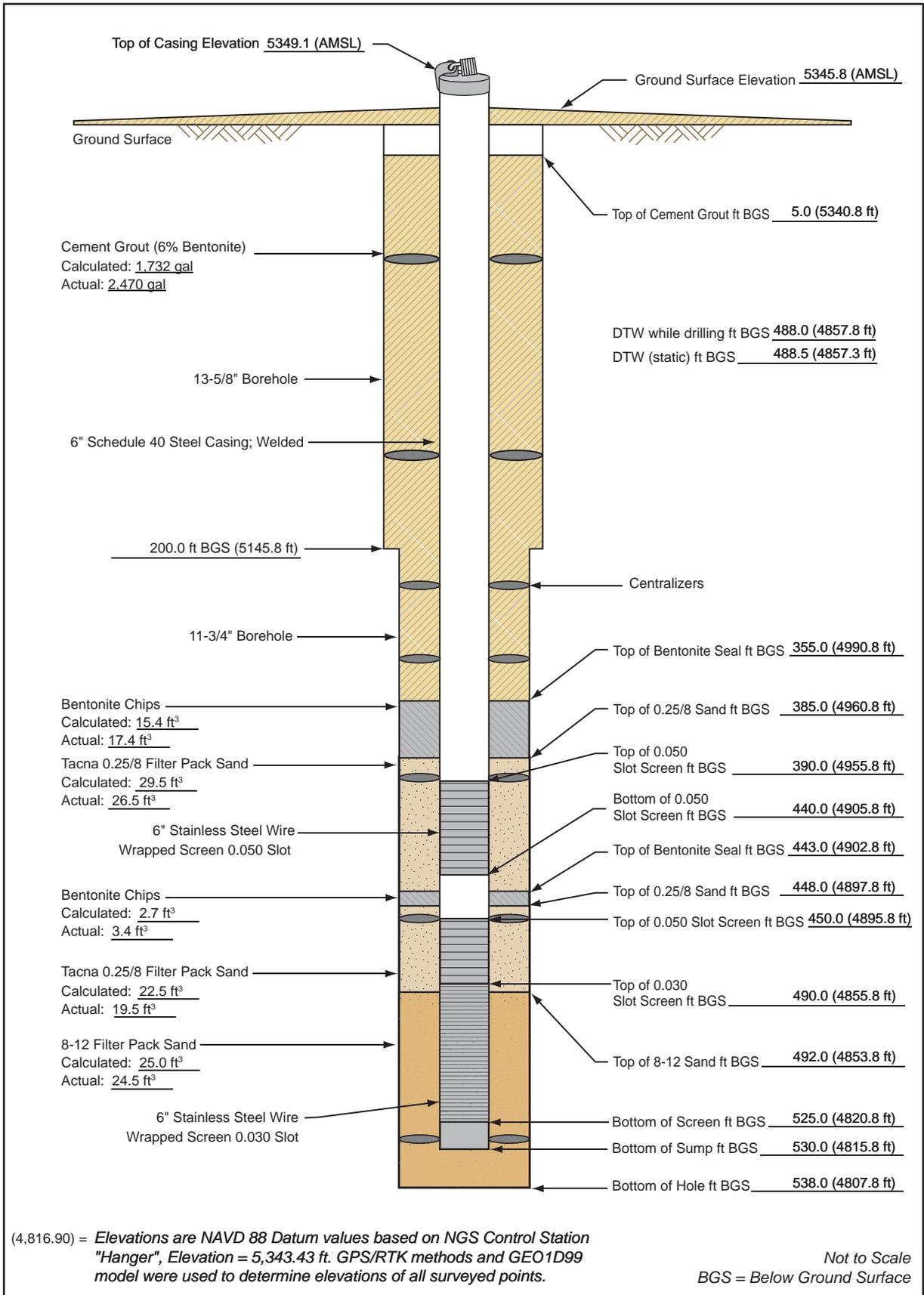


# Soil Vapor Extraction Well KAFB-106161

Installation Start Date/Time: 2/13/2012 @ 0915

Installation End Date/Time: 2/23/2012 @ 1720











# Borehole ID: KAFB-106161

**Client:** US Army Corps of Engineers  
**Project Location:** KAFB, Albuquerque, NM  
**Project Name:** KAFB BFF SWMU ST-106 and SS-111  
**Project Number:** 140705

Hole Diameter Upper (in.): 13-5/8  
 Hole Diameter Lower (in.): 11-3/4  
 Surface Completion Type: Stick-up

**Date Started:** 2/6/2012  
**Date TD Reached:** 2/9/2012  
**Date Completed:** 2/23/2012

**Groundwater Levels BGS (ft):**  
 ▽ At Time of Drilling: 488.00  
 ▼ At End of Drilling: Not Recorded  
 ▽ After Drilling: 488.50

**Ground Elevation AMSL (ft):** 5345.8  
**Y Coordinate:** 1473334.69  
**X Coordinate:** 1541896.31

**Drilling Contractor:** WDC Drilling  
**Drilling Method:** Air Rotary Casing Hammer  
**Logged By:** Patrick Ostrye

KAFB\_BOREHOLE\_LOG - SHAW\_DRILLING.GDT - 3/20/12 13:53 - Z:\KAFB BFF\GINT\KAFB\_PROJECT\KAFB\_BFF.GPJ

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
90								
95					Silty SAND (SM); red (2.5YR 4/6); moist; loose; 65% fine to medium sand; 5% coarse to very coarse sand; 30% silt.			
100					Silty SAND (SM); red (2.5YR 4/6); moist; loose; 80% very fine to medium sand; 20% silt.	SM		New 20' connection @ 0917. Resumed drilling @ 0930.
105					Poorly graded SAND (SP); reddish brown (5YR 5/4); moist; loose; 95% fine to coarse sand; 5% silt and clay.			
110					Poorly graded SAND (SP); reddish brown (5YR 4/4); moist; loose; 95% fine to coarse sand; 5% silt and clay.	SP	Cement Grout	
115					Silty SAND (SM); red (2.5YR 4/6); moist; loose; 65% very fine to medium sand; 5% coarse sand; 30% silt.			
120					Silty SAND (SM); yellowish red (5YR 5/6); moist; loose; 85% very fine to medium sand; 15% silt.	SM		New 20' connection @ 0954. Cleaned out cyclone. Resumed drilling @ 1030.



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**Project Number:** 140705

Hole Diameter Upper (in.): 13-5/8  
 Hole Diameter Lower (in.): 11-3/4  
 Surface Completion Type: Stick-up

Date Started: 2/6/2012  
 Date TD Reached: 2/9/2012  
 Date Completed: 2/23/2012

Groundwater Levels BGS (ft):  
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 Drilling Method: Air Rotary Casing Hammer  
 Logged By: Patrick Ostrye

KAFB\_BOREHOLE\_LOG - SHAW\_DRILLING.GDT - 3/20/12 13:53 - Z:\KAFB BFF\GINT\KAFB\_PROJECT\KAFB\_BFF.GPJ

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
120					Silty SAND (SM); yellowish brown (5YR 5/6); moist; loose; 60% very fine to medium sand; 5% coarse to very coarse sand; 35% silt.			
125					Same as above (120 ft).	SM		
130					Silty SAND (SM); yellowish brown (5YR 5/6); moist; loose; 70% very fine to medium sand; trace coarse sand; 30% silt.			
135					Poorly graded SAND (SP); brown (7.5YR 5/3); dry; loose; 95% very fine to medium sand; 5% clay; non to low plasticity.			
140					Poorly graded SAND (SP); brown (7.5YR 5/3); dry; loose; 92% fine to medium sand; 3% coarse to very coarse sand; 5% clay; non to low plasticity.	SP		
145					Poorly graded SAND (SP); brown (7.5YR 5/3); dry; loose; 100% fine to coarse sand.			
150								

- Cement Grout

New 20' connection @ 1105. Resumed drilling @ 1130.



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**Project Number:** 140705

Hole Diameter Upper (in.): 13-5/8  
 Hole Diameter Lower (in.): 11-3/4  
 Surface Completion Type: Stick-up

Date Started: 2/6/2012  
 Date TD Reached: 2/9/2012  
 Date Completed: 2/23/2012

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Drilling Contractor: WDC Drilling  
 Drilling Method: Air Rotary Casing Hammer  
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Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
150					Silty SAND (SM); red (5YR 4/6); moist; loose; 80% very fine to coarse sand; 5% very coarse sand; trace gravel; 15% silt.	SM		
155					Poorly graded SAND with Silt (SP-SM); reddish brown (5YR 5/4); moist; loose; 85% very fine to medium sand; 5% coarse to very coarse sand; 10% silt.	SP-SM		New 20' connection @ 1150. Resumed drilling @ 1245.
160					Poorly graded SAND (SP); reddish brown (5YR 5/3); dry; loose; 95% very fine to very coarse sand; 5% silt and clay.			
165					Poorly graded SAND (SP); reddish brown (5YR 5/4); moist; loose; 90% very fine to very coarse sand; 10% gravel to 15mm; angular to subrounded. Note: pumice fragments to 6mm; rounded.		Cement Grout	
170					Poorly graded SAND (SP); light brown (7.5YR 6/3); dry; loose; 100% very fine to medium sand.	SP		
175					Poorly graded SAND (SP); reddish brown (5YR 5/4); moist; loose; 85% very fine to medium sand; 5% coarse to very coarse sand; 5% gravel to 4mm; subrounded to rounded; 5% silt and clay. Note: pumice fragments to 4mm; rounded.			New 20' connection @ 1315. Resumed drilling @ 1325.
180								

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# Borehole ID: KAFB-106161

**Client:** US Army Corps of Engineers  
**Project Location:** KAFB, Albuquerque, NM  
**Project Name:** KAFB BFF SWMU ST-106 and SS-111  
**Project Number:** 140705

Hole Diameter Upper (in.): 13-5/8  
 Hole Diameter Lower (in.): 11-3/4  
 Surface Completion Type: Stick-up

**Date Started:** 2/6/2012  
**Date TD Reached:** 2/9/2012  
**Date Completed:** 2/23/2012

**Groundwater Levels BGS (ft):**  
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 ▼ At End of Drilling: Not Recorded  
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**Drilling Contractor:** WDC Drilling  
**Drilling Method:** Air Rotary Casing Hammer  
**Logged By:** Patrick Ostrye

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Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
180					Poorly graded SAND (SP); light brown (7.5YR 6/3); dry; loose; 95% very fine to medium sand; 5% silt and clay.			
185					Poorly graded SAND (SP); brown (7.5YR 5/3); dry; loose; 90% very fine to medium sand; 5% coarse to very coarse sand; 5% silt and clay.			
190					Poorly graded SAND (SP); brown (7.5YR 5/3); dry; loose; 95% very fine to medium sand; 5% silt and clay.	SP		
195					Same as above (190 ft).		Cement Grout	New 5' connection @ 1353. Resumed drilling @ 1405.
200					Same as above (190 ft).			New 20' connection @ 1410. Resumed drilling @ 1705.
205					No cuttings returned.			
210					Poorly graded SAND with Gravel (SP); reddish brown (5YR 4/4); damp; loose; 75% fine to medium sand; 10% coarse	SP		





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**Project Number:** 140705

Hole Diameter Upper (in.): 13-5/8  
 Hole Diameter Lower (in.): 11-3/4  
 Surface Completion Type: Stick-up

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**Date Completed:** 2/23/2012

**Groundwater Levels BGS (ft):**  
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 ▼ At End of Drilling: Not Recorded  
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**Ground Elevation AMSL (ft):** 5345.8  
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**Drilling Contractor:** WDC Drilling  
**Drilling Method:** Air Rotary Casing Hammer  
**Logged By:** Patrick Ostrye

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Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
240					Poorly graded SAND (SP); brown (7.5YR 5/3); moist; loose; 100% fine to coarse sand.	SP		
245					Well graded SAND (SW); reddish brown (7.5YR 5/4); moist; loose; 85% sand; 10% gravel to 5mm; angular to subangular; 5% silt and clay.	SW		
250					Silty SAND (SM); reddish brown (5YR 5/4); moist; medium dense; 64% very fine to medium sand; 1% gravel to 8mm; rounded; 35% silt.			
255					Silty SAND (SM); light reddish brown (5YR 6/3); moist; medium dense; 64% very fine to medium sand; 1% gravel to 20mm; rounded; 35% silt.	SM	- Cement Grout	New 20' connection @ 0930. Resumed drilling @ 1053.
260					Silty SAND (SM); reddish brown (5YR 6/3); moist; loose; 60% fine to coarse sand; 5% very coarse sand; 30% silt. Note: gravel is composed of pumice.			
265					Sandy SILT (ML); brown (7.5YR 5/4); moist; firm; 60% silt; 40% very fine to fine sand.	ML		
270					Silty SAND (SM); brown (7.5YR 5/4); moist; medium dense; 80% very fine to medium sand; 5% coarse sand; 15% silt.	SM		



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 Surface Completion Type: Stick-up

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 Drilling Method: Air Rotary Casing Hammer  
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Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
270								
275					Silty SAND (SM); brown (7.5YR 5/4); moist; medium dense; 80% very fine to medium sand; 5% coarse sand; 15% silt.	SM		New 20' connection @ 1110. Resumed drilling @ 1120.
280				Poorly graded SAND (SP); brown (7.5YR 5/4); moist; medium dense; 85% very fine to medium sand; 10% coarse sand; 5% silt and clay.	SP			
285				Clayey SAND (SC); reddish brown (5YR 5/4); moist; medium dense; 70% very fine to fine sand; 20% clay; 10% silt; nonplastic.	SC			
290				Poorly graded SAND (SP); brown (7.5YR 5/4); moist; medium dense; 95% fine to medium sand; 5% silt and clay.			- Cement Grout	
295					Poorly graded SAND (SP); brown (7.5YR 5/4); dry; medium dense; 100% fine to coarse sand.	SP		New 20' connection @ 1135. Resumed drilling @ 1150.
300					Poorly graded SAND (SP); brown (7.5YR 5/4); dry; medium dense; 100% fine to coarse sand.			



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Hole Diameter Upper (in.): 13-5/8  
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 Surface Completion Type: Stick-up

**Date Started:** 2/6/2012  
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**Logged By:** Patrick Ostrye

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Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
300					Clayey GRAVEL (GC); gravel lense with clay.	GC		Possible perched layer.
305					Well graded SAND with Gravel (SW); reddish brown (5YR 4/4); moist; medium dense; 75% sand; 20% gravel to 10mm; angular to subangular; 5% silt and clay.	SW		
310					Poorly graded SAND (SP); reddish brown (5YR 4/4); moist; medium dense; 95% fine to medium sand; 5% very coarse sand.	SP		
315					Poorly graded SAND (SP); reddish brown (5YR 5/4); dry; medium dense; 85% very fine to medium sand; 10% coarse to very coarse sand; 5% silt and clay.	SP		
320					Well graded SAND with Gravel (SW); reddish brown (5YR 5/4); dry; medium dense to dense; 70% sand; 30% gravel to 12mm; angular to subangular.	SW		Heavy bit chatter. New 20' connection @ 1230. Resumed drilling @ 1445. Heavy bit chatter; added water to cyclone for dust suppression.
325					Well graded SAND with Gravel (SW); reddish brown (5YR 5/4); dry; medium dense to dense; 70% sand; 30% gravel to 15mm; angular to subangular.	SW		
330					Poorly graded SAND (SP); light reddish brown (5YR 6/3); dry; loose; 95% fine to medium sand; 5% coarse sand.	SP		



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 Drilling Method: Air Rotary Casing Hammer  
 Logged By: Patrick Ostrye

KAFB\_BOREHOLE\_LOG - SHAW\_DRILLING.GDT - 3/20/12 13:53 - Z:\KAFB BFF\GINT\KAFB\_PROJECT\KAFB\_BFF.GPJ

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
330					Poorly graded SAND (SP); reddish brown (5YR 5/4); dry; medium dense; 100% fine to very coarse sand.	SP		Heavy bit chatter.
335					Poorly graded SAND (SP); reddish brown (5YR 5/4); dry; medium dense; 97% fine to coarse sand; 3% very coarse sand.	SP		New 20' connection @ 1505. Resumed drilling @ 1530. Heavy bit chatter; added water to cyclone for dust suppression.
340				Clayey SAND (SC); yellowish red (5YR 4/6); damp; medium dense; 60% very fine to very coarse sand; 40% clay; plastic.	SC	- Cement Grout		
345					Poorly graded SAND (SP); light reddish brown (5YR 6/3); dry; loose; 80% very fine to medium sand; 15% coarse to very coarse sand; 5% gravel to 10mm; subrounded.	SP		
350					Poorly graded GRAVEL (GP); lense; gravel to 20mm; subangular to rounded.	GP		
355					Poorly graded SAND (SP); reddish brown (5YR 4/4); dry; loose; 95% very fine to very coarse sand; 5% silt and clay.	SP		
360					Well graded SAND (SW); brown (7.5YR 4/3); dry; loose; 95% sand; 5% silt and clay.	SW	- Top of Bentonite Seal	New 20' connection @ 1550. Resumed drilling @ 1600.





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Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
390					Poorly graded SAND (SP); brown (7.5YR 5/4); damp; medium dense; 95% fine to medium sand; 5% coarse sand.			Added water to cyclone for dust suppression.
395					Poorly graded SAND with Gravel (SP); brown (7.5YR 5/4); wet; medium dense; 85% fine to very coarse sand; 15% gravel to 5mm; subangular to subrounded.	SP		End of 2/8/12. Resumed drilling @ 0815 on 2/9/12.
400					Well graded SAND (SW); brown (7.5YR 5/4); dry; medium dense; 100% sand.	SW		
405					Poorly graded SAND (SP); brown (7.5YR 5/4); dry; medium sand; 100% fine to coarse sand. Note: gravel lense at 408 ft; 1 ft thick.			
410					Poorly graded SAND (SP); brown (7.5YR 5/4); dry; medium sand; 100% medium to coarse sand.	SP		
415					Poorly graded SAND (SP); brown (7.5YR 5/4); moist; medium dense; 80% fine to coarse sand; 10% very coarse sand; 10% gravel to 10mm; subangular to subrounded.			New 20' connection @ 0837. Resumed drilling @ 0913.
420								

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Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
420					Poorly graded SAND (SP); brown (7.5YR 4/4); damp; medium dense; 90% fine to coarse sand; 10% very coarse sand.			
425					Poorly graded SAND (SP); brown (7.5YR 4/4); damp; medium dense; 94% fine to coarse sand; 3% very coarse sand; 3% gravel to 5mm; subrounded to rounded.	SP	0.050 Slot Screen	
430					Poorly graded SAND with Gravel (SP); brown (7.5YR 4/4); moist; medium dense; 85% very fine to very coarse sand; 15% gravel to 10mm; subangular to subrounded.			
435					Well graded SAND with Gravel (SW); brown (7.5YR 4/4); moist; medium dense; 85% sand; 15% gravel to 15mm; angular to subrounded.	SW		New 20' connection @ 0935. Resumed drilling @ 0943.
440					Poorly graded SAND (SP); brown (7.5YR 4/4); moist; medium dense; 92% fine to coarse sand; 5% very coarse sand; 3% gravel to 5mm; angular to subrounded.		Bottom of Screen	
445					Poorly graded SAND (SP); strong brown (7.5YR 4/6); moist; medium dense; 91% very fine to medium sand; 3% coarse to very coarse sand; 1% gravel to 10mm; angular to rounded; 5% silt and clay.	SP	Top of Bentonite Seal	Petroleum odor from cyclone; breathing zone 0.0 ppm.
450							Top of 0.25/8 Sand	



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450					Poorly graded SAND (SP); brown (7.5YR 5/4); moist; medium dense; 97% very fine to medium sand; 3% coarse to very coarse sand; odor.			
455					Poorly graded SAND (SP); brown (7.5YR 5/4); moist; medium dense; 94% very fine to medium sand; 5% coarse to very coarse sand; 1% gravel to 10mm; angular to subrounded; odor.	SP		New 20' connection @ 1007. Resumed drilling @ 1020.
460					Well graded SAND (SW); brown (7.5YR 5/4); moist; medium dense; 90% sand; 10% gravel to 5mm; angular to subrounded; odor.	SW		
465					Poorly graded SAND (SP); strong brown (7.5YR 4/6); moist; medium dense; 94% very fine to medium sand; 5% coarse to very coarse sand; 1% gravel to 8mm; angular to subangular; odor.			
470					Poorly graded SAND (SP); brown (7.5YR 5/4); dry; medium dense; 100% very fine to very coarse sand; odor.	SP		
475					Poorly graded SAND (SP); brown (7.5YR 5/4); dry; medium dense to dense; 95% very fine to medium sand; 5% coarse sand; odor.			New 20' connection @ 1040. Resumed drilling @ 1057.
480								

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 Date Completed: 2/23/2012

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 ▽ At Time of Drilling: 488.00  
 ▼ At End of Drilling: Not Recorded  
 ▽ After Drilling: 488.50

Ground Elevation AMSL (ft): 5345.8  
 Y Coordinate: 1473334.69  
 X Coordinate: 1541896.31

Drilling Contractor: WDC Drilling  
 Drilling Method: Air Rotary Casing Hammer  
 Logged By: Patrick Ostrye

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
480					Poorly graded SAND (SP); light brown (7.5YR 6/3); dry; medium dense; 100% coarse to very coarse sand.	SP		New 20' connection @ 1140. Resumed drilling @ 1255.
485				Well graded SAND with Gravel (SW); light brown (7.5YR 6/3); dry; medium dense to dense; 80% sand; 20% gravel to 12mm; angular to subangular.	SW			
490				▼ Poorly graded SAND with Gravel (SP); brown (7.5YR 4/4); damp; dense; 75% medium to fine sand; 10% coarse to very coarse sand; 15% gravel to 15mm; subangular to subrounded.	SP			
495				Poorly graded SAND (SP); brown (7.5YR 4/3); damp; dense; 90% fine to very coarse sand; 10% gravel to 10mm; subangular to subrounded.	SP			
500					No cuttings returned.			
505					No cuttings returned.			
510								

KAFB\_BOREHOLE\_LOG - SHAW\_DRILLING.GDT - 3/20/12 13:53 - Z:\KAFB BFF\GINT\KAFB\_PROJECT\KAFB\_BFF.GPJ



# Borehole ID: KAFB-106161

**Client:** US Army Corps of Engineers  
**Project Location:** KAFB, Albuquerque, NM  
**Project Name:** KAFB BFF SWMU ST-106 and SS-111  
**Project Number:** 140705

Hole Diameter Upper (in.): 13-5/8  
 Hole Diameter Lower (in.): 11-3/4  
 Surface Completion Type: Stick-up

Date Started: 2/6/2012  
 Date TD Reached: 2/9/2012  
 Date Completed: 2/23/2012

Groundwater Levels BGS (ft):  
 ▽ At Time of Drilling: 488.00  
 ▼ At End of Drilling: Not Recorded  
 ▽ After Drilling: 488.50

Ground Elevation AMSL (ft): 5345.8  
 Y Coordinate: 1473334.69  
 X Coordinate: 1541896.31

Drilling Contractor: WDC Drilling  
 Drilling Method: Air Rotary Casing Hammer  
 Logged By: Patrick Ostrye

KAFB\_BOREHOLE\_LOG - SHAW\_DRILLING.GDT - 3/20/12 13:53 - Z:\KAFB BFF\GINT\KAFB\_PROJECT\KAFB\_BFF.GPJ

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
510					No cuttings returned.			
515					No cuttings returned.			
520					Well graded SAND with Gravel (SW); saturated; dense; 75% sand; 20% gravel to 20mm; subangular to subrounded; 5% silt and clay.	SW		
525					Poorly graded GRAVEL with Sand (GP); saturated; dense; 80% gravel to 20mm; angular to rounded; 20% medium to very coarse sand. Note: gravel is composed of quartz, chert, limestone, and granite.	GP	- Bottom of Slot Screen - Sump	
530					Silty SAND (SM); saturated; dense; 72% very fine to medium sand; 10% coarse to very coarse sand; 3% gravel to 10mm; angular to subangular; 15% silt.		- Bottom of Sump	
535					Silty SAND (SM); saturated; dense; 79% very fine to medium sand; 5% coarse to very coarse sand; 1% gravel to 5mm; subangular; 15% silt.	SM		
540							- Bottom of Filter Pack - Native Backfill	New 20' connection @ 1340. Resumed drilling @ 1355.



# Borehole ID: KAFB-106161

**Client:** US Army Corps of Engineers  
**Project Location:** KAFB, Albuquerque, NM  
**Project Name:** KAFB BFF SWMU ST-106 and SS-111  
**Project Number:** 140705

Hole Diameter Upper (in.): 13-5/8  
 Hole Diameter Lower (in.): 11-3/4  
 Surface Completion Type: Stick-up

Date Started: 2/6/2012  
 Date TD Reached: 2/9/2012  
 Date Completed: 2/23/2012

Groundwater Levels BGS (ft):  
 ▽ At Time of Drilling: 488.00  
 ▼ At End of Drilling: Not Recorded  
 ▽ After Drilling: 488.50

Ground Elevation AMSL (ft): 5345.8  
 Y Coordinate: 1473334.69  
 X Coordinate: 1541896.31

Drilling Contractor: WDC Drilling  
 Drilling Method: Air Rotary Casing Hammer  
 Logged By: Patrick Ostrye

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
540					Silty SAND (SM); saturated; dense; 80% very fine to medium sand; 20% silt.			
545					Same as above (540 ft).	SM	- Native Backfill	
550								Total Depth = 548 ft. Reached @ 1513 on 2/9/12.
555								Water added during drilling (gallons) = 0
560								Water added after drilling (gallons) = 550
565								
570								