EA Engineering, Science, and Technology, Inc., PBC

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07 September 2021
LN1741

Mr. Jonathan Williams
U.S. Environmental Protection Agency
Region 10 (ECL-111)
1200 Sixth Avenue
Seattle, Washington 98101

RE: Revised QASP Addendum for the Fall 2021 Quarterly Sampling Event
Boomsnub/Airco Superfund Site, Hazel Dell, Washington
EA Project No. 1611303.0007

Dear Mr. Williams:

On behalf of Messer LLC, EA Engineering, Science, and Technology, Inc., PBC (EA) has prepared this Addendum to the Quality Assurance and Sampling Plan (QASP) for the Fall 2021 Quarterly Groundwater Sampling Event at the Boomsnub/Airco Superfund Site (Site). EA created the attached schedule for the upcoming sampling event based on the Long-Term Monitoring Plan (EA 2007[1]), updates provided in the 2020 Annual Status Report (EA 2021[2]), the Final Closure Plan (EA 2018[3]), and the Work Plan for In-Situ Treatment of Residual Contamination (EA 2018[4]).

Per written agreement[5] Attainment Monitoring began in 2020 at wells that have an On-Hold status but are in steady state conditions, and in accordance with the Final Closure Plan. Messer began Attainment Monitoring on a quarterly basis for those monitoring well locations that qualify. Additional wells are now eligible for Attainment Monitoring following the 3 January 2021 shutdown of the Groundwater Treatment and subsequent return to steady state groundwater conditions across site, these eligible wells are included in the Fall 2021 Quarterly Sampling Event. Furthermore, Remediation Monitoring will continue for select wells that are below the Cleanup Level, in-situ performance monitoring will continue at key locations downgradient of permeable reactive barrier injection locations, and post-shutdown chromium concentration monitoring will commence in the vicinity of the Groundwater Treatment System.

The sampling event is scheduled to begin on 11 October 2021. It will include groundwater sampling for Operating Unit (OU)-2 (Messer Property), OU-3 (site-wide groundwater), and the offsite Northern Plume. Groundwater samples will be collected from extraction wells and selected monitoring wells as noted in the attached Schedule (Table 1). The samples will be analyzed for total chromium by U.S. Environmental Protection Agency (EPA) Method 200.7, and/or volatile organic compounds by EPA Method 8260C. Samples from select wells will also

[1] EA. 2007. *Long-Term Monitoring Plan, Boomsnub/Airco Superfund Site, Hazel Dell, Washington. Revision 0.* March.
[2] EA. 2021. *2020 Annual Status Report. Boomsnub/Airco Superfund Site, Hazel Dell, Washington. Revision 0.* March.
[3] EA. 2018. *Closure Plan. Boomsnub/Airco Superfund Site, Hazel Dell, Washington. Final.* March.
[4] EA. 2018. *Work Plan, In-Situ Treatment of Areas of Residual Contamination, Boomsnub/Airco Superfund Site, Hazel Dell, Washington, Revision 0.* July.
[5] Received via email from Jonathan Williams on 28 July 2020.

be analyzed for additional parameters as part of the in-situ treatment plan, as noted below. Sample locations for this event are presented on Figure 1.

Work will be conducted in accordance with the Site QASP (EA 2019[6]) with the following clarifications and exceptions:

- The Fall 2021 sampling event will take an estimated five working days (11 October through 15 October 2021). Two 2-person teams will complete the sampling effort.

- The attached Sampling Schedule (Table 1) lists the wells to be sampled along with the planned sampling sequence and sample analyses.

- Monitoring and extraction well construction information is presented in Table 2.

- Passive diffusion bag (PDB) samplers will be deployed, as necessary, at least two weeks in advance of sampling. PDBs are considered acceptable for sampling if they have been deployed between two weeks and one year prior to the sampling event. Upon retrieval, each PDB will be inspected for the possible presence of a biofilm on the outside of the sampler and the presence or absence will be noted on the sampling form. If a biofilm is observed, that well will also be sampled using a non-dedicated submersible pump and low-flow sampling procedures.

- Traffic control procedures are required to access MW-40/PZ-40 and MW-39/PZ-39, located within the County roadway. Therefore, water levels will be obtained in these wells/piezometers only when they are sampled. Both MW-40/PZ-40 and MW-39/PZ-39 are scheduled for sampling during this event.

- Measurement of field parameters is not required when collecting samples using PDBs. However, field parameters may be collected from PDBs in wells used to assess progress of in-situ remediation.

- EA will receive electronic files of the analytical reports from the project laboratory, ALS Environmental.

- Data validation will be performed on one chromium and one VOC sample delivery group for the Fall 2021 sampling event, in accordance with the Consent Decree (Docket No. CV07-05163-FDB, signed 29 June 2007).

- The results of this monitoring event will be summarized in the 2021 Annual Report, planned for submittal in March 2022.

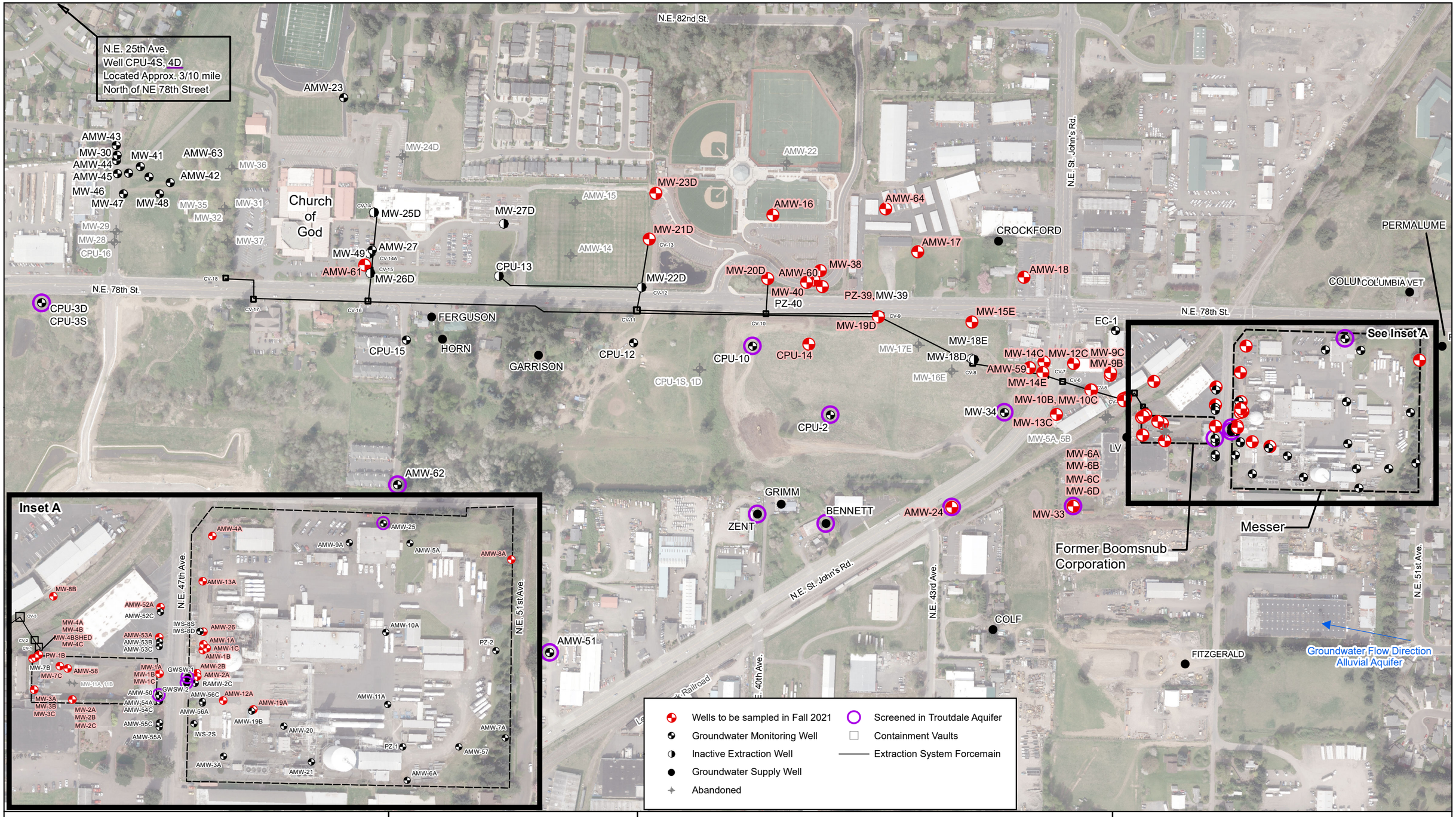
[6] EA. 2019. *Quality Assurance and Sampling Plan, Boomsnub/Airco Superfund Site, Hazel Dell, Washington. Revision 2.0*. October.

If you have any questions or comments, please contact me at 206-452-5348.

Sincerely,
EA ENGINEERING, SCIENCE,
AND TECHNOLOGY, INC., PBC

Jonathan Reeve, LHG
Project Coordinator

cc: Tim Maley, EPA (electronic copy)
Andy Smith, Ecology (hard and electronic copies)
Dave Sordi, Messer LLC (electronic copy)



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BOOMSNUB / AIRCO SUPERFUND SITE
HAZEL DELL, WASHINGTON

EA Project No. 1524098
File Location: C:\Users\hdennis\Desktop\Messer2021\2021QASP\Fig_1_Fall_2021_sample_locations.mxd
File Name: Fig_1_Fall_2021_sample_locations

FIGURE 1
Sample Locations, Fall 2021

TABLE 1. SAMPLING SCHEDULE
FALL 2021 QUARTERLY GROUNDWATER MONITORING EVENT
BOOMSNUB/AIRCO SUPERFUND SITE

					Environmental Samples									QA/QC Samples				
					VOCs	**TCr[1]**	**Field Parameters (ph,ORP, DO, Cond)**	**Metals[2]**	**Dissolved Iron[3]**	**Anions[4]**	**DOC**	**COD**	**Dissolved Gases[3]**	Field Duplicate VOCs	Field Duplicate TCr	Field Duplicate In-Situ	MS/MSD	Rinsate Blank
Well ID	**Reason**	**Well Type**	**Team No.**	**Notes**	EPA 8260C	EPA 6020A		EPA 6010C	EPA 6010C	EPA 300.0	SM 5310C	SM 5220C	RSK 175	6 total	3 total	1 total		One per day
AMW-1A	R	M	2	ORP/DO	X		X											
AMW-1B	A	M			X													
AMW-1C	A	M			X													
AMW-2A	R	M	2	ORP/DO	X		X											
AMW-2B	A	M			X													
AMW-4A	A	M	2		X													
AMW-8A	A	M			X													
AMW-12A	R	M	1	Includes in-situ treatment parameters[8]	X		X	X	X	X	X	X	X					
AMW-13A	A	M	1		X													
AMW-16	NP	M	1	Northern Plume, See note[5]	X													
AMW-17	NP	M/D	2	Northern Plume[7]	X													
AMW-18	NP	M	2	Northern Plume	X													
AMW-19A	A	M	1		X													
AMW-24	R	M		Annual, above MCL	X									X				
AMW-26	A	M	1		X													
AMW-52A	A	M	2		X												X	
AMW-53A	R	M	1	ORP/DO	X		X											
AMW-58	A	M	1		X													
AMW-59	R	M	2	Includes in-situ treatment parameters[8]	X			X	X	X	X	X	X					
AMW-60	A	M			X													
AMW-61	R	M		Annual, above MCL	X													
AMW-64	NP	M		Northern Plume	X													
CPU-14	R	M	1		X	X												
MW-1A	A	M	1	ORP/DO	X		X											
MW-1B	A	M	1		X									X				
MW-1C	A	M	1		X													
MW-2A	R	M	1		X	X	X							X	X			
MW-2B	A	M	1		X	X	X											
MW-2C	A	M	1		X		X											
MW-3A	GWTS	M	1			X	X											
MW-3B	A	M	2		X	X	X											
MW-3C	A	M	2		X	X	X											
MW-4A	GWTS	M	2		X	X	X											
MW-4B	GWTS	M	1		X	X	X											
MW-4BSHED	R	M	1		X	X	X											
MW-4C	GWTS	M	1		X	X	X											
MW-6A	GWTS	M	2		X	X	X							X				
MW-6B	GWTS	E	2		X	X	X											
MW-6C	A	M	1		X	X	X											
MW-6D	A	M	1		X	X	X											
MW-7C	A	M	1		X	X	X											
MW-8B	A	M	1		X	X	X											
MW-9B	GWTS	M	2		X	X	X											
MW-9C	A	M	2		X													

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FALL 2021 QUARTERLY GROUNDWATER MONITORING EVENT
BOOMSNUB/AIRCO SUPERFUND SITE

					Environmental Samples										QA/QC Samples				
					VOCs	TCr[1]	Field Parameters (ph,ORP, DO, Cond)	Metals[2]	Dissolved Iron[3]	Anions[4]	DOC	COD	Dissolved Gases[3]	Field Duplicate VOCs	Field Duplicate TCr	Field Duplicate In-Situ	MS/MSD	Rinsate Blank
Well ID	**Reason**	**Well Type**	**Team No.**	**Notes**	EPA 8260C	EPA 6020A		EPA 6010C	EPA 6010C	EPA 300.0	SM 5310C	SM 5220C	RSK 175	6 total	3 total	1 total		One per day
MW-10B	R	E	1		X	X	X											
MW-10C	A	E	2		X	X	X											
MW-12C	A	M	2		X	X	X										X	
MW-13C	A	M	2		X	X	X											
MW-14C	A	M	2	Includes in-situ treatment parameters[8]	X	X	X	X	X	X	X	X	X	X	X	X		
MW-14E	R	M	1	Includes in-situ treatment parameters[8]	X	X	X	X	X	X	X	X	X					
MW-15E	A	M	2		X	X	X											
MW-19D	R	M	1	Includes in-situ treatment parameters[8]	X	X	X	X	X	X	X	X	X				X	
MW-20D	R	E	2	Includes in-situ treatment parameters[8]	X	X	X	X	X	X	X	X	X					
MW-21D	NP	M		Northern Plume	X													
MW-23D	NP	M		Northern Plume	X													
MW-33	A	M	2		X													
MW-38	NP	M	2	Northern Plume	X													
MW-40	R	M			X	X	X							X	X			
PW-1B	A	E	1		X	X	X											
PZ-39	R	M	1	Includes in-situ treatment parameters[8]; See note[6]	X		X	X	X	X	X	X	X					
Collect Water Level Measurements - Alluvial and Troutdale Aquifers																		
Totals	PDBs	**29**			**59**	**28**	**34**	**7**	**7**	**7**	**7**	**7**	**7**	**6**	**3**	**1**	**3**	**-**

NOTES:
1 - If turbidity does not stabilize below 20 NTU, a 0.45-micron field filter will be used to filter an additional bottle for dissolved chromium (TCr + DCr), and the metals bottle will be filtered as well. Denote on COC which bottles are field filtered.
2 - Metals: arsenic, calcium, magnesium, manganese
3 - Dissolved samples will be field filtered with a 0.45-micron filter. If no field filters are available, the laboratory can filter the dissolved sample if the sample aliquot is collected in an un-preserved container.
4 - Anions: Nitrate, Sulfate
5 - Coordinate schedule with Bill Bjerke, Clark County, at 360-397-6118 ext. 1656.
6 - Need traffic control. Sampling to be performed between 9:00 and 11:00 am. 2021 ALS PO for O&M Work 21872
7 - Global Solarium contact, Roman Sobolweski, roman@globalsolariums.com, 360-821-9023. 2021 ALS PO for Northern Plume Wells 22030
8 - Monitored as part of the In-Situ Treatment Plan, following recommendations of the In-Situ Phase II Treatment Report.
J - The result is an estimated concentration less than the method reporting limit but greater than or equal to the method detection limit.
A - Attainment Monitoring.
DO - dissolved oxygen
R - Remediation Monitoring.
NP - Northern Plume Monitoring.
E - Extraction well (prior to GWTS shutdown).
M - Monitoring well.
M/D - Monitoring well with a dedicated pump.
MS/MSD - Matrix spike/matrix spike duplicate.
NA - Not available.
NS - Not sampled.
GWTS - Groundwater Treatment System Shutdown Monitoring - per Groundwater Treatment Shutdown Memorandum Rev. 1 dated 9/23/2020.
ORP - oxidation-reduction potential
QA/QC - Quality assurance/quality control.
TCE - Trichloroethene.
TCr - Total chromium.
U - The analyte was not detected at the specified reporting limit.
µg/L - Micrograms per liter.
UJ - The analyte was not detected and the limit is estimated.
VOCs - Volatile organic compounds.
BOLD - PDB sample, deploy PDB 2 weeks prior to sampling event if not currently installed.

TABLE 2. MONITORING AND EXTRACTION WELL CONSTRUCTION DETAILS

Well ID	Well Type	Total Depth (ft btoc)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Screen Length (ft)	Top of Casing Elevation (ft MSL)
AMW-1A	M	34.86	24.56	34.56	10	284.09
AMW-1B	M	56.49	46.49	56.49	10	284.11
AMW-1C	M	79	69	79	10	284.06
AMW-2A	M	34.51	24.51	34.51	10	284.03
AMW-2B	M	59	47	57	10	284.11
RAMW-2C	M	70.55	60.55	70.55	10	283.23
AMW-3A	M	34	24.5	34.5	10	283.92
AMW-4A	M	34.2	23.9	33.9	10	283.74
AMW-5A	M	34.5	24.5	34.5	10	284.14
AMW-6A	M/D	34	24	34	10	284.56
AMW-7A	M/D	34.25	24.25	34.25	10	285.02
AMW-8A	M	34.5	24.5	34.5	10	285.49
AMW-9A	M	34.5	24.5	34.5	10	283.92
AMW-10A	M/D	31.5	21.5	31.5	10	284.01
AMW-11A	M/D	34	24	34	10	283.21
AMW-12A	M	34.85	24.35	34.35	10	283.74
AMW-13A	M	34.3	23.8	33.8	10	283.88
AMW-16	M	92.13	81.13	91.13	10	266.11
AMW-17	M	90.38	79.55	89.38	10	260.25
AMW-18	M	103.65	92.65	102.65	10	278.80
AMW-19A	M	35.25	25.25	35.25	10	283.94
AMW-19B	M	54.5	44.5	54.5	10	283.97
AMW-20	M	35	25	35	10	283.69
AMW-21	M	35	25	35	10	284.45
AMW-23	M	85	75	85	10	278.26
AMW-24	M	200	190	200	10	264.72
AMW-25	M/D	225	215	225	10	282.94
AMW-26	M/D	34.5	24.2	34.2	10	283.02
AMW-27	E/M	88	78	88	10	272.60
AMW-42	M	97.97	82.97	97.97	15	257.41
AMW-43	M/D	85	72	85	13	247.71
AMW-44	M/D	81	71	81	10	247.82
AMW-45	M/D	77	67	77	10	244.87
AMW-50	M/D	195.19	185.19	195.19	10	282.78
AMW-51	M/D	195.7	185.7	195.7	10	258.44
AMW-52A	M	34.55	24.55	34.55	10	280.40
AMW-52C	M	73.63	63.63	73.63	10	280.38
AMW-53A	M	32.63	22.33	32.33	10	281.05
AMW-53B	M	54.55	44.55	54.55	10	281.20
AMW-53C	M	74.21	64.21	74.21	10	281.41
AMW-54A	M	34.3	24.3	34.3	10	283.31
AMW-54C	M	74.74	64.74	74.74	10	283.12
AMW-55A	M	30.83	20.83	30.83	10	282.11
AMW-55C	M	68.45	58.45	68.45	10	282.71
AMW-56A	M	35.24	25.24	35.24	10	283.67

TABLE 2. MONITORING AND EXTRACTION WELL CONSTRUCTION DETAILS

Well ID	Well Type	Total Depth (ft btoc)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Screen Length (ft)	Top of Casing Elevation (ft MSL)
AMW-56C	M	67.40	57.4	67.4	10	283.67
AMW-57	M	75.38	70.08	75.08	5	285.68
AMW-58	M	114.73	109.43	114.43	5	280.08
AMW-59	M	140.04	134.74	139.74	5	269.37
AMW-60	M	109.50	104.2	109.2	5	266.45
AMW-61	M	97.16	91.86	96.86	5	273.78
AMW-62	M/D	196.03	185.73	195.73	10	258.66
AMW-63	M	86.43	76.13	86.13	10	257.42
AMW-64	M	98.70	88.4	98.4	10	266.13
AOC1 GP-01	M	49.74	29.50	49.50	20	260.11
AOC1 GP-05	M	49.78	29.50	49.50	20	281.42
CPU-2	M	197.20	186.2	196.2	10	259.57
CPU-3D	M/D	219.38	212.38	217.38	5	246.77
CPU-3S	M	72.72	65.72	70.72	5	246.77
CPU-4D	M	210	203	208	5	234.05
CPU-4S	M	69.3	62.3	67.3	5	234.10
CPU-10	M	198.22	187.22	197.22	10	261.24
CPU-12	M	72.12	61.12	71.12	10	275.23
CPU-13	M	82.7	71.7	81.7	10	278.99
CPU-14	M	71.43	60.43	70.43	10	257.56
CPU-15	M	89.49	78.49	88.49	10	275.87
MW-1A	M	38.56	28.36	38.26	9.9	285.49
MW-1B	M	59.79	54.49	59.49	5	285.47
MW-1C	M	77.44	72.14	77.14	5	285.45
MW-2A	M	37.48	32.09	37.09	5	282.57
MW-2B	M	57.94	52.64	57.64	5	282.49
MW-2C	M	86.94	81.64	86.64	5	282.43
MW-3A	M	32.67	22.37	32.37	10	280.21
MW-3B	M	56.69	51.39	56.39	5	280.33
MW-3C	M	83.69	78.39	83.39	5	280.35
MW-4A	M	37.69	27.39	37.39	10	280.30
MW-4B	M	44.77	39.47	44.47	5	280.15
MW-4BShed	M	58.20	52.9	57.9	5	280.47
MW-4C	M	80	74.7	79.7	5	279.91
MW-6A	M	31.5	18.25	28.25	10	278.77
MW-6B	E	59	45.75	55.75	10	273.32
MW-6C	M	84.8	71.55	81.55	10	278.65
MW-6D	M	113.7	100.45	110.45	10	278.90
MW-7B	M	57.7	47	57	10	280.02
MW-7C	M	80.5	69	79	10	279.94
MW-8B	M	60	50	60	10	280.70
MW-9B	M	58	44.9	54.9	10	275.42
MW-9C	M	76.5	65	75	10	275.44
MW-10B	E	61.5	48	58	10	273.24
MW-10C	E	81.5	70	80	10	273.25

TABLE 2. MONITORING AND EXTRACTION WELL CONSTRUCTION DETAILS

Well ID	Well Type	Total Depth (ft btoc)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Screen Length (ft)	Top of Casing Elevation (ft MSL)
MW-12C	M	82.7	71.2	81.2	10	274.31
MW-13C	M	76.53	65.03	75.03	10	271.97
MW-14C	M	81.5	70	80	10	271.22
MW-14E	M	126	115	125	10	268.95
MW-15E	M	107.23	96.23	106.23	10	265.73
MW-18D	E/M	94.4	73.4	93.4	20	262.74
MW-18E	M	122.81	111.81	121.81	10	261.77
MW-19D	E/M	92.2	76.2	91.2	15	257.98
MW-20D	E	87	76	86	10	269.43
MW-21D	M	75.4	64.4	74.4	10	265.98
MW-22D	M	65.2	54	64	10	269.02
MW-23D	M	88.06	71.86	86.86	15	265.33
MW-25D	E	79.05	67.85	77.85	10	272.13
MW-26D	E	94.2	83	93	10	272.86
MW-27D	M	76.3	65.1	75.1	10	273.23
MW-30	M/D	63	51	61	10	246.75
MW-33	M/D	215	205	215	10	272.55
MW-34	M	197.99	187.99	197.99	10	260.32
MW-38	M	82	77	82	5	263.92
MW-39	M	68	63	68	5	265.52
MW-40	M	66	61	66	5	266.20
MW-41	M	83.53	73.56	83.56	10	254.94
MW-46	M	81.11	71.08	81.08	10	248.87
MW-47	M/D	83	72.7	82.7	10	246.39
MW-48	M	89.83	79.53	89.53	10	252.15
MW-49	E	81.5	71.2	81.2	10	271.68
PW-1B	E	58	48	58	10	276.56
PZ-1	PZ	38.79	23.79	38.79	15	284.15
PZ-2	PZ	42.97	27.97	42.97	15	286.54
PZ-39	M	91.2	89.2	91.2	2	265.41
PZ-40	M	90	88	90	2	266.12
BENNETT	Private	197	180	180	NA	260.00

NOTES:

btoc = Below top of casing.
E = Extraction well.
E/M = Extraction well (inactive) with pump pulled; sampled using monitoring well techniques.
ft = Feet.
M = Monitoring well.
M/D = Monitoring well with dedicated pump.
MSL = Mean sea level.
NA = Not available.
PZ = Piezometer.

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