3526 P1/2

BOREHOLE LOG

Field Support Facility

300s Line: SWMU 16-001(e)

Stake ID: 3526

Borehole ID: 16-609171 TA/FU: 161 Drill Depth From: 0.0 To 30.0 Page 1 of 2

Driller: Dave Staunes - Precision Drilling Start Date/Time: 3/11/10 1540hrs End Date/Time 3/11/10 1650

Print Name

Drilling Equipment/Method: Delta Base Hollowstem Auger Drill Rig with 5 ft long 7 1/4" OD augers and 3 3/4" ID Continuous Core Barrels

Sampling Equipment/Method: Continuous core

Depth (Feet)	Recovery (feet per feet/%)	Field Borehole Analytical Sample #	Field Screening Results	Top/Bottom of Core in Box	Lithology – Petrology - Soil	Graphic Log	Lithologic Unit	Notes
	32" / 60"	NA	0.0 ppm	NA	0-2.0 crushed tuff and river rock fill material. 2.0-10.0 Dark reddish brown lapilli tuff. 15% crystals in an ashy matrix flattened pumice to 2 cm are dark brownish red. Welded and well indurated.			Start 1540hrs
5	12" / 60"	NA	0.0 ppm	NA				
10	60" / 60"	NA	0.0 ppm	NA	10.0 — 15 Pinkish gray lapilli Tuff. Moderately welded. 30% crystals in an ash matrix. Becomes very moist at 13'. Matrix becomes more altered in moist zone. Rare pumice to 3mm are altered and only slightly flattened. Moderate welding. ~3% lithics @ 15'.			
15	60 / 60	NA	0.0 ppm	NA				
20								

Prepared By: John C Crocker 3/11/10

Print Name/Signature Date

Checked By: Elizabeth Birkos / Elizabeth Birkos 7/9/10

Print Name/Signature Date

Los Alamos Environmental Restoration Project

SOP-12.01

BOREHOLE LOG

Field Support Facility

300s Line: SWMU 16-001 (e)

Stake ID: 3526

Borehole ID: 16- TA/FU: 16 Drill Depth From: 0.0 ft To 30.0 ft Page 2 of 2

Driller: Dave Staunes - Precision Drilling Start Date/Time: 3/11/10 1540 hrs End Date/Time 3/11/10 1650 hrs

Print Name

Drilling Equipment/Method: Delta Base Hollowstem Auger Drill Rig with 5 ft long 7 1/4" OD augers and 3 3/4" ID Continuous Core Barrels

Sampling Equipment/Method: Continuous core

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Analytical Sample #	Field Screening Results	Top/Bottom of Core in Box	Lithology – Petrology - Soil	Graphic Log	Lithologic Unit	Notes
20	60"/60"	RE-16-10-14145	0.0 PPM	NA	15-26 Same as above. With increas in lithics. Crystals to 30% in ash matrix. Welding is moderate. Moderately indurated. Roughly 10% Lithics to 1 cm.			Vert fract 15-16.5' minor clay fill.
25	60"/60"	RE16-10-14144	0.0 PPM	NA	26-30 Same as above.			TD @ 1650 hrs
30								

Prepared By: John C Crock
John C Crocker 3/11/10
Print Name/Signature Date

Checked By: Elizabeth Birkos / Elizabeth Birkos 7/9/10
Print Name/Signature Date

Los Alamos Environmental Restoration Project

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BOREHOLE LOG

Field Support Facility

300s Line: SWMU 16-001(e)

Stake ID: 3s28

Borehole ID: 16-609174 TA/FU: 16 / Drill Depth From: 0 ft To 19 ft Page 1 of 1

Driller: Dave Staines - Jackson Box: NA Start Date/Time: 3/9/10 @ 1500 End Date/Time: to 1630

Print Name

Drilling Equipment/Method: Delta Base Hollowstem Auger Drill Rig with 7 1/4" OD augers and 5 ft long; 3 3/4" ID continuous sample core barrels

Sampling Equipment/Method: Core barrel samplers

Depth (Feet)	Recovery (feet per feet/%)	Field Borehole Analytical Sample #	Field Screening Results	Top/Bottom of Core in Box	Lithology – Petrology - Soil	Graphic Log	Lithologic Unit	Notes
					Surface - 4" Concrete Cap			* 1st Attempt
0' - 5'	36/36, 24/24	NA	NA, 0.0	NA	0-3 ft Fill material, medium brown sand, gravel, and tuff; dry, loose. 3-5 ft SAA, trash including steel and aluminum observed @ 5.0 ft		Fill	1/5/10 - potholed to 3.0 ft bgs with hand auger.
5' - 10'	24/60	NA	0.0, NA	NA	5-7 ft SAA 7-10 ft No Recovery		NR	
10' - 15'	12/60	NA	0.0, NA	NA	10-11 ft Fill material consisting of sand, gravel, and cobbles, water observed in borehole at 14.0 ft. 11-15.0 ft No Recovery		Fill, NR	
15' - 20'	0/48	NA	NA	NA	15.0-19.0 ft No Recovery. Augers seize up due to, deflecting off of cobble-sized fill material, unable to continue drilling. TD @ 19.0 ft		NR, TD	1630 Augers seize up at 19.0 ft, Dave Staines - Driller makes call to stop drilling efforts at this borehole location.

Prepared By: Amy K Howard / Amy K Howard 3/9/10
Print Name/Signature Date

Checked By: Elizabeth Bickos / Elizabeth Bickos 7/6/10
Print Name/Signature Date

SOP-12.01

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BOREHOLE LOG 300s Line, SWMU 16-001(a)

Field Support Facility

Stake ID: 3528

Borehole ID: 16-60091/74 TA/FU: 16 / Drill Depth From: 0ft To 22.5ft Page 1 of 2

Driller: Dave Stamos - Inclsion Box: NA Start Date/Time: 3/10/10 @ 0930 End Date/Time: to 1445

Print Name

Drilling Equipment/Method: Delta Base Hollowstem Auger Drill Rig with 7 1/4" OD augers and 5ft long; 3 3/4" ID continuous sample core barrels

Sampling Equipment/Method: Core barrel samplers

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Analytical Sample #	Field Screening Results	Top/Bottom of Core in Box	Lithology -- Petrology - Soil	Graphic Log	Lithologic Unit	Notes
					Surface - 4" concrete cap			* 2nd attempt - 2 ft east of 1st attempt located w/in dry well footprint.
0' - 5'	0/60	NA	NA / NA	NA	0-5ft No Recovery.		NR	
5' - 10'	0/60	NA	NA / NA	NA	5-10ft No Recovery, augers start deflecting off cobbles at 6ft and seize up.			
10' - 15'	12/60	NA	0.0 / NA	NA	10-11ft Fill material consisting of sand, gravel, and cobbles, dry. 11-15ft No Recovery		Fill / NR	
15' - 20'	12/60	NA	0.0 / NA	NA	15-16ft Fill material consisting of little silt, sand, gravel, and cobbles, wet. 16-20ft No Recovery.		Fill / NR	1445 Samples could not be collected due to poor sample recovery.

Prepared By: Amy Howard / Amy K Howard 3/10/10
Print Name/Signature Date

Checked By: Elizabeth Bickos / Elizabeth Bickos 7/6/10
Print Name/Signature Date

SOP-12.01

Los Alamos Environmental Restoration Project

BOREHOLE LOG

300s Line: SWMU 16-001(e)

Field Support Facility

Stake ID: 3s28

Borehole ID: 16-609174 TA/FU: 16 / Drill Depth From: 0ft To 22.5ft Page 2 of 2

Driller: Dave Stanes - Precision Box: NA Start Date/Time: 3/10/10 @ 0930 to 1445 End Date/Time

Print Name

Drilling Equipment/Method: Delta Base Hollowstem Auger Drill Rig with 7 1/4" OD augers and 5ft long; 3 3/4" ID continuous sample core barrels

Sampling Equipment/Method: Core barrel samplers

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Analytical Sample #	Field Screening Results	Top/Bottom of Core in Box	Lithology – Petrology - Soil	Graphic Log	Lithologic Unit	Notes
								*2nd attempt
20' - 25'	0/30	NA	NA	NA	20-22.5ft No recovery, auger refusal at 22.5ft.		NR	
					TD @ 22.5ft			

Prepared By: Amy Howard / Amy K Howard 3/10/10
Print Name/Signature Date

Checked By: Elizabeth Birkos / Elizabeth Birkos 7/6/10
Print Name/Signature Date

SOP-12.01

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BOREHOLE LOG

Field Support Facility

300s Line: SWMU 16-001(a)

Stake ID: 3s29

Borehole ID: 16-609173 TA/FU: 16 / Drill Depth From: 0 ft To 22.5 ft Page 1 of 2

Driller: Dave Stanes - Precision Drilling
Print Name

Start Date/Time: 3/10/10, 1315 End Date/Time: 3/10/10, 1445

Drilling Equipment/Method: Delta Base Hollowstem Auger Drill Rig with 5 ft long 7 1/4" OD augers and 3 3/4" ID Continuous Core Barrels

Sampling Equipment/Method: Core Barrel Sampler

Depth (Feet)	Recovery (feet per feet/%)	Field Borehole Analytical Sample #	Field Screening Results	Top/Bottom of Core in Box	Lithology – Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0' - 5'	36/36, 0/24	NA	NA NA	NA	0-5 ft No Recovery		NR	T-Pipe Location Previously potholed to 3 ft bgs on 1/5/10
5' - 10'	55/60	NA	0.0 0.0	NA	5-~~10 ft~~ 8 ft (AKA 3/10/10) Fill material, sand silt, clay, gravel, dk brown. wet. 8-10 ft Qbt 4 Tuff, strongly welded, dark gray, fine ash matrix, few qtz phenocrysts.		Fill	
10' - 15'	57/60	NA	0.0 0.0	NA	10-15 ft SAA, wet, reddish Fe staining throughout ~50%, weathered.		Qbt 4	
15' - 20'	24/60	RE16-10-2789	0.0 0.0	NA	15-~~20~~ ft coarse-grained sand + large tuff chunks → fill material few river cobbles from 16.8-17.0 ft wet. 17-20 ft No Recovery		Fill NR	1430 Collected sample RE16-10-2789 @ 15-17 ft

Prepared By: Amy K. Howard / Amy K. Howard 3/10/10
Print Name/Signature Date

Checked By: Elizabeth Birkos / Elizabeth Birkos 7/6/10
Print Name/Signature Date

Los Alamos Environmental Restoration Project

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BOREHOLE LOG

Field Support Facility

300s Line: SWMU 16-001(e)

Stake ID: 3s29

Borehole ID: 16-609173 TA/FU: 16 / Drill Depth From: 0 ft To 22.5 ft Page 2 of 2

Driller: Dave Stanes - Precision Box: NA Start Date/Time: 3/10/10 @ ~~14~~ 1315 to 1445 End Date/Time

Print Name

Drilling Equipment/Method: Delta Base Hollowstem Auger Drill Rig with 7 1/4" OD augers and 5 ft long; 3 3/4" ID continuous sample core barrels

Sampling Equipment/Method: Core barrel samplers

Depth (Feet)	Recovery (feet per feet/%)	Field Borehole Analytical Sample #	Field Screening Results	Top/Bottom of Core in Box	Lithology – Petrology - Soil	Graphic Log	Lithologic Unit	Notes
20' - 25'	10/30	NA	0.0	NA	20-20.8 ft Fill material, large river cobble and coarse-grained sand, moist. 20.8-22.5 ft No Recovery		Fill NR	
					TD @ 22.5 ft due to auger refusal.			

Prepared By: Amy Howard / Amy K Howard 3/10/10
Print Name/Signature Date

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Print Name/Signature Date

SOP-12.01

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Environmental Restoration Project

BOREHOLE LOG 300s Line: SLUMU 16-001 (a)

Field Support Facility

Stake ID: 3S 30

Borehole ID: 16-609172 TA/FU: 16 Drill Depth From: 0 To 15 Page 1 of 1

Driller: Dave Stanner - Precision Drilling Start Date/Time: 3/10/10, 1510 End Date/Time: 3/10/10, 1600

Print Name

Drilling Equipment/Method: Delta Base Hollowstem Auger Drill Rig with 5 ft long 7 1/4" OD augers and 3 3/4" ID Continuous Core Barrels

Sampling Equipment/Method: Continuous Core Sampling.

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Analytical Sample #	Field Screening Results	Top/Bottom of Core in Box	Lithology – Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0' - 5'	24/24	NA	NA 0.0	NA	3-5 ft Sand, silt, gravel backfill, saturated.		Fill	0-3ft previously posthole on 1/5/10
5' - 10'	33/60	NA	0.0 NA	NA	5-8 ft Strongly welded tuff mixed with coarse-grained sand, area of crushed material, abundant rootlets. 8-10 ft No recovery		X	
10' - 15'	48/60	NA	0.0 0.0	NA	10-14 Qbt tuff and red sand. Dark gray with reddish orange staining 13-14 ft, some qtz phenocrysts		X	
								abandon hole. could not re-enter with sampler. Move 2' towards Road

Prepared By: Amy K Hammond / Amy K Hammond 3/10/10
Print Name/Signature Date

Checked By: John C Cook 3/11/10
Print Name/Signature Date

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BOREHOLE LOG

Field Support Facility

300s Line: SWMU 16-001(e)

Stake ID: 3s30

Borehole ID: 16-609172 TA/FU: 161 Drill Depth From: 15.0' To 30.0' Page 2 of 3

Driller: Dave Staunes - Precision Drilling Start Date/Time: 3/11/10 0850 End Date/Time 3/11/10 / 1100hrs

Print Name

Drilling Equipment/Method: Delta Base Hollowstem Auger Drill Rig with 5 ft long 7 1/4" OD augers and 3 3/4" ID Continuous Core Barrels

Sampling Equipment/Method: Continuous Core.

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Analytical Sample #	Field Screening Results	Top/Bottom of Core in Box	Lithology – Petrology - Soil	Graphic Log	Lithologic Unit	Notes
DC 18/60	18"/60"	0.0 ppm NA	DC 3-11-10	NA	Silty sand and crushed reddish brown welded tuff fill to 2.0' 2.0 to 6.0 reddish Brown welded Tuff. Weathered, strongly flattend Pumice are altered to dark reddish Brow. ash matrix. 10% crystals		FILL	Second attempt. Relocate 2 ft Towards Road. (NW)
5'	17"/60"	NA	0.0 ppm		6.0'-10' Reddish Brown lapilli Tuff strongly welded. weathered and softer drilling 20% dark reddish Brown pumice are strongly flattened. ~15% crystals in matrix 2% mafics		QBT 4	
10'	50"/60"	NA	0.0 ppm	NA	10'-18' Gray lapilli tuff with abundant Pumice, moderately welded. Pumice to 3cm are reddish Brown but become gray with depth. 20% crystals 30% Pumice		QBT 4	crystal rich.
15'								

Prepared By: John C Crocker 3/11/10

Print Name/Signature Date

Checked By: Elizabeth Birkos / Cluth Birkos 7/9/10

Print Name/Signature Date

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BOREHOLE LOG

Field Support Facility

300s Line: SWMU 16-001(e)
Stake ID: 3s30

Borehole ID: 16-609172 TA/FU: 16 / — Drill Depth From: 0.0 To 30 Page 2 of 3

Driller: Dave Starnes Box: — Start Date/Time: 3/11/10 0850 hrs End Date/Time 3/11/10 1100 hrs
Print Name

Drilling Equipment/Method: Hollow Stem Auger w/ continuous core.

Sampling Equipment/Method: Continuous core

Depth (Feet)	Recovery (feet per feet/%)	Field Borehole Analytical Sample #	Field Screening Results	Top/Bottom of Core in Box	Lithology – Petrology - Soil	Graphic Log	Lithologic Unit	Notes
15	34"/60"	—	0.0 PPM	—	18-22 FT Reddish-brown moderately welded tuff (as above). Pumice now strongly altered to brick reddish-orange. Moist. Moderately indurated. Pumice size decreases from 3 cm to 0.25 cm with depth		X QBT 4	
20	36"/60"	RE16-10-14142 RE16-10-14137	0.0 PPM	—	22-30 FT Reddish-brown moderately welded lapilli tuff. 10% pumice in an ashy matrix. 15% crystals, 1% mafics		X Q B T 4	
25	36"/60"	RE16-10-14143	0.0 PPM	—				
30'					TD 30.0' BGS			

Prepared By: John C Crocker
John C. Crocker 3/11/10
Print Name/Signature Date

Checked By: Elizabeth Birkos / Elizabeth Birkos 7/9/10
Print Name/Signature Date

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