11.0
Appendixes

1. Photographs of core from the Norman arsenic test hole, 2004
2. Description of core from the Norman arsenic test hole, 2004
3. Chemical analyses of ground-water samples and quality-assurance samples from the Norman arsenic test hole, station number 351645097253801, in October 2004
4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006
5. A-K. Illustrations of natural gamma-ray logs, open-interval logs, flow contribution, and water quality with depth in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006
6. Chemical analyses of ground-water samples and quality-assurance samples collected after well modification in two selected public-supply wells, Norman, Oklahoma, 2005-2006

Appendix 1. Photographs of core from the Norman arsenic test hole, 2004, showing depth, in feet below land surface, for the top and bottom of core interval.

Norman arsenic test hole

Norman arsenic test hole

Box 3 of 26

346'

353'

Norman arsenic test hole

Box 4 of 26

353'

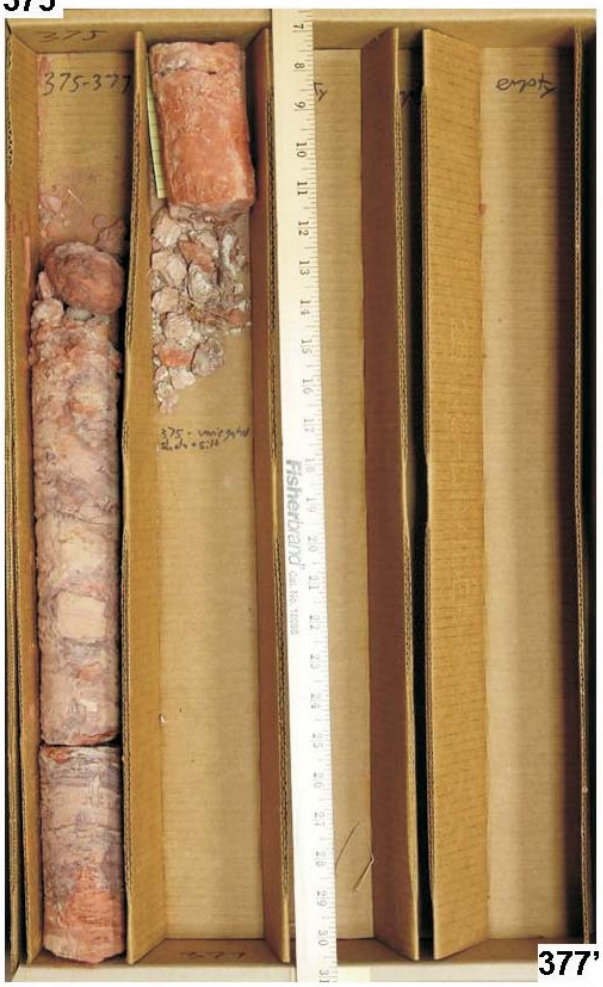
361'

Norman arsenic test hole

Box 5 of 26

Norman arsenic test hole

Box 6 of 26



Norman arsenic test hole

Box 7 of 26

Norman arsenic test hole

Box 8 of 26

Norman arsenic test hole

Box 9 of 26

Norman arsenic test hole

Box 10 of 26

Norman arsenic test hole

Box 11 of 26

Norman arsenic test hole

Box 12 of 26

Norman arsenic test hole

Box 13 of 26

Norman arsenic test hole

Box 14 of 26

Norman arsenic test hole

Box 15 of 26

Norman arsenic test hole

Box 16 of 26

Norman arsenic test hole

Box 17 of 26

Norman arsenic test hole

Box 18 of 26

Norman arsenic test hole

Box 19 of 26

Norman arsenic test hole

Box 20 of 26

Norman arsenic test hole

Box 21 of 26

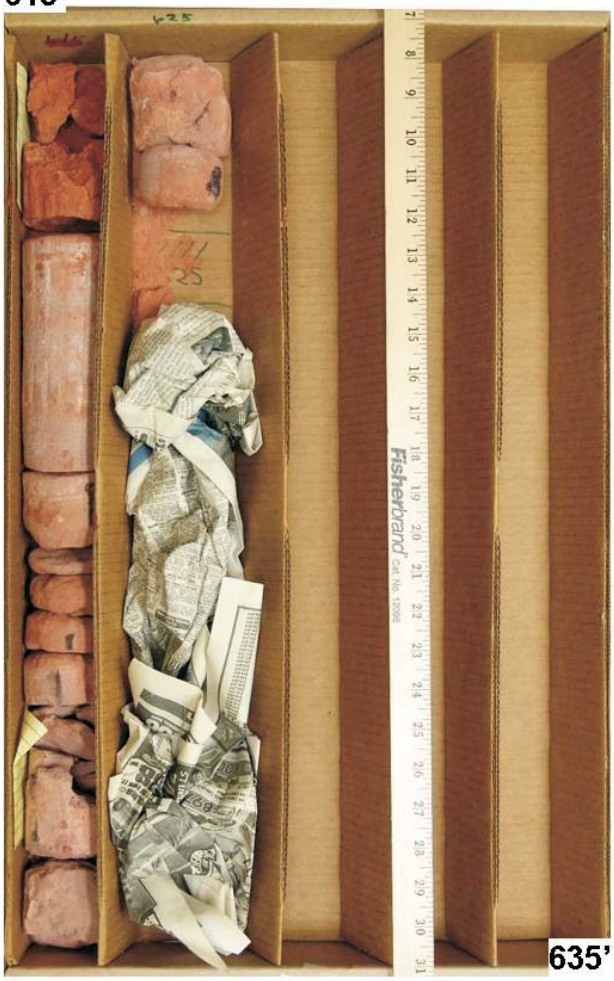
Norman arsenic test hole

Box 22 of 26

Norman arsenic test hole

Box 23 of 26

615'



635'

Norman arsenic test hole

Box 24 of 26

640'

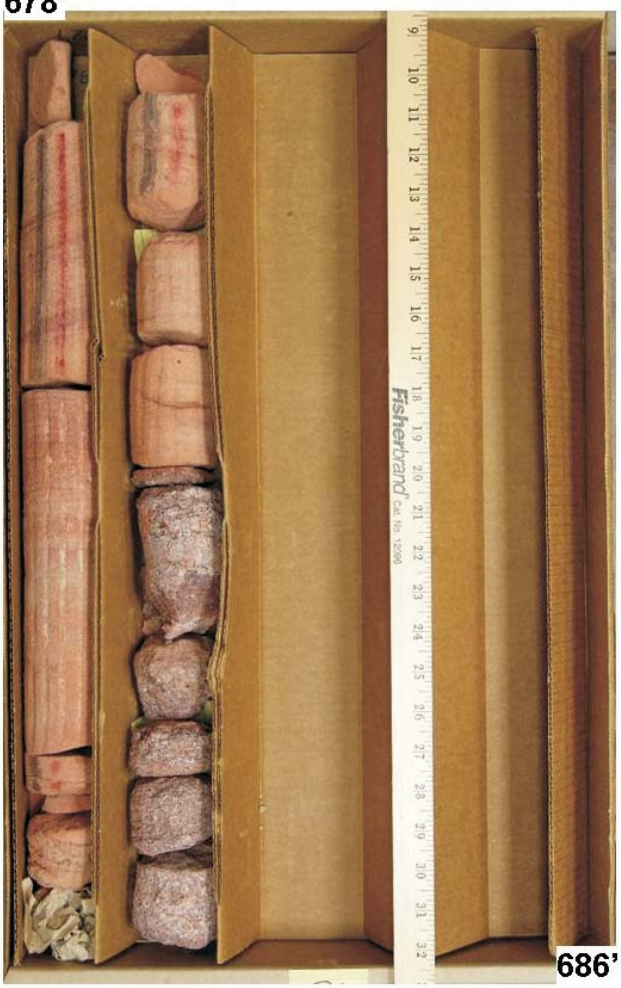
652'

Norman arsenic test hole

Box 25 of 26

Norman arsenic test hole

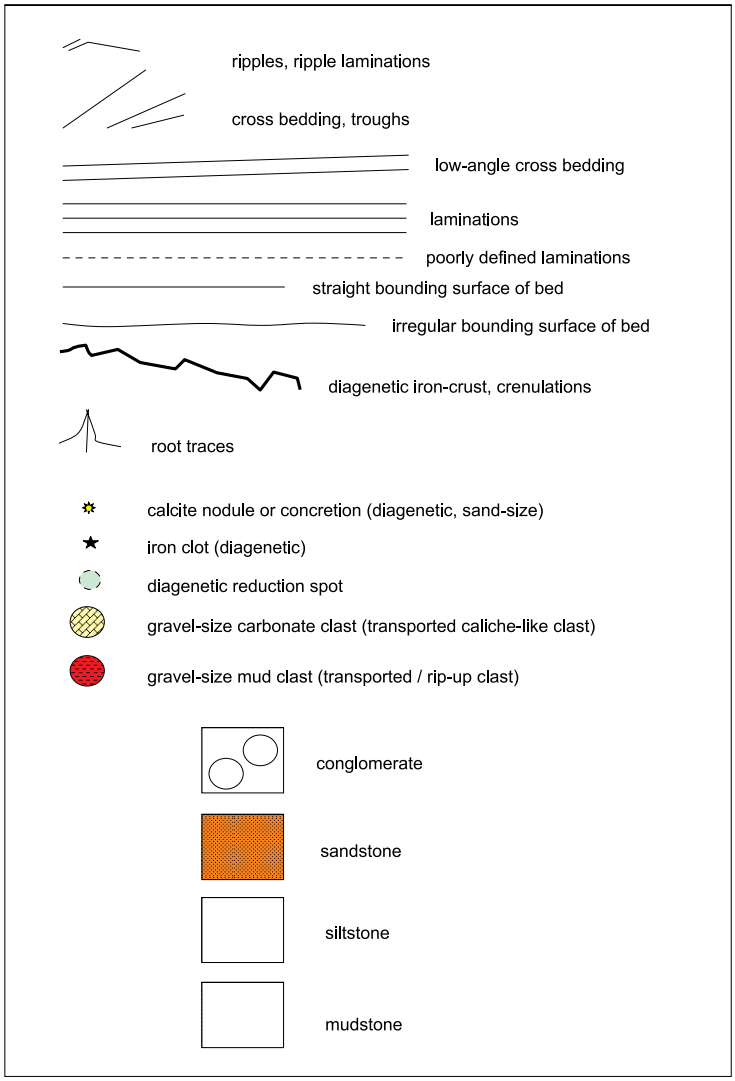
Box 26 of 26



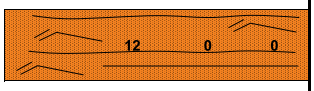
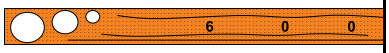
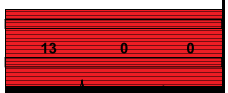
Norman arsenic test hole

Appendix 2. Description of core from the Norman arsenic test hole, 2004.

EXPLANATION



Core Description, Norman arsenic test hole, Norman, Oklahoma **Logged by: S.T. Paxton**

Depth below land surface, in feet		Thickness: Whole Inches	Thickness: Fractions of Inch	Box #	Draft Sheet #	Comments
302'		12	0 0	1	48	irregular, curved bedding surfaces, ripples, disintegrated mud clasts
303'						
	not recovered				48	
305'						
	not recovered				48	
310'						
	not recovered				47	
315'		6	0 0	1	47	conglomerate - irregular, curved bedding surfaces
315' 6"						
	not recovered				47	
317'		13	0 0	1	46, 47	crumbly, soil-like character
318' 1"				1	46	root traces
318' 8"						
	not recovered					
322'				1	46	root traces
323'						

323'							
		28	0	0	1	46	laminated, well cemented
325' 4"							
	not recovered					45, 46	
327'							
		10	0	0	1	45	cross beds, root traces
327' 10"							
	not recovered					45	
330'							
	not recovered					45	
332'							
		37	0	0	2	44, 45	
335' 1"							
335' 4"		3	0	0	2	44	
	not recovered						
337'							
		24	0	0	2	44	
339'							
	not recovered						
340'							
	not recovered						
342'							
					2	43	nearly unconsolidated

345'						
	112	**0**	**0**	2, 3	43	some shale clasts, sandstone is poorly consolidated, some very fine sand size iron oxide nodules
350'						
				3	42	some reduction features
351' 4"						
	47	**0**	**0**	3, 4	42	green (chemically-reduced) features
355' 3"						
	not recovered				42	
356'						
	57	**0**	**0**	4	41, 42	"ped"-like features, green (reduced) zone
360'						
				4	41	
360' 9"						
361'	**not recovered**					
	24	**0**	**0**	5	41	
363'						green (reduced) zone
	39	**0**	**0**	5	40, 41	
366' 3"						
	4	**0**		5	40	
366' 7"						

366' 7"							
	not recovered					40	
370'							
	not recovered					40	
373'							
		24	0	0	5	39, 40	
375'							
		24	0	0	6	39	conglomerate - cemented
377'							
					7	38	reduction spots and other redoxymorphic feartures throughout
380'							
		116	0	0	7	38, 39	reductlon spots and other redoxymorphic feartures throughout
385'							
					7	38	reduction spots and other redoxymorphic feartures throughout
386' 8"							
387'	not recovered						
		4	0	0	8	38	
					8	38	cemented mudstone
		6	0	0	8	38	
388' 6"							
	not recovered					38	
390'							

390'							
	not recovered					37	
393'							
					8	37	
395'		68	0	0			
					8	36, 37	
398' 8"		2	0	0	8	36	vf
		16	0	0	8	36	laminated, vfL-silt
400' 2"							
	not recovered					36	
402'							
		24	0	0	9	36	laminated muddy sandstone with some cross bedding
404'							
404' 6"		6	0	0	9	36	muddy sandstone with clasts
405'	not recovered					36	
	not recovered					35, 36	
410'							
	not recovered					35	
412'		6	0	0	9	35	
412' 6"		3	0	0	9	35	
412' 9"							

412' 9"

	27	0	0	9	34, 35	

415'

	12	0	0	9	34	

416'

	24	0	0	9	34	

418'

not recovered

	34		

420'

10	33, 34	large-scale cross sets, horizontal laminations	

425'

10	33		

426' 1"

10	33	purple sandstone, large-scale cross sets	

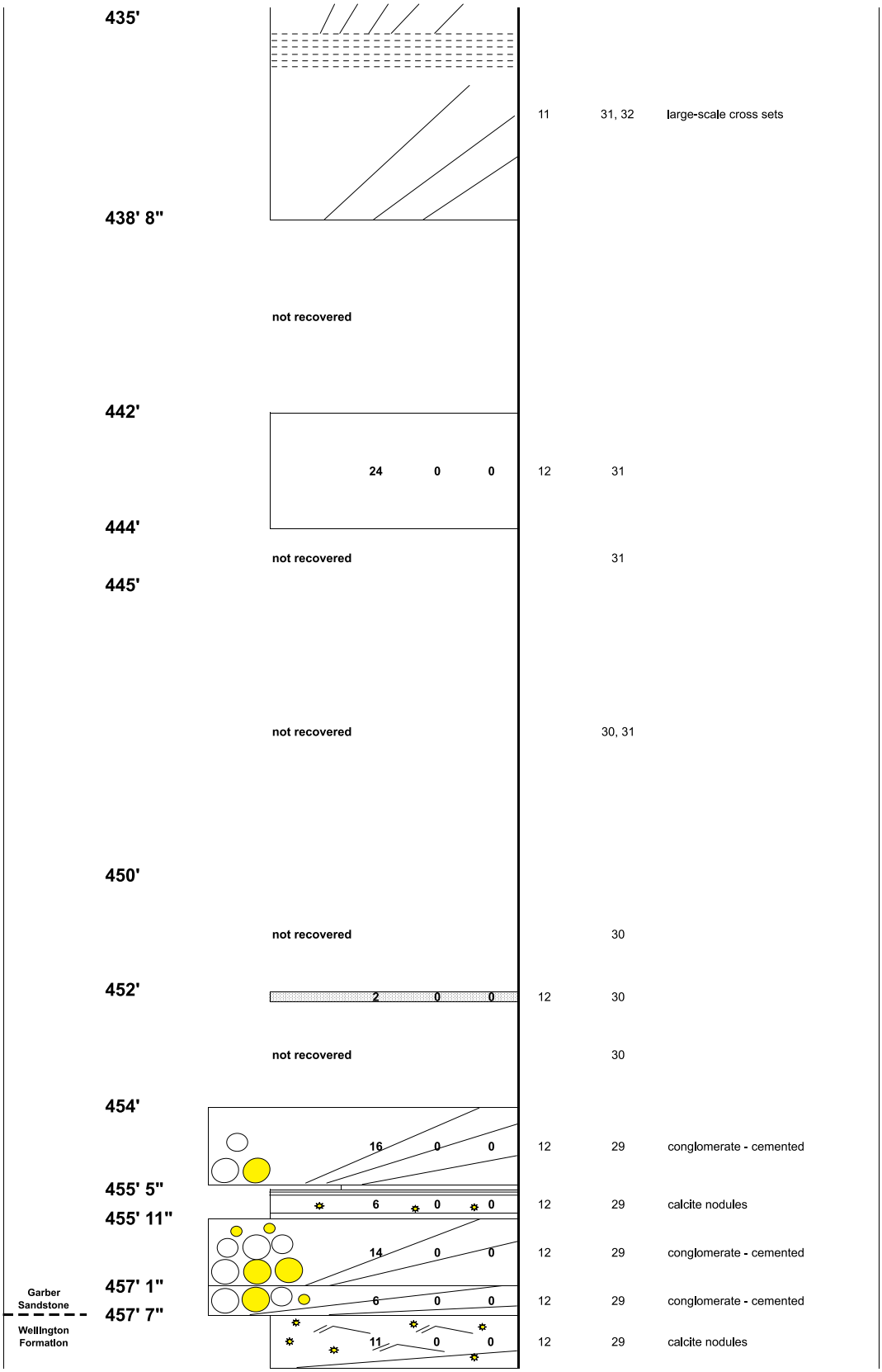
429' 4"

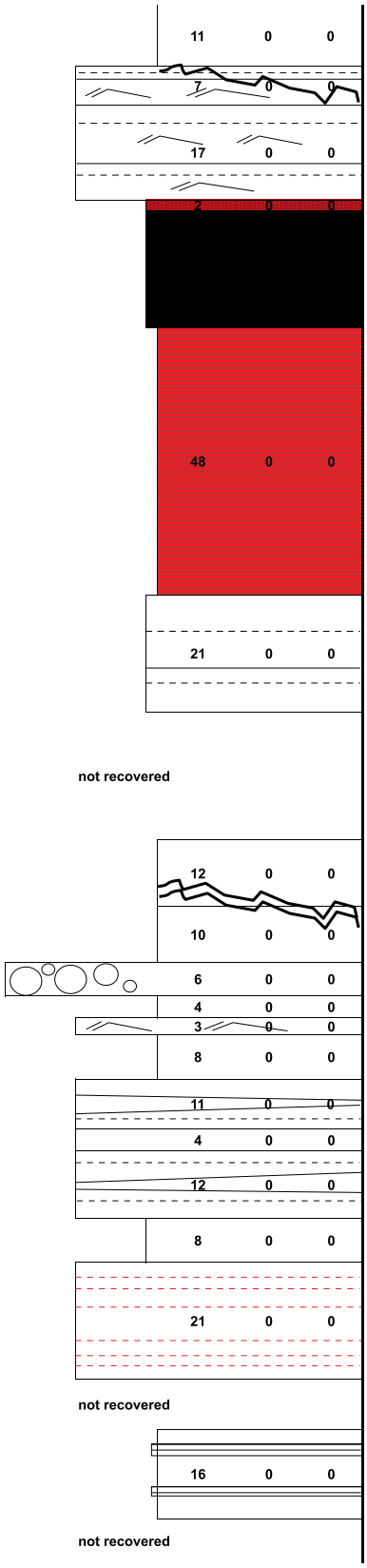
not recovered

430'

11	32	large-scale cross sets	

435'


435'
11
31, 32
large-scale cross sets
438' 8"
not recovered
442'
24
0
0
12
31
444'
not recovered
31
445'
not recovered
30, 31
450'
not recovered
30
452'
2
0
0
12
30
not recovered
30
454'
16
0
0
12
29
conglomerate - cemented
455' 5"
6
0
0
12
29
calcite nodules
455' 11"
14
0
0
12
29
conglomerate - cemented
457' 1"
6
0
0
12
29
conglomerate - cemented
Garber Sandstone
457' 7"
Wellington Formation
11
0
0
12
29
calcite nodules



458' 6"	11	0	0	12	29	core depths overlapping with below
459' 5"	7	0	0	12	29	core depths overlapping with above
460'	17	0	0	13	29	
461' 7"	2	0	0	13	29	
				13	28, 29	siltstone
463' 4"	48	0	0	13	28	no clear evidence for paleosol
467' 4"	21	0	0	13	28	siltstone
469' 1"	not recovered				27, 28	
471'	12	0	0	14	27	crenulated iron laminations
472'	10	0	0	14	27	
472' 10"	6	0	0	14	27	conglomerate - cemented
473' 4"	4	0	0	14	27	
473' 8"	3	0	0	14	27	ripples
473' 11"	8	0	0	14	27	
474' 7"	11	0	0	14	27	
475' 6"	4	0	0	14	27	
475' 10"	12	0	0	14	27	
476' 10"	8	0	0	14	27	siltstone
477' 6"	21	0	0	14	26, 27	
479' 3"	not recovered				26	
480'	16	0	0	15	26	
481' 4"	not recovered				26	

482'							
		23	0	0	15	26	siltstone
483' 11"							
		14	0	0	15	26	
485' 3"		2	0	0	15	26	
485' 7"		4	0	0	15	26	ripples
		26	0	0	15	25	siltstone and mudstone
488'		3	0	0	15	25	
		24	0	0	15	25	calcite nodules
490'	not recovered					25	
491'							6" overlap of core relative to depths on core box
		18	0	0	15	25	
492' 6"	not recovered					25	
493'							
		40	0	0	16	24, 25	low-angle cross sets
496' 4"		8	0	0	16	24	
497' 4"		4	0	0	16	24	
	not recovered						
502'							20" recovery, no evidence for paleosol
		24	0	0	17	23	
504'							22" recovery
		24	0	0	17	23	

506'		**24**	**0**	**0**	17	23	22" recovery
508'		**24**	**0**	**0**	17	23	23" recovery
510'		**17**	**0**	**0**	17	22	no clear evidence for paleosol
	not recovered					22	
512'		**24**	**0**	**0**	17	22	no clear evidence for paleosol
514'		**24**	**0**	**0**	18	22	no clear evidence for paleosol
516'		**24**	**0**	**0**	18	22	no clear evidence for paleosol
518'		**24**	**0**	**0**	18	21	
520'		**24**	**0**	**0**	18	21	
522'		**24**	**0**	**0**	18	21	
524'		**19**	**0**	**0**	19	21	
525' 7"							

525' 7"							
	not cored					20, 21	
530'							
	not cored						
531'							
		12	**0**	**0**	19	20	no iron clots
532'		★					iron clots begin @ 532' - intervals of chemical reduction 533' 6" to 535"
			★				
		36	**0**	**0** ★	19	19, 20	
		★					
		★		★			
535'							
		20	**0**	★ **0**	19	19	iron clots
		★	★				
536' 8"		**5**	**0**	**0**	19		no iron clots
537' 1"							
	not cored					15, 16, 17, 18, 19	
540'							
	not cored					15, 16, 17, 18, 19	
545'							
	not cored					15, 16, 17, 18, 19	

550'

not cored

15, 16, 17, 18, 19

555'

not cored

15, 16, 17, 18, 19

560'

not cored

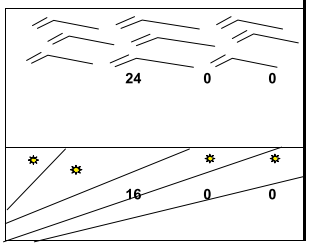
15, 16, 17, 18, 19

565'

not cored

15, 16, 17, 18, 19

570'



20	15	ripples	
20	15	calcite nodules	

573' 4"

573' 4"		8	0	0	20	15	calcite nodules
574'							
		64	1	2	20	14	calcite nodules
579' 5"	not recovered						
580'							
		24	0	0	21	13	trough cross bedding
582'		9	0	0	21	13	
		15	0	0	21	13	iron nodules
		11	0	0	21	13	iron nodules
		6	0	0	21	13	Iron nodules
		7	0	0	21	13	
		37	0	0	21	13	
589' 1"	not recovered						
590'		4	0	0	22	12	
		6	0	0	22	12	cemented
		23	0	0	22	12	conglomerate - cemented
		8	0	0	22	12	
		7	0	0	22	12	conglomerate - cemented
		5	0	0	22	12	cemented
		4	0	0	22	12	cemented
		1	0	0	22	12	
		4	0	0	22	12	cemented

595' 2"						
	not recovered					9, 10, 11, 12
	not recovered					9, 10, 11, 12
	not recovered					9, 10, 11, 12
615'		**2**	**0**	**0**	23	9
		22	**0**	**0**	23	9
617'						
	not recovered					8, 9

	not recovered					8, 9
625' **625' 4"**		**4**	**0**	**0**	23	8
	not recovered					6, 7, 8
	not recovered / not cored					6, 7, 8
	not recovered					6, 7, 8
640'						

640'		24	0	0	24	6	
642'							
642' 4"		4	0	0	24	6	
	32" - not recovered				24	6	
645'		14	0	0			
646' 2"		32	0	0	24	5, 6	trough cross beds
648' 10"		12	0	0	24	5	
649' 10"		12	0	0	24	3, 4	
650' 10"							
	not cored						
	not cored						
	not cored					3. 4	

	not cored				3 4		
670'				25	2		
				25	2		
		94	**0**	**0**	25	2	large-scale cross beds
	4" - not recovered				25	2	
		24			25	2	large-scale cross beds
677' 3"	9"- not recovered				25	2	
678'		**18**	**0**	**0**	26	1	cross beds
		10	**0**	**0**	26	1	
		13	**0**	**0**	26	1	conglomerate - cemented
681' 5"							

Appendix 3. Chemical analyses of ground-water samples and quality-assurance samples from the Norman arsenic test hole, station number 351645097253801, in October 2004

Zone	Date	Time	Quality assurance sample type	Depth to bottom of water-bearing zone (feet)	Depth to top of water-bearing zone (feet)	Elevation of land surface (feet)	Flow rate (gpm)	Pumping period prior to sampling (min)	Specific conductance, field (mS/cm at 25 °C)	pH, field, standard units	Temperature, air (°C)	Temperature, water (°C)	Turbidity, field (NTU)	Barometric pressure (mm Hg)	Dissolved oxygen, field (mg/L)	Dissolved oxygen, field (%)	Calcium (mg/L)	Magnesium (mg/L)
Zone 1	Oct 9 2004	1900		350	320	1,125	5.8	75	498	7.65	13.5	18.4	23.0	737.1	7.34	76.5	37.0	30.3
		1900	Duplicate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zone 2	Oct 11 2004	1000		456	416	1,125	5.0	60	433	7.71	16.2	18.3	35.6	729.1	6.46	68.7	25.9	21.4
Zone 3	Oct 12 2004	0900		502	488	1,125	5.1	75	474	8.76	9.3	18.5	459	732.3	6.01	64.2	2.66	1.75
		0900	Duplicate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zone 4	Oct 13 2004	1400		598	568	1,125	4.0	90	602	8.97	22.2	19.0	365	733.9	7.74	83.5	1.35	.542
		1400	Duplicate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zone 5	Oct 15 2004	0900		636	615	1,125	6.0	85	644	8.90	15.7	18.6	212	726.5	4.35	46.7	1.53	.587
		0900	Duplicate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zone 6	Oct 16 2004	1300		652	640	1,125	6.0	110	662	9.02	20.1	18.8	72.8	732.1	4.59	49.3	1.30	.443
		1300	Duplicate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zone 7	Oct 17 2004	1700		686	668	1,125	5.8	70	769	9.02	25.5	18.8	138	725.3	3.78	40.6	1.20	.433
		1700	Duplicate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Appendix 3. Chemical analyses of ground-water samples and quality-assurance samples from the Norman arsenic test hole, station number 351645097253801, in October 2004, (continued)

Zone	Date	Time	Sodium (mg/L)	Sodium adsorption ratio	Potassium (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Acid neutralizing capacity (mg/L as $CaCO_3$)	Sulfate (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Bromide (mg/L)	Iodide (mg/L)	Nitrite (mg/L as N)	Nitrite plus nitrate (mg/L as N)	Ammonia (mg/L as N)	Ortho-phosphate (mg/L as P)
Zone 1	Oct 9 2004	1900	19.5	.58	2.42	301.6	.5	248.2	7.61	14.5	.28	<1.00	<.025	<.100	.805	<.100	E.015
		1900	--	--	--	--	--	--	7.47	14.4	.28	<1.00	--	--	--	--	--
Zone 2	Oct 11 2004	1000	29.8	1.05	2.12	243.1	.5	200.2	7.61	14.5	.28	<1.00	<.025	<.100	.531	<.100	E.013
Zone 3	Oct 12 2004	0900	99.7	11.7	.821	270.6	6.9	233.5	11.9	2.34	.47	<1.00	<.025	<.100	.130	E.046	.020
		0900	--	--	--	--	--	--	--	--	--	--	<.025	--	--	--	E.019
Zone 4	Oct 13 2004	1400	133	24.5	.601	322.7	16.8	292.9	17.2	3.16	.83	<1.00	<.025	<.100	.142	<.100	.041
		1400	--	--	--	--	--	--	--	--	--	--	--	<.100	.146	<.100	--
Zone 5	Oct 15 2004	0900	150	26.1	.658	344.1	15.1	307.6	19.3	3.37	1.27	<1.00	<.025	<.100	.285	<.100	.040
		0900	--	--	--	--	--	--	19.1	3.52	1.28	<1.00	--	--	--	--	--
Zone 6	Oct 16 2004	1300	155	30.0	.766	374.4	17.5	314.3	19.1	3.44	1.17	<1.00	<.025	<.100	.274	<.100	.039
		1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zone 7	Oct 17 2004	1700	180	35.8	.660	379.4	24.5	352.3	27.9	5.72	1.35	<1.00	<.025	<.100	.265	.224	.051
		1700	--	--	--	--	--	--	--	--	--	--	<.025	<.100	.261	.213	.051

Appendix 3. Chemical analyses of ground-water samples and quality-assurance samples from the Norman arsenic test hole, station number 351645097253801, in October 2004, (continued)

Zone	Date	Time	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Arsenate (mg/L as As)	Arsenite (mg/L as As)	Dimethyl-arsinate (mg/L as As)	Monomethyl-arsonate (mg/L as As)	Barium (mg/L)	Beryllium (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Iron(II), field (mg/L)	Iron, field (mg/L)	Iron (mg/L)
Zone 1	Oct 9 2004	1900	89	<57	<110	<10	<10	<20	<10	472	<13	538	<13	30	<10	<37	<.01	.02	E68
		1900	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zone 2	Oct 11 2004	1000	E31	<57	<110	<10	<10	<20	<10	279	<13	272	<13	39	<10	<37	<.01	.01	E46
Zone 3	Oct 12 2004	0900	E67	<57	<110	E9	<10	<20	<10	103	<13	933	<13	80	<10	<37	.04	.09	<117
		0900	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zone 4	Oct 13 2004	1400	E46	<57	E45	28	<10	<20	<10	104	<13	1,420	<13	78	<10	<37	<.01	.04	<117
		1400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zone 5	Oct 15 2004	0900	E57	<57	E83	58	<10	<20	<10	131	<13	2,510	<13	79	<10	<37	.08	.65	<117
		0900	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zone 6	Oct 16 2004	1300	92	<57	67	54	<10	<20	<10	135	<13	2,600	<13	82	<10	<37	<.01	.03	E52
		1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zone 7	Oct 17 2004	1700	114	<57	E73	52	<10	<20	<10	172	<13	3,090	<13	101	<10	<37	<.01	<.01	E56
		1700	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Appendix 3. Chemical analyses of ground-water samples and quality-assurance samples from the Norman arsenic test hole, station number 351645097253801, in October 2004, (continued)

Zone	Date	Time	Lead (mg/L)	Manganese (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Strontium (mg/L)	Thallium (mg/L)	Titanium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)	Uranium (mg/L)	Deuterium/ Protium ratio (per mil)	Oxygen-18/ Oxygen-16 ratio (per mil)	Organic carbon (mg/L)
Zone 1	Oct 9 2004	1900	<50	E8	<30	<13	<100	<7	910	<90	78	<33	229	<13	-34.0	-5.70	E.497
		1900	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zone 2	Oct 11 2004	1000	<50	15	<30	<13	<100	<7	620	<90	28	<33	165	<13	-36.9	-6.10	<.500
Zone 3	Oct 12 2004	0900	<50	E8	<30	<13	<100	<7	73	<90	52	71	E17	<13	-42.0	-6.72	1.20
		0900	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.21
Zone 4	Oct 13 2004	1400	<50	E5	<30	<13	E33	<7	34	<90	31	209	<57	<13	-42.8	-6.79	<.500
		1400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zone 5	Oct 15 2004	0900	<50	E5	E9	<13	100	<7	33	<90	53	660	<57	14	-41.8	-6.75	<.500
		0900	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zone 6	Oct 16 2004	1300	<50	E5	<30	<13	E93	<7	25	<90	88	597	<57	<13	-41.6	-6.68	E.486
		1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.533
Zone 7	Oct 17 2004	1700	<50	E5	E12	<13	E46	<7	26	<90	110	510	<57	<13	-40.6	-6.62	<.500
		1700	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. Shaded rows denote quality-assurance samples [23p, packer tests in Well 23; mg/L, milligrams per liter; µg/L, micrograms per liter; gpm, gallons per minute; %, percent; min, minutes; uS/cm at 25°C, microsiemens per centimeter at 25 degrees Celsius; °C, degrees Celsius; NTU, Nephelometric Turbidity Units; mm Hg, millimeters of mercury; E, estimated below quantitation limit; <, less than quantitation limit; --, no data].

Well	USGS station number	Station name	Quality assurance sample type	Date	Time	Sampling depth (feet)	Depth to bottom of water-bearing zone (feet)	Depth to top of water-bearing zone (feet)	Elevation of land surface (feet)	Flow rate (gpm)	Pumping period prior to sampling (min)	Specific conductance, field (uS/cm at 25 °C)	pH, field, standard units	Temperature, air (°C)	Temperature, water (°C)
02	351426097232201	09N-02W-22 ADD 1	Blank	Mar 22 2005	1000	--	--	--	1128	--	--	--	--	--	--
02	351426097232201	09N-02W-22 ADD 1	Duplicate	Mar 22 2005	1001	--	--	--	1128	--	--	--	--	--	--
02	351426097232201	09N-02W-22 ADD 1		Mar 24 2005	0900	420	--	--	1128	--	--	434	7.46	12.9	--
02	351426097232201	09N-02W-22 ADD 1	Duplicate	Mar 24 2005	0900	420	--	--	1128	--	--	--	--	--	--
02	351426097232201	09N-02W-22 ADD 1		Mar 24 2005	0930	470	--	--	1128	--	--	476	7.93	14.3	--
02	351426097232201	09N-02W-22 ADD 1		Mar 24 2005	1030	530	--	--	1128	--	--	506	7.97	18.1	--
02	351426097232201	09N-02W-22 ADD 1		Mar 24 2005	1300	well head	--	--	1128	--	--	526	8.33	23.3	17.5
02	351426097232201	09N-02W-22 ADD 1		Mar 22 2005	1130	560	--	--	1128	--	--	659	7.85	8.0	--
02	351426097232201	09N-02W-22 ADD 1		Mar 24 2005	1230	600	--	--	1128	--	--	625	7.89	22.4	--
02	351426097232201	09N-02W-22 ADD 1		Mar 22 2005	1030	615	--	--	1128	--	--	659	7.60	8.9	--
02	351426097232201	09N-02W-22 ADD 1	Duplicate	Mar 22 2005	1030	615	--	--	1128	--	--	--	--	--	--
02	351426097232201	09N-02W-22 ADD 1		Jan 26 2006	1200	470	--	--	1128	--	--	445	8.13	--	--
02	351426097232201	09N-02W-22 ADD 1	Duplicate	Jan 26 2006	1200	470	--	--	1128	--	--	--	--	--	--
02	351426097232201	09N-02W-22 ADD 1		Jan 26 2006	1300	495	--	--	1128	--	--	435	7.81	--	--
02	351426097232201	09N-02W-22 ADD 1	Replicate	Jan 26 2006	1300	495	--	--	1128	--	--	--	--	--	--
02	351426097232201	09N-02W-22 ADD 1		Jan 26 2006	1230	525	--	--	1128	--	--	444	7.77	--	--
02	351426097232201	09N-02W-22 ADD 1	Duplicate	Jan 26 2006	1230	525	--	--	1128	--	--	--	--	--	--
02	351426097232201	09N-02W-22 ADD 1		Jan 26 2006	1400	well head	--	--	1128	--	--	580	8.51	--	17.8
02	351426097232201	09N-02W-22 ADD 1		Jan 26 2006	1030	615	--	--	1128	--	--	1,006	8.79	--	--
02	351426097232201	09N-02W-22 ADD 1	Duplicate	Jan 26 2006	1030	615	--	--	1128	--	--	--	--	--	--
05	351409097231801	09N-02W-22 DDA 1		Dec 20 2004	1400	well head	--	--	1161	--	--	483	8.45	19.0	17.6
05	351409097231801	09N-02W-22 DDA 1		Dec 21 2004	1030	435	--	--	1161	--	--	438	8.14	9.4	--
05	351409097231801	09N-02W-22 DDA 1		Dec 20 2004	1600	470	--	--	1161	--	--	435	8.30	19.0	--
05	351409097231801	09N-02W-22 DDA 1		Dec 21 2004	1100	500	--	--	1161	--	--	435	8.36	9.4	--
05	351409097231801	09N-02W-22 DDA 1	Duplicate	Dec 21 2004	1100	500	--	--	1161	--	--	--	--	--	--
05	351409097231801	09N-02W-22 DDA 1	Replicate	Dec 21 2004	1200	500	--	--	1161	--	--	433	8.33	9.4	--
05	351409097231801	09N-02W-22 DDA 1	Duplicate	Dec 21 2004	1201	500	--	--	1161	--	--	--	--	--	--
05	351409097231801	09N-02W-22 DDA 1		Dec 20 2004	1500	550	--	--	1161	--	--	447	8.28	19.3	--
05	351409097231801	09N-02W-22 DDA 1	Duplicate	Dec 20 2004	1500	550	--	--	1161	--	--	--	--	--	--
05	351409097231801	09N-02W-22 DDA 1		Dec 20 2004	1430	605	--	--	1161	--	--	447	8.31	19.2	--
05	351409097231801	09N-02W-22 DDA 1		Dec 20 2004	1200	635	--	--	1161	--	--	442	8.33	18.3	--
05	351409097231801	09N-02W-22 DDA 1	Duplicate	Dec 20 2004	1200	635	--	--	1161	--	--	--	--	--	--
05	351409097231801	09N-02W-22 DDA 1		Dec 20 2004	1300	660	--	--	1161	--	--	595	8.91	18.3	--
05	351409097231801	09N-02W-22 DDA 1		Nov 9 2005	1000	470	--	--	1161	--	--	442	6.92	--	--
05	351409097231801	09N-02W-22 DDA 1		Nov 9 2005	1200	500	--	--	1161	--	--	453	8.24	--	--
05	351409097231801	09N-02W-22 DDA 1	Duplicate	Nov 9 2005	1200	500	--	--	1161	--	--	--	--	--	--
05	351409097231801	09N-02W-22 DDA 1		Nov 9 2005	1100	550	--	--	1161	--	--	460	8.16	--	--
05	351409097231801	09N-02W-22 DDA 1		Nov 9 2005	1300	600	--	--	1161	--	--	466	8.32	--	--
05	351409097231801	09N-02W-22 DDA 1		Nov 9 2005	1600	well head	--	--	1161	--	--	559	8.46	--	17.6
05	351409097231801	09N-02W-22 DDA 1	Duplicate	Nov 9 2005	1600	well head	--	--	1161	--	--	--	--	--	--
05	351409097231801	09N-02W-22 DDA 1		Nov 9 2005	1500	630	--	--	1161	--	--	716	8.78	--	--
05	351409097231801	09N-02W-22 DDA 1	Duplicate	Nov 9 2005	1500	630	--	--	1161	--	--	--	--	--	--
05	351409097231801	09N-02W-22 DDA 1		Nov 9 2005	1400	660	--	--	1161	--	--	1,116	8.92	--	--

Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	Sampling depth (feet)	Turbidity, field (NTU)	Barometric pressure (mm Hg)	Dissolved oxygen, field (mg/L)	Dissolved oxygen, field (%)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)	Sodium, filtered (mg/L)	Sodium adsorption ratio	Potassium, filtered (mg/L)	Bicarbonate, unfiltered (mg/L)	Carbonate, unfiltered (mg/L)	Acid neutralizing capacity (mg/L as $CaCO_3$)
02	--	--	--	--	--	<.167	<.300	E.753	--	E.108	--	--	--
02	--	--	--	--	--	--	--	--	--	--	--	--	--
02	420	.71	724.3	--	--	13.0	11.0	67.0	3.31	1.77	263.3	1.0	217.7
02	420	--	--	--	--	--	--	--	--	--	--	--	--
02	470	.59	724.9	--	--	13.7	11.5	75.5	3.64	1.85	285.3	1.1	235.9
02	530	.74	725.2	--	--	13.6	11.4	82.5	3.99	1.76	303.7	1.3	251.4
02	well head	.35	725.2	5.99	54.1	13.4	11.1	88.6	4.33	1.73	315.8	1.5	261.5
02	560	.53	722.8	--	--	16.7	13.8	108	4.73	1.92	310.7	1.2	310.7
02	600	1.27	725.2	--	--	16.1	13.3	104	4.64	1.86	369.9	1.5	306.0
02	615	1.47	722.8	--	--	16.7	13.8	109	4.78	1.88	377.3	1.5	312.0
02	615	--	--	--	--	--	--	--	--	--	--	--	--
02	470	4.22	739.4	--	--	10.8	8.60	75.1	4.14	1.63	247.2	.9	204.2
02	470	--	--	--	--	10.9	8.59	75.2	4.14	1.58	--	--	--
02	495	2.27	739.4	--	--	10.9	8.63	75.2	4.13	1.64	252.0	2.1	210.3
02	495	--	--	--	--	10.7	8.39	74.8	4.16	1.61	--	--	--
02	525	3.26	739.4	--	--	10.1	7.88	79.5	4.56	1.57	253.2	1.6	210.3
02	525	--	--	--	--	--	--	--	--	--	--	--	--
02	well head	2.61	739.4	9.13	96.2	6.91	5.18	118	8.27	1.15	305.2	3.2	255.8
02	615	2.28	739.4	--	--	6.27	4.63	136	10.0	1.10	E407.2	E15.2	359.4
02	615	--	--	--	--	--	--	--	--	--	--	--	--
05	well head	11.4	722.3	6.30	61.6	7.24	5.34	97.3	6.69	1.13	286.0	3.6	240.6
05	435	4.25	728.8	--	--	9.53	7.56	81.5	4.79	1.98	269.2	1.7	223.7
05	470	2.24	722.3	--	--	7.03	5.27	86.9	6.04	1.17	273.5	2.8	229.1
05	500	5.55	728.8	--	--	7.08	5.26	87.9	6.10	1.17	273.9	1.5	227.1
05	500	--	--	--	--	--	--	--	--	--	--	--	--
05	500	4.72	728.8	--	--	7.00	5.26	87.3	6.07	1.14	270.6	2.7	226.4
05	500	--	--	--	--	--	--	--	--	--	--	--	--
05	550	11.89	722.3	--	--	7.85	5.85	94.4	6.22	1.22	271.1	2.8	227.1
05	550	--	--	--	--	--	--	--	--	--	--	--	--
05	605	.29	722.3	--	--	7.57	5.63	88.9	5.96	1.18	285.4	2.7	238.6
05	635	21.2	722.3	--	--	7.54	5.59	87.1	5.86	1.16	278.6	2.8	233.2
05	635	--	--	--	--	--	--	--	--	--	--	--	--
05	660	18.2	722.3	--	--	5.47	4.06	130	10.3	.998	321.2	17.3	292.5
05	470	.49	734.5	--	--	7.07	5.40	86.7	5.97	1.26	256.7	2.3	214.3
05	500	.87	734.5	--	--	7.14	5.34	90.0	6.21	1.20	262.5	2.4	219.4
05	500	--	--	--	--	--	--	--	--	--	--	--	--
05	550	.69	734.5	--	--	7.25	5.48	91.4	6.24	1.19	267.6	3.5	225.4
05	600	.69	734.5	--	--	6.52	4.85	93.3	6.74	1.14	262.8	2.3	219.4
05	well head	.57	734.5	6.17	64.8	5.60	4.08	114	8.94	1.07	288.1	5.0	244.6
05	well head	--	--	--	--	--	--	--	--	--	--	--	--
05	630	1.30	734.5	--	--	4.53	3.10	158	14.0	.862	338.1	11.9	297.2
05	630	--	--	--	--	--	--	--	--	--	--	--	--
05	660	14.7	734.5	--	--	2.35	1.13	245	32.9	.458	414.6	24.8	381.6

Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	Sampling depth (feet)	Sulfate, unfiltered (mg/L)	Chloride, unfiltered (mg/L)	Fluoride, unfiltered (mg/L)	Bromide, unfiltered (mg/L)	Iodine, unfiltered (mg/L)	Nitrite, unfiltered (mg/L as N)	Nitrite plus nitrate, unfiltered (mg/L as N)	Ammonia, unfiltered (mg/L as N)	Orthophosphate, unfiltered (mg/L as P)	Aluminum, filtered (ug/L)	Antimony, filtered (ug/L)	Arsenic, filtered (ug/L)
02	--	<1.00	E.15	<.50	<1.00	<.025	<.100	E.032	<.100	E.009	E81	<57	<110
02	--	--	--	--	--	<.025	<.100	E.017	<.100	E.008	--	--	--
02	420	12.3	4.64	E.28	<1.00	<.025	<.100	.350	<.100	E.013	138	<57	<110
02	420	--	--	--	--	<.025	--	--	--	E.014	--	--	--
02	470	14.7	5.96	E.24	<1.00	<.025	<.100	.347	<.100	E.014	217	<57	<110
02	530	16.5	6.76	E.24	<1.00	<.025	<.100	.334	.311	E.013	98	<57	<110
02	well head	17.3	7.36	E.24	<1.00	<.025	<.100	.327	<.100	E.013	111	<57	<110
02	560	24.4	11.5	E.19	<1.00	<.025	<.100	.298	<.100	E.013	130	<57	<110
02	600	24.4	11.1	E.21	<1.00	<.025	<.100	.298	.334	E.013	102	<57	<110
02	615	25.8	11.8	E.21	<1.00	<.025	<.100	.278	<.100	E.013	108	<57	<110
02	615	25.8	11.8	E.19	<1.00	--	--	--	--	--	--	--	--
02	470	12.8	4.20	--	<.250	<.025	<.100	.288	<.100	E.016	158	<10	.767
02	470	--	--	--	--	--	--	--	--	--	166	E3	--
02	495	12.9	4.25	--	<.250	<.025	<.100	.283	<.100	E.016	174	<10	.757
02	495	12.9	4.17	--	<.250	<.025	<.100	.290	<.100	E.017	220	E4	.743
02	525	13.1	3.88	--	<.250	<.025	<.100	.288	<.100	E.015	211	<10	1.01
02	525	13.0	3.93	--	<.250	<.025	<.100	.288	E.043	E.016	--	--	--
02	well head	18.4	15.2	--	<.250	<.025	<.100	.263	<.100	.023	220	E3	11.0
02	615	39.2	59.9	--	<.250	<.025	<.100	.235	<.100	.047	212	E4	13.1
02	615	--	--	--	--	--	--	--	--	--	--	--	13.1
05	well head	12.0	5.86	E.42	<1.00	<.025	E.016	.248	<.100	.021	E78	<57	<110
05	435	10.4	2.93	E.31	<1.00	<.025	E.015	.274	E.057	E.018	96	<57	<110
05	470	9.99	2.09	E.26	<1.00	<.025	E.016	.229	E.064	E.018	143	<57	<110
05	500	10.1	2.18	E.30	<1.00	<.025	E.017	.232	<.100	.020	110	<57	<110
05	500	--	--	--	--	--	E.016	.229	<.100	--	--	--	--
05	500	10.0	2.04	E.28	<1.00	<.025	<.100	.242	<.100	.020	E81	<57	<110
05	500	9.94	2.03	E.28	<1.00	<.025	--	--	--	E.019	--	--	--
05	550	10.5	3.05	E.29	<1.00	<.025	<.100	.260	<.100	.021	<87	<57	<110
05	550	--	--	--	--	<.025	--	--	--	.020	--	--	--
05	605	10.4	3.23	E.38	<1.00	<.025	E.016	.248	<.100	.020	E76	<57	<110
05	635	10.4	2.98	E.39	<1.00	<.025	<.100	.261	<.100	.020	106	<57	<110
05	635	10.7	2.98	E.40	<1.00	--	--	--	--	--	--	--	--
05	660	14.8	13.7	E.43	<1.00	<.025	<.100	.303	<.100	.027	114	<57	<110
05	470	10.2	2.36	--	<.250	<.025	<.100	.239	<.100	E.015	176	<10	1.73
05	500	10.7	3.50	--	<.250	<.025	<.100	.262	<.100	E.013	154	<10	2.28
05	500	--	--	--	--	<.025	--	--	--	E.013	--	--	--
05	550	10.9	3.68	--	<.250	<.025	<.100	.262	<.100	E.014	149	<10	2.53
05	600	11.2	3.90	--	<.250	<.025	<.100	.253	<.100	E.013	161	<10	2.90
05	well head	15.7	13.2	--	<.250	<.025	<.100	.246	<.100	E.017	185	<10	10.9
05	well head	15.6	13.1	--	<.250	--	<.100	.246	<.100	--	--	--	--
05	630	23.3	30.7	--	<.250	<.025	<.100	.240	<.100	.028	176	<10	28.3
05	630	--	--	--	--	--	--	--	--	--	--	--	--
05	660	42.9	86.9	--	E.225	<.025	<.100	.259	E.037	.052	195	<10	63.1

Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	Sampling depth (feet)	Arsenate, filtered (ug/L as As)	Arsenite, filtered (ug/L as As)	Dimethyl-arsinate, filtered (ug/L as As)	Monomethyl-arsonate, filtered (ug/L as As)	Barium, filtered (ug/L)	Beryllium, filtered (ug/L)	Boron, filtered (ug/L)	Cadmium, filtered (ug/L)	Chromium, filtered (ug/L)	Cobalt, filtered (ug/L)	Copper, filtered (ug/L)	Iron(II), filtered, field (mg/L)	Iron, filtered, field (mg/L)	Iron, filtered (ug/L)
02	--	<10	<10	<20	<10	108	<13	375	<13	<10	<10	<37	.01	.06	E45
02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
02	420	<10	<10	<20	<10	323	<13	955	<13	73	<10	<37	.02	.05	E60
02	420	--	--	--	--	--	--	--	--	--	--	--	--	--	--
02	470	<10	<10	<20	<10	441	<13	1,210	<13	64	<10	<37	.03	.10	E99
02	530	<10	<10	<20	<10	272	<13	1,120	<13	58	<10	<37	.10	.20	E53
02	well head	<10	<10	<20	<10	284	<13	1,250	<13	54	<10	<37	.07	.18	E58
02	560	<10	<10	<20	<10	298	<13	1,580	<13	30	<10	<37	.14	.33	66
02	600	<10	<10	<20	<10	254	<13	1,480	<13	35	<10	<37	.02	.06	E55
02	615	<10	<10	<20	<10	261	<13	1,560	<13	29	<10	<37	.06	.09	E60
02	615	--	--	--	--	--	--	--	--	--	--	--	--	--	--
02	470	<10	<10	<10	<10	359	<3	934	<3	76	<3	<20	.01	.01	71
02	470	--	--	--	--	361	<3	930	<3	76	<3	<20	--	--	72
02	495	<10	<10	<10	<10	367	<3	1,030	<3	75	<3	<20	<.01	.07	76
02	495	<10	<10	<10	<10	440	<3	1,040	<3	80	<3	<20	--	--	100
02	525	<10	<10	<10	<10	408	<3	1,200	<3	76	<3	<20	<.01	.01	94
02	525	<10	<10	<10	<10	--	--	--	--	--	--	--	--	--	--
02	well head	E9.14	<10	<10	<10	372	<3	1,860	<3	83	<3	<20	.03	.03	104
02	615	17.0	<10	<10	<10	351	<3	2,270	<3	85	<3	<20	.08	.08	94
02	615	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	well head	<10	<10	<20	<10	285	<13	782	<13	68	<10	<37	.01	.03	E35
05	435	<10	<10	<20	<10	296	<13	788	<13	64	<10	<37	.04	.12	E43
05	470	<10	<10	<20	<10	344	<13	912	<13	68	<10	<37	.04	.08	E63
05	500	<10	<10	<20	<10	321	<13	838	<13	69	<10	<37	.03	.16	E53
05	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	500	<10	<10	<20	<10	289	<13	644	<13	68	<10	<37	.09	.19	<117
05	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	550	<10	<10	<20	<10	282	<13	881	<13	70	<10	<37	.08	.23	<117
05	550	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	605	<10	<10	<20	<10	281	<13	703	<13	67	<10	<37	.07	.18	<117
05	635	<10	<10	<20	<10	327	<13	758	<13	67	<10	<37	.06	.07	E47
05	635	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	660	22	<10	<20	<10	256	<13	1,460	<13	64	<10	<37	.10	.12	E62
05	470	<10	<10	<10	<10	420	<3	1,030	<3	67	<3	<20	.82	.93	79
05	500	<10	<10	<10	E5.32	392	<3	944	<3	67	<3	<20	.17	.33	68
05	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	550	<10	<10	<10	<10	380	<3	1,030	<3	68	<3	<20			68
05	600	<10	<10	<10	<10	389	<3	1,120	<3	69	<3	<20	.08	.15	73
05	well head	<10	<10	<10	<10	401	<3	1,370	<3	73	<3	<20	.02	.04	85
05	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	630	20	<10	<10	<10	353	<3	2,260	<3	85	<3	<20	.14	.26	88
05	630	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	660	48	<10	<10	<10	339	<3	3,620	<3	114	<3	<20	.28	.32	96

Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	Sampling depth (feet)	Lead, filtered (ug/L)	Manganese, filtered (ug/L)	Molybdenum, filtered (ug/L)	Nickel, filtered (ug/L)	Selenium, filtered (ug/L)	Silver, filtered (ug/L)	Strontium, filtered (ug/L)	Thallium, filtered (ug/L)	Titanium, filtered (ug/L)	Vanadium, filtered (ug/L)	Zinc, filtered (ug/L)	Uranium, filtered (ug/L)	Organic carbon, filtered (mg/L)	Deuterium /Protium ratio (per mil)	Oxygen-18 /Oxygen-16 ratio (per mil)
02	--	<50	<10	<30	<13	<100	<7	<20	<90	48	<33	<57	<13	<.500	--	--
02	--	--	--	--	--	--	--	--	--	--	--	--	--	<.500	--	--
02	420	<50	<10	<30	<13	<100	E3	363	<90	64	<33	<57	<13	<.500	-38.5	-6.50
02	420	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
02	470	<50	<10	<30	<13	<100	E3	374	<90	117	<33	<57	<13	E.418	--	--
02	530	<50	<10	<30	<13	<100	E3	365	<90	50	<33	<57	<13	<.500	--	--
02	well head	<50	<10	<30	<13	<100	<7	358	<90	56	<33	<57	<13	<.500	-37.0	-6.32
02	560	<50	<10	<30	<13	<100	<7	424	<90	69	E11	<57	<13	E.339	--	--
02	600	<50	<10	<30	<13	<100	<7	406	<90	<52	E13	<57	<13	E.359	--	--
02	615	<50	<10	<30	<13	E31	<7	423	<90	57	E12	<57	<13	E.252	-35.8	-5.98
02	615	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
02	470	<10	<3	E2	<3	E7	E1	312	<20	81	E6	<17	<20	E.570	--	--
02	470	<10	<3	E2	<3	E6	<3	313	<20	81	7	<17	<20	--	--	--
02	495	<10	<3	E3	<3	E8	<3	313	<20	88	7	<17	<20	E.890	--	--
02	495	<10	<3	3	<3	E7	<3	310	<20	120	10	<17	<20	1.00	--	--
02	525	<10	<3	3	<3	E10	<3	295	<20	110	8	<17	<20	<1.00	--	--
02	525	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
02	well head	<10	<3	9	<3	20	<3	198	<20	110	112	E14	<20	E.758	--	--
02	615	<10	<3	13	<3	23	<3	181	<20	108	157	<17	<20	.996	--	--
02	615	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	well head	<50	<10	<30	<13	<100	<7	189	<90	70	53	<57	<13	<.500	-40.6	-6.59
05	435	<50	<10	<30	<13	<100	<7	245	<90	81	E13	<57	<13	.881	-41.0	-6.64
05	470	<50	<10	<30	<13	<100	<7	185	<90	121	E18	<57	<13	<.500	-41.2	-6.67
05	500	<50	<10	<30	<13	<100	<7	186	<90	99	E20	<57	<13	<.500	-39.8	-6.55
05	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	500	<50	<10	<30	<13	<100	<7	186	<90	67	E18	<57	<13	.675	-39.8	-6.61
05	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	550	<50	<10	<30	<13	<100	<7	205	<90	<27	E20	<57	<13	1.53	-40.1	-6.65
05	550	--	--	--	--	--	--	--	--	--	--	--	--	1.61	--	--
05	605	<50	<10	<30	<13	<100	<7	197	<90	65	E20	<57	<13	<.500	-40.5	-6.60
05	635	<50	<10	<30	<13	<100	<7	196	<90	94	E20	<57	<13	.788	-40.3	-6.62
05	635	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	660	<50	<10	<30	<13	<100	<7	134	<90	102	202	<57	<13	E.365	-39.7	-6.48
05	470	<10	<3	E2	<3	E9	<3	196	<20	89	18	<17	<20	E.338	--	--
05	500	<10	<3	E2	<3	E7	<3	196	<20	77	21	<17	<20	<.500	--	--
05	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	550	<10	<3	E2	<3	E10	<3	199	<20	73	24	<17	<20	<.500	--	--
05	600	<10	<3	3	<3	E12	E1	179	<20	83	27	<17	<20	<.500	--	--
05	well head	<10	<3	7	<3	14	<3	155	<20	95	100	<17	<20	<.500	--	--
05	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	630	<10	<3	17	<3	23	<3	118	<20	87	267	<17	<20	2.63	--	--
05	630	--	--	--	--	--	--	--	--	--	--	--	--	2.40	--	--
05	660	<10	E1	29	<3	40	<3	54	<20	98	578	<17	<20	E.253	--	--

Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	USGS station number	Station name	Quality assurance sample type	Date	Time	Sampling depth (feet)	Depth to bottom of water-bearing zone (feet)	Depth to top of water-bearing zone (feet)	Elevation of land surface (feet)	Flow rate (gpm)	Pumping period prior to sampling (min)	Specific conductance, field (uS/cm at 25 °C)	pH, field, standard units	Temperature, air (°C)	Temperature, water (°C)
06	351357097242001	09N-02W-27 BBB 2		Mar 25 2005	1100	435	--	--	1190	--	--	689	8.35	12.4	--
06	351357097242001	09N-02W-27 BBB 2		Mar 25 2005	1000	480	--	--	1190	--	--	724	8.40	8.3	--
06	351357097242001	09N-02W-27 BBB 2	Duplicate	Mar 25 2005	1000	480	--	--	1190	--	--	--	--	--	--
06	351357097242001	09N-02W-27 BBB 2		Mar 25 2005	1030	540	--	--	1190	--	--	702	8.39	8.9	--
06	351357097242001	09N-02W-27 BBB 2	Duplicate	Mar 25 2005	1030	540	--	--	1190	--	--	--	--	--	--
06	351357097242001	09N-02W-27 BBB 2		Mar 25 2005	1230	580	--	--	1190	--	--	680	8.41	14.8	--
06	351357097242001	09N-02W-27 BBB 2		Mar 25 2005	1330	605	--	--	1190	--	--	951	8.73	13.6	--
06	351357097242001	09N-02W-27 BBB 2	Duplicate	Mar 25 2005	1330	605	--	--	1190	--	--	--	--	--	--
06	351357097242001	09N-02W-27 BBB 2		Mar 25 2005	1400	well head	--	--	1190	--	--	699	8.35	14.8	17.6
06	351357097242001	09N-02W-27 BBB 2	Duplicate	Mar 25 2005	1400	well head	--	--	1190	--	--	--	--	--	--
06	351357097242001	09N-02W-27 BBB 2		Mar 25 2005	1200	620	--	--	1190	--	--	815	8.77	13.2	--
07	351414097293901	09N-03W-23 CBC 1		Nov 8 2004	1500	580	--	--	1162	--	--	1,366	8.39	22.0	--
07	351414097293901	09N-03W-23 CBC 1	Duplicate	Nov 8 2004	1500	580	--	--	1162	--	--	--	--	--	--
07	351414097293901	09N-03W-23 CBC 1		Nov 8 2004	1400	598	--	--	1162	--	--	1,364	8.38	21.8	--
07	351414097293901	09N-03W-23 CBC 1		Nov 8 2004	1300	610	--	--	1162	--	--	1,369	8.40	21.2	--
07	351414097293901	09N-03W-23 CBC 1		Nov 8 2004	1200	625	--	--	1162	--	--	1,357	8.42	19.5	--
07	351414097293901	09N-03W-23 CBC 1		Nov 8 2004	1000	655	--	--	1162	--	--	1,356	8.35	19.5	--
07	351414097293901	09N-03W-23 CBC 1	Duplicate	Nov 8 2004	1000	655	--	--	1162	--	--	--	--	--	--
07	351414097293901	09N-03W-23 CBC 1		Nov 8 2004	1100	well head	--	--	1162	--	--	1,252	8.45	19.5	18.1
13	351550097283801	09N-03W-12 CCB 1		Aug 24 2004	1300	490	--	--		--	--	577	8.99	--	--
13	351550097283801	09N-03W-12 CCB 1	Duplicate	Aug 24 2004	1300	490	--	--		--	--	--	--	--	--
13	351550097283801	09N-03W-12 CCB 1		Aug 24 2004	1030	515	--	--		--	--	545	8.84	--	--
13	351550097283801	09N-03W-12 CCB 1		Aug 24 2004	0900	535	--	--		--	--	546	8.59	--	--
13	351550097283801	09N-03W-12 CCB 1		Aug 23 2004	1300	560	--	--		--	--	543	8.88	--	--
13	351550097283801	09N-03W-12 CCB 1	Duplicate	Aug 23 2004	1300	560	--	--		--	--	--	--	--	--
13	351550097283801	09N-03W-12 CCB 1		Aug 23 2004	1030	595	--	--		--	--	543	8.74	--	--
13	351550097283801	09N-03W-12 CCB 1		Aug 23 2004	1130	well head	--	--		--	--	571	8.90	--	19.9
13	351550097283801	09N-03W-12 CCB 1		Aug 23 2004	0900	615	--	--		--	--	534	8.82	--	--
13	351550097283801	09N-03W-12 CCB 1	Duplicate	Aug 23 2004	0900	615	--	--		--	--	--	--	--	--
15	351648097285101	09N-03W-11 AAC 1		Jan 10 2005	1000	500	--	--	1155	--	--	533	9.02	15.1	--
15	351648097285101	09N-03W-11 AAC 1	Duplicate	Jan 10 2005	1000	500	--	--	1155	--	--	--	--	--	--
15	351648097285101	09N-03W-11 AAC 1		Jan 10 2005	0930	525	--	--	1155	--	--	555	9.08	13.7	--
15	351648097285101	09N-03W-11 AAC 1		Jan 10 2005	0900	565	--	--	1155	--	--	641	9.15	12.4	--
15	351648097285101	09N-03W-11 AAC 1		Jan 10 2005	1030	605	--	--	1155	--	--	618	9.12	15.4	--
15	351648097285101	09N-03W-11 AAC 1	Duplicate	Jan 10 2005	1030	605	--	--	1155	--	--	--	--	--	--
15	351648097285101	09N-03W-11 AAC 1		Jan 10 2005	1300	well head	--	--	1155	--	--	632	9.11	18.7	17.6
15	351648097285101	09N-03W-11 AAC 1		Jan 10 2005	1230	625	--	--	1155	--	--	692	9.22	17.2	--
15	351648097285101	09N-03W-11 AAC 1		Jan 10 2005	1400	645	--	--	1155	--	--	693	9.20	18.7	--
15	351648097285101	09N-03W-11 AAC 1	Duplicate	Jan 10 2005	1400	645	--	--	1155	--	--	--	--	--	--

Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	Sampling depth (feet)	Turbidity, field (NTU)	Barometric pressure (mm Hg)	Dissolved oxygen, field (mg/L)	Dissolved oxygen, field (%)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)	Sodium, filtered (mg/L)	Sodium adsorption ratio	Potassium, filtered (mg/L)	Bicarbonate, unfiltered (mg/L)	Carbonate, unfiltered (mg/L)	Acid neutralizing capacity (mg/L as $CaCO_3$)
06	435	2.48	728.6	--	--	7.07	4.42	150	10.9	.977	410.1	5.6	345.7
06	480	.76	727.8	--	--	6.86	4.06	159	11.9	.878	427.2	7.3	362.6
06	480	--	--	--	--	--	--	--	--	--	--	--	--
06	540	2.39	727.8	--	--	6.91	4.17	154	11.4	.968	418.2	5.6	352.5
06	540	--	--	--	--	--	--	--	--	--	--	--	--
06	580	4.19	728.6	--	--	7.25	4.25	149	10.9	.966	410.6	4.7	344.7
06	605	4.62	728.6	--	--	4.68	2.30	211	20.0	.749	431.6	15.6	380.1
06	605	--	--	--	--	--	--	--	--	--	--	--	--
06	well head	1.63	728.6	3.78	36.9	6.67	4.12	150	11.3	.970	404.1	6.7	342.7
06	well head	--	--	--	--	--	--	--	--	--	--	--	--
06	620	13.3	728.6	--	--	4.74	2.46	183	17.0	.765	437.3	14.0	382.1
07	580	2.26	739.7	--	--	3.81	1.37	303	33.9	1.19	434.7	7.6	369.3
07	580	--	--	--	--	--	--	--	--	--	--	--	--
07	598	1.25	739.7	--	--	3.86	1.38	304	33.8	1.25	439.6	6.9	372.0
07	610	.67	739.7	--	--	3.84	1.38	304	33.9	1.19	444.6	8.0	378.1
07	625	1.16	739.7	--	--	3.82	1.37	303	33.8	1.17	437.1	7.4	371.0
07	655	.93	739.7	--	--	3.72	1.38	302	34.0	1.08	441.5	7.7	375.0
07	655	--	--	--	--	--	--	--	--	--	--	--	--
07	well head	1.59	739.7	2.21	23.4	3.33	1.18	278	33.3	1.11	426.4	8.5	363.9
13	490	5.22	731.0	--	--	1.61	.766	132	21.4	.648	290.9	8.4	252.7
13	490	--	--	--	--	--	--	--	--	--	--	--	--
13	515	.77	731.0	--	--	2.24	1.15	125	16.9	.735	290.0	11.8	257.7
13	535	3.92	731.0	--	--	2.05	1.01	126	18.0	.795	280.7	10.4	247.7
13	560	2.15	731.7	--	--	1.96	.982	126	18.3	.707	287.9	10.5	253.7
13	560	--	--	--	--	--	--	--	--	--	--	--	--
13	595	.96	731.7	--	--	2.13	.979	126	17.9	.722	285.8	10.3	251.7
13	well head	3.93	731.7	5.95	68.2	1.98	.959	126	18.4	.678	272.8	12.5	244.7
13	615	.96	731.7	--	--	2.06	.972	125	18.0	.671	291.9	3.1	244.7
13	615	--	--	--	--	--	--	--	--	--	--	--	--
15	500	8.67	730.2	--	--	1.65	.995	124	18.8	.470	302.3	14.3	271.9
15	500	--	--	--	--	--	--	--	--	--	--	--	--
15	525	3.52	730.2	--	--	1.55	.896	129	20.4	.470	300.0	17.2	275.0
15	565	1.14	730.2	--	--	1.19	.547	148	28.2	.389	319.5	23.3	301.2
15	605	2.48	730.2	--	--	1.27	.630	145	26.3	.431	316.0	22.0	296.2
15	605	--	--	--	--	--	--	--	--	--	--	--	--
15	well head	1.97	730.2	5.57	58.4	2.00	.712	147	22.7	.423	327.0	20.9	303.3
15	625	8.28	730.2	--	--	.949	.323	162	36.7	.342	329.7	28.6	318.4
15	645	1.86	730.2	--	--	.968	.320	163	36.7	.335	324.1	28.3	313.4
15	645	--	--	--	--	--	--	--	--	--	--	--	--

Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	Sampling depth (feet)	Sulfate, unfiltered (mg/L)	Chloride, unfiltered (mg/L)	Fluoride, unfiltered (mg/L)	Bromide, unfiltered (mg/L)	Iodine, unfiltered (mg/L)	Nitrite, unfiltered (mg/L as N)	Nitrite plus nitrate, unfiltered (mg/L as N)	Ammonia, unfiltered (mg/L as N)	Orthophosphate, unfiltered (mg/L as P)	Aluminum, filtered (ug/L)	Antimony, filtered (ug/L)	Arsenic, filtered (ug/L)
06	435	19.9	11.7	E.18	<1.00	<.025	<.100	.181	<.100	.021	119	<57	9.12
06	480	20.9	12.7	E.17	<1.00	<.025	<.100	.164	.344	.023	103	<57	11.4
06	480	20.9	12.7	E.18	<1.00	--	--	--	--	--	--	--	--
06	540	20.2	12.2	E.18	<1.00	<.025	<.100	.166	.339	.023	151	<57	10.5
06	540	--	--	--	--	<.025	--	--	--	.022	--	--	--
06	580	19.5	11.3	E.18	<1.00	<.025	<.100	.183	<.100	E.019	117	<57	8.99
06	605	35.4	60.4	.68	<1.00	<.025	<.100	.206	<.100	.031	123	<57	24.5
06	605	--	--	--	--	--	<.100	.221	<.100	--	--	--	--
06	well head	20.4	15.4	E.20	<1.00	<.025	<.100	.194	.329	E.019	135	<57	9.55
06	well head	--	--	--	--	<.025	--	--	--	E.019	--	--	--
06	620	25.3	26.9	E.36	<1.00	<.025	<.100	.171	<.100	.029	149	<57	19.0
07	580	278	22.2	2.15	<1.00	E.012	<.100	E.033	<.100	.024	E80	<57	E36
07	580	--	--	--	--	<.025	<.100	E.034	E.049	E.015	--	--	--
07	598	282	21.9	2.17	<1.00	<.025	<.100	E.029	E.027	.023	90	<57	E38
07	610	284	22.6	2.19	<1.00	<.025	<.100	E.037	E.027	.024	109	<57	E39
07	625	282	22.7	2.22	<1.00	<.025	<.100	E.044	<.100	.024	E61	<57	E33
07	655	292	21.9	2.13	<1.00	E.010	<.100	E.030	E.048	.025	E44	<57	<110
07	655	294	23.2	2.16	<1.00	--	--	--	--	--	--	--	--
07	well head	223	20.3	1.99	<1.00	<.025	<.100	E.067	E.063	.027	96	<57	E40
13	490	13.7	3.94	.21	<.250	<.025	<.100	.261	<.100	.030	196	<57	E43
13	490	--	--	--	<.250	<.025	<.100	.267	E.037	.033	--	--	--
13	515	12.4	3.92	.22	<.250	<.025	<.100	.277	<.100	.032	206	<57	E35
13	535	12.4	3.73	.23	<.250	<.025	<.100	.266	<.100	.027	916	<57	E37
13	560	12.6	3.75	.24	<.250	<.025	<.100	.272	E.045	.029	200	<57	E35
13	560	--	--	--	--	--	--	--	--	--	--	--	--
13	595	12.9	3.76	.23	<.250	<.025	<.100	.271	E.079	.029	265	<57	E38
13	well head	13.1	3.79	.21	<.250	<.025	<.100	.267	E.030	.030	226	<57	E36
13	615	12.7	4.53	.28	<.250	<.025	<.100	.266	E.076	.029	198	<57	E37
13	615	12.6	4.58	.26	--	--	--	--	--	--	--	--	--
15	500	11.8	4.43	E.22	<1.00	<.025	<.100	.385	<.100	.028	88	<57	<110
15	500	12.1	4.42	E.22	<1.00	--	--	--	--	--	--	--	--
15	525	14.9	5.02	E.22	<1.00	<.025	<.100	.404	<.100	.030	E44	<57	E37
15	565	27.5	7.93	E.21	<1.00	<.025	<.100	.473	<.100	.033	E42	<57	E51
15	605	24.8	7.38	E.25	<1.00	<.025	<.100	.457	E.034	.033	E75	<57	E50
15	605	--	--	--	--	<.025	--	--	--	.033	--	--	--
15	well head	26.4	7.79	E.21	<1.00	<.025	<.100	.467	E.074	.032	E70	<57	E49
15	625	35.8	9.99	E.32	<1.00	<.025	<.100	.530	E.048	.037	E33	<57	E60
15	645	35.1	9.90	E.29	<1.00	<.025	<.100	.529	<.100	.037	E64	<57	E60
15	645	--	--	--	--	<.025	<.100	.532	<.100	.036	--	--	--

Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	Sampling depth (feet)	Arsenate, filtered (ug/L as As)	Arsenite, filtered (ug/L as As)	Dimethyl-arsinate, filtered (ug/L as As)	Monomethyl-arsonate, filtered (ug/L as As)	Barium, filtered (ug/L)	Beryllium, filtered (ug/L)	Boron, filtered (ug/L)	Cadmium, filtered (ug/L)	Chromium, filtered (ug/L)	Cobalt, filtered (ug/L)	Copper, filtered (ug/L)	Iron(II), filtered, field (mg/L)	Iron, filtered, field (mg/L)	Iron, filtered (ug/L)
06	435	<10	<10	<20	<10	579	<13	1,580	<13	19	<10	<37	.13	.19	E57
06	480	10	<10	<20	<10	587	<13	1,580	<13	16	<10	<37	.08	.13	E57
06	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06	540	10	<10	<20	<10	659	<13	1,640	<13	17	<10	<37	.06	.07	E73
06	540	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06	580	<10	<10	<20	<10	606	<13	1,570	<13	21	<10	<37	.15	.38	E64
06	605	22	<10	<20	<10	375	<13	2,250	<13	34	<10	<37	.17	.18	E108
06	605	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06	well head	<10	<10	<20	<10	614	<13	1,590	<13	23	<10	<37	.02	.09	E67
06	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06	620	21	<10	<20	<10	431	<13	1,990	<13	19	<10	<37	.01	.16	E93
07	580	17	<10	<20	<10	100	<13	5,080	<13	<10	<10	<37	<.01	.07	E41
07	580	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07	598	15	<10	<20	<10	101	<13	5,000	<13	<10	<10	<37	.01	.09	E44
07	610	16	<10	<20	<10	131	<13	5,070	<13	<10	<10	<37	.03	.06	E53
07	625	15	<10	<20	<10	84	<13	4,850	<13	<10	<10	<37	.02	.04	<117
07	655	15	<10	<20	<10	69	<13	4,770	<13	<10	<10	<37	.08	.15	<117
07	655	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07	well head	22	<10	<20	<10	118	<13	4,460	<13	14	<10	<37	.05	.13	E51
13	490	34	<10	<20	<10	422	<13	1,440	<13	23	<10	<37	.07	.15	E107
13	490	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13	515	28	<10	<20	<10	476	<13	1,440	<13	22	<10	<37	.07	.18	E110
13	535	30	<10	<20	<10	518	<13	1,590	<13	23	<10	<37	.02	.07	E109
13	560	28	<10	<20	<10	445	<13	1,460	<13	24	<10	<37	.08	.21	E102
13	560	27	<10	<10	<20	--	--	--	--	--	--	--	--	--	--
13	595	28	<10	<20	<10	523	<13	1,550	<13	24	<10	<37	.06	.16	137
13	well head	27	<10	<20	<10	469	<13	1,470	<13	24	<10	<37	.03	.07	E116
13	615	28	<10	<20	<10	434	<13	1,340	<13	26	<10	<37	.01	.10	E100
13	615	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15	500	27	<10	<20	<10	238	<13	1,170	<13	19	<10	<37	.07	.10	E48
15	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15	525	32	<10	<20	<10	194	<13	981	<13	19	<10	<37	.02	.04	<117
15	565	44	<10	<20	<10	163	<13	1,040	<13	22	<10	<37	.02	.03	<117
15	605	36	<10	<20	<10	200	<13	1,260	<13	22	<10	<37	.02	.04	E47
15	605	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15	well head	41	<10	<20	<10	209	<13	1,210	<13	21	<10	<37	<.01	.07	E54
15	625	44	<10	<20	<10	140	<13	1,100	<13	22	<10	<37	.10	.29	E87
15	645	51	<10	<20	<10	157	<13	1,240	<13	23	<10	<37	.24	.28	E49
15	645	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	Sampling depth (feet)	Lead, filtered (ug/L)	Manganese, filtered (ug/L)	Molybdenum, filtered (ug/L)	Nickel, filtered (ug/L)	Selenium, filtered (ug/L)	Silver, filtered (ug/L)	Strontium, filtered (ug/L)	Thallium, filtered (ug/L)	Titanium, filtered (ug/L)	Vanadium, filtered (ug/L)	Zinc, filtered (ug/L)	Uranium, filtered (ug/L)	Organic carbon, filtered (mg/L)	Deuterium /Protium ratio (per mil)	Oxygen-18 /Oxygen-16 ratio (per mil)
06	435	<50	<10	<30	<13	E34	<7	191	<90	57	65	<57	<13	.854	-36.9	-6.30
06	480	<50	<10	<30	<13	E39	<7	184	<90	50	75	<57	<13	.541	-37.4	-6.18
06	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06	540	<50	<10	<30	<13	<100	E2	187	<90	78	70	<57	<13	.829	-38.2	-6.18
06	540	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06	580	<50	<10	<30	<13	<100	<7	187	<90	59	64	<57	<13	1.38	-37.7	-6.20
06	605	<50	<10	E14	<13	E43	<7	113	<90	63	241	<57	<13	1.27	-38.7	-6.31
06	605	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06	well head	<50	<10	<30	<13	<100	<7	182	<90	71	73	<57	<13	E.405	-37.2	-6.29
06	well head	--	--	--	--	--	--	--	--	--	--	--	--	E.379	--	--
06	620	<50	<10	<30	<13	E33	<7	117	<90	77	176	<57	<13	1.31	-37.2	-6.24
07	580	<50	<10	52	<13	<100	<7	97	<90	76	E19	<57	29	.655	-41.4	-6.72
07	580	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07	598	<50	<10	52	<13	<100	<7	98	<90	78	E21	<57	27	E.302	--	--
07	610	<50	E3	52	<13	<100	<7	100	<90	104	E21	<57	21	.558	--	--
07	625	<50	<10	49	<13	<100	<7	97	<90	58	E18	<57	42	<.500	--	--
07	655	<50	E3	49	<13	<100	<7	96	<90	45	E13	<57	44	1.38	-41.8	-6.76
07	655	--	--	--	--	--	--	--	--	--	--	--	--	1.51	--	--
07	well head	<50	<10	42	<13	<100	<7	84	<90	93	83	<57	16	<.500	-42.4	-6.82
13	490	<50	<10	<30	<13	<100	<7	51	<90	111	196	<57	<13	E.488	-39.2	-6.51
13	490	--	--	--	--	--	--	--	--	--	--	--	--	.522	--	--
13	515	<50	<10	<30	<13	<100	<7	70	<90	110	167	<57	<13	1.19	--	--
13	535	<50	<10	<30	<13	<100	<7	63	<90	172	172	<57	<13	.547	--	--
13	560	<50	<10	<30	<13	<100	<7	61	<90	109	171	<57	<13	<.500	--	--
13	560	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13	595	<50	<10	<30	<13	<100	<7	61	<90	141	173	<57	<13	.608	--	--
13	well head	<50	<10	<30	<13	<100	<7	60	<90	119	170	<57	<13	.595	-39.0	-6.60
13	615	<50	<10	<30	<13	<100	<7	60	<90	109	167	<57	<13	E.483	-38.9	-6.53
13	615	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15	500	<50	<10	<30	<13	<100	<7	54	<90	78	146	<57	<13	.510	-38.8	-6.50
15	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15	525	<50	<10	<30	<13	<100	<7	50	<90	45	153	<57	<13	1.17	--	--
15	565	<50	<10	<30	<13	<100	<7	41	<90	45	182	<57	<13	.538	--	--
15	605	<50	<10	<30	<13	<100	<7	43	<90	76	178	<57	<13	E.267	--	--
15	605	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15	well head	<50	E7	<30	<13	<100	<7	49	<90	83	161	<57	<13	1.11	-38.3	-6.40
15	625	<50	<10	<30	<13	<100	<7	33	<90	42	199	<57	<13	.545	--	--
15	645	<50	<10	<30	<13	<100	<7	33	<90	62	201	<57	<13	1.17	-38.2	-6.47
15	645	--	--	--	--	--	--	--	--	--	--	--	--	1.29	--	--

Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	USGS station number	Station name	Quality assurance sample type	Date	Time	Sampling depth (feet)	Depth to bottom of water-bearing zone (feet)	Depth to top of water-bearing zone (feet)	Elevation of land surface (feet)	Flow rate (gpm)	Pumping period prior to sampling (min)	Specific conductance, field (uS/cm at 25 °C)	pH, field, standard units	Temperature, air (°C)	Temperature, water (°C)
18	351726097290901	09N-03W-02 BAA 1		Jan 20 2005	1030	495	--	--	1180	--	--	567	8.96	14.6	--
18	351726097290901	09N-03W-02 BAA 1	Duplicate	Jan 20 2005	1030	495	--	--	1180	--	--	--	--	--	--
18	351726097290901	09N-03W-02 BAA 1		Jan 20 2005	1000	535	--	--	1180	--	--	570	8.96	11.9	--
18	351726097290901	09N-03W-02 BAA 1	Duplicate	Jan 20 2005	1000	535	--	--	1180	--	--	--	--	--	--
18	351726097290901	09N-03W-02 BAA 1		Jan 20 2005	1100	585	--	--	1180	--	--	573	8.96	19.7	--
18	351726097290901	09N-03W-02 BAA 1	Duplicate	Jan 20 2005	1100	585	--	--	1180	--	--	--	--	--	--
18	351726097290901	09N-03W-02 BAA 1		Jan 20 2005	1330	well head	--	--	1180	--	--	576	8.89	19.8	17.5
18	351726097290901	09N-03W-02 BAA 1		Jan 20 2005	1230	615	--	--	1180	--	--	573	8.96	19.9	--
18	351726097290901	09N-03W-02 BAA 1		Jan 20 2005	1300	655	--	--	1180	--	--	582	8.92	19.8	--
23p	351401097252301	09N-02W-21 CCC 1		Sep 18 2003	0900		412	403	1213	5.5	41	759	9.01	--	18.72
23p	351401097252301	09N-02W-21 CCC 1	Duplicate	Sep 18 2003	0900		412	403	1213	--	--	--	--	--	--
23p	351401097252301	09N-02W-21 CCC 1		Sep 17 2003	1800		444	437	1213	3.3	43	973	8.85	--	20.11
23p	351401097252301	09N-02W-21 CCC 1	Duplicate	Sep 17 2003	1800		444	437	1213	--	--	--	--	--	--
23p	351401097252301	09N-02W-21 CCC 1		Sep 19 2003	0900		487	458	1213	5.4	78	956	8.90	--	19.46
23p	351401097252301	09N-02W-21 CCC 1	Duplicate	Sep 19 2003	0900		487	458	1213	--	--	--	--	--	--
23p	351401097252301	09N-02W-21 CCC 1		Sep 18 2003	1700		522	494	1213	6.7	45	940	8.90	--	18.64
23p	351401097252301	09N-02W-21 CCC 1	Duplicate	Sep 18 2003	1700		522	494	1213	--	--	--	--	--	--
23p	351401097252301	09N-02W-21 CCC 1	Replicate	Sep 18 2003	1701		522	494	1213	6.7	45	940	8.9	--	18.6
23p	351401097252301	09N-02W-21 CCC 1	Duplicate	Sep 18 2003	1702		522	494	1213	--	--	--	--	--	--
23p	351401097252301	09N-02W-21 CCC 1		Sep 17 2003	1100		533	527	1213	3.5	71	920	8.87	--	19.99
23p	351401097252301	09N-02W-21 CCC 1	Duplicate	Sep 17 2003	1100		533	527	1213	--	--	--	--	--	--
23p	351401097252301	09N-02W-21 CCC 1		Sep 17 2003	0900		548	540	1213	3.9	73	936	8.90	--	19.51
23p	351401097252301	09N-02W-21 CCC 1		Sep 16 2003	1500		577	567	1213	4.5	45	924	8.95	--	19.77
23p	351401097252301	09N-02W-21 CCC 1	Duplicate	Sep 16 2003	1500		577	567	1213	--	--	--	--	--	--
23	351401097252301	09N-02W-21 CCC 1		May 11 2004	0900	420	--	--	1213	--	--	881	8.97	--	--
23	351401097252301	09N-02W-21 CCC 1	Duplicate	May 11 2004	0900	420	--	--	1213	--	--	--	--	--	--
23	351401097252301	09N-02W-21 CCC 1		May 10 2004	1300	445	--	--	1213	--	--	816	8.98	--	--
23	351401097252301	09N-02W-21 CCC 1		May 6 2004	0900	485	--	--	1213	--	--	801	9.04	--	--
23	351401097252301	09N-02W-21 CCC 1	Duplicate	May 6 2004	0900	485	--	--	1213	--	--	--	--	--	--
23	351401097252301	09N-02W-21 CCC 1		May 5 2004	1100	510	--	--	1213	--	--	829	8.96	--	--
23	351401097252301	09N-02W-21 CCC 1	Duplicate	May 5 2004	1100	510	--	--	1213	--	--	--	--	--	--
23	351401097252301	09N-02W-21 CCC 1		May 4 2004	1200	550	--	--	1213	--	--	902	8.95	--	--
23	351401097252301	09N-02W-21 CCC 1	Duplicate	May 4 2004	1200	550	--	--	1213	--	--	--	--	--	--
23	351401097252301	09N-02W-21 CCC 1		May 3 2004	1100	560	--	--	1213	--	--	909	8.87	--	--
23	351401097252301	09N-02W-21 CCC 1		May 11 2004	1300	well head	--	--	1213	--	--	912	8.95	--	19.5
23	351401097252301	09N-02W-21 CCC 1	Duplicate	May 11 2004	1300	well head	--	--	1213	--	--	--	--	--	--
31	351542097262801	09N-02W-17 BBB 1		Apr 5 2005	0900	480	--	--	1170	--	--	649	8.90	21.8	--
31	351542097262801	09N-02W-17 BBB 1	Duplicate	Apr 5 2005	0900	480	--	--	1170	--	--	--	--	--	--
31	351542097262801	09N-02W-17 BBB 1		Apr 5 2005	1430	525	--	--	1170	--	--	651	8.99	23.5	--
31	351542097262801	09N-02W-17 BBB 1	Duplicate	Apr 4 2005	1430	525	--	--	1170	--	--	--	--	--	--
31	351542097262801	09N-02W-17 BBB 1		Apr 5 2005	1000	540	--	--	1170	--	--	655	8.93	22.3	--
31	351542097262801	09N-02W-17 BBB 1	Duplicate	Apr 5 2005	1000	540	--	--	1170	--	--	--	--	--	--
31	351542097262801	09N-02W-17 BBB 1		Apr 5 2005	1300	well head	--	--	1170	--	--	652	8.84	25.3	17.7
31	351542097262801	09N-02W-17 BBB 1		Apr 5 2005	1200	560	--	--	1170	--	--	657	8.95	25.3	--
31	351542097262801	09N-02W-17 BBB 1		Apr 4 2005	1300	620	--	--	1170	--	--	668	8.99	22.4	--
31	351542097262801	09N-02W-17 BBB 1		Apr 4 2005	1030	645	--	--	1170	--	--	655	8.99	21.5	--
31	351542097262801	09N-02W-17 BBB 1	Duplicate	Apr 4 2005	1030	645	--	--	1170	--	--	--	--	--	--

Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	Sampling depth (feet)	Turbidity, field (NTU)	Barometric pressure (mm Hg)	Dissolved oxygen, field (mg/L)	Dissolved oxygen, field (%)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)	Sodium, filtered (mg/L)	Sodium adsorption ratio	Potassium, filtered (mg/L)	Bicarbonate, unfiltered (mg/L)	Carbonate, unfiltered (mg/L)	Acid neutralizing capacity (mg/L as $CaCO_3$)
18	495	.40	730.3	--	--	1.40	.544	134	24.3	.385	298.5	14.9	269.9
18	495	--	--	--	--	--	--	--	--	--	--	--	--
18	535	.81	730.3	--	--	1.46	.542	134	24.1	.568	304.7	14.9	275.0
18	535	--	--	--	--	--	--	--	--	--	--	--	--
18	585	.46	730.3	--	--	1.46	.545	136	24.4	.586	303.8	13.6	271.9
18	585	--	--	--	--	--	--	--	--	--	--	--	--
18	well head	.29	730.3	6.65	69.7	1.49	.560	134	23.8	.597	299.8	14.3	269.9
18	615	.80	730.3	--	--	1.39	.529	135	24.7	.449	307.7	14.1	276.0
18	655	1.58	730.3	--	--	1.44	.548	136	24.5	.482	312.6	13.5	279.0
23p		1.08	732.0	3.63	40.6	1.23	.672	180	32.4	.489	342.9	19.2	313.3
23p		--	--	--	--	--	--	--	--	--	--	--	--
23p		1.37	732.3	1.68	19.4	1.43	.588	232	41.2	.561	401.5	12.0	349.3
23p		--	--	--	--	--	--	--	--	--	--	--	--
23p		3.36	732.3	3.79	43.1	1.29	.537	223	41.6	.552	E342.9	E33.6	337.3
23p		--	--	--	--	--	--	--	--	--	--	--	--
23p		4.91	--	5.70	--	1.31	.537	224	41.6	.559	364.9	21.6	335.3
23p		--	--	--	--	--	--	--	--	--	--	--	--
23p		4.72	--	5.7	--	1.29	.529	222	41.6	.555	365	22	335
23p		--	--	--	--	--	--	--	--	--	--	--	--
23p		17.0	732.3	1.80	20.7	1.34	.561	224	41.0	.545	396.6	10.8	343.3
23p		--	--	--	--	--	--	--	--	--	--	--	--
23p		19.8	730.3	2.12	24.2	1.38	.580	225	40.5	.551	367.3	27.6	347.3
23p		6.53	736.4	2.60	29.6	1.34	.556	221	40.5	.514	E368.8	E64.1	409.4
23p		--	--	--	--	--	--	--	--	--	--	--	--
23	420	2.17	730.2	--	--	1.29	.588	199	36.5	1.45	390.3	22.5	357.8
23	420	--	--	--	--	--	--	--	--	--	--	--	--
23	445	1.88	732.7	--	--	1.29	.669	187	33.3	1.35	363.0	23.2	336.8
23	485	1.37	731.4	--	--	1.26	.651	179	32.3	1.36	387.3	20.9	352.8
23	485	--	--	--	--	--	--	--	--	--	--	--	--
23	510	.76	731.0	--	--	1.28	.634	202	36.5	1.26	387.7	21.9	354.8
23	510	--	--	--	--	--	--	--	--	--	--	--	--
23	550	.56	731.0	--	--	1.28	.598	208	38.1	1.50	301.9	19.7	280.7
23	550	--	--	--	--	--	--	--	--	--	--	--	--
23	560	2.57	731.0	--	--	1.28	.601	213	38.9	1.28	357.0	3.3	298.3
23	well head	.68	730.2	2.88	32.9	1.29	.605	210	38.2	1.45	413.5	21.3	374.8
23	well head	--	--	--	--	--	--	--	--	--	--	--	--
31	480	.76	722.8	--	--	1.76	.663	147	24.0	.479	309.4	17.4	283.0
31	480	--	--	--	--	--	--	--	--	--	--	--	--
31	525	1.14	727.4	--	--	1.75	.659	145	23.7	.497	312.6	16.8	284.7
31	525	--	--	--	--	--	--	--	--	--	--	--	--
31	540	1.09	722.8	--	--	1.97	.729	147	22.7	.488	303.1	18.0	279.0
31	540	--	--	--	--	--	--	--	--	--	--	--	--
31	well head	.51	722.8	5.72	61.8	1.85	.685	149	23.8	.497	306.9	14.3	276.0
31	560	2.88	722.8	--	--	1.94	.731	149	23.1	.519	304.0	15.8	276.0
31	620	1.28	727.4	--	--	2.29	.733	151	22.2	.518	309.9	15.2	279.7
31	645	1.89	727.4	--	--	2.17	.687	150	22.7	.534	309.9	15.2	279.7
31	645	--	--	--	--	--	--	--	--	--	--	--	--

Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	Sampling depth (feet)	Sulfate, unfiltered (mg/L)	Chloride, unfiltered (mg/L)	Fluoride, unfiltered (mg/L)	Bromide, unfiltered (mg/L)	Iodine, unfiltered (mg/L)	Nitrite, unfiltered (mg/L as N)	Nitrite plus nitrate, unfiltered (mg/L as N)	Ammonia, unfiltered (mg/L as N)	Orthophosphate, unfiltered (mg/L as P)	Aluminum, filtered (ug/L)	Antimony, filtered (ug/L)	Arsenic, filtered (ug/L)
18	495	19.1	10.6	E.21	<1.00	<.025	<.100	.682	.135	E.019	93	<57	<110
18	495	19.3	10.4	E.21	<1.00	--	--	--	--	--	--	--	--
18	535	19.4	10.5	E.19	<1.00	<.025	<.100	.678	.135	E.016	740	<57	<110
18	535	--	--	--	--	--	<.100	.678	E.080	--	--	--	--
18	585	19.9	10.7	E.19	<1.00	<.025	<.100	.678	<.100	E.016	805	<57	<110
18	585	--	--	--	--	<.025	--	--	--	E.017	--	--	--
18	well head	19.9	10.7	E.21	<1.00	<.025	<.100	.680	<.100	E.016	744	<57	<110
18	615	20.9	10.9	E.19	<1.00	<.025	<.100	.686	.247	E.017	E53	<57	<110
18	655	21.7	11.0	E.20	<1.00	<.025	<.100	.681	E.072	E.017	125	<57	<110
23p		37.5	8.35	.385	<.250	<.025	<.100	.150	E.05	.057	E38	<57	E99
23p		--	--	--	--	--	--	--	--	--	--	--	--
23p		82.6	13.9	.658	<.250	<.025	<.100	.119	<.100	.051	<87	<57	174
23p		83.4	13.9	.648	<.250	<.025	<.100	.119	--	.051	--	--	--
23p		76.6	13.2	.645	<.250	<.025	<.100	.121	E.03	.053	<87	<57	173
23p		--	--	--	--	--	<.100	.125	E.004	.054	--	--	--
23p		75.7	13.1	.646	E.191	<.025	<.100	.123	E.07	.057	<87	<57	179
23p		--	--	.636	E.110	<.025	--	--	--	--	--	--	--
23p		76.0	13.1	.633	<.250	<.025	<.100	.127	E.060	.056	<87	<57	175
23p		76.5	13.0	--	--	--	--	--	--	--	--	--	--
23p		76.5	13.1	.633	E.163	<.025	<.100	.132	E.06	.054	E27	<57	172
23p		--	--	--	--	--	--	--	--	--	--	--	--
23p		76.1	13.0	.493	E.215	<.025	<.100	.129	E.05	.064	E34	<57	165
23p		75.2	13.4	.716	E.086	<.025	<.100	.123	E.08	.054	<87	<57	161
23p		75.8	13.3	.699	E.084	<.025	--	--	--	.052	--	--	--
23	420	51.8	10.2	E.47	<1.00	<.025	<.100	.132	<.100	.049	114	<57	120
23	420	--	--	--	--	<.025	--	--	--	.045	--	--	--
23	445	48.3	9.59	E.43	<1.00	<.025	<.100	.130	.204	.049	140	<57	E100
23	485	57.9	11.2	.52	<1.00	<.025	<.100	.126	E.062	.052	165	<57	E96
23	485	--	--	--	--	--	--	--	--	--	--	--	--
23	510	58.8	11.3	.55	<1.00	<.025	<.100	.123	E.056	.061	E30	<57	122
23	510	58.1	11.5	.54	<1.00	--	--	--	--	--	--	--	--
23	550	61.4	11.8	.58	<1.00	<.025	<.100	.125	E.030	.060	<87	<57	122
23	550	--	--	--	--	--	<.100	.124	E.037	--	--	--	--
23	560	62.4	11.9	.54	<1.00	<.025	<.100	.120	E.039	.061	<87	<57	127
23	well head	68.6	12.9	.57	<1.00	<.025	<.100	.113	E.067	.058	139	<57	143
23	well head	68.4	13.0	.57	<1.00	--	--	--	--	.055	--	--	--
31	480	39.9	10.5	E.29	<1.00	<.025	<.100	.504	.175	E.015	153	<57	44.3
31	480	39.9	10.5	E.26	<1.00	--	--	--	--	--	--	--	--
31	525	39.6	10.6	.29	<1.00	<.025	<.100	.507	<.100	.031	143	<57	43.9
31	525	--	--	--	--	--	<.100	.506	<.100	--	--	--	--
31	540	38.8	11.4	E.28	<1.00	<.025	<.100	.504	<.100	.031	128	<57	41.2
31	540	--	--	--	--	<.025	--	--	--	.030	--	--	--
31	well head	39.2	10.7	E.32	<1.00	<.025	<.100	.506	<.100	.031	148	<57	41.8
31	560	38.5	10.9	E.28	<1.00	<.025	<.100	.503	<.100	.030	174	<57	40.4
31	620	38.5	13.7	E.29	<1.00	<.025	<.100	.543	<.100	.029	150	<57	40.2
31	645	38.6	12.2	E.33	<1.00	<.025	<.100	.515	<.100	.030	163	<57	41.4
31	645	--	--	--	--	--	--	--	--	--	--	--	--

Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	Sampling depth (feet)	Arsenate, filtered (ug/L as As)	Arsenite, filtered (ug/L as As)	Dimethyl-arsinate, filtered (ug/L as As)	Monomethyl-arsonate, filtered (ug/L as As)	Barium, filtered (ug/L)	Beryllium, filtered (ug/L)	Boron, filtered (ug/L)	Cadmium, filtered (ug/L)	Chromium, filtered (ug/L)	Cobalt, filtered (ug/L)	Copper, filtered (ug/L)	Iron(II), filtered, field (mg/L)	Iron, filtered, field (mg/L)	Iron, filtered (ug/L)
18	495	17	<10	<20	<10	168	<13	1,080	<13	16	<10	<37	.06	.18	<37
18	495	--	--	--	--	--	--	--	--	--	--	--	--	--	--
18	535	19	<10	<20	<10	318	<13	1,360	<13	15	<10	<37	.04	.06	E85
18	535	--	--	--	--	--	--	--	--	--	--	--	--	--	--
18	585	17	<10	<20	<10	356	<13	1,480	<13	16	<10	<37	.05	.08	E93
18	585	--	--	--	--	--	--	--	--	--	--	--	--	--	--
18	well head	18	<10	<20	<10	335	<13	1,460	<13	16	<10	<37	.02	.02	E87
18	615	<16	<10	<20	<10	136	<13	905	<13	16	<10	<37	.06	.09	<117
18	655	16	<10	<20	<10	154	<13	1,110	<13	17	<10	<37	.06	.11	E56
23p		69	<13	<19	<19	43	<13	1,600	<13	20	<10	<37	--	--	<117
23p		--	--	--	--	--	--	--	--	--	--	--	--	--	--
23p		117	<13	<19	<19	55	<13	2,890	<13	11	<10	<37	--	--	<117
23p		--	--	--	--	--	--	--	--	--	--	--	--	--	--
23p		140	<13	<19	<19	31	<13	2,700	<13	13	<10	<37	--	--	E73
23p		--	--	--	--	--	--	--	--	--	--	--	--	--	--
23p		69	<13	<19	<19	31	<13	2,710	<13	12	<10	<37	--	--	E73
23p		--	--	--	--	--	--	--	--	--	--	--	--	--	--
23p		127	<13	<19	<19	31	<13	2,700	<13	13	<10	<37	--	--	E43
23p		--	--	--	--	--	--	--	--	--	--	--	--	--	--
23p		115	<13	<19	<19	28	<13	2,700	<13	11	<10	<37	--	--	E99
23p		--	--	--	--	--	--	--	--	--	--	--	--	--	--
23p		116	<13	<19	<19	27	<13	2,720	<13	13	<10	<37	--	--	E55
23p		107	<13	<19	<19	31	<13	2,630	<13	14	<10	<37	--	--	E76
23p		--	--	--	--	--	--	--	--	--	--	--	--	--	--
23	420	100	<10	<20	<10	107	<13	2,270	<13	15	<10	<37	<.01	.01	E70
23	420	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23	445	74	<10	<20	<10	143	<13	1,930	<13	18	<10	<37	<.01	.02	E51
23	485	71	<10	<20	<10	174	<13	1,890	<13	19	<10	<37	<.01	.07	E67
23	485	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23	510	95	<10	<20	<10	42	<13	2,100	<13	17	<10	<37	<.01	.05	<117
23	510	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23	550	112	<10	<20	<10	39	<13	2,300	<13	17	<10	<37	<.01	.11	<117
23	550	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23	560	108	<10	<20	<10	39	<13	2,350	<13	16	<10	<37	<.01	.11	<117
23	well head	120	<10	<20	<10	139	<13	2,640	<13	14	<10	<37	<.01	.02	E63
23	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--
31	480	41	<10	<20	<10	259	<13	1,520	<13	26	<10	<37	<.01	.01	E69
31	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--
31	525	44	<10	<20	<10	233	<13	1,660	<13	26	<10	<37	.08	.28	E69
31	525	--	--	--	--	--	--	--	--	--	--	--	--	--	--
31	540	35	<10	<20	<10	223	<13	1,580	<13	31	<10	<37	<.01	.01	E60
31	540	--	--	--	--	--	--	--	--	--	--	--	--	--	--
31	well head	39	<10	<20	<10	246	<13	1,690	<13	27	<10	<37	<.01	<.01	E66
31	560	38	<10	<20	<10	283	<13	1,660	<13	29	<10	<37	<.01	.01	E77
31	620	39	<10	<20	<10	243	<13	1,700	<13	54	<10	<37	.04	.12	E69
31	645	40	<10	<20	<10	248	<13	1,700	<13	47	<10	<37	.03	.10	E76
31	645	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	Sampling depth (feet)	Lead, filtered (ug/L)	Manganese, filtered (ug/L)	Molybdenum, filtered (ug/L)	Nickel, filtered (ug/L)	Selenium, filtered (ug/L)	Silver, filtered (ug/L)	Strontium, filtered (ug/L)	Thallium, filtered (ug/L)	Titanium, filtered (ug/L)	Vanadium, filtered (ug/L)	Zinc, filtered (ug/L)	Uranium, filtered (ug/L)	Organic carbon, filtered (mg/L)	Deuterium /Protium ratio (per mil)	Oxygen-18 /Oxygen-16 ratio (per mil)
18	495	<50	<10	<30	<13	<100	<7	30	<90	83	60	<57	<13	E.461	-36.4	-6.02
18	495	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
18	535	<50	<10	<30	<13	<100	<7	31	<90	127	61	<57	<13	.710	--	--
18	535	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
18	585	<50	<10	<30	<13	<100	<7	32	<90	145	60	<57	<13	1.29	--	--
18	585	--	--	--	--	--	--	--	--	--	--	--	--	1.38	--	--
18	well head	<50	<10	<30	<13	<100	<7	33	<90	134	59	<57	<13	E.260	-36.2	-6.06
18	615	<50	<10	<30	<13	<100	<7	29	<90	50	58	<57	<13	E.324	--	--
18	655	<50	<10	<30	<13	<100	<7	33	<90	75	62	<57	<13	.69	-34.8	-6.07
23p		<50	<10	<30	<13	E53	<7	23	<90	<27	304	<57	44	--	-39.8	-6.54
23p		--	--	--	--	--	--	--	--	--	--	--	--	E.089	--	--
23p		<50	<10	<30	<13	E83	<7	32	<90	<27	531	E18	84		-37.3	-6.27
23p		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23p		<50	<10	<30	<13	E76	<7	28	<90	<27	537	<57	78		-38.1	-6.28
23p		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23p		<50	<10	<30	<13	E81	<7	28	<90	<27	546	E18	85		-38.2	-6.31
23p		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23p		<50	<10	<30	<13	E79	<7	28	<90	<27	539	<57	81	--	-37.3	-6.27
23p		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23p		<50	<10	<30	<13	E78	<7	29	<90	<27	533	E27	80		-36.8	-6.21
23p		--	--	--	--	--	--	--	--	--	--	--	--	.142	--	--
23p		<50	<10	<30	<13	E68	<7	29	<90	<27	537	E23	82	--	-37.9	-6.27
23p		<50	E3	<30	<13	E75	<7	28	<90	<27	523	E49	76	--	-38.8	-6.23
23p		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23	420	<50	<10	<30	<13	E57	<7	27	<90	45	446	67	76	4.47	-39.3	-6.38
23	420	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23	445	<50	<10	<30	<13	E51	<7	27	<90	58	360	E21	63	2.06	--	--
23	485	<50	<10	<30	<13	E50	<7	27	<90	83	337	<57	61	1.06	--	--
23	485	--	--	--	--	--	--	--	--	--	--	--	--	.978	--	--
23	510	<50	<10	<30	<13	E53	<7	27	<90	<27	437	<57	67	3.15	--	--
23	510	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23	550	<50	<10	<30	<13	E46	<7	27	<90	<27	478	E20	67	6.51	--	--
23	550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23	560	<50	<10	<30	<13	<47	<7	27	<90	<27	493	<57	67	2.13	-38.4	-6.26
23	well head	<50	<10	<30	<13	E65	<7	29	<90	68	497	<57	85	.923	-37.8	-6.26
23	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
31	480	<50	<10	<30	<13	E32	<7	40	<90	71	158	<57	<13	2.19	-38.2	-6.43
31	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
31	525	<50	<10	<30	<13	E33	<7	40	<90	69	156	<57	<13	.717	--	--
31	525	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
31	540	<50	<10	<30	<13	E33	<7	45	<90	63	162	<57	<13	3.76	--	--
31	540	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
31	well head	<50	<10	<30	<13	E34	<7	42	<90	72	160	<57	<13	E.258	-38.6	-6.48
31	560	<50	<10	<30	<13	<100	<7	44	<90	83	163	<57	<13	3.27	--	--
31	620	<50	<10	<30	<13	E40	35	45	<90	70	150	<57	<13	.882	--	--
31	645	<50	<10	<30	<13	E38	<7	42	<90	75	154	<57	<13	.557	-38.1	-6.47
31	645	--	--	--	--	--	--	--	--	--	--	--	--	.565	--	--

Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	USGS station number	Station name	Quality assurance sample type	Date	Time	Sampling depth (feet)	Depth to bottom of water-bearing zone (feet)	Depth to top of water-bearing zone (feet)	Elevation of land surface (feet)	Flow rate (gpm)	Pumping period prior to sampling (min)	Specific conductance, field (uS/cm at 25 °C)	pH, field, standard units	Temperature, air (°C)	Temperature, water (°C)
33	351541097245301	09N-02W-16 ABB 1		Mar 15 2006	1300	well head	--	--	1170	--	--	435	--	--	17.9
33	351541097245301	09N-02W-16 ABB 1	Duplicate	Mar 15 2006	1300	well head	--	--	1170	--	--	--	--	--	--
33	351541097245301	09N-02W-16 ABB 1		Apr 10 2006	1400	440	--	--	1170	--	--	450	7.98	--	19.5
33	351541097245301	09N-02W-16 ABB 1	Duplicate	Apr 10 2006	1400	440	--	--	1170	--	--	--	--	--	--
33	351541097245301	09N-02W-16 ABB 1		Apr 10 2006	1130	500	--	--	1170	--	--	434	7.69	--	19.6
33	351541097245301	09N-02W-16 ABB 1	Duplicate	Apr 10 2006	1130	500	--	--	1170	--	--	--	--	--	--
33	351541097245301	09N-02W-16 ABB 1		Apr 10 2006	1230	550	--	--	1170	--	--	428	8.03	--	19.2
33	351541097245301	09N-02W-16 ABB 1	Duplicate	Apr 10 2006	1230	550	--	--	1170	--	--	--	--	--	--
33	351541097245301	09N-02W-16 ABB 1		Apr 10 2006	1300	595	--	--	1170	--	--	432	8.13	--	19.3
33	351541097245301	09N-02W-16 ABB 1	Duplicate	Apr 10 2006	1300	595	--	--	1170	--	--	--	--	--	--
33	351541097245301	09N-02W-16 ABB 1	Replicate	Apr 10 2006	1301	595	--	--	1170	--	--	438	8.02	--	19.48
33	351541097245301	09N-02W-16 ABB 1		Apr 10 2006	1500	well head	--	--	1170	--	--	449	7.68	--	18.1
36	351633097241901	09N-02W-10 BBB 1		Oct 28 2004	1500	415	--	--	1080	--	--	455	8.48	26.7	--
36	351633097241901	09N-02W-10 BBB 1		Oct 28 2004	1400	480	--	--	1080	--	--	454	7.70	26.6	--
36	351633097241901	09N-02W-10 BBB 1	Duplicate	Oct 28 2004	1400	480	--	--	1080	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1		Oct 28 2004	1300	520	--	--	1080	--	--	442	7.54	26.6	--
36	351633097241901	09N-02W-10 BBB 1		Oct 29 2004	1400	595	--	--	1080	--	--	449	7.68	29.6	--
36	351633097241901	09N-02W-10 BBB 1		Oct 29 2004	1100	645	--	--	1080	--	--	449	7.79	27.5	--
36	351633097241901	09N-02W-10 BBB 1	Duplicate	Oct 29 2004	1100	645	--	--	1080	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1		Oct 29 2004	0930	680	--	--	1080	--	--	440	7.70	25.4	--
36	351633097241901	09N-02W-10 BBB 1		Oct 29 2004	1500	well head	--	--	1080	--	--	472	7.74	30.0	17.7
36	351633097241901	09N-02W-10 BBB 1	Duplicate	Oct 29 2004	1500	well head	--	--	1080	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1	Blank	Jun 7 2005	0900		--	--	1080	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1	Duplicate	Jun 7 2005	0901		--	--	1080	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1		Jun 7 2005	1230	480	--	--	1080	--	--	448	7.75	--	--
36	351633097241901	09N-02W-10 BBB 1	Duplicate	Jun 7 2005	1230	480	--	--	1080	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1		Jun 8 2005	0900	520	--	--	1080	--	--	447	7.75	--	--
36	351633097241901	09N-02W-10 BBB 1		Jun 7 2005	1200	595	--	--	1080	--	--	469	7.82	--	--
36	351633097241901	09N-02W-10 BBB 1		Jun 7 2005	1000	645	--	--	1080	--	--	469	7.88	--	--
36	351633097241901	09N-02W-10 BBB 1	Replicate	Jun 7 2005	1000	645	--	--	1080	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1		Jun 7 2005	1300	680	--	--	1080	--	--	520	8.18	--	--
36	351633097241901	09N-02W-10 BBB 1	Duplicate	Jun 7 2005	1300	680	--	--	1080	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1	Duplicate	Jun 7 2005	1301	680	--	--	1080	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1		Jun 8 2005	1000	well head	--	--	1080	--	--	539	8.24	--	18.0

Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	Sampling depth (feet)	Turbidity, field (NTU)	Barometric pressure (mm Hg)	Dissolved oxygen, field (mg/L)	Dissolved oxygen, field (%)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)	Sodium, filtered (mg/L)	Sodium adsorption ratio	Potassium, filtered (mg/L)	Bicarbonate, unfiltered (mg/L)	Carbonate, unfiltered (mg/L)	Acid neutralizing capacity (mg/L as $CaCO_3$)
33	well head	.62	734.2	6.37	67.0	22.8	19.7	36.1	1.34	2.00	219.0	<.1	179.9
33	well head	--	--	--	--	22.8	20.0	36.1	1.33	2.06	--	--	--
33	440	1.31	734.1	--	--	28.2	24.2	27.8	.93	2.50	231.3	.2	190.0
33	440	--	--	--	--	--	--	--	--	--	--	--	--
33	500	1.47	734.1	--	--	22.6	19.6	37.6	1.40	2.15	220.2	.2	180.9
33	500	--	--	--	--	--	--	--	--	--	--	--	--
33	550	1.08	734.1	--	--	21.3	18.5	40.9	1.56	2.07	220.0	.3	180.9
33	550	--	--	--	--	21.3	18.4	41.0	1.57	2.07	--	--	--
33	595	.72	734.1	--	--	21.2	18.3	40.4	1.55	2.06	229.8	.3	189.0
33	595	--	--	--	--	--	--	--	--	--	--	--	--
33	595	1.19	734.1	--	--	21.3	18.5	40.6	1.55	2.14	219.1	.1	179.9
33	well head	.46	734.1	6.00	63.6	22.3	19.4	38.2	1.43	2.16	223.6	.4	184.0
36	415	1.01	738.1	--	--	26.1	21.3	34.4	1.21	2.42	174.7	2.1	146.8
36	480	.11	738.1	--	--	26.1	21.3	34.6	1.22	2.39	264.1	.6	217.5
36	480	--	--	--	--	--	--	--	--	--	--	--	--
36	520	.72	738.1	--	--	26.0	21.2	34.5	1.22	2.38	265.0	.9	218.9
36	595	.85	732.3	--	--	25.9	21.1	35.6	1.26	2.40	261.2	.5	215.0
36	645	.86	732.3	--	--	25.8	21.0	35.5	1.26	2.39	263.2	.6	216.9
36	645	--	--	--	--	--	--	--	--	--	--	--	--
36	680	.88	732.3	--	--	26.1	21.2	36.0	1.27	2.45	302.7	.8	249.6
36	well head	.67	732.3	6.10	64.2	21.3	17.3	55.1	2.15	2.13	364.8	1.2	301.2
36	well head	--	--	--	--	--	--	--	--	--	--	--	--
36		--	--	--	--	E45	<.300	.754	--	E.105	--	--	--
36		--	--	--	--	--	--	--	--	--	--	--	--
36	480	1.28	734.5	--	--	25.8	20.9	35.0	1.24	2.48	267.9	1.0	221.4
36	480	--	--	--	--	--	--	--	--	--	--	--	--
36	520	.31	733.6	--	--	25.8	20.9	34.9	1.24	2.44	265.8	.8	219.4
36	595	1.00	735.0	--	--	18.8	14.9	54.2	2.27	2.09	277.1	1.3	229.5
36	645	1.13	733.4	--	--	20.8	16.4	55.4	2.21	2.13	281.4	1.6	233.5
36	645	--	--	--	--	20.9	16.6	54.6	2.16	2.08	--	--	--
36	680	.80	735.2	--	--	15.1	11.9	82.6	3.86	1.79	302.9	3.1	253.7
36	680	--	--	--	--	--	--	--	--	--	--	--	--
36	680	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	.31	733.2	6.51	82.5	13.8	10.9	93.1	4.55	1.64	314.3	4.2	264.9

Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	Sampling depth (feet)	Sulfate, unfiltered (mg/L)	Chloride, unfiltered (mg/L)	Fluoride, unfiltered (mg/L)	Bromide, unfiltered (mg/L)	Iodine, unfiltered (mg/L)	Nitrite, unfiltered (mg/L as N)	Nitrite plus nitrate, unfiltered (mg/L as N)	Ammonia, unfiltered (mg/L as N)	Orthophosphate, unfiltered (mg/L as P)	Aluminum, filtered (ug/L)	Antimony, filtered (ug/L)	Arsenic, filtered (ug/L)
33	well head	9.07	7.88	--	<.250	<.025	<.100	.580	<.100	E.017	202	E5	.562
33	well head	9.02	7.80	--	<.250	<.025	<.100	.584	<.100	E.017	199	E4	.550
33	440	9.13	10.40	--	<.250	<.025	<.100	.740	.144	.020	219	<10	.262
33	440	--	--	--	--	--	--	--	--	.020	--	--	--
33	500	9.11	7.84	--	<.250	<.025	<.100	.608	E.053	.021	183	<10	.498
33	500	--	--	--	--	--	--	--	--	--	--	--	.527
33	550	9.88	8.04	--	<.250	<.025	<.100	.581	.114	.020	172	E4	.600
33	550	--	--	--	--	--	--	--	--	--	180	<10	--
33	595	9.80	8.01	--	E.104	<.025	<.100	.585	E.045	.020	159	<10	.531
33	595	9.76	8.01	--	<.250	<.025	<.100	.583	E.043	--	--	--	--
33	595	9.87	7.97	--	<.250	<.025	<.100	.583	E.041	E.019	270	<10	.555
33	well head	9.70	8.30	--	<.250	<.025	<.100	.607	E.034	E.019	191	<10	.423
36	415	9.21	4.99	.39	<1.00	<.025	<.100	.461	<.100	.020	E67	<57	<110
36	480	9.09	4.99	.41	<1.00	<.025	<.100	.464	<.100	.023	94	<57	<110
36	480	9.21	4.93	.39	<1.00	--	--	--	--	--	--	--	--
36	520	9.36	5.07	.41	<1.00	<.025	<.100	.465	<.100	.022	96	<57	<110
36	595	9.23	4.99	.40	<1.00	<.025	<.100	.467	<.100	E.019	105	<57	<110
36	645	9.22	5.02	.42	<1.00	<.025	<.100	.469	<.100	.023	94	<57	<110
36	645	--	--	--	--	<.025	--	--	--	E.018	--	--	--
36	680	9.11	5.11	.39	<1.00	<.025	<.100	.453	<.100	E.018	E76	<57	<110
36	well head	9.58	6.95	.47	<1.00	<.025	<.100	.481	<.100	.020	116	<57	<110
36	well head	--	--	--	--	--	<.100	.484	<.100	--	--	--	--
36		<1.00	<1.00	<.100	<1.00	<.025	<.100	E.049	<.100	.020	128	<57	E.098
36		--	--	--	--	--	--	--	--	--	--	--	--
36	480	9.07	5.09	E.132	<1.00	<.025	<.100	1.08	<.100	.022	202	E3	.487
36	480	--	--	--	--	--	<.100	1.07	<.100	.022	--	--	--
36	520	9.06	5.18	E.154	<1.00	<.025	<.100	.471	.331	.028	186	<57	.429
36	595	10.7	4.74	.217	<1.00	<.025	<.100	.403	<.100	.022	185	E3	1.30
36	645	10.7	5.66	.238	<1.00	<.025	<.100	.430	.323	.024	120	E4	2.72
36	645	10.5	5.39	.225	<1.00	<.025	<.100	.429	.453	.025	E36	E4	E13
36	680	11.7	8.32	.384	<1.00	<.025	<.100	.422	.272	.031	191	E4	11.0
36	680	--	--	--	--	--	--	--	--	--	--	--	11.2
36	680	11.5	8.20	.400	<1.00	<.025	--	--	--	--	--	--	--
36	well head	12.0	11.1	.535	<1.00	<.025	<.100	.460	<.100	.034	212	<57	16.5

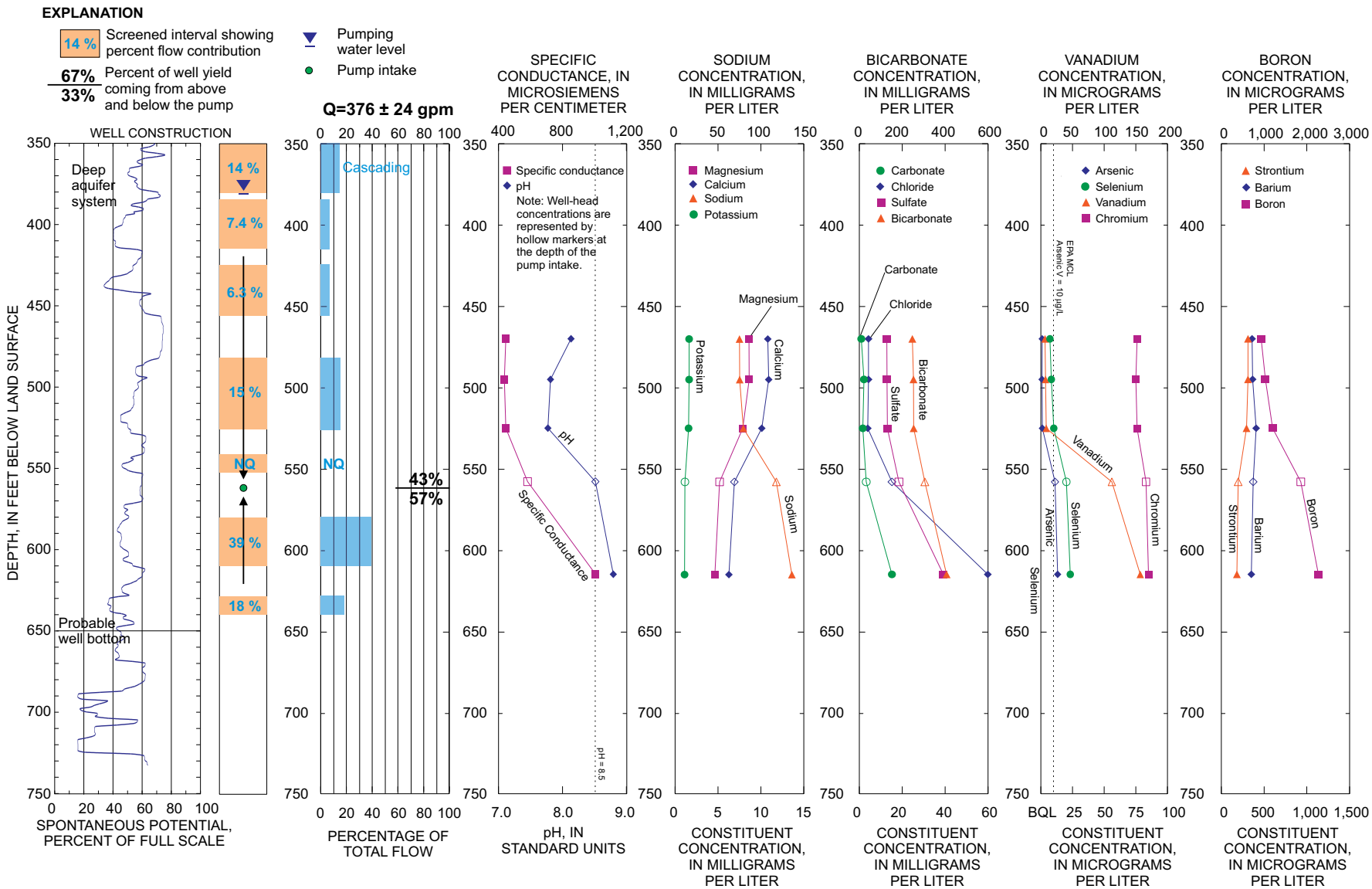
Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	Sampling depth (feet)	Arsenate, filtered (ug/L as As)	Arsenite, filtered (ug/L as As)	Dimethyl-arsinate, filtered (ug/L as As)	Monomethyl-arsonate, filtered (ug/L as As)	Barium, filtered (ug/L)	Beryllium, filtered (ug/L)	Boron, filtered (ug/L)	Cadmium, filtered (ug/L)	Chromium, filtered (ug/L)	Cobalt, filtered (ug/L)	Copper, filtered (ug/L)	Iron(II), filtered, field (mg/L)	Iron, filtered, field (mg/L)	Iron, filtered (ug/L)
33	well head	<10	<10	<10	<20	501	<3	816	<3	60	<3	<20	.07	.12	94
33	well head	<10	<10	<10	<20	499	<3	818	<3	60	<3	<20	--	--	94
33	440	<10	<10	<10	<20	545	<3	875	<3	49	<3	<20	.13	.14	100
33	440	--	--	--	--	--	--	--	--	--	--	--	--	--	--
33	500	<10	<10	<10	<20	453	<3	846	<3	61	<3	<20	.34	.37	77
33	500	<10	<10	<10	<20	--	--	--	--	--	--	--	--	--	--
33	550	<10	<10	<10	<20	427	<3	841	<3	63	<3	<20	.14	.24	76
33	550	--	--	--	--	429	<3	848	<3	63	<3	<20	--	--	77
33	595	<10	<10	<10	<20	428	<3	795	<3	63	<3	<20	.06	.14	74
33	595	--	--	--	--	--	--	--	--	--	--	--	--	--	--
33	595	<10	<10	<10	<20	552	<3	1,010	<3	62	<3	<20	.06	.44	121
33	well head	<10	<10	<10	<20	480	<3	821	<3	57	<3	<20	.17	.41	92
36	415	<10	<10	<20	<10	319	<13	354	<13	58	<10	<37	<.01	.01	<117
36	480	<10	<10	<20	<10	346	<13	576	<13	57	<10	<37	.01	.03	E42
36	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	520	<10	<10	<20	<10	336	<13	476	<13	57	<10	<37	<.01	<.01	E41
36	595	<10	<10	<20	<10	350	<13	502	<13	56	<10	<37	.12	.15	E42
36	645	<10	<10	<20	<10	331	<13	442	<13	56	<10	<37	<.01	.08	E39
36	645	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	680	<10	<10	<20	<10	322	<13	347	<13	48	<10	<37	<.01	<.01	<117
36	well head	<10	<10	<20	<10	337	<13	721	<13	60	<10	<37	.01	.03	E47
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36		<10	<10	<20	<10	162	<13	504	<13	<10	<10	<37	--	--	37
36		--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	480	<10	<10	<20	<10	548	<13	869	<13	57	<10	<37	.07	.09	78
36	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	520	<10	<10	<20	<10	517	<13	798	<13	57	<10	<37	.08	.17	70
36	595	<10	<10	<20	<10	439	<13	1,050	<13	65	<10	<37	.04	.07	71
36	645	<10	<10	<20	<10	356	<13	1,030	<13	67	<10	<37	.04	.35	29
36	645	--	--	--	--	271	<13	579	<13	67	<10	<37	--	--	<117
36	680	E9	<10	<20	<10	450	E1	1,500	<13	80	<10	<37	.22	.33	73
36	680	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	680	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	14	<10	<20	<10	464	<13	1,760	<13	84	<10	<37	.01	.08	90

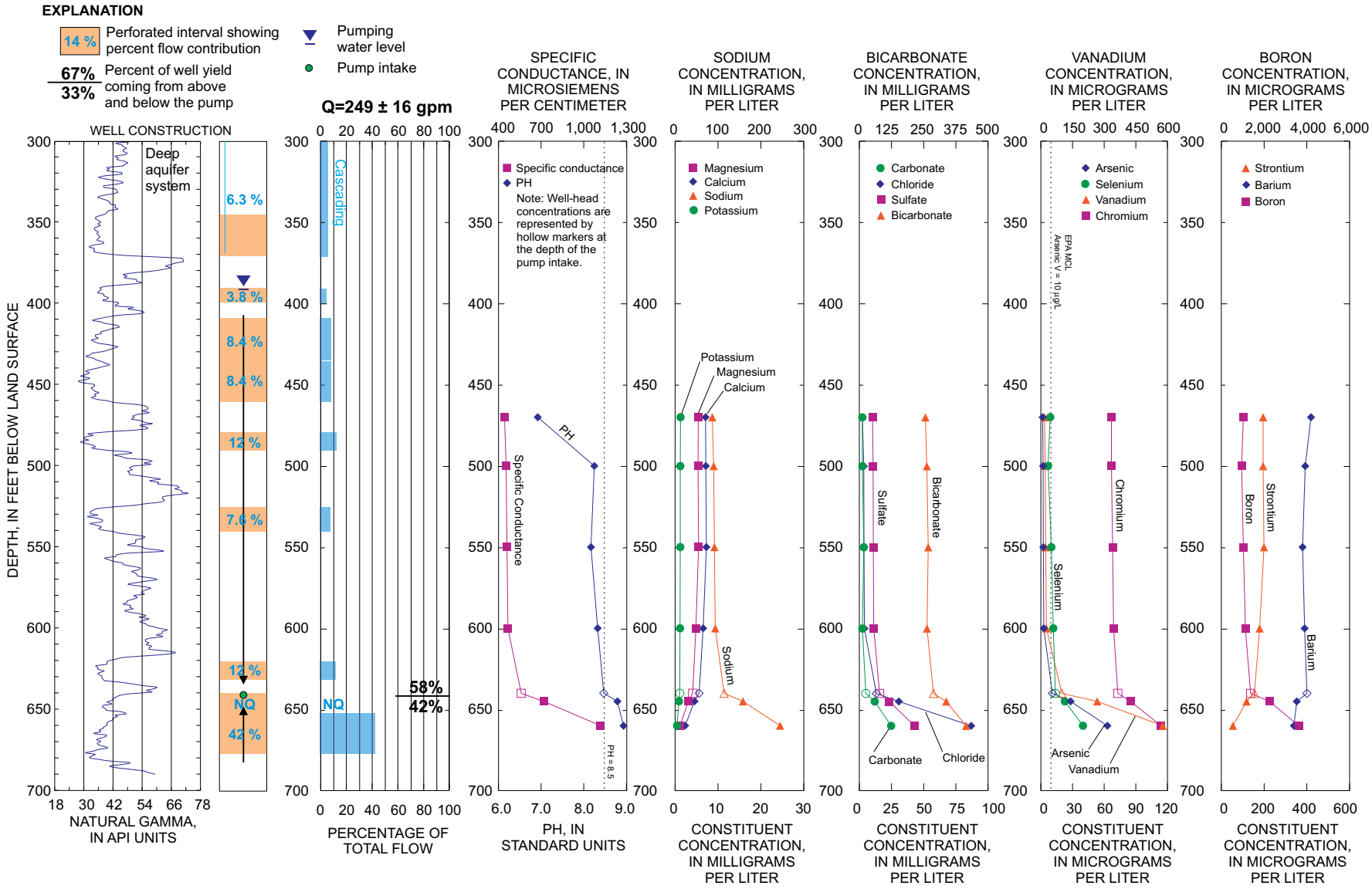
Appendix 4. Chemical analyses of ground-water samples and quality-assurance samples collected to assess potential for arsenic remediation by well modification in 11 selected public-supply wells, Norman, Oklahoma, 2003-2006. (continued)

Well	Sampling depth (feet)	Lead, filtered (ug/L)	Manganese, filtered (ug/L)	Molybdenum, filtered (ug/L)	Nickel, filtered (ug/L)	Selenium, filtered (ug/L)	Silver, filtered (ug/L)	Strontium, filtered (ug/L)	Thallium, filtered (ug/L)	Titanium, filtered (ug/L)	Vanadium, filtered (ug/L)	Zinc, filtered (ug/L)	Uranium, filtered (ug/L)	Organic carbon, filtered (mg/L)	Deuterium /Protium ratio (per mil)	Oxygen-18 /Oxygen-16 ratio (per mil)
33	well head	<10	<3	E2	<3	E8	<3	614	<20	100	E6	E16	<20	1.49	--	--
33	well head	<10	<3	E3	<3	E8	<3	612	<20	101	E6	E16	<20	1.51	--	--
33	440	<10	<3	E2	<3	E9	3	736	<20	114	E4	24	<20	<.500	--	--
33	440	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
33	500	<10	<3	E3	<3	E8	E1	588	<20	91	E6	19	<20	1.32	--	--
33	500	--	--	--	--	--	--	--	--	--	--	--	--	1.35	--	--
33	550	<10	<3	E2	<3	E7	<3	555	E7	85	E6	21	<20	<.500	--	--
33	550	<10	<3	E2	<3	E9	E2	558	<20	84	8	21	<20		--	--
33	595	<10	<3	E3	<3	E10	<3	557	<20	83	8	18	<20	<.500	--	--
33	595	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
33	595	<10	<3	E3	<3	E9	E1	561	<20	134	9	E16	<20	<.500	--	--
33	well head	<10	<3	E3	<3	E9	E1	587	<20	104	7	19	<20	<.500	--	--
36	415	<50	<10	<30	<13	<100	<7	671	<90	58	<33	E20	<13	1.58	-38.5	-6.35
36	480	<50	<10	<30	<13	<100	<7	671	<90	82	<33	<57	<13	1.94	--	--
36	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	520	<50	<10	<30	<13	<100	<7	663	<90	79	<33	E18	<13	1.11	--	--
36	595	<50	<10	<30	<13	<100	<7	667	<90	87	<33	E18	<13	.610	--	--
36	645	<50	<10	<30	<13	<100	<7	660	<90	78	<33	E20	<13	1.10	--	--
36	645	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	680	<50	E5	<30	<13	<100	<7	662	<90	57	E14	111	<13	.839	-37.0	-6.34
36	well head	<50	<10	<30	<13	<100	<7	547	<90	92	79	<57	<13	<.500	-37.5	-6.40
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	<.500	--	--
36		<50	E2	E1	<13	<100	<7	3	<90	72	<33	<57	<13	2.37	--	--
36		--	--	--	--	--	--	--	--	--	--	--	--	2.42	--	--
36	480	<50	<10	E3	E1	E7	<7	662	E11	115	E6	<57	<13	.720	--	--
36	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	520	<50	<10	E3	<13	E8	<7	659	E10	106	E6	<57	<13	1.67	--	--
36	595	<50	<10	4	<13	E15	<7	484	E7	100	10	<57	<13	1.09	--	--
36	645	<50	<10	4	<13	E15	<7	531	E10	61	36	<57	<13	.968	--	--
36	645	<50	E2	4	E1	16	<7	532	E7	35	33	<57	<13	<.500	--	--
36	680	<50	<10	6	E1	E32	<7	393	E7	112	151	<57	<13	E.483	--	--
36	680	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	680	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	<50	<10	6	<13	E40	<7	357	<90	122	239	<57	<13	1.18	--	--

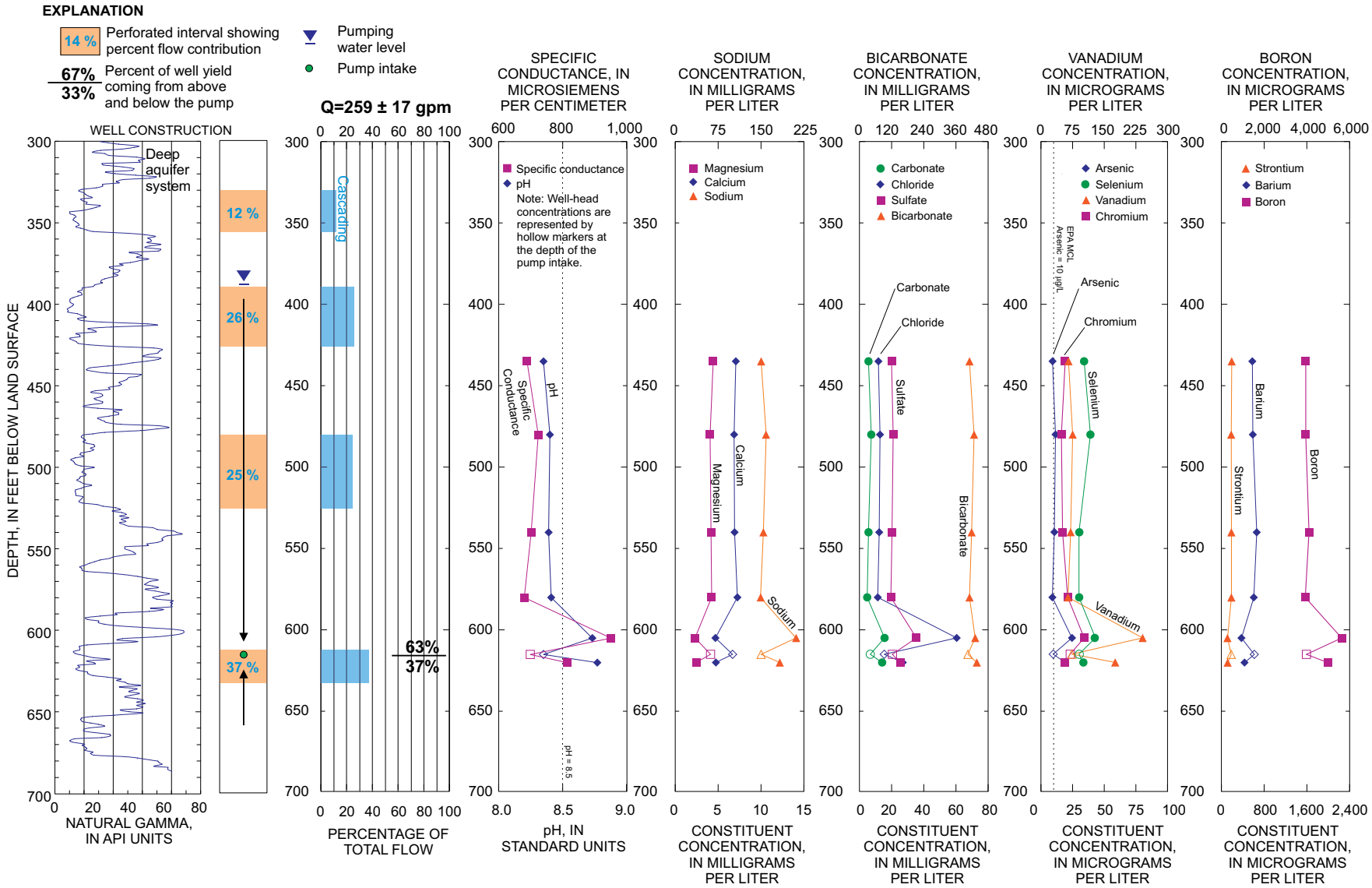
Appendix 5A Natural gamma-ray log, open-interval (screen) log, flow contribution, and water quality with depth in Norman Well 02, March 2005 [µg/L, micrograms per liter; NQ, not quantifiable; %, percent; Q, estimated well yield in gallons per minute (gpm); BQL, below practical quantitation limit; EPA MCL, Environmental Protection Agency maximum contaminant level for arsenic].



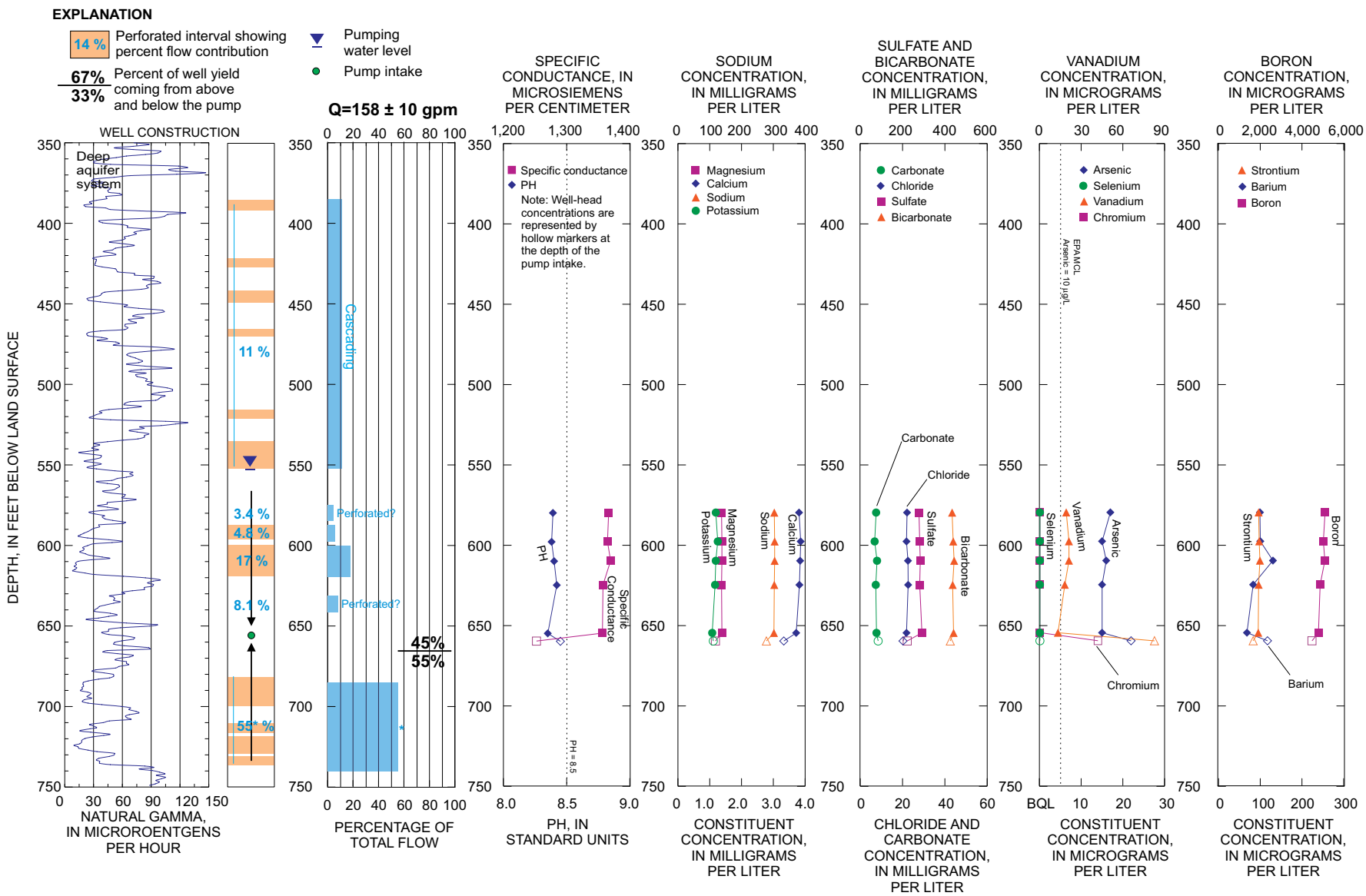
Appendix 5B. Natural gamma-ray log, open-interval (perforation) log, flow contribution, and water quality with depth in Norman Well 05, November 2005 [µg/L, micrograms per liter; API, American Petroleum Institute; NQ, not quantifiable; %, percent; Q, estimated well yield in gallons per minute (gpm); EPA MCL, Environmental Protection Agency maximum contaminant level for arsenic].



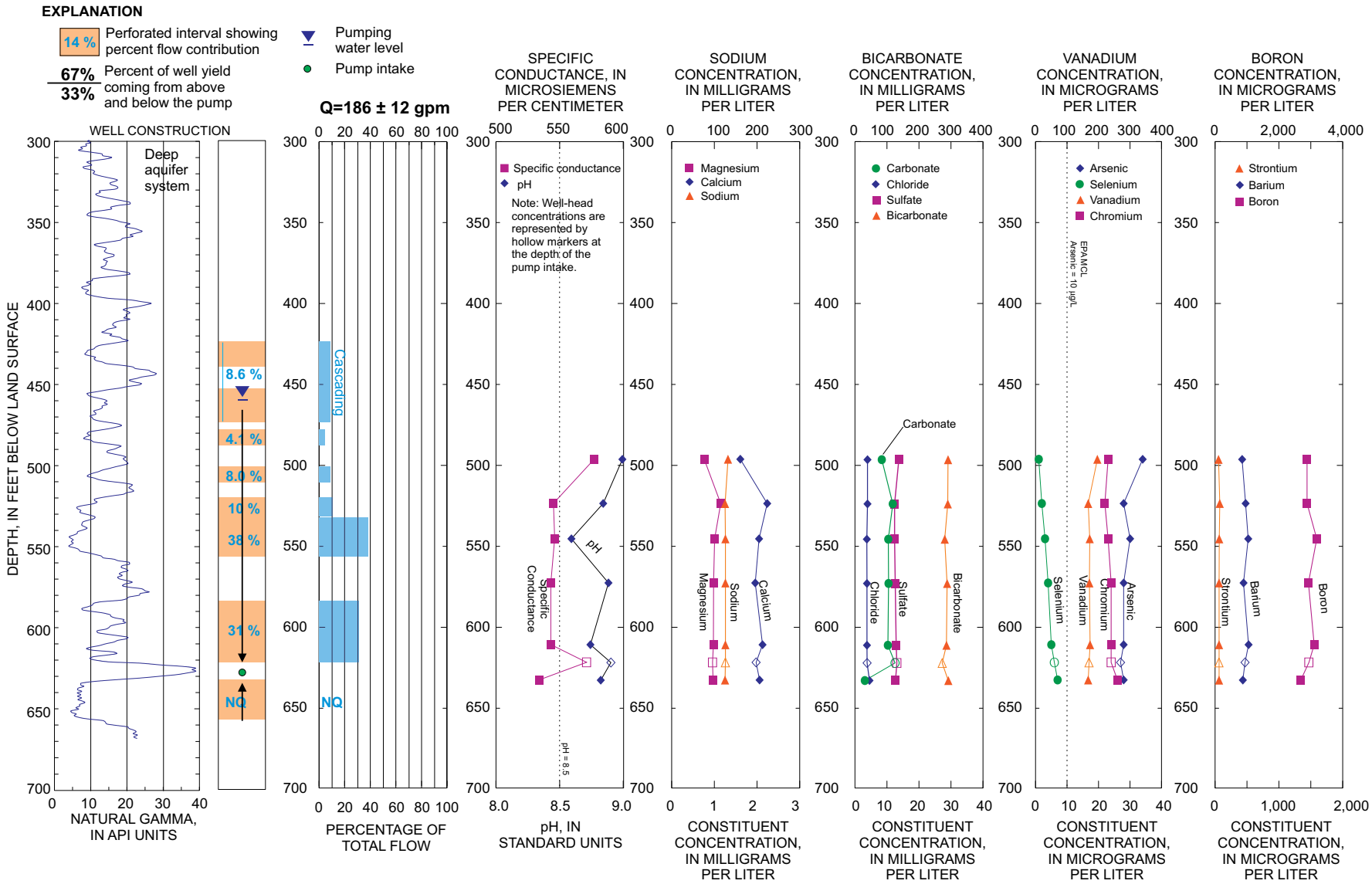
Appendix 5C. Natural gamma ray log, open-interval (perforation) log, flow contribution, and water quality with depth in Norman Well 06, March 2005 [µg/L, micrograms per liter; API, American Petroleum Institute; NQ, not quantifiable; %, percent; Q, estimated well yield in gallons per minute (gpm); EPA MCL, Environmental Protection Agency maximum contaminant level for arsenic].



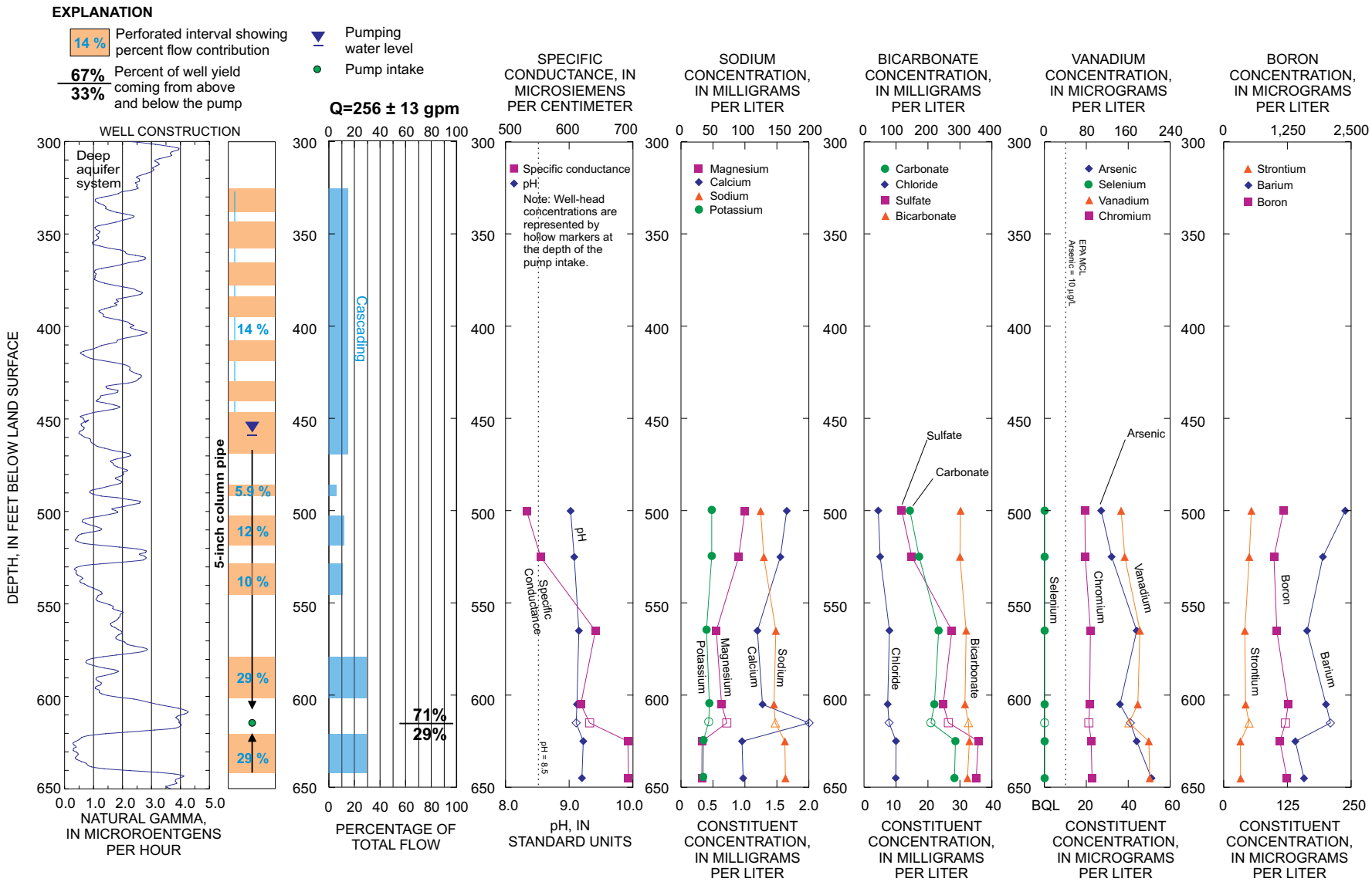
Appendix 5D. Natural gamma-ray log, open-interval (perforation) log, flow contribution, and water quality with depth in Norman Well 07, November 2004 [µg/L, micrograms per liter; NQ, not quantifiable; %, percent; Q, estimated well yield in gallons per minute (gpm); BQL, below practical quantitation limit; * indicates that flow contribution was determined by subtracting flow above the pump, calculated using an effective area of 0.21 square foot, from the maximum estimate of well yield; EPA MCL, Environmental Protection Agency maximum contaminant level for arsenic].



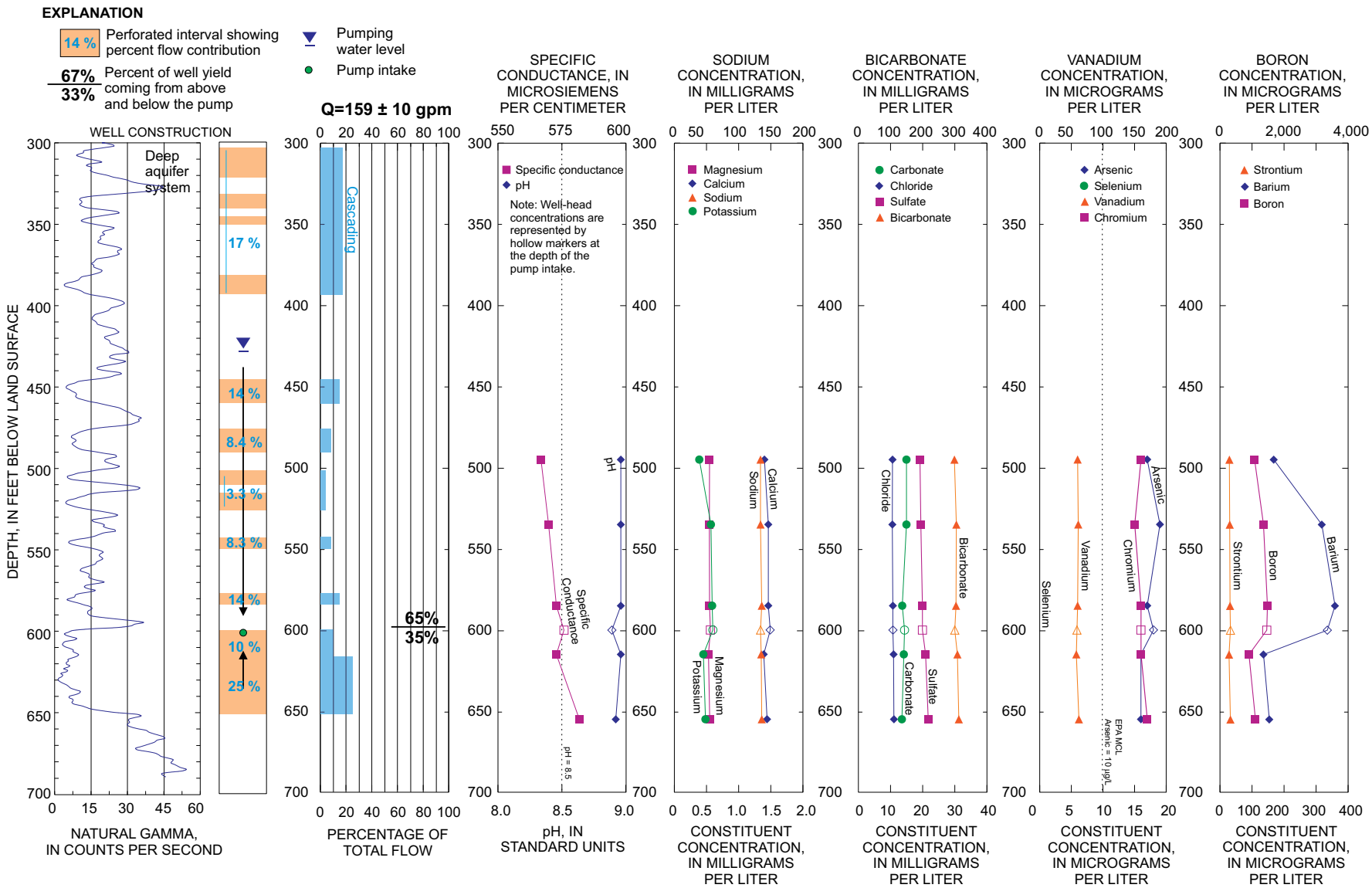
Appendix 5E. Natural gamma-ray log, open-interval (perforation) log, flow contribution, and water quality with depth in Norman Well 13, August 2004 [µg/L, micrograms per liter; API, American Petroleum Institute; NQ, not quantifiable; %, percent; Q, estimated well yield in gallons per minute (gpm); EPA MCL, Environmental Protection Agency maximum contaminant level for arsenic].



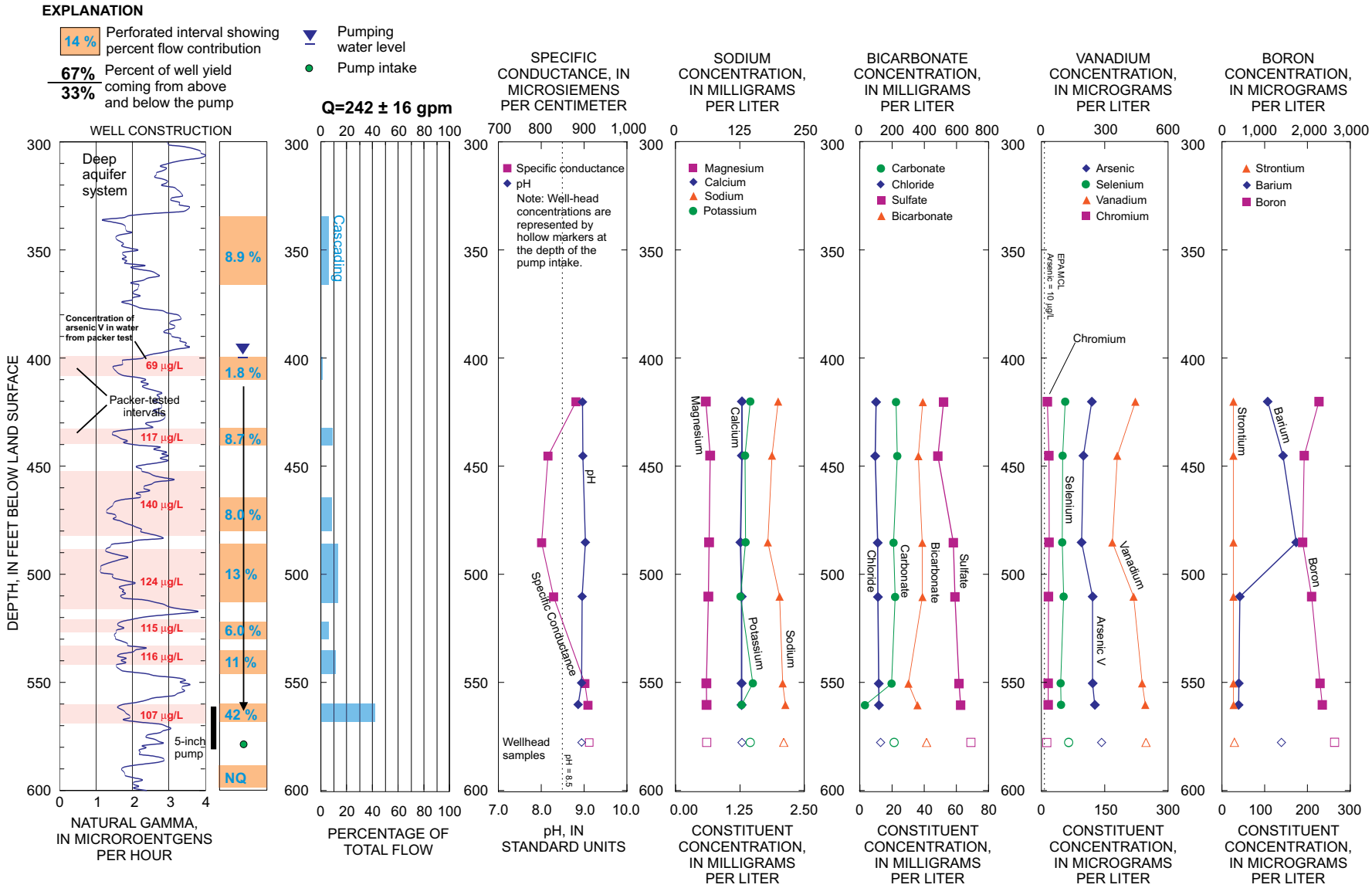
Appendix 5F. Natural gamma-ray log, open-interval (perforation) log, flow contribution, and water quality with depth in Norman Well 15, January 2005 [µg/L, micrograms per liter; NQ, not quantifiable; %, percent; Q, estimated well yield in gallons per minute (gpm); BQL, below practical quantitation limit; EPA MCL, Environmental Protection Agency maximum contaminant level for arsenic].



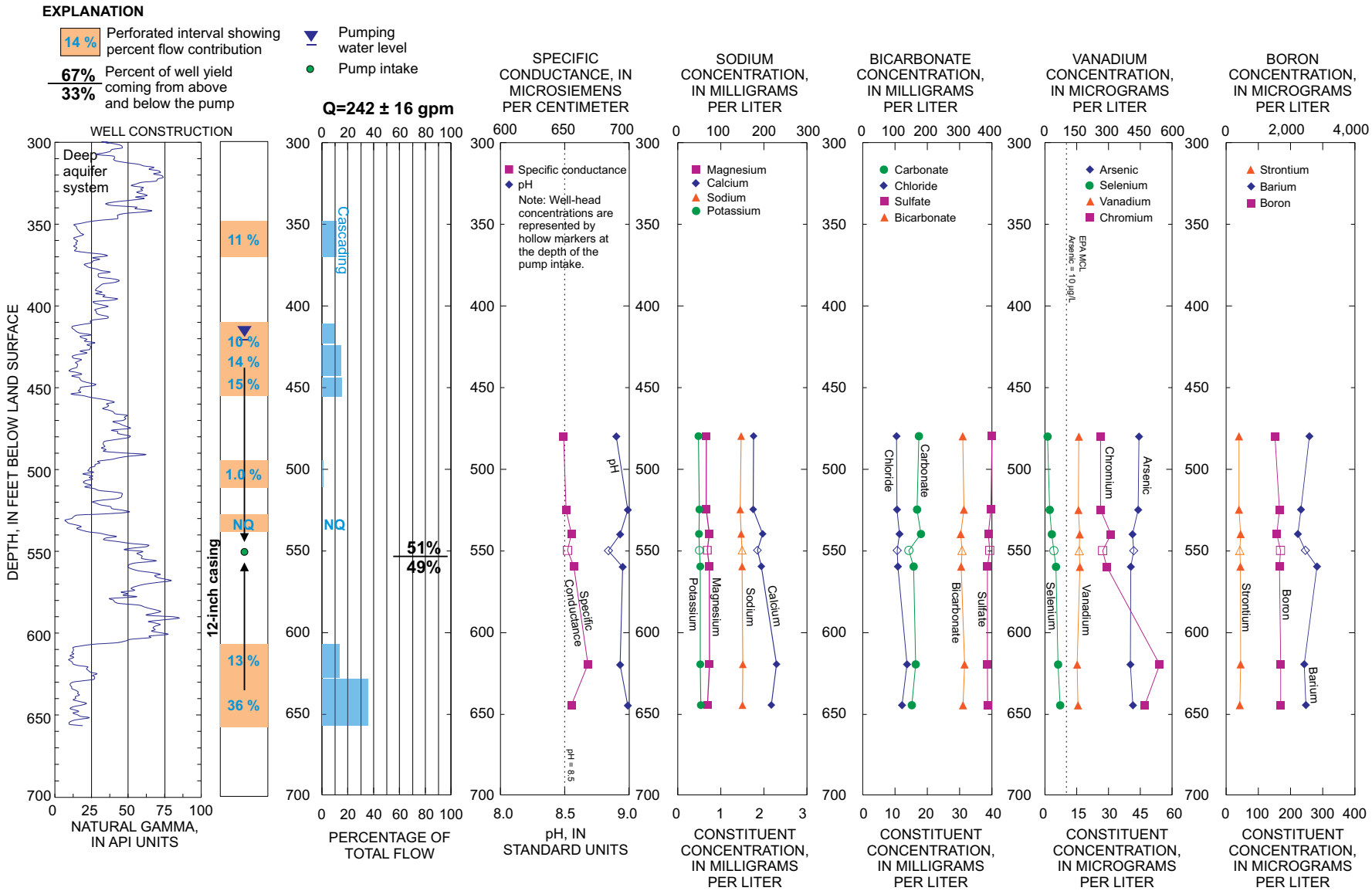
Appendix 5G. Natural gamma-ray log, open-interval (perforation) log, flow contribution, and water quality with depth in Norman Well 18, January 2005 [µg/L, micrograms per liter; NQ, not quantifiable; %, percent; Q, estimated well yield in gallons per minute (gpm); EPA MCL, Environmental Protection Agency maximum contaminant level for arsenic].



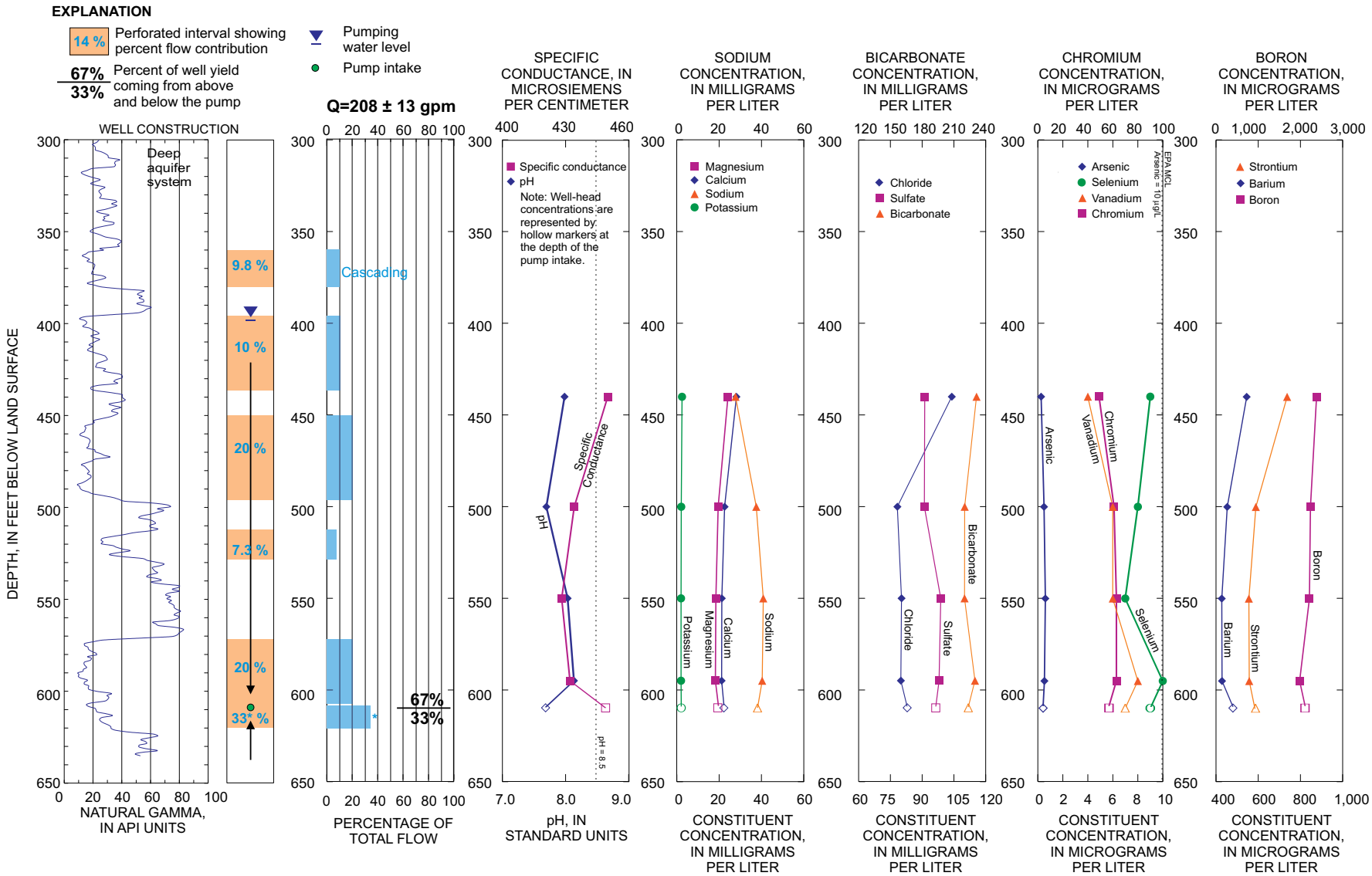
Appendix 5H. Natural gamma-ray log, open-interval (perforation) log, flow contribution, and water quality with depth in Norman Well 23, April-May 2004 [µg/L, micrograms per liter; NQ, not quantifiable; %, percent; Q, estimated well yield in gallons per minute (gpm); EPA MCL, Environmental Protection Agency maximum contaminant level for arsenic].



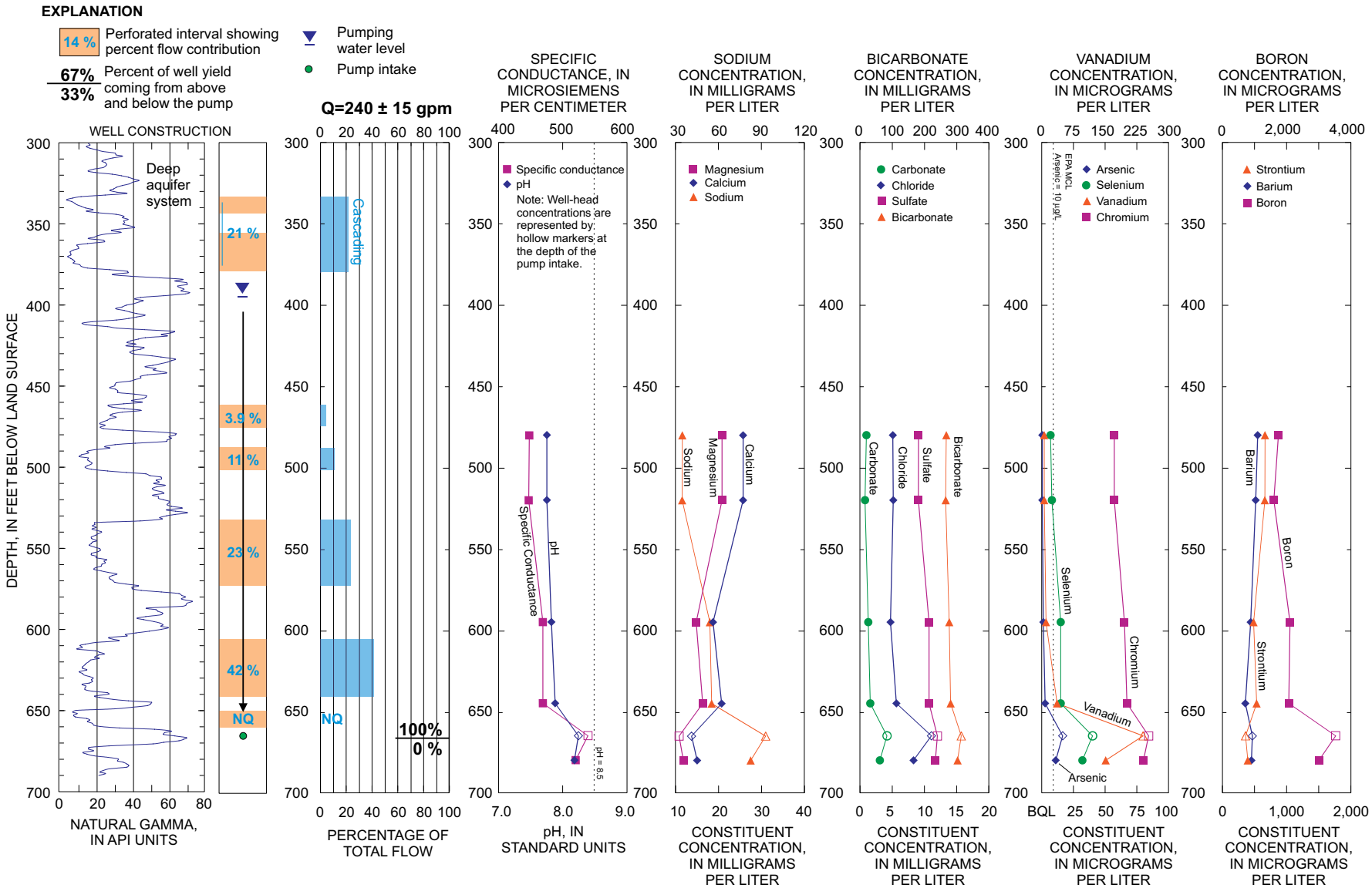
Appendix 5I. Natural gamma-ray log, open-interval (perforation) log, flow contribution, and water quality with depth in Norman Well 31, March 2005 [µg/L, micrograms per liter; API, American Petroleum Institute; NQ, not quantifiable; %, percent; Q, estimated well yield in gallons per minute (gpm); EPA MCL, Environmental Protection Agency maximum contaminant level for arsenic].



Appendix 5J. Natural gamma-ray log, open-interval (perforation) log, flow contribution, and water quality with depth in Norman Well 33, March 2006 (* indicates that flow contribution was determined by subtracting flow above the pump, calculated using an effective area of 0.21 square foot, from the maximum estimate of well yield) [µg/L, micrograms per liter; API, American Petroleum Institute; NQ, not quantifiable; %, percent; Q, estimated well yield in gallons per minute (gpm); EPA MCL, Environmental Protection Agency maximum contaminant level for arsenic].



Appendix 5K. Natural gamma-ray log, open-interval (perforation) log, flow contribution, and water quality with depth in Norman Well 36, October 2004 (flow) and June 2005 (water quality) [µg/L, micrograms per liter; API, American Petroleum Institute; NQ, not quantifiable; %, percent; Q, estimated well yield in gallons per minute (gpm); BQL, below practical quantitation limit; EPA MCL, Environmental Protection Agency maximum contaminant level for arsenic].



Appendix 6. Chemical analyses of ground-water samples and quality-assurance samples collected after well modification in two selected public-supply wells, Norman, Oklahoma, 2005-2006. Shaded rows denote quality-assurance samples [mg/L, milligrams per liter; ug/L, micrograms per liter; %, percent; uS/cm at 25°C, microsiemens per centimeter at 25 degrees Celsius; °C, degrees Celsius; NTU, Nephelometric Turbidity Units; mm Hg, millimeters of mercury; E, estimated below quantitation limit; <, less than quantitation limit; --, no data]

Well	USGS station number	Station name	Quality-assurance sample type	Date	Time	Depth of pump intake (feet)	Sampling depth (feet)	Elevation of land surface (feet)	Specific conductance, field (uS/cm at 25 °C)	pH, field, standard units	Temperature, water (°C)	Turbidity, field (NTU)	Barometric pressure (mm Hg)	Dissolved oxygen, field (mg/L)	Dissolved oxygen, field (%)	Calcium, filtered (mg/L)	Calcium, unfiltered (mg/L)
05	351409097231801	09N-02W-22 DDA 1		Nov 17 2005	1000	610	430	1161	435	6.68	--	.12	728.4	--	--	9.02	--
05	351409097231801	09N-02W-22 DDA 1		Nov 17 2005	1100	610	470	1161	428	7.92	--	1.62	738.4	--	--	6.72	--
05	351409097231801	09N-02W-22 DDA 1		Nov 17 2005	1200	610	500	1161	441	7.95	--	.23	738.4	--	--	7.41	--
05	351409097231801	09N-02W-22 DDA 1	Duplicate	Nov 17 2005	1200	610	500	1161	--	--	--	--	--	--	--	--	--
05	351409097231801	09N-02W-22 DDA 1		Nov 17 2005	1230	610	550	1161	446	7.96	--	1.26	738.4	--	--	7.41	--
05	351409097231801	09N-02W-22 DDA 1		Nov 17 2005	1500	610	well head	1161	515	8.18	17.5	1.02	738.4	6.02	63.0	6.77	--
05	351409097231801	09N-02W-22 DDA 1	Duplicate	Nov 17 2005	1500	610	well head	1161	--	--	--	--	--	--	--	--	--
05	351409097231801	09N-02W-22 DDA 1		Nov 17 2005	1300	610	620	1161	588	8.56	--	.92	738.4	--	--	4.68	--
05	351409097231801	09N-02W-22 DDA 1		Nov 17 2005	1330	610	630	1161	674	8.75	--	6.32	738.4	--	--	4.33	--
05	351409097231801	09N-02W-22 DDA 1		Nov 17 2005	1400	610	660	1161	901	8.76	--	.48	738.4	--	--	4.59	--
05	351409097231801	09N-02W-22 DDA 1	Duplicate	Nov 17 2005	1400	610	660	1161	--	--	--	--	--	--	--	--	--
05	351409097231801	09N-02W-22 DDA 1		Jan 13 2006	0930	560	470	1161	551	8.21	--	.96	719.8	--	--	6.82	--
05	351409097231801	09N-02W-22 DDA 1	Duplicate	Jan 13 2006	0930	560	470	1161	--	--	--	--	--	--	--	--	--
05	351409097231801	09N-02W-22 DDA 1		Jan 13 2006	1000	560	550	1161	453	8.35	--	.58	719.8	--	--	7.24	--
05	351409097231801	09N-02W-22 DDA 1	Duplicate	Jan 13 2006	1000	560	550	1161	--	--	--	--	--	--	--	7.23	--
05	351409097231801	09N-02W-22 DDA 1		Jan 13 2006	1300	560	well head	1161	514	8.48	17.5	.53	719.8	E4.08	E42.7	6.93	--
05	351409097231801	09N-02W-22 DDA 1		Jan 13 2006	1230	560	580	1161	869	8.88	--	3.33	719.8	--	--	4.17	--
05	351409097231801	09N-02W-22 DDA 1	Replicate	Jan 13 2006	1230	560	580	1161	--	--	--	--	--	--	--	4.18	--
05	351409097231801	09N-02W-22 DDA 1		Jan 13 2006	1200	560	630	1161	844	8.88	--	4.15	719.8	--	--	4.22	--
05	351409097231801	09N-02W-22 DDA 1	Duplicate	Jan 13 2006	1200	560	630	1161	--	--	--	--	--	--	--	--	--
05	351409097231801	09N-02W-22 DDA 1		Jan 13 2006	1100	560	660	1161	732	8.86	--	4.10	719.8	--	--	4.53	--
05	351409097231801	09N-02W-22 DDA 1	Duplicate	Jan 13 2006	1100	560	660	1161	--	--	--	--	--	--	--	--	--
05	351409097231801	09N-02W-22 DDA 1		Jan 20 2006	0930	505	470	1161	445	7.97	--	2.16	725.7	--	--	6.65	--
05	351409097231801	09N-02W-22 DDA 1	Duplicate	Jan 20 2006	0930	505	470	1161	--	--	--	--	--	--	--	--	--
05	351409097231801	09N-02W-22 DDA 1		Jan 20 2006	1300	505	well head	1161	537	8.61	17.5	1.14	725.7	5.37	56.2	6.78	--
05	351409097231801	09N-02W-22 DDA 1		Jan 20 2006	1030	505	500	1161	855	8.66	--	2.34	725.7	--	--	5.18	--
05	351409097231801	09N-02W-22 DDA 1	Duplicate	Jan 20 2006	1030	505	500	1161	--	--	--	--	--	--	--	5.07	--
05	351409097231801	09N-02W-22 DDA 1		Jan 20 2006	1200	505	580	1161	1,003	9.07	--	1.23	725.7	--	--	3.46	--
05	351409097231801	09N-02W-22 DDA 1		Jan 20 2006	1130	505	630	1161	995	9.15	--	3.92	725.7	--	--	3.62	--
05	351409097231801	09N-02W-22 DDA 1	Duplicate	Jan 20 2006	1130	505	630	1161	--	--	--	--	--	--	--	--	--
05	351409097231801	09N-02W-22 DDA 1		Jan 20 2006	1100	505	660	1161	980	8.85	--	4.28	725.7	--	--	4.00	--
05	351409097231801	09N-02W-22 DDA 1	Duplicate	Jan 20 2006	1100	505	660	1161	--	--	--	--	--	--	--	--	--

Appendix 6. Chemical analyses of ground-water samples and quality-assurance samples collected after well modification in two selected public-supply wells, Norman, Oklahoma, 2005-2006. (continued)

Well	Sampling depth (feet)	Magnesium, filtered (mg/L)	Magnesium, unfiltered (mg/L)	Sodium, filtered (mg/L)	Sodium adsorption ratio	Sodium, unfiltered (mg/L)	Potassium, filtered (mg/L)	Potassium, unfiltered (mg/L)	Bicarbonate, unfiltered (mg/L)	Carbonate, unfiltered (mg/L)	Acid neutralizing capacity (mg/L as $CaCO_3$)	Sulfate, unfiltered (mg/L)	Chloride, unfiltered (mg/L)	Bromide, unfiltered (mg/L)	Iodine, unfiltered (mg/L)	Nitrite, unfiltered (mg/L as N)	Nitrite plus nitrate, unfiltered (mg/L as N)	Ammonia, unfiltered (mg/L as N)
05	430	7.22	--	81.4	4.90	--	1.35	--	256.5	1.1	212.3	10.6	3.41	<.250	<.025	<.100	.283	<.100
05	470	5.14	--	89.0	6.29	--	1.10	--	255.7	1.5	212.3	10.0	2.14	<.250	<.025	<.100	.244	.163
05	500	5.66	--	87.5	5.89	--	1.16	--	259.3	1.6	215.3	10.4	3.04	<.250	<.025	<.100	.256	E.019
05	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	550	5.67	--	88.0	5.92	--	1.17	--	259.3	1.6	215.3	E.186	<1.00	<.250	<.025	<.100	.269	<.100
05	well head	5.05	--	105	7.44	--	1.11	--	280.3	3.3	235.5	E.172	<1.00	<.250	<.025	<.100	.254	E.074
05	well head	--	--	--	--	--	--	--	--	--	--	--	--	<.250	--	<.100	.258	E.021
05	620	3.20	--	129	11.3	--	.850	--	303.3	10.2	265.9	E.228	<1.00	<.250	<.025	<.100	.279	E.020
05	630	2.84	--	146	13.4	--	.770	--	316.2	12.6	280.5	20.0	22.8	<.250	<.025	<.100	.272	E.022
05	660	3.15	--	199	17.5	--	.771	--	375.1	19.1	339.7	32.2	55.6	E.150	<.025	E.015	.259	<.100
05	660	--	--	--	--	--	--	--	--	--	--	32.3	56.3	--	<.025	--	--	--
05	470	5.24	--	86.8	6.08	--	1.18	--	250.0	3.7	211.3	11.4	2.63	<.250	<.025	<.100	.262	<.100
05	470	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	550	5.56	--	88.9	6.04	--	1.20	--	254.5	1.5	211.3	10.7	3.25	<.250	<.025	<.100	.256	<.100
05	550	5.53	--	88.6	6.03	--	1.20	--	--	--	--	--	--	--	--	--	--	--
05	well head	5.31	--	104	7.23	--	1.18	--	285.4	3.9	240.6	13.9	9.26	<.250	<.025	<.100	.269	<.100
05	580	2.90	--	190	17.5	--	.768	--	354.9	27.7	337.6	32.3	45.6	<.250	<.025	<.100	.255	.260
05	580	2.88	--	188	17.3	--	.754	--	--	--	--	--	--	--	--	--	--	--
05	630	2.91	--	182	16.7	--	.767	--	358.4	20.6	328.5	30.4	42.3	<.250	<.025	<.100	.258	.268
05	630	--	--	--	--	--	--	--	--	--	--	--	--	<.250	<.025	--	--	--
05	660	3.35	--	161	14.0	--	.895	--	325.6	21.0	302.3	22.7	32.3	<.250	<.025	<.100	.311	<.100
05	660	--	--	--	--	--	--	--	--	--	--	22.9	32.2	--	--	<.100	.305	<.100
05	470	5.10	--	88.9	6.31	--	1.13	--	257.0	1.5	213.3	10.1	2.42	<.250	<.025	<.100	.233	<.100
05	470	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	well head	5.01	--	108	7.67	--	1.14	--	280.1	5.9	239.6	15.2	12.8	<.250	<.025	<.100	.260	E.051
05	500	3.59	--	181	15.0	--	.852	--	358.9	18.0	324.5	31.5	44.7	<.250	<.025	<.100	.261	<.100
05	500	3.48	--	181	15.2	--	.899	--	--	--	--	--	--	--	--	--	--	--
05	580	2.18	--	218	22.6	--	.669	--	411.1	19.0	369.0	40.9	63.1	<.250	<.025	<.100	.236	<.100
05	630	2.31	--	216	21.8	--	.655	--	409.1	18.8	366.9	40.1	61.5	E.098	<.025	<.100	.245	.318
05	630	--	--	--	--	--	--	--	--	--	--	39.8	61.5	E.126	<.025	--	--	--
05	660	2.85	--	212	19.8	--	.742	--	387.2	24.0	357.9	38.3	62.0	E.113	<.025	<.100	.245	<.100
05	660	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<.100	.245	<.100

Appendix 6. Chemical analyses of ground-water samples and quality-assurance samples collected after well modification in two selected public-supply wells, Norman, Oklahoma, 2005-2006. (continued)

Well	Sampling depth (feet)	Orthophosphate, unfiltered (mg/L as P)	Aluminum, filtered (ug/L)	Aluminum, unfiltered (ug/L)	Antimony, filtered (ug/L)	Antimony, unfiltered (ug/L)	Arsenic, filtered (ug/L)	Arsenic, unfiltered (ug/L)	Arsenate, filtered (ug/L as As)	Arsenite, filtered (ug/L as As)	Dimethyl-arsinate, filtered (ug/L as As)	Monomethyl-arsonate, filtered (ug/L as As)	Barium, filtered (ug/L)	Barium, unfiltered (ug/L)	Beryllium, filtered (ug/L)	Beryllium, unfiltered (ug/L)	Boron, filtered (ug/L)	Boron, unfiltered (ug/L)
05	430	E.014	174	--	E5	--	1.24	--	<10	<10	<10	<10	433	--	<3	--	947	--
05	470	E.014	157	--	<10	--	1.76	--	<10	<10	<10	<10	399	--	<3	--	1,020	--
05	500	.022	134	--	E4	--	1.70	--	<10	<10	<10	<10	384	--	<3	--	942	--
05	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	550	E.019	148	--	E4	--	1.84	--	<10	<10	<10	<10	393	--	<3	--	1,040	--
05	well head	.028	174	--	<10	--	8.11	--	<10	<10	<10	<10	410	--	<3	--	1,320	--
05	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	620	.030	159	--	E4	--	27.7	--	19.9	<10	<10	<10	340	--	<3	--	1,690	--
05	630	.036	212	--	<10	--	36.5	--	26	<10	<10	<10	395	--	<3	--	2,080	--
05	660	.045	204	--	E3	--	52.0	--	37	<10	<10	<10	437	--	<3	--	2,970	--
05	660	.049	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	470	E.019	192	--	E5	--	1.59	--	<10	<10	<10	<10	456	--	<3	--	976	--
05	470	--	--	--	--	--	1.57	--	--	--	--	--	--	--	--	--	--	--
05	550	E.019	150	--	<10	--	1.73	--	<10	<10	<10	<10	382	--	<3	--	989	--
05	550	--	146	--	E4	--	--	--	--	--	--	--	381	--	<3	--	991	--
05	well head	.020	186	--	E5	--	6.54	--	<10	<10	<10	<10	419	--	<3	--	1,350	--
05	580	.039	193	--	E3	--	34.4	--	30.5	<10	<10	<10	362	--	<3	--	2,650	--
05	580	--	187	--	E4	--	34.0	--	--	--	--	--	357	--	<3	--	2,680	--
05	630	.038	188	--	E4	--	31.9	--	24.8	<10	<10	<10	347	--	<3	--	2,630	--
05	630	.039	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	660	.031	214	--	<10	--	26.4	--	16.6	<10	<10	<10	391	--	<3	--	2,210	--
05	660	--	--	--	--	--	--	--	18.5	<10	<10	<10	--	--	--	--	--	--
05	470	E.019	194	--	<10	--	1.58	--	<10	<10	<10	<10	435	--	<3	--	1,050	--
05	470	--	--	--	--	--	1.59	--	--	--	--	--	--	--	--	--	--	--
05	well head	.032	161	--	<10	--	7.38	--	10.7	<10	<10	<10	405	--	<3	--	1,330	--
05	500	.036	186	--	<10	--	26.7	--	26.2	<10	<10	<10	357	--	<3	--	2,660	--
05	500	--	177	--	<10	--	--	--	--	--	--	--	359	--	<3	--	2,650	--
05	580	.051	204	--	<10	--	40.3	--	32.7	<10	<10	<10	387	--	<3	--	3,260	--
05	630	.047	153	--	<10	--	39.5	--	33.5	<10	<10	<10	317	--	<3	--	3,150	--
05	630	.046	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	660	.047	156	--	<10	--	38.4	--	16.6	<10	<10	<10	354	--	<3	--	3,160	--
05	660	--	--	--	--	--	--	--	31.8	<10	<10	<10	--	--	--	--	--	--

Appendix 6. Chemical analyses of ground-water samples and quality-assurance samples collected after well modification in two selected public-supply wells, Norman, Oklahoma, 2005-2006. (continued)

Well	Sampling depth (feet)	Cadmium, filtered (ug/L)	Cadmium, unfiltered (ug/L)	Chromium, filtered (ug/L)	Chromium, unfiltered (ug/L)	Cobalt, filtered (ug/L)	Cobalt, unfiltered (ug/L)	Copper, filtered (ug/L)	Copper, unfiltered (ug/L)	Iron(II), filtered, field (mg/L)	Iron, filtered, field (mg/L)	Iron, filtered (ug/L)	Iron, unfiltered (ug/L)	Lead, filtered (ug/L)	Lead, unfiltered (ug/L)	Manganese, filtered (ug/L)	Manganese, unfiltered (ug/L)	Molybdenum, filtered (ug/L)	Molybdenum, unfiltered (ug/L)	Nickel, filtered (ug/L)	Nickel, unfiltered (ug/L)
05	430	<3	--	64	--	<3	--	<20	--	.13	.23	86	--	<10	--	E1	--	<3	--	<3	--
05	470	<3	--	66	--	<3	--	<20	--	.12	.33	75	--	<10	--	<3	--	E2	--	<3	--
05	500	<3	--	66	--	<3	--	<20	--	.15	.15	64	--	<10	--	<3	--	E2	--	<3	--
05	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	550	<3	--	66	--	<3	--	<20	--	.26	.44	82	--	<10	--	<3	--	4	--	<3	--
05	well head	<3	--	70	--	<3	--	<20	--	.12	.19	80	--	<10	--	<3	--	6	--	<3	--
05	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	620	<3	--	66	--	<3	--	<20	--	.07	.22	81	--	<10	--	<3	--	8	--	<3	--
05	630	<3	--	66	--	<3	--	<20	--	.06	.28	132	--	<10	--	E1	--	11	--	<3	--
05	660	<3	--	85	--	<3	--	<20	--	.20	.51	136	--	<10	--	E2	--	23	--	<3	--
05	660	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	470	<3	--	67	--	<3	--	<20	--	.01	.04	92	--	<10	--	<3	--	E2	--	<3	--
05	470	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	550	<3	--	66	--	<3	--	<20	--	.09	.12	69	--	<10	--	<3	--	E2	--	<3	--
05	550	<3	--	67	--	<3	--	<20	--	--	--	69	--	<10	--	<3	--	E2	--	<3	--
05	well head	<3	--	68	--	<3	--	<20	--	.03	.10	85	--	<10	--	<3	--	6	--	<3	--
05	580	<3	--	81	--	<3	--	<20	--	.01	.09	92	--	<10	--	<3	--	<23	--	<3	--
05	580	<3	--	82	--	<3	--	<20	--	--	--	93	--	<10	--	<3	--	23	--	<3	--
05	630	<3	--	78	--	<3	--	<20	--	.01	.06	110	--	<10	--	E1	--	21	--	<3	--
05	630	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	660	<3	--	66	--	E1	--	<20	--	.18	.64	117	--	<10	--	E1	--	11	--	<3	--
05	660	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	470	<3	--	67	--	<3	--	<20	--	.20	.23	86	--	<10	--	<3	--	E3	--	<3	--
05	470	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	well head	<3	--	69	--	<3	--	<20	--	.05	.11	77	--	<10	--	<3	--	6	--	<3	--
05	500	<3	--	88	--	<3	--	<20	--	.09	.15	96	--	<10	--	<3	--	23	--	<3	--
05	500	<3	--	87	--	<3	--	<20	--	--	--	94	--	<10	--	<3	--	23	--	<3	--
05	580	<3	--	94	--	<3	--	<20	--	.09	.32	125	--	<10	--	<3	--	31	--	<3	--
05	630	<3	--	96	--	<3	--	<20	--	.07	.11	85	--	<10	--	<3	--	32	--	<3	--
05	630	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	660	<3	--	96	--	<3	--	<20	--	.14	.15	85	--	<10	--	<3	--	28	--	<3	--
05	660	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Appendix 6. Chemical analyses of ground-water samples and quality-assurance samples collected after well modification in two selected public-supply wells, Norman, Oklahoma, 2005-2006. (continued)

Well	Sampling depth (feet)	Selenium, filtered (ug/L)	Selenium, unfiltered (ug/L)	Silver, filtered (ug/L)	Silver, unfiltered (ug/L)	Strontium, filtered (ug/L)	Strontium, unfiltered (ug/L)	Thallium, filtered (ug/L)	Thallium, unfiltered (ug/L)	Titanium, filtered (ug/L)	Titanium, unfiltered (ug/L)	Vanadium, filtered (ug/L)	Vanadium, unfiltered (ug/L)	Zinc, filtered (ug/L)	Zinc, unfiltered (ug/L)	Uranium, filtered (ug/L)	Uranium, unfiltered (ug/L)	Organic carbon, filtered (mg/L)
05	430	E6	--	<3	--	247	--	<20	--	91	--	13	--	<17	--	<20	--	E.353
05	470	E7	--	<3	--	187	--	<20	--	80	--	19	--	<17	--	<20	--	.603
05	500	E6	--	<3	--	205	--	<20	--	72	--	19	--	<17	--	<20	--	.641
05	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.638
05	550	E9	--	<3	--	205	--	<20	--	80	--	21	--	<17	--	<20	--	E.233
05	well head	E10	--	<3	--	186	--	<20	--	88	--	83	--	<17	--	<20	--	<.500
05	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	620	E12	--	<3	--	117	--	<20	--	84	--	262	--	<17	--	<20	--	<.500
05	630	14	--	<3	--	104	--	<20	--	112	--	354	--	<17	--	<20	--	<.500
05	660	29	--	<3	--	116	--	<20	--	108	--	460	--	<17	--	<20	--	E.365
05	660	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	470	E9	--	<3	--	188	--	<20	--	101	--	18	--	<17	--	<20	--	1.09
05	470	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	550	E4	--	<3	--	197	--	<20	--	76	--	19	--	<17	--	<20	--	<1.00
05	550	E6	--	<3	--	197	--	<20	--	76	--	19	--	<17	--	<20	--	--
05	well head	E11	--	<3	--	188	--	<20	--	96	--	73	--	<17	--	<20	--	<1.00
05	580	22	--	<3	--	104	--	<20	--	100	--	382	--	<17	--	<20	--	1.63
05	580	23	--	<3	--	103	--	<20	--	101	--	382	--	<17	--	<20	--	1.63
05	630	21	--	<3	--	104	--	<20	--	98	--	363	--	<17	--	<20	--	E.779
05	630	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	660	E11	--	<3	--	117	--	<20	--	108	--	304	--	<17	--	<20	--	<1.00
05	660	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	470	E10	--	<3	--	183	--	<20	--	97	--	18	--	<17	--	<20	--	E.843
05	470	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05	well head	E9	--	E1	--	185	--	<20	--	86	--	83	--	<17	--	<20	--	<1.00
05	500	21	--	<3	--	127	--	<20	--	90	--	315	--	102	--	<20	--	E.645
05	500	20	--	E1	--	128	--	<20	--	90	--	309	--	99	--	<20	--	--
05	580	29	--	E1	--	88	--	<20	--	107	--	451	--	<17	--	<20	--	<1.00
05	630	29	--	<3	--	89	--	<20	--	80	--	457	--	<17	--	<20	--	E.898
05	630	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E.916
05	660	27	--	<3	--	106	--	<20	--	80	--	425	--	<17	--	<20	--	E.838
05	660	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Appendix 6. Chemical analyses of ground-water samples and quality-assurance samples collected after well modification in two selected public-supply wells, Norman, Oklahoma, 2005-2006. (continued)

Well	USGS station number	Station name	Quality-assurance sample type	Date	Time	Depth of pump intake (feet)	Sampling depth (feet)	Elevation of land surface (feet)	Specific conductance, field (uS/cm at 25 °C)	pH, field, standard units	Temperature, water (°C)	Turbidity, field (NTU)	Barometric pressure (mm Hg)	Dissolved oxygen, field (mg/L)	Dissolved oxygen, field (%)	Calcium, filtered (mg/L)	Calcium, unfiltered (mg/L)
36	351633097241901	09N-02W-10 BBB 1	Blank	Sep 28 2005	0930	650		1080	--	--	--	--	--	--	--	.419	--
36	351633097241901	09N-02W-10 BBB 1		Sep 28 2005	1400	650	520	1080	453	7.73	--	5.01	735.3	--	--	23.8	--
36	351633097241901	09N-02W-10 BBB 1		Sep 28 2005	1300	650	595	1080	493	8.12	--	1.65	735.3	--	--	14.0	--
36	351633097241901	09N-02W-10 BBB 1		Sep 28 2005	1600	650	645	1080	508	8.27	--	2.31	735.3	--	--	12.9	--
36	351633097241901	09N-02W-10 BBB 1		Sep 28 2005	1700	650	well head	1080	546	8.55	18.0	.76	735.3	5.92	62.7	10.3	--
36	351633097241901	09N-02W-10 BBB 1	Duplicate	Sep 28 2005	1700	650	well head	1080	--	--	--	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1		Sep 28 2005	1500	650	660	1080	854	9.12	--	1.46	735.3	--	--	2.83	--
36	351633097241901	09N-02W-10 BBB 1		Sep 28 2005	1100	650	670	1080	839	8.94	--	.79	735.3	--	--	4.81	--
36	351633097241901	09N-02W-10 BBB 1	Duplicate	Sep 28 2005	1100	650	670	1080	--	--	--	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1		Nov 3 2005	1000	590	520	1080	453	7.26	--	3.17	730.5	--	--	25.9	--
36	351633097241901	09N-02W-10 BBB 1		Nov 3 2005	0900	590	575	1080	447	7.63	--	.47	730.5	--	--	25.9	--
36	351633097241901	09N-02W-10 BBB 1		Nov 3 2005	1500	590	well head	1080	456	7.39	17.6	.49	730.5	6.74	70.5	22.5	--
36	351633097241901	09N-02W-10 BBB 1		Nov 3 2005	1100	590	595	1080	461	7.74	--	.79	730.5	--	--	21.5	--
36	351633097241901	09N-02W-10 BBB 1	Duplicate	Nov 3 2005	1100	590	595	1080	--	--	--	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1		Nov 3 2005	1300	590	640	1080	474	7.84	--	.71	730.5	--	--	19.6	--
36	351633097241901	09N-02W-10 BBB 1	Duplicate	Nov 3 2005	1300	590	640	1080	--	--	--	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1		Nov 3 2005	1400	590	670	1080	540	8.58	--	11.4	730.5	--	--	8.83	--
36	351633097241901	09N-02W-10 BBB 1	Duplicate	Nov 3 2005	1400	590	670	1080	--	--	--	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1		Jan 18 2006	0900	590	well head	1080	567	8.48	17.6	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1		Jan 18 2006	0901	590	well head	1080	567	8.48	17.6	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1		Jan 18 2006	0902	590	well head	1080	567	8.48	17.6	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1		Jan 18 2006	0903	590	well head	1080	--	--	--	--	--	--	--	--	10.4
36	351633097241901	09N-02W-10 BBB 1	Duplicate	Jan 18 2006	0903	590	well head	1080	--	--	--	--	--	--	--	--	10.5
36	351633097241901	09N-02W-10 BBB 1		Jan 18 2006	0904	590	well head	1080	--	--	--	--	--	--	--	10.5	--
36	351633097241901	09N-02W-10 BBB 1		Jan 18 2006	0905	590	well head	1080	--	--	--	--	--	--	--	10.1	--
36	351633097241901	09N-02W-10 BBB 1	Blank	Jan 18 2006	0910	590		1080	--	--	--	--	--	--	--	.337	--
36	351633097241901	09N-02W-10 BBB 1		Jun 12 2006	1100	600	well head	1080	509	8.19	18.3	--	737.7	5.64	60	16.3	--
36	351633097241901	09N-02W-10 BBB 1	Duplicate	Jun 12 2006	1100	600	well head	1080	--	--	--	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1		Jun 13 2006	1000	600	well head	1080	545	8.43	18.1	--	737.7	5.61	59.5	11.9	--
36	351633097241901	09N-02W-10 BBB 1	Duplicate	Jun 13 2006	1000	600	well head	1080	--	--	--	--	--	--	--	11.9	--
36	351633097241901	09N-02W-10 BBB 1		Jun 14 2006	1630	600	well head	1080	556	8.41	18.1	--	737.7	5.64	59.8	11.4	--
36	351633097241901	09N-02W-10 BBB 1	Duplicate	Jun 14 2006	1630	600	well head	1080	--	--	--	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1		Jun 15 2006	1430	600	well head	1080	554	8.41	18.1	--	737.7	5.71	60.5	11.3	--
36	351633097241901	09N-02W-10 BBB 1	Duplicate	Jun 15 2006	1430	600	well head	1080	--	--	--	--	--	--	--	--	--
36	351633097241901	09N-02W-10 BBB 1		Jun 16 2006	0900	600	well head	1080	555	8.44	18.5	--	737.7	5.58	59.7	11.2	--
36	351633097241901	09N-02W-10 BBB 1	Duplicate	Jun 16 2006	0900	600	well head	1080	--	--	--	--	--	--	--	--	--

Appendix 6. Chemical analyses of ground-water samples and quality-assurance samples collected after well modification in two selected public-supply wells, Norman, Oklahoma, 2005-2006. (continued)

Well	Sampling depth (feet)	Magnesium, filtered (mg/L)	Magnesium, unfiltered (mg/L)	Sodium, filtered (mg/L)	Sodium adsorption ratio	Sodium, unfiltered (mg/L)	Potassium, filtered (mg/L)	Potassium, unfiltered (mg/L)	Bicarbonate, unfiltered (mg/L)	Carbonate, unfiltered (mg/L)	Acid neutralizing capacity (mg/L as $CaCO_3$)	Sulfate, unfiltered (mg/L)	Chloride, unfiltered (mg/L)	Bromide, unfiltered (mg/L)	Iodine, unfiltered (mg/L)	Nitrite, unfiltered (mg/L as N)	Nitrite plus nitrate, unfiltered (mg/L as N)	Ammonia, unfiltered (mg/L as N)
36		<.067	--	1.1	--	--	E.045	--	--	--	--	<1.00	<1.00	<.250	<.025	<.100	E.065	<.100
36	520	19.0	--	41.3	1.53	--	2.39	--	258.8	.9	213.8	9.59	5.46	<.250	<.025	<.100	.427	<.100
36	595	10.8	--	76.8	3.75	--	1.86	--	284.4	1.1	235.0	12.3	4.88	<.250	<.025	<.100	.333	<.100
36	645	9.9	--	84.9	4.32	--	1.68	--	291.8	2.2	243.1	12.8	6.67	<.250	<.025	<.100	.350	<.100
36	well head	7.81	--	108	6.18	--	1.37	--	313.8	5.9	267.4	12.9	12.7	<.250	<.025	<.100	.375	<.100
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<.100	.393	<.100
36	660	1.98	--	187	20.9	--	.474	--	363.2	34.4	356.3	14.9	36.9	E.156	<.025	<.100	.748	<.100
36	670	3.77	--	178	14.8	--	.747	--	374.7	23.5	347.2	14.9	36.7	E.108	<.025	<.100	.751	.444
36	670	--	--	--	--	--	--	--	--	--	--	15.0	36.7	E.130	<.025	--	--	--
36	520	21.1	--	34.8	1.23	--	2.42	--	253.3	.6	208.7	9.26	5.45	<.250	<.025	<.100	.463	<.100
36	575	21.0	--	35.7	1.26	--	2.50	--	256.1	.8	211.3	9.52	5.60	E.108	<.025	<.100	.459	E.014
36	well head	18.2	--	48.4	1.84	--	2.32	--	264.8	.7	218.4	9.40	5.72	<.250	<.025	<.100	.456	E.026
36	595	17.4	--	52.5	2.04	--	2.27	--	264.8	.7	218.4	9.0	5.87	<.250	<.025	<.100	.453	E.036
36	595	--	--	--	--	--	--	--	--	--	--	8.94	5.84	--	<.025	--	--	--
36	640	15.5	--	60.7	2.49	--	2.07	--	268.4	2.5	224.4	9.39	6.04	<.250	<.025	<.100	.459	E.049
36	640	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	670	6.97	--	105	6.41	--	1.39	--	294.2	8.5	255.8	9.80	7.33	<.250	<.025	<.100	.465	<.100
36	670	--	--	--	--	--	--	--	--	--	--	--	--	<.250	--	<.100	.458	<.100
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	--	7.83	--	--	113	--	1.25	--	--	--	--	--	--	--	--	--	--
36	well head	--	7.98	--	--	113	--	1.28	--	--	--	--	--	--	--	--	--	--
36	well head	7.97	--	113	6.40	--	1.29	--	--	--	--	--	--	--	--	--	--	--
36	well head	7.50	--	113	6.57	--	1.28	--	--	--	--	--	--	--	--	--	--	--
36		E.023	--	.963	--	--	<.140	--	--	--	--	--	--	--	--	--	--	--
36	well head	12.9	--	84.1	3.78	--	1.67	--	--	--	--	11.3	11.9	<.250	<.025	<.100	0.5	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	9.23	--	100	5.29	--	1.36	--	--	--	--	12.7	11.7	<.250	<.025	<.100	0.434	--
36	well head	9.24	--	99.3	5.25	--	1.33	--	--	--	--	--	--	--	--	--	--	--
36	well head	8.8	--	100	5.41	--	1.29	--	--	--	--	12.9	11.5	<.250	<.025	<.100	0.436	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	<.025	--	--	--
36	well head	8.62	--	98.9	5.39	--	1.28	--	--	--	--	12.7	11.5	<.250	<.025	<.100	0.435	--
36	well head	--	--	--	--	--	--	--	--	--	--	12.5	11.4	<.250	--	--	--	--
36	well head	8.6	--	100	5.47	--	1.35	--	--	--	--	12.7	11.4	<.250	<.025	<.100	0.438	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<.100	0.436	--

Appendix 6. Chemical analyses of ground-water samples and quality-assurance samples collected after well modification in two selected public-supply wells, Norman, Oklahoma, 2005-2006. (continued)

Well	Sampling depth (feet)	Orthophosphate, unfiltered (mg/L as P)	Aluminum, filtered (ug/L)	Aluminum, unfiltered (ug/L)	Antimony, filtered (ug/L)	Antimony, unfiltered (ug/L)	Arsenic, filtered (ug/L)	Arsenic, unfiltered (ug/L)	Arsenate, filtered (ug/L as As)	Arsenite, filtered (ug/L as As)	Dimethyl-arsinate, filtered (ug/L as As)	Monomethyl-arsonate, filtered (ug/L as As)	Barium, filtered (ug/L)	Barium, unfiltered (ug/L)	Beryllium, filtered (ug/L)	Beryllium, unfiltered (ug/L)	Boron, filtered (ug/L)	Boron, unfiltered (ug/L)
36		E.015	97	--	<10	--	.122	--	<10	<10	<10	<10	79	--	<3	--	126	--
36	520	E.017	223	--	<10	--	.435	--	<10	<10	<10	<10	495	--	<3	--	1,030	--
36	595	.020	274	--	E4	--	2.71	--	<10	<10	<10	<10	485	--	<3	--	1,540	--
36	645	.021	211	--	E3	--	6.65	--	<10	<10	<10	<10	410	--	<3	--	1,610	--
36	well head	.028	237	--	<10	--	18.8	--	10.6	<10	<10	<10	434	--	<3	--	2,060	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	660	.056	267	--	<10	--	62.8	--	57.7	<10	<10	<10	407	--	<3	--	3,520	--
36	670	.051	255	--	<10	--	58.0	--	53.8	<10	<10	<10	415	--	<3	--	3,450	--
36	670	.050	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	520	E.015	207	--	E7	--	.479	--	<10	<10	<10	<10	482	--	<3	--	875	--
36	575	E.014	219	--	E5	--	.523	--	<10	<10	<10	<10	505	--	<3	--	942	--
36	well head	E.013	293	--	E8	--	2.61	--	<10	<10	<10	<10	606	--	<3	--	965	--
36	595	E.014	195	--	E5	--	1.35	--	<10	<10	<10	<10	468	--	<3	--	920	--
36	595	E.014	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	640	E.014	219	--	E4	--	2.60	--	<10	<10	<10	<10	497	--	<3	--	974	--
36	640	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	670	E.019	192	--	E5	--	15.7	--	10.5	<10	<10	<10	354	--	<3	--	1,070	--
36	670	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	--	--	--	--	--	--	17.34	--	--	--	--	--	--	--	--	--	--
36	well head	--	--	--	--	--	17.71	--	--	--	--	--	--	--	--	--	--	--
36	well head	--	--	--	--	--	17.87	--	--	--	--	--	--	--	--	--	--	--
36	well head	--	--	<57	--	<10	--	20.62	--	--	--	--	--	148	--	<3	--	1350
36	well head	--	--	<57	--	<10	--	20.3	--	--	--	--	--	148	--	<3	--	1350
36	well head	--	<57	--	E7	--	20.4	--	--	--	--	--	149	--	<3	--	1,350	--
36	well head	--	<57	--	E3	--	20.4	--	--	--	--	--	150	--	<3	--	1,350	--
36		--	E49	--	E3	--	<.11	--	--	--	--	--	<3	--	<3	--	<43	--
36	well head	0.024	<57	--	E4	--	18.3	--	--	--	--	--	205	--	<3	--	1,050	--
36	well head	--	--	--	--	--	18.6	--	--	--	--	--	--	--	--	--	--	--
36	well head	0.025	E20	--	<10	--	20.2	--	--	--	--	--	160	--	<3	--	1,270	--
36	well head	--	<57	--	E3	--	--	--	--	--	--	--	161	--	<3	--	1,280	--
36	well head	0.024	E25	--	<10	--	20.1	--	--	--	--	--	154	--	<3	--	1,290	--
36	well head	0.025	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	0.024	<57	--	<10	--	20.3	--	--	--	--	--	151	--	<3	--	1,300	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	0.024	E25	--	<10	--	20.2	--	--	--	--	--	151	--	<3	--	1,310	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Appendix 6. Chemical analyses of ground-water samples and quality-assurance samples collected after well modification in two selected public-supply wells, Norman, Oklahoma, 2005-2006. (continued)

Well	Sampling depth (feet)	Cadmium, filtered (ug/L)	Cadmium, unfiltered (ug/L)	Chromium, filtered (ug/L)	Chromium, unfiltered (ug/L)	Cobalt, filtered (ug/L)	Cobalt, unfiltered (ug/L)	Copper, filtered (ug/L)	Copper, unfiltered (ug/L)	Iron(II), filtered, field (mg/L)	Iron, filtered, field (mg/L)	Iron, filtered (ug/L)	Iron, unfiltered (ug/L)	Lead, filtered (ug/L)	Lead, unfiltered (ug/L)	Manganese, filtered (ug/L)	Manganese, unfiltered (ug/L)	Molybdenum, filtered (ug/L)	Molybdenum, unfiltered (ug/L)	Nickel, filtered (ug/L)	Nickel, unfiltered (ug/L)
36		<3	--	E1	--	<3	--	<20	--	--	--	60	--	<10	--	E1	--	<3	--	<3	--
36	520	<3	--	59	--	<3	--	<20	--	.23	.46	100	--	<10	--	<3	--	3	--	<3	--
36	595	<3	--	78	--	<3	--	<20	--	.06	.15	122	--	<10	--	<3	--	5	--	<3	--
36	645	<3	--	82	--	<3	--	<20	--	.10	.29	96	--	<10	--	<3	--	6	--	<3	--
36	well head	<3	--	91	--	<3	--	<20	--	.03	.07	107	--	<10	--	<3	--	7	--	<3	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	660	<3	--	123	--	<3	--	<20	--	.20	.48	121	--	<10	--	<3	--	14	--	<3	--
36	670	<3	--	122	--	<3	--	<20	--	.06	.11	113	--	<10	--	<3	--	13	--	<3	--
36	670	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	520	<3	--	58	--	<3	--	<20	--	.17	.23	92	--	<10	--	E2	--	E3	--	<3	--
36	575	<3	--	57	--	<3	--	<20	--	.11	.11	95	--	<10	--	<3	--	<3	--	<3	--
36	well head	<3	--	57	--	<3	--	E9	--	.08	.08	134	--	E3	--	E1	--	4	--	<3	--
36	595	<3	--	50	--	<3	--	<20	--	.28	.42	87	--	<10	--	<3	--	3	--	<3	--
36	595	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	640	<3	--	54	--	<3	--	<20	--	.31	.42	103	--	<10	--	<3	--	3	--	<3	--
36	640	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	670	<3	--	56	--	<3	--	<20	--	.19	.22	89	--	<10	--	<3	--	E3	--	<3	--
36	670	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	--	<3	--	91	--	<3	--	<20	--	--	--	<20	--	<10	--	<3	--	5	--	<3
36	well head	--	<3	--	90	--	<3	--	<20	--	--	--	<20	--	<10	--	<3	--	5	--	<3
36	well head	<3	--	90	--	E1	--	<20	--	--	--	<20	--	<10	--	<3	--	6	--	<3	--
36	well head	<3	--	90	--	<3	--	<20	--	--	--	<20	--	<10	--	<3	--	5	--	<3	--
36		<3	--	<3	--	<3	--	<20	--	--	--	E17	--	<10	--	<3	--	<3	--	<3	--
36	well head	<3	--	78	--	<3	--	<20	--	--	--	<20	--	<10	--	<3	--	4	--	<3	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	<3	--	89	--	<3	--	<20	--	--	--	<20	--	<10	--	<3	--	5	--	<3	--
36	well head	<3	--	89	--	<3	--	<20	--	--	--	<20	--	<10	--	<3	--	5	--	<3	--
36	well head	<3	--	90	--	<3	--	<20	--	--	--	<20	--	<10	--	<3	--	5	--	<3	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	<3	--	89	--	<3	--	<20	--	--	--	<20	--	<10	--	<3	--	6	--	<3	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	<3	--	89	--	<3	--	<20	--	--	--	<20	--	<10	--	<3	--	5	--	<3	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Appendix 6. Chemical analyses of ground-water samples and quality-assurance samples collected after well modification in two selected public-supply wells, Norman, Oklahoma, 2005-2006. (continued)

Well	Sampling depth (feet)	Selenium, filtered (ug/L)	Selenium, unfiltered (ug/L)	Silver, filtered (ug/L)	Silver, unfiltered (ug/L)	Strontium, filtered (ug/L)	Strontium, unfiltered (ug/L)	Thallium, filtered (ug/L)	Thallium, unfiltered (ug/L)	Titanium, filtered (ug/L)	Titanium, unfiltered (ug/L)	Vanadium, filtered (ug/L)	Vanadium, unfiltered (ug/L)	Zinc, filtered (ug/L)	Zinc, unfiltered (ug/L)	Uranium, filtered (ug/L)	Uranium, unfiltered (ug/L)	Organic carbon, filtered (mg/L)
36		<13	--	E2	--	E2	--	<20	--	60	--	<7	--	<17	--	<20	--	E.463
36	520	E10	--	E1	--	614	--	E9	--	124	--	7	--	<17	--	<20	--	E.209
36	595	27	--	<3	--	372	--	<20	--	150	--	21	--	<17	--	<20	--	.570
36	645	30	--	E1	--	341	--	<20	--	114	--	76	--	<17	--	<20	--	E.487
36	well head	47	--	<3	--	273	--	<20	--	127	--	273	--	<17	--	<20	--	<.50
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	660	119	--	<3	--	67	--	<20	--	148	--	1,040	--	<17	--	<20	--	E.449
36	670	114	--	<3	--	118	--	<20	--	139	--	955	--	<17	--	<20	--	3.47
36	670	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.61
36	520	E9	--	<3	--	663	--	E8	--	109	--	E6	--	<17	--	<20	--	<.50
36	575	E9	--	<3	--	664	--	E10	--	113	--	E6	--	<17	--	<20	--	<.50
36	well head	E11	--	<3	--	584	--	E8	--	145	--	25	--	E10	--	<20	--	<.50
36	595	E6	--	<3	--	550	--	E10	--	104	--	18	--	E5	--	<20	--	E.261
36	595	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	640	E9	--	<3	--	502	--	E8	--	117	--	29	--	<17	--	<20	--	1.52
36	640	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.65
36	670	15	--	<3	--	223	--	<20	--	101	--	107	--	<17	--	<20	--	.583
36	670	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	--	48	--	<3	--	275	--	<20	--	<3	--	274	--	<17	--	23	--
36	well head	--	44	--	<3	--	274	--	<20	--	<3	--	281	--	<17	--	23	--
36	well head	48	--	<3	--	277	--	<20	--	E2	--	281	--	<17	--	22	--	--
36	well head	44	--	<3	--	278	--	<20	--	<3	--	272	--	<17	--	23	--	--
36		<13	--	<3	--	E1	--	<20	--	<3	--	<7	--	<17	--	<20	--	--
36	well head	43	--	<3	--	413	--	E7	--	<3	--	257	--	E14	--	E14	--	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	49	--	<3	--	304	--	<20	--	<3	--	269	--	E8	--	E19	--	--
36	well head	49	--	<3	--	305	--	<20	--	<3	--	269	--	E7	--	E20	--	--
36	well head	51	--	<3	--	292	--	<20	--	<3	--	271	--	E6	--	E20	--	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	51	--	<3	--	285	--	<20	--	<3	--	270	--	E6	--	E19	--	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
36	well head	49	--	<3	--	284	--	E7	--	<3	--	271	--	E6	--	E20	--	--
36	well head	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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