

TA 18



Los Alamos National Laboratory/University of California
Risk Reduction & Environmental Stewardship (RRES)
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National Nuclear Security Administration
Los Alamos Site Operations, MS A316
Environmental Restoration Program
Los Alamos, New Mexico 87544
(505) 667-7203/FAX (505) 665-4504

Date: February 18, 2003
Refer to: RRES-GPP-03-019

Mr. John Young, Corrective Action Project Leader
Permits Management Program
NMED – Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building 1
Santa Fe, NM 87505-6303



SUBJECT: WELL COMPLETION FACT SHEETS FOR REGIONAL (R) WELLS R-14, 16, 20, 23, AND 32

Dear Mr. Young:

Enclosed are two copies of well completion fact sheets for characterization wells, installed under the Groundwater Protection Program. Fact sheets are provided for wells: R-14 (TA-35, Ten Site Canyon), R-16 (White Rock, North of Overlook Road), R-20 (TA-18, south side of Pajarito Road), R-23 (Pajarito Canyon), and R-32 also located in the vicinity of TA-54, in Pajarito Canyon.

If you have any questions, please call Steve Pearson at (505) 667-3005 or Tom Whitacre at (505) 665-5042.

Sincerely,

Charles Nylander, Program Manager
Groundwater Protection Program
Los Alamos National Laboratory

Sincerely,

Mat Johansen, Project Manager
Program Compliance Manager
National Nuclear Security Admin.
Office of Los Alamos Site Operations



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Enclosure: Well Completion Fact Sheets for Wells 14, 16, 20, 23, and 32

Cy (w/enc.):

D. Broxton, EES-6, MS M992
A. Dorries, RRES-R, MS M992
H. Granzow, RRES-GPP, MS M992
T. Herrera, RRES-WQH, MS M992
D. Hickmott, EES-6, MS M992
E. Keating, EES-6, MS T001
P. Longmire, EES-6, MS D462
J. McCann, RRES-WQH, MS M992
C. Nylander, RRES-GPP, MS M992
N. Quintana, RRES-R, MS M992
B. Robinson, EES-6, MS T001
D. Rogers, RRES-WQH, MS K497
B. Stone, EES-6, MS T001
D. Vaniman, EES-6, MS D462
B. Enz, OLASO, MS A316
M. Johansen, OLASO, MS A316
E. Trollinger, OLASO, MS A316
T. Whitacre, LAAO, MS A316
J. Kieling, NMED-HWB
J. Young, NMED-HWB (1 extra copy of Attachment)
M. Leavitt, NMED-GWQB
J. Davis, NMED-SWQB
S. Yanicak, NMED-DOE OB, MS J993
L. King, US EPA (2 copies)
T. Trujillo, DOE-AL, MS A906
IM-5, MS A150
RRES-GPP File, MS M992
RPF, MS M707 (ER2002-0375)

Cy (w/o enc.):

D. McInroy, RRES-R, MS M992
B. Ramsey, RRES-DO, MS J591
J. Bearzi, NMED-HWB
T. Longo, DOE-HQ, EM 453
J. Parker, NMED-DOE OB

Construction, Stratigraphic, and Hydrogeologic Information for Hydrogeologic Workplan Characterization Well R-14 Rev. 0 (1-10-03).

Location: In Ten Site Canyon, east of the former radioactive liquid waste and septic treatment facilities at TA-35.

Survey coordinates (brass marker in NW corner of R-14 cement pad):
 x: 1629855 E y: 1768953 N (NAD 83)
 z: 7062.1 ft asl (NGVD 29)

Drilling: air rotary core w/ wireline retrieval, conventional mud drilling, casing advance.
 R-14 Start date: 06/02/02.
 R-14 End date: 07/02/02.

Borehole R-14 drilled to 1327 ft. bgs. (T.D.).

Data collection:
 Hydrologic properties: Field hydraulic test: Constant Rate Injection Test on screen #2
 Cores/cuttings submitted for geochemical and contaminant characterization: (24)
 Groundwater samples submitted for geochem and contaminant characterization: (2)
 Geologic properties: (11)
 Mineralogy, petrography, and chemistry.

Borehole logs from R-14:
 Lithologic: 0-1327 ft.
 Video (LANL tool): 0-923 ft. and 0-975 ft.
 Natural gamma (LANL tool): 0-1068 ft. and 1046-1325 ft. bgs.
 Schlumberger Logs: 0-12.2 ft (cased), 12.2-1068 ft (open hole): Litho density, Spectral Gamma, Elemental Capture, Thermal/Epithermal Neutron, Combinable Magnetic Resonance, and Natural Gamma.

Contaminants Detected in R-14 Water Samples: none

Well construction:
 Drilling Completed: 07/02/02
 Contract Geophysics: 06/19/02 - 06/20/02
 Well Constructed : 07/04/02 - 07/11/02
 Well Developed : 07/19/02 - 11/18/02
 Westbay Installed : 11/19/02 - 11/25/02

Casing: 4.5-in I.D. stainless steel with external couplings.

Number of Screens: 2
 4.5-in I.D. pipe based, s.s. wire-wrapped with 0.010-in slots.

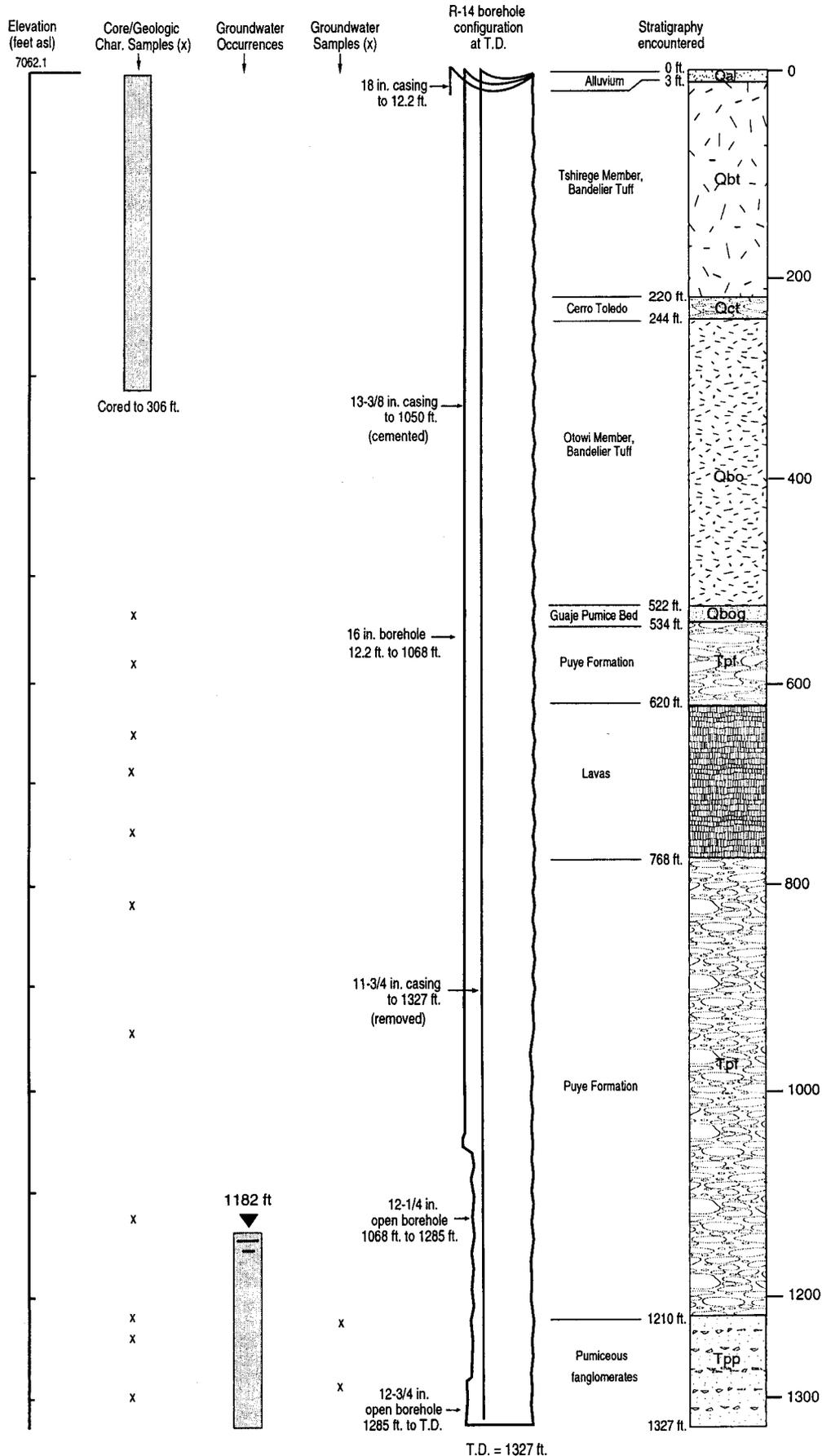
Screen (perforated pipe interval):
 Screen #1 - 1200.6-1233.2 ft. bgs.
 Screen #2 - 1286.5-1293.1 ft. bgs.

Well development consisted of wire brushing, bailing, chemical treatments, surging, and pumping.

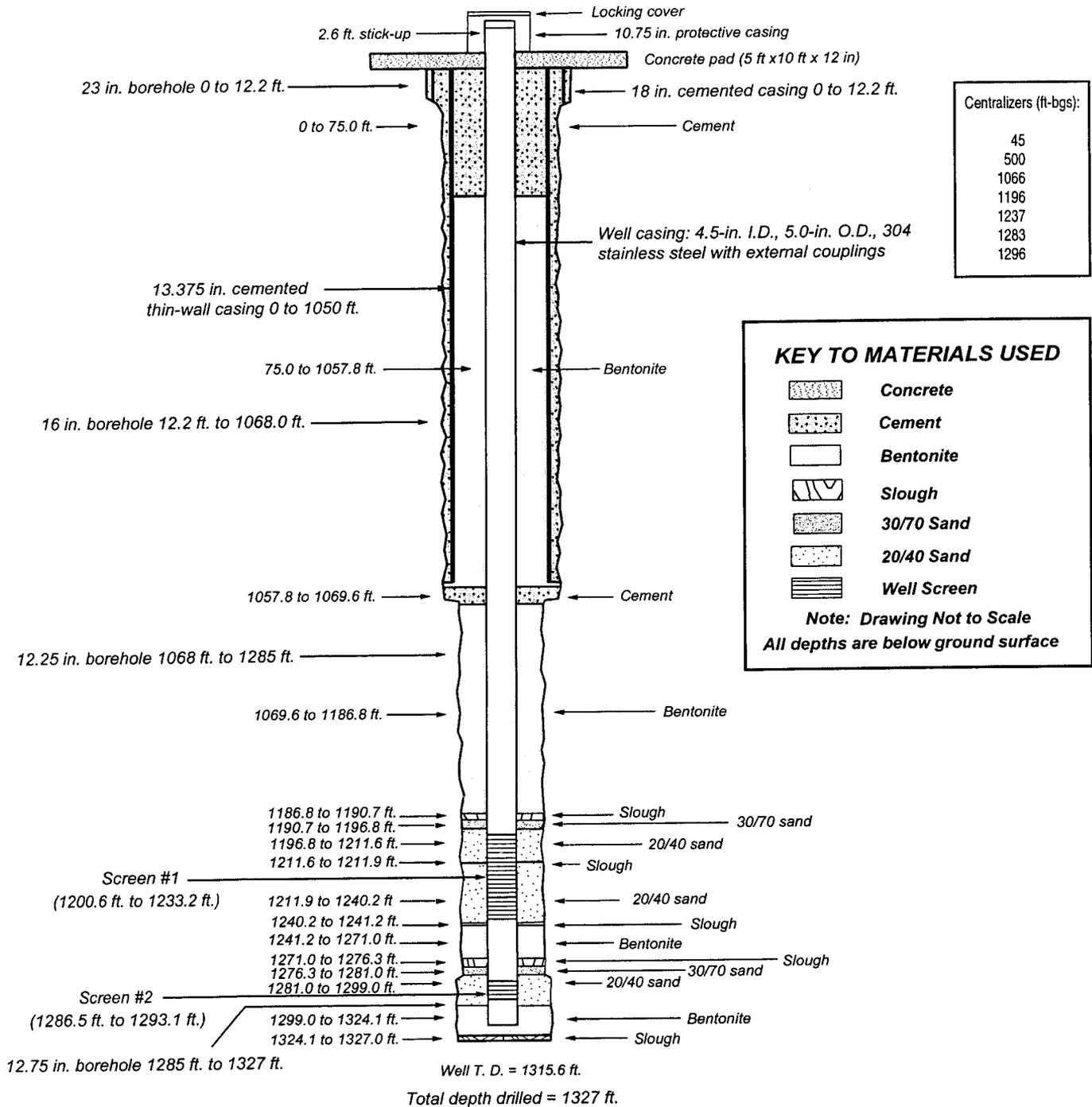
Groundwater occurrence was determined for R-14 by recognition of first water produced while drilling, by borehole geophysics, and by borehole video. Static water levels were determined after the R-14 borehole was rested.

Groundwater samples collected from packed off screen intervals after well development.

Geologic contacts for R-14 were determined by examination of cuttings and interpretation of borehole video and geophysical logs. Contacts and stratigraphy may be refined by petrographic, geochemical, or mineralogic analysis of geologic samples.



As-built Well Completion Diagram of Well R-14, Rev. 0 (1-10-03)



- Note:
1. Each screen interval lists the footage of the pipe perforations, not the top and bottom of screen joints.
 2. The intervals of slough consist of sands and gravel of the Puye Formation.
 3. Westbay multiport sampling system (MP-55) casing not shown.
 4. Pipe-based screen: 4.5-in. I.D., 5.563-in. O.D., 304 stainless steel with s.s. wire wrap; 0.010-in slot.
 5. Well sump interval: 1293.1 to 1315.6 ft.

Construction, Stratigraphic, and Hydrogeologic Information for Hydrogeologic Workplan Characterization Well R-16 Rev. 0 (1-14-03).

Location: West of the waste treatment ponds, north of Overlook Road in White Rock, N.M.

Survey coordinates (brass marker in NW corner of R-16 cement pad):
 x: 1659284 E y: 1756711 N (NAD 83)
 z: 6256.9 ft asl (NGVD 29)

Drilling: Conventional mud drilling, casing advance.
 R-16 Start date: 08/16/02.
 R-16 End date: 08/29/02.

Borehole R-16 drilled to 1287 ft. bgs. (T.D.).

Data collection:

Hydrologic properties: Field hydraulic test:
 Constant Rate Injection Test on screen #2, screen #3, and screen #4

Cores/cuttings submitted for geochemical and contaminant characterization: (0)

Groundwater samples submitted for geochem and contaminant characterization: (3)

Geologic properties: (16)

Mineralogy, petrography, and chemistry

Borehole logs from R-16:

Lithologic: 0-867 ft. and 1047 ft.-1287 ft.
 Natural gamma (LANL tool): 0-729 ft. (cased), 729-1287 ft. (open hole).

Schlumberger Logs: 0-729 ft. (cased), 729-1287 ft. (open hole): Array Induction, Combinable Magnetic Resonance, Micro Imager, Sonic, Caliper, Litho density, Spectral Gamma, Elemental Capture, Thermal/Epithermal Neutron, Natural Gamma.

Contaminants Detected in R-16 Water Samples: none.

Well construction:

Drilling Completed: 08/29/02
 Contract Geophysics: 08/30/02 - 08/31/02
 Well Constructed: 08/31/02 - 09/07/02
 Well Developed: 09/14/02 - 12/04/02
 Westbay Installed: 12/6/02 - 12/10/02

Casing: 4.5-in I.D. stainless steel with external couplings.

Number of Screens: 4

4.5-in I.D. pipe based, s.s. wire-wrapped with 0.010-in slots.

Screen (perforated pipe interval):

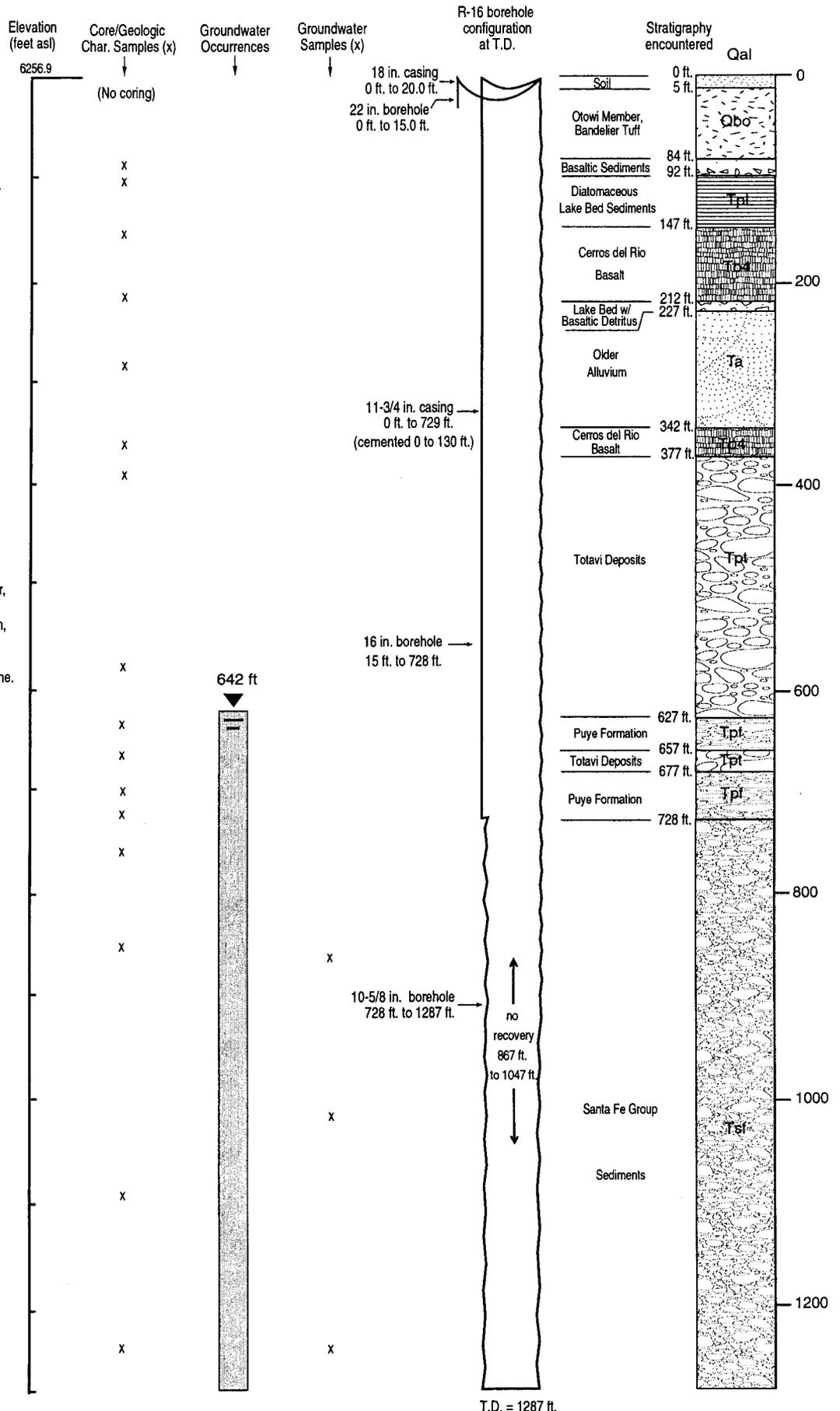
Screen #1 - 641.0 - 648.6 ft. bgs. (isolated behind stuck casing)
 Screen #2 - 863.4 - 870.9 ft. bgs.
 Screen #3 - 1014.8 - 1022.4 ft. bgs.
 Screen #4 - 1237.0 - 1244.6 ft. bgs.

Well development consisted of wire brushing, bailing, chemical treatments, surging, simultaneous jetting and pumping, and pumping.

Groundwater occurrence was determined for R-16 by recognition of first water produced while drilling, by borehole geophysics, and by borehole video. Static water levels were determined after the R-16 borehole was rested.

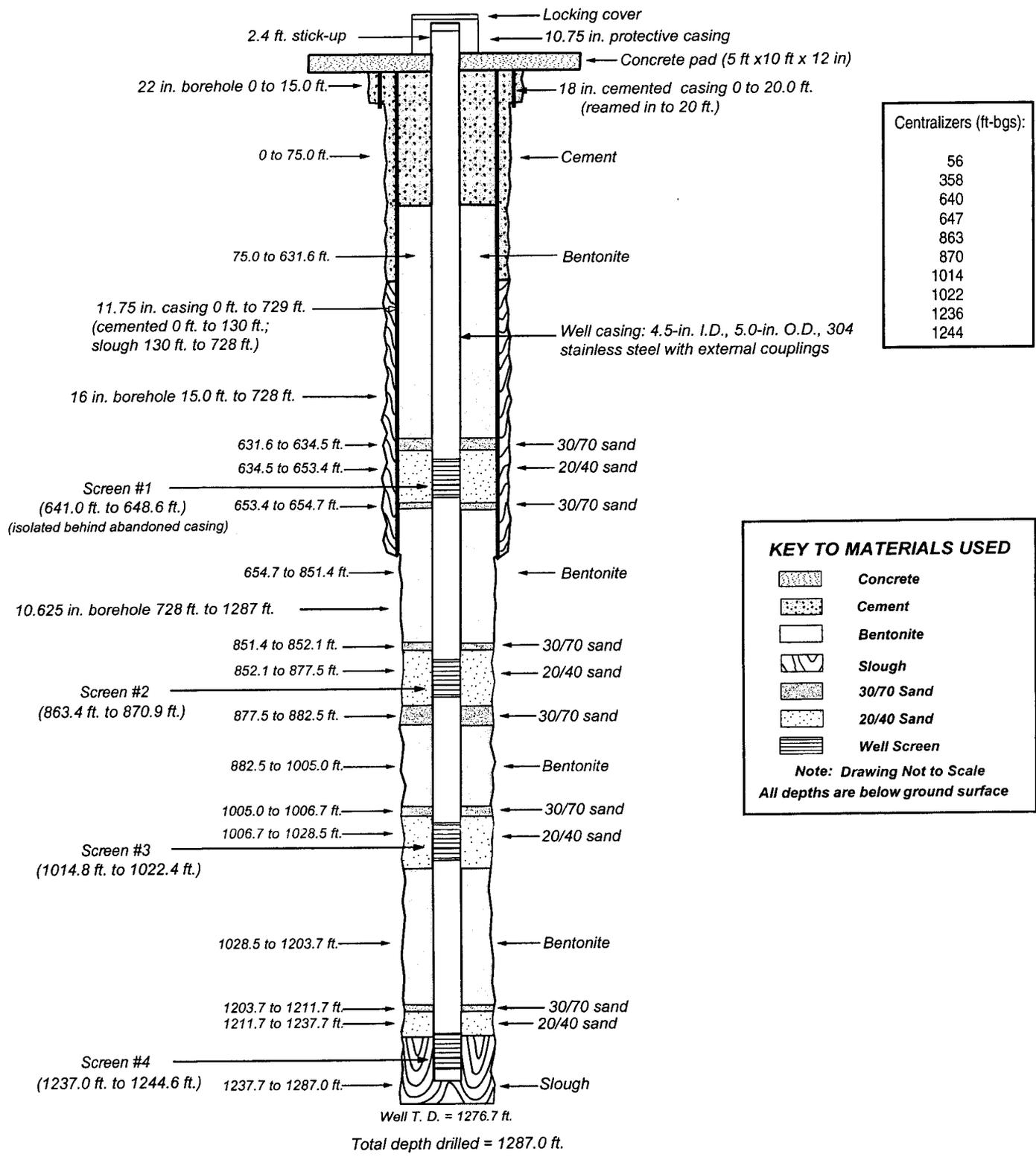
Groundwater samples collected from packed off screen intervals after well development.

Geologic contacts for R-16 were determined by examination of cuttings and interpretation of geophysical logs. Contacts may be refined by petrographic, geochemical, or mineralogic analysis of geologic samples.



T.D. = 1287 ft.

As-built Well Completion Diagram of Well R-16, Rev. 0 (1-14-03)



- Note:
1. Each screen interval lists the footage of the pipe perforations, not the top and bottom of screen joints.
 2. All screens are pipe-based 304 stainless steel, 4.5 in. I.D., 5.563 in. O.D., with s.s. 0.010 in. wire wrap slots.
 3. The interval of slough consists of sands and gravel of the Santa Fe Group Sediments.
 4. Westbay multiport sampling system (MP-55) casing not shown.
 5. 11.75 in. casing abandoned in borehole rendered screen #1 non-functional.
 6. Well sump interval: 1244.6 to 1276.4 ft.

Construction, Stratigraphic, and Hydrologic Information for Hydrogeologic Workplan Characterization Well R-20 Rev. 0 (1-16-03).

Location: East of TA-18 on the south side of Pajarito Rd., east of the stream channel.

Survey coordinates (brass marker in NW corner of R-20 cement pad): x: 1637835 E y: 1759695 N (NAD 83) z: 6694.3 ft asl (NGVD 29)

Drilling: Conventional mud drilling, casing advance; air rotary core w/ wireline retrieval.
R-20 Start date: 08/15/02, end date: 09/06/02.
Coring start date: 10/16/02, end date: 10/19/02

Borehole R-20 drilled to 1365 ft. bgs. (T.D.).

Data collection:

Hydrologic properties: Field hydraulic test:
Constant Rate Injection Test on screen #1, screen #2, and screen #3
Cores/cuttings submitted for geochemical and contaminant characterization: (0)
Groundwater samples submitted for geochemical and contaminant characterization: (3)
Geologic properties: (12)
Mineralogy, petrography, and chemistry
Borehole logs from R-20:
Lithologic: 0-490 ft. and 785 ft.-1365 ft.
Borehole Video (LANL tool): 82-785 ft. (open hole).
Natural gamma + Induction (LANL tool): 0-80.2 ft. (cased), 80.2 ft.-785 ft. (cased).
Schlumberger Logs: 0-80.2 ft. (cased), 80.2-785 ft. (open hole); Array Induction, Litho Density, Natural Gamma, Thermal/Epithermal Neutron, Caliper, Combinable Magnetic Resonance, and Elemental Capture Sonde.
Natural Gamma (LANL tool): 0-780 ft. (cased), 780-1365 ft. (open hole).
Schlumberger Logs: 0-780 ft. (cased), 780-1365 ft. (open hole); Thermal/Epithermal Neutron, Litho Density, Micro Imager, Array Induction, and Natural Gamma.

Contaminants Detected in R-20 Water Samples: none

Well construction:

Drilling Completed: 09/06/02
Contract Geophysics: 08/26/02; 09/06/02
Well Constructed: 09/07/02-09/15/02
Well Developed: 09/15/02-12/22/02
Westbay Installed: 01/08/03-01/18/03

Casing: 4.5-in I.D. stainless steel with external couplings.

Number of Screens: 3
4.5-in I.D. pipe based, s.s. wire-wrapped with 0.010-in slots.

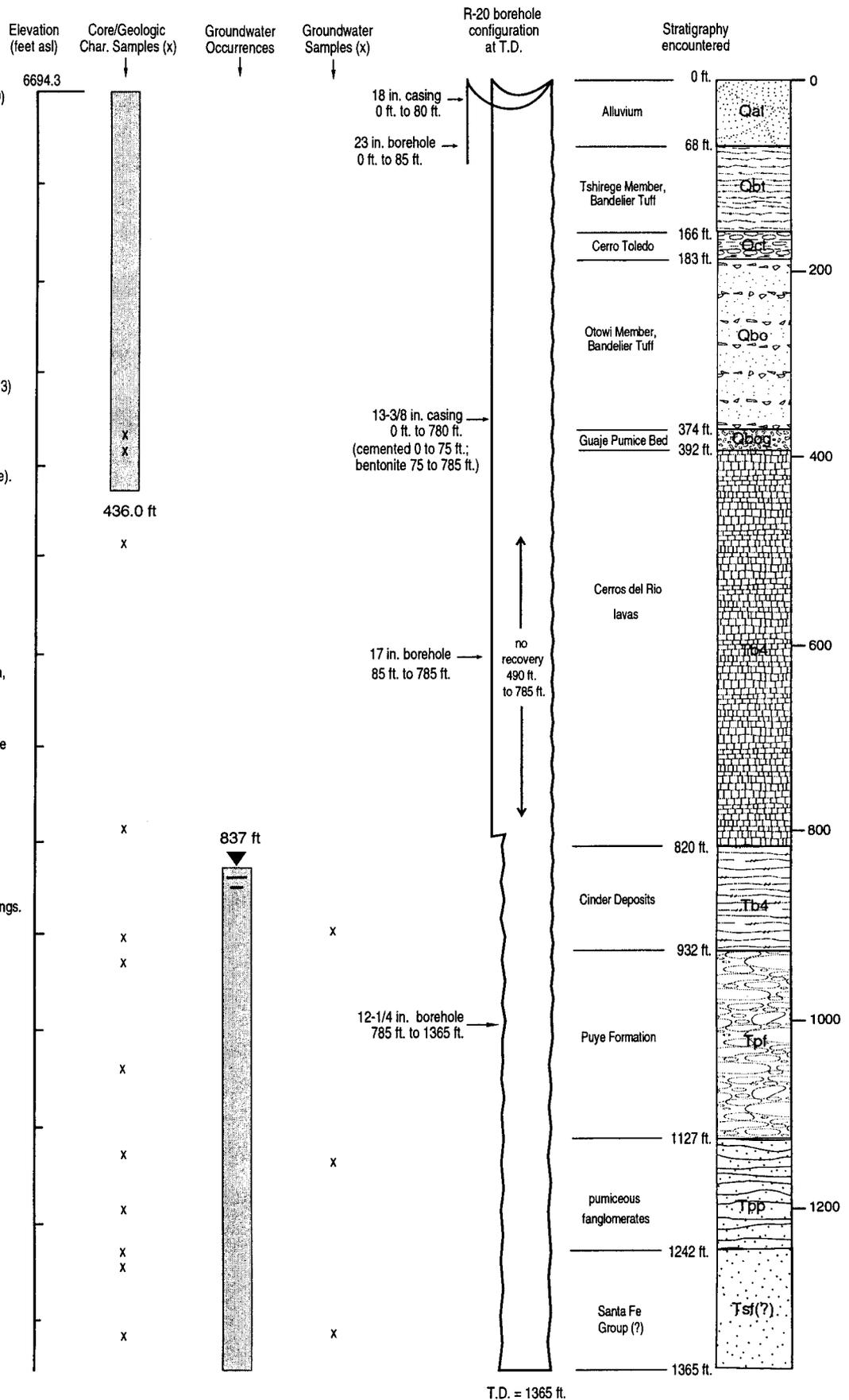
Screen (perforated pipe interval):
Screen #1 - 904.6 - 912.2 ft. bgs.
Screen #2 - 1147.1 - 1154.7 ft. bgs.
Screen #3 - 1328.8 - 1336.5 ft. bgs.

Well development consisted of wire brushing, bailing, chemical treatment, surging, and pumping.

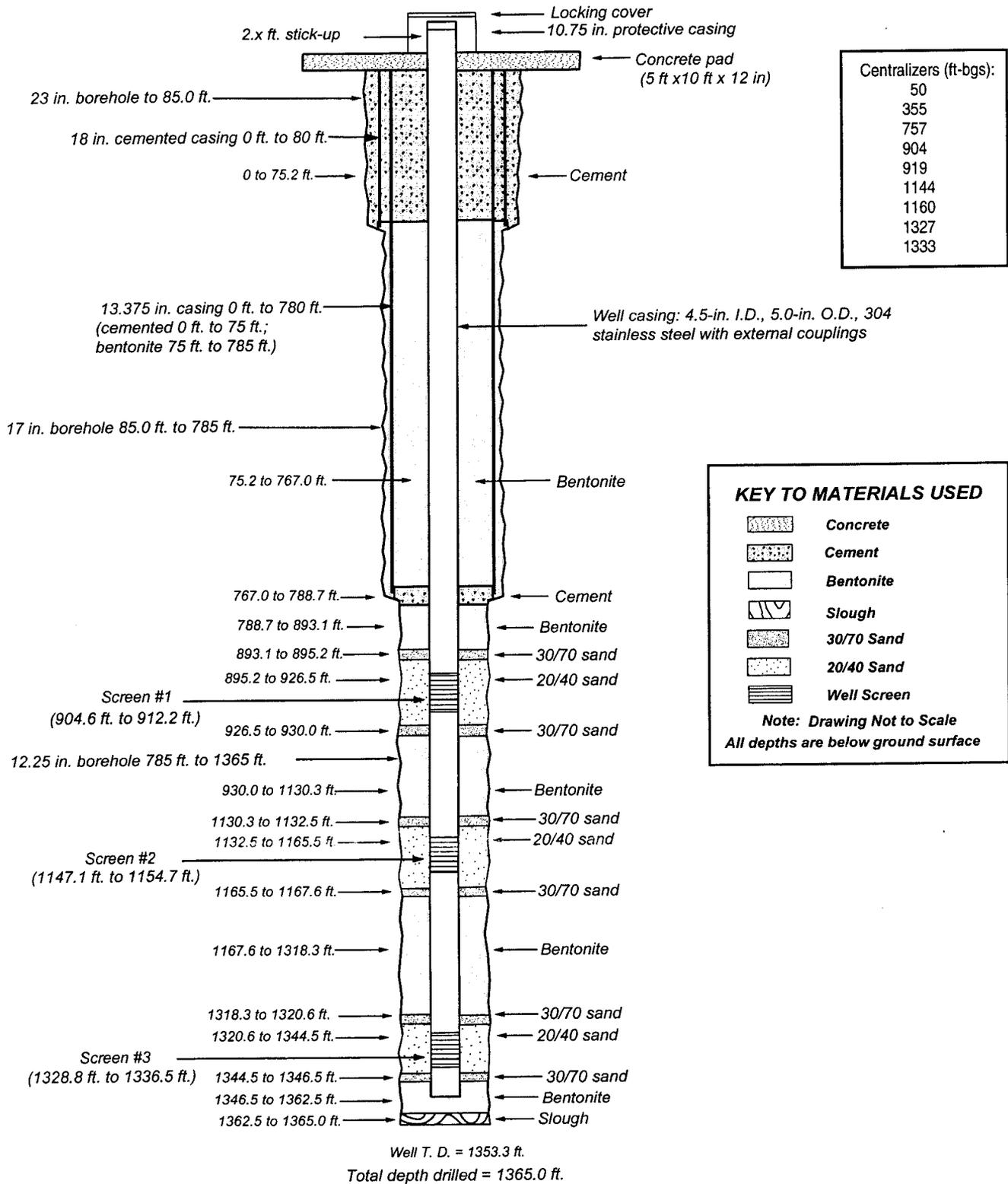
Groundwater occurrence was determined for R-20 by recognition of first water produced while drilling, by borehole geophysics, and by borehole video. Static water levels were determined after the R-20 borehole was rested.

Groundwater samples collected from packed off screen intervals after well development.

Geologic contacts for R-20 were determined by examination of cuttings and interpretation of geophysical logs. Contacts may be refined by petrographic, geochemical, or mineralogic analysis of geologic samples.



As-built Well Completion Diagram of Well R-20, Rev. 0 (1-16-03)



- Note:
1. Each screen interval lists the footage of the pipe perforations, not the top and bottom of screen joints.
 2. The interval of slough consists of sands and gravel provisionally attributed to the Santa Fe Group.
 3. Westbay multiport sampling system (MP-55) casing not shown.
 4. Pipe-based screen: 4.5-in. I.D., 5.563-in. O.D., 304 stainless steel with s.s. wire wrap; 0.010-in. slot.
 5. Well sump interval: 1336.5 to 1353.3 ft.

Construction, Stratigraphic, and Hydrologic Information for Hydrogeologic Workplan Characterization Well R-23 Rev. 0 (1-16-03).

Location: In Pajarito Canyon, just west of the N.M. 4 and Pajarito Road intersection; on the south side of Pajarito Road.

Survey coordinates (brass marker in NW corner of R-23 cement pad):
 x: 1647914 E y: 1755165 N (NAD 83)
 z: 6527.8 ft asl (NGVD 29)

Drilling: air rotary drilling, casing advance.
 R-23 Start date: 8/17/02
 R-23 End date: 9/27/02

Borehole R-23 drilled to 935.0 ft. bgs. (T.D.).

Data collection:
 Hydrologic properties: Field hydraulic test:
 Pump test
 Cores/cuttings submitted for geochemical and contaminant characterization: (0)
 Groundwater samples submitted for geochem and contaminant characterization: (1)
 Geologic properties: (14)
 Mineralogy, petrography, and chemistry
 Borehole logs from R-23:
 Lithologic: 0-935.0 ft.
 Video (LANL tool): 0-599 ft. (cased) and 599-826.6 ft. (open hole).
 Natural gamma (LANL tool): 0-599 ft. (cased) and 599-840 ft. (open hole).
 Schlumberger Logs: 0-599 ft. (cased) and 599-828 ft. (open hole): Litho density, Thermal/Epithermal Neutron, Array Induction, Natural Gamma, Elemental Capture, and Combinable Magnetic Resonance.

Contaminants Detected in R-23 Water Sample: none

Well construction:
 Drilling Completed: 09/27/02.
 Contract Geophysics: 09/23-24/02.
 Well Constructed : 09/27/02-10/02/02.
 Well Developed : 10/08/02-pending
 Dedicated Pump: 01/06/03-01/08/03

Casing: 4.5-in I.D. stainless steel with external couplings.

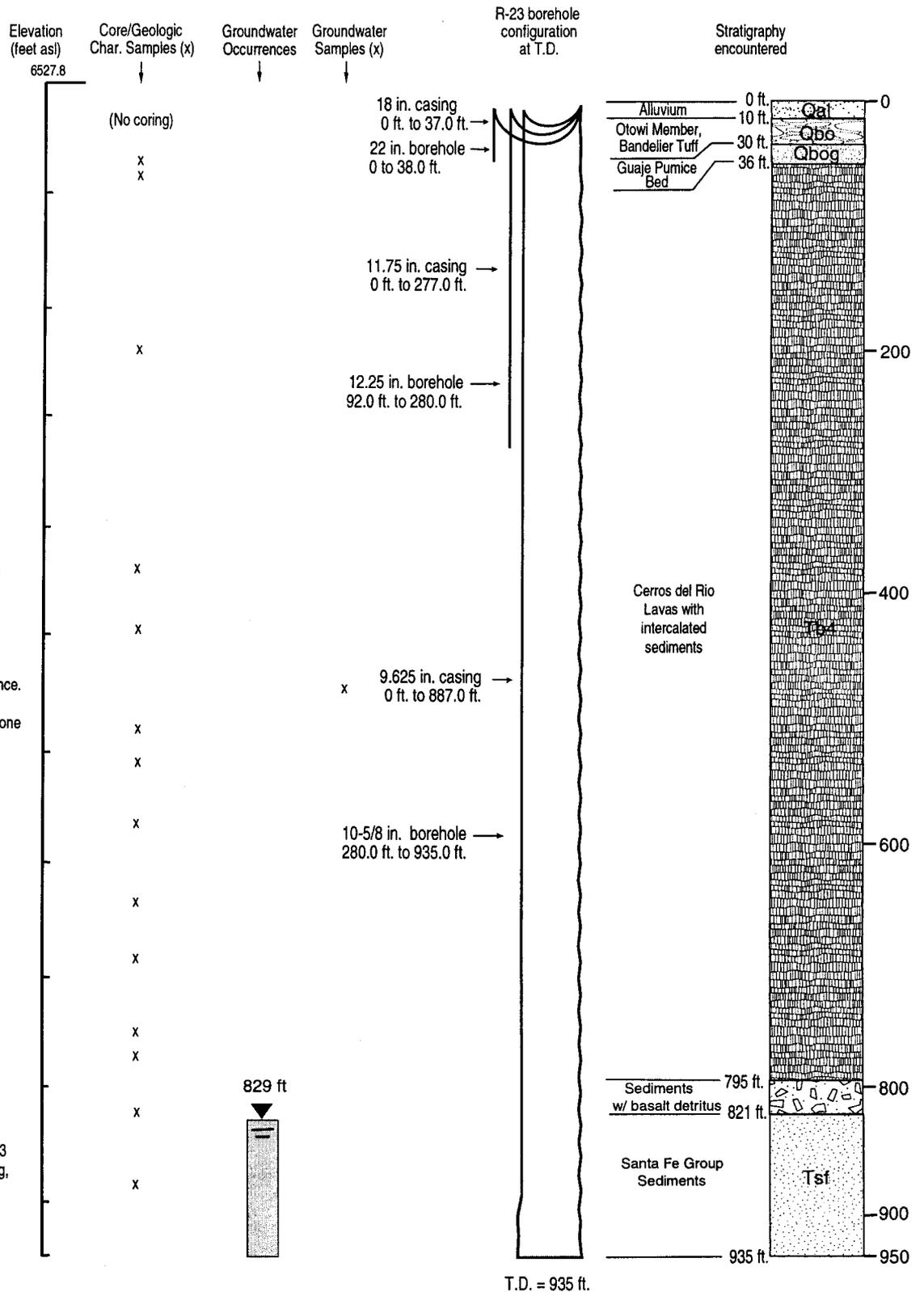
Number of Screens: 1
 4.5-in I.D. pipe based, s.s. wire-wrapped with 0.010-in slots.

Screen (perforated pipe interval):
 Screen #1 - 816.0 - 873.2 ft. bgs.

Well development consisted of wire brushing, bailing, surging, and pumping.

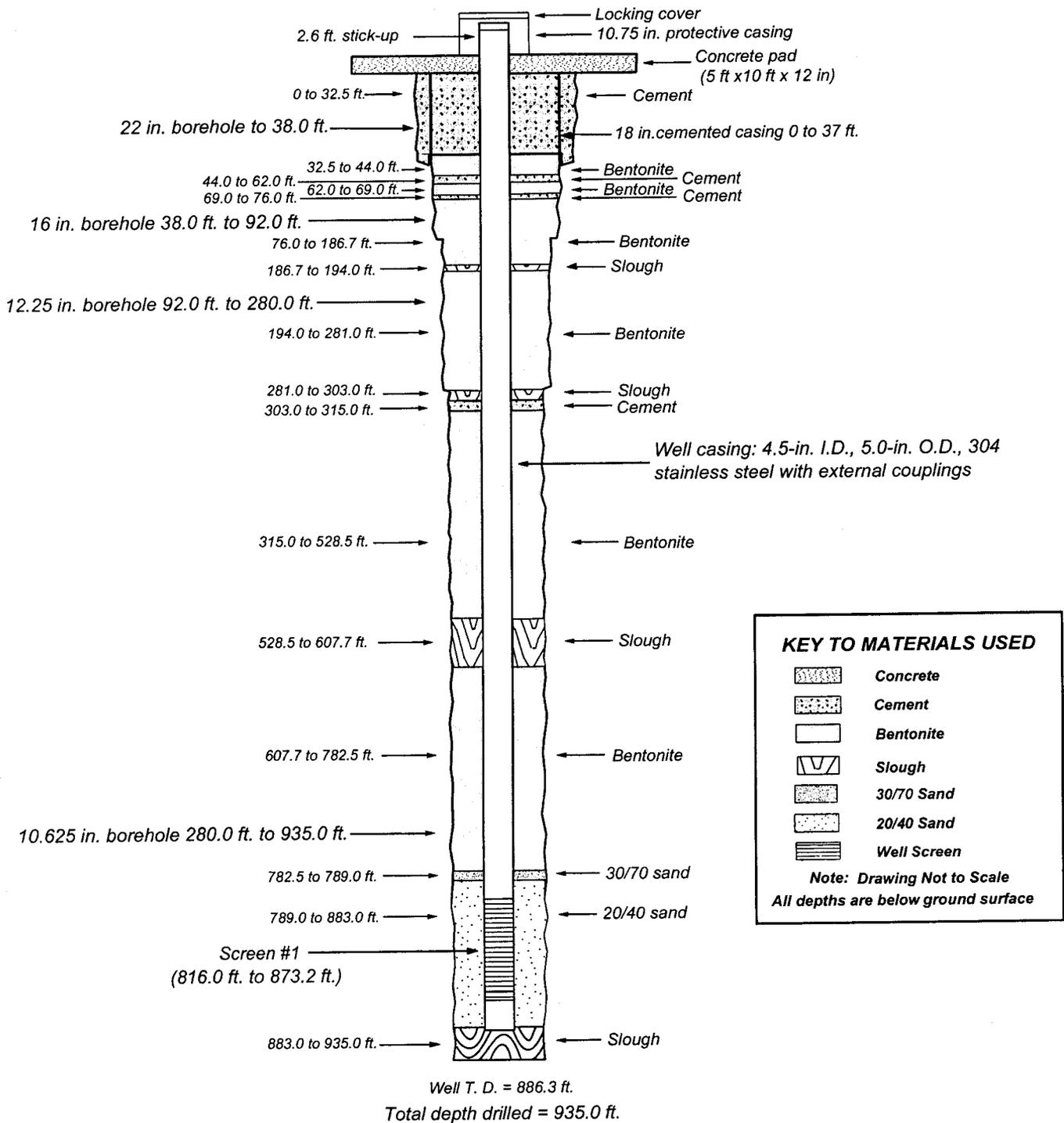
Groundwater occurrence was determined for R-23 by recognition of first water produced while drilling, by borehole geophysics, and by borehole video. Static water levels were determined after the R-23 borehole was rested.

Geologic contacts for R-23 were determined by examination of cuttings and interpretation of geophysical logs. Contacts may be refined by petrologic, geochemical, or mineralogic analysis of geologic samples.



T.D. = 935 ft.

As-built Well Completion Diagram of Well R-23, Rev. 0 (1-16-03)



- Note:
1. The screen interval lists the footage of the pipe perforations, not the top and bottom of screen joints.
 2. Pipe-based screen: 4.5-in. I.D., 5.563-in. O.D., 304 stainless steel with s.s. wire wrap; 0.010-in slot
 3. The upper intervals of slough consist of basaltic gravels; slough at the base of the borehole consists of Santa Fe Group sands.
 4. Centralizers not placed due to use of 9-5/8" casing for borehole stability.
 5. Dedicated pump location not shown.
 6. Well sump interval: 873.2 to 886.3 ft.

Construction, Stratigraphic, and Hydrologic Information for Hydrogeologic Workplan Characterization Well R-32 Rev. 0 (1-13-03).

Location: In Pajarito Canyon, south of TA-54, along the north side of Pajarito Rd.

Survey coordinates (brass marker in NW corner of R-32 cement pad):
 x: 1640798 E y: 1757730 N (NAD 83)
 z: 6637.6 ft asl (NGVD 29)

Drilling: air rotary core w/ wireline retrieval, conventional mud drilling.
 R-32 Start date: 07/13/02.
 R-32 End date: 08/7/02.

Borehole R-32 drilled to 1008 ft. bgs. (T.D.).

Data collection:

- Hydrologic properties: Field hydraulic test: Constant Rate Injection Test on screen #1 and screen #3
- Cores/cuttings submitted for geochemical and contaminant characterization: (13)
- Groundwater samples submitted for geochem and contaminant characterization: (3)
- Geologic properties: (7)
 Mineralogy, petrography, and chemistry.
- Borehole logs from R-32:
 Lithologic: 0-915.5 ft.
 Caliper (LANL): 0-1008 ft.
 Video (LANL tool): 0-720 ft.
 Natural gamma + Induction (LANL tool): 0-808 ft. and 0-1008 ft.
 Schlumberger Logs: 0-54.5 ft. (cased), 54.5-808 ft. (open hole): Epithermal Neutron, Litho density, Induction, Combinable Magnetic Resonance, Elemental Capture, Spectral Gamma.

Contaminants Detected in R-32 Water Samples: none

Well construction:

- Drilling Completed: 08/07/02
- Contract Geophysics: 07/31/02
- Well Constructed: 08/09/02 - 08/12/02
- Well Developed: 8/18/02 - 11/10/02
- Westbay Installed: 11/11/02 - 11/17/02

Casing: 4.5-in I.D. stainless steel with external couplings.

Number of Screens: 3

4.5-in I.D. pipe based, s.s. wire-wrapped with 0.010-in slots.

Screen (perforated pipe interval):

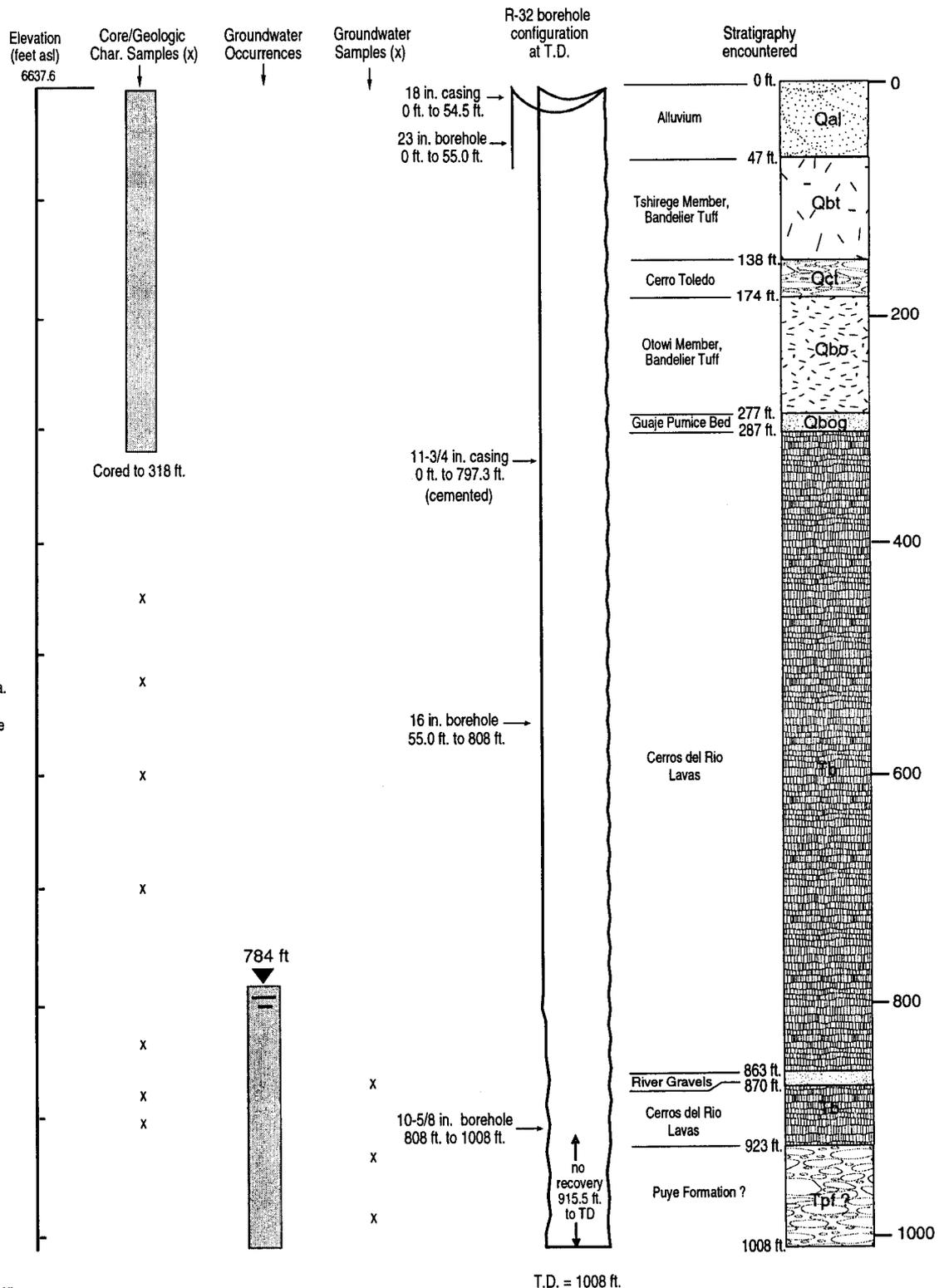
- Screen #1 - 867.5 - 875.2 ft. bgs.
- Screen #2 - 931.8 - 934.9 ft. bgs.
- Screen #3 - 972.9 - 980.6 ft. bgs.

Well development consisted of wire brushing, bailing, chemical treatments, surging, and pumping.

Groundwater occurrence was determined for R-32 by recognition of first water produced while drilling, by borehole geophysics, and by borehole video. Static water levels were determined after the R-32 borehole was rested.

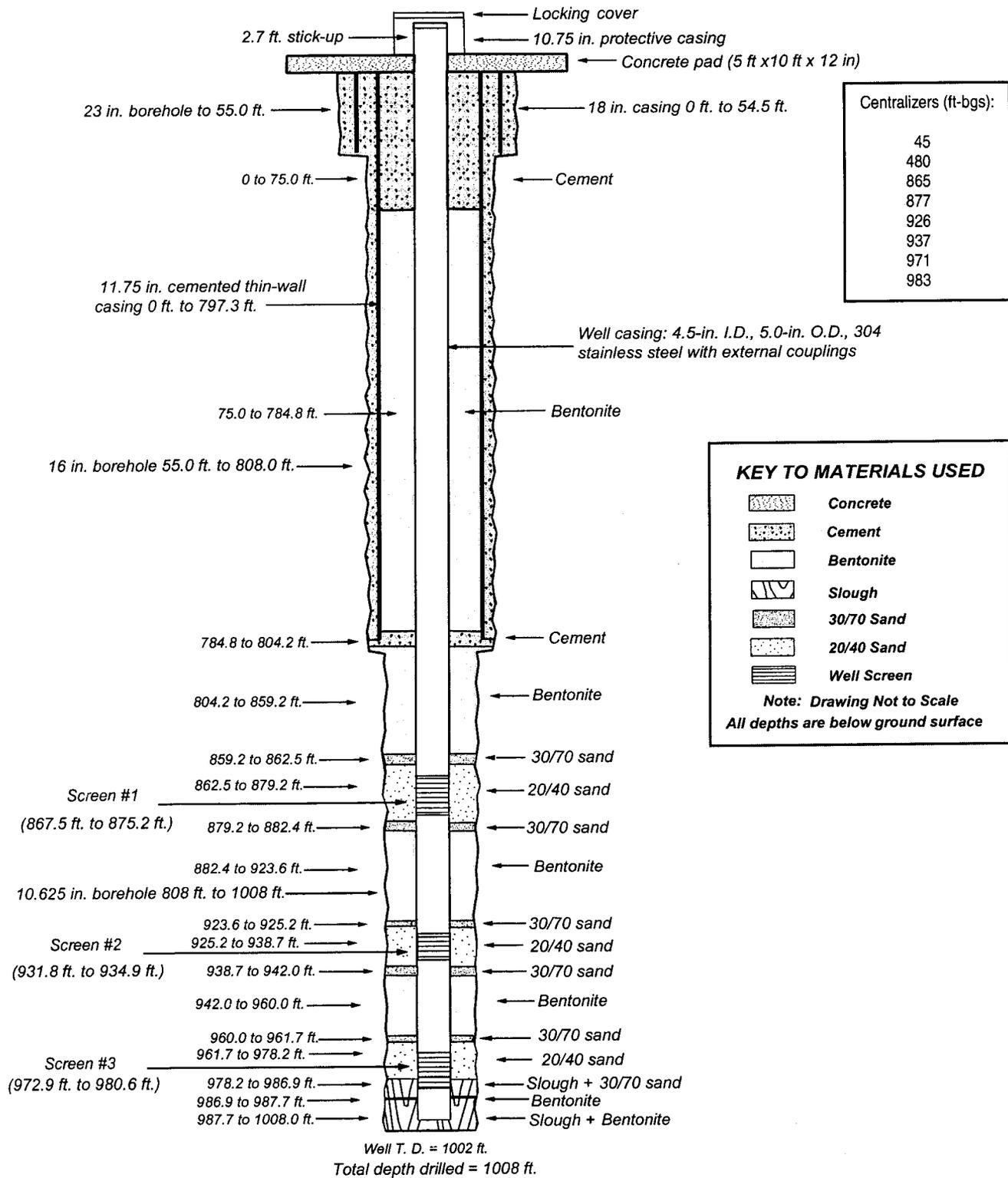
Groundwater samples collected from packed off screen intervals after well development.

Geologic contacts for R-32 were determined by examination of cuttings and interpretation of geophysical logs. Contacts may be refined by petrographic, geochemical, or mineralogic analysis of geologic samples.



T.D. = 1008 ft.

As-built Well Completion Diagram of Well R-32, Rev. 0 (1-13-03)



- Note:
1. Each screen interval lists the footage of the pipe perforations, not the top and bottom of screen joints.
 2. The interval of slough probably consist of sands and gravel of the Puye Formation.
 3. Westbay multiport sampling system (MP-55) casing not shown.
 4. Pipe-based screen: 4.5-in. I.D., 5.563-in. O.D., 304 stainless steel with s.s. wire wrap; 0.010-in slot.
 5. Well sump interval: 980.6 to 1002 ft.