Technical Memorandum

Exploratory and Shallow Well Drilling Rio Grande Watershed Study–Phase I San Acacia Surface Water/Groundwater Investigation

Prepared For:

U.S. Army Corps of Engineers – Albuquerque District
Contract No. DACW47-99-C-0012, Modification No. P00007

Prepared By:

S.S. PAPADOPULOS & ASSOCIATES, INC.
Boulder, Colorado

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1877 Broadway, Suite 703, Boulder, Colorado 80302-5245 · (303) 939-8880

S. S. PAPADOPULOS & ASSOCIATES, INC.
Environmental & Water-Resource Consultants

Technical Memorandum

Date: December 1, 2003

From: S. S. Papadopulos & Associates, Inc.

To: Ron Kneebone – U. S. Army Corps of Engineers
Page Pegram – New Mexico Interstate Stream Commission

Subject: Exploratory and Shallow Well Drilling, Rio Grande Watershed Study - Phase I, San Acacia Surface Water/Groundwater Investigation

This memorandum transmits data collected from the drilling of exploratory boreholes and the drilling and construction of monitoring wells conducted as part of the Rio Grande Watershed Study, Phase 1. Exploratory and monitoring well drilling was conducted by Geotest, Inc. Drive-point monitoring wells were installed at the San Acacia transect on the east side of the Rio Grande by Detech, Inc. Test extraction wells were drilled and constructed by WDC Exploration and Wells. All drilling and well construction activities were supervised by an S.S. Papadopulos and Associates, Inc. (SSP&A), geologist. Procedures followed during drilling, soil sampling, geologic logging, and well construction are presented in detail in the Work Plan for Exploratory and Shallow Well Drilling Activities, Rio Grande Watershed Study, Phase 1 (SSP&A, 2002). The primary purpose of this memorandum is to present data collected during this phase of the Rio Grande Water Supply Study.

DATA PACKAGE

The following data is transmitted as part of this memorandum:

- Drilling program base map and individual transect plan view maps (Figures 1 through 9)
- Tabulated well construction data (Table 1)
- Tabulated well and staff gage survey data (Tables 2 through 9)
- Geologic logs and well construction diagrams (Appendix A)
- Geophysical logs for SAC east-side boreholes (Appendix B)
- Geologic cross sections for each transect (Figures 10 through 16)
- Graphical presentation of the results of grain size distribution analyses (Figures 17 through 23)

- Laboratory data reports for grain size and hydrometer/Atterberg limits testing (Appendix C)
- Summary of unsaturated soil hydraulic properties (Table 10)
- Laboratory reports for unsaturated soil characteristics testing (Appendix D)
- Photocopies of field log books (Appendix E)

A CD containing Adobe Acrobat copies of the transect plan view maps, the geologic logs and well construction diagrams, and the geologic cross sections is included with this memorandum. The CD also includes Excel files of the well details table, survey data table, and the unsaturated soil characteristics table.

REFERENCES

S.S. Papadopulos and Associates, Inc., 2002. Work Plan for Exploratory and Shallow Well Drilling Activities, Rio Grande Watershed Study, Phase 1, SSP&A report to U.S. Army Corps of Engineers and the New Mexico Interstate Stream Commission.

van Genuchten, M. T., 1980. A closed-form equation for predicting the hydraulic conductivity of unsaturated soils, Soil Science Society of America Journal, vol. 44, p. 892.

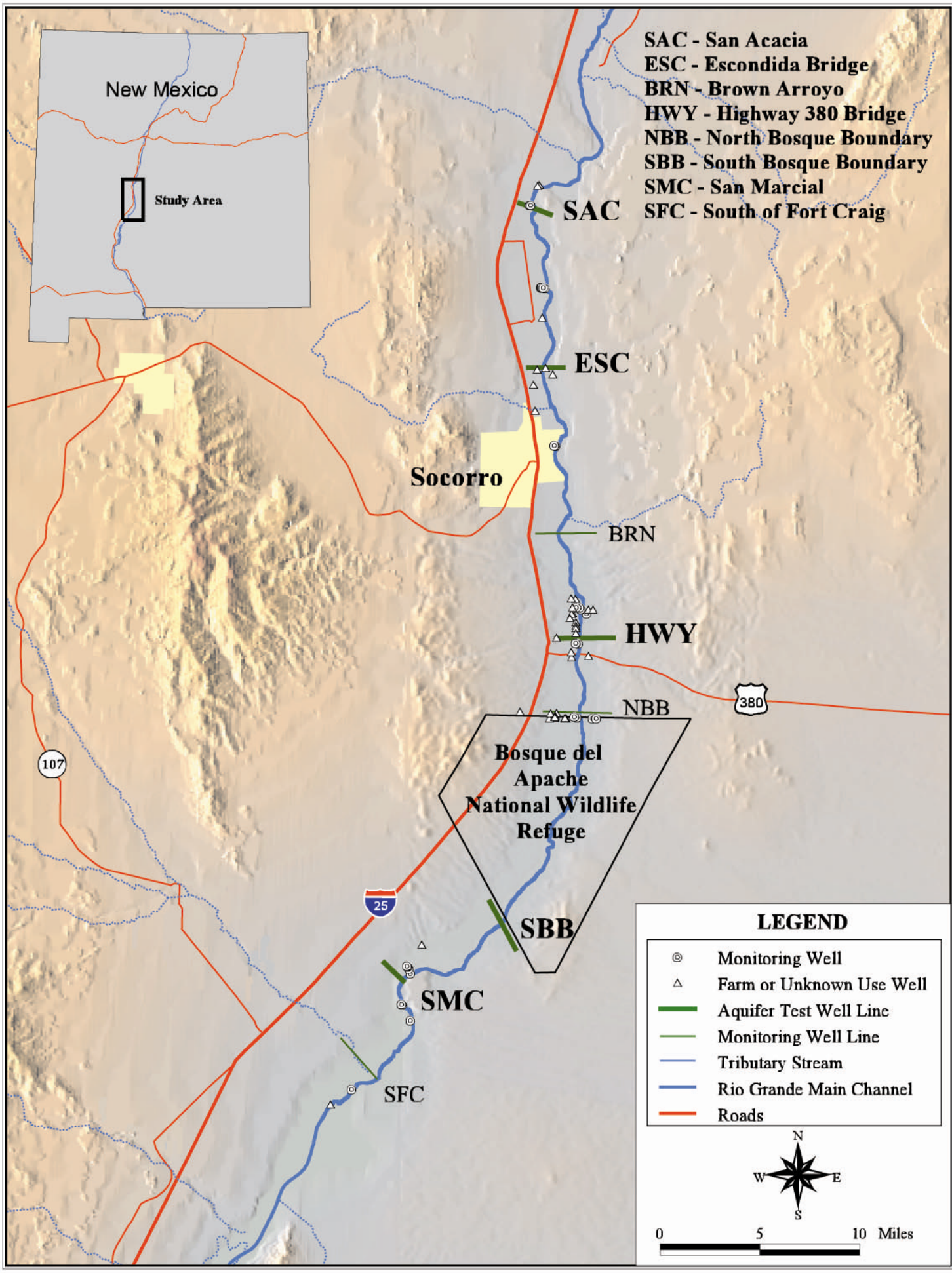

Figure 1. Well transects, Rio Grande Watershed Study, Phase 1

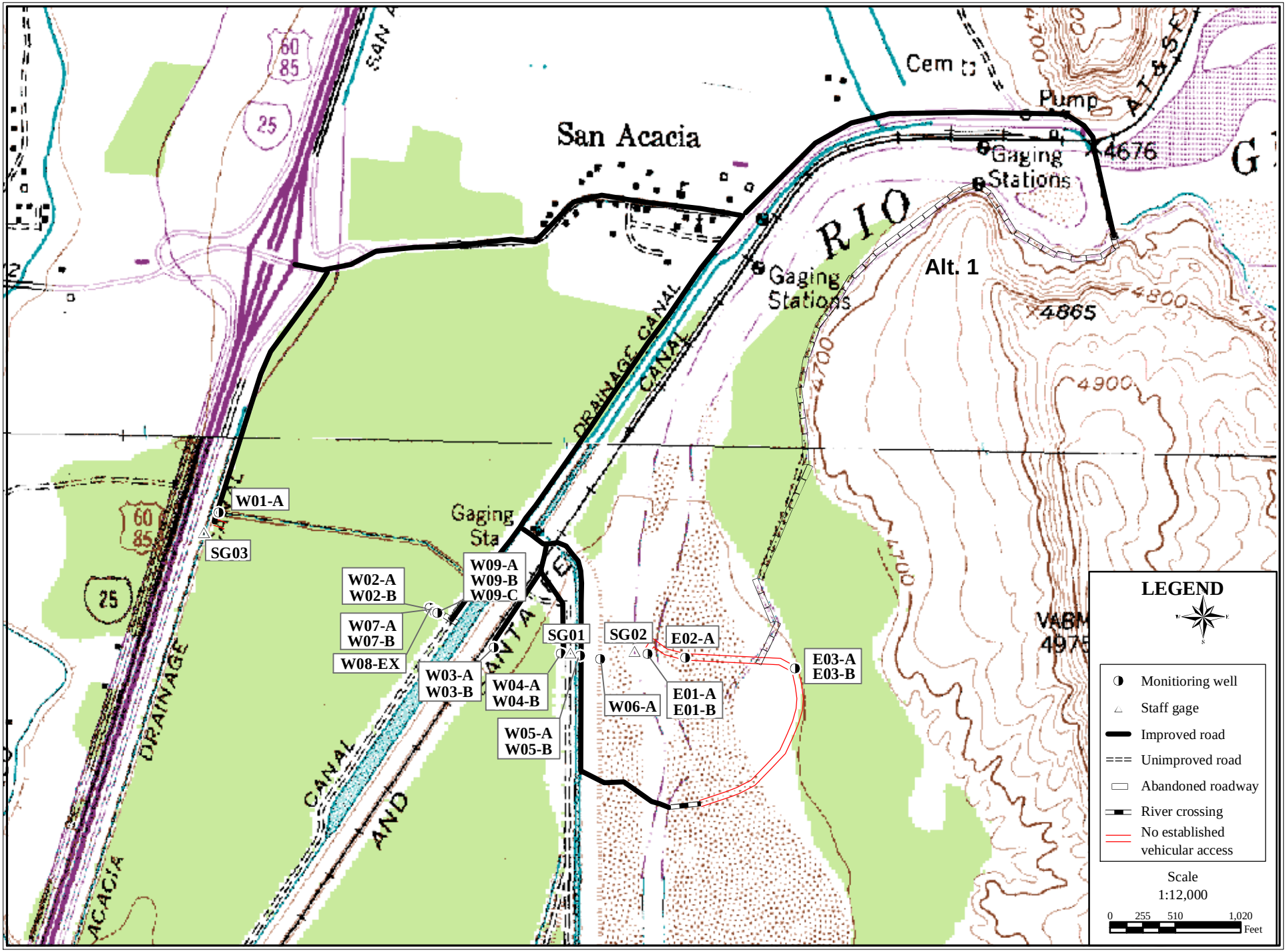

Figure 2. San Acacia (SAC) surveyed well locations and access roads

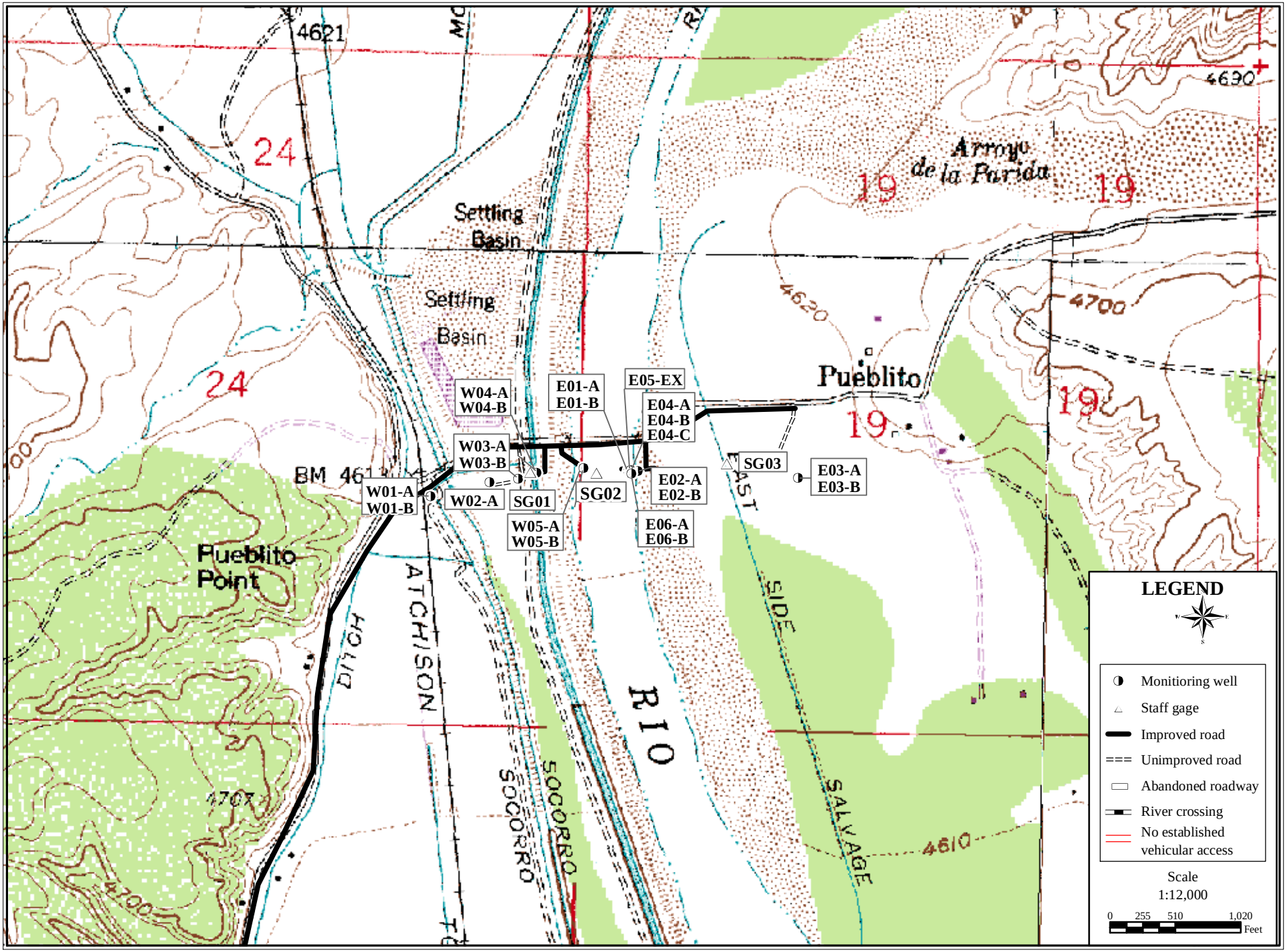

Figure 3. Escondida Bridge (ESC) surveyed well locations and access roads

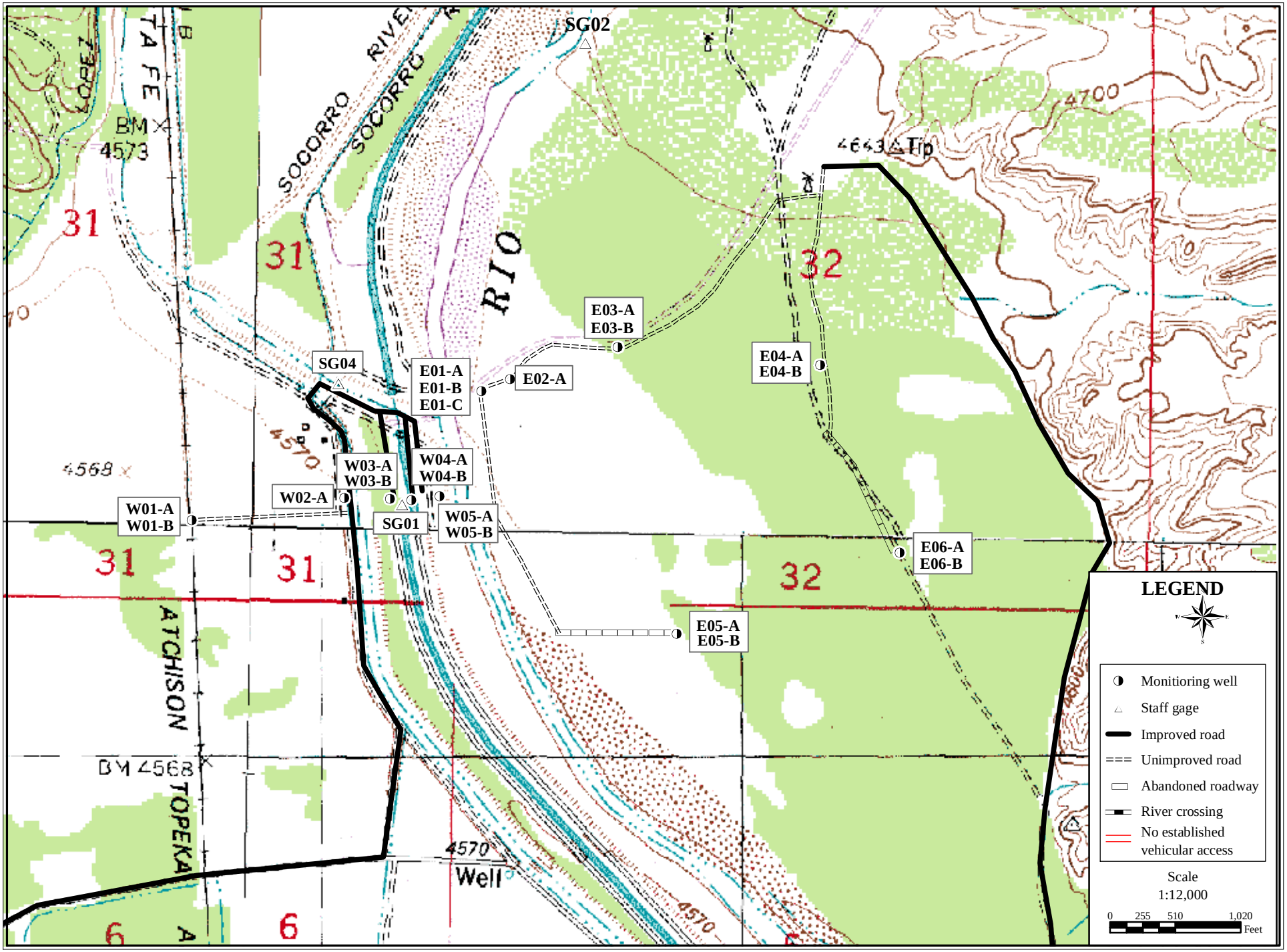

Figure 4. Brown Arroyo (BRN) surveyed well locations and access roads

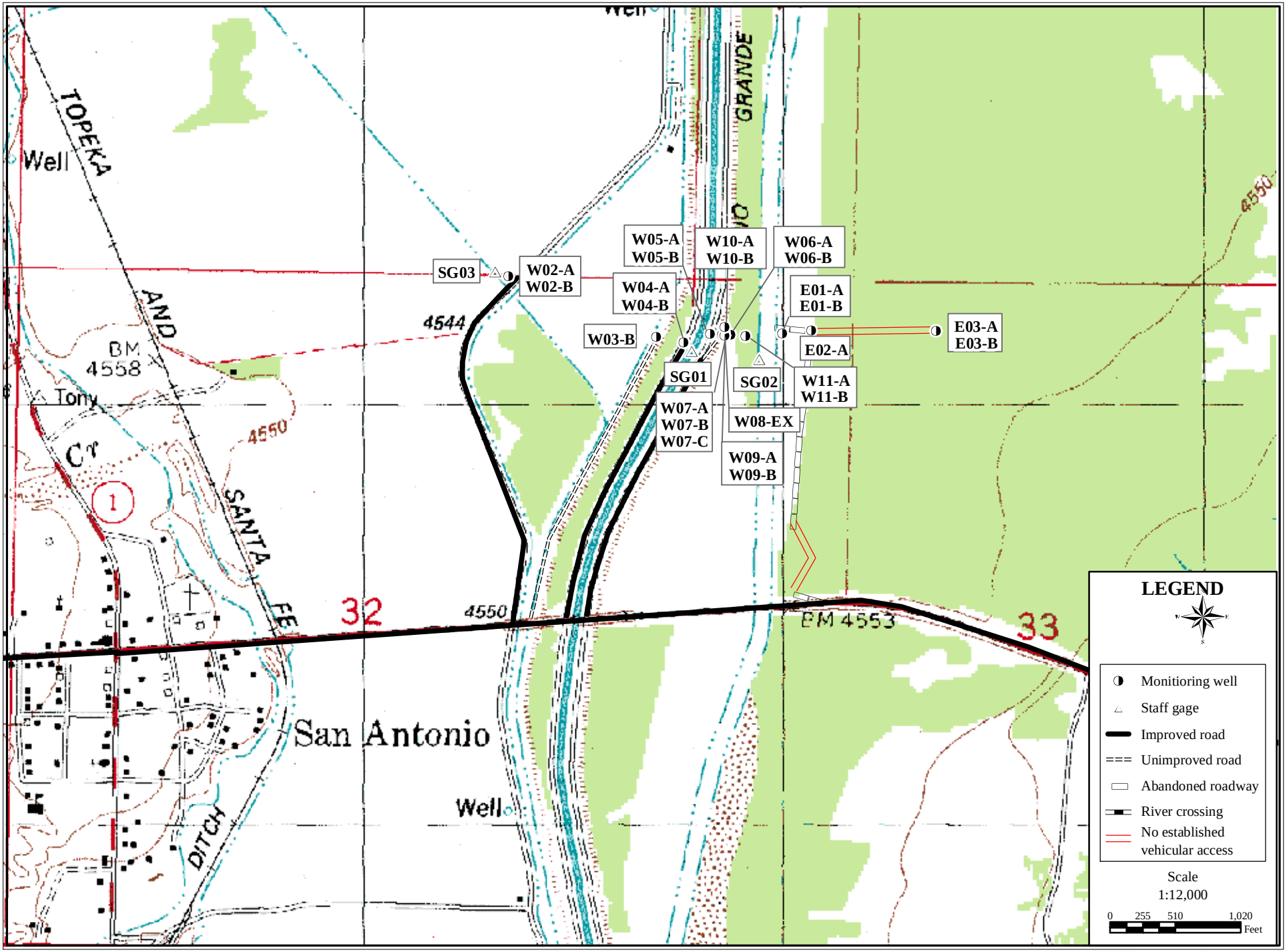

Figure 5. Highway 380 Bridge (HWY) surveyed well locations and access roads

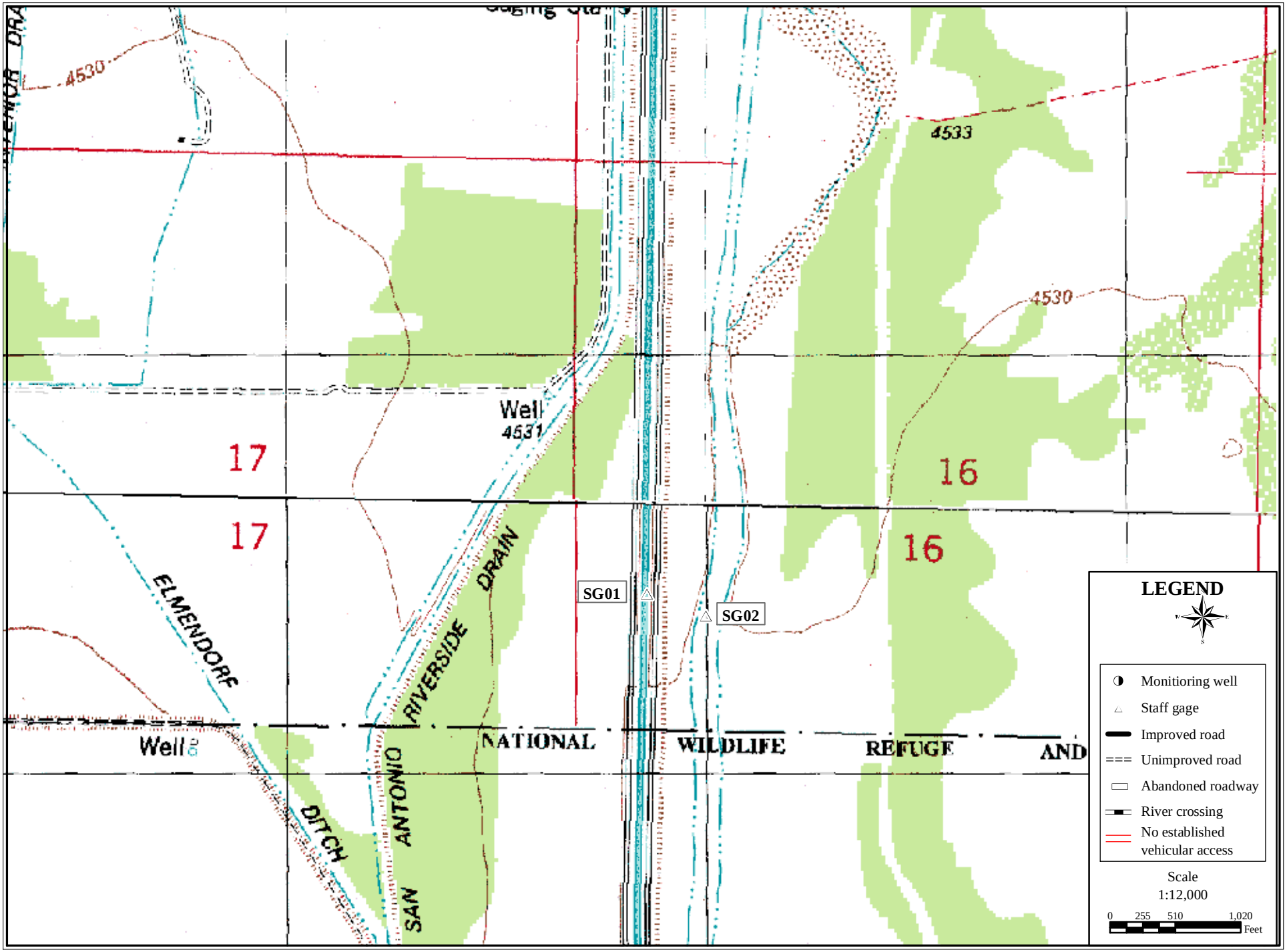

Figure 6. North Bosque Boundary (NBB) surveyed well locations and access roads

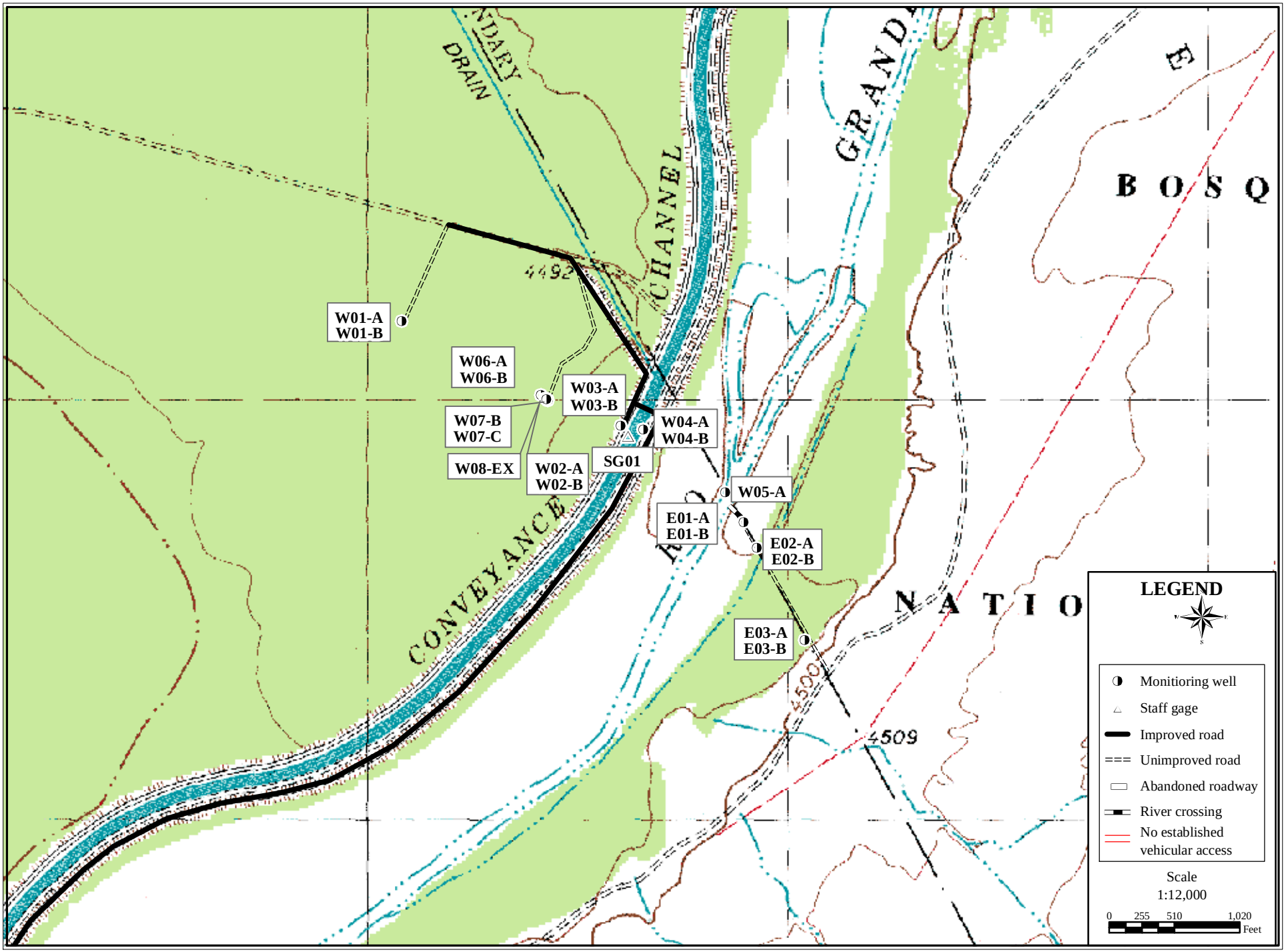

Figure 7. South Bosque Boundary (SBB) surveyed well locations and access roads

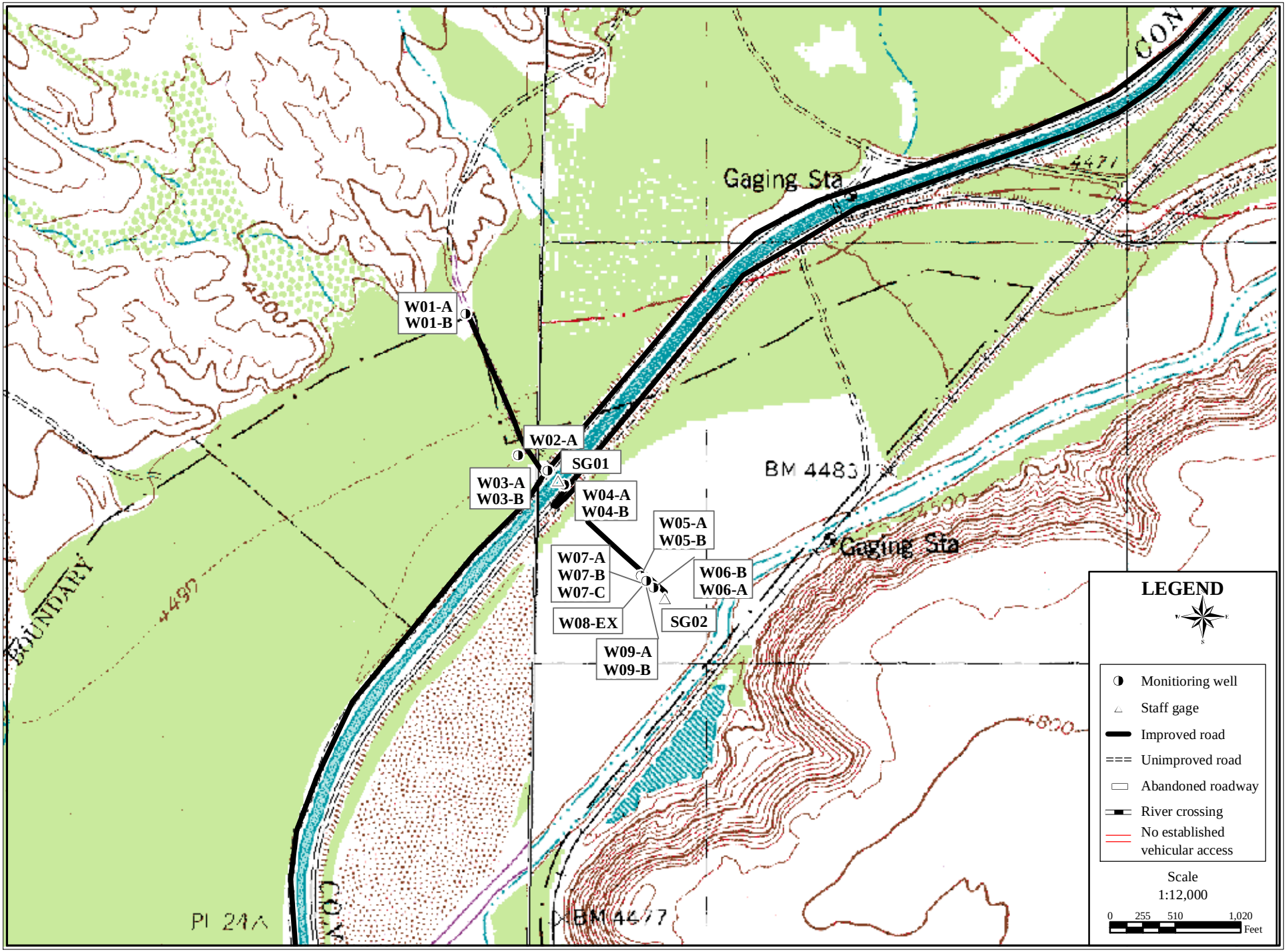

Figure 8. San Marcial (SMC) surveyed well locations and access roads

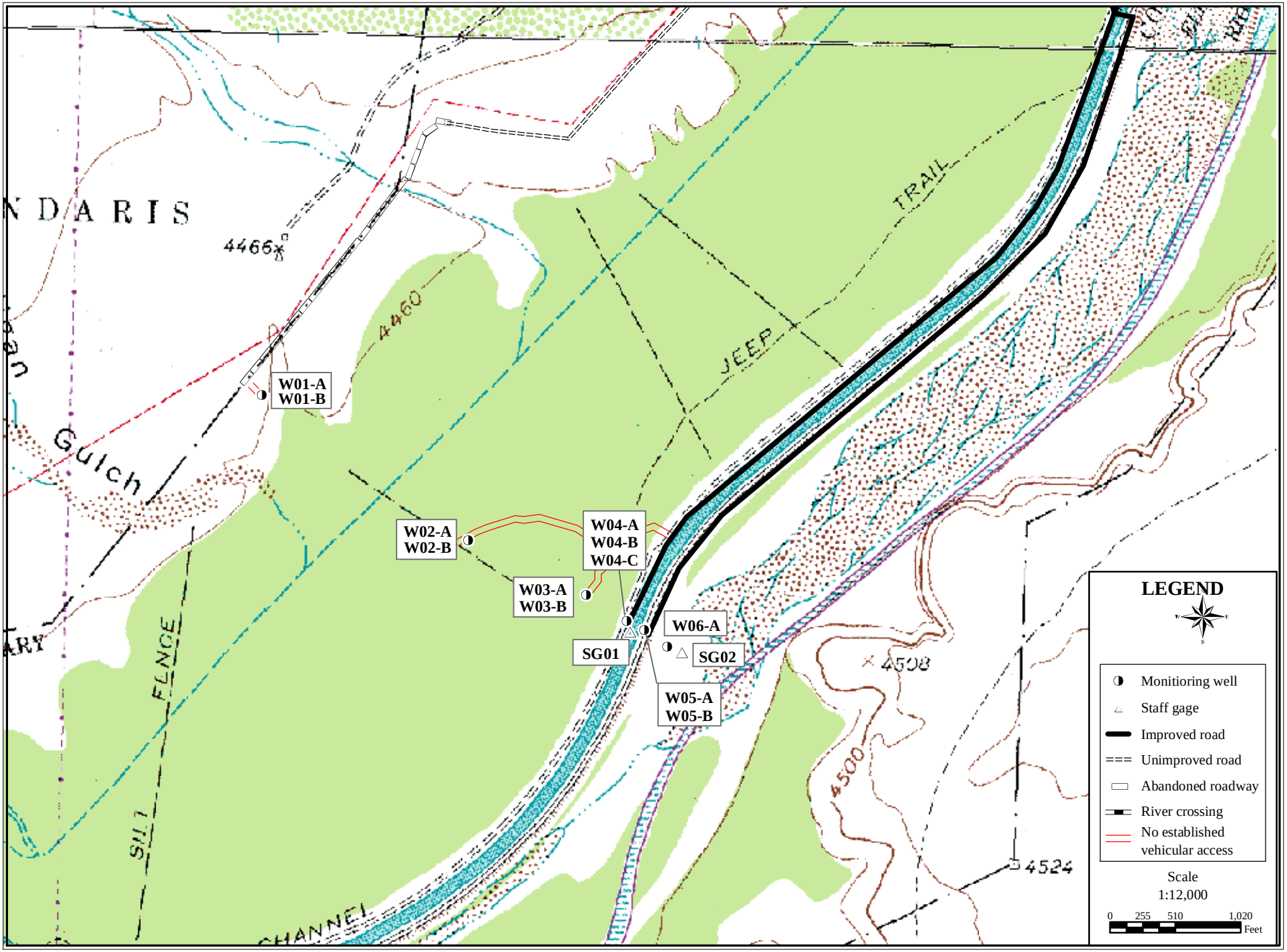

Figure 9. South of Ft. Craig (SFC) surveyed well locations and access roads

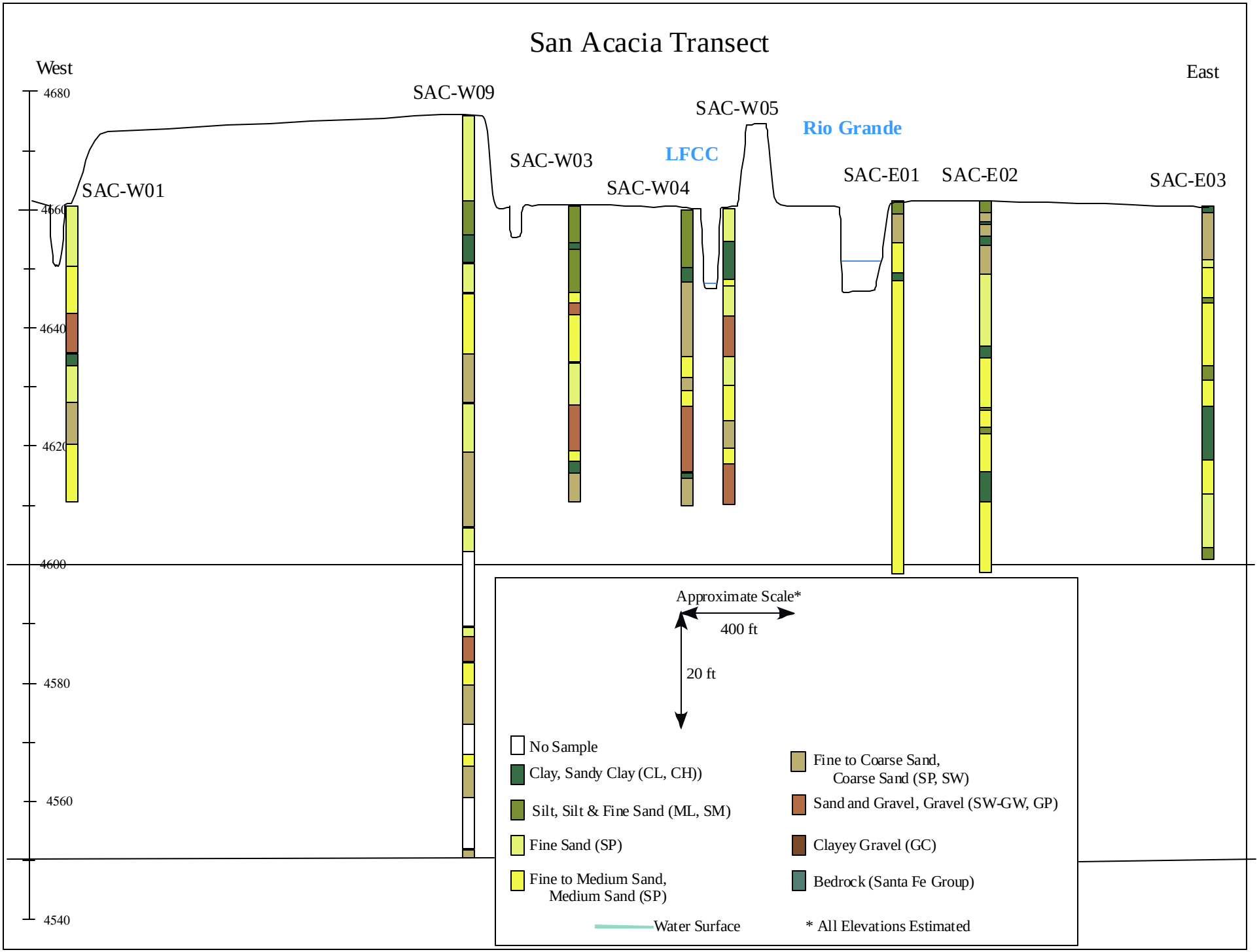

Figure 10. Geologic Cross Section, San Acacia Transect

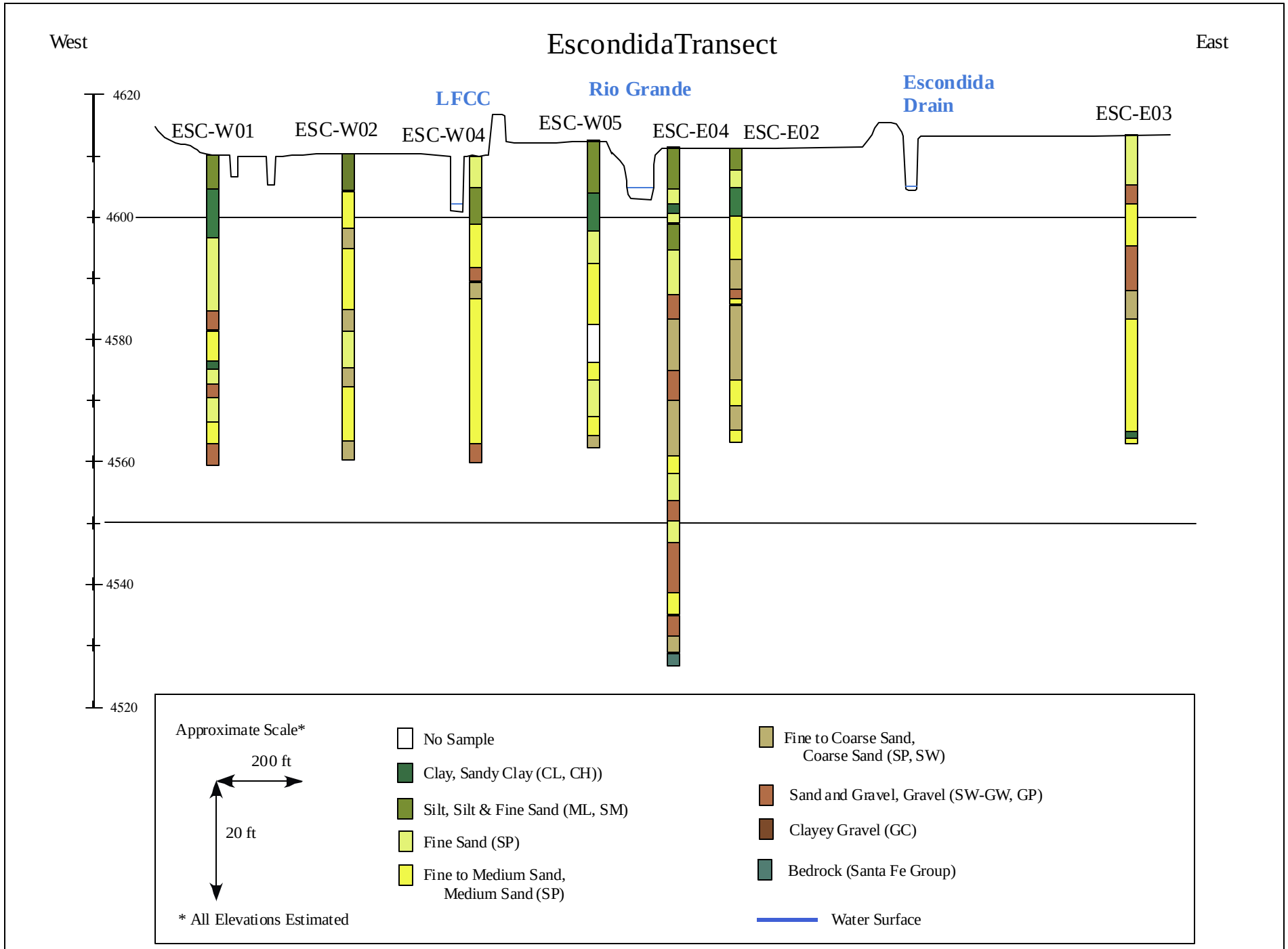

Figure 11. Geologic Cross Section, Escondida Transect

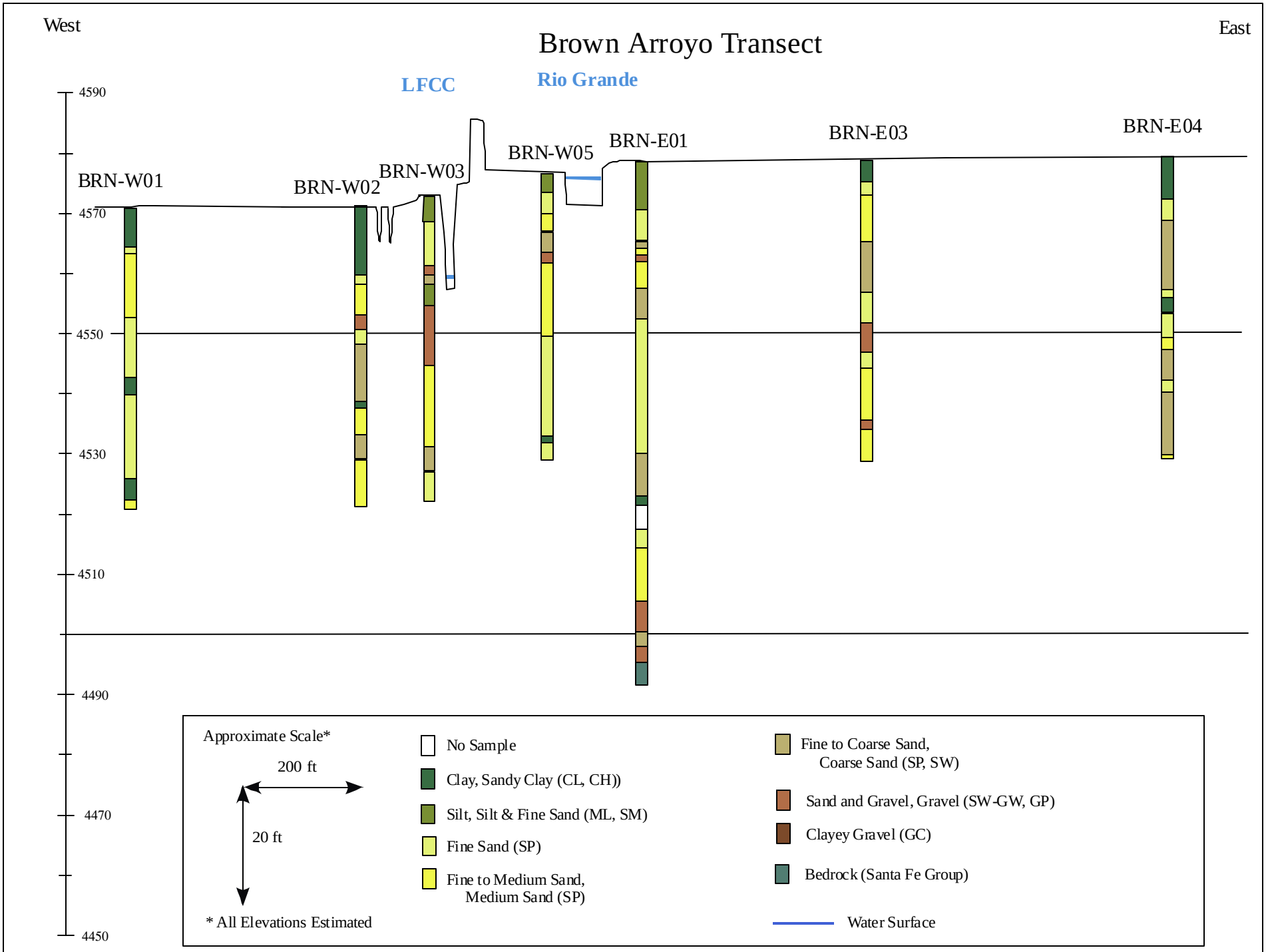

Figure 12. Geologic Cross Section, Brown Arroyo Transect

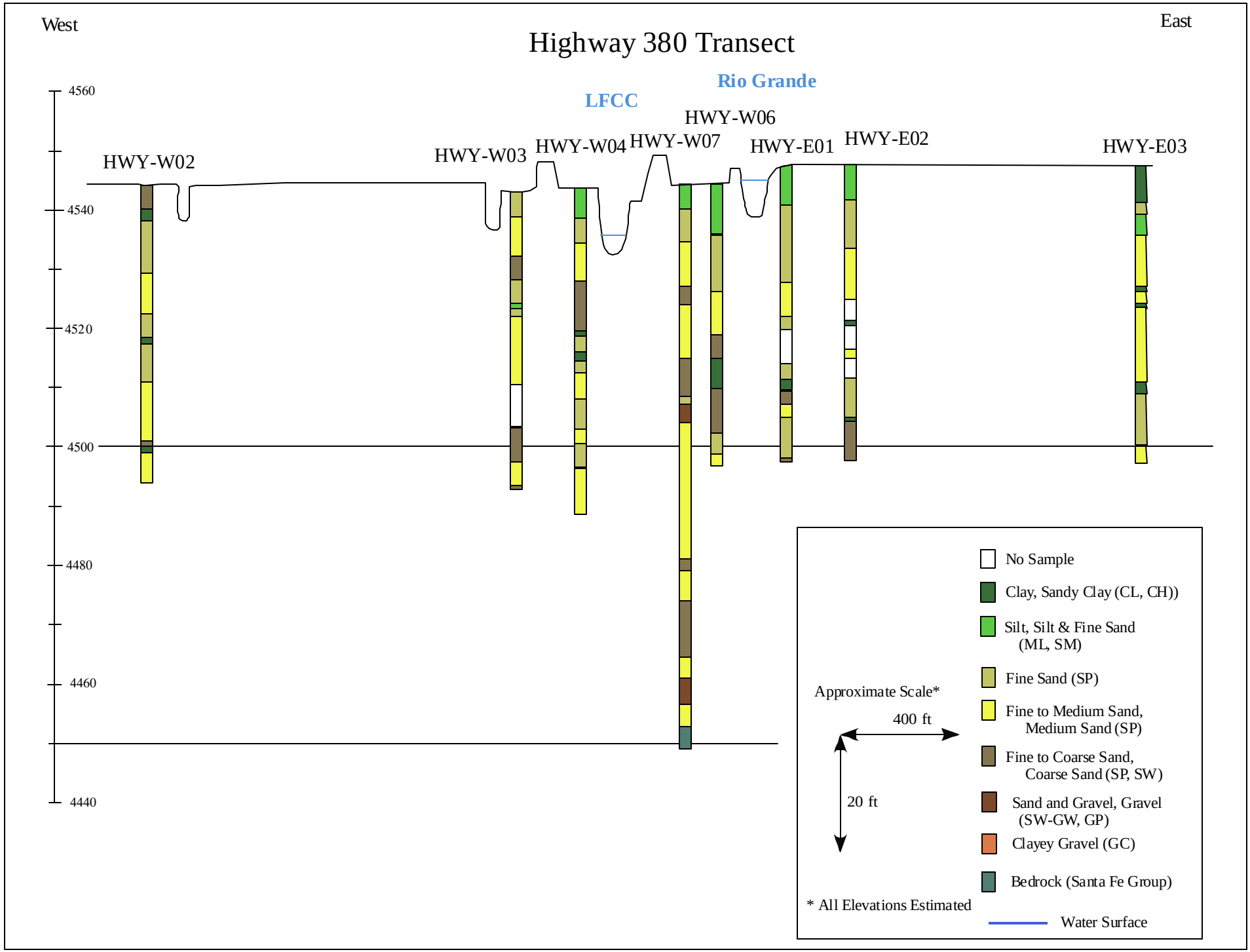

Figure 13. Geologic Cross Section, Highway 380 Transect

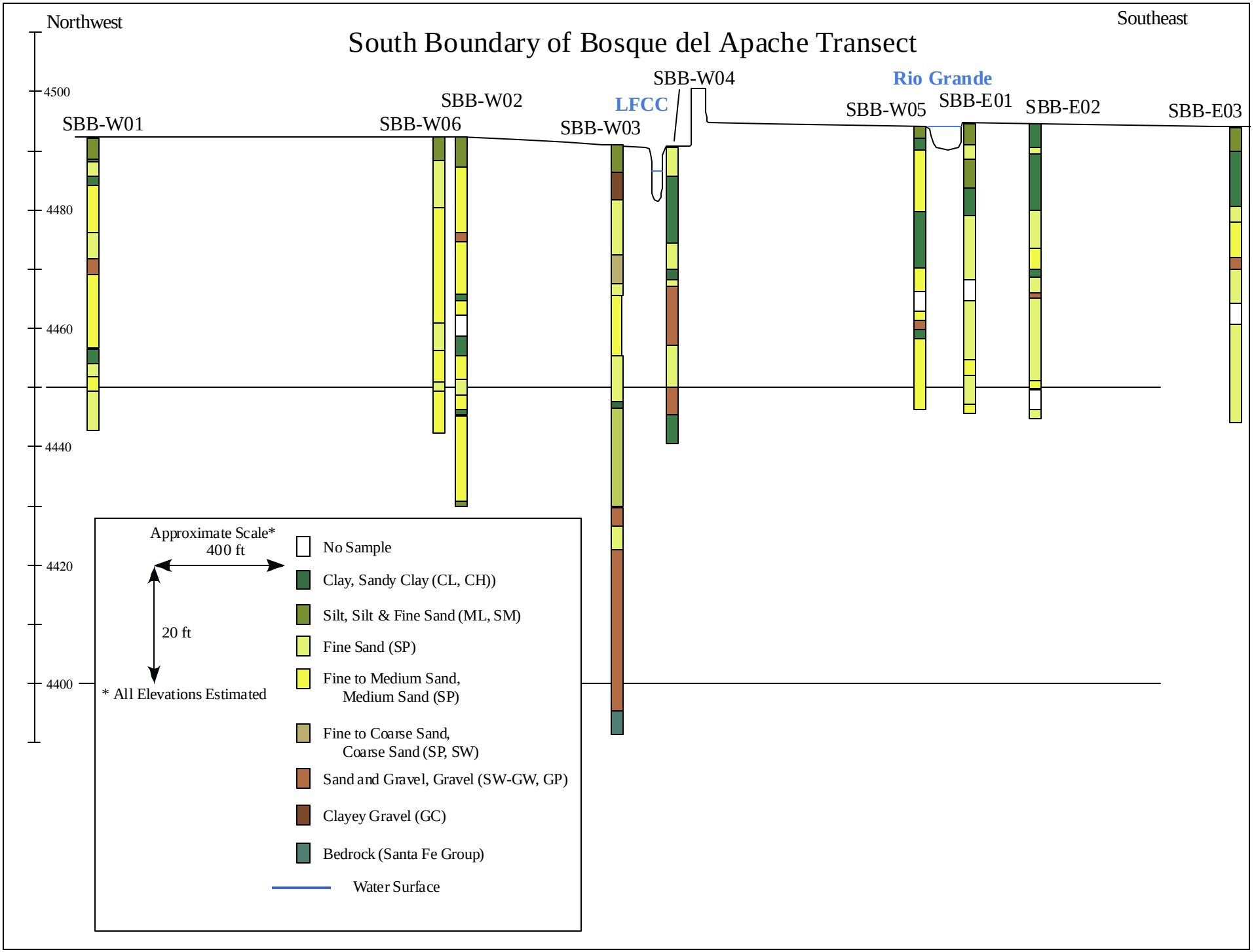

Figure 14. Geologic Cross Section, South Bosque Boundary Transect

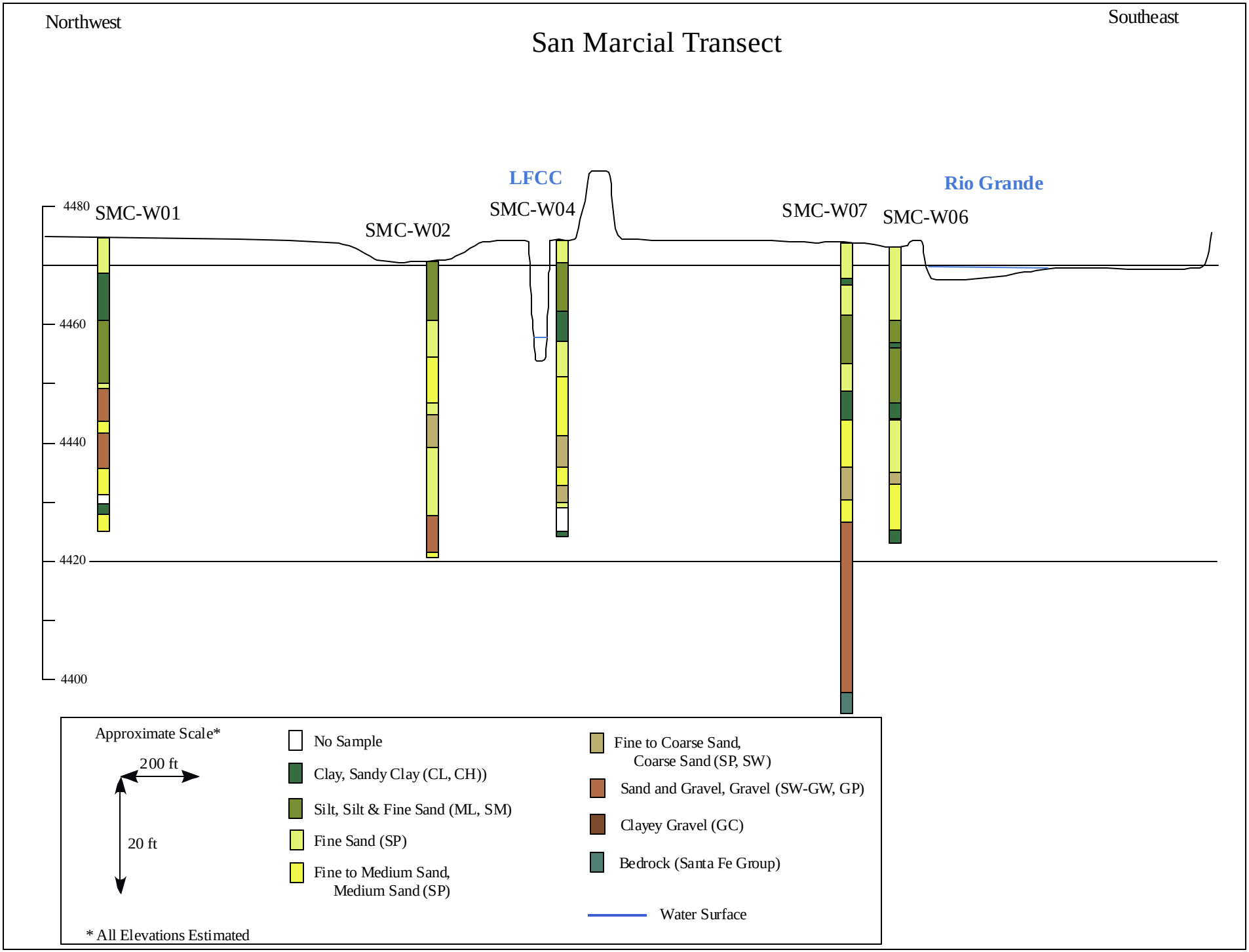

Figure 15. Geologic Cross Section, San Marcial Transect

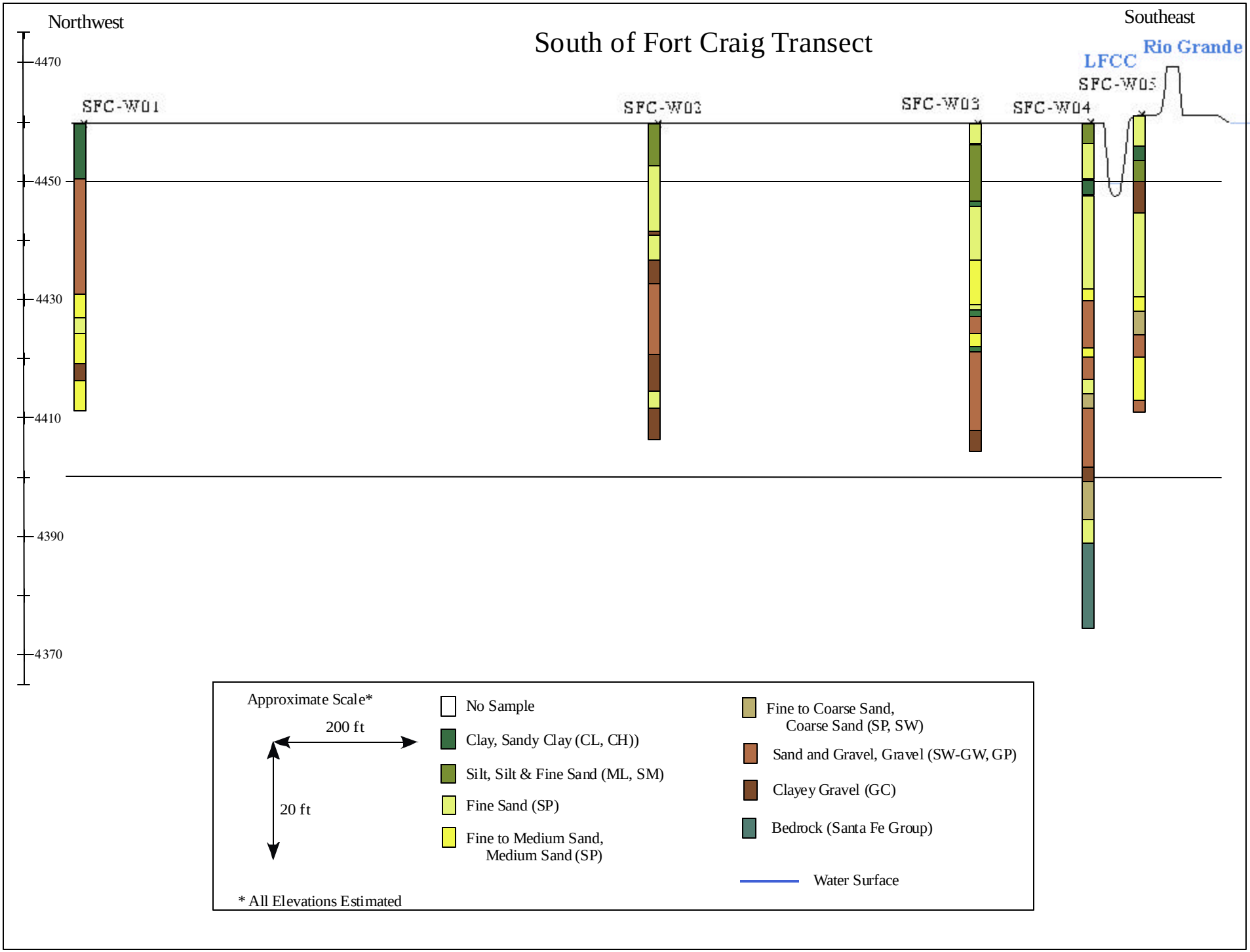

Figure 16. Geologic Cross Section, South of Fort Craig Transect

Figure 17. SAC-W09 Grain Size Distribution

(Rio Grande Watershed Study - Phase 1)

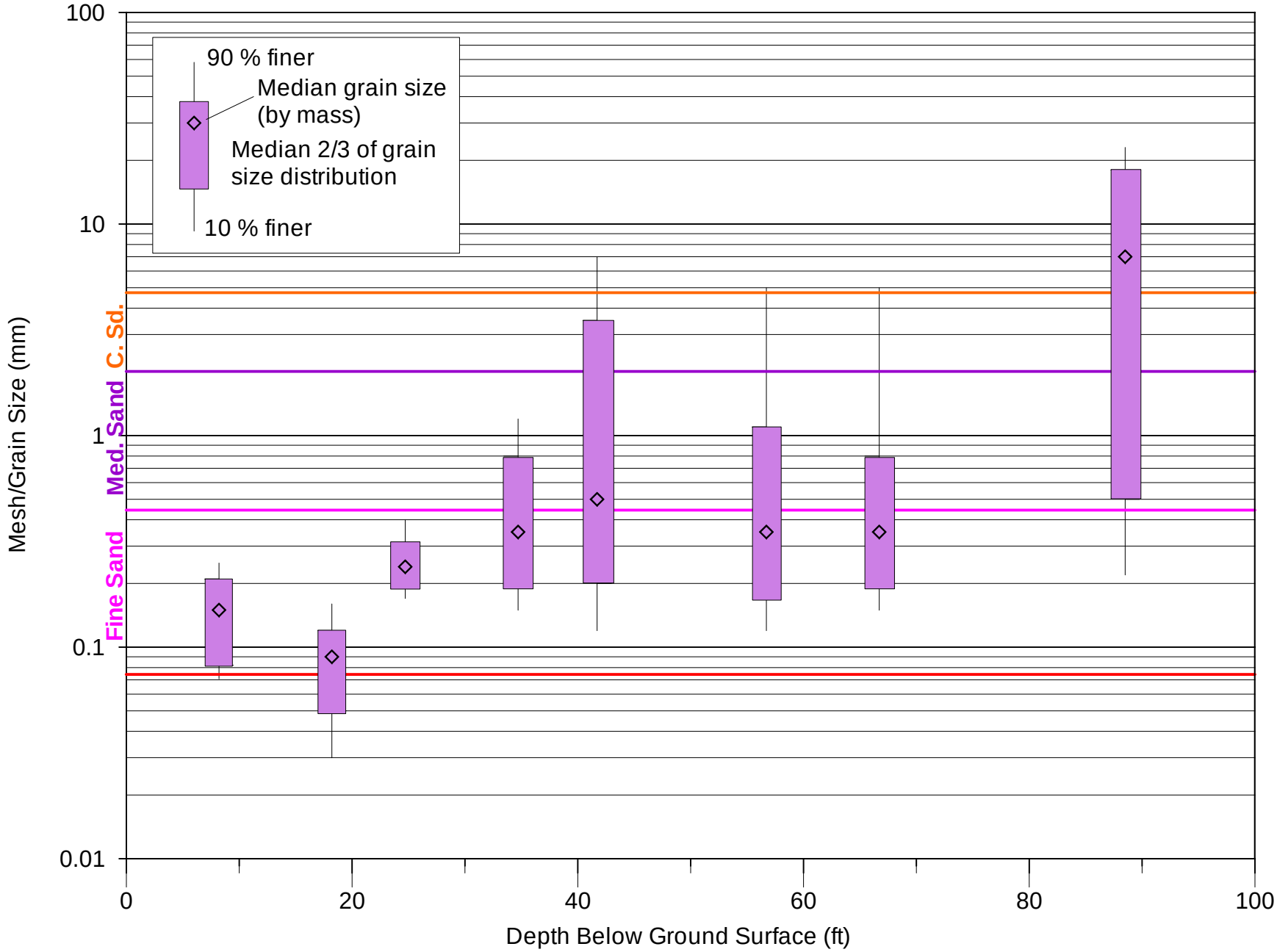

Figure 18. ESC-E04 Grain Size Distribution

(Rio Grande Watershed Study - Phase 1)

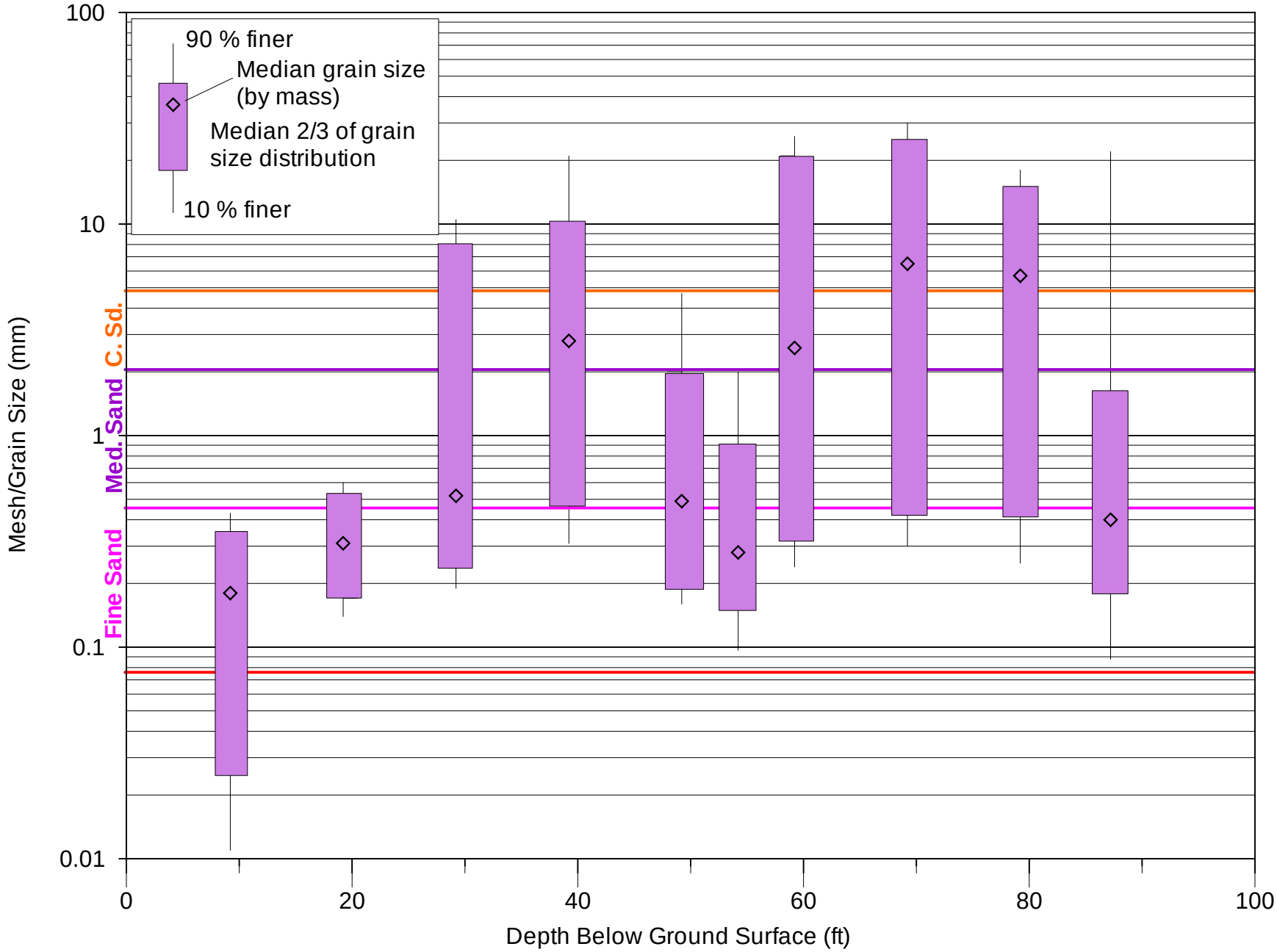

Figure 19. BRN-E01 Grain Size Distribution

(Rio Grande Watershed Study - Phase 1)

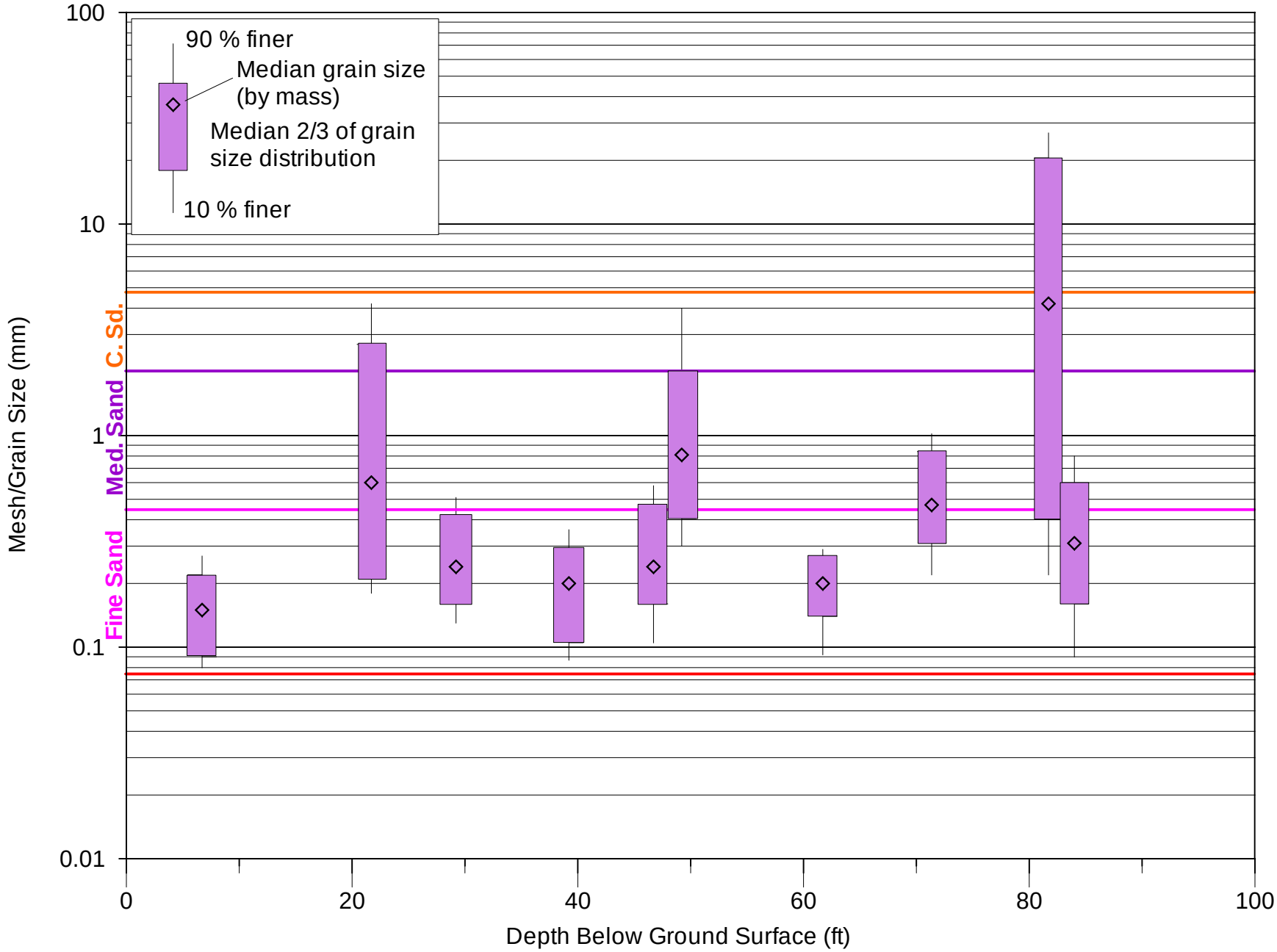

Figure 20. HWY-W07 Grain Size Distribution

(Rio Grande Watershed Study - Phase 1)

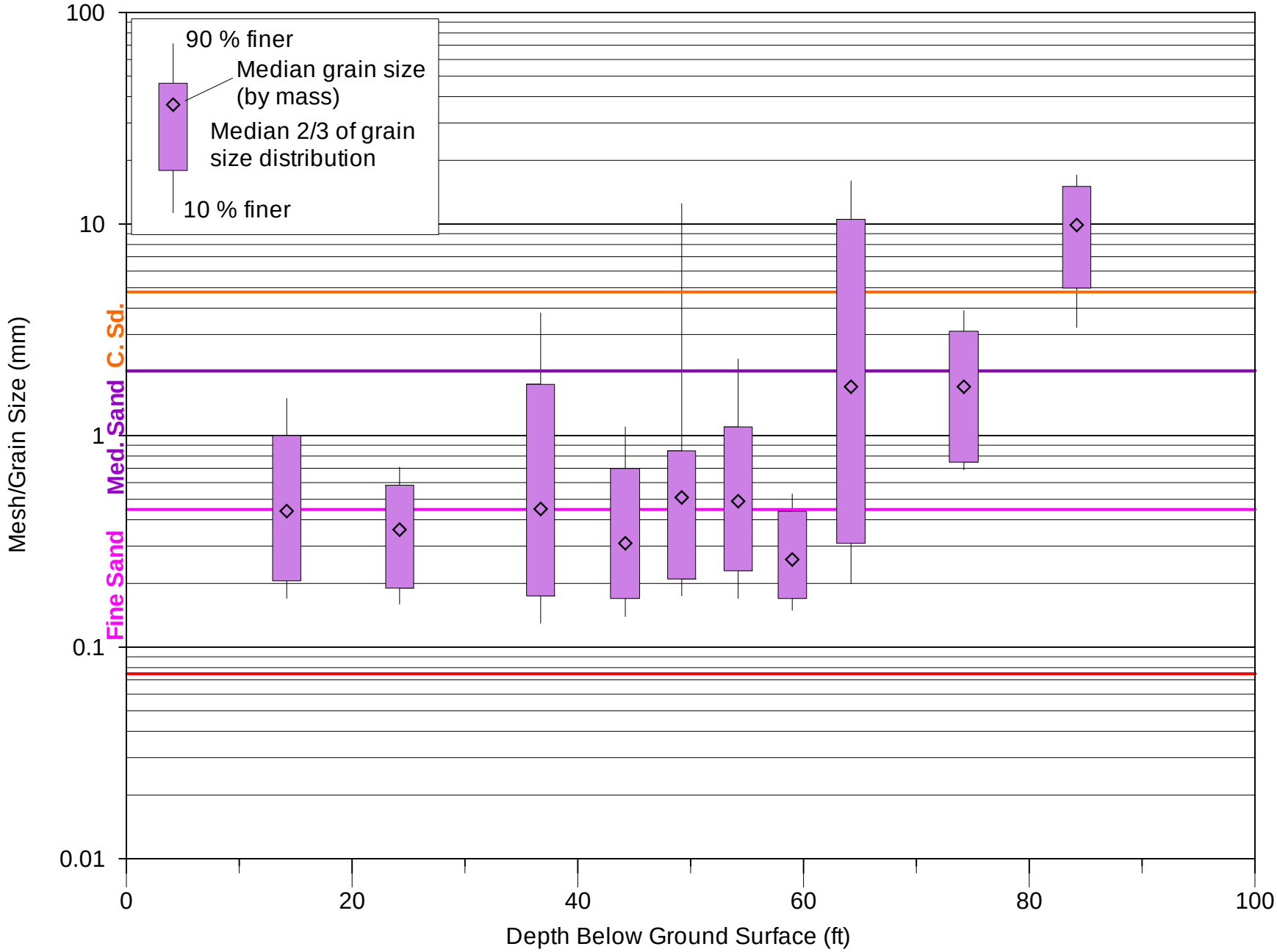

Figure 21. SBB-W03 Grain Size Distribution

(Rio Grande Watershed Study - Phase 1)

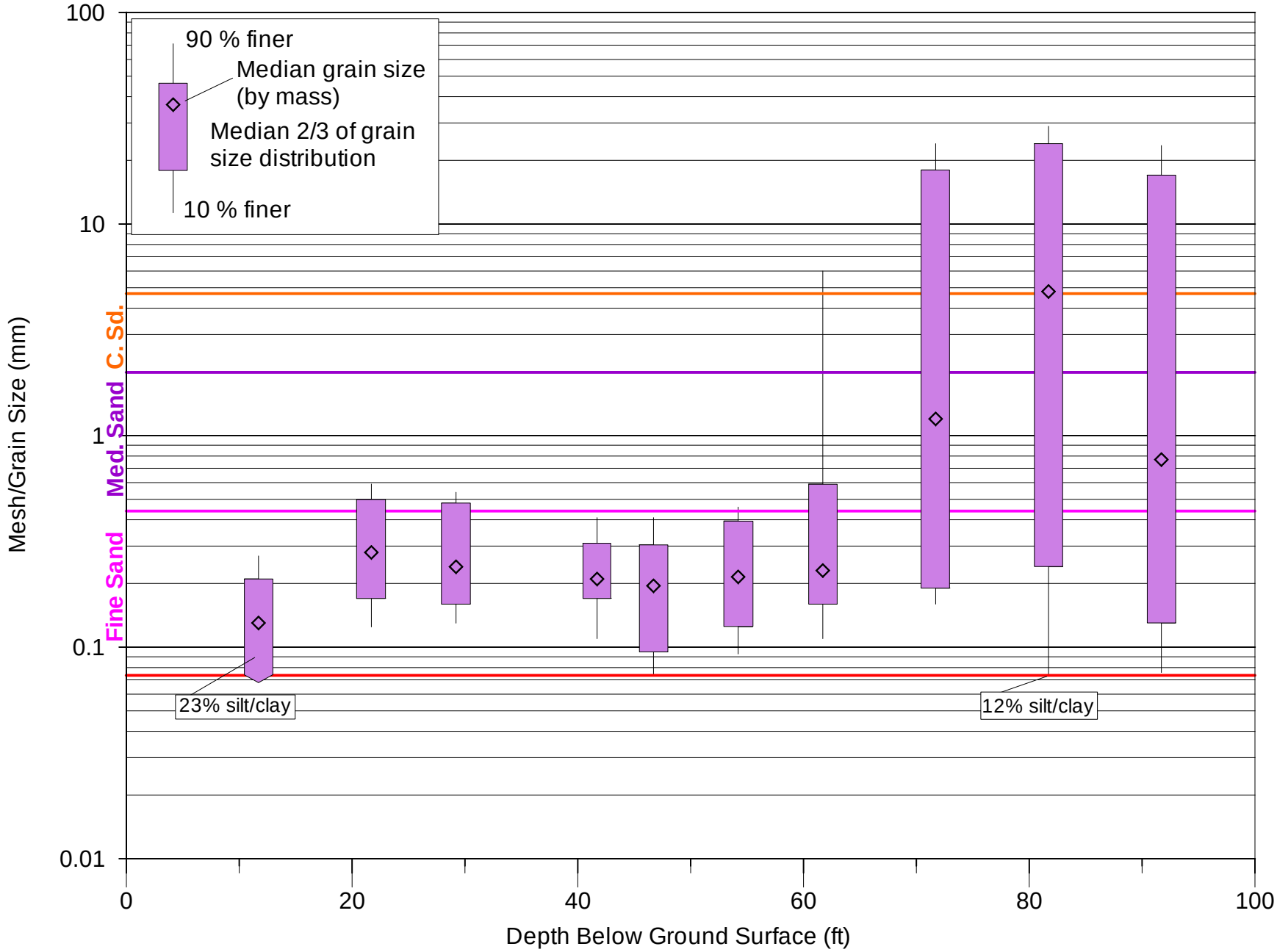

Figure 22. SMC-W07 Grain Size Distribution

(Rio Grande Watershed Study - Phase 1)

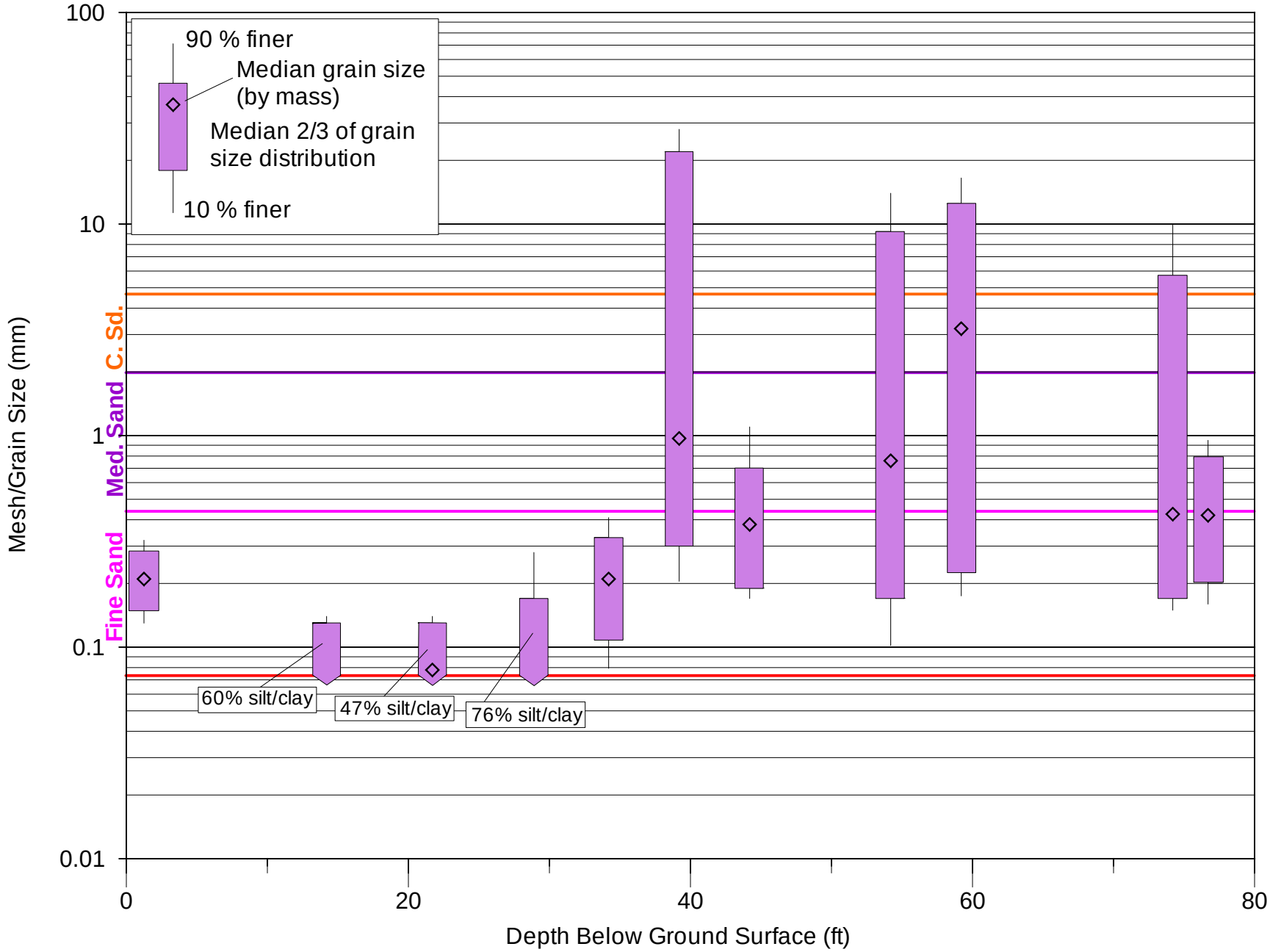

TABLE 1.
Middle Rio Grande Watershed Study
Well Construction Details

Transect	Well ID	Surface Elevation (ft amsl)	Total Depth (ft bgs)	Borehole Diameter (in)	Casing Diameter (in)	Screened Interval[1]	Filter Pack[2]	Lower Seal	Upper Seal
Brown Arroyo	BRN-E01A	4575.92	19.2	10	2	4.0-19.0	1.9-21.2	21.2-23.4	0.5-1.9
	BRN-E01B	4575.92	49.7	10	2	44.5-49.5	42.2-50	NA	38.7-42.2
	BRN-E01C	4575.91	81.2	8	2	75.9-80.9	71.3-83	NA	63-72.2
	BRN-E02A	4575.3	19.2	10	2	4.0-19.0	2.0-19.2	NA	0.6-2.0
	BRN-E03A	4573.47	18.8	10	2	4.3-18.6	2.0-20.9	20.9-23.5	0-2
	BRN-E03B	4573.47	49.5	10	2	43.7-8.7	42.2-50	NA	20.9-23.5
	BRN-E04A	4571.08	16.7	10	2	2.3-16.5	1.5-21.2	21.2-23.8	0-1.5
	BRN-E04B	4571.08	49.2	10	2	44.7-49.7	42-50	NA	38.5-42
	BRN-E05A	4572.1	19.2	10	2	4.0-19	1.7-20.5	20.5-24.4	0.4-1.7
	BRN-E05B	4572.1	49.2	10	2	44.5-49.5	41.9-49.5	NA	38.3-41.9
	BRN-E06A	4572.71	19.2	10	2	4.0-19.0	1.9-22.2	22.2-23.7	0.4-1.9
	BRN-E06B	4572.71	54.2	10	2	49.0-54.0	46.3-55.2	NA	43.4-46.3
	BRN-W01A	4570.9	19.8	10	2	4.8-19.8	2.2-21.2	21.2-23.5	1.0-2.2
	BRN-W01B	4570.9	46.7	10	2	41.7-16.7	39-47	NA	36-39
	BRN-W02A	4570.95	19.5	10	1	4.0-19.0	2.2-20.0	NA	1.1-2.2
	BRN-W03A	4574.31	19.4	10	2	4.4-19.4	3.0-20.0	20-23.5	0.9-2.5
	BRN-W03B	4574.31	51	10	2	45.5-50.5	43.5-52.5	NA	40.5-43.5
	BRN-W04A	4571.22	21.2	10	2	6.0-21.0	4.0-22.4	22.4-25	1.5-4.0
	BRN-W04B	4571.22	50.8	10	2	46.7-50.6	43.8-52.5	NA	41-43.8
	BRN-W05A	4575.89	20	10	2	5.0-20.0	3.5-21	21-24	1-3.5
	BRN-W05B	4575.89	51	10	2	46-51	43-52	NA	40.5-43
Escondida	ESC-E01A	4617.86	19.7	10	2	4.5-19.5	3.1-23	23-26.2	0.8-3.1
	ESC-E01B	4617.86	49.2	10	2	44-49	39.3-51	NA	34.6-39.3
	ESC-E02A	4618.3	20.2	10	2	4.75-19.75	3-23.2	23.2-26	0.5-3.0
	ESC-E02B	4618.3	49.8	10	2	44.3-49.3	39.2-51	NA	35.3-39.2
	ESC-E03A	4610.79	13.5	10	2	3.0-13.0	2.0-16.3	16.3-18.9	1.0-2.0
	ESC-E03B	4610.79	45	10	2	39.5-44.5	34.4-46	NA	32.3-34.4
	ESC-E04A	4618.21	20	10	2	5.0-20.0	2.7-22.9	22.9-26.1	0.6-2.7
	ESC-E04B	4618.21	50.7	10	2	45.5-50.5	41.6-52	NA	38.7-41.6
	ESC-E04C	4618.1	83.9	8	2	78.4-83.4	72.6-84	NA	62.5-72.6
	ESC-E05EX	4618.93	55.3	13.8	10	30.4-49.2	26.0-51	NA	22.6-26.0
	ESC-E06A	4618.53	20.5	10	2	5.0-20.0	3.1-23.5	23.5-25.8	0.8-3.1
	ESC-E06B	4618.53	50.5	10	2	45.0-50.0	38.9-52	NA	35.7-38.9
	ESC-W01A	4616.32	20.5	10	2	5.0-20.0	2.8-23.1	23.1-26.3	1.0-2.75
	ESC-W01B	4616.32	51	10	2	45.5-50.5	41-52	NA	32.5-41
	ESC-W02A	4616.89	19.5	8	2	4.0-19.0	2.5-21	NA	1.0-2.5
	ESC-W03A	4615.45	20.2	10	2	4.8-19.8	2.5-21.5	21.5-24.7	0.9-2.5
	ESC-W03B	4615.45	50	10	2	44.5-49.5	40.1-50	NA	35.8-40.1
	ESC-W04A	4615.58	16.5	10	2	6.5-16.5	2.2-16.5	18.3-20.8	0.5-2.2
	ESC-W04B	4615.58	50.2	10	2	44.4-49.7	39.7-51	NA	31-39.75
	ESC-W05A	4618.05	19.2	10	2	4.0-19.0	2.0-23.2	23.2-25.8	1.0-2.0
	ESC-W05B	4618.05	51	10	2	45.5-50.5	38.5-52	NA	32.7-38.5

TABLE 1.
Middle Rio Grande Watershed Study
Well Construction Details

Transect	Well ID	Surface Elevation (ft amsl)	Total Depth (ft bgs)	Borehole Diameter (in)	Casing Diameter (in)	Screened Interval[1]	Filter Pack[2]	Lower Seal	Upper Seal
Highway 380	HWY-E01A	4553.67	19.2	10	2	4.0-19.0	3.0-23.3	23.3-25.2	1.0-3.0
	HWY-E01B	4553.67	50.2	10	2	45-50	39.7-50.5	NA	35.5-39.7
	HWY-E02A	4552.06	19.5	10	2	4.0-19.0	2.5-20	NA	1.0-2.5
	HWY-E03A	4551.11	18.7	10	2	3.5-18.5	1.5-21.1	21.1-23.3	0-1.5
	HWY-E03B	4551.11	50.5	10	2	45-50	41.8-51.5	NA	36.7-41.8
	HWY-W02A	4548.06	19.5	10	2	4.0-19.0	1.0-23.1	23.1-26.1	0-1.0
	HWY-W02B	4548.06	49.5	10	2	44.0-49.0	42.1-50.5	NA	39.4-42.1
	HWY-W03B	4547.23	49.5	10	2	44.0-49.0	38.6-50.5	NA	37.8-38.6
	HWY-W04A	4549.29	19.5	10	2	4.0-19.0	3.0-21.3	21.3-25.4	0-3.0
	HWY-W04B	4549.29	49.5	10	2	44.0-49.0	41.2-50.5	NA	37.4-41.2
	HWY-W05A	4550.05	20	10	2	4.5-19.5	2.0-23.3	23.3-25.5	0.5-2.0
	HWY-W05B	4550.05	50	10	2	44.5-49.5	41.9-50.5	NA	37.9-41.9
	HWY-W06A	4550.05	19.2	10	2	4.0-19.0	1.7-22.7	22.7-23.9	0.4-1.7
	HWY-W06B	4550.05	49.2	10	2	44.0-49.0	41-50	NA	37.4-41
	HWY-W07A	4551.47	19.9	10	2	5.0-20.0	3.0-21.0	21.0-24.0	1.0-3.0
	HWY-W07B	4551.47	49.5	10	2	44.0-49.0	42.0-51.0	NA	38.2-41.8
	HWY-W07C	4551.49	91.5	8	2	86.0-91.0	52-92.5	NA	70.4-82
	HWY-W08EX	4550.53	64.6	13.8	10	35.1-58.9	32.0-61.0	NA	28.5-32.0
	HWY-W09A	4550.24	19.8	10	2	3.5-18.5	3.0-20.0	20.0-22.0	1.0-3.0
	HWY-W09B	4550.24	49.5	10	2	44.0-49.0	41.8-50	NA	38.2-41.8
	HWY-W10A	4551.43	19	10	2	4.0-19.0	2.3-23.2	23.2-26.6	0.8-2.3
	HWY-W10B	4551.43	49	10	2	44.0-49.0	40.4-50	NA	37.5-40.4
	HWY-W11A	4555.44	21.5	10	2	6.7-21.0	3.0-23.0	24.0-26.0	0-3.0
	HWY-W11B	4555.44	54.5	10	2	49.8-54.0	47.6-55	NA	42.5-47.6
San Acacia	SAC-E01A	4658.31	18.7	2.125	1	3.5-18.5	0.2-18.7	NA	None
	SAC-E01B	4658.28	50.2	2.125	1	45.0-50.0	0.2-50.8	NA	None
	SAC-E02A	4663.7	21.2	2.125	1	6.0-21.0	0.2-21.5	NA	None
	SAC-E03A	4664.57	21.7	2.125	1	6.5-21.5	0.3-21.7	NA	None
	SAC-E03B	4664.53	55.7	2.125	1	50.5-55.5	0.3-56	NA	None
	SAC-W01A	4662.37	18.5	10	2	3.0-18.0	2.0-19.1	19.1-26.8	1.0-2.0
	SAC-W01B		49.5	10	2	44.0-49.0	36.3-49	NA	33.8-36.3
	SAC-W02A	4677.1	35.5	10	2	20.0-35.0	16.8-36.0	36-42	13.6-16.8
	SAC-W02B	4677.1	59.2	10	2	53.7-58.7	51-59.2	NA	43.2-51
	SAC-W03A	4663.34	19	10	2	4.0-19.0	2.5-19.5	19.5-21	1-2.5
	SAC-W03B	4663.34	51	10	2	45.5-50.5	42.8-51.5	NA	36.0-42.8
	SAC-W04A	4662.36	18.2	10	2	3.2-18.2	2.2-20.8	20.8-23.1	1.0-2.2
	SAC-W04B	4662.36	49.4	10	2	44.0-49.0	38-49.5	NA	33.7-38.0
	SAC-W05A	4663.35	22	10	2	7.0-22.0	3.7-24.2	24.2-25.5	2.3-3.7
	SAC-W05B	4663.35	51	10	2	45.5-50.5	41.5-52	NA	40.3-41.5
	SAC-W06A	4655.16	9	Drive point	1	6.0-9.0	0.2-9	NA	None
	SAC-W07A	4677.46	34	10	2	18.5-33.5	16.6-35	NA	13.7-16.6
	SAC-W07B	4677.46	59	10	2	53.5-58.5	49-60	NA	45.5-49
	SAC-W08EX	4677.31	80.5	13.8	10	46.0-74.9	43.5-77.0	NA	41.0-43.5

TABLE 1.
Middle Rio Grande Watershed Study
Well Construction Details

Transect	Well ID	Surface Elevation (ft amsl)	Total Depth (ft bgs)	Borehole Diameter (in)	Casing Diameter (in)	Screened Interval[1]	Filter Pack[2]	Lower Seal	Upper Seal
San Acacia (cont.)	SAC-W09A	4677.87	34	10	2	18.5-33.5	14.5-38	38-40	10-14.5
	SAC-W09B	4677.87	59	10	2	53.5-58.5	51-60	NA	48.2-51.0
	SAC-W09C	4677.87	98.6	8	2	93.1-98.1	87.8-99	NA	77.0-87.8
South Boundary Bosque del Apache	SBB-E01A	4498.81	20.2	10	2	15.0-20.0	2.0-23.0	23-23.5	1.0-2.0
	SBB-E01B	4498.81	48.7	10	2	43.5-48.5	40-49.5	NA	38-40
	SBB-E02A	4498.26	20.2	10	2	5.0-20.0	2.8-23.2	23.2-26	1.0-2.8
	SBB-E02B	4498.26	48.7	10	2	43.5-48.5	38.9-49.5	NA	32.5-38.9
	SBB-E03A	4495.48	18.2	10	2	3.0-18.0	2.0-23.7	23.7-24.5	1.0-2.0
	SBB-E03B	4495.48	46.7	10	2	41.5-46.5	39.5-47	NA	39.0-39.5
	SBB-W01A	4484.47	20.2	10	2	5.0-20.0	2.8-22.5	22.5-25.8	0.8-2.8
	SBB-W01B	4484.47	49.7	10	2	44.5-49.5	39.7-50.5	NA	33-39.7
	SBB-W02A	4487.96	20.2	10	2	5.0-20.0	3-24.8	24.8-29.5	1.0-3.0
	SBB-W02B	4487.96	49.2	10	2	44.0-49.0	29.5-49.5	NA	None
	SBB-W03A	4488.81	20.2	10	2	5.0-20.0	2.8-24.5	24.5-26.3	0.9-2.8
	SBB-W03B	4488.81	45.2	10	2	42.0-47.0	39.7-47.5	NA	36.3-39.7
	SBB-W04A	4493.86	24.2	10	2	9.0-24.0	5.4-26.4	26.4-28.7	3.3-5.4
	SBB-W04B	4493.86	53.2	10	2	48.0-53.0	43.8-54	NA	41.5-43.8
	SBB-W05A	4498.66	19.7	8	2	4.5-19.5	2.0-27.0	22.3-27	0.5-2.0
	SBB-W06A	4488.1	20.2	10	2	5.0-20.0	3.0-22.0	22.0-24.0	1.0-3.0
	SBB-W06B	4488.1	49.2	10	2	44.0-49.0	42.5-50	NA	39.0-42.5
	SBB-W07B	4488.19	49.2	8	2	44.0-49.0	42.0-51.0	51-76.5	38.5-42.0
	SBB-W07C	4488.19	86.3	8	2	81.3-86.3	42.0-51.0	NA	51.0-76.5
	SBB-W08EX	4487.9	67.1	13.8	8	37.0-62.0	35.1-63.5	NA	32.1-35.1
South of Fort Craig	SFC-W01A		20.5	10	2	5.0-20.0	3.0-29.4	29.4-30	0.5-3.0
	SFC-W01B	4462.68	50.5	10	2	45.0-50.0	35-50.5	NA	30-35
	SFC-W02A	4457.58	19.1	10	2	3.9-18.9	2.0-20.0	20.0-23.9	0.5-2.0
	SFC-W02B	4457.58	49.2	10	2	44.0-49.0	39.3-51	NA	34.7-39.3
	SFC-W03A	4458.08	20.2	10	2	5.0-20.0	1.5-21.0	21.0-25.2	0.5-1.5
	SFC-W03B	4458.08	49.7	10	2	44.5-49.5	35-5.05	NA	32.0-35.0
	SFC-W04A	4456.64	18.2	10	2	3.0-18.0	2.0-23.2	23.2-25.3	1.0-2.0
	SFC-W04B	4456.64	50.2	10	2	45.0-50.0	38.7-51	NA	32.8-38.7
	SFC-W04C	4456.88	84.5	8	2	79.0-84.0	62.0-85.5	NA	40.0-62.0
	SFC-W05A	4457.17	19.5	10	2	4.0-19.0	3.0-20.0	20.0-25.5	0.5-3.0
	SFC-W05B	4457.17	49.5	10	2	44.0-49.0	38-50.5	NA	28.3-38.0
	SFC-W06A	4464.17	11.3	Drive point	1.5	8.0-11.0	1.0-11.8	NA	none

TABLE 1.
Middle Rio Grande Watershed Study
Well Construction Details

Transect	Well ID	Surface Elevation (ft amsl)	Total Depth (ft bgs)	Borehole Diameter (in)	Casing Diameter (in)	Screened Interval[1]	Filter Pack[2]	Lower Seal	Upper Seal
San Marcial	SMC-W01A		20.2	10	2	5.0-20.0	2.0-25.0	25.0-26.0	1.0-2.0
	SMC-W01B	4468.71	50.2	10	2	45.0-50.0	39.5-50.5	NA	35.0-39.5
	SMC-W02A	4471.29	19.5	10	2	4.3-19.3	2.0-20.0	NA	0.5-2.0
	SMC-W03A	4473.72	20.2	10	2	5.0-20.0	3.0-22.0	22.0-22.5	1.0-3.0
	SMC-W03B	4473.72	49.7	10	2	44.5-49.5	38.2-50.5	NA	32.4-38.2
	SMC-W04A	4470.91	20.2	10	2	5.0-20.0	3.0-23.0	23.0-25.2	1.0-3.0
	SMC-W04B	4470.91	50.2	10	2	45.0-50.0	37.9-50.5	NA	33.6-37.9
	SMC-W05A	4476.65	17.7	10	2	2.5-17.5	1.0-23.9	23.9-26.7	0.2-1.0
	SMC-W05B	4476.65	54.2	10	2	49.0-54.0	46.2-54	NA	44.7-46.2
	SMC-W06A	4477.05	18.2	10	2	3.0-18.0	1.2-22.0	22.0-29.3	0.4-1.2
	SMC-W06B	4477.05	54.7	10	2	49.5-54.5	46.8-55.5	NA	43.7-46.8
	SMC-W07A	4476.63	18.7	10	2	3.5-18.5	1.3-20.6	20.6-23.8	0.4-1.3
	SMC-W07B	4476.63	54.7	10	2	49.5-54.5	44.6-55.5	NA	42.3-44.6
	SMC-W07C	4476.8	76.7	8	2	71.5-76.5	66.8-77.5	NA	46.8-66.8
	SMC-W08EX	4476.79	74.5	14.75	10	44.6-69.6	42.5-72.1	NA	39.6-42.5
	SMC-W09A	4476.57	18.7	10	2	3.5-18.5	1.4-24.0	24.0-27.2	0.3-1.4
	SMC-W09B	4476.57	54.7	10	2	49.5-54.5	46.7-55.5	NA	38.3-46.7

[1]Note: All monitoring well screens are 0.010" slot. Extraction well screens range from 0.030" to 0.090" slots.

[2]Note: All monitoring well filter pack is natural pack or 20-40 silica sand Extraction well filter pack ranges from 4-8 to 10-20.

TABLE 2.
Middle Rio Grande Watershed Study,
San Acacia Survey Data

SAN ACACIA (SAC) - PVC PIPES

Well No.	Latitude	Longitude	PVC Pipe ELEV.	Concrete ELEV.	Casing ELEV.
W01-A	N 34º 14' 54.32277"	W 106º 54' 35.59211"	4663.20	4662.37	4664.41
W02-A	N 34º 14' 47.25096"	W 106º 54' 15.83149"	4677.58	4677.10	4679.18
W02-B	N 34º 14' 47.25109"	W 106º 54' 15.83512"	4677.74	4677.10	4679.18
W03-A	N 34º 14' 44.29280"	W 106º 54' 09.80978"	4664.18	4663.34	4665.29
W03-B	N 34º 14' 44.29521"	W 106º 54' 09.81158"	4664.15	4663.34	4665.29
W04-A	N 34º 14' 43.92241"	W 106º 54' 03.54852"	4662.69	4662.36	4664.38
W04-B	N 34º 14' 43.92169"	W 106º 54' 03.55215"	4662.36	4662.36	4664.38
W05-A	N 34º 14' 43.77692"	W 106º 54' 01.73609"	4664.37	4663.35	4665.29
W05-B	N 34º 14' 43.77531"	W 106º 54' 01.73477"	4664.15	4663.35	4665.29
W06-A	N 34º 14' 43.56394"	W 106º 53' 59.89611"	4658.30	4655.16	4658.83
W07-A	N 34º 14' 47.02365"	W 106º 54' 15.39558"	4678.01	4677.46	4679.48
W07-B	N 34º 14' 47.05097"	W 106º 54' 15.38880"	4678.16	4677.46	4679.37
W08-EX	N 34º 14' 46.96576"	W 106º 54' 15.35975"	4678.75	4677.31	4679.59
W09-A	N 34º 14' 46.88902"	W 106º 54' 15.07282"	4678.52	4677.87	4680.00
W09-B	N 34º 14' 46.89067"	W 106º 54' 15.07057"	4678.61	4677.87	4680.00
W09-C	N 34º 14' 46.87357"	W 106º 54' 15.09573"	4679.11	4677.87	4679.96
E01-A	N 34º 14' 44.02863"	W 106º 53' 55.47999"	4661.53	4658.31	4661.61
E01-B	N 34º 14' 44.02263"	W 106º 53' 55.48897"	4661.16	4658.28	4661.11
E02-A	N 34º 14' 43.77483"	W 106º 53' 51.96039"	4666.48	4663.70	4666.40
E03-A	N 34º 14' 43.10808"	W 106º 53' 41.77328"	4667.34	4664.57	4667.20
E03-B	N 34º 14' 43.10096"	W 106º 53' 41.76808"	4667.30	4664.53	4667.12

Geodetic Coordinates (Latitude and Longitude) are based on NAD 83 Horizontal Datum and Elevations are NGVD 88 Datum Values.

TABLE 3.
Middle Rio Grande Watershed Study,
Escondida Bridge Survey Data

ESCONDIDA BRIDGE (ESC) - MONITORING WELLS (PVC PIPES)

Well No.	Latitude	Longitude	PVC Pipe ELEV.	Concrete ELEV.	Casing ELEV.
W01-A	N 34º 07' 11.06826"	W 106º 53' 29.33244"	4617.30	4616.32	4618.37
W01-B	N 34º 07' 11.06980"	W 106º 53' 29.33540"	4617.20	4616.32	4618.37
W02-A	N 34º 07' 12.25187"	W 106º 53' 23.91738"	4617.96	4616.89	4618.97
W03-A	N 34º 07' 12.54634"	W 106º 53' 21.24507"	4616.62	4615.45	4617.43
W03-B	N 34º 07' 12.54772"	W 106º 53' 21.24778"	4616.58	4615.45	4617.43
W04-A	N 34º 07' 13.05085"	W 106º 53' 19.55172"	4616.72	4615.58	4618.00
W04-B	N 34º 07' 13.04916"	W 106º 53' 19.55014"	4616.28	4615.58	4618.00
W05-A	N 34º 07' 13.46197"	W 106º 53' 15.20643"	4619.97	4618.05	4620.05
W05-B	N 34º 07' 13.46188"	W 106º 53' 15.20280"	4619.71	4618.05	4620.05
E01-A	N 34º 07' 13.30051"	W 106º 53' 11.01091"	4618.44	4617.86	4619.81
E01-B	N 34º 07' 13.29912"	W 106º 53' 11.01254"	4618.42	4617.86	4619.81
E02-A	N 34º 07' 13.33380"	W 106º 53' 10.16802"	4619.17	4618.30	4620.25
E02-B	N 34º 07' 13.33191"	W 106º 53' 10.16981"	4619.15	4618.30	4620.25
E03-A	N 34º 07' 13.01238"	W 106º 52' 55.26056"	4611.58	4610.79	4612.91
E03-B	N 34º 07' 13.01175"	W 106º 52' 55.25685"	4611.47	4610.79	4612.91
E04-A	N 34º 07' 13.31378"	W 106º 53' 10.81751"	4619.06	4618.21	4620.18
E04-B	N 34º 07' 13.31308"	W 106º 53' 10.81642"	4618.99	4618.21	4620.18
E04-C	N 34º 07' 13.28895"	W 106º 53' 10.82674"	4618.91	4618.10	4620.01
E05-EX	N 34º 07' 13.36871"	W 106º 53' 10.84893"	4619.65	4618.93	4621.89
E06-A	N 34º 07' 13.13010"	W 106º 53 10.75735"	4619.48	4618.53	4620.52
E06-B	N 34º 07' 13.12791"	W 106º 53' 10.75816"	4619.55	4618.53	4620.52

Geodetic Coordinates (Latitude and Longitude) are based on NAD 83 Horizontal Datum and Elevations are NGVD 88 Datum Values.

TABLE 4.
Middle Rio Grande Watershed Study,
Brown Arroyo Survey Data

BROWN ARROYO (BRN) - MONITORING WELLS (PVC PIPES)

Well No.	Latitude	Longitude	PVC Pipe ELEV.	Concrete ELEV.	Casing ELEV.
W01-A	N 34º 00' 00.48520"	W 106º 52' 37.59919"	4571.99	4570.90	4573.12
W01-B	N 34º 00' 00.48827"	W 106º 52' 37.59482"	4572.06	4570.90	4573.12
W02-A	N 34º 00' 02.41229"	W 106º 52' 23.48245"	4571.78	4570.95	4573.17
W03-A	N 34º 00' 02.40549"	W 106º 52' 19.26465"	4575.09	4574.31	4576.61
W03-B	N 34º 00' 02.40773"	W 106º 52' 19.26372"	4575.48	4574.31	4576.61
W04-A	N 34º 00' 02.33190"	W 106º 52' 17.27183"	4572.36	4571.22	4573.42
W04-B	N 34º 00' 02.33485"	W 106º 52' 17.27423"	4572.51	4571.22	4573.42
W05-A	N 34º 00' 02.65798"	W 106º 52' 14.66424"	4576.62	4575.89	4578.16
W05-B	N 34º 00' 02.66051"	W 106º 52' 14.66875"	4576.24	4575.89	4578.16
E01-A	N 34º 00' 10.89319"	W 106º 52' 10.95924"	4577.41	4575.92	4578.13
E01-B	N 34º 00' 10.89344"	W 106º 52' 10.96392"	4576.48	4575.92	4578.13
E01-C	N 34º 00' 10.84829"	W 106º 52' 10.95043"	4577.37	4575.91	4578.18
E02-A	N 34º 00' 11.80577"	W 106º 52' 08.30281"	4576.58	4575.30	4577.45
E03-A	N 34º 00' 14.45214"	W 106º 51' 58.37058"	4574.41	4573.47	4575.54
E03-B	N 34º 00' 14.45273"	W 106º 51' 58.37567"	4574.34	4573.47	4575.54
E04-A	N 34º 00' 13.33824"	W 106º 51' 39.56927"	4572.39	4571.08	4573.36
E04-B	N 34º 00' 13.33495"	W 106º 51' 39.56781"	4571.74	4571.08	4573.36
E05-A	N 33º 59' 52.37607"	W 106º 51' 52.44922"	4573.05	4572.10	4574.29
E05-B	N 33º 59' 52.37802"	W 106º 51' 52.44507"	4572.98	4572.10	4574.29
E06-A	N 33º 59' 58.95910"	W 106º 51' 31.92397"	4573.75	4572.71	4574.82
E06-B	N 33º 59' 58.95987"	W 106º 51' 31.92079"	4573.79	4572.71	4574.82

Geodetic Coordinates (Latitude and Longitude) are based on NAD 83 Horizontal Datum and Elevations are NGVD 88 Datum Values.

TABLE 5.
Middle Rio Grande Watershed Study,
Highway 380 Survey Data

HIGHWAY 380 BRIDGE (HWY) - MONITORING WELLS (PVC PIPES)

Well No.	Latitude	Longitude	PVC Pipe ELEV.	Concrete ELEV.	Casing ELEV.
W02-A	N 33º 55' 33.51142"	W 106° 51' 27.37846"	4548.83	4548.06	4550.28
W02-B	N 33º 55' 33.51611"	W 106° 51' 27.37810"	4548.62	4548.06	4550.28
W03-B	N 33º 55' 29.03397"	W 106° 51' 13.55067"	4547.78	4547.23	4549.31
W04-A	N 33º 55' 28.65537"	W 106° 51' 11.02269"	4549.69	4549.29	4551.37
W04-B	N 33º 55' 28.65255"	W 106° 51' 11.02110"	4549.34	4549.29	4551.37
W05-A	N 33º 55' 29.34710"	W 106° 51' 08.60026"	4550.33	4550.05	4551.96
W05-B	N 33º 55' 29.34789"	W 106° 51' 08.59733"	4550.19	4550.05	4551.96
W06-A	N 33º 55' 29.28909"	W 106° 51' 06.66598"	4550.98	4550.05	4552.07
W06-B	N 33º 55' 29.29277"	W 106° 51' 06.66932"	4550.89	4550.05	4552.07
W07-A	N 33º 55' 29.27124"	W 106° 51' 07.44169"	4552.44	4551.47	4553.69
W07-B	N 33º 55' 29.26810"	W 106° 51' 07.44334"	4552.07	4551.47	4553.69
W07-C	N 33º 55' 29.30093"	W 106° 51' 07.45630"	4551.81	4551.49	4554.01
W08-EX	N 33º 55' 29.29155"	W 106° 51' 07.24961"	4552.45	4550.53	4553.13
W09-A	N 33º 55' 29.23421"	W 106° 51' 07.25576"	4550.65	4550.24	4552.16
W09-B	N 33º 55' 29.23789"	W 106° 51' 07.25513"	4550.99	4550.24	4552.16
W10-A	N 33° 55' 29.87586"	W 106° 51' 07.25392"	4552.10	4551.43	4553.79
W10-B	N 33º 55' 29.87141"	W 106° 51' 07.25464"	4552.24	4551.43	4553.79
W11-A	N 33º 55' 29.20272"	W 106° 51' 05.29976"	4556.93	4555.44	4557.77
W11-B	N 33º 55' 29.20410"	W 106° 51' 05.29424"	4556.12	4555.44	4557.77
E01-A	N 33º 55' 29.45916"	W 106° 51' 01.90768"	4554.19	4553.67	4555.58
E01-B	N 33º 55' 29.46170"	W 106° 51' 01.90869"	4554.03	4553.67	4555.58
E02-A	N 33º 55' 29.75145"	W 106° 50' 59.21588"	4552.70	4552.06	4554.14
E03-A	N 33º 55' 29.86520"	W 106° 50' 47.66863"	4551.44	4551.11	4553.20
E03-B	N 33º 55' 29.86803"	W 106° 50' 47.66827"	4552.04	4551.11	4553.20

Geodetic Coordinates (Latitude and Longitude) are based on NAD 83 Horizontal Datum and Elevations are NGVD 88 Datum Values.

TABLE 6.
Middle Rio Grande Watershed Study,
South Bosque Boundary Survey Data

SOUTH BOUNDARY OF BOSQUE DEL APACHE (SBB) - MONITORING WELLS (PVC PIPES)

Well No.	Latitude	Longitude	PVC Pipe ELEV.	Concrete ELEV.	Casing ELEV.
W01-A	N 33° 43' 31.95768"	W 106° 55' 14.95594"	4484.80	4484.47	4486.16
W01-B	N 33° 43' 31.96000"	W 106° 55' 14.95491"	4484.96	4484.47	4486.16
W02-A	N 33° 43' 26.05089"	W 106° 55' 01.29448"	4488.33	4487.96	4489.51
W02-B	N 33° 43' 26.05481"	W 106° 55' 01.29129"	4488.43	4487.96	4489.51
W03-A	N 33° 43' 24.19842"	W 106° 54' 54.53000"	4489.68	4488.81	4490.54
W03-B	N 33° 43' 24.20186"	W 106° 54' 54.52892"	4489.76	4488.81	4490.54
W04-A	N 33° 43' 23.94996"	W 106° 54' 52.44152"	4495.08	4493.86	4495.87
W04-B	N 33° 43' 23.94617"	W 106° 54' 52.43741"	4495.07	4493.86	4495.87
W05-A	N 33° 43' 19.20301"	W 106° 54' 44.74922"	4499.51	4498.66	4500.71
W06-A	N 33° 43' 26.44928"	W 106° 55' 01.96530"	4488.71	4488.10	4489.74
W06-B	N 33° 43' 26.44643"	W 106° 55' 01.96732"	4488.55	4488.10	4489.74
W07-B	N 33° 43' 26.18947"	W 106° 55' 01.51410"	4489.00	4488.19	4490.44
W07-C	N 33° 43' 26.18640"	W 106° 55' 01.51168"	4489.93	4488.19	4490.44
W08-EX	N 33° 43' 26.12750"	W 106° 55' 01.44261"	4489.82	4487.90	4490.83
E01-A	N 33° 43' 16.90771"	W 106° 54' 42.99820"	4499.56	4498.81	4500.68
E01-B	N 33° 43' 16.90432"	W 106° 54' 42.99812"	4499.84	4498.81	4500.68
E02-A	N 33° 43' 14.96478"	W 106° 54' 41.70178"	4499.44	4498.26	4500.28
E02-B	N 33° 43' 14.96136"	W 106° 54' 41.70077"	4499.67	4498.26	4500.28
E03-A	N 33° 43' 07.90537"	W 106° 54' 37.13864"	4497.09	4495.48	4497.32
E03-B	N 33° 43' 07.90945"	W 106° 54' 37.13944"	4496.79	4495.48	4497.32

Geodetic Coordinates (Latitude and Longitude) are based on NAD 83 Horizontal Datum and Elevations are NGVD 88 Datum Values.

TABLE 7.
Middle Rio Grande Watershed Study,
San Marcial Survey Data

SAN MARCIAL (SMC) - MONITORING WELLS (PVC PIPES)

Well No.	Latitude	Longitude	PVC Pipe ELEV.	Concrete ELEV.	Casing ELEV.
W01-A	N 33° 41' 06.09143"	W 107° 00' 08.91565"	4469.28	4468.71	4470.42
W01-B	N 33° 41' 06.09489"	W 107° 00' 08.91714"	4469.68	4468.71	4470.42
W02-A	N 33° 40' 55.25087"	W 107° 00' 03.83086"	4472.49	4471.29	4473.44
W03-A	N 33° 40' 54.12814"	W 107° 00' 01.08614"	4474.44	4473.72	4475.23
W03-B	N 33° 40' 54.12888"	W 107° 00' 01.08175"	4474.31	4473.72	4475.23
W04-A	N 33° 40' 53.03519"	W 106° 59' 59.51005"	4471.49	4470.91	4472.49
W04-B	N 33° 40' 53.03814"	W 106° 59' 59.51256"	4471.62	4470.91	4472.49
W05-A	N 33° 40' 46.13085"	W 106° 59' 52.26070"	4478.14	4476.65	4478.96
W05-B	N 33° 40' 46.13221"	W 106° 59' 52.25475"	4478.22	4476.65	4478.96
W06-A	N 33° 40' 45.24915"	W 106° 59' 51.07910"	4477.48	4477.05	4478.95
W06-B	N 33° 40' 45.24701"	W 106° 59' 51.08126"	4477.60	4477.05	4478.95
W07-A	N 33° 40' 45.87865"	W 106° 59' 51.88124"	4478.07	4476.63	4478.71
W07-B	N 33° 40' 45.87895"	W 106° 59' 51.88571"	4478.27	4476.63	4478.71
W07-C	N 33° 40' 45.85440"	W 106° 59' 51.92906"	4478.01	4476.80	4478.96
W08-EX	N 33° 40' 45.84017"	W 106° 59' 51.81962"	4478.42	4476.79	4479.25
W09-A	N 33° 40' 45.73792"	W 106° 59' 51.74478"	4478.11	4476.57	4478.75
W09-B	N 33° 40' 45.73968"	W 106° 59' 51.73996"	4478.12	4476.57	4478.75

Geodetic Coordinates (Latitude and Longitude) are based on NAD 83 Horizontal Datum and Elevations are NGVD 88 Datum Values.

TABLE 8.
Middle Rio Grande Watershed Study,
South of Fort Craig Survey Data

SOUTH OF FORT CRAIG (SFC) - MONITORING WELLS (PVC PIPES)

Well No.	Latitude	Longitude	PVC Pipe ELEV.	Concrete ELEV.	Casing ELEV.
W01-A	N 33° 37' 02.17090"	W 107° 01' 39.07426"	4464.06	4462.68	4464.53
W01-B	N 33° 37' 02.16955"	W 107° 01' 39.07284"	4463.07	4462.68	4464.53
W02-A	N 33° 36' 51.26606"	W 107° 01' 19.76862"	4458.48	4457.58	4459.44
W02-B	N 33° 36' 51.26364"	W 107° 01' 19.77151"	4458.42	4457.58	4459.44
W03-A	N 33° 36' 47.20817"	W 107° 01' 08.78307"	4458.72	4458.08	4459.92
W03-B	N 33° 36' 47.20516"	W 107° 01' 08.78304"	4458.44	4458.08	4459.92
W04-A	N 33° 36' 45.28145"	W 107° 01' 05.07666"	4457.82	4456.64	4458.89
W04-B	N 33° 36' 45.28196"	W 107° 01' 05.07819"	4457.92	4456.64	4458.89
W04-C	N 33° 36' 45.27439"	W 107° 01' 05.00126"	4458.05	4456.88	4458.95
W05-A	N 33° 36' 44.58968"	W 107° 01' 03.37437"	4458.03	4457.17	4459.23
W05-B	N 33° 36' 44.59170"	W 107° 01' 03.38040"	4458.37	4457.17	4459.23
W06-A	N 33° 36' 43.33635"	W 107° 01' 01.19555"	4467.78	(Ground) 4464.94	4468.59

Geodetic Coordinates (Latitude and Longitude) are based on NAD 83 Horizontal Datum and Elevations are NGVD 88 Datum Values.

TABLE 9.
Middle Rio Grande Watershed Study,
Staff Gage Survey Data

STAFF GAGES

Staff Gage No.	Latitude	Longitude	6 Ft. (3 Ft.) Mark Elevation	Flowline Elevation
SAC SG01	N 34º 14' 43.97556"	W 106º 54' 02.68179"	4653.72	4646.70
SAC SG02	N 34º 14' 44.20205"	W 106º 53' 56.69766"	4657.63	4649.69
SAC SG03	N 34º 14' 52.75769"	W 106º 54' 36.95378"	4659.79	4652.52
ESC SG01	N 34º 07' 13.08266"	W 106º 53' 20.16842"	4610.55	4603.74
ESC SG02	N 34º 07' 13.09886"	W 106º 53' 14.00248"	4614.81	4608.07
ESC SG03	N 34º 07' 14.02766"	W 106º 53' 01.92003"	4608.16 (3 Ft. Mark)	4604.43
BRN SG01	N 34º 00' 01.94406"	W 106º 52' 18.13989"	4564.47	4557.76
BRN SG02	N 34º 00' 37.85875"	W 106º 52' 01.90909"	4578.76	4573.29
BRN SG03	Not Found			
BRN SG04	N 34º 00' 11.21637"	W 106º 52' 24.22358"	4575.62 (3 Ft. Mark)	4572.74
HWY SG01	N 33º 55' 27.95113"	W 106º 51' 10.25045"	4543.98	4537.02
HWY SG02	N 33º 55' 27.41276"	W 106º 51' 03.97547"	4554.20	4546.30
HWY SG03	N 33º 55' 33.83092"	W 106º 51' 28.59657"	4547.53	4540.23
NBB SG01	N 33º 52' 23.04770"	W 106º 51' 03.10065"	4534.59	4527.98
NBB SG02	N 33º 52' 21.44480"	W 106º 50' 57.61193"	4540.17	4534.59
NBB SG03	Not Found			
SBB SG01	N 33º 43' 23.39672"	W 106º 54' 53.83789"	4483.17	4475.21
SBB SG02	Not Found			
SMC SG01	N 33º 40' 53.33618"	W 107º 00' 00.11143"	4468.51	4462.11
SMC SG02	N 33º 40' 44.41148"	W 106º 59' 50.00719"	4481.40	4473.74
SFC SG01	N 33º 36' 44.41995"	W 107º 01' 04.66636"	4459.53	4453.21
SFC SG02	N 33º 36' 42.91010"	W 107º 00' 59.86990"	4467.81	4461.32

Geodetic Coordinates (Latitude and Longitude) are based on NAD 83 Horizontal Datum and Elevations are NGVD 88 Datum Values.

TABLE 10
Middle Rio Grande Watershed Study
Summary of Unsaturated Soil Samples Hydraulic Properties

Well ID (Sample Depth)	**Soil Type**	**Porosity, n (% vol)**	**Saturation (% vol)**	**K_{sat} (cm/sec)**	**Unsaturated Hydraulic Properties**			
					a (cm^{-1})	**N**	**q_r**	**q_s**
SAC-W09C (23.5-24)	CL	42.6	90.1	1.3E-07	0.0009	1.7252	0.0477	0.4135
BRN-E04AB (4.5-5)	SM/CH	41.1	95.4	1.3E-07	0.0007	1.3076	0.0000	0.3901
HWY-W07C (29-29.5)	CL	47.5	58.3	1.9E-07	0.0008	1.6706	0.0689	0.4582
SBB-W04AB (14-14.5)	CL	52.1	92	2.4E-08	0.0007	1.2504	0.0000	0.4941
SMC-W07C (6-6.5)	CL/SM	44	97.2	1.1E-06	0.0114	1.2201	0.0000	0.4448

K_{sat} = saturated hydraulic conductivity (cm/sec)

α = fitting parameter for soil-water retention curve (cm^{-1}) [van Genuchten, 1980]

N = fitting parameter for soil-water retention curve [van Genuchten, 1980]

θ_r = residual water content

θ_s = saturated water content

SUMMARY OF LAI ORATORY TEST DATA

Test Hole	Depth (feet)	Unified Classification	Atterberg Limits		SIEVE ANALYSIS-% PASSING BY WEIGHT										Description
			LL	PI	1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200	
ESC-E04BC	8.5-10	SM					100	98	98	97	95	75	39	30.9	
ESC-E04BC	18.5-20	SP					100	99	98	98	90	42	9	2.6	
ESC-E04BC	28.5-30	SP g			100	95	84	78	72	67	56	24	7	4.4	
ESC-E04BC	38.5-40	SP g			100	89	79	64	47	32	18	9	5	3.6	
ESC-E04BC	48.5-50	SP g				100	95	90	85	77	59	30	9	3.8	
ESC-E04BC	53.5-55	SP-SM				100	96	94	91	88	77	53	20	4.9	
ESC-E04BC	58.5-60	SP g			100	83	71	59	49	41	32	13	5	3.4	
ESC-E04BC	68.5-70	GP s			100	69	56	44	35	30	22	10	4	2.4	
ESC-E04BC	78.5-80	GP s			100	90	64	45	32	25	20	11	6	3.7	
ESC-E04BC	86-86.5	SP-SM			100	88	88	87	85	83	68	37	17	8.3	

Project Number : 02-2-586
Project : SSP 771-3

Table No. : 1

SUMMARY OF LABORATORY TEST DATA

Test Hole	Depth (feet)	Unified Classification	Natural Moisture Content (%)	Atterberg Limits		SIEVE ANALYSIS-% PASSING BY WEIGHT										Description
				LL	PI	1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200	
SACW09BC	7.5-9	SP-SM	1.7	NV	NP							100	95	48	10.3	
SACW09BC	17.5-19	SM	5.3	NV	NP							100	99	86	37.7	
SACW09BC	24-25.5	SP	20.4	NV	NP		100	99	98	98	98	98	78	9	2.7	
SACW09BC	34-35.5	SP	16.4	NV	NP	100	97	97	96	93	89	76	42	13	5.6	
SACW09BC	41-42.5	SP	14.1	NV	NP		100	93	86	79	72	59	28	11	6.2	
SACW09BC	56-57.5	SP	17.6	NV	NP	100	97	94	90	87	84	76	40	11	5.5	
SACW09BC	66-67.5	SP	19.6	NV	NP	100	97	94	90	88	86	80	39	8	3.4	
SACW09BC	88-89	GP s	8.4	NV	NP	100	83	60	39	28	23	19	12	5	3.5	
SACW09BC	22.5-24	ML		61	34											

NV= not a valid value, NP= Non plastic.

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Table No. : 1

SUMMARY OF LAB ORATORY TEST DATA

Test Hole	Depth (feet)	Unified Classification	Atterberg Limits		SIEVE ANALYSIS-% PASSING BY WEIGHT									Description
			LL	PI	1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200	
SACW09BC	96-97.5	SW-SM				100	96	93	84	72	52	27	15	10.5	
SACW09BC	98-5.100	SW-SW g				100	88	72	60	46	32	21	13	9.7	
SACW09BC	108.5-110	SM				100	96	88	79	69	50	26	17	12.7	
SACW09BC	124-125.5	SM				100	96	90	81	68	52	33	17	12.0	
SFCW04	8.5-9.8	ML				100	100	100	100	99	99	99	98	78.2	
SFCW04	18.5-20	SM				100	100	100	100	100	100	95	38	11.9	
SFCW04	33.5-34.5	SP-SM			100	92	84	55	45	40	34	20	10	7.0	
SFCW04	43.5-45	SM				100	99	96	94	92	91	85	68	25	
SFCW04	48.5-52.5	GP-GM s			100	84	66	50	36	26	19	14	11	8.8	
SFCW04	58.5-60	GM s			100	71	58	49	40	33	28	21	16	14.3	
SFCW04	66-67.5	SM			100	97	96	92	90	83	58	25	16	13.0	
SFCW04	71-72.5	SM				100	97	95	94	89	68	32	17	12.8	
SFCW04	81-82	SW-SM				100	100	100	100	99	89	47	16	11.2	

NV= not a valid value, NP= Non plastic.

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Table No. : 1

SUMMARY OF LAB ORATORY TEST DATA

Test Hole	Depth (feet)	Unified Classification	Atterberg Limits		SIEVE ANALYSIS-% PASSING BY WEIGHT										Description
			LL	PI	1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200	
HWY-W07BC	13.5-15	SP				100	99	97	94	88	68	27	6	3.1	
HWY-W07BC	23.5-25	SP						100	99	98	87	37	8	3.6	
HWY-W07BC	36-37.5	SP				100	96	92	86	79	63	32	12	3.4	
HWY-W07BC	43.5-45	SP				100	97	96	94	91	80	49	11	3.9	
HWY-W07BC	48.5-50	SP g			100	96	85	76	69	66	58	24	7	4.3	
HWY-W07BC	53.5-55	SP				100	99	94	90	83	63	22	8	3.6	
HWY-W07BC	58.5-60	SP						100	99	98	96	64	11	4.3	
HWY-W07BC	63.5-65	SP g			100	94	80	63	54	47	35	15	6	3.3	
HWY-W07BC	73.5-75	SP					100	98	73	28	6	2	1	0.1	
HWY-W07BC	bottom of auger	GP			100	96	48	14	6	4	3	2	2	1.2	

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Project : SSP 771-3

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SUMMARY OF LAL ORATORY TEST DATA

Test Hole	Depth (feet)	Unified Classification	Atterberg Limits		SIEVE ANALYSIS-% PASSING BY WEIGHT										Description
			LL	PI	1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200	
BRN-E01	6-7.5	SW-SM			100	100	100	100	100	100	100	97	46	7.7	
BRN-E01	21-22.5	SP			100	100	98	92	81	69	50	25	5	2.2	
BRN-E01	28.5-320	SP			100	100	99	98	98	98	95	68	11	2.1	
BRN-E01	38.5-40	SW-SM			100	100	100	100	100	100	99	88	25	5.8	
BRN-E01	46-47.5	SP-SM			100	100	100	99	99	98	94	63	15	5.6	
BRN-E01	48.5-50	SP-SM			100	100	94	91	87	77	26	9	5	4.5	
BRN-E01	56-57.5	CL	32	9	100	100	100	100	99	98	98	93	88	85.5	
BRN-E01	61-62.5	SP-SM			100	100	100	100	100	100	100	96	19	5.8	
BRN-E01	71-71.7	SP			100	100	100	100	99	94	71	14	3	2.4	
BRN-E01	81-82.5	GP s			100	80	66	51	41	33	23	12	7	4.4	
BRN-E01	83.5-84.5	SP			100	100	100	99	98	96	85	48	14	8.5	

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SUMMARY OF LABORATORY TEST DATA

Test Hole	Depth (feet)	Unified Classification	Atterberg Limits		SIEVE ANALYSIS-% PASSING BY WEIGHT										Description
			LL	PI	1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200	
SMC-W07	0-2.5	SP								100	99	89	12	2.8	
SMC-W07	13.5-15	ML										100	92	59.8	
SMC-W07	21-22.5	SM										100	98	47.1	
SMC-W07	28.5-29.3	CL	41	21					100	99	98	91	82	76.0	
SMC-W07	33.5-35	SP-SM								100	99	82	23	8.8	
SMC-W07	38.5-40	SP g			100	76	71	64	57	53	44	16	5	2.8	
SMC-W07	43.5-45	SP				100	98	95	92	90	81	37	6	3.2	
SMC-W07	53.5-50	SP g			100	96	83	72	61	54	48	34	14	7.0	
SMC-W07	58.5-60	SW g			100	95	76	57	43	36	32	22	7	3.9	
SMC-W07	73.5-75	SP g				100	89	81	74	69	62	37	10	5.2	
SMC-W07	76-77.5	SP				100	99	99	99	97	75	26	10	6.7	

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SUMMARY OF LABORATORY TEST DATA

Test Hole	Depth (feet)	Unified Classification	Atterberg Limits		SIEVE ANALYSIS-% PASSING BY WEIGHT									Description
			LL	PI	1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200	
SBB-W03	11-12.5	SM									100	99	61	23.1	
SBB-W03	21-22.5	SP					100	99	98	97	92	54	13	5.1	
SBB-W03	28.5-30	SW					100	98	97	97	94	63	11	4.4	
SBB-W03	41-42.5	SW									100	82	14	4.7	
SBB-W03	46-47.5	SP-SM								100	98	83	29	10.3	
SBB-W03	53.5-55	SP-SM								100	98	75	19	5.8	
SBB-W03	61-62.5	SP			100	93	92	89	88	87	84	70	15	4.3	
SBB-W03	71-72.5	SP g			100	84	70	60	53	50	45	31	9	4.6	
SBB-W03	81-82.5	GP s			100	72	62	50	40	34	28	19	13	11.9	
SBB-W03	91-92.5	SP-SM g			100	85	73	64	58	54	48	33	19	9.8	

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APPENDIX A

Geologic Logs and Well Construction Diagrams

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

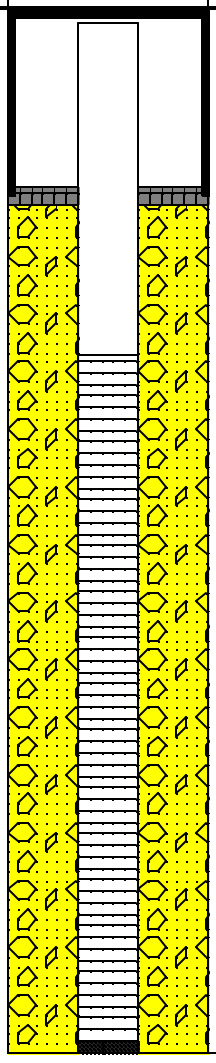
BORING NO. : SAC-E01A

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** Detech
PROJECT NUMBER: 771-3	**CREW LEADER:** John MaClure
LOCATION: San Acacia Transect	**RIG TYPE:** Geoprobe 54DT
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** Geologic resistivity
START DATE: 4/16/2003	**WELL ELEVATION:** 4661.53 ft.
FINISH DATE: 4/16/2003	**GROUND ELEVATION:** 4658.31 ft.

NOTES: Borehole Diameter: 2.125 in.-direct push

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM A	WELL CONSTRUCTION
0							Locking protective casing 1 in. ID sch 40 PVC riser Concrete collar Natural backfill/collapse 1 in. ID sch 40 PVC screen, 0.010 in. slots Borehole TD: 18.75 ft. End cap
5							
10							
15							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-E01B

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** Detech
PROJECT NUMBER: 771-3	**CREW LEADER:** John MaClure
LOCATION: San Acacia Transect	**RIG TYPE:** Geoprobe 54DT
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** Geologic/Resistivity
START DATE: 4/16/03	**WELL ELEVATION:** 4661.16 ft.
FINISH DATE: 4/16/03	**GROUND ELEVATION:** 4658.28 ft.

NOTES: Borehole Diameter: 2.125 in.-direct push

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B	WELL CONSTRUCTION
0							Locking protective casing 1 in. ID sch 40 PVC riser Concrete collar Natural backfill/collapse
5							
10							
15							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-E01B

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B	WELL CONSTRUCTION
20							
25							
30							
35							
40							
45							1 in. ID sch 40 PVC screen, 0.010 in. slots
							Borehole TD: 50.8 ft.
50							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-E02A

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grand Watershed Study Phase 1	**DRILLING FIRM:** Detech
PROJECT NUMBER: 771-3	**CREW LEADER:** John MaClure
LOCATION: San Acacia Transect	**RIG TYPE:** Geoprobe 54DT
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** Geologic/Resistivity
START DATE: 4/16/2003	**WELL ELEVATION:** 4666.48 ft.
FINISH DATE: 4/16/2003	**GROUND ELEVATION:** 4663.70 ft.

NOTES: Borehole Diameter: 2.125 in.-direct push

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM A	WELL CONSTRUCTION
0							Locking protective casing 1 in. ID sch 40 PVC riser Concrete collar Natural backfill/collapse
5							1 in. ID sch 40 PVC screen, 0.010 in. slots
10							
15							
20							Borehole TD: 21.5 ft. End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-E03A

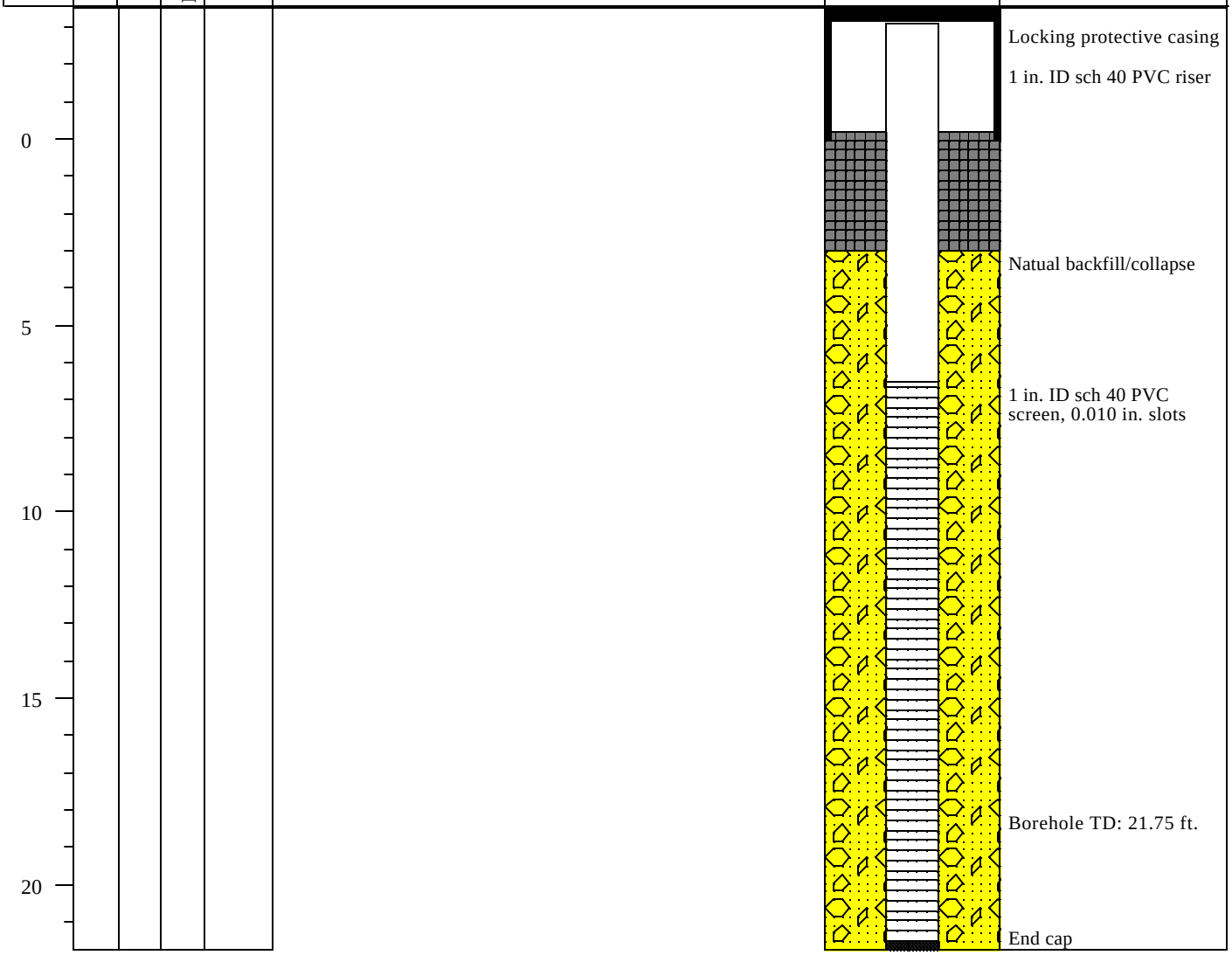
PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grand Watershed Study Phase 1	**DRILLING FIRM:** Detech
PROJECT NUMBER: 771-3	**CREW LEADER:** John MaClure
LOCATION: San Acacia Transect	**RIG TYPE:** Geoprobe 54DT
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** Geologic/Resistivity
START DATE: 4/16/2003	**WELL ELEVATION:** 4667.34 ft.
FINISH DATE: 4/16/2003	**GROUND ELEVATION:** 4664.57 ft.

NOTES: Borehole Diameter: 2.125 in.-direct push

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM A	WELL CONSTRUCTION



S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-E03B

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** Detech
PROJECT NUMBER: 771-3	**CREW LEADER:** John MaClure
LOCATION: San Acacia Transect	**RIG TYPE:** Geoprobe 54DT
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** Geologic/Resistivity
START DATE: 4/16/2003	**WELL ELEVATION:** 4667.30 ft.
FINISH DATE: 4/16/2003	**GROUND ELEVATION:** 4664.53 ft.

NOTES: Borehole Diameter: 2.125 in.-direct push

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B	WELL CONSTRUCTION
0							Locking protective casing 1 in. ID sch 40 PVC riser Concrete collar
5							Natural backfill/collapse
10							
15							
20							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-E03B

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B	WELL CONSTRUCTION
25							
30							
35							
40							
45							
50							1 in. ID sch 40 PVC screen, 0.010 in. slots
55							Borehole TD: 56 ft. End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W01AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Acacia Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** Split Spoon
START DATE: 11/11/2002	**WELL ELEVATION:**
FINISH DATE: 1/7/2003	**GROUND ELEVATION:**

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0					SAND, f., brownish yellow (10YR6/6), rounded-subrounded, quartz and feldspar, dry (SP)		Locking protective casing; 2 in. ID sch 40 PVC riser; Bentonite chips
5	1	4	1.5		As above, yellowish brown (10YR5/4), some silt in basal 0.1 ft., v. moist (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
▼					CLAY, no sand, olive (5YR4/4), firm (CL)		
	2	9	1.4		SAND, f., wet, (SP)		Natural backfill/collapse
					SAND, m., some f. sand, rounded-subrounded, quartz and feldspar, 90/10 quartz/other (SP)		
10	3	11	1		SAND, f.-v.f., few m. sand, tr. c. sand, no fines, dk. yellowish brown (10YR4/4), firm (SP)		
	4	9	1.0		SAND, m., some f. sand, few c. sand and gravel, dk. grayish brown (10YR4/2), soft (SW)		
					SAND, v.f., and SILT, brown (10YR4/3), firm (SP)		
					SAND, f.-m., (SP)		
	5	9	1		SAND, m., tr. f. sand, ltl. c. sand, tr. gravel, subangular-rounded, quartz, lithic and mafic, 60/40 quartz/other, c. fraction is		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W01AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
15	5	9	1		carbonates, quartz, quartzite, granite and some volcanics (SP)		
	6	16	0.9		SAND, f.-m., tr. c. sand, and no gravel, dk. grayish brown to v. dk. grayish brown (10YR4/2-3/2), lithology as above (SP)		End cap
	7	22	0.8		SAND, f.-c., f. gravel, tr. c. gravel, few fines, lithology as above (SW)		Bentonite pellets
20	8	22	0.2		GRAVEL, broken cobble pieces, quartzite, redish f. grain volcanics, weathering to clay (GP)		
	9	42	1		CLAYSTONE, pale olive to olive (5YR6/4-5/4) (CL) Top 0.8 ft suspected sluff of f.-m. sand. CLAY, hard, dry, pale olive to olive (5YR6/4-5/4) (CL)		
25	10	34	1.5		SAND, f., some silt/clay, lt. yellowish brown to brownish yellow (10YR6/4-6/6), firm (SW) SAND, c., GRAVEL, f., loose, (SP-GP)		Natural backfill/collapse
	11	55	1.3		SAND, f., ltl. m. sand, yellowish brown (10YR5/4), firm, few fines (SP) SAND, f.-m., ltl. c. sand, 1 piece of quartzite gravel, few fines, rounded-subrounded quarzt, feldspar, lithic and mafics, 90/10 quartz/other; c. fraction is carbonate, quartzite, granite and volcanics (SP)		
30	12	62	1.1		SAND, f.-v.f., brown to yellowish brown (10YR5/3-5/4), few fines, firm (SP) SAND, m., few f. and c. sand, brown to yellowish brown (10YR5/3-5/4), lithology as above, layer of c. sand and f. gravel 33.7-33.8 ft. (SP)		
	13	66	1.3		As above, (SP)		Bentonite pellets
35	14	52	1.4		As above, (SP)		20-40 Silica sand pack

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W01AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
					SAND, f., f., gravel at base, few m. sand at top (SP)		
	15	60	1.4		SAND, f.-m., few fines, f.-c. sand in upper 0.3 ft., brown (10YR5/3), quartz feldspar, lithic/mafic, 80/20 quartz/other, soft (SP)		
40							
	16	48	1.1		As above, few c. sand, tr. f. gravel (SP)		
	17	65	1.2		As above, pieces of red clay, olive brown (2.5YR4/9), v. firm, big piece of clay in bottom 0.3 ft of drive shoe (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
45							
	18	48	1.3		As above, no clay (SP)		Borehole TD: 50 ft.
	19	85	0.3		As above, no clay (SP)		End cap
50							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W02AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Acacia Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** NA
START DATE: 1/10/2003	**WELL ELEVATION:** A: 4677.58 ft. B: 4677.74 ft.
FINISH DATE: 1/10/2003	**GROUND ELEVATION:** 4677.10 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
0					Not sampled. See log of SAC-W09C for lithology.		Locking protective casing; 2 in. ID sch 40 PVC riser; Cement Bentonite grout
5							
10							
15							Bentonite slurry; Natural backfill/collapse
20							2 in. ID sch 40 PVC screen, 0.010 in. slots

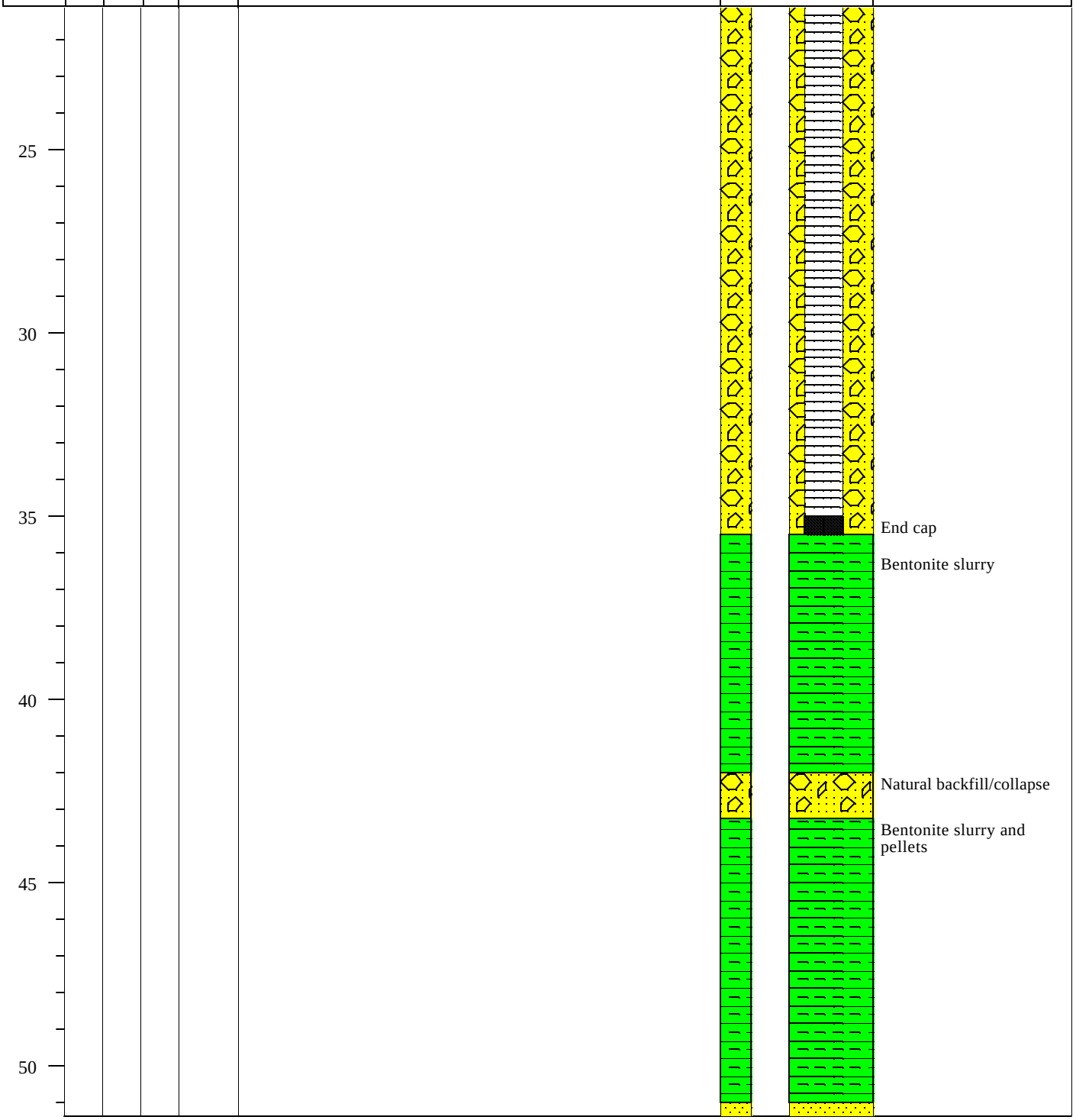
S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W02AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION

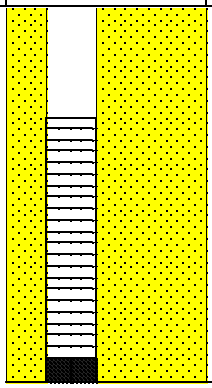


S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W02AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
55							20-40 Silica sand pack 2 in. ID sch 40 PVC screen, 0.010 in. slots Borehole TD: 59 ft. End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W03AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Acacia Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** Split Spoon
START DATE: 11/12/2002	**WELL ELEVATION:** A: 4664.18 ft. B: 4664.15 ft.
FINISH DATE: 1/7/2003	**GROUND ELEVATION:** 4663.34 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0					SAND/SILT, f.-v.f sand, balls of clay in cuttings, dk. yellowish brown (10YR4/4-4/6), loose, dry (SM)		Locking protective casing; 2 in. ID sch 40 PVC riser; Bentonite chips; 20-40 Silica sand pack; 2 in. ID sch 40 PVC screen, 0.010 in. slots
5	1	5	1.5		SAND, f.-v.f., moist and soft (SP); CLAY, no sand, v. hard, dk. yellowish brown (10YR4/4), high plasticity, high toughness, no dilatancy, high dry strength (CH); SAND, f., ltl.-some fines yellowish brown (10YR5/6), soft, moist (SP)		
	2	8	1.5		CLAY, ltl. f. sand, brown (10YR4/3), firm (CL); SAND, f.-v.f., clay in basal 0.1 ft., yellowish brown (10YR5/4), soft, moist, (SP)		
10 ▼	3	6	1.5		CLAY, ltl. f. sand, firm, v. dk. gray (10YR3/1) (CL); SAND, f., some clay, soft (SP); CLAY, no sand, dk. yellowish brown (10YR4/4), firm-hard (CL); SILT, dk. yellowish brown (10YR4/4), wet (ML)		
	4	12	1.2		SAND, f.-v.f., and silt, (some clay?), firm, yellowish brown (10YR5/4), moist (SM); CLAY, firm, v. dk. grayish brown (10YR3/2), organic material, slight motteling (CL); SAND, f.-v.f, ltl. fines, yellowish brown (10YR5/4), subrounded-rounded, quartz and feldspar, 80/20 quartz/other (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W03AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B	WELL DIAGRAM A	WELL CONSTRUCTION
15	5	10	1.8		CLAY, scraped off augers (CL)			
					SAND, m., ltl. f. sand, few c. sand, tr. f. gravel, dk. grayish brown (10YR4/2), f.-m. sand is rounded-subrounded, quartz, feldspar and lithic/mafic. c. sand is volcanics, calcite cemented sandstone, quartzite, and granite (SP)			
	6	11	1		SAND, f.-c., f. GRAVEL, tr. fines, dk grayish brown (10YR4/2), lithology as above (SW-GW)			
	7	18	0.9		SAND, f.-m., tr. c. sand, no gravel, tr. fines, dk. grayish brown to v. dk. grayish brown (10YR4/2-3/2), firm, lithology as above (SP)			End cap
20								Bentonite slurry and pellets
	8	16			As above, (SP)			Natural backfill/collapse
	9	18	1.0		SAND, m., few f. sand, ltl. c. sand and f. gravel, dk. grayish brown (10YR4/2), lithology as above, 70/30 quartz/other (SP)			
25								
	10	20	0.8		SAND, f., 6 f. gravel pieces in bottom 0.1 ft., faint layering with some m. sand in basal 0.4 ft., dk. grayish brown (10YR4/2) (SP)			
					As above, (SP)			
	11	13	1.1		SAND, m., ltl. f. sand, few c. sand and f. gravel, lithology as above (SP)			
30								
	2	14	1.1		SAND, f., ltl. c. sand in upper 0.3 ft., m. sand in basal 0.2 ft. (SP)			
	13	40	0.6		SAND, f.-c., GRAVEL, f.-c., 1 piece of clay along side of sampler, lithology as above (SW-GW)			
35								

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W03AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	14	13	0.6		As above, (SW-GW)		Bentonite slurry
	15	11	0.5		As above, v. loose (SW-GW)		
40							
	16	18	1.0		SAND, f., few m. sand, tr. c. sand, tr. fines, dk. grayish brown (10YR4/2), firm, lithology as above, 70/30 quartz/other, (SP)		Natural backfill/collapse
	17	18	1.8		CLAY, no sand, soft, black (10YR2/1), organic matter, charcoal (CH)		
					SAND, f.-c., as above (SW)		
45							2 in. ID sch 40 PVC screen, 0.010 in. slots
	18	14	1.1		SAND, f.-m., few c. sand, tr. fines, lithology as above, 60/40 quartz other (SP)		Borehole TD: 51 ft.
	19	32			GRAVEL, f., minimal recovery (GP)		
50							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W04AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Acacia Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** Split Spoon
START DATE: 11/12/2002	**WELL ELEVATION:** A: 4662.69 ft. B: 4662.36 ft.
FINISH DATE: 1/2/2003	**GROUND ELEVATION:** 4662.36 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0							Locking protective casing; 2 in. ID sch 40 PVC riser
					SAND, f., tr. m. sand, few fines, dk. yellowish brown (10YR4/4) (SP)		Bentonite chips
							20-40 Silica sand pack
	1	4	1		SILT, some f. sand, dk. yellowish brown (10YR4/4), soft (SM)		2 in. ID sch. 40 PVC screen, 0.010 in. slots
5							
					SAND, f., clean, lt. yellowish brown (10YR6/4) (SP)		
	2	4	1.4		SILT, as above, (SM)		
					SAND, f.-v.f., some fines, lt. yellowish brown (10YR6/4), (SP) interbedded with clay, ltl. f. sand, iron oxide stains and charcoal layers (CL)		
▼	3	5	1.5		As above (CL)		
10					SILT, some f. sand, lt. yellowish brown (10YR6/4), rapid dilatancy, no plasticity, wet (ML)		
					CLAY, organic matter, dk. brown (10YR3/3), iron oxide staining (CL)		
	4	7	2.2		CLAY, few f. sand, dk. yellowish brown (10YR4/4), firm (CL)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W04AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
15	5	9	1.2		SAND, f.-m., tr. c. sand, no fines, yellowish brown (10YR5/4), soft, moist (SP)		
	6	12	0.8		SAND, f.-m., few c. sand, tr. f. gravel, dk. gray to v. dk. grayish brown (10YR4/1-3/2), charcoal, black staining, rounded-subrounded, quartz, feldspar, lithic and mafic, 70/30 quartz/other, c. fraction is volcanic, carbonate, quartzite and granite (SP)		
					As above, (SP)		
					SAND, f.-c., ltl. fines, 2 pieces of c. gravel/cobble pieces, quartzite, and a dense pale green sandstone (SW)		End cap
20	7	10	0.9		SAND, f.-m., ltl.-some c. sand, few f. gravel, tr.-few fines, dk. grayish brown (10YR4/2), lithology as above, soft (SP)		
	8	15	0.7		As above, 1 c. gravel piece (SP)		Bentonite pellets
	9	16	1		As above, f. sand, at bottom, c. sand and gravel at top, loose (SP)		20-40 Silica sand pack
25	10	16	0.9		SAND, f., ltl.-some m. sand, tr. c. sand, no fines, dk. gray to v. dk. grayish brown (10YR4/1-3/2), rounded-subrounded grains, quartz/feldspar, gravel pieces are quartzite and granite (SP)		
							Natural backfill/collapse
	11	9	1.1		SAND, f.-c., few f. gravel, c. fraction is carbonate, granite, quartzite and volcanics (SW)		
30							
	12	17	1.0		SAND, f., ltl. m. sand, tr. c. sand, dk. grayish brown (10YR4/2), tr. fines, lithology as above, soft (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W04AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	13	19	0.8		SAND, f.-c., f.-c. gravel, ltl. fines, soft, lithology as above (SW-GW)		Bentonite slurry
35							
	14	15	0.2		As above, loose in sampler (SW-GW)		
							Natural backfill/collapse
	15	17	1.1		As above, few f.-c. gravel (SW)		
40							
	16	20	1.0		SAND, f.-m., ltl. c. sand, few f. gravel, dk. grayish brown (10YR4/2), soft, lithology as above, silt and sand are clacite cemented (SP)		
					As above, (SP)		
	17	21	1.1		CLAY, no sand, (10YR3/1), plastic, charcoal (CL)		
					SAND, f., with clay matrix, dk. gray (10YR4/1), several gravel size pieces also appear to be weathering, sandy limestone (SP)		2 in. ID sch. 40 PVC screen, 0.010 in. slots
45							
	18	18			SAND, f., few m. sand, tr. c. sand, tr. f. gravel, dk. grayish brown (10YR4/2), soft (SP)		Borehole TD=49.5
	19	9	0.8		SAND, f.-c., few f. gravel, lithology as above, 60/40 quartz/other (SW)		End cap
50							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W05AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Acacia Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** Split Spoon
START DATE: 11/13/2002	**WELL ELEVATION:** A: 4664.37 ft. B: 4664.15 ft.
FINISH DATE: 1/21/2003	**GROUND ELEVATION:** 4663.35 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0							2 in. ID sch 40 PVC riser
					SAND, f., few fines, dk. yellowish brown (10YR4/4) (SP)		Bentonite chips
					As above, loose (SP)		20-40 Silica sand pack
	1	12	0.5		As above, lt. yellowish brown (10YR6/4), loose, balls of clay (SP)		
5							
					CLAY, ltl. f. sand, dk. yellowish brown (10YR4/6), firm, dry (CL)		
	2	13	1.5		SAND, f., loose, dry, rounded-subrounded, quartz and feldspar 90/10 quartz/other (SP)		2 in. ID Sch 40 PVC screen, 0.010 in. slots
					CLAY, ltl. f. sand, iron oxide staining, lt. yellowish brown (10YR6/4), dry, hard (CL)		
					As above, some sand, soft-firm (CL)		
	3	6	1.8				
10					CLAY, no sand, dk. brown to dark yellowish brown (10YR3/3-3/4), iron oxide staining, charcoal, blocky texture, firm (CL)		
					As above, roots, moist (CL)		
	4	7	1.5		SAND, f., few m. sand, tr. c. sand, lt. yellowish brown to yellowish brown (10YR5/4-6/4), moist, soft (SP)		
▼							
	5	7	1.0		SAND, f.-v.f., tr. m. sand, tr. fines, wet, soft, lithology as above (SP)		
15							Natural backfill/collapse

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W05AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	6	15	1.3		As above, layer of clay, brown (10YR4/3), soft at 16.4-16.6 ft. (SP)		
					SAND, f.-m., few c. sand, 1 cs. gravel piece of red calcite, cemented siltstone (SP)		
	7	21	0.3		SAND/GRAVEL, f.-c., 1 piece of broken cobble size quartzite, c. fraction is red siltstone, quartzite, gray carbonate, fossil shells, dk. gray volcanics, angular-rounded (SW)		
20							
	8	14	0.6		As above, f. material may have washed out (SW)		End cap
	9	13	0.9		As above, interval of gray clay, dk. greenish gray (GLEY 1 4/N), charcoal, 0.4 ft. thick, has some structure, may be scraped off inside of augers (SW)		Bentonite pellets
25							Natural backfill/collapse
	10	25	1.1		SAND, f., dk. grayish brown (10YR4/2), rounded-subrounded, quartz, 80/20 quartz/other, 1 piece of angular c. gravel size black carbonate with crinoid stem and shell fragments (SP)		
	11	13	0.9		As above, few c. sand in bottom 0.1 ft, 1 broken-up cobble size piece of grayish carbonate, no fossils (SP)		
30							
	12	6	1.3		SAND, f.-m., few c., sand, ltl.-some clay, abundant wood and charcoal, black to v. dk. gray (10YR2/1-3/1) (SP)		
					SAND, f., and silt, v. dk. grayish brown (10YR3/2), soft (SP)		
	13	9	1.2		SAND, tr. m.-c., tr. fines, dk. grayish brown (10YR4/2), firm (SP)		
					As above, some m. sand, few c. sand, 2 f. gravel pieces (SP)		
35							
	14	17	1.0		SAND, f.-c., few f.-c. gravel, f.-m. sand in the basal 0.6 ft., c. fraction volcanic, quartzite, red siltstone, granite, no carbonate fragments (SW)		

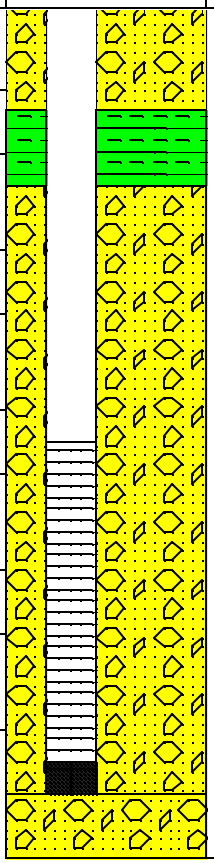
S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W05AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
	15	23			As above, (SW)
40					
	16	19	0.9		SAND, m., some f. sand, some c. sand at bottom, dk. grayish brown (10YR4/2), (SW)
	17	11			SAND, c., minimal recovery (SP)
45					
	18	18	0.2		SAND, f.-c., f. gravel, tr. fines, dk. grayish brown (10YR4/2), loose, lithology as above but with carbonates (SW)
					No Recovery
	19	19	0		
50					



WELL CONSTRUCTION

- Bentonite pellets and slurry
- Natural backfill/collapse
- 2 in. ID sch 40 PVC screen, 0.010 in. slots
- Borehole TD: 52 ft.
- End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

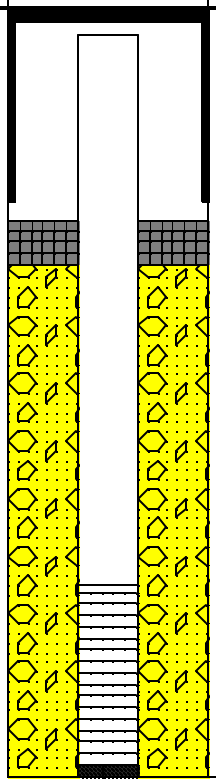
BORING NO. : SAC-W06A

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Acacia Transect	**RIG TYPE:** Manual Drive Point
ONSITE GEOLOGIST:	**SAMPLE TYPE:** NA
START DATE: 5/7/2003	**WELL ELEVATION:** 4658.30 ft.
FINISH DATE: 5/7/2003	**GROUND ELEVATION:** 4655.1 ft.

NOTES: Borehole Diameter: 2 inches

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM A	WELL CONSTRUCTION
0							Locking protective casing 1.5 in. Galvanized steel pipe riser Concrete collar Natural backfill/collapse
5							Wire wrap, stainless steel drive point well Borehole TD: 9.0 ft. End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W07A

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Acacia Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:**
START DATE: 1/14/2003	**WELL ELEVATION:** 4678.01 ft.
FINISH DATE: 1/14/2003	**GROUND ELEVATION:** 4677.46 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM A	WELL CONSTRUCTION
0					Not sampled. See log of SAC-W09C for lithology.		Locking protective casing; 2 in. ID sch 40 PVC riser; Cement Bentonite grout
5							
10							Natural backfill/collapse
15							Bentonite chips; 20-40 Silica sand pack
20							2 in. ID sch 40 PVC screen, 0.010 in. slots

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W07A

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM A	WELL CONSTRUCTION
25							
30							Borehole TD: 35 ft.
35							End cap Natural backfill/collapse

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W07B

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Acacia Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** NA
START DATE: 1/14/2003	**WELL ELEVATION:** 4678.16 ft.
FINISH DATE: 1/14/2003	**GROUND ELEVATION:** 4677.46 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B	WELL CONSTRUCTION
0					Not sampled. See log of SAC-W09C for lithology.		Locking protective casing 2 in. ID sch 40 PVC riser Cement bentonite grout
5							
10							Natural backfill/collapse
15							
20							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W07B

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

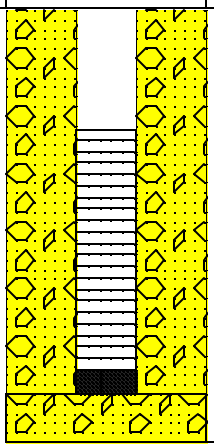
DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B	WELL CONSTRUCTION
25							
30							
35							
40							
45							Slurry and Bentonite pellets
50							Natural backfill/collapse

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W07B

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B	WELL CONSTRUCTION
55							2 in. ID sch 40 PVC screen, 0.010 in. slots Borehole TD: 60 ft. End cap
60							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W08EX

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** WDC Exploration
PROJECT NUMBER: 771-3	**CREW LEADER:** Mike Thomas
LOCATION: San Acacia Transect	**RIG TYPE:** Speedstar 30K
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** NA
START DATE: 4/18/2003	**WELL ELEVATION:** 4678.75 ft.
FINISH DATE: 4/18/2003	**GROUND ELEVATION:** 4677.31 ft.

NOTES: Borehole Diameter: 13.875 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM EX	WELL CONSTRUCTION
0					Not sampled. See log of SAC-W09C for lithology.		10 in. ID sch 40 PVC riser Cement Bentonite grout
5							
10							
15							
20							

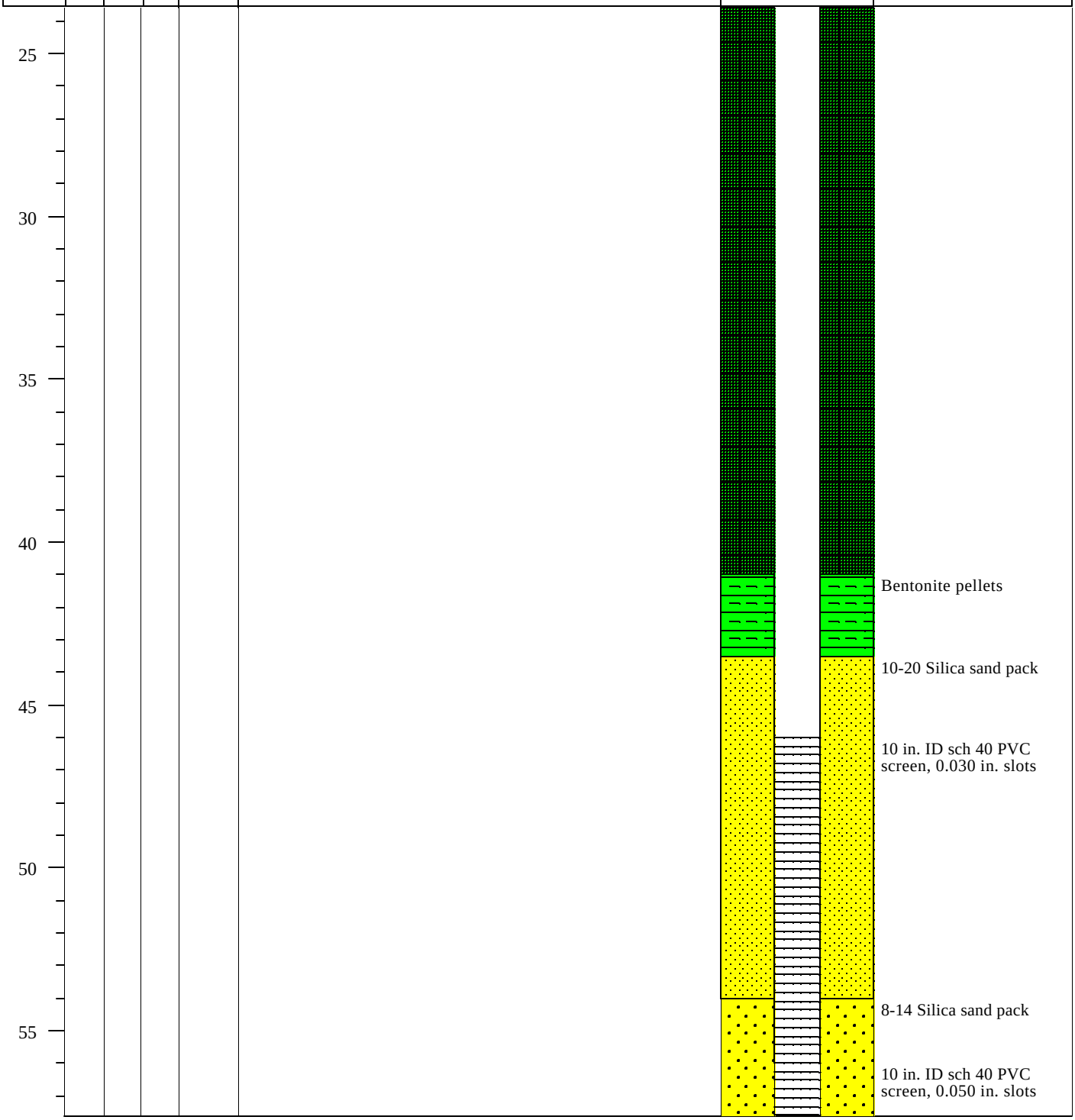
S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W08EX

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM EX	WELL CONSTRUCTION



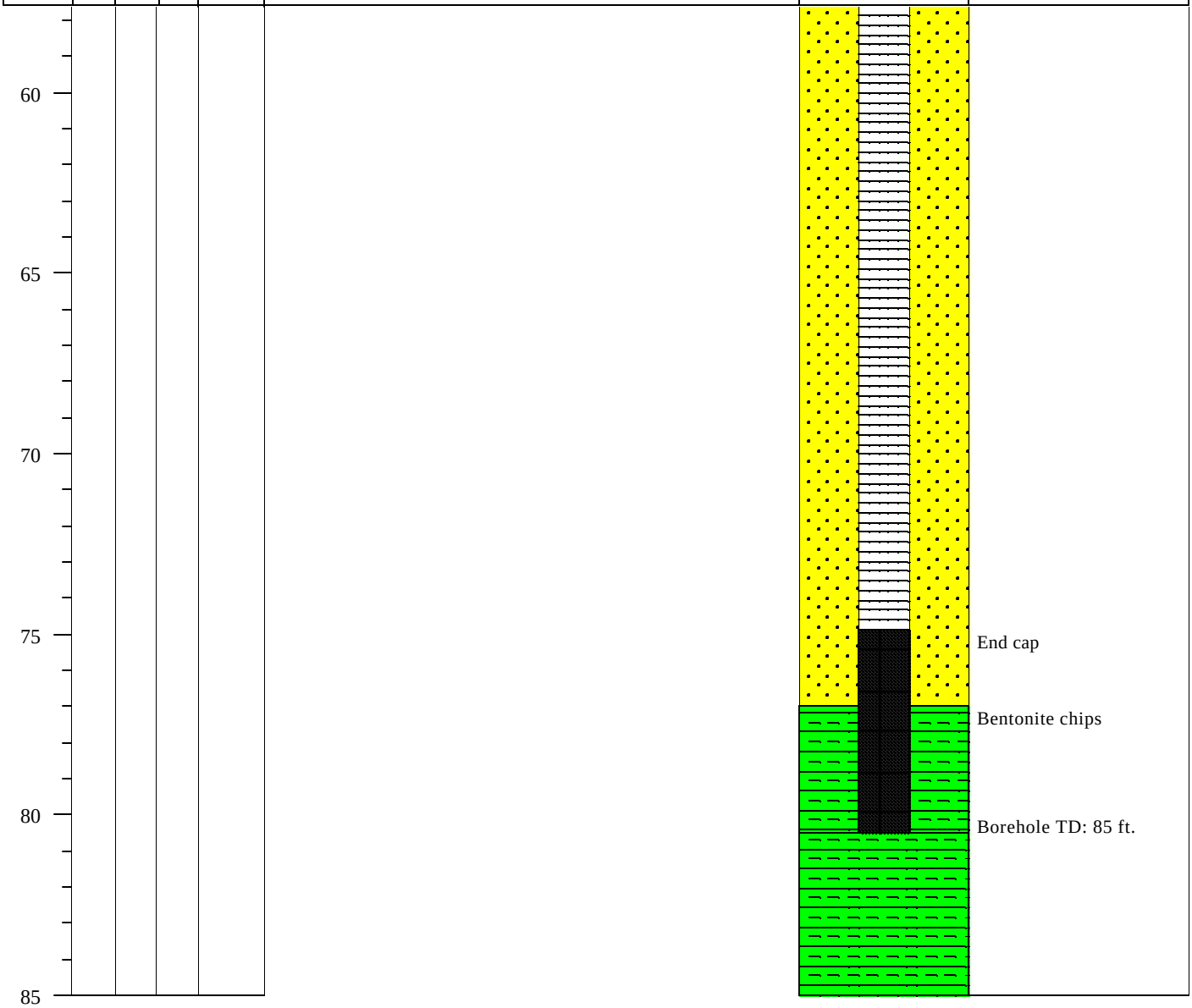
S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W08EX

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM EX	WELL CONSTRUCTION



S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W09AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Acacial Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** NA
START DATE: 1/15/2003	**WELL ELEVATION:** A: 4678.52 ft. B: 4678.61 ft.
FINISH DATE: 1/15/2003	**GROUND ELEVATION:** 4677.87 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
0					Not sampled. See log of SAC-W09C for lithology.		Locking protective casing; 2 in. ID sch 40 PVC riser; Cement Bentonite grout
5							
10							Bentonite chips
15							20-40 Silica sand pack
20							2 in ID sch 40 PVC screen, 0.010 in. slots

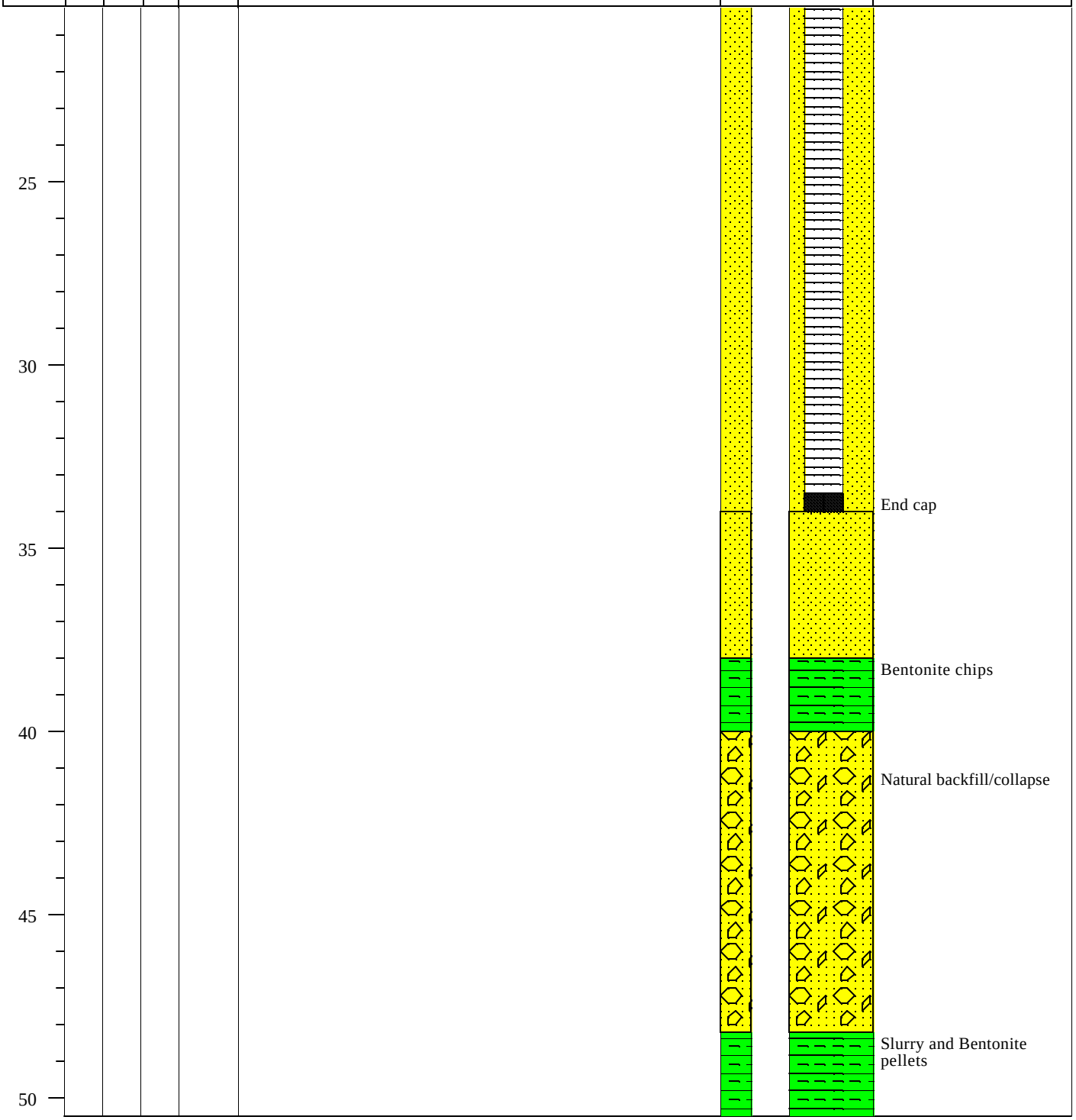
S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W09AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION

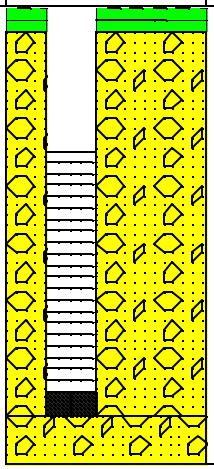


S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W09AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
55							Natural backfill/collapse 2 in. ID sch 40 PVC screen, 0.010 in. slots Borehole TD: 60 ft. End cap
60							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W09C

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Acacial Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** Split Spoon
START DATE: 10/1/2002	**WELL ELEVATION:** 4679.11 ft.
FINISH DATE: 1/16/2003	**GROUND ELEVATION:** 4677.87 ft.

NOTES: Borehole Diameter: 6 in. geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
							Locking protective casing
0							2 in. ID sch 40 PVC riser
							Cement Bentonite grout
	1	11	1.4		SAND, f., v. pale brown (10YR8/2), tr.-no mafic grains, rounded quartz and feldspar grains, moist upper 0.4 ft, dry and v. soft below (SP)		
5	2	7	1.3		As above, increasing fines and roots in basal 1 ft. Fines, same color, no dry strength, rapid dilatancy, low toughness, low plasticity, f. zone contains some f. sand, tr. m. sand (SP-SM)		
	3	14	1.5		SAND, f.-v. f. sand, rounded quartz and feldspar, trace mafic and no lithic grains, v. soft, dry (SP)		
10	4	7	1.5		As above, becoming yellower, lt. yellowish brown (10YR6/4), color returns to (10YR5/2) when dry, moist (SP)		Natural backfill/collapse
	5	9	1.5		As above, layers that grade into layers of f.-v.f. sand with tr. m. sand, m. sand zones concentrated in 13.5-13.9 ft. (SP)		
					SAND, f.-v. f., v. pale brown (10YR8/2) when dry, loose, moist (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W09C

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
15	6	7	1.5		SAND, f.-v.f., yellower than above lt. yellowish brown (10YR6/4), quartz and feldspar, tr. mafic grains, rounded-subrounded, v. soft, ~~thin lens of silty sand at 14.5-14.6, moist (SP)~~		
					As above, (SP)		
	7	7	1.5		SAND, f.-v.f., interbedded with v. thin layers of clay and silt (CL/MH) and iron oxide staining, no to slow dilatancy, low to medium dry strength (SP)		
					As above, increased fines, color change to dk. yellowish brown (10YR4/4-4/6), soft, moist (SW)		
20	8	10	1.5		CLAY, v. dk. grayish brown (10YR3/2), high dry strength, no dilatancy, high toughness, med.-high plasticity (CH/CL)		
	9	8	1.3		As above, color change to dk. gray to gray (10YR4/1-5/1), root structures and organics, basal 0.4 ft firm, v. dk. grayish brown (10YR3/2), still root structures, high dry strength, no dilatancy, high toughness, high plasticity (CL)		
25	10	11	nr		SAND, f., tr. m. sand, dk. grayish brown (10YR4/2), lithology as above, a few epidote grains, clay lens at 25.2-25.4, attributes as above, no roots (SP)		
	11	22	nr		As above, tr. fines in upper 0.5 ft, a couple of volcanic and carbonate pebbles, tr. f. gravel, subrounded, (SP)		
30	12	17	nr		SAND, f.-c. sand, and f. gravel, rounded-subrounded quartz and feldspar, some lithic and mafic grains, c. fraction includes carbonates (SW)		
35	13	0	1		As above, some c. sand and fn. gravel, including red subrounded Permian siltstone, rounded dark sandstone, angular granite (SW)		
	14	26	1		As above, (SW)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W09C

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
	15	17	0.91		As above, one c. red volcanic gravel piece with carbonate inclusion (SW)		Bentonite seal
40							
	16	33	1		SAND, f.-c., few f. gravel, ltl. c. gravel, quartz and feldspar, some mafic and lithic grains (SW)		
	17	12	0.5		As above, (SW)		
45							
	18	13	0.6		As above dk. grayish brown (10YR4/2), slight odor indicative of reducing environment (SW)		
	19	16	1		CLAY, black (2.5Y3/1 - 2.5Y2/1), no dilatancy, medium toughness, organic material (OL) SAND, f., no c. or m. sand, quartz and feldspar, rounded to well-rounded, charcoal fragments (SP)		Natural backfill/collapse
50							
	20	20	1.1		As above, tr. f. gravel pieces, charcoal fragments (SP)		
	21	30	0		As above, v. loose and fluid, suspected sluff (SP)		
55							
	22	16	1		SAND, f., no m.-c. sand, no gravel, dk. gray (2.5YR4/1) soft (SW) SAND, f.-c., few f. gravel, predominantly quartz and feldspar, some mafic and lithic sandstone, quartzite (SP)		
	23	26	1.2		As above, (SP)		
					SAND, f. sand, no c. material, no gravel, dk. gray (2.5YR4/1) soft		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W09C

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
60					SAND, f. sand, no c. material, no gravel, dk. gray (2.5YR4/1) soft (SP)		
	24	21	1.5		SAND, f.-m., tr.-few c. sand, tr.-few f. gravel, v. dk. grayish brown (2.5Y3/2 -10YR3/2), one 2.5'x1.5' piece of rounded c. gravel (SP-SW)		
	25	18	0.9		As above, ltl.-some f.-c. gravel, well rounded quartzite, quartz biotite schist, a subangular dolomite piece, some broken quartzite pieces indicate larger pieces in situ (SW)		
65							
	26	25	1.2		SAND, f.-m., tr. c. sand, t. f. gravel, v. dk.-dk. grayish brown (2.5YR4/2-3/2), broken fragments c. gravel top 0.1 ft., 0.01 ft. magnetite grains @ 67.35 ft., soft/firm (SP)		
					As above, thin magnetite layer at 68.6 ft, f. magnetite grains throughout in tr. quantities, (SP)		
	27	28	1.3		SAND, f., no c. fraction except 1 f. gravel pieces at bottom (SP)		
70							
	28	12	1.1		As above, unable to tell if this is in situ or sluff (SP)		
75							Bentonite seal
80							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SAC-W09C

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
					Rig Chatter		
85							
	29	12	1.1		SAND, f., tr. m. sand, well rounded-rounded quartz, little feldspar, little mafic, few lithic, trace fine gravel, no structure. Sample could be "blow-up" into augers. Driller off by 10 ft. in depth, thus, no samples from 72-86 ft. Rig Chatter (SP)		
	30	68	0		GRAVEL, f.-c., rounded, angular, piece appears to be broken off of larger rounder pieces of cobble, few c. sand, subangular, ltl. f. sand, rounded, f. fraction quartz and feldspar, c. sand and gravel, lithic quartzite, igneous, f. grain quartz and feldspar with tr. pyroxene and biotite (GP)		Natural backfill/collapse
90							
	31	46	0.9		SAND, m., few f. sand, tr. few fines, v. dk. gray (10YR3/1), rounded-subrounded quarz, feldspar, mafics/lithics, 70/30 quartz/other, drilled like sand (SP)		
					SAND, f.-c., tr. fines, soft (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
	32	77	1.0		CLAY, no sand, grayish brown (2.5YR5/2), hard (CL)		
95					SAND, f., tr. m. sand, very dk. gray to v. dk. grayish brown (10YR3/1-3/2), rounded-subrounded, quartz, feldspar, mafic/lithics, 70/30 quartz/other, soft (SP)		
	33	130	1.3		SAND, f.-c., few f. gravel, few-ltl. clay, lithology as above, 6-10 chunks of weathered material that is green-lt. green pebbles, small pieces soft clay and larger pieces have hard inner section (SW)		Borehole TD: 99 ft.
							End cap
					SAND, f.-c., f. GRAVEL, ltl. clay, green-white weathered material as above, c. fraction is angular-rounded, quartzite, granite and volcanics (SW)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-E01AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Escondida Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** NA
START DATE: 1/31/2003	**WELL ELEVATION:** A: 4618.44 ft. B: 4618.42 ft.
FINISH DATE: 1/31/2003	**GROUND ELEVATION:** 4617.86 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
0					Not sampled. See log of ESC-E04C for lithology.		Locking protective casing; 2 in. ID sch 40 PVC riser; Bentonite chips; Natural backfill/collapse; 2 in. ID sch 40 PVC screen, 0.010 in. slots; End cap
5							
10							
15							
20							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-E01AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
25							Bentonite pellets
							Natural backfill/collapse
30							
35							Slurry and Bentonite pellets
40							Natural backfill/collapse
45							2 in. ID sch 40 PVC screen , 0.010 in. slots
							Borehole TD=51 ft.
50							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-E02AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study, Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Escodida Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** Split Spoon
START DATE: 11/18/2002	**WELL ELEVATION:** A: 4619.17 ft. B: 4619.15 ft.
FINISH DATE: 1/29/2003	**GROUND ELEVATION:** 4618.30 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0					SAND, v.f., silt, brown (SP-ML)		Locking protective casing; 2 in. ID 40 sch PVC riser; Bentonite chips
5	1	6	1.5		SAND, v.f., brown, slightly moist (SP) SAND, f., poorly graded, lt. brown, quartz, tr. mafic, dry (SP)		20-40 Silica sand pack; 2 in. ID 40 sch PVC screen, 0.010 in. slots
	2	12	1.5		As above, (SP) CLAY, brown, (Pp=1.2), oxidized layer (CL)		
▼							
10	3	3	1.5		CLAY, some f. sand, brown, (Pp=1.0), (CL) CLAY, with f. sand, brown, plastic, (Pp=0), v. moist (CL-SC)		
	4	3	1.1		CLAY, with some m. sand (CL-SC) SAND, v.f.-m., sand, lt. brown, quartz, (SP)		
15	5	9	0.9		SAND, m., tr. v.f. sand, well graded, lt. brown, subrounded-subangular, may be sluff (SP)		
	6	11	0.85		SAND, m., tr. mafic f. sand, tr. lithic f. gravel, lt. brown, subrounded (SP)		
20	7	11	NR		SAND, few f. gravel, well graded, fragmented volcanics (SW)		Natural backfill/collapse; End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-E02AB

PROJECT NAME: Rio Grande Watershed Study, Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	8	13	0.6		As above, (SW)		
					SAND, m., graded to f. sand, gray, (SP)		Bentonite pellets
25	9	12	1.0		GRAVEL, f., c. sand, some m. sand, (SW)		
	10	18	0.7		SAND, m.-f., gray, no visible structure (SP)		Natural backfill/collapse
					CLAY, dk. gray, soft, (Pp=0), very moist (CL)		
	11	14	1.2		SAND, m., poorly graded, olive gray (SP)		
30					SAND, m., poorly graded, lt. brown (SP)		
	12	4	0.8		CLAY, dk. brown, (Pp=0.1), (CL)		
					GRAVEL, f., (suspected sluff) (GW)		
	13	15	1.0		SAND, m., poorly graded, no visible structure (SP)		
35							Slurry and Bentonite pellets
	14	13	0.8		As above, tr. m. gravel, rounded (SP)		
	15	12	0.9		SAND, c., some f. gravel and m. sand, no visible structure, (SP)		Natural backfill/collapse
40					No Recovery		
	16	13	0				
	17	13	0.5		SAND, m., tr. c. sand and f. gravel., poorly graded, (SP)		2 in. ID 40 sch PVC screen, 0.010 in. slots
45							
	18	13	0.7		SAND, m.-c., tr. f. sand, ltl. f. gravel, poorly graded, no visible structure (SP-SW)		Borehole TD= 51 ft.
	19	19	0.1		SAND, m.-f., tr. c. sand, tr. v.f. mafic grains, poorly graded (SP)		End cap
50							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

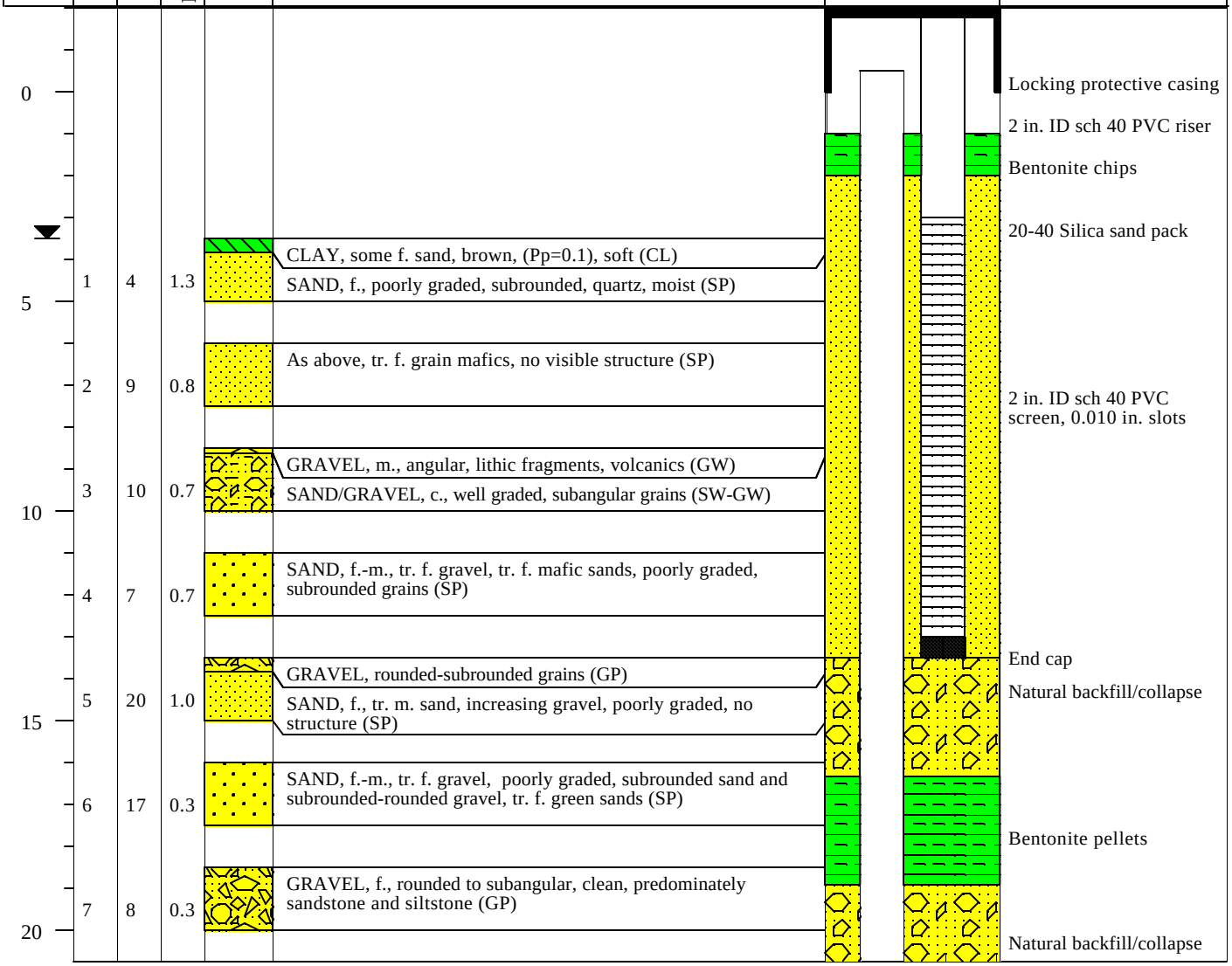
BORING NO. : ESC-E03AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Escondida Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** Split Spoon
START DATE: 11/19/2002	**WELL ELEVATION:** A: 4611.58 ft. B: 4611.47 ft.
FINISH DATE: 1/27/2003	**GROUND ELEVATION:** 4610.79 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
0					
▼					
5	1	4	1.3		CLAY, some f. sand, brown, (Pp=0.1), soft (CL) SAND, f., poorly graded, subrounded, quartz, moist (SP)
	2	9	0.8		As above, tr. f. grain mafics, no visible structure (SP)
10	3	10	0.7		GRAVEL, m., angular, lithic fragments, volcanics (GW) SAND/GRAVEL, c., well graded, subangular grains (SW-GW)
	4	7	0.7		SAND, f.-m., tr. f. gravel, tr. f. mafic sands, poorly graded, subrounded grains (SP)
15	5	20	1.0		GRAVEL, rounded-subrounded grains (GP) SAND, f., tr. m. sand, increasing gravel, poorly graded, no structure (SP)
	6	17	0.3		SAND, f.-m., tr. f. gravel, poorly graded, subrounded sand and subrounded-rounded gravel, tr. f. green sands (SP)
20	7	8	0.3		GRAVEL, f., rounded to subangular, clean, predominately sandstone and siltstone (GP)



WELL CONSTRUCTION

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-E03AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	8	11	0.8		CLAY, m, some angular gravel and f. sand, (Pp=0.1) (CL)		
					SAND, some f. gravel, well graded, subrounded, no fines, quartz, gravel is predominately sandstone (SW)		
	9	13	0.5		GRAVEL, f., SAND, c., some to ltl. m.-f. sand, moderately well graded, angular to subrounded grains (SW-SP)		
25							
	10	11	0.6		SAND, m.-c., some f. gravel, predominately rounded to subrounded, becoming finer downward to f.-m. sand, some clay at base (SP)		
	11	10	0.8		SAND, m.-c., some f. gravel, some f.-m. sand, (SP)		
30					SAND, f., tr. m. sand, tr. f. mafic sands, poorly graded (SP)		
	12	20	1.0		SAND, f., poorly graded, olive gray, subangular to subrounded, no visible structure (SP)		
							Bentonite slurry and pellets
	13	6	1.0		CLAY/SAND, alternating layers 0.2 ft. thick, (Pp=0.25-0.75), clay is olive gray brown, with significant f.-m. sand (CL-SC)		
35							
	14	19	1.0		SAND, f.-m., tr. f. gravel, moderately poorly graded, gray, subrounded, tr.-ltl. mafics, no visible structure (SP-SW)		Natural backfill/collapse
	15	17	0.9		As above (SP-SW)		
40							
	16		1.0		As above, no gravel (SP-SW)		2 in. ID sch 40 PVC screen, 0.010 in. slots
	17		0.8		As above, no gravel (SP-SW)		
45							End cap
	18	28	0.5		As above, no gravel (SP-SW)		Borehole TD: 46.5 ft.
	19	21	0.9		CLAY, some v.f. sand/silt, olive brown, (Pp=0.2), soft, moist (CL)		
50					SAND, f., tr. f. gravel, moderately poorly graded (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-EO4AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grand Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Escondida Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** Split spoon
START DATE: 1/30/2003	**WELL ELEVATION:** A: 4619.06 ft. B: 4618.99 ft.
FINISH DATE: 1/30/2003	**GROUND ELEVATION:** 4618.21 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
0					Not sampled. See log of ESC-E04C for lithology.		Locking protective casing Concrete 2 in. ID sch 40 PVC riser Bentonite chips 20-40 Silica sand pack 2 in. ID sch 40 PVC screen, 0.010 in. slots Natural backfill/collapse End cap
5							
10							
15							
20							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-EO4AB

PROJECT NAME: Rio Grand Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
25							Bentonite pellets
30							Natural backfill/collapse
35							
40							Slurry and Bentonite pellets
							Natural backfill/collapse
45							2 in. ID sch 40 PVC screen, 0.010 in. slots
							Borehole TD= 52 ft.
50							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-EO4C

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grand Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Greg Sena
LOCATION: Escondida Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** Split Spoon
START DATE: 10/4/2002	**WELL ELEVATION:** 4618.91 ft.
FINISH DATE: 1/28/2003	**GROUND ELEVATION:** 4618.10 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
8 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
0							Locking protective casing; 2 in. ID sch 40 PVC riser; Concrete
	1	11	1.3		SAND, v.f.-f., lt. yellow brown (2.5Y6/4), quartz and feldspar grains, subangular (SP)		
					CLAY, high dry strength, no dilatancy, high plasticity, high toughness (CL-CH)		2 in. ID sch. 40 PVC screen, 0.010 in. slots
					SAND, v.f-f., as above (SP)		
					SAND, v.f-f., as above (SP)		
	2	11	1.5		CLAY, high dry strength, no dilatancy, high plasticity, high toughness, roots and iron oxide staining (CH)		Cement Bentonite grout
5					SAND, v.f-f., as above (SP)		
					CLAY, as above (CH)		
	3	8	1.5		SAND, f., thin (2mm) clay layer at 7.25 ft., subround-round quartz and feldspar, tr. few mafic and lithic grains (SP)		
▼					SAND, f., tr. m. sand, lt. brownish gray (10YR6/2), rounded quartz and feldspar, few lithic and mafic grains, v.soft, wet (SP)		
	4	5	1.5		CLAY, d. brown (10YR3/3), roots, gray zones (CL-CH) 0.1 ft. v.f. sand at 9.6 ft.		
10							
	5	7	1.5		SAND, f., charcoal fragments and color change to black (10YR2/1) at 11.4ft (SP)		
					SILT, slow dilatancy, low plasticity, low dry strength, low toughness (ML-MH)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-EO4C

PROJECT NAME: Rio Grand Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
15	6	6	1.5		CLAY, lt. yellowish brown (2.5YR4/6), soft (CL) SAND, v.f. sand, tr. clay, v. soft (SP)		Natural backfill/collapse
	7	9	1.1		As above, (SP) SAND, f.-m., tr. c. sand, tr.subangular to subround carbonate pieces (SP)		
20	8	12	1.5		SAND, f. m. sand, dk. grayish brown overall (10YR5/2), loose rounded quartz grains, ltl.-some mafic and lithic grains (SP)		
	9	18	.8		As above, gravel size piece of rhyolite tuff at 21.8 ft. (SP)		
25	10	8	1.3		As above, (SP) SAND f.-c., ltl. f. gravel, c. fraction rounded volcanics, subrounded carbonates and subangular quartzite, f. fraction primarily quartz and feldspar with little mafic or lithics (SW)		
	11	27	.5		SAND, f.-c. and f. GRAVEL, rounded to angular quartz and feldspar, quartzite, conglomerate, bottom of sampler pluggued with rhyolite gravel piece. (SW-GW) rig chatter		
30	12	24	1		SAND, f.-m., ltl. c. sand, tr. f. gravel, brown (10YR5/3), red calcite cemented sandstone, red siltstone, f. fraction rounded quartz and feldspar with little mafic and lithic grains, c. fraction rounded to angular carbonate, loose (SP-SW)		
	13	17	1		As above, tr. f. gravel (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-EO4C

PROJECT NAME: Rio Grand Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
	14	23	1		As above. No layering or sedimentary structures are apparent. (SP)		
35							
					As above, (SP)		
	15	28	1.1		SAND, c. and f.-c. gravel, angular well-rounded quartzite, siltstone, carbonate, fines entrained in drilling mud, loose. (SW-GW)		
	16	12	1.5		SAND, m.-c.,and f. GRAVEL, tr. c. gravel, few-ltl. f. sand, sand is well rounded quartz and feldspar, angular lithics, gravel is carbonate, red siltstone, banded orange-clear metamorphic (quartzite?) (SW-GW)		
40							
					As above, few f. gravel (SW-GW)		
	17	32	1.5		SAND, f.-m., tr. c. sand and f. gravel, gray to d. grayish brown (10YR5/1-4/2), rounded quartz and feldspar, few angular lithic c. sand (SP)		
					SAND, m.-c., few f. sand (SP)		
	18	22	1.3		SAND, f.-m., tr. c. sand, tr. f. gravel, (SP), layer of c. sand-f. gravel, 44.2-44.4 (SP)		
45							
	19	16	.7		SAND, f-m sand, tr. c. sand, and f. gravel, composition and color as above, gravel size piece of rhyolite appears to be a part of larger in situ cobble (SP) 0.2 ft of clay in bottom of sampler		
					SAND, f.-c. and f. GRAVEL, gravel is lithic with no carbonate (SW-GW)		
	20	12	.8		SAND, f., some m. sand, few c. sand, dk. gray to v. dk. grayish brown (10YR4/1-3/2) (SP-SW)		
50							
					SAND, f., ltl. m. sand, (10YR4/1-3/2), rounded quartz grains, less		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-EO4C

PROJECT NAME: Rio Grand Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
	21	0	.9		feldspar, ltl. mafic and lithic grains, tr. c. sand in drive shoe (SP)		
	22	13	1.4		SAND, f.-v.f. and f.-c., interbedded, 0.01-0.02 ft layers in basal 0.6 ft of sample, thicker (0.05-0.15 ft) in upper 0.8 ft, (SP, SW		
55	23	14	1.1		SAND, f., tr. m.-c. sand, tr. f. gravel, dark gray (10YR4/1), well rounded quartz grains, ltl. few mafic/lithic, flecks of biotite (SP)		
	24	27	1		SAND, f.-c. and f.-c. GRAVEL (largest pieces appear to be broken off of cobble size), thin lens of (0.02') of gray sandy clay, very d. grayish brown (10YR3/2) at 59 ft., c. fraction is igneous and metamorphic, trace of c. sand is rounded carbonates (SW-GW)		
60					SAND, m.-c., loose (SP) rig chatter		
	25	32	1.2		SAND, f., v. d. grayish brown (10YR3/2), rounded- well rounded quartz grains, few-ltl. feldspar, mafic and lithic, faint bands with magnetite or mafics (SP)		Bentonite slurry
	26	33	1.5		As above (SP)		
65					SAND, f.-c., and f. GRAVEL, with clay, v.d. grayish brown, (10YR3/2) (SP)		
	27	12	.7		SAND, f.-c., and f. GRAVEL, clay clast, v. d. grayish brown (10YR3/2) with red staining and charcoal in middle of sample, broken cobble of red calcite cemented quartz sandstone (SW-GW)		
	28	25	.7		SAND, f.-c., and f.-c. GRAVEL, gravel quartzite and basalt, several pieces v. angular quartz (SW-GW)		
70							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-EO4C

PROJECT NAME: Rio Grand Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
	29	50	1.2		SAND, f., tr. m. sand, v.d. gray (10YR3/1), rounded quartz, ltl. to some mafic/lithic grains (SP) GRAVEL, f.-c., f.-m. sand matrix, ltl. c. sand, gravel is rounded granite, basalt and calcite cemented siltstone olive (5Y5/6), calcite cemented sandstone and broken pieces of cobbles (SW-GW)		Natural backfill/collapse
	30	95	1.6		SAND, f., tr. m. sand, v.d. gray (10YR3/1), rounded quartz, ltl.-some lithic/mafic grains (SP) bottom 0.2 ft has some c. sand and f. gravel in firm clay matrix		
75							
	31	46	1.8		As above, (SP) GRAVEL, f.-c., some f.-c. sand, black f. volcanics with white crystalline inclusions, olive gray f. sandstone, calcite cemented siltstone, silicate with abundant pyroxene, rounded-subrounded or broken off pieces of cobbles (GW)		
	32	64	1.2		GRAVEL, f.-c., some f.-c. sand, gravel is subrounded-rounded quartzite, siltstone, charcoal, with fragments of larger pieces, (GW)		2 in. ID sch 40 PVC screen, 0.010 in. slots
80							Borehole TD= 84 ft.
	33	50	1		SAND, f., tr. c. sand and f. gravel, rounded quartz grains, ltl. lithic or mafic grains, firm, dk. grayish brown (10YR4/2) (SP)		
	34	60	1		SAND, f., tr.-no m. or c. sand, quartz, well-rounded, few lithic or mafic grains, firm (SP) top 0.5 ft may be slough, grades from f.-c. sand at top to f. gravel		End cap
85							
	35	70	0.5		SAND, f.-m., tr. c. sand, one gravel piece at top of sample, d. grayish brown (10YR4/2), rounded quartz and feldspar, ltl lithic or mafic grains (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-E05EX

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** WDC Exploration
PROJECT NUMBER: 771-3	**CREW LEADER:** Mike Thomas
LOCATION: Escondida Transect	**RIG TYPE:** Speedstar 30K
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** NA
START DATE: 4/16/2003	**WELL ELEVATION:** 4619.65 ft.
FINISH DATE: 4/16/2003	**GROUND ELEVATION:** 4618.93 ft.

NOTES: Borehole Diameter: 13.875 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM EX	WELL CONSTRUCTION
0					Not Sampled. See log of ESC-E04C for lithology.		Locking protective casing 10 in. ID sch 40 PVC riser Cement Bentonite grout
5							
10							
15							
20							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-E05EX

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM EX	WELL CONSTRUCTION
25							Bentonite pellets 8-14 Silica sand pack
30							10 in. ID sch 40 PVC screen, 0.050 in. slots
35							
40							
45							10 in. ID sch 40 PVC screen, 0.030 in. slots 10-20 Silica sand pack
50							End cap

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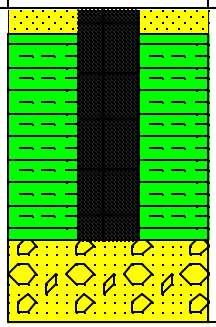
GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-E05EX

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM EX	WELL CONSTRUCTION
55							Bentonite pellets Borehole TD: 57 ft.

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-E06AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Escondida Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** NA
START DATE: 1/30/2003	**WELL ELEVATION:** A: 4619.48 ft. B: 4619.55 ft.
FINISH DATE: 1/30/2003	**GROUND ELEVATION:** 4618.53 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
0					Not sampled. See log of ESC-E04BC for lithology.		Locking protective casing; 2 in. ID sch 40 PVC riser; Bentonite chips
5							20-40 Silica sand pack; 2 in. ID sch 40 PVC screen, 0.010 in. slots
10							
15							
20							Natural backfill/collapse; End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-E06AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
25							Bentonite pellets
							Natural backfill/collapse
30							
35							Slurry and Bentonite pellets
							Natural backfill/collapse
40							
45							2 in. ID sch 40 PVC screen, 0.010 in. slots
							Borehole TD= 52 ft.
50							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-W01AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Escondida Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** Split Spoon
START DATE: 11/13/02	**WELL ELEVATION:** A: 4617.30 ft. B: 4617.20 ft.
FINISH DATE: 1/23/2003	**GROUND ELEVATION:** 4616.32 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0					Fill		Locking protective casing; 2 in. ID sch 40 PVC riser; Bentonite chips; 20-40 Silica sand pack
	1	3	0.8		SAND, v.f., silt, dk. yellowish brown (10YR4/6), soft (SP)		
5					CLAY, high plasticity, no dilatancy, high toughness, med. density, hard, moist, (CL)		
	2	5	1.5		CLAY, ltl. f. sand, iron oxide stained, layers of some f. sand 6.6.-6.9 ft and 7.3-7.5 ft.,calcite deposits (CL)		
					As above (CL)		
▼	3	4	1.5		SAND, f., some clay, wet (SP)		
10					As above, v. dk. gray (10YR3/1), abundant charcoal and wood, (SP)		
	4	3	1.5		CLAY, some sand, v. dk. gray (10YR4/2), grades to clay, ltl.-few sand, gray (10YR5/1), abundant organic matter (CL)		2 in. ID sch 40 PVC screen, 0.010 in slots
	5	2			SILT, and v. f. sand, dk. grayish brown to v. dk. grayish brown (10YR4/2-3/2), rapid dilatancy, low plasticity, low toughness, layers of high organic matter, ltl. f. sand at 14 ft and 15.2 ft. (ML)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-W01AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
15							
	6	7	1.2		SAND, f.-v.f., few m. sand, tr. c. sand, dk. grayish brown to v. dk. grayish brown (10YR4/2-3/2), soft, no layering or structure, rounded-subrounded quartz and feldspar, 90/10 quartz-other (SP)		
	7	10	0.8		As above, (SP)		Natural backfill/collapse
20							End cap
	8	14	0.9		As above, (SP)		
	9	11	1.1		As above, some m.-c. sand, several 3-5 mm. size bands of m. sand throughout (SP)		Bentonite pellets
25							
	10	37	1.2		SAND, f.-c., gravel, few fines in matrix, c. pieces are broken chunks of cobbles of quartzite, clacite cemented sandstone, f. grain volcanics with hornblende crystals. Gravel and cobbles dominate basal 0.7 ft, (SW)		Natural backfill/collapse
	11	31	0.5		SAND, f., few m. sand, scattered c. sand on top of sample, 1 piece broken from cobble of red siltstone, in drive shoe, dk. grayish brown (10YR4/2), firm (SP)		
30							
	12	10	0.9		SAND, m., ltl.-some f. sand, dk. grayish brown to v. dk. grayish brown (10YR4/2-3/2), 60/40 quartz/other (SP)		
					SAND, f.-c., f. gravel, (SW)		
					CLAY, no sand, gray-green, plastic in drive shoe (CL-CH)		
					CLAY, no sand, gray (10YR5/1), firm (Pp=0.5), abundant wood in basal 0.2 ft. (CL)		
	13	6	1.5		SAND, f.-m., some clay, v. dk. gray (10YR3/1), charcoal, thin layer of brown clay near bottom (SP)		
35					SILT, some v.f. sand, tr. m. sand, wood and charcoal fragments, high dilatancy, no dry strength, no plasticity, no toughness (ML)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-W01AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	14	23	1.2		SAND, f., no fines or c. fraction, lithology as above, less mafic and lithic grains, 70/30 quartz/other (SP)		Bentonite slurry and pellets
					SAND, f.-c., f. gravel, tr. fines, lithology as above, few dolomite pieces (SW)		
					As above, some broken cobble size pieces, 2 pieces of weathered vesicular basalt (SW)		
	15	31	1.3		SAND, f., tr. m. sand, few fines, dk. grayish brown (10YR4/2), 80/20 quartz/other (SP)		
40							
	16	27	0.9		As above, tr.-m. sand, a dozen loose c. sand and fine gravel size pieces on top that may not be in place (SP)		Natural backfill/collapse
	17	24	0.9		SAND, f.-m., few c. sand, tr. fines, dk. grayish brown to v. dk. grayish brown (10YR4/2-3/2), slightly more mafic/lithic grains, loose c. sand and f. gravel on top of sample (SP)		
45							
					As above, ltl. c. sand and f. gravel (SP)		
	18	47	1.2		GRAVEL, ltl. c. sand, few m.-f. sand, few fines, shattered cobble size pieces of rhyolite tuff, red siltstone and quartzite. Smaller pieces are rounded-subangular (GP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
					As above, some c. sand, (GP)		
	19	29	0.5				
50							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-W02A

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Escodida Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** Split Spoon
START DATE: 11/18/2002	**WELL ELEVATION:** 4617.96 ft.
FINISH DATE: 1/23/2003	**GROUND ELEVATION:** 4616.89 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
8 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM A	WELL CONSTRUCTION
							Locking protective casing
0					SAND, v.f., silt, brown (SP-ML)		Concrete
							Bentonite chips
							20-40 Silica sand pack
	1	6	1.5		SAND, v.f., brown, slightly moist (SP) SAND, f., poorly graded, lt. brown, quartz, tr. mafic, dry (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
5							
	2	12	1.5		As above, (SP) CLAY, brown, (Pp=1.2), oxidized layer (CL)		
▼							
	3	3	1.5		CLAY, some f. sand, brown, (Pp=1.0), (CL) CLAY, with f. sand, brown, plastic, (Pp=0), v. moist (CL-SC)		
10							
	4	3	1.1		CLAY, with some m. sand (CL-SC) SAND, v.f.-m., sand, lt. brown, quartz, (SP)		Natural backfill/collapse
	5	9	0.9		SAND, m., tr. v.f. sand, well graded, lt. brown, subrounded-subangular, may be sluff (SP)		
15							
	6	11	0.85		SAND, m., tr. mafic f. sand, tr. lithic f. gravel, lt. brown, subrounded (SP)		Borehole TD= 21 ft.
	7	11	NR		SAND, few f. gravel, well graded, fragmented volcanics (SW)		End cap
20							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-W02A

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM A	WELL CONSTRUCTION
	8	13	0.6		As above, (SW)		
					SAND, m., graded to f. sand, gray, (SP)		
25	9	12	1.0		GRAVEL, f., c. sand, some m. sand, (SW)		
	10	18	0.7		SAND, m.-f., gray, no visible structure (SP)		
	11	14	1.2		CLAY, dk. gray, soft, (Pp=0), very moist (CL) SAND, m., poorly graded, olive gray (SP)		
30					SAND, m., poorly graded, lt. brown (SP)		
	12	4	0.8		CLAY, dk. brown, (Pp=0.1), (CL)		
	13	15	1.0		GRAVEL, f., (suspected sluff) (GW) SAND, m., poorly graded, no visible structure (SP)		
35							
	14	13	0.8		As above, tr. m. gravel, rounded (SP)		
	15	12	0.9		SAND, c., some f. gravel and m. sand, no visible structure, (SP)		
40							
	16	13	0		No Recovery		
	17	13	0.5		SAND, m., tr. c. sand and f. gravel., poorly graded, (SP)		
45							
	18	13	0.7		SAND, m.-c., tr. f. sand, ltl. f. gravel, poorly graded, no visible structure (SP-SW)		
	19	19	0.1		SAND, m.-f., tr. c. sand, tr. v.f. mafic grains, poorly graded (SP)		
50							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-W03AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Escondida Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** NA
START DATE: 1/24/2003	**WELL ELEVATION:** A: 4616.62 ft. B: 4616.58 ft.
FINISH DATE: 1/24/2003	**GROUND ELEVATION:** 4615.45 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
0					Not sampled. See log of ESC-W02AB for lithology.		Locking protective casing; 2 in. ID sch 40 PVC riser; Bentonite chips; 20-40 Silica sand pack
5							2 in. ID sch 40 PVC, 0.010 in. slots
10							
15							Natural backfill/collapse
20							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-W03AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
25							Bentonite pellets Natural backfill/collapse
30							
35							Slurry and Bentonite pellets
40							Natural backfill/collapse
45							2 in. ID sch 40 PVC, 0.010 in. slots
50							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

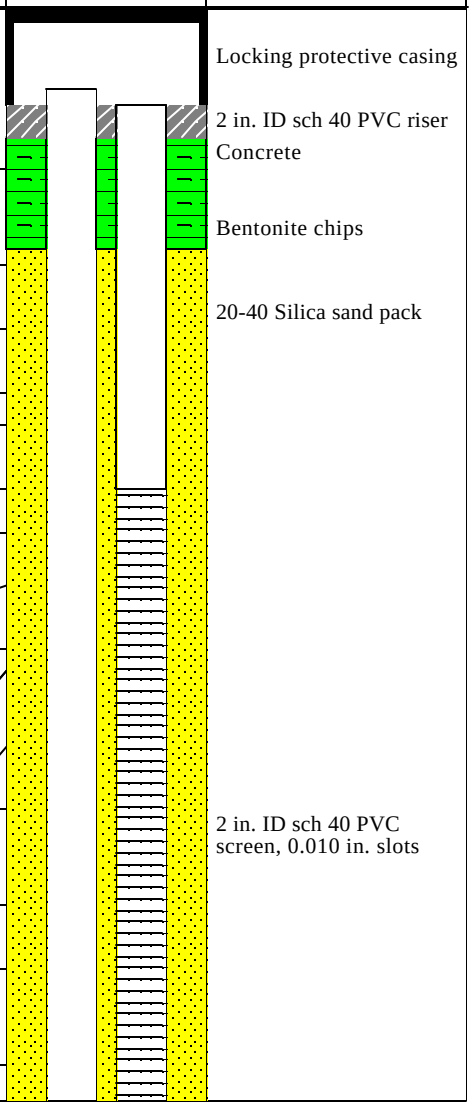
BORING NO. : ESC-WO4AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Escondida Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** Split Spoon
START DATE: 11/15/2002	**WELL ELEVATION:** A: 4616.72 ft. B: 4616.28 ft.
FINISH DATE: 1/22/2003	**GROUND ELEVATION:** 4615.58 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
0					
					SAND, f., few fines, yellowish brown (10YR5/4), dry (SP)
					As above, iron oxide staining, soft (SP)
5	1	6	1.1		CLAY, no sand, firm, iron oxide staining, roots, moist (CL)
					SILT, tr.-no v. f. sand (ML)
	2	11	1.3		SAND, v. f., few fines, yellowish brown (10YR5/4-5/6), firm, moist-wet (SP)
▼					
					CLAY, (may be scraping of inside augers), (CL)
	3	6	1.5		SAND, v.f., few fines, yellowish brown (10YR5/4-5/6), firm, moist-wet, rounded-subrounded quartz and feldspar, few lithic/mafic grains 90/10 quartz/other (SP)
10					
	4	6	0.8		SAND, f., ltl. m. sand, tr. c. sand, tr.-no fines, f. sand lithology as above, c. sand: angular-rounded quartzite and quartz, lithic and mafic (SP)
	5	5	0.9		SAND, m., some f. sand, ltl. c. sand, lithology as above, f. and c. sand seperated by v. faint 2-3 mm. thick layers (SP)
15					



S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-WO4AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B	WELL DIAGRAM A	WELL CONSTRUCTION
					SAND, c., f. gravel, ltl. f.-m. sand, (SP)			End cap
	6	10	0.8		SAND, m., some f. sand, ltl. c. sand (SP)			Natural backfill/collapse
	7	10	0.7		SAND, f.-c., ltl. f. gravel, tr. c. gravel, tr. fines, dk. grayish brown (10YR4/2), c. material, carbonates, red siltstone, quartzite, volcanics and basalt, f. sand primarily quartz (SW)			Bentonite pellets
20								
	8	13	0.7		SAND, m.-c., ltl. f. sand, no fines, tr. f. gravel, 2 c. gravel quartzite pieces, lithology as above (SP)			Natural backfill/collapse
	9	17	0.7		SAND, m., ltl. f. sand, few c. sand, tr. gravel, no fines, dk. grayish brown to brown (10YR4/2-4/3), lithology as above (SP)			
25								
	10	20	1.0		As above, 1-2 cm. thick layers dominated by f. and c. sand, tr.-no fines (SP)			
	11	18	0.8		SAND, f., tr. m. sand, no fines, several c. sand, f. gravel pieces loose on top of sample, 3 magnetite layers in top 0.4 ft. of sample (SP)			
30								
	12	30	0		No Recovery			Slurry and Bentonite pellets
	13	18	1.1		SAND, f., few m. sand, layers of m. sand throughout, dk. grayish brown to brown (10YR4/2-4/3), 3 cm. c. sand layer at 34.3 ft. lithology as above, silt and ltl. f. sand, v.dk. grayish brown (10YR3/2) in drive shoe (SP)			
35								
	14	19	0.7		SAND, v.f., some silt, v. dk. grayish brown (10YR3/2), organic matter (SP)			
					SAND, m., ltl. c. sand, ltl. f sand and tr. f. gravel, dk. grayish brown (10YR4/2) (SP)			

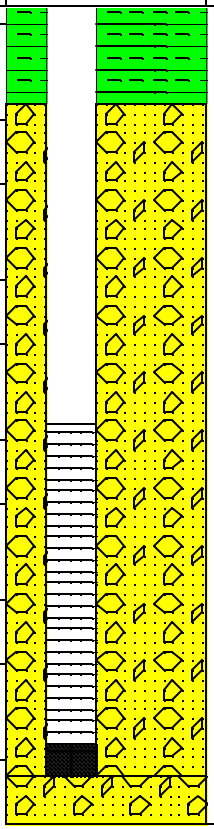
S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-WO4AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
40	15	17	0.1		SAND, f.-m., ltl. c. sand, tlt. f. gravel, loose (SP)
	16	12	1.0		SAND, f., ltl. m. sand, tr. c. sand, several chunks of red and gray clay in upper 0.4 ft., 2 c. gravel limestone pieces (SP)
45	17	23	0.9		SAND, f., few m. sand, dk. grayish brown to v. dk. grayish brown (10YR4/2-3/2), soft rounded-subrounded, quartz and feldspar, 80/20 quartz and others, bottom of sample is wash-out (SP)
	18	15	0.9		SAND, f.-c., ltl. f. gravel, dk. grayish brown to v. dk. grayish brown (10YR4/2-3/2), lithology as above, few-ltl. fines (SW)
50	19	22	0.7		SAND, f.-m., ltl. c. sand and few f. gravel, 1-2 c. gravel pieces, rounded quartz, some fines in basal 0.3 ft. (SP)



WELL CONSTRUCTION

Natural backfill/collapse

2 in. ID sch 40 PVC screen, 0.010 in. slots

Borehole TD= 51 ft.

End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-W05AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Escondida Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** Split Spoon
START DATE: 11/18/02	**WELL ELEVATION:** A: 4619.97 ft. B: 4619.71 ft.
FINISH DATE: 1/22/2003	**GROUND ELEVATION:** 4618.05 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0							Locking protective casing
					SAND, v. f., red (SP)		2 in. ID sch 40 PVC riser
					As above, lt. brown (SP)		Concrete
							Bentonite chips
							20-40 Silica sand pack
					SILT, tr. clay, clumps slightly, slightly moist (ML)		
5	1	15	1.5		SILT, tan, slightly compacted, f. varve-like layering, dry (ML)		2 in. ID sch 40 PVC screen, 0.010 in. slots
					SAND, f.-v.f., poorly graded, lt. tan (SP)		
	2	8	1.5		CLAY, brown, (Pp=1.5), (CL)		
					SAND, f.-v.f., lt. tan (SP)		
▼							
					SILT, ltl. clay, brown (ML)		
10	3	4	1.4		CLAY, soft, brown, (Pp=0.25) (CL)		
	4	2	1.5		CLAY, some f. sand, brown changing to gray, some organic matter, layer of increasing sand content between 11.5-12 ft., moist (CL)		
					CLAY, ltl. f. sand, brown/gray, v. moist and soft (CL)		
	5	9	1.5		SAND, f., poorly graded, clean (SP)		
15							
	6	8	0.9		SAND, f., poorly graded, lt. brown, clean (SP)		Natural backfill/collapse
	7	23	0.6		As above, slightly compacted (SP)		End cap
20							
					GRAVEL, c., f.-m. sand at bottom, well graded (SW)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : ESC-W05AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	8	5	0.5				
	9	14	0.7		SAND, f., some m. sand, lt. brown, quartz, subrounded (SP)		Bentonite pellets
25	10	14	0		No Recovery		Natural backfill/collapse
	11	13	1.2		SAND, m.-f., subrounded-subangular grains, fining upward, sample may not be in place (SP)		
30	12	10	0		SILT/CLAY, brown to lt. brown, (Pp=0.1) (ML-CL)		
	13	14	0.5		SAND, f., ltl. f. gravel, lt. brown, rounded-subrounded. Majority of sample has washed away (SP)		Bentonite slurry
35	14	23	1.1		SAND, f.-m., poorly graded, tan-lt. brown, no visible structure (SP)		
	15	20	0		SAND, and f. gravel, subrounded-subangular. Majority of sample has washed away. (SP-GW)		Natural backfill/collapse
40	16	27	0.8		SAND, f.-v.f., poorly graded, brown, tr. mafic grains, no visible sturcture (SP)		
	17	12	0.9		SAND, f., poorly graded, brown to lt. brown (SP)		
45	18	12	1.1		SAND, f.-m., lt. brown, no visible structure (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots Borehole TD= 52 ft.
	19	24	0.6		SAND, m.-c., tr. f. sand, well graded (SW) SAND, m.-f., tr. mafic grains, subrounded (SP)		End cap
50							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-E01AB

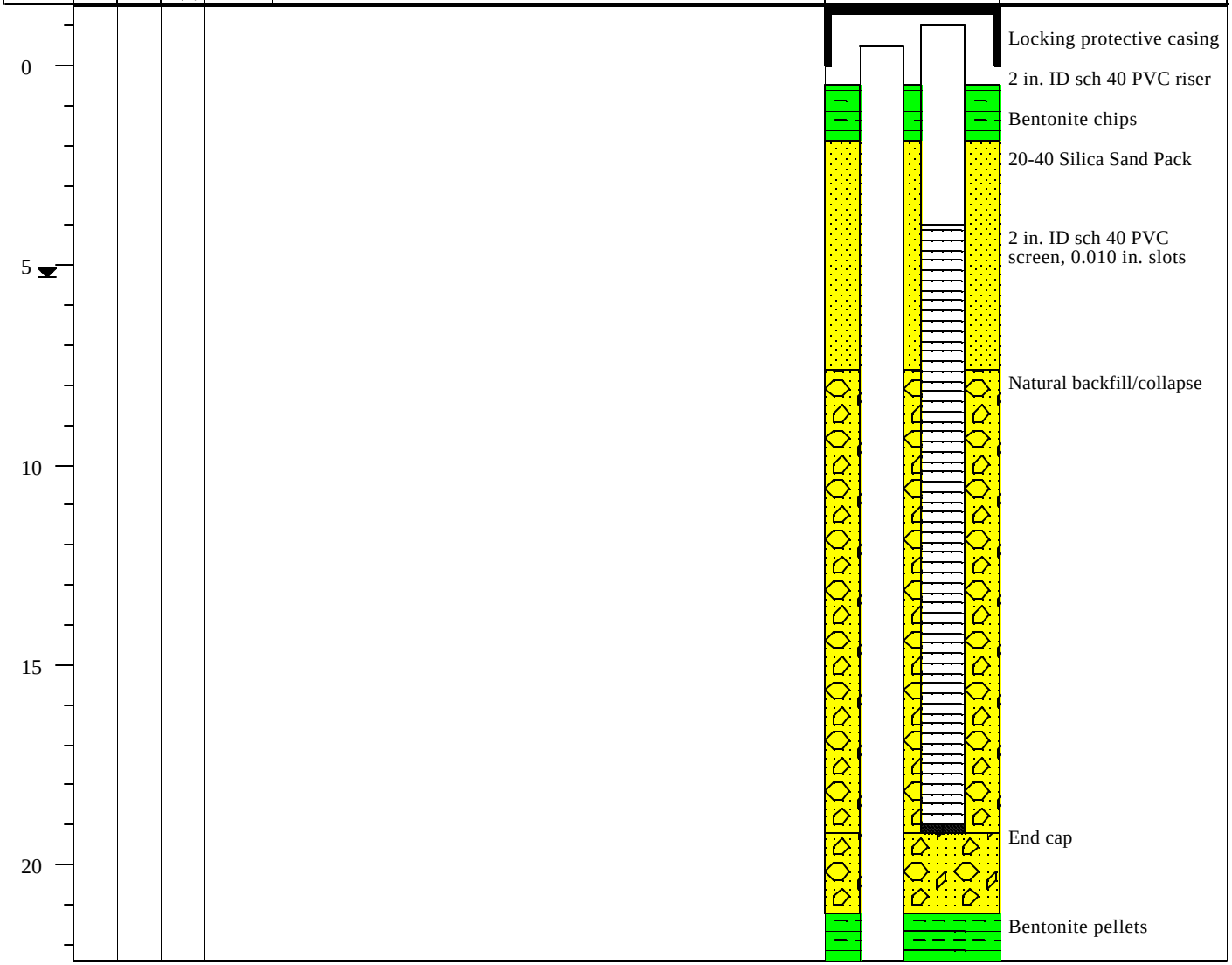
PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Brown Arroyo Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: P. Lang	**SAMPLE TYPE:** Split Spoon
START DATE: 4/30/03	**WELL ELEVATION:** A: 4577.41 ft. B: 4576.48 ft.
FINISH DATE: 4/30/03	**GROUND ELEVATION:** 4575.92 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION



S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-E01AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
25							Natural backfill/collapse
30							
35							
40							Bentonite pellets
							Natural backfill/collapse
45							2 in ID sch 40 PVC screen, 0.010 in. slots
							Borehole TD= 50 ft.
50							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

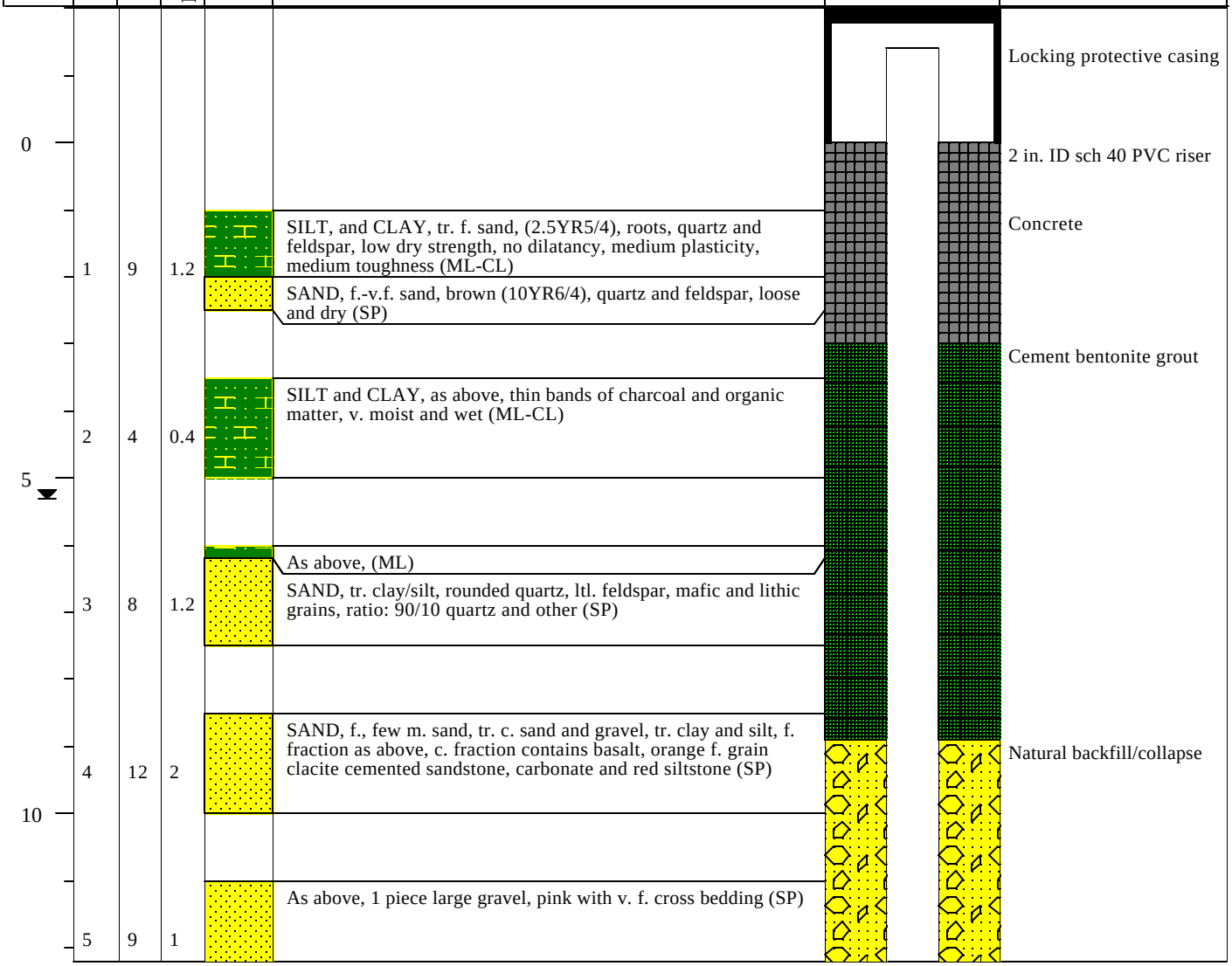
BORING NO. : BRN-E01C

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study, Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Brown Arroyo Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: S. Lindblom, B. Grigsby	**SAMPLE TYPE:** Split Spoon
START DATE: 10/14/2002	**WELL ELEVATION:** 4577.37 ft.
FINISH DATE: 5/7/03	**GROUND ELEVATION:** 4575.91 ft.

NOTES: Borehole Diameter: 6 in.- geologic sampling
8 in.- well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
0					
	1	9	1.2		SILT, and CLAY, tr. f. sand, (2.5YR5/4), roots, quartz and feldspar, low dry strength, no dilatancy, medium plasticity, medium toughness (ML-CL)
					SAND, f.-v.f. sand, brown (10YR6/4), quartz and feldspar, loose and dry (SP)
	2	4	0.4		SILT and CLAY, as above, thin bands of charcoal and organic matter, v. moist and wet (ML-CL)
5 ▼					
					As above, (ML)
	3	8	1.2		SAND, tr. clay/silt, rounded quartz, ltl. feldspar, mafic and lithic grains, ratio: 90/10 quartz and other (SP)
	4	12	2		SAND, f., few m. sand, tr. c. sand and gravel, tr. clay and silt, f. fraction as above, c. fraction contains basalt, orange f. grain clacite cemented sandstone, carbonate and red siltstone (SP)
10					
	5	9	1		As above, 1 piece large gravel, pink with v. f. cross bedding (SP)



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GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-E01C

PROJECT NAME: Rio Grande Watershed Study, Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
					SAND, m., some c. sand, ltl. fn. sand, tr. gravel, soft (SP-SW)		
	6	14	1.5		SAND, f., tr. m. sand, tr. silt, m. dense, rounded quartz and feldspar, few lithic and mafic grains (SP)		
15							
					SAND, f.-m. sand, ltl. c. sand and f.-c. gravel (SP)		
	7	11	1.2		As above, tr. c. sand, no gravel (10YR4/2) (SP)		
					As above, (SP)		
	8	n/a	0				
20							
					SAND, f.-m., some c. sand, tr. silt/clay, f. fraction rounded quartz, ltl. lithic and mafic, c. fraction angular-rounded siltstone, black f. grain volcanics, quartzite, no structure, m. dense (SP)		
	9	17	1.1				
					As above, loose (SP)		
	10	9	0.25				
25							
					SAND, f. no m.-c. sand tr.-no clay/silt, brown gray (10YR5/2-4/2) rounded quartz, few-ltl. lithic and mafic grains (SP)		
	11	11	0.6				
					As above, no structure, 6 f. gravel pieces, loose (SP)		
	12	6	0.8				
30							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-E01C

PROJECT NAME: Rio Grande Watershed Study, Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
	13	11	0.6		As above, (SP)		
	14	n/a	0		No Recovery		
35	15	33	1.0		SAND, f., tr. m. sand, tr. clay/silt, brown-gray (10YR5/2-4/2), rounded quartz, f. gravel and c. sand in top few layers, magnatite at 36.5 ft. dense (SP)		
	16	48	1.2		SAND, f., no m.-c. sand, ltl. clay/silt, (10YR5/1-5/2), 3 thin layers of tr. m. sand at 39 ft. (SP)		
40	17	24	1.3		As above, tr.-few m. sand, tr.-few silt/clay, no apparent structure o layering (SP)		
	18	42	1.5		SAND, f., tr.-few m. sand, tr. few clay/silt, thin faint layer of m. sand in basal 0.8 ft of sample (SP)		
45	19	29	0.9		As above, 2 thin faint magnetite layers on top 0.3 ft of sample (SP		
	20	27	1.2		As above, (SP		
50							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-E01C

PROJECT NAME: Rio Grande Watershed Study, Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
50					SAND, m., some f. sand, ltl. c. sand, tr. f. gravel, (10YR4/1), f.-m. fraction rounded quartz and angular-rounded lithics and mafics, 60/40 quartz/other, c. sand and gravel is red siltstone and yellow brown sandstone, gray carbonate, dk. gray volcanics, granite (SW)		
					SAND, f.-m. sand, tr. c. sand, lithology as above (SW)		
	21	42	1.7		SAND, c., some f. gravel, ltl. m.-f. sand, angular-subrounded volcanics and carbonate, quartz and quartzite, granite (SW)		
					SAND, f.-m., ltl. c. sand, no gravel, few clay/silt (10YR4/2) (SP)		
					SAND, c., f. gravel, angular-rounded grains, lithology as above (SP)		
	22	46	1.5		SAND, f.-m., few c. sand (SP)		
55							
	23	67	0.5		CLAY, slow dilatancy, high plasticity, high toughness, medium dry strength, appears to be organic matter, charcoal and roots, 1 piece of gravel in sampler (CL-CH)		
					SAND, f., (SP)		
					No Recovery		
	24	81	0				
60							
	25	85	1.25		SAND, f., no m.-c., tr.-few clay/silt, gray to brown gray, (10YR4/1-4/2), rounded quartz grains, 75-80% quartz, 20-25% pink orange quartz, rounded grains, firm, faint magnetite rich layer at 61.6 ft. (SP)		Bentonite pellets and slurry
					As above, (SP)		
	26	47	1.2		SAND, f., ltl., m. sand, tr.-few c. sand, tr. fine gravel, c. sand is volcanic, quartz and quartzite, rhyolite gravel is subrounded, fine grain volcanic and metamorphic and well rounded quartzite (SP-SW)		
65							
					SAND, f., some m. sand, few c. sand, tr.-few f. gravel pieces, lithology as above, 1 c. gravel piece of dolomite (SP)		
	27	105	1.5		SAND, c., fine gravel, few lithic and mafic f. sand, angular and rounded dk. gray volcanics, gray carbonate, quartz and quartzite grains (SP-GP)		
					SAND, f.-m., several layers with f.-c. gravel (SP-SW)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-E01C

PROJECT NAME: Rio Grande Watershed Study, Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
70	28	56	1.2		SAND, f.-m., several layers with f.-c. gravel (SP-SW)		
					SAND, f.-m. grades to f.-c. sand (SP)		
	29	80	1.4		SAND, grades back to f. sand with tr. f. gravel (SP)		
					SAND, f. with increasing silt and clay towards the bottom, dk. gray brown (10YR4/2) (SP-SM)		Natural backfill/collapse
					GRAVEL, f.-c., some f.-c. sand, gravel predominately subrounded, volcanics, quartz and sandstone, metamorphic sandstone (GW)		
	30	61	1.1		GRAVEL, increasing silt/clay matrix (GP)		Borehole TD= 83 ft.
75							
					CLAY, dk. green gray (5GY4/1), firm, (Pp=1.04), with 2 gravel clasts, no dilatancy, plastic, moist, bottom contact is sharp c. gravel (CL)		2 in. ID sch 40 PVC screen, 0.010 in. slots
	31	>10	1.1		GRAVEL, f.-c., and f.-c SAND, one clast greater than 2 inches in diameter (SW-GW)		
	32	68/6	0.5		SAND, f.-m., ltl.-some f. gravel and c. sand, tr.-few silt/clay, brown (10YR4/3) (SP-SW)		
80							
	33	45	0.9		As above, fewer fines, few c. gravel, same large clasts, subrounded-rounded (SP-SW)		End cap
	34	67	1.1		SAND, f., few-ltl. m. sand, tr. silt/clay, v. dk. brown (10YR2/2), poorly graded, v. dense, (SP) Probable Santa Fe Group.		
85							
	35	50/4	n/a		As above, tr. m. sand, only in fine zones, no apparent bedding (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-E02A

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study, Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Brown Arroyo Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** NA
START DATE: 4/30/03	**WELL ELEVATION:** 4576.58 ft.
FINISH DATE: 4/30/03	**GROUND ELEVATION:** 4575.3 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM A	WELL CONSTRUCTION
0					Not sampled. See log of BRN-E01C for lithology.		Locking protective casing; 2 in. ID sch 40 PVC riser; Bentonite chips; 20-40 Silica sand pack
5							2 in. ID sch 40 PVC screen, 0.010 in. slots; Natural backfill/collapse
10							
15							Borehole TD= 19.2 ft.; End cap

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GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-E03AB

PROJECT INFORMATION

PROJECT NAME: Rio Grande Watershed, Phase 1
PROJECT NUMBER: 771-3
LOCATION: Brown Arroyo Transect
ONSITE GEOLOGIST: Bryan Grigsby
START DATE: 10/18/02
FINISH DATE: 5/5/2003

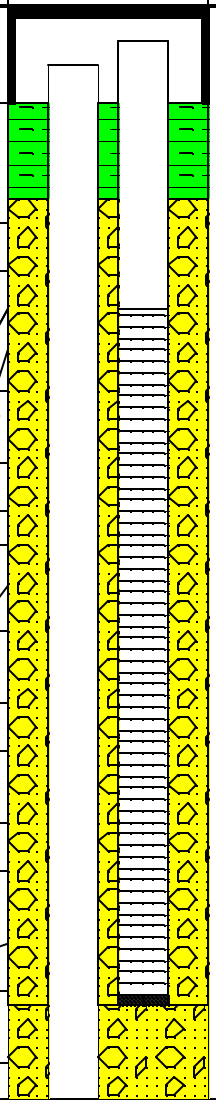
DRILLING INFORMATION

DRILLING FIRM: GeoTest
CREW LEADER: Greg Sena
RIG TYPE: CME 75
SAMPLE TYPE: Split Spoon
WELL ELEVATION: A: 4574.41 ft. B: 4574.34 ft.
GROUND ELEVATION: 4573.47 ft.

NOTES: Borehole Diameter: 6 in.- geologic sampling
10 in.- well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
0		n/a	0		Cuttings: CLAY, tr. silt and f. sand, dk. yellow brown (10YR3/4), plastic, wet (CL)
▼ 5	1	7	1.5		SAND, f.-m., grades to silty f. sand, to silt, dk. yellow brown (10YR4/4), moist-wet (SP, ML)
					SAND, f., tr.-few m. sand, tr. silt/clay, color as above, wetter in bottom (SP)
	2	3	1.5		SAND, f., tr. m.-c. sand, grades to f.-m. sand, tr.-few c. sand and f. gravel, brown (10YR4/3), wet (SP)
10	3	7	1.3		SAND, f.-m., as above, only tr. c. sand, 1 piece of f. gravel (SP)
					SAND, f. with faint thin dk. orgainc layers, yellow brown (10YR5/4) (SP)
	4	5	0.9		As above, f.-m. sand, and f. sand, 1 piece of c. gravel, subangular (SP)
15	5	5	0.2		SAND, f.-m., and f. GRAVEL, ltl. c. sand, (SW-GW)
	6	7	0.9		SAND, f.-m., tr.-few sand and f. gravel, dk. gray brown (10YR4/2), gravel is predominately sandstone and limestone, subangular, sand is subangular to subrounded (SP-SW)
20	7	13	0.7		As above, but less c. sand and gravel (SP-SW)



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GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-E03AB

PROJECT NAME: Rio Grande Watershed, Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	8	15	1.5		Sluff, Shows gradation from f.-m. sand to f. gravel, lots of green grass in upper 0.5 ft.		Bentonite pellets
	9	11	1.0		SAND, f., tr. m. sand, few mica flakes, dk. gray brown (10YR4/2) (SP)		Natural backfill/collapse
25	10	0	0.5		SAND, f., tr.-few c. sand and f. gravel, grades to f.-c. sand and f. gravel in base of sample (SW-GW)		
	11	9	0.9		As above, increasing gravel, piece of wood in bottom (SW-GW)		
30	12	21	1.7		As above, more young looking wood, no m.-c. sand (SW-GW) SAND, f., no m.-c. sand or gravel (SP)		
	13	23	1.1		SAND, f., v. dk. gray brown (10YR3/2) (SP) SAND, m., few c. sand, tr. f. gravel, dk. gray brown (10YR4/2) (SP)		
35	14	24	0.6		SAND, f.-m., tr. c. sand, color as above, few clay 0.1 ft. from the bottom (SP)		
	15	17	1.0		SAND, f.-m., tr.-few c. sand, and f. gravel, angular c. gravel, grades to f. sand, with thin organic rich lens, piece of old wood .5 ft. from bottom (SP)		Bentonite pellets
40	16	26	0.7		SAND, f.-m., tr. c. sand, dk. gray brown (10YR4/2), predominately quartz, angular to rounded, predominately subrounded (SP)		Natural backfill/collapse
	17	21	0.9		SAND, f.-c., ltl.-some f.-c. gravel (SW-GW) SAND, f, some m. sand (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
45	18	22	1.2		As above (SP) SAND, f., few m. sand and f. gravel (SP) SAND, f.-c. and f. GRAVEL, dk. gray (10YR4.5/1), clay lens less than 0.05 ft. from bottom (SW-GW)		
	19	36	1.0		Sluff, sand and gravel (SW-GW)		End cap
50							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

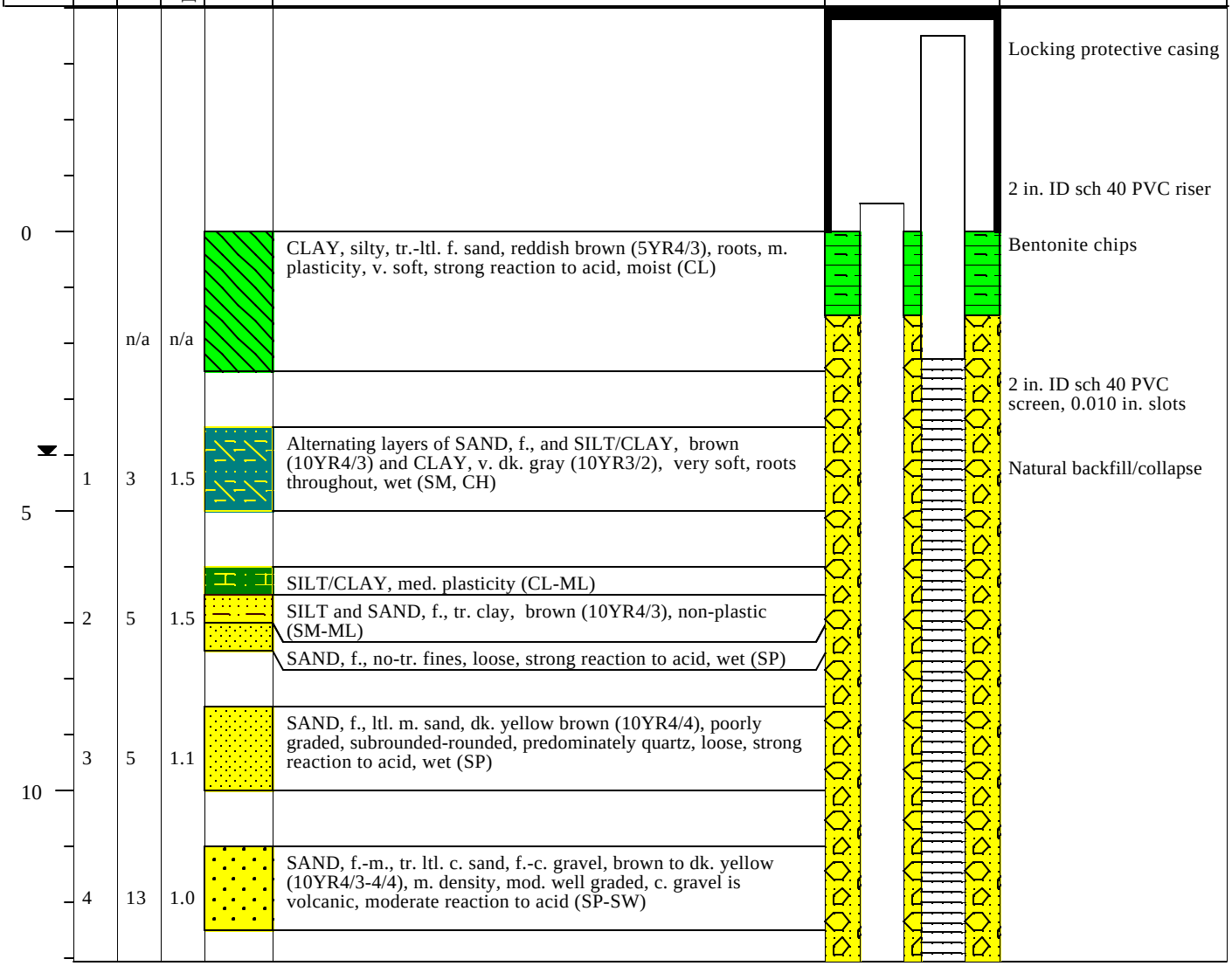
BORING NO. : BRN-E04AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Greg Sena
LOCATION: Brown Arroyo Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Bryan Grigsby	**SAMPLE TYPE:** Split Spoon
START DATE: 10/21/2002	**WELL ELEVATION:** A: 4572.39 ft. B: 4571.74 ft.
FINISH DATE: 5/6/2003	**GROUND ELEVATION:** 4571.08 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
0		n/a	n/a		CLAY, silty, tr.-ltl. f. sand, reddish brown (5YR4/3), roots, m. plasticity, v. soft, strong reaction to acid, moist (CL)
▼ 5	1	3	1.5		Alternating layers of SAND, f., and SILT/CLAY, brown (10YR4/3) and CLAY, v. dk. gray (10YR3/2), very soft, roots throughout, wet (SM, CH)
	2	5	1.5		SILT/CLAY, med. plasticity (CL-ML) SILT and SAND, f., tr. clay, brown (10YR4/3), non-plastic (SM-ML) SAND, f., no-tr. fines, loose, strong reaction to acid, wet (SP)
10	3	5	1.1		SAND, f., ltl. m. sand, dk. yellow brown (10YR4/4), poorly graded, subrounded-rounded, predominately quartz, loose, strong reaction to acid, wet (SP)
	4	13	1.0		SAND, f.-m., tr. ltl. c. sand, f.-c. gravel, brown to dk. yellow (10YR4/3-4/4), m. density, mod. well graded, c. gravel is volcanic, moderate reaction to acid (SP-SW)



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GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-E04AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
15	5	7	0.5		As above, c. gravel in tip of sampler, (SP-SW)		
	6	10	0.7		SAND, f.-c., few f.-c. gravel, 1 vesicular basalt clast, dk. yellow brown (10YR4/4), well graded, loose-medium density (SW)		End cap
	7	6	0.8		SAND, f.-m., tr. few c. sand and f. gravel, dk. gray brown (10YR4/2), loose, subangular-subrounded gravel clasts, volcanics, limestone, quartzite, weak-moderately weak reaction to acid (SP-SW)		
20							Bentonite pellets
	8	6	0.5		SAND, f.-m., coarsening to f.-c. sand, with gravel (SP-SW)		
					SAND, f., possibly tr. silt, dk. gray brown (10YR4/2), poorly graded, predominately quartz (SP)		
					CLAY, dk. gray brown (10YR4/2), v. soft, plastic (CH)		
	9	7	2.2		SILT, tr.-few f. sand and clay (ML)		Natural backfill/collapse
25					CLAY, plant material present (CH)		
					SAND, f. (SP)		
					CLAY, as above (CH)		
	10	21	1.1		SAND, f., dk. gray brown (10YR4/2), v. poorly graded, m. dense, thin horizontal bands of dk. material, plant matter below bands (SP)		
	11	21	1.0		SAND, f., ltl. m.-c. sand at 29-29.3 ft., finer towards the bottom (SP)		
30							
					SAND, f.-m., tr. c. sand and f. gravel, poorly graded (SP)		
	12	25	1.0		SAND, f., brown (10YR5/3), v. poorly graded, med. density (SP)		
	13	18	1.3		SAND, f.-c., ltl. f. gravel, well graded except for a 0.2 ft. interval of sand, f.-m. (SP-SW)		
35							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-E04AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	14	28	1.4		As above, (SP-SW)		
					SAND, f., few-ltl. m. sand (SP)		
	15	16	0.9		SAND, alternating layers f. sand, few m. sand, with f.-c. sand (SP-SW)		Bentonite pellets
40					SAND, few-ltl. f. gravel (SW-GW)		
	16	18	0.3		SAND, f.-m., tr. c. sand, ltl. f. gravel, 0.2 ft. of f. sand in bottom o sample (SP-SW)		Natural backfill/collapse
					SAND, f.-m., slight coarsening downward trend, (SP)		
	17	23	n/a		SAND, m., and CLAY (SC)		
45					SAND, f.-m., tr. c. sand and f. gravel (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
	18	15	0.7		Sluff, sand, coarsening downward from f. sand to c. sand and f. gravel, more gravel than in previous samples (SW-GW)		
					CLAY and SAND, f.-c., and f. GRAVEL (SC-GC)		Borehole TD= 50 ft.
					SAND, f.-m., tr.-ltl. c. sand and f. gravel (SW)		
					SAND, m.-c., few f.-c. sand, tr. few-med. sand and f. gravel (SW)		
	19	33/2			SAND, f.-m, tr. c. sand, tr. clay, few f. gravel (SP-SW)		End cap
50							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-E05AB

PROJECT INFORMATION

PROJECT NAME: Rio Grande Watershed Study Phase 1
PROJECT NUMBER: 771-3
LOCATION: Brown Arroyo Transect
ONSITE GEOLOGIST: Bryan Grigsby
START DATE: 10/17/2002
FINISH DATE: 4/29/2003

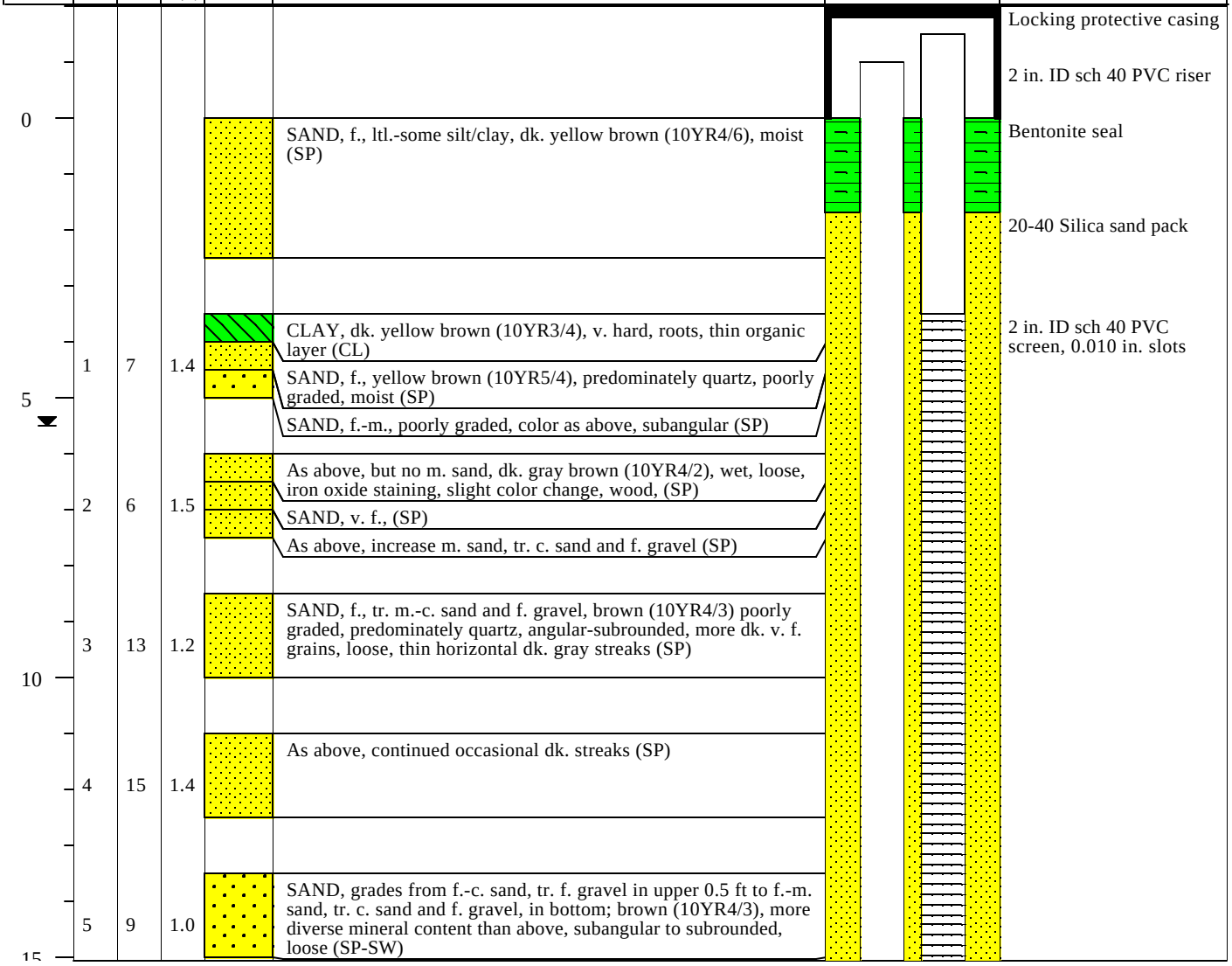
DRILLING INFORMATION

DRILLING FIRM: GeoTest
CREW LEADER: Dave Tanner
RIG TYPE: CME 75
SAMPLE TYPE: Split Spoon
WELL ELEVATION: A: 4573.05 ft. B: 4572.98 ft.
GROUND ELEVATION: 4572.10 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
0					SAND, f., ltl.-some silt/clay, dk. yellow brown (10YR4/6), moist (SP)
					CLAY, dk. yellow brown (10YR3/4), v. hard, roots, thin organic layer (CL)
	1	7	1.4		SAND, f., yellow brown (10YR5/4), predominately quartz, poorly graded, moist (SP)
5 ▼					SAND, f.-m., poorly graded, color as above, subangular (SP)
					As above, but no m. sand, dk. gray brown (10YR4/2), wet, loose, iron oxide staining, slight color change, wood, (SP)
	2	6	1.5		SAND, v. f., (SP)
					As above, increase m. sand, tr. c. sand and f. gravel (SP)
	3	13	1.2		SAND, f., tr. m.-c. sand and f. gravel, brown (10YR4/3) poorly graded, predominately quartz, angular-subrounded, more dk. v. f. grains, loose, thin horizontal dk. gray streaks (SP)
10					
	4	15	1.4		As above, continued occasional dk. streaks (SP)
	5	9	1.0		SAND, grades from f.-c. sand, tr. f. gravel in upper 0.5 ft to f.-m. sand, tr. c. sand and f. gravel, in bottom; brown (10YR4/3), more diverse mineral content than above, subangular to subrounded, loose (SP-SW)
15					



WELL CONSTRUCTION

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-E05AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	6	11	1		As above, coarser near top and bottom, frequent v. small angular black flecks (SP-SW)		
	7	7	1		SAND, f.-m., sand ltl. c. sand, ltl. f. gravel, loose (SP-SW)		End cap
20							Bentonite chips
	8	7	1.0		As above, slightly darker, dk. brown (10YR3/3), (SP-SW)		
					As above, coarser and darker, increased gravel, subangular limestone (SP-SW)		
					As above (SP-SW)		
	9	9	0.5		SILT and CLAY, dk. brown (10YR3/3), v. soft, sharp upper contact with sand, plastic (CL-ML)		Natural backfill/collapse
25							
					As above, soft in top of sample, firm in bottom (Pp=1.5) (CL-ML)		
	10	13	1.5		SAND, f.-m., tr. c. sand, dk. gray brown (10YR3/2), m. density, subangular-subrounded, predominately quartz (SP)		
	11	19	0.9		SAND, f.-m., grading to f.-c. sand, tr.-few f. gravel in bottom, brown (10YR3/2), clay lens 0.1 ft. thick in upper part of samples (SP)		
30							
	12	25	0		Sluff, coarsening down sequence from f. sand to c. sand, drilling mud in c. sand.		
	13	17	1.0		SAND, f.-m., tr. c. sand, v. dk. gray brown (10YR3/2), 0.1 ft. thick layer with vague dk. layering (SP)		
35							
	14	16	0.9		SAND, layers of f.-c. sand, f.-c. sand and f. gravel, and clay, v. dk. brown (10YR2/2 to 10YR3/2), clay is soft and plastic, some clay coatings on gravel, sands are subrounded and gravel is angular (SW-GW)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-E05AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
40	15	13	1.0		SAND, f.-m., tr. c. sand and f. gravel, not as dark as above, (10YR4/2), (SP)		Bentonite chips
					SAND, f.-c., ltl. f. gravel, (10YR5/2), small interval with silty clayey matrix, clay is also greater than above, volcanics and limestone gravel clasts (SW)		
	16	n/a	0		Sluff, did not get sampler to bottom of hole.		Natural backfill/collapse
45	17	5	2.0		SAND, f.-m., tr. c. sand, and f. gravel, color as above, poorly graded, 0.05-ft. clay layer 0.1 ft. from bottom (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
	18	24	1.1		SAND, f.-m., and f.-c. gravel, ltl. c. sand, tr. clay, m. density, well graded small clay coating on 1 of 2 large gravel pieces (SW-GW)		Borehole TD= 49.5 ft.
	19	8	0.7		SAND, f.-m., tr. c. sand and f. gravel, some intervals are clayey (SP)		
50					CLAY, dk. brown (10YR3/3), blackish streaks, high plasticity (CL)		End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-E06AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Brown Arroyo Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Bryan Grigsby	**SAMPLE TYPE:** Split Spoon
START DATE: 10/22/02	**WELL ELEVATION:** A: 4573.75 ft. B: 4573.79 ft.
FINISH DATE: 4/29/2003	**GROUND ELEVATION:** 4572.71 ft.

NOTES: Borehole Diameter: 6 in.- geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0					CLAY, tr.-few f. sand and silt, brown, moist (CL)		Locking protective casing; 2 in. ID sch 40 PVC riser; Bentonite chips
		n/a	n/a				20-40 Silica sand pack
					CLAY, tr. silt (CL)		
	1	7	1.4		SAND, v. f. with silt (SM-SP)		2 in ID sch 40 PVC screen, 0.010 in slots
5 ▼					CLAY, (CL)		
					SAND, v. f. (SP)		
					SAND, f., loose, wet (SP)		
	2	6	1.4		SAND, f.-m., brown (7.5YR4/4), fines downward (SP)		
					SAND, f., with organic matter. (SP)		
					SAND, f.-m. (SP)		
					SAND, f., tr. m. sand, tr. f. gravel, at 8.9 ft. there is a dark gray stain and a root (SP)		
	3	12	1.4		SAND, f.-m., tr. c. sand, f. gravel, brown (10YR4/3), med. dense (SP)		
10							
	4	8	1.2		SAND, f.-m., tr. c. sand and f. gravel (SP)		
					As above, (SP)		
	5	6	1.2		As above, increased c. sand and f. gravel (SP)		
15							Natural backfill/collapse

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-E06AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	6	7	1.1		As above, clay lens at 17.3 ft. (SP)		
	7	4/3	0.8		CLAY, dk. gray (2.5YR4/1) (CH) SAND, m.-c. few f. sand, tr.-few f. gravel, well graded (SW) SAND, f.-m., (SP)		End cap
20					SAND, m.-c., tr. f. sand, few f. gravel, well graded (SW)		
	8	11/2	0.5		SAND, f.-m., tr. c. sand, few f. gravel, (SP-SW)		Bentonite pellets
	9	14	1.5		SAND, f.-m., tr. f. gravel, poorly graded (SP) CLAY, dk. gray brown (2.5YR4/2) with dk. streaks and reddish streaks, firm, plastic, difficult to mold (CH)		Natural backfill/collapse
25							
	10	21	1.4		SAND, f.-m., tr. c. sand and f. gravel, (SP-SW) SILT, ltl.-some f. sand, non-plastic (ML) SILT and v. f. SAND, v. dk. gray brown (10YR3/2), non plastic (SM-ML)		
	11	22	1.2		SAND, f., dk. gray brown (10YR4/2), scattered dk. gray bands, v. poorly graded (SP)		
30							
	12	32	1.2		As above, 1 clast f. gravel at bottom of f. sand, dense (SP) SAND, f.-m., tr. f. gravel, dk. gray bands in upper 0.1 ft. (SP)		
	13	40	1.3		SAND, f.-m., poorly graded (SP) SAND, coarser, tr. f. gravel (SP) SAND, f.-m., poorly graded (SP)		
35							
	14	22	1.1		SAND, f.-m., faint dk. gray bands at 36.6 ft., tr. c. sand and f. gravel in bottom 0.5 ft. (SP)		

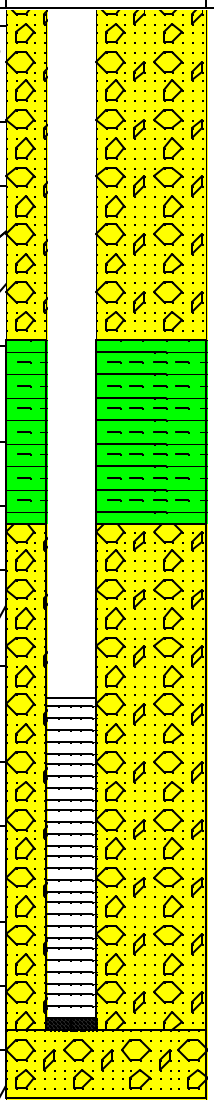
S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-E06AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
	15	16	1.4		As above, increased m. sand, c. sand in lenses, at 39.2 and 39.6 ft., tr. dk. gray brown (10YR4/2) v. weak reaction with acid (SP)
40					
	16	23	1.6		SAND, m., tr.-few f. sand, poorly graded, subangular to subrounded (SP)
					SAND, f., v. dk. gray brown (10YR3/2), v. poorly graded, subrounded-rounded, predominately quartz (SP)
	17	23	0.9		As above, with tr. c. sand and f. gravel (SP)
45					
	18	27	1.1		As above, (SP)
					SAND, f.-c,. and f.-c. GRAVEL, well graded, gravel is subrounded, metamorphic, carbonate, volcanics (SW-GW)
	19	28	1		SAND, m., few f.-c. sand and f. gravel, v. dk. gray brown (10YR3/2), medium density (SP)
50					
	20	39	0.1		As above, 1 clast of c. gravel, quartz sandstone (SP)
	21	47	1.6		As above, (SP)
					SAND, f., few-ltl. m. sand, tr. f. gravel, brown (10YR4/3), dense (SP)
55					
	22	45	0.2		As above, (SP)
	23	37	1.3		SAND, f.-m., v. poorly graded, dense, brown (10YR4/3) (SP)
60					



WELL CONSTRUCTION

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

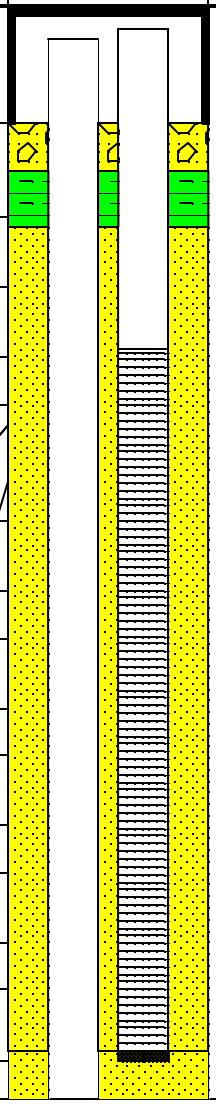
BORING NO. : BRN-W01AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study, Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** David Tanner
LOCATION: Brown Arroyo Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** Split Spoon
START DATE: 11/20/2002	**WELL ELEVATION:** A: 4571.99 ft. B: 4572.06 ft.
FINISH DATE: 4/22/2003	**GROUND ELEVATION:** 4570.90 ft.

NOTES: Borehole Diameter: 6 in.
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
0	1		0		CLAY, ltl. to some silt, d. brown, soft (CL)
5	2	3	1.3		CLAY, some v.f. sand, lt. brown, firm, (Pp=1.5), slightly moist (CL)
▼	3	3	1.2		As above, (CL) SAND, f. quartz sand, lt brown to yellow/orange, some rust colored staining of grains in cross-section, probably due to water movement, poorly graded (SP)
10	4	6	.9		SAND, f.-m., tr. f. mafic sand, tr. f. silliceous gravels, subangular, moderately poorly graded, no visible structure in sampler (SP)
	5	12	1		As above, (SP)
15	6	8	.8		As above, (SP)
	7	9	.9		As above, piece of cobble in sampler 0.7' from bottom (SP)
20	8	9	.8		SAND, f. quartz sand, tr. v. f. mafic sands, gray, very poorly graded, subangular to subrounded grains, no visible structure (SP)



WELL CONSTRUCTION

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-W01AB

PROJECT NAME: Rio Grande Watershed Study, Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	9	10	.7		SAND, f.-c., ltl. gravel, moderately graded, subrounded to subangular (SP-SW)		Natural backfill/collapse
					CLAY, some silt, olive gray clay, firm, (Pp=0.7) moist (CL)		
	10	21	1		SAND, f. quartz sand, tr. f. grain mafic sand, gray in color, poorly graded (SP)		
25							
	11	14	1.1		As above, increasing m. sand (SP)		
	12	12	1.0		CLAY, ltl. silt to v.f. sand, olive gray, med. firm (Pp=1.5-2.0), slightly moist (CL)		
30							
					As above, (CL)		
	13	15	.8		SAND, f. quartz sand, lt. gray to brown in color, poorly graded, subangular to subrounded grains (SP)		
	14	22	.2		As above. Increasing m. sand (SP)		
35							
	15	28	1.3		As above, some gravel 0.5'-0.6' from bottom of sample (SP)		Bentonite pellets
	16	13	.7		As above, some clay 0.4' from bottom, organic matter 0.1' from bottom (SP)		Natural backfill/collapse
40							
	17	14	1		As above, tr. clay at bottom of sampler, lt gray-gray in color, v. soft (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
					As above, with some m. sand and ltl. f. gravel (SP)		
	18	14	1.1		CLAY, ltl. to no silt, gray, med. stiff, (Pp=1.0-1.6) (CL)		
45							Borehole TD=47.2 ft.
					CLAY, gray, soft, (Pp-0.2), moist (CL)		
	19	8	1.2		CLAY, brown to lt. brown, soft, (Pp=0.4) (CL)		End cap
					CLAY, dk. gray to black clay, firm, (Pp=1.2-1.4) (CL)		
					CLAY, olive gray, firm (CL)		
	20	26	1		SAND, f.-m. quartz sand, tr. mafic f. sand, tr. f. gravel, poorly graded, (SP)		
50							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-W02A

PROJECT INFORMATION

PROJECT NAME: Rio Grande Watershed Study, Phase 1
PROJECT NUMBER: 771-3
LOCATION: Brown Arroyo Transect
ONSITE GEOLOGIST: Peter Lang, Dagmar Llewellyn
START DATE: 11/20/2002
FINISH DATE: 4/21/2003

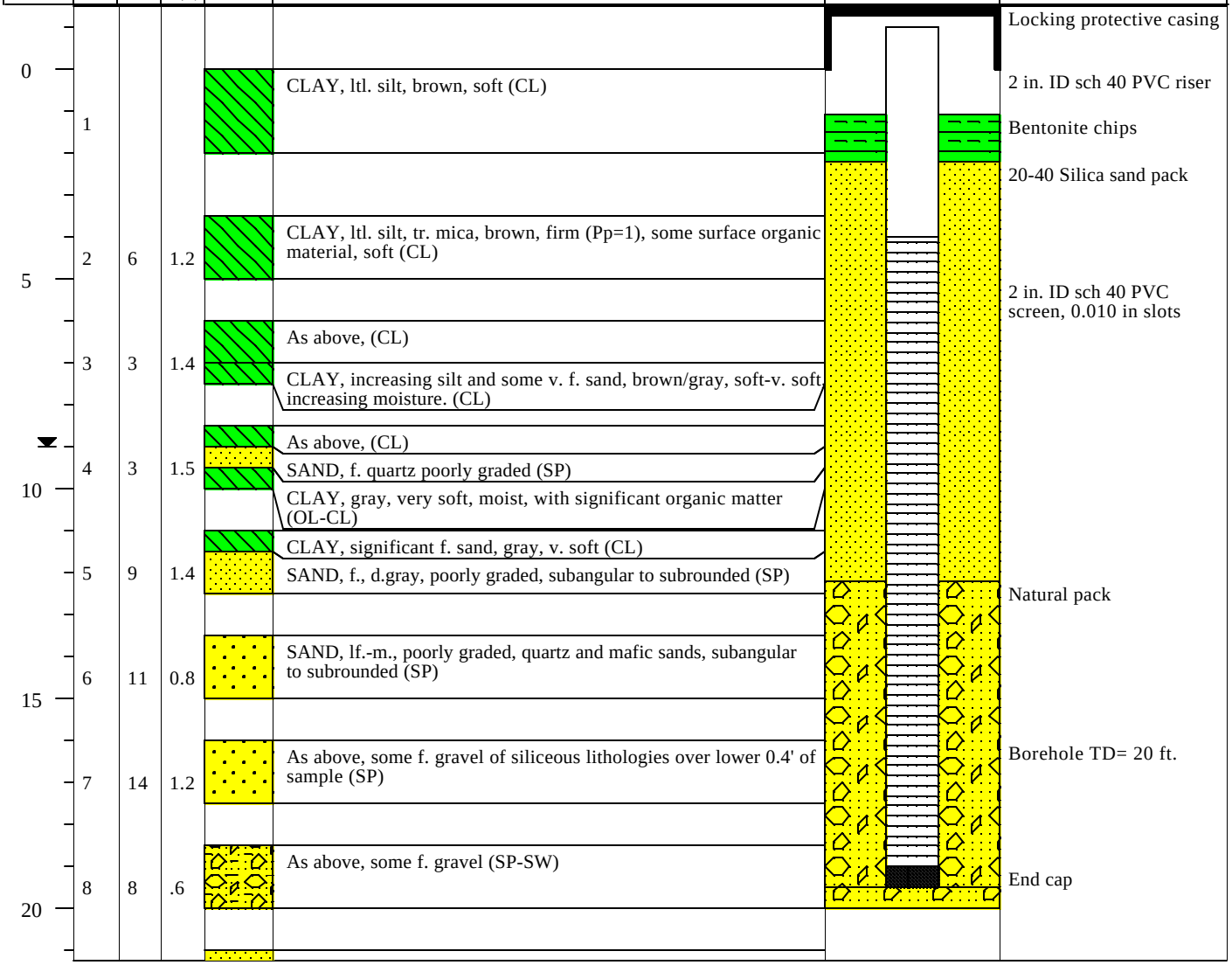
DRILLING INFORMATION

DRILLING FIRM: Geotest
CREW LEADER: Dave Tanner
RIG TYPE: CME 75
SAMPLE TYPE: Split Spoon
WELL ELEVATION: A: 4571.78 ft.
GROUND ELEVATION: 4570.95 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
0					
	1				CLAY, ltl. silt, brown, soft (CL)
	2	6	1.2		CLAY, ltl. silt, tr. mica, brown, firm (Pp=1), some surface organic material, soft (CL)
5					
	3	3	1.4		As above, (CL)
					CLAY, increasing silt and some v. f. sand, brown/gray, soft-v. soft increasing moisture. (CL)
▼					
	4	3	1.5		As above, (CL)
10					SAND, f. quartz poorly graded (SP)
					CLAY, gray, very soft, moist, with significant organic matter (OL-CL)
					CLAY, significant f. sand, gray, v. soft (CL)
	5	9	1.4		SAND, f., d.gray, poorly graded, subangular to subrounded (SP)
	6	11	0.8		SAND, lf.-m., poorly graded, quartz and mafic sands, subangular to subrounded (SP)
15					
	7	14	1.2		As above, some f. gravel of siliceous lithologies over lower 0.4' of sample (SP)
	8	8	.6		As above, some f. gravel (SP-SW)
20					



S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-W02A

PROJECT NAME: Rio Grande Watershed Study, Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM A	WELL CONSTRUCTION
	9	14	1.4		SAND, f., ltl. v. f. sand, lt. brown, poorly graded, no structure apparent, wet, part of sample washed away (SP)		
	10	13	0.9		SAND, f.-c., ltl. f. gravel, med. brown, poorly sorted, well graded, no structure apparent (SW)		
25	11	15	1.4		As above, but with a 1" diameter pocket of d. brown clay, ltl. sand, soft (SW)		
					SAND, m., some f. sand, lt. brown, clean, no fines, well sorted, poorly graded, no structure apparent (SP)		
	12	12	0.7		SAND, v. f.-m., tr. c. sand, lt. brown, clean, no fines, well sorted, poorly graded, no visible structure, wet (SP-SW)		
30	13	6	0.9		SAND, f.-c., with pockets of m. brown, soft clay. Bottom 0.1' of sampler is clean, well sorted, poorly graded, coarse sand. Tip of spoon is soft clay, some sand, m. clay (SM)		
	14	10	1.0		CLAY, ltl. sand, med. brown gray, soft, gummy (CL)		
35					SAND, f., ltl. m. sand, med. brown, clean, no fines, poorly graded (SP)		
	15	12	1.0		SAND, f., ltl. m. sand, tr. f. gravel, med. brown to lt. gray, clean, no fines, well sorted, poorly graded, no visible structure, wet (SP)		
	16	15	1.0		SAND, m.-c., ltl. fl-c. gravel, tr. silt to f. sand, well graded, gravel wash at top of sample, subrounded (SW)		
40	17	28	0.8		SAND, m.-c., ltl. f.-c. gravel, lt. brown, clean, no fines, well graded, wet (SW)		
	18	22	1.2		SAND, m., ltl. c. sand, tr. f. gravel, lt. brown, clean, no fines, well graded, wet (SP-SW)		
45	19	24	1.3		As above, (SP-SW)		
	20	25	0.4		As above, with subrounded gravel (SP-SW)		
50							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

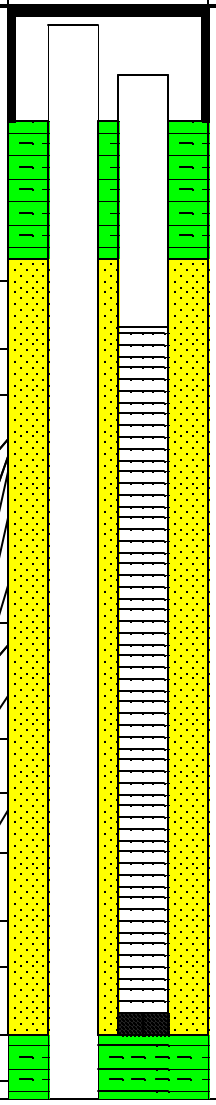
BORING NO. : BRN-W03AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study, Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Brown Arroyo Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** Split Spoon
START DATE: 11/20/02	**WELL ELEVATION:** A: 4575.09 ft. B: 4575.48 ft.
FINISH DATE: 4/22/2003	**GROUND ELEVATION:** 4574.31 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
0					
5	1	11	0.9		SAND, f.-v.f., some c. gravel, lt. brown, poorly graded (SP)
	2	6	1.5		SAND, f.-v.f., lt brown to yellowish orange, poorly graded, dry (SP)
					SAND, m. quartz, poorly graded (SP)
					SAND,v. f., lt brown to yellowish orange, poorly graded (SP)
10	3	15	1.2		As above, increasing f. gravel over lower .2' of sample, no visible structure, slightly moist (SP)
					As above, (SP)
	4	12	1.2		SAND, f.-c. sand, ltl. f. gravel, clean, moderately well graded, subrounded to subangular, moist (SW)
▼					
15	5	7	1.5		As above, (SW)
					SAND, f.-v.f., poorly graded, quartz (SP)
	6	3	1.5		SAND, f.-m. ltl. to some clay/silt, moderately poorly graded, subangular to subrounded (SM)
20	7	15	0.8		SAND, m.-c., f. gravel, some f. sand, quartz, moderately well graded, subrounded to subangular (SP-SW)



S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-W03AB

PROJECT NAME: Rio Grande Watershed Study, Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	8	17	0.9		GRAVEL, sand at base, fining upward to moderately graded f.-m. sand, some siliceous f. gravel, subrounded to subangular (SW)		Bentonite chips
	9	18	0.9		SAND, f.-m., some f.-c. gravel, lt. brown, little to no fines, moderately well graded, subrounded to subangular (SW)		Natural backfill/collapse
25	10	15	0.9		SAND, f.-c., and f. GRAVEL, well graded, quartz, subangular to subrounded (SW-GW)		
	11	10	1		SAND, f.-m., olive gray-brown, poorly graded, subrounded to subangular (SP)		
30	12	17	1.1		As above, with some f. gravel (SP)		
	13	14	0.9		As above, with thin soft olive brown clay layer 0.5' from the bottom of sampler (SP)		
35	14	15	1.1		As above, horizontal bedding of what appears to be organic matter 0.1', 0.25' & 0.45' from bottom of sampler (SP)		
	15	28	1.0		As above, horizontal banding of f. mafic mineral approximately every 0.05' (SP)		
40	16	11	.9		SAND, f.-m., some f. gravel, gray, increasing f. grain mafic sands, subrounded to subangular (SP-SW)		Bentonite chips
	17	26	0.7		SAND, f.-c., some gravel, well graded, predominantly quartz (SW)		Natural backfill/collapse
45	18	29	1.0		SAND, f., tr. m. sand, gray, poorly graded, bedding visible in dark layers, 0.4' and 0.6' from the bottom of the sample (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
	19	21	NR		As above, increasing to m. sand (SP)		
50							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-W04AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Brown Arroyo Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:**
START DATE: 4/20/2003	**WELL ELEVATION:** A: 4572.36 ft. B: 4572.51 ft.
FINISH DATE: 4/20/2003	**GROUND ELEVATION:** 4571.22 ft.

NOTES: Borehole Diameter: NA
8 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
0					Not sampled. See log of BRN-W03 for lithology.		Locking protective casing 2 in. ID sch 40 PVC riser Cement Bentonite chips Natural backfill/collapse 2 in. ID sch 40 PVC screen, 0.010 in. slots End cap
5							
10							
15							
20							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-W04AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
25							Bentonite pellets
30							Natural backfill/collapse
35							
40							Bentonite pellets
45							Natural backfill/collapse
50							2 in. ID sch 40 PVC screen, 0.010 in. slots Borehole TD= 52.5 ft. End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-W05AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Brown Arroyo Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Bryan Grigsby	**SAMPLE TYPE:** Split Spoon
START DATE: 12/5/2002	**WELL ELEVATION:** A: 4576.62 ft. B:4576.24 ft.
FINISH DATE: 4/25/2003	**GROUND ELEVATION:** 4575.89 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0							Locking protective casing
							2 in. ID sch 40 PVC riser
					SILT, and v. f. sand, yellow brown (10YR5/8), v. poorly graded, dry (ML-SM)		Bentonite chips
	0						
	1	9	1.2		SAND, f., few-ltl. silt, yellow brown (10YR5/6), v. poorly graded, dry-moist (SP)		Natural pack and 20-40 Silica sand pack
5 ▼							2 in. ID sch 40 PVC screen, 0.010 in. slots
					As above, (SP)		
	2	5	1.4		SAND, f.-m., dk. yellow brown (10YR4/4), poorly graded, few thin dk. gray black bands, wet (SP)		
					As above, with tr. c. sand and f. gravel (SP)		
	3	8	1.0		SAND, f.-c., tr. clay, some f. gravel, yellow brown, well graded, sands subrounded-subangular (SW-GW)		
10							
	4	32	0.5		SAND, f.-m., tr. c. sand and f. gravel, dk. yellow brown (10YR4/6), moderately well graded, med. density (SP-SW)		
					SAND, f.-c., and f.-c. gravel, sand washed out, possibly sluff (SW-GW)		
	5	15	0.3		SAND, f., tr.-few m.-c. sand, dk. yellow brown (10YR4/4), poorly graded (SP)		
15							

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GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-W05AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	6	15	1.4		SAND, layers of f. sand, tr. m.-cs. sand with f.-c. sand, tr.-some f. gravel dk. yellow brown, (SW)		
					SAND, f., tr. m. sand, poorly graded (SP)		
					GRAVEL, f.-c., f.-m. sand, sluff		
	7	18	1.1		SAND, f., tr.-ltl. m. sand, dk. yellow brown (10YR4/4), frequent thin dk. gray bands, poorly graded (SP)		
20							End cap
					GRAVEL, gravel comprised of volcanics, some sandstone predominately subangular, sluff		Bentonite pellets
	8	20	0.9		SAND, f.-m., tr.-ltl. c. sand, tr. f. gravel, brown (10YR4/3) poorly to m. graded (SP)		
	9	24	1.0		As above, (SP)		Natural backfill/collapse
25							
	10	20	1.0		As above, overall slightly finer grain size (SP)		
					SAND, f., tr. m. sand, brown (10YR4/3), v. poorly graded (SP)		
	11	10	0.9		As above, with thin layers of alternate f. sand, f.-m. sand with tr. c. sand and f. gravel. (SP)		
30							
	12	27	1.0		As above, brown (10YR4/3) (SP)		
					SAND, f. (SP)		
	13	37	1.1		SAND, f., tr.-few m. sand, brown (10YR4/3), poorly graded, massive (SP)		
35							
	14	28	1.1		As above, sand is predominately quartz, some feldspar and tr. v. f. black flecks, subround (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : BRN-W05AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
40	15	33	0.9		SAND, f.-m., ltl. c. sand, few f. gravel, moderately well graded (SW)		
					SAND, f., brown (10YR4/3), to dk. gray brown (10YR4/2) (SP)		Bentonite pellets
	16	30	0.4		As above, (SP)		
					SAND, f.-c., and f. gravel, sluff		Natural backfill/collapse
45	17	21	1.6		SILT and CLAY, v. dk. gray brown (10YR3/2), v. sloft, plastic, slow-rapid dilatancy, (ML-CL)		
					SAND, f.-m., tr. few c. sand, tr. f. gravel, dk. gray brown (10YR4/2), moderately poorly sorted, (SP)		
	18	16	0.5		As above, (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
							Borehole TD= 52 ft.
50							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-E01AB

PROJECT INFORMATION

PROJECT NAME: Rio Grande Watershed Study Phase 1
PROJECT NUMBER: 771-3
LOCATION: Highway 380 Transect
ONSITE GEOLOGIST: Dagmar Llewellyn
START DATE: 11/22/2002
FINISH DATE: 4/4/2003

DRILLING INFORMATION

DRILLING FIRM: GeoTest
CREW LEADER: Dave Tanner
RIG TYPE: CME 75
SAMPLE TYPE: Split Spoon
WELL ELEVATION: A: 4554.19 ft. B: 4554.03 ft.
GROUND ELEVATION: 4553.67 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0							Locking protective casing
	1				SILT and SAND, v.f., light brown, some roots/surface organics, dry (SM)		2 in. ID sch 40 PVC riser; Concrete; Bentonite chips
	2	5	1.2		SILT, and v.f. SAND, vertically compacted, 2, 1 inch clay and silt layers (SM)		20-40 Silica sand pack
5					As above, (SM)		
▼	3	9	1.5		CLAY, mottled brown and olive, (Pp=1.25-3.5), soft to hard (CL-CH)		2 in. ID sch 40 PVC screen, 0.010 in. slots
					SAND, v.f., ltl. f. sand, light brown, (SP)		
	4	9	1.4		As above, (SP)		
10							
	5	4	1.5		SAND, f., ltl. v. f. sand, poorly graded, brown, clean, wet (SP)		
	6	24	0.7		As above, (SP)		
15							
	7	13	1.0		SAND, f., ltl. m. sand, m. brown, clean (SP)		
					SAND, f., ltl. v. f. sand, light brown, clean (SP)		
	8	13	0.8		SAND, m., ltl. c. sand, med. brown, clean (SP)		End cap
20							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-E01AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	9	12	1.0		SAND, m., poorly graded, piece of red angular c. gravel in bottom of sampler, clean (SP)		
	10	5	1.0		SAND, m., ltl. c. sand, poorly graded, 0.1 ft. layer of firm olive clay at top, possibly sluff (SP)		Bentonite pellets
25							Natural backfill/collapse
	11	17	1.0		SAND, f., ltl. v.f. sand, poorly graded, clean, (SP)		
	12	21	0		No Recovery		
30							
	13	20	0		No Recovery		
	14	16	1.3		SAND, f.-m., ltl. c. sand, well graded (SP-SW) CLAY, med. brown, (Pp=1.5) (CL) SAND, f.-m., ltl. c. sand and tr. v.f. sand, poorly graded (SP)		
35							Bentonite pellets
	15	12	1.1		CLAY, medium brown, with mottled gray, soft (Pp=1.0), 0.1 ft. thick layer of clean subrounded fine gravel (CL)		
	16	17	1.2		SAND, v. f., tr. c. sand, tr. c. gravel, medium brown, well graded, gravel is subangular (SW)		
40							Natural backfill/collapse
	17	32	0.3		SAND,v. f. to m., tr. silt, well graded (SW)		
	18	27	1.1		SAND, f., ltl. v. f. sand, poorly graded, med. brown, 0.2 ft. thick layer of clean well sorted f.-m. sand 0.2 ft. from the bottom (SP)		
45							2 in. ID sch 40 PVC screen, 0.010 in. slots
	19	19	0.9		CLAY, soft-med., med. brown (CL) SAND, f., ltl. v. f. sand, poorly graded, med. brown to grayish (SP)		Borehole TD= 50.5 ft.
	20	16	1.1		CLAY, soft-med., brown-gray mottles (CL) CLAY/SAND, soft clay and f.-c. sand (CL-SP) SAND, f.-c., ltl. f. gravel, well graded (SW)		
50							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

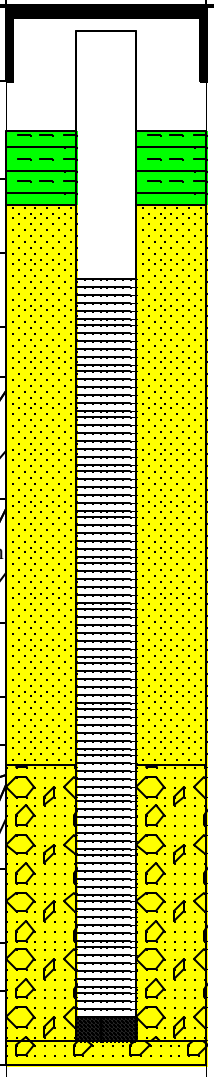
BORING NO. : HWY-E02A

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Highway 380 Transect	**RIG TYPE:** CME75
ONSITE GEOLOGIST: Dagmar Llewellyn	**SAMPLE TYPE:** Split Spoon
START DATE: 11/22/2002	**WELL ELEVATION:** 4552.70 ft.
FINISH DATE: 4/7/2003	**GROUND ELEVATION:** 4552.06 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
0	1	n/a	n/a		SILT, with balls of clay, ltl. v. f. sand, med. brown, roots and surface orgaincs (ML)
5	2	7	1.5		SILT, some clay in layers, buff colored, roots and surface organics present, compacted horizontally, breaks into plates, dry (ML)
	3	7	1.5		SILT/CLAY, med.-dk. brown clay, compacted (ML-CL) SAND, f., ltl. v. f. sand, poorly graded, light brown, clean, wet (SP)
10	4	3	1.5		CLAY, ltl. silt, med.-dk brown, (CL-ML) SAND, f., ltl. m. sand, tr. v. f. sand, poorly graded, lt. brown, clean (SP)
	5	8	1.4		SAND, f., tr. m. sand, tr. v. f. sand, poorly graded, m. brown to m. gray, clean (SP)
15	6	9	1.0		SAND, f., (SP) SAND, m., (SP) SAND, m.-c., tr. gravel (SP)
	7	9	0.9		SAND, m., tr. c. sand and subangular f. gravel, more mafics than in previous samples, poorly graded, med. gray, clean (SP)
20	8	8	1.2		As above (SP)



WELL CONSTRUCTION

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-E02A

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM A	WELL CONSTRUCTION
	9	10	1.0		CLAY, soft, dk. gray, v. soft, (Pp=0.05), (CL)		
					SAND, m., tr. c. sand and f. gravel, poorly graded med. gray, clean (SP)		
	10	7	0		No Recovery		
25							
	11	18	1.3		CLAY, soft, dk. gray to olive, gummy (CL)		
					SAND, f., poorly graded, lt. gray, clean (SP)		
	12	19	0		No Recovery		
30							
	13	7	1.2		SAND, f.-m., m. gray, with mafics, 0.2 ft. thick layer of olive soft clay in the middle (Pp=0.5); (SP)		
	14	26	0		No Recovery		
35							
	15	17	0.9		SAND, f., tr. v. f. sand, clean, med. gray (SP)		
	16	17	1.3		SAND, f., ltl. m. sand, m., gray, 2.5 inch layer of clay, soft, m. brown (SP and CL)		
40							
	17	19	1.2		SAND, f., tr.-few v. f. sand, m. gray, well sorted, clean (SP)		
					CLAY, gray, firm, (Pp=1.25), gummy (CL)		
	18	21	0.8		SAND, m.-c, tr. f. gravel, dk. gray, lots of mafics, occasional blobs of clay, gravel is subangular to subrounded (SP)		
45							
	19	33	0.6		SAND, m.-c., ltl. f. sand, tr. f. gravel, angular (SW)		
	20	39	0.4		As above, (SW)		
50							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-E03AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Highway 380 Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Bryan Grigsby	**SAMPLE TYPE:** Split Spoon
START DATE: 12/2/2002	**WELL ELEVATION:** A: 4551.44 ft. B: 4552.04 ft.
FINISH DATE: 4/8/2003	**GROUND ELEVATION:** 4551.11 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0							Locking protective casing
							2 in. ID sch 40 PVC riser
							Bentonite chips
							20-40 Silica sand pack
5 ▼	1	7	1.5		CLAY, sandy at top, dk. yellow brown (10YR3/4), hard, (Pp=2.8) (CL)		2 in. ID sch 40 PVC screen, 0.010 in slots
					SILT, few clay, (10YR4/4-4/6), non-plastic, wet at bottom (ML)		
					CLAY, hard, (Pp=2.2), (CL)		
	2	4	1.4		SAND/CLAY, interbedded f. sand and clay layers 0.1 ft. thick, wet, roots (SP)		
					SAND, f., tr.-few silt, poorly graded, yellow brown (10YR5/4), root traces, some oxidized intervals (SP)		
					SILT, ltl.-some clay, brown (10YR4/3), with reddish/organic, zones sl. plastic, (ML-CL)		
	3	8	1.7		SAND and SILT, (SM))		
10					SAND, f., poorly graded (SP)		
					SILT/CLAY, brown (10YR4/3) with grayish layers, v. soft, slow dilatancy (ML-CL)		
	4	7	2.0		SAND, f.-m., tr. f. gravel, slight coarsening downward, brown (10YR5/3), gravel is predominately quartz and feldspar grains, subangular to subrounded (SP)		
	5	5	2.3		SAND, f., tr.-ltl. m. sand, v. poorly graded, dk gray brown to brown (10YR4/2-4/3), 1 piece of grayish wood near bottom, 0.1 ft layer of silt/clay at 14.2 ft. (SP)		
15							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-E03AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	6	16	1.1		SAND, f.-m., few c. sand, tr. f. gravel, moderatley well graded (SP)		
					SAND, f.-m., no tr. c. sand, poorly graded, v. dk. gray brown (10YR3/2) (SP)		Upper backfill/natural collapse
	7	14	0.9		SAND, f., tr. c. sand, tr. f. gravel (SP)		End cap
20							
	8	11	1.4		CLAY, soft-firm, dk. brown (10YR3/3), greenish intervals in the middle, plastic (CH)		Bentonite pellets
					SAND, f.-m., tr.-ltl. c. sand, few thin clay intervals, v. dk. gray brown (10YR3/2), f. sand is subrounded, and angular, c. sand is subrounded with volcanic pieces, soft (SP)		
	9	15	1.2		CLAY, v. dk. gray (10YR3/1), soft, firm, plastic (CH)		Natural backfill/collapse
25					SAND, f., v. poorly graded, dk. brown (10YR3/3), piece of f. gravel in bottom (SP)		
	10	16	1.0		SAND, f.-m., tr. f. gravel (1 piece), poorly graded, v. dk. gray brown (10YR3/2), predominately quartz, subrounded-angular, med. density (SP)		
	11	19	1.2		As above, possible 0.1 ft. of clay at top (SP)		
30							
	12	32	0		No Recovery		
	13	14	0.9		SAND, f.-m., tr.-few c. sand and f. gravel, (10YR3/2), thin clay intervals in bottom 0.4 ft., hard sandstone clast in bottom of spoo (SP)		
35							
	14	6			SAND, f.-m., tr-few c. sand, tr. gravel, moderately well graded, some clay intervals (SP)		
					CLAY, firm, (Pp=0.7), thin gray-black organic looking intervals, plastic, few layers of sand and f. gravel (CH)		Bentonite pellets

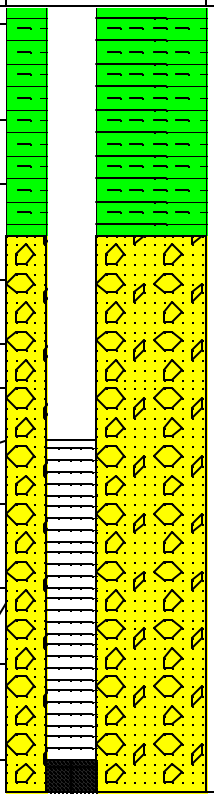
S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-E03AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
40	15	17	1.2		SAND, f., tr.-few m.-c. sand, tr. f. gravel, v. poorly graded, 0.2 ft. clay interval over thin gravel lens (not in place?) (SP)
	16	30	0.8		SAND, f., v. poorly graded, 1 piece of f. gravel (SP)
					SAND, f.-m., v. poorly graded, 0.07 ft. clay lense, (SP)
45	17	52	1.6		SAND, f., v. poorly graded, tr.-few silt/clay, v. dense, few thin dk. gray bands (SP)
	18	34	0.5		As above, (SP)
					SAND, f.-m., poorly graded, dense (SP)
50	19	29	0.1		As above, (SP)



WELL CONSTRUCTION

- Natural backfill/collapse
- 2 in. ID sch 40 PVC screen, 0.010 in. slots
- Borehole TD= 51.5 ft.
- End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W02AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Highway 380 Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Dagmar Llewellyn	**SAMPLE TYPE:** Split Spoon
START DATE: 11/21/2002	**WELL ELEVATION:** A: 4548.83 ft. B: 4548.62 ft.
FINISH DATE: 4/16/2003	**GROUND ELEVATION:** 4548.06 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0							Locking protective casing
							2 in. ID sch 40 PVC riser
	1	n/a	n/a		SILT, some f.-c. sand, ltl. f.-c. gravel, med. brown, well graded, recent organics, roots, angular, dry (SW)		Bentonite chips
							20-40 Silica sand pack
	2	10	1.5		CLAY, ltl. silt, soft, brown, with mottles of rust and white flecks, (Pp=0.2) (CL)		2 in. ID sch 40 PVC screen, 0.010 in. slots
5					SAND, f.-v.f., lt. brown, moist (SP)		
	3	9	1.2		CLAY, as above, (CL) SAND, v.f.-f. sand, thin horizontal black layers, moist (SP		
▼	4	9	1.5		SAND, f., ltl. v.f., light brown, clean, wet (SP)		
10	5	8	1.5		As above, (SP)		
	6	12	1.4		As above, with m. brown clay in upper 0.2 ft. (SP)		Natural backfill/collapse
15					SAND, m.-c., and m. brown clay, (SW-CL)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W02AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	7	8	0.8		SAND, m., ltl. c. sand, tr. f. gravel, angular, clean (SP)		
	8	8	0.5		As above, (SP)		End cap
20							
	9	28	0.8		As above, (SP) SAND, f., lt. brown, clean (SP)		Bentonite pellets
	10	30	0.5		As above, (SP)		
25							
	11	18	1.3		CLAY, ltl. f.-c. sand, soft, (Pp=0.5), med. brown (CL) SAND, f., lt. brown, clean, (SP)		Natural backfill/collapse
	12	22	1.2		As above, (SP) SAND, f.-c., ltl. f. gravel, with m. gray clay layer at bottom of sample (Pp=1.0), gravel is angular (SW)		
30							
	13	12	1.1		SAND, f., ltl. v. f. sand, gray, occasional mud balls, clay blobs (Pp=0.1) (SP)		
	14	15	0.9		SAND, m.-c., (SP) SAND, f.-m., poorly graded, lt. gray, well sorted, clean, (SP)		
35							
	15	7	0.5		As above, (SP)		

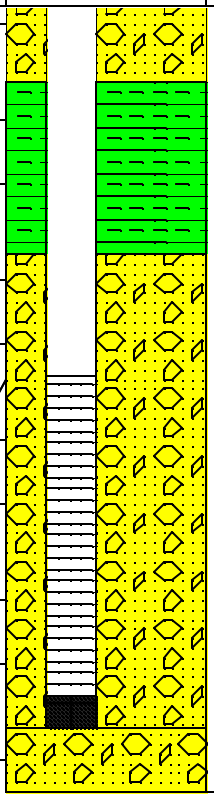
S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W02AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
40	16	17	1.2		As above, (SP)
	17	20	1.3		SAND, m., ltl. f. sand, ltl. c. sand, m.-c. sand in upper 0.1 ft., lt. gray, clean (SP)
					SAND, f., ltl. f. gravel, occasional clay blobs, lt. gray, gravel is subangular (SP)
45	18	6	1.5		CLAY, olive gray, v. soft, (Pp=0.1) (CL)
	19	15	0.6		SAND, f., ltl. m. sand, f. gravel in sluff, lt. gray (SP)
	20	29	1.3		SAND, f.-m., lt. gray, no apparent structure (SP)
50					



WELL CONSTRUCTION

- Bentonite pellets
- Natural backfill/collapse
- 2 in. ID sch 40 PVC screen, 0.010 in. slots
- Borehole TD= 50.5 ft.
- End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W03B

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Highway 380 Transect	**RIG TYPE:** CME 55
ONSITE GEOLOGIST: Bryan Grigsby	**SAMPLE TYPE:** Split Spoon
START DATE: 12/4/2002	**WELL ELEVATION:** 4547.78 ft.
FINISH DATE: 4/15/2003	**GROUND ELEVATION:** 4547.23 ft.

NOTES: Borehole Diameter: 6 in.-geological sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B	WELL CONSTRUCTION
0							Locking protective casing
					SAND, f., tr. m. sand, v. poorly graded, yellow brown (10YR5/6), dry (SP)		2 in. ID sch 40 PVC riser
							Bentonite grout
					CLAY, tr. few silt, brown (10YR5/3), reddish mottling, v. soft-soft, slightly plastic (CL)		
▼ 5	1	11	1.4		SAND, f., tr. m. sand, tr. f. gravel, with increasing m-c sand and f. gravel near the bottom, poorly graded, yellow brown (10YR5/6), moist-wet (SP)		
					SAND, m., few f. sand, poorly graded, yellow brown (10YR5/6), predominately quartz, subrounded, wet (SP)		
	2	6	1.2		CLAY, silty (CL)		
					SAND, f., ltl. m. sand, poorly graded, dk. gray brown (10YR4/2) (SP)		
	3	9	0.9		SAND, f.-m., tr. c. sand and f. gravel, poorly graded, dk. gray brown (10YR4/2), predominately quartz and feldspar, subangular to subrounded, gravel predominately volcanics (SP)		
10							
	4	8	0.7		SAND, m., few f. sand, tr.-few c. sand and few f. gravel, moderately poorly graded, dk. gray brown (10YR4/2) (SP)		
							Natural backfill/collapse
	5	7	0.7		As above, slightly coarser grain sand, v. diverse gravel: granite, basalt, sandstone, limestone, volcanics, f. sand in botton 0.03 ft of sample (SP-SW)		
15							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W03B

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B	WELL CONSTRUCTION
	6	20	1.0		SAND, f., tr. m. sand, v. poorly graded, dk. gray brown (10YR4/2) (SP)		
	7	29	1.2		SILT, f. sand and ltl. clay, v. soft, v. dk. gray brown (10YR3/2), non-plastic (ML-SM)		
20					SAND, f., tr.-few m. sand (SP)		
	8	34	1.1		SAND, f.-c., ltl.-some f. gravel (SW-GW)		
					SAND, f.-m., tr. c. sand, poorly graded, dk gray brown (10YR4/2) (SP)		
	9	21	0.9		SAND, f., tr.-few m. sand, poorly graded (SP)		
25							
	10	20	1.0		SAND, f., poorly graded, coarsening downward to m. sand tr. -few f. sand, and tr.-few c. sand (SP)		
	11	38	0.7		SAND, f.-c. sand and f. gravel (SP-GW)		
30					SAND, f.-m., poorly graded, v. dark gray brown (10YR3/2) (SP)		
	12	20	1		As above, (SP)		
					No Recovery		
	13	4					
35							
					No Recovery		
	14	14					Bentonite pellets

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W03B

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B	WELL CONSTRUCTION
40	15	38	1.3		SAND, f., tr. m. sand, v. poorly graded, dk. gray brown as above except the upper 0.1 ft. which is yellow brown (SP)		Natural backfill/collapse
	16	34	1		As above, dk. gray brown, (SP)		
	17	21	0.9		SAND, f., tr. m. sand, a 0.03 ft clay lens at 44.3 ft across 2/3 of sample (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
45	18	30	0.8		SAND, f.-m., tr. c. sand and f. gravel, moderately poorly graded dk. gray (10YR4/1) (SP)		Borehole TD= 50.5 ft.
					SAND, f.-m., poorly graded, dk. gray brown (10YR4/2) (SP)		
	19	22	1		SAND, f.-m., ltl. c. sand and f. gravel, well graded (SW)		End cap
50							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W04AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Highway 380 Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Bryan Grigsby	**SAMPLE TYPE:** Split Spoon
START DATE: 12/2/2002	**WELL ELEVATION:** A: 4549.69 ft. B: 4549.34 ft.
FINISH DATE: 4/17/2003	**GROUND ELEVATION:** 4549.29 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0							Locking protective casing
							2 in. ID sch. 40 PVC riser
					SAND, f.-m., tr.-few c. sand and f. gravel, dk. yellow brown (10YR4/4), roots (SP)		Bentonite chips
					SAND, v.f., silt, v. poorly graded, yellow brown (10YR5/6), dry (SP)		
							20-40 Silica sand pack
5	1	12	0.6		CLAY/SILT, wet, cobble and dry sand in sampler tip (ML-CL)		2 in. ID sch 40 PVC screen, 0.010 in. slots
	2	11	1.3		SAND, f., tr. m. sand, v. poorly graded, yellow brown (10YR5/4), v. thin grayish bands, dry-slightly moist (SP)		
					As above, (SP)		
▼	3	4	1.2		SAND, v. f., tr. silt/clay, brown (10YR4/2), (SP)		
10					SAND, f.-m., tr. c. sand and f. gravel, dk. gray brown (10YR4/2) (SP)		
	4	12	1.4		SAND, v. f., tr. silt/clay, brown (10YR4/3) (SP)		
					As above, (SP)		Natural backfill/collapse
	5	7	1.2		SAND, f.-m., tr. c. sand, tr.-few f. gravel, moderately poorly graded, dk. gray brown (10YR4/2) (SP)		
15							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W04AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B	WELL DIAGRAM A	WELL CONSTRUCTION
	6	9	1.1		SAND, f.-c., tr. few f. gravel, grades down to f.-m. sand, v. dk. gray brown (10YR3/2), quartz and feldspar, ltl.-some dk. grains and volcanics, subrounded to angular, (SP)			
	7	11	1.3		SAND, f.-m., and f.-c. sand, tr. f. gravel in alternating layers, poor-med. graded, dk. gray brown (10YR4/2), more quartz and less dk. minerals than above (SP-SW)			End cap
20	8	18	0.9		SAND, f.-c., with intervals of f.-m. sand, few-ltl. f. gravel, well graded, dk. gray brown (10YR4/2), gravel predominately volcanic clasts (SP-SW)			Bentonite pellets
	9	8	1.4		CLAY, v. soft (CL) SAND, f.-m., tr. c. sand, (SP) CLAY, tr.-few silt, dk. brown (10YR3/3), plastic with thin layers of sand (CH)			
25	0	10	1.3		SAND, f. tr. few m. sand, poorly graded, few small clay lenses, v.dk. gray brown (10YR3/2) (SP) CLAY, gravelly clay in the tip of the spoon (CH)			Natural backfill/collapse
	10	18	1.2		SAND/GRAVEL, m.-c. sand, and f.-c. gravel (SW-GW) SAND, f., tr. m. sand, v. poorly graded, dk. gray brown (10YR4/2-3/2) (SP)			
30	11	22	0.9		SAND, f.-m., tr. c. sand and f. gravel, poorly graded, dk. gray brown (10YR4/2) (SP)			
	12	21	0.8		As above, with increasing f. gravel in bottom 0.1 ft (SP)			
35	13	22	1.1		SAND, f., tr. m. sand, v. poorly graded, dk. gray brown (10YR4/2), with thin dk. gray band containing abundant v. small black flecks (organics?) (SP)			Bentonite pellets

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W04AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	14	19	1.0		As above, gravel fragment in tip of spoon (SP)		
40							
	15	17	1.0		SAND, f.-m., tr.-few c. sand, tr. f. gravel, moderatley poorly graded, dk. gray brown (10YR4/2) (SP)		Natural backfill/collapse
	16	14	0.6		SAND, f., v. poorly graded, v. dk. gray brown (10YR4/2) (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
45							
	17	11	0.9		SAND, f., tr. m. sand, tr. f. grave (1), poorly graded (SP)		Borehole TD= 50.5 ft.
					CLAY, tr.-few silt, v. dk. gray (10YR3/1), v. soft (SP)		
					SAND/GRAVEL, f.-c. sand and f. gravel (SW-GW)		
	18	35	0.3		SAND, f., tr. m.-c. sand, v. poorly graded, dk. gray brown (10YR4/2) (SP)		End cap
50							
	19	26	0.6		SAND, f.-m., tr. c. sand, and f. gravel, poorly graded with 0.1 ft. interval of well graded f.-c. sand, dk. gray brown (10YR4/2) (SP)		
					As above, (SP)		
	20	27	1.0		SAND, f.-c., piece of f. gravel with a 0.5 inch diameter (SW)		
55					SAND, f.-m. (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W05AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Highway 380 Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Stephanie Kuhn	**SAMPLE TYPE:** Split Spoon
START DATE: 4/18/2003	**WELL ELEVATION:** A: 4550.33 ft. B: 4550.19 ft.
FINISH DATE: 4/18/2003	**GROUND ELEVATION:** 4550.05 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
0					Not sampled. See log of HWY-W07C for lithology.		Locking protective casing; 2 in. ID sch 40 PVC riser; Bentonite chips; 20-40 Silica sand pack
5							2 in. ID sch 40 PVC screen, 0.010 in. slots
10							
15							Natural backfill/collapse
20							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W05AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
25							Bentonite pellets
							Natural backfill/collapse
30							
35							
40							Bentonite pellets
							Natural backfill/collapse
45							2 in. ID sch 40 PVC screen, 0.010 in. slots
							Borehole TD: 50.5 ft.
50							End Cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W06AB

PROJECT INFORMATION

PROJECT NAME: Rio Grande Watershed Study Phase 1
PROJECT NUMBER: 771-3
LOCATION: Highway 380 Transect
ONSITE GEOLOGIST: Dagmar Llewellyn
START DATE: 11/26/2002
FINISH DATE: 4/9/2003

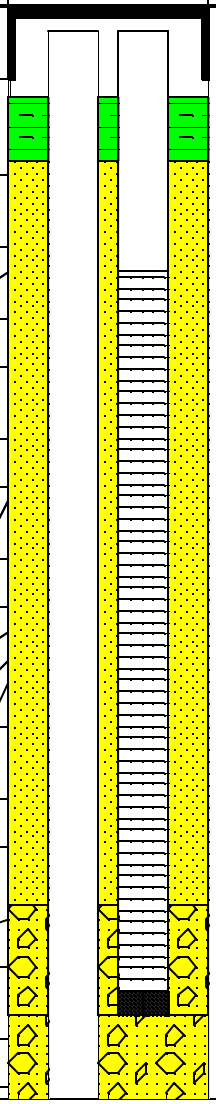
DRILLING INFORMATION

DRILLING FIRM: GeoTest
CREW LEADER: Dave Tanner
RIG TYPE: CME 75
SAMPLE TYPE: Split Spoon
WELL ELEVATION: A: 4550.98 ft. B: 4550.89 ft.
GROUND ELEVATION: 4550.05 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
0	1				SILT, some v. f. sand, tr. f.-c. sand, reddish brown, roots and organic debris (ML)
5	2	5	1.5		As above, (ML) As above, buff color, (ML)
	3	10	1.4		SAND, v. f., poorly graded, lt. brown, 0.2 ft. layer of med. brown silty clay, (Pp=0.5), (SP)
10	4	5	1.5		SILT, some clay, med. reddish brown (ML) SAND, v. f., tr. silt, buff colored (SP)
	5	7	1.5		SAND, f-v.f., med. brown, clean (SP) SAND, f.-c., gray to black, organics (SW) SAND, v.f., olive colored, poorly graded, clean (SP)
15	6	8	0.9		SAND, f.-v.f., med.-dk. gray at top and grading to med. brown at bottom, poorly graded, clean (SP)
	7	21	0.9		As above, top portion is organized and shows some horizontal structure , manganese layers, bottom of sample is med. brown, loose and wet (SP)
20	8	9	0.9		SAND, f.-m., ltl. v. f sand, med. brown (SP)



WELL CONSTRUCTION

- Locking protective casing
- 2 in. ID sch 40 PVC riser
- Bentonite chips
- 20-40 Silica sand pack
- 2 in. ID sch 40 PVC screen, 0.010 in. slots
- Natural backfill/collapse
- End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W06AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
	9	16	0.8		SAND, m., ltl. f. sand, poorly graded, med. brown, clean (SP)
	10	9	1.5		As above, (SP)
25	11	18	0.2		SAND, f.-c., ltl. f. gravel, well graded, mulitcolored, clean (SW)
	12	16	0		No Recovery
30	13	5	1.5		CLAY, mottled olive and reddish, (Pp=1.25), some layers have ltl. sand, one piece of c. subangular sandstone gravel (CL)
	14	17	1.4		As above, without the sand layers and somewhat gummier (CL) SAND, m., ltl. f. sand, tr. f. gravel. poorly graded, clean (SP)
35	15	15	1.0		SAND, f.-c., ltl. f subrounded gravel, brown/multicolored, well graded (SW)
	16	10	1.1		As above, med. brown at top grading to med. to dk. gray at bottom occasional med. brown mudballs/clay blobs, soft (SW)
40	17	23	0		No Recovery
	18	35	1.2		SAND, f., ltl. v.f. sand, poorly graded, clean, horizontal layering highlighted by manganese layers (SP)
45	19	27	0.8		SAND, f.-m., med. brown, poorly graded, clean (SP)
	20	20	0		No Recovery
50					

WELL DIAGRAM (B / A)

WELL CONSTRUCTION

- Bentonite pellets
- Natural backfill/collapse
- Bentonite pellets
- Natural backfill/collapse
- Bentonite pellets
- Natural backfill/collapse
- 2 in. ID sch 40 PVC screen, 0.010 in. slots
- Borehole TD= 50 ft.
- End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W07AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Highway 380	**RIG TYPE:** CME75
ONSITE GEOLOGIST: Dagmar Llewellyn	**SAMPLE TYPE:** NA
START DATE: 4/24/2003	**WELL ELEVATION:** A: 4552.44 ft. B: 4552.07 ft.
FINISH DATE: 4/24/2003	**GROUND ELEVATION:** 4551.47 ft.

NOTES: Borehole Diameter: 10 inches

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
0					Not sampled. See log of HWY-W07C for lithology.		Locking protective casing; 2 in. ID sch 40 PVC riser; Bentonite pellets; Natural backfill/collapse and 20-40 Silica sand pack; 2 in. ID sch 40 PVC screen, 0.010 in. slots; End cap
5							
10							
15							
20							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W07AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
25							Bentonite pellets
30							Natural backfill/collapse
35							
40							Bentonite pellets
45							Natural backfill/collapse
50							2 in. ID sch 40 PVC screen, 0.010 in. slots
							Borehole TD=51 ft.
							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W07C

PROJECT INFORMATION

PROJECT NAME: Rio Grande Watershed Study Phase 1
PROJECT NUMBER: 771-3
LOCATION: Highway 380 Transect
ONSITE GEOLOGIST: Dagmar Llewellyn
START DATE: 11/25/2002
FINISH DATE: 4/11/2003

DRILLING INFORMATION

DRILLING FIRM: GeoTest
CREW LEADER: Dave Tanner
RIG TYPE: CME 75
SAMPLE TYPE: Split Spoon
WELL ELEVATION: 4551.81 ft.
GROUND ELEVATION: 4551.49 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
0	1	n/a	n/a		SILT/CLAY, organic soil material and surface roots, red brown (OL)		Locking protective casing; 2 in. ID sch 40 PVC riser; Cement bentonite grout
5	2	16	1.5		As above, (OL); SAND, v.f., buff colored, poorly graded (SP)		
▼	3	4	1.4		SAND, v.f., coarsening downward towards to f.-m. sand, reddish near the top and getting more brown below, some black flecks, wet near bottom (SP)		
10	4	6	1.5		SAND, f., ltl. v. f. sand, lt. brown with reddish tinge, poorly graded, clean (SP)		Natural backfill/collapse
	5	13	1.5		SAND, f.-m., ltl. v. f. sand, m. reddish brown, occasional subrounded f. gravel and clay blob/mudball (SP)		
15	6	4	0.8		SAND, v.f.-m, some clay at top of sample, mudballs are present 0.2 ft from the top, moderately well graded, (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W07C

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
	7	7	1.0		SAND, v.f.-m., moderately well graded, med. brown, poorly sorted, (SW)		
	8	8	0.7		SAND, v.f.-c., tr. f. gravel, well graded, gravel is angular (SP)		
20	9	12	1.3		CLAY, organic, with root fragments, black (OL) SAND, v.f.-m., moderately well graded, soupy layer of silt and f. gravel about 0.2 ft. from the bottom (SP-SW)		
	10	37	1.2		SAND, f.-m., dk. gray near top and v.f. sand, lt. brown, clean near bottom (SP)		
25	11	10	1.4		CLAY, firm, brown olive (CL) SAND, f.-m., ltl. v. f. sand, med. gray, 1 piece of black organic debris (SP)		
	12	7	1.5		CLAY, and silt, soft, brown to olive (MH-CH) SAND, v.f.-c., tr. silt, occasional clay blobs, well graded, piece of woody organic material near top (SW)		
30					SAND, f., ltl. v.f. sand, lt. brown, poorly graded (SP)		
	13	10	1.2		CLAY, med. brown (CL) SAND, v.f.-c., tr. silt, dk. gray (SW)		
	14	7	2		SAND, f.-c., well graded, no fines, medium gray, mafics, mica (SW)		
35	15	9	0.6		SAND, f., tr. v.f. sand, med. brown, poorly graded, clean (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W07C

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
40	16	10	1.4		CLAY, olive, dk. gray, soft, (Pp=0), sticky, (CL)		
					SAND, v.f.-c., and f.-c. gravel, well graded, med. brown, subangular gravel (SW-GW)		
	17	17	0.7		SAND, f.-m., tr. c. sand, gray, f. gravel and blobs of clay, at top of sample, poorly graded (SP)		
45	18	9	0.8		As above, (SP)		
					CLAY, soft, olive (CL)		
	19	30	0		No Recovery		
	20	26	0.8		SAND, f.-m., moderately well graded, med. brown (SP)		
50					SAND, m. (SP)		
					SAND, f.-m., med. brown, poorly graded (SP)		
	21	39	0.8		SAND, f.-m., med. brown, poorly graded, 1 piece of subrounded c. gravel, (SP)		
	22	55	1.1		As above, (SP)		
55					SAND, f.-c., ltl. f. gravel, moderately well graded (SW)		
	23	52	1.3		SAND, f., lt. brown, poorly graded (SP)		
					SAND, v.f., mottled red, brown and black (manganese) (SP)		
	24	46	1.2		SAND, f.-m., clean, poorly graded, 1 layer of 5-10 pieces of subrounded f. gravel (SP)		
60							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W07C

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
	25	34	0.9		As above, including the layer of gravel, now at the bottom of the sample (SP)		
	26	33	1.0		SAND, f.-c., tr. f.-c. gravel, well graded, med. gray, no fines, gravel is subangular (SW)		
65	27	33	1.1		SAND, m., tr. c. sand, tr. f. gravel, poorly graded, clean, subangular (SP)		
	28	59	1.0		As above, tip contains f.-c., gravel, subrounded in a wet silt matrix, clast supported (SP)		
70	29	19	1.2		SAND, f.-c., and f.-c. GRAVEL, well graded, multi-colored (SW-GW))		Slurry and Bentonite pellets
					SAND, v.f., ltl. silt, gray, clean, poorly graded, 1 cm. layer of brown silt and clay (SP)		
	30	51	0.9		SAND, f.-c., ltl. f.-c. gravel, well graded, multicolored (SW)		
75	31	27	0.9		As above, (SW)		
	32	65	0		No Recovery		
80	33	45	1.2		SAND, m., some f. sand, ltl. f. gravel in lowest 0.2 ft. of sample, poorly graded (SP)		Natural backfill/collapse

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W07C

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
					SAND, f.-c., and f.-c. gravel, well graded (SW-GW)		
	34	41	0.8		GRAVEL, f., tr. silt, subrounded (GP)		
85							
					GRAVEL, c., ltl. f. gravel, multicolored, washed (GP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
	35	31	0.3				
							Borehole TD= 92.5 ft.
					SAND, m., ltl. f. sand, multi-colored gray, poorly graded, clean (SP)		
	36	95	1.3				
90							
					As above (SP)		End cap
	37	97	1.3		SAND, f., ltl. v.f. sand, tr. silt, olive, soft, but compacted in spoon (SP)		
					SAND, m., brown to slightly olive, poorly graded, clean (SP)		
	38	125	1.5		CLAY, some silt, bright green olive, densely compacted (Pp=2.0) (CL)		
95					SAND, f.-m., olive, clean (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W08EX

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** WDC Exploration
PROJECT NUMBER: 771-3	**CREW LEADER:** Mike Thomas
LOCATION: Highway 380 Transect	**RIG TYPE:** Speedstar 30K
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** NA
START DATE: 4/22/2003	**WELL ELEVATION:** 4552.45 ft.
FINISH DATE: 4/22/2003	**GROUND ELEVATION:** 4550.53 ft.

NOTES: Borehole Diameter: 13.875 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM EX	WELL CONSTRUCTION
0					Not sampled. See log of HWY-W07C for lithology.		Locking protective casing 10 in. ID sch 40 PVC riser Cement bentonite grout
5							
10							
15							
20							

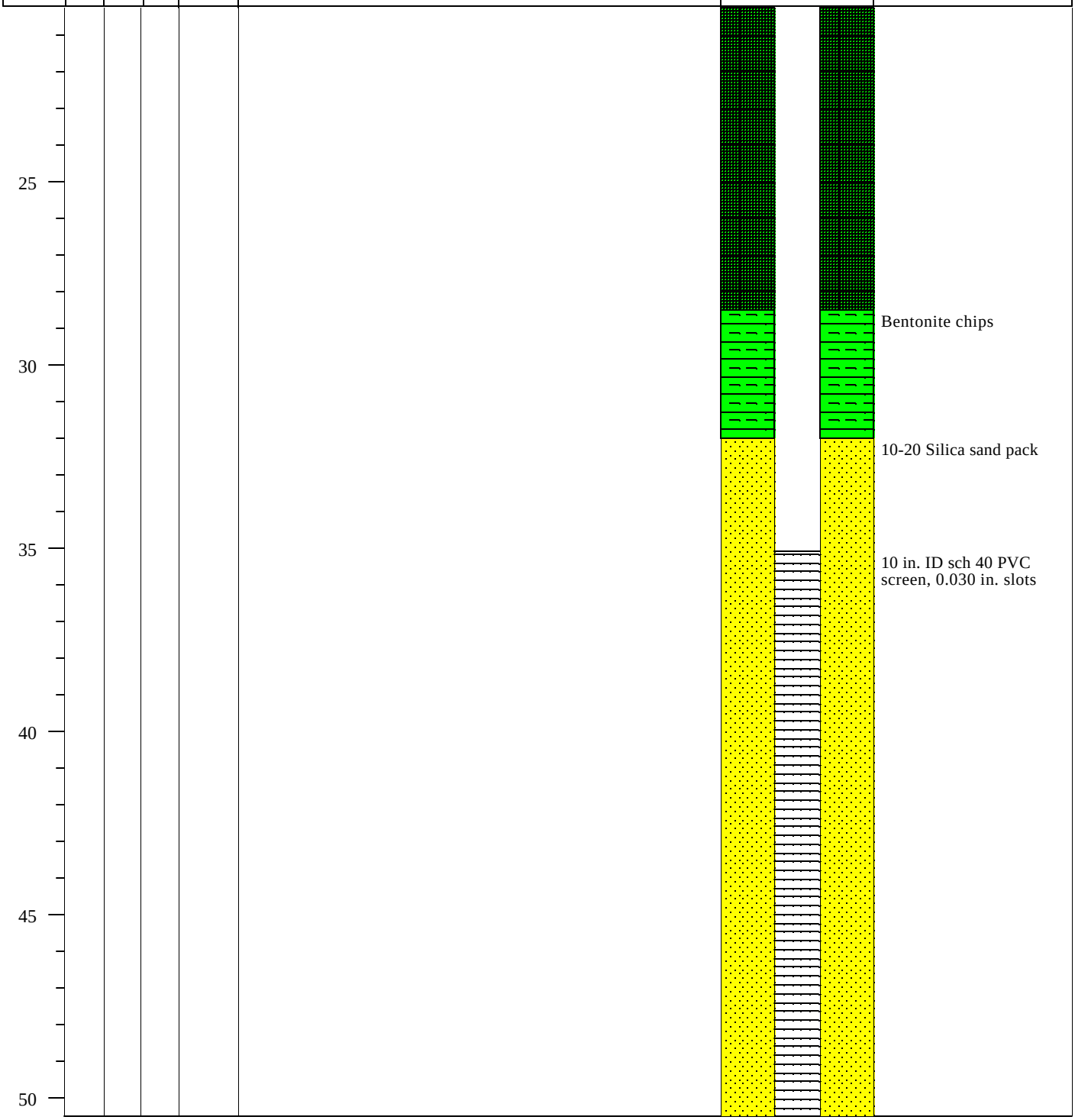
S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W08EX

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM EX	WELL CONSTRUCTION



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GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W08EX

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM EX	WELL CONSTRUCTION
55							
60							End cap Bentonite chips Borehole TD: 67 ft.
65							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W09AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Highway 380 Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** NA
START DATE: 4/24/2003	**WELL ELEVATION:** A: 4550.65 ft. B: 4550.99 ft.
FINISH DATE: 4/24/2003	**GROUND ELEVATION:** 4550.24 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
0					Not sampled. See log of HWY-W07C for lithology.		Locking protective casing 2 in. ID sch 40 PVC riser Bentonite pellets
5							2 in. ID sch 40 PVC screen, 0.010 in. slots 20-40 Silica sand pack
10							
15							
20							End cap Bentonite pellets

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W09AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
25							Natural backfill/collapse
30							
35							
40							Bentonite pellets
45							Natural backfill/collapse
50							2 in. ID shc 40 PVC screen, 0.010 in. slots
							Borehole TD: 50 ft.
							End cap

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GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W10AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Highway 380 Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** NA
START DATE: 4/10/2003	**WELL ELEVATION:** A: 4552.10 ft. B: 4552.24 ft.
FINISH DATE: 4/10/2003	**GROUND ELEVATION:** 4551.43 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
0					Not sampled. See log of HWY-W07C for lithology.		Locking protective casing 2 in. ID sch 40 PVC riser Bentonite chips 20-40 Silica sand pack 2 in. ID sch 40 PVC screen, 0.010 in. slots Natural backfill/collapse End cap
5							
10							
15							
20							

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GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W10AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
25							Bentonite pellets
							Natural backfill/collapse
30							Bentonite pellets
							Natural backfill/collapse
35							
40							Bentonite pellets
							Natural backfill/collapse
45							2 in. ID sch 40 PVC screen, 0.010 in. slots
							Borehole TD: 50 ft.
50							End cap

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GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W11AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: Highway 380 Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** NA
START DATE: 5/6/2003	**WELL ELEVATION:** A: 4556.93 ft. B: 4556.12 ft.
FINISH DATE: 5/6/2003	**GROUND ELEVATION:** 4555.44 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
0					Not sampled. See log of HWY-W07C for lithology.		Locking protective casing 2 in. ID sch 40 PVC riser Bentonite chips
5							Natural backfill/collapse
10							2 in. ID sch 40 PVC screen, 0.010 in. slots
15							
20							End cap Bentonite pellets

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : HWY-W11AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
25							Natural backfill/collapse
30							Bentonite pellets
35							Natural backfill/collapse
40							Bentonite pellets
45							Natural backfill/collapse
50							2 in. ID sch 40 PVC screen, 0.010 in. slots
							Borehole TD: 55 ft.
55							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-E01AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: South Bosque Boundary Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Stephanie Kuhn	**SAMPLE TYPE:** Split Spoon
START DATE: 2/12/2003	**WELL ELEVATION:** A: 4499.56 ft. B. 4499.84 ft.
FINISH DATE: 2/13/2003	**GROUND ELEVATION:** 4498.81 ft.

NOTES: Borehole Diameter: 6 in.-geological sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0					SILT, dk. yellowish brown, (10YR4/4), v. loose, dry (ML)		Locking protective casing; 2 in. ID sch 40 PVC riser; Bentonite pellets and mudgel
5	1	7	1.7		SAND, f.-v.f., poorly graded, yellowish brown (10YR5/4), loose, dry (SP)		20-40 Silica sand pack
	2	3	1		SILT, some sand, brown (7.5YR4/2), v. loose (ML-SM)		
					SILT, increase clay content, dk. brown, (10YR3/3), pinches into a ribbon 1.5 inches long (ML-CL)		
▼							
10	3	2	1.4		SILT, dark yellowish brown (10YR4/4) (ML)		
					SILT, increasing sand content and moisture, (ML)		
					SILT, v. dk. grayish brown (10YR5/2), moist (ML)		
	4	4	1.75		CLAY, higher sand content in upper 0.7 ft., (10YR4/3), pinches into a ribbon 4 inches long (CL)		
					SILT, (10YR4/4) (ML)		
					SILT, increasing clay, (ML)		
15	5	9	1.6		SILTand SAND v.f., dark grayish brown (10YR4/2), v. loose, moist (ML-SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
					CLAY, dk. grayish brown (10YR4/2), (Pp=0.5), (CL)		
	6	20	2.1		SAND, f.-v.f., grayish brown (10YR5/2), some bedding apparent in thin black layers of sand (SP)		
	7	4	2.1		SAND, f.-v.f., ltl.-few fines, dk. grayish brown, (10YR4/2) (SP)		
20					SAND, f.-m., ltl. fines, grayish brown (10YR5/2) (SP)		End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-E01AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B	WELL DIAGRAM A	WELL CONSTRUCTION
	8	5	0.8		SAND, f.-v.f., ltl.-few fines, dk. grayish brown, (10YR4/2) (SP)			
								Bentonite pellets
	9	4	1.5		SAND, f.-v.f., some silt, poorly graded, dk. grayish brown (10YR4/2), upper 0.7 ft. suspected sluff (SP)			Natural fill/bentonite slurry
25								
	10	50/4	2.3		As above, some bedding apparent in darker sand layers (SP)			
	11	50/6	0		No Recovery, cobble plugging sampler bottom when retrieved (SP)			
30								
	12	50/5	1.3		SAND, f.-v.f., few fines, brown (10YR5/3), 0.05 ft. layer of light brownish gray (10YR6/2), sandstone (SP)			
	13	50/5	1.3		As above, 0.25-0.50 inch cobbles at top of sample (SP)			
35								
	14	13	0.65		As above, including cobbles (probabaly sluff), (SP)			
								Bentonite slurry
	15	50/5	1.4		As above, top 0.4 ft. suspected sluff (SP)			
40								Natural fill/collapse
	16	50/4	0.9		SAND, f.-m., ltl. fines, poorly graded, brown (7.5YR4/6), dense (SP)			
	17	50/6	0.6		SAND, f.-v.f., some fines, poorly graded, brown (10YR4/3), dense, chunck of light brownish gray sandstone 0.35 ft. from bottom of sampler (SP)			2 in. ID sch 40 PVC screen, 0.010 in. slots
45								
	18	50/5	0.7		SAND, f.-m., poorly graded, brown (7.5YR4/6), ltl. fines, dense (SP)			Borehole TD: 49.5 ft.
					SAND, f.-v.f., (SP)			
	19	50/6	0.6		SAND, f.-m., (SP)			End cap
50								

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-E02AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: South Bosque Boundary Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** Split Spoon
START DATE: 2/4/2003	**WELL ELEVATION:** A: 4499.44 ft. B: 4499.67 ft.
FINISH DATE: 2/5/2003	**GROUND ELEVATION:** 4498.26 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0					SILT/CLAY, (10YR4/3), (Pp=0.1), slightly moist (ML-CL)		Locking protective casing; 2 in. ID sch 40 PVC riser; Bentonite chips
					As above, (ML-CL)		
5	1	6	1.5		SAND, v.f., poorly graded, (10YR7/2), dry, no visible structure (SP)		20-40 Silica sand pack
	2	6	1.3		CLAY, sandy, (10YR3/4), (Pp=0.3) (CL)		2 in. ID sch 40 PVC screen, 0.010 in. slots
					SAND, f., (SP)		
					CLAY, no sand, (Pp=1.4), dense (CL)		
					CLAY, no-tr. sand, (Pp=1.5-1.7) (CL)		
10	3	6	1.4				
					As above, (CL)		
	4	9	1.5		SILT, dk. gray, grading to sandy clay, grading to clayey sand, organic matter present (ML-SP)		
					CLAY, soft, (10YR4/3), dk. organic rich layers (CL)		
15	5	13	1.5		SAND, v.f., poorly graded, tr.-some fines (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-E02AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B	WELL DIAGRAM A	WELL CONSTRUCTION
	6	21	1.5		SAND, v.f., poorly graded, (10YR5/4), predominately quartz and carbonate sand, weak-moderate reaction to acid, 0.15 inch thick clay layer 0.3 ft. from bottom (SP)			
	7	9	0.8		As above, (SP)			
20								End cap
	8	11	1.0		SAND, f.-m., poorly graded, (10YR5/4), 80/20 quartz/other, subrounded-subangular, f. darker colored layer present (SP)			Natural backfill/collapse
	9	8	0.9		As above, (SP)			Bentonite pellets
					CLAY, (10YR4/6), some iron staining, (Pp=1.0), firm (CL)			
25								
	10	60	1.4		GRAVEL/SAND, c., suspected sluff (GP-SP)			Natural backfill/collapse
					SAND, f.-v.f., poorly graded, lt. brown to rust brown (10YR5/6), tr. fines, 80/20 quartz and other (SP)			
	11	50/5	2.0		GRAVEL/SAND, f., subrounded-subangular,silaceous (GP-SP)			
30					SAND, f.-v.f., v. poorly graded, rust brown(2.5YR6/4), no visible structures (SP)			
	12	50/5	1.2		GRAVEL, f.-m., suspected sluff (GP)			
					SAND, f.-v.f., dense, (SP)			Bentonite pellets and slurry
	13	50/5	1.2		SAND, f.-v.f., tr. f. gravel in upper 0.3 ft., carbonate present by acid test, dense (SP)			
35								
	14	50/5	0.2		As above, tr. f. gravel in upper 0.1 ft, may indicate sluff, no visble structure (SP)			
	15	51/5	1.9		GRAVEL/SAND, v.c., fining upward to f. gravel and c. sand, then m. sand to f. sand, suspected sluff (GP-SP)			Natural backfill/collapse
					SAND, f., (SP)			

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-E02AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
40					SAND, f., (SP)		
	16	50/4	1.0		SAND, f., some c. sand and f. gravel, upper 1.2 ft. suspected sluff (SP)		
					SAND, v.f.-f., (SP)		
	17	50/3	1.3		SAND, f.-m., color as above, f. gravel 0.4-0.6 ft. from top of sample (SP-GP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
45							
	18	50/5	0		No Recovery, small plug of f. sand in drive shoe with few f. gravel pieces		Borehole TD: 49.5 ft.
	19	50/4	0.5		SAND/GRAVEL, sluff		End cap
50					SAND, f.-v.f., (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

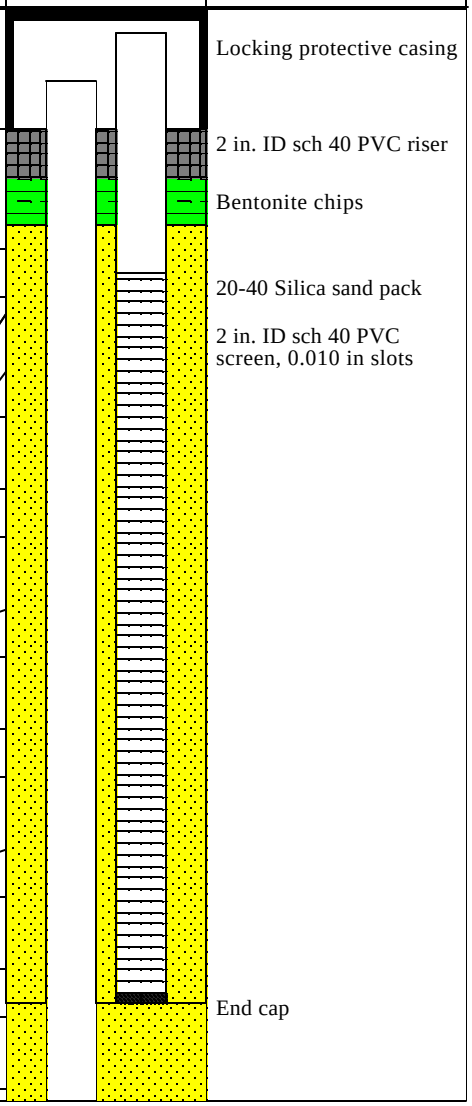
BORING NO. : SBB-E03AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: South Boundary Bosque Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: P. Lang, S. Kuhn	**SAMPLE TYPE:** Split Spoon
START DATE: 2/6/2003	**WELL ELEVATION:** A: 4497.09 ft. B: 4496.79 ft.
FINISH DATE: 2/11/2003	**GROUND ELEVATION:** 4495.48 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
0					SILT, SAND, v.f., lt. yellowish brown (10YR1/4), loose, dry (MH-SP)
					As above, (MH-SP)
5	1	6	0.6		CLAY, dk. yellow brown (10YR4/4), (Pp=2.0), forms ball when moist (CL)
	2	8	0.6		CLAY, as above, (Pp=1.5), med. stiffness (CL) Upper 0.5 ft. suspected sluff
	3	6	1.3		CLAY, brown to gray black (10YR4/3), (Pp=1.6), med. stiffness, blocky structure, significant organic matter (CL) Upper 0.2 ft. suspected sluff
10					
▼	4	3	1.5		As above, decreased organic matter, (Pp=1.0), forms ribbon to about 0.2 inches (CL)
	5	2	1.3		SAND, f., some m. sand, poorly graded, gray brown (10YR5/2), predominately silica, carbonate grains present by acid reaction, loose (SP)
15	6	7	0.8		SAND, f.-m., tr. c. sand, poorly graded, color as above, 80/20 quartz/other, loose (SP)
	7	15	0.8		As above, no visible bedding, loose (SP)
20					



WELL DIAGRAM

WELL CONSTRUCTION

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-E03AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	8	24	1.5		As above, increasing m.-c. sand (SP) SILT, loose, soft (ML) SAND, f.-c., with some f. gravel (SP-SW)		
	9	68	1.3		SAND, f.-c., increasing gravel, well graded, bedding visible (SW) SAND, f.-v.f., poorly graded, brown (7.5YR4/4), no visible bedding/structure, dense (SP)		Bentonite slurry Natural pack, sand, slurry
25	10	50/6	1.4		As above, some fines, few pieces of f.-m. gravel in upper 0.2 ft. (SP)		20-40 Silica Sand
	11	50/4	1.3		As above, m. gravel in upper 0.1 ft (SP)		Bentonite pellets
30	12	50/5	0		No Recovery		
	13	50/5	1.0		SAND, f.-v.f., as above (SP)		
35	14	50/5	0.9		As above, (SP)		Natural pack/collapse
	15	50/4	0.7		As above, sluff upper 0.5 ft. (SP)		Bentonite pellets
40	16	50/4	0.8		As above, gravel/cobble sized sandstone at 0.5 ft. from base (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
	17	50/5	1		As above, (SP)		
45	18	50/5	1		As above, with few sandstone gravel pieces at 46.3, 46.5 and 46.7 ft. (SP)		End cap Borehole TD= 47 ft.
50	19	50/4	0.8		As above, upper 0.1 ft. sluff (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W01AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: South Bosque Boundary Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** Split Spoon
START DATE: 2/25/2003	**WELL ELEVATION:** A: 4484.80 ft. B: 4484.96 ft.
FINISH DATE: 2/28/2003	**GROUND ELEVATION:** 4484.47 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0					SAND/SILT, v.f. sand, poorly graded, lt. yellow brown (10YR6/6), dry (SP-ML)		Locking protective casing; 2 in. ID sch 40 PVC riser; Bentonite pellets
					CLAY, ltl. silt/sand, brownish red, soft, (Pp=0.1), soft, dry (CL)		
5	1	10	1.3		SAND, v. f., poorly graded, lt. brown (SP)		20-40 Silica sand pack
					As above, dry (SP)		
▼	2	4	1.2		CLAY, ltl. sand, dk. gray brown (10YR4/1), (Pp=0.21), soft, mois significant organic material (CL)		2 in. ID sch 40 PVC screen, 0.010 in. slots
10	3	9	1.3		SAND, f.-m., tr. c. sand, poorly graded, yellowish brown (10YR5/4), darker layer representing bedding evident in sample, mica up to 1.5 mm present (SP)		
	4	7	1.0		As above, increasing to some c. sand, tr. f. gravel (SP) Top 1.2 ft. sluff made of f.-m. sand, c.-f. gravel (SP) Top 1.2 ft. suspected sluff.		
					SAND, v.f., some f. sand, poorly graded, dk. gray (GLEY13/5) (SP)		
15	5	16	1.2		SAND, f.-m., ltl. c. sand, ltl. f. gravel, poorly graded, brown/gray (10YR4/3), horizontal layering evident (SP)		
	6	22	0.6		As above, no gravel, tr.-few c. sand (SP)		
	7	29	1.2		SAND, f., poorly graded, lt. brown, (10YR5/4), layering present in thin bands (SP)		End cap
20							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W01AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	8	9	0.5		GRAVEL, f.-c., SAND, f.-c., well graded, gray brown, angular to rounded, silaceous lithologies. Large fragments of gravel stuck in shoe. (SW-GW)		Natural backfill/collapse
							Bentonite pellets
25	9	11	0.1		SAND, f.-m., some f. gravel, tr. clay, dk. gray, may be sluff (SP) Very little recovery.		
	10	18	0.7		SAND, f.-m., ltl.-some c. sand present in layers, poorly graded, gray brown (10YR5/1-5/2) (SP)		Natural backfill/collapse
	11	29	1.1		SAND, f.-m., v. poorly graded, brown-dk. brown (10YR3/3), layering visible in thin dk. bands (SP)		
30	12	38	1.1		As above, (SP)		
	13	12	1.0		SAND, as above, significant f. gravel over lower 0.2 ft. of sample, plug of soft clay in sample shoe overlain by gravel, clay contains gravel, (SP) Upper 0.2 ft contains suspected sluff of f. gravel with sand.		Bentonite slurry
35	14	61	1.1		CLAY, some gravel, no sand, matrix supported, brown (7.5YR5/5), (Pp=1.0-1.5), some organic layering (CL)		
	15	16	0.7		SAND, v.f., tr. gravel and c. sand near base, poorly graded, pale brown (10YR6/3), plug of dense clay in shoe, dk. brown (Pp=0.3), (SP)		
40	16	28	0.8		SAND, f.-m., poorly graded (SP)		Natural backfill/collapse
	17	32	1.2		SAND, v. f., poorly graded, brown (10YR4/3), horizontal layering present (SP)		
45	18	25	0.3		As above, (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots Borehole TD= 50.5 ft.
	19	24	0.8		As above, (SP)		
50							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W02AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: South Boundary Bosque Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Stephanie Kuhn	**SAMPLE TYPE:** Split Spoon
START DATE: 2/18/2003	**WELL ELEVATION:** A: 4488.33 ft. B: 4488.43 ft.
FINISH DATE: 2/19/2003	**GROUND ELEVATION:** 4487.96 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0							Locking protective casing
	1				SILT, yellowish brown (10YR5/4), soft, dry (MH)		2 in. ID sch 40 PVC riser
							Bentonite chips
							20-40 Silica sand pack
	2	10	1.3		As above, (MH)		
					SILT, lt. yellowish brown (10YR6/4), loose, dry, tr. roots (MH)		
5					CLAY, brown (10YR4/3), (Pp=3.75) (CL)		2 in. ID sch 40 PVC screen, 0.010 in. slots
	3	4	1.3		SAND, f.-m., ltl. fines, poorly graded, yellowish brown (10YR5/4), v. loose, moist (SP)		
▼							
	4	5	1.6		SAND, f.-m., ltl. fines, gravel in lower 0.6 ft., grayish brown (10YR5/2), wet (SP)		
10					SILT, some f.-m. sand, (10YR5/4), (SP)		
	5	11	2.1		SAND, f.-m., tr. fines, poorly graded, grayish brown, poorly graded, loose (SP)		
	6	9	1.9		As above, (SP)		
15							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W02AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	7	3	0.5		GRAVEL, largest piece 3/4 in. long, angular, flowing sands (GP)		
	8	8	0.7		SAND, f.-m., (SP)		
20							End cap
					CLAY/SILT, gray (10YR5/1) (CL-MH)		
	9	13	1.4		SAND, f.-m., (SP)		Natural backfill/collapse
							Bentonite pellets
	10	10	1		As above, (SP)		
25							
					SAND, f.-m., some fines, yellowish brown (10YR5/8), increasing silt content near the top (SP)		Natural backfill/collapse
	11	7	0.9		CLAY, v. dk. grayish brown (10YR3/2) (Pp=0.25) (CL)		
	12	21	0.8		SAND, f.-m., tr. fines, poorly graded, dk grayish brown (10YR4/2), med. dense (SP)		
30							
					No Recovery, Sluff		
	13	13	0				Bentonite pellets and slurry
					SAND, f.-m., tr. c. gravel (SP)		
	14	3	1.1		CLAY/SILT, dk. grayish brown (10YR4/2), (Pp=0.75), rolls into a ball easily and can be pinched into a 2 in. ribbon (CL-MH)		
35							
	15	10	2.2		CLAY, mottled color grayish brown (10YR5/2) to gray (10YR5/1) to brown (7.5YR 5/2), (Pp=0), rolls easily into a ball and pinches into a ribbon (CL)		
					SAND, f.-m., with 0.2 ft layer of clay (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W02AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
					SILT, few f. sand, dk grayish brown (10YR4/2) (ML)		Natural backfill/collapse
	16		1.5		SAND, few cobbles with largest being 1.5 in. (SP)		
40					CLAY, (CL)		
					SAND, (SP)		
	17	27	1.1		SAND, v.f.-f., ltl.-some fines, dk. gray (10YR4/1), poorly sorted, med. dense (SP)		
	18	31	1.0		SAND, f.-m., few fines, poorly graded, dk. gray (10YR4/1), med. dense, orange grease shows up on sampler, lower 0.3 ft. may be sluff, contains several pieces of rock, largest is 1.25 in. (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
45							
					CLAY, v. dk. gray (10YR3/1), (Pp=0.75), rolls into a ball easily and forms a 2 in. ribbon (CL)		Borehole TD= 49.5 ft.
	19	32	1.4		SAND, m-c., gravel, some fines, poorly graded, dk. grayish brown (10YR4/2), gravel is angular and largest piece is 1.5 in. (SW-GW)		
					SAND, f.-m. (SP)		
	20	18	1.0		SILT, some-ltl. f.-m. sand, tr. gravel, v. dk. grayish brown (10YR3/2), gravel are in angular pieces, largest pieces 1.5 in., large cobble stuck in shoe when sample pulled up size 2.25 in. (ML-SM)		End cap
50							
	21	50/5	0.5		SAND, f.-m., ltl. fines, f.-c. gravel in top of sampler, dk. yellowish brown (10YR4/4) (SP)		
	22	50/5	0.6		As above, tr. rounded gravel throughout sampler (SP)		
55							
	23	50/4	1.4		As above, no gravel (SP)		
	24	50/4	0.7		As above, (SP)		
60							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W02AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
					SAND, f.-m., rounded pieces of gravel, largest piece is 0.75 in (SP)		
	25	50/6	1.0		SILT, ltl. f. sand, dk. yellowish brown (10YR4/4), (Pp=1.25) (SP-ML)		
					SLUFF, No actual recovery		
	26	50/4	0				
65							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W03AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: South Bosque Boundary Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Dagmar Llewellyn	**SAMPLE TYPE:** Split Spoon
START DATE: 10/31/2002	**WELL ELEVATION:** A: 4489.68 ft. B: 4489.76 ft.
FINISH DATE: 3/5/2003	**GROUND ELEVATION:** 4488.81 ft.

NOTES: Borehole Diameter: 6 in.-geo. sampling, 10 in.-well construct. ▼ = visual observation of water during drilling
Located 38 ft. south of staked location Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0		n/a	n/a		SILT, loam, ltl. sand, lt. brown, dry (ML)		Locking protective casing; 2 in. ID sch 40 PVC riser; Bentonite chips
5	1	7	1.2		As above, (ML)		20-40 Silica sand pack
					CLAY, silty clay, transitioning to hard, moist dark brown clay, in tip, (Pp=2.0) (CH)		
	2	12	1.3		CLAY, dk. brown, fat, (Pp=2.5), moist, (CH)		
					SILT, some v. f. sand, lt. brown, dry (ML)		
▼							
10	3	12	1.3		CLAY, ltl. sand, dk. brown, mottled with med. orange clay, (Pp=3.25) (CH)		
					SAND, f., some v.f. sand, lt. gray (SP)		
	4	9	1.3		CLAY, dk. brown and m. orange clay, mottled, (Pp=1.75) (CH)		2 in. ID sch 40 PVC screen, 0.010 in. slots
					SAND, f., some v.f. sand, lt. gray (SP)		
15	5	9	1.3		SAND, f., lt. gray, few roots, 1 piece of f. white gravel (SP)		
					SAND, f.-m., clean, (SP)		
					SAND, m., lt. gray, clean (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W03AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	6	19	1.0		SAND, f.-v.f., poorly graded, med. brown, (SP)		
	7	19	1.0		SAND, f.-m. tr. c. gravel (SP)		
20					SAND, m., ltl. c. gravel, ltl. f.-v.f. sand (SP)		End cap
	8	16	1.0		SAND, m.-c. (SP)		Natural backfill/collapse
					SAND, m., some c. sand (SP)		
	9	15	0.9		SAND, f., some v. f. sand, lt. gray with some orange, clean (SP)		
25							Bentonite pellets
	10	30	1.5		SAND, m., some c. sand, tr. f. gravel, poorly graded, lt. gray, clean (SP)		Natural backfill/collapse
					SAND, f.-m., tr. c. sand, lt. gray, clean, no fines (SP)		
30							
	12	25	0.6		As above, (SP)		
	13	15	0		As above, ltl. f.-c. gravel. sample half full, suspected sluff (SP)		
35							
	14	20	0.9		SAND, f., ltl. v.f. sand, thin bands of m. sand, lt. gray (SP)		

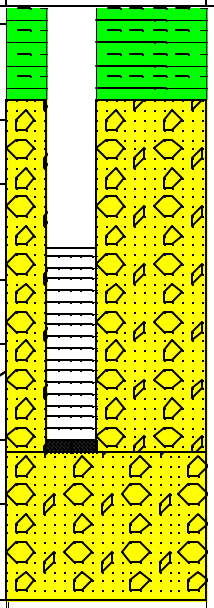
S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W03AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
40	15	20	0.0		SAND, f.-m., lt. gray, clean (SP)
	16	24	.9		As above, (SP)
					CLAY, ltl. f.-c. sand, dk. brown, (Pp=2.5) (CH)
	17	39	1.5		SAND, f.-m., clay peds, tr. c. sand (SP)
45	18	47	1.2		SAND, f.-m., 3-5mm layers of m. sand, lt. gray (SP)
	19	29	0.9		As above, (SP)
50	20	39	n/a		No Recovery
	21	39	1.2		SAND, f.-m., no fines, lt. gray, clean (SP)
55	22	39	1.2		SAND, f.-m., a couple of thick, 1 in. dark brown fat clay layers (SP)
	23	16	1.0		SAND., v.f.-f., med. brown (SP)
60					



WELL CONSTRUCTION

- Bentonite slurry
- Natural backfill/colapse
- 2 in. ID sch 40 PVC screen, 0.010 in. slots
- End cap
- Borehole TD: 47.5

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W03AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	24	32	1.2		SAND, f.-m., lt. gray, clean, f.-c. gravel in tip of spoon (SP-GP)		
	25	26	0.3		SAND, m., some f. sand, tr. f. gravel, lt. gray, suspected sluff (SW)		
65							
	26	43	0.6		SAND, f.-m., lt. gray, some blobs of clay (SP)		
	27	41	0		No Recovery		
70							
	28	50	1.0		SAND, f.-c., some f.-c. gravel, well graded, fines may have been washed out (SW)		
	29	23	0.7		GRAVEL, f.-c., ltl. f.-c. sand, clean, fines may have been washed out (GW)		
75							
	30	38	1.1		GRAVEL, f.-c., some f.-c. sand, multi-colored (GW-SW)		
	31	32	0.7		As above, (GW-SW)		
80							
	32	21	0.9		SAND, f.-c., f.-c. gravel, with 2 one inch layers of dk. brown clay, some striations of sand and gravel evident but disturbed by sampling (SW-GW)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W03AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
85	33	21	0.8		GRAVEL, f.-c., little f.-c. sand, slightly more gravel than above (GW-SW)		
	34	38	0.8		SAND, f.-c., f.-c. gravel, mixed up, brown (GW-SW)		
90	35	43	0.8		As above, tr.-ltl. silt, (GW-SW)		
	36	78	1.4		As above, tr. silt, (GW-SW)		
95	37	75/6	0		No Recovery		
	38	90	0.6		SAND, f.-m., sand, lt. brown, well sorted (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W04AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: South Bosque Boundary Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Dagmar Llewellyn	**SAMPLE TYPE:** Split Spoon
START DATE: 11/1/2002	**WELL ELEVATION:** A: 4495.08 ft. B: 4495.07 ft.
FINISH DATE: 3/6/2003	**GROUND ELEVATION:** 4493.86 ft.

NOTES: Borehole Diameter: 6 in.-geo. sampling, 10 in.-well construct. ▼ = visual observation of water during drilling
Located 23 ft. north of staked location Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0					SAND, f.-m., lt. brown, clean (SP)		Locking protective casing; 2 in. ID sch. 40 PVC riser
5	1	5	1.5		SILT/SAND, v.f., lt. brown, moist (SM)		Bentonite chips
	2	6	1.5		SILT, loam, clayey, med. brown (CL-ML)		20-40 Silica sand pack
	3	6	1.4		SILT/CLAY, med. brown, more silt at top and more clay near bottom of sample, moist (CL-ML)		
10	4	7	1.5		CLAY, some silt, med. brown, (Pp=0.5-0.75), slightly organic at top with a mottled gray and olive color, moist, (CL)		2 in. ID sch 40 PVC screen, 0.010 in. slots
	5	14	1.5		CLAY, with organics, greenish and black (CL)		
15					SAND, f., lt. brown (SP)		
	6	16	1.5		CLAY, med. brown, (Pp=1.5) (CL)		
					SAND, f.-m., lt. brown, clean (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W04AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B	WELL DIAGRAM A	WELL CONSTRUCTION
20	7	5	1.5		SAND, f.-m., lt. gray, clean (SP)			
	8	17	1.5		CLAY, greenish, organic with organic debris (CL)			
					SAND, f.-m., lt. brown, clean (SP)			
	9	15	1.5		SAND, m.-c., some f. sand, ltl. clay/silt, tr. f. gravel, med.-dk. brown (SW)			End cap
25								Natural backfill/collapse
	10	23	0.7		SAND, f.-c., ltl. f. gravel, med. brown, clean (SW)			Bentonite pellets
	11	14	0		No Recovery			
30								Natural backfill/collapse
	12	11	0.7		SAND, m.-c., tr. f. gravel, lt. gray, clean (SP)			
	13	19	0.7		SAND, f.-m., some black layers, lt. brown, clean (SP)			
35								
	14	20	0.6		SAND, f.-m., lt. gray, clean (SP)			
	15	44	0.6		As above, (SP)			
40								
	16	22	0.8		SAND, f.-c., and GRAVEL, f., tr. c. gravel, gray, more sand in bottom of sample (SW-GW)			Slurry and Bentonite pellets
	17	21	0.5		SAND, m., some c. sand, ltl. f.-c. gravel, lt. gray (SP)			
45								Natural backfill/collapse

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W04AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	18	33	0.7		SAND, f.-m., lt. gray, clean (SP)		
	19	11	0.9		As above, (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
50							Borehole TD= 54 ft.
							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W05A

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: South Bosque Boundary Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** Split Spoon
START DATE: 3/7/2003	**WELL ELEVATION:** 4499.51 ft.
FINISH DATE: 3/7/2003	**GROUND ELEVATION:** 4498.66 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
8 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM A	WELL CONSTRUCTION
0					SILT, some clay and v.f. sand, brown-brown gray in color, dry (ML)		Locking protective casing; 2 in ID sch 40 PVC screen, 0.010 in. slots; Bentonite chips; 20-40 Silica sand pack
					As above, (ML)		
5	1	3	1.4		CLAY, dk. yellowish brown (10YR4/4), moderately stiff (Pp=1.1) (CL)		2 in. ID sch 40 PVC screen, 0.010 in. slots
▼	2	5	1.4		SAND, v.f., some m. sand, some-ltl. fines, poorly graded, brownish yellow (10YR5/6) (SP)		
10	3	5	1.0		SAND, f.-m., few-tr. c. sand, no fines, poorly graded, brown (7.5YR5/4), 70/30 quartz/other (SP)		
	4	5	1.5		As above, (SP)		
15	5	7	2.0		SAND, f.-m., tr. c. sand and v. f. sand, tr. fines, some clay present in ball structure, poorly graded, brown (10YR4/4) (SP)		
					As above, (SP)		
	6	3	1.2		CLAY, gray brown (10YR4/2), alternating with few thin sand/silt layers, moderately stiff (Pp=0.7-1.0) (CL)		
	7	3	1.4		As above, no alternating sand (SP)		End cap
20							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W05A

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM A	WELL CONSTRUCTION
	8	1/18	2.2		CLAY, some silt and v.f. sand, brown (10YR5/3), (Pp=0.3-0.5) (CL)		
							Bentonite pellets
	9	14	1.5		CLAY, v. f. sand, color as above, mod. stiff-stiff (Pp=0.5-1.0) (CL)		
25							
	10	14	2.1		SAND, f., some m. sand, poorly graded, yellowish brown (10YR5/4) (SP)		Borehole TD= 27 ft.
	11	22	2.1		SAND, f.-m., tr. c. sand, poorly graded, lt. yellowish brown (10YR5/4), bedding visible in lower 1.4 ft. (SP) Sampler stuck in auger, had to free by using bonnet and water.		
30							
	12	10	0		No Recovery, some f.-c. sand and f. gravel loose in sampler		
	13	17	0.8		SAND, f.-m., some c. sand, some f. gravel, moderately-well graded, (SP-SW)		
35					GRAVEL, c., lithic gravel, angular (GP)		
					SAND, as above (SP)		
	14	50/4	0.9		CLAY, reddish brown (2.5YR4/4), very stiff (Pp=4.0-4.5) (CL)		
	15	50/5	0.8		SAND, f., some m. sand, tr. c. sand, some fines, poorly graded, yellowish red (5YR4/6) (SP)		
40							
	16	50/5	1.2		As above, (SP)		
	17	50/5	1.1		As above, (SP)		
45							
	18	50/5	1.3		As above, (SP)		
	19	50/5	1.0		As above, (SP)		
50							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W06AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: South Bosque Boundary Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Stephanie Kuhn	**SAMPLE TYPE:** Split Spoon
START DATE: 2/20/2003	**WELL ELEVATION:** A: 4488.71 ft. B: 4488.55 ft.
FINISH DATE: 2/21/2003	**GROUND ELEVATION:** 4488.10 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0					SILT, yellowish brown (10YR5/6), v. loose, dry (ML)		Locking protective casing; 2 in. ID sch 40 PVC riser; Concrete; Bentonite chips
					As above, piece of wood in sample (ML)		
5	1	11	1.6		SAND, v.f.-f., some-ltl. fines, poorly graded, brown (10YR6/3), loose, dry (SP)		20-40 Silica sand pack
	2	9	1.6		SAND, v.f.-f., some fines, poorly graded, yellowish brown (10YR5/4), bedding clearly present by color and lithology, fines increasing towards the top (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
▼							
	3	2	1.6		SAND, v.f.-f., increasing silt towards the top of sample, ltl. fines, grayish brown to brown (10YR5/2-5/3), v. loose, wet, bedding clearly present (SP)		
10							
	4	3	2.1		SAND, v.f.-f., some fines, grayish brown (10YR5/2) (SP) SILT, some f. sand, brown (10YR5/3) (ML) SAND. v.f.-f., some fines, grayish brown (10YR5/2) (SP) SAND, f.-m., ltl.-few fines, grayish brown (10YR5/2) (SP)		Natural backfill/collapse
	5	7	1.0		SAND, m.-f., ltl. fines, grayish brown (10YR5/2), v. loose (SP)		
15							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W06AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	6	11	1.0		SAND, m.-f., some fines, grayish brown (10YR5/2), more fines at top and bottom of sample; some gravel at the top of sampler, som bedding present in sand (SP)		
	7	26	0.9		As above, (SP)		
20							End cap
	8	13	1.1		SAND, m.-f., ltl. fines, dk. grayish brown (10YR4/2), loose (SP)		Bentonite pellets
	9	11	0.9		As above, coarsening upward (SP)		
25							
	10	11	1.1		SAND, v.f.-f., ltl. fines, grayish brown (10YR5/2), some bedding apparent (SP) SAND, m-c., few fines, dk. gray (10YR4/1), loose (SP)		Natural backfill/collapse
	11	16	0.3		SAND, f.-m., some fines, dk. gray (10YR4/1), 2 in. piece of rose quartz at top of sampler (SP)		
30							
	12	17	0.9		SAND, f.-m., f. gravel, poorly graded, dk. gray (10YR4/1), largest piece of gravel is 1 in. (SW-GW) SAND, v.f.-f., few-tr. fines, gray (10YR5/1) (SP)		
	13	5	1.1		As above, lots of fines in drive shoe, perhaps some clay color changes to gray (10YR5/1) at 34.5 ft. (SP)		
35							
	14	14	0.6		SAND, f.-m., few fines, well graded, dk. grayish brown (10YR4/2), loose (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W06AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
					As above, 0.5 in. piece of gravel in upper 0.4 ft. of sample (SP)		
	15	21	0.9		SILT, grayish brown (10YR5/2), rolls with some difficulty into a ball (ML)		Bentonite pellets
40					SAND, f.-m., dk. grayish brown (SP)		
					SAND, f.-m., ltl. f. gravel throughout sample, dk. gray (10YR4/1) (SP)		Bentonite slurry
	16	14	0.9		SAND, f.-v.f., few-ltl. fines, well graded, dk grayish brown (10YR4/2) (SP)		
							Natural backfill/collapse
					SAND, f.-m., ltl.-few fines (SP)		
	17	24	1.2		SAND. f.-v.f., some fines (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
45					SAND, f.-m., ltl. fines (SP)		
					As above, (SP)		Borehole TD= 50 ft.
	18	50	1.3		SAND, f.-m., some fines, ltl. gravel and cobble pieces (largest piece 1.5 in) (SP)		
					SAND, f.-m., some fines, brown (10YR5/3), 1.75 in. piece of gravel at top of sample (SP)		
	19	50/5	0.4				End cap
50							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W07BC

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** WDC Exploration
PROJECT NUMBER: 771-3	**CREW LEADER:** Mike Thomas
LOCATION: South Bosque Boundary Transect	**RIG TYPE:** Speedstar 30K
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** NA
START DATE: 4/14/2003	**WELL ELEVATION:** B: 4489.00 ft. C: 4489.93 ft.
FINISH DATE: 4/14/2003	**GROUND ELEVATION:** 4488.19 ft.

NOTES: Borehole Diameter: 8 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (C B)	WELL CONSTRUCTION
0					Not sampled. See log of SBB-W03AB for lithology.		Locking protective casing; 2 in. ID sch 40 PVC riser; Natural backfill/collapse
5							
10							
15							
20							

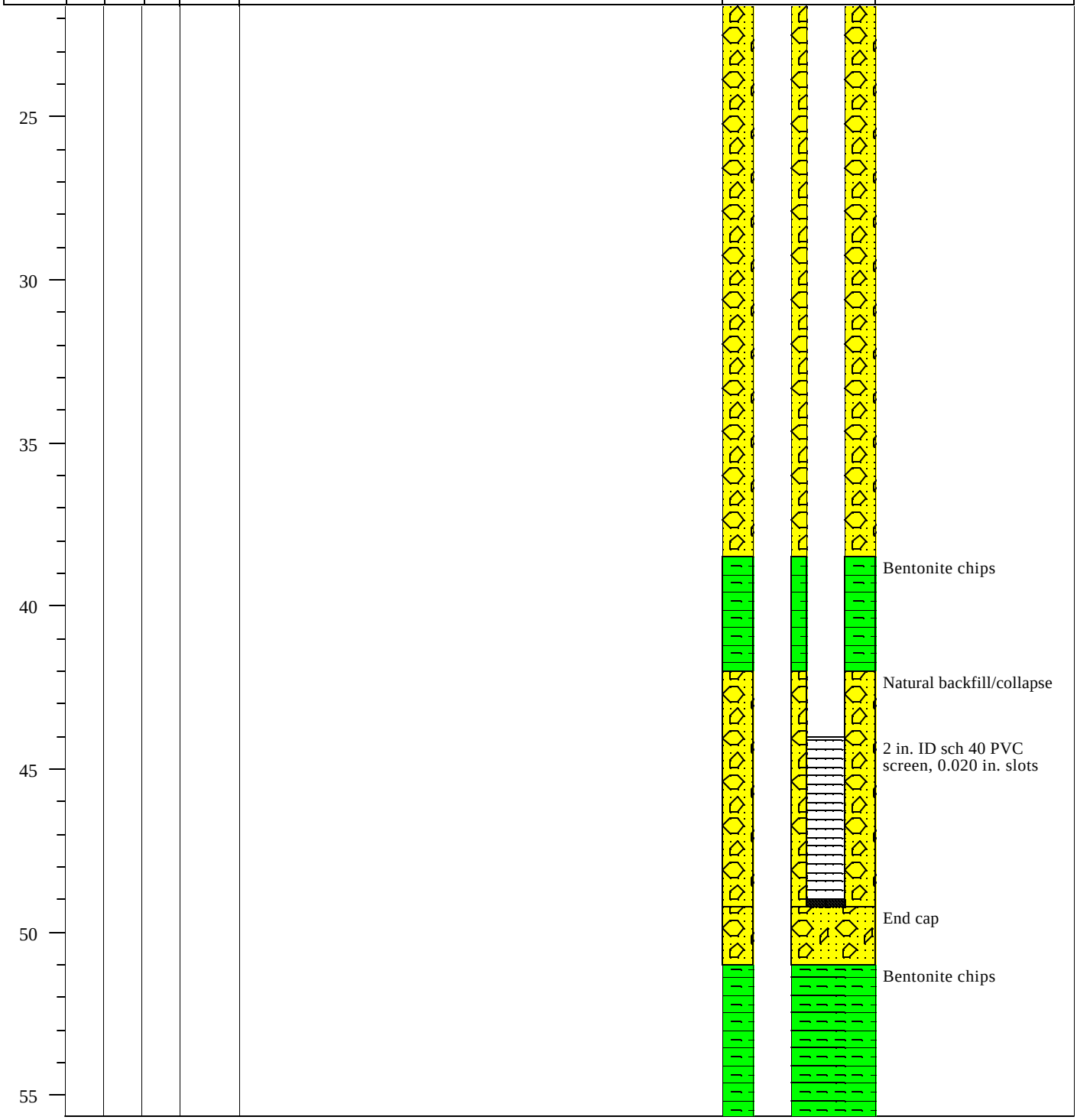
S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W07BC

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (C B)	WELL CONSTRUCTION



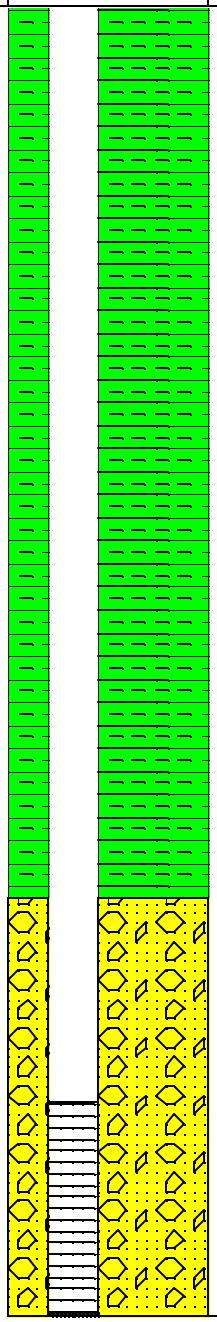
S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W07BC

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (C B)	WELL CONSTRUCTION
60							
65							
70							
75							
80							
85							



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GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W08EX

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** WDC Exploration
PROJECT NUMBER: 771-3	**CREW LEADER:** Mike Thomas
LOCATION: South Bosque Boundary Transect	**RIG TYPE:** Speedstar 30K
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** NA
START DATE: 4/13/2003	**WELL ELEVATION:** 4489.82 ft.
FINISH DATE: 4/14/2003	**GROUND ELEVATION:** 4487.90 ft.

NOTES: Borehole Diameter: 13.875 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM EX	WELL CONSTRUCTION
0							Locking protective casing 8 in. ID sch 40 PVC riser Cement Bentonite grout
5							
10							
15							
20							

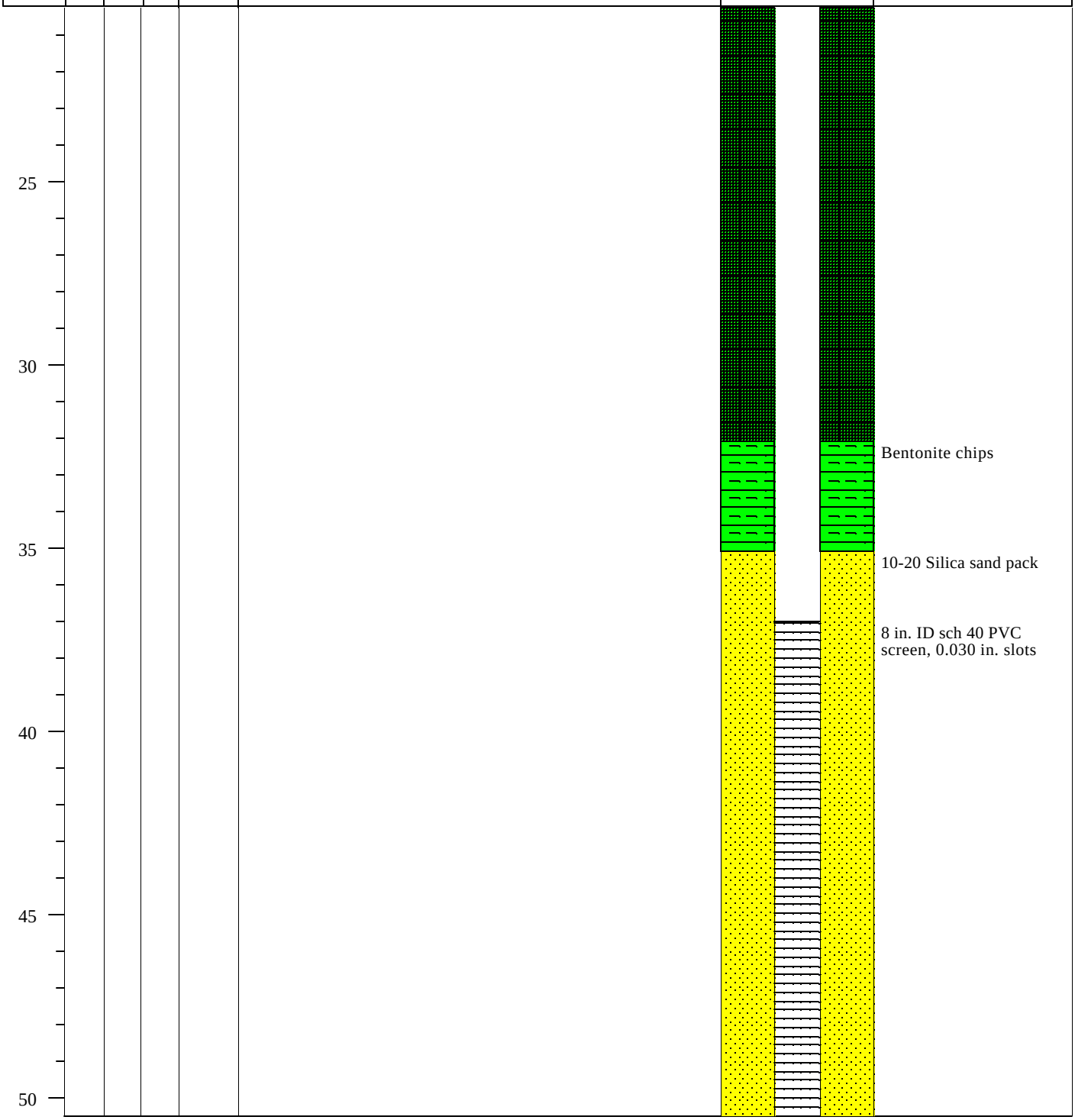
S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W08EX

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM EX	WELL CONSTRUCTION



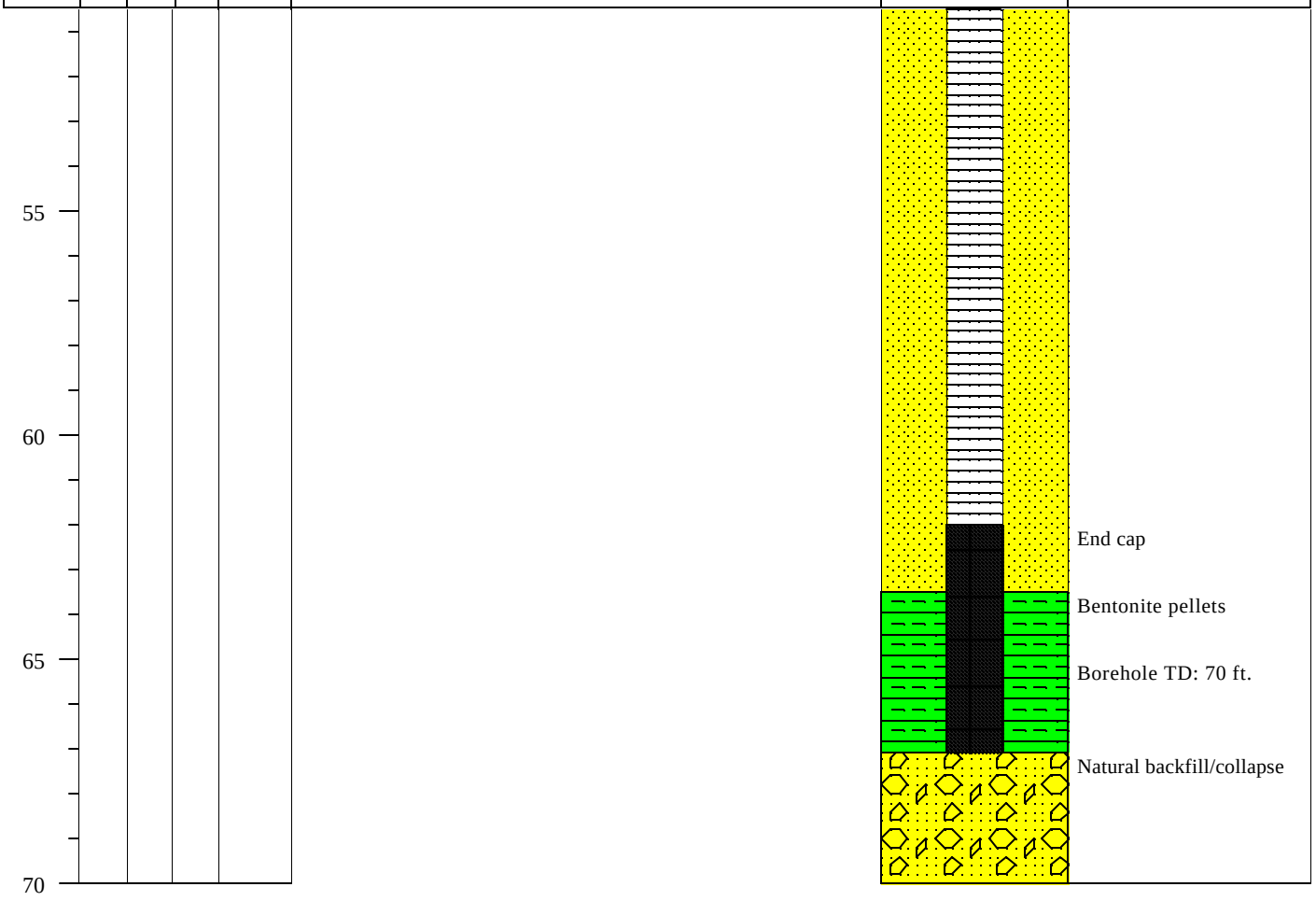
S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SBB-W08EX

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM EX	WELL CONSTRUCTION



S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

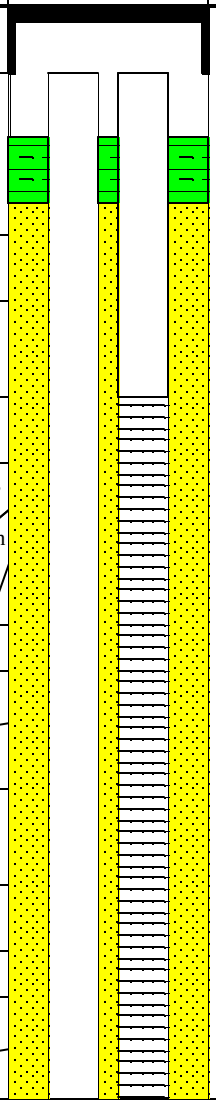
BORING NO. : SMC-W01AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Marcial Transect	**RIG TYPE:** ATV CME 55
ONSITE GEOLOGIST: Bryan Grigsby	**SAMPLE TYPE:** Split Spoon
START DATE: 12/10/2002	**WELL ELEVATION:** A: 4469.28 ft. B: 4469.68 ft.
FINISH DATE: 3/18/2003	**GROUND ELEVATION:** 4470.42 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
0					SAND, f., tr.-few. silt/clay, yellow brown (10YR5/6), v. poorly graded, slightly moist (SP)
5	1	8	1.2		SAND, f., tr.-m. sand, with thin intervals of silt, dk. yellow brown (10YR4/6), silt browner, few thin dk. gray black bands, thick, moist to wet at the bottom of the sample (SP)
	2	4	1.5		SILT, and sand, v.f., dk. yellow brown, with gray brown mottleing, wet, non-plastic (ML-SM)
					CLAY, ltl.-some silt, brown to dk. gray brown (10YR4/3-4/2) with yellow brown areas and frequent dk. gray-black bands, organic matter, plastic, slow dilatancy, v. soft (CL-ML)
					As above, (CL-ML)
10	3	7	1.5		CLAY, dk. gray brown (10YR4/2), firm, no dilatancy, med. plasticity, high toughness, 0.03 ft. of sand at 9.8 feet (CL)
	4	6	1.5		As above, plant material at 11.9 ft. (CL)
					CLAY, few-some silt, soft, plastic (CH-MH)
15	5	6	2.0		SAND, f., silt/clay, poorly graded, non-plastic, less silt and clay in bottom 0.4 in. (SM)



WELL CONSTRUCTION

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-W01AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
					As above, top 1.2 ft., suspected sluff, not described (SM)		
	6	2	1.2		SAND, f., ltl.-some silt, brown to dk. gray brown (10YR4/3-4/2), poorly graded non-plastic (SM)		
	7	6	1.4		As above, (ML-SM) in alternating layers		
20					SILT, clay, plastic, slow dilatancy, (MH-CH)		End cap
	8	1/18	1.0		SAND, f.-v.f., tr.-few silt, tr. clay, brown to dk. gray-brown (10YR4/3-4/2), v. poorly graded, predominately quartz grains, subrounded and difficult to see because of f. grain size (SP) Top 1.4 ft. is suspected sluff. Sluff is f. sand with clay pieces.		Bentonite pellets
	9	7	1.1		SAND, f., slightly coarser than above, brown-dk. gray-brown (10YR4/3-4/2), less fines and color change to yeloow-brown to brown (10YR5/4-5/3), in bottom 0.6 ft. (SP) Top 1.3 ft. is sluff. Sluff is f. sand, v. poorly graded		
25							Natural backfill/collapse
	10	7	0.9		SAND, f.-m. ltl. c. sand, few-ltl. f. gravel, 1 piece of c. gravel, sized vesicular basalt, dk. gray to dk. gray brown (10YR4/1-4/2), well graded, predominately quartz, but more dk. mineral (volcanic grains), subangular to subrounded (SW)		
	11	11	0.6		As above, gravel in sluff, gravel is mostly volcanic and platonic/metamorphic, angular to subrounded (SW)		
30							
	12	11	1.0		SAND, f. tr. m. sand, with 0.1 ft. interval containing c. sand and f. gravel 0.2 ft., above bottom of sample, dk gray (10YR4/1), poorly graded (SP)		
	13	50/1	0.1		GRAVEL, pieces of broken rhyolite in core catcher, gravel includes limestone and well-indurated sandstone (GW)		
35							Bentonite pellets
	14	59	1.0		SAND, m., ltl. f. sand, few -ltl. c. sand, tr. f. gravel, tr. silt and clay, dk. green gray (GLEY 1 3/1), clays apparently give overall color (SW) Top 0.2 ft. suspected sluff.		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-W01AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
					SAND, f.-c., gravel, f.-c., tr. few silt/clay, well graded (SW-GW)		
	15	52	1.1		SAND, f.-m. tr. c. sand, tr. silt/clay, still gray-green even though less silt and clay, med. poorly graded, (SP)		Natural backfill/collapse
40							
	16	50/3	1.0		SAND, m., tr. ltl. f. sand, tr. c. sand, tr. silt/clay, dk. green gray (GLEY1 4/1), predominately subangular quartz, much greenish feldspar and other minerals (SP)		
					No Recovery		
	17	60/4	0				
45							2 in. ID sch 40 PVC screen, 0.010 in. slots
					CLAY, few silt, tr. sand, thin intervals of f.-m. sand, lt. green gray (GLEY 1 7/1-6/1) changing to red brown (5YR5/3), v, hard (Pp=2-4), non-plastic at current moisture, (CL)		
	18	74	1.9		SAND, m., color gray green, as above (SP)		Borehole TD=50.5 ft.
					CLAY, lt. brn gray (GLEY 1 7/1), hard (CL)		
					SAND, f.-m., tr. silt/clay, green gray (GLEY1 4/1), poorly graded, predominately quartz, some feldspars, predominately subangular (SP) Top 0.4 ft. suspected sluff of f.-m. sand and gravel		
	19	50/5	0.9				
50							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

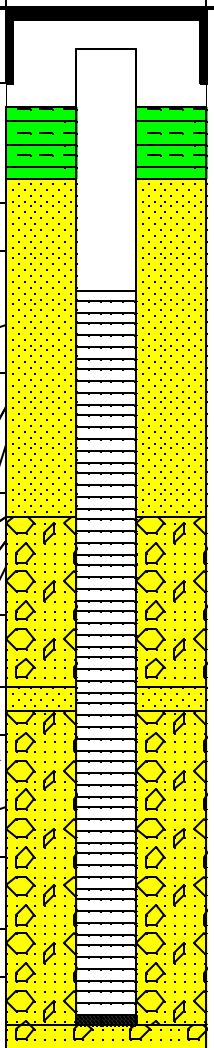
BORING NO. : SMC-W02A

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Marcial Transect	**RIG TYPE:** ATV CME 55
ONSITE GEOLOGIST: Bryan Grigsby	**SAMPLE TYPE:** Split Spoon
START DATE: 12/9/2002	**WELL ELEVATION:** 4472.49 ft.
FINISH DATE: 3/17/2003	**GROUND ELEVATION:** 4471.29 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
0					SAND, v.f., few-ltl. silt/clay, dk. yellow brown (10YR4/6), dry to slightly moist, non-plastic (SP-SM)
5 ▼	1	6	1.3		SAND, f., interbedded with silt and clay, layers are 0.05 ft. to 0.3 ft. thick. dk. yellow brown (10YR4/6), with thin dk. gray black bands, moist, wet in bottom, roots (ML-SM)
	2	6	0.8		As above, then large piece of wood, sluff (ML-SM) Top 0.5 ft. suspected sluff, not described.
					SILT and v.f. sand, brown (10YR4/3), very poorly graded, wet, non-plastic, one piece of wood (ML-SM)
					As above (ML-SM)
	3	4	1.1		CLAY, ltl.-some silt (CL-ML)
10					SAND, f., ltl.-some silt/clay, non-plastic (SP-SM)
	4	17	0.3		SAND, f., few-ltl. silt/clay, brown (10YR4/3), poorly graded (SP) Top 0.3 ft. suspected sluff, not described.
	5	13	1.1		SAND, f., tr. m. sand, tr. silt, brown (10YR5/3), with frequent thin dk. gray to black bands, possible charcoal flecks, v. poorly graded (SP)
15					
	6	10	0.8		SAND, f.-m., tr. c. sand, color as above with dk. bands, fines near bottom, poorly graded (SP)
	7	8	1.0		As above, with tr. c. sand and f. gravel, brown to dk. gray brown (10YR4/3-4/2) poorly graded (SP)
20					



WELL DIAGRAM A

WELL CONSTRUCTION

- Locking protective casing
- 2 in. ID sch 40 PVC riser
- Bentonite chips
- 20-40 Silica sand pack
- 2 in. ID sch 40 PVC screen, 0.010 in. slots
- Natural backfill/collapse
- 20-40 Silica sand pack
- Natural backfill/collapse
- Borehole TD= 20 ft.
- End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-W02A

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM A	WELL CONSTRUCTION
	8	11	1.1		As above, no gravel, grayer in bottom 4 inches, predominately quartz, tr. f. dk. minerals, subangular to subrounded (SP)		
					As above, with tr. f. gravel (SP)		
25	9	31	1.1		SAND, f, tr. m. sand, v. poorly graded (SP), brn (10YR4/3), fewer dk. minerals (SP)		
	10	14	1.2		SAND, f.-c., few-ltl. f.-c. gravel, dk. gray brown to brown (10YR4/2-4/3), well graded (SW)		
30	11	12	0.9		As above, slightly finer grain size overall, tr. gravel (SW)		
	12	34	0.5		SAND, f.-m., tr. c. sand, brown (10YR4/3) poorly graded, finer grained in bottom 0.2 ft. of sample (SP) Top 0.1 ft is sluff. Sluff is predominately c. sand, f. gravel		
35	13	33	0.8		SAND, f., tr. m.-c. sand, brown (10YR4/3) poorly graded (SP) Top 0.2 ft is sluff of c. sand and f. gravel.		
	14	32	0.9		As above, no c. sand (SP) Top 0.3 ft. suspected sluff.		
40	15	27	0.1		SAND, f., and f. gravel. Cannot tell if sampler is in place or sluff. (SP-GP)		
	16	17	0		SAND, f., tr.-ltl. m. sand, tr. c. sand, v. dk. gray brown (10YR3/2), poorly graded with ltl. c. sand on the bottom (SP)		
45	17	27	0.8		SAND, c., f.-c. gravel, few f.-m. sand, gray brown, well graded, sand and gravel predominately subangular to subrounded, v. diverse lithologies (SW-GW)		
	18	27	0.3		As above, with ltl.-some f.-m. sand, very well graded, sluff is f.-c. gravel (SW-GW)		
					SAND, f.-c., tr.-few f. gravel, poorly graded (SP-SW)		
50	19	16	0.8		SAND, f.-m. tr. c. sand, v.dk. gray brown (10YR3/2), poorly graded (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-W03AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Marcial Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Stephanie Kuhn	**SAMPLE TYPE:** NA
START DATE: 3/19/2003	**WELL ELEVATION:** A: 4474.44 ft. B: 4474.31 ft.
FINISH DATE: 3/19/2003	**GROUND ELEVATION:** 4473.72 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
0					Not sampled. See log of SMC-W02A and SMC-W04AB for lithology.		Locking protective casing 2 in. ID sch 40 PVC riser
							Bentonite chips
							20-40 Silica sand pack
5							2 in. ID sch 40 PVC screen, 0.010 in. slots
10							
15							
20							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-W03AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
25							Bentonite pellets
30							Natural backfill/collapse
35							Bentonite pellets
40							Natural backfill/collapse
45							2 in. ID sch 40 PVC screen, 0.010 in. slots
50							Borehole TD= 50.5 ft.
							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC W04AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Marcial Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** Split Spoon
START DATE: 11/04/2002	**WELL ELEVATION:** A: 4471.49 ft. B: 4471.62 ft.
FINISH DATE: 3/20/2003	**GROUND ELEVATION:** 4470.91 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0							Locking protective casing
					SAND, f., ltl. clay, dk. yellowish brown (10YR4/4), moist (SP)		Natural backfill/collapse
							Bentonite chips
							2 in. ID sch 40 PVC riser
					SAND, f.-v.f., some silt, thin layers of clay throughout, yellowish brown (10YR5/8-5/6) (SP)		
	1	6	1.6		CLAY, and silt, some sand, yelowish brown (10YR5/5) (CL)		
5					SAND, f.-v.f., no clay layers, moist (SP)		20-40 Silica sand pack
▼					SILT, dk. yellowish brown (10YR4/6) rapid dilatancy, low plasticity, low toughness, low dry strength, moist, roots, wet at 6.8 ft. (ML)		
	2	3	1.6		CLAY, high plasticity, high dry strength, no dilatancy (CL)		2 in. ID sch 40 PVC screen, 0.010 in. slots
					SILT, as above, wet (ML)		
					SAND, f., some silt, brown to yellowish brown (10YR5/3-5/4) (SW)		
	3	3	1.2		CLAY, v. dk. yellowish brown (10YR3/2), firm, sand filled partings at 8.6 ft, 8.8 ft. and 8.9ft. (CL)		
10					SAND, f., some silt, brown to yellowish brown (10YR5/3-5/4) (SW)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC W04AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
					SILT, tr. f. sand, dk. yellowish brown (10YR4/4), soft (ML)		
					CLAY, no sand, grayish brown (10YR5/2), charcoal pieces (CL)		
	4	6	1.4		SILT, and clay, interbedded, dk. grayish brown (10YR4/2) (ML-CL)		
					CLAY and silt, tr. sand, interbedded, soft, woody material at 14.8 ft. (CL-ML)		Natural backfill/collapse
	5	3	1.5				
15							
					SILT, and clay, appears to be sluff (ML-CL)		
	6	8	2.2		CLAY, no sand, dk. grayish brown (10YR4/2), firm (CL)		
					SAND, f., tr. m. sand, rounded quartz and feldspar, 80/20 quartz/other (SP)		
					SAND, f., tr.-no m. sand, tr.-few fines, rounded-subrounded quartz and feldspar, firm, (SP)		
	7	17	2.2				
20							End cap
					No Recovery		
	8	14	0				
							Bentonite pellets
					SAND, f.-m., ltl. c. sand, fine fraction rounded-subrounded quartz and feldspar, coarse fraction rounded-angular quartz, quartzite, granite, basalt, and metamorphic (SW)		
	9	15	0.8				
25					GRAVEL (GP)		Natural backfill/collapse

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC W04AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B	WELL DIAGRAM A	WELL CONSTRUCTION
								Natural backfill/collapse
	10	12	0.8		As above, gray to grayish brown (10YR5/1-5/2), no structure apparent a few carbonate pieces in c. fraction (SW)			
	11	17	0.8		As above, tr. f. gravel, 1 c. gravel piece (SW)			
30								
	12	14	0.6		As above, 1 c. gravel piece appears to be broken off cobble (SW)			
	13	5	0.8		SAND, f.-c., f. gravel, few c. gravel, tr. fines, v. dk. grayish brown (10YR3/2), lithology as above, pink fine sand, sandstone noted in c. fraction, (SW)			Bentonite pellets
35								
	14	17	0.7		SAND, f.-m., ltl. c. sand, few f. gravel, sample appears to be mostly reworked by drilling fluid, c. fraction concentrated in basal 0.2ft. (SW)			
								Natural backfill/collapse
					SAND, f.-m. no c. sand, firm, grayish brown to dk. grayish brown (10YR5/2-4/2) no fines (SP)			
	15	16	1.3		SAND, c., and gravel, ltl. f.-m. sand, coarse zone is angular-rounded quartzite, granite, carbonate, volcanic (SW)			
40					SAND, f.-m. rounded-subrounded quartz and feldspar, mafic grains (SP)			

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC W04AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	16	23	0.2		SAND, f.-c., f. gravel, loose (SW)		
	17	42	0.8		SAND, f.-v.f., no m. sand, v. dk. grayish brown (10YR3/2), appears to be washed by drilling fluid, firm, 2-3 gravel pieces (SW)		
45							2 in. ID sch 40 PVC screen, 0.010 in. slots
					No Recovery		
	18	36	0				Borehole TD= 50.5 ft.
					SAND, f.-c. sand, f. gravel, lithology as above (SP)		
	19	10	1.3		SAND, f., few m. sand, v. dk. gray to v. dk. grayish brown (10YR3/1-3/2) (SP)		
50					CLAY, no sand, dk. grayish brown to v. dk. grayish brown (10YR4/2-3/2), soft (CL)		End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-W05AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Marcial Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** NA
START DATE: 3/13/2003	**WELL ELEVATION:** A: 4478.14 ft. B: 4478.22 ft.
FINISH DATE: 3/13/2003	**GROUND ELEVATION:** 4476.65 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
0					Not sampled. See log for SMC-WO7C for lithology.		Locking protective casing; 2 in. ID sch 40 PVC riser; Bentonite chips; 20-40 Silica sand pack; 2 in. ID sch 40 PVC screen, 0.010 in. slots; End cap
5							
10							
15							
20							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-W05AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

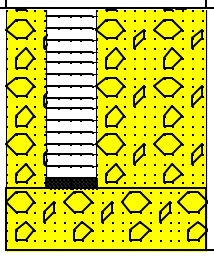
DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
25							Bentonite pellets
							Natural backfill/collapse
30							
							Bentonite pellets
35							Natural backfill/collapse
40							
45							Bentonite pellets
							Natural backfill/collapse
50							2 in. ID sch 40 PVC screen, 0.010 in. slots

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-W05AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
55							Borehole TD= 55.5 ft. End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-W06AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Marcial Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** Split Spoon
START DATE: 11/04/2002	**WELL ELEVATION:** A: 4477.48 ft. B: 4477.60 ft.
FINISH DATE: 3/10/2003	**GROUND ELEVATION:** 4477.05 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0							Locking protective casing
					SAND, f., ltl. silty clay, dk. yellowish brown (10YR4/4), rounded-subrounded quartz and feldspar (SP-SM)		2 in. sch 40 PVC riser
							Bentonite chips
							20-40 Silica sand pack
	1	3	0.9		SAND, f.-v.f., dk. yellowish brown (10YR4/4), rounded-subrounded quartz and feldspar, with a ratio of 90/10 quartz and other, ltl. fines (SP)		2 in ID sch 40 PVC screen, 0.010 in. slots
5							
	2	6	1.3		As above, lens of f. sand, some clay 6.7-6.9 feet (SP)		
	3	5	1.0		SAND, f.-v.f., no fines, dk. yellowish brown (10YR4/4), rounded-subrounded quartz and feldspar, with a ratio of 90/10 quartz and other, soft, no apparent structure (SP)		
10							
	4	11	1.1		As above, (SP)		
					SILT, dk. yellowish brown (10YR3/6-4/6) (ML)		
	5	2	1.2		CLAY, grayish brown (10YR5/2), high plasticity, (CL)		
15					SILT, no sand, dk. yellowish brown (10YR3/6-4/6) (ML)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-W06AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
	6	4	1.1		CLAY, no sand, grayish brown to dk. grayish brown (10YR5/2-4/2), soft, charcoal pieces, large wood piece at bottom, reducing odor, (CL)
	7	8	1.0		SILT, gray to dk. gray (10YR5/1-4/1), soft, piece of wood 0.8 ft. long and 0.5 inch thick by 1.5 inch wide, reducing odor (ML)
20	8	8	1.2		As above, wood chunks in top 0.3 ft (ML)
	9	7	1.8		SILT, and v.f. sand, gray to dk. gray (10YR5/1-4/1) v. soft, rapid dilatancy, low plasticity, low toughness and no dry strength (ML-SM)
25	10	6			CLAY, dk. gray (10YR4/1), soft, firm (Pp=0.25-1.5), no dilatancy high plasticity, high toughness, charcoal and organic matter throughout, (CL)
					As above, (CL)
	11	6	1.6		SAND, f., some fines, gray (10YR5/1) soft (SP)
30					CLAY, some f. sand, gray (10YR5/1), soft (CL)
	12	28	1.1		SAND, f., no m. sand, tr. fines, dk. grayish brown (10YR4/2), soft to firm (Pp=0.25-0.75), rounded-subrounded quartz, feldspar, and mafic, 80/20 quartz/other (SP)
	13	20	0		No Recovery
35					
	14	16	0.2		SAND, f., loose (SP)

WELL DIAGRAM (B A)

WELL CONSTRUCTION

- End cap
- Slurry and Bentonite pellets
- Natural backfill/collapse

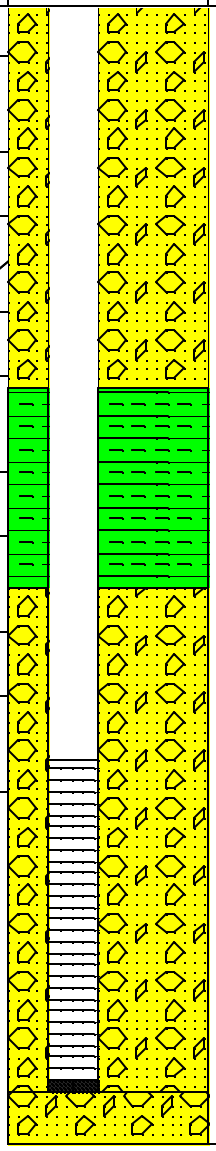
S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-W06AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
40	15	20	1.1		SAND, f.-c., ltl. f.-c. gravel, tr.-n. fines, soft, f.-m. sand is similar to lithology above, c. fraction angular-rounded quartzite, basalt, red siltstone, carbonate, and granite (SW)
	16	18	1.0		SAND, f.-m., tr-few c. sand, firm, layered with fine sand and f.-m. sand (SW) SAND, m., some f. sand, ltl. c. sand, few f. gravel (SP)
45	17	23	0.3		As above, dk. grayish brown (10YR4/2), 3 larger gravel pieces of olive f. grain quartz and sandstone, on top of recorded sample, (SP)
	18	24	1.2		SAND, f., ltl. m. sand, tr. c. sand, f. gravel, few fines, dk. grayish brown (10YR4/2), faint layering throughout, soft, (SP)
50	19	16	0.7		CLAY, some f.-c. sand, few gravel, some fines, high plasticity, high dry strength, no dilatancy (CL-SC)
55					



WELL CONSTRUCTION

- Slurry and Bentonite pellets
- Natural backfill/collapse
- 2 in ID sch 40 PVC screen, 0.010 in. slots
- Borehole TD= 55.5 ft
- End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-WO7AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Marcial Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** NA
START DATE: 3/14/2003	**WELL ELEVATION:** A: 4478.07 ft. B: 4478.27 ft.
FINISH DATE: 3/14/2003	**GROUND ELEVATION:** 4476.63 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
0					Not sampled. See log of SMC-W07C for lithology.		Locking protective casing; 2 in. ID sch 40 PVC riser; Bentonite chips; 20-40 Silica sand pack
5							2 in. sch 40 PVC screen, 0.010 in. slots
10							
15							
20							End cap; Bentonite pellets

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-WO7AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
25							Natural backfill/collapse
30							
35							
40							Bentonite pellets
45							Natural backfill/collapse
50							2 in. sch 40 PVC screen, 0.010 in. slots
							Borehole TD=55.5 ft.
55							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-W07C

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Marcial Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Bryan Grigsby	**SAMPLE TYPE:** Split Spoon
START DATE: 10/23/2002	**WELL ELEVATION:** 4478.01 ft.
FINISH DATE: 5/12/2003	**GROUND ELEVATION:** 4476.80 ft.

NOTES: Borehole Diameter: 8 in.-well construction

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
0							Locking protective casing
					SAND, f., tr. m. sand, yellow brown (10YR5/6), v. poorly graded, slightly moist, roots (SP)		2 in. ID sch. 40 PVC riser
							Cement Bentonite grout
	1	4	0.5		SAND, f., tr. m. sand, dk. yellow brown (10YR4/4), v. poorly graded, roots, orangish oxidized intervals, silty interval at 4.8 feet. (SP)		
5 ▼							
					CLAY, v. soft, plastic, roots, irregular sand pockets (CL)		
	2	3	1.7		SAND, f., some silt, v. poorly graded, dk. gray bands, wet (SM)		
					CLAY, silty, v. soft, slightly plastic (ML-CL)		
					SAND, as above, loose (SM)		
	3	4	1.1		As above (SM)		
10							Natural backfill/collapse
					As above, dk. brown yellow (SM)		
	4	3	0.8		SILT, some f. sand, dk. gray (ML)		
					SAND, f., some silt, as above (SM)		
	5	3/2	0.7		SAND, f., and SILT, tr. clay, v. loose, brown (10YR4/3), 1 thin dk gray band, 1 gravel clast, roots, predominately quartz (SM-ML)		
15							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-W07C

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
					As above, with silt and clay layers (SM-ML)		
	6	5/2	1.8		SAND f., ltl.-some silt, with interbedded thin layers of clay, change in color to v. dk. gray brown (10YR3/2), thin dk. gray-black bands, large root, fresh reddish color (5R3/4) (SP-SM)		
					SAND f., tr.-some silt/clay, color as above, frequent dk. gray bands, plant matter (SP-SM)		
	7	5	2.3		CLAY (CL)		
20					SAND, as above (SP-SM)		
	8	4/2	1.2		SAND f., some silt, frequent dk. gray bands, strong reaction to acid (SM)		
					As above (SM)		
	9	3	1.7		CLAY, v. soft, with woody matter (CL-CH)		
25							
	10	4	1.1		CLAY, as above soft and firm (Pp=0.3-0.8), f. sand lens, difficult to mold, plastic, plant matter in bottom 0.3 ft. (CL-CH)		
					CLAY, as above, some thin intervals of f. sand, higher plasticity than above (CH)		
	11	10	1.6		SAND, f., tr. m. sand, still plant matter (SP)		
30							
	12	13	0.1		CLAY, ltl. f. sand, organic matter (CL-CH)		
	13	18	0.9		SAND, f.-m., dk. gray brown (10YR4/2), loose to m. dense, poorly graded, no plant matter, subangular-subrounded, tr. charcoal flecks (SP)		
35							
	14	55	1.1		SAND, f.-m., grades downward, few m. sand, brown (10YR4/3), poorly graded, v. dense, small charcoal flecks near top, rare dk. bands (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-W07C

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
40	15	15	0.5		SAND, m. tr. f. sand, few c. sand, few-ltl. f.-c. gravel with c. gravel fragments at top, moderately well graded, gravel predominately igneous and metamorphic (SW)		
	16	26	1.0		As above (SW) As above, less gravel, possible dark pieces of charcoal (SP-SW) As above, with increasing gravel (SW)		
45	17	8	0.6		SAND, m., tr.-few f.and c. sand, tr. f. gravel (SP)		
	18	6	1.3		SAND, f.-m., poorly graded, young looking woody matter (SP) SILT/CLAY and f. SAND, older woody material SAND, f.-m., few c. sand and f. gravel (SP-SW)		Slurry and Bentonite pellets
50	19	14	1.0		SAND, f.-c., and f.-c. GRAVEL, tr.-few clay, well graded, gravel subangular to subrounded (SW-GW) SAND, m., ltl. f.-c. sand, ltl. f. gravel (SW) SAND f.-c., and f.-c. GRAVEL, tr.-few clay, well graded, gravel subangular to subrounded (SW-GW)		
	20	18	1.6		Sluff, grades downward from f.-m. sand to c. sand few f. gravel in bottom 0.3 ft. SAND, f.-m., irregular upper contact with c. sand and gravel (SP)		
55	21	21	1.1		SAND, f.-m., ltl. c. sand and f. gravel, tr.-few silt/clay, v. dk. gray brown (10YR3/2) (SW)		
	22	22	1.0		SAND, f.-m., tr-ltl. f. gravel, gravel in tip of sampler (SP-SW)		
60	23	21	0.6		SAND, f.-c., and f. GRAVEL, tr. clay, gravel predominately volcanics with some igneous and one sandstone clast, well graded (SW-GW)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-W07C

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
	24	13	0.5		As above, one clast of fossiliferous limestone (SW-SG)		
					As above, more gravel, probably sluff (SW-GW)		
	25	19	0.6		SAND, f.-m., brown (10YR4/3), poorly graded, subround-round (SP)		
65					As above, but drilled on cobbles above 66 ft. (SP)		
	26	49	0.9		GRAVEL, f.-c., fragment of quartzite clast stuck and in tip of sampler (GP-GW)		Natural backfill/collapse
	27	39	0.7		SAND, f.-c., and f. GRAVEL in alternating layers, gravel less sandstone and more well-indurated siliceous and metamorphics, subround (SW-GW)		
70					As above, gravel slightly more coarse (SW-GW)		
	28	22	1.1				2 in. ID sch 40 PVC screen, 0.010 in. slots
							Borehole TD= 77.5 ft.
	29	70	1.1		As above, less gravel and more f.-m. sand, cobble fragment stuck in tip of sampler (SW-GW)		
75					SAND and f.-c. GRAVEL, as above (SW-GW)		
	30	90	1.7		CLAY, silty, tr. sand, green gray (5GY5/1) (CL)		End cap
					SAND, f.-m., v. dk. gray brown (10YR3/2), v. dense, poorly graded, (SP) (Santa Fe Group)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-WO8EX

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** WDC Exploration
PROJECT NUMBER: 771-3	**CREW LEADER:** Mike Thomas
LOCATION: San Marcial Transect	**RIG TYPE:** Speedstar 30K
ONSITE GEOLOGIST: Steve Lindblom	**SAMPLE TYPE:** NA
START DATE: 4/11/2003	**WELL ELEVATION:** 4478.42 ft.
FINISH DATE: 4/11/2003	**GROUND ELEVATION:** 4476.79 ft.

NOTES: Borehole Diameter: 14.75 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
0					Not sampled. See log of SMC-W07C for lithology.		Locking protective casing 10 in. ID sch 40 PVC riser Cement Bentonite grout
5							
10							
15							
20							

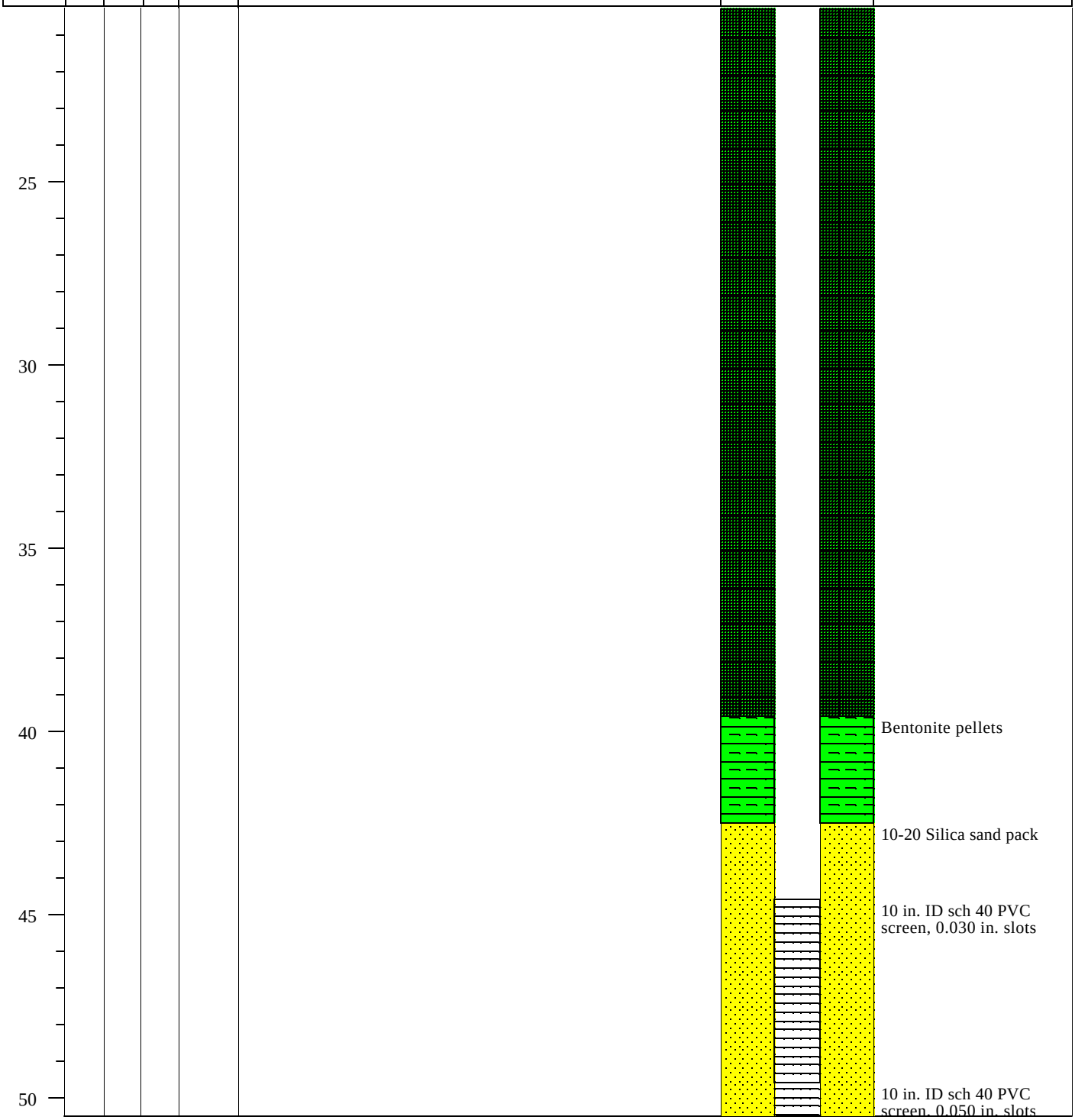
S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-WO8EX

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION



S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-WO8EX

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
55							screen, 0.050 in. slots
60							10 in. ID sch 40 PVC screen, 0.080 in. slots
65							
70							Borehole TD: 75 ft.
							Bentonite pellets
75							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-W09AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: San Marcial Tansect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** Split Spoon
START DATE: 3/11/2003	**WELL ELEVATION:** A: 4478.11 ft. B: 4478.12 ft.
FINISH DATE: 3/11/2003	**GROUND ELEVATION:** 4476.57 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
0					Not sampled. See log for SMC-W07C for lithology.		Locking protective casing; 2 in ID sch 40 PVC riser; Bentonite chips; 20-40 Silica sand pack; 2 in. ID sch 40 PVC screen, 0.010 in. slots
5							
10							
15							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-W09AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
15							
							Natural backfill/collapse
							End cap
20							
							Bentonite pellets
25							
							Natural backfill/collapse
30							
35							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SMC-W09AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
40							Slurry and Bentonite pellets
45							Natural backfill/collapse
50							2 in. ID sch 40 PVC screen, 0.010 in. slots
							Borehole TD= 55.5 ft.
55							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

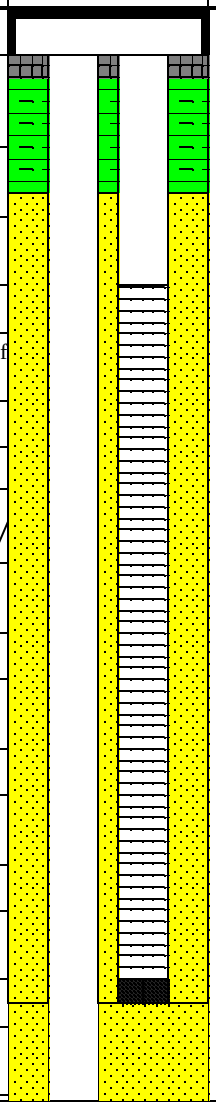
BORING NO. : SFC-WO1AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: South of Fort Craig Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Dagmar Llewellyn	**SAMPLE TYPE:** Split Spoon
START DATE: 10/29/2002	**WELL ELEVATION:** A: 4464.06 ft. B: 4463.07 ft.
FINISH DATE: 4/2/2003	**GROUND ELEVATION:** 4462.68 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
0					SILT, ltl. f.-c. sand, med. brown, contains some recent organics and evidence of soil formation. Driller says he encountered gravel at about 3 feet bgs. (ML)
	1	3	0.9		CLAY, some silt, med.-dk. brown. soft, (Pp=0), rolls into a thin tube; moist (CL)
5					
▼	2	2/18	1.2		CLAY, sandy in lower 0.3', (Pp=0), piece of coarse gravel in tip of sampler, dk. brown, soft, wet, very gummy; no resistance (CL)
	3	25	1.5		As above, (CL)
10					SAND and GRAVEL, c. sand and f.-c. gravel, with clay coating, clast supported. (SP-GP)
	4	30	0.8		GRAVEL, f.-c., ltl. f.-c. sand, clay (mud) coating, clast supported, angular gravel (GW)
	5	22	0.8		SAND, v.f.-c., f.-c. tr. silt and clay, gravel, well graded, med. brown, wet, angular clasts (GW)
15					
	6	26	1		As above, (GW)
	7	28	1		GRAVEL, f.-c., some sand, clay/silt coating, med. brown, wet (GW)
20					
	8	50/6	1.1		Same as above, some clay, some pockets are clay-cemented (GW-GC)



WELL CONSTRUCTION:
- Locking protective casing
- 2 in. ID sch 40 PVC riser
- Bentonite chips
- 20-40 Silica sand pack
- 2 in. ID sch 40 PVC screen, 0.010 in. slots
- End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SFC-WO1AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 | **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B	WELL DIAGRAM A	WELL CONSTRUCTION
25	9	50/2	.2		GRAVEL, f., ltl. c. sand. Driller was likely pushing a cobble, which would explain the spoon refusal, wet, muddy, soupy (GP)			
	10	50/1	0		No recovery. Driller says he is drilling through gravel and cobbles- he is probably pushing a cobble with his spoon. (GP?)			Natural backfill/collapse
	11	74	1.3		GRAVEL, f.-c., ltl. f.-c. sand, tr. silt, tr. clay, muddy (GW-GC)			
30					SAND, v. f.-m., no fines, lt. brown (SW)			Bentonite pellets
	12	67	0.9		SAND, v. f.-m sand, no fines, med. brown, well graded. Driller says that he is not drilling through gravel anymore past 30' bgs. (SW)			Natural backfill/collapse
	13	95	0.7		SAND, f., no fines, poorly graded, med. brown, wet, not muddy (SP)			
35								Bentonite Slurry
	14	86	1.2		SAND, some f. sand, tr. c. sand, med. brown, clean, well sorted (SP)			
								Natural backfill/collapse
	15	90	1.3		As above, (SP)			
40								
	16	90	1.2		GRAVEL, pockets of gravel, sand and clay, highly weathered material, decayed black rock or charcoal (GW-SW)			
	17	50/5	0.9		CLAY, lt brown (CL)			
					SAND, m., no fines, med. brown (SP)			
45								2 in. ID sch 40 PVC screen, 0.010 in. slots
	18	50/3	0		No recovery			Borehole TD= 50.5 ft.
	19	50/5	0.4		SAND, f.-m., no fines, med. brown (SP)			
50								End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SFC-W02AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: South of Fort Craig Transect	**RIG TYPE:** ATV CME 55
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** Split Spoon
START DATE: 12/12/2002	**WELL ELEVATION:** A: 4458.48 ft. B: 4458.42 ft.
FINISH DATE: 3/27/2003	**GROUND ELEVATION:** 4457.58 ft.

NOTES: Borehole Diameter: 6 in.-geological sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0							Locking protective casing
							2 in. ID sch 40 PVC riser
					SAND, v. f. sand and silt, lt. brown to yellow orange (10YR5/4), loose, dry, holds shape when compacted but will not form tube or ball (SM)		Bentonite chips
							20-40 Silica sand pack
5	1	26	1.3		As above, med. density, poorly graded, no visible structure, moist (SM)		2 in. ID sch 40 PVC screen, 0.010 in. slots
	2	7	1.5		As above, decreasing silt (SM-SP)		
10	3	10	1.5		SAND, f.-m. sand, lt. brown, predominately quartz, tr. mica up to 3mm, clay nodule 0.6 ft. and 1 ft. from the bottom, clay balls displaying spherical deposition patterns, organic matter 9.9 inches. Note: Sampler drove through approximately 8 inches of sluff. (SP)		
	4	24	1.1		SAND, as above, poorly graded, dense to medium dense, no tr. mica (SP)		
15	5	12	0.9		As above, tr. mica, Note: sampler may not reflect in place materia (SP)		
	6	7	1.0		As above, (SP)		Natural backfill/collapse
	7	2	1.8		CLAY, ltl. sand and silt, dk. brown (10YR3/3), soft, (Pp=0.2) (CL) Top 0.3 ft. of sample suspected sluff, not described.		End cap
20					SAND, fn.-m. (SM)		Bentonite pellets

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SFC-W02AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	8	3	1.7		SAND, v.f., ltl. v.f.-f. gravel, and ltl. silt, lt. brown (10YR4/3), loose to v. loose, poorly graded-moderately poorly graded (SP)		
	9	4	2.2		As above, no gravel, silt/clay increasing to ltl.-some, very loose, upper 0.9 ft fining upward (SP) Top 0.9 ft. suspected sluff.		Natural backfill/collapse
25							
	10	2	0		No sample		
	11	37	1.0		GRAVEL, f.-c., and cobbles, some f.-c. sand, tr.-no silt and clay, lt. brown (10YR3/4), moderately graded, rounded to angular, silaceous lithologies (sandstone and granite) (GW-GP)		
30							
	12	50/5	0.6		GRAVEL, f.-c., cobbles, some f.-c. sand, rounded-angular (GW-GP)		
	13	50/4	0.2		As above, increasing f.-c. sands (GW-GP)		
35							Bentonite pellets
	14	50/4	0.4		SAND, f.-c. sand, some angular-subrounded f. gravel, moderately well graded, may be sluff (SW)		
	15	66	0.9		GRAVEL, f.-c., m.-c. sand and ltl. f. sand in clay supported matrix, lt. brown clay (10YR7/6) is stiff-v. stiff, angular to subrounded gravel, gravel lithologies composed of silaceous sandstone, siltstone, rhyolite and basalt (GC)		Natural backfill/collapse
40							
	16	50/5	0.5		GRAVEL, and sand, suspected to be washed sluff (GC) GRAVEL, f.-c., m.-c. sand and ltl. f. sand in clay supported matrix (GC)		
	17	69	0.9		As above, clay supported m.-c. sand, and f.-c. gravel (GC)		2 in. ID sch 40 PVC screen, 0.010 in. slots
45							
	18	50/5	1.2		SAND, f.-v.f., tr. m. sand, no-tr. fines, dk. brown (10YR5/4), poorly graded, dense (SP)		Borehole TD= 51 ft.
	19	50/2	0.1		GRAVEL, washed gravel and sand, suspected sluff (GW)		End cap
50							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SFC-W02AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
55	20	50/0	0.35		SAND, fining upward from f. gravel with m.-c. sand, to poorly graded f.-m. sand, no fines, brown-brown gray in color (SP-SW)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SFC-W03AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: South of Fort Craig Transect	**RIG TYPE:** ATV CME 55
ONSITE GEOLOGIST: Bryan Grigsby	**SAMPLE TYPE:** Split Spoon
START DATE: 12/11/2002	**WELL ELEVATION:** A: 4458.72 ft. B: 4458.44 ft.
FINISH DATE: 3/25/2003	**GROUND ELEVATION:** 4458.08 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
0					SAND, f., tr. silt/clay, yellow brown, (10Y5/4-5/6), slightly moist, v. poorly graded (SP)		Locking protective casing; 2 in. ID sch 40 PVC riser; Natural backfill/collapse; Bentonite chips; 20-40 Silica sand pack
▼							
					SAND, f., ltl. silt, wet (SM)		
	1	8	1.0		SILT/CLAY, v. soft (MH)		
5					SAND, f., tr. silt/clay, brown (10YR5/3), v. poorly graded, sand of uniform grain size, predominately quartz, subrounded (SP)		2 in. ID sch 40 PVC screen, 0.010 in. slots
	2	8	1.1		As above, some siltier intervals, f. dk. gray black bands (SP) Top 1.3 ft. is suspected sluff, not described.		
	3	10	1.0		SAND, v.f.-f. ltl. silt, brown (10YR4/3), poorly graded (SP-SM)		
10							
	4	6	0.9		As above, v. thin lens (0.05") silt/clay at top of in-place sample (SP-SM) Top of 0.3 ft. is suspected sluff, not described.		
					CLAY, brown to gray-brown, firm, (Pp=0.75-1.0), no dilatency, tough, plastic, (CH-CL)		
	5	25	1.5		SAND, f., tr.-few silt/clay, brown to gray-brown, very poorly graded, roots and wood in several intervals (SP)		
15							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SFC-W03AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
	6	32	1.0		SAND, f., tr. m. sand, color changes from brown (10YR3/4) to dk. gray-brown (10YR3/2) with thin oxidized bands near transition, v. poorly graded (SP)		
	7	18			SAND, f.-m., v. dk. gray to dk. gray-brown (10YR3/1-3/2), 0.1" in dark organic clayey interval at about 19.2 ft., poorly graded (SP)		Natural backfill/collapse
20							End cap
	8	18	1.2		As above, no-few m. sand at bottom, tr. silt. Note: Sampler stuck in augers; had to pull 5 ft. auger to unstick. (SP)		Bentonite pellets
	9	15	0.7		SAND, f.-m., dk. gray brown to very dk. gray brown (10YR4/2-3/2), poorly graded, predominately quartz and feldspar, few-ltl. dk. grains, predominately subangular, ltl.-some subrounded grains (SP) Top 1.7 ft. suspected sluff of f.-m. sand, chunks of clay (SP)		
25					CLAY, sandy and sandy clay, (CL-SC)		Natural backfill/collapse
	10	16	1.2		SAND, f.-m., sluff is v. fine sand and some silt, (SP) Top 0.7 ft. suspected sluff of f.-v.f. sand, some silt. SAND, f., silt, tr. clay, v.dk. gray brown (10YR3/2) (SM)		Bentonite pellets
	11	32	1.0		As above, (SM) Top 1.4 ft. suspected sluff of f.-v.f. sand, some silt		
30					SAND, f., tr.-ltl. silt, tr. m. sand (SP-SM)		
	12	8	0.9		CLAY, soft-v. soft, black band of organic matter at bottom (CH) SAND, f., silty, as above (SM)		Natural backfill/collapse
	13	24	0.4		SAND, f.-c. and f. gravel, tr.-few silt/clay, well graded, limestone, quartz and volcanics, much of coarse sand is angular, gravel is subrounded (SW-GW)		
35					SAND, f.-m., poorly graded, wood (SP)		
	14	5	1.0		SAND, f.-m., few c. sand, tr. f. gravel, moderately well graded, frequent thin dk. gray-black bands (SW) CLAY, silty (CH-MH)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SFC-W03AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM B A	WELL CONSTRUCTION
40	15	50/5	0.2		GRAVEL, f., fragments of c. gravel (GW)		
	16	29	0.7		SAND, f.-c. and gravel, tr. silt/clay, well graded, several pieces of gray loose basalt in gravel (SW)		
45	17	17	0.2		SAND, c., f.-c. gravel, large fragments of rhyolite (SW-GW)		2 in. ID sch 40 PVC screen, 0.010 in. slots
	18	10	0.6		As above, no c. limestone, lots of f.-v.f. grained silaceous gravel (SW-GW)		Borehole TD= 50.5 ft.
50	19	19	0.8		As above, (SW-GW)		End cap
					Driling on gravel and cobble.		
55	20	76	nr		As above, ltl. silt/clay, lt. reddish brn, (5YR6/4), (GW-GC)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SFC-WO4AB

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: South of Fort Craig Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Dagmar Llewellyn	**SAMPLE TYPE:** NA
START DATE: 10/25/2002	**WELL ELEVATION:** A: 4457.82 ft. B: 4457.92 ft.
FINISH DATE: 3/21/2003	**GROUND ELEVATION:** 4456.64 ft.

NOTES: Borehole Diameter: 10 in.

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
0					Not sampled. See log of SFC-W04C for lithology.		Locking protective casing 2 in. ID sch 40 PVC riser Natural backfill/collapse Bentonite chips Natural backfill/collapse
5							2 in. ID sch 40 PVC screen, 0.010 in. slots
10							
15							20-40 Silica sand pack
20							End cap Natural backfill/collapse

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SFC-WO4AB

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM (B A)	WELL CONSTRUCTION
25							Bentonite pellets
							Natural backfill/collapse
30							
							Bentonite pellets
35							
							Natural backfill/collapse
40							
45							2 in. ID sch 40 PVC screen, 0.010 in. slots
							Borehole TD: 51 ft.
50							End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SFC-WO4C

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: South of Fort Craig Transect	**RIG TYPE:** CME 75
ONSITE GEOLOGIST: Dagmar Llewellyn	**SAMPLE TYPE:** Split Spoon
START DATE: 10/25/2002	**WELL ELEVATION:** 4458.05 ft.
FINISH DATE: 3/31/2003	**GROUND ELEVATION:** 4456.88 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
8 in. well construction

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	SAMPLES BLOWS	SAMPLES REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
							Locking protective casing
							2 in. ID sch 40 PVC riser
0 ▼					SAND, f., with silt and clay, dk. yellow brown (10YR4/4), loose and poorly graded, wet (SP)		Cement Bentonite grout
	1	3/2	1.5		SAND, f., tr. clay, dk. yellow brown (10YR4/4), wet (SP)		
5					SILT, and f. sand, non-plastic, (SM)		
	2	2	1.7		SAND, f., with occasional thin d. gray bands, some intervals with silty clay, v. loose, non-plastic, some oxidized spots, (SP)		
	3	4	1.7		As above, alternate layers of d. yellow brown (10YR4/4), v. dark gray brown (10YR3/2) less fines than above, roots, poorly graded (SP)		
10					CLAY, brown (10YR3/4), v. soft, slight plasticity (CH)		
					SAND, f., as above (SP) Top 1.2 ft. suspected sluff. Not described.		
	4	5	1.0		CLAY, silty, slightly plastic, soft (CH)		
					SAND, f., tr. m. sand, dk. yellow brown (10YR3/4) (SP)		Natural backfill/collapse
	5	12	1.5		SAND, f., v. dk. yellow brown (10YR3/4), 2 thin (0.02") clayey lenses near bottom (SP) Top 0.5 ft. suspected sluff, not described.		
15							
					No sample recovered		
	6	17	0				

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SFC-WO4C

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
20	7	6	1.2		SAND, f., tr.-few m. sand, poorly graded, brown (10YR4/3), predominately quartz, feldspars, dark reddish black grains, subangular, subrounded (SP)		
	8	16	0.2		As above, (SP)		
	9	6	1.0		SAND, f., tr. m. sand, tr. c. sand and f. gravel, dark gray brown (10YR4/2), thin dk. gray bands (SP) Top 0.3 ft. suspected sluff. Not described.		
25	10	18	0.6		As above, but no c. sand or c. gravel (SP)		
	11	18	1.1		SAND, m. tr. f. sand, poorly graded, med. density (SP)		
30	12	23	0.4		SAND. f.-c. sand and tr. silt/clay, tr. f. gravel, drilling on gravel, blow-up (SW-GW) Top 1.1 ft. suspected sluff of f.-c. sand, thin dk. gray bands, poorly graded (SP)		
	13	14	1.0		SAND, f.-c. sand, some c. gravel (GW) Top 0.5 ft. suspected sluff of f.-c. sand		
35					SAND, m., tr. f. sand, thin dk. gray bands, poorly graded (SP)		
	14	13	1.8		SAND, f.-c., tr. f. gravel (SW)		
					SAND and GRAVEL, m.-c. sand, f.-c. gravel, coarsening downward (SP-GW)		
					SAND, m., tr. f. and c. sand (SP)		
	15	13	0.9		SAND, m., and tr. f. sand, thin gray bands (0.2"); dark gray (10YR4/2) (SP) Top 0.2 ft. suspected sluff. Not described.		
40					SAND, f.-c. and f. gravel, tr. silt and clay (SW-GW)		Bentonite slurry
	16	32	0.2		As above, (SW-GW)		
					SAND, f. tr. m. sand, brown (10YR4/3), poorly graded med. density, two thin layers with gravel (SP)		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SFC-WO4C

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
45	17	16	1.1		density, two thin layers with gravel (SP)		
	18	38	1.0		SAND, v.f. to f. sand, ltl. angular f. gravel, some m.-c. sand, brown. Note: sluff above sample is well sorted f.-v.f. sand, light brown (SW)		
					Drilling through gravel (per driller)		
	19	70	0.6		SAND and GRAVEL, no fines, med. brown, poorly sorted, angular (GW)		
50	20	50/4	1.0		GRAVEL, some c. sand, no fines, med. brown, angular, max gravel size in sample is 1.5" elongated (GW)		
	21	52/6	0.8		GRAVEL, f.-c., some c. sand, med. brown, angular gravel (GW)		
55	22	50	0.8		GRAVEL, f.-c. some c. sand with some clay lenses, med. brown, gravel is angular with clay (GW)		
	23	37	0.8		GRAVEL, f.-c. gravel and f.-c. sand in gummy clay matrix, lt. brown to yellowish orange, clast supported (GC)		
60	24	50/4	1.0		SAND, m., some c. sand, f.-c. gravel in tip of spoon, no fines, poorly graded, reddish brown (SP)		Natural backfill/collapse
	25	80	1.5+		SAND, m.-c., ltl. f. sand, ltl. f. gravel (rounded), no fines, med. brown, (SP) Top 0.5 ft. suspected sluff. Same composition as sample.		
65	26	105	1.2		As above, bottom 0.2 ft f.-m. sand, no fines, med. brown (SP)		
	27	100/	0.2		SAND, f.-m., light brown, no fines, clean, driller believes that this is the Santa Fe Formation (SP)		
70							

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SFC-WO4C

PROJECT NAME: Rio Grande Watershed Study Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM C	WELL CONSTRUCTION
	28	130	1.5		As above, (SP)		
	29	85	1.0		SAND, some v. f. sand, feels soft in spoon, no structures apparent (SP)		
75	30	52	0		No recovery		
	31	120	1.5		SAND, f., ltl. v. f. sand in tip and lower few inches of sample, clean, light brown, coarsening upward to c. sand at top of sample (SW)		2 in. ID sch 40 PVC screen, 0.010 in. slots
80	32	57	1.0		SAND, f., ltl. v. f. sand, l. med. sand, no fines, compacted in sampler, but no apparent signs of induration (SP)		Borehole TD= 85.5 ft.
	33	55	1.0		As above, (SP)		End cap
85	34	75/6	0		No recovery		

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SFC-WO5AB

PROJECT INFORMATION

PROJECT NAME: Rio Grande Watershed Study, Phase 1
PROJECT NUMBER: 771-3
LOCATION: South of Fort Craig Transect
ONSITE GEOLOGIST: Dagmar Llewellyn
START DATE: 10/30/2002
FINISH DATE: 4/3/2003

DRILLING INFORMATION

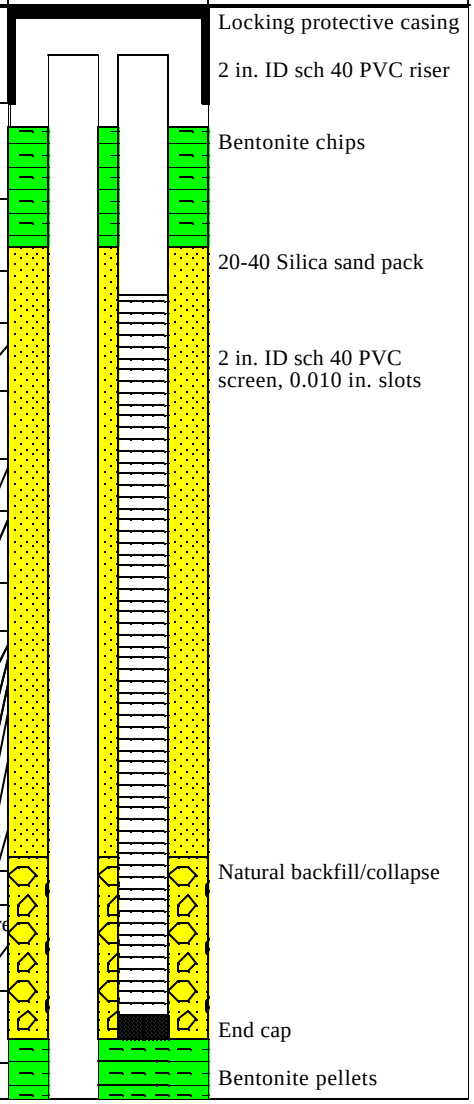
DRILLING FIRM: GeoTest
CREW LEADER: David Tanner
RIG TYPE: CME 75
SAMPLE TYPE: Split Spoon
WELL ELEVATION: A: 4458.03 ft. B: 4458.37 ft.
GROUND ELEVATION: 4457.17 ft.

NOTES: Borehole Diameter: 6 in.-geologic sampling
10 in.-well construction Water observation not noted.

▼ = visual observation of water during drilling
Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
0					SAND, v.f. sand and silt, lt.-med. brown, clean, well sorted, poorly graded, wet (SP)
					As above, (SP)
5	1	4	1.2		CLAY, some silt, lt-med. brown, (CL)
	2	5	1.5		CLAY, ltl. silt, ltl. v.f. sand, lt.-med. brown, (Pp=0), no structure apparent (CL)
					SILT, and v.f. sand, med. brown (SM)
					CLAY, ltl. silt, gray (CL)
10	3	2	1.2		SILT, v.f. sand, lt.-med. brown, no structure apparent (SM)
					As above, (SP)
	4	2	1.2		CLAY, with c. sand clasts, gray, dense (CL)
					SILT, and v.f. sand, med. brown with orange striations (SM)
					CLAY, and silt, med. brown (CL)
	5	2	1.5		CLAY/SILT, interbedded, clay, dense, gray, with orange striations, and brown silt and v. f. sand (CL-ML)
15					CLAY, lt.-med. brown, soft, gummy (CL)
	6	11	1.3		SAND, f., ltl. v.f. sand, no fines, med. brown, no apparent structure (SP)
					SAND, f., ltl. v. f. sand, med. brown. no apparent structure (SP)
	7	12	1.2		
20					

WELL DIAGRAM (B A) / WELL CONSTRUCTION



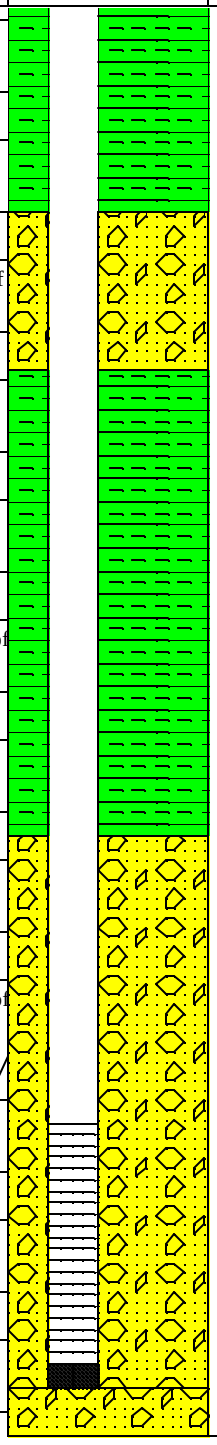
S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

BORING NO. : SFC-WO5AB

PROJECT NAME: Rio Grande Watershed Study, Phase 1 **PROJECT NUMBER:** 771-3

DEPTH (ft)	SAMPLES SPL. NO.	BLOWS	REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION
	8	8	.6		As above, (SP)
	9	13	1.5		As above, (SP) Sample contains some sluff. Cannot distinguish between sluff and sample.
25	10	30	?		As above, (SP) Sampler tip was empty and 1 ft. of sample was half washed out. Sample may be sluff.
	11	28	1.5		As above, (SP)
30	12	15	1.2		SAND, m., ltl. f. sand, ltl. c. sand, med. brown, clean (SW-SP)
	13	12	.9		SAND, c., ltl. f. gravel, tr. c. gravel, a couple of 0.1' thick layers of m. sand, med. brown (SP)
35	14	11	0		No recovery
	15	28	nr		GRAVEL, four pieces of c. gravel, hard, pink crystalline rock, washed, no other recovery (GP)
40	16	74	1.5		SAND, m., ltl. f. sand, tr. c. sand, some c. sand in the lowest 0.2' of sample. Sampler was lodged inside auger by rock and deeply scored the sampler. Driller had to trip out augers 30ft to get sample. (SW-SP)
	17	44	1.3		As above, (SW-SP)
45	18	50/3	1.4		As above, (SW-SP)
	19	62	1		GRAVEL, f.-c., some c. sand, ltl. silt and clay, lt. gray, angular stones, mud coating (GP-GW)
50					



WELL DIAGRAM B A

WELL CONSTRUCTION

- Natural backfill/collapse
- Bentonite pellets
- Natural backfill/collapse
- 2 in. ID sch 40 PVC screen, 0.010 in. slots
- Borehole TD= 50.5 ft.
- End cap

S. S. PAPADOPULOS & ASSOCIATES, INC.

GEOLOGIC LOG OF TEST BORING

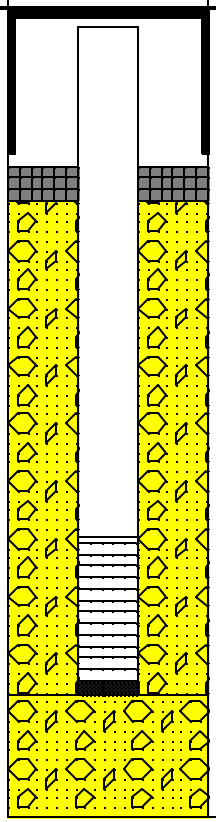
BORING NO. : SFC-W06A

PROJECT INFORMATION	DRILLING INFORMATION
PROJECT NAME: Rio Grande Watershed Study Phase 1	**DRILLING FIRM:** GeoTest
PROJECT NUMBER: 771-3	**CREW LEADER:** Dave Tanner
LOCATION: South of Fort Craig Transect	**RIG TYPE:** Manual Drive Point
ONSITE GEOLOGIST: Peter Lang	**SAMPLE TYPE:** NA
START DATE: 4/10/2003	**WELL ELEVATION:** 4467.78 ft.
FINISH DATE: 4/10/2003	**GROUND ELEVATION:** 4464.94 ft.

NOTES: Borehole Diameter: 2 inches

▼ = visual observation of water during drilling

Elevations based on NGVD 88 (ft. AMSL)

DEPTH (ft)	SAMPLES: SPL. NO.	SAMPLES: BLOWS	SAMPLES: REC'Y (ft)	LITHOLOGY	SOIL DESCRIPTION	WELL DIAGRAM A	WELL CONSTRUCTION
0							Locking protective casing 1.5 in. Galvanized steel pipe riser Concrete collar Natural backfill/collapse
5							Wire wrap, stainless steel drive point well
10							Borehole TD: 13.85 ft. End cap

APPENDIX B

Geophysical Logs for SAC East-Side Boreholes

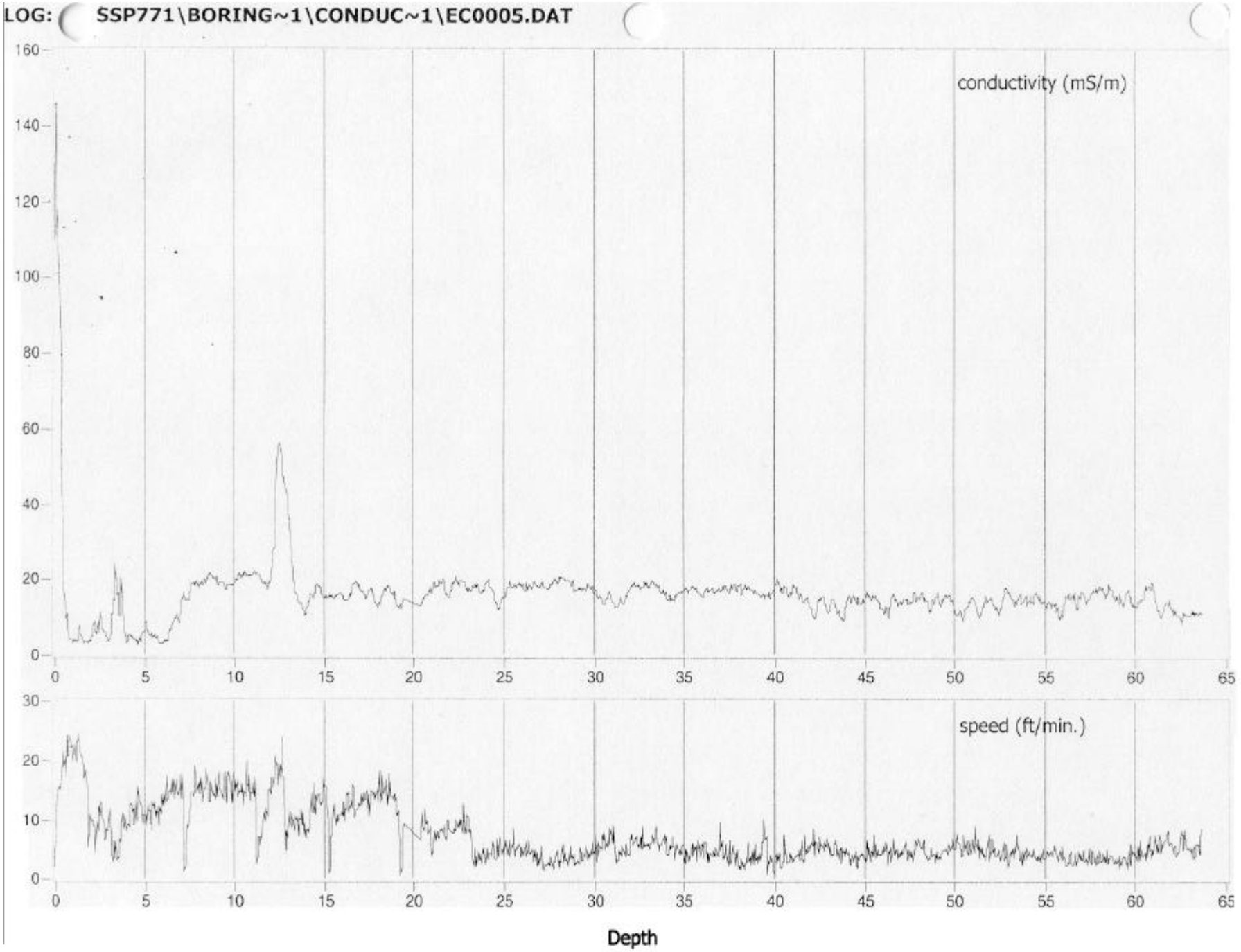


Figure B-1. SAC-E01 Borehole Conductivity Log

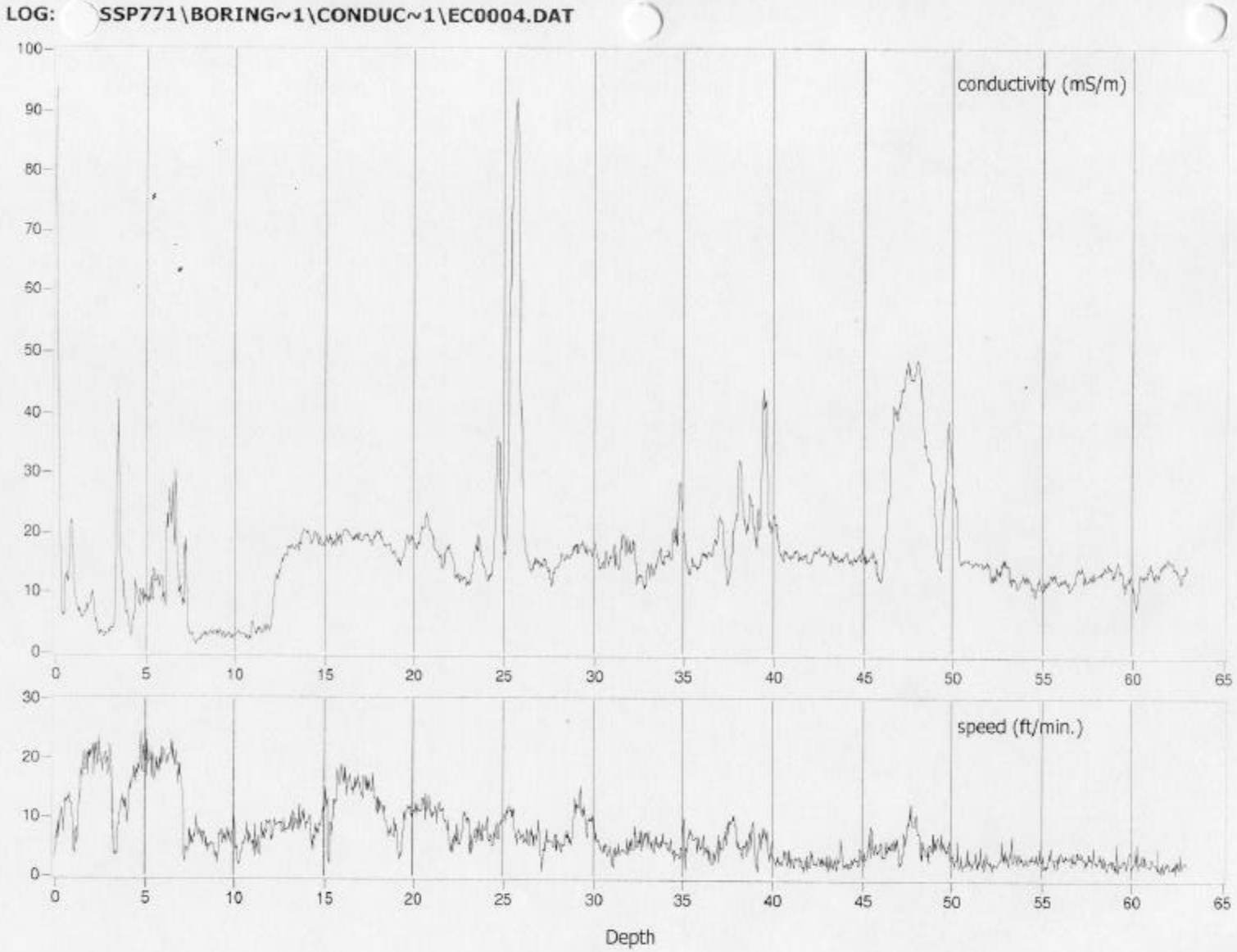


Figure B-2. SAC-E02 Borehole Conductivity Log

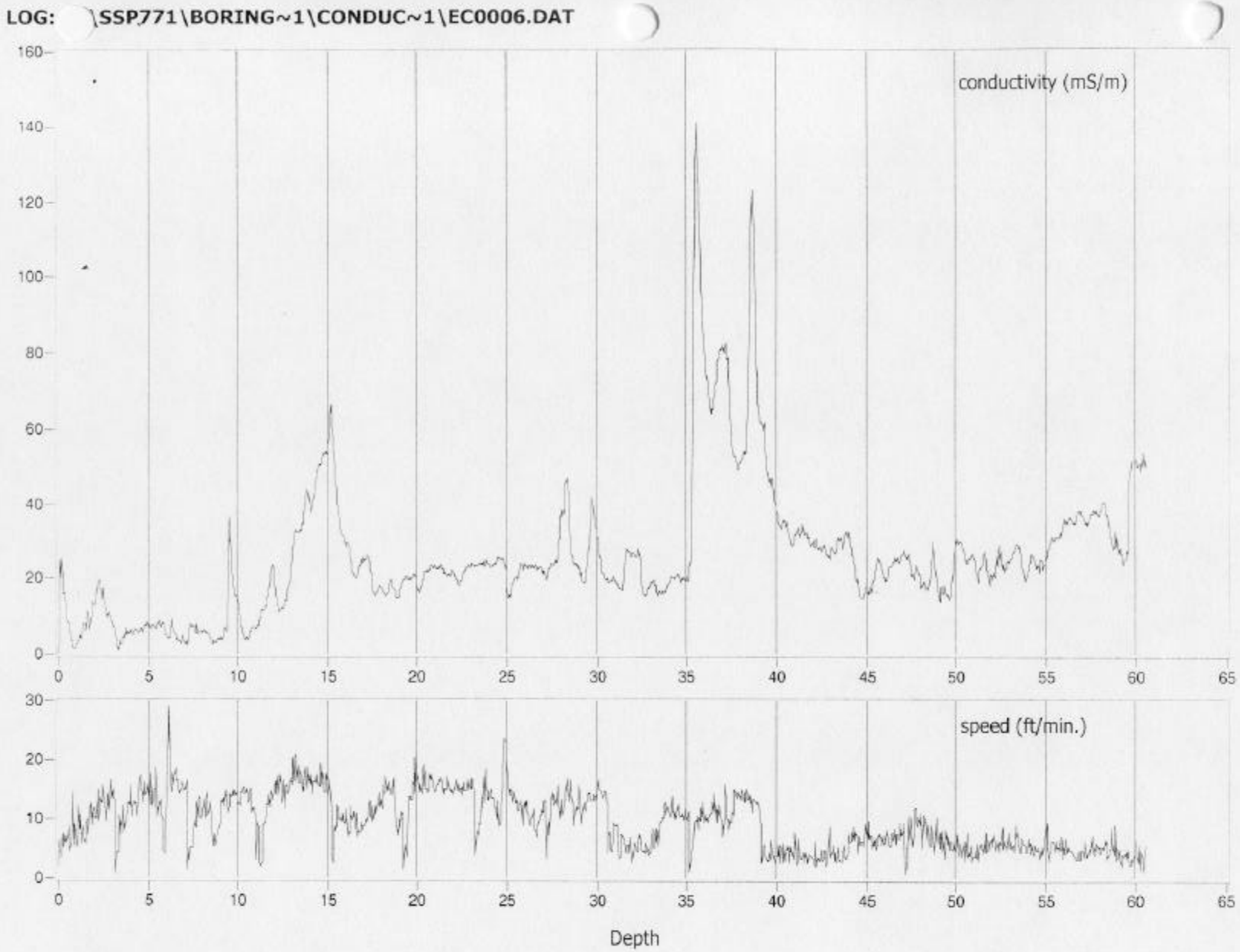


Figure B-3. SAC-E03 Borehole Conductivity Log

APPENDIX C

Laboratory Data Reports for Grain Size and
Hydrometer/Atterberg Limit Testing

Summary Tables C1-C7 located in Tables Section of Report.

Hard copies of particle size graphs are available by request from
Page Pegram, 505-764-3890

APPENDIX D

Laboratory Data Reports for Unsaturated Soil Characteristics Testing

Hard copies of laboratory data reports are available by request from
Page Pegram, 505-764-3890