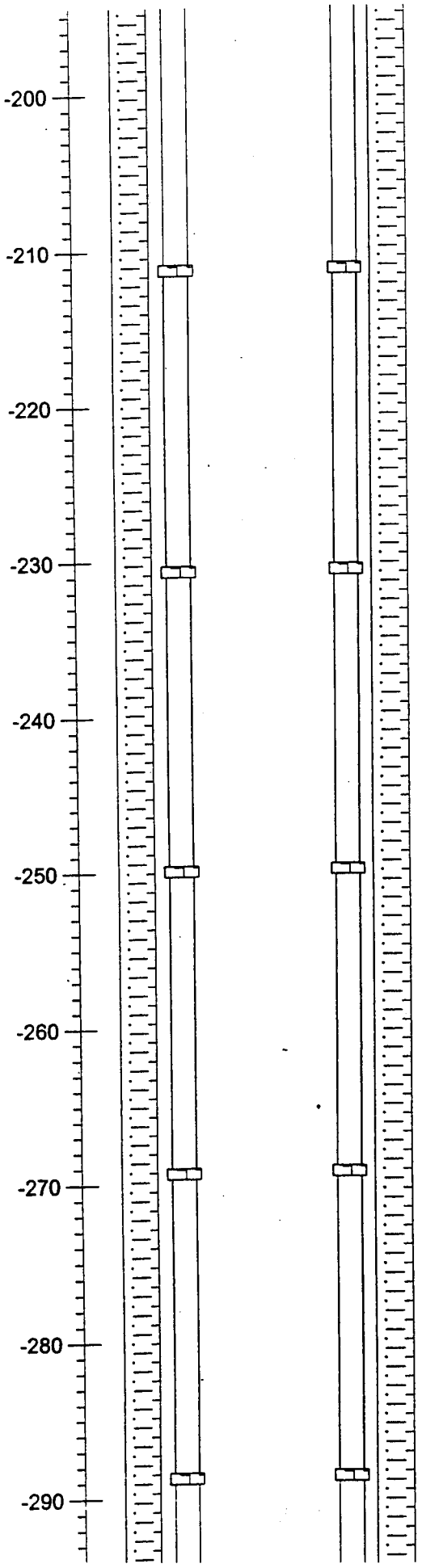

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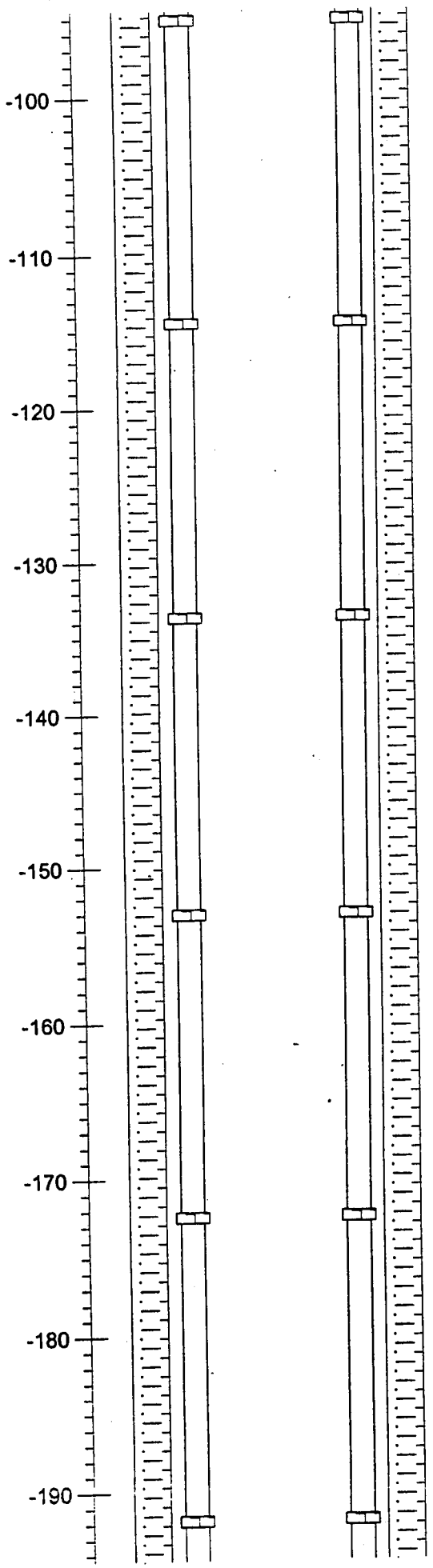

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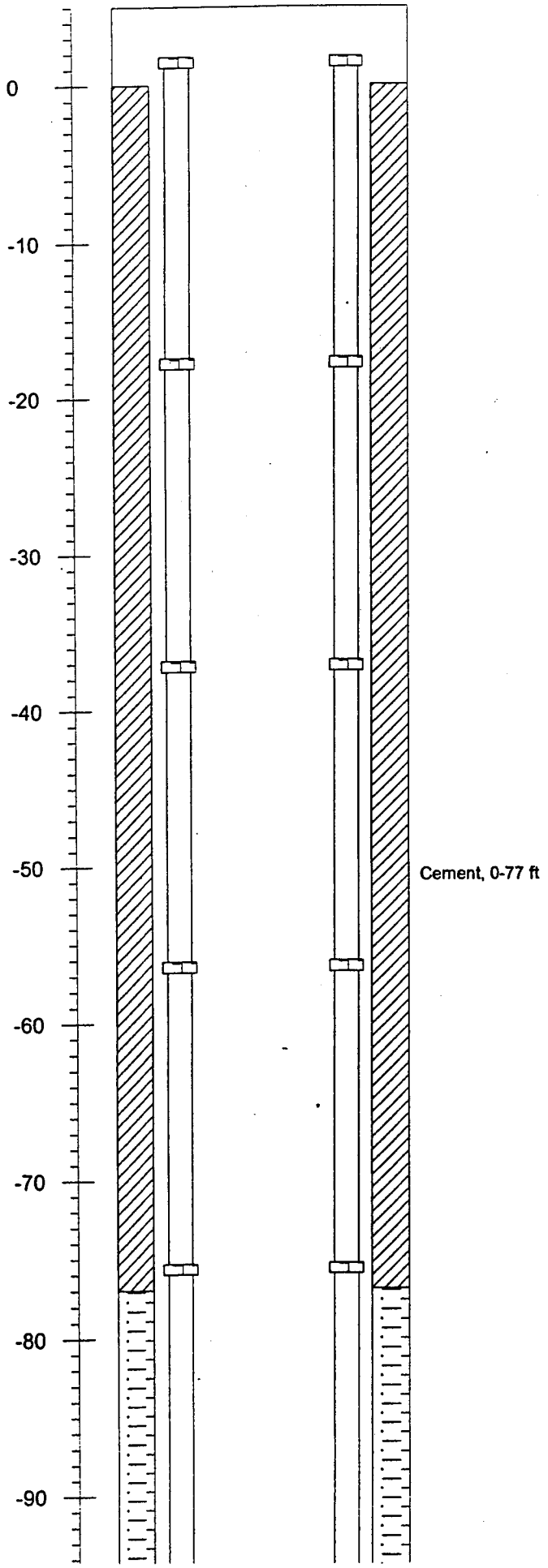
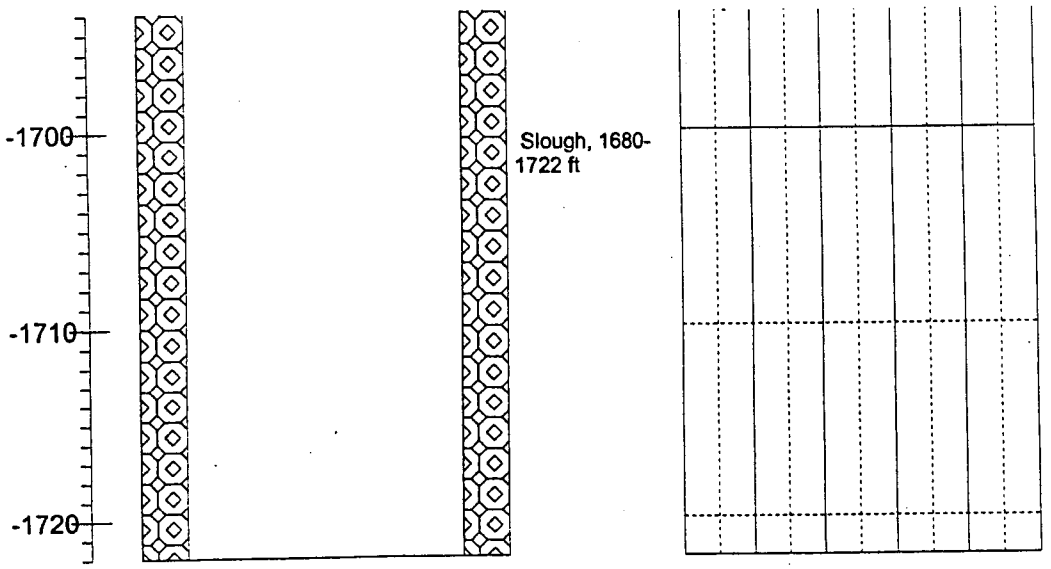


CDV-R15 Construction/Natural Gamma (8/11/00)



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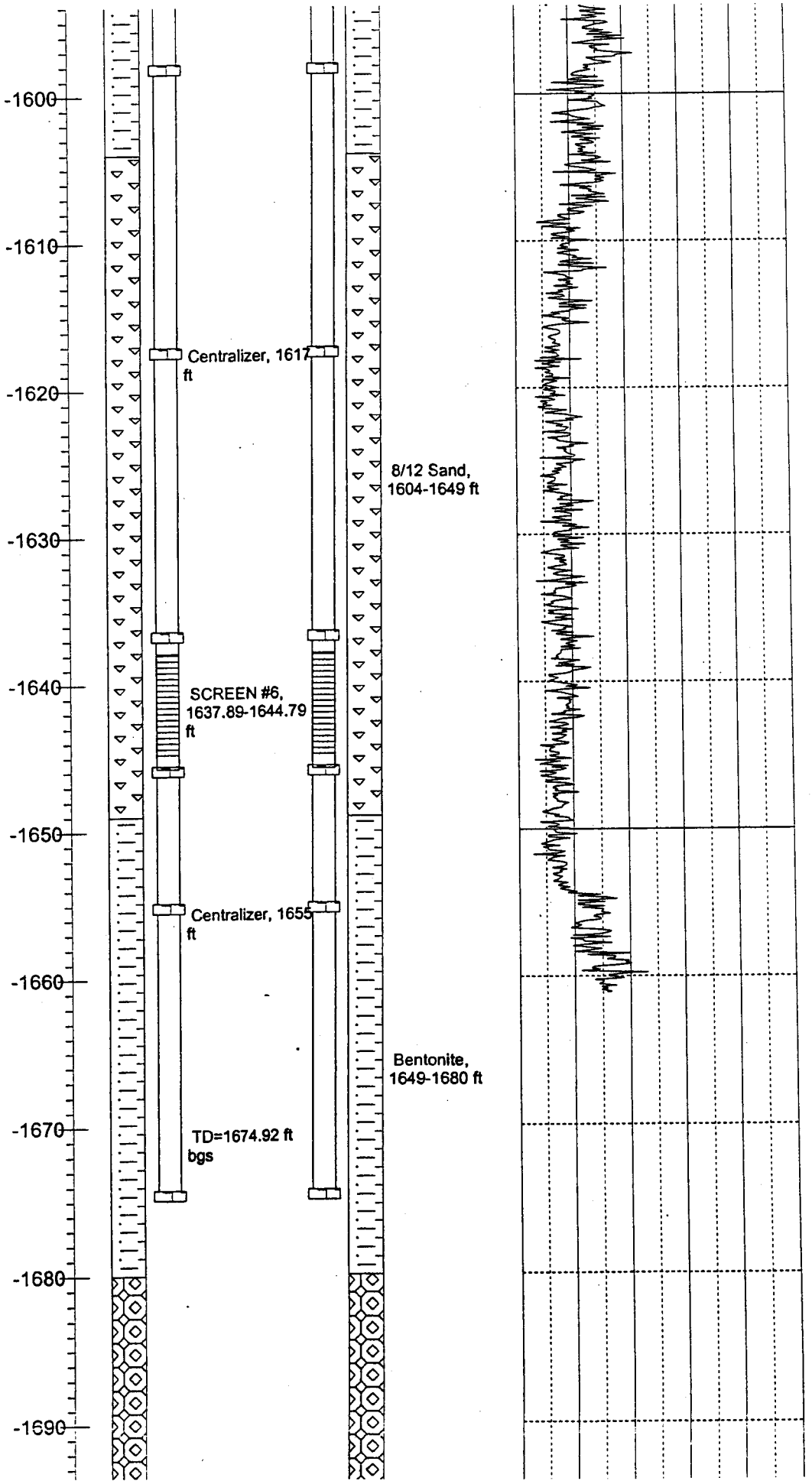
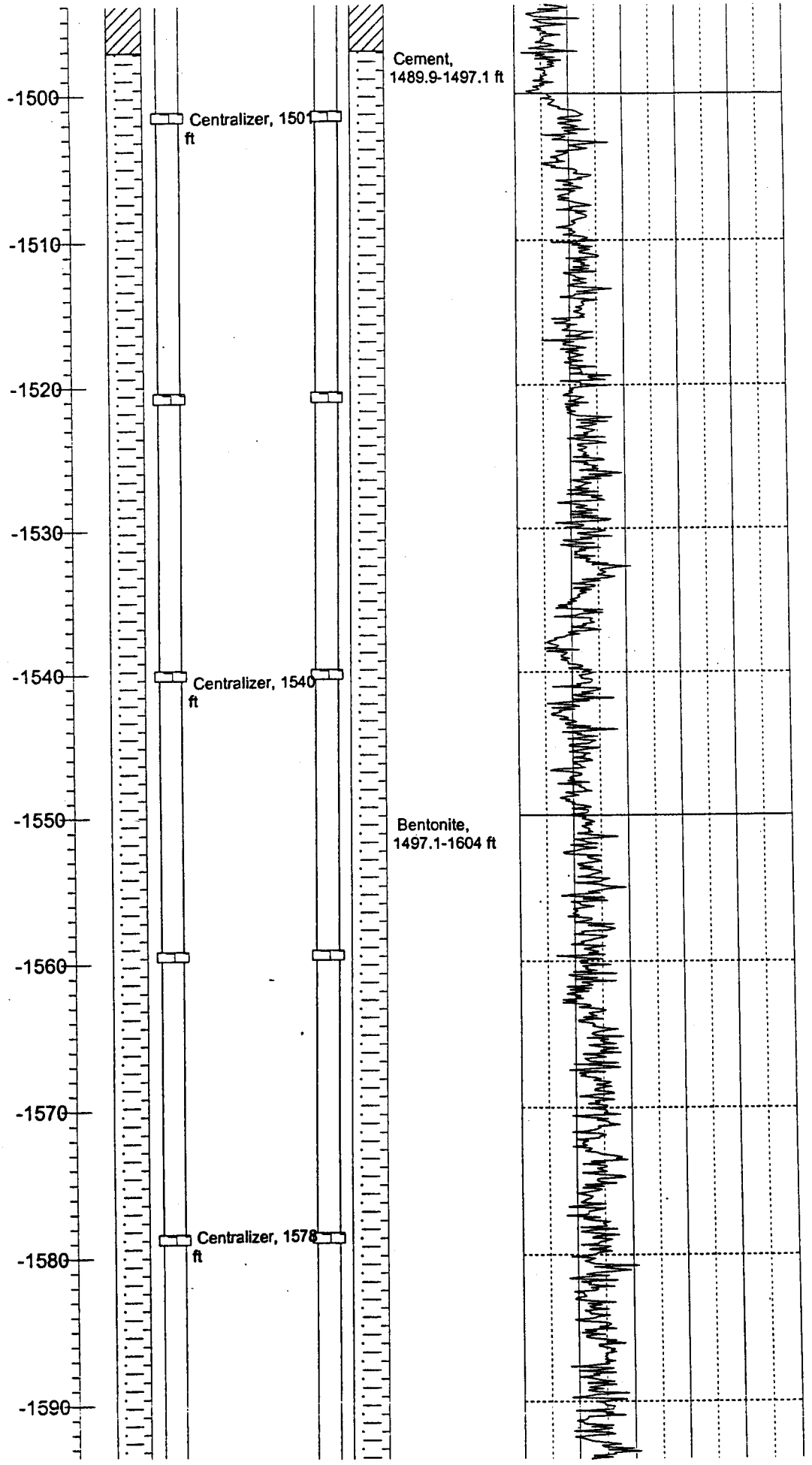


CDV-R15 Construction/Natural Gamma (8/11/00)



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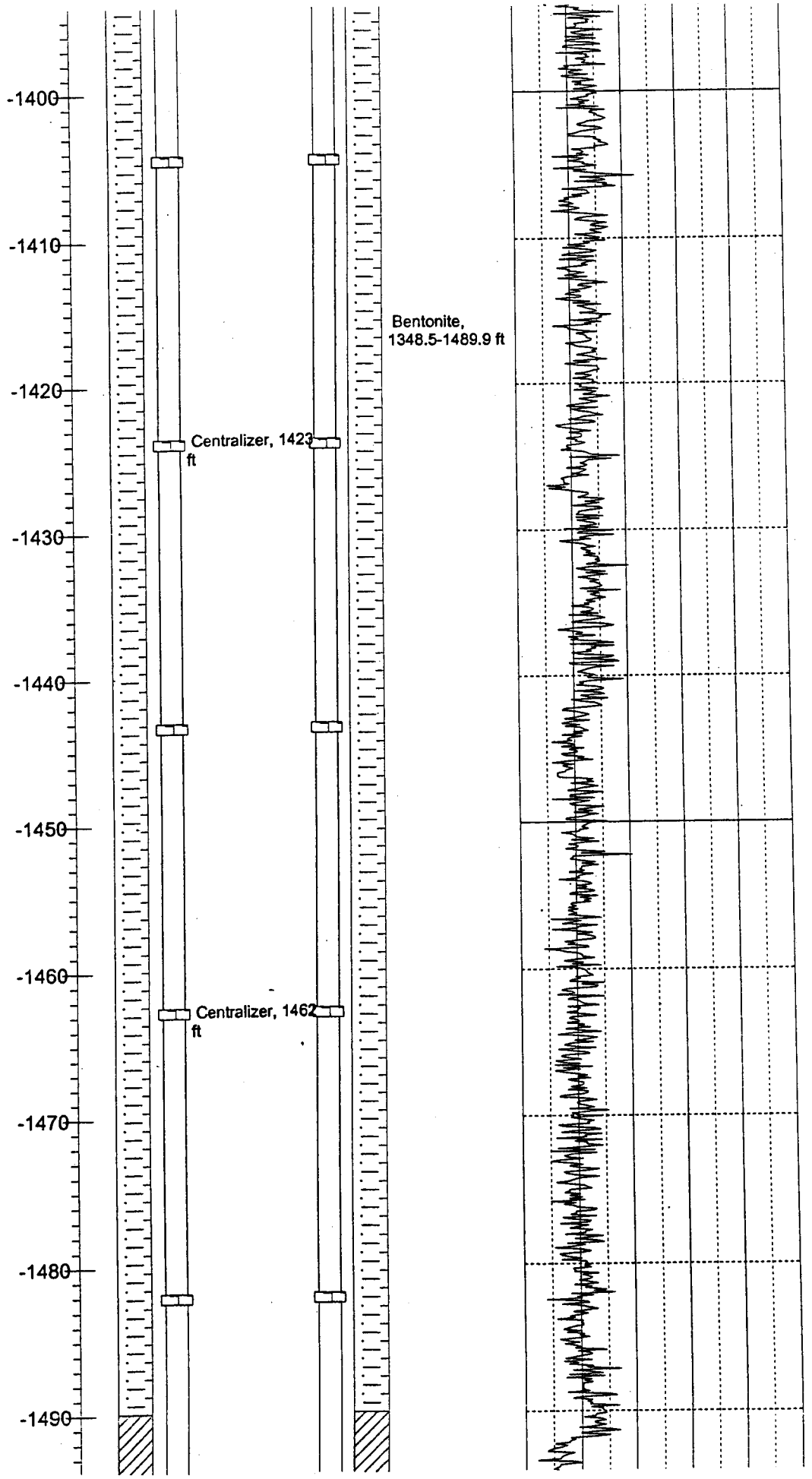
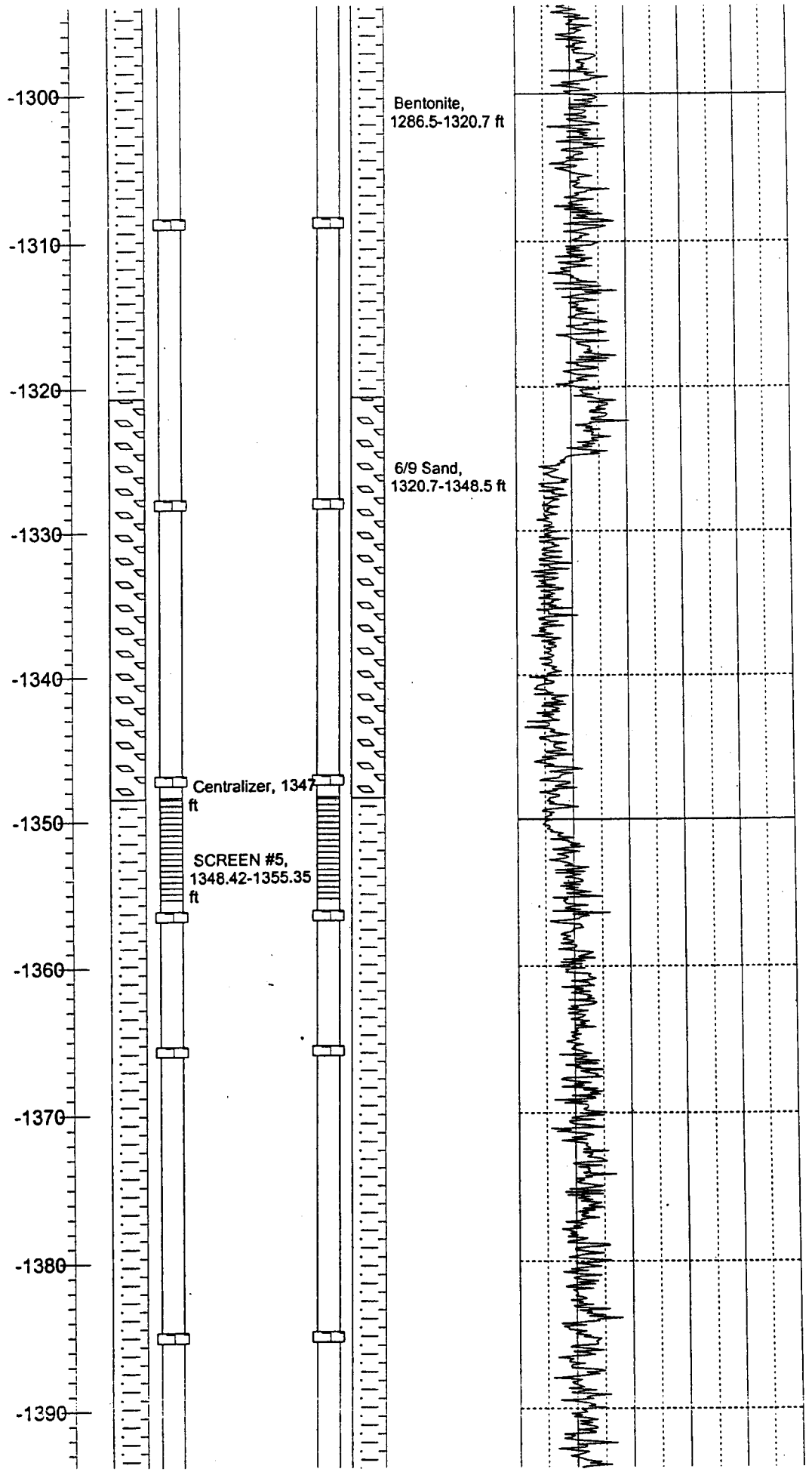


CDV-R15 Construction/Natural Gamma (8/11/00)



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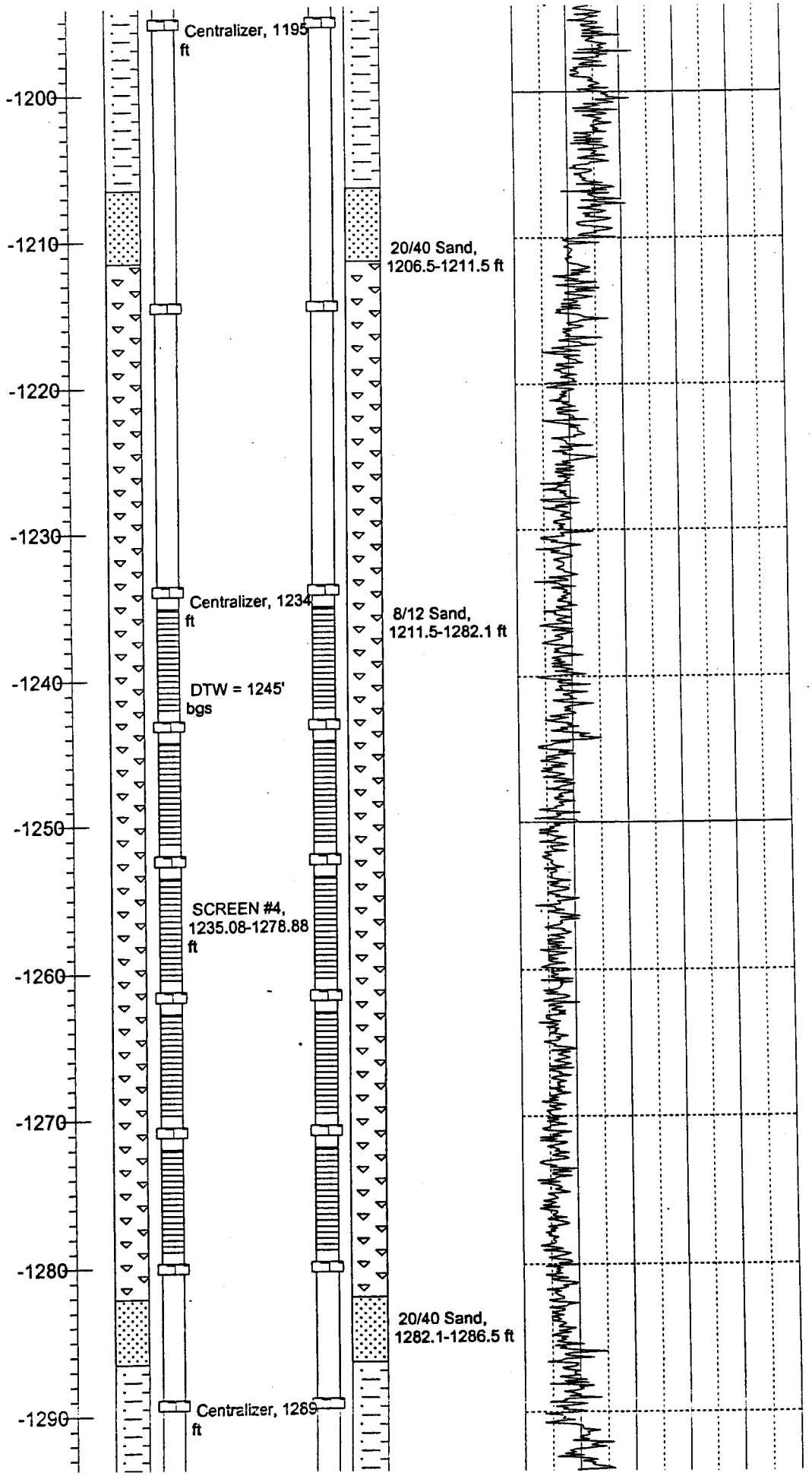

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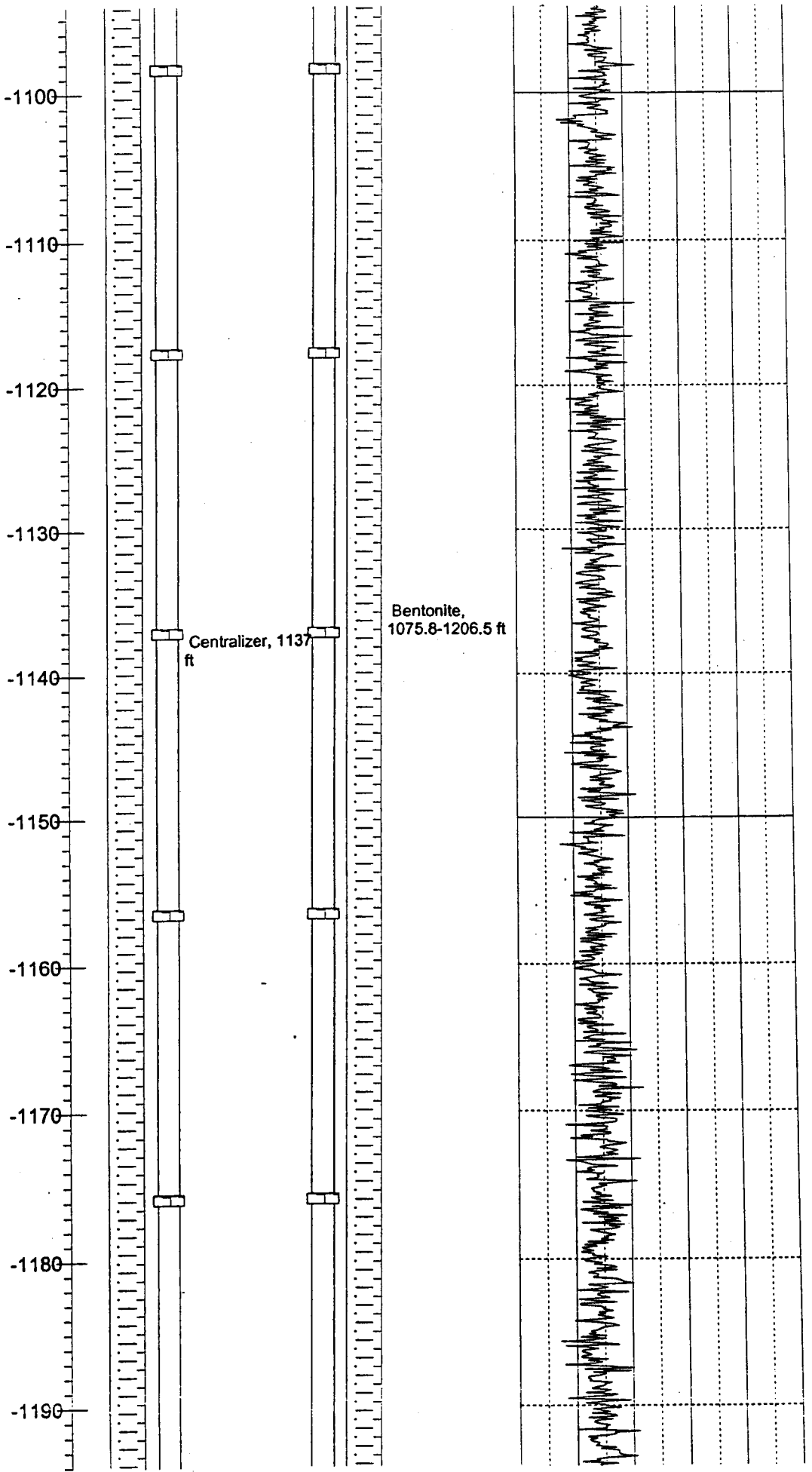
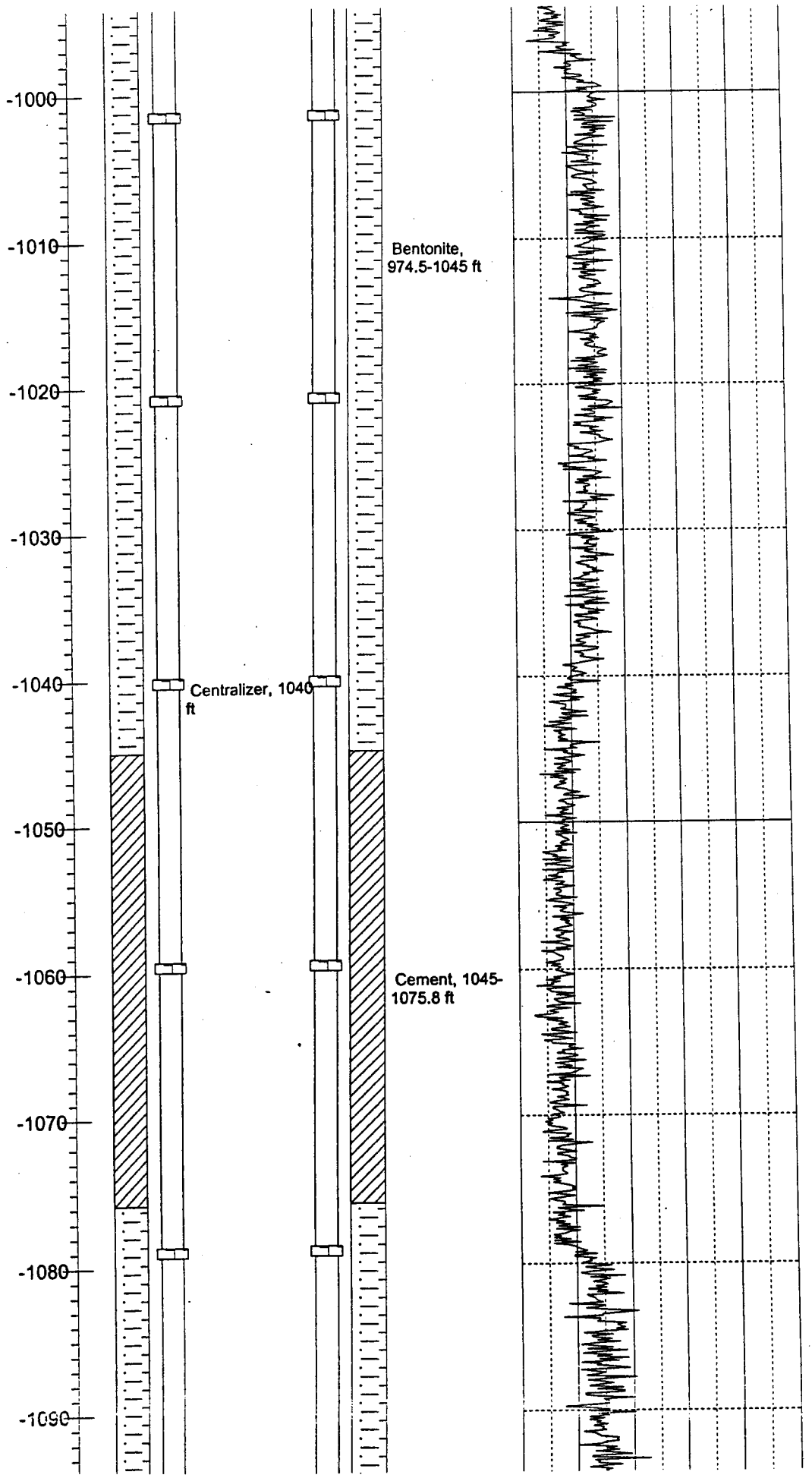
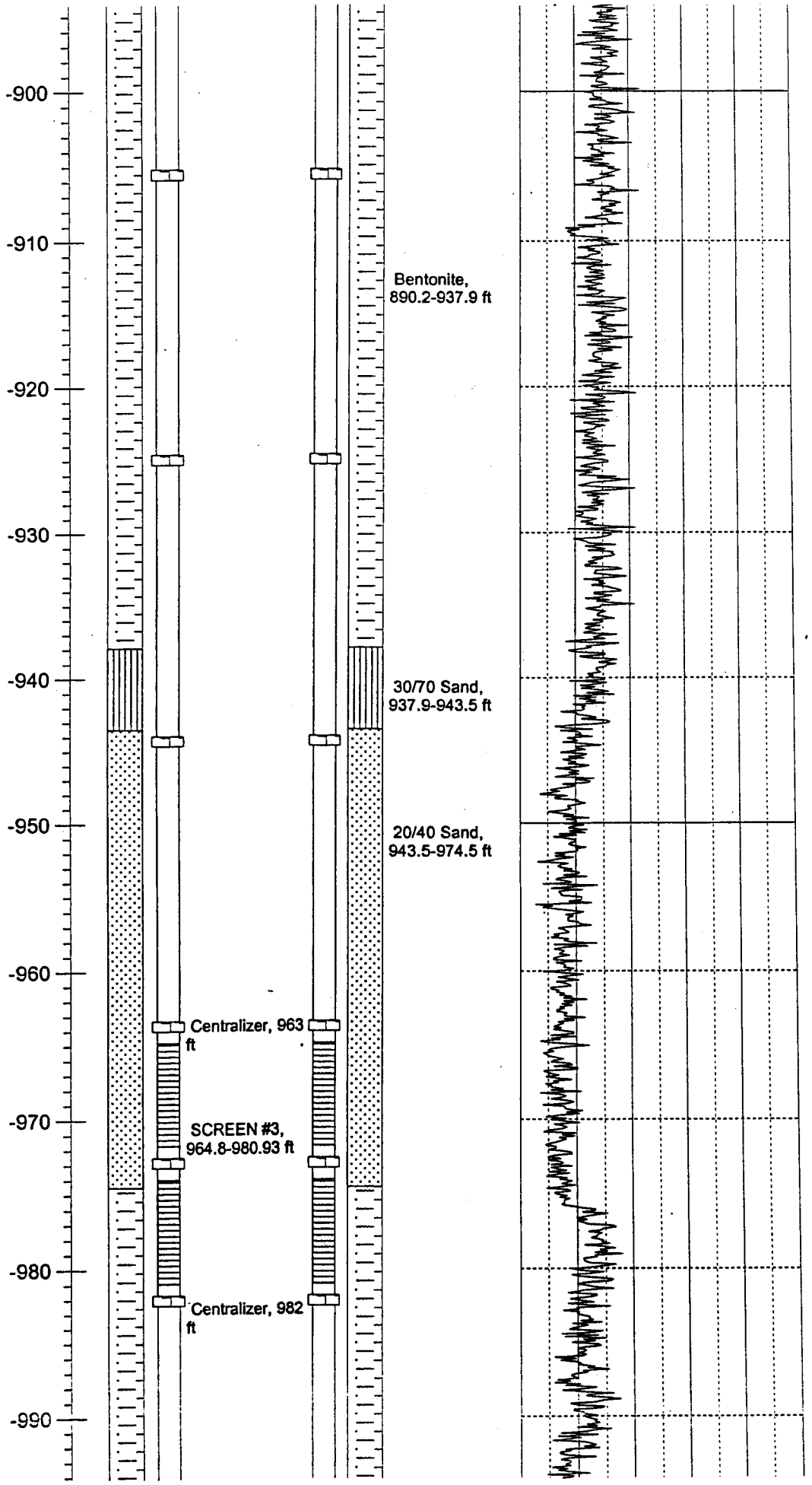


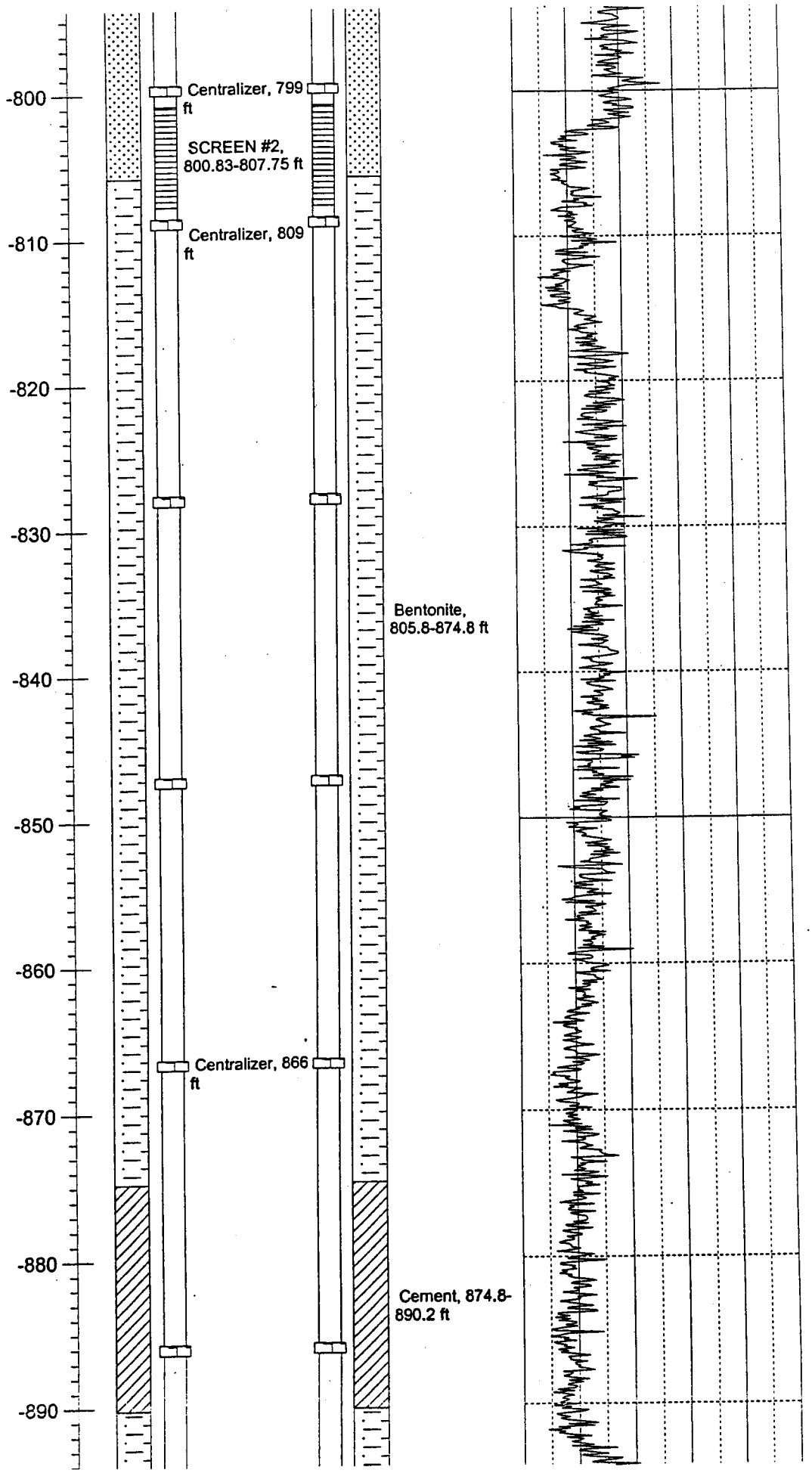
CDV-R15[illegible]3 Construction/Natural G[illegible]mma (8/11/00)



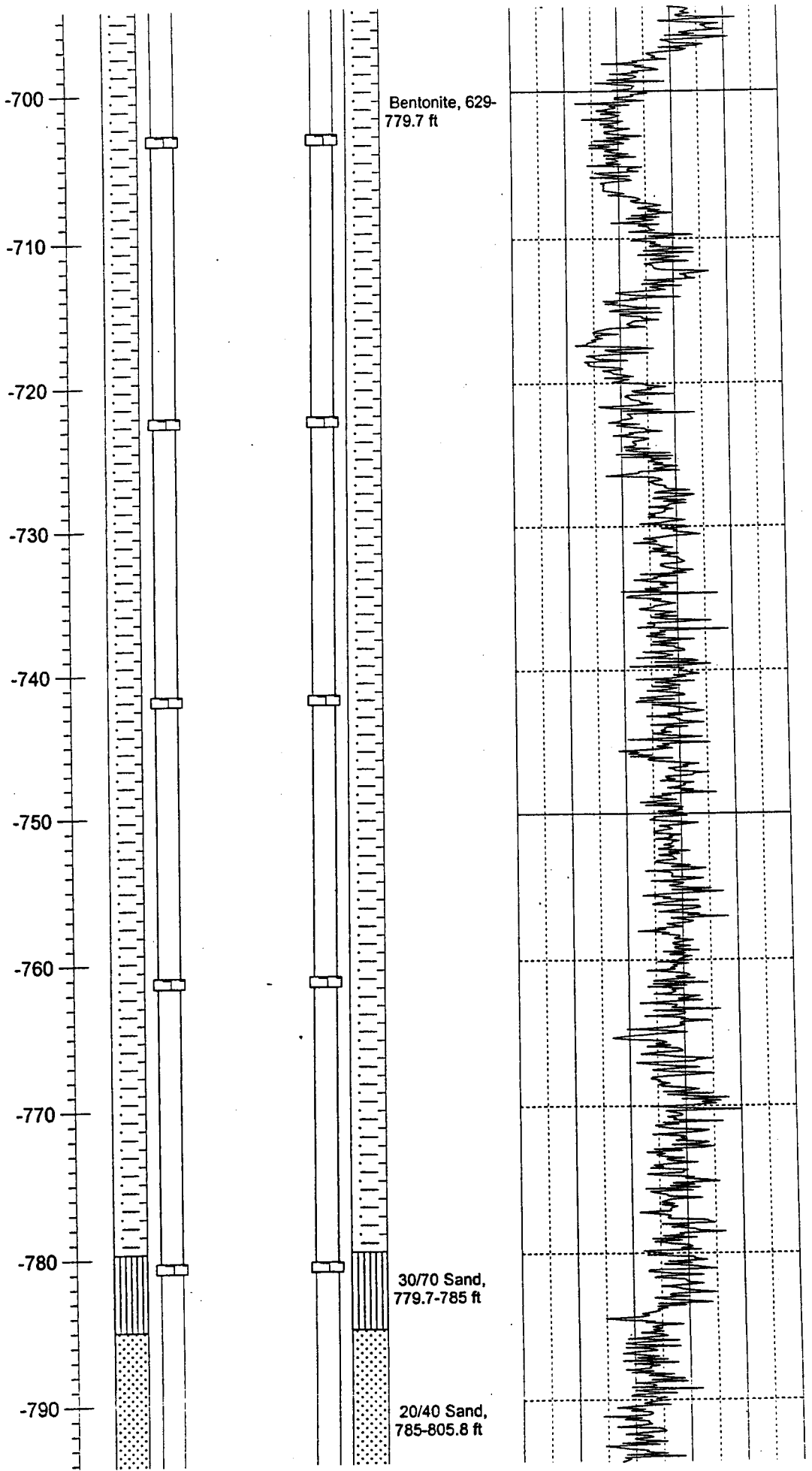
CDV-R15 Construction/Natural Gamma (8/11/00)



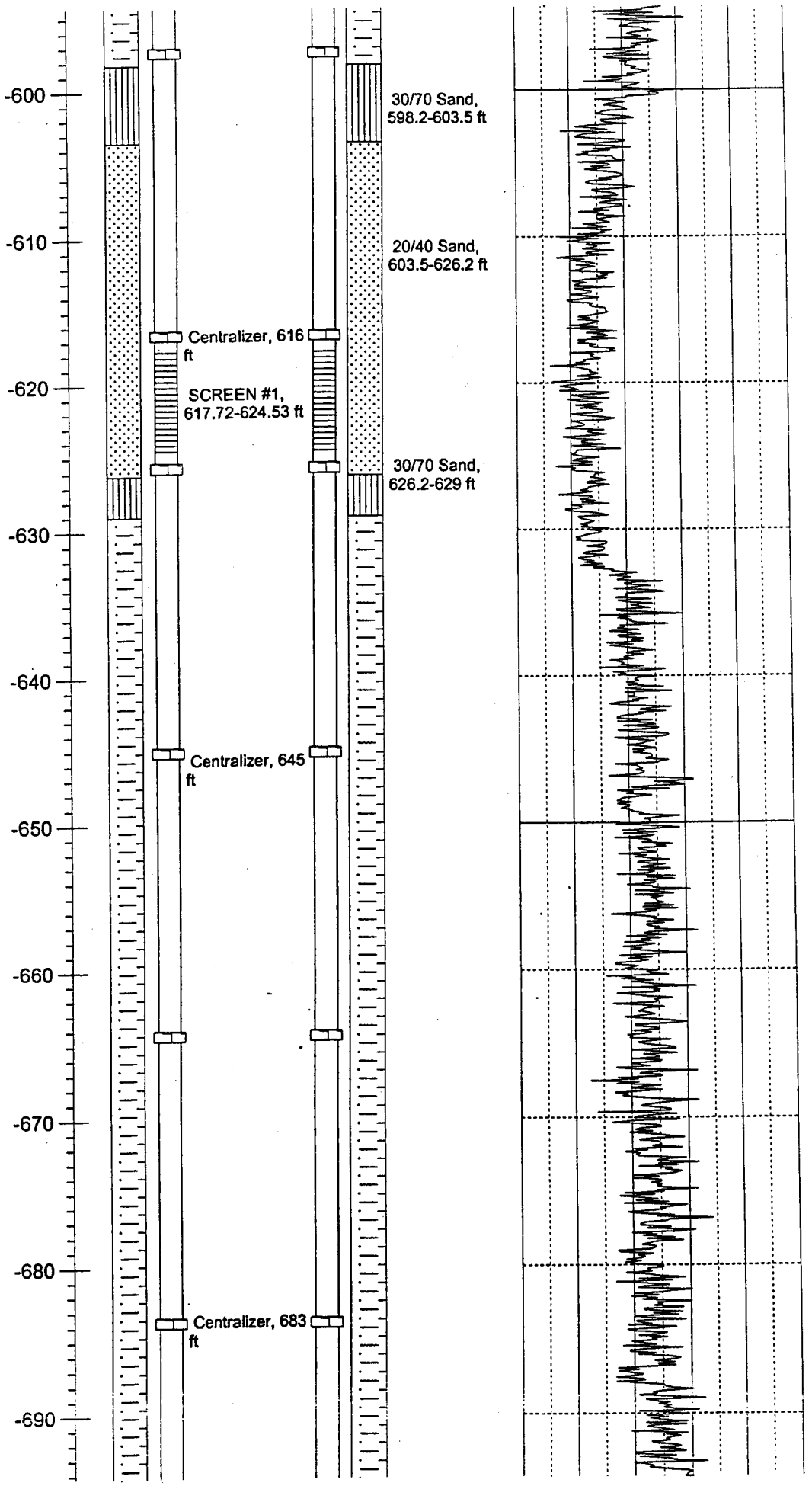
CDV-R15 Construction/Natural Gamma (8/11/00)



CDV-R15 Construction/Natural Gamma (8/11/00)



CDV-R15-3 Construction/Natural Gamma (8/11/00)



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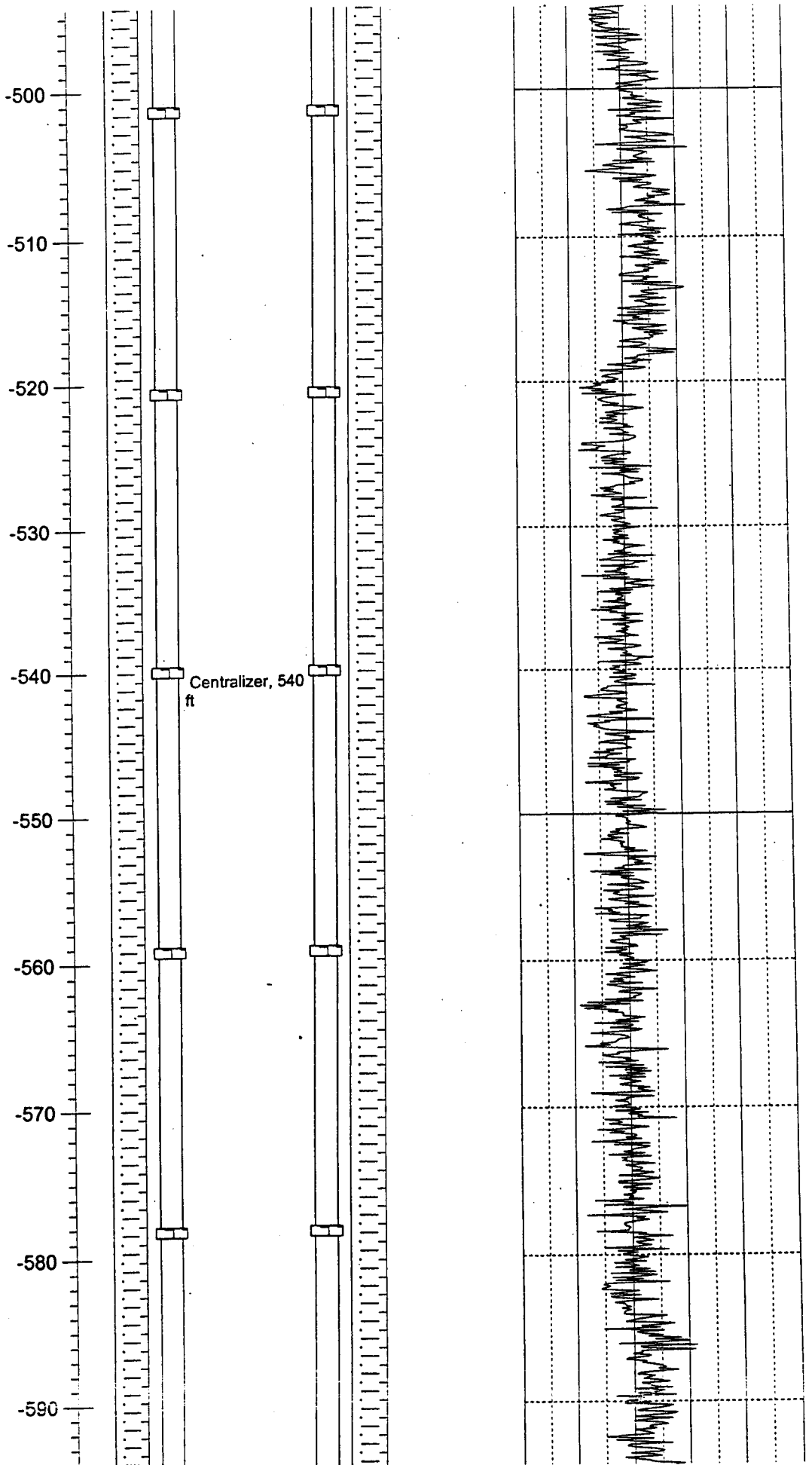
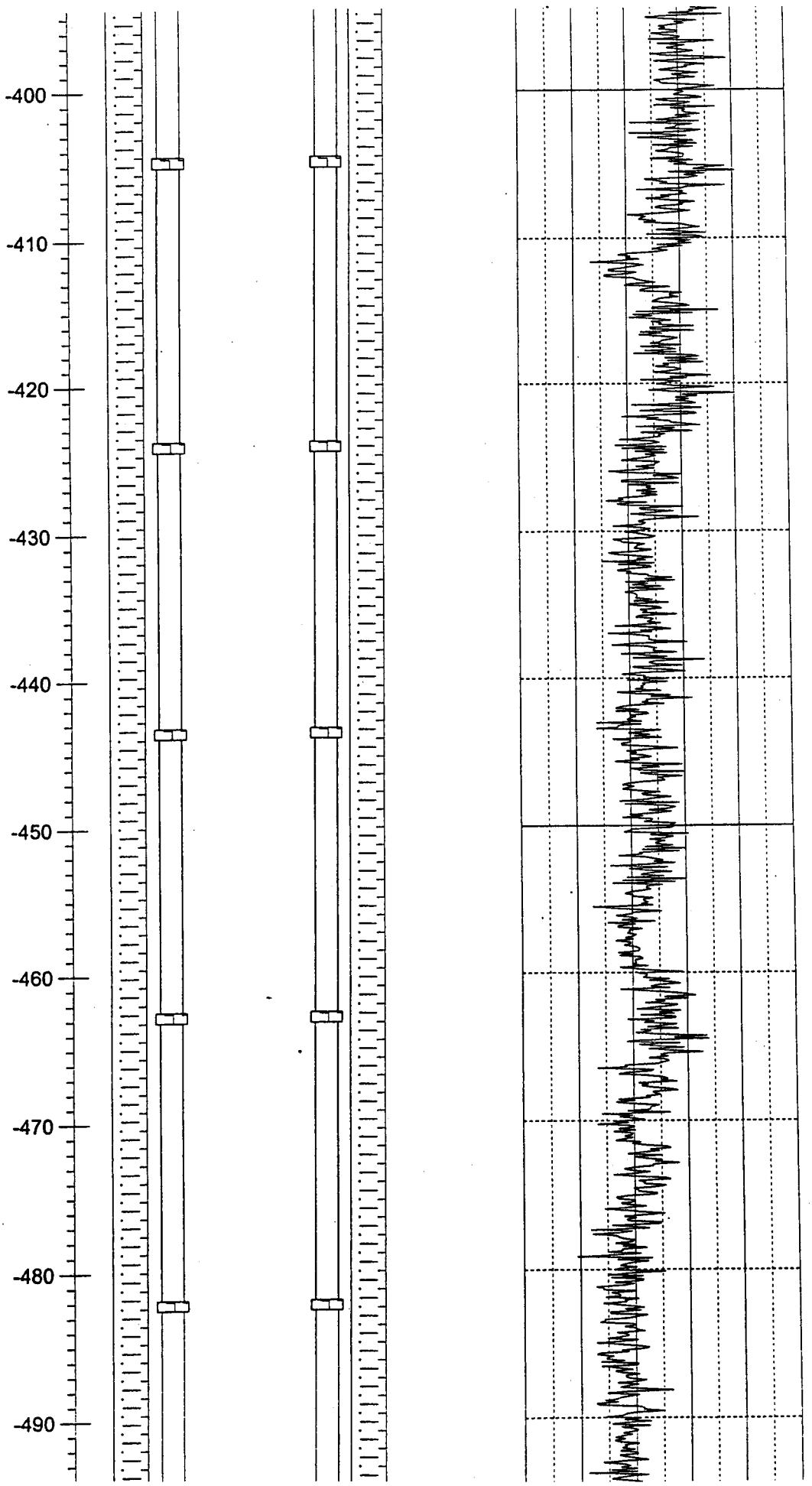
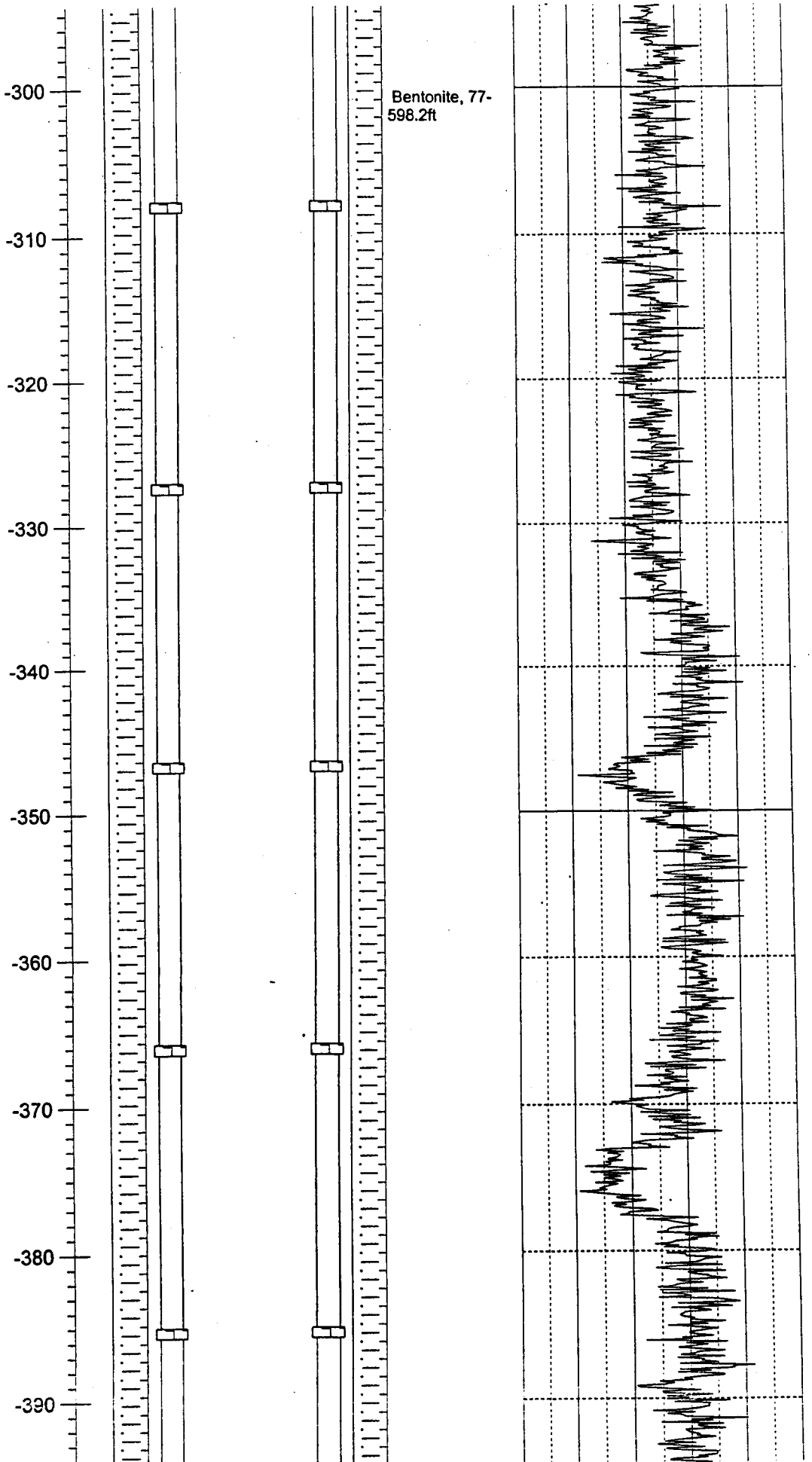


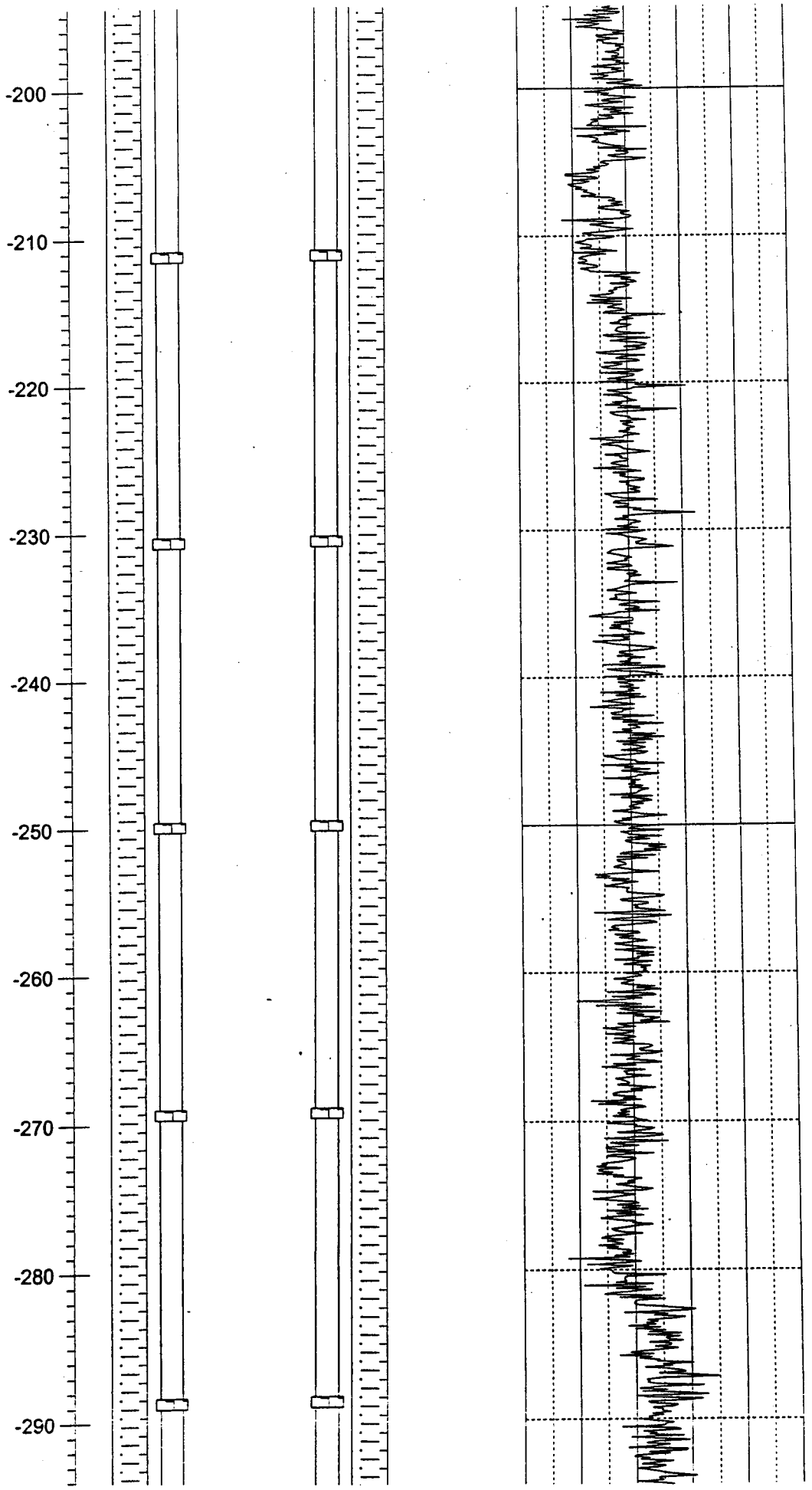
CDV-R15 Construction/Natural Gamma (8/11/00)



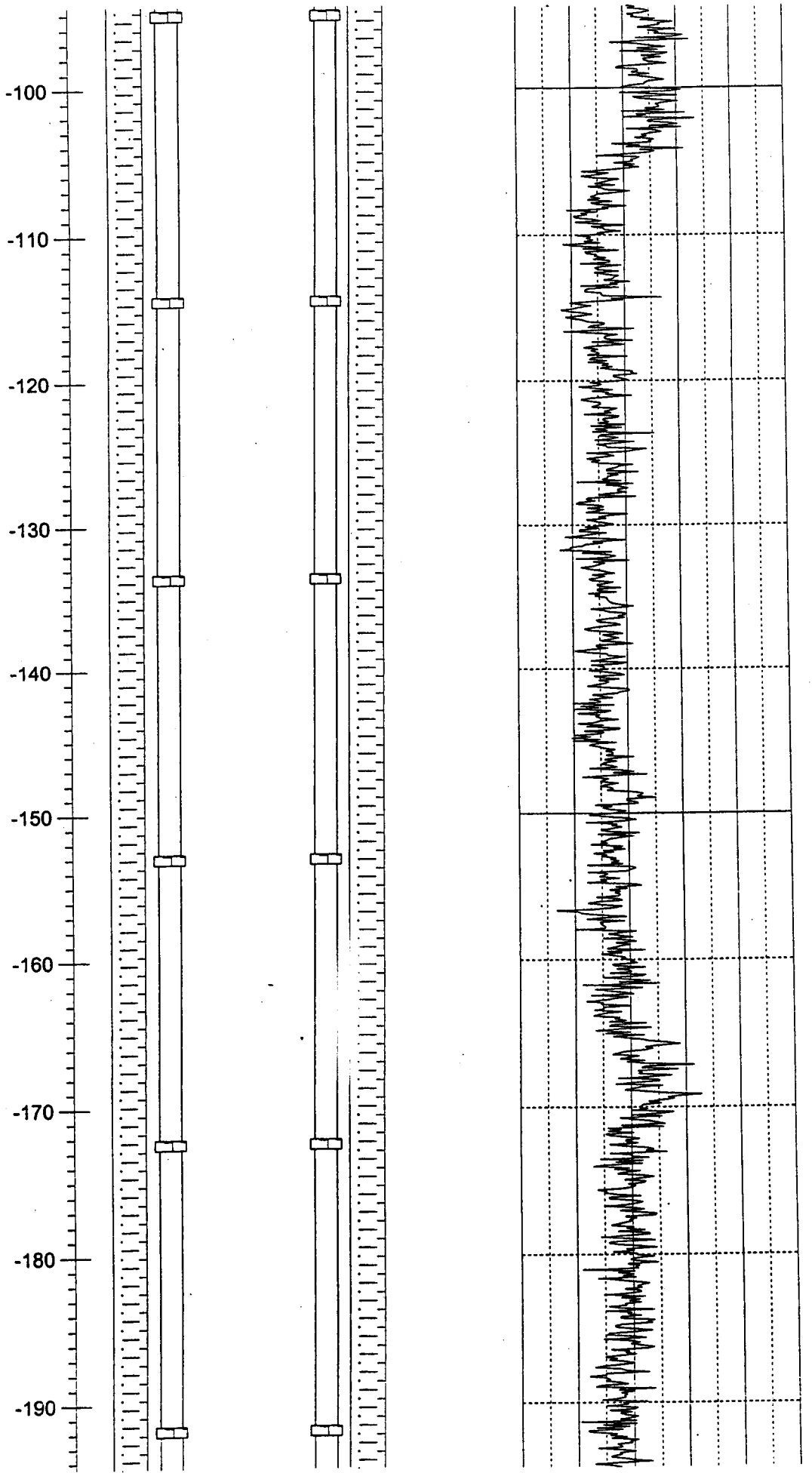
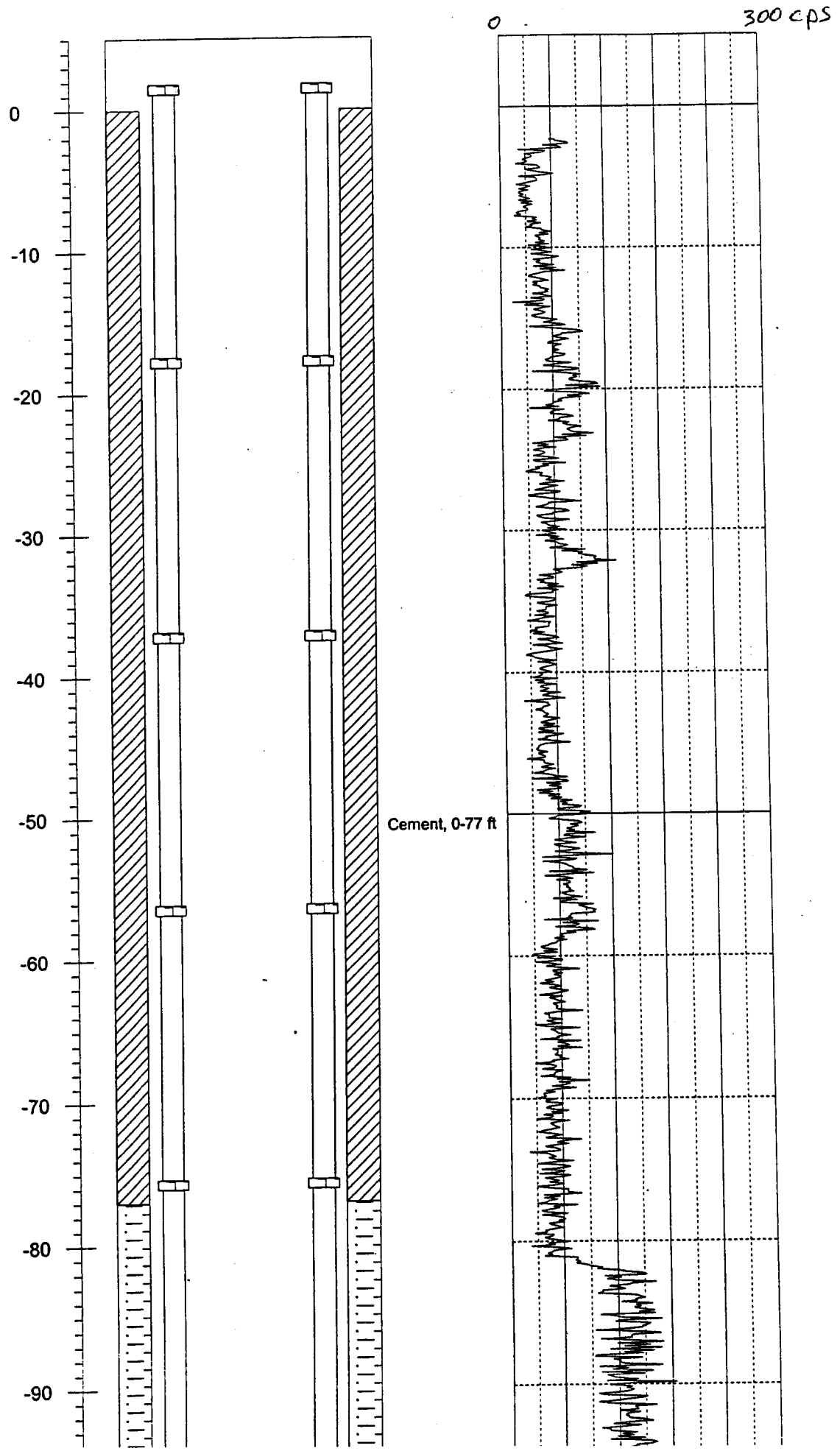
CDV-R15 Construction/Natural Gamma (8/11/00)



CDV-R15C Construction/Natural Gamma (8/11/00)



CDV-R15 Construction/Natural Gamma (8/11/00)



CDV-R15 Construction/Natural Gamma (8/11/00)