WELL DEVELOPMENT DATA SHEET
CLINCH RIVER SMR PROJECT
Project No. 6468-13-1072

KJF 8/20/13

Observation Well No. 0419U Development Date 8/19/13 Developer Crew Lee Miller - MW Drilling

AMEC Observer Kim Charles-Smith Reviewer Bill Lockhart

Total Well Depth, ft below ~~top of casing~~ g.s. 77 Initial depth to water, ft below ~~top of casing~~ g.s. 39.54'

Single Purge Well Volume, gallons 13 (From Well Purge Spreadsheet) KJF 8/19/13 KJF 8/19/13

Development Method: Waterra / Surge Block + Grundfos Pump

well stickup = 3.10' from TOC to g.s. KCS/8/20/13

Development Step	Volume Removed	Water Turbidity*	Water Level after removal, ft	Approx. Recovery Rate to initial level, ft/min **	
8/19 1	13	high	—	NA	KCS not on-site @ ow-419U, no water levels obtained @ the end of Volume 1-5.
2	13	high	—	NA	
3	13	moderate	—	NA	
4	13	moderate	—	NA	
5	13	Clear	—	NA	
8/19 * 6	13	Clear	43.60'	water level after 15 min = 42.76'	Surged w/ Grundfos
8/20 7	13	clear	44.45'	NA	
* 8	13	clear	44.43'	water level after 15 min = ~~43.35~~	43.20' KJF 8/20/13
9	13	Clear	44.51'	NA	Surged w/ Grundfos
* 10	13	clear	KCS 8/20/13 44.06	Water level After 15 min = 43.26'	Grundfos

* Visual - (1) Clear; (2) Slight; (3) Moderate; (4) High 8/20/13
** Record at selected steps; after 3, 6,8 and 10 suggested
Record Interval data in field book

NOTES

Procedure: Develop per Work Instruction

Static 8/19 39.54' g.s.; Static 8/20/13 = 43.03' from TOC
KCS 8/20/13
Purged 0419U @ Approx 2.5 gpm, little to no drawdown - clear
* Took water levels @ 5 min increments after stopping pump, 5, 10, 15 min.

KJF 8/20/13

M&TE
Pump(s) Grundfos pump Type MP1-2-A-B-C-TV 5HP & ID# 19255 Controller Boulder SN#: H04120660109
Bucket(s) (2) 5 gal. Buckets Calibrated by Amec CWB-1/CWB-2
Tank(s)
Water Level Meter Durham Geo slope indicator SN: 40868 300' # 51690030

TOC = Top of casing
g.s. = ground surface

WELL DEVELOPMENT DATA SHEET
CLINCH RIVER SMR PROJECT
Project No. 6468-13-1072

Observation Well No. 419U Development Date 8/20/13 Developer Crew Lee Miller - MTW

AMEC Observer Kim Chase-Smith Reviewer Bill Lockwood

Total Well Depth, ft below ~~top of casing~~ 95 77 Initial depth to water, ft below ~~top of casing~~ 9.5. 39.54' KJ 8/20/13

Single Purge Well Volume, gallons KJ 8/20/13 13 (From Well Purge Spreadsheet)

Development Method: Waterra Surge Block + Grundfos pump

Development Step	Volume Removed	Water Turbidity*	Water Level after removal, ft	Approx. Recovery Rate to initial level, ft/min **
1	13	Clear Sl. orge	46.62'	KJ 8/20/13
2				
3				
4				
5				
6				
7				
8				
9				
10				

8/20

Water level after 15 min = 43.39'

* Visual - (1) Clear; (2) Slight; (3) Moderate; (4) High
** Record at selected steps; after 3, 6,8 and 10 suggested
Record interval data in field book

NOTES KJ 8/20/13

Procedure: Develop per Work Instruction Note: KCS not on site during purging of vol 1-65 KCS W/ Downhole Camera @ ow-101D + ow-415L
Step 6: Approx Recovy Rate = 0.16 ft/min.
Step 8: Approx. Recovy Rate = 0.23 ft/min. } pumping @ 2.03pm
Step 10: Approx. Recovy Rate = 0.15 ft/min.
Step 11: Approx. Recovy Rate 0.63 ft/min - pumping @ 2.59pm

M&TE
Pump(s) Grundfos pump Type mpl-2-4-B-C-TV 5 HP ID# 19255 Controller Boulder-SN: H0412060109
Bucket(s) (2) 5 gal Buckets calibrated by Amec CWB-1 / CWB-2
Tank(s)
Water Level Meter Durham Geo Slope Indicator SN: 408868 300' # 51690030

Top of casing = TOC
ground surface = 9.5.

WELL DEVELOPMENT DATA SHEET
CLINCH RIVER SMR PROJECT
Project No. 6468-13-1072

Observation Well No. 419U Development Date 8/27/13 Developer Crew Lee Miller - mtw Drilling

AMEC Observer Kim Charles-Smith Reviewer Bill Lockett

Total Well Depth, ft below top of casing 77 Initial depth to water, ft below TOC top of casing 48.73'
KCS 8/27/13

Single Purge Well Volume, gallons 13 (From Well Purge Spreadsheet)

Development Method: _____

Development Step	Volume Removed	Water Turbidity*	Water Level After Removal, (ft)	Recovery Depth Interval Monitored	Start/End Times**	Approx. Recovery Rate Over Depth Interval (ft/min) ***
1	13	Clear	53.18'	53.18' - 49'	1515 1516	15.5
2	13	Clear	53.18'	53.18' - 49'	1525 1526	20.9
3	13	Clear	53.18'	53.18' - 49'	1535 1536	22.0
4	13	Clear	53.18'	53.18' - 49'	1545 1546	23.2
5	13	Clear	53.18'	53.18' - 49'	1600 1601	23.2
6	13	Clear	53.18'	53.18' - 49'	1605 1606	22.0
7						
8						
9						
10						

* Visual - (1) Clear; (2) Slight; (3) Moderate; (4) High
** May need to record dates with times for slow recovery rates (overnight).
*** Record at four to five selected steps; attempt to achieve three consecutive intervals of approximately constant recovery rate over same depth interval.

NOTES:

KJF 8/29/13
Grundfos pump ID # 19255 6 TYPE mp1-2-AB-C-TV 5HP
Controller Baldor SN: H04120600109
(2) 5 gal. Buckets calibrated by Amec CWB-1/CWB-2
Durham Geo slope indicator SN: 40868 300' # 51690030

TOC = Top of casing 9.5 = Ground Surface

Well Development Data Sheet Rev 1
Approved for Use by Al Tice, Technical Lead

WELL DEVELOPMENT DATA SHEET
CLINCH RIVER SMR PROJECT
Project No. 6468-13-1072

Observation Well No. 419L Development Date 8/20/13 Developer Crew Lee miller

AMEC Observer Kim Chaly-Smith Reviewer Bill [illegible]

Total Well Depth, ft below ~~top of casing~~ g.s. KS 8/20/13 124' Initial depth to water, ft below ~~top of casing~~ g.s. KS 8/20/13 ~~39.5~~ 40.61' KS 8/20/13

Single Purge Well Volume, gallons 21 (From Well Purge Spreadsheet)

Development Method: waterra/Surgeblock – Grundfos pump #19255

Well stickup = 3.09' from TOC to g.s.

Development Step	Volume Removed	Water Turbidity*	Water Level after removal, ft (TOC KCS 8/20/13)	Approx. Recovery Rate to initial level, ft/min **	
1	21	high	~~125~~ 57.40'	~~57.40'~~	KCS 8/20/13
2	21	moderate	64.68'	NA	3 gpm
* 3	21	moderate	68.69'	water level after 15 min = 44.58'	24.11' Recovery See notes
4	21	high	67.11'	NA	4 gpm (Surged w/Grundfos)
5	21	moderate	67.21'	NA	4 gpm
* 6	21	moderate	67.38'	water level after 15 min = 44.73'	4 gpm – see notes
7	21	moderate to sl. clear	71.95'	NA	4 gpm
* 8	21	moderate to sl. clear	72.15'	water level after 15 min = 44.82'	4 gpm – see notes
8/21 9	21	high	87.80'	NA	
* 10	21	high	92.70	9.16 ft/min	see notes

* Visual - (1) Clear; (2) Slight; (3) Moderate; (4) High
** Record at selected steps; after 3, 6, 8 and 10 suggested
Record interval data in field book

NOTES

Procedure: Develop per Work Instruction

8/19 Step 3: Approx Recovery Rate = 4.47 ft/min.
Step 6: Approx Recovery Rate = 4.27 ft/min. } pumping @ 4 gpm
Step 8: Approx Recovery Rate = 5.16 ft/min
8/20 Step 10: Approx Recovery Rate = 9.16 ft/min

M&TE Grundfos pump type MP1-2-A-B-C-TV 5HP ID# 19255
Controller Bybdor: SN 1404120600109

Pump(s)

Bucket(s) (2) 5 gal buckets calibrated by Amec CWB-1 / CWB-2

Tank(s)

Water Level Meter Durham Geo Slope indicator SN: 40868 (300') #51690030

TOC = Top of Casing
g.S. = ground Surface

Well Development Data Sheet Rev 0
Approved for Use by Al Tice, Techncial Lead

WELL DEVELOPMENT DATA SHEET
CLINCH RIVER SMR PROJECT
Project No. 6468-13-1072

Observation Well No. 419L Development Date 8/21 Developer Crew Lee Miller - MTW Drilling

AMEC Observer Kim Charles-Smith Reviewer Bill [illegible]

Total Well Depth, ft below ~~top of casing~~ g.s. KCS 8/21/13 124' Initial depth to water, ft below ~~top of casing~~ g.s. KCS 8/21/13 41.49'

Single Purge Well Volume, gallons 21 (From Well Purge Spreadsheet)

Development Method: grundfos pump # 19255

	Development Step	Volume Removed	Water Turbidity*	Water Level after removal, ft	Approx. Recovery Rate to initial level, ft/min **	Pump Rate Approx.
*	KCS 8/21/13 ~~1~~	90 gal	Clear	67.96'	4.30 ft/min	3 gpm
*	KCS 8/21/13 ~~2~~	84 gal	Clear	68.29'	4.35 ft/min	3 gpm
*	KCS 8/21/13 ~~3~~	84 gal	Clear	66.98'	4.17 ft/min	3 gpm
*	KCS 8/21/13 ~~4~~	84 gal	Clear	66.63'	4.01	3 gpm
	5					Well Development Complete
	6					
	7					
	8					
	9					
	10					

* Visual - (1) Clear; (2) Slight; (3) Moderate; (4) High
** Record at selected steps; after 3, 6,8 and 10 suggested
Record interval data in field book

NOTES

Procedure: Develop per Work Instruction

* Additional Volume removed to clear solids from the well. water levels for recovery rate were taken with pump ~~is~~ ~~set at~~ KCS 8/21/13 same level in well = mid screen. KCS 8/21/13

M&TE

Pump(s) Grundfos pump Type MP1-2-A-B-C-TV 5HP ID. #19255 Controller Baldor: SN: H0412060109

Bucket(s) (2) 5 gal. Buckets Calibrated by Amec. CWB-1 / CWB-2

Tank(s)

Water Level Meter Durham Geo Slope indicator SN: 40868 (300') #5169030

TOC = top of casing
g.S. = ground surface

Well Development Data Sheet Rev 0
Approved for Use by Al Tice, Technical Lead

WELL DEVELOPMENT PURGE VOLUME CALCULATIONS
CLINCH RIVER SMR PROJECT
AMEC Project # 6468-13-1072

Boring	(1) Bottom of Screen (ft.)	(2) Depth of Water (ft.)	(3) Screen Length (ft.)	(4) Sand Int. (thickness) (ft.)	(5) Water Column (ft.)	(6) Bore Hole Volume (gal.)	(7) Casing Volume (gal.)	(8) Purge Volume (gal.)	Total Purge Volume (ten volumes) (gal.)
OW-420U	46	44.5	20	24.8	1.5	12	0	8	80
OW-420L	150	58.9	20	23.5	91.1	11	15	22	220
0	0	0	0	0	0.0	0	0	0	0

Note - Prepare separate sheet for each welll cluster of three wells Input data into shaded cells

Column Information

(1) From Well Installation Log, ft below ground surface
(2) From measurement prior to development, ft below top of casing
(3) From Well Installation Log
(4) From Well Installation log, bottom of sand pack to top of sand pack
(5) Column 1 minus Column 2
(6) Column 4 times 1.5937 gallons per foot for 6.125-inch diameter borehole times 0.3 porosity (assumed) for well sand
(7) Column 5 times 0.17 gallons per foot for nominal 2-inch inside diameter PVC casing
(8) Column 6 minus (Column 4 times 0.17) plus Column 7. This step accounts for water in PVC within sand interval.

Spreadsheet master prepared by JAT 8-6-13

Spreadsheet master checked by SJC 8-6-13

Well Cluster Boring ID: OW 420

Prepared by: _____ Date: 8/27/13

Checked by: _____ Date: 8-27-13

WELL DEVELOPMENT ASSIGNMENT RECORD
CLINCH RIVER SMR PROJECT
AMEC NO. 6468-13-1072

Well Number: OW-420L

Bottom of Screen 150.0 ft BGS

Screen Length 20.0 ft BGS

Length of Sand Pack 235 ft BGS

Water level from g.s. on 58.90' on 8/27/13

See attached sheet for well construction details.

Check water level prior to start of development (AMEC Observer).

Develop well in accordance with project specifications and work instructions.

Record development data on Well Development data form (AMEC Observer).

Collect sample of water in glass jar when complete. Provide water sample to Bechtel Site Representative for approval of completion of development.

Contact site manager if there is insufficient water in well to complete development according to specifications.

SPECIFIC INSTRUCTIONS

ASSIGNED PERSONNEL

AMEC Observer: Kim Chyrs Smith Development Crew Leader: Lee Miller

Prepared by: Kim Chyrs Smith Date: 8/27/13

AMEC REVIEW AND APPROVAL:

Site Manager: BILL DEOSTAD (Name) Bill Deostad (Signature) Date: 8-27-13

BECHTEL CONCURS OW-420L IS ADEQUATELY DEVELOPED
L. M. 9/3/13

RCN No.: CRP-0145.0

AMEC_Well Development Assignment Record, Rev 0
Approved for Use, Al Tice, Technical Lead

WELL DEVELOPMENT DATA SHEET
CLINCH RIVER SMR PROJECT
Project No. 6468-13-1072

Observation Well No. 420U Development Date 8/28/13 Developer Crew Lee Miller MTW Drilling

AMEC Observer Kim Charles-Smith Reviewer Bill Deerhall

Total Well Depth, ft below ~~top of casing~~ 9.5. 46 (Kf 8/28/13) Initial depth to water, ft below ~~top of casing~~ 9.5. 44.5 (Kf 8/22/13)

Single Purge Well Volume, gallons 8 (From Well Purge Spreadsheet)

Development Method: Disposable Bailer

Development Step	Volume Removed	Water Turbidity*	Water Level After Removal, (ft) TOC	Recovery Depth Interval Monitored	Start/End Times**	Approx. Recovery Rate Over Depth Interval (ft/min) ***
1	4 gal	high	purged Down	NA	—	—
2						
3						
4						
5						
6						
7						
8						
9						
10						

8/29/13 Static = 48.15'

* Visual - (1) Clear; (2) Slight; (3) Moderate; (4) High
** May need to record dates with times for slow recovery rates (overnight).
*** Record at four to five selected steps; attempt to achieve three consecutive intervals of approximately constant recovery rate over same depth interval.

NOTES:

8/28/13 Unable to remove water from well w/waterra, hand bailed. Attempted to Add water to well to fill Screen water level would not come up in Screen, well took water.

(2) 5 gal Buckets calibrated by Amec. CWB-1/CWB-2
Durham Geo Slope Indicator SN: 40868 (300') # 51690030
TOC - Top of Casing / 9.5. = grand Surface

WELL DEVELOPMENT DATA SHEET
CLINCH RIVER SMR PROJECT
Project No. 6468-13-1072

Observation Well No. 420L Development Date 8/28/13 Developer Crew Lee Miller - MTW Drilling

AMEC Observer Kim Charles-Smith Reviewer Bill [illegible]

Total Well Depth, ft below ~~top of casing~~ g.s. KCS 8/28/13 150 Initial depth to water, ft below ~~top of casing~~ g.s. KCS 8/28/13 58.9'

Single Purge Well Volume, gallons 22 (From Well Purge Spreadsheet)

Development Method: Waterra/Surge Block + Grundfos pump

Date	Development Step	Volume Removed	Water Turbidity*	Water Level After Removal, (ft) TOC	Recovery Depth Interval Monitored	Start/End Times**	Approx. Recovery Rate Over Depth Interval (ft/min) ***	Notes
	1	8.5 gal	high	147.3' ~~122.5~~	KCS 8/28/13 NA	—	—	
	2	3.5 gal.	high	147.5'	NA	—	—	
	3	8.0 gal	high	KCS 8/29/13 ~~137.2~~	NA	—	—	STATIC 8/29/13 83.58' Well purged down
8/29/13	KCS 8/29/13 4	9.6 gal KCS 8/29/13	~~moderate~~ KCS 8/29/13	KCS 8/29/13 ~~127.75'~~	NA	—	—	
8/29/13	5	6.0 gal	moderate	127.75'	127.60' - 126.30'	0903	.08	very slow recharge
8/30/13	6	16.5 gal	moderate	133.82'	~~135'~~ - 130 - 127'	0900 0929	0.10	Static = 66.28' TOC
8/31/13	7	16.0 gal	Clear-moderate	KCS 8/31/13 ~~133.90~~	~~130'~~ ~~127'~~ KCS 8/31/13	—	—	Static - 64.68' TOC Used cork to prevent back flow During Yield Test.
8/31/13	8	—	—	143.90' KCS 8/31/13	136' - ~~132~~ 134' KCS 8/31/13	8/30/13 1226 KCS	9/1/13 0.03	
9/01/13	8 ~~9~~ KCS 8/31/13	~~17.5~~ 13.5 gal	clear slight	143.0'	136' - 134'	~~1130~~ 0835-0930 ~~1226~~ KCS 9/1/13	.03	Static = 84.89' TOC
09/03/13	9 ~~10~~ KCS 8/31/13	KCS 9/1/13						Static = 65.01' TOC
	10							

* Visual - (1) Clear; (2) Slight; (3) Moderate; (4) High
** May need to record dates with times for slow recovery rates (overnight).
*** Record at four to five selected steps; attempt to achieve three consecutive intervals of approximately constant recovery rate over same depth interval.

KCS 8/28/13

NOTES:

8/28/13 Surged well screen w/Waterra/Surge Block, pumped approx 8.5 gal. well purged down. Added 20 gal of water to well, purged 23.5 gal. well purged down

8/29/13 Surged well screen w/Waterra/Surge Block, removed 12 gal w/Grundfos well purged down.

8/29/13 ADDed Approx 10 gal, removed 12 gal.

Grundfos pump ID #17255 Type: MP1-2-A-B-C-TV 5HP

Controller - Baldor Sn: H0412060109

(2) 5 gal Buckets calibrated by Amec CWB-1/CWB-2

Durham Geo Slope Indicator Sn: 40868 (300' #5160030)

KCS 8/28/13 ~~Top~~ TOC = Top of casing / g.s. = ground surface

Well Developement Data Sheet Rev 1
Approved for Use by Al Tice, Techncial Lead

RCN: CRP-0619.2 Page 6 of 6

WELL DEVELOPMENT PURGE VOLUME CALCULATIONS
CLINCH RIVER SMR PROJECT
AMEC Project # 6468-13-1072

Boring	(1) Bottom of Screen (ft.)	(2) Depth of Water (ft.)	(3) Screen Length (ft.)	(4) Sand Int. (thickness) (ft.)	(5) Water Column (ft.)	(6) Bore Hole Volume (gal.)	(7) Casing Volume (gal.)	(8) Purge Volume (gal.)	Total Purge Volume (ten volumes) (gal.)
OW-421U	75	69.39	20	23.6	5.6	11	1	8	80
OW-421L	125.6	56.04	20	24.4	69.6	12	12	20	200
OW-421D	195	167.25	20	22.9	27.8	11	5	12	120

Note - Prepare separate sheet for each welll cluster of three wells Input data into shaded cells

Column Information

(1) From Well Installation Log, ft below ground surface
(2) From measurement prior to development, ft below top of casing
(3) From Well Installation Log
(4) From Well Installation log, bottom of sand pack to top of sand pack
(5) Column 1 minus Column 2
(6) Column 4 times 1.5937 gallons per foot for 6.125-inch diameter borehole times 0.3 porosity (assumed) for well sand
(7) Column 5 times 0.17 gallons per foot for nominal 2-inch inside diameter PVC casing
(8) Column 6 minus (Column 4 times 0.17) plus Column 7. This step accounts for water in PVC within sand interval.

Spreadsheet master prepared by JAT 8-6-13

Spreadsheet master checked by SJC 8-6-13

Well Cluster Boring ID: OW 421

Prepared by: KCJ Date: 8-18-13

Checked by: WBL Date: 8-18-13

WELL DEVELOPMENT DATA SHEET
CLINCH RIVER SMR PROJECT
Project No. 6468-13-1072

KLS 8/18/13 ~~417U~~ 421U
Observation Well No: ~~417U~~ Development Date 8/18/13 Developer Crew Lee Miller - MTW Drilling

AMEC Observer Kim Charles-Smith Reviewer Bill Lockhart

Total Well Depth, ft below ~~top of casing~~ 9.5. 75 KLS 8/18/13 Initial depth to water, ft below ~~top of casing~~ 9.5. 69.39' KLS 8/18/13

Single Purge Well Volume, gallons 8 (From Well Purge Spreadsheet)

Development Method: Waterra + Grundfos pump

Development Step	Volume Removed	Water Turbidity*	Water Level after removal, ft TOC	Approx. Recovery Rate to initial level, ft/min **
8/18 1	8	high	60.68'	NA
8/18 2	8	high	76.51'	NA
8/19 * 3	8	moderate	77.17'	water level after 15 min = 76.87' 0.028 ft/min (after 5 min)
4				
5				
6				
7				
8				
9				
10				

See sheet 2 of 2

* Visual - (1) Clear; (2) Slight; (3) Moderate; (4) High
** Record at selected steps; after 3, 6,8 and 10 suggested
Record interval data in field book

NOTES

Procedure: Develop per Work Instruction

BECHTEL CONCURS THAT THE PORTION OF THE SCREEND INTERVAL IN OW-421U THAT IS ABLE TO BE DEVELOPED HAS BEEN ADEQUATELY DEVELOPED. — M. McL 10/1/13

M&TE
Pump(s) Grundfos pump Type: MP1-2-A-B-C-TV 5HP Controller - Baldor SN: H04120601O9
Bucket(s) (2) 5 gal Buckets calibrated by Amec CWB-1/CWB-2
Tank(s)
Water Level Meter Durham Geo Slope Indicator SN: 40868 (300' # 51690030)

g.s. = ground surface / TOC = Top of casing

WELL DEVELOPMENT DATA SHEET
CLINCH RIVER SMR PROJECT
Project No. 6468-13-1072

PA NJS 9/18/13

Observation Well No. 421U Development Date 8/28/13 - 9/17/13 Developer Crew Lee Miller/Stanley Cross - MTW Drilling

AMEC Observer Kim Charles-Smith/Nicholas J. Smith 9/15/13 Reviewer Bill Lockard

Total Well Depth, ft below ~~top of casing~~ 0.5 GS 75 Initial depth to water, ft below top of casing 51.74

Single Purge Well Volume, gallons 8 (From Well Purge Spreadsheet)

51.01 Ft BTOC on 9/15/13 @ 1430
55.70 Ft BTOC on 9/16/13 @ 0828
63.91 Ft BTOC on 9/17/13 @ 0945

Development Method: Waterra/Surge Block + Grundfos Pump

Development Step	Volume Removed	Water Turbidity*	Water Level After Removal, (ft) TOC	Recovery Depth Interval Monitored	Start/End Times**	Approx. Recovery Rate Over Depth Interval (ft/min) ***	
1							See sheet 1 of 2
2							
3							
8/28/13 4	8 gal	moderate	72.72'	72.72' - 39.69'	0815-0822	0.55	
8/28/13 5	8 gal	slight	74.15'	RCS 8/28/13	—	—	
8/29/13 6	8 gal	slight	76.01'	—	—	—	STATIC = 52.95'
8/29/13 7	2.5 gal	slight	74.26'	72.72' - 69'	1118-1136	0.20	
8/29/13 8	5 gal	clear	74.53'	—	—	—	
8/31/13 9	8.5 gal	clear	74.10'	72.72' - 69.0'	0929-0943	0.28	STATIC = 54.58'
9/11/13 10	8.5 gal	slightly cloudy	74.88'	72.72' - 69.0'	1430-1438	0.10	STATIC = 53.72'
9/15/13 11	11 gal	mod-slight	77.40'	Purging only - Let recharge overnight			
9/16/13 12	9 gal	mod-slight	77.30'	↓			

KC Rec. to 66.55' BTOC
13: 5 gal. mod-slight 77.30'
14: 2 gal. slight 77.30'
EWD 9/16/13
START 9/17/13
15: 6 gal. mod-slight 77.30'

* Visual - (1) Clear; (2) Slight; (3) Moderate; (4) High
** May need to record dates with times for slow recovery rates (overnight).
*** Record at four to five selected steps; attempt to achieve three consecutive intervals of approximately constant recovery rate over same depth interval.

NOTES:

Grundfos pump ID# 19255 TYPE: mpl-2-A-B-C-TV 5HP
Controller - Baldor SN: H04120601O9
(2) 5 gal buckets calibrated by Amec CWB-1/CWB-2
Durham Geo Slope indicator SN: 40868 (300' # 51690030)
8/31/13 used Stopper on discharge line to prevent backflow RCS 8/31/13 during yeild test.

GS. = Grand Surface / TOC = Top of casing

WELL DEVELOPMENT DATA SHEET
CLINCH RIVER SMR PROJECT
Project No. 6468-13-1072

Observation Well No. 421V Development Date 9/18/13 Developer Crew MBW: Jimmy Cross

AMEC Observer Nicholas T. Smith Reviewer Bill Lockhart

Total Well Depth, ft below ~~top of casing~~ G.S. 75 Initial depth to water, ft below top of casing 69.82' @ 0855 on 9/18/13
NJS 9/19/13 68.69' @ 0800 on 9/19/13

Single Purge Well Volume, gallons 8 (From Well Purge Spreadsheet)

Development Method: Grundfos-type MP1-2-A-B-G-TV model A 1A106003P1 pump purging only, w/ calibrated 5 gal. bucket #CWB-2

Development Step	Volume Removed GAL	Water Turbidity*	Water Level After Removal, (ft)BTOC	Recovery Depth Interval Monitored	Start/End Times**	Approx. Recovery Rate Over Depth Interval (ft/min) ***
1	5.5	not-slight	77.3'	Purging only		
2	2.5	Slight	77.3'	↓		
3	3.5	Slight	77.2'	↓		
4						
5						
6						
7						
8						
9						
10						

EMN 9/18/13 9/19/13

⇒ recovered to 71.28ft BTOC

* Visual - (1) Clear; (2) Slight; (3) Moderate; (4) High
** May need to record dates with times for slow recovery rates (overnight).
*** Record at four to five selected steps; attempt to achieve three consecutive intervals of approximately constant recovery rate over same depth interval.

NOTES:

* BTOC = Below Top of Casing

WELL DEVELOPMENT DATA SHEET
CLINCH RIVER SMR PROJECT
Project No. 6468-13-1072

Observation Well No. 421L Development Date 8/18/13 Developer Crew Lee Miller - MTW Drilling

AMEC Observer Kim Charles-Smith Reviewer Bill Seibold

Total Well Depth, ft below ~~top of casing~~ 9.5. 126' Initial depth to water, ft below ~~top of casing~~ 9.5. 56.04'
KJS 8/18/13 KJS 8/18/13

Single Purge Well Volume, gallons 20 (From Well Purge Spreadsheet)

Development Method: Waterra + grundfos pump

Development Step	Volume Removed	Water Turbidity*	Water Level after removal, ft TOC	Approx. Recovery Rate to initial level, ft/min **
8/18 1	20	high	122.05'	NA
8/18 2	20	high	115.11'	NA
8/19 * 3	20	moderate	122.69'	water level after 15 min = 121.40' 0.142 ft/min (after 5 min)
4				
5				
6				
7				
8				
9				
10				

* Visual - (1) Clear; (2) Slight; (3) Moderate; (4) High
** Record at selected steps; after 3, 6,8 and 10 suggested
Record interval data in field book

NOTES

Procedure: Develop per Work Instruction

BECHTEL CONCURS THAT THE PORTION OF THE SCREENED INTERVAL IN DW-421L THAT IS ABLE TO BE DEVELOPED HAS BEEN ADEQUATELY DEVELOPED. — M. Mc 10/1/13

M&TE
Pump(s) GrundFos pump TYPE: mp1-2-A-B-C-TV 5 HP
Controller Baldor SN: H04-1206-0109
Bucket(s) (2) 5 gal Buckets calibrated by AMEC CWB-1 / CWB-2
Tank(s)
KJS 8/18/13
Water Level Meter ~~Heron~~ Durham Geo Slope indicator SN: 40868 (300' #516900-30)
9.5. = ground surface / TOC = Top of casing

WELL DEVELOPMENT DATA SHEET
CLINCH RIVER SMR PROJECT
Project No. 6468-13-1072

Observation Well No. 421L Development Date 8/28/13 - 9/17/13 Developer Crew Lee Miller / MTW Drilling (NJS 9/18/13 Jimmy Cross)

AMEC Observer Kim Charles-Smith / Nicholas J. Smith 9/15/13 Reviewer Bill Redwood

Total Well Depth, ft below ~~top of casing~~ g.s. 126' KJF 8/28/13 Initial depth to water, ft below top of casing 86.60'

Single Purge Well Volume, gallons 20 (From Well Purge Spreadsheet)

Development Method: _____

6 9.30" BTOC on 9/15/13 @ 1430
110.33' BTOC on 9/16/13 @ 0878
121.89' BTOC on 9/17/13 @ 0945

Development Step	Volume Removed	Water Turbidity*	Water Level After Removal, (ft) TOC	Recovery Depth Interval Monitored	Start/End Times**	Approx. Recovery Rate Over Depth Interval (ft/min) ***	
1							See Sheet 1 of 2
2							
3							
8/28/13 4	13 gal	Moderate	124.02'	123.8' - 123.0'	1000 - 1012	0.07	
8/29/13 5	12 gal	clear	124.98'	123.8' - 121.0'	1234 - 1236	1.65	STATIC = 112.48'
8/31/13 6	5 gal.	slight-clear	125.50'	123.8' - 121.0'	0830 - 0832	2.0	STATIC = 109.83'
8/31/13 7	11 gal.	clear	125.36'	—	—	— KJF 9/1/13	Added 12 gal water & removed 21.0 gal
9/15/13 8	14 gal.	moderately	115.2'	just purging			
9/16/13 9	10 gal.	slightly	127.3'	↓			
END 9/16/13 10	1 gal.	slight	127.3'	↓			→ Rec. to 123.45' BTOC
11	1.5 gal	slightly clear	127.3'	↓			→ Rec. to 123.41' BTOC
START/END 9/17/13 12	2.5 gal	slightly clear	127.3'	↓			

* Visual - (1) Clear; (2) Slight; (3) Moderate; (4) High
** May need to record dates with times for slow recovery rates (overnight).
*** Record at four to five selected steps; attempt to achieve three consecutive intervals of approximately constant recovery rate over same depth interval.

NOTES:

8/28/13 Volume #4, removed 13 gal, well purged down
8/28/13 Added Approx 15 gal of water to well, removed 12 gal, well purged down.
8/29/13 Volume #5, removed 12 gal, purged well Down
8/29/13 Added Approx 10 gal water to well, removed 12 gal, well purged down.

Grundfos Pump ID# 19255 Type: MPI-2-A-B-C-TV 5HP
Controller Baldor SN: Hag 1206109
(2) 5 gal Buckets calibrated by Amec CWB-1/CWB-2
Durham Geo Slope Indicator SN: 408688 (300' # 31690030)
g.s. = grand surface / TOC = Top of casing.

WELL DEVELOPMENT DATA SHEET
CLINCH RIVER SMR PROJECT
Project No. 6468-13-1072

Observation Well No. 421L Development Date 9/18/13 Developer Crew MSW: Jimmy Cross

AMEC Observer Nicholas J. Smith Reviewer Bill Lockhart

Total Well Depth, ft below ~~top of casing~~ 9.5. 126' (N33 9/18/13) Initial depth to water, ft below top of casing 121.59 Ft BTOC @ 0855 on 9/18/13
121.48 Ft BTOC @ 0800 on 9/19/13

Single Purge Well Volume, gallons 20 (From Well Purge Spreadsheet)

Development Method: _____

Development Step	Volume Removed GAL.	Water Turbidity*	Water Level After Removal, (ft) BTOC	Recovery Depth Interval Monitored	Start/End Times**	Approx. Recovery Rate Over Depth Interval (ft/min) ***
9/18/13 1	2.5	SLIGHT	127.10'	Purging	only	→ recovered to 123.70 ft BTOC
END 9/18/13 2	1	Slight-clear	127.10'	↓		
9/19/13 3	2	SLIGHT-clear	127.0'	↓		
4						
5						
6						
7						
8						
9						
10						

* Visual - (1) Clear; (2) Slight; (3) Moderate; (4) High
** May need to record dates with times for slow recovery rates (overnight).
*** Record at four to five selected steps; attempt to achieve three consecutive intervals of approximately constant recovery rate over same depth interval.

NOTES:

* BTOC = Below Top of Casing

BECHTEL CONCURS THAT THE PORTION OF THE SCREENED INTERVAL IN OW-421D THAT IS ABLE TO BE DEVELOPED HAS BEEN ADEQUATELY DEVELOPED.
[illegible] 10/1/13

WELL DEVELOPMENT DATA SHEET
CLINCH RIVER SMR PROJECT
Project No. 6468-13-1072

Observation Well No. 421D Development Date 8/~~18~~ 19/13 KJ 8/28/13 9/18/13 Developer Crew Lee Miller / Jimmy [illegible] - MTW Drilling
AMEC Observer Kim Charles Smith, Nicholas J. Smith, Kristen Lloyd Reviewer Bill [illegible]
Total Well Depth, ft below ~~top of casing~~ g.s. 195 Initial depth to water, ft below ~~top of casing~~ g.s. 167.25' 8/19/13
KJ 8/19/13 9/18/13
102.40' BToc @ 1430 on 9/15/13
160.14 Toc. 945, 9/17/13
167.24' BToc at 0855 on 9/18/13
189.40' BToc @ 0800 on 9/19/13
Single Purge Well Volume, gallons 12 (From Well Purge Spreadsheet)
Development Method:

Date	Development Step	Volume Removed	Water Turbidity*	Water Level After Removal (ft)	Recovery Depth Interval Monitored	Start/End Times**	Approx. Recovery Rate Over Depth Interval (ft/min) ***	
8/19/13	1	12 gal	high	184.04'	NA	—	—	Slow recovery
8/28/13	2	14 gal	moderate	180.30'	178'-177.2'	1055-1121	0.03	STATIC = 110.96' See notes below
8/29/13	3	4 gal	moderate	180.08'	178'-176'	1345-1346	See note *	STATIC = 161.46'
8/30/13	4	8 gal	moderate	183.30'	178'-176'	1536-1614	0.05	STATIC = 135.11'
8/30/13	5	9 gal.	clear	183.10'	—	—	—	Added Approx 10 gal, removed 19 gal. STATIC = 177.20'
9/15/13	6	7.5 gal	slight	145.00'	—	—	—	STATIC 102.40
9/16/13	7	6 gal	slight/mod	168.3	—	—	—	STATIC 141.03
9/17/13	8	9.5 gal	mod	185.5	—	—	—	
9/18/13	9	9.0 gal	mod-slight	197.3'	—	—	—	→ recovered to 189.85 ft BToc
end 9/18/13	10	2.0 gal.	mod.	197.3'	—	—	—	
9/19/13		3.0 gal	mod	197.0'	—	—	—	

* Visual - (1) Clear; (2) Slight; (3) Moderate; (4) High
** May need to record dates with times for slow recovery rates (overnight).
*** Record at four to five selected steps; attempt to achieve three consecutive intervals of approximately constant recovery rate over same depth interval.

NOTES:
KJ 8/19/13
8/19/13 Added Approx. 20 gal of water ~~to~~ removed 20, plus 1 volume, see step 1 above
8/19/13 Added Approx. 20 gal of water, removed Approx 17.5, well purged down
8/28/13 STATIC = 110.96' from ToC, Surged well screen
8/28/13 Added Approx 20 gal of water, removed Approx 12 gal, well purged down
8/29/13 STATIC = 161.46' from ToC, removed Approx 4 gal, well purged down
Grundfos Pump ID# 19255 ~~See [illegible]~~ KJ 8/19/13 Type MP1-2A-B-C-TV 5HP
Controller Baldor SN: H0412060109
8/29/13 - Added Approx 20 gal to well, removed Approx 16 gal, well purged down
8/29/13 * Discharge line backflowed into well. Data not representative.

Well Developement Data Sheet Rev 1
Approved for Use by Al Tice, Technical Lead
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9/15/13 Pumped 7.5 gal from well today.
9/17/13 STATIC 160.14 Pumped 2 gal, surged screen. ADDED 80 gal, removed 87.5 gal, and 2.0 gal from initial [illegible] net gain 6 9.5 gal removed

WELL DEVELOPMENT PURGE VOLUME CALCULATIONS
CLINCH RIVER SMR PROJECT
AMEC Project # 6468-13-1072

Boring	(1) Bottom of Screen (ft.)	(2) Depth of Water (ft.)	(3) Screen Length (ft.)	(4) Sand Int. (thickness) (ft.)	(5) Water Column (ft.)	(6) Bore Hole Volume (gal.)	(7) Casing Volume (gal.)	(8) Purge Volume (gal.)	Total Purge Volume (ten volumes) (gal.)
OW-423U	62	36.02	20	23.1	26.0	11	4	11	110
OW-423L	160	25.44	20	23	134.6	11	23	30	300
OW-423D	270	24.87	20	23.9	245.1	11	42	49	490

Note - Prepare separate sheet for each welll cluster of three wells Input data into shaded cells

Column Information

(1) From Well Installation Log, ft below ground surface
(2) From measurement prior to development, ft below top of casing
(3) From Well Installation Log
(4) From Well Installation log, bottom of sand pack to top of sand pack
(5) Column 1 minus Column 2
(6) Column 4 times 1.5937 gallons per foot for 6.125-inch diameter borehole times 0.3 porosity (assumed) for well sand
(7) Column 5 times 0.17 gallons per foot for nominal 2-inch inside diameter PVC casing
(8) Column 6 minus (Column 4 times 0.17) plus Column 7. This step accounts for water in PVC within sand interval.

Spreadsheet master prepared by JAT 8-6-13

Spreadsheet master checked by SJC 8-6-13

Well Cluster Boring ID: OW 423

Prepared by: [signature] Date: 8-31-13

Checked by: [signature] Date: 8-31-13

WELL DEVELOPMENT ASSIGNMENT RECORD
CLINCH RIVER SMR PROJECT
AMEC NO. 6468-13-1072

Well Number: OW-423U

Bottom of Screen 62.0 ft BGS

Screen Length 20 ft BGS

Length of Sand Pack 23.1 ft BGS

water level 8/31/13
36.02' g.s.

See attached sheet for well construction details.

Check water level prior to start of development (AMEC Observer).

Develop well in accordance with project specifications and work instructions.

Record development data on Well Development data form (AMEC Observer).

Collect sample of water in glass jar when complete. Provide water sample to Bechtel Site Representative for approval of completion of development.

Contact site manager if there is insufficient water in well to complete development according to specifications.

SPECIFIC INSTRUCTIONS

ASSIGNED PERSONNEL

AMEC Observer: Kim Charles-Smith Development Crew Leader: LEE MILLER

Prepared by: Kim Charles-Smith Date: 8/31/13

AMEC REVIEW AND APPROVAL:

Site Manager: BILL DEOBALD Bill Deobald Date: 8-31-13
Name Signature

BECHTEL CONCURS WITH WELL DEVELOPMENT COMPLETION
M. M 9/1/13

RCN No.: CRP-0153.0

AMEC_Well Development Assignment Record, Rev 0
Approved for Use, Al Tice, Technical Lead

WELL DEVELOPMENT ASSIGNMENT RECORD
CLINCH RIVER SMR PROJECT
AMEC NO. 6468-13-1072

Well Number: OW-423L

Bottom of Screen: 160 ft BGS

Screen Length: 20 ft BGS

Length of Sand Pack: 23 ft BGS

Water level on 8/31/13 = 25.44' g.s.

See attached sheet for well construction details.

Check water level prior to start of development (AMEC Observer).

Develop well in accordance with project specifications and work instructions.

Record development data on Well Development data form (AMEC Observer).

Collect sample of water in glass jar when complete. Provide water sample to Bechtel Site Representative for approval of completion of development.

Contact site manager if there is insufficient water in well to complete development according to specifications.

SPECIFIC INSTRUCTIONS

ASSIGNED PERSONNEL

AMEC Observer: Kim Charles-Smith Development Crew Leader: Lee Miller

Prepared by: Kim Charles-Smith Date: 8/31/13

AMEC REVIEW AND APPROVAL:

Site Manager: Bill Deobald (Name) Bill Deobald (Signature) Date: 8-31-13

BECHTEL CONCURS THAT OW-423 L IS ADEQUATELY DEVELOPED
M. McL 9/2/13

RCN No.: CRP-0153.0

AMEC_Well Development Assignment Record, Rev 0
Approved for Use, Al Tice, Technical Lead

WELL DEVELOPMENT ASSIGNMENT RECORD
CLINCH RIVER SMR PROJECT
AMEC NO. 6468-13-1072

Well Number: OW-423D

Bottom of Screen 270 ft BGS

Screen Length 20 ft BGS

Length of Sand Pack 23.9 ft BGS

Water level on 8/31/13 = 24.87' g.s.

See attached sheet for well construction details.

Check water level prior to start of development (AMEC Observer).
Develop well in accordance with project specifications and work instructions.
Record development data on Well Development data form (AMEC Observer).
Collect sample of water in glass jar when complete. Provide water sample to Bechtel Site Representative for approval of completion of development.
Contact site manager if there is insufficient water in well to complete development according to specifications.

SPECIFIC INSTRUCTIONS

ASSIGNED PERSONNEL

AMEC Observer: Kim Charles-Smith Development Crew Leader: Lee Miller

Prepared by: Kim Charles-Smith Date: 8/31/13

AMEC REVIEW AND APPROVAL:

Site Manager: Bill Deobald (Name) Bill Deobald (Signature) Date: 8-31-13

BECHTEL CONCURS THAT OBS. WELL OW-423D IS ADEQUATELY DEVELOPED L. McFo 9/13/13

RCN No.: CRP-0153.0

AMEC_Well Development Assignment Record, Rev 0
Approved for Use, Al Tice, Technical Lead

WELL DEVELOPMENT DATA SHEET
CLINCH RIVER SMR PROJECT
Project No. 6468-13-1072

Observation Well No. 423U Development Date 8/31/13 Developer Crew ~~Lee~~ Lee KJ 8/31/13 Miller MTW Drilling
AMEC Observer Kirk Charles-Smith Reviewer [signature]
Total Well Depth, ft below ~~top of casing~~ g.s. KJ 8/31/13 62 Initial depth to water, ft below ~~top of casing~~ g.s. KJ 8/31/13 36.02
Single Purge Well Volume, gallons 11 (From Well Purge Spreadsheet)
Development Method: Waterra / Surge Block + Grundfos pump

	Development Step	Volume Removed	Water Turbidity*	Water Level After Removal, (ft) TOC	Recovery Depth Interval Monitored	Start/End Times**	Approx. Recovery Rate Over Depth Interval (ft/min) ***	
8/31/13	1	11 gal	high	43.11'	NA	NA	NA	Surged well screen w/Waterra/Surge block
	2	11 gal	high	49.91'	NA	NA	NA	Surged w/Grundfos
	3	11 gal.	Slight	47.05	NA	NA	NA	pumping @ 1.0 gpm
	4	11 gal	Slight	48.39'	47'-44'	1544 1546	1.52	Surged w/Grundfos
	5	11 gal.	slight	48.15'	47'-44'	1603 1605	1.50	Surged w/Grundfos
	6	11 gal	Slight	47.73'	NA	NA	NA	pumped w/Grundfos
8/31/13	7	11 gal	Slight	49.17'	47'-44'	1637 1639	1.38	pumped w/Grundfos
9/01/13	8	11 gal	high	49.24'	47'-44'	1029 1031	2.65	Static = 39.11' TOC Surged well screen w/waterra + surge block
9/01/13	9	11 gal.	high	44.90'	—NA	—NA	—NA	Surged Screen
	10	11 gal.	Slight	49.51'	47'-44'	1105 1107	2.0	pumped w/Grundfos
	11	11 gal.	clear	47.10'	NA	NA	NA	pumped w/Grundfos
	12	11 gal	Clear	48.11'	47'-44'	1158 1200	1.5	pumped w/Grundfos
see page 2 of 2	13	11 gal					1.43	
	14	11 gal					1.50	

* Visual - (1) Clear; (2) Slight; (3) Moderate; (4) High
** May need to record dates with times for slow recovery rates (overnight).
*** Record at four to five selected steps; attempt to achieve three consecutive intervals of approximately constant recovery rate over same depth interval.

KJ 9/01/13 ~~1.43~~ ~~1.50~~ KJ 9/01/13 ~~water is clear development complete~~ KJ 9/01/13 See page 2 of 2

NOTES: - pumped well @ Approx. 1 gpm
* Used Rubber stopper to prevent water backflow from discharge line During recovery rate testing.
9/01/13
1248 - Removed Approx 35 gal, recovery test 3.0' (47'-44') 2:10.2 min = 1.43 ft/min step 13
— Removed Approx 11 gal, recovery test 3.0' (47'-44') 2:01:20 min = 1.5 ft/min step 14
— water is clear @ low flow rate.
KJ 8/31/13
Grundfos pump ID # 19255 ~~Grand~~ pump type: MP1-Z-A-B-C-TV 5HP
Controller Baldor SN: H0412060109
(2) 5 gal Buckets Calibrated by Amec CWB-1 / CWB-2
Durham Geo Slope indicator SN: 40868 (300' # 51690030)

Well Developement Data Sheet Rev 1
Approved for Use by Al Tice. Techncial Lead
g.s = ground surface
TOC = Top of Casing
RCN: CRP-0619.2 Page 6 of 6
Waterra Tubing W/D-25 Check valve + Surge block

WELL DEVELOPMENT DATA SHEET
CLINCH RIVER SMR PROJECT
Project No. 6468-13-1072

8/31/13–
Observation Well No. 423U Development Date 9/01/13 Developer Crew Lee Miller

AMEC Observer Kim Clarke-Smith Reviewer Bill Oesterle

Total Well Depth, ft below ~~top of casing~~ 9.5. 62 Initial depth to water, ft below ~~top of casing~~ 9.5. 36.02'
KJF 9/01/13 KJF 9/01/13

Single Purge Well Volume, gallons 11 (From Well Purge Spreadsheet)

Development Method: Waterra Surge block & Grundfos pump

Development Step	Volume Removed	Water Turbidity*	Water Level After Removal, (ft)	Recovery Depth Interval Monitored	Start/End Times**	Approx. Recovery Rate Over Depth Interval (ft/min) ***
13	11 gal	clear	52.10'	47'-44'	1248 1250	1.43
14	11 gal	clear	48.56'	47'-44'	1310 1313	1.50
3						
4						
5						
6						
7						
8						
9						
10						

well Development complete

* Visual - (1) Clear; (2) Slight; (3) Moderate; (4) High
** May need to record dates with times for slow recovery rates (overnight).
*** Record at four to five selected steps; attempt to achieve three consecutive intervals of approximately constant recovery rate over same depth interval.

NOTES:

See page 1 of 2 for Equipment ID's + notes
Step 4: 47'-44' (3' recov) 1:59.9
Step 5: 47'-44' (3' recov) 2:03.5
Step 7: 47'-44' (3' recov) 2:11.8
Step 8: 47'-44' (3' recov) 2:08.5
Step 10: 47'-44' (3' recovery) 1:59.9 KJF 9/01/13
Step 12: 47'-44' (3' recov) 2:01.1
Step 13: 47'-44' (3' recov) 2:10.2
Step 14: 47'-44' (3' recov) 2:01.20

WELL DEVELOPMENT DATA SHEET
CLINCH RIVER SMR PROJECT
Project No. 6468-13-1072

Observation Well No. 423L Development Date 09/01/13 Developer Crew Lee Miller/ MTW Drilling

AMEC Observer Kim Charles-Smith Reviewer Bill [illegible]

Total Well Depth, ft below ~~top of casing~~ g.s. KEB 09/01/13 160 Initial depth to water, ft below ~~top of casing~~ g.s. KEB 09/01/13 25.44

Single Purge Well Volume, gallons 30 (From Well Purge Spreadsheet)

Development Method: Grundfos pump

Date	Development Step	Volume Removed	Water Turbidity*	Water Level After Removal, (ft) TOC	Recovery Depth Interval Monitored	Start/End Times**	Approx. Recovery Rate Over Depth Interval (ft/min) ***	Remarks
09/01/13	1	30 gal	high	99.69'	NA	1330 1400	NA	pumping @ Approx. 1 gpm
	2	30 gal.	moderate	125.89'	118'-112'	1434 1435	5.45	
	3	30 gal.	clear	128.90'	NA	~~1515~~ 1440 1515 KEB 9/01/13	NA	Surged well screen w/Grundfos pump
	4	30 gal.	high	126.70'	118'-112	1520 1600	6.52	
9/01/13	5	30 gal	high	131.35'	NA	1605 1640	NA	
09/02/13	6	30 gal.	slight	130.10'	118'-112'	0945 ~~0946~~ 1000 KEB 9/2/13	11.7	STATIC = 28.94' TOC Surged well screen w/Grundfos pump pumping @ Approx 1 gpm.
	7	30 gal.	clear	129.04'	NA	1040 1125	NA	
	8	30 gal.	clear	130.62'	118'-112	1140 1210	3.37	
	9	30 gal	clear	127.85'	118'-112'	1215 1245	3.46	pumping @ Approx 1 gpm.
9/02/13	10	30 gal.	clear	135.89'	118'-112'	1250 1325	3.31	

* Visual - (1) Clear; (2) Slight; (3) Moderate; (4) High
** May need to record dates with times for slow recovery rates (overnight).
*** Record at four to five selected steps; attempt to achieve three consecutive intervals of approximately constant recovery rate over same depth interval. Rubber stopper used to prevent backflow from discharge line during recovery test.

NOTES: recovery tests: 6' Recovery 118'-112'
Vol #2 Time = 1:06.1 = 5.45 ft/min Vol #10 Time = 1:49.1
Vol #4 Time = 0:55.3 = 6.52 ft/min
Vol #6 Time = 0:31.4 = 11.7 ft/min
Vol #8 Time = 1:47.0 = 3.37 ft/min
Vol #9 Time = 1:44.2 = 3.46 ft/min
Grundfos pump ID #19255 Type MP1-2-A-B-C-TV 5HP
Controller Baldor SN: H0412060109
(2) 5 gal Buckets Calibrated by AMEC CWB-1/ CWB-2
Durham Geo Slope indicator SN: 40868 (300' #51690030)
g.s.= ground surface / TOC = Top of Casing

Well Developement Data Sheet Rev 1
Approved for Use by Al Tice. Techncial Lead

WELL DEVELOPMENT DATA SHEET
CLINCH RIVER SMR PROJECT
Project No. 6468-13-1072

Observation Well No. 423D Development Date 09/04/13 Developer Crew Lee miller - mtw drilling

AMEC Observer Kim Charles-Smith Reviewer Bill Cadwell

Total Well Depth, ft below ~~top of casing~~ 270 KJS 9/4/13 9.5. Initial depth to water, ft below ~~top of casing~~ 26.68' TOC KJS 9/4/13 9.5.

Single Purge Well Volume, gallons 49 (From Well Purge Spreadsheet)

Development Method: Grundfos pump

	Development Step	Volume Removed	Water Turbidity*	Water Level After Removal, (ft)	Recovery Depth Interval Monitored	Start/End Times**	Approx. Recovery Rate Over Depth Interval (ft/min) ***	
09/04/13	1	49 gal.	Moderate	187.14'	NA	NA	NA	
09/04/13	2	49 gal	moderate	183.50'	NA	NA	NA	
09/04/13	3	49 gal	clear	See note	See note KJS 9/10/13		—	
9/10/13	4	30 gal	clear	~~178.98~~ 9/10/13	~~167.0'-169'~~ 174'-169'	1005 1006	5.88	STATIC=27.52' pumping @ APPROX 1 GPM
	5	18 gal.	clear	176.44'	174'-169'	1234 1237	1.52 ft/min	
	6	13 gal.	clear	181.00'	174'-169'	1324 1325	5.68 ft/min	
9/11/13	7	38 gal.	clear	180.50'	174'-169'	1207 1210	1.56 ft/min	STATIC = 27.92'
9/11/13	* 8	49 gal	clear	155.34'	152'-147'	1609 1610	8.77 ft/min	see note * bladder pump
9/12/13 KJS 9/12/13	9	49 gal	clear	161.21'	152'-147'	1124 1129	0.97 ft/min	STATIC = 29.78'
9/12/13	10	49 gal.	Clear	167.35	152'-147'	1500 1503	2.40 ft/min	
9/13/13	11	49 gal.	clear	172.00'	152'-147'	0955 0958	1.36 ft/min	STATIC = 30.72'
9/13/13	12	20 gal	clear	191.94'	152'-147'	1436 1439	1.37 ft/min	well development complete for Bechtel Rep

* Visual - (1) Clear; (2) Slight; (3) Moderate; (4) High
** May need to record dates with times for slow recovery rates (overnight).
*** Record at four to five selected steps; attempt to achieve three consecutive intervals of approximately constant recovery rate over same depth interval.

NOTES:

Difficult to obtain a flow rate during purge well consistently drawing down during pumping, have to increase pump rate to get water to the surface.

Step 3: Attempted to run recovery rate test, probe became tangled in pump/discharge line. Test not valid.

* Recovery depth interval changed due to drawdown variance with bladder pump

Grundfos pump ID# 19255 TYPE mp1-2-A-B-C-TV 5HP

Controller Bilda SN: H0412060109

(2) 5 gal Buckets calibrated by AMEC CWB-1 / CWB-2

TOC = Top of casing / 9.5 = ground surface

Durham Geo slope indicator SN: 40868 (300'# 51690030)

WELL DEVELOPMENT PURGE VOLUME CALCULATIONS
CLINCH RIVER SMR PROJECT
AMEC Project # 6468-13-1072

Boring	(1) Bottom of Screen (ft.)	(2) Depth of Water (ft.)	(3) Screen Length (ft.)	(4) Sand Int. (thickness) (ft.)	(5) Water Column (ft.)	(6) Bore Hole Volume (gal.)	(7) Casing Volume (gal.)	(8) Purge Volume (gal.)	Total Purge Volume (ten volumes) (gal.)
OW-428U	60	38.72	20	26	21.3	12	4	12	120
0	0	0	0	0	0.0	0	0	0	0
0	0	0	0	0	0.0	0	0	0	0

Note - Prepare separate sheet for each welll cluster of three wells Input data into shaded cells

Column Information

(1) From Well Installation Log, ft below ground surface
(2) From measurement prior to development, ft below top of casing
(3) From Well Installation Log
(4) From Well Installation log, bottom of sand pack to top of sand pack
(5) Column 1 minus Column 2
(6) Column 4 times 1.5937 gallons per foot for 6.125-inch diameter borehole times 0.3 porosity (assumed) for well sand
(7) Column 5 times 0.17 gallons per foot for nominal 2-inch inside diameter PVC casing
(8) Column 6 minus (Column 4 times 0.17) plus Column 7. This step accounts for water in PVC within sand interval.

Spreadsheet master prepared by JAT 8-6-13

Spreadsheet master checked by SJC 8-6-13

Well Cluster Boring ID: OW-428U

Prepared by: [signature] Date: 10/30/13

Checked by: [signature] Date: 10/30/13

WELL DEVELOPMENT ASSIGNMENT RECORD
CLINCH RIVER SMR PROJECT
AMEC NO. 6468-13-1072

Well Number: OW-428U

Bottom of Screen: 60 ft BGS

Screen Length: 20 ft BGS

Length of Sand Pack: 26 ft BGS

~ STATIC LEVEL 10/30/13 38.72'

See attached sheet for well construction details.

Check water level prior to start of development (AMEC Observer).

Develop well in accordance with project specifications and work instructions.

Record development data on Well Development data form (AMEC Observer).

Collect sample of water in glass jar when complete. Provide water sample to Bechtel Site Representative for approval of completion of development.

Contact site manager if there is insufficient water in well to complete development according to specifications.

SPECIFIC INSTRUCTIONS

- CONTAINERIZE ALL DEVELOPMENT WATER
- TEST pH OF DEVELOPMENT WATER, EVERY 10 gal
- IF pH ≥ 12 STOP WORK IMMEDIATELY & CONTACT SITE MANAGEMENT

Development considered complete by Garrett Day, Bechtel Garrett Day 10/31/13

ASSIGNED PERSONNEL

AMEC Observer: Kim CHARLES-SMITH Development Crew Leader: LEE MILLER

Prepared by: BILL DEGEALD Date: 10-30-13

AMEC REVIEW AND APPROVAL:

Site Manager: MICHAEL B. LENK (Name) Michael B. Lenk (Signature) Date: 10-30-13

RCN No.: CRP-0809.0

AMEC_Well Development Assignment Record, Rev 0
Approved for Use, Al Tice, Technical Lead

WELL DEVELOPMENT PURGE VOLUME CALCULATIONS
CLINCH RIVER SMR PROJECT
AMEC Project # 6468-13-1072

Boring	(1) Bottom of Screen (ft.)	(2) Depth of Water (ft.)	(3) Screen Length (ft.)	(4) Sand Int. (thickness) (ft.)	(5) Water Column (ft.)	(6) Bore Hole Volume (gal.)	(7) Casing Volume (gal.)	(8) Purge Volume (gal.)	Total Purge Volume (ten volumes) (gal.)
OW-428L	135	48.02	20	25	87.0	12	15	23	230
0	0	0	0	0	0.0	0	0	0	0
0	0	0	0	0	0.0	0	0	0	0

Note - Prepare separate sheet for each welll cluster of three wells Input data into shaded cells

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Spreadsheet master prepared by JAT 8-6-13

Spreadsheet master checked by SJC 8-6-13

Well Cluster Boring ID: OW-428L

Prepared by: [signature] Date: 10/30/13

Checked by: [signature] Date: 10/30/13